



Microwave Components and Sources Catalog

2010

Microwave Synthesizer Modules | YIG-tuned Filters | YIG-tuned Oscillators

Celebrating **30** years

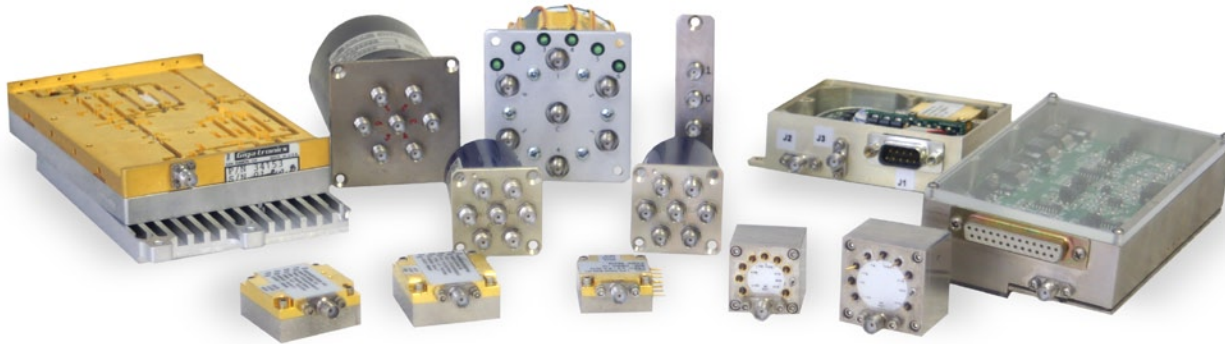
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Founded in 1980, Giga-tronics Incorporated (Nasdaq “GIGA”), an ISO 9001 and AS 9100 certified company, headquartered in San Ramon, California, is a leading engineering-and-design manufacturer of best-in-class RF and microwave signal generators, microwave power amplifiers, USB power sensors, microwave power meters, broadband switching matrices and high-performance microwave components and assemblies. R&D, production and test managers, scientists, engineers and technicians, around the world, use Giga-tronics products to realize higher productivity and greater ease of use in many applications: ATE systems, aerospace & defense and communications.

Table of Contents

Introduction	pg. 3
YIG-tuned Oscillators	pg. 4
YIG-tuned Filters	pg. 5
Frequency Synthesizer Modules	pg. 6
Custom Configurations	pg. 8
Service, Contact and Order Information	pg. 10



Overview:

Our core technologies in microwave signal generation and filtering have enabled us to design unique integrated electronic assemblies for leading aerospace and defense, test and measurement, and communications companies. These products include special microwave synthesizers, integrated microwave front ends, exciters, and ultra low noise YIG oscillators and fast tuned and highly accurate YIG filters. Many of our products and technologies are customizable for new military programs and commercial applications.

What is a YIG? YIG stands for Yttrium Iron Garnet and it is a crystal compound that resonates at microwave frequencies when in the presence of a magnetic field. YIGs are used to create resonant circuits in microwave oscillators and filters. What differentiates them from other types of microwave resonators is that they can resonate over very wide frequency ranges. Therefore, they are ideal for very broadband applications. They also are very stable having very low phase noise.

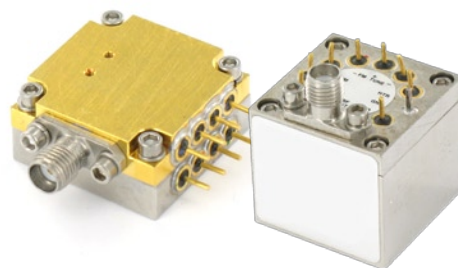
Giga-tronics uses YIG technology to create high performance microwave oscillators and filters.

Benefits:

- Providing custom integrated microwave source and filtering solutions for critical military and commercial applications.
- Reliable best-in-class microwave and millimeter wave designs providing smaller, more compact and a “cut above” in electrical specifications to improve your system performance.
- Time-proven processes to keep within your schedule and budget.

