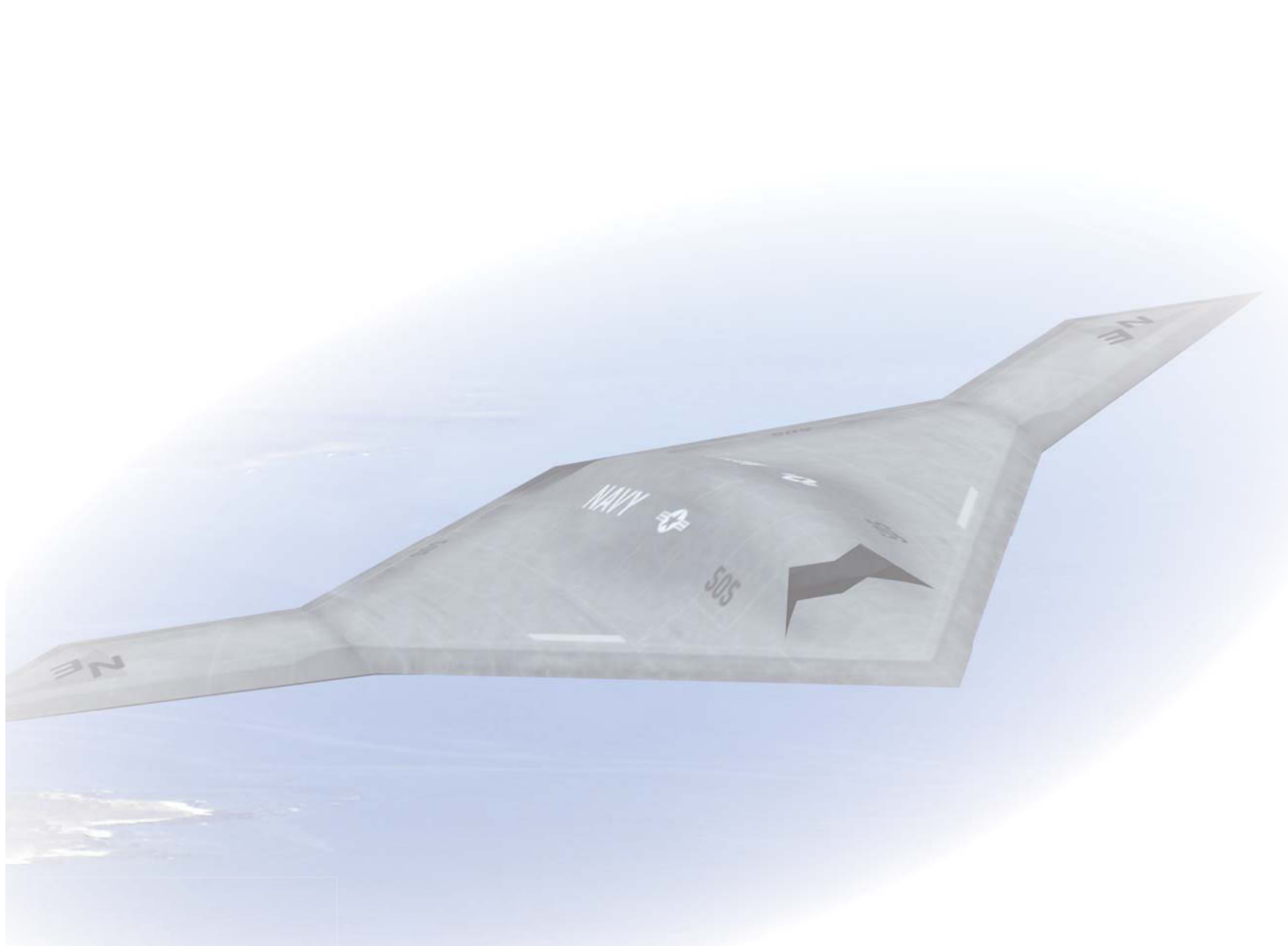


MtronPTI

2014 Short Form Catalog
Timing and Spectrum Control



INTERNET

WIRELESS

AVIONICS

DEFENSE

AEROSPACE

INSTRUMENTATION

COMMUNICATION

CONNECT WITH



CORE PRODUCTS

Spectrum Control

TUNABLE FILTERS:

- Digital Frequency Hopping
- Analog Varactor Tuned
- Switched

FIXED FREQUENCY FILTERS:

- Cavity
- Crystal
- Lumped Element
- Hybrid

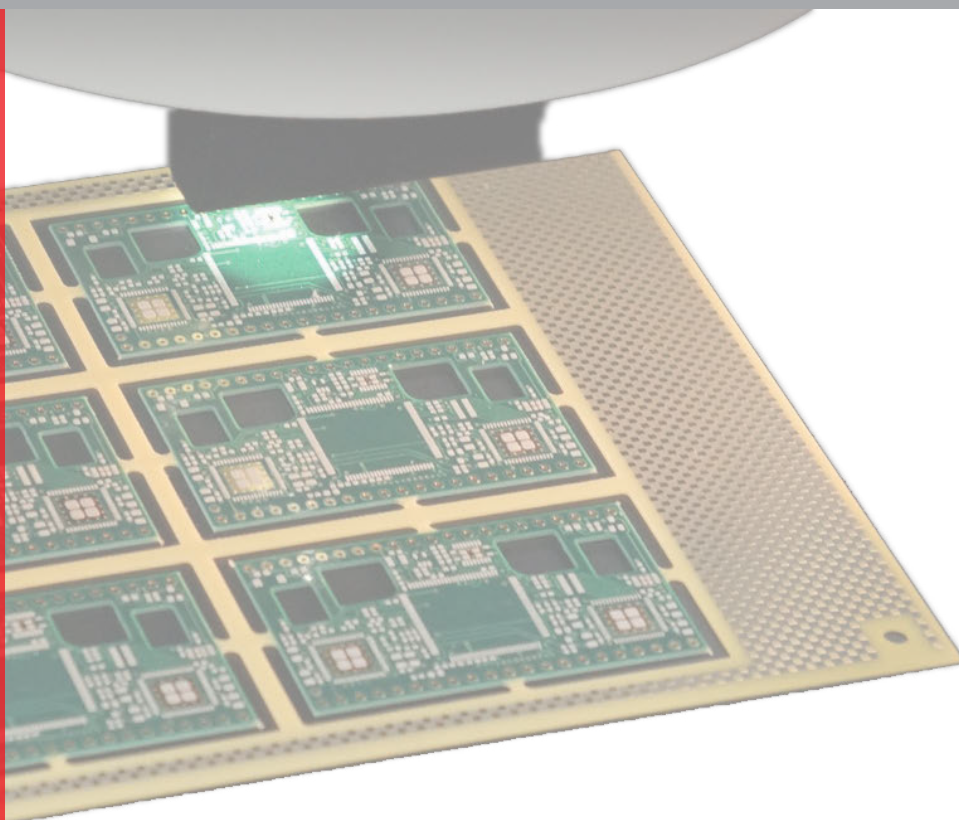
Timing Control

OSCILLATORS:

- Digitally Compensated
- Temperature Compensated
- Ovenized
- GPS Locked
- IEEE-1588, Stratum 2, Stratum 3
- Harsh Environment
- High Vibration, Low G-sensitivity
- High Shock Survival

RESONATORS:

- Quartz Crystal
- Ultra-low G-sensitivity



AS9100 Rev C

MtronPTI provides Spectrum and Timing Control Solutions for Communication, Measurement, Command and Control Applications. In business nearly fifty years, **MtronPTI** uses basic material science and a wealth of experience working with industry leading OEMs to design and manufacture precision Filters and Oscillators for Aerospace, Defense, Internet and Instrumentation markets.

