



# PLETRONICS *PRONTO*™ QM55L Series

## CMOS Configurable Clock Oscillator



QM55L  
5.0 x 3.2 x 1.2 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 <sup>2</sup>	1	-	160	MHz	(1.8V frequency range 1-125MHz)
Frequency Stability <sup>2</sup>	±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 <sup>2</sup>	-10 -20 -40 -40	- - - -	+70 +70 +85 +105	°C	Standard range Extended range <b>C</b> option Extended range <b>E</b> option Extended range <b>G</b> option (±50ppm)
Supply Voltage <sup>1,2</sup> V <sub>CC</sub>	1.8	-	3.3	V	± 5%, See Part Number options on page 3
Supply Current I <sub>CC</sub>	-	-	-	mA	See Page 2
Output Waveform	CMOS				Cl <sub>oad</sub> = 15 pF
Duty Cycle	45	-	55	%	At 50%V <sub>CC</sub> level
Output V <sub>HIGH</sub>	0.9V <sub>CC</sub>	-	-	V	See Load Circuit and waveform page
Output V <sub>LOW</sub>	-	-	0.1V <sub>CC</sub>	V	
Output T <sub>RISE</sub> and T <sub>FALL</sub>	-	-	2	ns	
Startup Time	-	-	8	ms	After V <sub>CC</sub> ≥ 1.62V, Time for output to reach specified frequency
V <sub>DISABLE</sub> V <sub>IL</sub>	-	-	0.3V <sub>CC</sub>	V	
V <sub>ENABLE</sub> V <sub>IH</sub>	0.7V <sub>CC</sub>	-			
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

<sup>1</sup> Place an appropriate power supply bypass capacitor next to device for correct operation

<sup>2</sup> Specified by part number



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### Electrical Characteristics - Input Current

Parameter	Min	Typ	Max	Unit	Condition V <sub>cc</sub> = 3.3V	
Supply Current I <sub>cc</sub>			27 30 35	mA	1MHz ≤ F <sub>o</sub> < 75MHz 75MHz ≤ F <sub>o</sub> < 125MHz 125MHz ≤ F <sub>o</sub> < 160MHz	15pF load

Parameter	Min	Typ	Max	Unit	Condition V <sub>cc</sub> = 2.5V	
Supply Current I <sub>cc</sub>			27 30 35	mA	1MHz ≤ F <sub>o</sub> < 75MHz 75MHz ≤ F <sub>o</sub> < 125MHz 125MHz ≤ F <sub>o</sub> ≤ 160MHz	15pF load

Parameter	Min	Typ	Max	Unit	Condition V <sub>cc</sub> = 1.8V	
Supply Current I <sub>cc</sub>			25	mA	1MHz ≤ F <sub>o</sub> ≤ 125MHz	15pF load



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### Part Number\*\*

Series Model	Frequency Stability		Operating Temperature Range	Supply Voltage V <sub>CC</sub>	Frequency in MHz
QM55	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.FFF**  
• **YMDxxx**

PRONTO = Pletronics Model  
FF.FFF = Frequency, max 6 characters including 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)

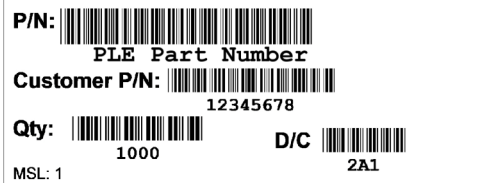
Code	3	4	5	6	7	Code	A	B	C	D	E	F	G	H	J	K	L	M
Year	2023	2024	2025	2026	2027	Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

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



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.