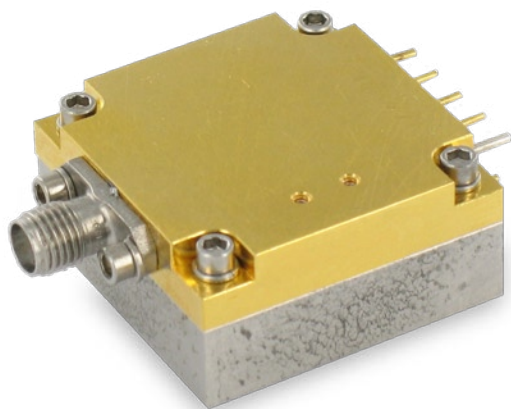
YIG-TUNED OSCILLATORS

- A YIG-tuned oscillator consists of a YIG sphere mounted on a rod that is positioned inside of a magnetic field. The magnetic field is generated by either a permanent or electro-magnet. The intensity of this field determines the frequency that the YIG sphere resonates. This resonator is coupled to a low-noise active device to create an oscillator.
- YIG-tuned oscillators provide the lowest phase noise for broadband microwave applications.
- Giga-tronics has 30 years of design experience to support your custom YIG-tuned oscillator and driver applications.

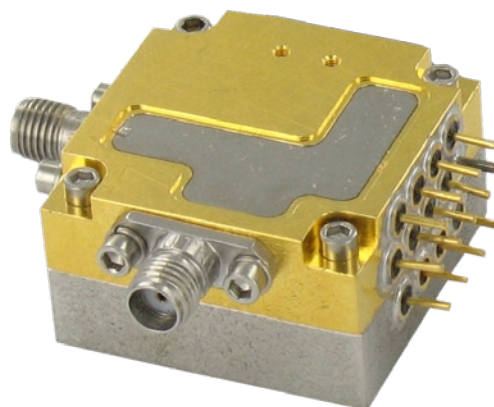


Model Number	Tuning Range (GHz)	RF Power (dBm min.)	Harmonics (dBc)	Phase Noise (dBc/Hz)		Tuning Linearity (%)	Frequency Drift (MHz)	Coil BW		Dimensions (inch)
				10 kHz	100 kHz			Main (kHz)	FM (MHz)	
LPO-0205-520-01	2.0 - 5.0	11	-12	-104	-126	0.1	+/- 15	5	1	1.0 x 1.0 x 0.5
LPO-0307-530-01	3.0 - 7.0	11	-12	-106	-127	0.1	+/- 15	5	3	1.25 x 1.25 x 0.6
LPO-0408-530-01	4.0 - 8.0	11	-12	-106	-127	0.1	+/- 15	5	3	1.25 x 1.25 x 0.6
LPO-0410-530-01	4.0 - 10.0	11	-12	-104	-126	0.1	+/- 15	5	3	1.25 x 1.25 x 0.6
FTO-0307-540-01	3.0 - 7.0	11	-12	-106	-127	0.1	+/- 15	16	3	1.25 x 1.25 x 0.6
FTO-0408-540-01	4.0 - 8.0	11	-12	-106	-127	0.1	+/- 15	16	3	1.25 x 1.25 x 0.6
FTO-0410-540-01	4.0 - 10.0	11	-12	-104	-126	0.1	+/- 15	16	3	1.25 x 1.25 x 0.6
MCO-0207-500-01	2.0 - 7.6	15	-10	-105	-128	0.1	+/- 15	5	1	1.0 x 1.0 x 0.9
MCO-0210-500-01	2.0 - 10.0	12	-10	-100	-120	0.1	+/- 15	5	1	1.25 x 1.25 x 1.0
MCO-0818-500-01	8.0 - 18.0	15	-15	-90	-115	0.1	+/- 20	5	1	1.25 x 1.25 x 1.0

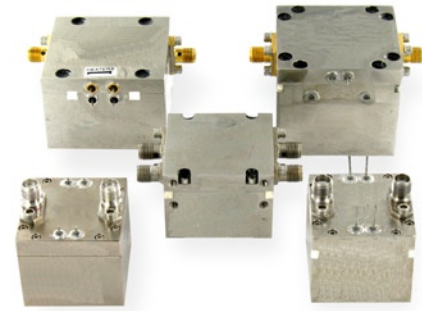
Custom Permanent Magnet YIG-tuned Oscillator (PMYTO)