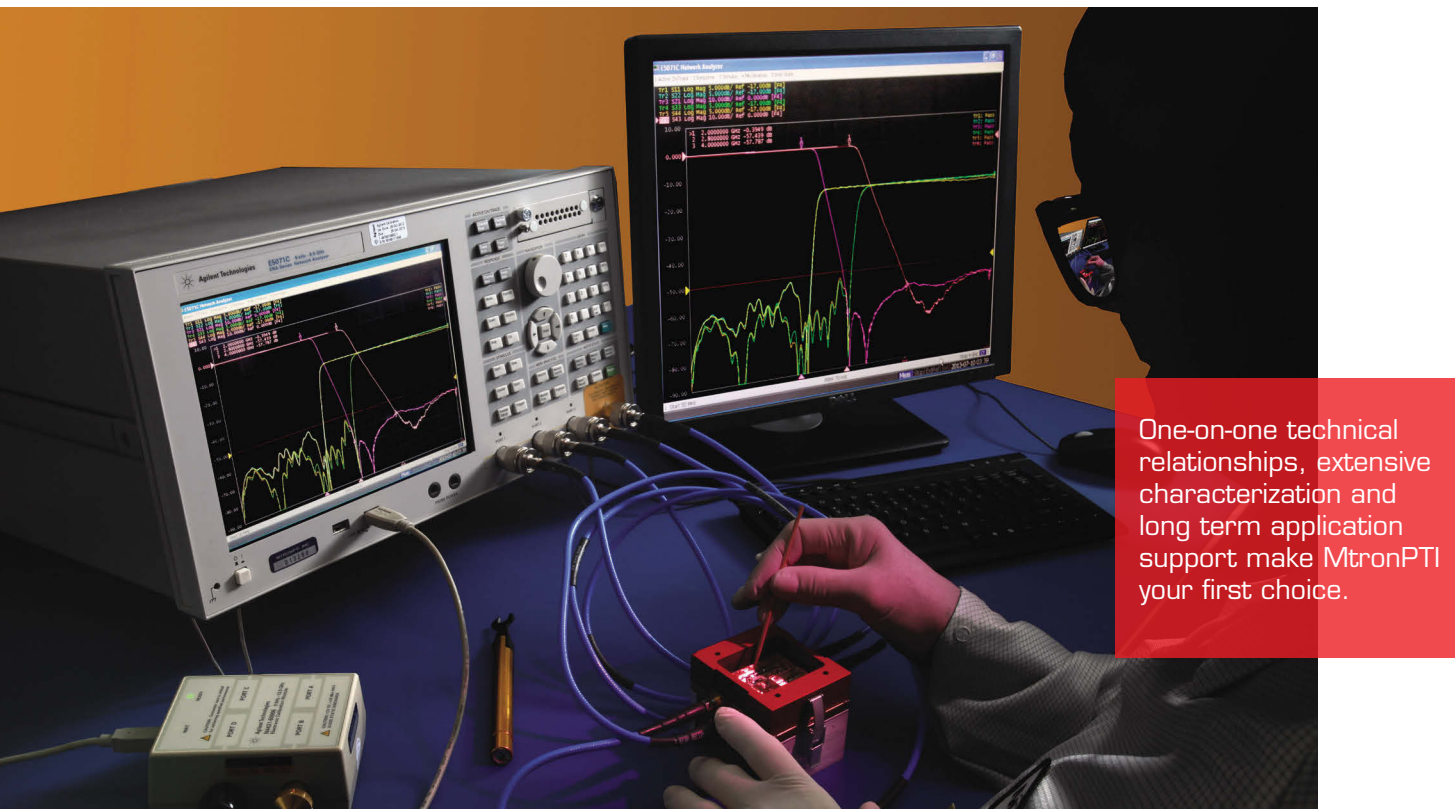
COMPONENTS AND MODULES

Focus on Service

MtronPTI's promise is Service, Commitment and Quality from initial client contact through product development, testing and after sales support.

MtronPTI headquarters are located in Orlando, Florida with five global service locations. The three manufacturing sites are **ISO 9001:2008** and **AS9100 Rev C Certified**.

MtronPTI's custom solution experience reduces risk, increases reliability and lowers overall cost in critical measurement, control or communication applications.



One-on-one technical relationships, extensive characterization and long term application support make MtronPTI your first choice.

MtronPTI is a subsidiary of The LGL Group, Inc., a NYSE MKT listed company.

TECHNICAL EXPERTS



Partnership

Your Goals Come First

Each project is unique in design, environmental, schedule and cost parameters. **MtronPTI** promises excellent Technology, Quality and Responsiveness based on the program's unique needs. Application engineers work with your system designers to select the best solution from alternatives. Component, module and process engineers select the characterization and test approach. Manufacturing Engineering using six sigma, lean and AS9100 Rev C methods works to ensure timely, reliable solutions now and in the future.

MtronPTI will also help manage the supply chain: aligning forecasts and qualifying purchased component suppliers, working with distributors, hubs and portals to make sure each time the system production line reaches for an **MtronPTI** part it'll be there.

MARKET SOLUTIONS

AEROSPACE / AVIONICS

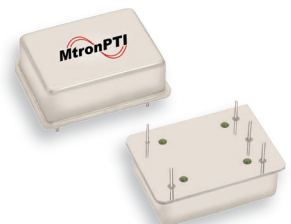
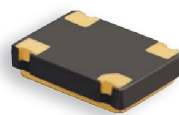
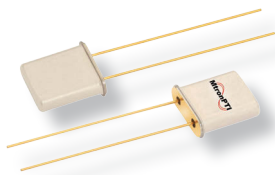
	Timing Solutions						RF & Microwave Solutions				
	Timing Modules	OCXO	TCXO	VCXO	Clocks	Crystals	Crystal Filter	LC Filter	Cavity Filter	Tunable / Switched	RF Module
Airframe Control (Harsh Environment)											
Avionics Radio											
Engine Control (Harsh Environment)											
Navigation											
Satellite Base Station											
Satellite Flight Hardware											

DEFENSE

	Timing Solutions						RF & Microwave Solutions				
	Timing Modules	OCXO	TCXO	VCXO	Clocks	Crystals	Crystal Filter	LC Filter	Cavity Filter	Tunable / Switched	RF Module
Airborne • Satellite Communication											
Anti-IED											
Command and Control											
Electronic Warfare											
Guided Munitions • Missile											
Land Mobile Radio (LMR)											
Radar											
Ship Communication											
Soldier Communication											
UAV Data Link											
Vehicle Communication											

