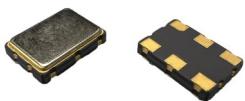




# PLETRONICS PE77F/G Series 3.3V PECL Clock Oscillator



PE77F/G  
7.0 x 5.0 x 1.7 mm  
LCC Ceramic Package

## Features

- Pletronics' PE77F/G Series is a Quartz crystal controlled Precision Square Wave Oscillator
- PECL Differential Output
- 'F' series is Fundamental; 'G' series is 3rd OT
- Enable/Disable Function on pad 1
- Low Jitter
- 3.3V nominal Supply Voltage

## Applications

Driving A/Ds, D/As, FPGAs  
Fibre Channel  
Ethernet, GbE, SynchE  
Medical  
Storage Area Networking  
COTS  
Telecom  
PON

## Electrical Characteristics

Parameter	Min	Typ	Max	Unit	Condition
Frequency Range <sup>2</sup>	13.5 35	-	110 220	MHz	'G' Series 'F' Series
Frequency Stability <sup>2</sup> ± 20 = <b>20*</b> , ± 25 = <b>44</b> , ± 50 = <b>45</b>	±20	-	±50	ppm	Includes supply voltage change, load change, aging for 1 year at 25°C ± 2°C, shock, vibration and temperatures. *limited frequencies, see page 2
Operating Temperature Range <sup>2</sup>	-10 -20 -40	-	+70 +70 +85	°C	Standard range Extended range <b>C</b> option Extended range <b>E</b> option
Supply Voltage <sup>1,2</sup> V <sub>CC</sub>	2.97	3.3	3.63	V	
Supply Current I <sub>CC</sub> 'F' Series	-	33 34	44 48	mA	< 80 MHz ≥ 80 MHz
Supply Current I <sub>CC</sub> 'G' Series	-	33 34 35 37	44 48 50 54	mA	< 90 MHz ≥ 90MHz ~ 125 MHz ≥ 125 MHz ~ 160 MHz ≥ 160 MHz
Output Waveform	PECL				
Output High Level V <sub>OH</sub>	2.275	2.35	2.42	V	Referenced to Ground
Output Low Level V <sub>OL</sub>	1.49	1.6	1.68	V	Referenced to Ground
Output T <sub>RISE</sub> and T <sub>FALL</sub>	-	0.2	0.4	ns	V <sub>th</sub> is 20% and 80% levels of output swing
Start Up Time	-	-	2	ms	Time for output to reach specified frequency
Duty Cycle	45	-	55	%	At output crossing point
V <sub>DISABLE</sub>	-	-	0.3V <sub>CC</sub>	V	Referenced to ground
V <sub>ENABLE</sub>	0.7V <sub>CC</sub>	-			
Enable Time	-	-	2	ms	Time for output to reach a logic high state
Disable Time	-	-	200	ns	Time for output to reach a high Z state
Enable/Disable Internal Pull-up	-	39	-	kΩ	Pin 1 open or High
Output Leakage V <sub>OUT</sub> = V <sub>CC</sub> V <sub>OUT</sub> = 0V	-10	-	+10 -	μA	Pad 1 low, device disabled
Standby Current	-	-	10	μA	
Jitter	-	-	0.6	ps rms	12 kHz to 20 MHz from the output frequency
	-	-	2.8		10 Hz to 1 MHz from the output frequency
Phase Noise 1 kHz 10 kHz 100 kHz 1 MHz 20 MHz	-	-129 -141 -146 -153 -157	-	dBc/Hz	25°C ± 2°C at 106.25 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



# PLETRONICS PE77F/G Series 3.3V PECL Clock Oscillator

## Part Number

Series Model	Frequency Stability		Operating Temperature Range	Supply Voltage V <sub>cc</sub>	Frequency in MHz	Optional T&R Packaging code
PE77	45	F or G	E	V	-100.0M	-XX
	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	V = 3.3V ± 10%	13.5 - 220 MHz	T250 = 250 per Reel T500 = 500 per Reel T1K = 1000 per Reel (Std)

\* Contact PLE sales for limited frequencies. Full frequency range available which excludes aging.

