

DSC1028 Series

2.8V PureSilicon™ Oscillator



Features

- Frequency Range: 1 to 150MHz
- Exceptional Stability over Temperature
 - ± 25 PPM, ± 50 PPM
- Operating voltage
 - 2.6 to 3.0V
- Operating Temperature Range
 - Industrial -40°C to 85°C
 - Ext. Commercial -20°C to 70°C
 - Commercial 0°C to 70°C
- Low Operating and Standby Current
 - 3mA Operating (40MHz)
 - 1uA Standby
- Ultra Miniature Footprint
 - 2.5 x 2.0 x 0.85 mm
 - 3.2 x 2.5 x 0.85 mm
 - 5.0 x 3.2 x 0.85 mm
 - 7.0 x 5.0 x 0.85 mm
- Excellent shock and Vibration Resistance
- Lead Free, RoHS & Reach HSVC Compliant

General Description

The DSC1028 is a 2.8V fixed frequency MEMS based PureSilicon™ Oscillator. It can be factory programmed to any frequency from 1 to 150MHz.

The DSC1028 incorporates an all silicon resonator that is extremely robust and nearly immune to stress related fractures, common to crystal based oscillators. Without sacrificing the performance and stability required of today's systems, a crystal-less design allows for a higher level of reliability, making the DSC1028 ideal for rugged, industrial, and portable applications where stress, shock, and vibration can damage quartz crystal based systems.

Available in industry standard packages, the DSC1028 can be "dropped-in" to the same PCB footprint as standard crystal oscillators.

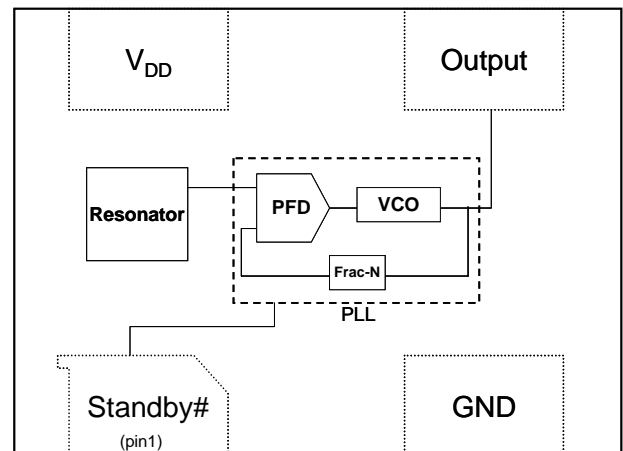
Benefits

- Pin for pin "drop-in" replacement for industry standard crystal oscillators
- Semiconductor level reliability, significantly higher than quartz
- Frequency Resolution to 4 decimals
- Short mass production lead-times
- Longer Battery Life / Reduced Power
- Compact Plastic package
- Cost effective

Applications

- Mobile Applications
- Consumer Electronics
- Portable Electronics
- CCD Clock for VTR Cameras
- Low Profile Applications
- Industrial

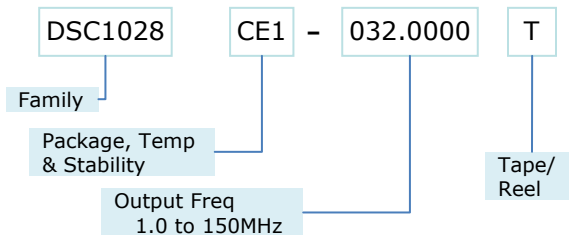
Block Diagram



Absolute Maximum Ratings¹

Item	Min.	Max	Unit	Condition
Supply Voltage	-0.3	+4.0	V	
Input Voltage	-0.3	VDD+0.3	V	
Junction Temp	-	+150	°C	
Storage Temp	-55	+150	°C	
Soldering Temp	-	+260	°C	40 sec max.
ESD				
HBM	-	2000	V	
MM	-	200		
CDM	-	500		