INTERNET

	Timing Solutions						RF & Microwave Solutions				
	Timing Modules	OCXO	TCXO	VCXO	Clocks	Crystals	Crystal Filter	LC Filter	Cavity Filter	Tunable / Switched	RF Module
3G • 4G • Wimax Base Station											
Cable Modem											
Cable Modem Head End											
Data Storage Bay											
Femto • Micro • Pico Cell											
Fiber Channel											
Gigabit Ethernet											
IEEE-1588 • SyncE Data Link											
Microwave Backhaul											
Microwave Repeater											
Optical Networking											
Server Rack											
Sonet • SDH											
Switch • Router											



MARKET SOLUTIONS

PUBLIC SAFETY / MEDICAL

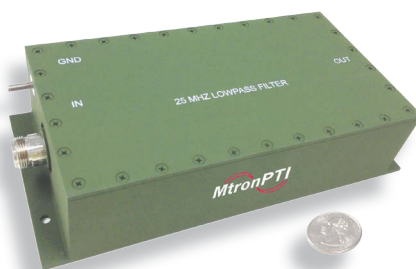
	Timing Solutions						RF & Microwave Solutions				
	Timing Modules	OCXO	TCXO	VCXO	Clocks	Crystals	Crystal Filter	LC Filter	Cavity Filter	Tunable / Switched	RF Module
Medical Equipment											
Public Safety Radio											

COMMERCIAL / AUTO

	Timing Solutions						RF & Microwave Solutions				
	Timing Modules	OCXO	TCXO	VCXO	Clocks	Crystals	Crystal Filter	LC Filter	Cavity Filter	Tunable / Switched	RF Module
Automotive Control											
Bluetooth											
Broadcasting											
Data Logger											
Flatbed Scanner											
Frequency Counter											
Home Automation											
Industrial Process Control											
POS System											
Professional Audio Processing											
Test and Measurement Equipment											
RFID											
Security System											
Synthesizer											
Telemetric System											
Video Digitizing											
Video Display Card											
Wi-Fi Hub											
Zigbee Transceiver											

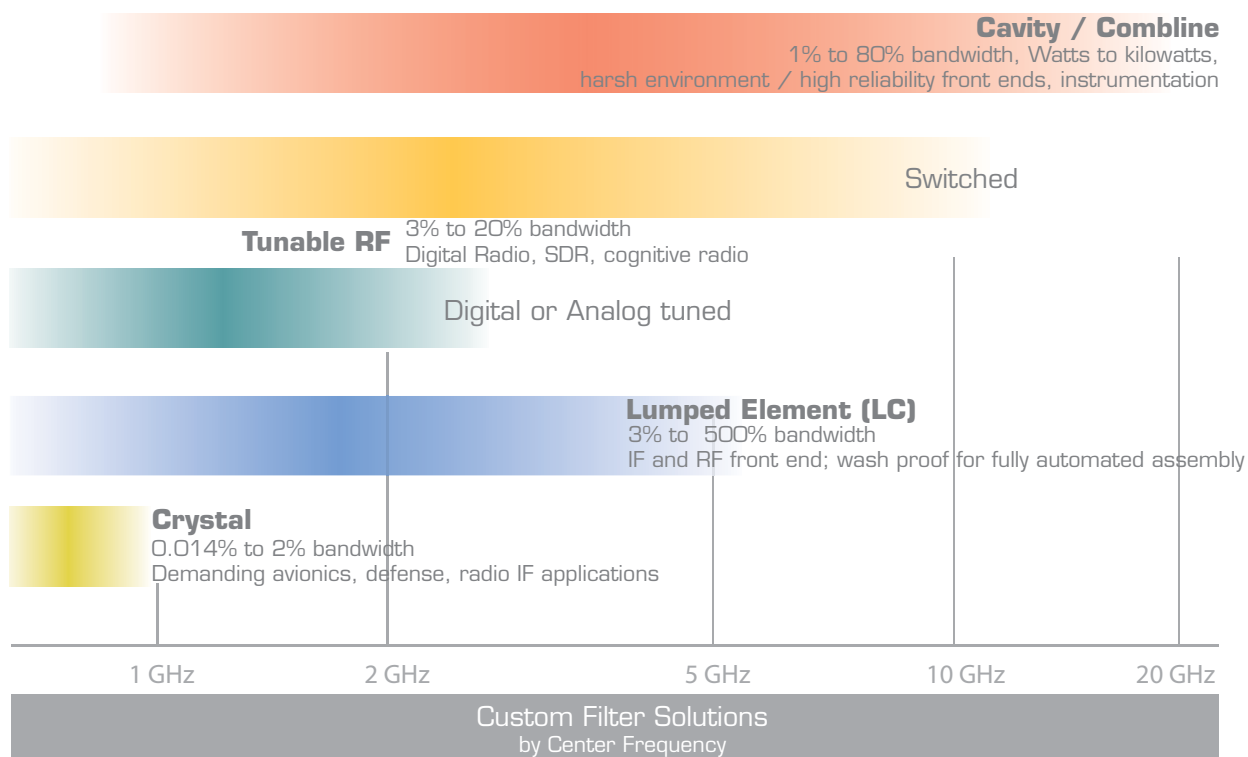
ENERGY / ENVIRONMENT

	Timing Solutions						RF & Microwave Solutions				
	Timing Modules	OCXO	TCXO	VCXO	Clocks	Crystals	Crystal Filter	LC Filter	Cavity Filter	Tunable / Switched	RF Module
Down Hole Drilling											
Environmental Monitoring											
Smart Grid											
Smart Meter											
Solar System											
Wind Turbine											



RF & MICROWAVE CUSTOM FILTERS

Clarity



Wireless Internet

Managing co-site interference, combining feeds to and from an antenna array, or picking an important signal out of the noise, **MtronPTI** RF & Microwave solutions make the world's communication more reliable.

Instrumentation

Communications

From its roots in radar filters in 1965, **MtronPTI** continues to design and manufacture custom RF & microwave solutions for harsh environment/high performance applications. Thorough electronic and thermal modeling followed by aging, stress and rigorous electrical test ensures a long and maintenance-free operating life in wireless backhaul, avionics, test equipment, public safety and military communications.

Avionics

Space

But filters are changing – software defined and cognitive radio designs reduce the need for fixed IF frequencies while demanding agile, tunable front end solutions. **MtronPTI's** line of Tunable RF solutions is ready to help.

