

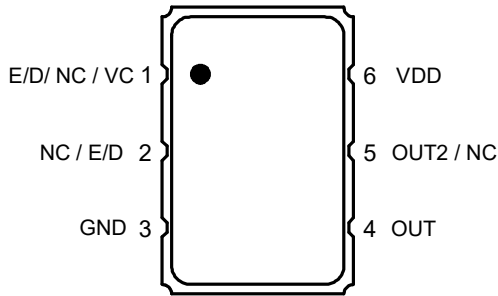
## Description

The SWPQ201 devices are low phase noise quartz-based PLL oscillators supporting a large range of frequencies and output interface types. These devices are designed to operate at three different power supplies and are available in multiple package sizes as well as temperature grades.

With a patented one-time program (OTP) allowing for infinite memory shelf life, the SWPQ201 devices can be programmed to generate an output frequency from 10MHz to 1500MHz with a resolution as low as 1Hz accuracy. The configuration capability of this family of devices allows for fast delivery times for both sample and large production orders.

## Pin Assignments

**Note:** To minimize power supply line noise, a 0.01µF bypass capacitor should be placed between V<sub>DD</sub> (Pin 6) and GND (Pin 3).



**Table 1. Pin Description**

Pin #	Name	Description
1	E/D NC VC	Enable/Disable <sup>[a][b]</sup> No connect VCXO
2	NC E/D	No connect Enable/Disable <sup>[a][b]</sup>
3	GND	Connect to ground
4	OUT	Output
5	OUT2 NC	Complementary output No connect
6	V <sub>DD</sub>	Supply voltage

[a] Pulled high internally = output enabled.

[b] Low = output disabled.

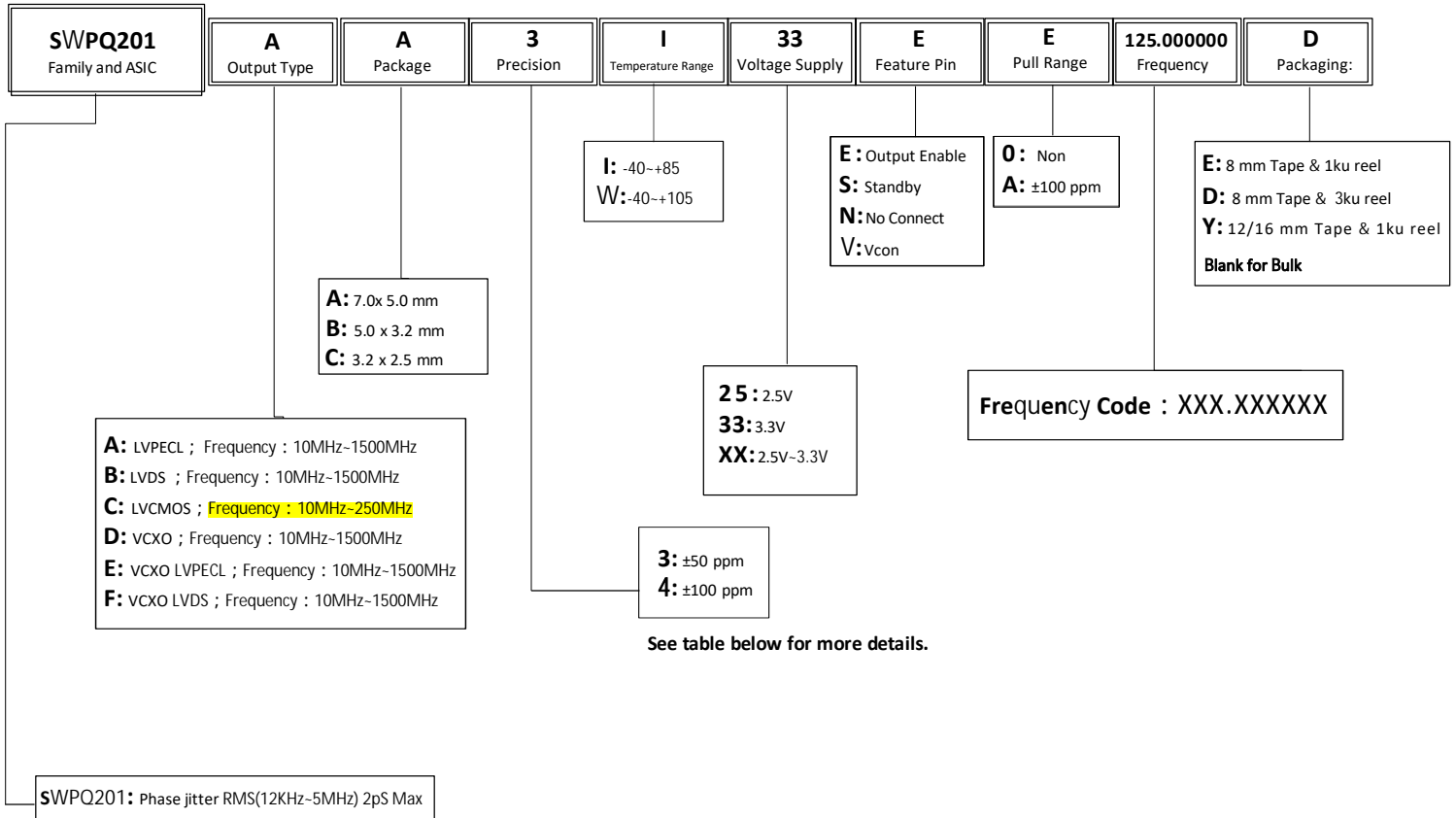
See [Ordering Information](#) for more details.

