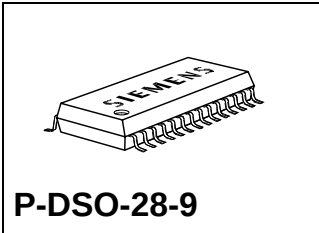
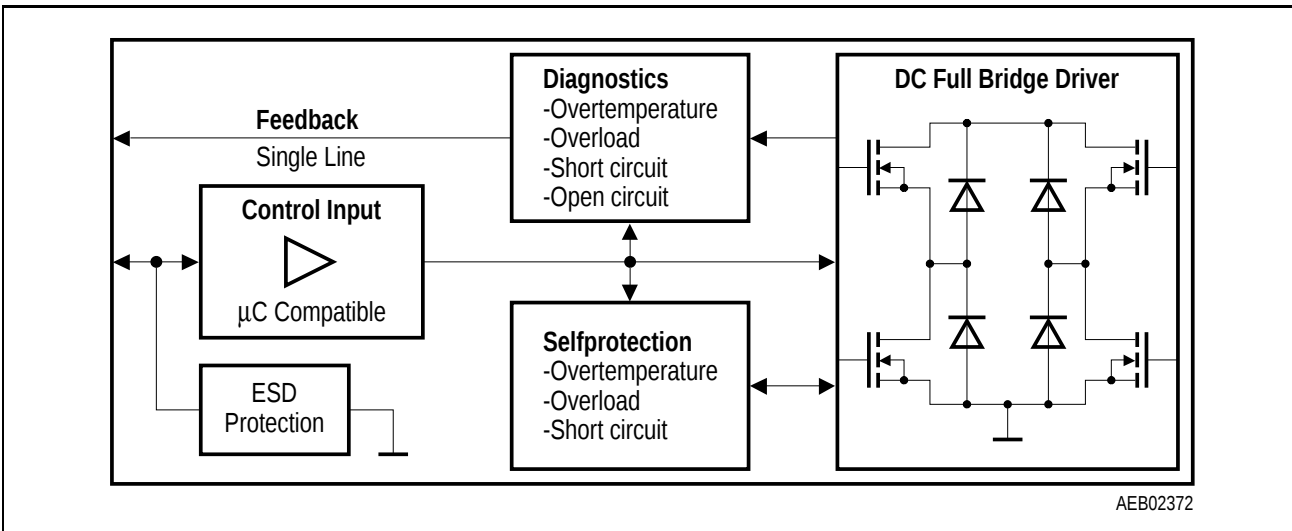


Features

- Free configurable as bridge or quad-switch
- Optimized for DC motor management applications
- Ultra low $R_{\text{DS(on)}}$ @ 25 °C :
High-side switch: typ. 165 mΩ
Low-side switch: typ. 55 mΩ
- Very high peak current capability
- Very low quiescent current
- Space- and thermal optimized power P-DSO-Package
- Operates up to 40 V
- Load/GND-short-circuit-protected
- Status flag diagnosis
- Overtemperature shut down with hysteresis
- Short-circuit detection and diagnosis
- Open-load detection and diagnosis
- C-MOS compatible inputs
- Internal clamp diodes
- Isolated sources for external current sensing
- Over- and under-voltage detection with hysteresis



Block Diagram



Type	Ordering Code	Package
BTS 770	Q67007-A9254	P-DSO-28-9

■ SMD = Surface Mounted Device

Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	V_{UVOFF}	36	V

Absolute Maximum Ratings

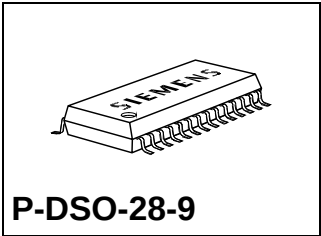
Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	– 0.3	43	V
Junction temperature	T_j	– 40	150	°C

Electrical Characteristics

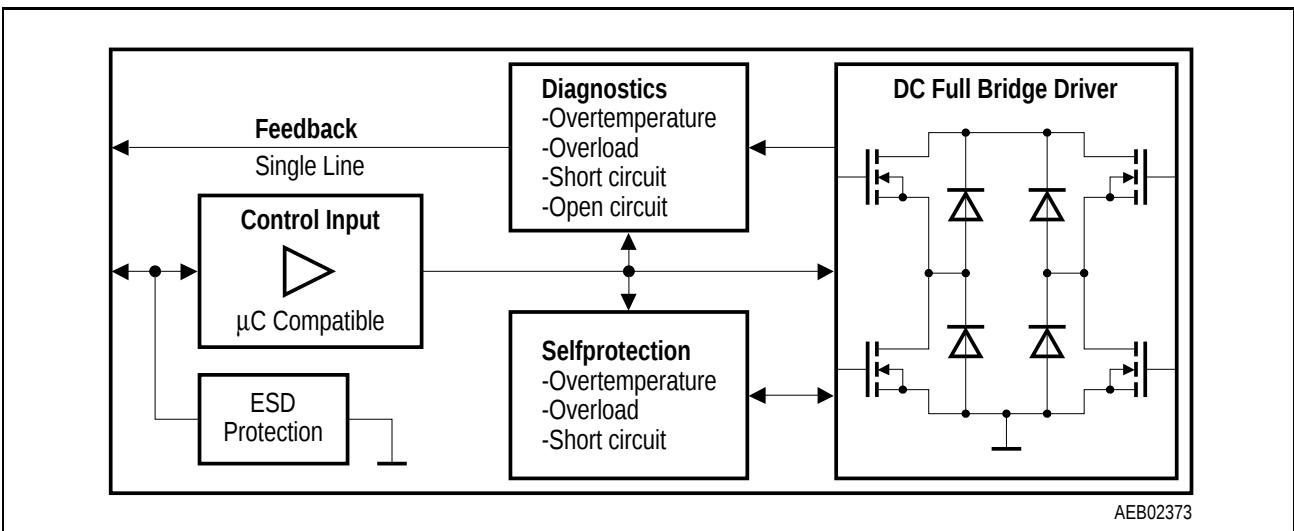
Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	I_S	–	–	35	μA	$V_S = 13.2\text{ V}$
R_{DSO} ; Bridge in Path	R_{DSOP}	–	200	500	mΩ	–
R_{DSO} ; High-Side-Switch	R_{DSONH}	–	165	220	mΩ	$T_j = 25\text{ °C}$
R_{DSO} ; Low-Side-Switch	R_{DSONL}	–	45	65	mΩ	$T_j = 25\text{ °C}$
Short circuit output current	I_{SCP}	5.5	–	9	A	$T_j = 85\text{ °C}$
Open load detection current	I_{OCD}	10	–	200	mA	–
Pull-down resistance	$R_{O1,2}$	4	–	30	kΩ	–
Undervolt. switch ON voltage	V_{UVON}	–	–	7	V	V_S increasing
Undervolt. switch OFF voltage	V_{UVOFF}	3.5	–	–	V	V_S decreasing

Features

- Free configurable as bridge or quad-switch
- Optimized for DC motor management applications
- Ultra low $R_{DS(on)}$ @ 25 °C :
High-side switch: typ. 85 mΩ
Low-side switch: typ. 40 mΩ
- Very high peak current capability
- Very low quiescent current
- Space- and thermal optimized power P-DSO-Package
- Operates up to 40 V
- Load/GND-short-circuit-protected
- Status flag diagnosis
- Overtemperature shut down with hysteresis
- Short-circuit detection and diagnosis
- Open-load detection and diagnosis
- C-MOS compatible inputs
- Internal clamp diodes
- Isolated sources for external current sensing
- Over- and under-voltage detection with hysteresis



Block Diagram



Type	Ordering Code	Package
BTS 771	Q67007-A9274	P-DSO-28-9

■ SMD = Surface Mounted Device

Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	V_{UVOFF}	36	V

Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	– 0.3	43	V
Junction temperature	T_j	– 40	150	°C

Electrical Characteristics

Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	I_S	–	–	35	μA	$V_S = 13.2\text{ V}$
$R_{DS(ON)}$; Bridge in Path	$R_{DS(ONP)}$	–	–	300	mΩ	–
$R_{DS(ON)}$; High-Side-Switch	$R_{DS(ONH)}$	–	85	110	mΩ	$T_j = 25\text{ °C}$
$R_{DS(ON)}$; Low-Side-Switch	$R_{DS(ONL)}$	–	40	55	mΩ	$T_j = 25\text{ °C}$
Short circuit output current	I_{SCP}	7	–	18	A	$T_j = 85\text{ °C}$
Open load detection current	I_{OCD}	20	–	400	mA	–
Pull-down resistance	$R_{O1,2}$	4	–	30	kΩ	–
Undervolt. switch ON voltage	V_{UVON}	–	–	7	V	V_S increasing
Undervolt. switch OFF voltage	V_{UVOFF}	3.5	–	–	V	V_S decreasing

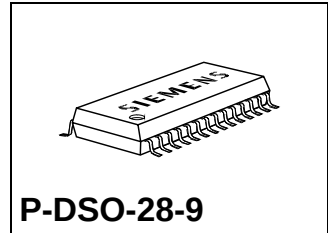
TRILITHIC™

BTS 774

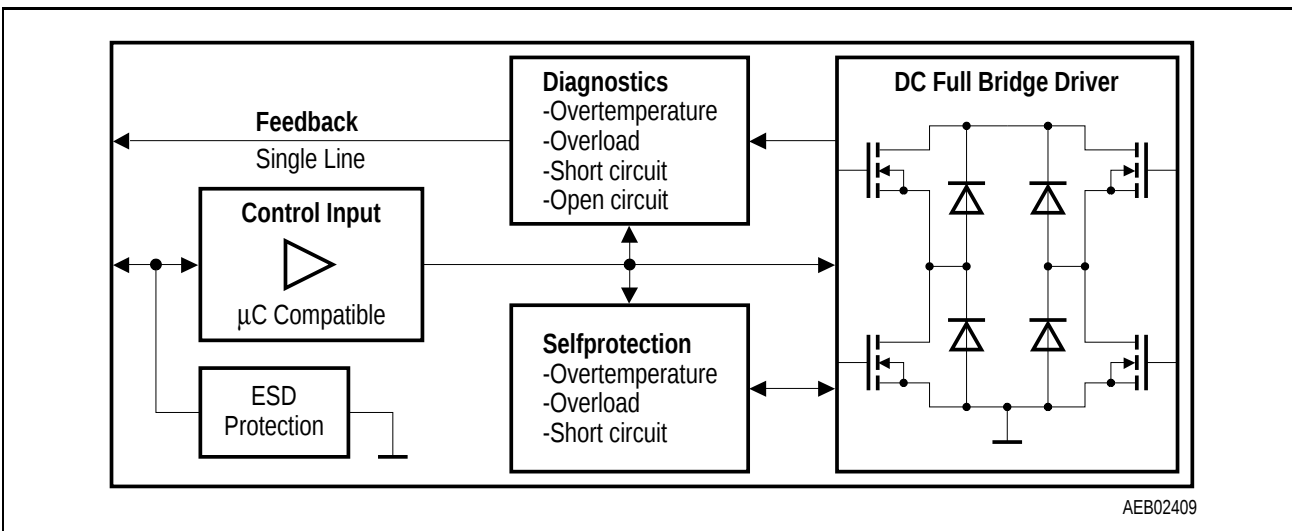
Preliminary Data

Features

- Free configurable as bridge or quad-switch
- Optimized for DC motor management applications
- Ultra low $R_{\text{DS(on)}}$ @ 25 °C :
High-side switch: typ. 165 mΩ
Low-side switch: typ. 55 mΩ
- Very high peak current capability
- Very low quiescent current
- Space- and thermal optimized power P-DSO-Package
- Operates up to 40 V
- **FULL**-short-circuit-protected
- Status flag diagnosis
- Overtemperature shut down with hysteresis
- Short-circuit detection and diagnosis
- Open-load detection and diagnosis
- C-MOS compatible inputs
- Internal clamp diodes
- Isolated sources for external current sensing
- Over- and under-voltage detection with hysteresis



Block Diagram



Type	Ordering Code	Package
BTS 774	on request	P-DSO-28-9

■ SMD = Surface Mounted Device

Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	V_{UVOFF}	36	V

Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	– 0.3	43	V
Junction temperature	T_j	– 40	150	°C

Electrical Characteristics

Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	I_S	–	–	50	μA	$V_S = 13.2\text{ V}$
R_{DSOn} ; Path in Bridge Config.	R_{DSOnP}	–	200	500	mΩ	–
R_{DSOn} ; High-Side-Switch	R_{DSOnH}	–	165	220	mΩ	$T_j = 25\text{ °C}$
R_{DSOn} ; Low-Side-Switch	R_{DSOnL}	–	45	60	mΩ	$T_j = 25\text{ °C}$
Short circuit output current	I_{SCP}	5.5	–	9	A	$T_j = 85\text{ °C}$
Pull-down resistance	$R_{O1,2}$	4	–	30	kΩ	–
Undervolt. switch ON voltage	V_{UVON}	–	–	7	V	V_S increasing
Undervolt. switch OFF voltage	V_{UVOFF}	3.5	–	–	V	V_S decreasing

