

DSC1018 Series

1.8V PureSilicon™ Oscillator



Features

- Frequency Range: 1 to 150MHz
- Exceptional Stability over Temperature
 - ± 25 PPM, ± 50 PPM
- Operating voltage
 - 1.65 to 1.95V
- 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
 - $2.5 \times 2.0 \times 0.85$ mm
 - $3.2 \times 2.5 \times 0.85$ mm
 - $5.0 \times 3.2 \times 0.85$ mm
- Excellent shock and Vibration Resistance
- Lead Free, RoHS & Reach HSVC Compliant

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

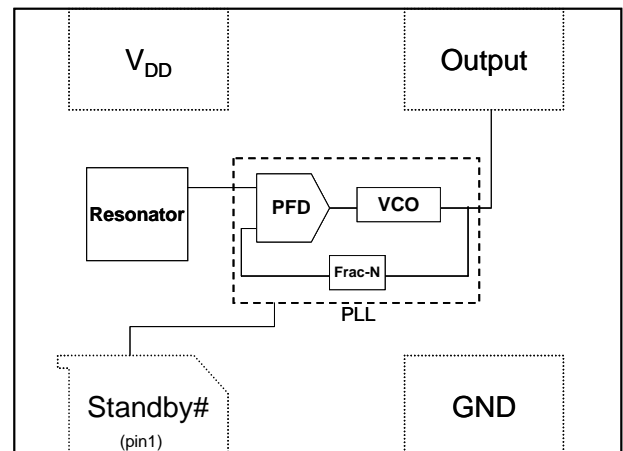
General Description

The DSC1018 is a 1.8V fixed frequency MEMS based PureSilicon™ Oscillator. It can be factory programmed to any frequency from 1 to 150MHz.

The DSC1018 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 DSC1018 ideal for rugged, industrial, and portable applications where stress, shock, and vibration can damage quartz crystal based systems.

Available in industry standard packages, the DSC1018 can be "dropped-in" to the same PCB footprint as standard crystal oscillators.

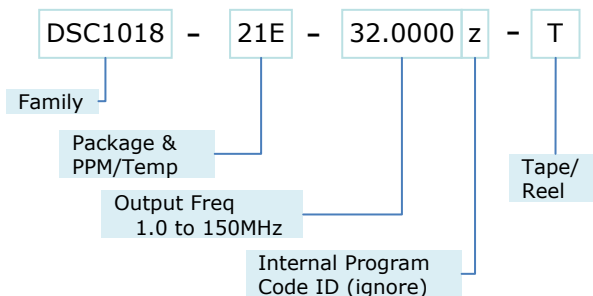
Block Diagram



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



Recommended Operating Conditions

Parameter	Symbol	Range
Supply Voltage	V _{DD}	1.65 – 1.95V
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

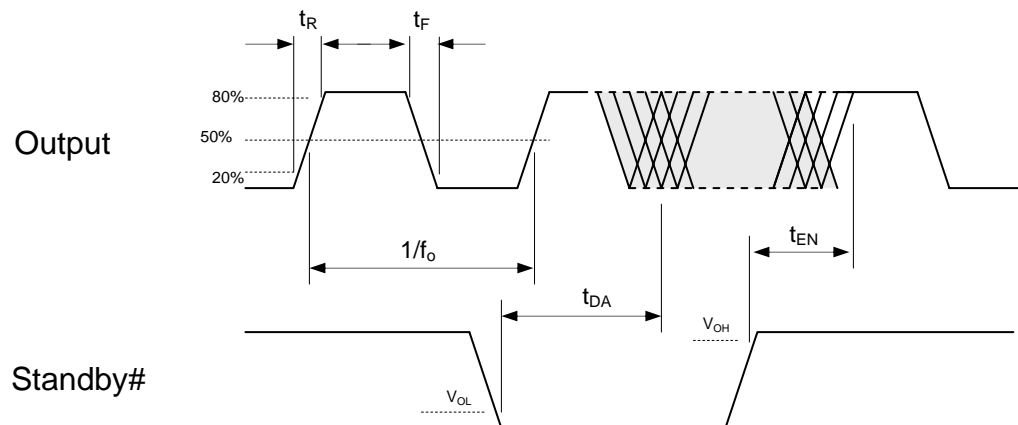
Specifications

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Frequency	f ₀	Single Frequency	1		150	MHz
Frequency Tolerance						
Option 1		-40°C to +85°C			±50	ppm
Option 2	Δf	-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		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		ns
Fall Time	t _F	20%/80%*V _{DD}		1.3		
Output Startup Time ²	t _{SU}	T=25°C		3		ms
Output Disable Time	t _{DA}			20		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}	

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.