## Device Marking



PLE = Pletronics  
PE7 = LVPECL 7050  
FFF.FFM = Frequency in MHz (Up to 5 significant digits)  
t = Version: F or G  
YMD or YWW = Date Code, All other marking = internal 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)

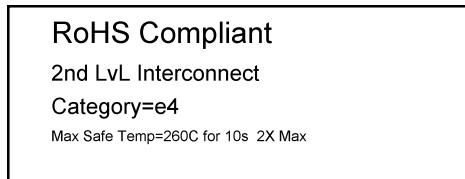
Code	3	4	5	6	7	Code	A	B	C	D	E	F	G	H	J	K	L	M
Year	2023	2024	2025	2026	2027	Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

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

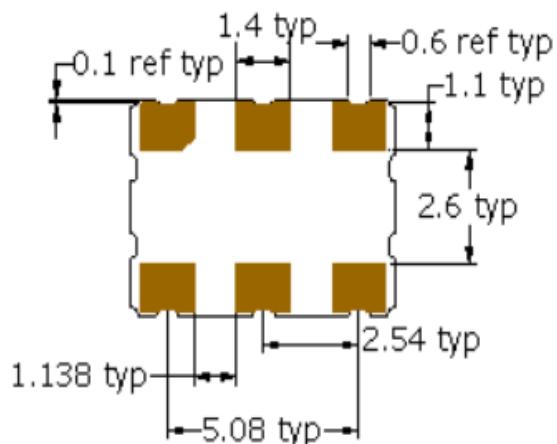
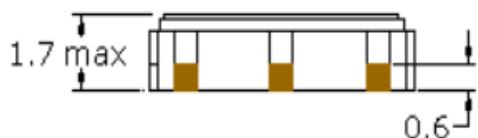
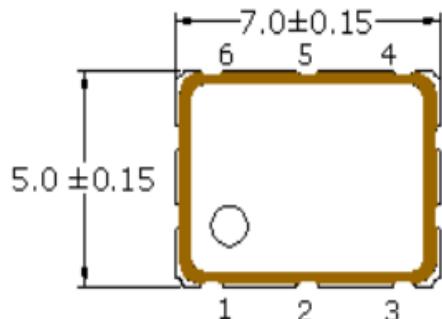
RoHS Label is 1" x 2.6" (25.4mm x 66.7mm)  
Font is Arial



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: 0.16 grams  
Moisture Sensitivity Level: 1 As defined in J-STD-020D  
Second Level Interconnect code: e4

## Mechanical Dimensions



Dimensions in mm

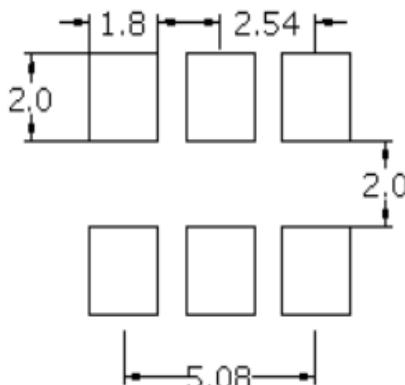
## Pad Connections

Pad	Function
1	Enable/Disable
2	No Connect
3	Ground/Lid
4	Output
5	Output-N
6	V <sub>CC</sub>