Security

TUNABLE RF

Low Insertion Loss
Digitally Tuned

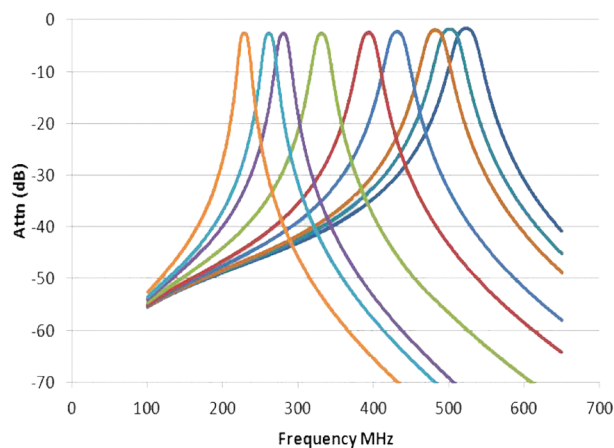
The right information at the right time is critical when lives are at stake. In an environment filled with RF generated by friend and foe, making a connection and holding it is difficult.



Tactical radio setup photo by Air Force Senior Airman Eric Harris

Increasing battlefield radio transmitter power and boosting receiver sensitivity have unwanted side effects. Interference from nonlinearities, reflected energy down mismatched paths and RF energy from radios nearby increase risk of a garbled or missed report. Or worse.

MtronPTI low insertion loss digitally tuned filters clean up the transmit spectrum before the final power amp and block out-of-band energy from entering the receiver, ensuring the message is received.



TFD10x low insertion loss digitally tuned filters
225 – 520 MHz VHF High/UHF, 30 – 90 or 200 – 400 MHz
250 tuning steps, 1 Watt
 $\pm 1\%$ pass band center frequency accuracy
3 dB or less insertion loss



CAVITY

Evanescent Mode High Power Low Cost

Evanescent Mode = high power / small size
Watts to kilowatts / harsh environment / high reliability
100 MHz – 20 GHz
1% - 80% bandwidth



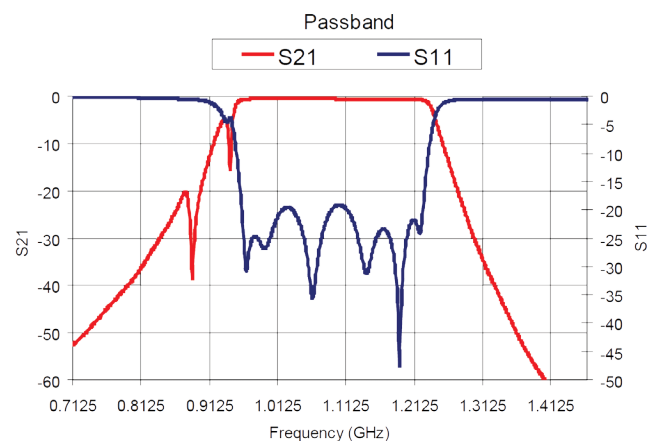
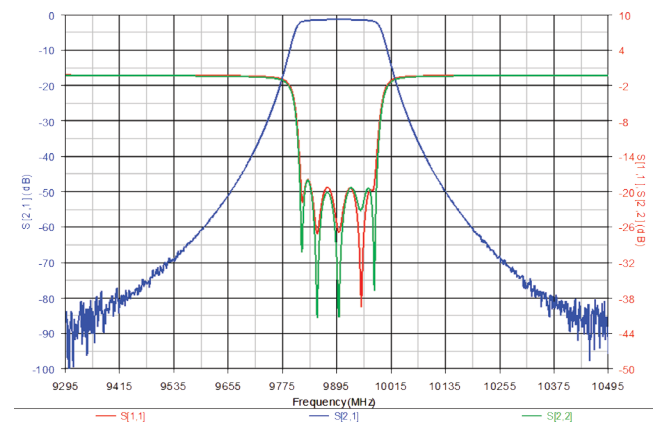
UF9193 filter (top)
UF9192 diplexer (bottom)

MtronPTI's UF9193 700 MHz dual band reject Cavity Filter uses a mixed design TM mode dielectric and TEM coaxial resonators to provide high Q and <1 MHz bandwidth (0.15%) in a 20% to 30% smaller package than full dielectric puck designs. The UF9193 is temperature compensated with a fully sealed die cast housing.

Evanescent mode in the 8906 Link 16 cavity/combine filter: 300 Watts_{peak} in a 2.75" x 1.3" x 0.6" sealed package, ideal for airframe or portable applications.



With frequencies to 20 GHz, cavity filters with laser welded packages perform in harsh environments. UF9382 shown here is a 9.9 GHz filter with less than 1.5 dB pass band attenuation.



LUMPED (LC)

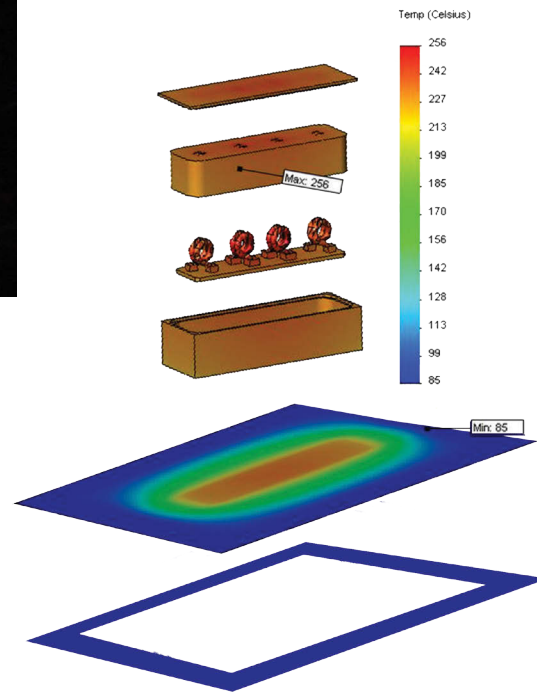
Wash-Proof
Sealed



Wash-proof surface mount • hermetic thru hole • connectorized
Small signal to over 500 Watts
DC - 5 GHz • 3% - 180% bandwidth



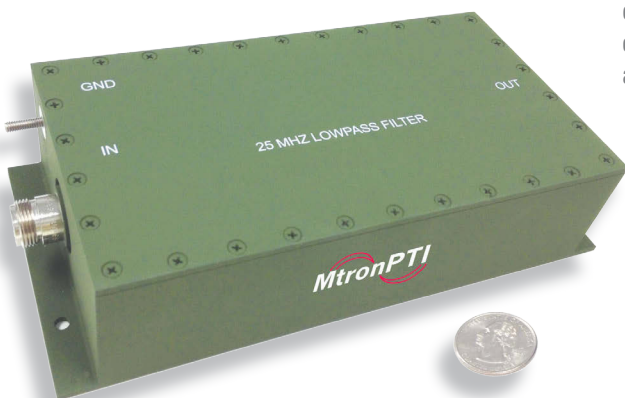
MtronPTI Lumped Element (LC) Filters allow true surface mount wash-proof assembly. Solder seal or laser weld prevents performance shifts during pre and post wash. Hermetic thru hole and connectorized versions are perfect for space and high power applications.



State-of-the-art Electronic and Thermal Modeling deliver high power custom filters while reducing volume, weight and cost.

High power LC filters, like this 200 Watt 25 MHz low pass are qualified for harsh environment, mobile applications where immunity to vibration and wide temperature extremes are mission critical.

