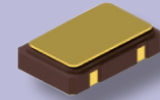


# C33

SERIES, < 50 KRad/Si - TID, Commercial Space

Crystal Oscillator | 3.3V | CMOS | 3.2x2.5 mm Ceramic SMD | SmallSat-CubeSat



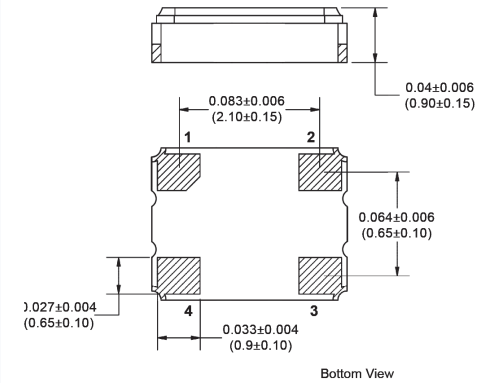
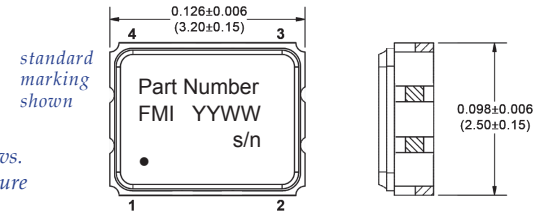
3.2x2.5 mm Ceramic SMD Package

**Features**

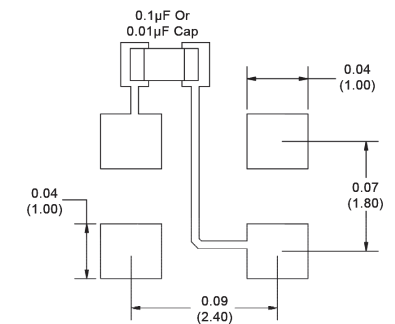
- Hi-Rel Design and Manufacture
- Proven High Shock Crystal Support
- ECCN - EAR 99
- Customer Support & Service
- High-Shock & Vibration Configuration
- Smallest Hi-Rel Package
- Mission Life Duration Choice
- Designed for > 20,000 Hours Life at +125°C
- Mission Success | Life Options 6 Months to 5 Years

- US Manufacture
- Design & Configuration Control
- Radiation Test Data Available upon Request

**Mechanical SPECIFICATIONS**



**Recommended Land Pattern**



**Electrical SPECIFICATIONS**

Mission Life / Screening Code			Frequency Range (MHz)	Supply Current @ 3.3V ±10% (mA)	Rise/Fall Time (tr/ff) max (nsec)	Symmetry min / max (%)	Aging per year max 1/ (ppm)	Frequency Stability Vs. Temperature			
A 6 Months to 1 year	B 1 Year to 2 years	C 3 Years to 5 years						-55°C to +125°C (ppm)	-55°C to +125°C (ppm)	-40°C to +105°C (ppm)	-40°C to +85°C (ppm)
CODE	CODE	CODE						CODE A	CODE B	CODE C	CODE D
01	02	03	0.5 to 0.9	1.1	3	45/55	±10	±100	±75	±60	±50
04	05	06	1 to 7.9	1.3	3	45/55	±10	±100	±75	±60	±50
07	08	09	8 to 15.9	3	3	45/55	±10	±100	±75	±60	±50
11	12	13	16 to 49.9	6	2	40/60	±10	±100	±75	±60	±50
14	15	16	50 to 74.9	8	2	40/60	±10	±100	±75	±60	±50
17	18	19	75 to 100	16	2	40/60	±10	±100	±75	±60	±50

See reverse side for screening details

CMOS Output, 15 pF Load	1/ Frequency Aging Limit
Output Voltage - Logic "0" is Vcc x 0.1 Vdc	Max change over 30 days
Output Voltage - Logic "1" is Vcc is 0.9 Vdc	Projected max change for 1 year after 30 days
Start-up Time: 10 msec max	

Please Contact Us for Specification Options that are Outside of or beyond those Shown in the Table Above

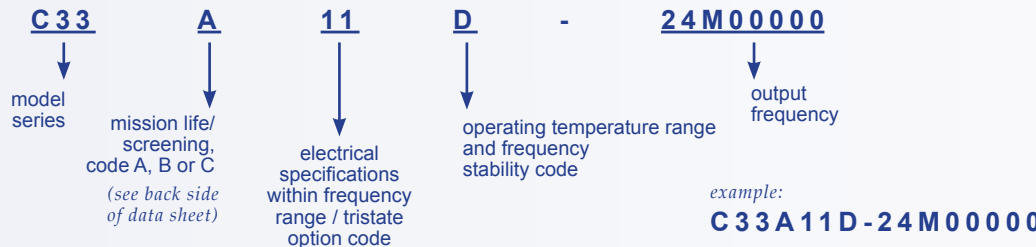
**Standard PAD CONFIGURATION**

Pin Number	Function
1	Output Enable (Tri-state)*
2	Ground (case)
3	Output
4	Supply V (Vcc)