Custom YIG-tuned Oscillator

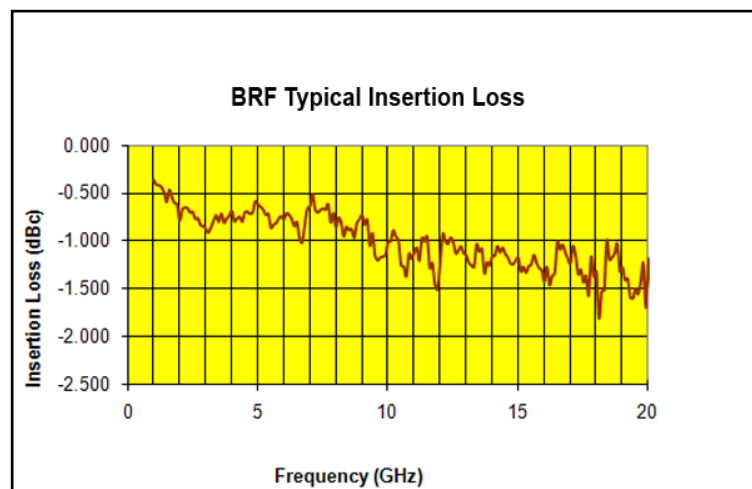
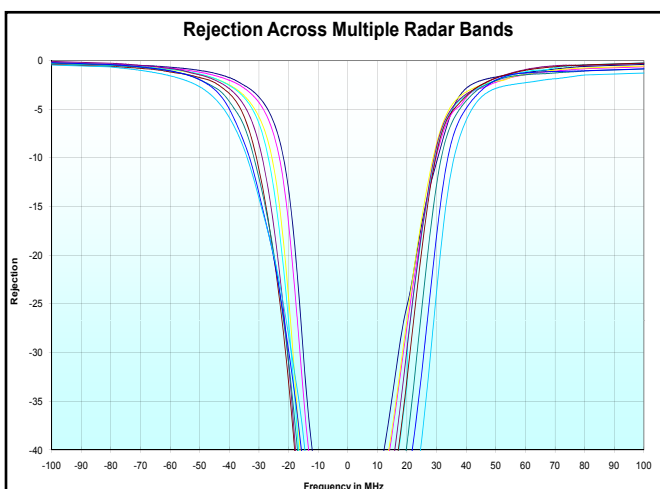
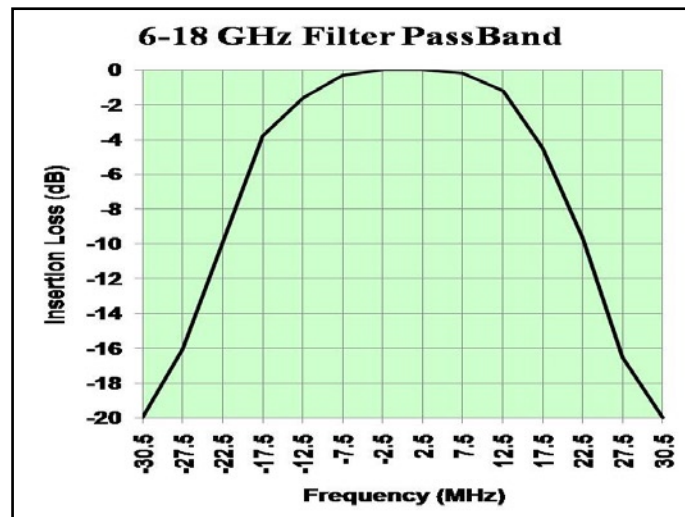
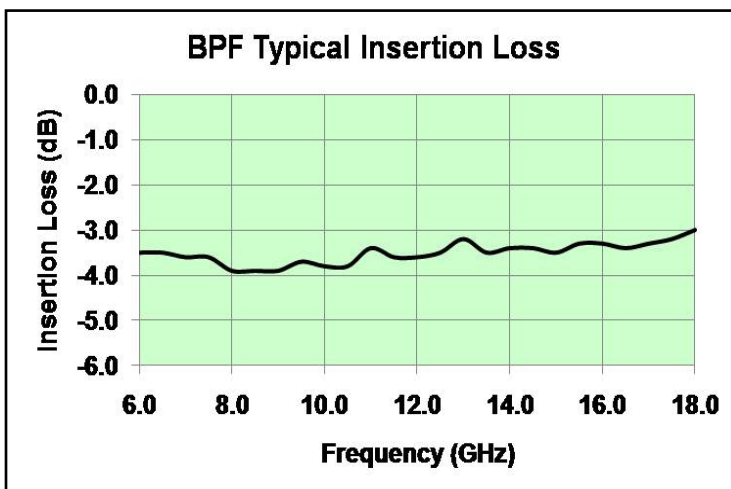


