

Features

- World's first differential spread spectrum oscillator
- Extremely low cycle-cycle jitter
 - As low as 10 ps (typical)
- Wide frequency range
 - 1 MHz to 220 MHz
 - 220 MHz to 800 MHz (contact SiTime)
- Eight spread selections (31.5 KHz modulation rate)
 - Center Spread: $\pm 0.25\%$, $\pm 0.5\%$, $\pm 1.0\%$, $\pm 2.0\%$
 - Down Spread: -0.5% , -1.0% , -2.0% , -4.0%
 - For -0.25% and $\pm 0.125\%$ contact SiTime
- Low frequency stability (Spread = OFF)
 - ± 25 ppm or ± 50 ppm
- Operating voltage
 - 1.8V or 2.5 or 3.3 V
- Operating temperature range:
 - Industrial, -40°C to 85°C
 - Extended Commercial, -20°C to 70°C
- Small footprint
 - $5.0 \times 3.2 \times 0.75$ mm
 - $7.0 \times 5.0 \times 0.90$ mm
- Pb-free and RoHS compliant
- Ultra-reliable start up and greater immunity from interference

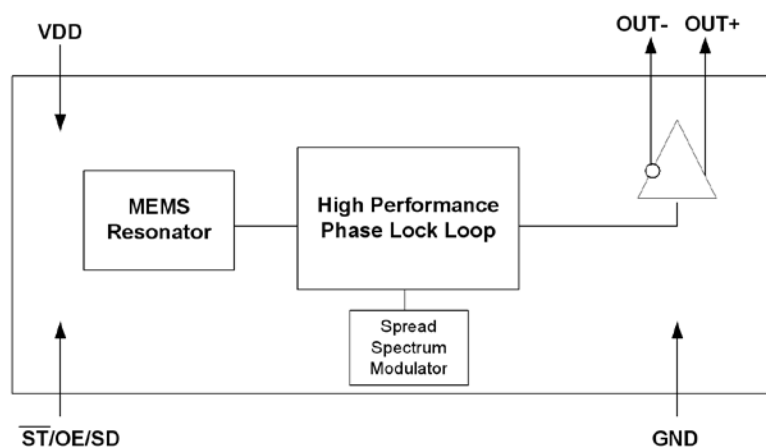
Benefits

- Services most PC peripherals, networking, and consumer applications
- Provides wide range of spread percentage for maximum electromagnetic interference (EMI) reduction
- Up to -17 dB reduction on third harmonic and -12dB on the fundamental
- Fast time to market due to not needing to redesign the PCB for EMI reduction
- Factory programmable for ultra-fast lead time
- No crystal or load capacitors required
- Eliminates crystal qualification time
- 50%+ board saving space
- Completely quartz-free

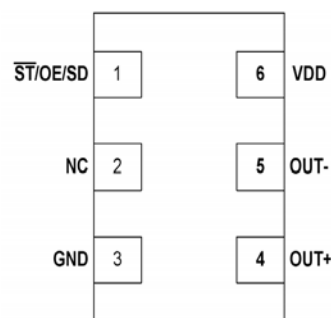
Applications

- PCI-Express
- USB 3.0
- Fully Buffered DIMM
- Blade Server
- Router
- System Clock
- Networking and Computing
- Automotive
- Industrial

Block Diagram



Pinout



Pin Description

| Pin No. | Name | | Pin Description |
|---------|----------|--------|---|
| 1 | ST/OE/SD | Input | Standby or Output Enable pin for OUT+ and OUT-. OE: When High or Open : OUT+ and OUT- = active When Low : OUT+ and OUT- = High Impedance state ST: When High or Open : OUT+ and OUT- = active When Low : OUT+ and OUT- = Output is low (weak pull down), oscillation stops SD: Spread Disable - disables spread spectrum When High or Open : Spread Spectrum modulation = active When Low : Spread Spectrum modulation = Off |
| 2 | NC | NA | No connect pin, leave it floating. |
| 3 | GND | Power | VDD power supply ground. Connect to ground |
| 4 | OUT+ | Output | 1 to 220 MHz programmable clock output. For frequencies > 220 MHz contact SiTime |
| 5 | OUT- | Output | |
| 6 | VDD | Power | Power supply |

Absolute Maximum Ratings

Attempted operation outside the absolute maximum ratings of the part may cause permanent damage to the part. Actual performance of the IC is only guaranteed within the operational specifications, not absolute maximum ratings.

