PLETRONICS PRONTO™ QM44L Series
CMOS Configurable Clock Oscillator



QM44L
3.2 x 2.5 x 0.95 mm
LCC Ceramic Package

Features

- A configurable quartz crystal controlled precision square wave oscillator
- CMOS Output (will interface with TTL devices)
- Enable/Disable Function (low standby power option)
- Low Jitter
- 1.8V, 2.5V, or 3.3V nominal Supply Voltage
- 1-160 MHz Frequency Range (1-125MHz at 1.8V)
- Fundamental crystal

Applications

Driving A/Ds, D/As, FPGAs
Digital Video
Ethernet, GbE
Medical
Storage Area Networking
COTS
Broad Band Access
SONET/ SDH/ DWDM
Test & Measurement

Electrical Characteristics

Parameter	Min	Typ	Max	Unit	Condition
Frequency Range [2]	1	-	160	MHz	(1.8V frequency range 1-125MHz)
Frequency Stability [2]	±20*	-	±50	ppm	For all supply voltages, load changes, aging for 1 year at 25°C ± 2°C, shock, vibration and temperatures. *Aging excluded
Operating Temperature Range [2]	-10 -20 -40 -40	- - - -	+70 +70 +85 +105	°C	Standard range Extended range **C** option Extended range **E** option Extended range **G** option
Supply Voltage [1, 2] V_{CC}	1.8	-	3.3	V	± 5%, See Part Number options on page 3
Supply Current I_{CC}	-	-	-	mA	See Page 2
Output Waveform	CMOS				Cload = 15 pF
Duty Cycle	45	-	55	%	
Output V_{HIGH}	0.9Vcc	-	-	V	See Load Circuit and waveform page
Output V_{LOW}	-	-	0.1Vcc	V	
Output T_{RISE} and T_{FALL}	-	-	2	ns	
Startup Time	-	-	8	ms	After Vcc ≥ 1.62V, Time for output to reach specified frequency
$V_{DISABLE}$ VIL	-	-	0.3Vcc	V	
V_{ENABLE} VIH	0.7Vcc	-			
Output Enable Time	-	-	100	ns	Time for valid output (E/D version)
Output Disable Time	-	-	100	ns	Time for output to reach a high Z state
Disable Current	- -	- 0.4	- -	mA	Enable/Disable: Pad 1 low, output disabled; See page 2 Standby option: Pad 1 low, output disabled, oscillator shutdown
Jitter	-	1.0	-	ps	12 kHz to 20 MHz @ 110 MHz
Storage Temperature Range	-55	-	+125	°C	

Notes: Specifications with Pad 1 E/D open circuit
[1] Place an appropriate power supply bypass capacitor next to Vcc for best performance
[2] Specified by part number

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Electrical Characteristics - Input Current

Parameter	Min	Typ	Max	Unit	Condition Vcc = 3.3V	
Supply Current I_{CC}			27 30 35	mA	1MHz ≤ Fo < 75MHz 75MHz ≤ Fo < 125MHz 125MHz ≤ Fo < 160MHz	15pF load

Parameter	Min	Typ	Max	Unit	Condition Vcc = 2.5V	
Supply Current I_{CC}			27 30 35	mA	1MHz ≤ Fo < 75MHz 75MHz ≤ Fo < 125MHz 125MHz ≤ Fo ≤ 160MHz	15pF load

Parameter	Min	Typ	Max	Unit	Condition Vcc = 1.8V	
Supply Current I_{CC}			25	mA	1MHz ≤ Fo ≤ 125MHz	15pF load

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Part Number**

Series Model	Frequency Stability		Operating Temperature Range	Supply Voltage V_{cc}	Frequency in MHz
QM44	45	L	E	V	- 125.0M
	45 = ± 50 ppm (STD) 44 = ± 25 ppm 20 = ± 20 ppm		Blank = -10 to +70°C (STD) C = -20 to +70°C E = -40 to +85°C G = -40 to +105°C	X = 1.8V ± 5% W = 2.5V ± 5% V = 3.3V ± 5%	1 - 160 MHz (1.8V: 1-125MHz)

** A custom part number is assigned for parts using the standby option

Device Marking

PFF.FF
- ***YMDxxx***

P = Pletronics
FF.FF = Frequency, max 5 digits includes decimal. Integer freq, i.e., 50MHz, to significant decimal (50.0)
YMD Date Code, Year Month Day (see below)
xxx = internal factory codes

Note: Specifications such as frequency stability, supply voltage and operating temperature range, etc. are not identified from marking. External packaging labels and packing list will correctly identify the ordered Pletronics part number.

