

W83793G

Winbond H/W Monitor

DATE: DECEMBER 11, 2006

REVISION: 1.0

W83793G DATA SHEET REVISION HISTORY

| | PAGES | DATES | VERSION | WEB VERSION | MAIN CONTENTS |
|---|-------------------|----------|---------|-------------|---|
| 1 | n.a. | | 0.1 | n.a. | Preliminary |
| 2 | n.a. | 06/06/05 | 0.2 | n.a. | Modify pin type for VID pins. Sec4.1 and 5.2 |
| 3 | n.a. | 08/01/05 | 0.3 | | Add Vtt and PECL pin. |
| 4 | n.a. | | 0.32 | n.a. | 1. Modify chap4(block diagram) and chap5(pin configuration) |
| 5 | n.a. | 01/20/06 | 0.33 | n.a. | Modify Register for B version. |
| 6 | n.a. | 01/06/06 | 0.34 | n.a. | 1. Modify the formula to calculate the RPM 2. Add information of "The Top Marking" 3. Change the part name to W83793G |
| 7 | Page 9, 13, 14 | 02/27/06 | 0.35 | n.a. | Add FANIN9~FANIN12 function description |
| 8 | | 12/1/06 | 1.0 | | 1. Modify 8.8.2.3 register description. 2. Update 8.9.2.1 Voltage reading formula 3. Remove AMD SI description 4. Update 8.3.2.2 Index 0Ch I2CADDR75B registers 5. Update AC Characteristic on Chap 9.3 |

Table of Contents-

| | | |
|-------|---|----|
| 1. | GENERAL DESCRIPTION | 1 |
| 2. | FEATURES | 2 |
| 2.1 | Monitoring Items | 2 |
| 2.2 | Address Resolution Protocol and Alert Standard Format | 2 |
| 2.3 | Actions Enabling | 3 |
| 2.4 | General | 3 |
| 2.5 | Package | 3 |
| 3. | KEY SPECIFICATIONS | 3 |
| 4. | BLOCK DIAGRAM | 4 |
| 5. | PIN CONFIGURATION | 5 |
| 6. | PIN DESCRIPTION..... | 6 |
| 6.1 | Pin Type Description..... | 6 |
| 6.2 | Pin Description List..... | 6 |
| 7. | FUNCTIONAL DESCRIPTION | 11 |
| 8. | CONFIGURATION REGISTERS | 12 |
| 8.1 | ID, Bank Select Registers..... | 12 |
| 8.1.1 | ID, Bank Select Registers Map..... | 12 |
| 8.1.2 | ID, Bank Select Register Details..... | 12 |
| 8.2 | Watch Dog Timer Registers | 14 |
| 8.2.1 | Watch Dog Timer Registers Map..... | 14 |
| 8.2.2 | Watch Dog Timer Register Details | 15 |
| 8.3 | Configuration and Address Select Registers..... | 17 |
| 8.3.1 | Register Maps | 17 |
| 8.3.2 | Register Details | 17 |
| 8.4 | VID Control/Status Registers..... | 20 |
| 8.4.1 | VID Control/Status Registers Map..... | 20 |
| 8.4.2 | VID Register Details | 21 |
| 8.5 | INT/SMI# Control/Status Registers | 26 |
| 8.5.1 | INT/SMI Control/Status Register Map | 27 |
| 8.5.2 | INT/SMI Control/Status Register Details..... | 27 |
| 8.6 | OVT/BEEP Control Register..... | 33 |
| 8.6.1 | OVT/BEEP Control Registers Map | 33 |
| 8.6.2 | OVT/BEEP Control Registers Details | 33 |
| 8.7 | Multi-Function Pin Control Register..... | 36 |
| 8.7.1 | Multi-Function Pin Control Register Map | 36 |
| 8.7.2 | Multi-Function Pin Control Register Details | 37 |



| | | |
|--------|--|-----|
| 8.8 | Temperature Sensors Control Register | 40 |
| 8.8.1 | Temperature Sensors Control Register Map | 40 |
| 8.8.2 | Temperature Sensors Control Register Details | 40 |
| 8.9 | Voltage Channel Registers | 44 |
| 8.9.1 | Voltage Channel Registers Map | 44 |
| 8.9.2 | Voltage Channel Register Details | 45 |
| 8.10 | Temperature Channel Registers | 48 |
| 8.10.1 | Temperature Channel Register Map | 48 |
| 8.10.2 | Temperature Channel Register Details | 49 |
| 8.11 | Fan Control Registers | 51 |
| 8.11.1 | Fan Register Map | 51 |
| 8.11.2 | Fan Register Details | 56 |
| 8.12 | PECI Control Registers | 81 |
| 8.12.1 | PECI Register Map | 82 |
| 8.12.2 | PECI Register Details | 83 |
| 8.13 | ASF Control Registers | 89 |
| 8.13.1 | ASF Register Map | 89 |
| 8.13.2 | ASF Register Details | 95 |
| 9. | ELECTRICAL CHARACTERISTICS | 112 |
| 9.1 | Absolute Maximum Ratings | 112 |
| 9.2 | DC Characteristics | 112 |
| 9.3 | AC Characteristics | 114 |
| 9.3.1 | Access Interface | 114 |
| 9.3.2 | Dynamic Vcore Limit Setting | 115 |
| 9.3.3 | Power On Reset | 116 |
| 10. | ORDER INFORMATION | 116 |
| 11. | APPENDIX | 117 |
| 11.1 | Register Summary | 117 |
| 12. | THE TOP MARKING | 125 |
| 13. | PACKAGE DRAWING AND DIMENSIONS | 126 |



1. GENERAL DESCRIPTION

W83793G is an evolving version of the W83792D. Besides the conventional functions of W83792D, W83793G uniquely provides several innovative features such as ASF 2.0 specification compliant, SMBus 2.0 ARP command compatible, 8 sets of Smart fan™. Conventionally, W83793G can be used to monitor several critical hardware parameters of the system, including power supply voltages, fan speeds, and temperatures, which are very important for a high-end computer system, such as server, workstation...etc, working very stably and efficiently.

A 10-bit analog-to-digital converter (ADC) is built inside W83793G. W83793G can simultaneously monitor 11 analog voltage inputs (including power VDD/5VSB/VBAT monitoring), 12 fan tachometer inputs, 6 remote temperatures, 4 of which support current mode (dual current source) temperature measurement method, and Watch Dog Timer function. The sense of remote temperature can be performed by thermistors, or directly from Intel® / AMD™ CPU with thermal diode output. W83793G provides 8 PWM (pulse width modulation) / DC fan output modes for smart fan control - “ Thermal Cruise™ ” mode and “ Smart Fan™ II ” mode. Under “Thermal Cruise™” mode, temperatures of CPU and the system can be maintained within specific programmable ranges under the hardware control. As Smart Fan™ II, which provides 8 sets of temperatures point each could control fan’s duty cycle, depends on this construction, fan could be operated at the lowest possible speed so that the acoustic noise could be avoided. As for warning mechanism, W83793G provides SMI#, OVT#, IRQ, BEEP signals for system protection events. W83793G also has 2 specific pins to provide selectable address setting for application of multiple devices (up to 4 devices) wired through I²C interface.

W83793G can uniquely serve as an ASF sensor to respond to ASF master’s request for the implementation of network management in OS-absent status. Through W83793G’s compliance with ASF2.0 sensor specification, network server is able to monitor the environmental status of each client in OS-absent state by PET (Platform Event Trap) frame values returned from W83793G, such as temperatures, voltages, fan speed and case open. Moreover, W83793G supports SMBus 2.0 ARP command to solve the problem of address conflicts by dynamically assigning a new unique address for W83793G ASF Function after W83793G’s UDID is sent.

Through the application software or BIOS, the users can read all the monitored parameters of the system from time to time. A pop-up warning can also be activated when the monitored item is out of the proper/preset range. The application software could be Winbond’s Hardware Doctor™ or other management application software. Besides, the users can set up the upper and lower limits (alarm thresholds) of these monitored parameters and activate corresponding maskable interrupts.



2. FEATURES

2.1 Monitoring Items

VOLTAGE

- Monitoring 11 voltages (3 power pins – VSB, VCC, VBAT, 8 external pins – Vcore x 4, +3V, +12V, Others x 2).

TEMPERATURE

- 4 thermal diode (D+, D-) inputs, supporting current mode (dual current source) temperature measurement method
- 2 thermistor inputs
- Support Intel® PECI

FAN

- 8 DC/PWM Fan outputs for fan speed control
- 8 Fan speed inputs for monitoring (up to 12 by register setups)
- Smart Fan™ -- control the most fitting speed automatically by temperature.

CASEOPEN

- Case open detection input.

2.2 Address Resolution Protocol and Alert Standard Format

- Support System Management Bus (SMBus) version 2.0 specification
- Comply with hardware sensor slave ARP (Address Resolution Protocol)
- Response ASF 2.0 command --- Get Event Data, Get Event Status, Device Type Poll
- Comply with ASF 2.0 sensors (Monitoring fan speed, voltage, temperature, thermal trip and case open event/status)
- Support Remote Control subset: Remote Power-on/ Power-off/ Reset.



2.3 Actions Enabling

- Issue SMI#, OVT# signals to activate system protection
- Issue BEEP signal to activate system speaker or buzzer

2.4 General

- I²C serial bus interface
- Watch Dog Timer function with pin: WDTRST#, SYSRST_IN.
- 2 pins (A0, A1) to provide selectable address settings for application of multiple devices (up to 4 devices) wired together through I²C interface
- 5V operation

2.5 Package

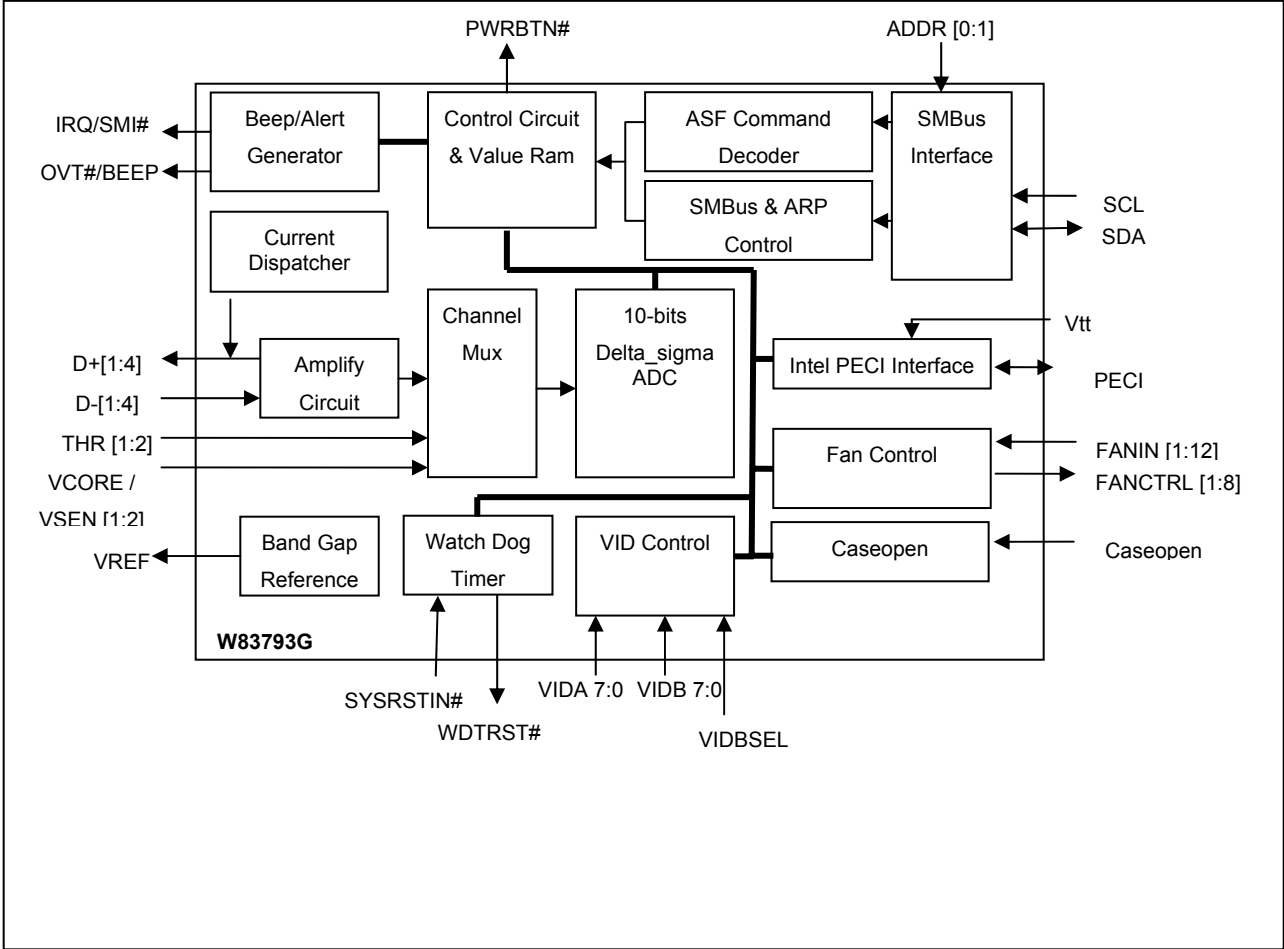
- 56 Pin SSOP 300mil.

3. KEY SPECIFICATIONS

| | |
|--------------------------------------|------------|
| Voltage monitoring accuracy | ±1% |
| ● Temperature Sensor Accuracy | |
| Remote Diode Sensor Accuracy | ± 1°C |
| Resolution | 0.5 °C |
| Supply Voltage (Pin 7, 5VSB) | 5±0.25V |
| ● Operating Supply Current | 25 mA typ. |
| Current without 48MHz input at Pin 1 | 8 mA typ. |
| ● ADC Resolution | 10 Bits |



4. BLOCK DIAGRAM





5. PIN CONFIGURATION

W83793G (56 SSOP)

| | | | |
|---------------|----|----|-----------------|
| CLK | 1 | 56 | VIDB7/FANCTL8 |
| OVT#/BEEP | 2 | 55 | VIDB6/FANIN8 |
| IRQ/SMI# | 3 | 54 | VIDB5/FANCTL7 |
| SCL | 4 | 53 | VIDB4/FANIN7 |
| SDA | 5 | 52 | VIDB3/FANCTL6 |
| PWRBTN# | 6 | 51 | VIDB2/FANIN6 |
| 5VSB | 7 | 50 | VIDB1/FANCTL5 |
| CASEOPEN# | 8 | 49 | VIDB0/FANCTL4 |
| VBAT | 9 | 48 | FANIN5 |
| VIDA4/FANIN8 | 10 | 47 | FANIN4 |
| VIDA5/FANCTL8 | 11 | 46 | FANCTL3/VIDBSEL |
| VIDA6 | 12 | 45 | FANIN3 |
| VIDA7 | 13 | 44 | FANCTL2/ADDR1 |
| WDTRST# | 14 | 43 | FANIN2 |
| SYSRSTIN# | 15 | 42 | FANCTL1/ADDR0 |
| GND | 16 | 41 | FANIN1 |
| PECI | 17 | 40 | VIDA3/FANIN12 |
| VTT | 18 | 39 | VIDA2/FANIN11 |
| VSEN1 | 19 | 38 | VIDA1/FANIN10 |
| VSEN2 | 20 | 37 | VIDA0/FANIN9 |
| VSEN3 | 21 | 36 | 4_D- |
| VSEN4 | 22 | 35 | 4_D+ |
| VCOREA | 23 | 34 | 3_D- |
| VCOREB | 24 | 33 | 3_D+ |
| 5VDD | 25 | 32 | 2_D- |
| VREF | 26 | 31 | 2_D+ |
| THR1 | 27 | 30 | 1_D- |
| THR2 | 28 | 29 | 1_D+ |



6. PIN DESCRIPTION

6.1 Pin Type Description

| SYMBOL | DESCRIPTION |
|--------|-----------------------------|
| t | TTL level |
| v1 | Vil/Vih=0.4/0.6 level |
| v2 | Vil/Vih=0.8/1.4 level |
| v3 | Vtt level |
| s | Schmitt trigger |
| 12 | 12mA sink/source capability |
| OUT | Output pin |
| OD | Open-drain output pin |
| AOUT | Output pin (Analog) |
| IN | Input pin (digital) |
| AIN | Input pin(Analog) |

6.2 Pin Description List

| PIN NAME | PIN NO. | POWER PLANE | TYPE | DESCRIPTION |
|-----------|---------|-------------|-----------------------|---|
| CLK | 1 | 5VSB | IN _{ts} | 48MHz System clock while VCC5V powered up. PECl and FAN will use this clock to drive logics. |
| OVT# | 2 | 5VSB | OD ₁₂ | Over temperature alert. Low active. |
| BEEP | | | | BEEP output when abnormal event occurs. When this is no abnormal events, this pin asserts low. |
| IRQ | 3 | 5VSB | OUT ₁₂ | Interrupt request output when abnormal events occur. |
| SMI# | | | OD ₁₂ | System Management Interrupt (open drain). |
| SCL | 4 | 5VSB | IN _{ts} | Serial Bus Clock. |
| SDA | 5 | 5VSB | IN/OD _{12ts} | Serial Bus bi-directional data. |
| PWRBTN# | 6 | 5VSB | OD ₁₂ | Power Button output for enable/disable power supply. This pin is related to ASF commands. |
| 5VSB | 7 | - | POWER | This pin is power for W83793G. Bypass with the parallel combination of 10μF (electrolytic or tantalum) and 0.1μF (ceramic) bypass capacitors. |
| CASEOPEN# | 8 | VBAT | IN _{ts} | CASE OPEN detection. An active low input from an external device when case is Intruded. This signal will be latched even the case is closed. |



Pin Description List, continued.

| PIN NAME | PIN NO. | POWER PLANE | TYPE | DESCRIPTION |
|-----------|---------|-------------|---|---|
| VBAT | 9 | | POWER | VBAT supplies power for CASEOPEN. Besides, it is also a voltage monitor channel. |
| VIDA4 | 10 | 5VSB | IN _{V1s} or IN _{V2s} | Voltage Supply readouts bit 4 from CPU A. (Default) |
| FANIN8 | | | IN _{ts} | 0V to +5V amplitude fan tachometer input |
| VIDA5 | 11 | 5VSB | IN _{V1s} or IN _{V2s} | Voltage Supply readouts bit 5 from CPU A. (Default) |
| FANCTL8 | | | OUT / OD _{12a} | FAN control output. The 8 th fan control signal can be programmed to output through pin 56 or this pin. When this pin is programmed to be fan control signal, it only supports PWM mode. |
| FANIN12 | | | IN _{ts} | 0V to +5V amplitude fan tachometer input |
| VIDA6 | 12 | 5VSB | IN _{V1s} or IN _{V2s} | Voltage Supply readouts bit 6 from CPU A. |
| VIDA7 | 13 | 5VSB | IN _{V1s} or IN _{V2s} | Voltage Supply readouts bit 7 from CPU A. (Default) |
| WDTRST# | 14 | 5VSB | OD ₁₂ | Low active system reset. If triggered, this pin will send out 100ms low pulse for system reset. |
| SYSRSTIN# | 15 | 5VSB | IN _{ts} | System reset input, used to control WDT. |
| GND | 16 | | POWER | System Ground. |
| PECI | 17 | 5VDD | IN/O _{V3} | Intel® CPU Peci interface |
| VTT | 18 | | POWER | Intel® CPU Vtt power |
| VSEN1 | 19 | | AIN | Voltage sensor input. Detect range is 0~4.096V |
| VSEN2 | 20 | | AIN | Voltage sensor input. Detect range is 0~4.096V |
| +12VSEN | 21 | - | AIN | +12V voltage input for monitoring. This +12V input voltage needs external resistors to scale it down. The detect range is 0~2.048V. |
| +3VSEN | 22 | | AIN | +3V voltage input for monitoring. The detect range is 0~4.096V. |



Pin Description List, continued.

| PIN NAME | PIN NO. | POWER PLANE | TYPE | DESCRIPTION |
|----------|---------|-------------|---|---|
| VCOREA | 23 | | AIN | CPU A core voltage input. Detect range is 0~2.048V |
| VCOREB | 24 | | AIN | CPU B Core Voltage Input. Detect range is 0~2.048V. |
| 5VDD | 25 | - | POWER | +5V VDD power. Bypass with the parallel combination of 10 μ F (electrolytic or tantalum) and 0.1 μ F (ceramic) bypass capacitors. |
| VREF | 26 | | AOUT | Reference voltage output. |
| THR1 | 27 | | AIN | Thermistor 1 terminal input. |
| THR2 | 28 | | AIN | Thermistor 2 terminal input. |
| 1_D+ | 29 | | AIN | Thermal diode 1 D+ . |
| 1_D- | 30 | | AIN | Thermal diode 1 D- . |
| 2_D+ | 31 | | AIN | Thermal diode 2 D+ . |
| 2_D- | 32 | | AIN | Thermal diode 2 D- . |
| 3_D+ | 33 | | AIN | Thermal diode 3 D+ . |
| 3_D- | 34 | | AIN | Thermal diode 3 D- . |
| 4_D+ | 35 | | AIN | Thermal diode 4 D+ . |
| 4_D- | 36 | | AIN | Thermal diode 4 D- . |
| VIDA0 | 37 | 5VSB | IN _{V1s} or IN _{V2s} | Voltage Supply readouts bit 0 from CPU A. (Default) |
| FANIN9 | | | IN _{ts} | 0V to +5V amplitude fan tachometer input |
| VIDA1 | 38 | 5VSB | IN _{V1s} or IN _{V2s} | Voltage Supply readouts bit 1 from CPU A. (Default) |
| FANIN10 | | | IN _{ts} | 0V to +5V amplitude fan tachometer input |



Pin Description List, continued.

| PIN NAME | PIN NO. | POWER PLANE | TYPE | DESCRIPTION |
|----------|---------|-------------|-------------------------------------|---|
| VIDA2 | 39 | 5VSB | IN _{v1s} | Voltage Supply readouts bit 2 from CPU A. (Default) |
| FANIN11 | | | IN _{ts} | 0V to +5V amplitude fan tachometer input |
| VIDA3 | 40 | 5VSB | IN _{v1s} | Voltage Supply readouts bit 3 from CPU A. (Default) |
| FANIN12 | | | IN _{ts} | 0V to +5V amplitude fan tachometer input |
| FANIN1 | 41 | 5VSB | IN _{ts} | 0V to +5V amplitude fan tachometer input |
| FANCTL1 | 42 | 5VSB | OUT / OD ₁₂ / AOUT | Fan speed control PWM/DC output. When the power of 5VDD is 0V, this pin will drive logic 0. The power of this pin is supplied by VSB 5V. As DC output, 64 steps output voltage scaled to 0~5VSB. |
| ADDR0 | | | IN _{ts} | I ² C device address bit 0 trapping during 5VSB power on. |
| FANIN2 | 43 | 5VSB | IN _{ts} | 0V to +5V amplitude fan tachometer input |
| FANCTL2 | 44 | 5VSB | OUT / OD ₁₂ / AOUT | Fan speed control PWM/DC output. When the power of 5VDD is 0V, this pin will drive logic 0. The power of this pin is supplied by VSB 5V. As DC output, 64 steps output voltage scaled to 0~5VSB. |
| ADDR1 | | | IN _{ts} | I ² C device address bit 1 trapping during 5VSB power on. |
| FANIN3 | 45 | 5VSB | IN _{ts} | 0V to +5V amplitude fan tachometer input |
| FANCTL3 | 46 | 5VSB | OUT / OD ₁₂ / AOUT | Fan speed control PWM/DC output. When the power of 5VDD is 0V, this pin will drive logic 0. The power of this pin is supplied by VSB 5V. As DC output, 64 steps output voltage scaled to 0~5VSB. |
| VIDBSEL | | | IN _{ts} | The pin straps Fan mode and VID mode during 5VSB power on. . When the strap to high, it will select VID mode. When strapped to low, it will select Fan mode for pin49~56. |



Pin Description List, continued.

| PIN NAME | PIN NO. | POWER PLANE | TYPE | DESCRIPTION |
|----------|---------|-------------|---|---|
| FANIN4 | 47 | 5VSB | IN _{ts} | 0V to +5V amplitude fan tachometer input |
| FANIN5 | 48 | 5VSB | IN _{ts} | 0V to +5V amplitude fan tachometer input |
| FANCTL4 | 49 | 5VSB | OUT / OD ₁₂ / AOUT | Fan speed control PWM/DC output. When the power of 5VDD is 0V, this pin will drive logic 0. The power of this pin is supplied by VSB 5V. As DC output, 64 steps output voltage scaled to 0~5VSB. |
| VIDB0 | | | IN _{v1s} or IN _{v2s} | Voltage Supply readouts bit 0 from CPU B. |
| FANCTL5 | 50 | 5VSB | OUT / OD ₁₂ / AOUT | Fan speed control PWM/DC output. When the power of 5VDD is 0V, this pin will drive logic 0. The power of this pin is supplied by VSB 5V. As DC output, 64 steps output voltage scaled to 0~5VSB. |
| VIDB1 | | | IN _{v1s} or IN _{v2s} | Voltage Supply readouts bit 1 from CPU B. |
| FANIN9 | | | IN _{ts} | 0V to +5V amplitude fan tachometer input |
| FANIN6 | 51 | 5VSB | IN _{ts} | 0V to +5V amplitude fan tachometer input |
| VIDB2 | | | IN _{v1s} or IN _{v2s} | Voltage Supply readouts bit 2 from CPU B. |
| FANCTL6 | 52 | 5VSB | OUT / OD ₁₂ / AOUT | Fan speed control PWM/DC output. When the power of 5VDD is 0V, this pin will drive logic 0. The power of this pin is supplied by VSB 5V. As DC output, 64 steps output voltage scaled to 0~5VSB. |
| FANIN10 | | | IN _{ts} | 0V to +5V amplitude fan tachometer input |
| VIDB3 | | | IN _{v1s} or IN _{v2s} | Voltage Supply readouts bit 3 from CPU B. |
| FANIN7 | 53 | 5VSB | IN _{ts} | 0V to +5V amplitude fan tachometer input |
| VIDB4 | | | IN _{v1s} or IN _{v2s} | Voltage Supply readouts bit 4 from CPU B. |



Pin Description List, continued.

| PIN NAME | PIN NO. | POWER PLANE | TYPE | DESCRIPTION |
|----------|---------|-------------|---|--|
| FANCTL7 | 54 | 5VSB | OUT / OD ₁₂ / AOUT | Fan speed control PWM/DC output. When the power of 5VDD is 0V, this pin will drive logic 0. The power of this pin is supplied by VSB 5V. As DC output, 64 steps output voltage scaled to 0~5VSB. |
| FANIN11 | | | INts | 0V to +5V amplitude fan tachometer input |
| VIDB5 | | | IN _{v1s} or IN _{v2s} | Voltage Supply readouts bit 5 from CPU B. |
| FANIN8 | 55 | 5VSB | INts | 0V to +5V amplitude fan tachometer input |
| VIDB6 | | | IN _{v1s} or IN _{v2s} | Voltage Supply readouts bit 6 from CPU B. |
| FANCTL8 | 56 | 5VSB | OUT / OD ₁₂ / AOUT | Fan speed control PWM/DC output. The 8 th fan control signal can be programmed to output through pin 11 or this pin. When the power of 5VDD is 0V, this pin will drive logic 0. The power of this pin is supplied by VSB 5V. As DC output, 64 steps output voltage scaled to 0~5VSB. |
| VIDB7 | | | IN _{v1s} or IN _{v2s} | Voltage Supply readouts bit 7 from CPU B. |

7. FUNCTIONAL DESCRIPTION

This section is blank now. Refer Chap 8 for function description.



8. CONFIGURATION REGISTERS

8.1 ID, Bank Select Registers

W83793G inside resides three banks of registers, customer must set bank correctly so that correct registers can be accessed. All the registers described here can be access in all banks.

8.1.1 ID, Bank Select Registers Map

Address 00_{HEX}, 0D_{HEX}, 0E_{HEX}, 0F_{HEX} in all three register banks are reserved as ID, Bank Select registers.

| MNEMONIC | REGISTER NAME | TYPE |
|-----------|---|------|
| BankSel. | Bank Select | RW |
| VendorID. | Winbond Vendor ID | RO |
| ChipID. | Winbond Chip ID | RO |
| DeviceID. | Winbond Device Version ID | RO |

8.1.2 ID, Bank Select Register Details

8.1.2.1 Bank Select Register (Bank Select)

Three banks of registers are inside W83793G. The register bank could be selected by programming Bank Select register. All Address 00_{HEX} in these there banks is defined as Bank Select register.

Location: Bank 0, 1, 2 Address 00_{HEX}

Type: Read / Write

Reset: VSB5V (Pin 7) Rising,

Init Reset (CR40.Bit7) is set,

VDD5V (Pin 25) Rising @ RST_VDD_MD (CR40.Bit4) set,

SYSRSTIN_N (Pin 15) Falling @ SYSRST_MD (CR40.Bit5) set.

BANKSELECT

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------|------------------|---|---|---|------------------|---|---|
| Name | HBACS | Reserve | | | | BANK Select | | |
| Reset | 1 | 0 _{HEX} | | | | 0 _{HEX} | | |

| BIT | DESCRIPTION |
|-----|--|
| 7 | HBACS (High Byte Access) 0: Return the low byte while reading Winbond Vendor ID. 1: Return the high byte while reading Winbond Vendor ID. |
| 6-3 | Reserved. |



Continued

| BIT | DESCRIPTION |
|-----|--|
| 2-0 | BANK Select. 000 _{BIN} : Bank 0 is selected to access. 001 _{BIN} : Bank 1 is selected to access. 010 _{BIN} : Bank 2 is selected to access. |

8.1.2.2 Winbond Vendor ID Register (Vender ID)

The Winbond Vendor ID contains two bytes data. By programming register [HBACS](#), it can customer can select to access either high or low byte of Winbond Vendor ID.

Location: Bank 0, 1, 2 Address 0D_{HEX}

Type: Read Only

Reset: No Reset

VENDORID (WINBOND VENDOR ID)

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|---------------------------------------|---|---|---|---|---|---|---|
| Name | VendorID | | | | | | | |
| Fixed | 5C _{HEX} / A3 _{HEX} | | | | | | | |

| BIT | DESCRIPTION |
|-----|--|
| 7-0 | VendorID. Return 5C _{HEX} if HBACS = 1; return A3 _{HEX} if HBACS = 0. |

8.1.2.3 Winbond Chip ID Register (ChipID)

Location: Bank 0, 1, 2 Address 0E_{HEX}

Type: Read Only

Reset: No Reset

CHIPID (WINBOND CHIP ID)

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | ChipID | | | | | | | |
| Reset | 7B _{HEX} | | | | | | | |

| BIT | DESCRIPTION |
|-----|--|
| 7-0 | ChipID. Chip ID of W83793G is 7B _{HEX} |



8.1.2.4 Winbond Version ID Register (Device ID)

Location: Bank 0, 1, 2 Address 0F_{HEX}

Type: Read Only

Reset: No Reset

VERSION ID

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|--------------------------------------|---|---|---|---|---|---|---|
| Name | DeviceID | | | | | | | |
| Fixed | 11 _{HEX} /12 _{HEX} | | | | | | | |

| BIT | DESCRIPTION |
|-----|---|
| 7-0 | Version ID. Device ID of W83793G B Version is 11 _{HEX} , C Version is 12 _{HEX} |

8.2 Watch Dog Timer Registers

W83793G is built in with a Watch Dog Timer, which enable users to reset the system by Pin 14 while system becomes abnormal. Once Watch Dog is enabled, W83793G starts to count down, and host should set the timer for further count down or clear/disable the timer to prevent W83793G issue reset signal.

8.2.1 Watch Dog Timer Registers Map

Watch Dog Timer is consisted of four registers. WDTLock and ENABLE_WDT are used to activate Soft-WDT and Hard-WDT, respectively. WDT_STS and DownCounter can inform the host whether the system is time up or not.

| MNEMONIC | REGISTER NAME | TYPE |
|--------------|----------------------------------|------|
| WDTLock. | Lock Watch Dog | WO |
| EnableWDT. | Watch Dog Enable | RO |
| WDT_STS. | Watch Dog Status | R/W |
| DownCounter. | Watch Dog Timer | R/W |

Two kinds of watchdog timer functions are supported by W83793G. One is so-called Soft Watch Dog Timer, and the other is Hard Watch Dog Timer.