Ordering Code



* See Ordering Information for details

Recommended Operating Conditions

Parameter	Symbol	Range
Supply Voltage	V _{DD}	2.6 – 3.0V
Output Load	Z _L	R>10KΩ, C≤15pF
Operating Temperature	T	
Option 1		-40 – +85 °C
Option 2		-20 – +70 °C
Option 3		0 – +70 °C

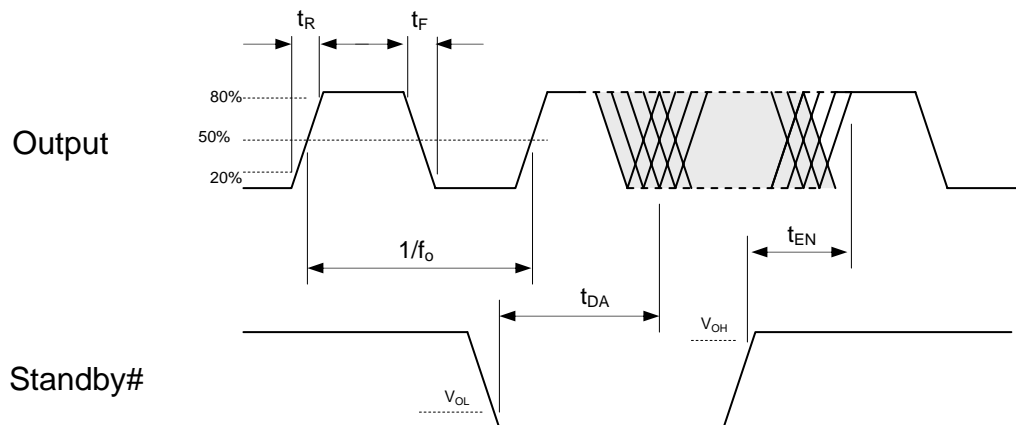
Specifications

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Frequency	f ₀	Single Frequency	1		150	MHz
Frequency Tolerance						
Option 1		-40°C to +85°C			±25,±50	ppm
Option 2		-20°C to +70°C			±25,±50	
Option 3		0°C to +70°C			±25,±50	
Supply Current, no load	I _{DD}	C _L =0p R _L =∞ T=25°C		3 4 5 6	10	mA
Supply Current, standby	I _{DD}	T=25°C			1.0	uA
Output Logic Levels						
Output logic high	V _{OH}	C _L =15pF	0.8*V _{DD}		-	Volts
Output logic low	V _{OL}		-		0.2*V _{DD}	
Output Transition time						
Rise Time	t _R	C _L =15pF; T=25°C		1.3	2	ns
Fall Time	t _F	20%/80%*V _{DD}		1.3	2	
Output Startup Time ²	t _{SU}	T=25°C		3	10	ms
Output Disable Time	t _{DA}			20	100	ns
Output Duty Cycle	SYM		45		55	%
Input Logic Levels						
Input logic high	V _{IH}		0.75*V _{DD}		-	Volts
Input logic low	V _{IL}		-		0.25*V _{DD}	
Jitter, Cycle to Cycle	J _{CC}	F = 100MHz ³		95		ps

Notes:

1. Absolute maximum ratings are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated beyond these limits.
2. Output frequency to within 100ppm of final stable output frequency.
3. See typical cycle to cycle jitter graph for frequency dependence.