Codes for Date Code YMD (Year Month Day)

Code	5	6	7	8	9	Code	A	B	C	D	E	F	G	H	J	K	L	M
Year	2025	2026	2027	2028	2029	Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

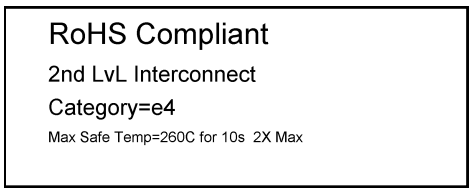
Code	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Code	H	J	K	L	M	N	P	R	T	U	V	W	X	Y	Z	
Day	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	

Package Labeling

P/N Label is 1" x 2.6" (25.4mm x 66.7mm)
Font is Courier New
Bar code is 39-Full ASCII



RoHS Label is 1" x 2.6" (25.4mm x 66.7mm)
Font is Arial

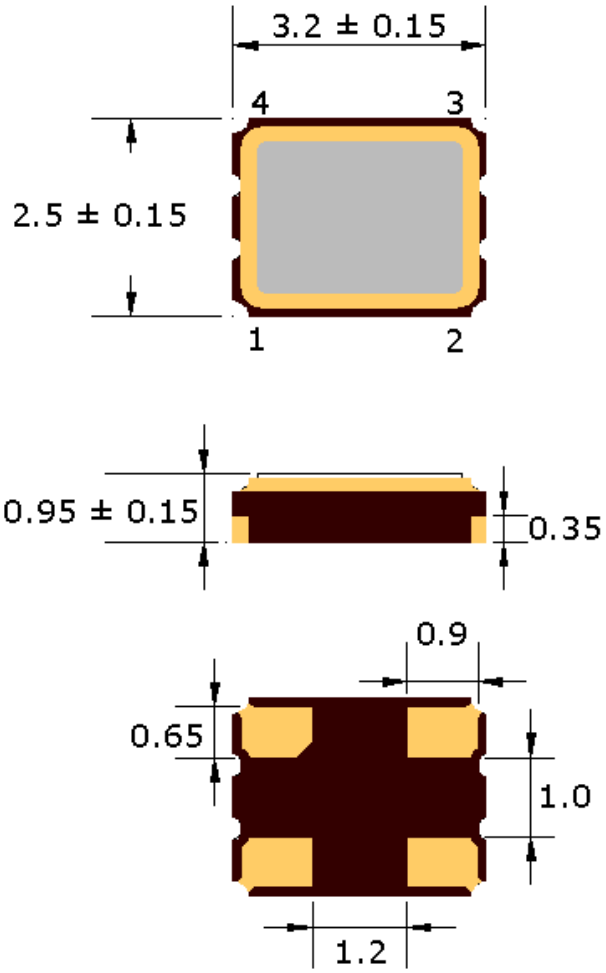


Pletronics Inc. certifies this device is in accordance with the RoHS and REACH directives.

Pletronics Inc. guarantees the device does not contain the following: Cadmium, Hexavalent Chromium, Lead, Mercury, PBB's, PBDE's
Weight of the Device: 0.026 grams
Moisture Sensitivity Level: 1 As defined in J-STD-020D
Second Level Interconnect code: e4

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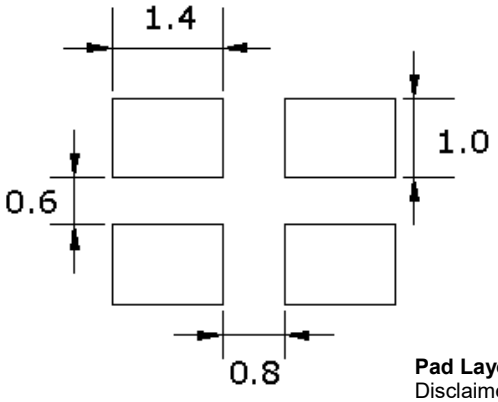
Mechanical Dimensions



Pad Connections

Pad	Function
1	Enable/Disable
2	Ground
3	Output
4	Vcc

ENABLE/DISABLE	
Pad 1	Output
V_{IH}/Open	Active
V_{IL}/Gnd	Disabled/Tristate



Pad Layout
Disclaimer: Recommended layout shown. Adjust layout as needed for individual process requirements.