MtronPTI specializes in High Performance Complex Multi-Pole extreme environment designs. Whether last-mile with aggressive cost/performance goals or flight hardware requiring clean room assembly, **MtronPTI** will help get it done right the first time.



Harsh
Environment

CRYSTAL

Most Accurate F_c
Very Narrow Band



Monolithic, discrete,
high frequency fundamental
5 MHz – 220 MHz,
0.01% - 2% bandwidth
Superior intermodulation performance
Precision phase & amplitude matched sets

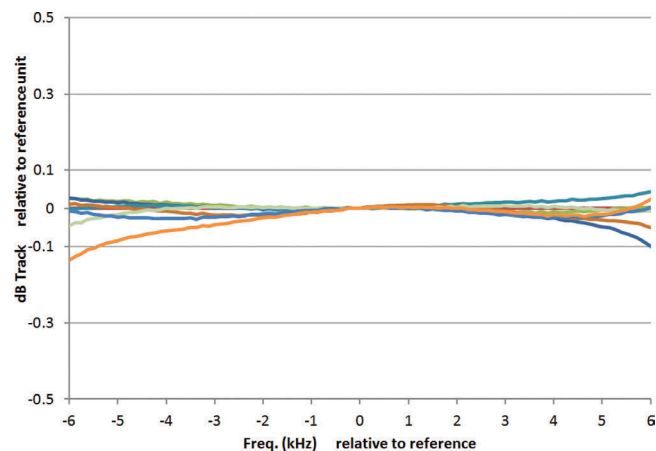
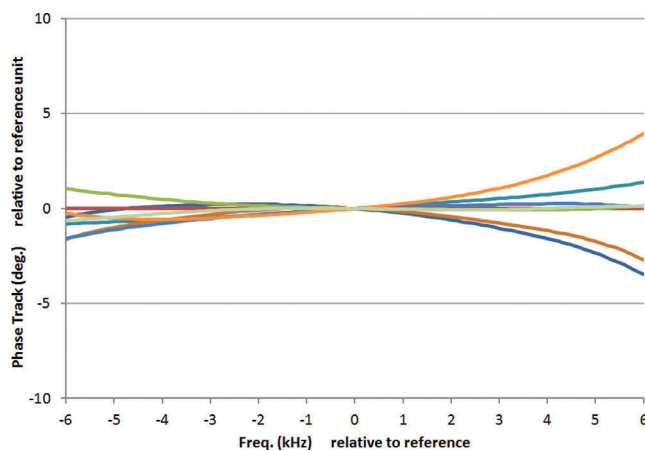
MtronPTI Crystal Filters are perfect for narrow bandwidth, low distortion, high frequency fundamental operation.

Very low Intermodulation (IM) Distortion prevents nonlinearities which can confuse receiver demodulation.

High frequency fundamentals offer wider bandwidth and lower insertion loss for data communications applications.

MtronPTI's fifty years of crystal filter making experience and customized test methods ensure initial technical performance and lifetime service.

Phase and amplitude matched sets are available for applications like AESA (active electronically scanned array) radar, EW and missile guidance – two to eight filters, matched and temperature compensated.



FREQUENCY CONTROL

Reducing lab instrument noise for finer measurements, quieting radar returns for clearer images, syncing with satellites for reliable smart phone data links or suppressing vibration and temperature effects for precise flight control...

MtronPTI high performance timing solutions help us see clearly, stay connected and reach our goals.



Cpl. Boe Trujillo, ISAF Photo used with permission

Accuracy Reliability

MtronPTI offers timing solutions from tight stability Crystal Oscillators and TCXOs for SyncE and Stratum 3 to GPS synchronized modules for cellular base stations, environmental monitoring and test equipment. Performance well past what semiconductors or software alone can deliver, **MtronPTI** Oscillators are the right fit whenever High Precision, Vibration Insensitivity or Very Low Phase Noise is required.

Since **85% of MtronPTI's timing solutions are custom**, start by looking through the tables on the next few pages to find a solution close to your needs. Then contact **MtronPTI** to extend your reach further.

Flight Control

Internet Data

Aircraft Radar

Defense Radio

Lab Instruments

Down Hole Drilling

Monolithic
Crystals Filters
in Space

1973

1985

1 GHz
Chemically
Milled
Resonators

Fast Turn
Oscillators to
1 GHz

2006

2009

GSPDO

100 MHz Low
Noise OCXO

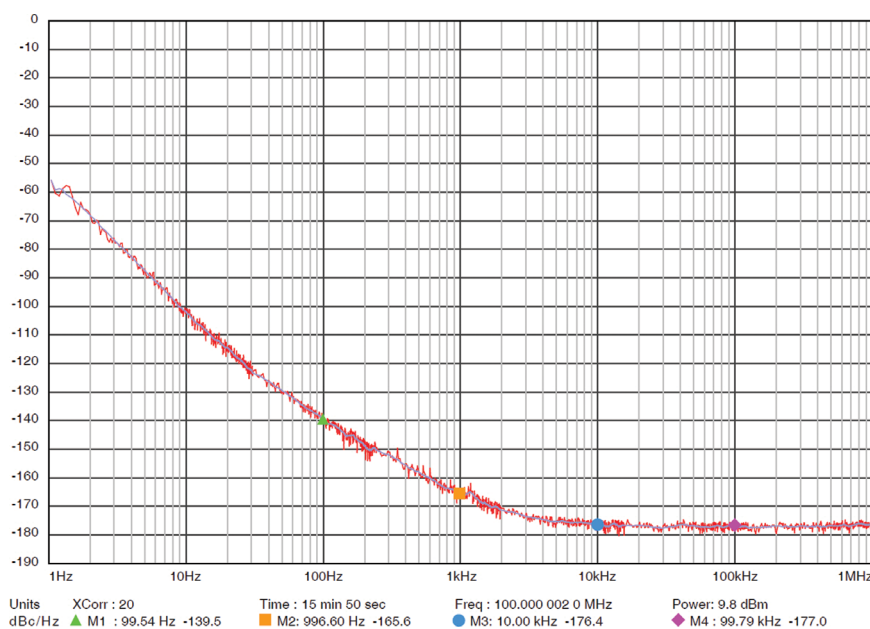
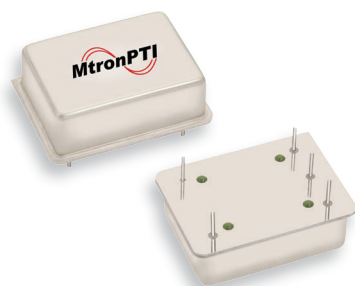
2012

OCXO

High Stability 1588 SyncE

Oven Controlled Crystal Oscillators

provide excellent stability, low noise and excellent long term aging for Stratum 3E and IEEE1588 SyncE. High frequency OCXOs with low phase noise improve signal-to-noise ratio in EW, RF ATE, lab instruments and radar.