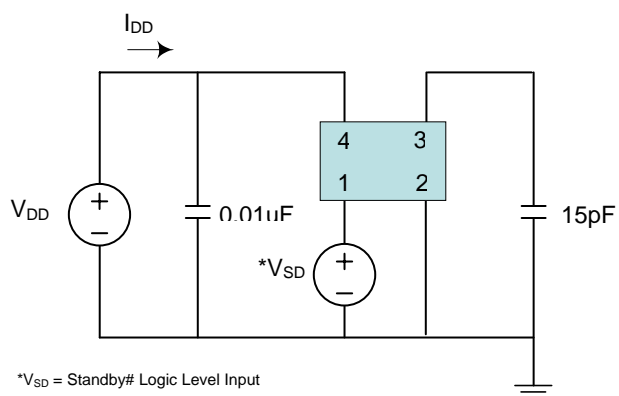
Output Waveform



Standby Function

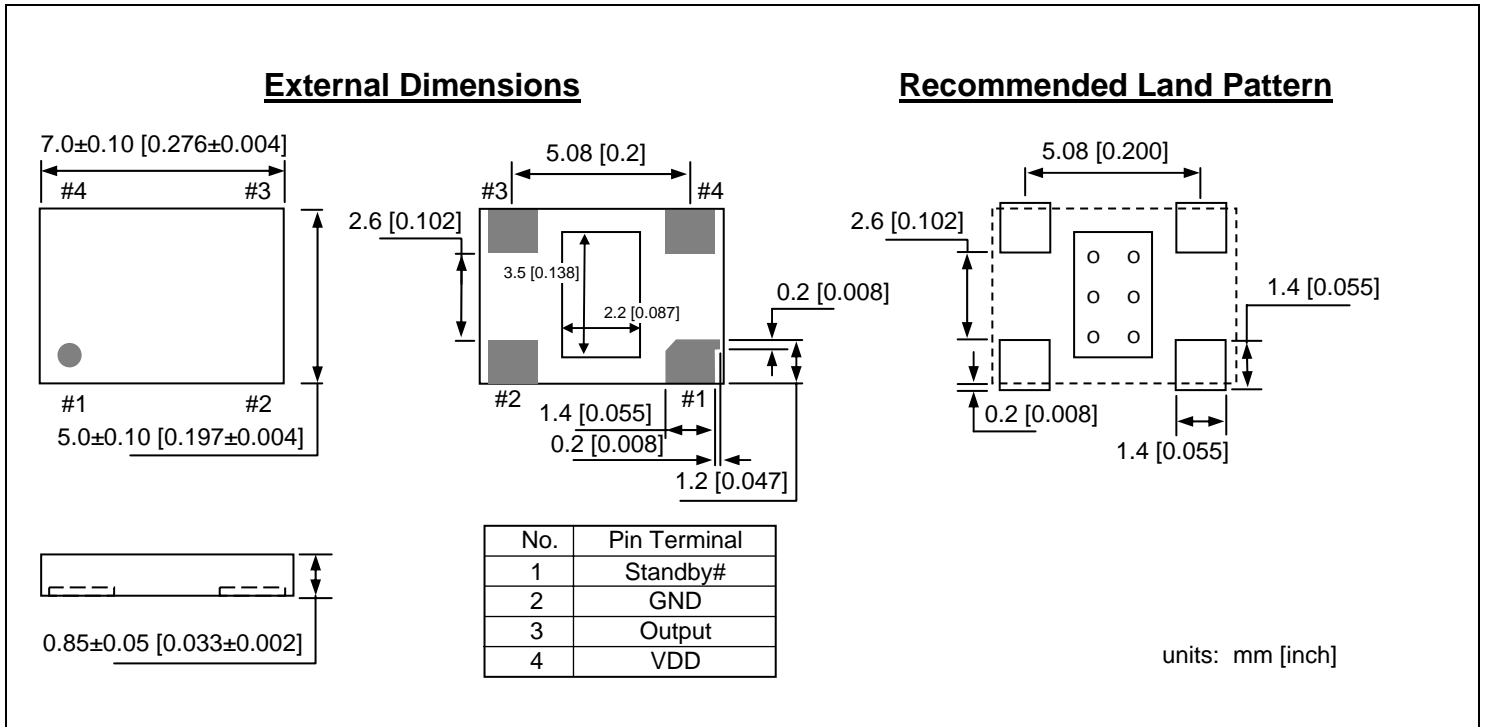
Standby# (pin 1)	Output (pin 3)
Hi Level	Output ON
Open (no connect)	Output ON
Low Level	High Impedance