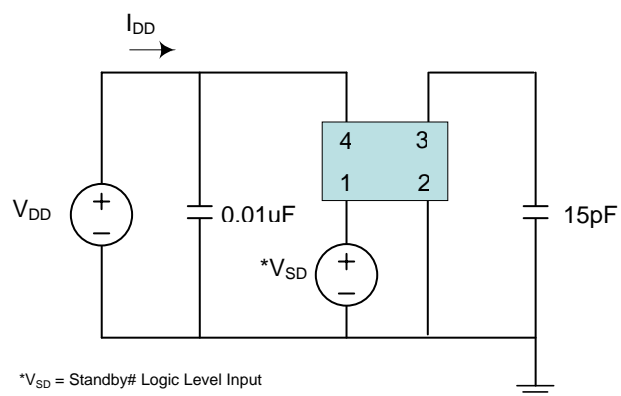
Output Waveform



Standby Function

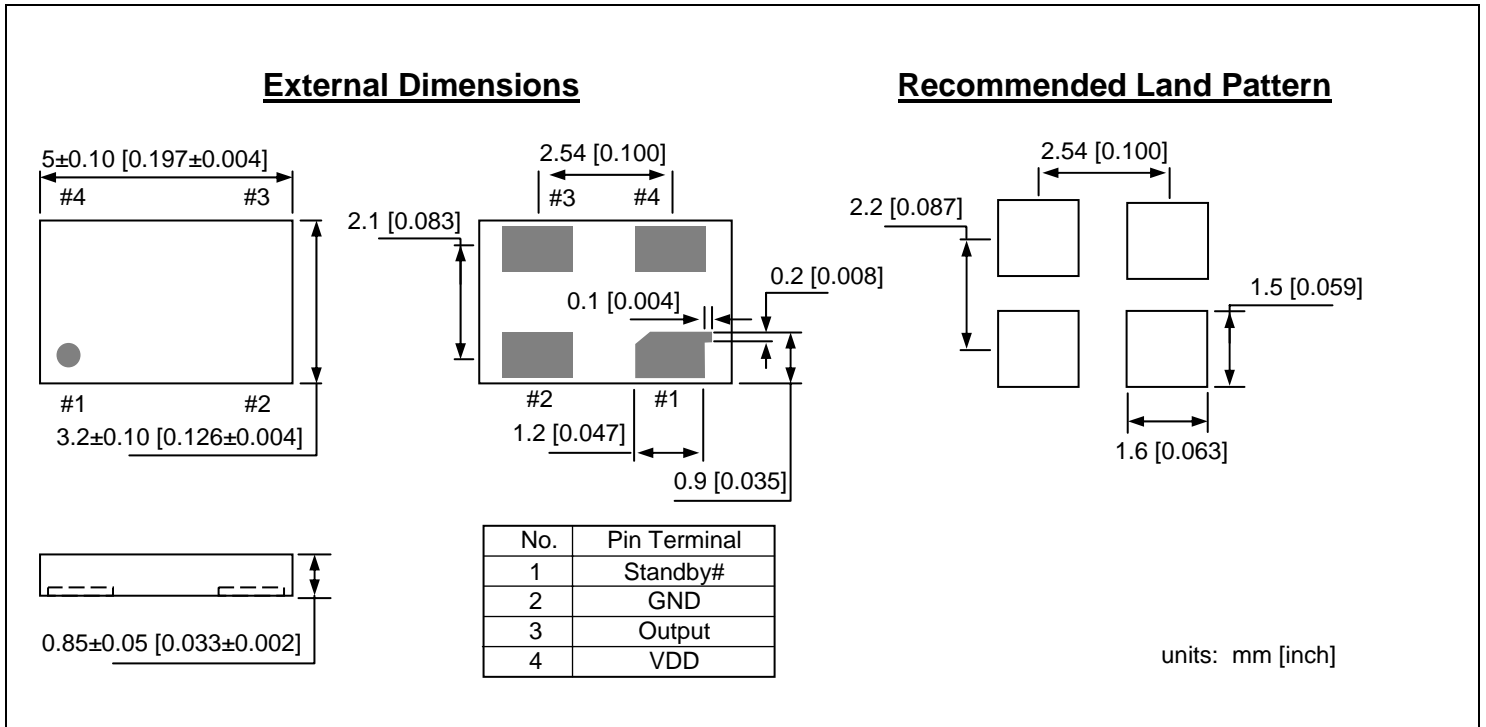
Standby# (pin 1)	Output (pin 3)
Hi Level	Output ON
Open (no connect)	Output ON
Low Level	High Impedance

