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DSC8104 | DSC8124



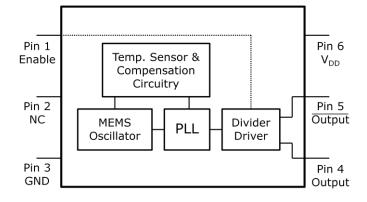
Programmable Low-Jitter Precision HCSL Oscillator

General Description

The DSC8104 & DSC8124 series of high performance field-programmable oscillators utilizes a proven silicon MEMS technology to provide excellent jitter and stability over a of supply voltages wide range and temperatures. Using the TIMEFLASH programmer, the end user can easily program the oscillators' frequency in the field for immediate testing or use in advance prototype development or production.

DSC8104 has a standby feature allowing it to completely power-down when EN pin is pulled low; whereas for DSC8124, only the outputs are disabled when EN is low. Both oscillators are available in industry standard packages, including the small 3.2x2.5 mm², and are "drop-in" replacement for standard 6-pin HCSL guartz oscillators.

Block Diagram



Output Enable Modes

EN Pin	DSC8104	DSC8124
High	Outputs Active	Outputs Active
NC	Outputs Active	Outputs Active
Low	Standby	Outputs Disabled

Features

- Low RMS Phase Jitter: <1 ps (typ)
- High Stability: ±10, ±25, ±50 ppm
- Wide Temperature Range Industrial: -40° to 85° C Ext. commercial: -20° to 70° C
- High Supply Noise Rejection: -50 dBc
- Wide Freq. Range: 10 to 460 MHz
- Small Industry Standard Footprints o 2.5x2.0, 3.2x2.5, 5.0x3.2, & 7.0x5.0 mm
- Excellent Shock & Vibration Immunity Qualified to MIL-STD-883
- High Reliability 20x better MTF than guartz oscillators
- Low Current Consumption
- Supply Range of 2.25 to 3.6 V
- Standby & Output Enable Function
- Lead Free & RoHS Compliant
- LVPECL & LVDS Versions Available

Applications

- Storage Area Networks SATA, SAS, Fibre Channel
- Passive Optical Networks o EPON, 10G-EPON, GPON, 10G-PON
- Ethernet 1G, 10GBASE-T/KR/LR/SR, and FCoE
- HD/SD/SDI Video & Surveillance
- PCI Express: Gen 1 & Gen 2
- DisplayPort

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Ordering Code

B: 5.0x3.2mm

C: 3.2x2.5mm

D: 2.5x2.0mm



Packing

Γ

Т

Temp Range

1: ±50ppm

2: ±25ppm

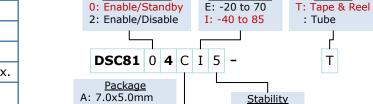
5: ±10ppm

Absolute Maximum Ratings

Item	Min	Мах	Unit	Condition
Supply Voltage	-0.3	+4.0	V	
Input Voltage	-0.3	V _{DD} +0.3	V	
Junction Temp	-	+150	°C	
Storage Temp	-55	+150	°C	
Soldering Temp	-	+260	°C	40sec max.
ESD	-		V	
HBM		4000		
MM		400		
CDM		1500		

Note: 1000+ years of data retention on internal memory

Specifications



Enable Modes

Parameter		Condition	Min.	Тур.	Max.	Unit
Supply Voltage ¹	V _{DD}		2.25		3.6	V
Supply Current	I _{DD}	EN pin low – outputs are disabled DSC8104 DSC8124		20	0.095 22	mA
Frequency Stability	Δf	Includes frequency variations due to initial tolerance, temp. and power supply voltage			±10 ±25 ±50	ppm
Aging	Δf	1 year @25°C			±5	ppm
Startup Time ²	t _{su}	T=25°C			5	ms
Input Logic Levels Input logic high Input logic low	V _{IH} V _{IL}		0.75xV _{DD} -		- 0.25xV _{DD}	V
Output Disable Time ³	t _{DA}				5	ns
Output Enable Time	t _{EN}	DSC8104 DSC8124			5 20	ms ns
Enable Pull-Up Resistor ⁴		Pull-up resistor exist		40		kΩ
		HCSL Outputs				
Supply Current	I _{DD}	Output Enabled, R_L =50 Ω		40	42	mA
Output Logic Levels Output logic high Output logic low	V _{он} V _{ol}	$R_L = 50\Omega$	0.725 -		- 0.1	V
Pk to Pk Output Swing		Single-Ended		750		mV
Output Transition time ³ Rise Time Fall Time	t _R t _F	20% to 80% $R_L=50\Omega$, $C_L=2pF$	200		400	ps
Frequency	f ₀	Single Frequency	10		460	MHz
Output Duty Cycle	SYM	Differential	48		52	%
Period Jitter	J _{PER}			2.5		ps _{RMS}
Integrated Phase Noise	200kHz to 20MHz @156.25MHz			0.25 0.37 1.7	2	ps _{rms}

1. 2.

Pin 6 V_{DD} should be filtered with 0.1uf capacitor. t_{su} is time to 100ppm of output frequency after V_{DD} is applied and outputs are enabled. Output Waveform and Test Circuit figures below define the parameters.

3.

