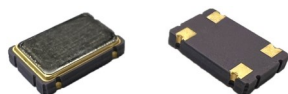




PLETRONICS *PRONTO*™ QM77L Series

CMOS Configurable Clock Oscillator



QM77L
7.0 x 5.0 x 1.3 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 (±50ppm)
Supply Voltage ^{1,2} V _{CC}	1.8	-	3.3	Volts	± 5%, See Part Number options on page 3
Supply Current I _{CC}	-	-	-	mA	See Page 2
Output Waveform	CMOS				Load = 15 pF
Duty Cycle	45	-	55	%	At 50%V _{CC} level See Load Circuit and waveform page
Output V _{HIGH}	0.9V _{CC}	-	-	V	
Output V _{LOW}	-	-	0.1V _{CC}	V	
Output T _{RISE} and T _{FALL}	-	-	2	ns	
Startup Time	-	-	8	ms	After V _{CC} ≥ 1.62V, Time for output to reach specified frequency
V _{DISABLE} V _{IL}	-	-	0.3V _{CC}	V	
V _{ENABLE} V _{IH}	0.7V _{CC}	-			
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 device for correct operation

² Specified by part number



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Electrical Characteristics - Input Current

Parameter	Min	Typ	Max	Unit	Condition V _{cc} = 3.3V	
Supply Current I _{cc}			27	mA	1MHz ≤ F _o < 75MHz	15pF load
			30		75MHz ≤ F _o < 125MHz	
			35		125MHz ≤ F _o < 160MHz	

Parameter	Min	Typ	Max	Unit	Condition V _{cc} = 2.5V	
Supply Current I _{cc}			27	mA	1MHz ≤ F _o < 75MHz	15pF load
			30		75MHz ≤ F _o < 125MHz	
			35		125MHz ≤ F _o ≤ 160MHz	

Parameter	Min	Typ	Max	Unit	Condition V _{cc} = 1.8V	
Supply Current I _{cc}			25	mA	1MHz ≤ F _o ≤ 125MHz	15pF load



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Part Number**

Series Model	Frequency Stability		Operating Temperature Range	Supply Voltage V _{CC}	Frequency in MHz
QM77	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 (±50ppm)	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

PRONTO
FF.FFFF
• **YMDxxx**

PRONTO = Pletronics Model
FF.FFFF = Frequency (MHz), max 7 characters 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	3	4	5	6	7	Code	A	B	C	D	E	F	G	H	J	K	L	M
Year	2023	2024	2025	2026	2027	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

P/N: 
PLE Part Number
Customer P/N: 
12345678
Qty: 
1000 D/C 
2A1
MSL: 1

RoHS Compliant

2nd Lvl Interconnect

Category=e4

Max Safe Temp=260C for 10s 2X Max

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

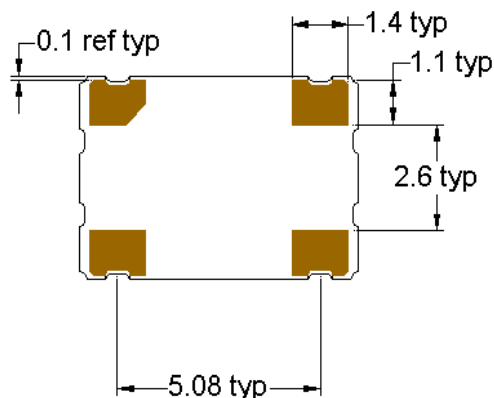
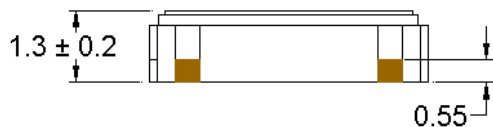
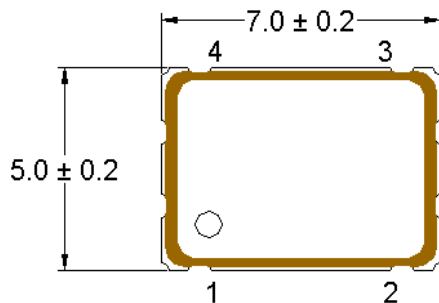
Pletronics Inc. guarantees the device does not contain the following: Cadmium, Hexavalent Chromium, Lead, Mercury, PBB's, PBDE's
Weight of the Device: 0.149 grams
Moisture Sensitivity Level: 1 As defined in J-STD-020D
Second Level Interconnect code: e4