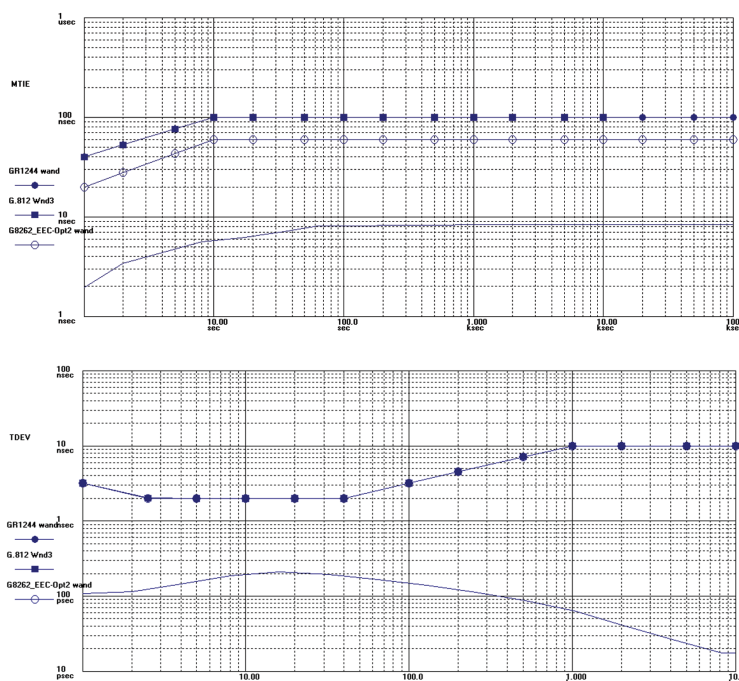
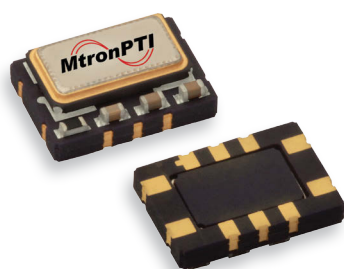


Application	Frequency (MHz)		Output	Temp. stability (ppb)	Package (inches)	Supply (V)
	Low	High				
Ultra low noise: < -170 dBc @ 100 kHz offset						
XO5085	50	160	Sine	±100	1 x 1	5, 12
Stratum 3E & SyncE compliant						
XO5184-1588	10	25	CMOS	±10	1 x 0.87	3.3, 5
XO5084-1588	10	25	CMOS	±10	1 x 1	3.3, 5
Stratum 3 compliant						
XO5165	10	20	CMOS	±100	14 pin DIP	3.3, 5
XO5166 / XO5167	10	53	CMOS	±100	14 pin DIP	3.3, 5
Low noise: < -155 dBc @ 10 kHz offset						
XO5123 / XO5124 SC cut	10	100	Sine / CMOS	±2	1 x 1.4	3.3 to 12
XO5121 / XO5122 AT cut	10	100	Sine / CMOS	±20	1 x 1.4	3.3 to 12
Low profile, compact						
XO5183 / XO5184 SC cut	10	100	Sine or CMOS	±5	1 x 0.87	3.3 to 12
XO5083 / XO5084 SC cut	10	100	Sine or CMOS	±5	1 x 1	3.3 to 12
XO5285	50	125	PECL	±20	0.8 x 0.8	3.3 to 5
XO5181 / XO5182 AT cut	10	100	Sine or CMOS	±20	1 x 0.87	3.3 to 12
XO5081 / XO5082 AT cut	10	100	Sine or CMOS	±20	1 x 1	3.3 to 12
Low aging high stability DOXO						
XO5153	10	10	Sine	±0.5	1 x 1.4	12
Fast warm-up: 2 minutes						
XO5160	10	20	CMOS	±50	14 pin DIP	5
XO5161	10	20	CMOS	±50	14 pin DIP	12
XO5162	10	20	Sine	±50	14 pin DIP	5
XO5163	10	20	Sine	±50	14 pin DIP	12
XO5164	10	20	CMOS	±50	14 pin DIP	3.3

Stratum 3 Low G-Sense High Frequency

Temperature Compensated Crystal Oscillators

Deliver low cost and stable timing for SyncE and Stratum 3 data links. Testing for wander generation, holdover and drift ensures reliable performance.



Application	Frequency (MHz)		Output	Temp. stability (ppm)	Package	Supply (V)
	Low	High				
Stratum 3 or SyncE compliant						
M617x	8	38.88	CMOS or Clipped sine	Stratum 3	3.2 x 5 mm	3.0, 3.3, 5.0
M610x	8	38.88	CMOS or Clipped sine	Stratum 3	5 x 7 mm	3.0, 3.3, 5.0
M615x Stratum 3	8	38.88	CMOS or Clipped sine	Stratum 3	5 x 7 mm	3.0, 3.3, 5.0
M610x SyncE	10	38.88	CMOS or Clipped sine	Stratum 3	5 x 7 mm	3.0, 3.3, 5.0
Miniature						
M618x	8	52	CMOS or Clipped sine	±0.1	3.2 x 5 mm	3.0, 3.3, 5.0
M6053	10	52	CMOS or Clipped sine	±0.2	3.2 x 5 mm	3.0
M6064	10	52	Clipped sine	±0.5	2 x 2.5 mm	3.0
M6055	10	52	Clipped sine	±0.5	2.5 x 3.2 mm	3.0
5 x 7 High Frequency, harsh environment						
M616x Low G-sensitivity: 0.6 ppb/g	8	52	CMOS or Clipped sine	±0.1	5 x 7 mm	3.0, 3.3, 5.0
M611x	8	52	CMOS or Clipped sine	±0.2	5 x 7 mm	3.0, 3.3, 5.0
M630x High Frequency	50	1400	LVPECL, LVDS or CML	±0.5	5 x 7 mm	1.8, 2.5, 3.3
	50	150	CMOS	±0.5	5 x 7 mm	1.8, 2.5, 3.3
M6029/M6030	12.6	26	Clipped sine	±1.5	5 x 7 mm	3.0
Low noise, low aging						
M612x	8	52	CMOS or Clipped sine	±0.2	0.84" x 0.46"	3.0, 3.3, 5.0
M613x	8	130	CMOS or Clipped sine	±0.2	9 x 14 mm	3.0, 3.3, 5.0
XO3030	10	100	CMOS or Sine	±0.25	1" x 1.25"	3.3, 5
XO3070	10	100	CMOS or Sine	±0.25	1" x 1"	5 to 15
XO3080	10	125	CMOS or Sine	±0.25	1.1" x 0.7"	3.3, 5
M6049/M6050	8	52	CMOS or Clipped sine	±0.5	14 Pin DIP	3.3, 5
M6001/M6002/M6003/M6004	10	30	CMOS	±0.5	9 x 14 mm FR-4	3.3, 5
XO3280	10	25	CMOS	±0.75	0.7" x 0.5"	3.3, 5

All TCXOs are available with voltage control as VCTCXOs.