Test Circuit



Package Dimensions

7.0 x 5.0 mm Plastic Package

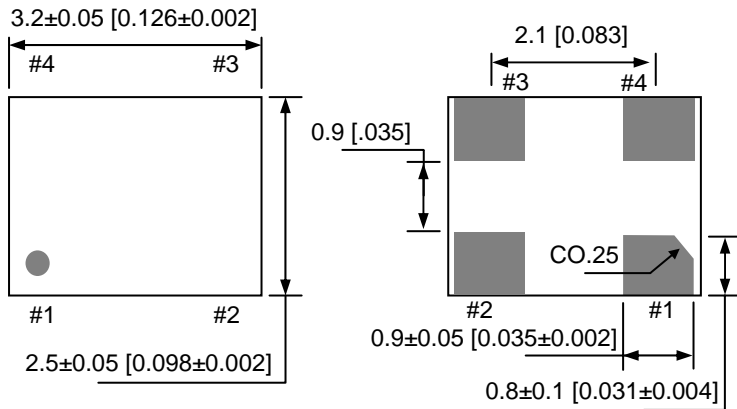


5.0 x 3.2 mm Plastic Package



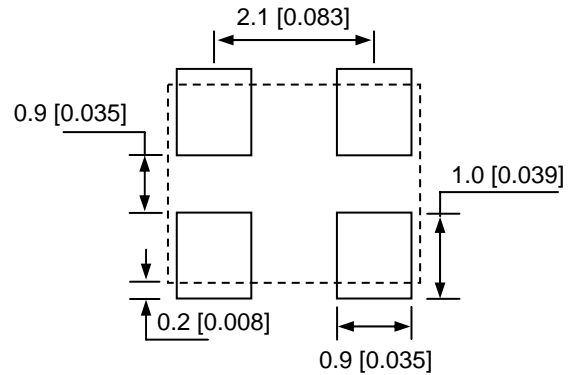
3.2 x 2.5 mm Plastic Package

External Dimensions



No	Pin Terminal
1	Standby#
2	GND
3	Output
4	VDD

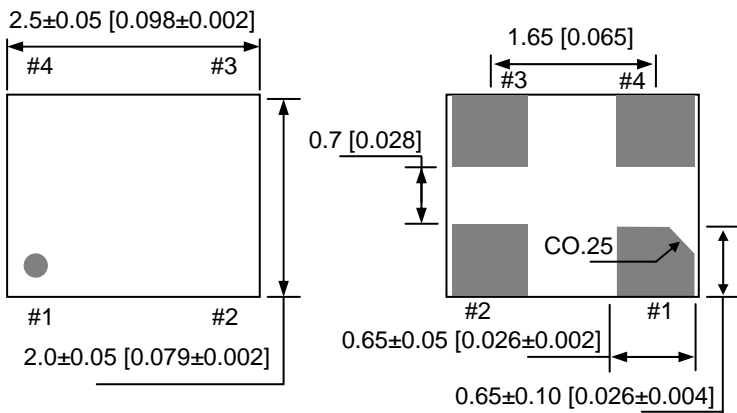
Recommended Land Pattern



units: mm [inch]

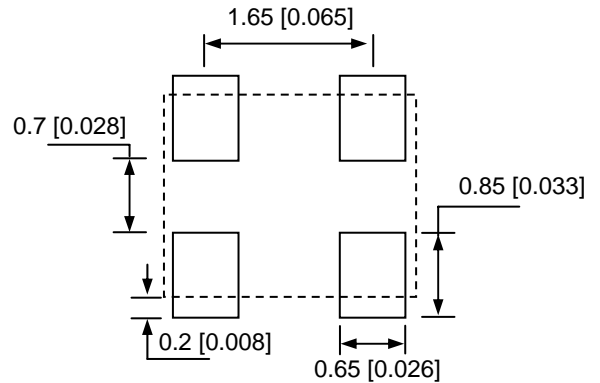
2.5 x 2.0 mm Plastic Package

External Dimensions



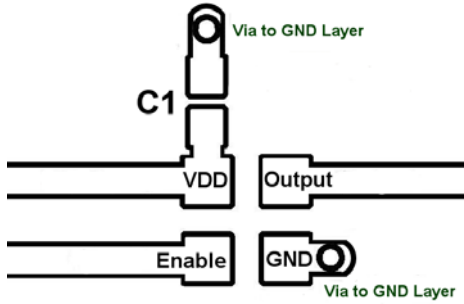
No	Pin Terminal
1	Standby#
2	GND
3	Output
4	VDD

