M2058/M2059 Series
5.0x7.0 mm, LVPECL/LVDS SMT OSCILLATOR

FEATURES

LVPECL/LVDS Differential Output
RMS Phase Jitter < 100 fs, 12 kHz to 20 MHz, (156.25 MHz, PECL output)
Low Phase Noise
3rd Overtone crystal Technology
Compliant to RoHS directive
Operating Voltage: 2.5/3.3 V

APPLICATIONS

10 Gigabit Ethernet switches/routers
Network Interface Card
Military Communications
Optical Transceiver

ORDERING INFORMATION

M205x	2	4	B	P	N	00.0000 MHz

Product Series
M2058 = 3.3 V
M2059 = 2.5 V

Temperature Range
1: 0°C to +70°C
6: -20°C to +70°C
2: -40°C to +85°C

Stability
3: ± 100 ppm
4: ± 50 ppm
6: ± 25 ppm
8: ± 20 ppm

Enable/Disable Function
B: Enable High (Pad 1)
G: Enable High (Pad 2)
U: No Enable/Disable Function

Output Type
P: LVPECL
L: LVDS

Package/Lead Configurations
N: Leadless Ceramic (6 Pad)

Frequency (customer specified)

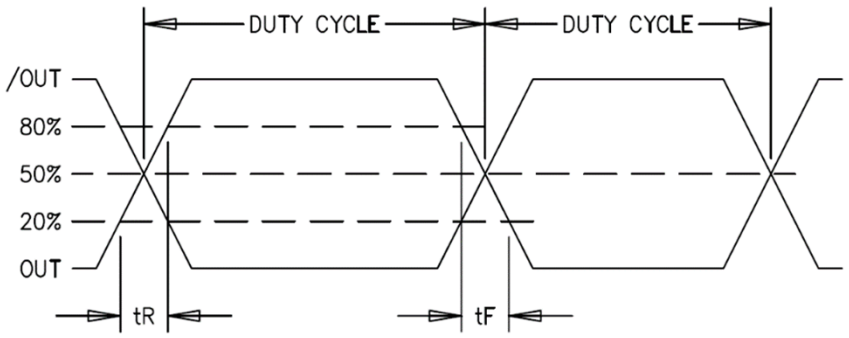
Example Part Number: M205824BPN 156.2500 MHz

LVPECL ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Min.	Typ.	Max.	Units	Conditions
Frequency Range	F_0	25		220	MHz	
Frequency Stabilities						
vs. Operating Temperature	$\Delta F/F$	See ordering information			ppm	Includes initial tolerance @ +25°C, deviation over operating temperature, variations to supply voltage, load, vibration and shock.
vs. Aging		-5.0		+5.0	ppm	1st year
RF Output						
		LVPECL Compatible				
Output Load		50 Ω to (V_{CC} - 2) or equivalent				
Symmetry (duty cycle)	T_{DC}	45		55	%	@ 50% of waveform
Logic Level "1"		V_{CC} - 1.085		V_{CC} - 0.860		
Logic Level "0"		V_{CC} - 1.810		V_{CC} - 1.620		
Rise/Fall Time	T_R/T_F		0.4	0.6	ns	20% to 80% of waveform
Start-up Time	T_{SU}			10	ms	$T_{ambient}$ = +25°C
Enable/Disable Logic		70% V_{CC} or N/C			V	Pad 1 or Pad 2 Outputs Enabled
				30% V_{CC}	V	Pad 1 or Pad 2 Outputs disabled to HIGH Impedance State, Oscillator Stops
Other Parameters						
Phase Jitter (RMS)	Φ_J			0.100	ps	12 KHz to 20 MHz 156.25HMz

Operating Voltage and Current						
Parameter	**Symbol**	**Min.**	**Typ.**	**Max.**	**Units**	**Conditions**
Operating Voltage	V_{CC}	3.135	3.300	3.465	V	M2058
		2.375	2.500	2.625	V	M2059
Operating Current	I_{CC}			75	mA	

