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1.0 Features

- Dual phase-locked loop (PLL) device with three output clock frequencies
- 3.3V supply voltage
- Small circuit board footprint (8-pin 0.150" SOIC)
- Custom frequency selections available - contact your local AMI Sales Representative for more information

2.0 Description

The FS6282 is a monolithic CMOS clock generator IC designed to minimize cost and component count in digital video/audio systems.

Two high-resolution phase-locked loops generate two output clocks (CLKA and CLKB) through an array of post-dividers. All frequencies are ratiometrically derived from the crystal oscillator frequency. The locking of all the output frequencies together can eliminate unpredictable artifacts in video systems and reduce electromagnetic interference (EMI) due to frequency harmonic stacking.

Figure 1: Pin Configuration

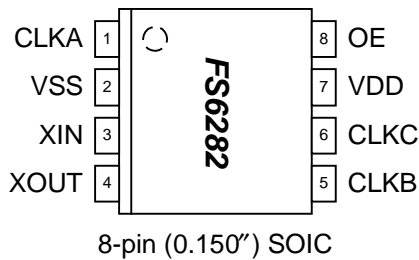


Table 1: Crystal / Output Frequencies

| DEVICE | f _{XIN} (MHz) | CLKA (MHz) | CLKB (MHz) | CLKC (MHz) |
|-----------|------------------------|------------|------------|------------|
| FS6282-03 | 20.000 | 20.000 | 48.000 | 8.000 |

NOTE: Contact AMI for custom PLL frequencies

Figure 2: Block Diagram

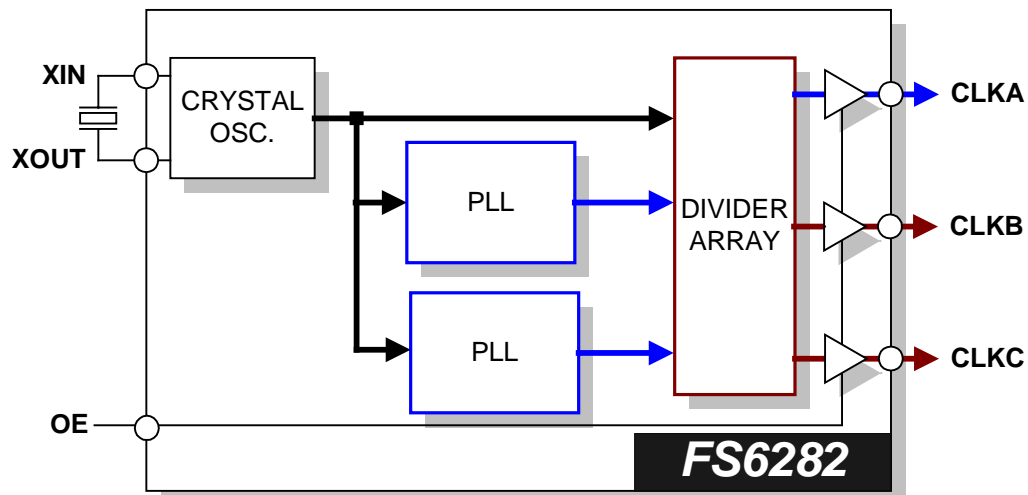


Table 2: Pin Descriptions

Key: AI = Analog Input; AO = Analog Output; DI = Digital Input; DI^U = Input with Internal Pull-Up; DI_D = Input with Internal Pull-Down; DIO = Digital Input/Output; DI-3 = Three-Level Digital Input, DO = Digital Output; P = Power/Ground; # = Active Low pin

| PIN | TYPE | NAME | DESCRIPTION |
|-----|-----------------|------|--|
| 1 | DO | CLKA | Clock Output A |
| 2 | P | VSS | Ground |
| 3 | AI | XIN | Crystal Oscillator Feedback |
| 4 | AO | XOUT | Crystal Oscillator Drive |
| 5 | DO | CLKB | Clock Output B |
| 6 | DO | CLKC | Clock Output C |
| 7 | P | VDD | Power (+3.3 volts) |
| 8 | DI ^U | OE | Output Enable (outputs active when OE=VDD) |