- A YIG-tuned filter consists of multiple YIG spheres as filter elements. The number of spheres (stages) determines the filter bandwidth and tuning range.
- Giga-tronics has different configurations covering many microwave frequency bands in a variety of package styles with many driver options.
- Both Band-Reject Filters (BRF) and Band-Pass Filters (BPF) designs are available.



Capability Table

Filter Type	Tuning Range (GHz)	Bandwidth (MHz)	Insertion Loss (dB)	Rejection (dB)	Number of Spheres
BRF	2.0 - 18.0	20 - 100	< 2.0	> 50	Up to 7
BPF	2.0 - 18.0	20 - 100	< 4.0	> 50	Up to 7



FREQUENCY SYNTHESIZER MODULES

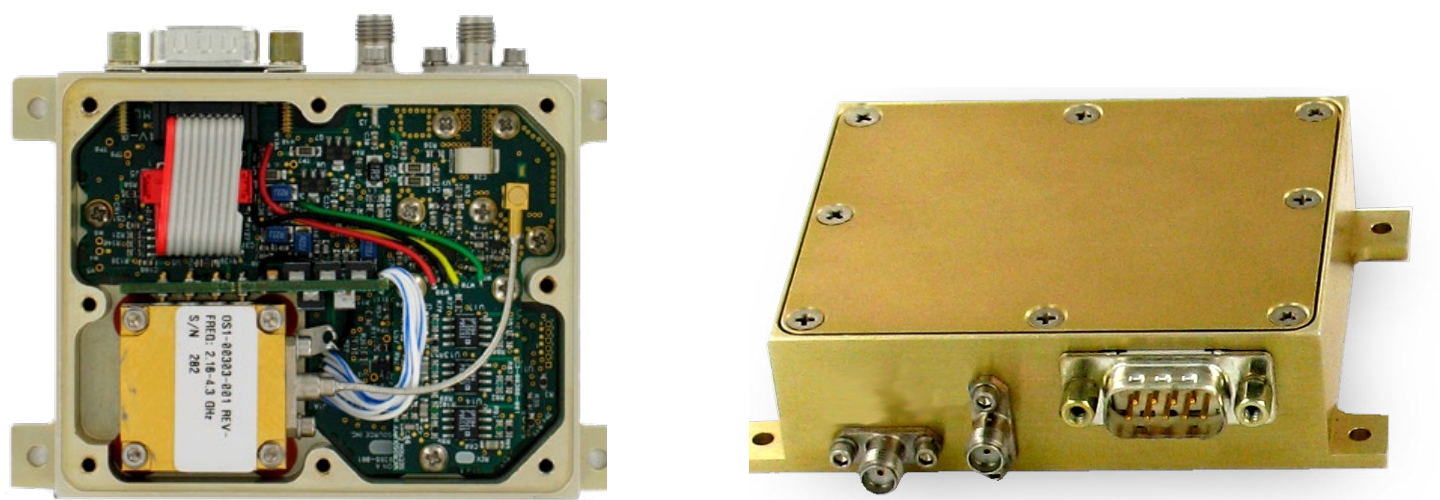
- Giga-tronics offers two standard product series of YIG-tuned frequency synthesizer modules. The SNY series provides simple phase locking in a compact size with a frequency resolution of 125 kHz or 250 kHz. The SNP series has more advanced phase locking circuitry and allows tuning to a 1 Hz resolution.
- Giga-tronics can design custom synthesizer modules up to 50 GHz featuring fast tuning and very low phase noise.