OUTPUT WAVEFORM

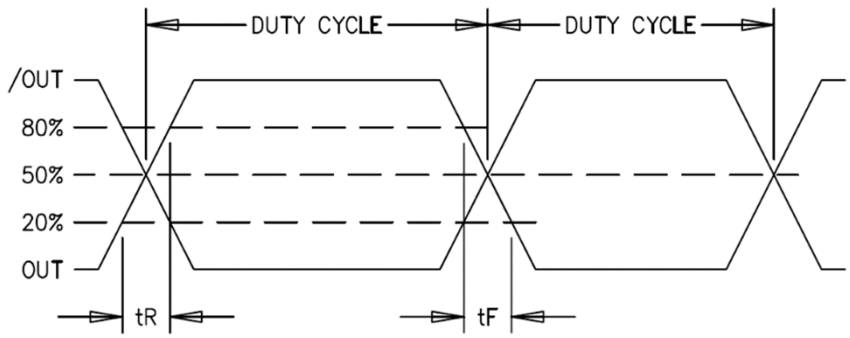


LVDS ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Min.	Typ.	Max.	Units	Conditions
Frequency Range	F_0	25		220	MHz	
Frequency Stabilities						
vs. Operating Temperature	$\Delta F/F$	See ordering information			ppm	Includes initial tolerance @ +25°C, deviation over operating temperature, variations to supply voltage, load, vibration and shock.
vs. Aging		-5.0		+5.0	ppm	1st year
RF Output						
		LVDS Compatible				
Output Load		100 Ω Differential				
Symmetry (duty cycle)	T_{DC}	45		55	%	@ 50% of waveform
Differential Output Voltage	V_{DIFF}	250	350	450	mV	peak-to-peak differential output voltage
Output Offset Voltage	V_{OS}	1.125	1.250	1.375	V	
Rise/Fall Time	T_R/T_F		0.4	0.6	ns	20% to 80% of waveform
Start-up Time	T_{SU}			10	ms	$T_{ambient}$ = +25°C
Enable/Disable Logic		70% V_{CC} or N/C			V	Pad 1 or Pad 2 Outputs Enabled
				30% V_{CC}	V	Pad 1 or Pad 2 Outputs disabled to HIGH Impedance State, Oscillator Stops
Other Parameters						
Phase Jitter (RMS)	Φ_J			0.150	ps	12 KHz to 20 MHz 156.25HMz

Operating Voltage and Current						
Parameter	**Symbol**	**Min.**	**Typ.**	**Max.**	**Units**	**Conditions**
Operating Voltage	V_{CC}	3.135	3.300	3.465	V	M2058
		2.375	2.500	2.625	V	M2059
Operating Current	I_{CC}			40	mA	

OUTPUT WAVEFORM

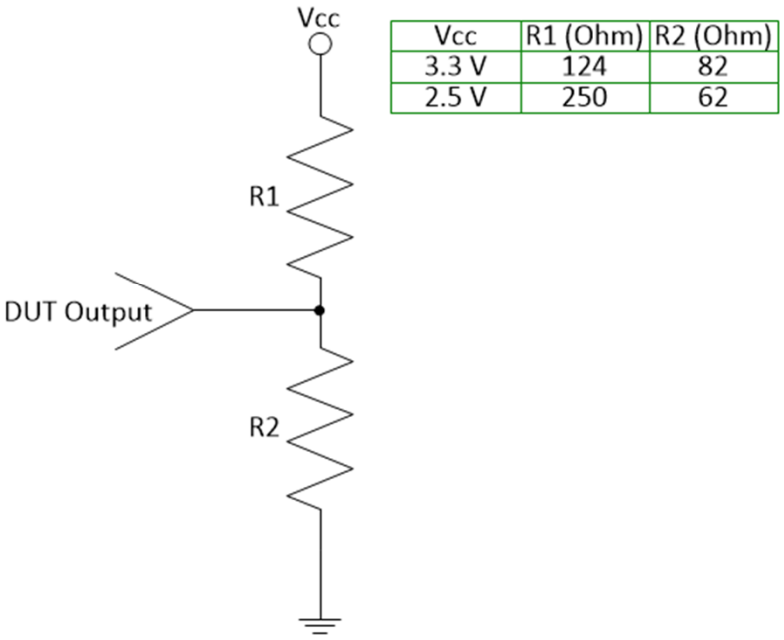


ENVIRONMENTAL CONDITIONS

Temperature						
Operating Temperature	T_A	See ordering information			°C	
Storage Temperature	T_S	-55		+125	°C	
Mechanical Shock	Per MIL-STD-202, Method 213, Condition E					
Vibration	Per MIL-STD-202, Method 204D, Condition D					
Aging	+85°C ±3°C, 720H (No BIAS)					
Humidity	+40°C ±2°CX90~95%, 96H (NO BIAS)					
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)					
Moisture Sensitivity Level	MSL1					
Solderability	Per EIAJ-STD-002, Method 208					
Max. Soldering Conditions	See solder profile, Figure 1					
Pad Termination	Gold, 1 µm maximum thickness					
Package Type	6-pad 5.0 X 7.0 mm leadless ceramic. RoHS compliant.					