Absolute Maximum Table

| Parameter | Min. | Max. | Unit |
|--|-----------|-----------|-------|
| Storage Temperature | -65 | 150 | °C |
| VDD | -0.5 | 4 | V |
| Vin | GND - 0.5 | VDD + 0.5 | V |
| Theta JA (with copper plane on VDD and GND) 5.0 x 3.2 package | — | 68 | °C/W |
| 7.0 x 5.0 package when center pad is soldered down | — | 38 | °C/W |
| 7.0 x 5.0 package when center pad is not soldered down | — | 90 | °C/W |
| Theta JC (with PCB traces of 0.010 inch to all pins) 5.0 x 3.2 package | — | 45 | °C/W |
| 7.0 x 5.0 package when center pad is soldered down | — | 35 | °C/W |
| 7.0 x 5.0 package when center pad is not soldered down | — | 48 | °C/W |
| Soldering Temperature (follow standard Pb free soldering guidelines) | — | 260 | °C |
| Number of Program Writes | — | 1 | NA |
| Program Retention over -40 to 125C, Process, VDD (0 to 3.6V) | — | 1,000+ | years |
| Human Body Model (JESD22-A114) | 2000 | — | V |
| Charged Device Model (JESD22-C101) | 750 | — | — |
| Machine Model (JESD22-A115) | 200 | — | — |

DC Electrical Specifications

Environmental Compliance

| Parameter | Condition/Test Method |
|----------------------------|---|
| Mechanical Shock | MIL-STD-883F, Method 2002 |
| Mechanical Vibration | MIL-STD-883F, Method 2007 |
| Temperature Cycle | MIL-STD-883F, Method 1010-65-150°C (1000 cycle) |
| Solderability | MIL-STD-883F, Method 2003 |
| Moisture Sensitivity Level | MSL1 @ 260°C |

LVCMOS input, OE or \overline{ST} pin, $3.3V \pm 10\%$ or $2.5V \pm 10\%$ or $1.8V \pm 5\%$, -40 to 85°C

| Symbol | Parameter | Condition | Min. | Typ. | Max. | Unit |
|----------|--------------------|---|------|------|------|------|
| V_{IH} | Input High Voltage | | 70 | – | – | %Vdd |
| V_{IL} | Input Low Voltage | | – | – | 30 | %Vdd |
| I_{IH} | Input High Current | OE or ST or SD pin | – | – | 10 | uA |
| I_{IL} | Input Low Current | OE or ST or SD pin | -10 | – | – | uA |
| T_{pu} | Power Up Time | Time from minimum power supply voltage to the first cycle (Guaranteed no runt pulses) | – | – | 10 | ms |

LVPECL, $3.3V \pm 10\%$ or $2.5V \pm 10\%$, -40 to 85°C

| Symbol | Parameter | Condition | Min. | Typ. | Max. | Unit |
|-------------|----------------------------|---|--------------|------|--------------|------|
| V_{DD} | Supply Voltage | | 2.97 | 3.3 | 3.63 | V |
| | | | 2.25 | 2.5 | 2.75 | V |
| I_{DD} | Supply Current | $V_{DD} = 3.3$, Excluding Load Termination Current | – | 75 | 84 | mA |
| | | $V_{DD} = 2.5$, Excluding Load Termination Current | – | 75 | 84 | mA |
| V_{OH} | Output High Voltage | 50 Ohm termination to $V_{DD} - 2.0V$ | $V_{DD}-1.1$ | – | $V_{DD}-0.7$ | V |
| V_{OL} | Output Low Voltage | See Figure 2,3. | $V_{DD}-2.0$ | – | $V_{DD}-1.4$ | V |
| V_{swing} | Pk-Pk Output Voltage Swing | | 600 | 800 | 1000 | mV |

HCSL, $3.3V \pm 10\%$ or $2.5V \pm 10\%$, -40 to 85°C

| Symbol | Parameter | Condition | Min. | Typ. | Max. | Unit |
|-------------|----------------------------|---|------|------|------|------|
| V_{DD} | Supply Voltage | | 2.97 | 3.3 | 3.63 | V |
| | | | 2.25 | 2.5 | 2.75 | V |
| I_{DD} | Supply Current | $V_{DD} = 3.3$, Excluding Load Termination Current | – | 73 | 80 | mA |
| | | $V_{DD} = 2.5$, Excluding Load Termination Current | – | 73 | 80 | mA |
| V_{OH} | Output High Voltage | 50 Ohm termination to GND | 0.6 | 0.75 | 0.95 | V |
| V_{OL} | Output Low Voltage | See Figure 4. | 0.0 | – | 50 | mV |
| V_{swing} | Pk-Pk Output Voltage Swing | | 600 | 750 | 950 | mV |

