DSC1102 | DSC1122



Low-Jitter Precision LVPECL Oscillator

General Description

The DSC1102 & DSC1122 series of high performance oscillators utilizes a proven silicon MEMS technology to provide excellent jitter and stability over a wide range of supply voltages and temperatures. Bv eliminating the need for quartz or SAW technology, MEMS oscillators significantly enhance reliability and accelerate product development, while meeting stringent clock performance criteria for a variety of communications, storage, and networking applications.

DSC1102 has a standby feature allowing it to completely power-down when EN pin is pulled low; whereas for DSC1122, 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" replacements for standard 6-pin LVPECL quartz crystal oscillators.

Block Diagram



Output Enable Modes

EN Pin	DSC1102	DSC1122
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
- Short Lead Time: 2 Weeks
- Wide Freq. Range: 2.3 to 460 MHz
- Excellent Shock & Vibration Immunity • Qualified to MIL-STD-883
- High Reliability • 20x better MTF than quartz oscillators
- Low Current Consumption
- Supply Range of 2.25 to 3.6 V
- Standby & Output Enable Function
- Lead Free & RoHS Compliant
- LVDS & HCSL Versions Available

Applications

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



Absolute Maximum Ratings

Item	Min	Max	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		

Ordering Code



Note: 1000+ years of data retention on internal memory

Specifications

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 DSC1102 DSC1122		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}	DSC1102 DSC1122			5 20	ms ns
Enable Pull-Up Resistor ⁴		Pull-up resistor exist		40		kΩ
		LVPECL Outputs				
Supply Current	I _{DD}	Output Enabled, $R_L = 50\Omega$		56.5	58	mA
Output Logic Levels Output logic high Output logic low	V _{OH} V _{OL}	$R_L = 50\Omega$	V _{DD} -1.08 -		- V _{DD} -1.55	V
Pk to Pk Output Swing		Single-Ended		800		mV
Output Transition time ³ Rise Time Fall Time	t _R t _F	20% to 80% $R_L=50\Omega$, $C_L=$ 0pF		250		ps
Frequency	f ₀	Single Frequency	2.3		460	MHz
Output Duty Cycle	SYM	Differential	48		52	%
Period Jitter	J _{PER}			2.5		р s_{RMS}
Integrated Phase Noise	J _{PH}	200kHz to 20MHz @156.25MHz 100kHz to 20MHz @156.25MHz 12kHz to 20MHz @156.25MHz		0.25 0.38 1.7	2	ps _{rms}

Notes:

1.

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

2. 3.

4.

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



Output Waveform



Typical Termination Scheme





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.			



Package Dimensions



7.0 x 5.0 mm Plastic Package









3.2 x 2.5 mm Plastic Package









7.0 x 5.0 mm Plastic Package

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MICREL, Inc.	•	2180 Fortune Drive,	San Jose, California	95131	•	USA
Phone: +1 (408) 944-0800	•	Fax: +1 (408) 474-1000	Email: hbwhelp@micrel	.com	•	www.micrel.com