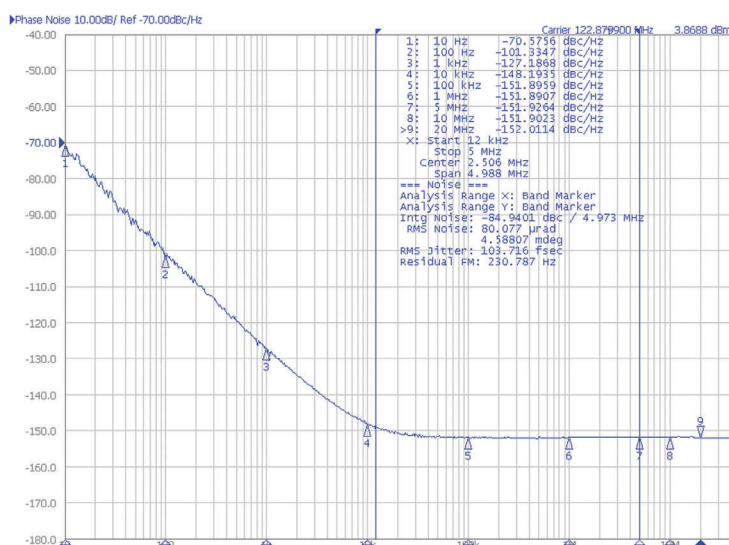
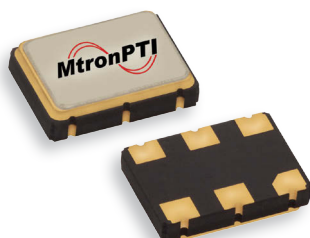
VCXO

Low Noise to 1.4 GHz Harsh Environment

Voltage Controlled Crystal Oscillators

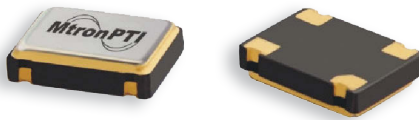
offer wide frequency range with tunability to match a reference clock.

MtronPTI VCXOs, designed for low jitter, are available in as few as two weeks for internet, base station, flight control and military communication applications.



Application	Frequency (MHz)		Output	Temp. stability (ppm)	Package	Supply (V)	APR (ppm)
	Low	High					
Low noise							
M3028 Low jitter	30	170	LVPECL		5 x 7 mm	3.3	±40
MV3	1.544	167	CMOS	±20	5 x 7 mm	3.3	±80
MV5	1.544	50	CMOS	±20	5 x 7 mm	5	±80
UVVJ Low jitter	0.75	800	LVPECL or LVDS	±20	5 x 7 mm	3.3	±80
Wide frequency range, high frequency, wide pull							
M310x	10	1400	LVPECL, LVDS, CML	±25	5 x 7 mm	1.8, 2.5, 3.3	±200
	10	150	CMOS	±25	5 x 7 mm	1.8, 2.5, 3.3	±200
M31x	10	1400	LVPECL, LVDS, CML	±25	5 x 7 mm	1.8, 2.5, 3.3	±200
	10	150	CMOS	±25	5 x 7 mm	1.8, 2.5, 3.3	±200
M320x	10	1400	LVPECL, LVDS, CML	±25	9 x 14 mm	1.8, 2.5, 3.3	±200
	10	150	CMOS	±25	9 x 14 mm	1.8, 2.5, 3.3	±200
UVV	0.75	800	LVPECL or LVDS	±20	5 x 7 mm	3.3	±100
9 x 14							
F17250B/F17350B, F17255B/F17355B	75	180	LVPECL	±30	9 x 14 mm	3.3, 5.0	±150
MPV3	0.75	800	LVPECL or LVDS	±80	9 x 14 mm	3.3	±100
MPV3J/MPV5J	30	800	LVPECL or LVDS	±80	9 x 14 mm	3.3, 5.0	±50
General purpose							
MVP	19.44	155.52	PECL	±20	14 pin DIP	5	±100
XO7082	10	160	CMOS	±12	1.08" x 0.69"	5	±30
XO7080	10	160	Sine	±12	1.08" x 0.69"	3.3, 5.0	±25
XO7060	30	240	Sine	±20	1.4" x 1'	5	±40
SAW oscillators							
M4005 / M4006 / M4007	1090	1090	Sine	±250	9 x 14 mm FR-4	3.3, 5, 12	n.a.

Compact High Temp Ruggedized



Crystal Oscillators provide very precise and stable clock frequencies from 10 MHz to 1.4 GHz. For example, the low jitter of 100 fs max makes the M2058 series ideal for 40 and 100 Gigabit Ethernet.

The M2052 class with an operating temperature to +200° C fits instrumentation and networking needs for down hole drilling and industrial process monitoring.

Application	Frequency (MHz)		Output	Temp. stability (ppm)	Package	Supply (V)
	Low	High				
Harsh environment, mil temp range						
HPO Series	25	150	CMOS	±5	5 x 7 mm	3.3
Miniature						
M2532	1	66	CMOS	±25	2.5 x 3.2 mm	3.3
M2030/31/32/33/34	1.5	80	CMOS	±20	3.2 x 5 mm	1.8, 2.5, 2.85, 3.0, 3.3
5 x 7						
M2058 Low Phase Jitter	120	170	LVPECL	±20	5 x 7 mm	3.3
M2001	53.125	156.25	LVPECL, LVDS or CMOS	±25	5 x 7 mm	3.3
M2250	1.5	125	CMOS	±20	5 x 7 mm	2.5
M2	1.5	135	CMOS	±20	5 x 7 mm	3.3
M1	1.5	125	CMOS	±20	5 x 7 mm	5
M2035 / M2036 / M2037	1.5	125	CMOS	±20	5 x 7 mm	2.85, 3.0, 3.3
M2180	1.5	70	CMOS	±25	5 x 7 mm	1.8
M2052 High temp. operation	2	35	CMOS	±250	5 x 7 mm	3.3
Wide frequency range						
M210x	10	1400	LVPECL, LVDS, CML	±20	5 x 7 mm	1.8, 2.5, 3.3
	10	150	CMOS	±20	5 x 7 mm	1.8, 2.5, 3.3
M21x	10	1400	LVPECL, LVDS, CML	±20	5 x 7 mm	1.8, 2.5, 3.3
	10	150	CMOS	±20	5 x 7 mm	1.8, 2.5, 3.3
M220x	10	1400	LVPECL, LVDS, CML	±20	9 x 14 mm	1.8, 2.5, 3.3
	10	150	CMOS	±20	9 x 14 mm	1.8, 2.5, 3.3
UVC	0.75	800	LVPECL or LVDS	±20	5 x 7 mm	3.3
UVCJ Low jitter version	0.75	800	LVPECL or LVDS	±20	5 x 7 mm	3.3



XTAL

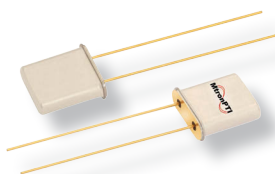


Low G-Sense

Precision Crystal Resonators are designed for high-reliability applications and also as the key element in reference oscillators and crystal filters.

MtronPTI works with college material labs, advanced space, military communications and avionics OEMs to reduce phase noise, lower g-sensitivity and improve stability.

