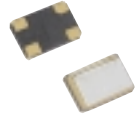




# CRYSTAL OSCILLATORS

## HCMOS/TTL 3.3V



**SURFACE MOUNT R models**  
 R1380, R1381,  
 R1382, R1388,  
 R1389  
 R3390, R3391,  
 R3392, R3398,  
 R3399

## Surface Mount 5 x 7mm

### Commercial: 0° to 70°C

### FIXED/TRISTATE, 1 MHz to 125 MHz

#### FEATURES

- Jitter from positive edge to positive edge is 6 ps RMS maximum, ensuring stable data transmission
- Fixed frequency or Tristate
- Very low power when tristated
- Frequency from 1.0 MHz to 125 MHz
- Start up time less than 5 ms
- Stability options from  $\pm 100$ ppm to  $\pm 20$  ppm
- Guaranteed start-up with ramping DC Supply
- 45/55 symmetry is standard

#### TYPICAL APPLICATIONS

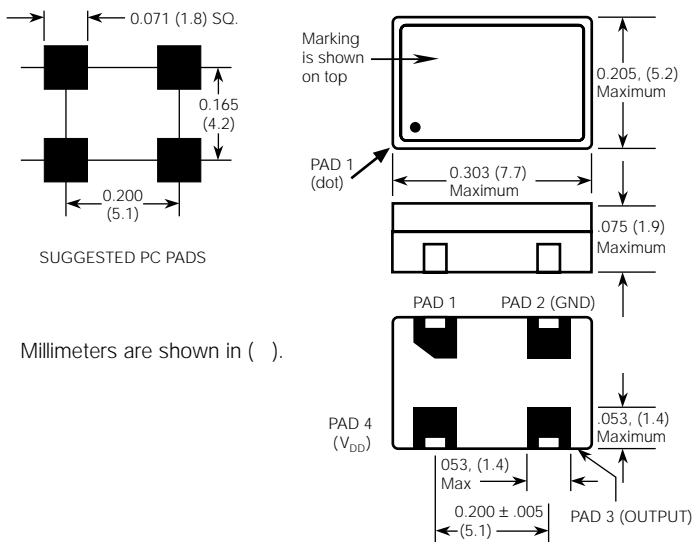
- Telecom and data networking applications that require low jitter, including:
  - DSL
  - Gigabit ethernet
  - Fibre Channel
  - VoIP

#### Description

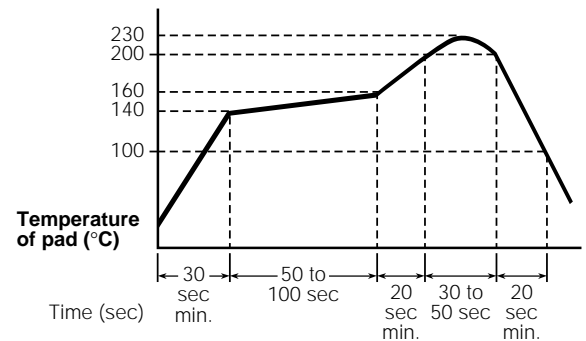
MF Electronics R-Series surface mount (SMD) oscillators provide clock waveforms needed to clock standard HCMOS or TTL circuits.

#### 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	+3.3V, V <sub>DD</sub>	



"R" Package



Recommended Reflow Soldering Profile





**CRYSTAL OSCILLATORS**  
**HCMOS/TTL 3.3V**  
**5 x 7mm Surface Mount**  
**Commercial: 0° TO 70°C**  
**FIXED/TRISTATE, 1 MHz to 125 MHz**

**SURFACE MOUNT**  
**R models**  
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**ELECTRICAL SPECIFICATIONS**

**Frequency Range**

Fixed Output 1.0 MHz to 125 MHz  
 Tristate 1.0 MHz to 125 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, V<sub>DD</sub></b>	3.0	3.3	3.6	volts

**Input Current**

	MIN.	TYP	MAX	UNITS
3 M to 10 MHz		3.0	4.5	ma
10.1 to 20 MHz		5.0	6.0	ma
20.1 to 30 MHz		10.0	15.0	ma
30.1 to 50 MHz		35.0	40.0	ma
50.1 to 67 MHz		40.0	50.0	ma
67.1 to 125 MHz		60.0	70.0	ma

**Output Levels**

"0" Level, sinking 16 ma			0.4	volts
"1" Level CMOS, sourcing 8 ma	V <sub>DD</sub> - .4			volts

**Rise and Fall Times**

CMOS, 15 pf, 20 to 80% (<60 MHz)	3.0	4	ns
CMOS, 30 pf, 20 to 80% (<60 MHz)	4.0	5	ns
CMOS, 50 pf, 20 to 80% (<60 MHz)	6.0	8	ns
CMOS, 15 pf, 20 to 80% (>60 MHz)	2.0	2.5	ns
CMOS, 30 pf, 20 to 80% (>60 MHz)	3.0	4.5	ns