## Features

- Frequency range: 10MHz to 1500MHz<sup>[1]</sup>
- Output types: LVDS, LVPECL, LVCMOS, VCXO  
VCXO LVPECL, VCXO LVDS
- Supply voltage options: 2.5V, or 3.3V
- Phase jitter (12kHz to 5MHz): 2.0pS Max
- Package options:
  - 3.2 × 2.5 × 1.2 mm
  - 5.0 × 3.2 × 1.3 mm
  - 7.0 × 5.0 × 1.6mm
- Frequency stability options: ±50, or ±100 ppm
- Operating temperature: -40°C to +85°C
- Frequency stability options: ±100 ppm
- Operating temperature: -40°C to +105°C

[1] There is a dead zone between 1037.5MHz to 1500MHz.  
Contact [support](#) for frequencies above 1500MHz.

## Ordering Information



**Table 2. Frequency Stability and Operating Temperature Decoder**

"Precision" and "Temperature Range" Codes	Operating Temperature	Frequency Stability		
		Minimum	Maximum	Units
"3" and "V"	-40°C to +85°C	-50	+50	ppm
"4" and "V"	-40°C to +85°C	-100	+100	ppm
"3" and "W"	-40° to +105°C	-50	+50	ppm
"4" and "W"	-40° to +105°C	-100	+100	ppm

## Absolute Maximum Ratings

Stresses above the ratings listed below can cause permanent damage to the device. The ratings, which are standard values for Starwave commercially rated parts, are stress ratings only. Functional operation of the device at these or any other conditions above those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods can affect product reliability. Electrical parameters are guaranteed only over the recommended operating temperature range.

**Table 3. Absolute Maximum Ratings**

Item	Rating			
V <sub>DD</sub>	-0.5 to +5.0V			
E/D	-0.5V to V <sub>DD</sub> + 0.5V			
OUT	-0.5V to V <sub>DD</sub> + 0.5V			
Storage Temperature	-55°C to 125°C			
Maximum Junction Temperature	105°C			
Core Current	30mA maximum( LVCMOS 10MHz-200MHz )			
Theta J <sub>A</sub>	JU6	75.9 °C/W	JS6	89.6 °C/W
Theta J <sub>B</sub>		48.6 °C/W		54.3 °C/W