Selection Table:

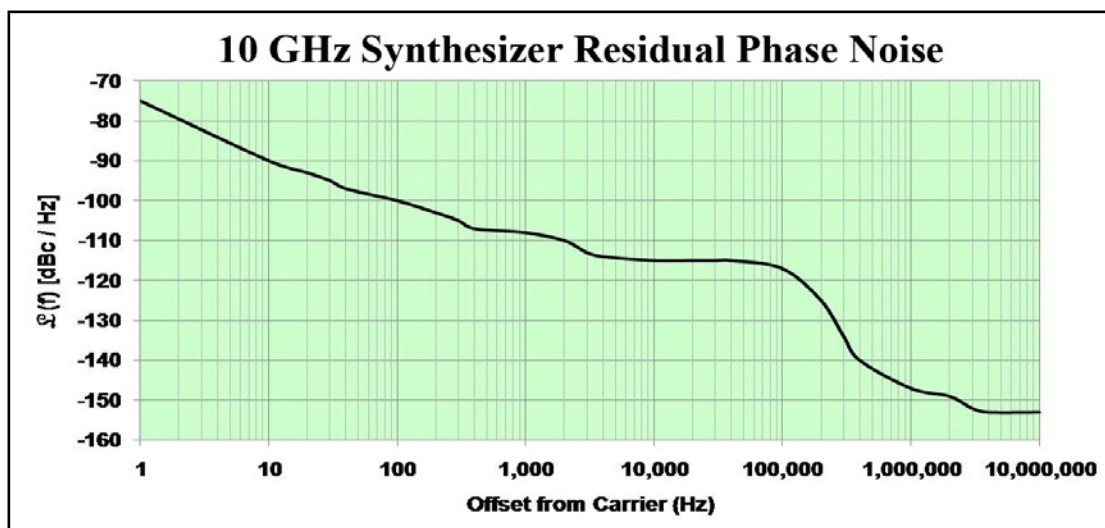
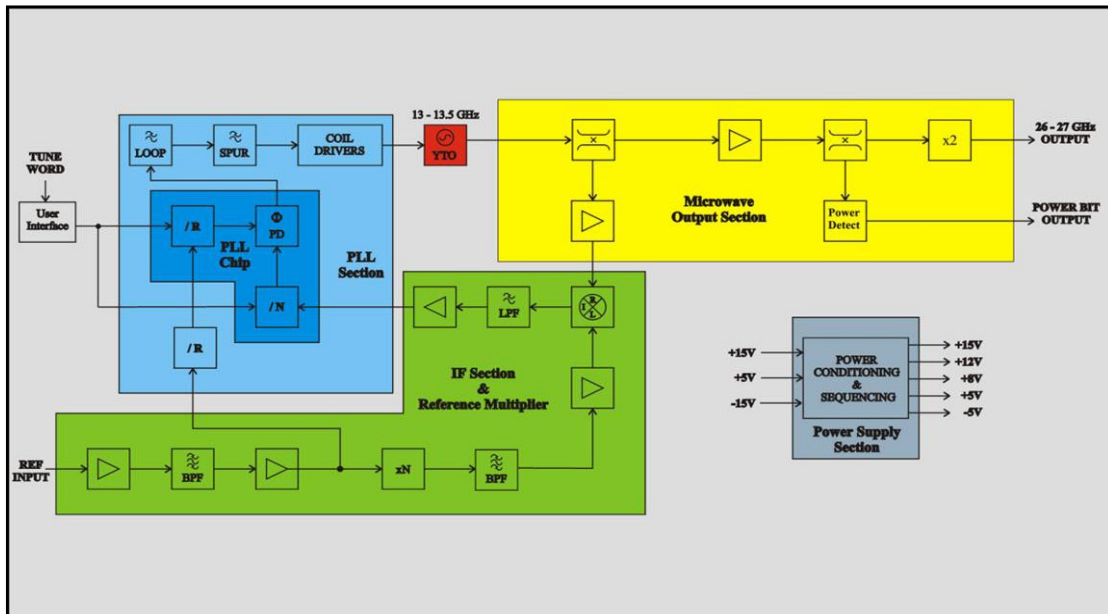
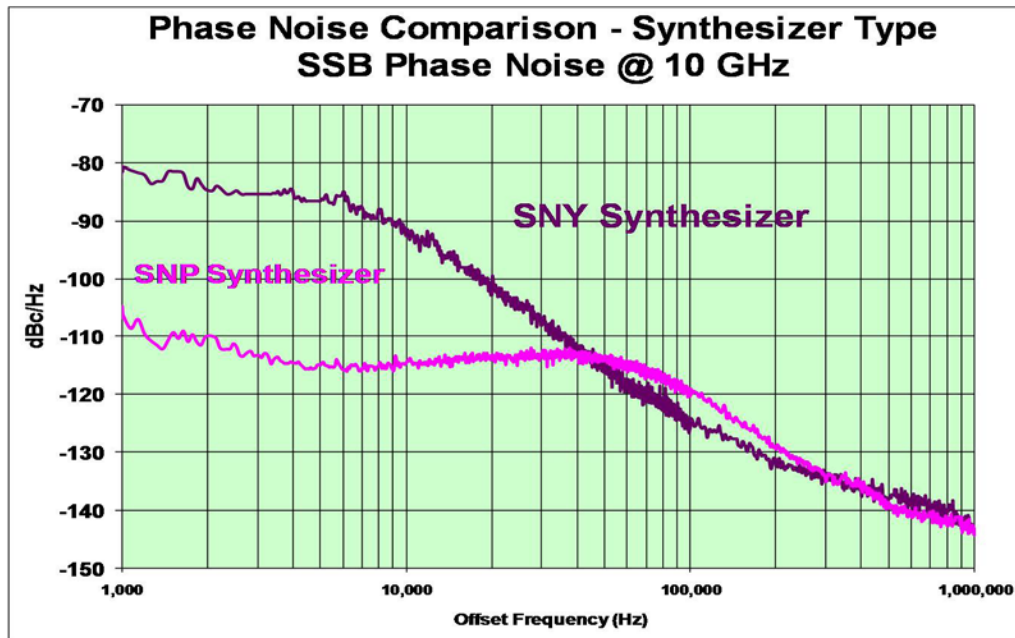
Model No.	Freq. Coverage (GHz)	Phase Noise (dBc/Hz)				RF Power (dBm)	Step Size (kHz)	Spurious (dBc)	Ext. Ref. (MHz)	Dim. (in.)
		1 kHz	10 kHz	100 kHz	1 MHz					
SNY-0205-510-01	2.1 - 5.0	-80	-100	-125	-146	+17	125	-70	10	2.56 x 3.8 x 0.94
SNY-410-510-01	4.0 - 10.0	-80	-94	-120	-143	+14	250	-70	10	2.56 x 4.0 x 0.80