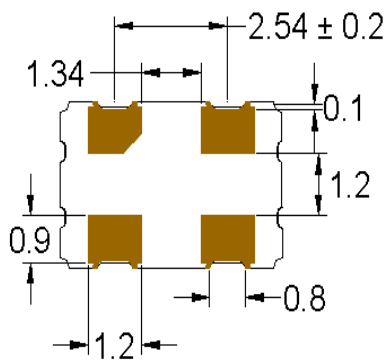
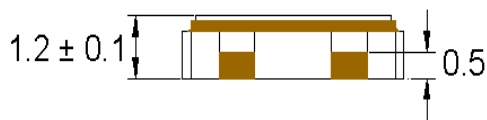
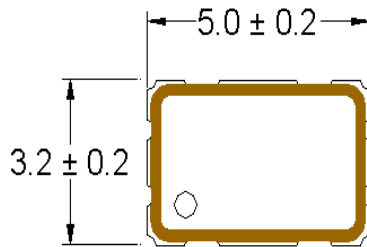
Pletronics Inc. guarantees the device does not contain the following: Cadmium, Hexavalent Chromium, Lead, Mercury, PBB's, PBDE's  
Weight of the Device: 0.057 grams  
Moisture Sensitivity Level: 1 As defined in J-STD-020D  
Second Level Interconnect code: e4



# PLETRONICS *PRONTO*™ QM55L Series

## CMOS Configurable Clock Oscillator

### Mechanical Dimensions

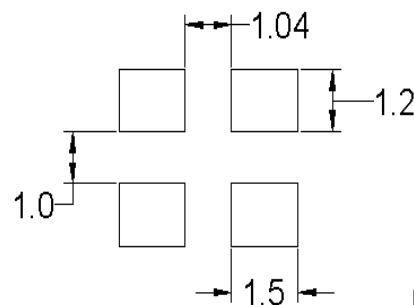


### Pad Connections

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

### ENABLE/DISABLE

Pad 1	Output
V <sub>IH</sub> /Open	Active
V <sub>IL</sub> /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  $\mu$ m) over Nickel (1.27 to 8.89  $\mu$ m)**

For Optimum Jitter Performance, Pletronics recommends:

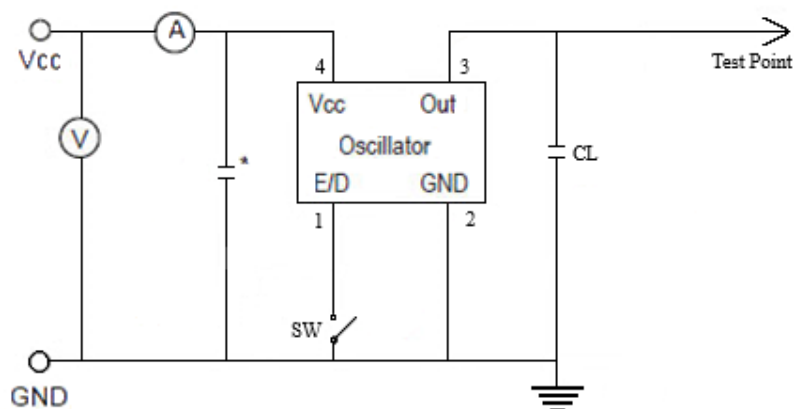
- A ground plane under the device
- Do not route large transient signals (both current and voltage) under the device
- Do not place near a large magnetic field such as a high frequency switching power supply
- Do not place near piezoelectric buzzers or mechanical fans



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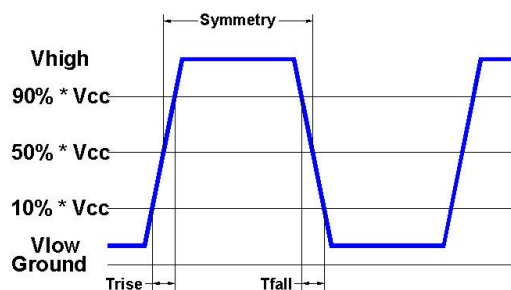
### Electrical Test / Load Circuit



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

Absolute Maximum Ratings

Parameter	Unit
V <sub>CC</sub> Supply Voltage	-0.5V to +7.0V
V <sub>i</sub> Input Voltage	-0.5V to V <sub>CC</sub> + 0.5V
V <sub>o</sub> Output Voltage	-0.5V to V <sub>CC</sub> + 0.5V