## ESD Compliance

**Table 4. ESD Compliance**

Human Body Model (HBM)	1000V
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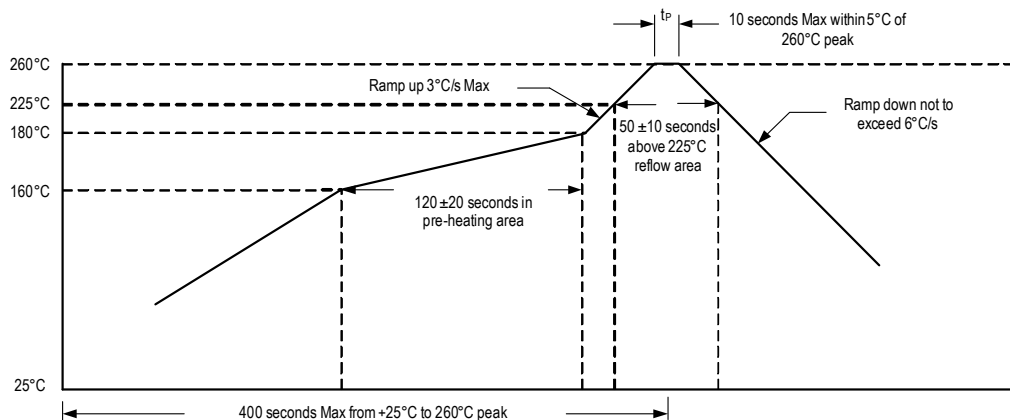
## Mechanical Testing

**Table 5. Mechanical Testing \***

Parameter	Test Method
Mechanical Shock	Half-sine wave with 0.3ms 3000G. X, Y, Z each direction 1 time.
Mechanical Vibration	Frequency: 10 – 55MHz amplitude: 1.5mm. Frequency: 55 – 2000Hz peak value: 20G. Duration time: 4H for each X,Y,Z axis; total 12hours.
High Temp Operating Life (HTOL)	2000 hours at 125°C (under power).
Hermetic Seal	Gross leak (air leak test). Fine leak (Helium leak test) He-pressure: 6kgf/cm <sup>2</sup> 2 hours.

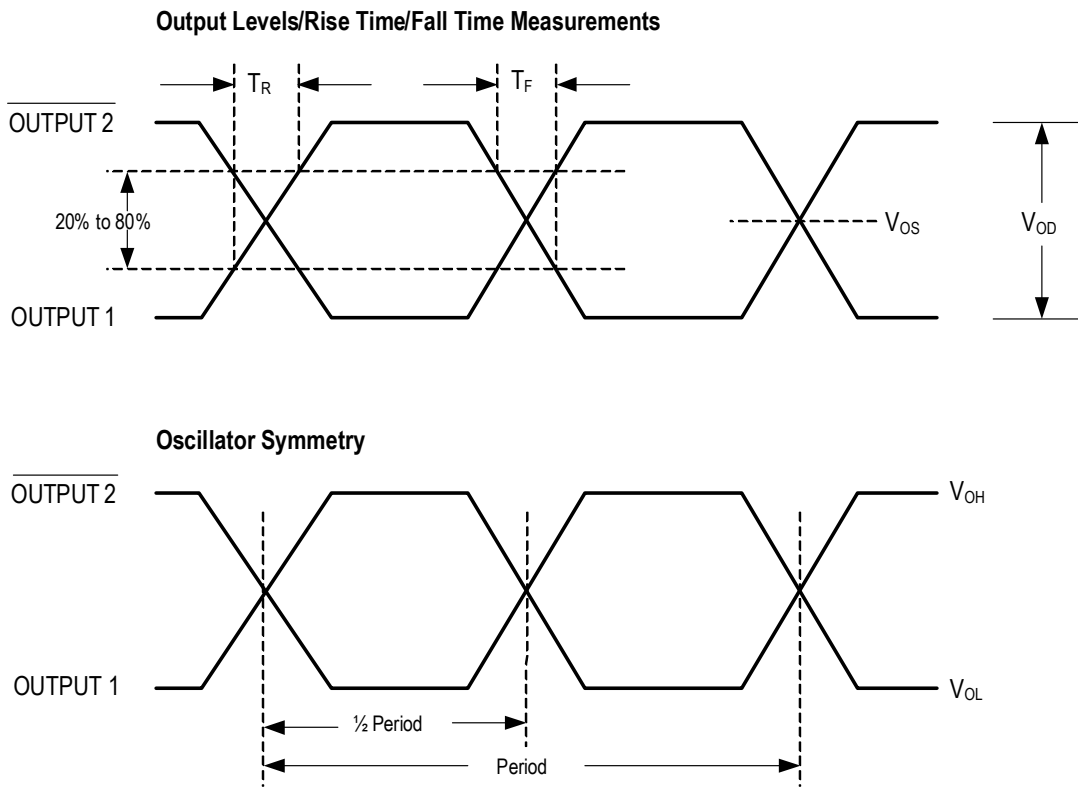
\* MSL level does not apply.