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Mechanical Dimensions

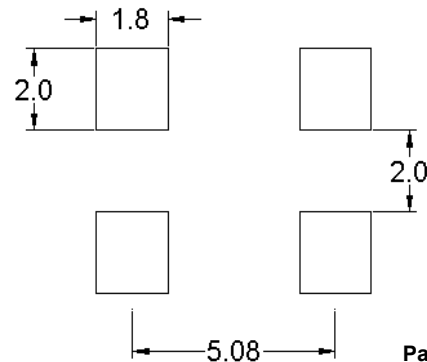


Dimensions in mm

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.

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

For Optimum Jitter Performance, Pletronics recommends:

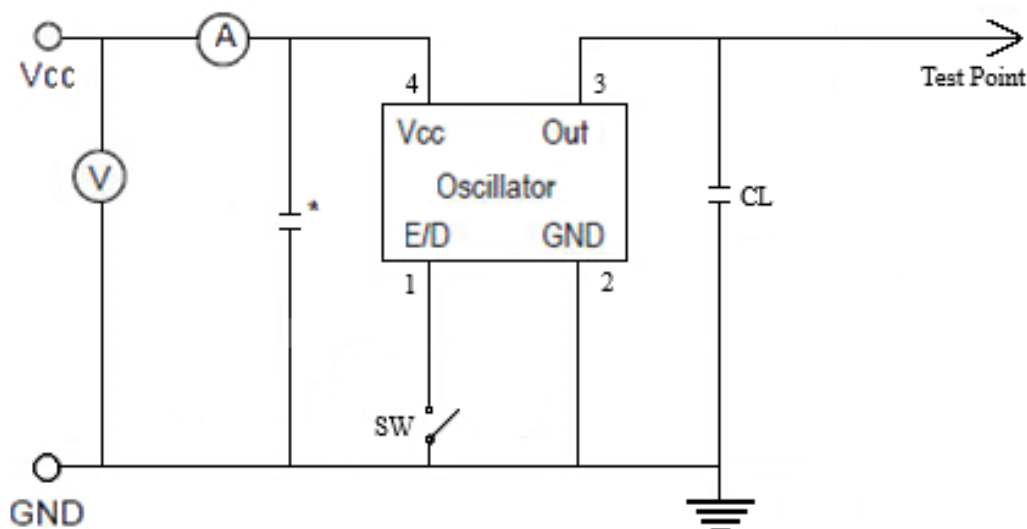
- A ground plane under the device
- Do not route large transient signals (both current and voltage) under the device
- Do not place near a large magnetic field such as a high frequency switching power supply
- Do not place near piezoelectric buzzers or mechanical fans



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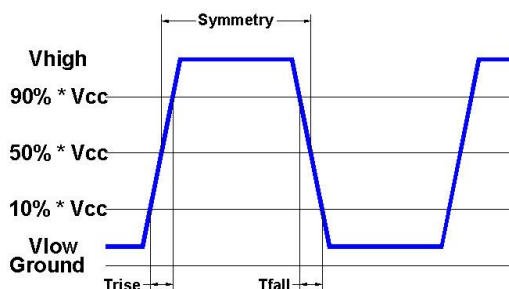
Electrical Test / Load Circuit



Notes:

CL: Includes the input capacitance of oscilloscope

* 0.01~0.1 μ F 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

Absolute Maximum Ratings

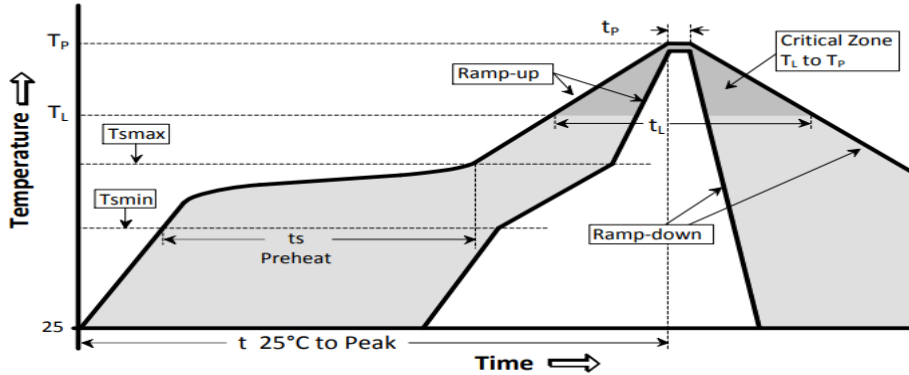
Parameter	Unit
V _{CC} Supply Voltage	-0.5V to +7.0V
V _i Input Voltage	-0.5V to V _{CC} + 0.5V
V _o Output Voltage	-0.5V to V _{CC} + 0.5V