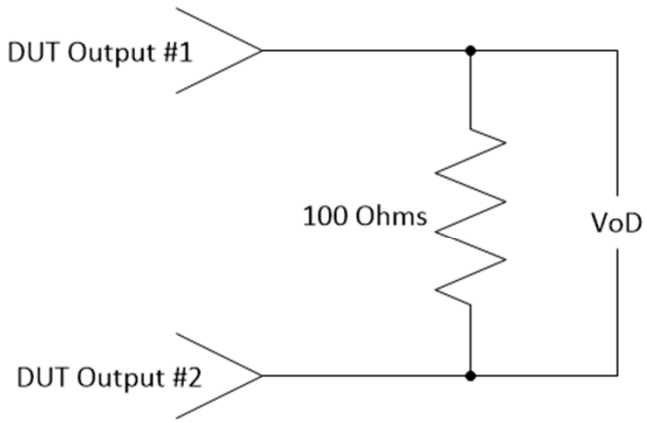
LOAD CIRCUIT DIAGRAMS

LVPECL Load Circuit



Vcc	R1 (Ohm)	R2 (Ohm)
3.3 V	124	82
2.5 V	250	62

LVDS Load Circuit



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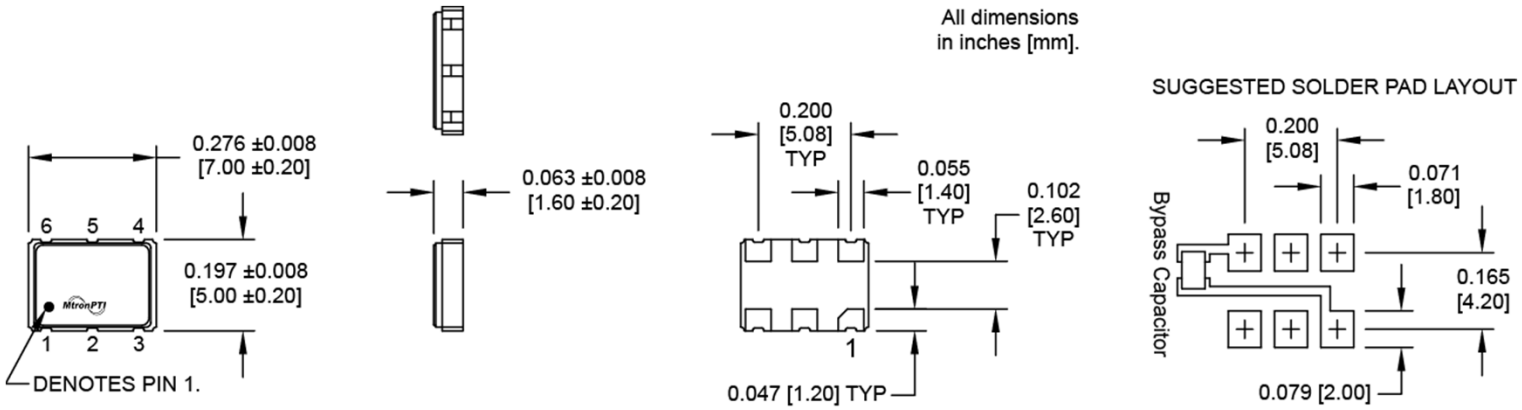
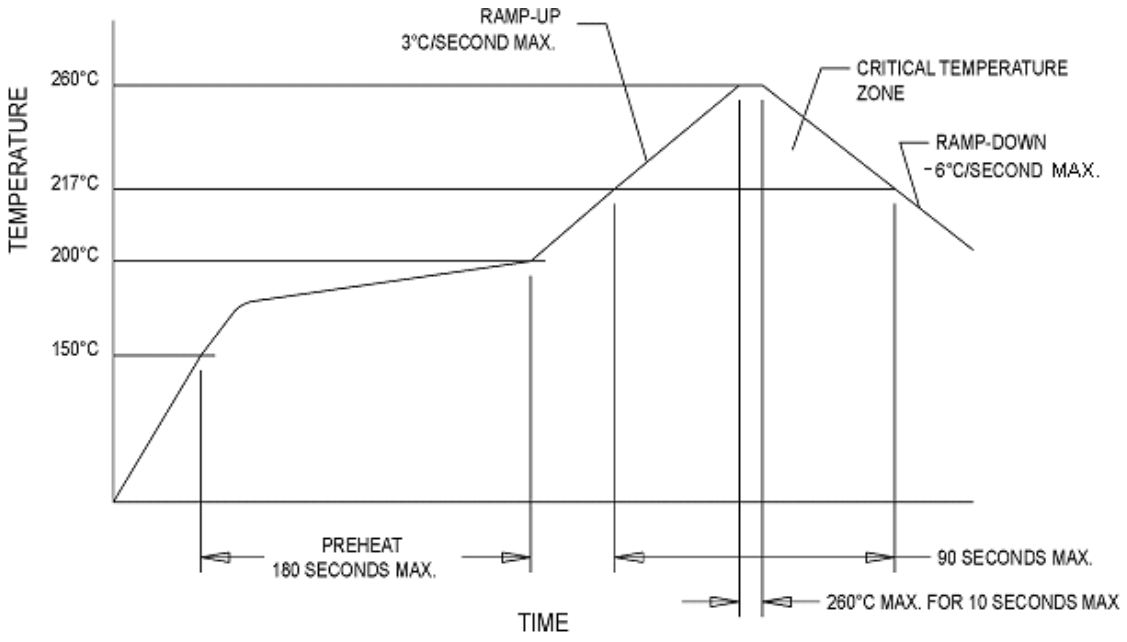
MECHANICAL AND PIN OUT INFORMATION