4. Output is enabled if pad is floated or not connected.

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50MHz-HCSL

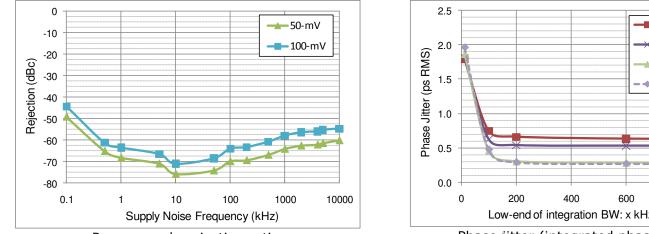
106MHz-HCSL

156MHz-HCSL

212MHz-HCSL

1000

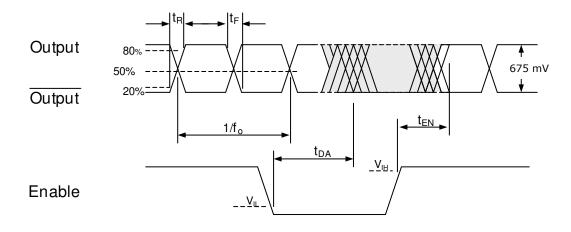
Nominal Performance Parameters (Unless specified otherwise: T=25° C, V_{DD}=3.3 V)



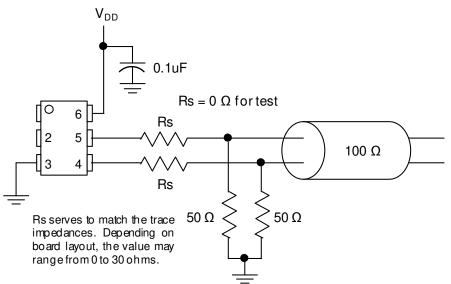
Power supply rejection ratio



Output Waveform



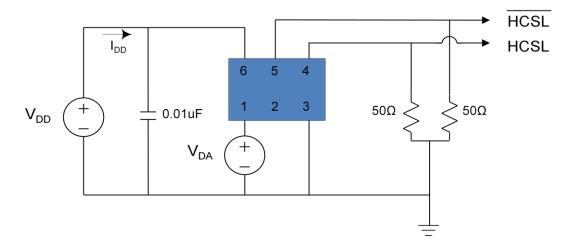
Typical Termination Scheme



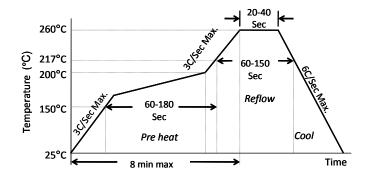
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Test Circuit



Solder Reflow Profile

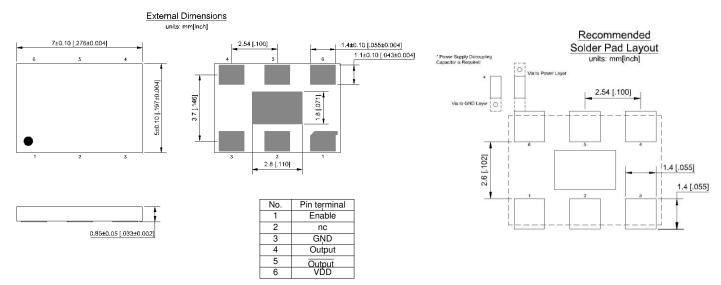


MSL 1 @ 260°C refer to JSTD-020C				
Ramp-Up Rate (200°C to Peak Temp)	3°C/Sec Max.			
Preheat Time 150°C to 200°C	60-180 Sec			
Time maintained above 217°C	60-150 Sec			
Peak Temperature	255-260°C			
Time within 5°C of actual Peak	20-40 Sec			
Ramp-Down Rate	6°C/Sec Max.			
Time 25°C to Peak Temperature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

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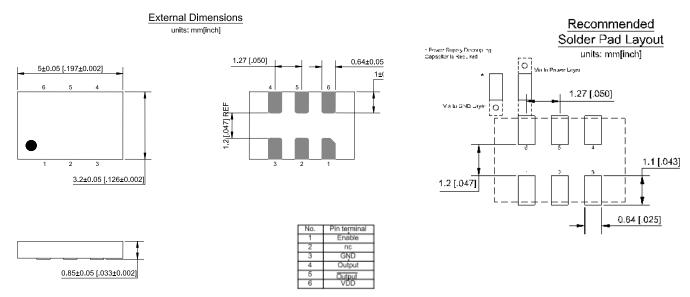
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Package Dimensions



7.0 x 5.0 mm Plastic Package

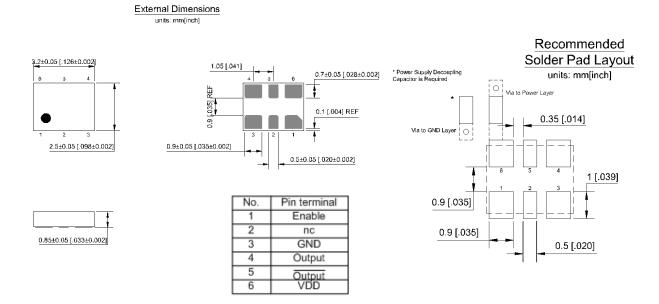




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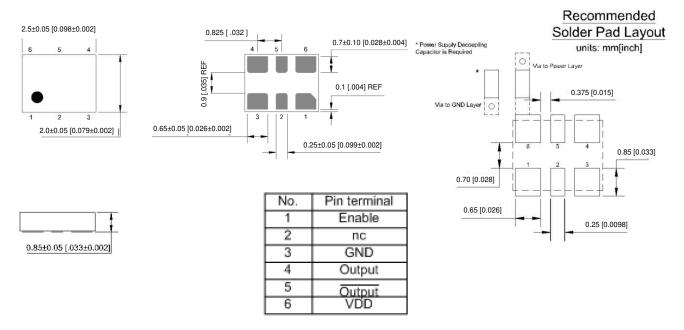
Programmable Low-Jitter Precision HCSL Oscillator

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3.2 x 2.5 mm Plastic Package





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