Test Circuit

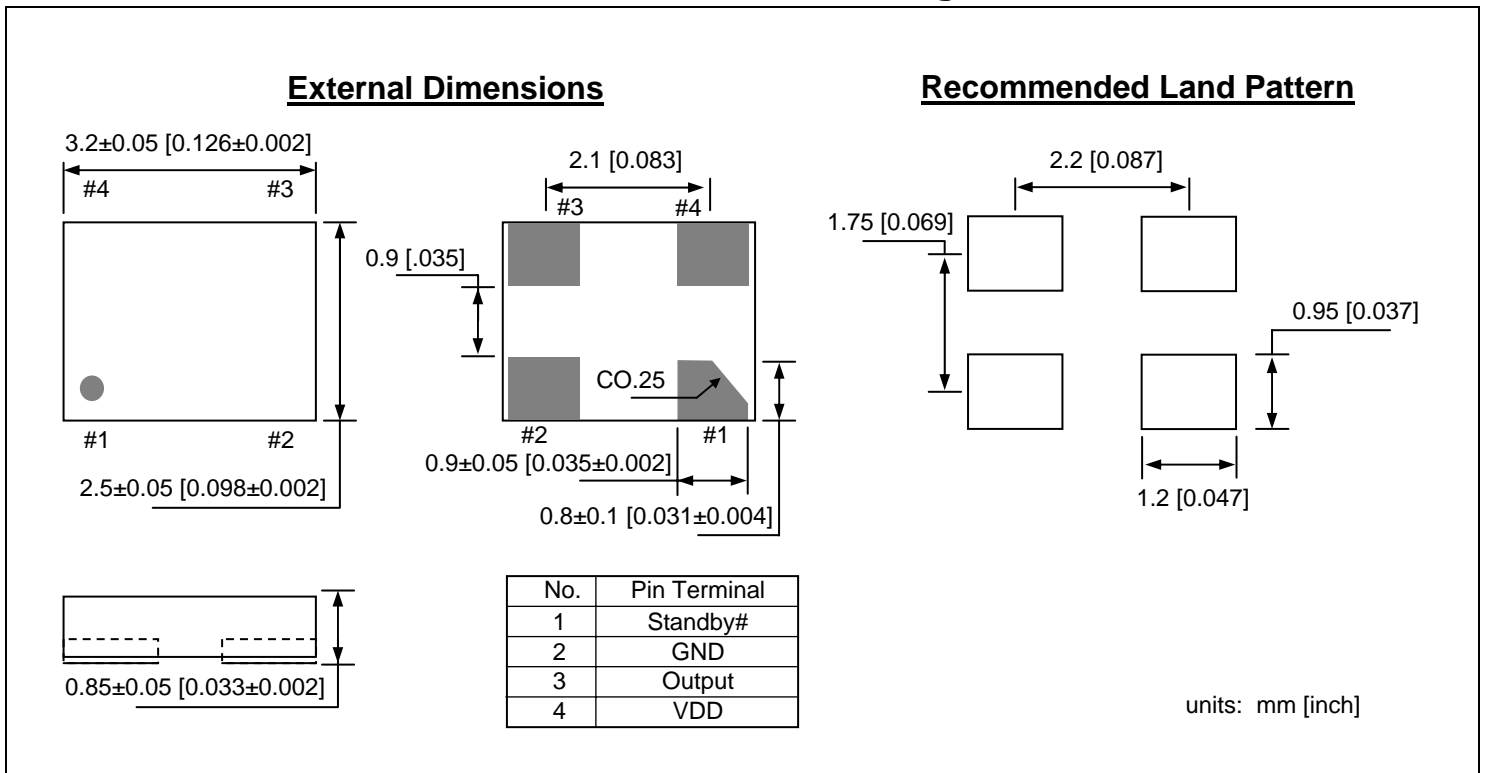


Package Dimensions

5.0 x 3.2 mm Plastic Package

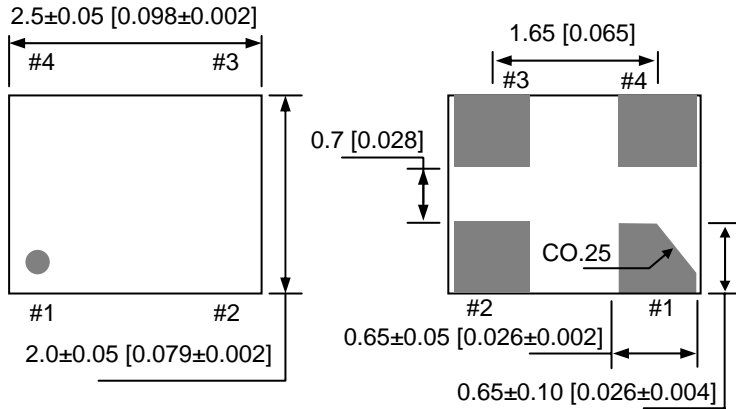


3.2 x 2.5 mm Plastic Package



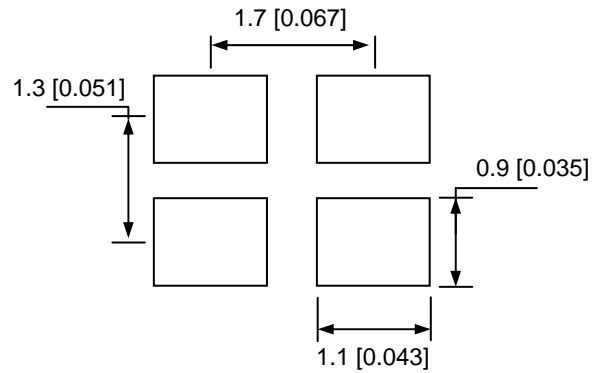