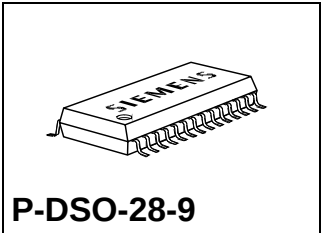
TRILITHIC™

BTS 775

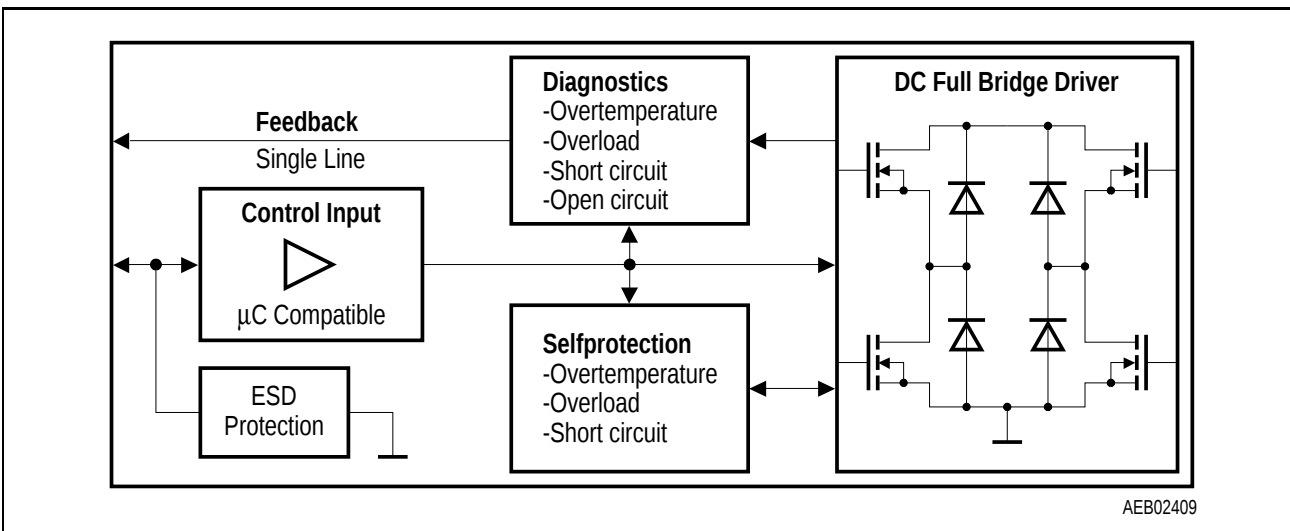
Preliminary Data

Features

- Free configurable as bridge or quad-switch
- Optimized for DC motor management applications
- Ultra low $R_{DS(on)}$ @ 25 °C :
High-side switch: typ. 85 mΩ
Low-side switch: typ. 45 mΩ
- Very high peak current capability
- Very low quiescent current
- Space- and thermal optimized power P-DSO-Package
- Operates up to 40 V
- **FULL**-short-circuit-protected
- Status flag diagnosis
- Overtemperature shut down with hysteresis
- Short-circuit detection and diagnosis
- Open-load detection and diagnosis
- C-MOS compatible inputs
- Internal clamp diodes
- Isolated sources for external current sensing
- Over- and under-voltage detection with hysteresis



Block Diagram



Type	Ordering Code	Package
BTS 775	on request	P-DSO-28-9

■ SMD = Surface Mounted Device

Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	V_{UVOFF}	36	V

Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	– 0.3	43	V
Output current	I_Q			A
Junction temperature	T_j	– 40	150	°C

Electrical Characteristics

Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	I_S	–	–	50	μA	$V_S = 13.2\text{ V}$
$R_{DS(ON)}$; Path in Bridge Config.	$R_{DS(ONP)}$	–	–	320	mΩ	–
$R_{DS(ON)}$; High-Side-Switch	$R_{DS(ONH)}$	–	85	110	mΩ	$T_j = 25\text{ °C}$
$R_{DS(ON)}$; Low-Side-Switch	$R_{DS(ONL)}$	–	45	60	mΩ	$T_j = 25\text{ °C}$
Short circuit output current	I_{SCP}	7	–	18	A	$T_j = 85\text{ °C}$
Pull-down resistance	$R_{O1,2}$	4	–	30	Ω	–
Undervolt. switch ON voltage	V_{UVON}	–	–	7	V	V_S increasing
Undervolt. switch OFF voltage	V_{UVOFF}	3.5	–	–	V	V_S decreasing

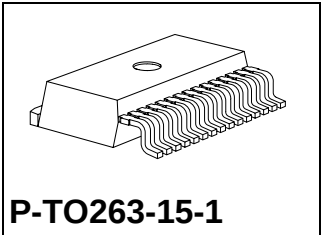
TRILITHIC™

BTS 780

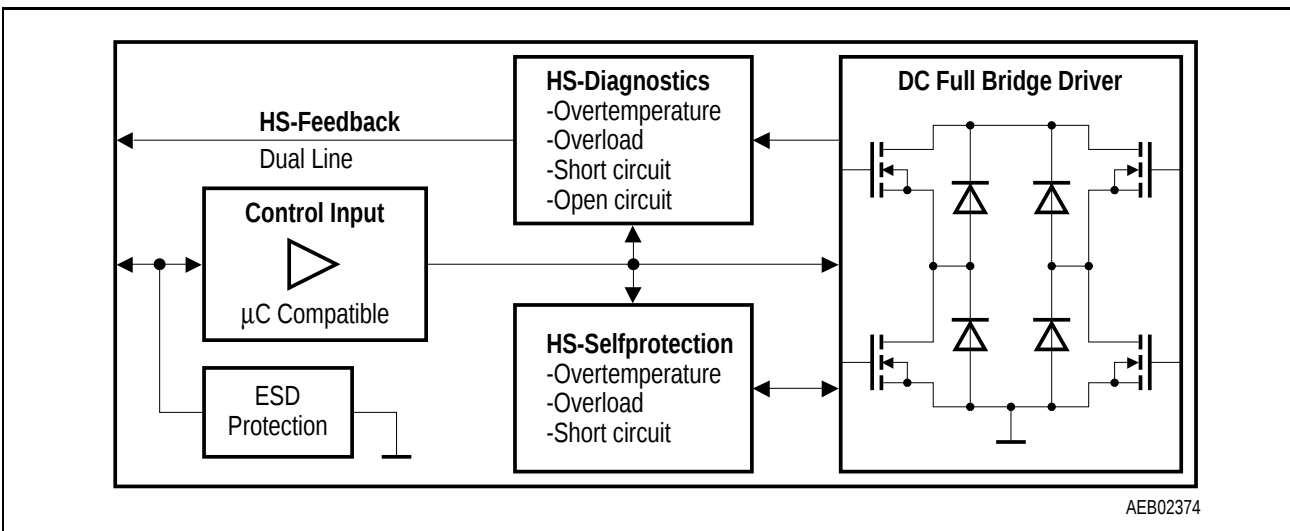
Target Data

Features

- Free configurable as bridge or quad-switch
- Optimized for DC motor management applications
- Ultra low $R_{DS(on)}$ @ 25 °C :
High-side switch: typ. 35 mΩ
Low-side switch: typ. 15 mΩ
- Very high peak current capability
- Very low quiescent current
- Space- and thermal optimized power SMD-Package
- Load/GND-short-circuit-protected
- Operates up to 40 V
- 2-Bit status flag diagnosis
- Overtemperature shut down with hysteresis
- Short-circuit detection and diagnosis
- Open-load detection and diagnosis
- C-MOS compatible inputs
- Internal clamp diodes
- Isolated sources for external current sensing
- Over- and under-voltage detection with hysteresis



Block Diagram



Type	Ordering Code	Package
BTS 780	on request	P-T0263-15-1

■ SMD = Surface Mounted Device

Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	V_{UVOFF}	36	V

Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	– 0.3	43	V
Output current	I_Q	– 30	30	A
Junction temperature	T_j	– 40	150	°C

Electrical Characteristics

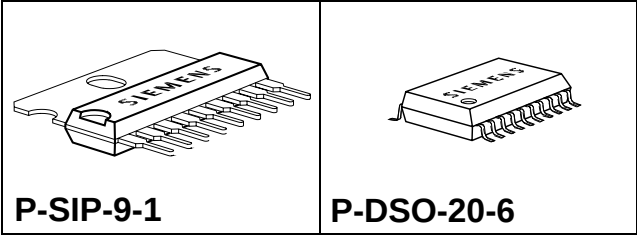
Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	I_S	–	–	50	μA	$V_S = 13.2\text{ V}$
$R_{DS(ON)}$; High-Side-Switch	$R_{DS(ON)H}$	–	35	75	mΩ	–
$R_{DS(ON)}$; Low-Side-Switch	$R_{DS(ON)L}$	–	15	35	mΩ	–
Short circuit output current	I_{SCP}	28	–	54	A	$25\text{ °C} < T_j < 85\text{ °C}$
Pull-down resistance	$R_{O1,2}$	4	–	30	kΩ	–
Undervolt. switch ON voltage	V_{UVON}	–	–	7	V	V_S increasing
Undervolt. switch OFF voltage	V_{UVOFF}	3.5	–	–	V	V_S decreasing

Dual Power Operational Amplifier

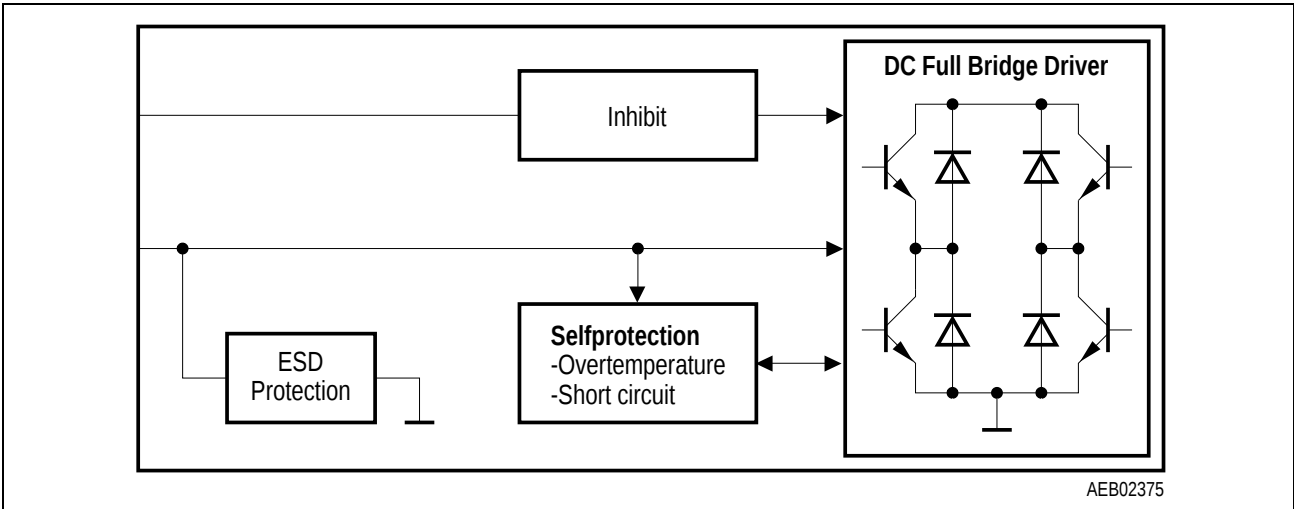
TCA 2465

Features

- 2 A dual power operational amplifier
- Wide operating range from 6 to 40 V
- Over temperature protection
- Short circuit protection to + V_S and GND
- Free wheeling diodes
- Inhibit enables tristate outputs



Block Diagram



Type	Ordering Code	Package
TCA 2465	Q67000-A8109	P-SIP-9-1
TCA 2465 G ¹⁾	Q67006-A8334	P-DSO-20-6

¹⁾ Maximum Output Current $I_Q = 1.4$ A

■ SMD = Surface Mounted Device

Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	6	40	V

Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	–	42	V
Output current	I_Q	– 2.5	2.5	A
Junction temperature	T_j	– 40	150	°C