## Solder Reflow Profile

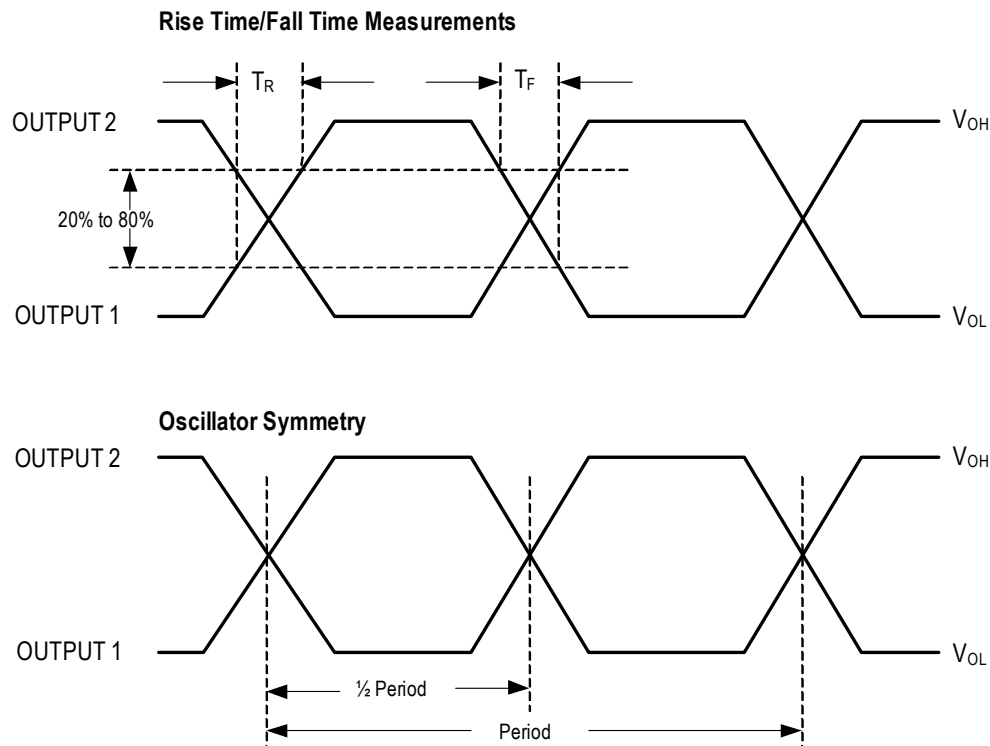


## Output Waveforms

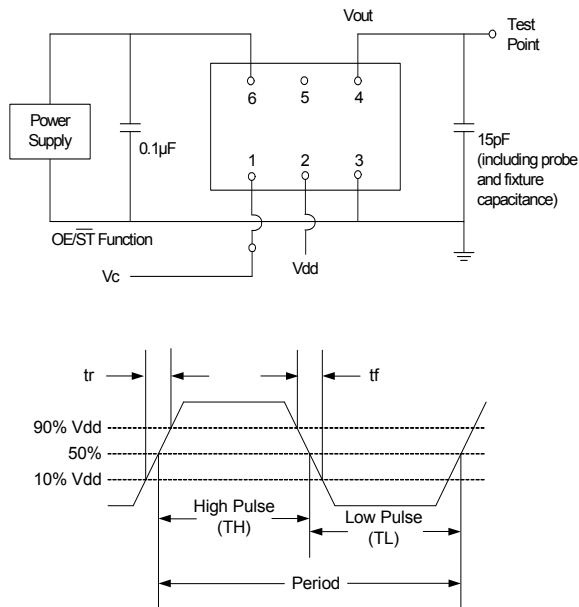
**Figure 1. LVDS Output Waveforms**



**Figure 2. LVPECL Output Waveforms**



**Figure 3. VCXO Output Waveforms**



**Note:** Duty Cycle is computed as Duty Cycle = TH/Period.