LVDS, $3.3V \pm 10\%$ or $2.5V \pm 10\%$, -40 to 85°C

| Symbol | Parameter | Condition | Min. | Typ. | Max. | Unit |
|------------------|-----------------------------|---|------|------|------|------|
| V_{DD} | Supply Voltage | | 2.97 | 3.3 | 3.63 | V |
| | | | 2.25 | 2.5 | 2.75 | V |
| I_{DD} | Supply Current | $V_{DD} = 3.3$, Excluding Load Termination Current | – | 75 | 85 | mA |
| | | $V_{DD} = 2.5$, Excluding Load Termination Current | – | 70 | 77 | mA |
| V_{OD1} | Differential Output Voltage | Swing Mode = Normal | 250 | 350 | 450 | mV |
| ΔV_{OD1} | V_{OD} Magnitude Change | Single load termination. See Figure 5. | – | – | 50 | mV |
| V_{OS1} | Offset Voltage | | – | 1.2 | – | V |
| ΔV_{OS1} | V_{OS} Magnitude Change | | – | – | 50 | mV |
| V_{OD2} | Differential Output Voltage | Swing Mode = High | 500 | 700 | 900 | mV |
| ΔV_{OD2} | V_{OD} Magnitude Change | Single load termination. See Figure 5. | – | – | 50 | mV |
| V_{OS2} | Offset Voltage | | – | 1.2 | – | V |
| ΔV_{OS2} | V_{OS} Magnitude Change | | – | – | 50 | mV |
| V_{OD3} | Differential Output Voltage | Swing Mode = High | 250 | 350 | 450 | mV |
| ΔV_{OD3} | V_{OD} Magnitude Change | Double load termination. See Figure 6. | – | – | 50 | mV |
| V_{OS3} | Offset Voltage | | – | 1.2 | – | V |
| ΔV_{OS3} | V_{OS} Magnitude Change | | – | – | 50 | mV |

CML, 3.3V \pm 10% or 2.5V \pm 10% or 1.8V \pm 5%, -40 to 85°C

| Symbol | Parameter | Condition | Min. | Typ. | Max. | Unit |
|---------------------|----------------------------|---|-----------------------|------------------------|----------------------|------|
| V _{DD} | Supply Voltage | | 2.97 | 3.3 | 3.63 | V |
| | | | 2.25 | 2.5 | 2.75 | V |
| | | | 1.71 | 1.8 | 1.89 | V |
| I _{DD} | Supply Current | V _{DD} = 3.3V | – | 48 | 51 | mA |
| | | V _{DD} = 2.5V | | | | |
| | | V _{DD} = 1.8V | | | | |
| | | Excluding Load Termination Current | | | | |
| V _{OH1} | Output High Voltage | Swing Mode = Normal Single Load Termination See Figure 7. | V _{DD} -0.1 | – | V _{DD} | V |
| V _{OL1} | Output Low Voltage | | V _{DD} -0.55 | V _{DD} -0.425 | V _{DD} -0.3 | V |
| V _{swing1} | Pk-Pk Output Voltage Swing | | 300 | 425 | 550 | mV |
| V _{OH2} | Output High Voltage | Swing Mode = High Single Load Termination See Figure 7. | V _{DD} -0.1 | – | V _{DD} | V |
| V _{OL2} | Output Low Voltage | | V _{DD} -1.1 | V _{DD} -0.85 | V _{DD} -0.6 | V |
| V _{swing2} | Pk-Pk Output Voltage Swing | | 600 | 850 | 1100 | mV |
| V _{OH3} | Output High Voltage | Swing Mode = High Double Load Termination See Figure 8. | V _{DD} -0.1 | – | V _{DD} | V |
| V _{OL3} | Output Low Voltage | | V _{DD} -0.55 | V _{DD} -0.425 | V _{DD} -0.3 | V |
| V _{swing3} | Pk-Pk Output Voltage Swing | | 300 | 425 | 550 | mV |

AC Electrical SpecificationsLVPECL, 3.3V \pm 10%, -40 to 85°C

| Symbol | Parameter | Condition | Min. | Typ. | Max. | Unit |
|--------------------------------|-----------------------|---|------|------|------|------|
| F _{out} | Output Frequency | | 1.0 | – | 220 | MHz |
| F _{stab} | Frequency Stability | Inclusive of initial stability, operating temp., rated power supply voltage change, load change | | | | |
| | | -20 to 70°C | -25 | – | +25 | ppm |
| | | -40 to 85°C | -50 | – | +50 | ppm |
| F _{age} | Aging | First year @ 25°C | – | – | 1 | PPM |
| DC | Duty Cycle | | 45 | – | 55 | % |
| t _R /t _F | Output Rise/Fall Time | 20% to 80% | 100 | 150 | 300 | ps |
| T _{CCJ} | Cycle-Cycle Jitter | F _{out} = 100 MHz, -0.5% down spread | – | 10 | 16 | ps |
| | | F _{out} = 150 MHz, -0.5% down spread | – | 8 | 14 | ps |
| | | F _{out} = 200 MHz, -0.5% down spread | – | 8 | 14 | ps |

