

# CRYSTAL OSCILLATORS HCMOS/TTL 5V

## SURFACE MOUNT

R models  
R1210, R1211,  
R1212  
R3210, R3211,  
R3212

## 5 x 7mm Surface Mount

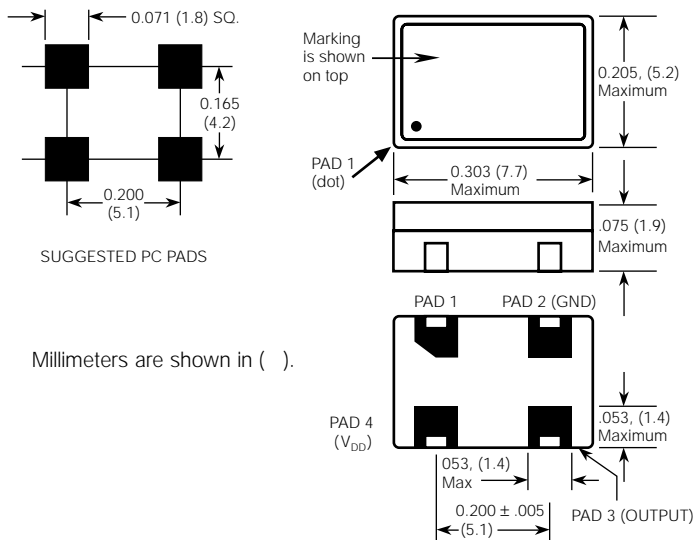
Industrial: -40° to +85°C  
FIXED/TRISTATE, 1 MHz to 105 MHz

### FEATURES

- Industrial operating temperature range from -40° to +85°C accommodates rugged environments
- Low jitter of 5 ps RMS max ensures stable data transmission
- Stability options of  $\pm 100$  ppm to  $\pm 25$  ppm
- 45/55 symmetry is standard
- Guaranteed start-up with ramping DC Supply
- Start up time less than 5 ms
- Tristate option available
- Very low power when tristated

### TYPICAL APPLICATIONS

- Telecom and data networking applications that require low jitter and are subjected to rugged environmental conditions, including:
  - ATM
  - Frame relay
  - DSL
  - Gigabit ethernet
  - Fibre Channel
  - VoIP



"R" Package

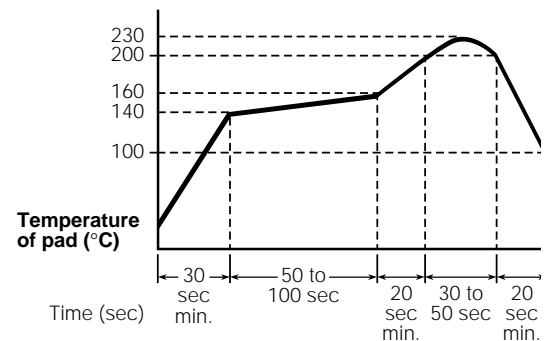
Millimeters are shown in ( ).

### Description

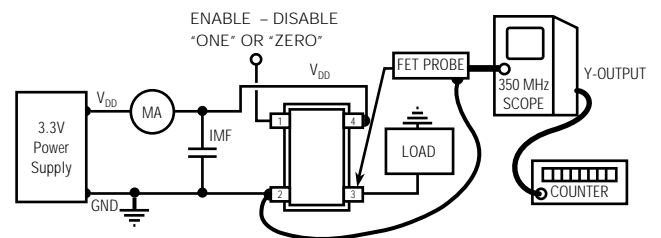
MF Electronics R-Series industrial temperature range surface mount (SMD) oscillators provide low jitter clock waveforms needed to clock standard HCMOS or TTL circuits in PCBs mounted in rugged environments.

### CONNECTIONS

	Fixed Output Models	Tristate Models
PAD 1	NOT USED	Floating or "1": Oscillator runs Ground or "0": Disable or Tristate
PAD 2	Ground and Case	
PAD 3	Output	
PAD 4	+5V, V <sub>DD</sub>	



### Recommended Reflow Soldering Profile



To adapt Fet probe to receptacle use Tektronix Part #103-0164-00

To connect output to scope use Tektronix Part #131-0258-00 (receptacle)

### TEST CIRCUIT





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HCMOS/TTL 5V  
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**SURFACE MOUNT**

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R1212  
R3210, R3211,  
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**ELECTRICAL SPECIFICATIONS**

**Frequency Range** 1 MHz to 105 MHz

**Frequency Stability** Includes calibration at 25°C, operating temperature, change of input voltage, change of load, shock and vibration.

	MIN	TYP	MAX	UNITS
<b>Input Voltage</b>	4.5	5.0	5.5	volts
<b>Input Current</b>			45	mA
<b>Output Levels</b>				
"0" Level, sinking 16 mA			0.4	volts
"1" Level, sourcing 8 mA	$V_{DD}-0.4$			volts

**Rise and Fall Time, max**

CMOS, 15pf,  
from 0.4 to ( $V_{DD}-0.4$ ) V,  $T_R/T_F$

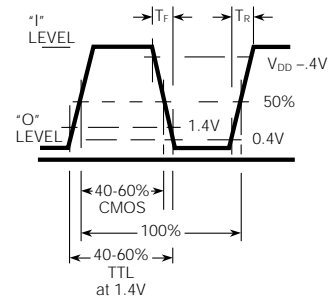
**Jitter**  
From positive edge to positive edge

**Symmetry**  
CMOS @50%  $V_{DD}$

**Aging**  
First year 3 ppm  
After first year 1 ppm/yr

**Input Requirements for Pin 1.:**

"1": On – Pin 1 may float or 2.4V min., sourcing 400 microAmp  
"0": Disable or Tristate – Pin 1 requires 0.4V, sinking 400 microAmp



**WAVEFORMS**

TRISTATE		FIXED OUTPUT		Frequency Stability
Model	Marking Letter ID*	Model	Marking Letter ID*	
R3210	GO	R1210	GK	±100 ppm
R3212	GP	R1212	GL	±50 ppm
R3211	GV	R1211	GU	±25 ppm

\* See Marking Specification

**ENVIRONMENTAL SPECIFICATIONS**

**Temperature**

Operating -40° to +85°C  
Storage -55° to +125°C

**Temperature Cycle** – Not to exceed ±5 ppm change when exposed to 2 hours maximum at each temperature from 0 to 120°C, with 25°C reference

**Shock** – 1000 Gs, 0.35 ms, 1/2 sine wave, 3 shocks in each plane

**Vibration** – 10-2000 Hz of .06" d.a. or 20 Gs, whichever is less

**Humidity** – Resistant to 85° R.H. at 85°C

**MECHANICAL SPECIFICATIONS**

**Gross Leak** – Each unit checked in 125°C fluorocarbon

**Fine Leak** – Mass spectrometer leak rate less than  $5 \times 10^{-8}$  atm, cc/sec of helium

**Case** – Ceramic

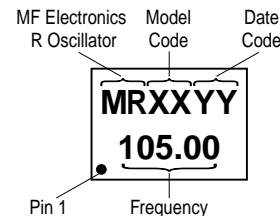
**Pads** – 15 microinch of gold over nickel

**Marking** – Print is permanent black ink or laser engraved

**Resistance to Solvents** – MIL STD 202, Method 215

**MARKING SPECIFICATION**

The format for the marking is:



**HOW TO ORDER**

For Part Number, put package type before model number, and add frequency in MHz, for example:



SS#	Rev.
R1210	A

**MF ELECTRONICS**

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