Hard Watch Dog timer if enabled that will start a 4 minutes WDT after completion of system reset. (A Low to High transition on SYSRSTIN# pin). BIOS need to write a 00_{HEX} into Watch Dog Timer Register (04_{HEX}) to disable timer within 4 minutes, otherwise pin 14 WDTRST# will assert to reset system.

Soft Watch Dog Timer will start down counting whenever Timeout Time is set and Soft Watch Dog Timer is enabled. A WDTRST# will be issued while the timer timeouts.

Soft Watch Dog Timer will be disabled automatically after received a SYSRSTIN_N low signal.

Bank0. CR40 [2]/[ENWDT](#) must set to 1 if there four Watch Dog Timer Registers want to be programming.



8.2.2 Watch Dog Timer Register Details

8.2.2.1 Lock Watch Dog Register (WDT Lock)

Writing this register enable the Soft Watch Dog Timer or Hard Watch Dog Timer. This register is written only and user can confirm the write success by reading ENABLE_WDT.

Location: Bank 0 Address 01_{HEX}

Type: Write Only

Reset: VSB5V (Pin 7) Rising,
SYSRSTIN_N (Pin 15) Falling in Soft WDT mode.

WDTLOCK (WATCH DOG TIMER LOCK)

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------|-------------|---|---|---|---|---|---|---|
| Name | UNLOCK CODE | | | | | | | |

| BIT | DESCRIPTION |
|-----|--|
| 7-0 | Unlock Code. Write 55 _{HEX} , Enable Soft Watch Dog Timer. Write AA _{HEX} , Disable Soft Watch Dog Timer. Write 33 _{HEX} , Enable Hard Watch Dog Timer. Write CC _{HEX} , Disable Hard Watch Dog Timer. |

8.2.2.2 Watch Dog Enable Register (Enable WDT)

Location: Bank 0 Address 02_{HEX}

Type: Read Only

Reset: VSB5V (Pin 7) Rising.

ENABLE WDT (WATCH DOG TIMER ENABLE STATUS)

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|---------|---|---|---|---|---|------|------|
| Name | Reserve | | | | | | HARD | SOFT |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| BIT | DESCRIPTION |
|-----|--|
| 7-2 | Reserved |
| 1 | HARD. 1: indicates the Hard Watch Dog is enabled. 0: Hard Watch Dog is disabled. |
| 0 | SOFT. 1: indicates the Soft Watch Dog is enabled. 0: Soft Watch Dog is disabled. |

8.2.2.3 Watch Dog Status Register

Location: Bank 0 Address 03_{HEX}

Type: Read / Write

Reset: VSB5V (Pin 7) Rising.

WDT_STS (WATCH DOG STATUS)

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|---------|---------|---------|---------|-----------|---|---------|---------|
| Name | Reserve | Reserve | Reserve | Reserve | WDT STAGE | | HARD_TO | SOFT_TO |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| BIT | DESCRIPTION |
|-----|--|
| 7-4 | Reserved |
| 3-2 | WDT Stage. These 2 bits record last WDT stage for BIOS readout. The information is used to help BIOS to identify WDT timeout issue. |
| 1 | HARD_TO. 1: a hard timeout occurs. This bit will be cleared after reading. |
| 0 | SOFT_TO. 1: a soft timeout occurs. This bit will be cleared after reading. |

8.2.2.4 Watch Dog Timer Register (Down Counter)

Location: Bank 0 Address 04_{HEX}

Type: Read / Write

Reset: VSB5V (Pin 7) Rising.



DOWN COUNTER (WATCH DOG TIMER)

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | Timeout Time | | | | | | | |
| Reset | 00 _{HEX} | | | | | | | |

| BIT | DESCRIPTION |
|-----|---|
| 7-0 | Timeout Time. To write 00 _{HEX} can disable timer while in Hard Watch Dog Timer mode. To set Timeout Time for SOFT Watch Dog Timer, unit is min. |

The Timeout Time is unit in minutes, and 0 represents the timer is timeout or cleared. 1 represents there still have 1 sec to 1 minute for this timer. In this fashion, 2 shows time to time up is 1 minute 1 sec to 2 minutes.

8.3 Configuration and Address Select Registers

8.3.1 Register Maps

8.3.1.1 I²C Address Registers Map

| MNEMONIC | REGISTER NAME | TYPE |
|--------------|--|------|
| I2CADDR | I²C Address | R/W |
| TEMPD1/2ADDR | LM75 Temperature Sensor I²C Address | R/W |

There are four Addresses (58_{HEX}, 5A_{HEX}, 5C_{HEX}, 5E_{HEX}) can be assigned for W83793G I²C interface. And it also provides four I²C Addresses for each LM75-like Temperature Sensor (90_{HEX}, 92_{HEX}, 94_{HEX}, 96_{HEX} for TD1 and 98_{HEX}, 9A_{HEX}, 9C_{HEX}, 9E_{HEX} for TD2). These three addresses can be set by trapping pin 42 & 44 input value at 100ms after power ready.

The registers for Temperature sensor D1 & D2 can also be accessed by respective addresses that set as I²C address of W83793G. The LM75-like functions default are enabled and can be disabled by setting bit 3 and bit 7 of TEMPD1/2ADDR to 1.

8.3.1.2 Configuration Register Maps

| MNEMONIC | REGISTER NAME | TYPE |
|----------|--|------|
| CONFIG | Configuration Register | R/W |

Configuration Register controls the system reset source, stop, power down and warning output mode.

8.3.2 Register Details

8.3.2.1 I²C Address Register (I2CADDR)

Location: Bank 0 Address 0B_{HEX}

Type: Read / Write

Reset: 100ms after VSB5V (Pin 7) Rising.



I2CADDR

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------|-----------|---|---|---|---|---|---|---|
| Name | SMBUSADDR | | | | | | | |

| BIT | DESCRIPTION | | | | | | | | | | | | | | | |
|-------|---|--------------------------|-------|--------------------------|---|---|-------------------|---|---|-------------------|---|---|-------------------|---|---|-------------------|
| 7-0 | <p>SMBUSADDR. The value of SMBUSADDR is trapping pin voltage on PADDR0 (pin42) and PADDR1 (pin44) at 100ms after VSB power ready.</p> <table border="1"> <thead> <tr> <th>ADDR1</th> <th>ADDR0</th> <th>I²C Address</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>58_{HEX}</td> </tr> <tr> <td>0</td> <td>1</td> <td>5A_{HEX}</td> </tr> <tr> <td>1</td> <td>0</td> <td>5C_{HEX}</td> </tr> <tr> <td>1</td> <td>1</td> <td>5E_{HEX}</td> </tr> </tbody> </table> | ADDR1 | ADDR0 | I ² C Address | 0 | 0 | 58 _{HEX} | 0 | 1 | 5A _{HEX} | 1 | 0 | 5C _{HEX} | 1 | 1 | 5E _{HEX} |
| ADDR1 | ADDR0 | I ² C Address | | | | | | | | | | | | | | |
| 0 | 0 | 58 _{HEX} | | | | | | | | | | | | | | |
| 0 | 1 | 5A _{HEX} | | | | | | | | | | | | | | |
| 1 | 0 | 5C _{HEX} | | | | | | | | | | | | | | |
| 1 | 1 | 5E _{HEX} | | | | | | | | | | | | | | |

8.3.2.2 LM75-like Temperature Sensor I²C Address Register

Location: Bank 0 Address 0C_{HEX}

Type: Read / Write

Reset: 100ms after VSB5V (Pin 7) Rising.

TEMPD1/2ADDR

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|---------|---------------|---|---|---------|---------------|---|---|
| Name | DIS_TD2 | I2CADDR75B | | | DIS_TD1 | I2CADDR75A | | |
| Reset | 0 | Trapped Value | | | 0 | Trapped Value | | |

| BIT | DESCRIPTION | | | | | | | | | | | | | | | | | | | | |
|-------|--|------------|----------------------------------|------------|----------------------------------|---|---|-----|-------------------|---|---|-----|-------------------|---|---|-----|-------------------|---|---|-----|-------------------|
| 7 | DIS_TD2. If set to 1, it cannot access registers for temperature sensor 2 by temperature sensor 2 I2C address. | | | | | | | | | | | | | | | | | | | | |
| 6-4 | <p>I2CADDR75B. The value of I2CADDR75B is trapping PADDR0 (pin42) and PADDR1 (pin44) at 100ms after VSB power good issue.</p> <table border="1"> <thead> <tr> <th>ADDR1</th> <th>ADDR0</th> <th>I2CADDR75B</th> <th>Temperature sensor 2 I2C Address</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>100</td> <td>98_{HEX}</td> </tr> <tr> <td>0</td> <td>1</td> <td>101</td> <td>9A_{HEX}</td> </tr> <tr> <td>1</td> <td>0</td> <td>110</td> <td>9C_{HEX}</td> </tr> <tr> <td>1</td> <td>1</td> <td>111</td> <td>9E_{HEX}</td> </tr> </tbody> </table> | ADDR1 | ADDR0 | I2CADDR75B | Temperature sensor 2 I2C Address | 0 | 0 | 100 | 98 _{HEX} | 0 | 1 | 101 | 9A _{HEX} | 1 | 0 | 110 | 9C _{HEX} | 1 | 1 | 111 | 9E _{HEX} |
| ADDR1 | ADDR0 | I2CADDR75B | Temperature sensor 2 I2C Address | | | | | | | | | | | | | | | | | | |
| 0 | 0 | 100 | 98 _{HEX} | | | | | | | | | | | | | | | | | | |
| 0 | 1 | 101 | 9A _{HEX} | | | | | | | | | | | | | | | | | | |
| 1 | 0 | 110 | 9C _{HEX} | | | | | | | | | | | | | | | | | | |
| 1 | 1 | 111 | 9E _{HEX} | | | | | | | | | | | | | | | | | | |
| 3 | DIS_TD1. If set to 1, it cannot access registers for temperature sensor 1 by temperature sensor 1 I2C address. | | | | | | | | | | | | | | | | | | | | |



Continued.

| BIT | DESCRIPTION | | | |
|-----|---|--------------|-------------------|---|
| 2-0 | I2CADDR75A. The value of I2CADDR75B is trapping PADDR0 (pin42) and PADDR1 (pin44) at 100ms after VSB power good issue. | | | |
| | ADDR1 | ADDR0 | I2CADDR75A | Temperature sensor 1 I2C Address |
| | 0 | 0 | 000 | 90 _{HEX} |
| | 0 | 1 | 001 | 92 _{HEX} |
| | 1 | 0 | 010 | 94 _{HEX} |
| 1 | 1 | 011 | 96 _{HEX} | |

8.3.2.3 Configuration Register

Location: Bank 0 Address 40_{HEX}

Type: Read / Write

Reset: bit 0~3 & 7:

VSB5V (Pin 7) Rising,

Init Reset (CR40.Bit7) is set,

VDD5V (Pin 25) Rising @ RST_VDD_MD (CR40.Bit4) set,

SYSRSTIN_N (Pin 15) Falling @ SYSRST_MD (CR40.Bit5) set.

Bit 4 & 5:

VSB5V (Pin 7) Rising,

Init Reset (CR40.Bit7) is set.

CONFIG

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|------|---------|-----------|------------|------------|--------|-----------|-------|
| Name | INIT | Reserve | SYSRST_MD | RST_VDD_MD | EN_BAT_MNT | EN_WDT | INT_Clear | START |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| BIT | DESCRIPTION |
|-----|--|
| 7 | INIT. Set one restores power on default value to all registers except the Serial Bus Address register. This bit clears itself since the power on default is zero. |
| 6 | Reserved |
| 5 | SYSRST_MD. Write 1, whole chip will reset when SYSRSTIN# input. Write 0, no any operation when SYSRSTIN# input. |
| 4 | RST_VDD_MD. Write 1, whole chip will reset when 5VDD up. Write 0, no any operation when 5VDD up. |

Continued

| BIT | DESCRIPTION |
|-----|---|
| 3 | EN_BAT_MNT. Write 1, enable battery voltage monitor. Write 0, disable battery voltage monitor. If enable this bit, the monitor value is valid after one monitor cycle. |
| 2 | EN_WDT. Set this bit to 1 will enable the Watch Dog Timer function. Watch dog timer function will reset system (pin 47) while it timeouts. |
| 1 | INT_Clear. A one disables the SMI# and IRQ# outputs without affecting the contents of Interrupt Status Registers. The device will stop monitoring at last channel. It will resume upon clearing of this bit. |
| 0 | START. 1 : enables startup of monitoring operations; 0 : puts the analog part in Power-down mode. |

8.4 VID Control/Status Registers

W83793G provides dual Vcore monitoring channels. Vcore Channels are automatically monitored once 5VSB applied onto W83793G, but W83793G will issue alert information only when their corresponding high/low limit is being violated. ASF is also based on these limit register to judge the current channel status and report to host.

Two methods are used to assign the Vcore Limits. Assigning it manually; or assigning it automatically by VID inputs. The following registers set can let users choose their preferred method.

8.4.1 VID Control/Status Registers Map

| MNEMONIC | REGISTER NAME | TYPE |
|-------------|--------------------------------------|------|
| VIDIN_A | VIDA Input Value | RO |
| VIDIN_B | VIDB Input Value | RO |
| VIDA_Latch | VIDA Latch Value | RO |
| VIDB_Latch | VIDB Latch Value | RO |
| VID_Control | VID Control | R/W |
| VCORE_LIMHI | Vcore High Tolerance | R/W |
| VCORE_LIMLO | Vcore Low Tolerance | R/W |

W83793G supplies two sets of VID input pin for VOCREA and VCOREB channels. If dynamic VID function is enabled, the high/low limit of VCOREA and VCOREB channel will auto-update while VID input value change.

Some VIDA and all VIDB input pins are multi function pin. It needs programming Bank0 CR58 Multi function Pin Control Registers adequately.



8.4.2 VID Register Details

8.4.2.1 VIDA Input Value Register (VIDIN_A)

Location: Bank 0 Address 05_{HEX}

Type: Read Only

VIDIN_A

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------|---------|---------|---------|---------|---------|---------|---------|---------|
| Name | VIDAIN7 | VIDAIN6 | VIDAIN5 | VIDAIN4 | VIDAIN3 | VIDAIN2 | VIDAIN1 | VIDAIN0 |

| BIT | DESCRIPTION |
|-----|---|
| 1 | INT_Clear. A one disables the SMI# and IRQ# outputs without affecting the contents of Interrupt Status Registers. The device will stop monitoring at last channel. It will resume upon clearing of this bit. |
| 7 | VIDAIN7. Real time pin 13 input value. That is available for VRM11 only. |
| 6 | VIDAIN6. Real time pin 12 input value. That is available for VRM10 and VRM11 only. |
| 5 | VIDAIN5. Real time pin 11 input value. That is available for VRM10, VRM11 and AMD Opteron™ 6-bit VID only. |
| 4 | VIDAIN4. Real time pin 10 input value. |
| 3 | VIDAIN3. Real time pin 40 input value. |
| 2 | VIDAIN2. Real time pin 39 input value. |
| 1 | VIDAIN1. Real time pin 38 input value. |
| 0 | VIDAIN0. Real time pin 37 input value. |



8.4.2.2 VIDB Input Value Register (VIDIN_B)

Location: Bank 0 Address 06_{HEX}

Type: Read Only

VIDIN_B

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------|---------|---------|---------|---------|---------|---------|---------|---------|
| Name | VIDBIN7 | VIDBIN6 | VIDBIN5 | VIDBIN4 | VIDBIN3 | VIDBIN2 | VIDBIN1 | VIDBIN0 |

| BIT | DESCRIPTION |
|-----|---|
| 7 | VIDBIN7. Real time pin 56 input value. That is available for VRM11 only. |
| 6 | VIDBIN6. Real time pin 55 input value. That is available for VRM10 and VRM11 only. |
| 5 | VIDBIN5. Real time pin 54 input value. That is available for VRM10, VRM11 and AMD Opteron™ 6-bit VID only. |
| 4 | VIDBIN4. Real time pin 53 input value. |
| 3 | VIDBIN3. Real time pin 52 input value. |
| 2 | VIDBIN2. Real time pin 51 input value. |
| 1 | VIDBIN1. Real time pin 50 input value. |
| 0 | VIDBIN0. Real time pin 49 input value. |

8.4.2.3 VIDA Latch Value Register (VIDA_Latch)

Previous [VIDIN_A](#) and [VIDIN_B](#) allows user to readout the current value on VID pins, but VIDA_Latch and VIDB_Latch can let users to keep the VID value at any time by assigning the [Latch VIDA/Latch VIDB](#) bits to 1.

Location: Bank 0 Address 07_{HEX}

Type: Read Only

VIDA_LATCH

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------|-------|-------|-------|-------|-------|-------|-------|-------|
| Name | VIDA7 | VIDA6 | VIDA5 | VIDA4 | VIDA3 | VIDA2 | VIDA1 | VIDA0 |

| BIT | DESCRIPTION |
|-----|---|
| 7 | VIDA7. To read this bit will return VIDA7 register value if Latch_VIDA is set to 1 else return the pin value of VIDAIN7. |
| 6 | VIDA6. To read this bit will return VIDA6 register value if Latch_VIDA is set to 1 else return the pin value of VIDAIN6. |
| 5 | VIDA5. To read this bit will return VIDA5 register value if Latch_VIDA is set to 1 else return the pin value of VIDAIN5. |
| 4 | VIDA4. To read this bit will return VIDA4 register value if Latch_VIDA is set to 1 else return the pin value of VIDAIN4. |
| 3 | VIDA3. To read this bit will return VIDA3 register value if Latch_VIDA is set to 1 else return the pin value of VIDAIN3. |
| 2 | VIDA2. To read this bit will return VIDA2 register value if Latch_VIDA is set to 1 else return the pin value of VIDAIN2. |
| 1 | VIDA1. To read this bit will return VIDA1 register value if Latch_VIDA is set to 1 else return the pin value of VIDAIN1. |
| 0 | VIDA0. To read this bit will return VIDA0 register value if Latch_VIDA is set to 1 else return the pin value of VIDAIN0. |

8.4.2.4 VIDB Latch Value Register (VIDB_Latch)

Location: Bank 0 Address 08_{HEX}

Type: Read Only

VIDB_LATCH

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------|-------|-------|-------|-------|-------|-------|-------|-------|
| Name | VIDB7 | VIDB6 | VIDB5 | VIDB4 | VIDB3 | VIDB2 | VIDB1 | VIDB0 |

| BIT | DESCRIPTION |
|-----|---|
| 7 | VIDB7. To read this bit will return VIDB7 register value if Latch_VIDB is set to 1 else return the pin value of VIDBIN7. |
| 6 | VIDB6. To read this bit will return VIDB6 register value if Latch_VIDB is set to 1 else return the pin value of VIDBIN6. |
| 5 | VIDB5. To read this bit will return VIDB5 register value if Latch_VIDB is set to 1 else return the pin value of VIDBIN5. |
| 4 | VIDB4. To read this bit will return VIDB4 register value if Latch_VIDB is set to 1 else return the pin value of VIDBIN4. |
| 3 | VIDB3. To read this bit will return VIDB3 register value if Latch_VIDB is set to 1 else return the pin value of VIDBIN3. |
| 2 | VIDB2. To read this bit will return VIDB2 register value if Latch_VIDB is set to 1 else return the pin value of VIDBIN2. |
| 1 | VIDB1. To read this bit will return VIDB1 register value if Latch_VIDB is set to 1 else return the pin value of VIDBIN1. |
| 0 | VIDB0. To read this bit will return VIDB0 register value if Latch_VIDB is set to 1 else return the pin value of VIDBIN0. |

8.4.2.5 VID Control Register (VID_Control)

Location: Bank 0 Address 59_{HEX}

Type: Read / Write

Reset: VSB5V (Pin 7) Rising,

Init Reset (CR40.Bit7) is set,

VDD5V (Pin 25) Rising @ RST_VDD_MD (CR40.Bit4) set,

SYSRSTIN_N (Pin 15) Falling @ SYSRST_MD (CR40.Bit5) set.

VID_CONTROL

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---------|------------|------------|--------------------|---|---|
| Name | Level_Select | | EN_DVID | Latch_VIDB | Latch_VIDA | VID_SEL | | |
| Reset | 00 _{BIN} | | 0 | 0 | 0 | 001 _{BIN} | | |

| BIT | DESCRIPTION |
|-----|---|
| 7-6 | Level_Select. Set VID input pin V_{IH}/V_{IL} level 00_{BIN} : 0.6V/0.4 for VRM10, 11 01_{BIN} : 1.6V/0.8V for AMD VID 10_{BIN} : 2.0V/0.8V 11_{BIN} : Reserved. |
| 5 | EN_DVID. Write 1, dynamic VID function is enabled. If VID changed, auto-updating high/low limit of corresponding Vcore sensing voltage. If programming High/Low limit of Vcore sensing voltage manually is required, this bit has to be cleared as 0. |
| 4 | Latch_VIDB. Write 1, CR08 latches current pin value of VIDB. |
| 3 | Latch_VIDA. Write 1, CR07 latches current pin value of VIDA. |
| 2-0 | VID_SEL. Selectable VID tables: 000_{BIN} : Reserved 001_{BIN} : VRM10 (default) 010_{BIN} : VRM11 011_{BIN} : AMD Opteron™ 5 bit VID Codes 100_{BIN} : AMD Opteron™ 6 bit VID Codes |

8.4.2.6 Vcore High Tolerance Register (VCORE_LIMHI)

Location : Bank 0 Address 09_{HEX}

Type : Read / Write

Reset : VSB5V(Pin 7) Rising,
 Init Reset(CR40.Bit7) is set,
 VDD5V(Pin 25) Rising @ RST_VDD_MD(CR40.Bit4) set,
 SYSRSTIN_N(Pin 15) Falling @ SYSRST_MD(CR40.Bit5) set.

**VCORE_LIMHI**

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------------------|---|---|---|---|---|---|---|
| Name | Vcore High Tolerance | | | | | | | |
| Reset | 64 _{HEX} | | | | | | | |

| BIT | DESCRIPTION |
|-----|---|
| 7-0 | Vcore High Tolerance. While enable dynamic VID function (set Bank0 CR59 bit5 to 1), writing Tolerance register will force VCORE Limit updated with new voltage limit for VCORE. The unit is 2mV |

8.4.2.7 Vcore Low Tolerance Register (VCORE_LIMLO)

Location : Bank 0 Address 0A_{HEX}

Type : Read / Write

Reset : VSB5V(Pin 7) Rising,
Init Reset(CR40.Bit7) is set,
VDD5V(Pin 25) Rising @ RST_VDD_MD(CR40.Bit4) set,
SYSRSTIN_N(Pin 15) Falling @ SYSRST_MD(CR40.Bit5) set.

VCORE_LIMLO

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|---------------------|---|---|---|---|---|---|---|
| Name | Vcore Low Tolerance | | | | | | | |
| Reset | 64 _{HEX} | | | | | | | |

| BIT | DESCRIPTION |
|-----|--|
| 7-0 | Vcore Low Tolerance. While enable dynamic VID function (set Bank0 CR59 bit5 to 1), writing Tolerance register will force VCORE Limit Generator generate new voltage limit for VCORE. The unit is 2mV |

8.5 INT/SMI# Control/Status Registers

Several mechanisms are provided to alarm system when monitored channels are abnormal. At this paragraph, three kinds of control/status registers are introduced, 'real time status', shows currently status of each channel; 'Channel Mask', defines which channel need issue warning when abnormal, and when channel should not be cared due to floating or other circumstances. Final one, 'Interrupt Status', it gives host information of which channel is issuing alert, and host can base on this channel and do proper process to ensure system reliable.



8.5.1 INT/SMI Control/Status Register Map

| MNEMONIC | REGISTER NAME | TYPE |
|----------------|---|------|
| INT_STS1 □ | Interrupt Status 1 □ | RO |
| INT_STS5 | Interrupt Status 5 | |
| MASK1 □ | SMI/IRQ Mask 1 □ | R/W |
| MASK5 | SMI/IRQ Mask 5 | |
| REAL_STS1 □ | Real Time status 1 □ | RO |
| REAL_STS5 | Real Time status 5 | |
| SMIINT_Ctrl | SMI/IRQ Control | R/W |

Pin 3 of W83793G is a multi-function pin. It can be the IRQ output or the SMI# output signal. The function is selected by programming Bank0 CR50 SMI/IRQ Control register.

The interrupt mode for voltage and FANIN is only two-time interrupt mode.

For temperature, there are three modes to serve: <1> Comparator mode, <2>One-Time Interrupt mode, and <3> Two-Time Interrupt mode.

8.5.2 INT/SMI Control/Status Register Details

8.5.2.1 Interrupt Status Register (INT_STS)

A one represents corresponding channel have been exceed its limit. Read Interrupt Status will clear the interrupt flag.

VIDCHG will assert while VID are on the fly. It indicates VID have change in last 1ms.

TART will assert while target temperature cannot be achieved after 3 minutes full speed of corresponding FAN.

Location:

INT_STS1 - Bank 0 Address 41_{HEX}

INT_STS2 - Bank 0 Address 42_{HEX}

INT_STS3 - Bank 0 Address 43_{HEX}

INT_STS4 - Bank 0 Address 44_{HEX}

INT_STS5 - Bank 0 Address 45_{HEX}

Type: Read Only

Reset: VSB5V (Pin 7) Rising,

Init Reset (CR40.Bit7) is set,

VDD5V (Pin 25) Rising @ RST_VDD_MD (CR40.Bit4) set,

SYSRSTIN_N (Pin 15) Falling @ SYSRST_MD (CR40.Bit5) set.



INT_STS1

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|--------|-------|-------|-------|---------|-----|--------|--------|
| Name | 12VSEN | 3VSEN | VSEN2 | VSEN1 | Reserve | VTT | VCOREB | VCOREA |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

INT_STS2

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-----|-----|-----|-----|--------|------|------|------|
| Name | TD4 | TD3 | TD2 | TD1 | VIDCHG | VBAT | 5VSB | 5VDD |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

INT_STS3

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|--------|--------|--------|--------|--------|--------|-----|-----|
| Name | FANIN6 | FANIN5 | FANIN4 | FANIN3 | FANIN2 | FANIN1 | TR2 | TR1 |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

INT_STS4

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|---------|---------|---------|---------|---------|--------|--------|--------|
| Name | Reserve | Chassis | FANIN12 | FANIN11 | FANIN10 | FANIN9 | FANIN8 | FANIN7 |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

INT_STS5

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|---------|---|-------|-------|-------|-------|-------|-------|
| Name | Reserve | | TART6 | TART5 | TART4 | TART3 | TART2 | TART1 |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

8.5.2.2 SMI/IRM Mask Register (MASK)

Set to one will disable the corresponding interrupt sources. Clear to 0 will enable that interrupt source.

SMI Mask4 bit 7 is CLR_CHS (Clear Chassis), write this bit with an one will clear internal caseopen latch, and after latch is clear, CLR_CHS will be reset to 0 itself.

Location:

MASK1 - Bank 0 Address 46_{HEX}

MASK2 - Bank 0 Address 47_{HEX}

MASK3 - Bank 0 Address 48_{HEX}

MASK4 - Bank 0 Address 49_{HEX}

MASK5 - Bank 0 Address 4A_{HEX}



Type: Read / Write

Reset: VSB5V (Pin 7) Rising,

Init Reset (CR40.Bit7) is set,

VDD5V (Pin 25) Rising @ RST_VDD_MD (CR40.Bit4) set,

SYSRSTIN_N (Pin 15) Falling @ SYSRST_MD (CR40.Bit5) set.

MASK1

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|--------|-------|-------|-------|---------|-----|--------|--------|
| Name | 12VSEN | 3VSEN | VSEN2 | VSEN1 | Reserve | VTT | VCOREB | VCOREA |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

MASK2

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-----|-----|-----|-----|--------|------|------|------|
| Name | TD4 | TD3 | TD2 | TD1 | VIDCHG | VBAT | 5VSB | 5VDD |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

MASK3

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|--------|--------|--------|--------|--------|--------|-----|-----|
| Name | FANIN6 | FANIN5 | FANIN4 | FANIN3 | FANIN2 | FANIN1 | TR2 | TR1 |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

MASK4

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|---------|---------|---------|---------|---------|--------|--------|--------|
| Name | CLR_CHS | Chassis | FANIN12 | FANIN11 | FANIN10 | FANIN9 | FANIN8 | FANIN7 |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

MASK5

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|---------|---|-------|-------|-------|-------|-------|-------|
| Name | Reserve | | TART6 | TART5 | TART4 | TART3 | TART2 | TART1 |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |



8.5.2.3 Real Time status Register (REAL_STS)

Real-time status registers show the related channel exceeding limit or not at the polling moment. Return 1 represents related channel has exceeded the limit defined in limit registers.

Location :

REAL_STS1 - Bank 0 Address 4B_{HEX}

REAL_STS2 - Bank 0 Address 4C_{HEX}

REAL_STS3 - Bank 0 Address 4D_{HEX}

REAL_STS4 - Bank 0 Address 4E_{HEX}

REAL_STS5 - Bank 0 Address 4F_{HEX}

Type : Read Only

Reset : VSB5V(Pin 7) Rising,

Init Reset(CR40.Bit7) is set,

VDD5V(Pin 25) Rising @ RST_VDD_MD(CR40.Bit4) set,

SYSRSTIN_N(Pin 15) Falling @ SYSRST_MD(CR40.Bit5) set.

REAL_STS1

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|--------|-------|-------|-------|---------|-----|--------|--------|
| Name | 12VSEN | 3VSEN | VSEN2 | VSEN1 | Reserve | VTT | VCOREB | VCOREA |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

REAL_STS2

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-----|-----|-----|-----|--------|------|------|------|
| Name | TD4 | TD3 | TD2 | TD1 | VIDCHG | VBAT | 5VSB | 5VDD |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

REAL_STS3

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|--------|--------|--------|--------|--------|--------|-----|-----|
| Name | FANIN6 | FANIN5 | FANIN4 | FANIN3 | FANIN2 | FANIN1 | TR2 | TR1 |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

REAL_STS4

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|---------|---------|---------|---------|---------|--------|--------|--------|
| Name | Reserve | Chassis | FANIN12 | FANIN11 | FANIN10 | FANIN9 | FANIN8 | FANIN7 |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |



REAL_STS5

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|---------|---|-------|-------|-------|-------|-------|-------|
| Name | Reserve | | TART6 | TART5 | TART4 | TART3 | TART2 | TART1 |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

8.5.2.4 SMI/IRQ Control Register (SMIINT_Ctrl)

Location : Bank 0 Address 50_{HEX}

Type : Read / Write

Reset : VSB5V(Pin 7) Rising,

Init Reset (CR40.Bit7) is set,

VDD5V (Pin 25) Rising @ RST_VDD_MD (CR40.Bit4) set,

SYSRSTIN_N (Pin 15) Falling @ SYSRST_MD (CR40.Bit5) set.

SMIINT_CTRL

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|---------|---|--------|--------|-------------|---|-----------|-----|
| Name | Reserve | | IRQ_MD | IRQSEL | TEMP_SMI_MD | | EN_IRQSMI | POL |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| BIT | DESCRIPTION |
|-----|---|
| 7-6 | Reserved. |
| 5 | IRQ_MD. Set 0, IRQ output level signal. Set 1, output 200 us pulse signal. Default is 0. |
| 4 | IRQ_SEL. Set Pin 3 to IRQ mode. While 1 and EN_IRQSMI set to 1, Pin 3 enabled with IRQ interrupt output. |
| 3-2 | TEMP_SMI_MD. Temperature SMI# Mode Select. 00 _{BIN} : Comparator Interrupt Mode:(Default) Temperature TD1/TD2/TD3/TD4/TR1/TR2 exceeds T _O (Over-temperature) limit causes an interrupt and this interrupt will be reset by reading all the Interrupt Status. 01 _{BIN} : Two Time Interrupt Mode: These bits use in temperature sensor TD1/TD2/TD3/TD4/TR1/TR2 interrupt mode with hysteresis type. Temperature exceeding T _O (Critical Temperature), causes an interrupt and then temperature going below T _{HYST} (Critical Temperature Hysteresis) will also cause an interrupt if the previous interrupt has been reset by reading all the interrupt Status Register. Once an interrupt event has occurred by exceeding T _O (Critical Temperature), then reset, if the temperature remains above the T _{HYST} (Critical Temperature Hysteresis). |

Continued

| BIT | DESCRIPTION |
|-----|--|
| 3-2 | <p>10_{BIN} : One Time Interrupt Mode:</p> <p>This bit use in temperature sensor TD1/TD2/TD3/TD4/TR1/TR2 interrupt mode with hysteresis type. Temperature exceeding T_O (Critical Temperature) causes an interrupt and then temperature going below T_{HYST} (Critical Temperature Hysteresis) will not cause an interrupt. Once an interrupt event has occurred by exceeding T_O (Critical Temperature), then going below T_{HYST} (Critical Temperature Hysteresis), and interrupt will not occur again until the temperature exceeding T_O (Critical Temperature).</p> <p>11_{BIN} : Two Time Non-related Interrupt Mode:</p> <p>This bit use in temperature sensor TD1/TD2/TD3/TD4/TR1/TR2 interrupt mode with hysteresis type. Temperature exceeding T_O, causes an interrupt and then temperature going below T_{HYST} will also cause an interrupt. Once an interrupt event has occurred by exceeding T_O, then reset, if the temperature remains above the T_{HYST}.</p> <p>If this mode is selected, for all monitor channels (it is not necessary to read the status for generating the next IRQ/SMI# pulse.</p> <p>Two-Time Interrupt Mode ** : Interrupt Status is read Note: It can be programmed to be as not necessary to read the status for generating the next SMI# pulse by setting $TEMP_SMI_MD = 2'b11$.</p> |
| 1 | <p>EN_IRQSMI.</p> <p>A one enables the IRQ/SMI# Interrupt output.</p> |
| 0 | <p>POL. (polarity)</p> <p>When set to 1, IRQ/SMI# active high. Set to 0, IRQ/SMI# active low.</p> |



8.6 OVT/BEEP Control Register

Another solution to deal with abnormal situation is through OVT(Over Temperature) or Beep.