LVPECL, 2.5V \pm 10%, -40 to 85°C

| Symbol | Parameter | Condition | Min. | Typ. | Max. | Unit |
|--------------------------------|-----------------------|---|------|------|------|------|
| F _{out} | Output Frequency | | 1.0 | – | 220 | MHz |
| F _{stab} | Frequency Stability | Inclusive of initial stability, operating temp., rated power supply voltage change, load change | | | | |
| | | -20 to 70°C | -25 | – | +25 | ppm |
| | | -40 to 85°C | -50 | – | +50 | ppm |
| F _{age} | Aging | First year @ 25°C | – | – | 1 | PPM |
| DC | Duty Cycle | | 45 | – | 55 | % |
| t _R /t _F | Output Rise/Fall Time | 20% to 80% | 100 | 150 | 300 | ps |
| T _{CCJ} | Cycle-Cycle Jitter | F _{out} = 100 MHz, -0.5% down spread | – | 10 | 16 | ps |
| | | F _{out} = 150 MHz, -0.5% down spread | – | 8 | 14 | ps |
| | | F _{out} = 200 MHz, -0.5% down spread | – | 8 | 14 | ps |

HCSL, 3.3V \pm 10%, -40 to 85°C

| Symbol | Parameter | Condition | | Min. | Typ. | Max. | Unit |
|--------------------------------|-----------------------|---|-------------|------|------|------|------|
| F _{out} | Output Frequency | | | 1.0 | — | 220 | MHz |
| F _{stab} | Frequency Stability | Inclusive of initial stability, operating temp., rated power supply voltage change, load change | -20 to 70°C | -25 | — | +25 | ppm |
| | | | -40 to 85°C | -50 | — | +50 | ppm |
| F _{age} | Aging | First year @ 25°C | | — | — | 1 | PPM |
| DC | Duty Cycle | | | 45 | — | 55 | % |
| t _R /t _F | Output Rise/Fall Time | 20% to 80% | | 200 | 280 | 375 | ps |
| T _{CCJ} | Cycle-Cycle Jitter | F _{out} = 100 MHz, -0.5% down spread | | — | 10 | 16 | ps |
| | | F _{out} = 150 MHz, -0.5% down spread | | — | 10 | 15 | ps |
| | | F _{out} = 200 MHz, -0.5% down spread | | — | 10 | 15 | ps |

HCSL, 2.5V \pm 10%, -40 to 85°C

| Symbol | Parameter | Condition | | Min. | Typ. | Max. | Unit |
|--------------------------------|-----------------------|---|-------------|------|------|------|------|
| F _{out} | Output Frequency | | | 1.0 | – | 220 | MHz |
| F _{stab} | Frequency Stability | Inclusive of initial stability, operating temp., rated power supply voltage change, load change | -20 to 70°C | -25 | – | +25 | ppm |
| | | | -40 to 85°C | -50 | – | +50 | ppm |
| F _{age} | Aging | First year @ 25°C | | – | – | 1 | PPM |
| DC | Duty Cycle | | | 45 | – | 55 | % |
| t _R /t _F | Output Rise/Fall Time | 20% to 80% | | 200 | 300 | 400 | ps |
| T _{CCJ} | Cycle-Cycle Jitter | F _{out} = 100 MHz, -0.5% down spread | | – | 9 | 19 | ps |
| | | F _{out} = 150 MHz, -0.5% down spread | | – | 9 | 17 | ps |
| | | F _{out} = 200 MHz, -0.5% down spread | | – | 9 | 15 | ps |

LVDS, 3.3V \pm 10%, -40 to 85°C

| Symbol | Parameter | Condition | | Min. | Typ. | Max. | Unit |
|--------------------------------|-----------------------|---|-------------|------|------|------|------|
| F _{out} | Output Frequency | | | 1.0 | – | 220 | MHz |
| F _{stab} | Frequency Stability | Inclusive of initial stability, operating temp., rated power supply voltage change, load change | -20 to 70°C | -25 | – | +25 | ppm |
| | | | -40 to 85°C | -50 | – | +50 | ppm |
| F _{age} | Aging | First year @ 25°C | | – | – | 1 | PPM |
| DC | Duty Cycle | | | 45 | – | 55 | % |
| t _R /t _F | Output Rise/Fall Time | 20% to 80% | | 100 | 200 | 325 | ps |
| T _{CCJ} | Cycle-Cycle Jitter | F _{out} = 100 MHz, -0.5% down spread | | – | 11 | 19 | ps |
| | | F _{out} = 150 MHz, -0.5% down spread | | – | 11 | 20 | ps |
| | | F _{out} = 200 MHz, -0.5% down spread | | – | 11 | 21 | ps |

LVDS, 2.5V \pm 10%, -40 to 85°C

| Symbol | Parameter | Condition | | Min. | Typ. | Max. | Unit |
|--------------------------------|-----------------------|---|-------------|------|------|------|------|
| F _{out} | Output Frequency | | | 1.0 | — | 220 | MHz |
| F _{stab} | Frequency Stability | Inclusive of initial stability, operating temp., rated power supply voltage change, load change | -20 to 70°C | -25 | — | +25 | ppm |
| | | | -40 to 85°C | -50 | — | +50 | ppm |
| F _{age} | Aging | First year @ 25°C | | — | — | 1 | PPM |
| DC | Duty Cycle | | | 45 | — | 55 | % |
| t _R /t _F | Output Rise/Fall Time | 20% to 80% | | 100 | 260 | 325 | ps |
| T _{CCJ} | Cycle-Cycle Jitter | F _{out} = 100 MHz, -0.5% down spread | | — | 14 | 26 | ps |
| | | F _{out} = 150 MHz, -0.5% down spread | | — | 14 | 26 | ps |
| | | F _{out} = 200 MHz, -0.5% down spread | | — | 14 | 27 | ps |