Dimensions in mm

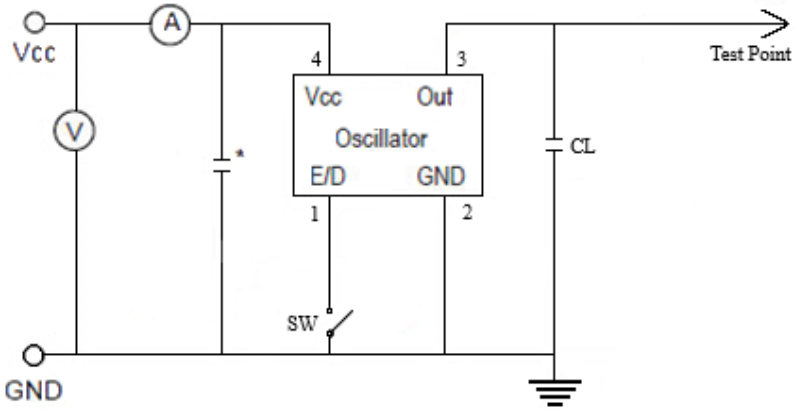
Contacts (pads): Gold (0.3 to 1.0 µm) over Nickel (1.27 to 8.89 µm)

For Optimum Jitter Performance, Pletronics recommends:

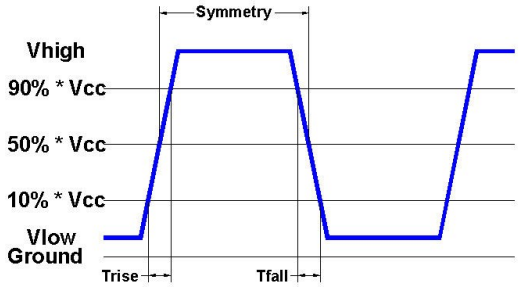
- A ground plane under the device
- Do not route large transient signals (both current and voltage) under the device
- Do not place near a large magnetic field such as a high frequency switching power supply
- Do not place near piezoelectric buzzers or mechanical fans

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Electrical Test / Load Circuit



Notes:
CL: 15pF Includes the input capacitance of oscilloscope
* 0.01~0.1µF external by-pass filter is recommended



Environmental / ESD Ratings

Reliability: Environmental

Parameter	Condition
Mechanical Shock	MIL-STD-883, Method 2002, Condition B
Vibration	MIL-STD-883, Method 2007, Condition A
Solderability	IPC J-STD-002
Thermal Cycle	MIL-STD-883 Method 1010, Condition B

ESD Rating

Model	Min. Voltage	Condition
Human Body Model	2000V	MIL-STD-883 3015.7
Machine Model	200V	EIAJ ED-4701/304

Thermal Characteristics:
The maximum die or junction temperature is 125°C

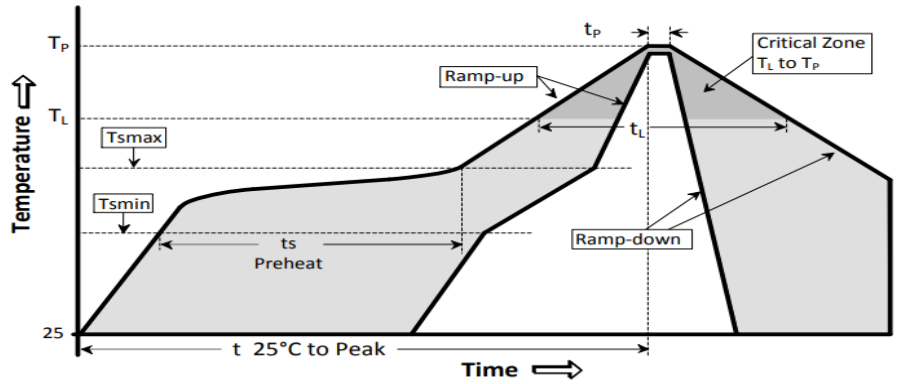
Absolute Maximum Ratings

Parameter	Unit
V_{CC} Supply Voltage	-0.5V to +7.0V
Vi Input Voltage	-0.5V to V_{CC} + 0.5V
Vo Output Voltage	-0.5V to V_{CC} + 0.5V