\* Enable, Logic 1 | Disable, Logic 0

**How To ORDER**

MIL-STD-790 Certified  
QPL per MIL-PRF-55310  
ISO 9001:2015  
Pb-free RoHS Certified



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

FrequencyManagement.com

Ph. 714 373 8100  
Fx. 714 373 8700  
Sales@FrequencyManagement.com

Lower than 3.3 Volt versions of our 3.2x2.5 mm SMD Crystal Oscillator for Commercial Satellite are available, please inquire!



C32, 1.8V

Designed Specifically for Lower-cost Space Missions

## SmallSat | CubeSat

Mission Life   Screening- A, B & C OPTIONS			CODE		
Screening	Method	Options:	A	B	C
Non-Destruct Bond Pull	MIL-STD-883, Method 2023		•	•	•
Internal Visual	MIL-STD-883, Method 2017		•	•	•
Stabilization (Vacuum) Bake	MIL-STD-883, Method 1008, Condition C, 150°C, 24 hours min		•	•	•
Temperature Cycling	MIL-STD-883, Method 1010, Condition B, 10 Cycles		•	•	•
Constant Acceleration	MIL-STD-883, Method 2001, Condition A (Y1 only, 5000 g's)			•	•
PIND Test	MIL-STD-883, Method 2020, Condition B, 5 passes max				•
Seal: Fine Leak	MIL-STD-883, Method 1014, Condition A1 MIL-STD-202, Method 112, Condition C, 111A			•	•
Seal: Gross Leak	MIL-STD-202, Method 112, Condition D		•	•	•
Electrical Test	Functional Test Only at +23°C		•	•	•
Marking & Serialization	MIL-STD-1285		•	•	•
Electrical Test	Nominal Vcc & Extremes and Nominal Temp and Extremes			•	•
Burn-in (load)	+125°C, Nominal Supply Voltage and Burn-in load, 160 hours min			•	•
Burn-in (no-load)	+125°C, Nominal Supply Voltage and Burn-in load, 48 hours min		•		
Interim Electrical	Functional Test Only				•
Burn-in (load)	+125°C, Nominal Supply Voltage and Burn-in load, 160 hours min				•
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 #					
Radiography	MIL-STD-883, Method 2012				•
Frequency Aging	MIL-PRF-55310, +70°C Condition				•
Frequency/Temperature Stability	MIL-PRF-55310, Over temperature extremes, 20 points equally spaced				•
External Visual & Mechanical	MIL-STD-883, Method 2009		•	•	•

note: other options, screening levels and custom test plans available.

**MIL-STD-790 Certified**  
**QPL per MIL-PRF-55310**  
**ISO 9001:2015**  
**Pb-free RoHS Certified**

### 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

### Environmental COMPLIANCE

Environmental	Specification	Method	Condition	
Vibration – Sine	MIL-STD-202	Method 204	Condition D	20g, 10 to 2 KHz
Vibration – Random	MIL-STD-202	Method 214	Condition 1	30g rms, 10 to 2 KHz Random
Shock	MIL-STD-202	Method 213	Condition I	100g, 6 ms, F:1500, 0.5 ms
Seal Test	MIL-STD-883	Method 1014	Condition A1	Fine Leak
Seal Test	MIL-STD-883	Method 1014	Condition C1	Gross Leak
Temperature Cycling	MIL-STD-883	Method 1010	Condition B	10 Cycles Minimum
Constant Acceleration	MIL-STD-883	Method 2001	Condition A	5000g, Y1 Axis
Thermal Shock	MIL-STD-202	Method 107	Condition B	

continued...

Environmental	Specification	Method	Condition
Ambient Pressure	MIL-STD-202	Method 105	Condition C
Resistance to Soldering Heat	MIL-STD-202	Method 210	Condition C
Moisture Resistance	MIL-STD-202	Method 106	with 7B Sub-cycle
Salt Atmosphere (corrosion)	MIL-STD-883	Method 1009	Condition A (24 hrs)
Terminal Strength	MIL-STD-202	Method 211	Test Condition D
Solderability	MIL-STD-883	Method 2003	
Resistance to Solvents	MIL-STD-202	Method 215	

### Materials

- Package Materials:  
Ceramic, Alumina 90% min
- External Lead Plating Material:  
Gold plated Kovar, 0.15 µm (60 µ inch) min, over 2.0 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.

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