OVT, as it naming, represents for temperature abnormal is happening. In some applications, it can be combined with Fan control and used to throttle the Fan Speed.

Beep can directly use sound of two tones to inform user system abnormal. Unlike OVT, Beep can associate with any channel.

8.6.1 OVT/BEEP Control Registers Map

| MNEMONIC | REGISTER NAME | TYPE |
|-------------------------------|---|------|
| OVT_Ctrl | OVT Control | R/W |
| OVT_BeepEn | OVT/Beep Global Enable | R/W |
| BEEP_Ctrl1 □ BEEP_Ctrl5 | BEEP Control 1 □ BEEP Control 5 | R/W |

Pin 2 of W83793G is also a multi-function pin. It can be OVT# output signal or BEEP output signal and be selected by programming Bank0 CR52 OVT/BEEP Control register.

8.6.2 OVT/BEEP Control Registers Details

8.6.2.1 OVT Control Register (OVT_Ctrl)

Location : Bank 0 Address 51_{HEX}

Type : Read / Write

Reset : VSB5V(Pin 7) Rising.

OVT_CTRL

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|--------|----------|----------|----------|----------|----------|----------|--------|
| Name | OVT_MD | EN_OVTR2 | EN_OVTR1 | EN_OVTD4 | EN_OVTD3 | EN_OVTD2 | EN_OVTD1 | OVTPOL |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| BIT | DESCRIPTION |
|-----|--|
| 7 | <p>OVT_MD.</p> <p>There are two OVT# signal output type.</p> <p>0_{BIN} : Comparator Mode: (Default)</p> <p>Temperature exceeding T_{critical} (Critical Temperature) causes the OVT# output activated until the temperature is less than T_{HYST} (Critical Temperature Hysteresis).</p> <p>1_{BIN} : Interrupt Mode:</p> <p>Setting temperature exceeding T_{critical} (Critical Temperature) causes the OVT# output activated indefinitely until reset reading temperature sensor TD1/TD2/TD3/TD4/TR1/TR2 registers.</p> <p>Temperature exceeding T_{critical} (Critical Temperature), then OVT# reset, and then temperature going below T_{HYST} (Critical Temperature Hysteresis) will also cause the OVT# activated indefinitely until reset by reading temperature sensor TD1/TD2/TD3/TD4/TR1/TR2(reading interrupt status). Once the OVT# will not be activated by exceeding T_{critical} (Critical Temperature), then reset, if the temperature remains above T_{HYST} (Critical Temperature Hysteresis), the OVT# will not be activated again.</p> |
| 6 | <p>EN_OVTR2.</p> <p>Enable temperature sensor TR2 over-temperature (OVT) output if set to 1. Default 0; disable OVTR2 output through pin OVT#. The pin OVT# is wire OR with OVTD1, OVTD2, OVTD3, OVTD4 and OVTR1.</p> |
| 5 | <p>EN_OVTR1.</p> <p>Enable temperature sensor TR1 over-temperature (OVT) output if set to 1. Default 0; disable OVTR1 output through pin OVT#. The pin OVT# is wire OR with OVTD1, OVTD2, OVTD3, OVTD4 and OVTR2.</p> |
| 4 | <p>EN_OVTD4.</p> <p>Enable temperature sensor TD4 over-temperature (OVT) output if set to 1. Default 0; disable OVTD4 output through pin OVT#. The pin OVT# is wire OR with OVTD1, OVTD2, OVTD3, OVTR1 and OVTR2</p> |
| 3 | <p>EN_OVTD3.</p> <p>Enable temperature sensor TD3 over-temperature (OVT) output if set to 1. Default 0; disable OVTD3 output through pin OVT#. The pin OVT# is wire OR with OVTD1, OVTD2, OVTD4, OVTR1 and OVTR2</p> |
| 2 | <p>EN_OVTD2.</p> <p>Enable temperature sensor TD2 over-temperature (OVT) output if set to 1. Default 0; disable OVTD2 output through pin OVT#. The pin OVT# is wire OR with OVTD1, OVTD3, OVTD4, OVTR1 and OVTR2</p> |
| 1 | <p>EN_OVTD1.</p> <p>Enable temperature sensor TD1 over-temperature (OVT) output if set to 1. Default 0; disable OVTD1 output through pin OVT#. The pin OVT# is wire OR with OVTD2, OVTD3, OVTD4, OVTR1 and OVTR2</p> |
| 0 | <p>OVTPOL.</p> <p>Write 1, OVT# active high. Write 0, OVT# active low.</p> |



8.6.2.2 OVT/Beep Global Enable Register (OVT_BeepEn)

Location : Bank 0 Address 52_{HEX}

Type : Read / Write

Reset : VSB5V(Pin 7) Rising.

OVT_BEEPEN

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------|---|---|---|---|---------|---------|--------|
| Name | Reserved | | | | | BEEPSEL | EN_BEEP | EN_OVT |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| BIT | DESCRIPTION |
|-----|--|
| 7-3 | Reserved. |
| 2 | BEEPSEL. 1 : Direct Beep signal to Pin 2. 0 : Direct OVT signal to Pin 2. |
| 1 | EN_BEEP. (Beep Output Global Enable) 1 : Beep is enabled, customer can select event trigger source from BEEP_Ctrl. 0 : Beep is disabled. |
| 0 | ENOVT. (OVT Output Global Enable) 1 : OVT is enabled, users can select OVT trigger source from OVT_Ctrl. 0 : OVT is disable. |

8.6.2.3 BEEP Control Register (BEEP_Ctrl)

Set to one will enable the corresponding BEEP output. Clear to 0 will disable that BEEP output.

Location:

BEEP_Ctrl1 - Bank 0 Address 53_{HEX}

BEEP_Ctrl2 - Bank 0 Address 54_{HEX}

BEEP_Ctrl3 - Bank 0 Address 55_{HEX}

BEEP_Ctrl4 - Bank 0 Address 56_{HEX}

BEEP_Ctrl5 - Bank 0 Address 57_{HEX}

Type: Read / Write

Reset: VSB5V (Pin 7) Rising,

Init Reset (CR40.Bit7) is set,

VDD5V (Pin 25) Rising @ RST_VDD_MD (CR40.Bit4) set,

SYSRSTIN_N (Pin 15) Falling @ SYSRST_MD(CR40.Bit5) set.

BEEP_CTRL1

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|--------|-------|-------|-------|---------|-----|--------|--------|
| Name | 12VSEN | 3VSEN | VSEN2 | VSEN1 | Reserve | VTT | VCOREB | VCOREA |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

BEEP_CTRL2

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-----|-----|-----|-----|---------|------|------|------|
| Name | TD4 | TD3 | TD2 | TD1 | RESERVE | VBAT | 5VSB | 5VDD |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

BEEP_CTRL3

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|--------|--------|--------|--------|--------|--------|-----|-----|
| Name | FANIN6 | FANIN5 | FANIN4 | FANIN3 | FANIN2 | FANIN1 | TR2 | TR1 |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

BEEP_CTRL4

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|---------|---------|---------|---------|---------|--------|--------|--------|
| Name | Reserve | Chassis | FANIN12 | FANIN11 | FANIN10 | FANIN9 | FANIN8 | FANIN7 |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

BEEP_CTRL5

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|---------|---|-------|-------|-------|-------|-------|-------|
| Name | Reserve | | TART6 | TART5 | TART4 | TART3 | TART2 | TART1 |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

8.7 Multi-Function Pin Control Register

Many functions exhibited in W83793G are not default function, and they might share pin out with other functions. Here lists three registers defines the function enable registers.

8.7.1 Multi-Function Pin Control Register Map

| MNEMONIC | REGISTER NAME | TYPE |
|------------|---|------|
| MFC | Multi-Function Pin Control | R/W |
| FANIN_Ctrl | FANIN Control | R/W |
| FAN_SEL | FANIN Input Pin Redirection | R/W |

In W83793G Pin 10~13, Pin 37~40, Pin 49~56 are multi-function pin. All non-default functions are enabled by setting Bank0 CR58, CR5C and CR5D.



8.7.2 Multi-Function Pin Control Register Details

8.7.2.1 Multi-Function Pin Control Register (MFC)

Location: Bank 0 Address 58_{HEX}

Type: Read / Write

Reset: bit 0~6:

VSB5V (Pin 7) Rising,
 Init Reset (CR40.Bit7) is set,
 VDD5V (Pin 25) Rising @ RST_VDD_MD (CR40.Bit4) set,
 SYSRSTIN_N (Pin 15) Falling @ SYSRST_MD (CR40.Bit5) set.

Bit7: Trapping at 100ms after VSB5V (Pin 7) Rising.

MFC

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|---------|---------|---------|---|---------|---|---------|---------|
| Name | VIDBSEL | SIB_SEL | SID_SEL | | SIC_SEL | | SIA_SEL | FAN8SEL |
| Reset | Trap | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| BIT | DESCRIPTION |
|-----|--|
| 7 | <p>VIDBSEL.</p> <p>Pin 49~56 function select. Power On Trapping input value of Pin 46.</p> <p>1_{BIN}: Pin49~56 are VIDB.</p> <p>0_{BIN} : Pin 49~54 are fan speed control output or fan tachometer input; function of Pin 55~56 is controlled by bit SIB_SEL.</p> |
| 6 | <p>SIB_SEL.</p> <p>While VIDBSEL is 0, SIB_SEL set function of Pin55~56:</p> <p>0_{BIN}: Pin55~56 are FANIN8/FANCTRL8.</p> <p>1_{BIN}: Reserved.</p> <p>This bit must be set to 0.</p> |
| 5-4 | <p>SID_SEL.</p> <p>Set function of Pin39~40:</p> <p>0X_{BIN}: Pin 39~40 are VIDA2/VIDA3.</p> <p>10_{BIN}: Pin 39~40 are FANIN1/FANIN12.</p> <p>11_{BIN}:Reserved.</p> <p>These two bits should not be set to 11_{BIN}.</p> |



Continued.

| BIT | DESCRIPTION |
|-----|--|
| 3-2 | <p>SIC_SEL.</p> <p>Set function of Pin37~38:</p> <p>0_{BIN}: Pin 37~38 are VIDA0/VIDA1.</p> <p>10_{BIN}: Pin 37~38 are FAIN9/FANI10.</p> <p>11_{BIN}: Reserved.</p> <p>These two bits should not be set to 11_{BIN}.</p> |
| 1 | <p>SIA_SEL.</p> <p>Set function of Pin12~13:</p> <p>0_{BIN}: Pin 12~13 are VIDA6/VIDA7.</p> <p>1_{BIN}: Reserved.</p> <p>This bit must be set to 0.</p> |
| 0 | <p>FAN8SEL.</p> <p>Set function of Pin10~11:</p> <p>0_{BIN}: Pin 10~11 are VIDA4/VIDA5.</p> <p>1_{BIN}: Pin 12~13 are FANIN8/FANCTRL8.</p> |

8.7.2.2 FANIN Control Register (FANIN_Ctrl)

The register enables setup the functions of multi-function fan inputs, while reset it is cleared. (00_{HEX})

Location: Bank 0 Address 5C_{HEX}

Type: Read / Write

Reset: VSB5V (Pin 7) Rising,

Init Reset (CR40.Bit7) is set,

VDD5V (Pin 25) Rising @ RST_VDD_MD (CR40.Bit4) set,

SYSRSTIN_N (Pin 15) Falling @ SYSRST_MD (CR40.Bit5) set.

FANIN_CTRL

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|---------|------------|------------|------------|-----------|-----------|-----------|-----------|
| Name | Reserve | EN_FANIN12 | EN_FANIN11 | EN_FANIN10 | EN_FANIN9 | EN_FANIN8 | EN_FANIN7 | EN_FANIN6 |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| BIT | DESCRIPTION |
|-----|---|
| 7 | Reserved. |
| 6 | <p>EN_FANIN12.(Fan In 12 Enable Bit)</p> <p>1 : If SID_SEL = 10_{BIN}, enable FANIN12 monitor.</p> <p>0 : Disable . Default is VID function.</p> |



Continued.

| BIT | DESCRIPTION |
|-----|--|
| 5 | EN_FANIN11. (Fan In 11 Enable Bit) If SID_SEL = 10, Setting to 1 will enable FANIN11 monitor. If cleared, Pin39 can be selected as Processor A VID Bit 2(EN_D-VID). |
| 4 | EN_FANIN10. (Fan In 10 Enable Bit) If SIC_SEL = 10, Setting to 1 will enable FANIN10 monitor. If cleared, Pin 38 can be selected as Processor A VID Bit 1. |
| 3 | EN_FANIN9. (Fan In 9 Enable Bit) If SIC_SEL = 10, Setting to 1 will enable FANIN9 monitor. If cleared, Pin 37 can be selected as Processor A VID Bit 0(EN_D-VID). |
| 2 | EN_FANIN8. (Fan In 8 Enable Bit) Setting to 1 enables FANIN8 monitor. If FANIN8 connect to Pin55 is desired, setting VIDBSEL = 0, SIDB_SEL = 0 and FAN8SEL = 0 are must. If FANIN8 connect to Pin 10, Setting FAN8SEL = 1 is a must. Setting to 0 enables Pin 10 with Processor A VID Bit 4(EN_D-VID) |
| 1 | EN_FANIN7. (Fan In 7 Enable Bit) If VIDBSEL = 0, Setting to 1 will enable FANIN7 monitor. Setting to 0 enables Pin 53 with Processor B VID Bit 4(VIDBSEL = 1) |
| 0 | EN_FANIN6. (Fan In 6 Enable Bit) If VIDBSEL = 0, Setting to 1 will enable FANIN6 monitor. Setting to 0 enables Pin 51 with Processor B VID Bit2(VIDBSEL = 1) |

8.7.2.3 FANIN Input Pin Redirection Register(FANIN_Sel)

Location : Bank 0 Address 5D_{HEX}

Type : Read / Write

Reset : VSB5V(Pin 7) Rising,

Init Reset(CR40.Bit7) is set,

VDD5V(Pin 25) Rising @ RST_VDD_MD(CR40.Bit4) set,

SYSRSTIN_N(Pin 15) Falling @ SYSRST_MD(CR40.Bit5) set.

FANIN_SEL

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------|---|---|---|------------|------------|------------|-----------|
| Name | Reserved | | | | FANIN12Sel | FANIN11Sel | FANIN10Sel | FANIN9Sel |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| BIT | DESCRIPTION |
|-----|---|
| 7-4 | Reserve. |
| 3 | FANIN12Sel. If FANIN12Sel is set to 0, connecting FANIIN12 to Pin 40; else connect FANIN9 to Pin 11. While FANIIN12 connect to Pin 11, Bank0 CR58 bit0 FAN8SEL must set to 1. |
| 2 | FANIN11Sel. If FANIN11Sel is set to 0, connecting FANIIN11 to Pin 39; else connect FANIN11 to Pin 54. While FANIIN11 connect to Pin 54, Bank0 CR58 bit7 VIDBSEL must set to 0. |
| 1 | FANIN10Sel. If FANIN10Sel is set to 0, connecting FANIIN10 to Pin 38; else connect FANIN10 to Pin 52. While FANIIN10 connect to Pin 52, VIDBSEL must set to 0. |
| 0 | FANIN9Sel. If FANIN9Sel is set to 0, connecting FANIIN9 to Pin 37; else connect FANIN9 to Pin 50. While FANIIN9 connect to Pin 50, VIDBSEL must set to 0. |

8.8 Temperature Sensors Control Register

W83793G provides two sets of LM75-like sensors, and they can be treated as two independent sensors through different I²C address access(90_{HEX} ~ 9E_{HEX}). Two sensor can also be accessed and controlled from W83793G address(58_{HEX} ~ 5E_{HEX}). Here lists the control registers for the LM75-like sensors.

8.8.1 Temperature Sensors Control Register Map

| MNEMONIC | REGISTER NAME | TYPE |
|-------------|--|------|
| TD1_Config. | Temperature Sensor TD1 Configuration (LM75A) | R/W |
| TD2_Config. | Temperature Sensor TD2 Configuration (LM75B) | R/W |
| TD_MD | Temperature Sensor mode Select 1 | R/W |
| TR_MD | Temperature Sensor mode Select 2 | R/W |
| TempOffset | Temperature Channel Offset | R/W |

8.8.2 Temperature Sensors Control Register Details

8.8.2.1 TD1 Configuration (LM75A) Register (TD1_Config)

Location : Bank 0 Address 5A_{HEX}

Type : Read / Write

Reset : VSB5V(Pin 7) Rising,

Init Reset(CR40.Bit7) is set,



VDD5V(Pin 25) Rising @ RST_VDD_MD(CR40.Bit4) set,
 SYSRSTIN_N(Pin 15) Falling @ SYSRST_MD(CR40.Bit5) set.

TD1_CONFIG

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|---------|---|---------|---|---------|---|---|-------|
| Name | Reserve | | FaultQ1 | | Reserve | | | STOP1 |
| Reset | 0 | 0 | 00 | | 0 | 0 | 0 | 0 |

| BIT | DESCRIPTION |
|-----|--|
| 7-6 | Reserved. |
| 5-4 | FaultQ1. Number of faults to detect before setting OVT# output to avoid false tripping due to noise. |
| 3-1 | Reserved. |
| 0 | STOP1. If temperature sensor TD1 is set as internal temperature sensor (CR5D), set to 1 the temperature sensor will stop monitor. |

8.8.2.2 TD2 Configuration (LM75B) Register (TD2_Config)

Location : Bank 0 Address 5B_{HEX}

Type : Read / Write

Reset : VSB5V(Pin 7) Rising,

Init Reset(CR40.Bit7) is set,

VDD5V(Pin 25) Rising @ RST_VDD_MD(CR40.Bit4) set,

SYSRSTIN_N(Pin 15) Falling @ SYSRST_MD(CR40.Bit5) set.

TD2_CONFIG

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|---------|---|---------|---|---------|---|---|-------|
| Name | Reserve | | FaultQ2 | | Reserve | | | STOP2 |
| Reset | 0 | 0 | 00 | | 0 | 0 | 0 | 0 |

| BIT | DESCRIPTION |
|-----|--|
| 7-6 | Reserved. |
| 5-4 | FaultQ2. Number of faults to detect before setting OVT# output to avoid false tripping due to noise. |
| 3-1 | Reserved. |
| 0 | STOP2. If temperature sensor TD2 is set as internal temperature sensor (CR5D), set to 1 the temperature sensor will stop monitor. |



8.8.2.3 TD Mode Select Register (TD_MD)

Before enable monitor, it needs to set function of pins (Bank0.CR58) and sensor select (Bank0.CR5E) to correct value.

Location : **TD_MD** - Bank 0 Address 5E_{HEX}
 Type : Read / Write
 Reset : VSB5V(Pin 7) Rising,
 Init Reset(CR40.Bit7) is set,
 VDD5V(Pin 25) Rising @ RST_VDD_MD(CR40.Bit4) set,
 SYSRSTIN_N(Pin 15) Falling @ SYSRST_MD(CR40.Bit5) set.

TD_MD

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|--------|---|--------|---|--------|---|--------|---|
| Name | TD4_MD | | TD3_MD | | TD2_MD | | TD1_MD | |
| Reset | 01 | | 01 | | 01 | | 01 | |

| BIT | DESCRIPTION |
|-----|--|
| 7-6 | TD4_MD. Temperature D4 mode 00 _{BIN} : Temperature D4 stop monitor 01 _{BIN} : Temperature D4 start monitor using internal temperature sensor (default). 10 _{BIN} : Reserved. 11 _{BIN} : Temperature D4 start monitor using temperature sensor in Intel CPU and get result by PECCI. |
| 5-4 | TD3_MD. Temperature D3 mode 00 _{BIN} : Temperature D3 stop monitor 01 _{BIN} : Temperature D3 start monitor using internal temperature sensor (default). 10 _{BIN} : Reserved. 11 _{BIN} : Temperature D3 start monitor using temperature sensor in Intel CPU and get result by PECCI. |
| 3-2 | TD2_MD. Temperature D2 mode 00 _{BIN} : Temperature D2 stop monitor 01 _{BIN} : Temperature D2 start monitor using internal temperature sensor (default). 10 _{BIN} : Reserved. 11 _{BIN} : Temperature D2 start monitor using temperature sensor in Intel CPU and get result by PECCI. |



Continued.

| BIT | DESCRIPTION |
|-----|---|
| 1-0 | TD1_MD. Temperature D1 mode 00 _{BIN} : Temperature D1 stop monitor 01 _{BIN} : Temperature D1 start monitor using internal temperature sensor (default). 10 _{BIN} : Reserved. 11 _{BIN} : Temperature D1 start monitor using temperature sensor in Intel CPU and get result by PECl. |

8.8.2.4 TR Mode Select Register (TR_MD)

Location : **TR_MD** - Bank 0 Address 5F_{HEX}

Type : Read / Write

Reset : VSB5V(Pin 7) Rising,

Init Reset(CR40.Bit7) is set,

VDD5V(Pin 25) Rising @ RST_VDD_MD(CR40.Bit4) set,

SYSRSTIN_N(Pin 15) Falling @ SYSRST_MD(CR40.Bit5) set.

TR_MD

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|---------|---|---|---|---|---|--------|--------|
| Name | Reserve | | | | | | TR2_MD | TR1_MD |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |

| BIT | DESCRIPTION |
|-----|---|
| 7-2 | Reserve. |
| 1 | TR2_MD. Setting to 1 will enable Temperature sensor TR2 monitor. |
| 0 | TR1_MD. Setting to 1 will enable Temperature sensor TR1 monitor. |

8.8.2.5 Temperature Channel Offset Register (TempOffset)

Each temperature channel has a corresponding offset register, in some situation customer may want to shift the offset. Default is 00_{HEX}.

Location :

TD1Offset - Bank 0 Address A8_{HEX}

TD2Offset - Bank 0 Address A9_{HEX}

TD3Offset - Bank 0 Address AA_{HEX}



TD4Offset - Bank 0 Address AB_{HEX}

TR1Offset - Bank 0 Address AC_{HEX}

TR2Offset - Bank 0 Address AD_{HEX}

Type : Read / Write

Reset : VSB5V(Pin 7) Rising.

TD/TROFFSET

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|------|--------------|---|---|---|---|---|---|
| Name | Sign | Offset value | | | | | | |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |

| BIT | DESCRIPTION |
|-----|-----------------------|
| 7-0 | TD1~TR2 Offset Value. |

8.9 Voltage Channel Registers

Here, both monitored value and their corresponding limitation settings are listed. W83793G provides more detailed resolution for VCoreA, VCoreB, and Vtt channels, besides 8-bit readout, they have lower-bit can be read.

8.9.1 Voltage Channel Registers Map

8.9.1.1 Voltage Channel Monitor Value Register Map

| MNEMONIC | REGISTER NAME | TYPE |
|----------|---------------------|------|
| VcoreA. | VCOREA Readout | RO |
| VcoreB. | VCOREB Readout | RO |
| Vtt. | Vtt Readout | RO |
| VINLowB. | VIN Low bit Readout | RO |
| VSEN1. | VSEN1 Readout | RO |
| VSEN2. | VSEN2 Readout | RO |
| 3VSEN. | 3VSEN Readout | RO |
| 12VSEN. | 12VSEN Readout | RO |
| 5VDD. | 5VDD Readout | RO |
| 5VSB. | 5VSB Readout | RO |
| VBAT. | VBAT Readout | RO |



8.9.1.2 Voltage Channel Limit Value Registers Map

| MNEMONIC | REGISTER NAME | TYPE |
|---------------|------------------------|------|
| VcoreA HL/LL. | VCOREA High/Low Limit | R/W |
| VcoreB HL/LL. | VCOREB High/Low Limit | R/W |
| Vtt HL/LL. | Vtt High/Low Limit | R/W |
| VINHLLowB. | VIN High Limit Low bit | R/W |
| VINLLLowB. | VIN Low Limit Low bit | R/W |
| VSEN1 HL/LL. | VSEN1 High/Low Limit | R/W |
| VSEN2 HL/LL. | VSEN2 High/Low Limit | R/W |
| 3VSEN HL/LL. | 3VSEN High/Low Limit | R/W |
| 12VSEN HL/LL. | 12VSEN High/Low Limit | R/W |
| 5VDD HL/LL. | 5VDD High/Low Limit | R/W |
| 5VSB HL/LL. | 5VSB High/Low Limit | R/W |
| VBAT HL/LL. | VBAT High/Low Limit | R/W |

8.9.2 Voltage Channel Register Details

8.9.2.1 Voltage Channel Monitored Value

Location :

VCOREA Readout - Bank 0 Address 10_{HEX}

VCOREB Readout - Bank 0 Address 11_{HEX}

Vtt Readout - Bank 0 Address 12_{HEX}

VIN Low bit - Bank 0 Address 1B_{Hex}

VSEN1 Readout - Bank 0 Address 14_{HEX}

VSEN2 Readout - Bank 0 Address 15_{HEX}

3VSEN Readout - Bank 0 Address 16_{HEX}

12VSEN Readout - Bank 0 Address 17_{HEX}

5VDD Readout - Bank 0 Address 18_{HEX}

5VSB Readout - Bank 0 Address 19_{HEX}

VBAT Readout - Bank 0 Address 1A_{HEX}

Type : Read Only

Reset : No Reset

**VOLTAGE READOUT**

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------|-----------------|---|---|---|---|---|---|---|
| Name | Voltage Voltage | | | | | | | |

VIN LOW BIT READOUT

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------|---------|---|------|---|---------|---|---------|---|
| Name | Reserve | | VttL | | VCOREBL | | VcoreAL | |

Channel VcoreA/B, and Vtt combined two registers for each channel to express their monitor result, and so it is 10-bit format data. For example, Monitored value of VcoreA can get from combination of VcoreA Readout and VIN Low bit Readout bit1~0. In order to read the correct monitor result, it needs to read high byte first than to read its corresponding low byte. The real voltage calculation of these three channels should follow the formula

$$V_{coreA} \text{ Voltage} = (CR[10] * 4 + CR[1B] \& 0x03) * 0.002;$$

$$V_{coreB} \text{ Voltage} = (CR[11] * 4 + (CR[1B] \& 0x0C) / 4) * 0.002;$$

$$V_{tt} \text{ Voltage} = (CR[12] * 4 + (CR[1B] \& 0x30) / 16) * 0.002;$$

The rest of voltage channels only supply 8-bit output format. The real voltage calculation of these three channels should follow the formula

$$V_{SEN1} \text{ Voltage} = CR[14] * (2 * 0.008);$$

$$V_{SEN2} \text{ Voltage} = CR[15] * (2 * 0.008);$$

$$3V_{SEN} \text{ Voltage} = CR[16] * (2 * 0.008);$$

$$12V_{SEN} \text{ Voltage} = CR[17] * 0.008;$$

$$5V_{DD} \text{ Voltage} = CR[18] * (2 * 1.5 * 0.008) + 0.15;$$

$$5V_{SB} \text{ Voltage} = CR[19] * (2 * 1.5 * 0.008) + 0.15;$$

$$V_{BAT} \text{ Voltage} = CR[1A] * (2 * 0.008);$$

8.9.2.2 Voltage Channel Limitation Registers

Location :

VCOREA High Limit Bank 0 Address 60_{HEX}

VCOREA Low Limit Bank 0 Address 61_{HEX}

VCOREB High Limit Bank 0 Address 62_{HEX}

VCOREB Low Limit Bank 0 Address 63_{HEX}

Vtt High Limit Bank 0 Address 64_{HEX}

Vtt Low Limit Bank 0 Address 65_{HEX}

High Limit Low bit Bank 0 Address 68_{HEX}

Low Limit Low bit Bank 0 Address 69_{HEX}

VSEN1 High Limit Bank 0 Address 6A_{HEX}

VSEN1 Low Limit Bank 0 Address 6B_{HEX}

VSEN2 High Limit Bank 0 Address 6C_{HEX}

VSEN2 Low Limi Bank 0 Address 6D_{HEX}



- 3VSEN High Limit** Bank 0 Address 6E_{HEX}
- 3VSEN Low Limit** Bank 0 Address 6F_{HEX}
- 12VSEN High Limit** Bank 0 Address 70_{HEX}
- 12VSEN Low Limit** Bank 0 Address 71_{HEX}
- 5VDD High Limit** Bank 0 Address 72_{HEX}
- 5VDD Low Limit** Bank 0 Address 73_{HEX}
- 5VSB High Limit** Bank 0 Address 74_{HEX}
- 5VSB Low Limit** Bank 0 Address 75_{HEX}
- VBAT High Limit** Bank 0 Address 76_{HEX}
- VBAT Low Limit** Bank 0 Address 77_{HEX}

Type : Read / Write
 Reset : VSB5V(Pin 7) Rising,
 Init Reset(CR40.Bit7) is set.
 Voltage High Limit

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|--------------------|---|---|---|---|---|---|---|
| Name | Voltage High Limit | | | | | | | |
| Reset | FF _{HEX} | | | | | | | |

VOLTAGE LOW LIMIT

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | Voltage Low Limit | | | | | | | |
| Reset | 00 _{HEX} | | | | | | | |

VIN HIGH LIMIT LOW BIT

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|---------|---|--------|---|-----------|---|-----------|---|
| Name | Reserve | | VTTHLL | | VCOREBHLL | | VcoreAHLL | |
| Reset | 00 | | 11 | | 11 | | 11 | |

VIN LOW LIMIT LOW BIT

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|---------|---|---------|---|-----------|---|-----------|---|
| Name | Reserve | | VTTL LL | | VCOREBLLL | | VcoreALLL | |
| Reset | 00 | | 00 | | 00 | | 00 | |

The code calculation of high/low limit should follow the formula

VCoreA, VCoreB, Vtt Limit Setup

$$\begin{aligned}
 \text{CR60~66} &= [\text{Desired Voltage}]/0.008; \\
 \text{CR68/69} &= ([\text{Desired Voltage}]/0.002) - \text{CR60~67} * 4;
 \end{aligned}$$



VSEN1, VSEN2, 3VSEN Limit Setup

CR6A~6F = [Desired Voltage] / 0.016;

12VSEN Limit Setup

CR70~71 = [Desired Voltage] / 0.08;

5VDD, 5VSB Limit Setup

CR72~75 = [Desired Voltage] / 0.024;

VBAT Limit Setup

CR76~77 = [Desired Voltage] / 0.016;

8.10 Temperature Channel Registers

8.10.1 Temperature Channel Register Map

8.10.1.1 Temperature Channel Monitored Value Register Map

| MNEMONIC | REGISTER NAME | TYPE |
|----------|---------------------------------------|------|
| TD1. | Temperature Sensor TD1 Readout | RO |
| TD2. | Temperature Sensor TD2 Readout | RO |
| TD3. | Temperature Sensor TD3 Readout | RO |
| TD4. | Temperature Sensor TD4 Readout | RO |
| TDLowB. | Temperature Sensor TD Low Bit Readout | RO |
| TR1. | Temperature Sensor TR1 Readout | RO |
| TR2. | Temperature Sensor TR2 Readout | RO |

8.10.1.2 Temperature Channel Limitation Value Register Map

| MNEMONIC | REGISTER NAME | TYPE |
|-------------|--|------|
| TD1 CT/CTH. | TD1 Critical Temperature / Critical Temperature Hysteresis | R/W |
| TD1 WT/WTH. | TD1 Warning Temperature / Warning Temperature Hysteresis | R/W |
| TD2 CT/CTH. | TD2 Critical Temperature / Critical Temperature Hysteresis | R/W |
| TD2 WT/WTH. | TD2 Warning Temperature / Warning Temperature Hysteresis | R/W |
| TD3 CT/CTH. | TD3 Critical Temperature / Critical Temperature Hysteresis | R/W |
| TD3 WT/WTH. | TD3 Warning Temperature / Warning Temperature Hysteresis | R/W |
| TD4 CT/CTH. | TD4 Critical Temperature / Critical Temperature Hysteresis | R/W |
| TD4 WT/WTH. | TD4 Warning Temperature / Warning Temperature Hysteresis | R/W |
| TR1 CT/CTH. | TR1 Critical Temperature / Critical Temperature Hysteresis | R/W |



Continued.

| MNEMONIC | REGISTER NAME | TYPE |
|-------------|--|------|
| TR1 WT/WTH. | TR1 Warning Temperature / Warning Temperature Hysteresis | R/W |
| TR2 CT/CTH. | TR2 Critical Temperature / Critical Temperature Hysteresis | R/W |
| TR2 WT/WTH. | TR2 Warning Temperature / Warning Temperature Hysteresis | R/W |

8.10.2 Temperature Channel Register Details

8.10.2.1 Temperature Channel Monitored Registers

Location :

- TD1 Readout** - Bank 0 Address 1C_{HEX}
- TD2 Readout** - Bank 0 Address 1D_{HEX}
- TD3 Readout** - Bank 0 Address 1E_{HEX}
- TD4 Readout** - Bank 0 Address 1F_{HEX}
- Low bit Readout** - Bank 0 Address 22_{HEX}
- TR1 Readout** - Bank 0 Address 20_{HEX}
- TR2 Readout** - Bank 0 Address 21_{HEX}

Type : Read Only

TEMP READOUT

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------|-------------|---|---|---|---|---|---|---|
| Name | Temperature | | | | | | | |

TD LOW BIT READOUT

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------|------|---|------|---|------|---|------|---|
| Name | TD4L | | TD3L | | TD2L | | TD1L | |

The format of Temperature channel readout is 2's complement. TD channel express temperature using 10-bit data including 1-bit sign bit, 7-bit integer, and 2 bits decimal. TR channel express temperature using 8-bit data including 1-bit sign bit, and 7-bit integer.

