



MX553BBD156M250

Ultra-Low Jitter 156.25MHz HCSL XO

ClockWorks® FUSION

General Description

The MX553BBD156M250 is an ultra-low phase jitter XO with HCSL output optimized for high line rate applications.

Applications

- 10/40/400 Gigabit Ethernet
- Fibre Channel 10G/12G SERDES

Absolute Maximum Ratings¹

Supply Voltage (VIN).....	+4.6V
Lead Temperature (soldering, 10s).....	260°C
Case Temperature.....	115°C
Storage Temperature (T _s).....	-65°C to +125°C
ESD Machine Model.....	200V
ESD Rating (HBM).....	2kV

Electrical Characteristics

VDD = 2.5V ±5% or 3.3V ±10%, -40°C to +85°C, outputs terminated with 50 Ohms to VSS.³

Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
IDD	Supply Current				95	mA
F0	Center Frequency			156.25		MHz
	Frequency Stability	Note 4			±50	ppm
∅j	Phase Noise	Integration Range (12kHz to 20MHz) Integration Range (1.875MHz to 20MHz)		163 83		fsRMS
Tstart	Start-Up Time				10	ms
TR/TF	Rise/Fall time	20%-80%	150	300	450	ps
	Duty Cycle		48	50	52	%
VOH	Output High Voltage	HCSL output levels	660	700	850	mV
VOL	Output Low Voltage	HCSL output levels	-150	0	27	mV
VOVS	Max Output Including Overshoot				VOH + 0.3	V
VUDS	Min Output Including Undershoot		VOL - 0.3			V
VRB	Ringback Voltage		0.2			V
VOX	Absolute Crossing Point		250	350	550	mV
Vswing	Peak to Peak Output Voltage Swing		640	700	950	mV

Notes:

1. Exceeding the absolute maximum ratings may damage the device.
2. The device is not guaranteed to function outside its operating ratings.
3. Guaranteed after thermal equilibrium.
4. Inclusive of initial accuracy, temperature drift, aging, shock, vibration.

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Features

- 156.25MHz HCSL
- Typical phase noise:
 - 83fs (Integration range: 1.875MHz-20MHz)
- ±50ppm total frequency stability
- -40°C to +85°C temperature range
- Industry standard 6-Pin 5mm x 3.2mm LGA package

Operating Ratings²

Supply Voltage (VIN).....	+2.375V to +3.63V
Ambient Temperature (TA).....	-40°C to +85°C
Junction Thermal Resistance	
LGA (T _{JA}) Still Air.....	58°C/W

Ordering Information

Ordering Part Number	Marking Line 1	Marking Line 3	Shipping	Package
MX553BBD156M250	MX553B	BD1562	Tube	6-Pin 5mm x 3.2mm LGA
MX553BBD156M250-TR	MX553B	BD1562	Tape and Reel	6-Pin 5mm x 3.2mm LGA

Devices are Green and RoHS compliant. Sample material may have only a partial top mark.

Pin Configuration



Pin Description

Pin Number	Pin Name	Pin Type	Pin Level	Pin Function
1	OE	I, SE	LVC MOS	Output Enable, disables output to tri-state, 0 = Disabled, 1 = Enabled, 50k Ohms Pull-Up
2	DNC			Make no connection, leave floating.
3	GND	PWR		Power Supply Ground
4, 5	Q, /Q	O, Diff	HC SL	Clock Output Frequency = 156.25MHz
6	VDD	PWR		Power Supply

Environmental Specifications

Thermal Shock	MIL-STD-883, Method 1011, Condition A
Moisture Resistance	MIL-STD-883, Method 1004
Mechanical Shock	MIL-STD-883, Method 2002, Condition C
Mechanical Vibration	MIL-STD-883, Method 2007, Condition B
Resistance to Soldering Heat	J-STD-020C, Table 5-2 Pb-free devices (except 2 cycles max)
Hazardous Substance	Pb-Free / RoHS / Green Compliant
Solderability	JESD22-B102-D Method 2 (Preconditioning E)
Terminal Strength	MIL-STD-883, Method 2004, Test Condition D
Gross Leak	MIL-STD-883, Method 1014, Condition C
Fine Leak	MIL-STD-883, Method 1014, Condition A2, R1=2x10 ⁻⁸ atm cc/s
Solvent Resistance	MIL-STD-202, Method 215