**Figure 4. LVCMOS Output Waveforms**

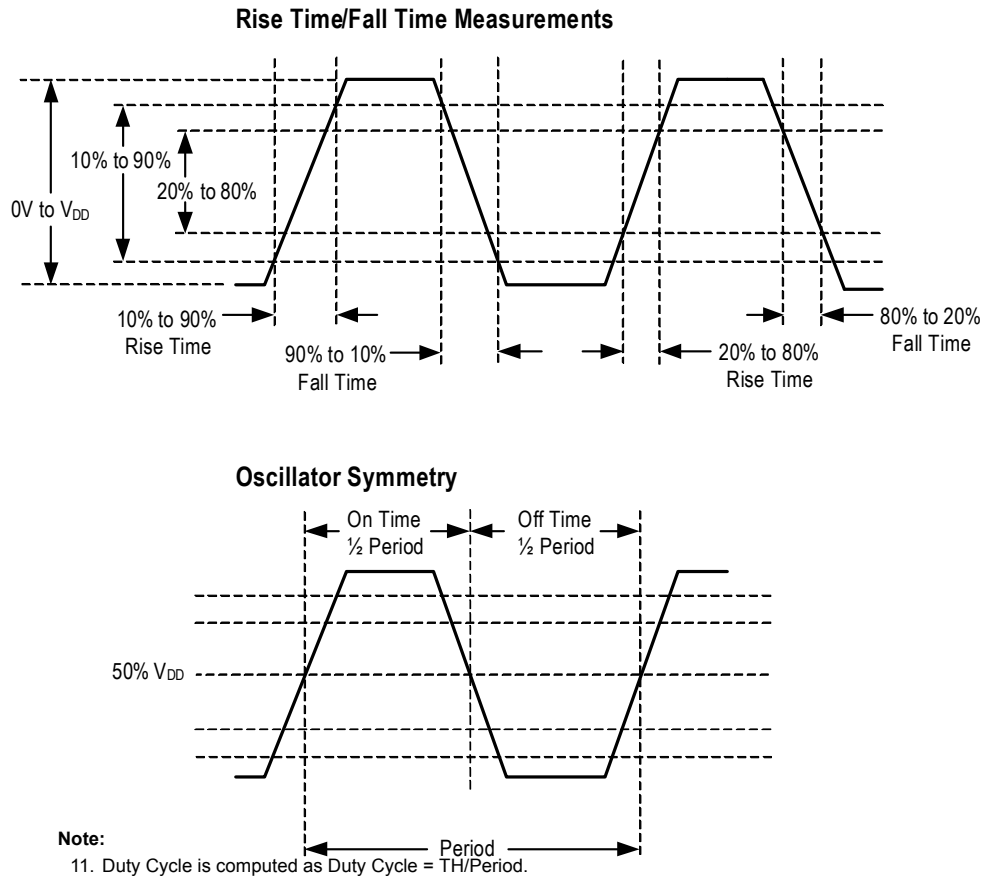


Figure 5. VCXO LVPECL Output Waveforms

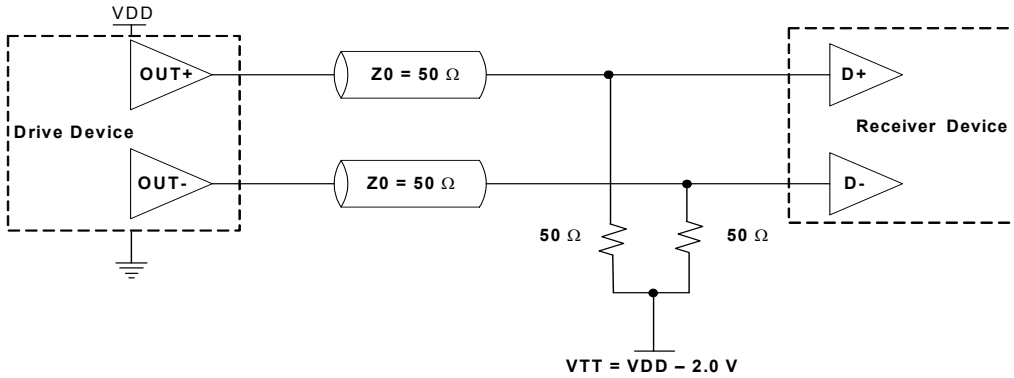


Figure 1. LVPECL Typical Termination

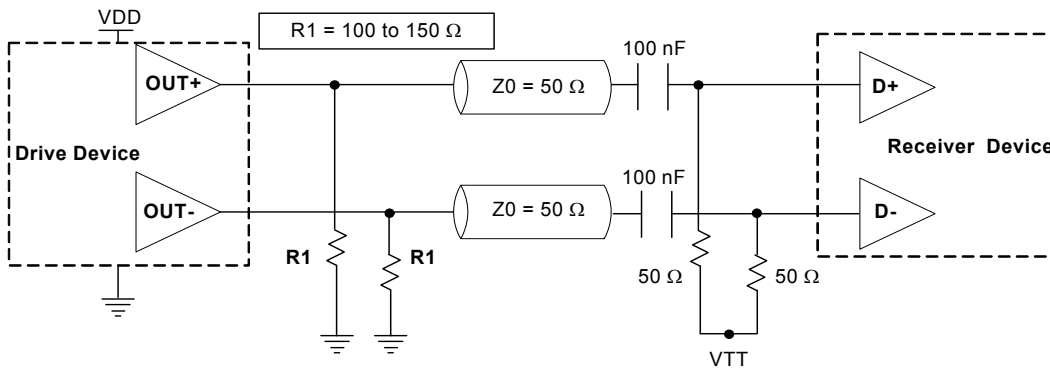