CML, 3.3V \pm 10%, -40 to 85°C

| Symbol | Parameter | Condition | | Min. | Typ. | Max. | Unit |
|--------------------------------|-----------------------|---|-------------|------|------|------|------|
| F _{out} | Output Frequency | | | 1.0 | – | 220 | MHz |
| F _{stab} | Frequency Stability | Inclusive of initial stability, operating temp., rated power supply voltage change, load change | -20 to 70°C | -25 | – | +25 | ppm |
| | | | -40 to 85°C | -50 | – | +50 | ppm |
| F _{age} | Aging | First year @ 25°C | | – | – | 1 | PPM |
| DC | Duty Cycle | | | 45 | – | 55 | % |
| t _R /t _F | Output Rise/Fall Time | 20% to 80% | | 150 | 220 | 300 | ps |
| T _{CCJ} | Cycle-Cycle Jitter | F _{out} = 100 MHz, -0.5% down spread | | – | 11 | 20 | ps |
| | | F _{out} = 150 MHz, -0.5% down spread | | – | 11 | 18 | ps |
| | | F _{out} = 200 MHz, -0.5% down spread | | – | 10 | 19 | ps |

CML, 2.5V \pm 10%, -40 to 85°C

| Symbol | Parameter | Condition | | Min. | Typ. | Max. | Unit |
|--------------------------------|-----------------------|---|-------------|------|------|------|------|
| F _{out} | Output Frequency | | | 1.0 | – | 220 | MHz |
| F _{stab} | Frequency Stability | Inclusive of initial stability, operating temp., rated power supply voltage change, load change | -20 to 70°C | -25 | – | +25 | ppm |
| | | | -40 to 85°C | -50 | – | +50 | ppm |
| F _{age} | Aging | First year @ 25°C | | – | – | 1 | PPM |
| DC | Duty Cycle | | | 45 | – | 55 | % |
| t _R /t _F | Output Rise/Fall Time | 20% to 80% | | 150 | 230 | 300 | ps |
| T _{CCJ} | Cycle-Cycle Jitter | F _{out} = 100 MHz, -0.5% down spread | | – | 13 | 22 | ps |
| | | F _{out} = 150 MHz, -0.5% down spread | | – | 12 | 19 | ps |
| | | F _{out} = 200 MHz, -0.5% down spread | | – | 11 | 20 | ps |

| Symbol | Parameter | Condition | Min. | Typ. | Max. | Unit | |
|--------------------------------|-----------------------|---|-------------|------|------|------|-----|
| F _{out} | Output Frequency | | 1.0 | – | 220 | MHz | |
| F _{stab} | Frequency Stability | Inclusive of initial stability, operating temp., rated power supply voltage change, load change | -20 to 70°C | -25 | – | +25 | ppm |
| | | | -40 to 85°C | -50 | – | +50 | ppm |
| F _{age} | Aging | First year @ 25°C | – | – | 1 | PPM | |
| DC | Duty Cycle | | 45 | – | 55 | % | |
| t _R /t _F | Output Rise/Fall Time | 20% to 80% | 150 | 230 | 300 | ps | |
| T _{CCJ} | Cycle-Cycle Jitter | F _{out} = 100 MHz, -0.5% down spread | – | 13 | 23 | ps | |
| | | F _{out} = 150 MHz, -0.5% down spread | – | 12 | 22 | ps | |
| | | F _{out} = 200 MHz, -0.5% down spread | – | 12 | 21 | ps | |

SiT9002, LVPECL-0

Drive Device

OUT+

OUT-

R1

R1

Z0 = 50 Ohm

100 nF

100 nF

50 Ohm

50 Ohm

Receiver Device

D+

D-

VTT = Any External Voltage

| |
|--------------|
| VDD = 3.3V |
| R1 = 150 Ohm |
| VDD = 2.5V |
| R1 = 120 Ohm |

The diagram illustrates the SiT9002, LVPECL-1 driver and receiver interface. On the left, the **Drive Device** contains two output pins, **OUT+** and **OUT-**. Each output is connected to a 50Ω transmission line (represented by a cylinder labeled $Z_0 = 50\Omega$). These lines connect to the **D+** and **D-** inputs of the **Receiver Device** (represented by triangles). A 50Ω resistor is connected between the **D+** and **D-** inputs. The bottom terminal of this resistor is connected to ground, which is labeled $V_{TT} = V_{DD} - 2.0\text{ V}$.