3.0 Electrical Specifications

Table 3: Absolute Maximum Ratings

Stresses above those listed under Absolute Maximum Ratings may cause permanent damage to the device. These conditions represent a stress rating only, and functional operation of the device at these or any other conditions above the operational limits noted in this specification is not implied. Exposure to maximum rating conditions for extended conditions may affect device performance, functionality, and reliability.

| PARAMETER | SYMBOL | MIN. | MAX. | UNITS |
|---|----------|--------------|--------------|-------|
| Supply Voltage (V_{SS} = ground) | V_{DD} | $V_{SS}-0.5$ | 7 | V |
| Input Voltage, dc | V_I | $V_{SS}-0.5$ | $V_{DD}+0.5$ | V |
| Output Voltage, dc | V_O | $V_{SS}-0.5$ | $V_{DD}+0.5$ | V |
| Input Clamp Current, dc ($V_I < 0$ or $V_I > V_{DD}$) | I_{IK} | -50 | 50 | mA |
| Output Clamp Current, dc ($V_I < 0$ or $V_I > V_{DD}$) | I_{OK} | -50 | 50 | mA |
| Storage Temperature Range (non-condensing) | T_S | -65 | 150 | °C |
| Ambient Temperature Range, Under Bias | T_A | -55 | 125 | °C |
| Junction Temperature | T_J | | 125 | °C |
| Lead Temperature (soldering, 10s) | | | 260 | °C |
| Input Static Discharge Voltage Protection (MIL-STD 883E, Method 3015.7) | | | 2 | kV |



CAUTION: ELECTROSTATIC SENSITIVE DEVICE

Permanent damage resulting in a loss of functionality or performance may occur if this device is subjected to a high-energy electrostatic discharge.

Table 4: Operating Conditions

| PARAMETER | SYMBOL | CONDITIONS/DESCRIPTION | MIN. | TYP. | MAX. | UNITS |
|-------------------------------------|----------|------------------------|------|------|------|-------|
| Supply Voltage | V_{DD} | $3.3V \pm 10\%$ | 3.0 | 3.3 | 3.6 | V |
| Ambient Operating Temperature Range | T_A | | 0 | | 70 | °C |

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Table 5: DC Electrical Specifications

Unless otherwise stated, $V_{DD} = 3.3V \pm 10\%$, no load on any output, and ambient temperature range $T_A = 0^\circ C$ to $70^\circ C$. Parameters denoted with an asterisk (*) represent nominal characterization data and are not production tested to any specific limits. Where given, MIN and MAX characterization data are $\pm 3\sigma$ from typical. Negative currents indicate current flows out of the device.

| PARAMETER | SYMBOL | CONDITIONS/DESCRIPTION | MIN. | TYP. | MAX. | UNITS |
|--|---------------|---|------|------|------|----------|
| Overall | | | | | | |
| Supply Current, Dynamic, with Loaded Outputs | I_{DD} | $f_{XTAL} = 13.5MHz$; $C_L = 10pF$, $V_{DD} = 3.6V$ | | 30 | | mA |
| Crystal Oscillator | | | | | | |
| Crystal Loading Capacitance | $C_{L(xtal)}$ | As seen by a crystal connected to XIN and XOUT | | 18 | | pF |
| Clock Outputs (CLKA, CLKB) | | | | | | |
| Output Impedance * | Z_{OH} | $V_O = 0.1V_{DD}$; output driving high | | 45 | | Ω |
| | Z_{OL} | $V_O = 0.1V_{DD}$; output driving low | | 45 | | |
| Short Circuit Source Current * | I_{OSH} | $V_O = 0V$; shorted for 30s, max. | | -35 | | mA |
| Short Circuit Sink Current * | I_{OSL} | $V_O = 3.3V$; shorted for 30s, max. | | 35 | | mA |