For TD channel temperature = TDx + TDxL * 0.25

TR channel temperature = TRx



8.10.2.2 Temperature Channel Limitation Registers

Location:

| | |
|-------------------------------|------------------------------------|
| TD1 Critical | - Bank 0 Address 78 _{HEX} |
| TD1 Critical Hystersis | - Bank 0 Address 79 _{HEX} |
| TD1 Warning | - Bank 0 Address 7A _{HEX} |
| TD1 Warning Hystersis | - Bank 0 Address 7B _{HEX} |
| TD2 Critical | - Bank 0 Address 7C _{HEX} |
| TD2 Critical Hystersis | - Bank 0 Address 7D _{HEX} |
| TD2 Warning | - Bank 0 Address 7E _{HEX} |
| TD2 Warning Hystersis | - Bank 0 Address 7F _{HEX} |
| TD3 Critical | - Bank 0 Address 80 _{HEX} |
| TD3 Critical Hystersis | - Bank 0 Address 81 _{HEX} |
| TD3 Warning | - Bank 0 Address 82 _{HEX} |
| TD3 Warning Hystersis | - Bank 0 Address 83 _{HEX} |
| TD4 Critical | - Bank 0 Address 84 _{HEX} |
| TD4 Critical Hystersis | - Bank 0 Address 85 _{HEX} |
| TD4 Warning | - Bank 0 Address 86 _{HEX} |
| TD4 Warning Hystersis | - Bank 0 Address 87 _{HEX} |
| TR1 Critical | - Bank 0 Address 88 _{HEX} |
| TR1 Critical Hystersis | - Bank 0 Address 89 _{HEX} |
| TR1 Warning | - Bank 0 Address 8A _{HEX} |
| TR1 Warning Hystersis | - Bank 0 Address 8B _{HEX} |
| TR2 Critical | - Bank 0 Address 8C _{HEX} |
| TR2 Critical Hystersis | - Bank 0 Address 8D _{HEX} |
| TR2 Warning | - Bank 0 Address 8E _{HEX} |
| TR2 Warning Hystersis | - Bank 0 Address 8F _{HEX} |

Type: Read / Write

Reset: VSB5V (Pin 7) Rising.

SENSOR CRITICAL TEMPERATURE

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|---------------------------|---|---|---|---|---|---|---|
| Name | Temp Critical Temperature | | | | | | | |
| Reset | 64 _{HEX} (100 C) | | | | | | | |



SENSOR CRITICAL TEMPERATURE HYSTERSIS

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|--|---|---|---|---|---|---|---|
| Name | Sensor Critical Temperature Hysteresis | | | | | | | |
| Reset | 5F _{HEX} (95 C) | | | | | | | |

SENSOR CRITICAL TEMPERATURE

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------------------------|---|---|---|---|---|---|---|
| Name | Sensor Warning Temperature | | | | | | | |
| Reset | 55 _{HEX} (85 C) | | | | | | | |

SENSOR WARNING TEMPERATURE HYSTERSIS

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|---------------------------------------|---|---|---|---|---|---|---|
| Name | Sensor Warning Temperature Hysteresis | | | | | | | |
| Reset | 50 _{HEX} (80 C) | | | | | | | |

The format of Temperature channel limit is 2's complement, bit 7 is sign bit, range is -128~127.

8.11 Fan Control Registers

All Fan Control/Status register are allocated in Bank 0 and Bank 2. Bank 0 resides common-used control/status registers, and Bank 2 inside has Smart Fan Control setups.

8.11.1 Fan Register Map

8.11.1.1 Common Register Control/Status registers Block

All common Fan Control/Status registers are located in Bank 0.



| MNEMONIC | REGISTER NAME | TYPE |
|---------------------------------------|--|------|
| Fan1CountH/L. Fan12CountH/L. | Fan tachometer readout high/low Byte | RO |
| Fan1LimitH/L. Fan12LimitH/L. | Fan Count Limit high/low Byte | RW |
| FanCtrl1. FanCtrl2. | Fan Output style Control | RW |
| DefaultSpeed. | Default Fan Speed at power-on | RW |
| Fan1Duty. Fan8Duty. | Current Fan output Duty Cycle | RW |
| PWM1Prescalar. PWM8Prescalar. | Fan PWM output frequency pre-scalar | RW |

Here listed registers which can read out tachometer values, and their limit registers. All these registers are separated into 2 bytes. Reading tachometer count high byte will lock the corresponding low byte to ensure next reading on low byte will get consistent data with high byte.

Due to Fan input 6~12 are multifunction pins, **FanInControl** provides selection between FanIn functions or other functions.

Also here provides Fan Output style(DC/PWM), Duty cycle, and frequency controls.

8.11.1.2 Smart Fan Setup/Status registers

Registers of SmartFan setup resides in Bank 0 and Bank 2. Most used step timing control and critical temperature setup are located in Bank 0, all others located in Bank 2.

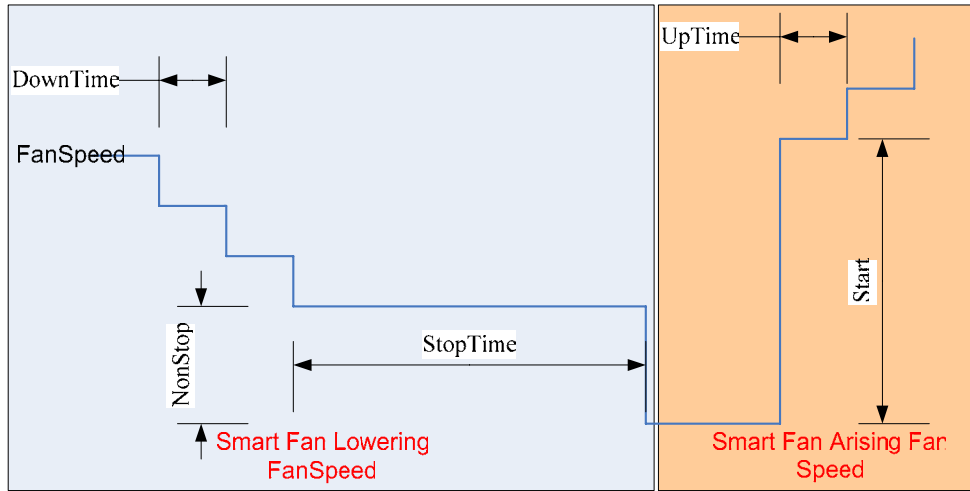


| MNEMONIC | REGISTER NAME | TYPE |
|-------------------------------------|---|------|
| UpTime. | SmartFan Fan Step Up Time | RW |
| DownTime. | SmartFan Fan Step Down Time | RW |
| CriticalTemp. | All Fan full speed temperature | RW |
| TD1FanSelect. □ TR2FanSelect. | Temperature to Fan mapping relationships in SmartFan mode | RW |
| FanCtrlMode. | SmartFan Control Mode Select | RW |
| ToITD12. □ ToITR12. | Hysteresis tolerance of each temperature source | RW |
| Fan1Nonstop. □ Fan8Nonstop. | Fan Output Nonstop Duty cycle | RW |
| Fan1Start. □ Fan8Start. | Fan Output Start Duty Cycle | RW |
| Fan1StopTime. □ Fan8StopTime. | Fan Stop Time from nonstop level to turn off. | RW |

Smart Fan Mode is activated on corresponding Fan once users define their relationship with temperature input in TempFanSelect. Under SmartFan Mode, user can select Thermal Cruise mode or Smart Fan II mode by assigning FanCtrlMode.

TempFanSelect enables users to arbitrarily define the Temperature-to-Fan relationship. For example, one can define Thermistor input 1 as chassis temperature sensor, and Temperature 1(Diode Input 1) as CPU sensor. User can do following manipulation to the Fan1(CPU Fan) and Fan2(System Fan). Assigning TD1FanSelect 03_{HEX} and TR1FanSelect 02_{HEX}, W83793G will associate the system Fan with CPU sensor and Chassis sensor, but CPU Fan only affects by CPU sensor. More descriptions can be found at the register definition section for this issue.

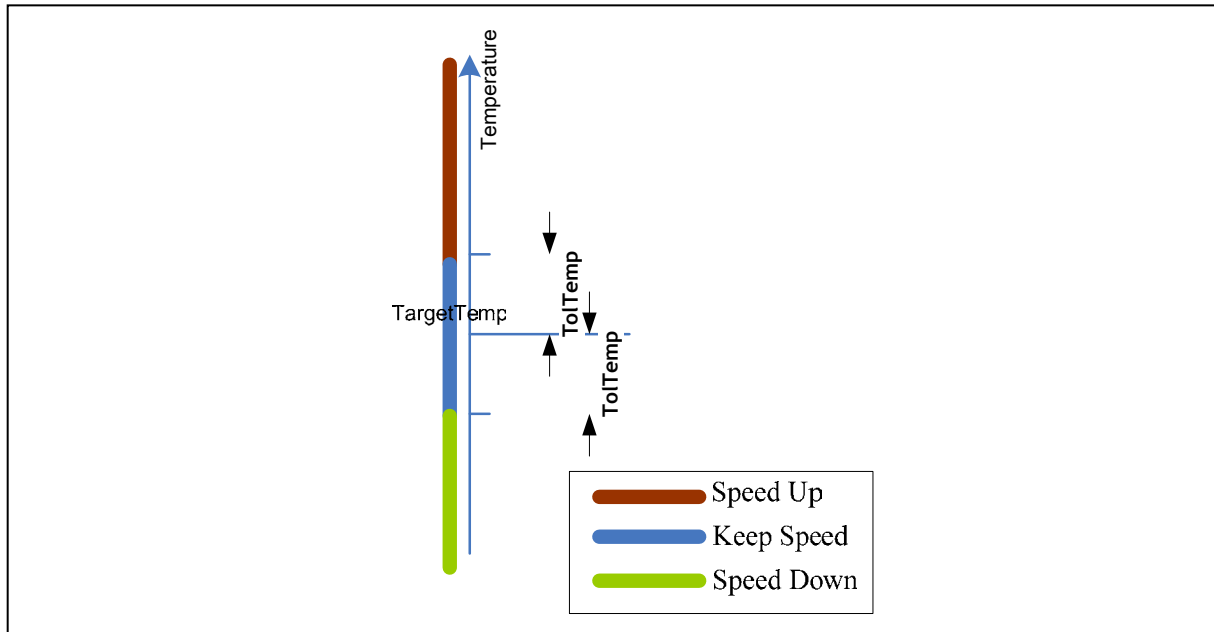
Under SmartFan Mode, a specific temperature will be defined in **CriticalTemp**, when any temperature input detected temperature higher than this will cause all fan to full speed simultaneously. Beside this, in normal use several control parameters can be defined in following graph.



8.11.1.3 Thermal Cruise Mode Registers(Bank 2)

| MNEMONIC | REGISTER NAME | TYPE |
|-----------------|--|------|
| TD1Target. □ | Target Temperature of Temperature inputs | RW |
| TR2Target. | | |

Thermal Cruise mode is an algorithm to control Fan speed to keep the temperature source around the target temperature. If the temperature source detects temperatures higher or lower than target with **TolTemp** tolerance, Smart Fan Control will take actions to speed up or lower down the fan to keep the temperature within the tolerance range.





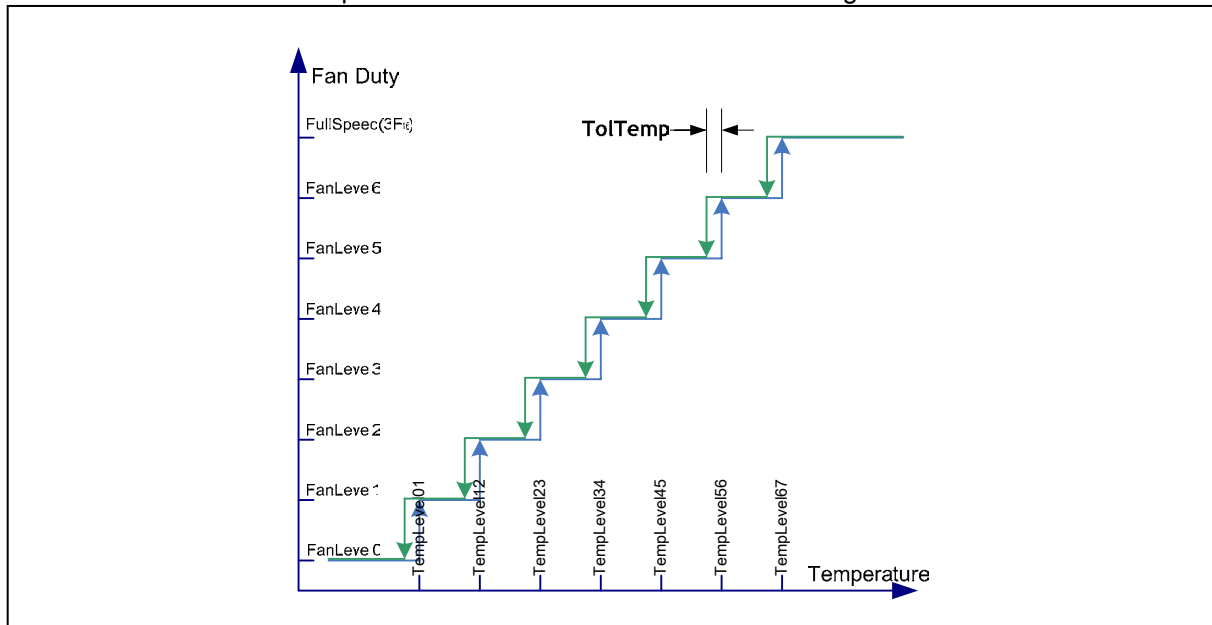
The concept is quite simple, when temperature is larger(not include equal) than **TargetTemp+TolTemp**, Fan will speed up; When temperature is less(not include equal) than **TargetTemp-TolTemp**, Fan will slow down; Otherwise, Fan keeps its current speed.

8.11.1.4 Smart Fan II Control registers(Bank 2)

| MNEMONIC | REGISTER NAME | TYPE |
|-------------------------------------|--|------|
| TD1Level01. □ TR2Level67. | Smart Fan II Fan Transition temperature levels | RW |
| TD1FanLevel0. □ TR2FanLevel6. | Smart Fan II Fan Output Levels | RW |

Smart Fan II algorithm provides user a mechanism to setup Fan speed via Temperature level relationship. Each temperature source has a corresponding table, and totally six tables are used to control Temperature 1(D1) to Temperature 6 (R2).

A table is consisted of 7 temperature levels and 7 fan levels as following.



While Fan speed jump from one level to another level, there is a hysteresis mechanism to prevent fan from throttling. When speed jump high to another level, temperature need to at specified temperature level, but instead when speed is slow down, it must wait until temperature is lower than specified temperature level minus tolerance.



8.11.2 Fan Register Details

8.11.2.1 Fan Tachometer Readout high/low Byte Register(FanCountH/L)

The FanCountH/L maintains current count value of corresponding Fan inputs. When VSB 5V power on, it is cleared(00_{HEX}). Effective width of FanCountH/L is 12-bits, FanCountH high nibble is not used.

Location :

- Fan1CountH** - Bank 0 Address 23_{HEX}
- Fan1CountL** - Bank 0 Address 24_{HEX}
- Fan2CountH** - Bank 0 Address 25_{HEX}
- Fan2CountL** - Bank 0 Address 26_{HEX}
- Fan3CountH** - Bank 0 Address 27_{HEX}
- Fan3CountL** - Bank 0 Address 28_{HEX}
- Fan4CountH** - Bank 0 Address 29_{HEX}
- Fan4CountL** - Bank 0 Address 2A_{HEX}
- Fan5CountH** - Bank 0 Address 2B_{HEX}
- Fan5CountL** - Bank 0 Address 2C_{HEX}
- Fan6CountH** - Bank 0 Address 2D_{HEX}
- Fan6CountL** - Bank 0 Address 2E_{HEX}
- Fan7CountH** - Bank 0 Address 2F_{HEX}
- Fan7CountL** - Bank 0 Address 30_{HEX}
- Fan8CountH** - Bank 0 Address 31_{HEX}
- Fan8CountL** - Bank 0 Address 32_{HEX}
- Fan9CountH** - Bank 0 Address 33_{HEX}
- Fan9CountL** - Bank 0 Address 34_{HEX}
- Fan10CountH** - Bank 0 Address 35_{HEX}
- Fan10CountL** - Bank 0 Address 36_{HEX}
- Fan11CountH** - Bank 0 Address 37_{HEX}
- Fan11CountL** - Bank 0 Address 38_{HEX}
- Fan12CountH** - Bank 0 Address 39_{HEX}
- Fan12CountL** - Bank 0 Address 3A_{HEX}

Type : Read Only

Reset : VSB5V(Pin 7) Rising

FAN1COUNTH~FAN12COUNTH

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | FanCountH | | | | | | | |
| Reset | 00 _{HEX} | | | | | | | |



| BIT | DESCRIPTION |
|-----|---|
| 7-0 | FanCountH (Fan tachometer readout high byte). The count value high byte of FanIn signal period with 45KHz clock. |

FAN1COUNTL~FAN12COUNTL

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | FanCountL | | | | | | | |
| Reset | 00 _{HEX} | | | | | | | |

| BIT | DESCRIPTION |
|-----|---|
| 7-0 | FanCountL (Fan tachometer readout low byte). The count value low byte of FanIn signal period with 45KHz clock. |

FAN COUNT CALCULATION

Fan1CountL combined with Fan1CountH forms the 12-bit count value. If reading the Fan1CountH and Fan1CountL successively, W83793G will make these two count value consistent(i.e. The same counting). If user read them in reverse order or other read/write between them, it is possible that the high/low byte may come from different counting and leads to some abnormal reading. Same rules can be applied to other FanCounts.

Real RPM(Rotate Per Minute) calculations should follow the formula

$$FanSpeed(RPM) = \frac{1.35 \times 10^6}{(12 - bitCountValue) \times (FanPoles/4)}$$

In this formula, *12-bitCountValue* represents the values stored in the FanCountH/L, and *FanPoles* stands for the number of NS poles pair inside the Fan, normally a N-S-N-S Fan(*FanPoles* = 4) will generate 2 pulses when complete one rotate.

Fan tachometer normal operating range is below 4.5KHz(if FanPoles=4, it means 135KRPM), nearly impossible but a Fan rotating faster than this will cause W83793G works abnormally.

8.11.2.2 Fan Count Limit High/Low Byte(FanLimitH/L)

The **FanLimitH/L** setups the Limit range for Fan in count values, if counter counts value larger than these register indicates, W83793G will show alert in real-time status and may take further actions based on user setups. While reset it is set(FF_{HEX}).

Location :

Fan1LimitH - Bank 0 Address 90_{HEX}

Fan1LimitL – Bank 0 Address 91_{HEX}

Fan2LimitH – Bank 0 Address 92_{HEX}

Fan2LimitL – Bank 0 Address 93_{HEX}

Fan3LimitH – Bank 0 Address 94_{HEX}

Fan3LimitL – Bank 0 Address 95_{HEX}



- Fan4LimitH** – Bank 0 Address 96_{HEX}
Fan4LimitL – Bank 0 Address 97_{HEX}
Fan5LimitH – Bank 0 Address 98_{HEX}
Fan5LimitL – Bank 0 Address 99_{HEX}
Fan6LimitH – Bank 0 Address 9A_{HEX}
Fan6LimitL – Bank 0 Address 9B_{HEX}
Fan7LimitH – Bank 0 Address 9C_{HEX}
Fan7LimitL – Bank 0 Address 9D_{HEX}
Fan8LimitH – Bank 0 Address 9E_{HEX}
Fan8LimitL – Bank 0 Address 9F_{HEX}
Fan9LimitH – Bank 0 Address A0_{HEX}
Fan9LimitL – Bank 0 Address A1_{HEX}
Fan10LimitH – Bank 0 Address A2_{HEX}
Fan10LimitL – Bank 0 Address A3_{HEX}
Fan11LimitH – Bank 0 Address A4_{HEX}
Fan11LimitL – Bank 0 Address A5_{HEX}
Fan12LimitH – Bank 0 Address A6_{HEX}
Fan12LimitL – Bank 0 Address A7_{HEX}

Type : Read / Write

Reset : VSB5V(Pin 7) Rising.

FAN1LIMITH ~ FAN12LIMITH

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | FanLimitH | | | | | | | |
| Reset | FF _{HEX} | | | | | | | |

| BIT | DESCRIPTION |
|-----|--|
| 7-0 | FanLimitH (Fan tachometer limit high byte). The limitation of count value high byte of FanIn. |

FAN1LIMITL~FAN12LIMITL

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | FanLimitL | | | | | | | |
| Reset | FF _{HEX} | | | | | | | |



| BIT | DESCRIPTION |
|-----|---|
| 7-0 | FanLimitL (Fan tachometer readout limit low byte). The limitation count value low byte of FanIn. |

8.11.2.3 Fan Output Style Control (FanCtrl)

The FanCtrl1/2 decides the Fan output style. There are several output styles available in W83793G, which are OD mode(Open-Drain), OB mode(Output-Buffer), and DC mode(DAC output). Default all fans outputs are set to OD mode.

Location :

FanCtrl1 - Bank 0 Address B0_{HEX}

FanCtrl2 – Bank 0 Address B1_{HEX}

Type : Read / Write

Reset : . VSB5V(Pin 7) Rising,
 Init Reset(CR40.Bit7) is set,
 VDD5V(Pin 25) Rising @ RST_VDD_MD(CR40.Bit4) set,
 SYSRSTIN_N(Pin 15) Falling @ SYSRST_MD(CR40.Bit5) set.

FANCTRL1

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Name | F8OB | F7OB | F6OB | F5OB | F4OB | F3OB | F2OB | F1OB |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| BIT | DESCRIPTION |
|-----|---|
| 7 | F8OB (Fan output 8 Output Buffer Mode Control). 0: Depends on F8DC (CRB1.Bit7), if F8DC=1, Pin 11 output with DC mode. Otherwise output is configured with OD mode. 1: Depends on F8DC (CRB1.Bit7), if F8DC=1, Pin 11 output with DC mode. Otherwise output is configured with OB mode |
| 6 | F7OB (Fan output 7 Output Buffer Mode Control). 0: Depends on F7DC (CRB1.Bit6), if F7DC=1, Pin 54 output with DC mode. Otherwise output is configured with OD mode. 1: Depends on F7DC (CRB1.Bit6), if F7DC=1, Pin 54 output with DC mode. Otherwise output is configured with OB mode |
| 5 | F6OB (Fan output 6 Output Buffer Mode Control). 0: Depends on F6DC (CRB1.Bit5), if F6DC=1, Pin 52 output with DC mode. Otherwise output is configured with OD mode. 1: Depends on F6DC (CRB1.Bit5), if F6DC=1, Pin 52 output with DC mode. Otherwise output is configured with OB mode |



Continued.

| BIT | DESCRIPTION |
|-----|---|
| 4 | <p>F5OB(Fan output 5 Output Buffer Mode Control).</p> <p>0: Depends on F5DC(CRB1.Bit4), if F5DC=1, Pin 50 output with DC mode. Otherwise output is configured with OD mode.</p> <p>1: Depends on F5DC(CRB1.Bit4), if F5DC=1, Pin 50 output with DC mode. Otherwise output is configured with OB mode</p> |
| 3 | <p>F4OB(Fan output 4 Output Buffer Mode Control).</p> <p>0: Depends on F4DC(CRB1.Bit3), if F4DC=1, Pin 49 output with DC mode. Otherwise output is configured with OD mode.</p> <p>1: Depends on F4DC(CRB1.Bit3), if F4DC=1, Pin 49 output with DC mode. Otherwise output is configured with OB mode</p> |
| 2 | <p>F3OB(Fan output 3 Output Buffer Mode Control).</p> <p>0: Depends on F3DC(CRB1.Bit2), if F3DC=1, Pin 46 output with DC mode. Otherwise output is configured with OD mode.</p> <p>1: Depends on F3DC(CRB1.Bit2), if F3DC=1, Pin 46 output with DC mode. Otherwise output is configured with OB mode</p> |
| 1 | <p>F2OB(Fan output 2 Output Buffer Mode Control).</p> <p>0: Depends on F2DC(CRB1.Bit1), if F2DC=1, Pin 44 output with DC mode. Otherwise output is configured with OD mode.</p> <p>1: Depends on F2DC(CRB1.Bit1), if F2DC=1, Pin 44 output with DC mode. Otherwise output is configured with OB mode</p> |
| 0 | <p>F1OB(Fan output 1 Output Buffer Mode Control).</p> <p>0: Depends on F1DC(CRB1.Bit0), if F1DC=1, Pin 42 output with DC mode. Otherwise output is configured with OD mode.</p> <p>1: Depends on F1DC(CRB1.Bit0), if F1DC=1, Pin 42 output with DC mode. Otherwise output is configured with OB mode</p> |

FANCTRL2

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Name | F8DC | F7DC | F6DC | F5DC | F4DC | F3DC | F2DC | F1DC |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| BIT | DESCRIPTION |
|-----|--|
| 7 | <p>F8DC(Fan output 8 Direct Current Mode Control).</p> <p>0: OD or OB mode on Pin 11. Depend on F8OB(CRB0.Bit7)</p> <p>1: Pin 11 set as DC mode.</p> |



Continued.

| BIT | DESCRIPTION |
|-----|---|
| 6 | F7DC (Fan output 7 Direct Current Mode Control). 0: OD or OB mode on Pin 54. Depend on F7OB (CRB0.Bit6) 1: Pin 54 set as DC mode. |
| 5 | F6DC (Fan output 6 Direct Current Mode Control). 0: OD or OB mode on Pin 52. Depend on F6OB (CRB0.Bit5) 1: Pin 52 set as DC mode. |
| 4 | F5DC (Fan output 5 Direct Current Mode Control). 0: OD or OB mode on Pin 50. Depend on F5OB (CRB0.Bit4) 1: Pin 50 set as DC mode. |
| 3 | F4DC (Fan output 4 Direct Current Mode Control). 0: OD or OB mode on Pin 49. Depend on F4OB (CRB0.Bit3) 1: Pin 49 set as DC mode. |
| 2 | F3DC (Fan output 3 Direct Current Mode Control). 0: OD or OB mode on Pin 46. Depend on F3OB (CRB0.Bit2) 1: Pin 46 set as DC mode. |
| 1 | F2DC (Fan output 2 Direct Current Mode Control). 0: OD or OB mode on Pin 44. Depend on F2OB (CRB0.Bit1) 1: Pin 44 set as DC mode. |
| 0 | F1DC (Fan output 1 Direct Current Mode Control). 0: OD or OB mode on Pin 42. Depend on F1OB (CRB0.Bit0) 1: Pin 42 set as DC mode. |

8.11.2.4 Default Fan Speed at Power-on (DefaultSpeed)

DefaultSpeed set the initial speed of every fan. When system is turned on, all Fans output will be set a default Duty as this register content. This register's reset is specially design to be reset by VSB only, so at second system power on, the system will use the latest setup speed to turn on all Fans.

Location : **DefaultSpeed** - Bank 0 Address B2_{HEX}

Type : Read / Write

Reset : VSB5V(Pin 7) Rising.



DefaultSpeed

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------|---|-------------------|---|---|---|---|---|
| Name | Reserved | | DefaultSpeed | | | | | |
| Reset | 0 | 0 | 30 _{HEX} | | | | | |

| BIT | DESCRIPTION |
|-----|---|
| 7-6 | Reserved. |
| 5-0 | DefaultSpeed (Default Fan Speed at Power-on). Specifies The Fan Duty at next power on. |

8.11.2.5 Current Fan Output Duty Cycle (FanDuty)

FanDuty reflects the current output duty cycle. In manual mode it also can be set user desired duty cycles. But in Smart Fan mode, it is read-only.

Location :

Fan1Duty - Bank 0 Address B3_{HEX}

Fan2Duty - Bank 0 Address B4_{HEX}

Fan3Duty - Bank 0 Address B5_{HEX}

Fan4Duty - Bank 0 Address B6_{HEX}

Fan5Duty - Bank 0 Address B7_{HEX}

Fan6Duty - Bank 0 Address B8_{HEX}

Fan7Duty - Bank 0 Address B9_{HEX}

Fan8Duty - Bank 0 Address BA_{HEX}

Type : Read / Write(Only in Manual Mode, make sure 5VDD and Pin 1 CLK is ready)

Reset : VSB5V(Pin 7) Rising,
 Init Reset(CR40.Bit7) is set,
 VDD5V(Pin 25) Rising @ RST_VDD_MD(CR40.Bit4) set,
 SYSRSTIN_N(Pin 15) Falling @ SYSRST_MD(CR40.Bit5) set.

FAN1DUTY ~ FAN8DUTY

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------|---|--|---|---|---|---|---|
| Name | Reserved | | FanDuty | | | | | |
| Reset | 0 | 0 | Depend on DefaultSpeed . | | | | | |

| BIT | DESCRIPTION |
|-----|---|
| 7-6 | Reserved. |
| 5-0 | FanDuty (Current Fan output Duty Cycle). Specifies the current Fan output duty cycle. While VDD5V is low, this register is forcing to be zero by hardware. |



FanDuty also has a special characteristic; it's called sequential power-on. This function is used to avoid system current over-load while system power-on and all fans start to spin. W83793G will turn on each fan in sequence and it take 0.1sec to power on all fans.(12.5ms intervals for 8 Fans)

8.11.2.6 Fan PWM Output Frequency Prescaler (PWMPrescalar)

PWMPrescalar controls the output frequency in PWM mode. Here a large range of clock can be selected to fit customer needs. Default output frequency is 25KHz.

Location :

PWM1Prescalar - Bank 0 Address BB_{HEX}

PWM2Prescalar - Bank 0 Address BC_{HEX}

PWM3Prescalar - Bank 0 Address BD_{HEX}

PWM4Prescalar - Bank 0 Address BE_{HEX}

PWM5Prescalar - Bank 0 Address BF_{HEX}

PWM6Prescalar - Bank 0 Address C0_{HEX}

PWM7Prescalar - Bank 0 Address C1_{HEX}

PWM8Prescalar - Bank 0 Address C2_{HEX}

Type : Read / Write(Only in Manual Mode)

Reset : VSB5V(Pin 7) Rising,
 Init Reset(CR40.Bit7) is set,
 VDD5V(Pin 25) Rising @ RST_VDD_MD(CR40.Bit4) set,
 SYSRSTIN_N(Pin 15) Falling @ SYSRST_MD(CR40.Bit5) set.