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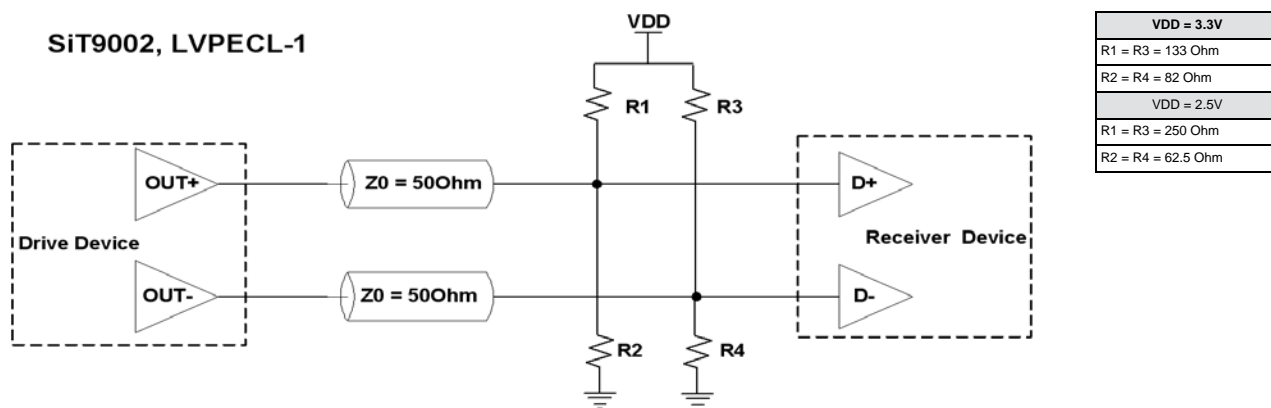


Figure 3. LVPECL DC Coupled Typical Termination without Termination Voltage

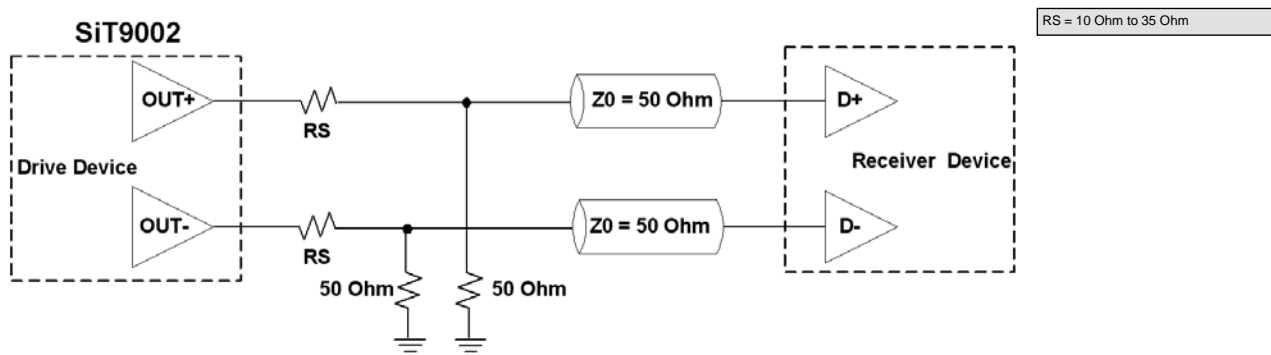


Figure 4. HCSL Typical Termination

Note:

1. All the tests are done with RS = 20 Ohm (recommended).

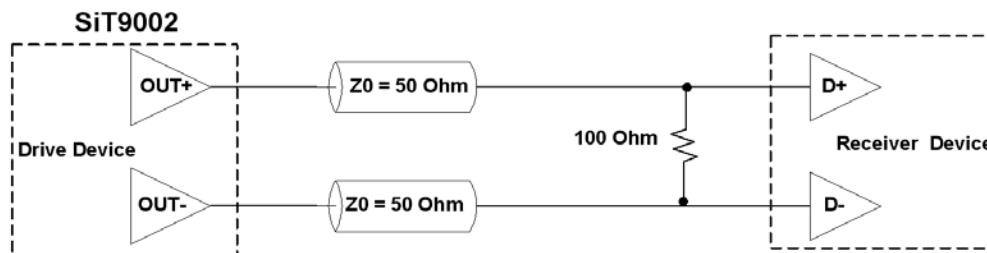
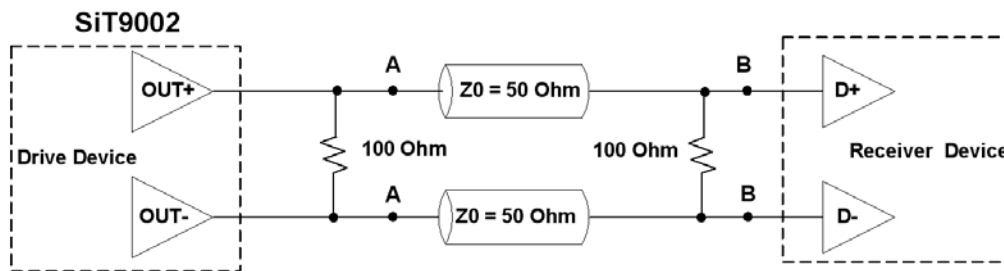