Electrical Characteristics

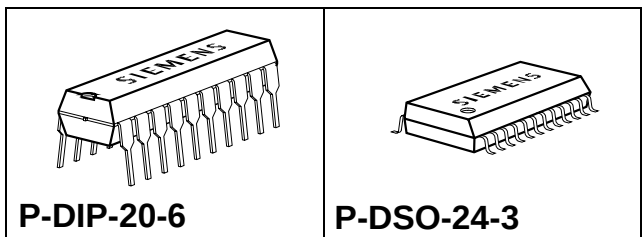
Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Saturation voltage	V_{Qsat}	–	–	3.2	V	in path
High slew rate	SR	–	2	–	V/μs	–
Fully protected outputs	–	–	–	–	–	DC short-circuit proof

2-Phase Stepper-Motor Driver

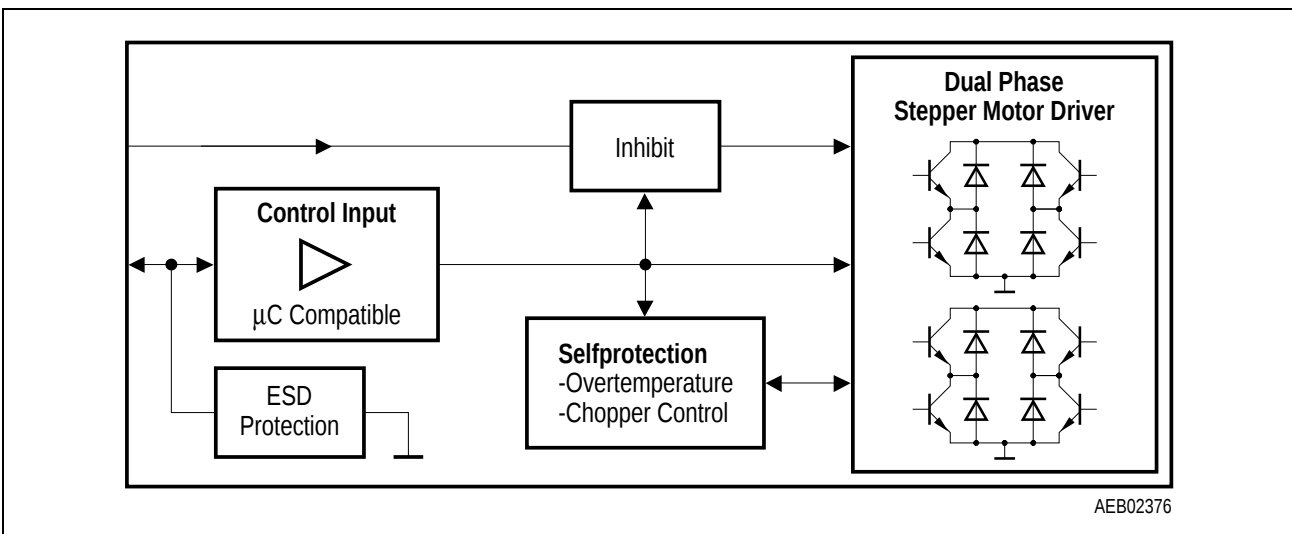
TCA 3727

Features

- 2×0.75 A dual phase stepper motor driver full, half, quarter, mini, quasi-sine step
- Integrated driver, control logic and current control
- Wide operating range from 5 to 50 V
- Wide temperature range
- Over temperature protection
- Inhibit
- Low standby-current
- Free wheeling diodes



Block Diagram



Type	Ordering Code	Package
TCA 3727	Q67000-A8302	P-DIP-20-6
TCA 3727 G	Q67006-A8335	P-DSO-24-3

■ SMD = Surface Mounted Device

Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	5	50	V

Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	–	52	V
Output current	I_Q	–	2×1	A
Junction temperature	T_j	– 40	150	°C

Electrical Characteristics

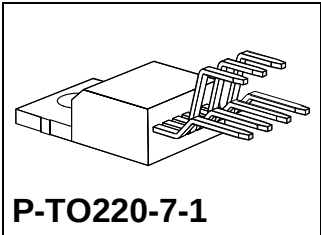
Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	I_S	–	0.2	0.5	mA	–
Saturation voltage	V_{Qsat}	–	1.4	1.9	V	total
Logic supply voltage	V_L	–	4.5	6.5	V	–
Standby output threshold	V_{inh} (L→H)	–	3	4	V	$V_L = 5\text{ V}$
Standby output threshold	V_{inh} (H→L)	–	2.3	2.9	V	$V_L = 5\text{ V}$
Hysteresis	V_{inhhy}	–	0.7	1.1	V	$V_L = 5\text{ V}$

2-A DC Motor Driver

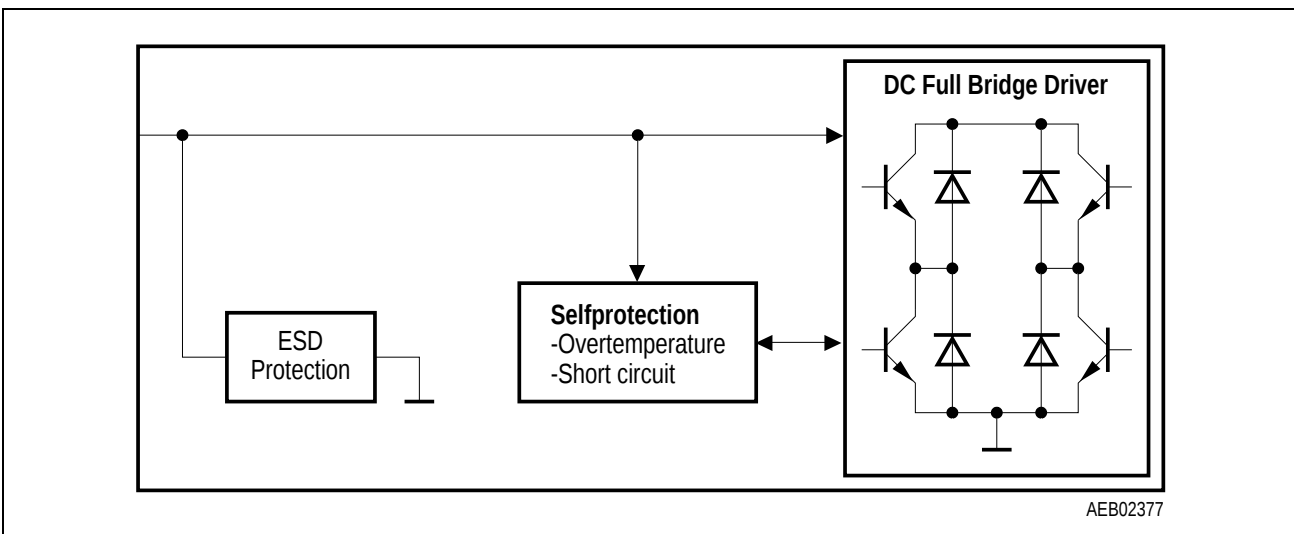
TLE 4202 B

Features

- 2 A full bridge driver
- Wide operating range from 3.5 to 17 V
- Wide temperature range
- Over temperature protection
- Short circuit protection to GND
- Free wheeling diodes
- Low saturation voltage



Block Diagram



Type	Ordering Code	Package
TLE 4202 B	Q67000-A8225	P-TO220-7-1

Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	3.5	17	V

Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	–	40	V
Output current	I_Q	–	2.5	A
Junction temperature	T_j	– 40	150	°C

The two power comparators can switch magnets, motors or other loads either by being sepersted from each other or being combined to a full-bridge circuit.

The IC contains two amplifiers featuring a typical open-loop voltage gain of 80 dB at 500 Hz.

Electrical Characteristics

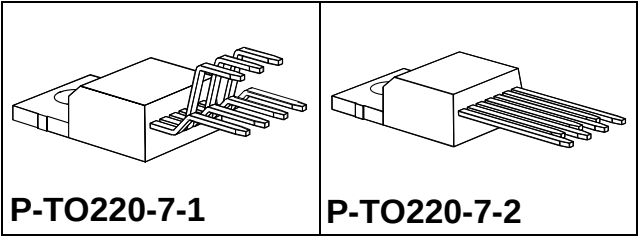
Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	I_S	–	15	25	mA	–
Saturation voltage	V_{Qsat}	–	–	2.5	V	total
Short circuit current	ISC	–	1.25	1.6	A	$V_Q = 0\text{ V}$
Switch-ON delay	t_{ON}	–	3	–	μs	–
Switch-OFF delay	t_{OFF}	–	1.5	–	μs	–

4-A DC Motor Driver

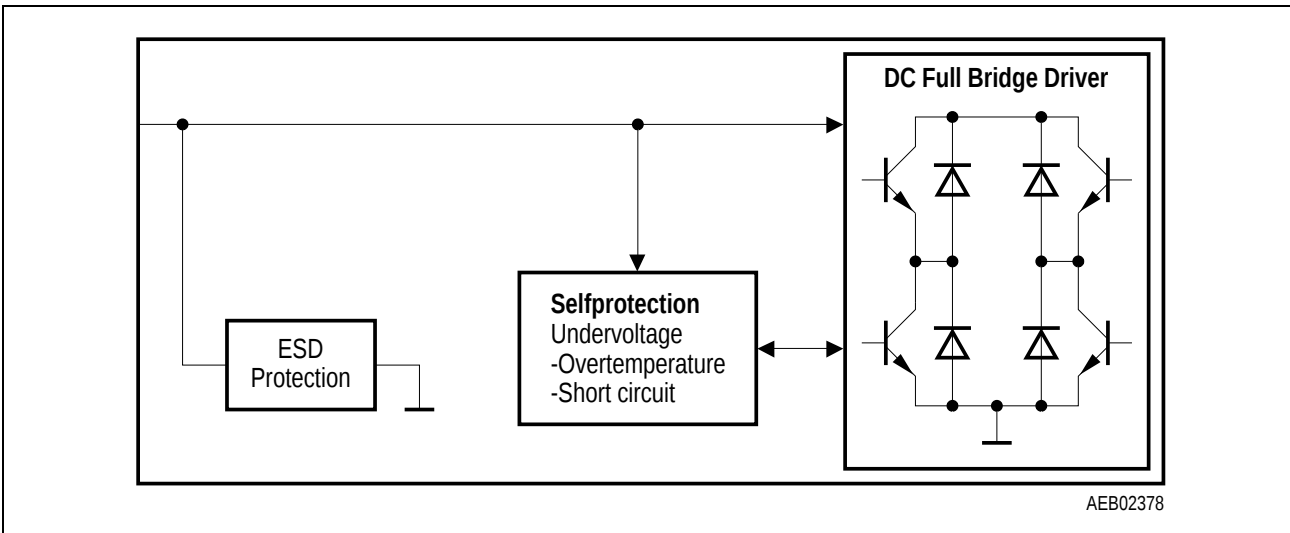
TLE 4203

Features

- 4 A full bridge driver
- Final push-pull stage free of cross-over currents
- Wide temperature range
- Over temperature protection
- Short circuit protection to + V_S and GND
- Free wheeling diodes
- Undervoltage protection



Block Diagram



Type	Ordering Code	Package
TLE 4203	Q67000-A8121	P-TO220-7-1
TLE 4203 S	Q67000-A9101	P-TO220-7-2

Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	5	20	V

Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	–	45	V
Output current	I_Q	–	4	A
Junction temperature	T_j	– 40	150	°C

The TLE 4203 is a versatile double power driver of up to 4 A output current which is particularly suitable as a driver for DC motors in reversible operation. The push-pull power output stage operates in the switching mode and can be combined to a full-bridge configuration.