PWM1PRESCALAR ~ PWM8PRESCALAR

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------|-------------------|---|---|---|---|---|---|
| Name | CKSEL | Divisor | | | | | | |
| Reset | 1 | 09 _{HEX} | | | | | | |

| BIT | DESCRIPTION |
|-----|--|
| 7 | CKSEL (clock source select). 0: 512Hz. 1: 250KHz. |
| 6-0 | Divisor (Clock Divisor). Clock frequency Divisor. |

The clock source selected by CKSEL will be divided by Divisor and used as a Fan PWM output frequency. There are 2 cases of Divisor depends on CKSEL.

If CKSEL equals 1, then output clock is simply equals to 250/(Divisor+1) KHz.

If CKSEL equals 0, output clock is 512Hz/MappedDivisor. MappedDivisor depends on Divisor[3:0] and looks like below table.

| DIVISOR[3:0] | MAPPED DIVISOR | OUTPUT FREQUENCY | DIVISOR[3:0] | MAPPED DIVISOR | OUTPUT FREQUENCY |
|--------------|----------------|------------------|--------------|----------------|------------------|
| 0000 | 1 | 512Hz | 1000 | 12 | 43Hz |
| 0001 | 2 | 256Hz | 1001 | 16 | 32Hz |
| 0010 | 3 | 171Hz | 1010 | 32 | 16Hz |
| 0011 | 4 | 128Hz | 1011 | 64 | 8Hz |
| 0100 | 5 | 102Hz | 1100 | 128 | 4Hz |
| 0101 | 6 | 85Hz | 1101 | 256 | 2Hz |
| 0110 | 7 | 73Hz | 1110 | 512 | 1Hz |
| 0111 | 8 | 64Hz | 1111 | 1024 | 0.5Hz |

8.11.2.7 SmartFan Output Step Up Time (UpTime)

UpTime regulates the time interval of fastest Fan speed up a unit. Default setting is 0.6sec.

Location : **UpTime** - Bank 0 Address C3_{HEX}

Type : Read / Write

Reset : VSB5V(Pin 7) Rising,
 Init Reset(CR40.Bit7) is set,
 VDD5V(Pin 25) Rising @ RST_VDD_MD(CR40.Bit4) set,
 SYSRSTIN_N(Pin 15) Falling @ SYSRST_MD(CR40.Bit5) set.

UPTIME

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | UpTime | | | | | | | |
| Reset | 06 _{HEX} | | | | | | | |

| BIT | DESCRIPTION |
|-----|---|
| 7-0 | UpTime (SmartFan Step Up Time). Unit in 0.1sec. Programmed as the interval of continuous Fan ramping up. |

SmartFan mostly control fans smoothly, which means it seldom suddenly add a large duty to fan or decrease a large duty. Instead, most often it increase/decrease duty by 1 LSB one time. The Up Time / Down Time register defines the time interval between successively increase/decrease duty. If this value set too small, Fan will have no time to reflect the speed after tuning the duty and sometimes may cause Fan speed unstable; on the other hand, if set Up Time / Down Time too large, Fan may not act fast enough to dissipate the heat. This register should never set to 0, otherwise will cause Fan Duty abnormal.

Only in these cases, fan will suddenly jump large duty.

→VDD Power – on/off



- Critical Temperature reached
- Fan Turn off state to Start
- Fan at NonStop Level to turn off state

8.11.2.8 SmartFan Output Step Down Time (DownTime)

Down Time regulates the time interval of fastest Fan speed lowered a unit. Default setting is 0.6sec.

Location : **DownTime** - Bank 0 Address C4_{HEX}Type : Read / Write

Reset : VSB5V(Pin 7) Rising,
Init Reset(CR40.Bit7) is set,
VDD5V(Pin 25) Rising @ RST_VDD_MD(CR40.Bit4) set,
SYSRSTIN_N(Pin 15) Falling @ SYSRST_MD(CR40.Bit5) set.

DOWNTIME

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | DownTime | | | | | | | |
| Reset | 06 _{HEX} | | | | | | | |

| BIT | DESCRIPTION |
|-----|---|
| 7-0 | DownTime (SmartFan Step Down Time). Unit in 0.1sec. Programmed as the interval of continuous Fan ramping Down. |

This register should never set to 0, otherwise will cause Fan Duty abnormal.

8.11.2.9 All Fan Full Speed Temperature (CriticalTemp)

CriticalTemp defines a system critical temperature while exceeding this temperature may lead to system damage or crash. When W83793G detects any temperature input exceeding **CriticalTemp**, it will speed all Fans and try to lowering the temperature.

Location :

CriticalTemp - Bank 0 Address C5_{HEX}

Type : Read / Write

Reset : VSB5V(Pin 7) Rising,
Init Reset(CR40.Bit7) is set,
VDD5V(Pin 25) Rising @ RST_VDD_MD(CR40.Bit4) set,
SYSRSTIN_N(Pin 15) Falling @ SYSRST_MD(CR40.Bit5) set.

UPTIME

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-----------------|---------------------|---|---|---|---|---|---|
| Name | Reserved | CriticalTemp | | | | | | |
| Reset | 0 | 50 _{HEX} | | | | | | |



| BIT | DESCRIPTION |
|-----|---|
| 7 | Reserved. |
| 6-0 | CriticalTemp (All Fan Full Speed Temperature). |

8.11.2.10 Temperature to Fan mapping relationships Register (TempFanSelect)

The **TempFanSelect** is responsible for dealing with the relationship between Fan and Temperature source. While reset it is cleared(00_{HEX}).

Location :

TD1FanSelect - Bank 2 Address 01_{HEX}

TD2FanSelect - Bank 2 Address 02_{HEX}

TD3FanSelect - Bank 2 Address 03_{HEX}

TD4FanSelect - Bank 2 Address 04_{HEX}

TR1FanSelect - Bank 2 Address 05_{HEX}

TR2FanSelect - Bank 2 Address 06_{HEX}

Type : Read / Write

Reset : VSB5V(Pin 7) Rising,
Init Reset(CR40.Bit7) is set,
VDD5V(Pin 25) Rising @ RST_VDD_MD(CR40.Bit4) set,
SYSRSTIN_N(Pin 15) Falling @ SYSRST_MD(CR40.Bit5) set.

TD1FANSELECT ~ TR2FANSELECT

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Name | Fan8 | Fan7 | Fan6 | Fan5 | Fan4 | Fan3 | Fan2 | Fan1 |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

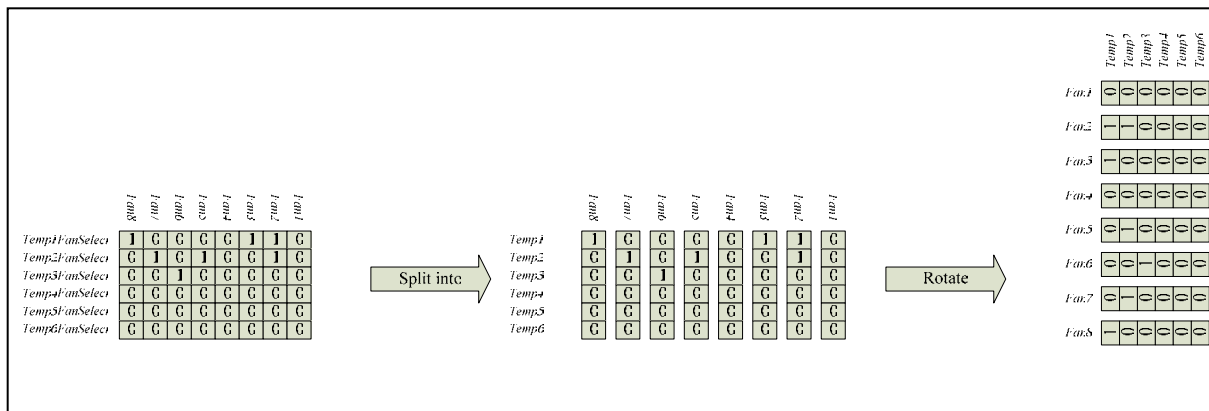
| BIT | DESCRIPTION |
|-----|--|
| 7 | Fan8 (Enable Fan8 Smart Fan). 0: Fan8 has no relation with this temperature source. 1: Applies SmartFan control on Fan8 and this temperature. |
| 6 | Fan7 (Enable Fan7 Smart Fan). 0: Fan7 has no relation with this temperature source. 1: Applies SmartFan control on Fan7 and this temperature. |
| 5 | Fan6 (Enable Fan6 Smart Fan). 0: Fan6 has no relation with this temperature source. 1: Applies SmartFan control on Fan6 and this temperature. |



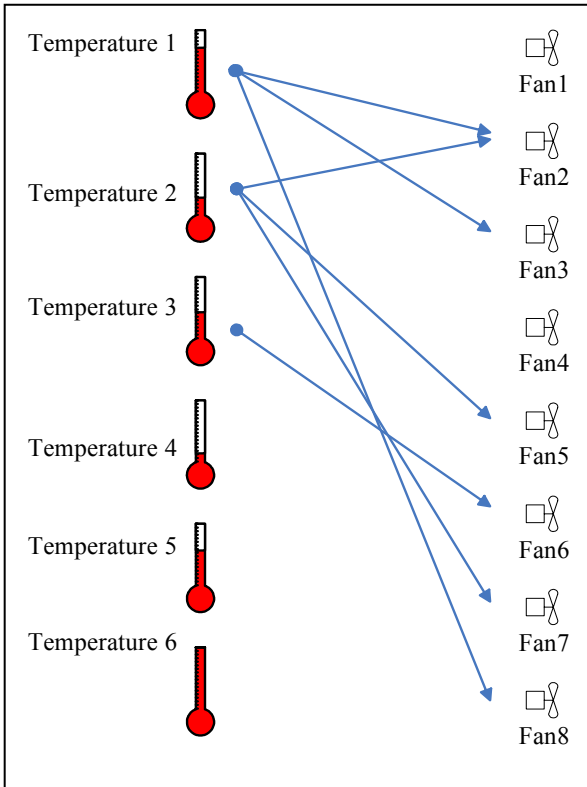
Continued.

| BIT | DESCRIPTION |
|-----|--|
| 4 | Fan5 (Enable Fan5 Smart Fan). 0: Fan5 has no relation with this temperature source. 1: Applies SmartFan control on Fan5 and this temperature. |
| 3 | Fan4 (Enable Fan4 Smart Fan). 0: Fan4 has no relation with this temperature source. 1: Applies SmartFan control on Fan4 and this temperature. |
| 2 | Fan3 (Enable Fan3 Smart Fan). 0: Fan3 has no relation with this temperature source. 1: Applies SmartFan control on Fan3 and this temperature. |
| 1 | Fan2 (Enable Fan2 Smart Fan). 0: Fan2 has no relation with this temperature source. 1: Applies SmartFan control on Fan2 and this temperature. |
| 0 | Fan1 (Enable Fan1 Smart Fan). 0: Fan1 has no relation with this temperature source. 1: Applies SmartFan control on Fan1 and this temperature. |

Here using an example to explain the concept of **TempFanSelect** Mapping. Considering this case, **TD1FanSelect** is set to 86_{HEX}, **TD2FanSelect** is set to 52_{HEX}, **TD3FanSelect** is set 20_{HEX}, and other 3 left unset.

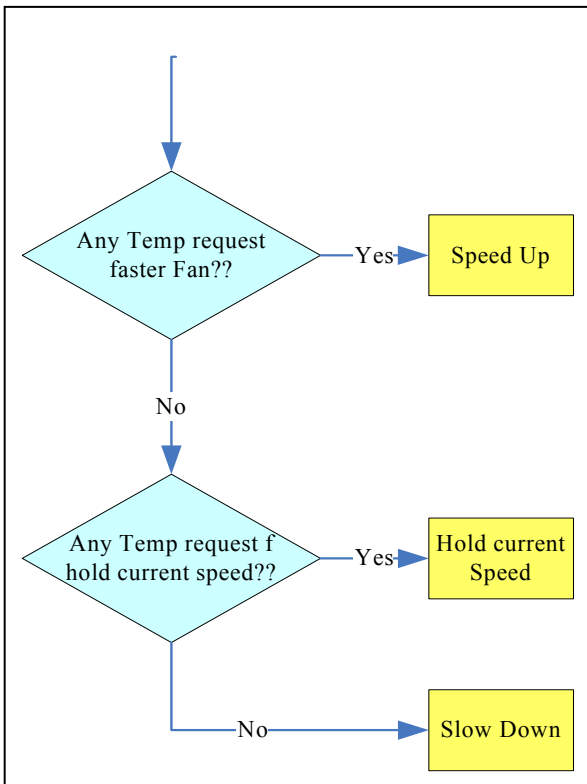


We can split the six registers bit by bit as above figure, and give it a rotation, this help us to understand the relationship from the point of fan easier. For Fan1 and Fan4 row, all temperature is de-asserted, that means Fan1/Fan4 does not have any relationship with temperature, thus they are in manual mode under this setting. For Fan2, it is clear that it has relation with temperature 1 and 2, so it will activate SmartFan control with temperature 1/2 as it input.



The right graph give a picture of how the mapping relationship is made by this setting.

In this example, Fan2 retrieves information from Temperature 1 and Temperature 2, and decide the next duty cycle applied to Fan2. But how did it decide to speed up/slow down fan? Basically, W83793G sorting the information comes from each temperature sensor and SmartFan Controls. After sorting the information, W83793G will get something like, TD1 need to speed up fan, and TD2 does not need so fast Fan speed; or TD1 would no more need fast fan, and TD2 hopes to keep current fan speed. And after that, the algorithm will make a decision to control fan by a very simple rule, which can expressed very simply in the following.



If TD1 say, "I need faster fan", and TD2 says, "No fast fan needed". W83793G will take request of TD1 and start to speed up Fan. In short, W83793G always prefers to pick the most critical request and applies it to the related Fan.



8.11.2.11 SmartFan Control Mode Select Register (FanCtrlMode)

There are two SmartFan modes supported with W83793G once SmartFan function enabled (Please refer [TempFanSelect](#) to enable SmartFan Function), they are Thermal Cruise mode and SmartFan II mode. While reset it is cleared (00_{HEX}), SmartFan II mode.

Location : **FanCtrlMode** - Bank 2 Address 07_{HEX}

Type : Read / Write

Reset : VSB5V(Pin 7) Rising,
Init Reset(CR40.Bit7) is set,
VDD5V(Pin 25) Rising @ RST_VDD_MD(CR40.Bit4) set,
SYSRSTIN_N(Pin 15) Falling @ SYSRST_MD(CR40.Bit5) set.

FANCTRLMODE

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------|---|--------|--------|--------|--------|--------|--------|
| Name | Reserved | | TR2_MD | TR1_MD | TD4_MD | TD3_MD | TD2_MD | TD1_MD |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| BIT | DESCRIPTION |
|-----|--|
| 7-6 | Reserved. |
| 5 | TR2_MD (Thermistor 2 SmartFan Control Mode) 0: SmartFan II mode. 1: Thermal Cruise mode. |
| 4 | TR1_MD (Thermistor 1 SmartFan Control Mode) 0: SmartFan II mode. 1: Thermal Cruise mode. |
| 3 | TD4_MD (Thermal Diode 4 SmartFan Control Mode) 0: SmartFan II mode. 1: Thermal Cruise mode. |
| 2 | TD3_MD (Thermal Diode 3 SmartFan Control Mode) 0: SmartFan II mode. 1: Thermal Cruise mode. |
| 1 | TD2_MD (Thermal Diode 2 SmartFan Control Mode) 0: SmartFan II mode. 1: Thermal Cruise mode. |
| 0 | TD1_MD (Thermal Diode 1 SmartFan Control Mode) 0: SmartFan II mode. 1: Thermal Cruise mode. |

8.11.2.12 Hysteresis Tolerance of Temperature Register(TolTemp)

In SmartFan mode, to avoid temperature unstable causing fan throttling, W83793G uses a hysteresis temperature to separate the speed up/slow down temperature point. While reset it is set to 2°C (22_{HEX}).

Location :



ToITD12 - Bank 2 Address 08_{HEX}

ToITD34 - Bank 2 Address 09_{HEX}

ToITR12 - Bank 2 Address 0A_{HEX}

Type : Read / Write

Reset : VSB5V(Pin 7) Rising,
Init Reset(CR40.Bit7) is set,
VDD5V(Pin 25) Rising @ RST_VDD_MD(CR40.Bit4) set,
SYSRSTIN_N(Pin 15) Falling @ SYSRST_MD(CR40.Bit5) set.

TOLTD12

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|------------------|---|---|---|------------------|---|---|---|
| Name | ToITD2 | | | | ToITD1 | | | |
| Reset | 2 _{HEX} | | | | 2 _{HEX} | | | |

| BIT | DESCRIPTION |
|-----|---|
| 7-4 | ToITD2(TD 2 Tolerance Range). Unit in °C. |
| 3-0 | ToITD1(TD 1 Tolerance Range). Unit in °C. |

TOLTD34

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|------------------|---|---|---|------------------|---|---|---|
| Name | ToITD4 | | | | ToITD3 | | | |
| Reset | 2 _{HEX} | | | | 2 _{HEX} | | | |

| BIT | DESCRIPTION |
|-----|---|
| 7-4 | ToITD4(TD 4 Tolerance Range). Unit in °C. |
| 3-0 | ToITD3(TD 3 Tolerance Range). Unit in °C. |

TOLTR12

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|------------------|---|---|---|------------------|---|---|---|
| Name | ToITR2 | | | | ToITR1 | | | |
| Reset | 2 _{HEX} | | | | 2 _{HEX} | | | |

| BIT | DESCRIPTION |
|-----|--|
| 7-4 | ToITR2(TR2 Tolerance Range). Unit in °C. |
| 3-0 | ToITR1(TR1 Tolerance Range). Unit in °C. |



8.11.2.13 Fan Output Nonstop Duty Cycle Register(FanNonStop)

Due to bring a fan from stop to work might take some time. The design of FanNonStop is hope to have a minimum duty cycle to keep the fan rotating when system does not require fan help getting ride of heat but still want to keep the fast response time to speed up fan. (Reference to [Graph](#))

Location :

Fan1NonStop - Bank 2 Address 18_{HEX}

Fan2NonStop - Bank 2 Address 19_{HEX}

Fan3NonStop - Bank 2 Address 1A_{HEX}

Fan4NonStop - Bank 2 Address 1B_{HEX}

Fan5NonStop - Bank 2 Address 1C_{HEX}

Fan6NonStop - Bank 2 Address 1D_{HEX}

Fan7NonStop - Bank 2 Address 1E_{HEX}

Fan8NonStop - Bank 2 Address 1F_{HEX}

Type : Read / Write

Reset : VSB5V(Pin 7) Rising,
Init Reset(CR40.Bit7) is set,
VDD5V(Pin 25) Rising @ RST_VDD_MD(CR40.Bit4) set,
SYSRSTIN_N(Pin 15) Falling @ SYSRST_MD(CR40.Bit5) set.

FANNONSTOP

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------|---|------------------|---|---|---|---|---|
| Name | Reserved | | FanNonStop | | | | | |
| Reset | 0 | | 4 _{HEX} | | | | | |

| BIT | DESCRIPTION |
|-----|--|
| 7-6 | Reserved. |
| 5-0 | FanNonStop (Fan Output NonStop Duty Cycle). |

8.11.2.14 Fan Output Start Duty Cycle Register(FanStart)

From still to rotate, Fan usually needs a higher duty cycle to generate enough torque to conquer the restriction force. Thus W83793G include a FanStart to bring the Fan live with the duty specified. (Reference to [Graph](#))

Location :

Fan1Start - Bank 2 Address 20_{HEX}

Fan2Start - Bank 2 Address 21_{HEX}

Fan3Start - Bank 2 Address 22_{HEX}

Fan4Start - Bank 2 Address 23_{HEX}



Fan5Start - Bank 2 Address 24_{HEX}

Fan6Start - Bank 2 Address 25_{HEX}

Fan7Start - Bank 2 Address 26_{HEX}

Fan8Start - Bank 2 Address 27_{HEX}

Type : Read / Write

Reset : VSB5V(Pin 7) Rising,
Init Reset(CR40.Bit7) is set,
VDD5V(Pin 25) Rising @ RST_VDD_MD(CR40.Bit4) set,
SYSRSTIN_N(Pin 15) Falling @ SYSRST_MD(CR40.Bit5) set.

FANSTART

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------|---|------------------|---|---|---|---|---|
| Name | Reserved | | FanStart | | | | | |
| Reset | 0 | | 8 _{HEX} | | | | | |

| BIT | DESCRIPTION |
|-----|--|
| 7-6 | Reserved. |
| 5-0 | FanStart (Fan Output Start Duty Cycle). |

8.11.2.15 Fan Output Stop Time Register(FanStopTime)

A time interval is specified to tell W83793G when to turn off fan if SmartFan continuously request to slower down Fan, but fan already reached the **NonStop** Level. Default is 10 sec. (Reference to [Graph](#))

Location :

Fan1StopTime - Bank 2 Address 28_{HEX}

Fan2StopTime - Bank 2 Address 29_{HEX}

Fan3StopTime - Bank 2 Address 2A_{HEX}

Fan4StopTime - Bank 2 Address 2B_{HEX}

Fan5StopTime - Bank 2 Address 2C_{HEX}

Fan6StopTime - Bank 2 Address 2D_{HEX}

Fan7StopTime - Bank 2 Address 2E_{HEX}

Fan8StopTime - Bank 2 Address 2F_{HEX}

Type : Read / Write

Reset : VSB5V(Pin 7) Rising,
Init Reset(CR40.Bit7) is set,
VDD5V(Pin 25) Rising @ RST_VDD_MD(CR40.Bit4) set,
SYSRSTIN_N(Pin 15) Falling @ SYSRST_MD(CR40.Bit5) set.



FANSTOPTIME

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | FanStopTime | | | | | | | |
| Reset | 64 _{HEX} | | | | | | | |

| BIT | DESCRIPTION |
|-----|---|
| 7-0 | <p>FanStopTime(Fan Stop time from Nonstop level to turn off). Unit in 0.1sec. Ranged from 0.1sec to 25.5sec. If set to 0, Fan will never stop.</p> |

8.11.2.16 Target Temperature of Temperature Inputs Register(TempTarget)

In Thermal Cruise mode, a target temperature is needed to be defined for each temperature source. W83793G will try to tune fan speed to keep the temperature of target device around the target temperature. Default target temperature for diode sensors is 40°C, and 32°C for thermistor sensors.

Location :

TD1Target - Bank 2 Address 10_{HEX}

TD2Target - Bank 2 Address 11_{HEX}

TD3Target - Bank 2 Address 12_{HEX}

TD4Target - Bank 2 Address 13_{HEX}

TR1Target - Bank 2 Address 14_{HEX}

TR2Target - Bank 2 Address 15_{HEX}

Type : Read / Write

Reset : VSB5V(Pin 7) Rising,
 Init Reset(CR40.Bit7) is set,
 VDD5V(Pin 25) Rising @ RST_VDD_MD(CR40.Bit4) set,
 SYSRSTIN_N(Pin 15) Falling @ SYSRST_MD(CR40.Bit5) set.

TD1TARGET ~ TD4TARGET

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------|-------------------|---|---|---|---|---|---|
| Name | Reserved | TempTarget | | | | | | |
| Reset | 0 | 28 _{HEX} | | | | | | |

| BIT | DESCRIPTION |
|-----|---|
| 7 | Reserved. |
| 6-0 | TempTarget. (Diode Temperature sensor target temperature). Unit in °C |

TR1TARGET ~ TR2TARGET

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------|-------------------|---|---|---|---|---|---|
| Name | Reserved | TempTarget | | | | | | |
| Reset | 0 | 20 _{HEX} | | | | | | |

| BIT | DESCRIPTION |
|-----|--|
| 7 | Reserved. |
| 6-0 | TempTarget. (Thermistor Temperature sensor target temperature). Unit in °C |

See also : [ToITemp](#), [FanCtrlMode](#), [Thermal Cruise mode](#).

8.11.2.17 Smart Fan II Fan Transition Temperature Level Registers (TempLevel)

SmartFan II, an algorithm providing a table mapping mechanism to translate temperature information into output Fan duties. The mapping table need user to provide 2 domains for the translation, those are at certain temperature mapping to certain duty. **TempLevel**(Temperature) and **TempFanLevel**(Duty Cycle) are used to define the table. There totally are six tables reside in W83793G, one table per temperature channel; 7 entries per table. Therefore here **TempLevel** will have 42 registers, and another 42 registers for **TempFanLevel** in this and next section.

Location :

TD1Level01 - Bank 2 Address 30_{HEX}

TD1Level12 - Bank 2 Address 31_{HEX}

TD1Level23 - Bank 2 Address 32_{HEX}

TD1Level34 - Bank 2 Address 33_{HEX}

TD1Level45 - Bank 2 Address 34_{HEX}

TD1Level56 - Bank 2 Address 35_{HEX}

TD1Level67 - Bank 2 Address 36_{HEX}

TD2Level01 - Bank 2 Address 40_{HEX}

TD2Level12 - Bank 2 Address 41_{HEX}

TD2Level23 - Bank 2 Address 42_{HEX}

TD2Level34 - Bank 2 Address 43_{HEX}

TD2Level45 - Bank 2 Address 44_{HEX}

TD2Level56 - Bank 2 Address 45_{HEX}
TD2Level67 - Bank 2 Address 46_{HEX}
TD3Level01 - Bank 2 Address 50_{HEX}
TD3Level12 - Bank 2 Address 51_{HEX}
TD3Level23 - Bank 2 Address 52_{HEX}
TD3Level34 - Bank 2 Address 53_{HEX}
TD3Level45 - Bank 2 Address 54_{HEX}
TD3Level56 - Bank 2 Address 55_{HEX}
TD3Level67 - Bank 2 Address 56_{HEX}
TD4Level01 - Bank 2 Address 60_{HEX}
TD4Level12 - Bank 2 Address 61_{HEX}
TD4Level23 - Bank 2 Address 62_{HEX}
TD4Level34 - Bank 2 Address 63_{HEX}
TD4Level45 - Bank 2 Address 64_{HEX}
TD4Level56 - Bank 2 Address 65_{HEX}
TD4Level67 - Bank 2 Address 66_{HEX}
TR1Level01 - Bank 2 Address 70_{HEX}
TR1Level12 - Bank 2 Address 71_{HEX}
TR1Level23 - Bank 2 Address 72_{HEX}
TR1Level34 - Bank 2 Address 73_{HEX}
TR1Level45 - Bank 2 Address 74_{HEX}
TR1Level56 - Bank 2 Address 75_{HEX}
TR1Level67 - Bank 2 Address 76_{HEX}
TR2Level01 - Bank 2 Address 80_{HEX}
TR2Level12 - Bank 2 Address 81_{HEX}
TR2Level23 - Bank 2 Address 82_{HEX}
TR2Level34 - Bank 2 Address 83_{HEX}
TR2Level45 - Bank 2 Address 84_{HEX}
TR2Level56 - Bank 2 Address 85_{HEX}
TR2Level67 - Bank 2 Address 86_{HEX}

Type : Read / Write

Reset : VSB5V(Pin 7) Rising,

Init Reset(CR40.Bit7) is set,

VDD5V(Pin 25) Rising @ RST_VDD_MD(CR40.Bit4) set,

SYSRSTIN_N(Pin 15) Falling @ SYSRST_MD(CR40.Bit5) set.

TD1LEVEL01 ~ TR2LEVEL01

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------|-------------------|---|---|---|---|---|---|
| Name | Reserved | TempLevel01 | | | | | | |
| Reset | 0 | 1E _{HEX} | | | | | | |

| BIT | DESCRIPTION |
|-----|--|
| 7 | Reserved. |
| 6-0 | TempLevel01. (Temperature Level between TempFanLevel0 and TempFanLevel1). Unit in °C |

TD1LEVEL12 ~ TR2LEVEL12

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------|-------------------|---|---|---|---|---|---|
| Name | Reserved | TempLevel12 | | | | | | |
| Reset | 0 | 23 _{HEX} | | | | | | |

| BIT | DESCRIPTION |
|-----|--|
| 7 | Reserved. |
| 6-0 | TempLevel12. (Temperature Level between TempFanLevel1 and TempFanLevel2). Unit in °C |

TD1LEVEL23 ~ TR2LEVEL23

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------|-------------------|---|---|---|---|---|---|
| Name | Reserved | TempLevel23 | | | | | | |
| Reset | 0 | 28 _{HEX} | | | | | | |

| BIT | DESCRIPTION |
|-----|--|
| 7 | Reserved. |
| 6-0 | TempLevel23. (Temperature Level between TempFanLevel2 and TempFanLevel3). Unit in °C |

TD1LEVEL34 ~ TR2LEVEL34

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------|-------------------|---|---|---|---|---|---|
| Name | Reserved | TempLevel34 | | | | | | |
| Reset | 0 | 2D _{HEX} | | | | | | |



| BIT | DESCRIPTION |
|-----|--|
| 7 | Reserved. |
| 6-0 | TempLevel34. (Temperature Level between TempFanLevel3 and TempFanLevel4). Unit in °C |

TD1LEVEL45 ~ TR2LEVEL45

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------|-------------------|---|---|---|---|---|---|
| Name | Reserved | TempLevel45 | | | | | | |
| Reset | 0 | 32 _{HEX} | | | | | | |

| BIT | DESCRIPTION |
|-----|--|
| 7 | Reserved. |
| 6-0 | TempLevel45. (Temperature Level between TempFanLevel4 and TempFanLevel5). Unit in °C |

TD1LEVEL56 ~ TR2LEVEL56

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------|-------------------|---|---|---|---|---|---|
| Name | Reserved | TempLevel56 | | | | | | |
| Reset | 0 | 37 _{HEX} | | | | | | |

| BIT | DESCRIPTION |
|-----|--|
| 7 | Reserved. |
| 6-0 | TempLevel56. (Temperature Level between TempFanLevel5 and TempFanLevel6). Unit in °C |

TD1LEVEL67 ~ TR2LEVEL67

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------|-------------------|---|---|---|---|---|---|
| Name | Reserved | TempLevel67 | | | | | | |
| Reset | 0 | 3C _{HEX} | | | | | | |

| BIT | DESCRIPTION |
|-----|---|
| 7 | Reserved. |
| 6-0 | TempLevel67 . (Temperature Level between TempFanLevel6 and TempFanLevel7). Unit in °C |

See also : [TolTemp](#), [FanCtrlMode](#), [Smart Fan II mode](#).

8.11.2.18 Smart Fan II Fan Output Levels Registers (TempFanLevel)

Previous section describes one temperature axis of Smart Fan II Table, here introduced Fan Duty axis for the table, **TempFanLevel** registers.

Location :

- TD1FanLevel0** - Bank 2 Address 38_{HEX}
- TD1FanLevel1** - Bank 2 Address 39_{HEX}
- TD1FanLevel2** - Bank 2 Address 3A_{HEX}
- TD1FanLevel3** - Bank 2 Address 3B_{HEX}
- TD1FanLevel4** - Bank 2 Address 3C_{HEX}
- TD1FanLevel5** - Bank 2 Address 3D_{HEX}
- TD1FanLevel6** - Bank 2 Address 3E_{HEX}
- TD2FanLevel0** - Bank 2 Address 48_{HEX}
- TD2FanLevel1** - Bank 2 Address 49_{HEX}
- TD2FanLevel2** - Bank 2 Address 4A_{HEX}
- TD2FanLevel3** - Bank 2 Address 4B_{HEX}
- TD2FanLevel4** - Bank 2 Address 4C_{HEX}
- TD2FanLevel5** - Bank 2 Address 4D_{HEX}
- TD2FanLevel6** - Bank 2 Address 4E_{HEX}
- TD3FanLevel0** - Bank 2 Address 58_{HEX}
- TD3FanLevel1** - Bank 2 Address 59_{HEX}
- TD3FanLevel2** - Bank 2 Address 5A_{HEX}
- TD3FanLevel3** - Bank 2 Address 5B_{HEX}
- TD3FanLevel4** - Bank 2 Address 5C_{HEX}
- TD3FanLevel5** - Bank 2 Address 5D_{HEX}
- TD3FanLevel6** - Bank 2 Address 5E_{HEX}
- TD4FanLevel0** - Bank 2 Address 68_{HEX}
- TD4FanLevel1** - Bank 2 Address 69_{HEX}
- TD4FanLevel2** - Bank 2 Address 6A_{HEX}
- TD4FanLevel3** - Bank 2 Address 6B_{HEX}



- TD4FanLevel4** - Bank 2 Address 6C_{HEX}
- TD4FanLevel5** - Bank 2 Address 6D_{HEX}
- TD4FanLevel6** - Bank 2 Address 6E_{HEX}
- TR1FanLevel0** - Bank 2 Address 78_{HEX}
- TR1FanLevel1** - Bank 2 Address 79_{HEX}
- TR1FanLevel2** - Bank 2 Address 7A_{HEX}
- TR1FanLevel3** - Bank 2 Address 7B_{HEX}
- TR1FanLevel4** - Bank 2 Address 7C_{HEX}
- TR1FanLevel5** - Bank 2 Address 7D_{HEX}
- TR1FanLevel6** - Bank 2 Address 7E_{HEX}
- TR2FanLevel0** - Bank 2 Address 88_{HEX}
- TR2FanLevel1** - Bank 2 Address 89_{HEX}
- TR2FanLevel2** - Bank 2 Address 8A_{HEX}
- TR2FanLevel3** - Bank 2 Address 8B_{HEX}
- TR2FanLevel4** - Bank 2 Address 8C_{HEX}
- TR2FanLevel5** - Bank 2 Address 8D_{HEX}
- TR2FanLevel6** - Bank 2 Address 8E_{HEX}

Type : Read / Write

Reset : VSB5V(Pin 7) Rising,

Init Reset(CR40.Bit7) is set,

VDD5V(Pin 25) Rising @ RST_VDD_MD(CR40.Bit4) set,

SYSRSTIN_N(Pin 15) Falling @ SYSRST_MD(CR40.Bit5) set.