Figure 5. LVDS Single Load Termination (Load Terminated)



Note: For AC coupled operation, include/insert decoupling caps at points **A** or **B**

Figure 6. LVDS Double Termination (Source + Load Terminated)

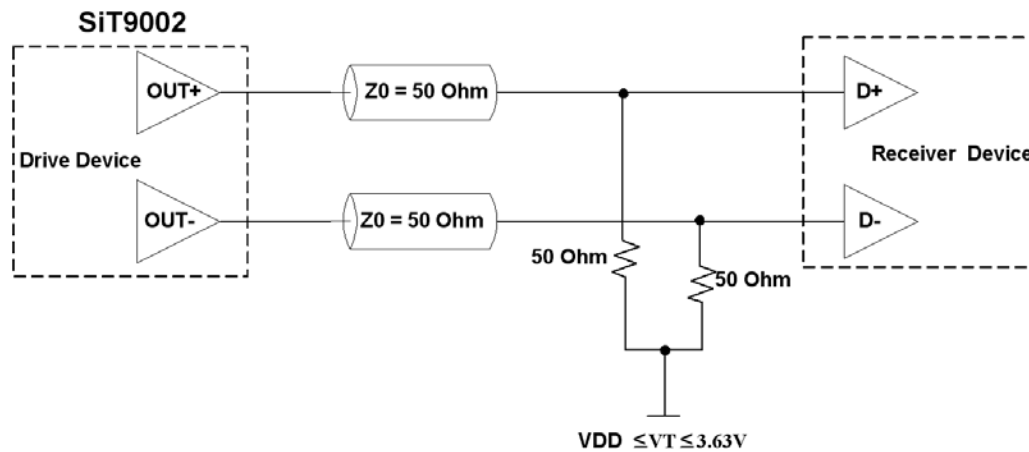
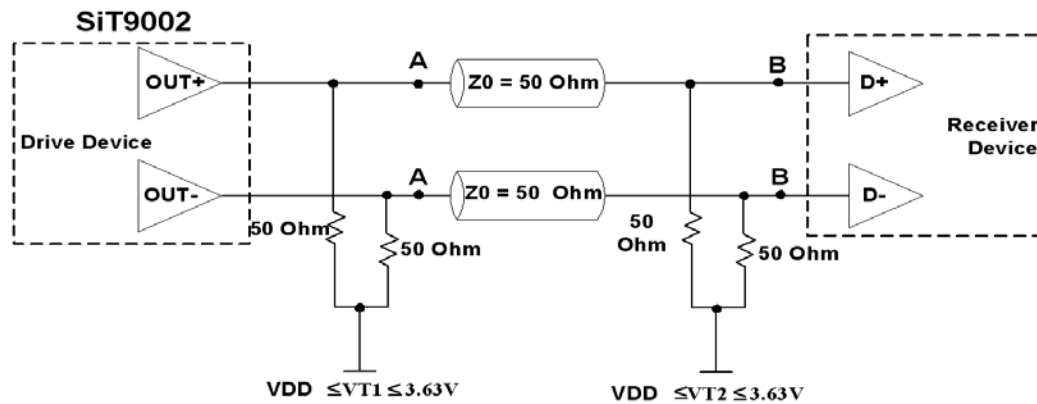


Figure 7. CML Single Load Termination



Notes:

1. For DC-coupled operation, $VT1 = VT2$
2. For AC coupled operation, include/insert decoupling caps at points A or B
3. For AC-coupled operation with capacitors placed at point A, $VT2$ sets the input common mode of Receiver Device and need not to be related to $VT1$

Figure 8. CML Double Load Termination

Ordering Information

The Part No. Guide is for reference only. For real-time customization and exact part number, use the SiTime [Part Number Generator](#).

SiT9002AC -132N33EB123.12345T

Part Family

"SiT9002"

Revision Letter

"A" is the revision of Silicon

Temperature Range

"C" Extended Commercial, -20 to 70°C

"I" Industrial, -40 to 85°C

Signalling Type

"0" = LVPECL-0, (Figure 1)

"1" = LVPECL-1, (Figure 2,3)

"2" = LVDS

"3" = CML

"4" = HCSL

Package Size

"3" 5.0 x 3.2 mm

"4" 7.0 x 5.0 mm

"8" 7.0 x 5.0 mm^[1]

Frequency Stability

"2" for ±25 PPM

"3" for ±50 PPM

Packaging

"T" for Tape & Reel (3Ku Reel)

"Y" for Tape & Reel (1Ku Reel)