Pad	Function
1	Enable/Disable or N/C
2	Enable/Disable or N/C
3	Ground
4	Output Q
5	Output $\bar{Q}$
6	Supply +Vcc



LEAD FREE SOLDER PROFILE



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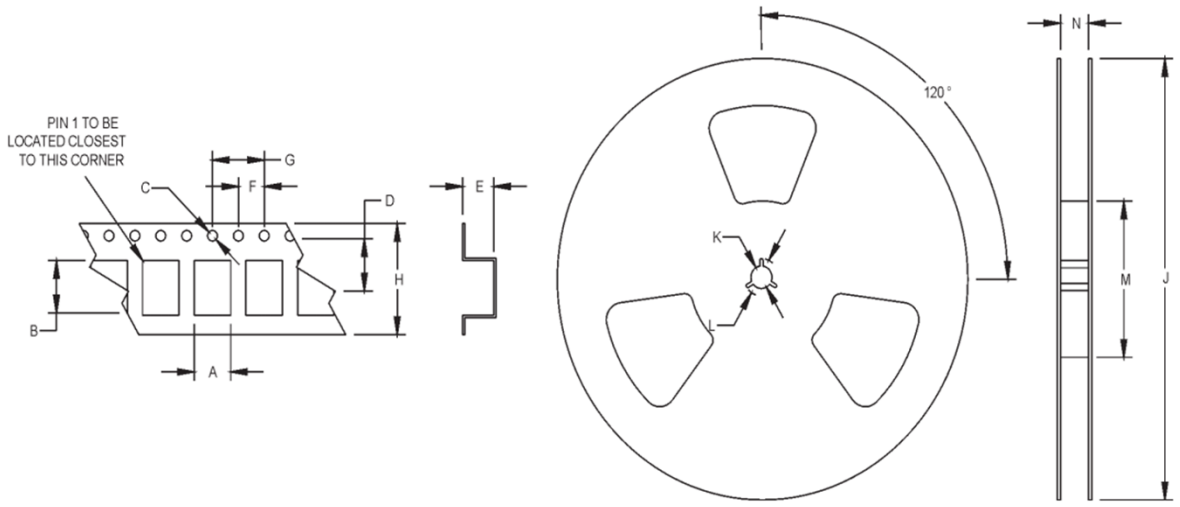
TAPE AND REEL SPECIFICATIONS

All units in mm



A	B	C	D	E	F	G	H	J	K	L	M
5.32	7.28	1.5	7.5	2.2	4	8	16	178	13.5	24.8	80

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No liability is assumed as a result of their use or application.