Surface mount



QPL

Application	Frequency (MHz)		PPM		Temperature range (°C)	Package
	Low	High	Tolerance	Stability		
Low g-sensitivity, low aging						
XR Series	3	200	custom	custom	-55 to +125	custom
Surface mount						
PP	10	180	±10	±10	-40 to +85	3.5 x 6 mm
PM	8	150	±10	±10	-40 to +85	5 x 7 mm
ATSM-49	3.58	72	±30	±50	-10 to +70	HC-49/S
M1253	12	54	±10	±10	-10 to +70	2.5 x 3.2 mm
M1325	12	54	±10	±10	-10 to +70	3.2 x 5 mm
QPL						
MIL-PRF-3098-QPL	1	61	±50		-55 to +105	HC-48/U
MIL-PRF-3098-QPL	2.4	61	to ±20		-55 to +105	HC-49/U
MIL-PRF-3098-QPL	2.2	61	to ±15		-55 to +105	HC-50/U
MIL-PRF-3098-QPL	1	20	±50		-55 to +105	HC-51/U
Real time clock						
MMCC-2	32.768 KHz		±30		-20 to +70	1.5 mm diameter
MMCC-3	32.768 KHz		±30		-20 to +70	2 mm diameter
SX1555-R	32.768 KHz		±30		-40 to +85	3.8 x 8 mm
Through hole						
ATS-49	3.58	72	±30	±50	-10 to +70	HC-49U/S
UM-1	6	200	±25	±35	-20 to +70	UM-1
UM-5	12	200	±25	±35	-20 to +70	UM-5

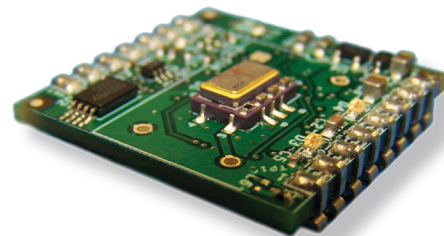
GPS TIMING MODULES



Custom Solutions

GPS Timing Modules use satellite signals to discipline a highly stable local reference clock for Stratum 1 Performance – better than 5×10^{-12} over 24 hours in the M9100 series. Wireless small cell base stations, lab grade test equipment and battery-powered environmental monitoring stations all benefit from the very accurate timing and long term stability only GPS sync can provide.

MtronPTI custom GPS Timing Modules also offer real time data, direction, and velocity for avionics, navigation, smart weapons and similar defense applications.



Application	Temp. stability (unlocked)	Hold over @ 25°C	1 PPS accuracy to UTC (ns rms)	Temperature range (°C)	Package (inch)	Supply (V)
GPSDO High accuracy / stability						
M9101D	$\pm 2.5 \text{ E-}10$	$\pm 7 \mu\text{s}$ (24 hours)	± 15	0 to +75	1.5 x 3	12
M9103D	$\pm 2.5 \text{ E-}10$	$\pm 7 \mu\text{s}$ (24 hours)	± 15	-25 to +75	1.5 x 3	12
M9101S	$\pm 2.5 \text{ E-}08$	$\pm 50 \mu\text{s}$ (24 hours)	± 25	0 to +60	1.5 x 3	12
M9103S	$\pm 2.5 \text{ E-}08$	$\pm 50 \mu\text{s}$ (24 hours)	± 25	0 to +60	1.5 x 3	12
GPSDO Compact versions						
M9100	$\pm 2.5 \text{ E-}08$	$\pm 11 \mu\text{s}$ (3 hours)	± 40	0 to +60	1 x 2.5	12
M9107	$\pm 5.0 \text{ E-}08$	$\pm 11 \mu\text{s}$ (3 hours)	± 40	-20 to +70	1 x 1	3.3
M9108	$\pm 5.0 \text{ E-}08$	custom	± 50	-20 to +70	1 x 1	3.3

COMMITMENT TO QUALITY



Quality in Every Action Equals Quality in Every Person and Product

All three **MtronPTI** design and manufacturing sites are ISO 9001:2008 certified; Yankton, SD and Orlando, FL are also AS9100 Rev C certified. As the first US frequency control company to achieve ISO 9001 in 1993, **MtronPTI** continues to lead the way in assuring your systems will work first time, every time.

Extensive Electrical, Mechanical and Thermal Modeling with Design of Experiments ensure components will meet specification. Prototypes are Exhaustively Characterized over Time and Temperature. Vibration, High Shock and Radiofrequency Leak Tests are performed based on end application needs.

Crystal Bases, Oscillator Headers, Capacitors, Diodes, Manufactured Crystals and other raw materials are tested to verify they meet industry and client specified requirements.

MtronPTI takes a continuous improvement approach to manufacturing systems. Rapid Process Feedback Loops, Lean Manufacturing, and Demand Flow Technology work together to provide right product at the right time, on specification.

Electrical, Mechanical, Thermal Modeling

Highly Reliable

Characterization

Production Testing

Continuous Improvement

AS9100 Rev C

Support Second to None

Thank You to our clients for continued support and recognition of our efforts together to deliver **Complex High Performance Solutions.**

"The responsiveness of **MtronPTI** is absolutely outstanding. I can always count on you and your team to answer any question I have almost instantaneously, regardless of where you have to go to get it....from my viewpoint, I don't think **MtronPTI** could possibly get any better..."

Fortune 500
Aerospace Client

"It's very important to understand the need for responsiveness. Don't know why our other suppliers don't see it as much as you do. Most of [our] market losses are time-to-market errors. You folks make us feel like you have no other priorities!"

\$35B Wireless
Infrastructure Client

"We've a long relationship with **MtronPTI**. We count on you for a broad product line, product reliability, but most important: Service. Whenever we have a problem, sometimes even when it is not your device but instead the circuits surrounding, your experts jump right in. The quality of response and depth of knowledge are outstanding."

\$2B Data, Voice, Video
Communications Client

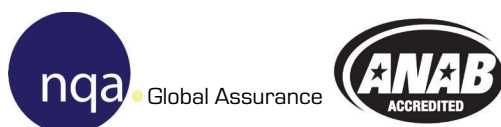
REGISTERED • ENVIRONMENTALLY COMPLIANT • CERTIFIED



ISO 9001: 2008 Registered - India



AS9100 Rev C Certified - Yankton, SD



AS9100 Rev C Certified - Orlando, FL



MIL-STD-790 Certified



RoHS Compliance

OUR PROMISE

When Time Matters

Connect with MtronPTI



As a Defense, Aerospace, Instrumentation or Telecom Equipment maker, you strive to improve products and services by focusing on the few suppliers who share common principles: **on function, on time and on cost.** MtronPTI continues to invest to bring the right technology choices, a continuous improvement collaborative culture and a passion to help you excel. Unique technologies, custom products and exceptional service – these are the reasons to choose **MtronPTI** for your High Performance or Harsh Environment Frequency and Timing Control needs.

*One Simple Decision
Endless Solutions*

WORLDWIDE



MtronPTI may change specifications without notice to improve end application performance or product manufacturability.
No liability is assumed as a result of product use or application.
Please contact MtronPTI for latest information.
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