### ENABLE/DISABLE

Pad 1	Output
V <sub>IH</sub> /Open	Active
V <sub>IL</sub> /Gnd	Disabled/Tristate

## Solder pad layout



### Pad Layout

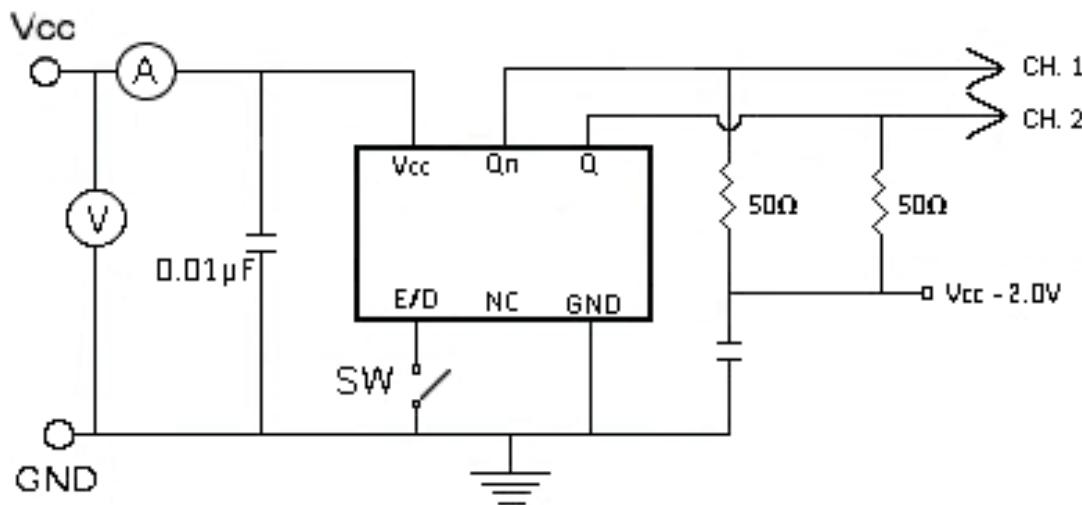
Disclaimer: Recommended layout shown. Adjust layout as needed for individual process requirements.

**Contacts (pads): Gold (0.3 to 1.0  $\mu$ m) over Nickel (1.27 to 8.89  $\mu$ m)**

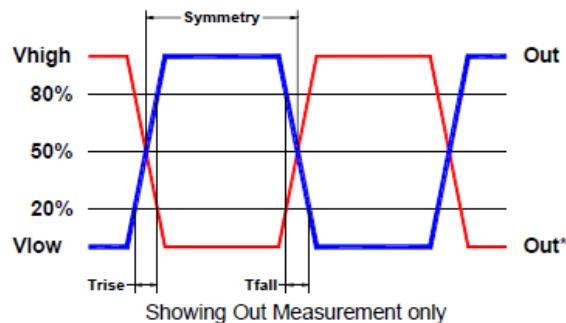
For Optimum Jitter Performance, Pletronics recommends:

- 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

## Electrical Test /Load Circuit



## Test Waveform



## Environmental / ESD Ratings

Reliability: Environmental

ESD Rating

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

Model	Min. Voltage	Condition
Human Body Model	2000V	EIAJ ED-4701/300 Ref test method
Machine Model	200V	EIAJ ED-4701/300 Test method 304