Thermal Characteristics:

The maximum die or junction temperature is 125°C

Reflow Cycle

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

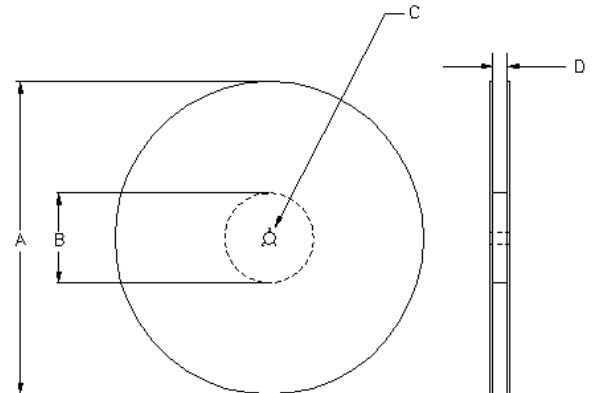
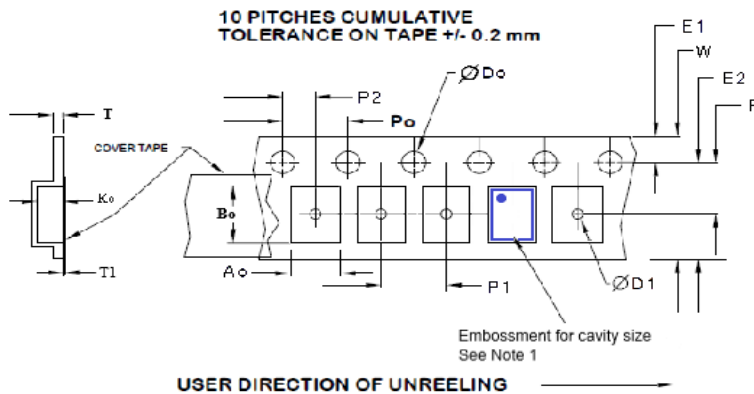


The part may be reflowed 2 times without degradation (typical for lead free processing).

Temperature Profile	Symbol	Condition	Unit
Average ramp-up rate	(T _{smax} 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-peak}	8 minutes max	min
Preheat			
Temperature min	T _{smin}	150	°C
Temperature max	T _{smax}	200	°C
Time T _{smin} to T _{smax}	t _s	60 – 180	sec
Soldering above liquidus			
Temperature liquidus	T _L	217	°C
Time above liquidus	t _L	60 – 150	sec
Peak temperature			
Peak Temperature	T _p	260	°C
Time within 5°C of peak temperature	t _p	20 – 40	sec

Tape and Reel

Tape and Reel available for quantities of 250 to 1000 per reel, cut tape for < 250. 16mm tape, 8mm pitch.



Tape Variable Dimensions Table 2							
Tape Size	E2 typ	F	P1	W max	A0	B0	K0
16mm	14.25	7.5 ±0.05	8.0 ±0.1	16.3	5.56±0.1	7.85±0.1	2.0±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 typ	E1	Po	P2	T max	T1 max
16mm	1.5 +0.1 -0.0	1.5	1.75 ±0.1	4.0 ±0.1	2.0 ±0.1	0.3	0.1

Reel Dimensions (may vary) Table 3						
Reel Size	A		B		C	D
	Inches	mm	Inches	mm	mm	mm
7	7.0	177.8	2.50	63.5	13.0 +0.5 -0.2	Tape size +0.4 +2.0 -0.0
10	10.0	254.0	4.00	101.6		
13	13.0	330.2	3.75	95.3		



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