

...when timing matters

M9200
Ultra Low Jitter Quad Frequency Oscillator

FEATURES

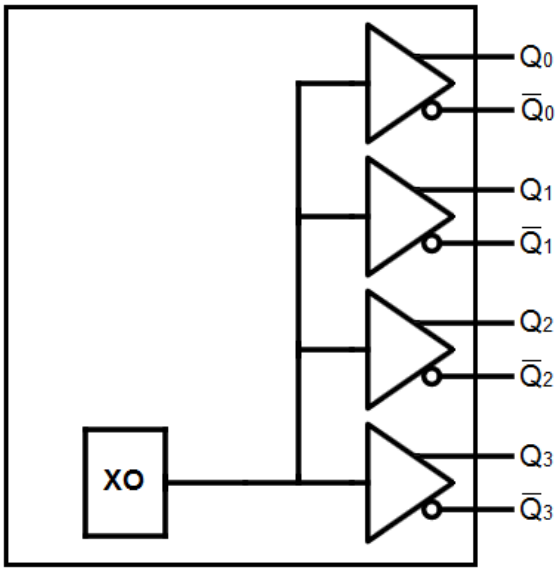
- **No clock input required (plug & play!)**
- **4 simultaneous outputs**
- **LVPECL output**
- **RMS Phase Jitter 120 fs Max, 12kHz to 20MHz (all four outputs)**
- **Low Phase Noise (-154 dBc/Hz @ 1MHz offset)**
- **3rd Overtone design technology**
- **Full RoHS directive**
- **-40°C to +85°C operating temperature range**

APPLICATIONS

- **10/40/100 Gigabit Ethernet**
- **ASIC/FPGA Interface**
- **Telecom**
- **Networking**

Description:

MtronPTI's M9200 simultaneously provides 4 differential (for LVPECL) or single ended (for CMOS) outputs. The M9200 does not require an external input clock source, just simply connect supply power and ground (plug & play!). The low noise internal clock source provides a best in class maximum RMS jitter specification of 100fs.



Environmental & Packaging Requirements:

Operating Temperature	T_A	-40		+85	°C	
Storage Temperature	T_S	-50		+125	°C	
Mechanical Shock	Per MIL-STD-202, Method 213, Condition E					
Vibration	Per MIL-STD-202, Method 204D, Condition D					
Thermal Cycle	Per MIL-STD-883, Method 1011, Condition A					
Hermeticity	Per MIL-STD-202, Method 112 (1 x 10^{-8} atm cc/s of Helium)					
Solderability	Per EIAJ-STD-002, Method 208					
Max. Soldering Conditions	See solder profile, Figure 1					
Package Type	10-pad 9.6 X 11.51 mm leadless FR-4. RoHS compliant.					

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Electrical Specifications:

Parameter	Symbol	Min.	Typ.	Max.	Units	Conditions
Frequency of Operation	F_O		156.250000		MHz	
Frequency Stability						
Frequency Stability	ΔF/F	-50		+50	ppm	Includes initial tolerance @ +25°C, deviation over operating temperature, variations to supply voltage, load, vibration and shock.
Aging		-5		+5	ppm	1st year
RF Output						
Output Type			LVPECL Compatible			
Output Load			50 Ω to (Vcc-2.0) V_{DC}		V	
Symmetry (duty cycle)	V_{OH}	45		55	%	Ref. to 50% of waveform
Logic Level "1"	V_{OH}	V_{cc}-1.40			V	
Logic Level "0"	T_{DC}			V_{cc}-1.620	V	
Differential Output Voltage	V_{OD}	0.5		0.9	V	
Rise/Fall Time	T_R/T_F		0.2	0.4	nS	20% to 80% of waveform
Start-up Time	T_{SU}			10	mS	$T_{ambient}$ = +25°C
Supply Voltage & Power Consumption						
Operating Voltage	V_{CC}	3.135	3.3	3.465	V	
Supply Current	I_{CC}			220	mA	
Phase Noise						
Phase Noise (measured @ 156.25MHz)			-70		dBc/Hz	@ 10 Hz
			-100			@ 100 Hz
			-125			@ 1 kHz
			-141			@ 10 kHz
			-154			@ 100 kHz
			-155			@ 1 MHz
RMS Jitter						
Phase Jitter (RMS)	ΦJ			0.120	pS	12KHz to 20MHz