Blank for Bulk

Frequency

1.00000 to 220.00000 MHz

Spread Percentage

Center: "B" = ±0.25, "D" = ±0.50

"G" = ±1.0, "K" = ±2.0

Down: "O" = -0.50, "Q" = -1.0,

"T" = -2.0, "X" = -4.0

Feature Pin

"E" for Output Enable

"S" for Standby

"D" for Spread Disable

Voltage Supply

"18" for 1.8 V ±5% (CML only)

"25" for 2.5 V ±10%

"33" for 3.3 V ±10%

Swing Select

"N" = Normal

"H" = High (LVDS & CML only)

Frequency Stability vs. Temperature Range Options

| Frequency Stability (PPM) | Temperature Range | Supply Voltage | | |
|---------------------------|-------------------|----------------|-------|-------|
| | | 1.8 V | 2.5 V | 3.3 V |
| ±25 | C (-20 to +70°C) | ✓ | ✓ | ✓ |
| | I (-40 to +85°C) | ✓ | ✓ | ✓ |
| ±50 | C (-20 to +70°C) | ✓ | ✓ | ✓ |
| | I (-40 to +85°C) | ✓ | ✓ | ✓ |

Signaling Type vs. Swing Select Options

| Signaling Type | Swing Select | Supply Voltage | | |
|----------------|--------------|----------------|-------|-------|
| | | 1.8 V | 2.5 V | 3.3 V |
| LVPECL-0 | Normal | – | ✓ | ✓ |
| | High | – | – | – |
| LVPECL-1 | Normal | – | ✓ | ✓ |
| | High | – | – | – |
| LVDS | Normal | – | ✓ | ✓ |
| | High | – | ✓ | ✓ |
| CML | Normal | ✓ | ✓ | ✓ |
| | High | ✓ | ✓ | ✓ |
| HCSL | Normal | – | ✓ | ✓ |
| | High | – | – | – |

Note:

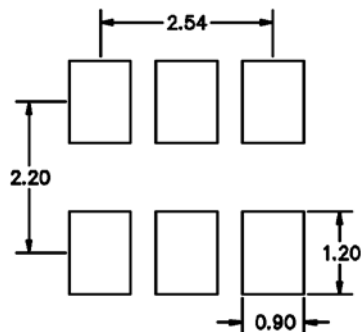
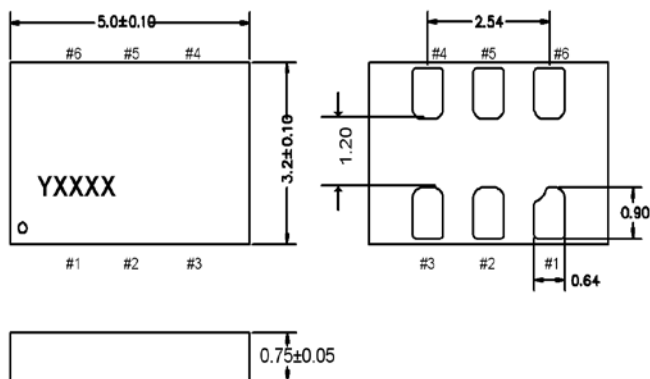
1. Without Center Pad.

Package Information [2]

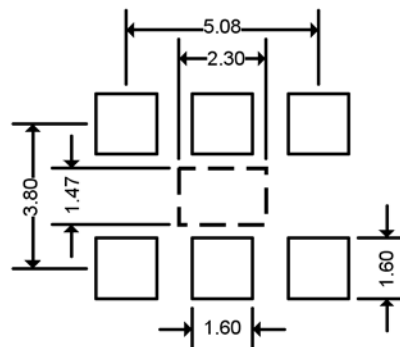
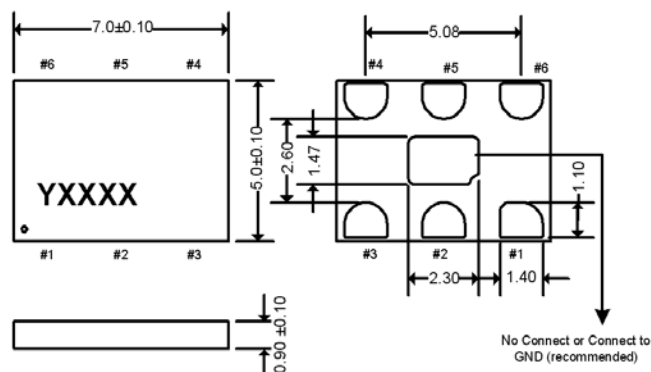
Dimension (mm)

Land Pattern^[3] (recommended) (mm)

5.0 x 3.2 x 0.75mm



7.0 x 5.0 x 0.90mm



Notes:

- Y denotes manufacturing origin and XXXX denotes manufacturing lot number. The value of "Y" will depend on the assembly location of the device.
- A capacitor of value 0.1μF between VDD and GND is recommended.
- The 7050 package with part number designation "-8" has NO center pad.

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