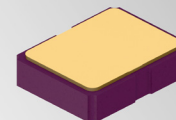


# M90

**SERIES : Low Jitter - Low Phase Noise - Best Frequency Stability**  
 Crystal Oscillator | 2.5 to 70 MHz | 2.5V & 3.3V | CMOS | 3.2x2.5 mm Ceramic SMD Package



3.2x2.5 mm Ceramic SMD Package

- Features**
- Industry Standard Package
  - Shortest Lead Time
  - Tightest Stability Over Temperature
  - ECCN - EAR 99
  - Smallest Hi-Rel Package
  - Customer Support & Service

**Electrical SPECIFICATIONS**

Supply Voltage Options	Voltage CODE	Frequency Range (MHz)	Supply Current @ Vcc ±10% (mA)		Rise/Fall Time (tr/TF) max 1/ (nsec)	Symmetry min / max (%)	Aging per year max 2/ (ppm)	Operating Temperature vs. Stability*		
			@2.5V	@3.3V				-55°C to +125°C (ppm)	-55°C to +105°C (ppm)	-40°C to +85°C (ppm)
2.5V ±10%	25	2.5 to 70	2.8	3.0	5	45/55	±2	CODE A	CODE B	CODE C
3.3V ±10%	33	2.5 to 70	2.8	3.0	5	45/55	±2	-	±15	-
		2.5 to 70	2.8	3.0	5	45/55	±2	±25	-	-

\* includes initial accuracy

**Phase Noise PERFORMANCE**

Phase @ 25 MHz Noise	Offset (Hz)	Phase Noise (dBc/Hz)
	100	-110
	1K	-139
	10K	-155
<b>RMS Jitter: 0.3 psec</b>	100K	-158
	1M	-160

notes:  
 1/ Rise/FallTime measured 10/90% & 90/0% nominal Vcc Levels  
 2/ Frequency Aging Limits, 1 ppm per year

**CMOS Output, 15 pF Load**  
 Output Voltage - Voh is Vcc -0.4 Vdc  
 Output Voltage - Vol is Vcc 0.4 Vdc  
 Start-up Time: 10 msec max

**Mechanical SPECIFICATIONS**

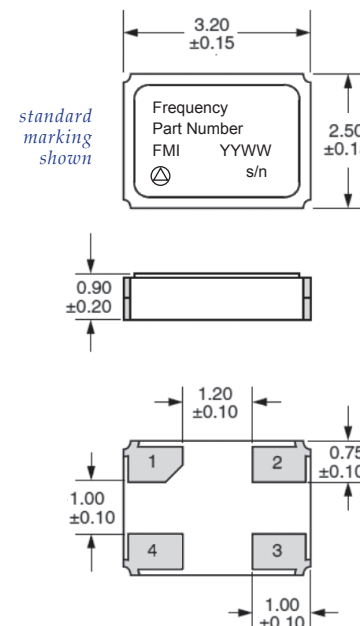
**TriState Function Pad 1**  
 VIH: 0.7 \* Vcc (min); VIL: 0.3 \*Vcc (max)  
 Output is disabled and high-Z impedance when logic low and oscillator is stopped.  
 Enabled with lock operational with either logic high or no connect.

Solder Reflow Profile, 10 seconds max at peak temp ≤260°C.

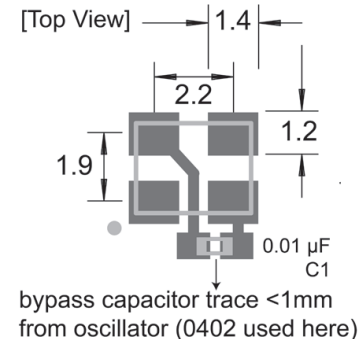
**Standard PIN CONFIGURATION**

Pin Number	Function
1	TriState Output Enable
2	Ground (case)
3	Output
4	Supply V (Vcc)

**Package OUTLINE DRAWING**



**Recommended Land Pattern**

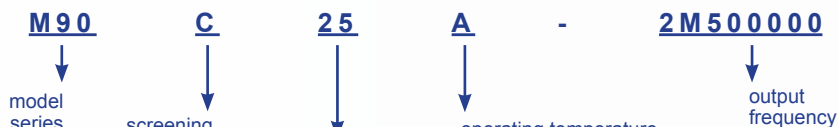


dimensions: inches / (mm)