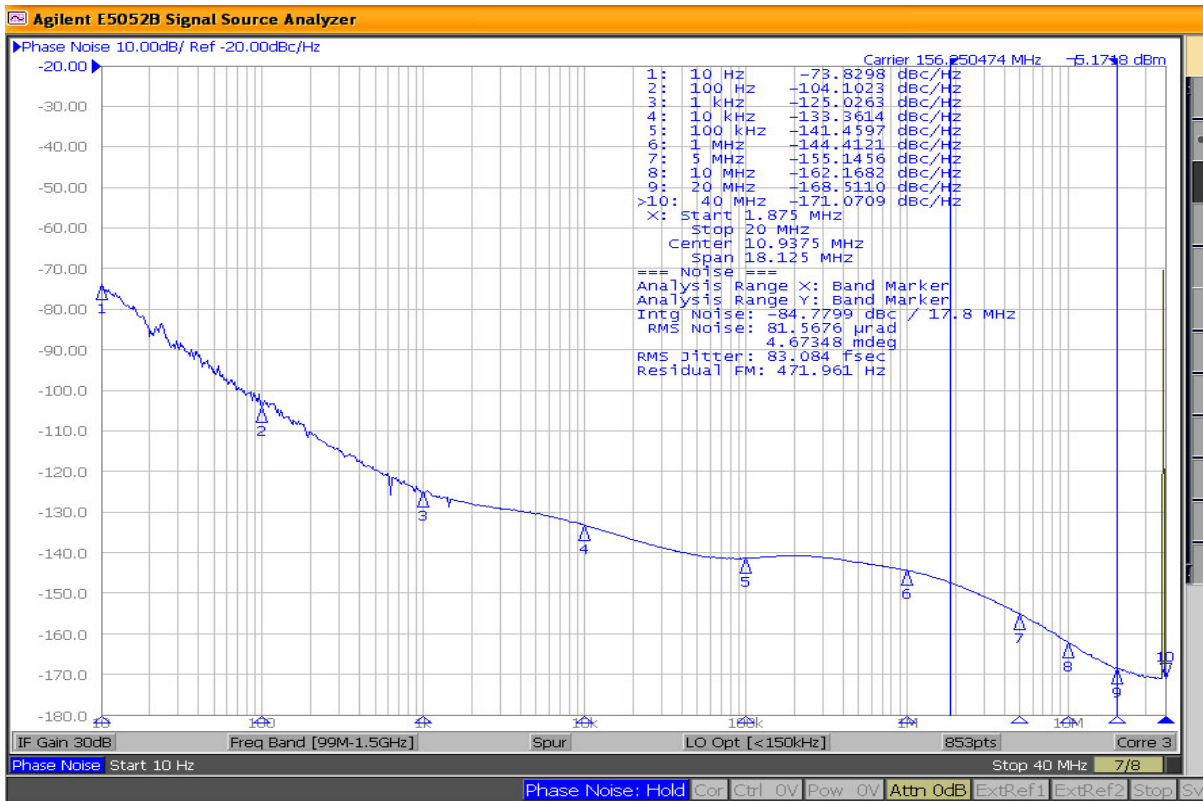


Figure 1. HCSL Output 156.25MHz 1.875MHz-20MHz 83fs

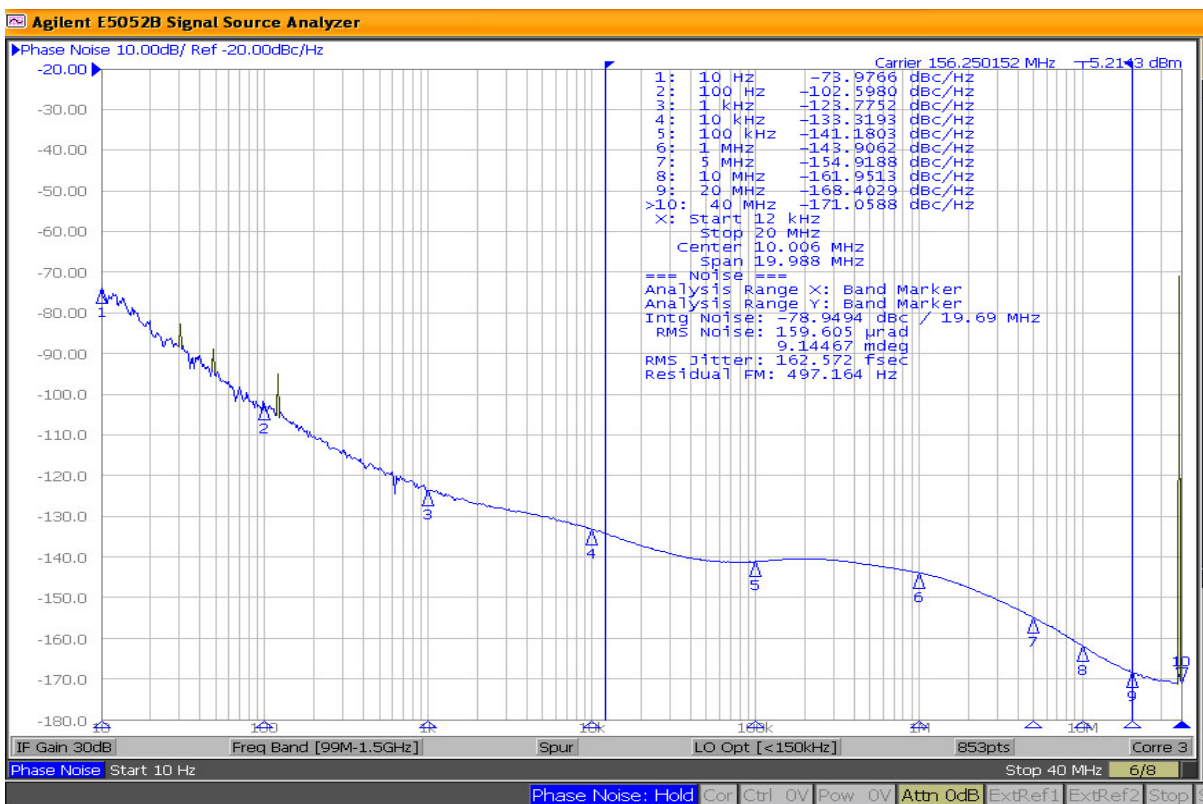
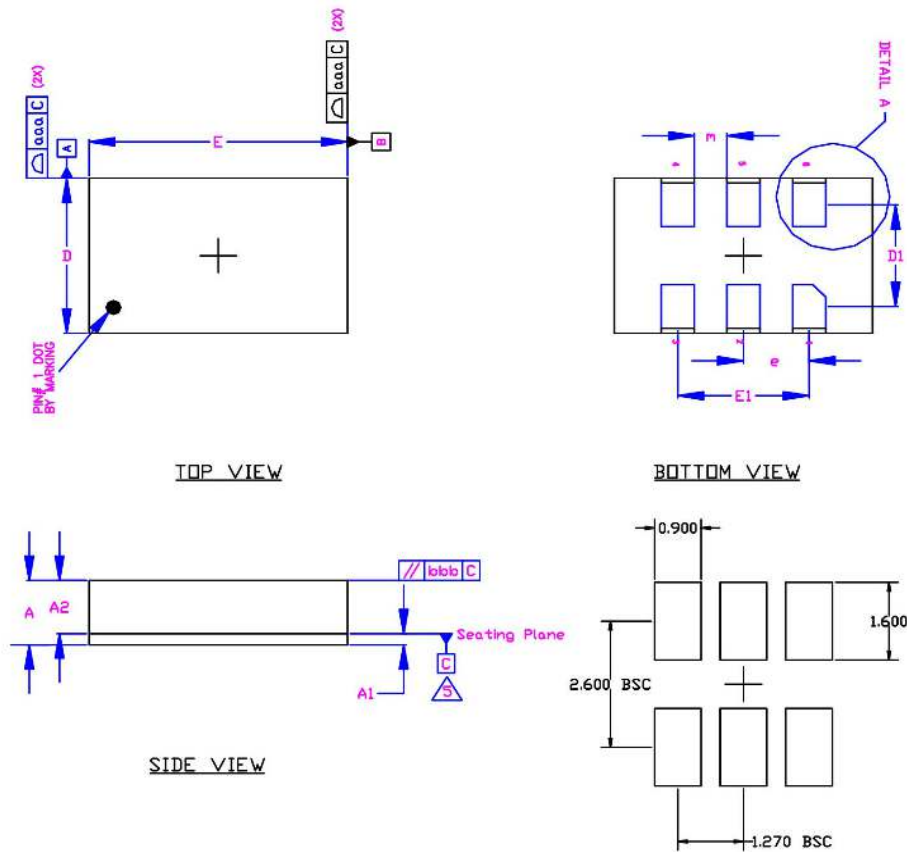


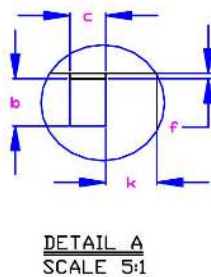
Figure 2. HCSL Output 156.25MHz 12kHz-20MHz 163fs

Package Information and Recommended Land Pattern for 6-Pin LGA³

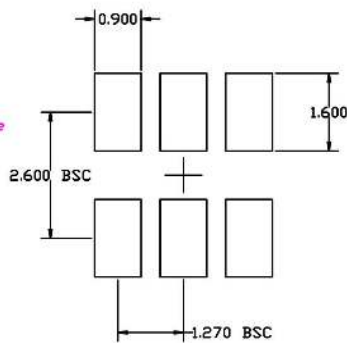


Dimensional Tol.	
aaa	0.100
bbb	0.170

Dimensional Ref.			
REF.	Min.	Nom.	Max.
A	1.260	1.330	1.400
A1	0.190	0.230	0.270
A2	1.070	1.100	1.130
D	3.100	3.200	3.300
D1	2.100 BSC		
E	4.900	5.100	5.100
E1	2.540 BSC		
b	0.850	0.900	0.950
c	0.850	0.900	0.950
e	1.270 BSC		
f	0.850	0.100	0.150
k	0.860	0.910	0.960
m	0.580	0.630	0.680
n	6		



RECOMMENDED LAND PATTERN



Notes

1. Dimensioning and Tolerancing per ASME Y14.5M-1994.
2. Dimensions are in millimeters.
3. 'e' represents the basic LGA pitch
4. 'n' is the maximum no. of Land for a specified Package.
5. Package warp shall be 0.050 max.
6. Substrate base is BT Resin
7. The Pin#1 corner must be identified on top side only.
8. Reference Jeduc Spec M0-220

Note:

3. Package information is correct as of the publication date. For updates and most current information, go to www.microchip.com.

6-Pin LGA (5x3.2mm)

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