Figure 2. LVPECL AC Coupled Termination

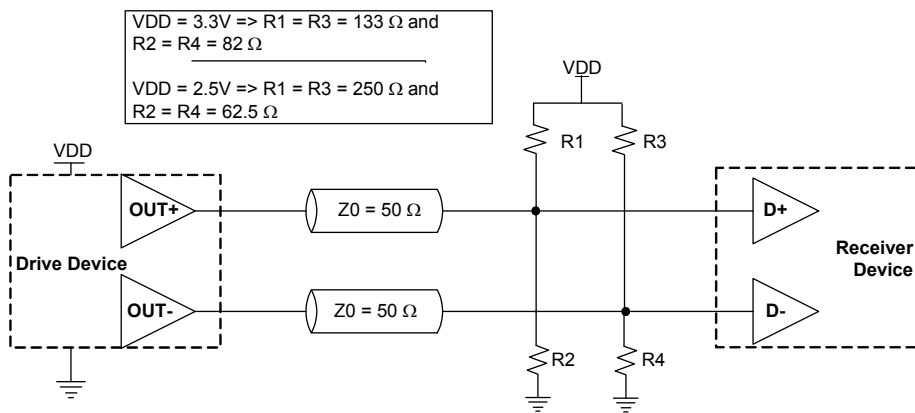


Figure 3. LVPECL with Thevenin Typical Termination

Figure 6. VCXO LVDS Output Waveforms

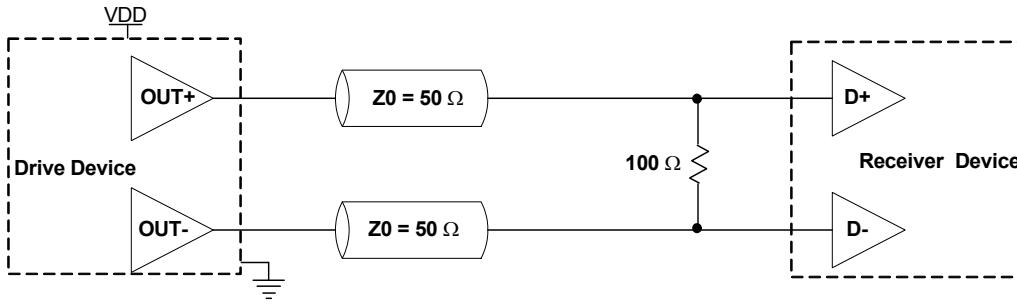
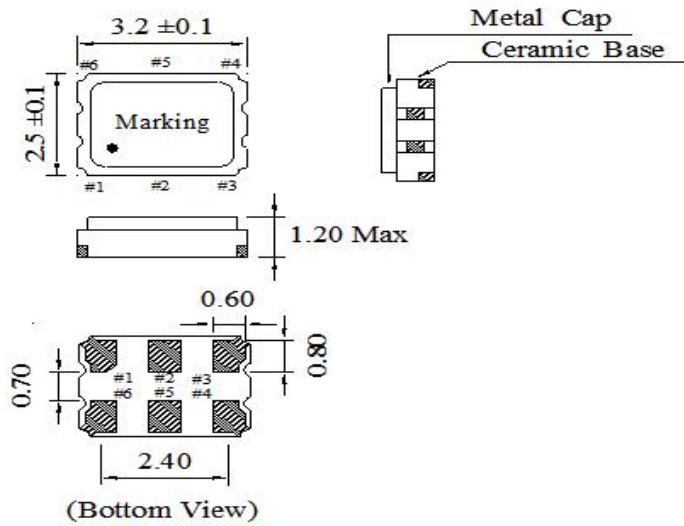
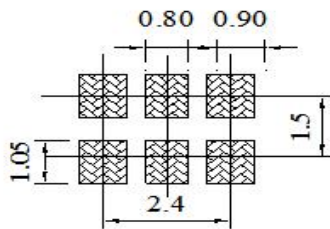