Electrical Characteristics

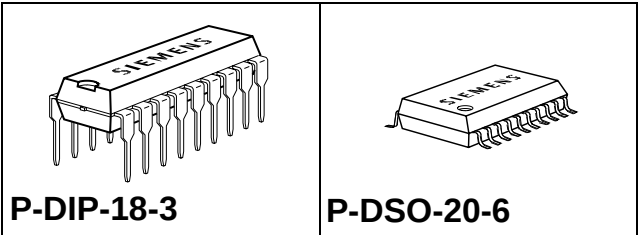
Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	I_S	–	20	25	mA	–
Saturation voltage	V_{Qsat}	–	–	2.5	V	total
Short circuit current	I_{SC}	–	3	3.8	A	–

1-A DC Motor Driver

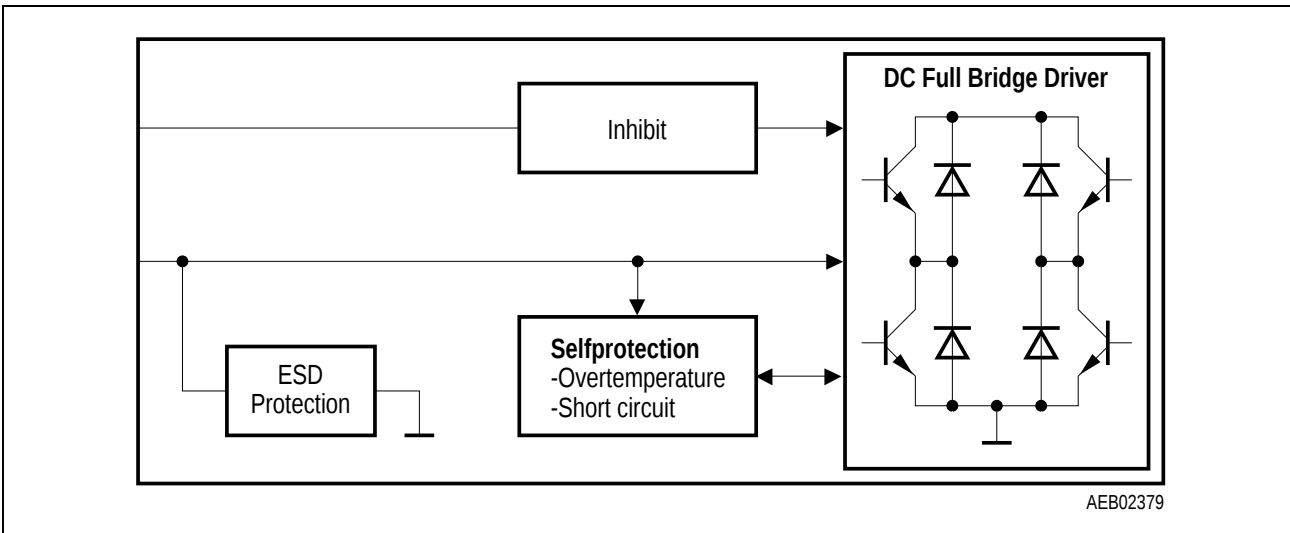
TLE 4205

Features

- 1 A full bridge driver
- Wide operating range from 6 to 32 V
- Over temperature protection
- Short circuit protection to GND
- Free wheeling diodes
- Inhibit
- ESD protected inputs



Block Diagram



Type	Ordering Code	Package
TLE 4205	Q67000-A9025	P-DIP-18-3
TLE 4205 G	Q67006-A9114	P-DSO-20-6

■ SMD = Surface Mounted Device

Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	6	32	V

Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	–	45	V
Output current	I_Q	– 1	1	A
Junction temperature	T_j	– 40	150	°C

The circuit contains two power comparators that can be combined to a full-bridge circuit. The TLE 4205 is particularly suitable as a driver for DC motors in reversible operation.

Electrical Characteristics

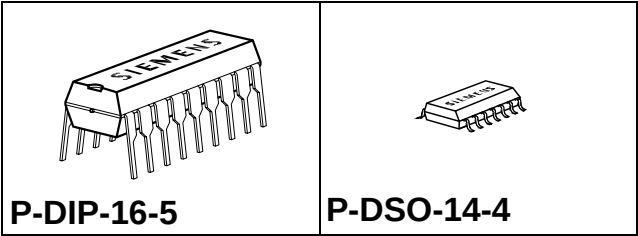
Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	I_S	–	10	100	μA	inhibit
Saturation voltage	V_{Qsat}	–	–	1.9	V	total
Inhibit voltage	V_9	– 15	–	+ V_S	V	–
Switch-ON delay	t_{ON}	–	10	20	μs	–
Switch-OFF delay	t_{OFF}	–	10	20	μs	–

1-A DC Motor Driver for Servo Driver Applications

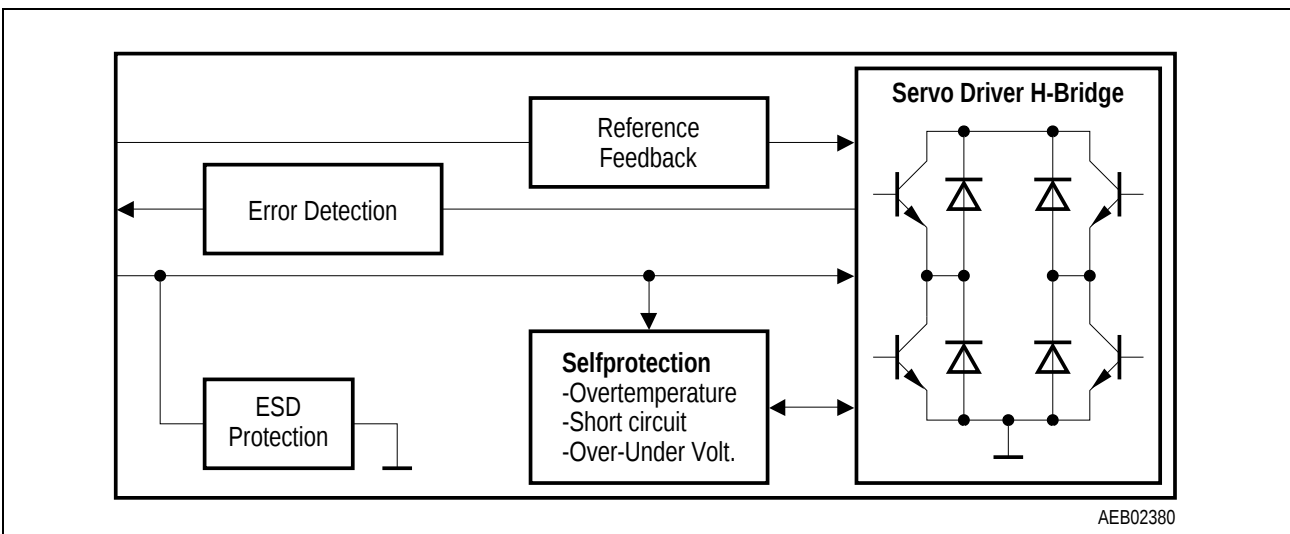
TLE 4206

Features

- 0.8 A servo motor driver
- Very low stand by current consumption
- Low saturation voltage
- Full short circuit protected outputs
- Overtemperature protection with diagnosis
- Over- and under-voltage lockout
- Error flag diagnosis
- Enhanced power P-DSO package



Block Diagram



Type	Ordering Code	Package
TLE 4206	Q67000-A9303	P-DIP-16-5
TLE 4206 G	Q67006-A9299	P-DSO-14-4

■ SMD = Surface Mounted Device

Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	7	18	V
Logic input voltages	V_{IN}	– 2	18	V

Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	– 0.3	45	V
Output current	I_Q	– 1	1	A
Junction temperature	T_j	– 40	150	°C

The circuit contains one power full bridges for servo driver optimized control inputs.
The TLE 4206 G is particularly suitable as a driver for DC motors in reversible operation.

Electrical Characteristics

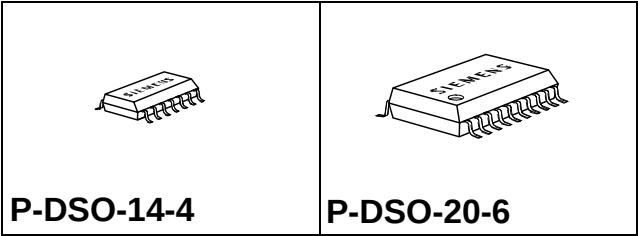
Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	I_S	–	20	50	μA	inhibit
Saturation voltage	V_{Qsat}	–	1.2	1.7	V	total 0.4 A
0 V Switch OFF voltage	V_{0VOFF}	–	20.2	24	V	–
0 V Switch ON voltage	V_{0VON}	18	19.5	–	V	–

1-A Dual-HBD (Dual-Half-Bridge Driver)

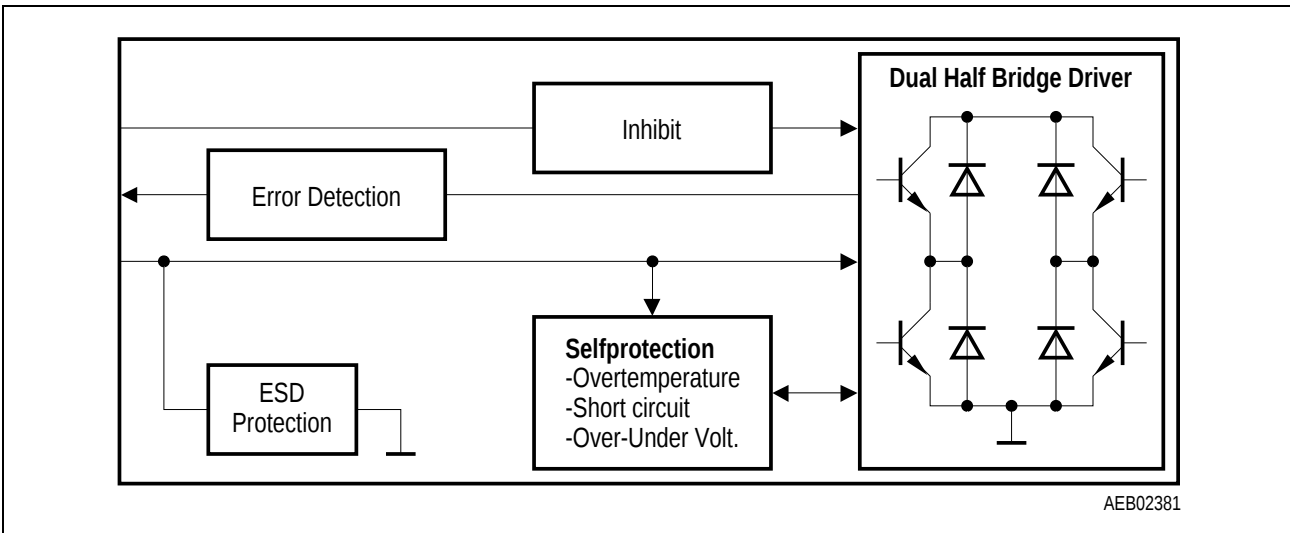
TLE 4207

Features

- 0.8 A dual half bridge driver
- Very low stand by current consumption
- Very low saturation voltage
- Full short circuit protected outputs
- Overtemperature protection with diagnosis
- Over- and under-voltage lockout
- Error flag diagnosis
- Enhanced power P-DSO package



Block Diagram



Type	Ordering Code	Package
TLE 4207 G	Q67006-A9275	P-DSO-14-4
TLE 4207 GL	on request	P-DSO-20-6

■ SMD = Surface Mounted Device

Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	7	18	V
Logic input voltages	V_{IN}	– 2	18	V

Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	– 0.3	45	V
Output current	I_Q	– 1	1	A
Junction temperature	T_j	– 40	150	°C

The circuit contains two power half bridges which can be combined to a full-bridge circuit. The TLE 4207G is particularly suitable as a driver for DC motors in reversible operation.

Electrical Characteristics

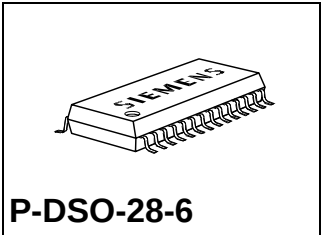
Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	I_S	–	20	50	μA	inhibit
Saturation voltage	V_{Qsat}	–	1.2	1.7	V	total 0.4 A
0 V Switch OFF voltage	V_{0VOFF}	–	20.2	24	V	–
0 V Switch ON voltage	V_{0VON}	18	19.5	–	V	–

1-A Quad-HBD (Quad-Half-Bridge Driver)

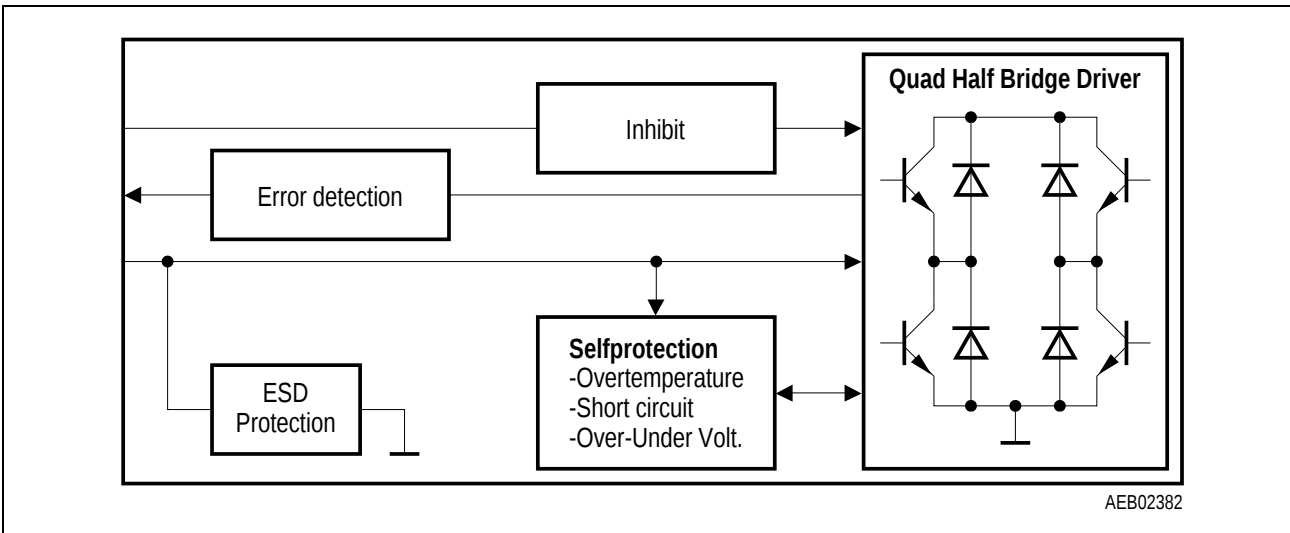
TLE 4208

Features

- 0.8 A quad half bridge driver
- Very low stand by current consumption
- Very low saturation voltage
- Full short circuit protected outputs
- Overtemperature protection with diagnosis
- Over- and under-voltage lockout
- Error flag diagnosis
- Enhanced power P-DSO package



Block Diagram



Type	Ordering Code	Package
TLE 4208 G	on request	P-DSO-28-6

■ SMD = Surface Mounted Device

Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	7	18	V
Logic input voltages	V_{IN}	– 2	18	V

Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	– 0.3	45	V
Output current	I_Q	– 1	1	A
Junction temperature	T_j	– 40	150	°C

The circuit contains four power half bridges which can be combined to two full-bridge circuits.