Recommended Land Pattern

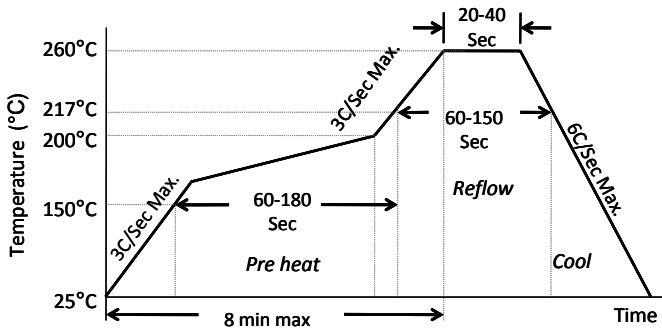


units: mm [inch]

Board Layout (recommended)



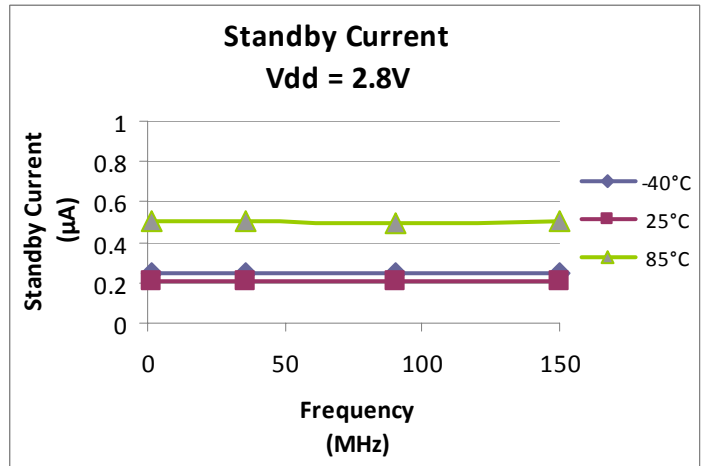
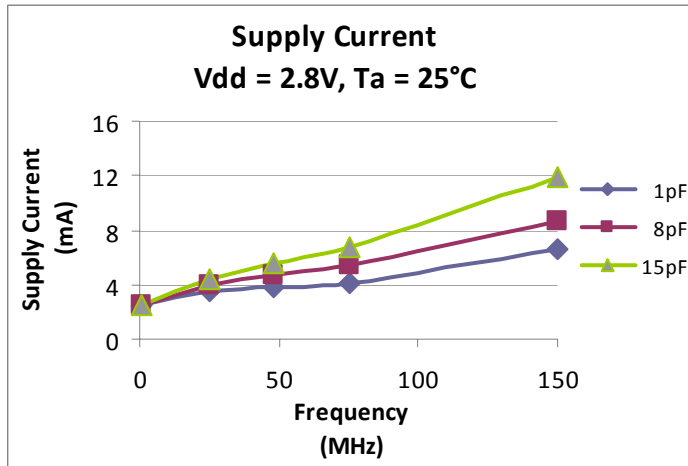
Solder Reflow Profile