Model No.	Freq. Coverage (GHz)	Phase Noise (dBc/Hz)				RF Power (dBm)	Step Size (Hz)	Spurious (dBc)	Dim (in.)
		1 kHz	10 kHz	100 kHz	1 MHz				
SNP-0608-520-01	6.0 - 8.0	-104	-110	-123	-145	+17	1	-70	5.00 X 5.50 X 1.60
SNP-0810-520-01	8.0 - 10.0	-102	-108	-120	-143	+17	1	-70	5.00 X 5.50 X 1.60
SNP-1012-520-01	10.0 - 12.0	-100	-106	-119	-141	+17	1	-70	5.00 X 5.50 X 1.60
SNP-1216-520-01	12.0 - 16.0	-98	-104	-117	-140	+17	1	-70	5.00 X 5.50 X 1.60
SNP-1620-520-01	16.0 - 20.0	-96	-103	-115	-139	+17	1	-70	5.00 X 5.50 X 1.60
SNP-2024-520-01	20.0 - 24.0	-94	-101	-113	-138	+17	1	-70	5.00 X 5.50 X 1.60

SNP models are available with a connection for an external reference source (SNP-xxxx-520-02). No internal reference is supplied with the -02 model.



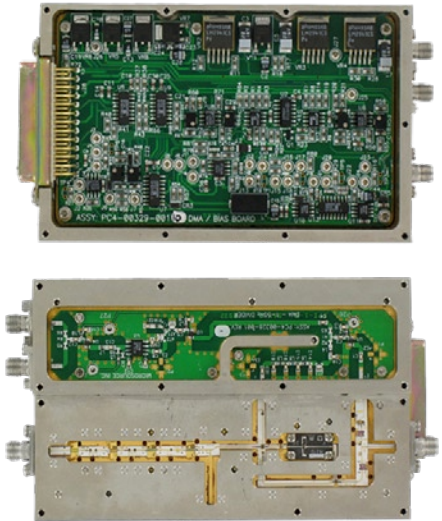
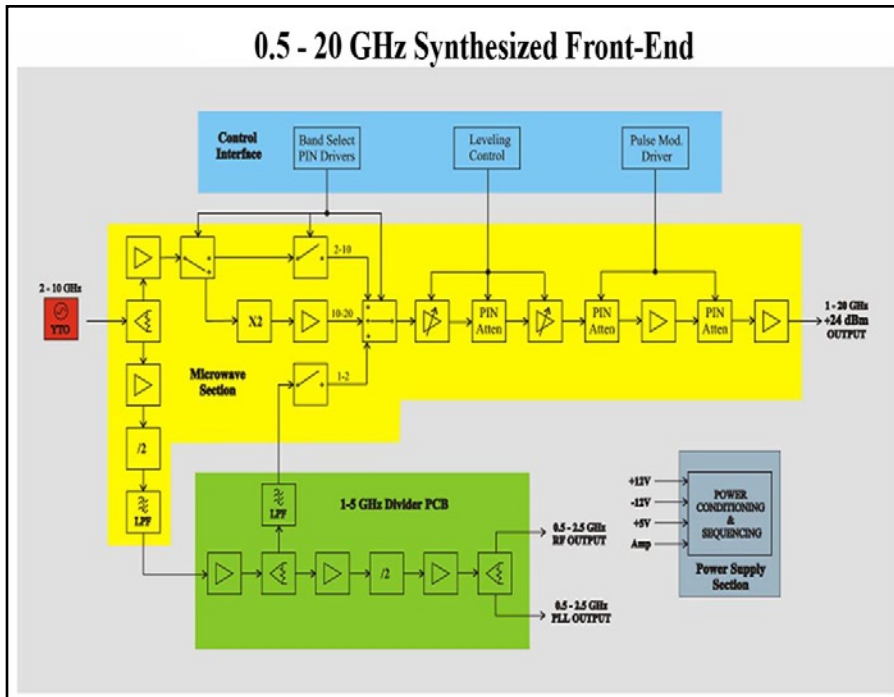
Frequency Synthesizer Module



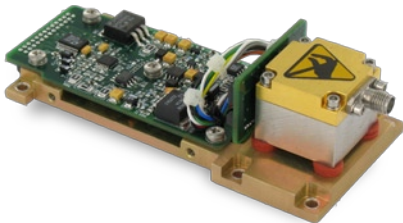
CUSTOM CONFIGURATIONS

- Giga-tronics designs many custom configurations of YIG-tuned oscillators, filters and frequency synthesizer modules.
- We specialize in integrating synthesized driver circuits for fast, accurate tuning of filters.
- Applications include: Surveillance Receivers, Tracking Radars, Transponders, Broadband Instrumentation, Radiometry, Microwave Spectroscopy, Radar Range Testing, Microwave and mm-wave Communications and Optical Communications.