The TLE 4208 G is particularly suitable as a driver for DC motors in reversible operation.

Electrical Characteristics

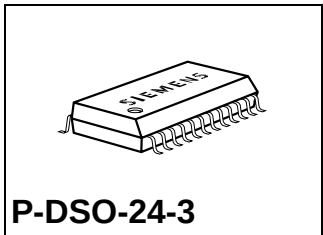
Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	I_S	–	20	50	μA	inhibit
Saturation voltage	V_{Qsat}	–	1.2	1.7	V	total 0.4 A
Switch-ON delay	V_{0VON}	18	19.5	–	V	–
Switch-OFF delay	V_{0VOFF}	–	20.2	24	V	–

2-Phase Stepper-Motor Driver

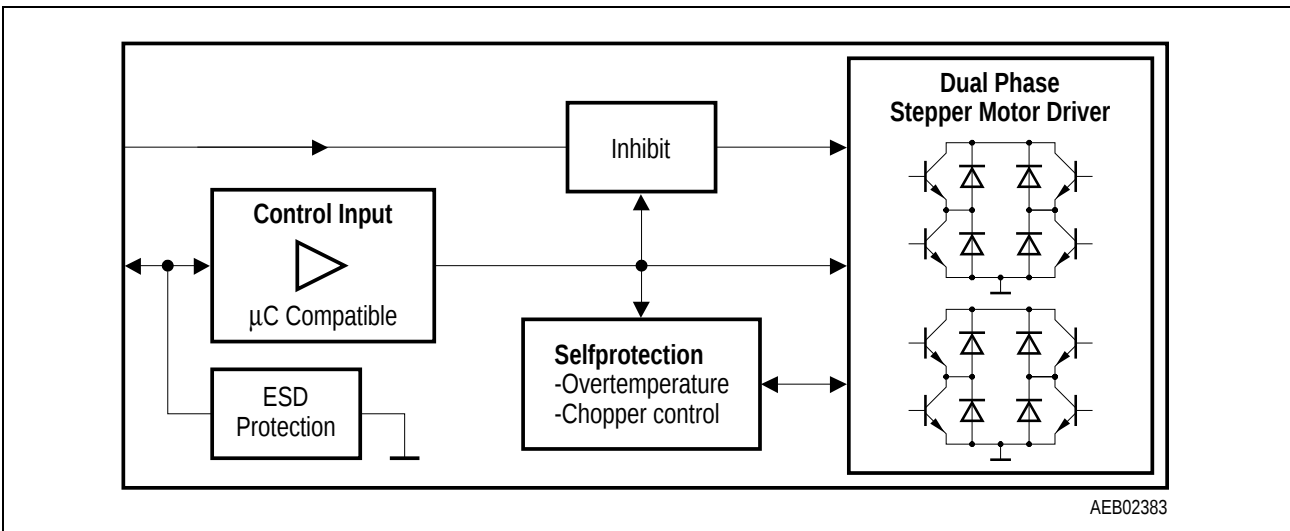
TLE 4726

Features

- 2×0.75 A dual phase stepper motor driver full, half, quarter, mini, quasi-sine step
- Integrated driver, control logic and current control
- Wide operating range from 5 to 50 V
- Wide temperature range
- Over temperature protection
- Inhibit
- Low standby-current
- Free wheeling diodes



Block Diagram



Type	Ordering Code	Package
TLE 4726 G	Q67006-A9297	P-DSO-24-3

■ SMD = Surface Mounted Device

Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	5	50	V

Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	–	52	V
Output current	I_Q	–	2×0.8	A
Junction temperature	T_j	– 40	150	°C

Electrical Characteristics

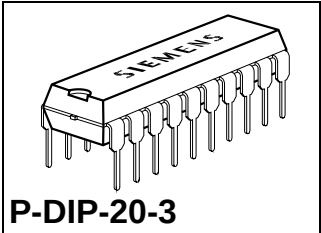
Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	I_S	–	0.2	0.5	mA	–
Saturation voltage	V_{Qsat}	–	1.4	1.9	V	total
Logic supply voltage	V_L	–	4.5	6.5	V	–
Standby output threshold	V_{inh} (L→H)	–	3	4	V	$V_L = 5\text{ V}$
Standby output threshold	V_{inh} (H→L)	–	2.3	2.9	V	$V_L = 5\text{ V}$
Hysteresis	V_{inhhy}	–	0.7	1.1	V	$V_L = 5\text{ V}$

2-Phase Stepper-Motor Driver

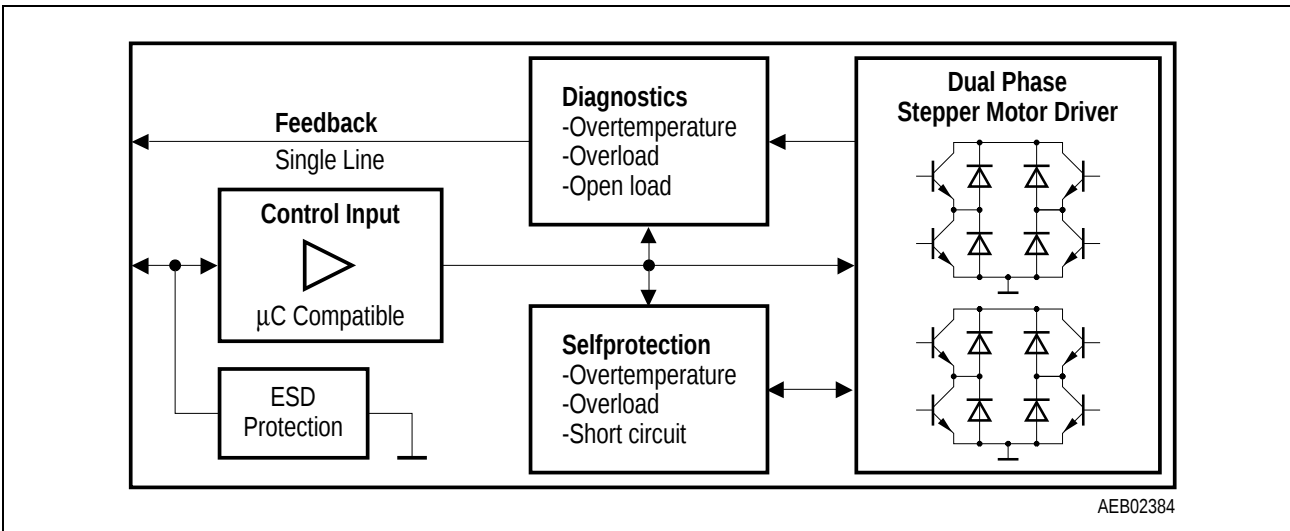
TLE 4727

Features

- 2×0.7 A dual phase stepper motor driver
- Wide temperature range
- Short circuit protection to $+V_S$ and GND
- Over temperature protection
- 5 V TTL logic supply
- Current control
- Free wheeling diodes
- Low saturation voltage



Block Diagram



Type	Ordering Code	Package
TLE 4727	Q67000-A9099	P-DIP-20-3

Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	5	16	V

Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	− 0.3	45	V
Output current	I_Q	2×-1	2×1	A
Junction temperature	T_j	− 40	150	°C

The TLE 4727 is a bipolar monolithic IC for driving bipolar stepper motors, DC motors and other inductive loads that operate on constant current. The control logic and power output stages for two bipolar windings are integrated on a single chip. The direction and value of current are programmable for each phase via seperate control inputs. The two output stages in full bridge configuration include fast integrated free-wheeling diodes and are free of crossover current.

Electrical Characteristics

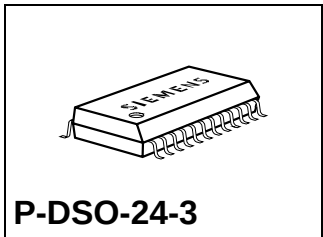
Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	I_S	−	30	50	mA	−
Saturation voltage	V_{Qsat}	−	1.5	1.7	V	total
Logic supply voltage	V_L	−	4.5	6	V	−
Error output	V_{Err}	−	−	25	V	operating range
	I_{Err}	−	−	1	mA	operating range
Logic input hysteresis	V_{lhy}	−	50	−	mV	−

2-Phase Stepper-Motor Driver

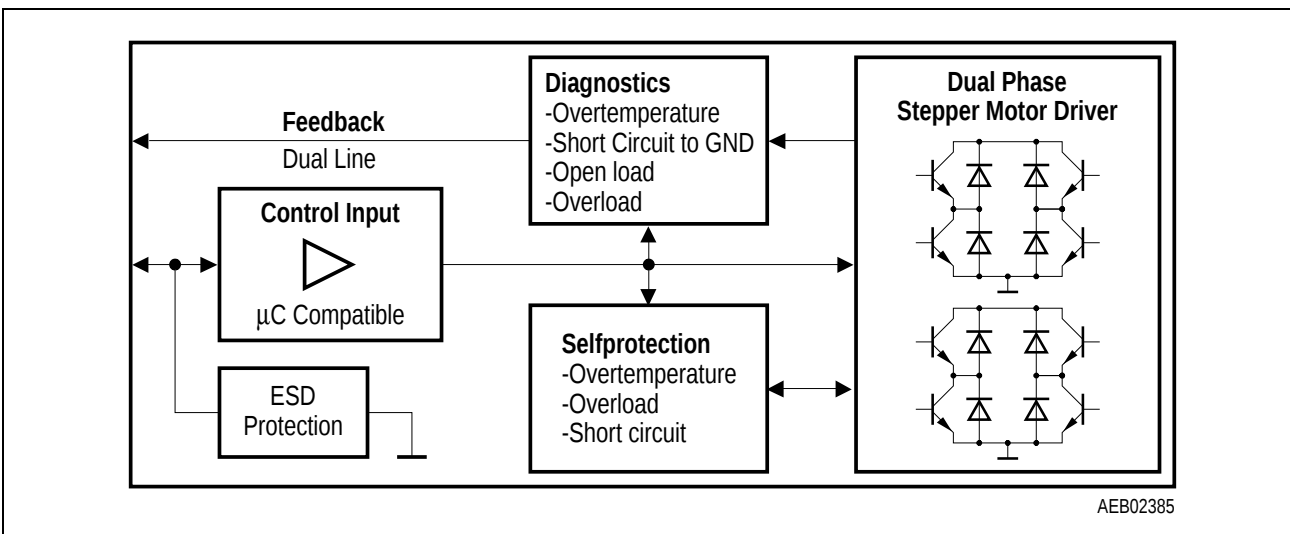
TLE 4728

Features

- 2×0.7 A dual phase stepper motor driver
- Wide temperature range
- Short circuit protection to + V_S and GND
- Over temperature protection
- Output stages free of cross over current
- Free wheeling diodes
- Low saturation voltage



Block Diagram



Type	Ordering Code	Package
TLE 4728 G	Q67006-A9077	P-DSO-24-3

■ SMD = Surface Mounted Device

Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	5	16	V

Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	– 0.3	45	V
Output current	I_Q	2×-1	2×1	A
Junction temperature	T_j	– 40	150	°C

The TLE 4728 is a bipolar monolithic IC for driving bipolar stepper motors, DC motors and other inductive loads that operate on constant current. The control logic and power output stages for two bipolar windings are integrated on a single chip. The direction and value of current are programmable for each phase via seperate control inputs. The two output stages in full bridge configuration include fast integrated free-wheeling diodes and are free of crossover current.