TD1FANLEVEL0 ~ TR2FANLEVEL0

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------|---|-------------------|---|---|---|---|---|
| Name | Reserved | | TempFanLevel0 | | | | | |
| Reset | 0 | | 08 _{HEX} | | | | | |

| BIT | DESCRIPTION |
|-----|--|
| 7-6 | Reserved. |
| 5-0 | TempFanLevel0 . (Fan Output Level 0). |



TD1FANLEVEL1 ~ TR2FANLEVEL1

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------|---|-------------------|---|---|---|---|---|
| Name | Reserved | | TempFanLevel1 | | | | | |
| Reset | 0 | | 0C _{HEX} | | | | | |

| BIT | DESCRIPTION |
|-----|---|
| 7-6 | Reserved. |
| 5-0 | TempFanLevel1. (Fan Output Level 1). |

TD1FANLEVEL2 ~ TR2FANLEVEL2

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------|---|-------------------|---|---|---|---|---|
| Name | Reserved | | TempFanLevel2 | | | | | |
| Reset | 0 | | 10 _{HEX} | | | | | |

| BIT | DESCRIPTION |
|-----|---|
| 7-6 | Reserved. |
| 5-0 | TempFanLevel2. (Fan Output Level 2). |

TD1FANLEVEL3 ~ TR2FANLEVEL3

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------|---|-------------------|---|---|---|---|---|
| Name | Reserved | | TempFanLevel3 | | | | | |
| Reset | 0 | | 18 _{HEX} | | | | | |

| BIT | DESCRIPTION |
|-----|---|
| 7-6 | Reserved. |
| 5-0 | TempFanLevel3. (Fan Output Level 3). |

TD1FANLEVEL4 ~ TR2FANLEVEL4

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------|---|-------------------|---|---|---|---|---|
| Name | Reserved | | TempFanLevel4 | | | | | |
| Reset | 0 | | 20 _{HEX} | | | | | |



| BIT | DESCRIPTION |
|-----|---|
| 7-6 | Reserved. |
| 5-0 | TempFanLevel4. (Fan Output Level 4). |

TD1FANLEVEL5 ~ TR2FANLEVEL5

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------|---|-------------------|---|---|---|---|---|
| Name | Reserved | | TempFanLevel5 | | | | | |
| Reset | 0 | | 30 _{HEX} | | | | | |

| BIT | DESCRIPTION |
|-----|---|
| 7-6 | Reserved. |
| 5-0 | TempFanLevel5. (Fan Output Level 5). |

TD1FANLEVEL6 ~ TR2FANLEVEL6

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------|---|-------------------|---|---|---|---|---|
| Name | Reserved | | TempFanLevel6 | | | | | |
| Reset | 0 | | 38 _{HEX} | | | | | |

| BIT | DESCRIPTION |
|-----|---|
| 7-6 | Reserved. |
| 5-0 | TempFanLevel6. (Fan Output Level 6). |

See also: [TolTemp](#), [FanCtrlMode](#), [Smart Fan II mode](#).

8.12 PECl Control Registers

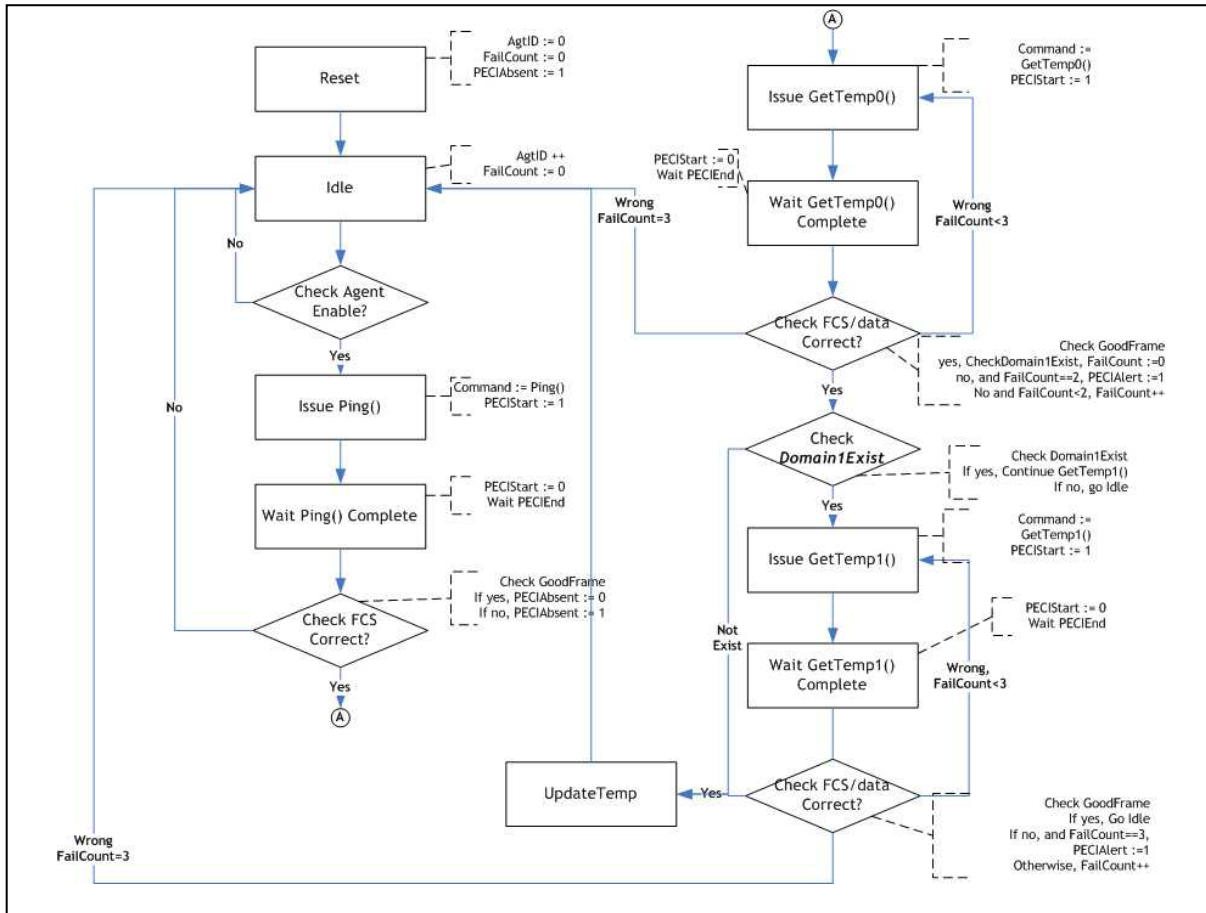
Intel® new generation CPUs such as Presler begin to support new single wire digital temperature monitor interface which is called Platform Environment Control Interface or PECl. W83793G supports the PECl* version 1.0 for these new generation CPUs. All PECl control registers are allocated in Bank 0. Pin 1, PCLK, is the timing base of PECl control circuit, if PECl function is desired, Pin 1 is required to feed a 48MHz clock.



8.12.1 PECE Register Map

| MNEMONIC | REGISTER NAME | TYPE |
|---------------------------------------|--|------|
| AgtConfig | Agent Configuration Register | RW |
| Agt1Tcontrol Agt4Tcontrol | Tcontrol Register | RW |
| ReportStyle | PECE Report Temperature Style Register | RW |
| PECEWarning | PECE Warning Flag Register | RO |
| Agt1RelTempH/L Agt4RelTempH/L | Agent Relative Temperature Registers | RO |

Three control registers and 2 status registers are listed here. The detailed operation of PECE host can be referred to below figure.



Everytime W83793G PECEI host detects user enable an agent by setting **AgtEn**, it start to Ping if the client really exist. If not true, it set **PECEIAbsent** flag to inform host; otherwise it continue to issue GetTemp0 or GetTemp1 (when **DM1Exist** asserted). A three-level fault queue is made to ensure host can get correct temperature and return.

8.12.2 PECEI Register Details

8.12.2.1 Agent Configuration Register (AgtConfig)

This register commands PECEI host to proceed related agents and domains, only agent or domain specified in this register will proceed PECEI transactions. It is reset as 00_{HEX}.

Location : **AgtConfig** - Bank 0 Address D0_{HEX}

Type : Read Write

Reset : VSB5V(Pin 7) Rising,

VDD5V(Pin 25) Rising @ RST_VDD_MD(CR40.Bit4) set.

AGTCONFIG

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|
| Name | Agt4EN | Agt3EN | Agt2EN | Agt1EN | Agt4D1 | Agt3D1 | Agt2D1 | Agt1D1 |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| BIT | DESCRIPTION |
|-----|--|
| 7 | Agt4EN (Agent 4 Enable Bit). 0 _{BIN} : Agent 4 is disabled. 1 _{BIN} : Agent 4 enabled. |
| 6 | Agt3EN (Agent 3 Enable Bit). 0 _{BIN} : Agent 3 is disabled. 1 _{BIN} : Agent 3 enabled. |
| 5 | Agt2EN (Agent 2 Enable Bit). 0 _{BIN} : Agent 2 is disabled. 1 _{BIN} : Agent 2 enabled. |
| 4 | Agt1EN (Agent 1 Enable Bit). 0 _{BIN} : Agent 1 is disabled. 1 _{BIN} : Agent 1 enabled. |
| 3 | Agt4D1 (Agent 4 Domain 1 Enable Bit). 0 _{BIN} : Agent 4 does not have domain 1. 1 _{BIN} : Agent 4 have domain 1. |
| 2 | Agt3D1 (Agent 3 Domain 1 Enable Bit). 0 _{BIN} : Agent 3 does not have domain 1. 1 _{BIN} : Agent 3 have domain 1. |
| 1 | Agt2D1 (Agent 2 Domain 1 Enable Bit). 0 _{BIN} : Agent 2 does not have domain 1. 1 _{BIN} : Agent 2 have domain 1. |
| 0 | Agt1D1 (Agent 1 Domain 1 Enable Bit). 0 _{BIN} : Agent 1 does not have domain 1. 1 _{BIN} : Agent 1 have domain 1. |

8.12.2.2 Agent TControl Register (AgtTcontrol)

Intel® CPU introduces a Tcontrol concept on temperature management. In Presler generation CPUs, Tcontrol can be read from CPU register by BIOS and refill to W83793G registers. Our default setup is 70°C, which is 10°C higher than [TempLevel67](#). In later generation CPUs, CPU might only response the Tcontrol value as an offset temperature to PROCHOT# assertion. It is reset as 46_{HEX}.



Location :

Agt1TControl - Bank 0 Address D1_{HEX}

Agt2TControl - Bank 0 Address D2_{HEX}

Agt3TControl - Bank 0 Address D3_{HEX}

Agt4TControl - Bank 0 Address D4_{HEX}

Type : Read / Write

Reset : VSB5V(Pin 7) Rising,

VDD5V(Pin 25) Rising @ RST_VDD_MD(CR40.Bit4) set.

AGT1TCONTROL~AGT4TCONTROL

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------|----------------------|---|---|---|---|---|---|
| Name | Reserved | TControl Temperature | | | | | | |
| Reset | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 |

| BIT | DESCRIPTION |
|-----|--|
| 7 | Reserved. |
| 6-0 | TControl (TControl Temperature Setting). TControl must always be a positive value, negative value will introduce abnormal temperature response. |

8.12.2.3 PECE Report Temperature Style Register (ReportStyle)

ReportStyle controls which value being loaded into Absolute Temp or Relative Temp.

If RtHigh, PECE host will automatically compares the highest temperature domain and load it into Abs/Rel-Temp. If **RtHigh** = 0, **RtDm** will return Domain 0 temperature if set 0, return Domain 1 temperature if set 1. It is reset as 00_{HEX}.

Location : **ReportStyle** - Bank 0 Address D5_{HEX}

Type : Read / Write

Reset : VSB5V(Pin 7) Rising,

VDD5V(Pin 25) Rising @ RST_VDD_MD(CR40.Bit4) set.

REPORTSTYLE

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------|---|---|--------|------|------|------|------|
| Name | Reserved | | | RtHigh | RTD4 | RTD3 | RTD2 | RTD1 |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| BIT | DESCRIPTION |
|-----|---|
| 7-5 | Reserved. |
| 4 | RtHigh (Return High Temperature). 0 _{BIN} : Return domain by RTD selection (RTD1~RTD4). 1 _{BIN} : Return highest temperature in the same agent. |
| 3 | RtD4 (Agent 4 Return Domain 1 Enable Bit). Only take effect when RtHigh deasserts. 0 _{BIN} : Agent 4 always return domain 0. 1 _{BIN} : Agent 4 always return domain 1. |
| 2 | RtD3 (Agent 3 Return Domain 1 Enable Bit). Only take effect when RtHigh deasserts. 0 _{BIN} : Agent 3 always return domain 0. 1 _{BIN} : Agent 3 always return domain 1. |
| 1 | RtD2 (Agent 2 Return Domain 1 Enable Bit). Only take effect when RtHigh deasserts. 0 _{BIN} : Agent 2 always return domain 0. 1 _{BIN} : Agent 2 always return domain 1. |
| 0 | RtD1 (Agent 1 Return Domain 1 Enable Bit). Only take effect when RtHigh deasserts. 0 _{BIN} : Agent 1 always return domain 0. 1 _{BIN} : Agent 1 always return domain 1. |

8.12.2.4 PECl Warning Flag Register (PEClWarning)

Few warnings may be generated while PECl protocol applies. First, PECl host may not able to detect a PECl Client (or say, client does not reponse to host Ping() command), in this case PECl issue a flag called Absent to inform users it cannot detect the client. Another case is about the PECl Client return bad FCS in successive 3 time polling, host will issue an Alert flag. It is reset as 00_{HEX}.

Location: **PEClWarning** - Bank 0 Address D6_{HEX}

Type: Read Only

Reset: VSB5V (Pin 7) Rising,
VDD5V (Pin 25) Rising @ RST_VDD_MD (CR40.Bit4) set.

PEClWARNING

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|---------|---------|---------|---------|--------|--------|--------|--------|
| Name | Absent4 | Absent3 | Absent2 | Absent1 | Alert4 | Alert3 | Alert2 | Alert1 |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| BIT | DESCRIPTION |
|-----|---|
| 7 | Absent4 (PECI Agent 4 Absent Bit). 0 _{BIN} : Agent 4 is detected. 1 _{BIN} : Agent 4 cannot be detected. |
| 6 | Absent3 (PECI Agent 3 Absent Bit). 0 _{BIN} : Agent 3 is detected. 1 _{BIN} : Agent 3 cannot be detected. |
| 5 | Absent2 (PECI Agent 2 Absent Bit). 0 _{BIN} : Agent 2 is detected. 1 _{BIN} : Agent 2 cannot be detected. |
| 4 | Absent1 (PECI Agent 1 Absent Bit). 0 _{BIN} : Agent 1 is detected. 1 _{BIN} : Agent 1 cannot be detected. |
| 3 | Alert4 (PECI Agent 4 Alert Bit). 0 _{BIN} : Agent 4 has good FCS. 1 _{BIN} : Agent 4 has bad FCS in last 3 transactions. |
| 2 | Alert3 (PECI Agent 3 Alert Bit). 0 _{BIN} : Agent 3 has good FCS. 1 _{BIN} : Agent 3 has bad FCS in last 3 transactions. |
| 1 | Alert2 (PECI Agent 2 Alert Bit). 0 _{BIN} : Agent 2 has good FCS. 1 _{BIN} : Agent 2 has bad FCS in last 3 transactions. |
| 0 | Alert1 (PECI Agent 1 Alert Bit). 0 _{BIN} : Agent 1 has good FCS. 1 _{BIN} : Agent 1 has bad FCS in last 3 transactions. |

While PECI is activated, Alert flag will be asserted when corresponding agent return successive 3 time bad FCS. In this case, W83793G will think this agent has some problem in interface, and for safety reason W83793G will turn on the related Fan to full speed in SmartFan mode. The Fan and PECI agent relationship is defined in [TempFanSelect](#) registers.

8.12.2.5 Agent Relative Temperature Register (AgtRelTemp)

These registers return the raw data retrieved from PECI interface. They may be the error code (range: 8000H~81FFH) or relative temperature to processor defined PROCHOT#. Error code will only update in **AgtRelTemp**, Absolute Temp will not be updated when error code received. If **ReturnHigh** mechanism is activated, normal temperature will always return first. In case both 2 domain returns error, return priority will be Overflow error > Underflow Error > Missing diode > General Error. Reset value is 8001_{HEX} due to PECI is default turned off, in PECI, 8001_{HEX} means diode missing.



Location:

Agt1RelTempH - Bank 0 Address D8_{HEX}

Agt1RelTempL - Bank 0 Address D9_{HEX}

Agt2RelTempH - Bank 0 Address DA_{HEX}

Agt2RelTempL - Bank 0 Address DB_{HEX}

Agt3RelTempH - Bank 0 Address DC_{HEX}

Agt3RelTempL - Bank 0 Address DD_{HEX}

Agt4RelTempH - Bank 0 Address DE_{HEX}

Agt4RelTempL - Bank 0 Address DF_{HEX}

Type: Read Only

Reset: VSB5V (Pin 7) Rising,

VDD5V (Pin 25) Rising @ RST_VDD_MD (CR40.Bit4) set.

AGT1RELTEMPH/L~AGT4RELTEMPH/L

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|------------------|------------------|--------|--------|--------|---------|---------|---------|
| Name | Sign | Temperature[8:2] | | | | | | |
| Reset | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Name | Temperature[1:0] | | TEMP_2 | TEMP_4 | TEMP_8 | TEMP_16 | TEMP_32 | TEMP_64 |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

| BIT | DESCRIPTION |
|------|---|
| 15 | Sign Bit. In PECL Protocol, this bit should always be 1 to represent a negative temperature. |
| 14-6 | Temperature The integer part of relative temperature. |
| 5 | TEMP_2. 0.5°C unit. |
| 4 | TEMP_4. 0.25°C unit. |
| 3 | TEMP_8. 0.125°C unit. |
| 2 | TEMP_16. 0.0625°C unit. |
| 1 | TEMP_32. 0.03125°C unit. |
| 0 | TEMP_64. 0.015625°C unit. |

In some occasion, the PECL interface will return the abnormal states of the PECL bus other than temperature, all these information will be recorded in [AgtRelTemp](#), and in some cases W83793G will also do further processing for alert mechanism. The following describes these code and their effects to W83793G.



| ERROR CODE | DESCRIPTION | W83793G HOST OPERATION |
|---|---|---|
| 8000 _{HEX} | General Sensor Error | No further processing. |
| 8001 _{HEX} | Sensing Device Missing | |
| 8002 _{HEX} | Operational, but temperature is lower than sensor operation range. | Force writing back temperature with 0°C in temperature readouts.(Bank 0 Index 1C _{HEX} ~ 1F _{HEX}) |
| 8003 _{HEX} | Operational, but temperature is higher than sensor operation range. | Force writing back temperature with 127°C in temperature readouts.(Bank 0 Index 1C _{HEX} ~ 1F _{HEX}) |
| 8004 _{HEX} □ 81FF _{HEX} | Reserved. | No further operation. |

Besides error conditions or bad FCS, normal temperature will be wrote back to [Temperature Readouts](#) with the sum of [AgtRelTemp](#) and [Tcontrol](#).

8.13 ASF Control Registers

ASF or Alert Standard Format provides remote system abilities to monitor, discover and manage the local platform. All ASF control registers are allocated in Bank 1*.

*About the Bank Selection, please reference Bank Select register located at address 00_{Hex}.

8.13.1 ASF Register Map

8.13.1.1 SMBus ARP UDID Control Registers

| MNEMONIC | REGISTER NAME | TYPE |
|--|--|------|
| UDIDDevCap. | UDID Device Capability Register | RO |
| UDIDVersion. | UDID Version Number Register | RO |
| UDIDVendorH. UDIDVendorL. | UDID Vendor ID High/Low Byte Register | RO |
| UDIDDevH. UDIDDevL. | UDID Device ID High/Low Byte Register | RW |
| UDIDIFH. UDIDIFL. | UDID Interface High/Low Byte Register | RW |
| UDIDSubVenH. UDIDSubVenL. | UDID Subsystem Vendor ID High/Low Byte Registers | RW |
| UDIDSubDevH. UDIDSubDevL. | UDID Subsystem Device ID High/Low Byte Registers | RW |
| UDIDSpeID1. <input type="checkbox"/> UDIDSpeID4. | UDID Vendor Specific ID Byte 1~4 | RW |
| RNG1. <input type="checkbox"/> RNG4. | Random Number Generator Byte 1~4 | RO |
| ASFAddr. | ASF Assigned Address Register | RO |

Before activating ASF, user must go through the ARP (Address Resolution Protocol) to dynamically get a valid address to manipulate ASF commands. In ARP, a very important ID must be defined to distinguish different devices, called UDID (Unique Device Identifier). Registers in this section are used to setup the UDID content.

For detailed operation of ARP and UDID, you can refer to SMBus Specification version 2.0 (<http://www.smbus.org/specs/smbus20.pdf>) section 5.6 page 34.

8.13.1.2 [ASF Sensor Entity Definition Registers](#)

In ASF Sensor, each sensor channel has 2 parameters to tell ASF host its related location information on the platform. They are entity Instance and entity ID. In case of user uses the temperature sensor in locations different with default specified, W83793G provides all channel parameter programmable to fit customers' application.



| MNEMONIC | REGISTER NAME | TYPE |
|----------------------------------|---------------------------------|------|
| VCA_ENTY. | VCoreA Entity ID Register | RW |
| VCB_ENTY. | VCoreB Entity ID Register | RW |
| Vtt_ENTY. | Vtt Entity ID Register | RW |
| VDD_ENTY. | VDD Entity ID Register | RW |
| VSB_ENTY. | VSB Entity ID Register | RW |
| VBAT_ENTY. | VBAT Entity ID Register | RW |
| VSEN1_ENTY. □ 12VSEN_ENTY. | VSEN1~12VSEN Entity ID Register | RW |
| FAN1_ENTY. □ FAN12_ENTY. | FAN1~FAN12 Entity ID Register | RW |
| TD1_ENTY. □ TR2_ENTY. | TD1~TR2 Entity ID Register | RW |
| CHS_ENTY. | Chassis Entity Register | RW |

For details of entity ID, you can refer to [Platform Event Trap Format Specification](#) Version 1.0 Table 6 page 13.



| MNEMONIC | REGISTER NAME | TYPE |
|-----------|--|------|
| ENTINS1. | VCoreA/VCoreB Entity Instance Register | RW |
| ENTINS2. | VDD/Vtt Entity Instance Register | RW |
| ENTINS3. | VBAT/VSB Entity Instance Register | RW |
| ENTINS4. | VIN1/VIN2 Entity Instance Register | RW |
| ENTINS5. | VIN3/VIN4 Entity Instance Register | RW |
| ENTINS6. | FAN1/FAN2 Entity Instance Register | RW |
| ENTINS7. | FAN3/FAN4 Entity Instance Register | RW |
| ENTINS8. | FAN5/FAN6 Entity Instance Register | RW |
| ENTINS9. | FAN7/FAN8 Entity Instance Register | RW |
| ENTINS10. | FAN9/FAN10 Entity Instance Register | RW |
| ENTINS11. | FAN11/FAN12 Entity Instance Register | RW |
| ENTINS12. | TD1/TD2 Entity Instance Register | RW |
| ENTINS13. | TD3/TD4 Entity Instance Register | RW |
| ENTINS14. | TR1/TR2 Entity Instance Register | RW |
| ENTINS15. | Chassis Entity Instance Register | RW |

Entity Instance is a sequential number which help identifies this sensor's location. Customer can set the sequence at any order they want.



A summary of the entity and entity instance is at following table.

| SENSOR IN W83793G | EVENT STATUS INDEX | EVENT SENSOR TYPE | EVENT NUMBER | ENTITY ID (PROGRAMMABLE) | ENTITY INSTANCE (PROGRAMMABLE) |
|-----------------------|--------------------|------------------------|--------------|--------------------------|--------------------------------|
| VCOREA | 00h | 02h | 01h | 03h (Processor) | 01h |
| VCOREB | 01h | 02h | 02h | | 02h |
| Vtt | 02h | 02h | 03h | | 03h |
| TD1 | 03h | 01h (Temperature) | 04h | 07h (System Board) | 01h |
| TD2 | 04h | 01h | 05h | | 02h |
| TD3 | 05h | 01h | 06h | | 03h |
| TD4 | 06h | 01h | 07h | | 04h |
| TR1 | 07h | 01h | 08h | | 05h |
| TR2 | 08h | 01h | 09h | | 06h |
| 5VDD | 09h | 02h | 0Ah | | 01h |
| VSB | 0Ah | 02h | 0Bh | | 02h |
| VBAT | 0Bh | 02h | 0Ch | | 03h |
| VSEN1 | 0Ch | 02h (Voltage) | 0Dh | | 04h |
| VSEN2 | 0Dh | 02h | 0Eh | | 05h |
| 3VSEN | 0Eh | 02h | 0Fh | | 06h |
| 12VSEN | 0Fh | 02h | 10h | | 07h |
| FAN1 | 10h | 04h (Fan) | 11h | | 01h |
| FAN2 | 11h | 04h | 12h | | 02h |
| FAN3 | 12h | 04h | 13h | | 03h |
| FAN4 | 13h | 04h | 14h | | 04h |
| FAN5 | 14h | 04h | 15h | | 05h |
| FAN6 | 15h | 04h | 16h | 06h | |
| FAN7 | 16h | 04h | 17h | 07h | |
| FAN8 | 17h | 04h | 18h | 08h | |
| FAN9 | 18h | 04h | 19h | 09h | |
| FAN10 | 19h | 04h | 1Ah | 0Ah | |
| FAN11 | 1Ah | 04h | 1Bh | 0Bh | |
| FAN12 | 1Bh | 04h | 1Ch | 0Ch | |
| Case OPEN / Intrusion | 1Ch | 05h(Physical Security) | 1Dh | 23h(System Chassis) | 01h |

Channels in light-green indicates them could be disabled by multi-function pin selection or control registers.



And according to each channel status, they are expressed in the following terms.

| DESCRIPTION | STATUS | EVENT SENSOR TYPE | EVENT TYPE | EVENT OFFSET | EVENT SEVERITY |
|---------------------------------|----------------|-----------------------------|-----------------------------|--------------|---------------------|
| TEMPERATURE SENSORS | | | | | |
| Upper-Critical Going High | 3h Assert | 01h Temperature | 01h Threshold- Based | 09h | 10h Critical |
| Upper-Critical Going Low | | | | 08h | |
| Upper-Non-critical Going High | | | | 07h | 08h Non-critical |
| Upper-Non-critical Going Low | | | | 06h | |
| Lower-Non-critical Going High | 2h Deassert | | | 01h | 01h Monitor |
| Lower-Non-critical Going Low | | | | 00h | |
| VOLTAGE SENSORS | | | | | |
| Generic Over Voltage Problem | 3h | 02h Voltage | 07h Generic- Severity | 02h | 10h |
| Normal Voltage | 2h | | | 07h | 01h |
| Generic Under Voltage Problem | 3h | | | 02h | 10h |
| FAN SENSORS | | | | | |
| Normal FAN Speed | 2h | 04h Fan | 07h | 07h | 01h |
| Generic FAN Failure | 3h | | | 02h | 10h |
| CASEOPEN/ CASE INTRUSION | | | | | |
| Case Intruded | 3h | 05h Physical Security | 6Fh Sensor Specific | 00h | 10h |
| Case Normal | 2h | | | 80h | 01h |

8.13.1.3 ASF Remote Control Definition Registers

ASF function in W83793G also supports the Remote Control. This function enables MIS to remotely power on, power down, or reset while he finds the client computer goes into abnormal.

| MNEMONIC | REGISTER NAME | TYPE |
|--------------|--|------|
| PwrOnOption. | Power On Control Option Register | RW |
| PwrOnCmd. | Remote Control Power On Command Register | RW |
| PwrOffCmd. | Remote Control Power Down Command Register | RW |
| RstCmd. | Remote Control Reset Command Register | RW |

Remote Control function in W83793G enables MIS to use side-band of Network Interface Controller to send ASF commands with SMBus, its format looks like



| | | | | | | | | | | |
|---|------------------------|----|---|-----------------|---|--------------------|---|--------------|---|---|
| 1 | 7 | 1 | 1 | 8 | 1 | 8 | 1 | 8 | 1 | 1 |
| S | Slave Address | Wr | A | Command | A | Write Data | A | PEC | A | P |
| | Control Device Address | 0 | 0 | Control Command | 0 | Control Data Value | 0 | CRC Checksum | 0 | |

'S' represents "Start" Cycle of SMBus transaction, 'Wr' means "Write" Flag, 'A' means "Acknowledge" from W83793G, and 'P' indicates a "Stop" Cycle. All letter in shadow means it is a response from W83793G; otherwise it is a host transmitted signal.

Last row above shows what is each data meaning, where Control Device Address is the address assigned in the ARP process, Control Command is specified in above registers, and Control Data option is not supported in W83793G, thus with any value in this field W83793G will perform the same action.

In [Alert Standard Format Specification v2.0](#), there are two sections describe this. They are Section 5.4 at page 76, and Section 3.2.4.1 at page 33.

8.13.2 ASF Register Details

8.13.2.1 UDID Device Capability Register (UDIDDevCap)

SMBus Specification Working Group intends to use device capability to distinguish the arbitration priority of GeneralGetUDID() first. Thus the very first byte the UDID is device capability, because SMBus is a MSB first serial protocol and client sent low will win the arbitration. It is set as C1_{HEX}.

Location: **UDIDVersion** - Bank 1 Address 20_{HEX}
 Type: Read Only
 Reset: No Reset.

UDIDDEVCAP

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|--------------|---|----------|---|---|---|---|-----|
| Name | Address Type | | Reserved | | | | | PEC |
| Reset | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |

| BIT | DESCRIPTION |
|-----|---|
| 7-6 | Address Type. 00 _{BIN} : Fixed address device. It's the highest priority device. 01 _{BIN} : Dynamic and persistent address device. 10 _{BIN} : Dynamic and volatile address device. If power-down, the address needs to reassign at next power on. W83793G ASF address will lost while VSB5V not exist. 11 _{BIN} : Random number device. |



Continued

| BIT | DESCRIPTION |
|-----|---|
| 5-1 | Reserved. |
| 0 | PEC Suppot. 0: Not known support PEC(Packet Error Code) on this device. 1: PEC is supported on this device. |

8.13.2.2 UDID Version Number Register (UDIDVersion)

This field defines the version of UDID and Silicon for W83793G. It is 08_{HEX}.

Location: **UDIDVersion** - Bank 1 Address 21_{HEX}

Type: Read Only

Reset: No Reset

UDIDVERSION

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------|---|--------------|---|---|-----------------|---|---|
| Name | Reserved | | UDID Version | | | Silicon Version | | |
| Fixed | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |

| BIT | DESCRIPTION |
|-----|--|
| 7-6 | Reserved. |
| 5-3 | UDID Version. 000 _{BIN} : Reserved. 001 _{BIN} : UDID version 1. 010 _{BIN} -111 _{BIN} : Reserved for future use. |
| 2-0 | Silicon Version. For W83793G silicon version identification use. 000 _{BIN} stands for Version A/B. |

8.13.2.3 UDID Vendor ID High/Low Byte Register (UDIDVendorH/L)

This field defines Winbond vendor ID. Default is 1050_{HEX}.