Table 6: AC Timing Specifications

Unless otherwise stated, $V_{DD} = 3.3V \pm 10\%$, no load on any output, and ambient temperature range $T_A = 0^\circ C$ to $70^\circ C$. Parameters denoted with an asterisk (*) represent nominal characterization data and are not production tested to any specific limits. Where given, MIN and MAX characterization data are $\pm 3\sigma$ from typical.

| PARAMETER | SYMBOL | CONDITIONS/DESCRIPTION | MIN. | TYP. | MAX. | UNITS |
|---|-------------------|--|------|------|------|-------|
| Overall | | | | | | |
| Synthesis Error | | (unless otherwise noted in Frequency Table) | | | 0 | ppm |
| Clock Outputs (CLKA, CLKB, CLKC) | | | | | | |
| Duty Cycle * | | Ratio of high pulse width (as measured from rising edge to next falling edge at $V_{DD}/2$) to one clock period | 45 | | 55 | % |
| Jitter, Period (peak-peak) * | $t_{j(\Delta P)}$ | From rising edge to next rising edge at $V_{DD}/2$, $C_L = 10pF$ | | 300 | | ps |
| Rise Time * | t_r | $V_{DD} = 3.3V$; $V_O = 0.3V$ to $3.0V$; $C_L = 10pF$ | | 3 | | ns |
| Fall Time * | t_f | $V_{DD} = 3.3V$; $V_O = 3.0V$ to $0.3V$; $C_L = 10pF$ | | 2.5 | | ns |

FS6282

Dual PLL Clock Generator IC



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4.0 Package Information

Table 7: 8-pin SOIC (0.150") Package Dimensions

| | DIMENSIONS | | | |
|----------|------------|--------|-------------|-------|
| | INCHES | | MILLIMETERS | |
| | MIN. | MAX. | MIN. | MAX. |
| A | 0.061 | 0.068 | 1.55 | 1.73 |
| A1 | 0.004 | 0.0098 | 0.102 | 0.249 |
| A2 | 0.055 | 0.061 | 1.40 | 1.55 |
| B | 0.013 | 0.019 | 0.33 | 0.49 |
| C | 0.0075 | 0.0098 | 0.191 | 0.249 |
| D | 0.189 | 0.196 | 4.80 | 4.98 |
| E | 0.150 | 0.157 | 3.81 | 3.99 |
| e | 0.050 BSC | | 1.27 BSC | |
| H | 0.230 | 0.244 | 5.84 | 6.20 |
| h | 0.010 | 0.016 | 0.25 | 0.41 |
| L | 0.016 | 0.035 | 0.41 | 0.89 |
| Θ | 0° | 8° | 0° | 8° |

Table 8: 8-pin SOIC (0.150") Package Characteristics

| PARAMETER | SYMBOL | CONDITIONS/DESCRIPTION | TYP. | UNITS |
|--|---------------|-------------------------------|------|-------|
| Thermal Impedance, Junction to Free-Air 8-pin 0.150" SOIC | Θ_{JA} | Air flow = 0 m/s | 110 | °C/W |
| Lead Inductance, Self | L_{11} | Corner lead | 2.0 | nH |
| | | Center lead | 1.6 | |
| Lead Inductance, Mutual | L_{12} | Any lead to any adjacent lead | 0.4 | nH |
| Lead Capacitance, Bulk | C_{11} | Any lead to V_{SS} | 0.27 | pF |

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5.0 Ordering Information

| ORDERING CODE | DEVICE NUMBER | PACKAGE TYPE | OPERATING TEMPERATURE RANGE | SHIPPING CONFIGURATION |
|------------------|---------------|--|-----------------------------|------------------------|
| 11640-828 | FS6282-03 | 8-pin (0.150") SOIC (Small Outline Package) | 0° C to 70° C (Commercial) | Tape and Reel |
| 11640-838 | FS6282-03 | 8-pin (0.150") SOIC (Small Outline Package) | 0° C to 70° C (Commercial) | Tubes |

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