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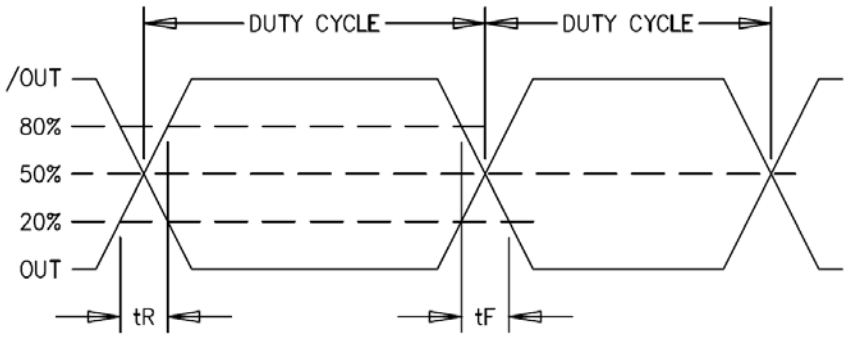
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Output Waveform:



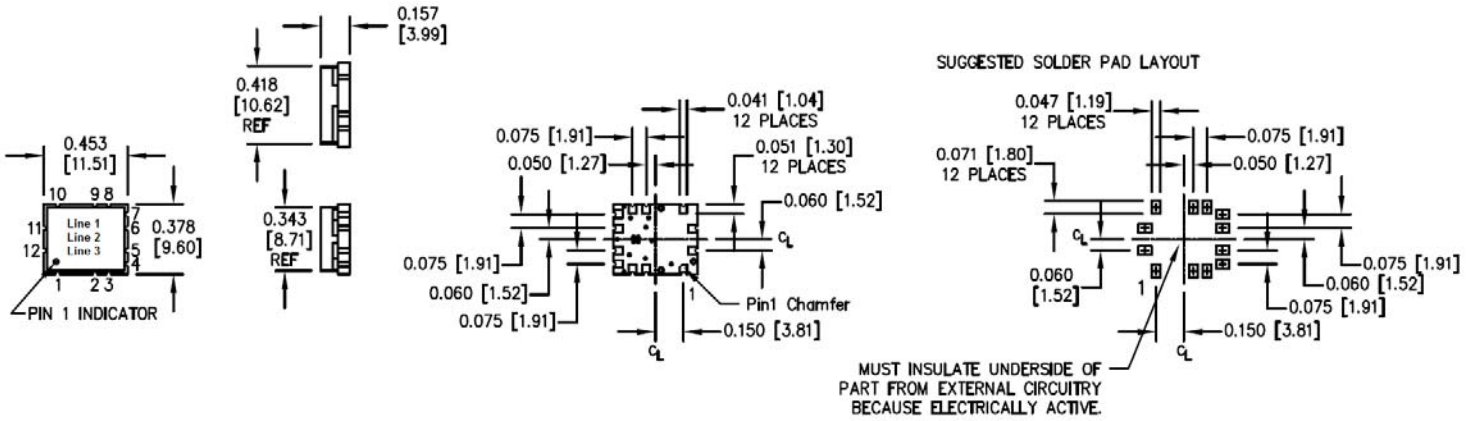
Marking, Pin Out:

Pad	Function
1	Ground
2	Output Q_3
3	Output $\overline{Q}_3$
4	Output Q_2
5	Output $\overline{Q}_2$
6	Output Q_1
7	Output $\overline{Q}_1$
8	Output Q_0
9	Output $\overline{Q}_0$
10	$+V_{CC}$
11	Ground
12	Ground

Part Marking	
Line 1	M9200S001
Line 2	156.2500 MHz
Line 3	M yyww

Legend	
yy	Year
ww	Work Week

Dimensions:



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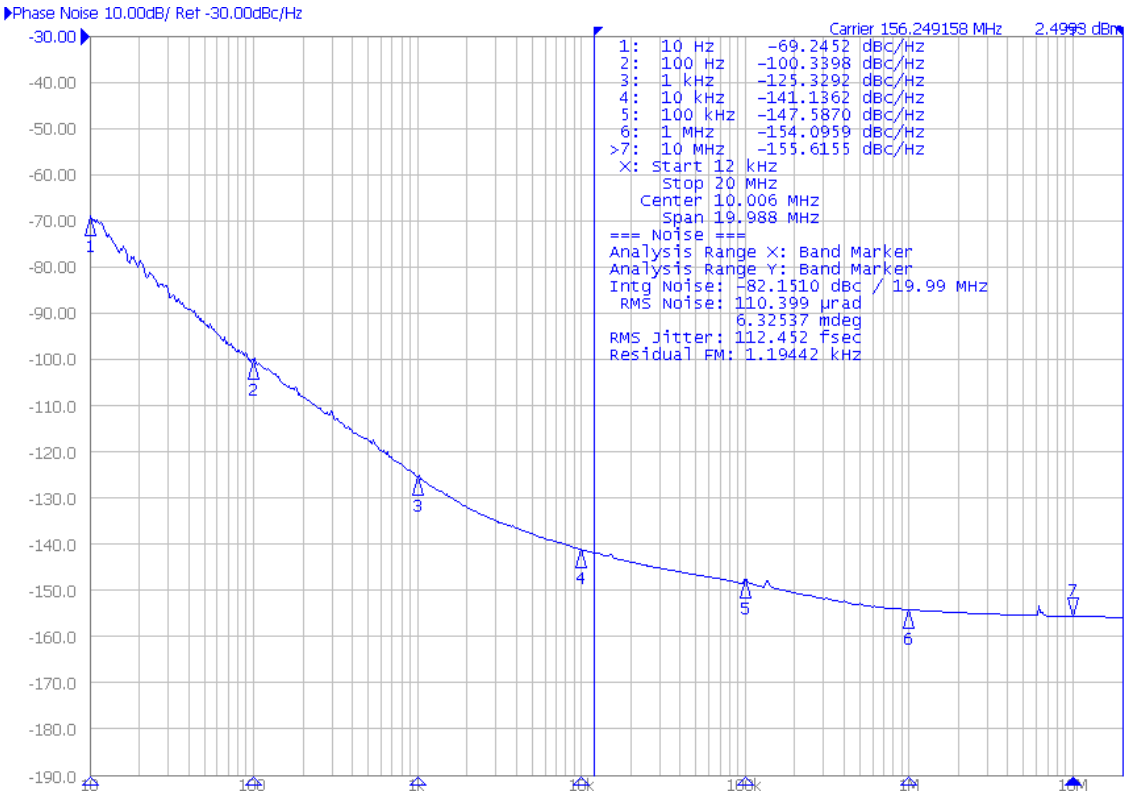
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SSB Phase Noise Plot:



Recommended reflow Profile:

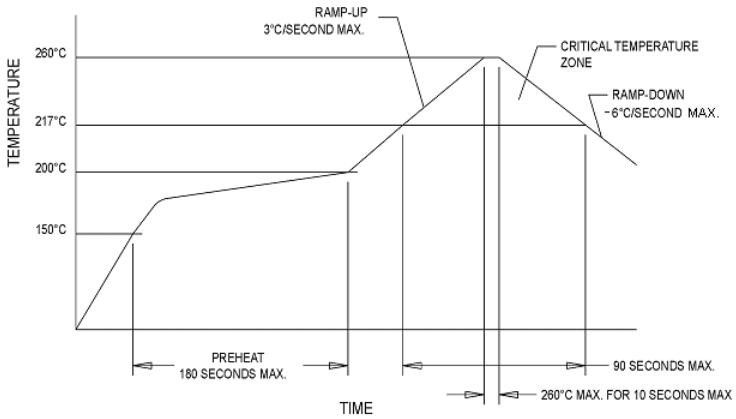


Figure 1

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