#### Thermal Characteristics:

The maximum die or junction temperature is 125°C

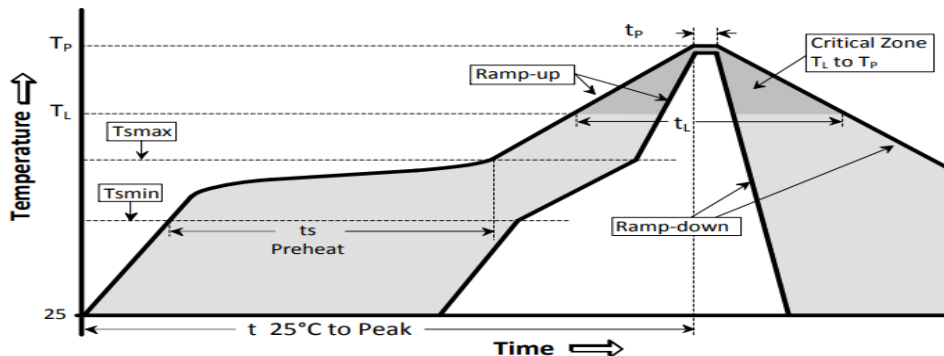


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### Reflow Cycle

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

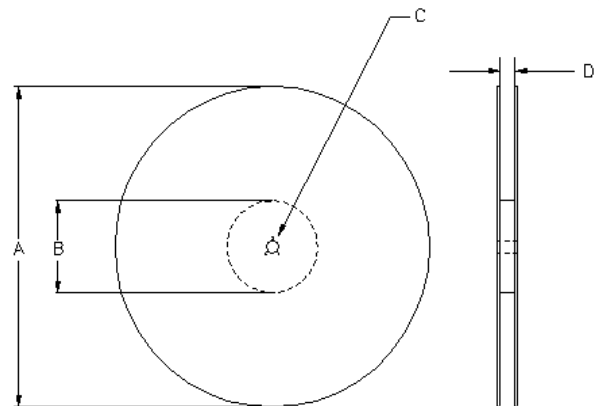
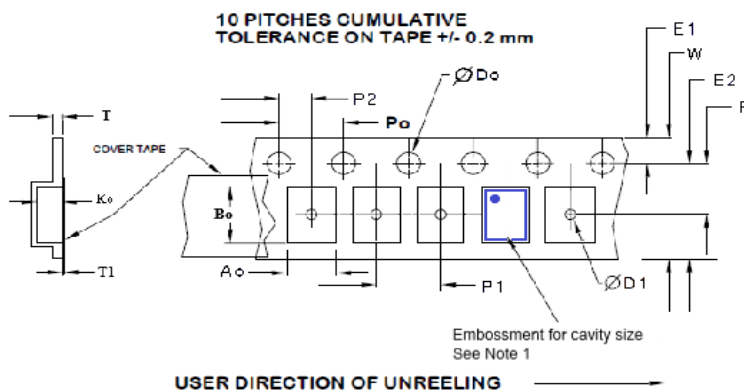


The part may be reflowed 2 times without degradation (typical for lead free processing).

Temperature Profile	Symbol	Condition	Unit
Average ramp-up rate	( $T_{S_{max}}$ 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	$T_{to-peak}$	8 minutes max	min
<b>Preheat</b>			
Temperature min	$T_{S_{min}}$	150	°C
Temperature max	$T_{S_{max}}$	200	°C
Time $T_{S_{min}}$ to $T_{S_{max}}$	$t_s$	60 – 180	sec
<b>Soldering above liquidus</b>			
Temperature liquidus	$T_L$	217	°C
Time above liquidus	$t_L$	60 – 150	sec
<b>Peak temperature</b>			
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. 12mm (or 16mm) tape, 8mm pitch.



Tape Variable Dimensions Table 2

Tape Size	E2 typ	F	P1	W max	Ao	Bo	Ko
12mm	10.25	5.5 ±0.05	8.0 ±0.1	12.2	3.6±0.1	5.4±0.1	1.4±0.1
16mm	14.25	7.5 ±0.05	8.0 ±0.1	16.3	3.6±0.1	5.4±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
12mm	1.5 +0.1 -0.0	1.5	1.75 ±0.1	4.0 ±0.1	2.0 ±0.05 2.0 ±0.1	0.3	0.1
16mm		1.5					

Reel Dimensions (may vary) Table 3

	A		B		C	D
Reel Size	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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