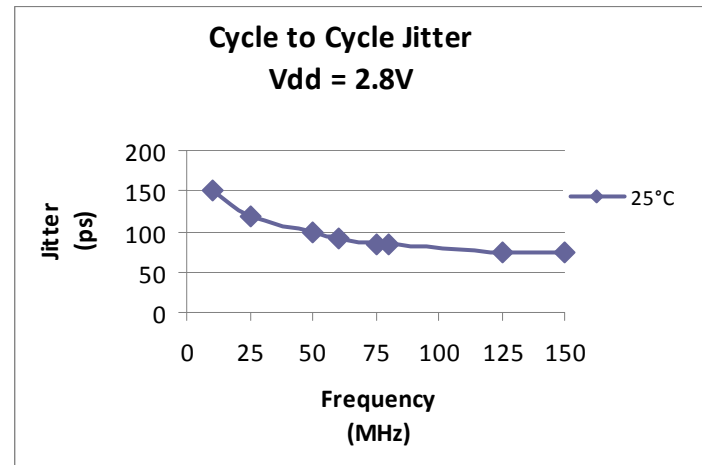
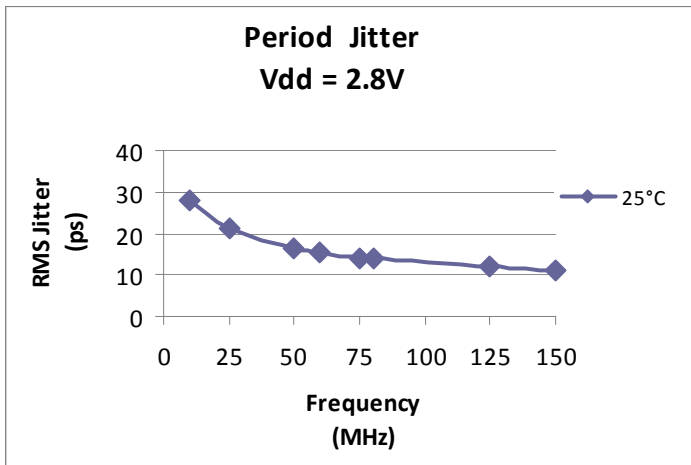
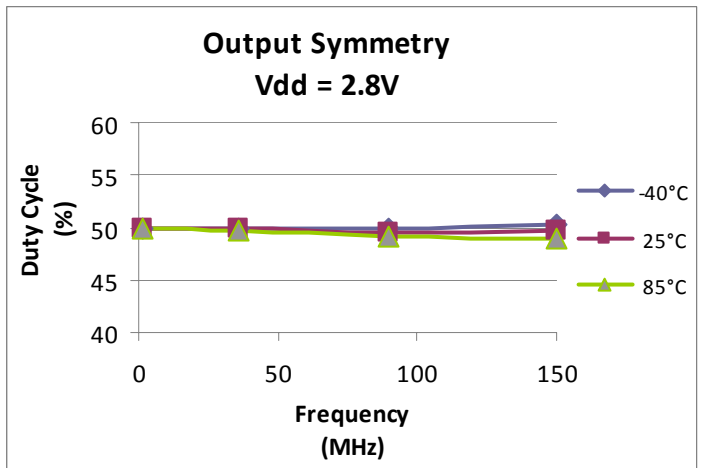
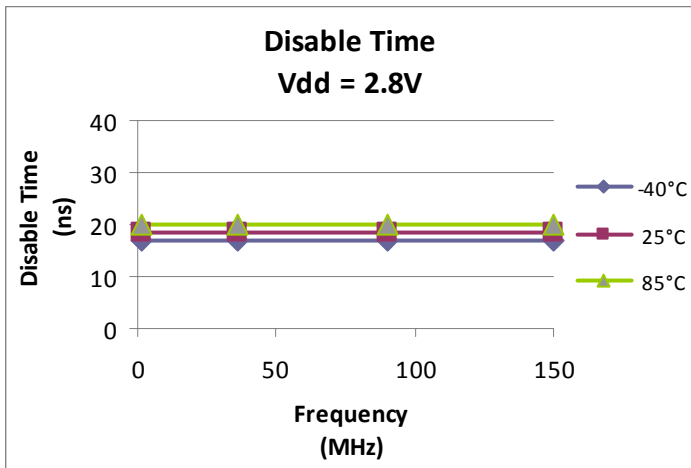
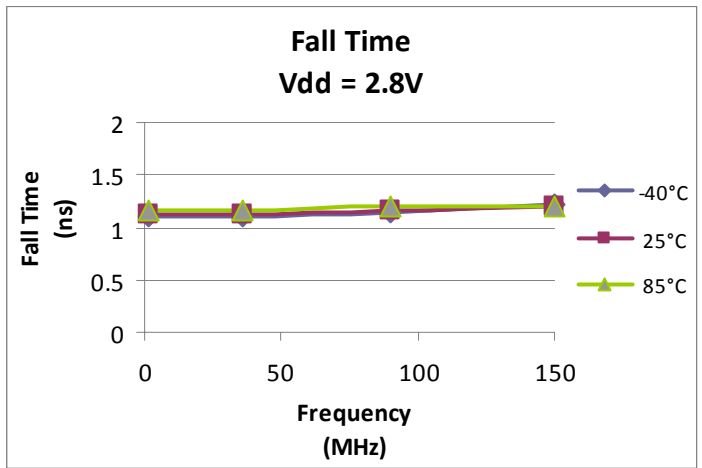
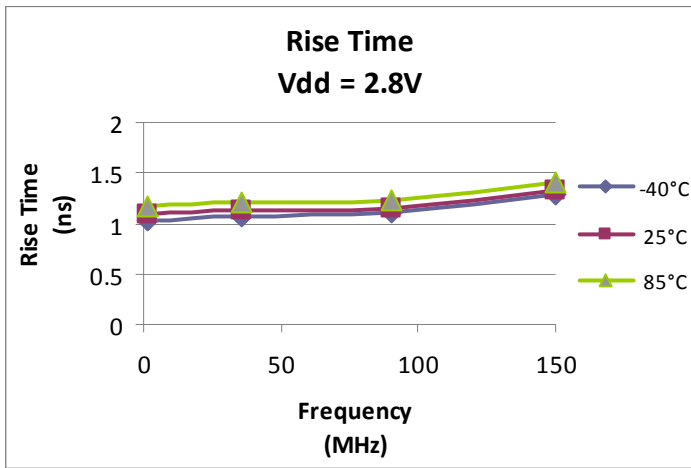