2.5 x 2.0 mm Plastic Package

External Dimensions



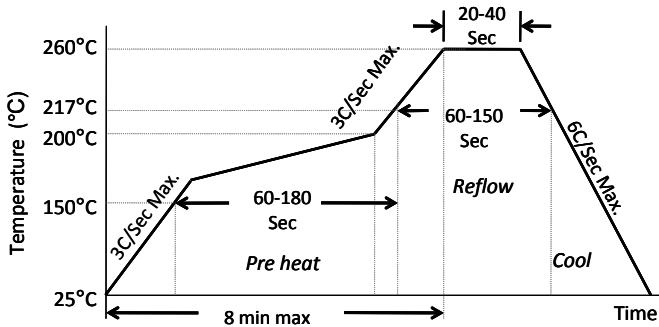
No	Pin Terminal
1	Standby#
2	GND
3	Output
4	VDD

Recommended Land Pattern



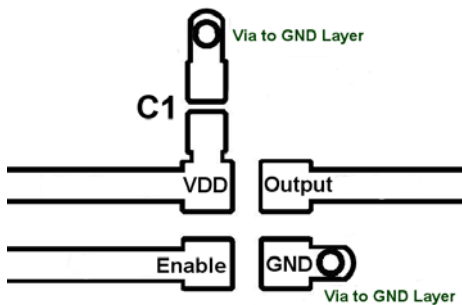
units: mm [inch]