Electrical Characteristics

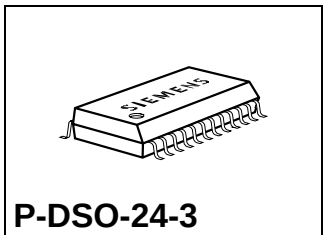
Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	I_S	–	30	50	mA	–
Saturation voltage	V_{Qsat}	–	1.5	1.7	V	total
Logic supply voltage	V_{lxx}	– 5	–	6	V	operating range
Error output	V_{Err}	–	–	25	V	operating range
	I_{Err}	–	–	1	mA	operating range
Logic input hysteresis	V_{lhy}	–	50	–	mV	–

2-Phase Stepper-Motor Driver

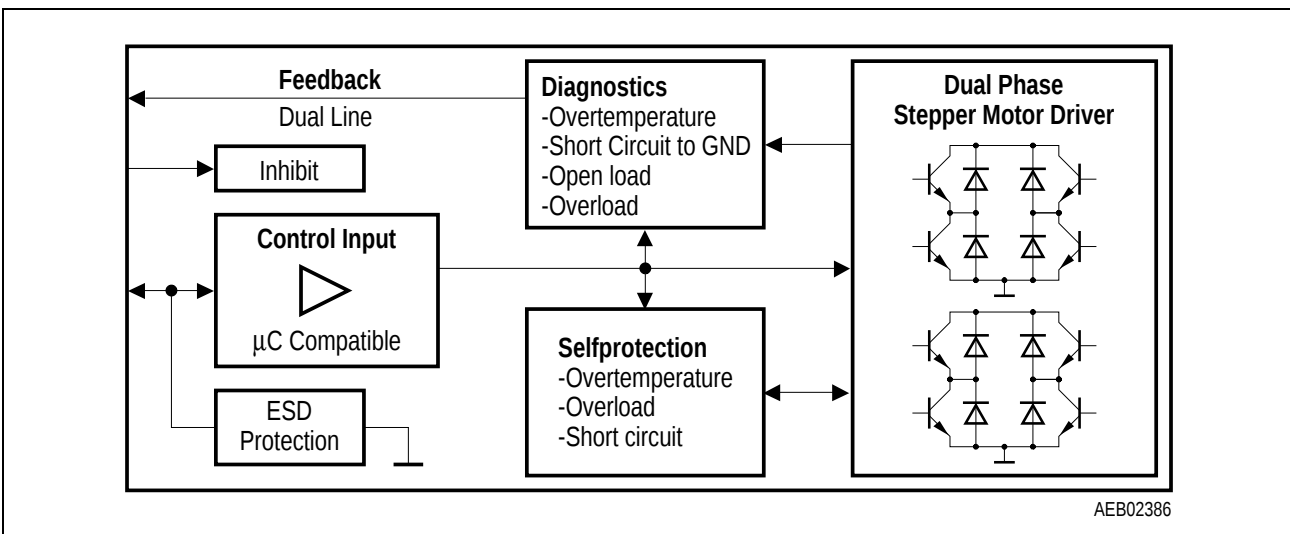
TLE 4729

Features

- 2×0.7 A dual phase integrated stepper motor driver with control logic and current control
- Low quiescent current in INHIBIT mode
- Wide temperature range
- Short circuit protection to $+V_S$ and GND
- Over temperature protection
- Output stages free of cross over current
- Free wheeling diodes
- Low saturation voltage



Block Diagram



Type	Ordering Code	Package
TLE 4729 G	on request	P-DSO-24-3

■ SMD = Surface Mounted Device

Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	5	16	V

Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	– 0.3	45	V
Output current	I_Q	2×-1	2×1	A
Junction temperature	T_j	– 40	150	°C

The TLE 4729 is a bipolar monolithic IC for driving bipolar stepper motors, DC motors and other inductive loads that operate on constant current. The control logic and power output stages for two bipolar windings are integrated on a single chip. The direction and value of current are programmable for each phase via seperate control inputs. The two output stages in full bridge configuration include fast integrated free-wheeling diodes and are free of crossover current.

Electrical Characteristics

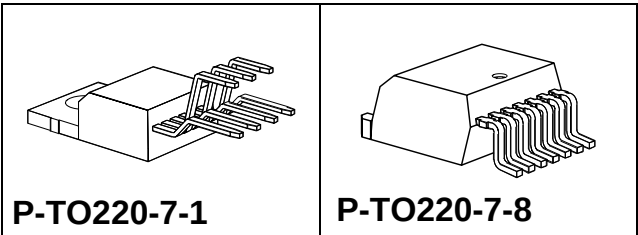
Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	I_S	–	30	50	mA	–
Saturation voltage	V_{Qsat}	–	1.5	1.7	V	total
Logic supply voltage	V_{lxx}	– 5	–	6	V	operating range
Error output	V_{Err}	–	–	25	V	operating range
	I_{Err}	–	–	1	mA	operating range
Logic input hysteresis	V_{lhy}	–	50	–	mV	–

3-A DC Motor Driver

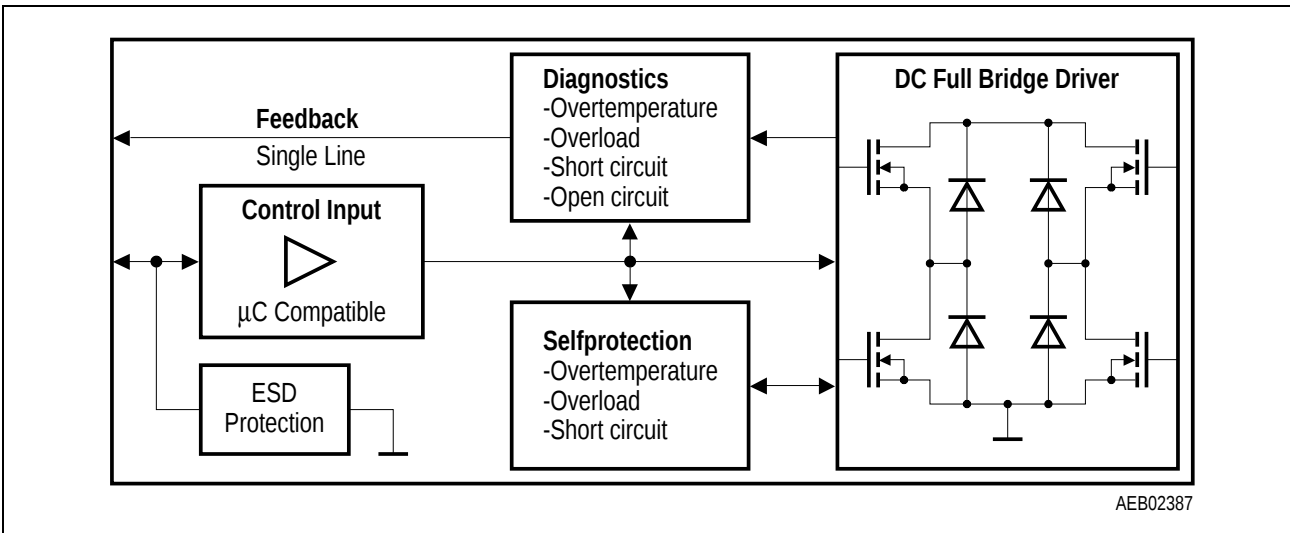
TLE 5203

Features

- 3 A full H-bridge driver
- Wide operating range from 6 to 40 V
- Over temperature protection
- Overload detection
- Open load detection
- Short circuit protection to + V_S and GND
- Free wheeling diodes
- I/O error diagnostic
- Low $R_{DS(on)}$



Block Diagram



Type	Ordering Code	Package
TLE 5203	Q67000-A9096	P-TO220-7-1
TLE 5203 G	Q67006-A9242	P-TO220-7-8

■ SMD = Surface Mounted Device

Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	6	40	V

Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	– 0.3	40	V
Output current	I_Q	– 4	4	A
Junction temperature	T_j	– 40	150	°C

This motor bridge is optimized for driving DC motors in reversible operation. The internal protective circuitry in particular ensures that no cross over currents can occur.

Electrical Characteristics

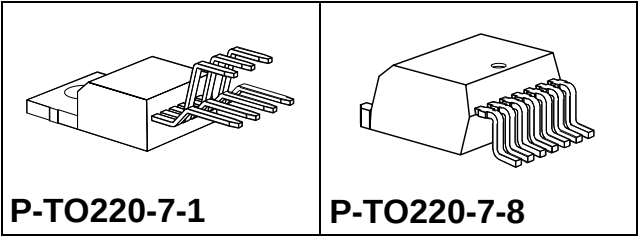
Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	I_S	–	–	10	mA	–
R_{DSON}	–	–	0.6	1.2	Ω	total
Logic input voltage	$V_{\text{I1,2}}$	– 0.3	–	7	V	–
Diagnostic output voltage	V_{EF}	– 0.3	–	7	V	–
Pull up/pull down resistance	R	5	–	25	k Ω	–
Turn-ON delay	td1	–	–	10	μs	–
Turn-OFF delay	td2	–	–	10	μs	–

3-A DC Motor Driver

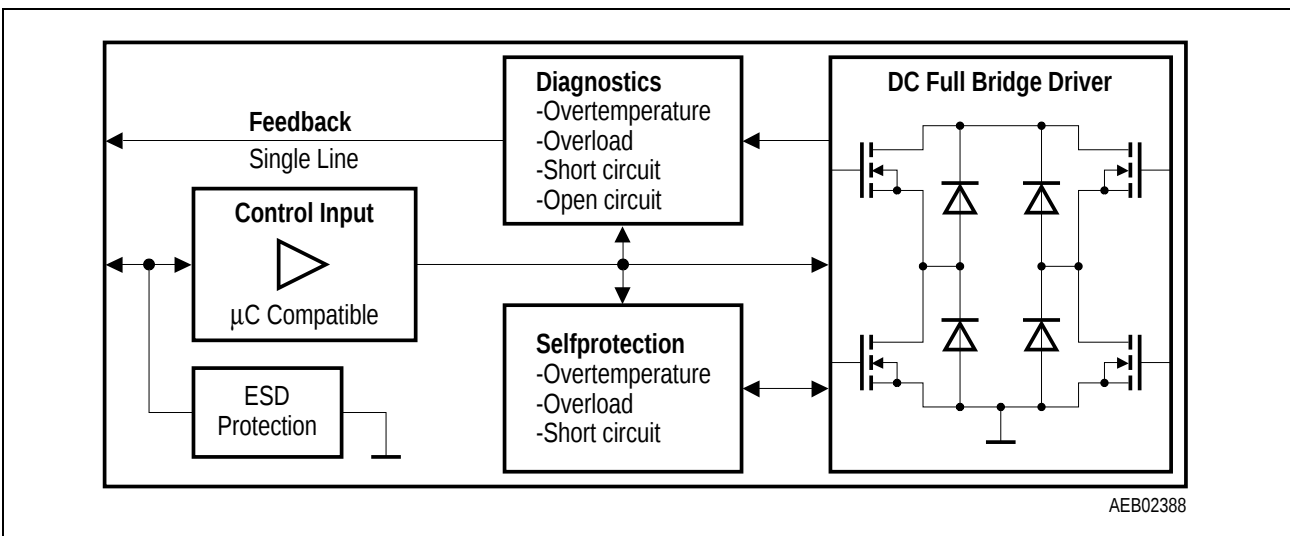
TLE 5204

Features

- 3 A full H-bridge driver
- Wide operating range from 6 to 40 V
- Break Low **and** break High
- Over temperature protection
- Overload detection
- Open load detection
- Short circuit protection to + V_S and GND
- Free wheeling diodes
- I/O error diagnostic
- Low $R_{DS(on)}$



Block Diagram



Type	Ordering Code	Package
TLE 5204	Q67000-A9177	P-TO220-7-1
TLE 5204 G	Q67006-A9234	P-TO220-7-8

■ SMD = Surface Mounted Device

Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	6	40	V

Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	– 0.3	40	V
Output current	I_Q	– 4	4	A
Junction temperature	T_j	– 40	150	°C

This motor bridge is optimized for driving DC motors in reversible operation. The internal protective circuitry in particular ensures that no cross over currents can occur.