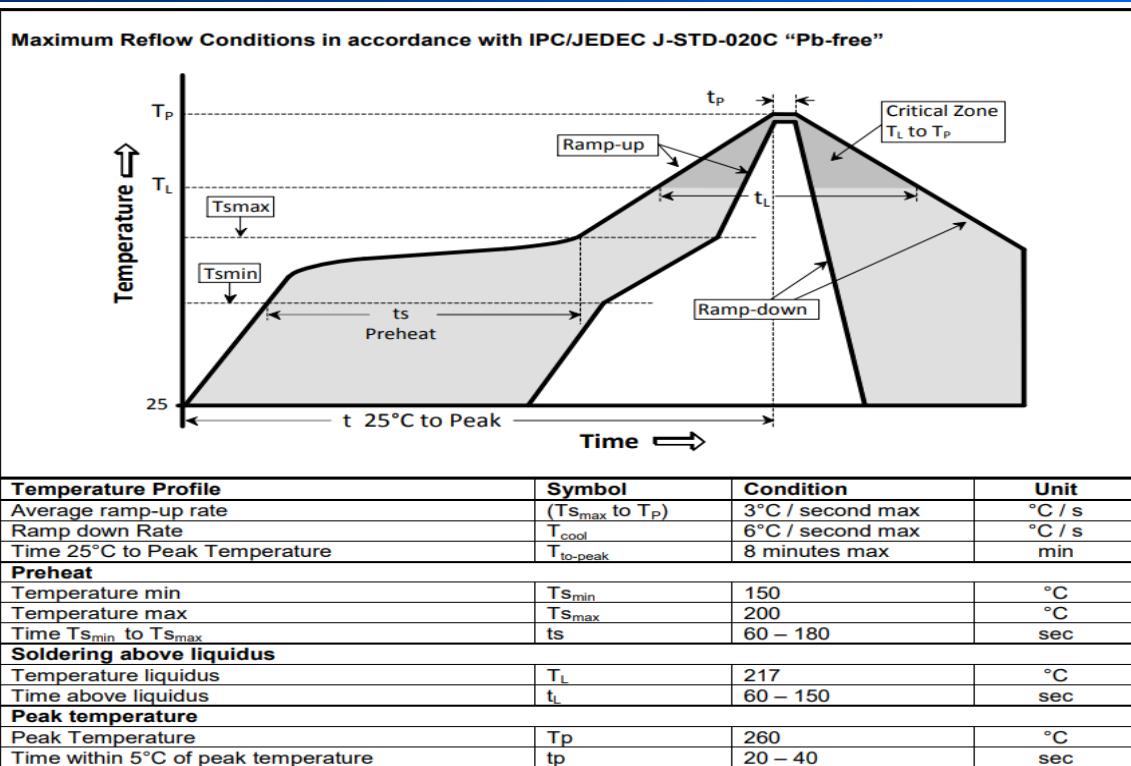
## Absolute Maximum Ratings

Parameter	Unit
$V_{CC}$ Supply Voltage	-0.5V to +5.0V
$V_i$ Input Voltage	-0.5V to $V_{CC} + 0.5V$
$V_o$ Output Voltage	-0.5 to $V_{CC} + 0.5V$

### Thermal Characteristics:

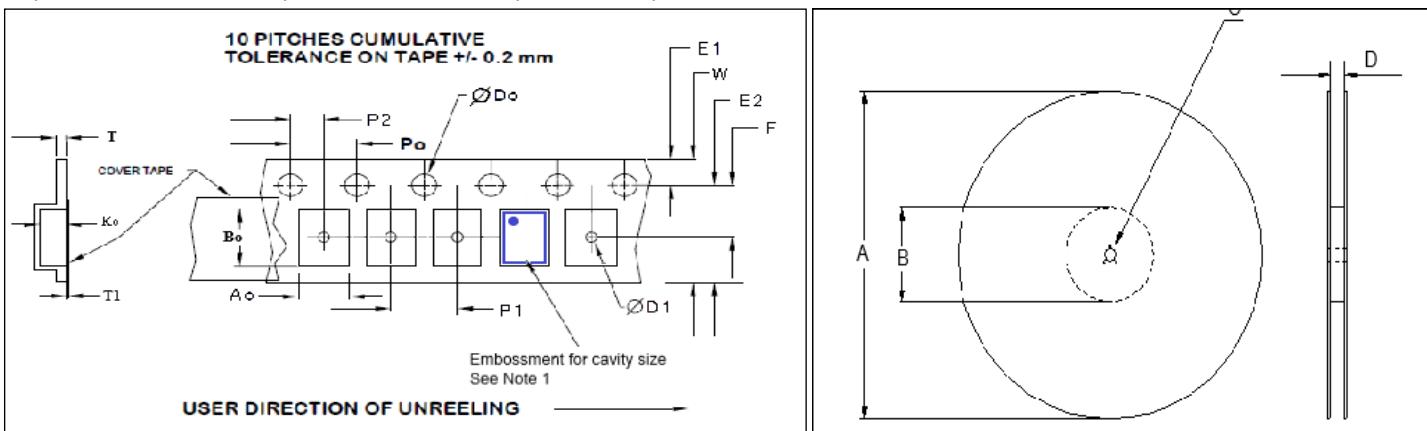
The maximum die or junction temperature is 150°C

## Reflow Cycle



## Tape and Reel

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



Tape Variable Dimensions Table 2							
Tape Size	E2 typ	F	P1	W max	Ao	Bo	Ko
16mm	14.25 ±0.05	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						
	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
13	13.0	330	4	100		



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