Solder Reflow Profile



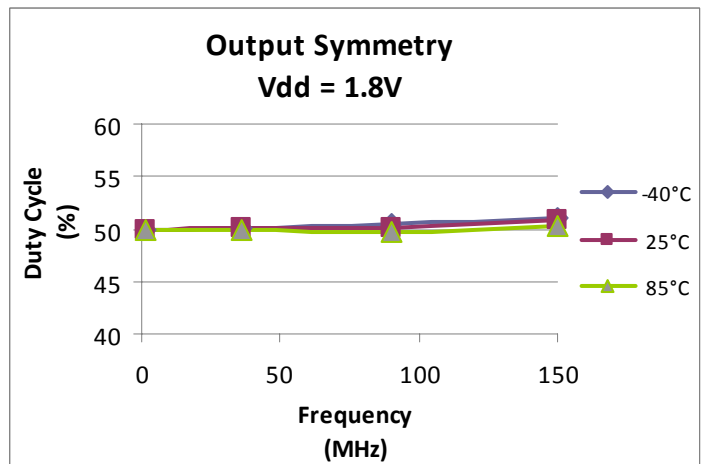
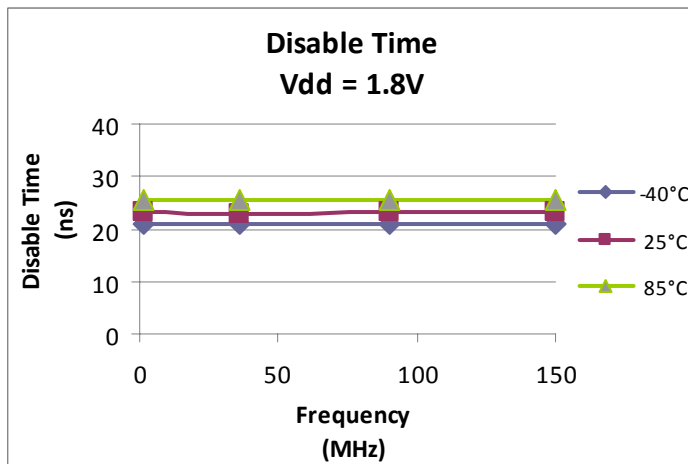
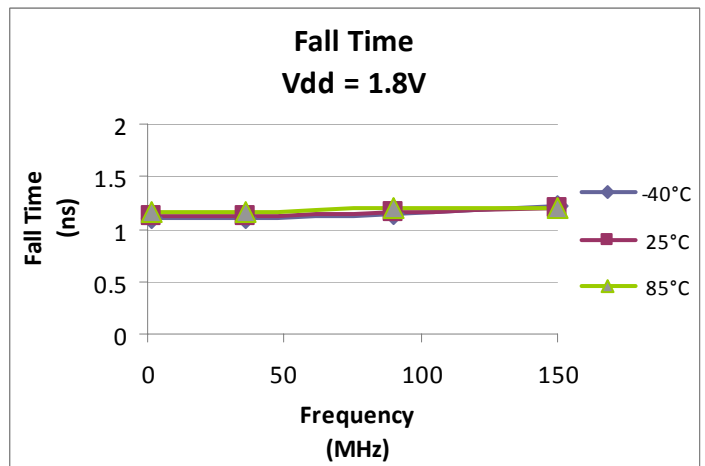
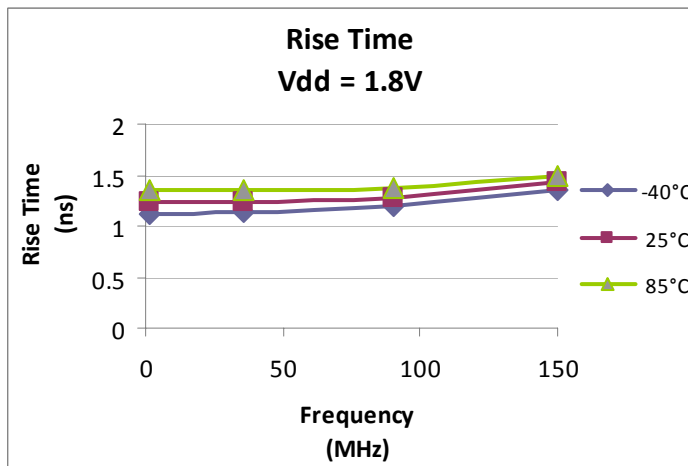
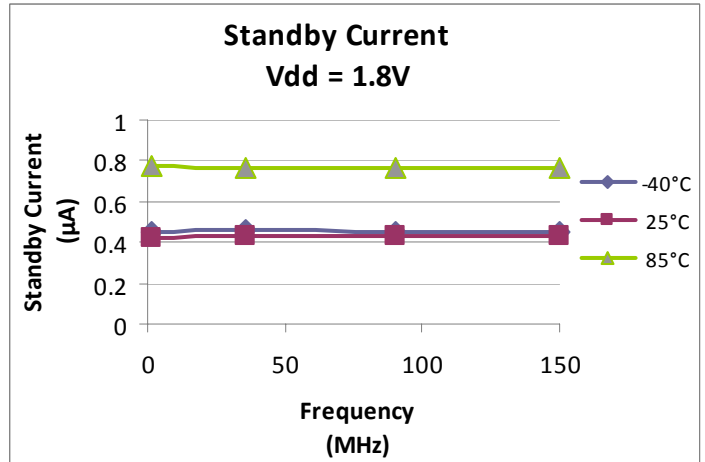
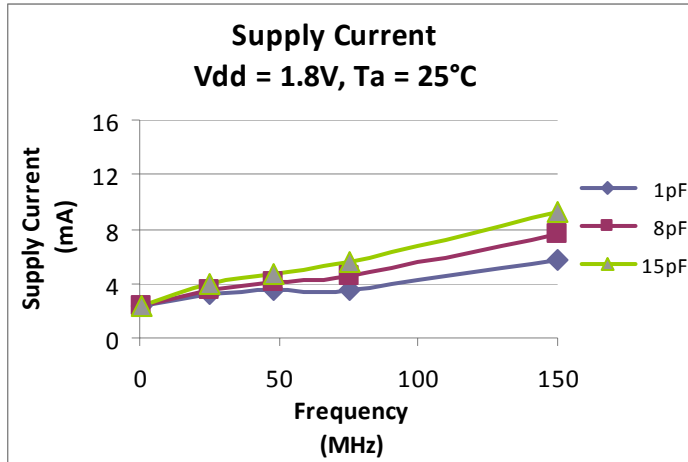
MSL 1 @ 260°C refer to JSTD-020C	
Ramp-Up Rate (200°C to Peak Temp)	3°C/Sec Max.
Preheat Time 150°C to 200°C	60-180 Sec
Time maintained above 217°C	60-150 Sec
Peak Temperature	255-260°C
Time within 5°C of actual Peak	20-40 Sec
Ramp-Down Rate	6°C/Sec Max.
Time 25°C to Peak Temperature	8 min Max.

Board Layout (recommended)



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Nominal Performance Characteristics



Ordering Information

DSC1018 - PSS - XXX.XXXX z - T

PART NUMBERING GUIDE				
Package (Plastic QFN)	Stability and Temperature	Frequency	Reserved	Packing Option
P=1: 5.0x3.2mm P=2: 3.2x2.5mm P=3: 2.5x2.0mm	SS=1C: ±50ppm (0° ~ +70° C) SS=2C: ±25ppm (0° ~ +70° C) SS=1E: ±50ppm (-20° ~ +70° C) SS=2E: ±25ppm (-20° ~ +70° C) SS=1I: ±50ppm (-40° ~ +85° C)	XXX.XXXX (4 decimal places)	Z	Blank: Tubes T1: 7" T/R T2: 13" T/R

Example: **DSC1018 - 21E - 123.0000z - T**

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**. The reserved character, ("z" in the above example) will be assigned during programming and can be ignored.

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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