Electrical Characteristics

Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	I_S	–	–	10	mA	–
R_{DSON}	–	–	0.6	1.2	Ω	total
Logic input voltage	$V_{\text{I1,2}}$	– 0.3	–	7	V	–
Diagnostic output voltage	V_{EF}	– 0.3	–	7	V	–
Pull up/pull down resistance	R	5	–	25	k Ω	–
Turn-ON delay	td1	–	–	10	μ s	–
Turn-OFF delay	td2	–	–	10	μ s	–

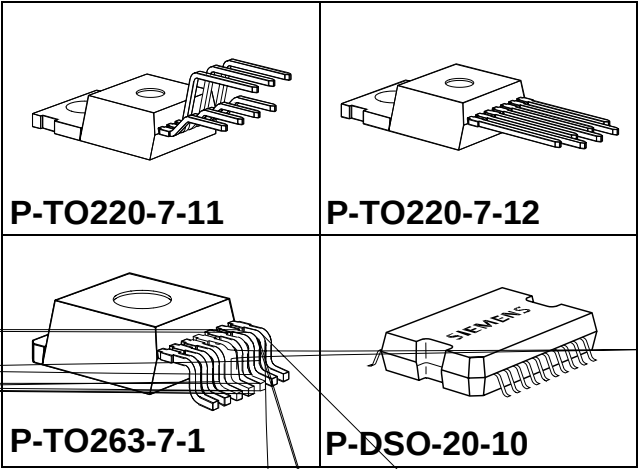
5-A H-Bridge for DC-Motor Applications

TLE 5205-2

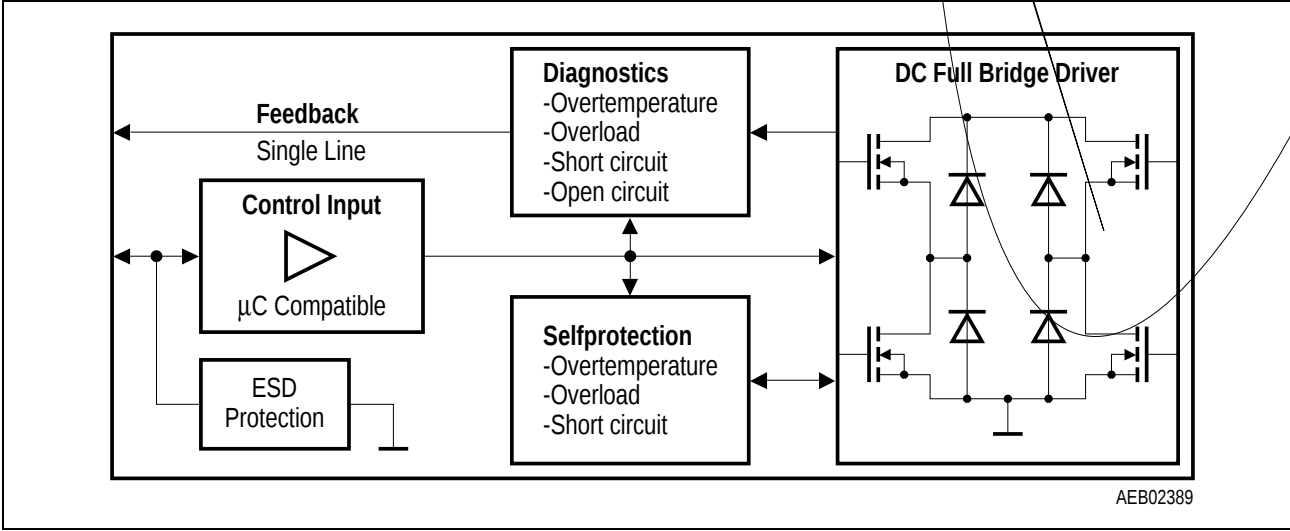
Preliminary Data

Features

- 5.0 A full H-bridge driver
- Wide operating range from 6 to 40 V
- Over temperature protection
- Overload detection
- Open load detection
- Open load diagnosis
- Full short circuit protection
- Integrated free wheeling diodes
- I/O error diagnostic
- Low $R_{\text{DS(on)}}$ typ. 200 m Ω @ 25 °C



Block Diagram



Type	Ordering Code	Package
TLE 5205-2	Q67000-A9283	P-TO220-7-11
TLE 5205-2S	Q67000-A9324	P-TO220-7-12
TLE 5205-2G	Q67006-A9325	P-TO263-7-1
TLE 5205-2GP	Q67006-A9237	P-DSO-20-10

■ SMD = Surface Mounted Device

Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	6	40	V

Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	– 0.3	40	V
Output current	I_Q	– 6	6	A
Junction temperature	T_j	– 40	150	°C

This motor bridge is optimized for driving DC motors in reversible operation. The internal protective circuitry in particular ensures that no cross over currents can occur.

Electrical Characteristics

Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	I_S	–	–	10	mA	–
$R_{\text{DS(on)}}$	–	–	–	1.3	Ω	total $T_j = 150\text{ °C}$
Logic input voltage	$V_{\text{I1,2}}$	– 0.3	–	7	V	–
Diagnostic output voltage	V_{EF}	– 0.3	–	7	V	–
Turn-ON delay	td1	–	–	20	μs	–
Turn-OFF delay	td2	–	–	20	μs	–

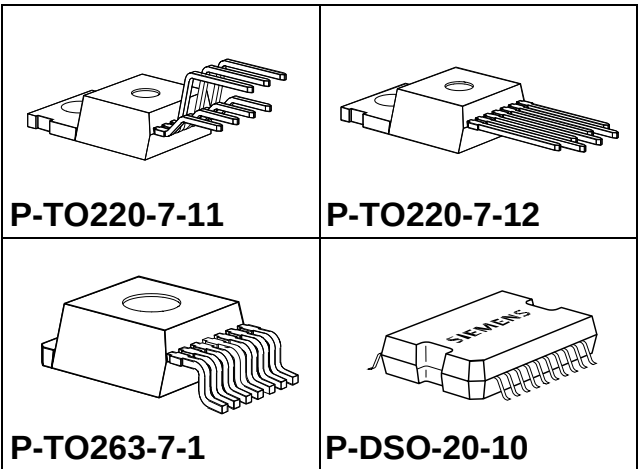
5-A H-Bridge for DC-Motor Applications

TLE 5206-2

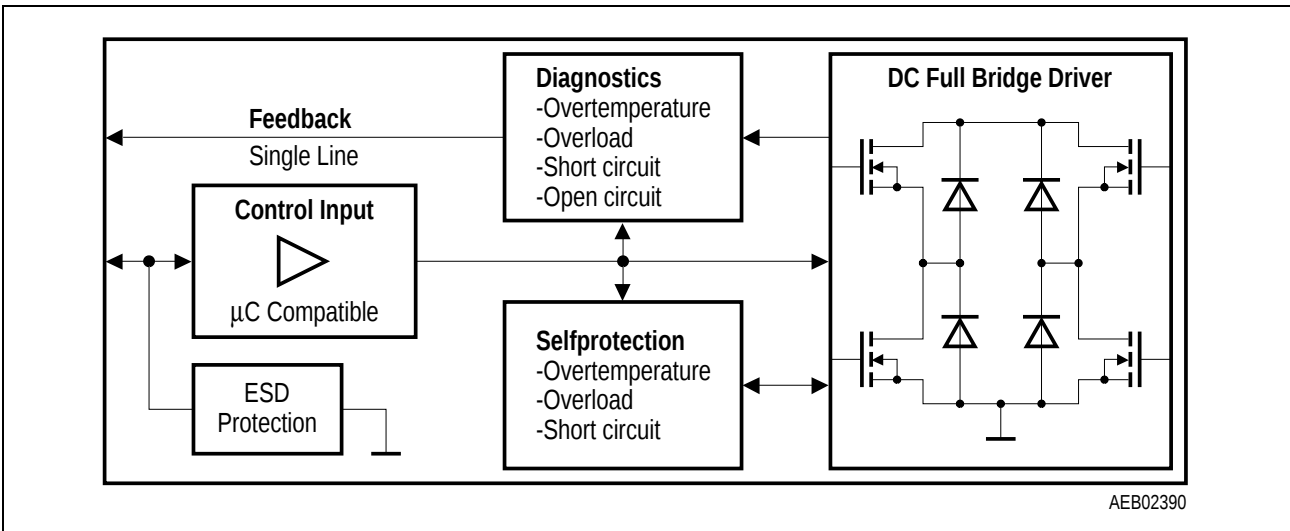
Preliminary Data

Features

- 5.0 A full H-bridge driver
- Wide operating range from 6 to 40 V
- Break Low **and** break High
- Over temperature protection
- Overload detection
- Full short circuit protection
- Integrated free wheeling diodes
- I/O error diagnostic
- Low $R_{DS(on)}$ typ. 200 m Ω @ 25 °C



Block Diagram



Type	Ordering Code	Package
TLE 5206-2	Q67000-A9290	P-TO220-7-11
TLE 5206-2S	Q67000-A9326	P-TO220-7-12
TLE 5206-2G	Q67006-A9323	P-TO263-7-1
TLE 5206-2GP	Q67006-A9239	P-DSO-20-10

■ SMD = Surface Mounted Device

Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	6	40	V

Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	– 0.3	40	V
Output current	I_Q	– 6	6	A
Junction temperature	T_j	– 40	150	°C

This motor bridge is optimized for driving DC motors in reversible operation. The internal protective circuitry in particular ensures that no cross over currents can occur.

Electrical Characteristics

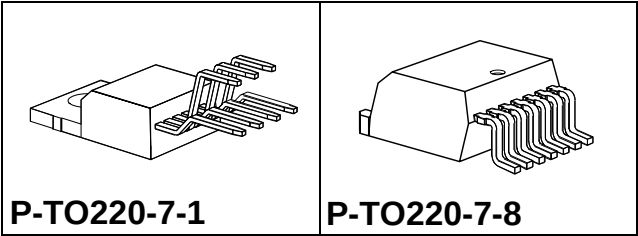
Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	I_S	–	–	10	mA	–
R_{DSON}	–	–	–	1.3	Ω	total $T_j = 150\text{ °C}$
Logic input voltage	$V_{\text{I1,2}}$	– 0.3	–	7	V	–
Diagnostic output voltage	V_{EF}	– 0.3	–	7	V	–
Turn-ON delay	td1	–	–	20	μs	–
Turn-OFF delay	td2	–	–	20	μs	–

6-A DC Motor Driver with Inhibit

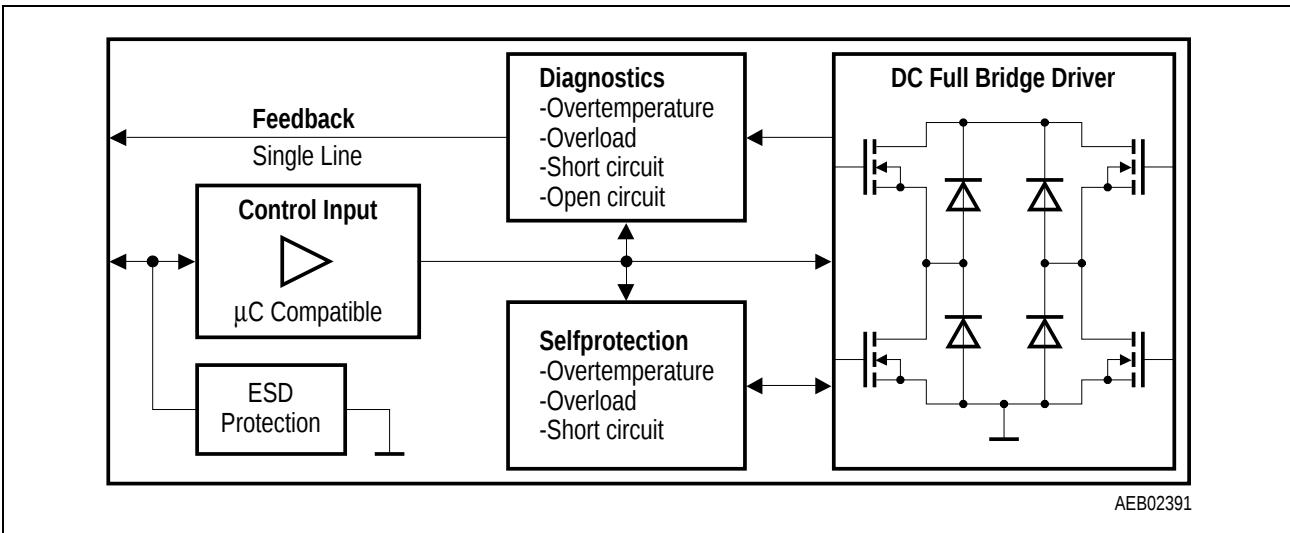
TLE 5207

Features

- 6 A full bridge driver
- Wide operating range from 6 to 40 V
- Over temperature protection
- Low quiescent current
- Overload detection
- Short circuit protection to + V_S and GND
- Free wheeling diodes
- I/O error diagnostic
- Low $R_{DS(on)}$



Block Diagram



Type	Ordering Code	Package
TLE 5207	Q67000-A9295	P-TO220-7-1
TLE 5207 G	Q67006-A9296	P-TO220-7-8