Figure 4. LVDS Single Termination (Load Terminated)

Dimensions



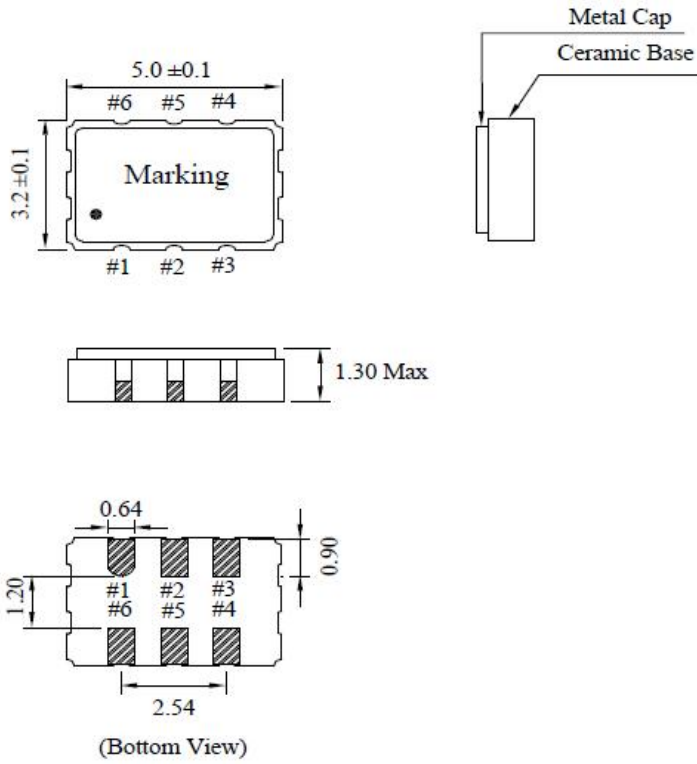
**Recommended Soldering Pattern**



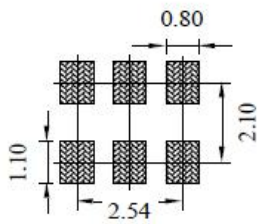
NOTES:

1. ALL DIMENSIONS IN MM.

Dimensions



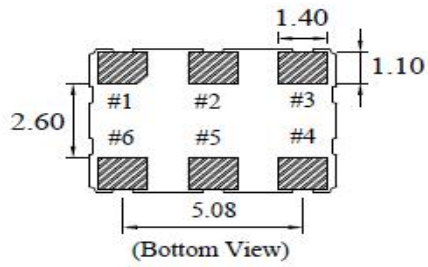
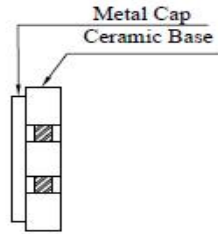
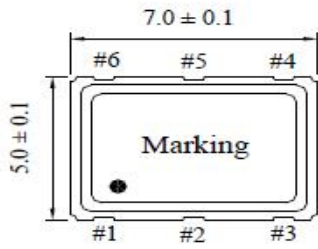
**Recommended Soldering Pattern**



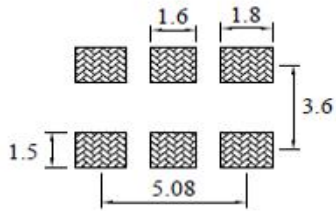
NOTES:

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Dimensions



**Recommended Soldering Pattern**



NOTES:

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