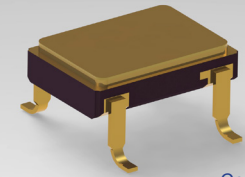


# C88

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

Crystal Oscillator | 3.3V | CMOS | 5x7mm Gull Wing Leads | SmallSat-CubeSat



5x7 mm  
Gull Wing Leaded  
Ceramic SMD Package

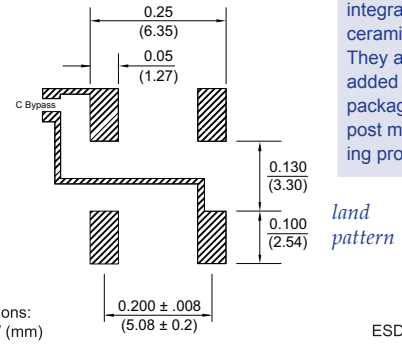
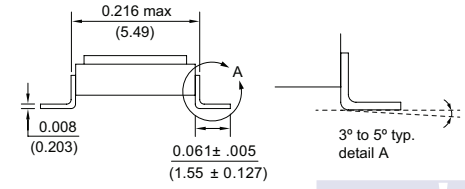
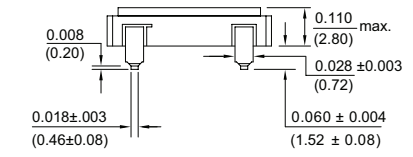
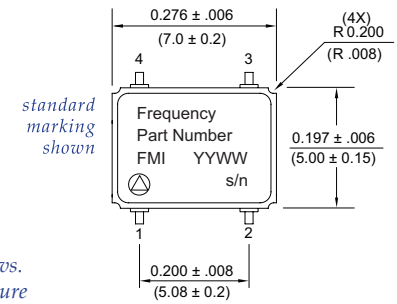
**Features**

- Hi-Rel Design and Manufacture
- Proven High Shock Crystal Support
- ECCN - EAR 99
- Customer Support & Service
- High-Shock & Vibration Configuration
- Small 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 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	3	48/52	±10	±100	±75	±60	±50
04	05	06	1 to 7.9	1.2	3	48/52	±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	3	45/55	±10	±100	±75	±60	±50
14	15	16	50 to 79.9	8	2	40/60	±10	±100	±75	±60	±50
17	18	19	80 to 94.9	10	2	40/60	±10	±100	±75	±60	±50
21	22	23	95 to 130	25	2	40/60	±10	±100	±75	±60	±50

**Mechanical SPECIFICATIONS**



Leads are integral to the ceramic header. They are **not** added on to the package in a post manufacturing process.

land pattern

Pad 1, ESD Symbol

An external bypass capacitor 0.01µF is required between Vdd and GND

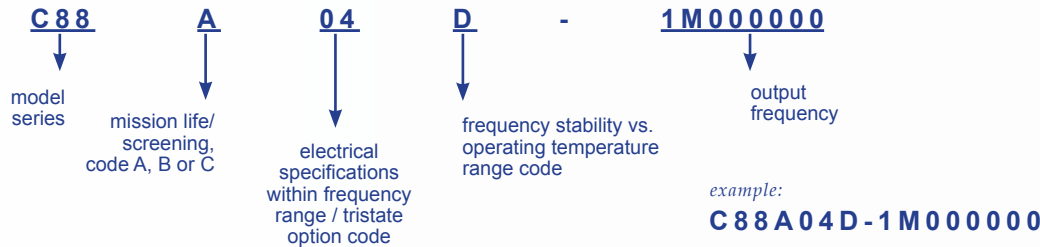
See reverse side for screening details

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 PIN CONFIGURATION	Pin Number	Function
* Enable, Logic 1   Disable, Logic 0 Terminate any unused leads, (they are not terminated internally).	1	Output Enable (Tri-state)*
	2	Ground (case)
	3	Output
	4	Supply V (Vcc)

**How To ORDER**



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

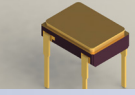


**FREQUENCY MANAGEMENT** | International  
15302 Bolsa Chica Street  
Huntington Beach, CA 92649

FrequencyManagement.com


Ph. 714 373 8100  
Fx. 714 373 8700

Sales@FrequencyManagment.com



**C78**  
Other Thru-hole Leaded  
5x7 mm Ceramic  
SMD for Space,  
Please Inquire!

New 5x3.2 Radiation  
Tolerant Oscillator  
for Space,  
Please Inquire!



**C53**



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.

### 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	

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

#### Helpful & Relevant 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 **higher level specifications**. We will provide you with the technical support and the required documentation.

Issue 11\_12192023



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15302 Bolsa Chica Street  
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[FrequencyManagement.com](http://FrequencyManagement.com)

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