■ SMD = Surface Mounted Device

Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	6	40	V

Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	– 0.3	40	V
Output current	I_Q	– 6	6	A
Junction temperature	T_j	– 40	150	°C

Electrical Characteristics

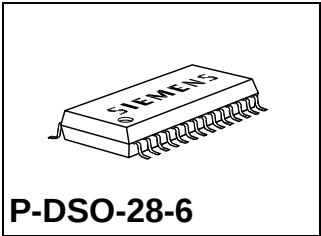
Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	I_S	–	–	100	μA	$V_S = 12\text{ V}$ stand by mode
$R_{\text{DS(ON)}}$	–	–	0.6	1.2	Ω	total
Logic input voltage	$V_{\text{I1,2}}$	– 0.3	–	6	V	$V_S = 0\text{--}40\text{ V}$
Diagnostic output voltage	V_{EF}	– 0.3	–	40	V	–
Pull up/pull down resistance	R	5	–	25	kΩ	–
Turn-ON delay	td1	–	–	20	μs	–
Turn-OFF delay	td2	–	–	20	μs	–

Hex-Half-Bridge / Double Six-Driver

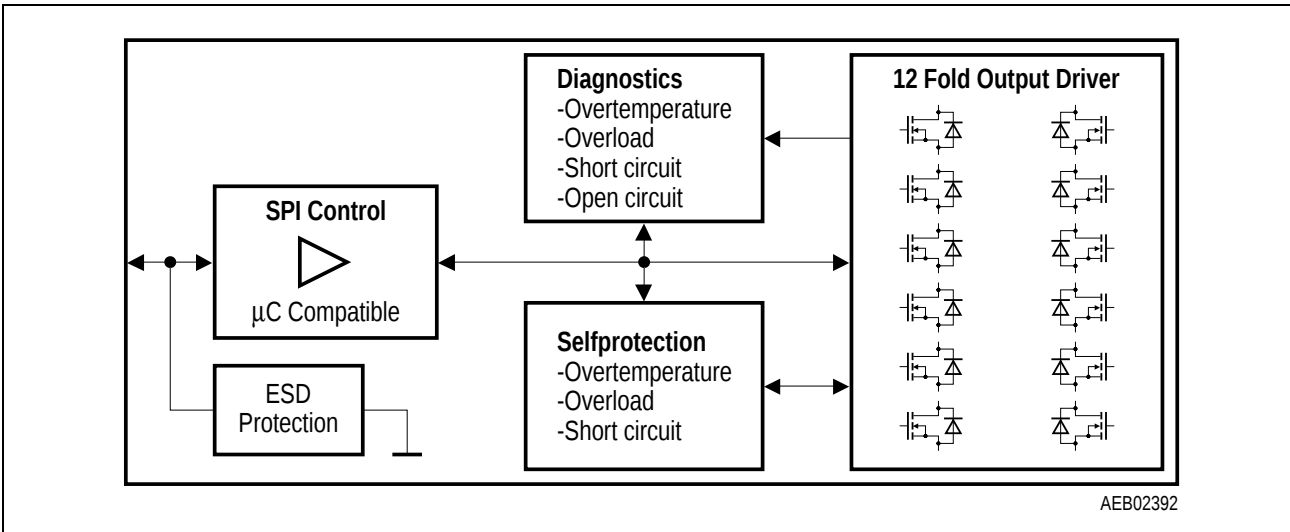
TLE 5208-6

Features

- Multifunctional 6 fold 1.0 A half bridge driver for motors, inductive loads and lamps
- $R_{\text{DS(on)}}$ typ. 1.0Ω @ 25°C
- Individual configurable with 16 bit SPI
- Full diagnostic with 16 bit SPI
- Wide operating range from 6 to 32 V
- Over temperature protection with prewarning
- Very low quiescent current
- Overload detection (maskable)
- Open load and under load detection
- Over- and under voltage lockout
- Full short circuit protected
- Free wheeling diodes



Block Diagram



Type	Ordering Code	Package
TLE 5208-6 G	Q67007-A9282	P-DSO-28-6

■ SMD = Surface Mounted Device

Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	$V_{UV\ OFF}$	40	V

Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	− 0.3	40	V
Output current (overload detection activ)	I_Q	− 2	2	A
Output current (overload detection not activ)	I_Q	− 5	5	A
Junction temperature	T_j	− 40	150	°C

Electrical Characteristics

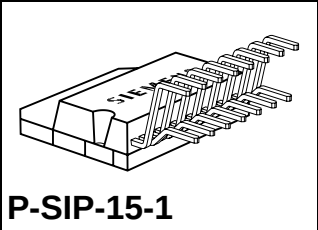
Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	I_S	−	−	50	μA	stand-by mode
$R_{DS\ ON}$		−	1.0	2.5	Ω	−
SPI clock frequency	f_{CLK}	−	−	2.0	MHz	−
Setup delay time	$t_{set\ d}$	−	−	300	μs	stand-by to activ
Output delay time source	−	−	5	20	μs	−
Output delay time sink	−	−	7	30	μs	−
Thermal prewarning	−	120	145	170	°C	−
Thermal shutdown	−	150	175	200	°C	−
Thermal switch on	−	120	−	170	°C	after thermal shutdown

High Performance Smart Power Stepper Motor Driver with Diagnostic Interface

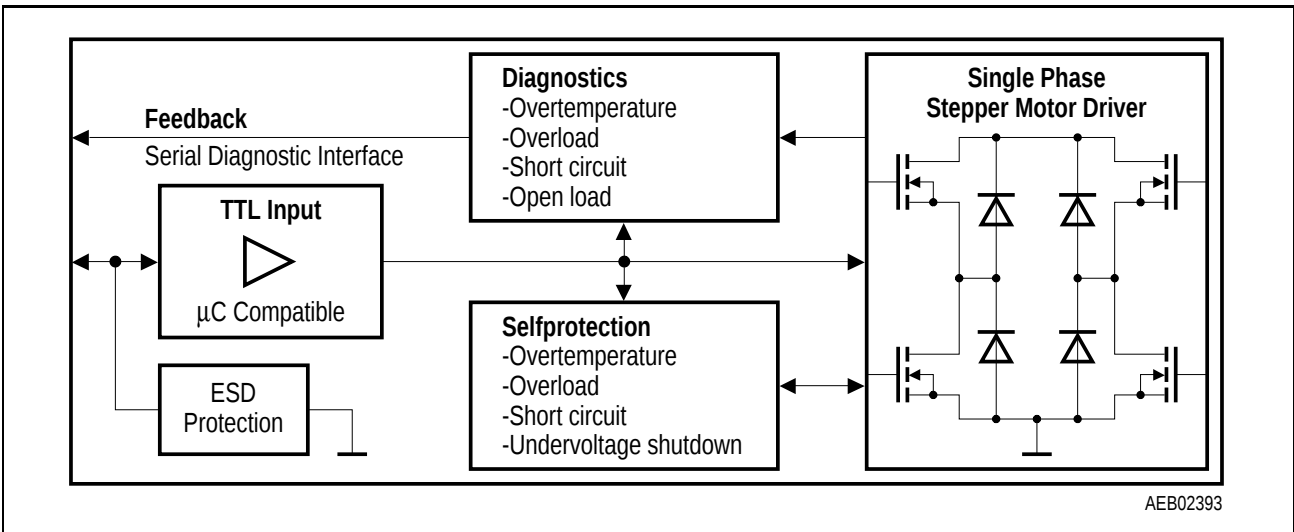
TLE 5250

Features

- 1 × 2.5 A single phase stepper motor driver
- Fast nominal/actual comparator for micro stepper mode
- Short circuit protection to + V_S and GND
- Over temperature protection
- Undervoltage shutdown
- Dynamic current control
- Free wheeling diodes
- Serial 16-Bit diagnostic interface



Block Diagram



Type	Ordering Code	Package
TLE 5250	Q67000-A9103	P-SIP-15-1

Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	6	40	V

Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	– 0.3	45	V
Output current	I_Q	0	3	A
Junction temperature	T_j	– 40	150	°C

The TLE 5250 has TTL-compatible logic inputs, includes a H-bridge with integrated fast free-wheeling diodes plus dynamic limiting of the motor current by chopper mode. The nominal current can be set continuously by a control voltage. Microstep mode can be produced by applying a sinoidal control voltage.

Two TLE 5250 with a minimum of external circuitry and a single supply voltage form a complete system that can be driven direct by a μ C for two-phase bipolar stepping motors with output current of up to 2.5 A per phase.

Electrical Characteristics

Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Supply current	I_S	–	–	11	mA	–
$R_{DS(ON)}$	–	–	0.35	0.6	Ω	total
Logic input	V_I	– 0.3	–	5.5	V	operating range
Output current	I_Q	– 2.5	–	2.5	A	operating range
RC/Sync, frequency	f	–	20	100	kHz	–

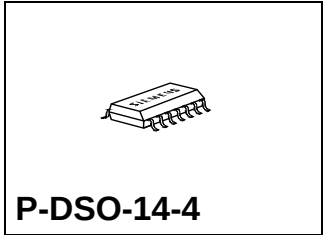
Triple-Half-Bridge Driver

TLE 6208-3

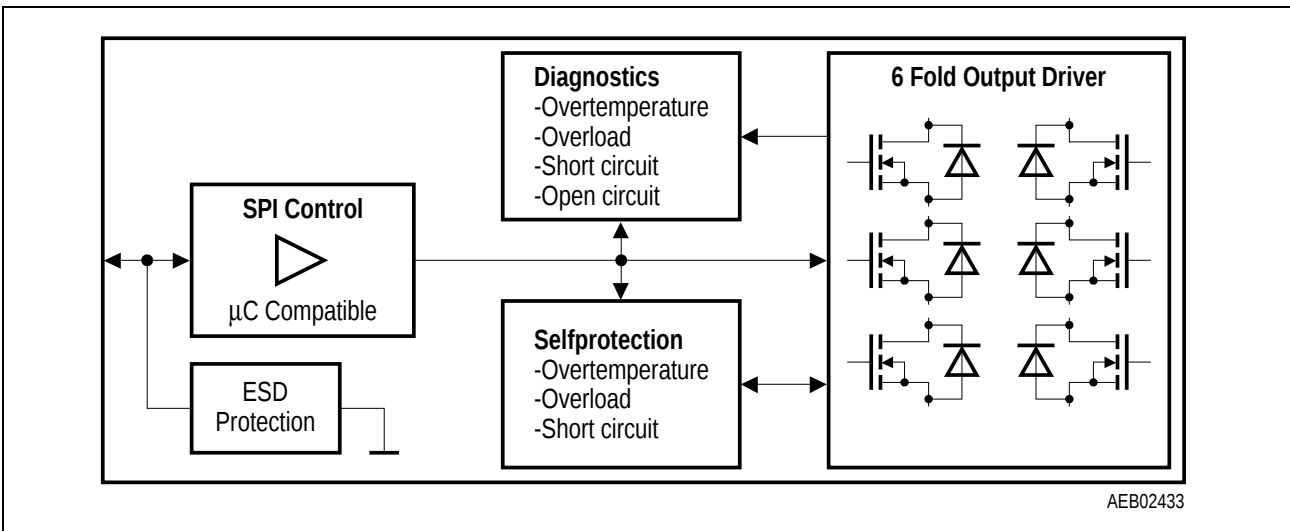
Target Data

Features

- Multifunctional 3 fold 1.0 A half bridge driver for motors, inductive loads and lamps
- $R_{\text{DS(on)}}$ typ. 0.8Ω @ 25°C
- Individual configurable with 16 bit SPI
- Full diagnostic with 16 bit SPI
- Wide operating range from 6 to 32 V
- Over temperature protection with prewarning
- Very low quiescent current
- Overload detection (maskable)
- Open load and under load detection
- Over- and under voltage lockout
- Full short circuit protected
- Free wheeling diodes



Block Diagram



Type	Ordering Code	Package
TLE 6208-3 G	on request	P-DSO-14-4

■ SMD = Surface Mounted Device

Operating Range

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	6	32	V

Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S	– 0.3	40	V
Output current (overload detection activ)	I_Q	– 2	2	A
Output current (overload detection not activ)	I_Q	– 5	5	A
Junction temperature	T_j	– 40	150	°C

Electrical Characteristics

Parameter	Symbol	Limit Values			Unit	Remarks
		min.	typ.	max.		
Quiescent current	I_S	–	–	50	μA	stand-by mode
$R_{\text{DS(on)}}$	–	–	0.8	2.5	Ω	–
SPI clock frequency	–	–	–	2	MHz	–
Setup delay time	–	–	–	300	μs	stand-by to activ
Output delay time source	–	–	5	20	μs	–
Output delay time sink	–	–	7	30	μs	–
Thermal prewarning	–	120	145	170	°C	–
Thermal shutdown	–	150	175	200	°C	–