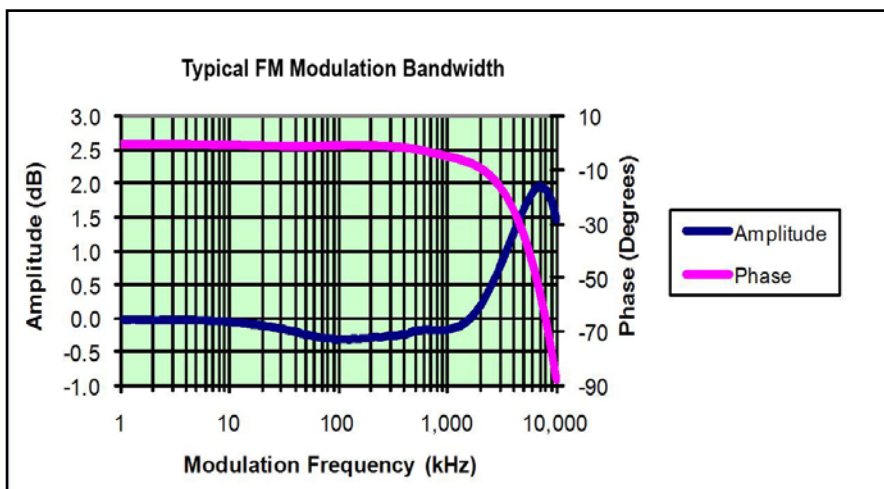
Custom Synthesized Assembly



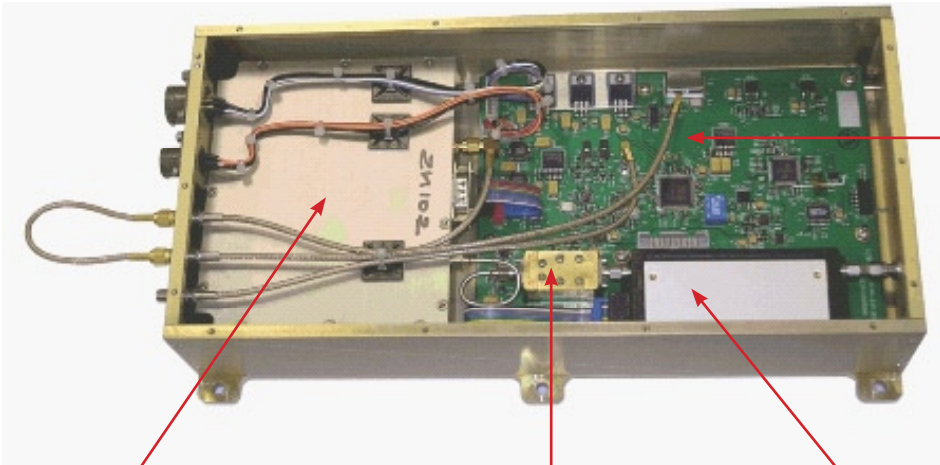
Ultra-wideband FM-tuned Permanent-Magnet YIG-Tuned Oscillator (PMYTO)



Fast-tuning, Synthesized Band-Reject Filter (BRF)



Ka-Band Synthesizer with Pulse Modulation and Amplitude Control



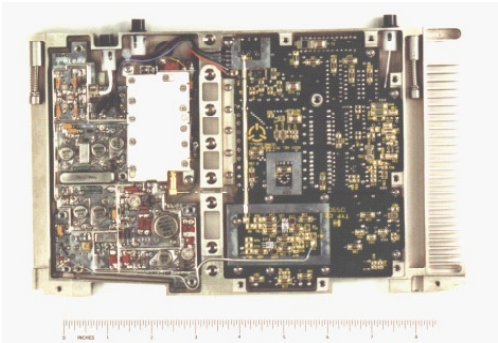
Control PCB

Synthesizer Module
SNP-1012-520-01

Step Attenuator

Pulse Modulator

Airborne Transponder



**2 to 20 GHz YIG-Tuned
Oscillator and Filter**





High-Performance Test & Measurement

Giga-tronics designs and manufactures best-in-class fast-switching, ultra-low noise RF and microwave signal generators, broadband solid-state microwave power amplifiers, CW and Peak USB power sensors, high dynamic range microwave power meters and sensors, with frequency ranges to 50 GHz. R&D, production and test managers, scientists, engineers and technicians use Giga-tronics test equipment to realize higher performance, higher productivity and greater ease-of-use in many applications in aerospace and defense, communications and microwave component test

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SERVICE

Finding Solutions...

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Giga-tronics offers unmatched engineering and technical expertise to help you gain the maximum return on your investment. At Giga-tronics, we understand the challenges you face. We help you achieve both top-line growth and bottom-line efficiencies by working to identify your precise needs and implement smart and result orientated solutions. Our support services are tailored to assist your team with integration and next-generation product and process technology.



SUPPORT

Repair Service

All repairs are certified and traceable to NIST, and include calibration to published factory specifications

- ISO-9001:2008 with AS9100 Certification
- Repair Record Retention
- Factory-authorized Hardware, Firmware, and Software Upgrades, as applicable



Calibration Services

All calibrations are processed in full accordance with ANSI-Z-540-1 1994, ISO 10012, and MIL-STD-45662

- Calibrations Performed Against Same Specifications Used in Original Manufacturing of the Instrument
- All Test Equipment is Traceable to NIST
- ISO-9001:2008 with AS9100 Certification



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CONTACT

For Quotes, Order Assistance, or Demonstration Equipment:

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