Location: **UDIDVendorH** - Bank 1 Address 22_{HEX}

UDIDVendorL - Bank 1 Address 23_{HEX}

Type: Read Only

Reset: No Reset



UDIDVENDORH

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|---------------------|---|---|---|---|---|---|---|
| Name | Vendor ID High Byte | | | | | | | |
| Fixed | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |

UDIDVENDORL

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|--------------------|---|---|---|---|---|---|---|
| Name | Vendor ID Low Byte | | | | | | | |
| Fixed | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |

| BIT | DESCRIPTION |
|------|--------------------|
| 15-0 | Winbond Vendor ID. |

8.13.2.4 UDID Device ID High/Low Byte Register (UDIDDevH/L)

This field defines Winbond device ID. Default is 0100_{HEX}.

Location: **UDIDDevH** - Bank 1 Address 24_{HEX}

UDIDDevL - Bank 1 Address 25_{HEX}

Type: Read Write

Reset: VSB5V (Pin 7) Rising,
Init Reset (CR40.Bit7) is set.

UDIDDEVH

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|---------------------|---|---|---|---|---|---|---|
| Name | Device ID High Byte | | | | | | | |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

UDIDDEVL

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|--------------------|---|---|---|---|---|---|---|
| Name | Device ID Low Byte | | | | | | | |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| BIT | DESCRIPTION |
|------|--------------------|
| 15-0 | Winbond Device ID. |



8.13.2.5 UDID Interface High/Low Byte Register (UDIDIFH/L)

This field defines SMBus version and supported protocol. It is reset to 0024_{HEX}.

Location:

UDIDIFH - Bank 1 Address 26_{HEX}

UDIDIFL - Bank 1 Address 27_{HEX}

Type: Read Write

Reset: VSB5V (Pin 7) Rising,

Init Reset (CR40.Bit7) is set.

UDIDIFH

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------|---|---|---|---|---|---|---|
| Name | Reserved | | | | | | | |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

UDIDIFL

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------|------|-----|-----|---------------|---|---|---|
| Name | Reserved | IPMI | ASF | OEM | SMBus Version | | | |
| Reset | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |

| BIT | DESCRIPTION |
|------|--|
| 15-7 | Reserved. |
| 6 | IPMI . This device supports additional interface access capability per IPMI specification. 0: not supported. 1: supported. |
| 5 | ASF . This device supports additional interface access capability per ASF specification. 0: not supported. 1: supported. |
| 4 | OEM . Device supports vendor specific access capability per Subsystem Vendor ID and Subsystem Device ID . 0: not supported. 1: supported. |
| 3-0 | SMBus Version 0 _{HEX} : SMBus 1.0, not ARPable. 1 _{HEX} : SMBus 1.1, not ARPable. 4 _{HEX} : SMBus 2.0. |



8.13.2.6 UDID Subsystem Vendor ID High/Low Byte Register (UDIDSubVenH/L)

This field defines UDID supporting for Subsystems. If no subsystem is supported, it must specify 0000_{HEX}. It is reset to 0000_{HEX}.

Location: **UDIDSubVenH** - Bank 1 Address 28_{HEX}

UDIDSubVenL - Bank 1 Address 29_{HEX}

Type: Read Write

Reset: VSB5V (Pin 7) Rising,

Init Reset (CR40.Bit7) is set.

UDIDSUBVENH

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|------------------------------------|---|---|---|---|---|---|---|
| Name | UDID Subsystem Vendor ID High Byte | | | | | | | |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

UDIDSUBVENL

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-----------------------------------|---|---|---|---|---|---|---|
| Name | UDID Subsystem Vendor ID Low Byte | | | | | | | |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| BIT | DESCRIPTION |
|------|------------------------|
| 15-0 | UDID subsystem Vendor. |

8.13.2.7 UDID Subsystem Device ID High/Low Byte Register (UDIDSubDevH/L)

This field defines UDID supporting for Subsystems. If no subsystem is supported, it must specify 0000_{HEX}. It is reset to 0000_{HEX}.

Location: **UDIDSubDevH** - Bank 1 Address 2A_{HEX}

UDIDSubDevL - Bank 1 Address 2B_{HEX}

Type: Read Write

Reset: VSB5V (Pin 7) Rising,

Init Reset (CR40.Bit7) is set.

UDIDSUBVENH

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|------------------------------------|---|---|---|---|---|---|---|
| Name | UDID Subsystem Device ID High Byte | | | | | | | |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |



UDIDSUBVENL

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-----------------------------------|---|---|---|---|---|---|---|
| Name | UDID Subsystem Device ID Low Byte | | | | | | | |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| BIT | DESCRIPTION |
|------|---------------------------|
| 15-0 | UDID subsystem Device ID. |

8.13.2.8 UDID Vendor-Specific ID Register (UDIDSpecID1/2/3/4)

This field defines unique Vendor-Specific ID for each W83793G. With this field different W83793G will be identified on the same SMBus interface, and it is loaded with a random number while the reset signal is received.

Location :

UDIDSpecID1 - Bank 1 Address 2C_{HEX}

UDIDSpecID2 - Bank 1 Address 2D_{HEX}

UDIDSpecID3 - Bank 1 Address 2E_{HEX}

UDIDSpecID4 - Bank 1 Address 2F_{HEX}

Type: Read Write

Reset: VSB5V (Pin 7) Rising,

Init Reset (CR40.Bit7) is set,

ARP ResetDevice Command.

UDIDSPECID1~UDIDSPECID4

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------------|---|---|---|---|---|---|---|
| Name | UDID Specific Vendor ID | | | | | | | |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| BIT | DESCRIPTION |
|------|--------------------------|
| 31-0 | UDID Vendor-Specific ID. |

8.13.2.9 Random Number Generator Register (RNG1/2/3/4)

W83793G internally generates a pseudo random number by using a CRC generator and internal clock. Due to the internal clock always having small different deviations, different ICs and different power-on times will affect the result of the random number. It is reset to FFFF_{HEX}.

Location:

RNG4 - Bank 1 Address 30_{HEX}

RNG3 - Bank 1 Address 31_{HEX}

RNG2 - Bank 1 Address 32_{HEX}

RNG1 - Bank 1 Address 33_{HEX}



Type: Read Only

Reset: None.

RNG1~RNG4

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|--------------------|---|---|---|---|---|---|---|
| Name | Random Number Code | | | | | | | |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| BIT | DESCRIPTION |
|------|---------------------|
| 31-0 | Random Number Code. |

8.13.2.10 ASF Assigned Address Register (ASFAddr)

After ARP host get related device UDID, it will start to assign each device for later usage. W83793G will record this assigned address and set it as default address for ASF transactions. It is reset to 00_{HEX}.

Location: **ASFAddr** - Bank 1 Address 4F_{HEX}

Type: Read Only

Reset: VSB5V (Pin 7) Rising,

Init Reset (CR40.Bit7) is set,

ASFADDR

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------|---|---|---|---|---|---|---|
| Name | ASF Address | | | | | | | |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| BIT | DESCRIPTION |
|------|--|
| 31-0 | ASF Address. This register will be assigned while ARP AssignAddress command issued. |

8.13.2.11 ASF Entity/Instance Registers (ENITIIY/ENTINS)

W83793G supports various channels which can be reported to host through ASF protocol. Each sensor channel is associated with an entity (or said location on motherboard) and entity instance. [Table](#) provides an overall look for these registers.

Location:

VCA_ENTY - Bank 1 Address 50_{HEX}

VCB_ENTY - Bank 1 Address 51_{HEX}

Vtt_ENTY - Bank 1 Address 52_{HEX}

VDD_ENTY - Bank 1 Address 53_{HEX}

VSB_ENTY - Bank 1 Address 54_{HEX}
VBAT_ENTY - Bank 1 Address 55_{HEX}
VSEN1_ENTY - Bank 1 Address 56_{HEX}
VSEN2_ENTY - Bank 1 Address 57_{HEX}
3VSEN_ENTY - Bank 1 Address 58_{HEX}
12VSEN_ENTY - Bank 1 Address 59_{HEX}
FAN1_ENTY - Bank 1 Address 5A_{HEX}
FAN2_ENTY - Bank 1 Address 5B_{HEX}
FAN3_ENTY - Bank 1 Address 5C_{HEX}
FAN4_ENTY - Bank 1 Address 5D_{HEX}
FAN5_ENTY - Bank 1 Address 5E_{HEX}
FAN6_ENTY - Bank 1 Address 5F_{HEX}
FAN7_ENTY - Bank 1 Address 60_{HEX}
FAN8_ENTY - Bank 1 Address 61_{HEX}
FAN9_ENTY - Bank 1 Address 62_{HEX}
FAN10_ENTY - Bank 1 Address 63_{HEX}
FAN11_ENTY - Bank 1 Address 64_{HEX}
FAN12_ENTY - Bank 1 Address 65_{HEX}
TD1_ENTY - Bank 1 Address 66_{HEX}
TD2_ENTY - Bank 1 Address 67_{HEX}
TD3_ENTY - Bank 1 Address 68_{HEX}
TD4_ENTY - Bank 1 Address 69_{HEX}
TR1_ENTY - Bank 1 Address 6A_{HEX}
TR2_ENTY - Bank 1 Address 6B_{HEX}
CHS_ENTY - Bank 1 Address 6C_{HEX}
ENTINS1 - Bank 1 Address 70_{HEX}
ENTINS2 - Bank 1 Address 71_{HEX}
ENTINS3 - Bank 1 Address 72_{HEX}
ENTINS4 - Bank 1 Address 73_{HEX}
ENTINS5 - Bank 1 Address 74_{HEX}
ENTINS6 - Bank 1 Address 75_{HEX}
ENTINS7 - Bank 1 Address 76_{HEX}
ENTINS8 - Bank 1 Address 77_{HEX}
ENTINS9 - Bank 1 Address 78_{HEX}
ENTINS10 - Bank 1 Address 79_{HEX}
ENTINS11 - Bank 1 Address 7A_{HEX}



ENTINS12 - Bank 1 Address 7B_{HEX}

ENTINS13 - Bank 1 Address 7C_{HEX}

ENTINS14 - Bank 1 Address 7D_{HEX}

ENTINS15 - Bank 1 Address 7E_{HEX}

Type: Read / Write

Reset: 5VSB (Pin 7) Rising.

VCA_ENTITY

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|--------------------|---|---|---|---|---|---|---|
| Name | VCore A Entity ID. | | | | | | | |
| Reset | 03 _{HEX} | | | | | | | |

VCB_ENTITY

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|--------------------|---|---|---|---|---|---|---|
| Name | VCore B Entity ID. | | | | | | | |
| Reset | 03 _{HEX} | | | | | | | |

VTT_ENTITY

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | Vtt Entity ID. | | | | | | | |
| Reset | 03 _{HEX} | | | | | | | |

VDD_ENTITY

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | VDD Entity ID. | | | | | | | |
| Reset | 07 _{HEX} | | | | | | | |

VSB_ENTITY

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | VSB Entity ID. | | | | | | | |
| Reset | 07 _{HEX} | | | | | | | |

VBAT_ENTITY

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | VBAT Entity ID. | | | | | | | |
| Reset | 07 _{HEX} | | | | | | | |

**VSEN1_ENTITY**

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | VSEN1 Entity ID. | | | | | | | |
| Reset | 07 _{HEX} | | | | | | | |

VSEN2_ENTITY

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | VSEN2 Entity ID. | | | | | | | |
| Reset | 07 _{HEX} | | | | | | | |

3VSEN_ENTITY

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | 3VSEN Entity ID. | | | | | | | |
| Reset | 07 _{HEX} | | | | | | | |

12VSEN_ENTITY

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | 12VSEN Entity ID. | | | | | | | |
| Reset | 07 _{HEX} | | | | | | | |

FAN1_ENTITY

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | FAN1 Entity ID. | | | | | | | |
| Reset | 07 _{HEX} | | | | | | | |

FAN2_ENTITY

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | FAN2 Entity ID. | | | | | | | |
| Reset | 07 _{HEX} | | | | | | | |

FAN3_ENTITY

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | FAN3 Entity ID. | | | | | | | |
| Reset | 07 _{HEX} | | | | | | | |

**FAN4_ENTITY**

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | FAN4 Entity ID. | | | | | | | |
| Reset | 07 _{HEX} | | | | | | | |

FAN5_ENTITY

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | FAN5 Entity ID. | | | | | | | |
| Reset | 07 _{HEX} | | | | | | | |

FAN6_ENTITY

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | FAN6 Entity ID. | | | | | | | |
| Reset | 07 _{HEX} | | | | | | | |

FAN7_ENTITY

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | FAN7 Entity ID. | | | | | | | |
| Reset | 07 _{HEX} | | | | | | | |

FAN8_ENTITY

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | FAN8 Entity ID. | | | | | | | |
| Reset | 07 _{HEX} | | | | | | | |

FAN9_ENTITY

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | FAN9 Entity ID. | | | | | | | |
| Reset | 07 _{HEX} | | | | | | | |

FAN10_ENTITY

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | FAN10 Entity ID. | | | | | | | |
| Reset | 07 _{HEX} | | | | | | | |



FAN11_ENTITY

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | FAN11 Entity ID. | | | | | | | |
| Reset | 07 _{HEX} | | | | | | | |

FAN12_ENTITY

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | FAN12 Entity ID. | | | | | | | |
| Reset | 07 _{HEX} | | | | | | | |

TD1_ENTITY

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | TD1 Entity ID. | | | | | | | |
| Reset | 07 _{HEX} | | | | | | | |

TD2_ENTITY

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | TD2 Entity ID. | | | | | | | |
| Reset | 07 _{HEX} | | | | | | | |

TD3_ENTITY

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | TD3 Entity ID. | | | | | | | |
| Reset | 07 _{HEX} | | | | | | | |

TD4_ENTITY

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | TD4 Entity ID. | | | | | | | |
| Reset | 07 _{HEX} | | | | | | | |

TR1_ENTITY

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | TR1 Entity ID. | | | | | | | |
| Reset | 07 _{HEX} | | | | | | | |



TR2_ENTITY

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|---|---|---|---|
| Name | TR2 Entity ID. | | | | | | | |
| Reset | 07 _{HEX} | | | | | | | |

CHS_ENTITY

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|--------------------|---|---|---|---|---|---|---|
| Name | Chassis Entity ID. | | | | | | | |
| Reset | 23 _{HEX} | | | | | | | |

ENTINS1

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|------------------------|---|---|---|------------------------|---|---|---|
| Name | VCoreB Entity Instance | | | | VCoreA Entity Instance | | | |
| Reset | 02 _{HEX} | | | | 01 _{HEX} | | | |

ENTINS2

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|---------------------|---|---|---|---------------------|---|---|---|
| Name | VDD Entity Instance | | | | Vtt Entity Instance | | | |
| Reset | 01 _{HEX} | | | | 03 _{HEX} | | | |

ENTINS3

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------------------|---|---|---|---------------------|---|---|---|
| Name | VBAT Entity Instance | | | | VSB Entity Instance | | | |
| Reset | 03 _{HEX} | | | | 02 _{HEX} | | | |

ENTINS4

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-----------------------|---|---|---|-----------------------|---|---|---|
| Name | VSEN2 Entity Instance | | | | VSEN1 Entity Instance | | | |
| Reset | 05 _{HEX} | | | | 04 _{HEX} | | | |

ENTINS5

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|------------------------|---|---|---|-----------------------|---|---|---|
| Name | 12VSEN Entity Instance | | | | 3VSEN Entity Instance | | | |
| Reset | 07 _{HEX} | | | | 06 _{HEX} | | | |

ENTINS6

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------------------|---|---|---|----------------------|---|---|---|
| Name | FAN2 Entity Instance | | | | FAN1 Entity Instance | | | |
| Reset | 02 _{HEX} | | | | 01 _{HEX} | | | |

ENTINS7

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------------------|---|---|---|----------------------|---|---|---|
| Name | FAN4 Entity Instance | | | | FAN3 Entity Instance | | | |
| Reset | 04 _{HEX} | | | | 03 _{HEX} | | | |

ENTINS8

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------------------|---|---|---|----------------------|---|---|---|
| Name | FAN6 Entity Instance | | | | FAN5 Entity Instance | | | |
| Reset | 06 _{HEX} | | | | 05 _{HEX} | | | |

ENTINS9

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------------------|---|---|---|----------------------|---|---|---|
| Name | FAN8 Entity Instance | | | | FAN7 Entity Instance | | | |
| Reset | 08 _{HEX} | | | | 07 _{HEX} | | | |

ENTINS10

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-----------------------|---|---|---|----------------------|---|---|---|
| Name | FAN10 Entity Instance | | | | FAN9 Entity Instance | | | |
| Reset | 0A _{HEX} | | | | 09 _{HEX} | | | |

ENTINS11

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-----------------------|---|---|---|-----------------------|---|---|---|
| Name | FAN12 Entity Instance | | | | FAN11 Entity Instance | | | |
| Reset | 0C _{HEX} | | | | 0B _{HEX} | | | |

ENTINS12

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|---------------------|---|---|---|---------------------|---|---|---|
| Name | TD2 Entity Instance | | | | TD1 Entity Instance | | | |
| Reset | 02 _{HEX} | | | | 01 _{HEX} | | | |



ENTINS13

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|---------------------|---|---|---|---------------------|---|---|---|
| Name | TD4 Entity Instance | | | | TD3 Entity Instance | | | |
| Reset | 04 _{HEX} | | | | 03 _{HEX} | | | |

ENTINS14

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|---------------------|---|---|---|---------------------|---|---|---|
| Name | TR2 Entity Instance | | | | TR1 Entity Instance | | | |
| Reset | 06 _{HEX} | | | | 05 _{HEX} | | | |

ENTINS15

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------|---|---|---|-------------------------|---|---|---|
| Name | Reserved | | | | Chassis Entity Instance | | | |
| Reset | 00 _{HEX} | | | | 01 _{HEX} | | | |

| BIT | DESCRIPTION |
|-----|--|
| 7-0 | ENTITY. Entity of each sensor channel. 03 _{HEX} : Processor 07 _{HEX} : System Board. 23 _{HEX} : Chassis Back Panel Board. For other entity types, please refer to PET Spec. page 13. |

8.13.2.12 Power On Control Option Register (PwrOnOption)

W83793G supports 2 kinds of power on. One is power on only one time, no matter VDD5V rised or not. The other is W83793G always issues power on cycles until it detects VDD is already power on.

Location: **PwrOnOption** - Bank 1 Address 7F_{HEX}

Type: Read Write

Reset: VSB5V (Pin 7) Rising.

PWRONOPTION

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|--------------------|---|---|---|---|---|---|-------|
| Name | Winbond Test Modes | | | | | | | PWR1T |
| Reset | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |



| BIT | DESCRIPTION |
|-----|--|
| 7-1 | Winbond Test Mode. Test modes for production. Winbond strongly suggest customer do not use these registers in case of causing system malfunction. |
| 0 | PWR1T (Power on One Time). 0: always issue power on cycles (PWRBTN_N assert 0.1sec every 1sec) until VDD power on. 1: Only issue 1 time power on cycle. |

8.13.2.13 Power On Command Register (PwrOnCmd)

ASF Remote Control Command supports Remote Power On features, here defines the Power on commands accepted by W83793G.

Location: **PwrOnCmd** - Bank 1 Address 80_{HEX}

Type: Read Write

Reset: VSB5V (Pin 7) Rising.

PWRONCMD

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|-------------------------|---|---|---|---|---|---|---|
| Name | Remote Power On Command | | | | | | | |
| Reset | 11 _{HEX} | | | | | | | |

| BIT | DESCRIPTION |
|-----|--------------------------|
| 7-0 | Remote Power On Command. |

8.13.2.14 Power Down Command Register (PwrOffCmd)

ASF Remote Control Command supports Remote Power Down features, here defines the Power off commands accepted by W83793G.

Location: **PwrOffCmd** - Bank 1 Address 81_{HEX}

Type: Read Write

Reset: VSB5V (Pin 7) Rising.

PWROFFCMD

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|--------------------------|---|---|---|---|---|---|---|
| Name | Remote Power Off Command | | | | | | | |
| Reset | 12 _{HEX} | | | | | | | |



| BIT | DESCRIPTION |
|-----|---------------------------|
| 7-0 | Remote Power Off Command. |

8.13.2.15 Reset Command Register (Rst Cmd)

ASF Remote Control Command supports Remote Reset features, here defines the Reset commands accepted by W83793G.

Location: **RstCmd** - Bank 1 Address 82_{HEX}

Type: Read Write

Reset: VSB5V (Pin 7) Rising.

RSTCMD

| BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|----------------------|---|---|---|---|---|---|---|
| Name | Remote Reset Command | | | | | | | |
| Reset | 10 _{HEX} | | | | | | | |

| BIT | DESCRIPTION |
|-----|-----------------------|
| 7-0 | Remote Reset Command. |

9. ELECTRICAL CHARACTERISTICS

9.1 Absolute Maximum Ratings

| PARAMETER | RATING | UNIT |
|-----------------------|-----------------|------|
| Power Supply Voltage | -0.5 to 7.0 | V |
| Input Voltage | -0.5 to VDD+0.5 | V |
| Operating Temperature | 0 to +70 | °C |
| Storage Temperature | -55 to +150 | °C |

9.2 DC Characteristics

($T_a = 0^\circ\text{C}$ to 70°C , $5V_{DD} = 5V \pm 10\%$, $5V_{SB} = 5V \pm 5\%$, $V_{SS} = 0V$)

| PARAMETER | SYM. | MIN. | TYP. | MAX. | UNIT | CONDITIONS |
|--|------------------|------|------|------|------|-----------------------------------|
| OUT/OD ₁₂ – Output buffer or Open-drain output pin with source-sink capability of 12 mA | | | | | | |
| Output Low Voltage | V _{OL} | | | 0.4 | V | I _{OL} = 12 mA |
| Output High Voltage | V _{OH} | 2.4 | | | V | I _{OH} = -12 mA, OB mode |
| IN/ODB _{12V1SB} - bi-directional pin with sink capability of 12 mA and schmitt-trigger level input | | | | | | |
| Input Low Voltage | V _{IL} | | | 0.4 | V | 5V _{DD} = 5 V |
| Input High Voltage | V _{IH} | 0.6 | | | V | 5V _{DD} = 5 V |
| Hysteresis | V _{TH} | 0.2 | | | V | 5V _{DD} = 5 V |
| Output Low Voltage | V _{OL} | | | 0.4 | V | I _{OL} = 12 mA |
| Input High Leakage | I _{LIH} | | | +10 | μA | V _{IN} = VDD |
| Input Low Leakage | I _{LIL} | | | -10 | μA | V _{IN} = 0V |
| IN/ODB _{12tSB} - TTL level bi-directional pin with sink capability of 12 mA and schmitt-trigger level input | | | | | | |
| Input Low Voltage | V _{IL} | | | 0.8 | V | 5V _{DD} = 5 V |
| Input High Voltage | V _{IH} | 2.0 | | | V | 5V _{DD} = 5 V |
| Hysteresis | V _{TH} | 1.2 | | | V | 5V _{DD} = 5 V |
| Output Low Voltage | V _{OL} | | | 0.4 | V | I _{OL} = 12 mA |
| Input High Leakage | I _{LIH} | | | +10 | μA | V _{IN} = VDD |
| Input Low Leakage | I _{LIL} | | | -10 | μA | V _{IN} = 0V |
| OUTB _{12B} - TTL level output pin with source-sink capability of 12 mA | | | | | | |
| Output Low Voltage | V _{OL} | | | 0.4 | V | I _{OL} = 12 mA |
| Output High Voltage | V _{OH} | 2.4 | | | V | I _{OH} = -12 mA |

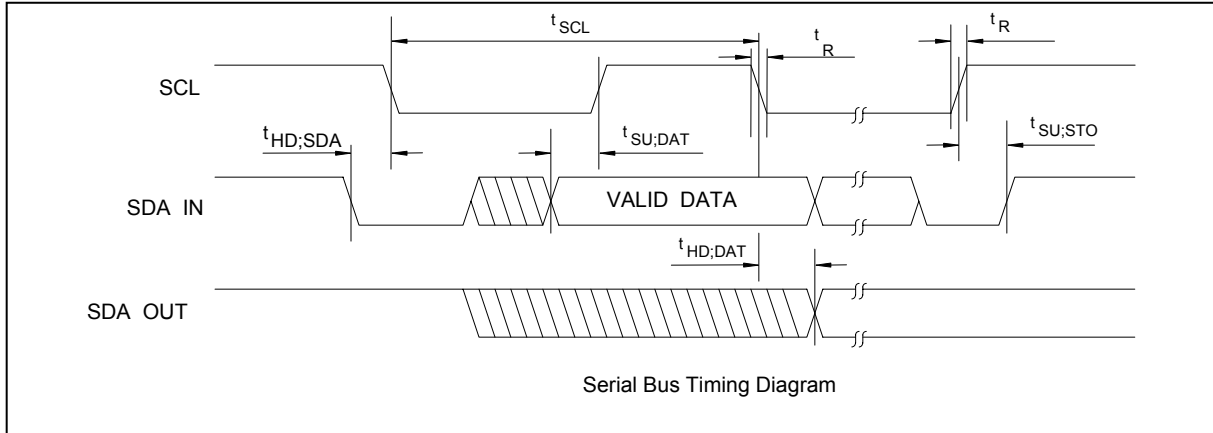


DC Characteristics, continued.

| PARAMETER | SYM. | MIN. | TYP. | MAX. | UNIT | CONDITIONS |
|--|------------------|----------------------|------|----------------------|------|-------------------------|
| ODB _{12B} - Open-drain output pin with sink capability of 12 mA | | | | | | |
| Output Low Voltage | V _{OL} | | | 0.4 | V | I _{OL} = 12 mA |
| AOUT – Analog output | | | | | | |
| | | N.A. | | | | |
| INB _{V1SB} - VID input pin | | | | | | |
| for INTEL™ VRM10.0, and VRM11 design | | | | | | |
| Input Low Voltage | V _{IL} | | | 0.4 | V | |
| Input High Voltage | V _{IH} | 0.6 | | | V | |
| IN _{V2SB} - VID input pin | | | | | | |
| for AMD™ VRM design | | | | | | |
| Input Low Voltage | V _{IL} | | | 0.8 | V | |
| Input High Voltage | V _{IH} | 1.4 | | | V | |
| IN/OB _{V3B} – Bi-direction pin with source capability of 6 mA and sink capability of 1 mA | | | | | | |
| for INTEL™ PECl | | | | | | |
| Input Low Voltage | V _{IL} | 0.275V _{tt} | | 0.5V _{tt} | V | |
| Input High Voltage | V _{IH} | 0.55V _{tt} | | 0.725V _{tt} | V | |
| Output Low Voltage | V _{OL} | | | 0.25V _{tt} | V | |
| Output High Voltage | V _{OH} | 0.75V _{tt} | | | V | |
| Hysterisis | V _{Hys} | 0.1V _{tt} | | | V | |
| INB _{tsB} - TTL level Schmitt-triggered input pin | | | | | | |
| Input Low Voltage | V _{IL} | | | 0.8 | V | 5VDD = 5 V |
| Input High Voltage | V _{IH} | 2.0 | | | V | 5VDD = 5 V |
| Hysteresis | V _{TH} | 1.2 | | | V | 5VDD = 5 V |
| Input High Leakage | I _{LIH} | | | +10 | μA | V _{IN} = VDD |
| Input Low Leakage | I _{LIL} | | | -10 | μA | V _{IN} = 0 V |

9.3 AC Characteristics

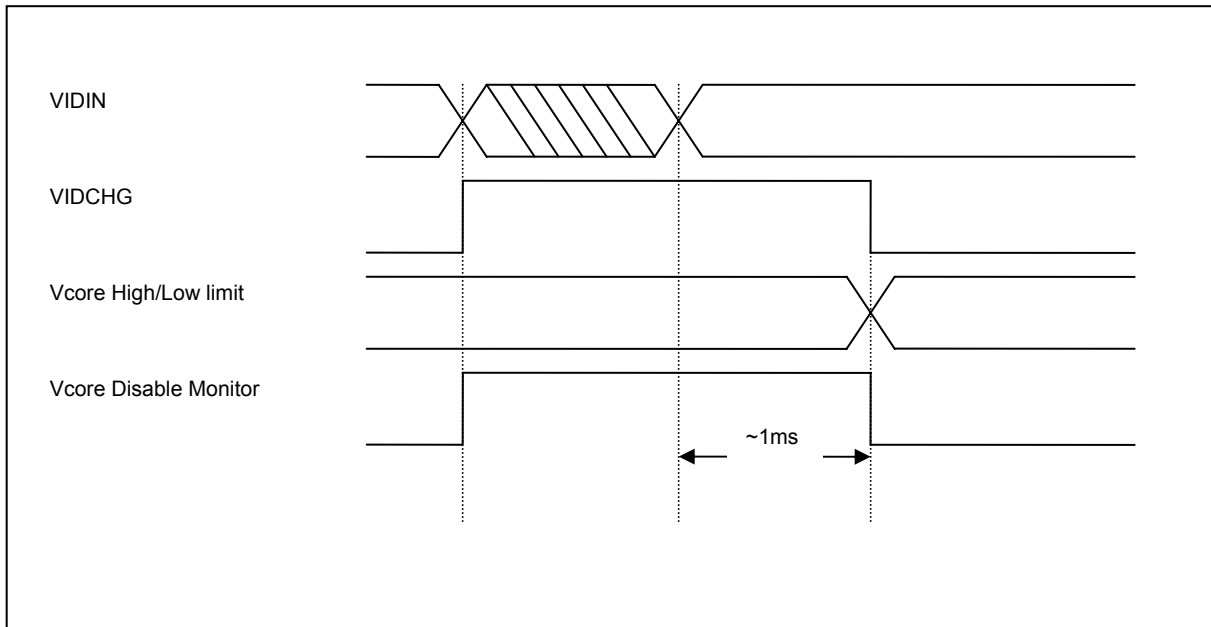
9.3.1 Access Interface



| PARAMETER | SYMBOL | MIN. | MAX. | UNIT |
|------------------------------|--------------|------|------|------|
| SCL clock period | t_{SCL} | 10 | | uS |
| Start condition hold time | $t_{HD:SDA}$ | 4.7 | | uS |
| Stop condition setup-up time | $t_{SU:STO}$ | 4.7 | | uS |
| DATA to SCL setup time | $t_{SU:DAT}$ | 150 | | nS |
| DATA to SCL hold time | $t_{HD:DAT}$ | 270 | | nS |
| SCL and SDA rise time | t_R | | 1.0 | uS |
| SCL and SDA fall time | t_F | | 300 | nS |

9.3.2 Dynamic Vcore Limit Setting

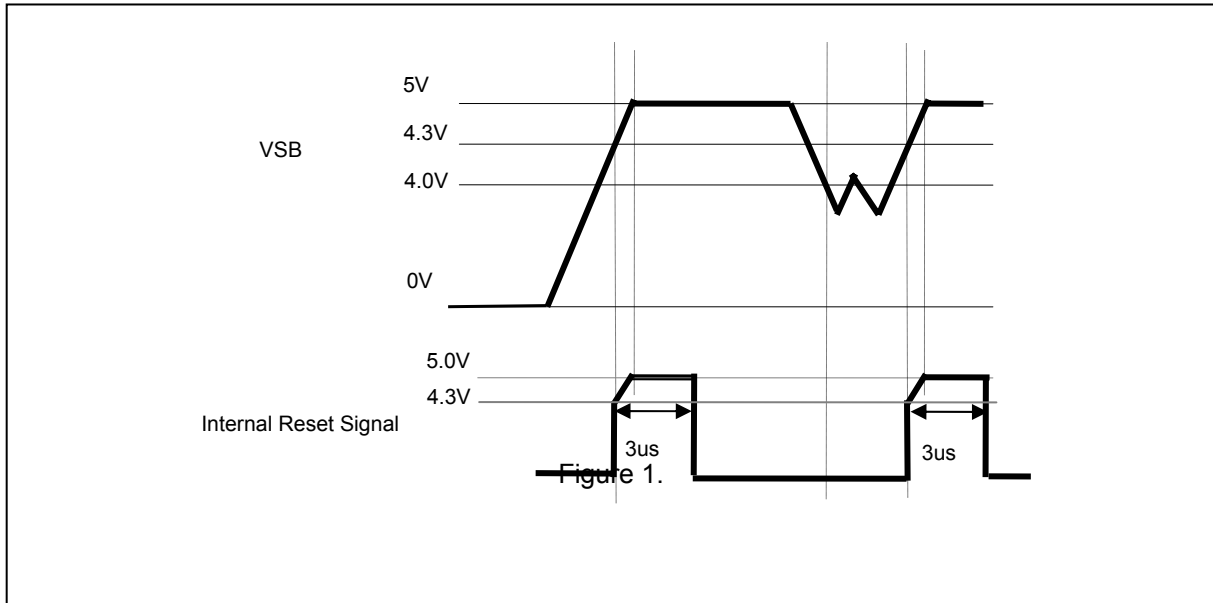
If dynamic VID function enable, Vcore channel high/low limit will change in accordance with VID table. When VIDIN value change, internal VIDCHG signal will set until VIDIN value has stabled more than 1ms. New Vcore high/low limit will set at falling edge of VIDCHG and Vcore channel will enable monitor at the same time.



