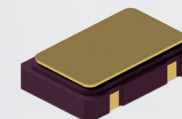


# C53

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

Crystal Oscillator | 3.3V | CMOS | 5x3.2mm Ceramic SMD | SmallSat-CubeSat



5x3.2 mm Ceramic SMD Package

## Features

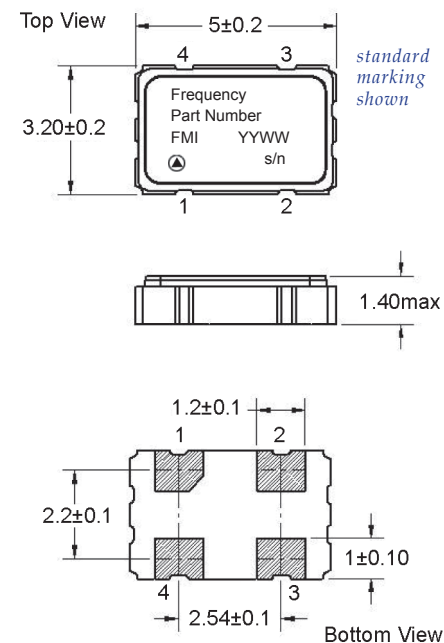
- Hi-Rel Design and Manufacture
- Proven High Shock Crystal Support
- ECCN - EAR 99
- Customer Support & Service
- High-Shock & Vibration Configuration
- Smallest Hi-Rel Package
- Mission Life Duration Choice
- Designed for > 20,000 Hours Life at +125°C
- Mission Success | Life Options 6 Months to 5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

## 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<br>6 Months to 1 year       | B<br>1 Year to 2 years | C<br>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                                | ±65                   | ±50                   | ±40                  |
| 04                            | 05                     | 06                      | 1 to 7.9              | 1.3                             | 3                                 | 40/60                  | ±10                         | ±100                                | ±65                   | ±50                   | ±40                  |
| 07                            | 08                     | 09                      | 8 to 15.9             | 3                               | 3                                 | 40/60                  | ±10                         | ±100                                | ±65                   | ±50                   | ±40                  |
| 11                            | 12                     | 13                      | 16 to 49.9            | 6                               | 2                                 | 40/60                  | ±10                         | ±100                                | ±65                   | ±50                   | ±40                  |
| 14                            | 15                     | 16                      | 50 to 74.9            | 8                               | 2                                 | 40/60                  | ±10                         | ±100                                | ±65                   | ±50                   | ±40                  |
| 17                            | 18                     | 19                      | 75 to 94.9            | 16                              | 2                                 | 40/60                  | ±10                         | ±100                                | ±65                   | ±50                   | ±40                  |
| 21                            | 22                     | 23                      | 95 to 130             | 25                              | 2                                 | 40/60                  | ±10                         | ±100                                | ±65                   | ±50                   | ±40                  |

stability vs. temperature code

## Mechanical SPECIFICATIONS



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

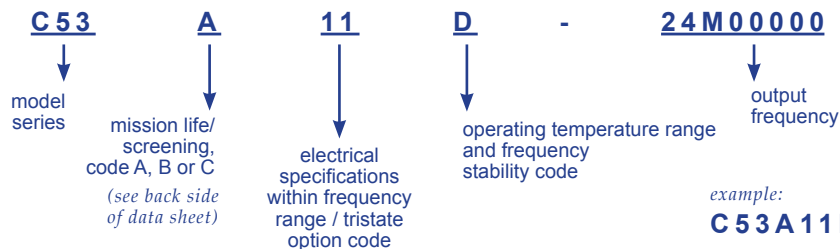
### Standard PAD CONFIGURATION

| 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



example:  
**C53A11D-24M0000**

dimensions: mm

Pad 1, ESD Symbol



**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)

Lower than 3.3 Volt versions of our 5x3.2 mm SMD Crystal Oscillator for Commercial Satellite are available, please inquire!



C5X



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<br>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<br>b) Frequency stability is tested over the specified temperature range; at both extremes and at +25°C at a minimum of 5 temperature increments<br>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.

Issue4\_11162020



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