MSL 1* @ 260°C refer to JSTD-020C	
Ramp-Up Rate (200°C to Peak Temp)	3°C/Sec Max.
Preheat Time 150°C to 200°C	60-180 Sec
Time maintained above 217°C	60-150 Sec
Peak Temperature	255-260°C
Time within 5°C of actual Peak	20-40 Sec
Ramp-Down Rate	6°C/Sec Max.
Time 25°C to Peak Temperature	8 min Max.

*MSL2 for all 7050 packages

Nominal Performance Characteristics





Ordering Information

DSC1028 PTS – XXX.XXXX T

PART NUMBERING GUIDE				
Package (Plastic QFN)	Temperature	Stability	Frequency	Packing Option
P=A: 7.0x5.0mm P=B: 5.0x3.2mm P=C: 3.2x2.5mm P=D: 2.5x2.0mm	T=C: 0° ~ +70° C T=E: -20° ~ +70° C T=I: -40° ~ +85° C	S=1: ±50ppm S=2: ±25ppm	XXX.XXXX (4 decimal places)	Blank: Tubes T: Tape & Reel

Example: DSC1028CE1-123.0000T

The example part number above is a 123.0000MHz oscillator in Plastic 3.2x2.5mm package, with ±50ppm stability over an operating temperature of -20 to +70°C, shipped in Tape and Reel. The reel size (7" or 13" diameter) will be determined by the factory based on quantity.

Discera's PureSilicon™ Clock Oscillators are built and tested to meet customers' application requirements. Our quality, sales and technical teams are fully dedicated to provide all customers with world-class products and services.

For application requirements and additional information, call, fax, email or visit us on the Web.

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