**Jitter**

from positive edge to positive edge	6	ps RMS
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**Symmetry**

CMOS, @ 50% V <sub>DD</sub>	48/52	45/55	percent
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**Aging**

First year	3	ppm
After first year	1	ppm/yr

**Input Requirements for Pin 1.:**

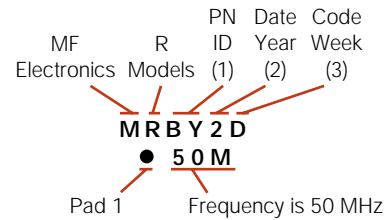
"1": On – Pin 1 may float or 2.4V min., sourcing 400 microAmp  
 "0": Disable or Tristate – Pin 1 requires 0.4V, sinking 400 microAmp

FIXED OUTPUT		TRISTATE		Frequency Stability
MODEL	Marking Letter ID*	MODEL	Marking Letter ID*	
R1380	E	R3390	G	±100 ppm
R1381	AL	R3391	Q	±25 ppm
R1382	F	R3392	H	±50 ppm
R1388	BV	R3398	BY	±20 ppm
R1389	BW	R3399	BZ	±32 ppm

\* See Marking Specification

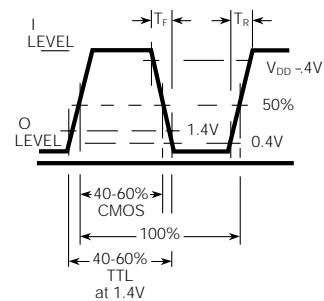
**MARKING SPECIFICATION**

The format for the marking is:



**NOTES**

- (1) One or two letters are used to identify the model. See Table 1.
- (2) Number in date code is year. In example, "2" is 2002.
- (3) Letter in date code is one two-week period. Year is divided into 26 two-week intervals. Each two-week interval is represented by one letter of the alphabet, in sequence.



**WAVEFORMS**



CRYSTAL OSCILLATORS  
 HCMOS/TTL 3.3V  
**5 x 7mm Surface Mount**  
 Commercial: 0° TO 70°C  
 FIXED/TRISTATE, 1 MHz to 125 MHz

**SURFACE MOUNT  
 R models**  
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**ENVIRONMENTAL SPECIFICATIONS**

**Temperature**

Operating 0° to 70°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 fluoro-carbon

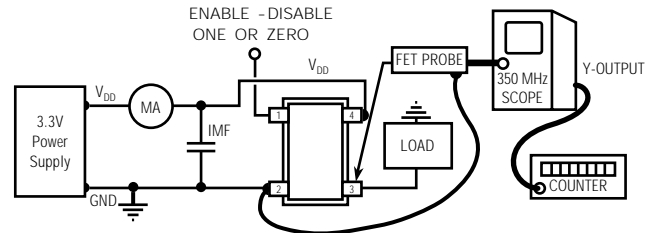
**Fine Leak** – Mass spectrometer leak rate less than  $2 \times 10^{-8}$  atmos, cc/sec of helium

**Case** – Ceramic with hermetic resistance-welded metal lid

**Pads** – 60 microinch of gold over nickel

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

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



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**

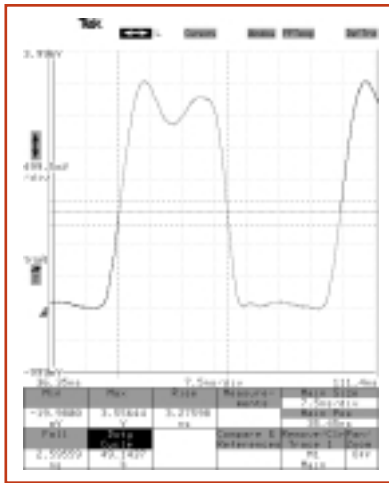


Fig.1 R3392-20M with 25pf load

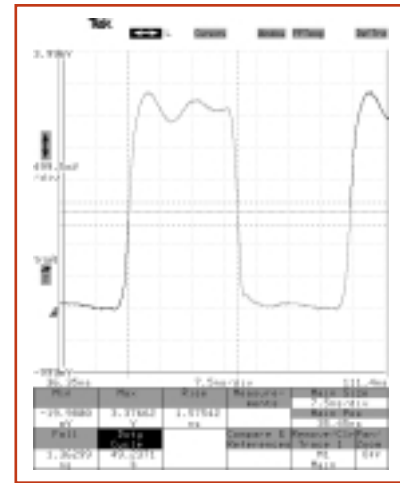


Fig. 2 R3392-20M without load

**HOW TO ORDER**

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

**R 3391 - 50M**

\*"R" is SMD model

"3391" is model type

"50 M" frequency

SS#	Rev.
M1380	A



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