9.3.3 Power On Reset

The power-on reset threshold is 4.3V (typical). When Vcc crosses this threshold, the internal reset signal will be asserted for 3 μ S. During this time period, W83793G is in the reset state. When the internal reset signal is de-asserted, W83793G is in the operating state.

In the operating state, if Vcc drops below 4.0V and then rises above 4.3V, the internal reset signal will be asserted immediately. Fig 1 illustrates the reset mechanism.



10. ORDER INFORMATION

| PART NO. | PACKAGE | REMARKS |
|----------|---------|-----------------|
| W83793G | SSOP56 | Pb-free Package |



11. APPENDIX

11.1 Register Summary

BANK 0

| INDEX | REGISTER NAME | INDEX | REGISTER NAME |
|-----------------------------|--|-------------------|---------------------------------------|
| BANK 0 ADDRESS 00-1F | | | |
| 00 _{HEX} | Bank Selection | 10 _{HEX} | VCore A Readout |
| 01 _{HEX} | Watch Dog Lock | 11 _{HEX} | VCore B Readout |
| 02 _{HEX} | Watch Dog Enable | 12 _{HEX} | Vtt Readout |
| 03 _{HEX} | Watch Dog Status | 13 _{HEX} | |
| 04 _{HEX} | Watch Dog Timer | 14 _{HEX} | VSEN1 Readout |
| 05 _{HEX} | VIDA Input Value | 15 _{HEX} | VSEN2 Readout |
| 06 _{HEX} | VIDB Input Value | 16 _{HEX} | 3VSEN Readout |
| 07 _{HEX} | VIDA Latch | 17 _{HEX} | 12VSEN Readout |
| 08 _{HEX} | VIDB Latch | 18 _{HEX} | 5VDD Readout |
| 09 _{HEX} | VCore High Tolerance | 19 _{HEX} | 5VSB Readout |
| 0A _{HEX} | VCore Low Tolerance | 1A _{HEX} | VBAT Readout |
| 0B _{HEX} | I²C Address | 1B _{HEX} | VIN Low Bit |
| 0C _{HEX} | Sensor 1/2 Address | 1C _{HEX} | TD1 Readout |
| 0D _{HEX} | Winbond Vendor ID | 1D _{HEX} | TD2 Readout |
| 0E _{HEX} | Winbond Chip ID | 1E _{HEX} | TD3 Readout |
| 0F _{HEX} | Winbond Device ID | 1F _{HEX} | TD4 Readout |
| BANK 0 ADDRESS 20-3F | | | |
| 20 _{HEX} | TR1 Readout | 30 _{HEX} | Fan7 Count Low Byte |
| 21 _{HEX} | TR2 Readout | 31 _{HEX} | Fan8 Count High Byte |
| 22 _{HEX} | Temp Low Bit Readout | 32 _{HEX} | Fan8 Count Low Byte |
| 23 _{HEX} | Fan1 Count High Byte | 33 _{HEX} | Fan9 Count High Byte |
| 24 _{HEX} | Fan1 Count Low Byte | 34 _{HEX} | Fan9 Count Low Byte |
| 25 _{HEX} | Fan2 Count High Byte | 35 _{HEX} | Fan10 Count High Byte |
| 26 _{HEX} | Fan2 Count Low Byte | 36 _{HEX} | Fan10 Count Low Byte |
| 27 _{HEX} | Fan3 Count High Byte | 37 _{HEX} | Fan11 Count High Byte |
| 2A _{HEX} | Fan4 Count Low Byte | 3A _{HEX} | Fan12 Count Low Byte |
| 2B _{HEX} | Fan5 Count High Byte | 3B _{HEX} | |
| 2C _{HEX} | Fan5 Count Low Byte | 3C _{HEX} | |



Register Summary, continued.

| INDEX | REGISTER NAME | INDEX | REGISTER NAME |
|-----------------------------|--------------------------------------|-------------------|--|
| 2D _{HEX} | Fan6 Count High Byte | 3D _{HEX} | |
| 2E _{HEX} | Fan6 Count Low Byte | 3E _{HEX} | |
| 2F _{HEX} | Fan7 Count High Byte | 3F _{HEX} | |
| BANK 0 ADDRESS 40-5F | | | |
| 40 _{HEX} | Configuration | 50 _{HEX} | SMI/IRQ Control |
| 41 _{HEX} | Interrupt Status 1 | 51 _{HEX} | OVT Control |
| 42 _{HEX} | Interrupt Status 2 | 52 _{HEX} | OVT/Beep Global Enable |
| 43 _{HEX} | Interrupt Status 3 | 53 _{HEX} | Beep Control 1 |
| 44 _{HEX} | Interrupt Status 4 | 54 _{HEX} | Beep Control 2 |
| 45 _{HEX} | Interrupt Status 5 | 55 _{HEX} | Beep Control 3 |
| 46 _{HEX} | Interrupt Mask 1 | 56 _{HEX} | Beep Control 4 |
| 47 _{HEX} | Interrupt Mask 2 | 57 _{HEX} | Beep Control 5 |
| 48 _{HEX} | Interrupt Mask 3 | 58 _{HEX} | Multi-Function Pin Control |
| 49 _{HEX} | Interrupt Mask 4 | 59 _{HEX} | VID Control |
| 4A _{HEX} | Interrupt Mask 5 | 5A _{HEX} | TD1 Configuration |
| 4B _{HEX} | Real Time Status 1 | 5B _{HEX} | TD2 Configuration |
| 4C _{HEX} | Real Time Status 2 | 5C _{HEX} | FanIn Control |
| 4D _{HEX} | Real Time Status 3 | 5D _{HEX} | FanIn Redirection |
| 4E _{HEX} | Real Time Status 4 | 5E _{HEX} | TD Mode Select |
| 4F _{HEX} | Real Time Status 5 | 5F _{HEX} | TR Mode Select |
| BANK 0 ADDRESS 60-7F | | | |
| 60 _{HEX} | VCoreA High Limit | 70 _{HEX} | 12VSEN High Limit |
| 61 _{HEX} | VCoreA Low Limit | 71 _{HEX} | 12VSEN Low Limit |
| 62 _{HEX} | VCoreB High Limit | 72 _{HEX} | 5VDD High Limit |
| 63 _{HEX} | VCoreB Low Limit | 73 _{HEX} | 5VDD Low Limit |
| 64 _{HEX} | Vtt High Limit | 74 _{HEX} | 5VSB High Limit |
| 65 _{HEX} | Vtt Low Limit | 75 _{HEX} | 5VSB Low Limit |
| 66 _{HEX} | | 76 _{HEX} | VBAT High Limit |
| 67 _{HEX} | | 77 _{HEX} | VBAT Low Limit |
| 68 _{HEX} | High Limit Low Bit | 78 _{HEX} | TD1 Critical |
| 69 _{HEX} | Low Limit Low Bit | 79 _{HEX} | TD1 Critical Hysteresis |
| 6A _{HEX} | VSEN1 High Limit | 7A _{HEX} | TD1 Warning |



Register Summary, continued.

| INDEX | REGISTER NAME | INDEX | REGISTER NAME |
|-----------------------------|---|-------------------|---|
| 6B _{HEX} | VSEN1 Low Limit | 7B _{HEX} | TD1 Warning Hysterisis |
| 6C _{HEX} | VSEN2 High Limit | 7C _{HEX} | TD2 Critical |
| 6D _{HEX} | VSEN2 Low Limit | 7D _{HEX} | TD2 Critical Hysterisis |
| 6E _{HEX} | 3VSEN High Limit | 7E _{HEX} | TD2 Warning |
| 6F _{HEX} | 3VSEN Low Limit | 7F _{HEX} | TD2 Warning Hysterisis |
| BANK 0 ADDRESS 80-9F | | | |
| 80 _{HEX} | TD3 Critical | 90 _{HEX} | Fan1 Limit High Byte |
| 81 _{HEX} | TD3 Critical Hysterisis | 91 _{HEX} | Fan1 Limit Low Byte |
| 82 _{HEX} | TD3 Warning | 92 _{HEX} | Fan2 Limit High Byte |
| 83 _{HEX} | TD3 Warning Hysterisis | 93 _{HEX} | Fan2 Limit Low Byte |
| 84 _{HEX} | TD4 Critical | 94 _{HEX} | Fan3 Limit High Byte |
| 85 _{HEX} | TD4 Critical Hysterisis | 95 _{HEX} | Fan3 Limit Low Byte |
| 86 _{HEX} | TD4 Warning | 96 _{HEX} | Fan4 Limit High Byte |
| 87 _{HEX} | TD4 Warning Hysterisis | 97 _{HEX} | Fan4 Limit Low Byte |
| 88 _{HEX} | TR1 Critical | 98 _{HEX} | Fan5 Limit High Byte |
| 89 _{HEX} | TR1 Critical Hysterisis | 99 _{HEX} | Fan5 Limit Low Byte |
| 8A _{HEX} | TR1 Warning | 9A _{HEX} | Fan6 Limit High Byte |
| 8B _{HEX} | TR1 Warning Hysterisis | 9B _{HEX} | Fan6 Limit Low Byte |
| 8C _{HEX} | TR2 Critical | 9C _{HEX} | Fan7 Limit High Byte |
| 8D _{HEX} | TR2 Critical Hysterisis | 9D _{HEX} | Fan7 Limit Low Byte |
| 8E _{HEX} | TR2 Warning | 9E _{HEX} | Fan8 Limit High Byte |
| 8F _{HEX} | TR2 Warning Hysterisis | 9F _{HEX} | Fan8 Limit Low Byte |
| BANK 0 ADDRESS A0-BF | | | |
| A0 _{HEX} | Fan9 Limit High Byte | B0 _{HEX} | Fan Output Style 1 |
| A1 _{HEX} | Fan9 Limit Low Byte | B1 _{HEX} | Fan Output Style 2 |
| A2 _{HEX} | Fan10 Limit High Byte | B2 _{HEX} | Fan Default Speed |
| A3 _{HEX} | Fan10 Limit Low Byte | B3 _{HEX} | Fan1 Duty |
| A4 _{HEX} | Fan11 Limit High Byte | B4 _{HEX} | Fan2 Duty |
| A5 _{HEX} | Fan11 Limit Low Byte | B5 _{HEX} | Fan3 Duty |
| A6 _{HEX} | Fan12 Limit High Byte | B6 _{HEX} | Fan4 Duty |
| A7 _{HEX} | Fan12 Limit Low Byte | B7 _{HEX} | Fan5 Duty |
| A8 _{HEX} | TD1 Temperature Offset | B8 _{HEX} | Fan6 Duty |



Register Summary, continued.

| INDEX | REGISTER NAME | INDEX | REGISTER NAME |
|-----------------------------|--|-------------------|---------------------------------------|
| A9 _{HEX} | TD2 Temperature Offset | B9 _{HEX} | Fan7 Duty |
| AA _{HEX} | TD3 Temperature Offset | BA _{HEX} | Fan8 Duty |
| AB _{HEX} | TD4 Temperature Offset | BB _{HEX} | Fan1 Output Prescaler |
| AC _{HEX} | TR1 Temperature Offset | BC _{HEX} | Fan2 Output Prescaler |
| AD _{HEX} | TR2 Temperature Offset | BD _{HEX} | Fan3 Output Prescaler |
| AE _{HEX} | | BE _{HEX} | Fan4 Output Prescaler |
| AF _{HEX} | | BF _{HEX} | Fan5 Output Prescaler |
| BANK 0 ADDRESS C0-DF | | | |
| C0 _{HEX} | Fan6 Output Prescaler | D5 _{HEX} | PECI Return Domain |
| C1 _{HEX} | Fan7 Output Prescaler | D6 _{HEX} | PECI Warning Flags |
| C2 _{HEX} | Fan8 Output Prescaler | D7 _{HEX} | |
| C3 _{HEX} | Step Up Time | D8 _{HEX} | PECI Agent1 RelTempH |
| C4 _{HEX} | Step Down Time | D9 _{HEX} | PECI Agent1 RelTempL |
| C5 _{HEX} | Critical Temperature | DA _{HEX} | PECI Agent2 RelTempH |
| D0 _{HEX} | PECI Agent Configure | DB _{HEX} | PECI Agent2 RelTempL |
| D1 _{HEX} | PECI Agent1 Tcontrol | DC _{HEX} | PECI Agent3 RelTempH |
| D2 _{HEX} | PECI Agent2 Tcontrol | DD _{HEX} | PECI Agent3 RelTempL |
| D3 _{HEX} | PECI Agent3 Tcontrol | DE _{HEX} | PECI Agent4 RelTempH |
| D4 _{HEX} | PECI Agent4 Tcontrol | DF _{HEX} | PECI Agent4 RelTempL |

BANK 1

| INDEX | REGISTER NAME | INDEX | REGISTER NAME |
|-----------------------------|--|-------------------|--|
| BANK 1 ADDRESS 00-1F | | | |
| 00 _{HEX} | Bank Select | 0E _{HEX} | Winbond Chip ID |
| 0D _{HEX} | Winbond Vendor ID | 0F _{HEX} | Winbond Device ID |
| BANK 1 ADDRESS 20-33 | | | |
| 20 _{HEX} | UDID Device Capability | 2A _{HEX} | UDID SubDevice ID High |
| 21 _{HEX} | UDID Version Number | 2B _{HEX} | UDID SubDevice ID Low |
| 22 _{HEX} | UDID Vendor ID High | 2C _{HEX} | UDID Specific Vendor ID1 |
| 23 _{HEX} | UDID Vendor ID Low | 2D _{HEX} | UDID Specific Vendor ID2 |
| 24 _{HEX} | UDID Device ID High | 2E _{HEX} | UDID Specific Vendor ID3 |
| 25 _{HEX} | UDID Device ID Low | 2F _{HEX} | UDID Specific Vendor ID4 |



Bank 1, continued.

| INDEX | REGISTER NAME | INDEX | REGISTER NAME |
|-----------------------------|--|-------------------|--|
| 26 _{HEX} | UDID Interface High Byte | 30 _{HEX} | Random Number 1 |
| 27 _{HEX} | UDID Interface Low Byte | 31 _{HEX} | Random Number 2 |
| 28 _{HEX} | UDID SubVendor ID High | 32 _{HEX} | Random Number 3 |
| 29 _{HEX} | UDID SubVendor ID Low | 33 _{HEX} | Random Number 4 |
| BANK 1 ADDRESS 40 | | | |
| 40 _{HEX} | ARP Assigned Address | | |
| BANK 1 ADDRESS 50-6F | | | |
| 50 _{HEX} | VCoreA Entity ID | 60 _{HEX} | Fan7 Entity ID |
| 51 _{HEX} | VCoreB Entity ID | 61 _{HEX} | Fan8 Entity ID |
| 52 _{HEX} | Vtt Entity ID | 62 _{HEX} | Fan9 Entity ID |
| 53 _{HEX} | VDD Entity ID | 63 _{HEX} | Fan10 Entity ID |
| 54 _{HEX} | VSB5V Entity ID | 64 _{HEX} | Fan11 Entity ID |
| 55 _{HEX} | VBAT Entity ID | 65 _{HEX} | Fan12 Entity ID |
| 56 _{HEX} | VSEN1 Entity ID | 66 _{HEX} | TD1 Entity ID |
| 57 _{HEX} | VSEN2 Entity ID | 67 _{HEX} | TD2 Entity ID |
| 58 _{HEX} | 3VSEN Entity ID | 68 _{HEX} | TD3 Entity ID |
| 59 _{HEX} | 12VSEN Entity ID | 69 _{HEX} | TD4 Entity ID |
| 5A _{HEX} | Fan1 Entity ID | 6A _{HEX} | TR1 Entity ID |
| 5B _{HEX} | Fan2 Entity ID | 6B _{HEX} | TR2 Entity ID |
| 5C _{HEX} | Fan3 Entity ID | 6C _{HEX} | Chassis Entity ID |
| 5D _{HEX} | Fan4 Entity ID | 6D _{HEX} | |
| 5E _{HEX} | Fan5 Entity ID | 6E _{HEX} | |
| 5F _{HEX} | Fan6 Entity ID | 6F _{HEX} | |
| BANK 1 ADDRESS 70-8F | | | |
| 70 _{HEX} | VCoreA/VCoreB EntityID | 80 _{HEX} | Remote PowerOn Command |
| 71 _{HEX} | VDD/Vtt EntityID | 81 _{HEX} | Remote Power Off Command |
| 72 _{HEX} | VBAT/VSB EntityID | 82 _{HEX} | Remote Reset Command |
| 73 _{HEX} | VCoreA/VCoreB EntityID | 83 _{HEX} | |
| 74 _{HEX} | VSEN1/VSEN2 EntityID | 84 _{HEX} | |
| 75 _{HEX} | 12VSEN/3VSEN EntityID | 85 _{HEX} | |
| 76 _{HEX} | Fan1/2 EntityID | 86 _{HEX} | |
| 77 _{HEX} | Fan3/4 EntityID | 87 _{HEX} | |



Bank 1, continued.

| INDEX | REGISTER NAME | INDEX | REGISTER NAME |
|-------------------|-----------------------------------|-------------------|---------------|
| 78 _{HEX} | Fan5/6 EntityID | 88 _{HEX} | |
| 79 _{HEX} | Fan7/8 EntityID | 89 _{HEX} | |
| 7A _{HEX} | Fan9/10 EntityID | 8A _{HEX} | |
| 7B _{HEX} | Fan11/12 EntityID | 8B _{HEX} | |
| 7C _{HEX} | TD1/2 EntityID | 8C _{HEX} | |
| 7D _{HEX} | TD3/4 EntityID | 8D _{HEX} | |
| 7E _{HEX} | Chassis EntityID | 8E _{HEX} | |
| 7F _{HEX} | Power On Option | 8F _{HEX} | |

BANK 2

| INDEX | REGISTER NAME | INDEX | REGISTER NAME |
|-----------------------------|---|-------------------|---|
| BANK 2 ADDRESS 00-1F | | | |
| 00 _{HEX} | Bank Select | 10 _{HEX} | TD1 Target Temperature |
| 01 _{HEX} | TD1 Fan Mapping Select | 11 _{HEX} | TD2 Target Temperature |
| 02 _{HEX} | TD2 Fan Mapping Select | 12 _{HEX} | TD3 Target Temperature |
| 03 _{HEX} | TD3 Fan Mapping Select | 13 _{HEX} | TD4 Target Temperature |
| 04 _{HEX} | TD4 Fan Mapping Select | 14 _{HEX} | TR1 Target Temperature |
| 05 _{HEX} | TR1 Fan Mapping Select | 15 _{HEX} | TR2 Target Temperature |
| 06 _{HEX} | TR2 Fan Mapping Select | 16 _{HEX} | |
| 07 _{HEX} | Fan Control Mode Select | 17 _{HEX} | |
| 08 _{HEX} | TD1/2 Temp Tolerance | 18 _{HEX} | Fan1 Nonstop Duty Cycle |
| 09 _{HEX} | TD3/4 Temp Tolerance | 19 _{HEX} | Fan2 Nonstop Duty Cycle |
| 0A _{HEX} | TR1/2 Temp Tolerance | 1A _{HEX} | Fan3 Nonstop Duty Cycle |
| 0B _{HEX} | | 1B _{HEX} | Fan4 Nonstop Duty Cycle |
| 0C _{HEX} | | 1C _{HEX} | Fan5 Nonstop Duty Cycle |
| 0D _{HEX} | Winbond Vendor ID | 1D _{HEX} | Fan6 Nonstop Duty Cycle |
| 0E _{HEX} | Winbond Chip ID | 1E _{HEX} | Fan7 Nonstop Duty Cycle |
| 0F _{HEX} | Winbond Device ID | 1F _{HEX} | Fan8 Nonstop Duty Cycle |
| BANK 2 ADDRESS 20-3F | | | |
| 20 _{HEX} | Fan1 Start Duty Cycle | 30 _{HEX} | TD1 Temp Level01 |
| 21 _{HEX} | Fan2 Start Duty Cycle | 31 _{HEX} | TD1 Temp Level12 |
| 22 _{HEX} | Fan3 Start Duty Cycle | 32 _{HEX} | TD1 Temp Level23 |
| 23 _{HEX} | Fan4 Start Duty Cycle | 33 _{HEX} | TD1 Temp Level34 |



Bank 2, continued.

| INDEX | REGISTER NAME | INDEX | REGISTER NAME |
|-----------------------------|---------------------------------------|-------------------|----------------------------------|
| 24 _{HEX} | Fan5 Start Duty Cycle | 34 _{HEX} | TD1 Temp Level45 |
| 25 _{HEX} | Fan6 Start Duty Cycle | 35 _{HEX} | TD1 Temp Level56 |
| 26 _{HEX} | Fan7 Start Duty Cycle | 36 _{HEX} | TD1 Temp Level67 |
| 27 _{HEX} | Fan8 Start Duty Cycle | 37 _{HEX} | |
| 28 _{HEX} | Fan1 Stop Time | 38 _{HEX} | TD1 Fan Level0 |
| 29 _{HEX} | Fan2 Stop Time | 39 _{HEX} | TD1 Fan Level1 |
| 2A _{HEX} | Fan3 Stop Time | 3A _{HEX} | TD1 Fan Level2 |
| 2B _{HEX} | Fan4 Stop Time | 3B _{HEX} | TD1 Fan Level3 |
| 2C _{HEX} | Fan5 Stop Time | 3C _{HEX} | TD1 Fan Level4 |
| 2D _{HEX} | Fan6 Stop Time | 3D _{HEX} | TD1 Fan Level5 |
| 2E _{HEX} | Fan7 Stop Time | 3E _{HEX} | TD1 Fan Level6 |
| 2F _{HEX} | Fan8 Stop Time | 3F _{HEX} | |
| BANK 2 ADDRESS 40-5F | | | |
| 40 _{HEX} | TD2 Temp Level01 | 50 _{HEX} | TD3 Temp Level01 |
| 41 _{HEX} | TD2 Temp Level12 | 51 _{HEX} | TD3 Temp Level12 |
| 42 _{HEX} | TD2 Temp Level23 | 52 _{HEX} | TD3 Temp Level23 |
| 43 _{HEX} | TD2 Temp Level34 | 53 _{HEX} | TD3 Temp Level34 |
| 44 _{HEX} | TD2 Temp Level45 | 54 _{HEX} | TD3 Temp Level45 |
| 45 _{HEX} | TD2 Temp Level56 | 55 _{HEX} | TD3 Temp Level56 |
| 46 _{HEX} | TD2 Temp Level67 | 56 _{HEX} | TD3 Temp Level67 |
| 47 _{HEX} | | 57 _{HEX} | |
| 48 _{HEX} | TD2 Fan Level0 | 58 _{HEX} | TD3 Fan Level0 |
| 49 _{HEX} | TD2 Fan Level1 | 59 _{HEX} | TD3 Fan Level1 |
| 4A _{HEX} | TD2 Fan Level2 | 5A _{HEX} | TD3 Fan Level2 |
| 4B _{HEX} | TD2 Fan Level3 | 5B _{HEX} | TD3 Fan Level3 |
| 4C _{HEX} | TD2 Fan Level4 | 5C _{HEX} | TD3 Fan Level4 |
| 4D _{HEX} | TD2 Fan Level5 | 5D _{HEX} | TD3 Fan Level5 |
| 4E _{HEX} | TD2 Fan Level6 | 5E _{HEX} | TD3 Fan Level6 |
| 4F _{HEX} | | 5F _{HEX} | |
| BANK 2 ADDRESS 60-7F | | | |
| 60 _{HEX} | TD4 Temp Level01 | 70 _{HEX} | TR1 Temp Level01 |
| 61 _{HEX} | TD4 Temp Level12 | 71 _{HEX} | TR1 Temp Level12 |

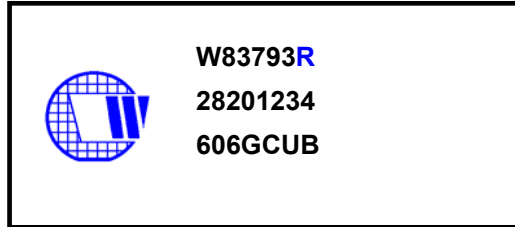


Bank 1, continued.

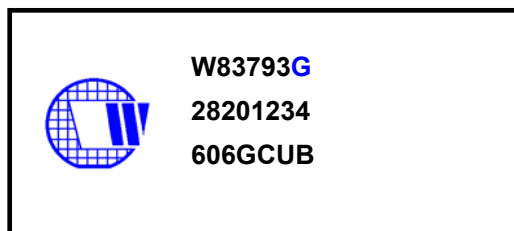
| INDEX | REGISTER NAME | INDEX | REGISTER NAME |
|-----------------------------|----------------------------------|-------------------|----------------------------------|
| 62 _{HEX} | TD4 Temp Level23 | 72 _{HEX} | TR1 Temp Level23 |
| 63 _{HEX} | TD4 Temp Level34 | 73 _{HEX} | TR1 Temp Level34 |
| 64 _{HEX} | TD4 Temp Level45 | 74 _{HEX} | TR1 Temp Level45 |
| 65 _{HEX} | TD4 Temp Level56 | 75 _{HEX} | TR1 Temp Level56 |
| 66 _{HEX} | TD4 Temp Level67 | 76 _{HEX} | TR1 Temp Level67 |
| 67 _{HEX} | | 77 _{HEX} | |
| 68 _{HEX} | TD4 Fan Level0 | 78 _{HEX} | TR1 Fan Level0 |
| 69 _{HEX} | TD4 Fan Level1 | 79 _{HEX} | TR1 Fan Level1 |
| 6A _{HEX} | TD4 Fan Level2 | 7A _{HEX} | TR1 Fan Level2 |
| 6B _{HEX} | TD4 Fan Level3 | 7B _{HEX} | TR1 Fan Level3 |
| 6C _{HEX} | TD4 Fan Level4 | 7C _{HEX} | TR1 Fan Level4 |
| 6D _{HEX} | TD4 Fan Level5 | 7D _{HEX} | TR1 Fan Level5 |
| 6E _{HEX} | TD4 Fan Level6 | 7E _{HEX} | TR1 Fan Level6 |
| 6F _{HEX} | | 7F _{HEX} | |
| BANK 2 ADDRESS 80-8F | | | |
| 80 _{HEX} | TR2 Temp Level01 | 88 _{HEX} | TR2 Fan Level0 |
| 81 _{HEX} | TR2 Temp Level12 | 89 _{HEX} | TR2 Fan Level1 |
| 82 _{HEX} | TR2 Temp Level23 | 8A _{HEX} | TR2 Fan Level2 |
| 83 _{HEX} | TR2 Temp Level34 | 8B _{HEX} | TR2 Fan Level3 |
| 84 _{HEX} | TR2 Temp Level45 | 8C _{HEX} | TR2 Fan Level4 |
| 85 _{HEX} | TR2 Temp Level56 | 8D _{HEX} | TR2 Fan Level5 |
| 86 _{HEX} | TR2 Temp Level67 | 8E _{HEX} | TR2 Fan Level6 |
| 87 _{HEX} | | 8F _{HEX} | |



12. THE TOP MARKING



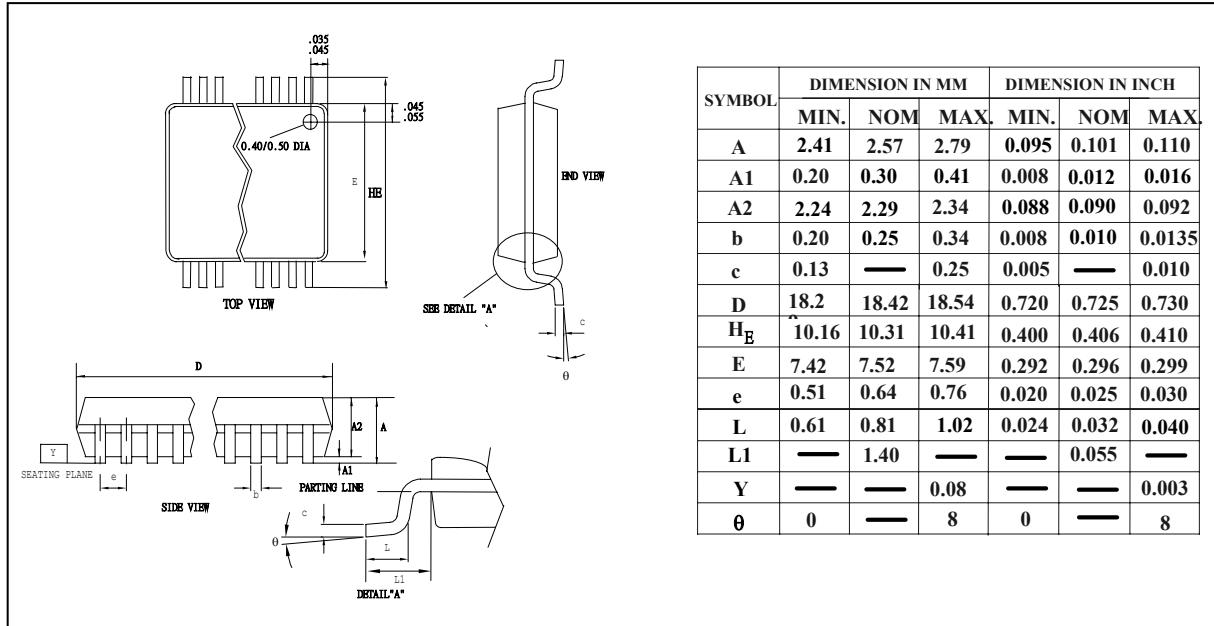
Left Winbond Logo.
First Line IC part number: W83793R; R means SSOP, leaded package.
Second Line Serial number
Third Line Tracking Code: 6 06 G B UB for Package information
6 Package is made in 2006
06 Week: 06
G Assembly house ID; G means Greatek; A means ASE; O means OSE
C IC version
UB Mask version



Left Winbond Logo.
First Line IC part number: W83793G; G means Pb-free package.
Second Line Serial number
Third Line Tracking Code: 6 06 G B UB for Package information
6 Package is made in 2006
06 Week: 06
G Assembly house ID; G means Greatek; A means ASE; O means OSE
C IC version
UB Mask version

13. PACKAGE DRAWING AND DIMENSIONS

(56-pin SSOP 300mil)





Important Notice

Winbond products are not designed, intended, authorized or warranted for use as components in systems or equipment intended for surgical implantation, atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, or for other applications intended to support or sustain life. Further more, Winbond products are not intended for applications wherein failure of Winbond products could result or lead to a situation wherein personal injury, death or severe property or environmental damage could occur.

Winbond customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Winbond for any damages resulting from such improper use or sales.



Headquarters

No. 4, Creation Rd. III,
Science-Based Industrial Park,
Hsinchu, Taiwan
TEL: 886-3-5770066
FAX: 886-3-5665577
<http://www.winbond.com.tw/>

Taipei Office

9F, No.480, Rueiguang Rd.,
Neihu District, Taipei, 114,
Taiwan, R.O.C.
TEL: 886-2-8177-7168
FAX: 886-2-8751-3579

Winbond Electronics Corporation America

2727 North First Street, San Jose,
CA 95134, U.S.A.
TEL: 1-408-9436666
FAX: 1-408-5441798

Winbond Electronics Corporation Japan

7F Daini-ueno BLDG, 3-7-18
Shinyokohama Kohoku-ku,
Yokohama, 222-0033
TEL: 81-45-4781881
FAX: 81-45-4781800

Winbond Electronics (Shanghai) Ltd.

27F, 2299 Yan An W. Rd. Shanghai,
200336 China
TEL: 86-21-62365999
FAX: 86-21-62365998

Winbond Electronics (H.K.) Ltd.

Unit 9-15, 22F, Millennium City,
No. 378 Kwun Tong Rd.,
Kowloon, Hong Kong
TEL: 852-27513100
FAX: 852-27552064

*Please note that all data and specifications are subject to change without notice.
All the trademarks of products and companies mentioned in this datasheet belong to their respective owners.*