Pad 1, ESD Symbol

**How To ORDER**

ISO 9001:2008  
 MIL-STD-790 Certified  
 Pb-free RoHS Certified  
 QPL per MIL-PRF-55310



example:  
**M90C25A-2M50000**

## Features

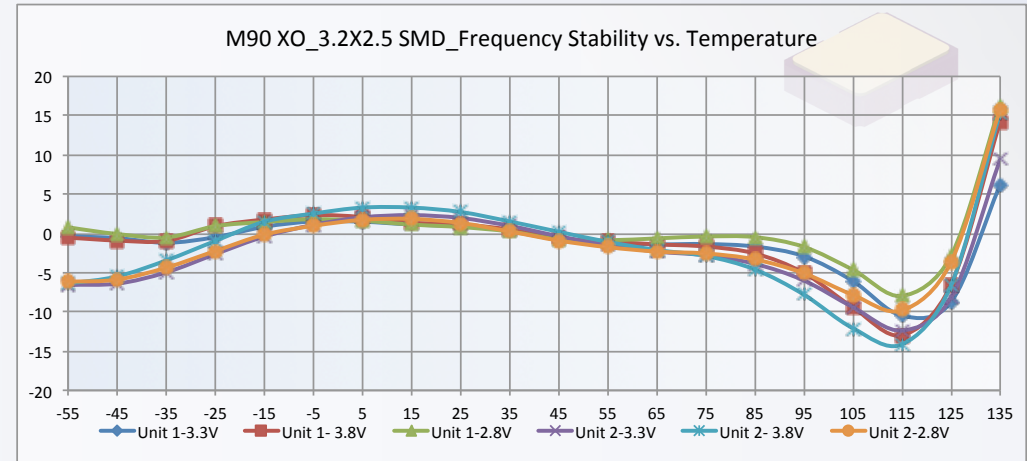
- Best Frequency Stability vs. Temperature in its class
- Ultra Small Form Factor
- Ruggedized Design
- High-Shock & Vibration
- Best Service
- ECCN - EAR 99
- Highest Temperature Ranges
- Wider Frequency Ranges
- Higher Reliability
- Smaller Packages
- Very Low Power

## Applications

- Mobile and Stationary Systems
- UAV, Drone
- Radar DSP
- Vision Systems
- Position Sensors
- Smart Ammunition
- Navigation Systems
- Guidance Systems
- Aircraft Control

## Environmental COMPLIANCE

Environmental	Specification	Method	Condition
Thermal Shock	MIL-STD-883	Method 1011	Condition A
Moisture Resistance	MIL-STD-883	Method 1004	
Terminal Strength	MIL-STD-883	Method 2004	Condition D
Solderability	MIL-STD-883	Method 2003	
Resistance to Soldering Heat	MIL-STD-202	Method 210	Condition I or J
Mechanical Shock	MIL-STD-883	Method 2002	Condition B
Mechanical Vibration	MIL-STD-883	Method 2007	Condition A
Gross Leak	MIL-STD-883	Method 1004	Condition C
Fine Leak	MIL-STD-883	Method 1004	Condition A2, R1=2x10E-8 atm cc/s
Moisture Sensitivity Level	MSL 1		



## Screening, B & C LEVELS

Screening	Method	Level:	CODE	
			B	C
Temperature Cycling	MIL-STD-883, Method 1010, Condition B		•	
Constant Acceleration	MIL-STD-883, Method 2001, Condition A (Y1 only, 5000 g's)		•	
Seal: Fine Leak	MIL-STD-883, Method 1014, Condition A1		•	
Seal: Gross Leak	MIL-STD-202, Method 112, Condition D		•	•
Electrical Test	Functional Test Only		•	•
Marking & Serialization	MIL-STD-1285		•	•
Electrical Test	Nominal Vcc & Extremes and Nominal Temp and Extremes		•	
Burn-in (no-load)	+125°C, Nominal Supply Voltage and Burn-in load, 48 hours min			•
Burn-in (load)	+125°C, Nominal Supply Voltage and Burn-in load, 160 hours min		•	
External Visual & Mechanical	MIL-STD-883, Method 2009.10		•	•
Final Electrical Test			•	•
a) Input current, output frequency, output waveform, are tested at +23°C ±2°C b) Frequency stability is tested over the specified temperature range; at both extremes and at +25°C at a minimum of 5 temperature increments note: Recording of test data is by lot # and then serial #				

*note: other screening levels and custom test plans available.*

### Military Reference Specifications

MIL-PRF-55310 Oscillators, Crystal Controlled, General Specification For  
 MIL-PRF-38534 Hybrid Microcircuits, General Specification For  
 MIL-STD-202 Test Method Standard, Electronic and Electrical Components  
 MIL-STD-883 Test Methods and Procedures for Microelectronics  
 MIL-STD-1686 Electrostatic Discharge Control Program for Protection of Electrical and Electronic Parts, Assemblies and Equipment

### Materials

- Package Materials:  
Ceramic, Alumina 90% min
- Pad Plating Material:  
Gold Plate 0.3 µm (12 µ inch)  
over 2 µm (80 µ inch) min. Nickel

### Products for Space Applications

Contact us for assistance with your specification. We will provide you with the technical support and the required documentation.

issue 4, 06272017



**FREQUENCY MANAGEMENT | International**  
 15302 Bolsa Chica Street  
 Huntington Beach, CA 92649

[FrequencyManagement.com](http://FrequencyManagement.com)

Ph. 714 373 8100  
 Fx. 714 373 8700  
[Sales@FrequencyManagement.com](mailto:Sales@FrequencyManagement.com)