



*MILITARY, AEROSPACE and AVIONICS*  
*Hi-Reliability Crystals, Oscillators & VCXOs*



**FREQUENCY MANAGEMENT | INTERNATIONAL**



**Rugged Timing & Frequency Control  
Devices, QPL and Beyond**

*Higher Temperature Ranges*  
*Wider Frequency Ranges*  
*Higher Reliability*  
*Smaller Packages*  
*Lower Current*

**FMI**

# MIL / AEROSPACE / AVIONICS - Product Highlights

- Targeting both New System Designs and Legacy Replacements
- Complies to Operating Conditions Beyond Industry Standards
- Solutions for new Jet Engine Controllers and Sensors at Higher Operating Temperatures
- Smallest Available Product Footprints
- Lowest Available Power Consumption
- Established Reliability
- Fixed, Variable, & Multiple Frequency
- Low Phase Jitter
- Wide Operating Temperature Range | Tight Stability
- DC to 500 MHz

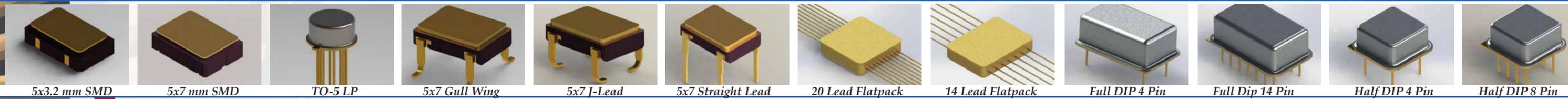
*notes:*  
 1. Initial accuracy and frequency vs. temperature tolerance could be combined to provide more precision overall frequency tolerance.  
 2. Customer specified operating temperature are available from -180°C to +300°C.  
 3. CMOS/TTL frequency range shown in the table. LVDS and PECL frequency range extends higher

## Electrical Specifications

This table represents typical performance criteria for CMOS output and various packages

Output Freq. Range (MHz)	Vcc = 3.3V max Current (mA)	Pulse Characteristics		Initial Accuracy at 23°C±1°C	Frequency vs. Temperature Tolerance (ppm)			
		Rise & Fall Times max	Duty Cycle min-max		-55 to +150°C	-55 to +125°C	-55 to +105°C	-40 to +85°C
0.01 ~ 0.09	2	6 ns	48-52%	±15 ppm	±70 ppm	±50 ppm	±40 ppm	±25 ppm
0.1 ~ 0.9	2	5 ns	48-52%	±15 ppm	±70 ppm	±50 ppm	±40 ppm	±25 ppm
1.0 ~ 7.9	2	5 ns	48-52%	±15 ppm	±70 ppm	±50 ppm	±40 ppm	±25 ppm
8.0 ~ 15.9	3	4 ns	45-55%	±15 ppm	±70 ppm	±50 ppm	±40 ppm	±25 ppm
16.0 ~ 49.9	3	4 ns	45-55%	±15 ppm	±70 ppm	±50 ppm	±40 ppm	±25 ppm
50.0 ~ 64.9	4	3 ns	40-60%	±15 ppm	±70 ppm	±50 ppm	±40 ppm	±25 ppm
65.0 ~ 84.9	6	3 ns	40-60%	±15 ppm	±70 ppm	±50 ppm	±40 ppm	±25 ppm
85.0 ~ 99.9	8	3 ns	40-60%	±15 ppm	±70 ppm	±50 ppm	±40 ppm	±25 ppm
100.0 ~ 120.0	10	3 ns	40-60%	±15 ppm	±70 ppm	±50 ppm	±40 ppm	±25 ppm

(Below are only a few cases, others are available)



## Quality Assurance Program

Our dedication to customer satisfaction is the backbone of our quality program.