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Reflow Cycle

Maximum Reflow Conditions in accordance with IPC/JEDEC J-STD-020C "Pb-free"

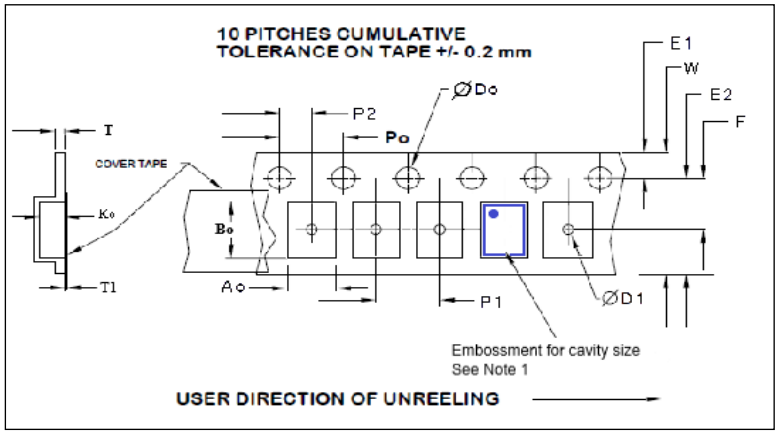


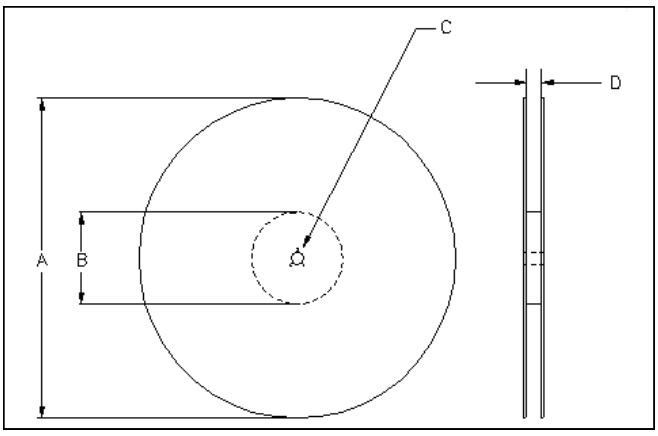
Temperature Profile	Symbol	Condition	Unit
Average ramp-up rate	(Ts_{max} to T_P)	3°C / second max	°C / s
Ramp down Rate	T_{cool}	6°C / second max	°C / s
Time 25°C to Peak Temperature	$T_{to\text{-}peak}$	8 minutes max	min
Preheat			
Temperature min	Ts_{min}	150	°C
Temperature max	Ts_{max}	200	°C
Time Ts_{min} to Ts_{max}	ts	60 – 180	sec
Soldering above liquidus			
Temperature liquidus	T_L	217	°C
Time above liquidus	t_L	60 – 150	sec
Peak temperature			
Peak Temperature	Tp	260	°C
Time within 5°C of peak temperature	tp	20 – 40	sec

The part may be reflowed 2 times without degradation (typical for lead free processing).

Tape and Reel

Tape and Reel available for quantities of 250 to 3000 per reel, cut tape for < 250. 8mm tape, 4mm pitch.





Tape Variable Dimensions Table 2							
Tape Size	E2 typ	F	P1	W max	Ao	Bo	Ko
8mm	6.25	3.5 ±0.05	4.0 ±0.1	8.2	2.7 ± 0.1	3.4 ± 0.1	1.4 ± 0.1

Dimensions in mm Drawing Not to scale

Note 1: Embossed cavity to conform to EIA– 481-B

Tape Constant Dimensions Table 1							
Tape Size	Do	D1 min	E1	Po	P2	T max	T1 max
8mm	1.5 +0.1 -0.0	1.0	1.75 ±0.1	4.0 ±0.1	2.0 ±0.05	0.3	0.1

Reel Dimensions (may vary) Table 3						
	A		B		C	D
Reel Size	Inches	mm	Inches	mm	mm	mm
7	7.0	180	2.50	60	13.0 +0.5 -0.2	Tape size +0.4 +2.0 -0.0

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