- MIL-PRF-55310 Class B (QPL Certified)
- ISO 9001-2008 (Certified & Registered)
- MIL-STD-790
- MIL-PRF-3098
- MIL-STD-883
- MIL-PRF-38534
- MIL-STD-202
- ESD: JESD625-A

### MIL-PRF-55310 B Level Screening (standard)

Screening	MIL Spec / Method
Non-Destruct Bond Pull	MIL-STD-883, Method 2023
Internal Visual	MIL-STD-883, Method 2017, Class H; Method 2032, Class H
Stabilization (Vacuum) Bake	MIL-STD-883, Method 1008, Condition C, 150°C, 48 hours min
Temperature Cycle	MIL-STD-883, Method 1010, Condition B, 10 cycles
Constant Acceleration	MIL-STD-883, Method 2001, Condition A, Y1 Plane only, 5000 g's
Burn-in	MIL-STD-883, Method 1015, Condition B
Electrical Test	Nominal VCC & Extremes and Nominal Temp and Extremes
Seal: Fine Leak	MIL-STD-883, Method 1014, Condition A2
Seal: Gross leak	MIL-STD-202, Method 112, Condition D
External Visual & Mechanical	MIL-STD-883, Method 2009

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

### Package Style vs. Supply V vs. Frequency Range Offered

Package Style	Supply Voltage	Frequency Range
5x3.2 SMD	1.2V to 5V	300 KHz to 100 MHz
5x7 (SMD & Leaded)	1.2V to 5V	300 KHz to 100 MHz
Half DIP	1.2V to 15V	10 KHz to 100 MHz
Full DIP	1.2V to 15V	0.1 Hz to 100 MHz
TO-5 LP	1.2V to 15V	300 KHz to 100 MHz
Flatpack, 20 Lead	1.2V to 15V	300 KHz to 100 MHz
Flatpack, 14 Lead	1.2V to 15V	300 KHz to 100 MHz

VCXOs are available in all of the above packages offered at various operating temperatures and supply voltages. Please inquire.

*Please contact us with your requirements*

# Military | Aerospace | Avionics Product Offering - FMI

## Capabilities & Features

- Best Optimized Frequency Stability vs. Temperature Range Options
- Smallest Package Footprints
- Industry Standard Packages and I/O Connections
- Lowest Power Consumption
- Proven Long Operating Life over the Entire Operating Conditions
- Crystals, Oscillators, VCXOs, Temperature Sensors
- Voltage Options: 1.2V, 1.8V, 2.5V, 3.3V, 5V, and up to 15V
- Radiation Tolerance: from 10krad and Up
- COTS Alternatives Available
- Temperature Range: -180°C to +300°C
- High Shock and Vibration
- High Pressure Tolerant to 7,000 PSI
- CMOS/TTL, Sine-wave, LVPECL & LVDS
- Low Phase Jitter
- Facilitated Source Inspection Provisions
- Maximum Use of Established Reliability Components
- Rugged Design & Construction Optimized for Severe Environments
- Robust Manufacturing & Assembly Techniques
- Very Rugged Crystal Design and Mechanical Assembly
- Long Term Performance & Life Test Under Extreme Conditions
- Surface Mount and Thru-hole Package Options

**Offering both standard and custom solutions, our team of engineers is ready and able for any challenge. Contact us for all your Frequency Control Product needs.**

**FMI** is a global leader in the design and manufacturing of high reliability – extreme environment and industrial grade – frequency control and hybrid electronic solutions. Committed to the industry's highest level of service and total customer satisfaction, we help our customers achieve competitive advantages and strategic differentiation in their product applications.

At **FMI**, our foremost commitment is to complete customer satisfaction. This ideal is consistently reflected throughout our superior product performance, QA systems, prompt product delivery and effective customer assistance.

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**Ruggedized Frequency  
Control Devices,  
QPL & Beyond**



#### **Applications:**

Mobile and Stationary Systems

Radar DSP

Vision Systems

Aircraft Control

Position Sensors

Drone

Smart Ammunition

Deep Space Robotic

Navigation and Guidance Systems

Short and Long Earth Orbit (EO) Scientific Missions

Commercial Satellites and Reusable Rockets

QPL per MIL-PRF-55310 | ISO 9001-2008 | MIL-STD-790



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#### **FREQUENCY MANAGEMENT | International**

#### **World Class Manufacturing and First Class Customer Service**

Located within easy reach from 3 major airports, our headquarters is located in Huntington Beach, CA with more than 16000 SF operating space for manufacturing and test equipment, clean room, and administration.

