



Microwave Components and Sources Catalog

2010

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

Celebrating **30** years
34888-Rev.A / US100609

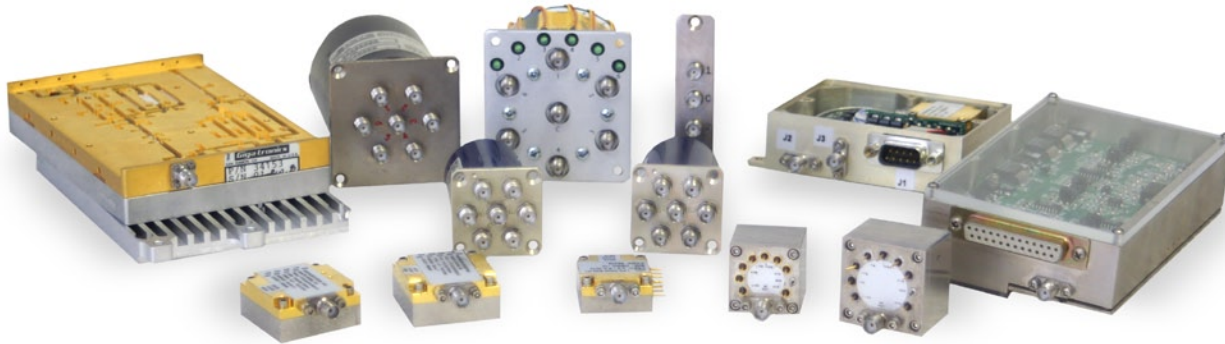
www.gigatronics.com



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.

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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.

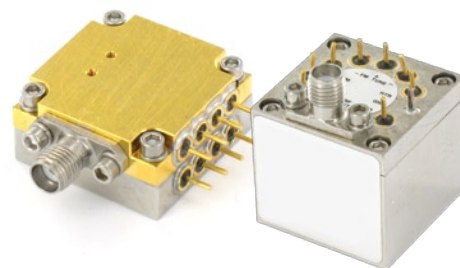
What is a YIG? YIG stands for Yttrium Iron Garnet and it is a crystal compound that resonates at microwave frequencies when in the presence of a magnetic field. YIGs are used to create resonant circuits in microwave oscillators and filters. What differentiates them from other types of microwave resonators 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:

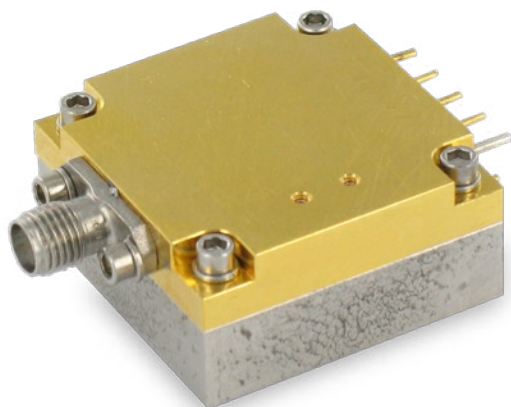
- Providing custom integrated microwave source and filtering solutions for critical military and commercial applications.
- Reliable best-in-class microwave and millimeter wave designs providing smaller, more compact and a “cut above” in electrical specifications to improve your system performance.
-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

- 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.

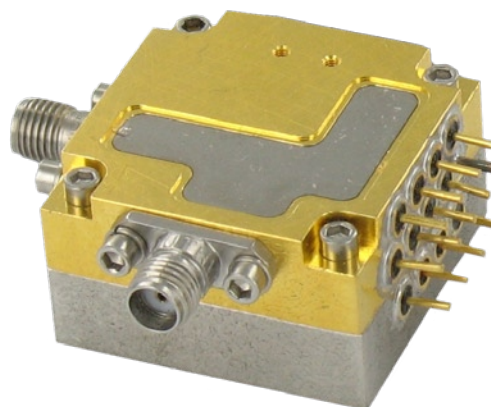


Model Number	Tuning Range (GHz)	RF Power (dBm min.)	Harmonics (dBc)	Phase Noise (dBc/Hz)		Tuning Linearity (%)	Frequency Drift (MHz)	Coil BW		Dimensions (inch)
				10 kHz	100 kHz			Main (kHz)	FM (MHz)	
LPO-0205-520-01	2.0 - 5.0	11	-12	-104	-126	0.1	+/- 15	5	1	1.0 x 1.0 x 0.5
LPO-0307-530-01	3.0 - 7.0	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

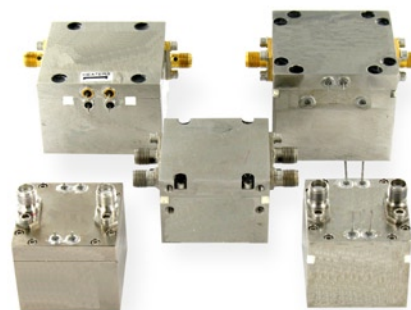
Custom Permanent Magnet YIG-tuned Oscillator (PMYTO)



Custom YIG-tuned Oscillator

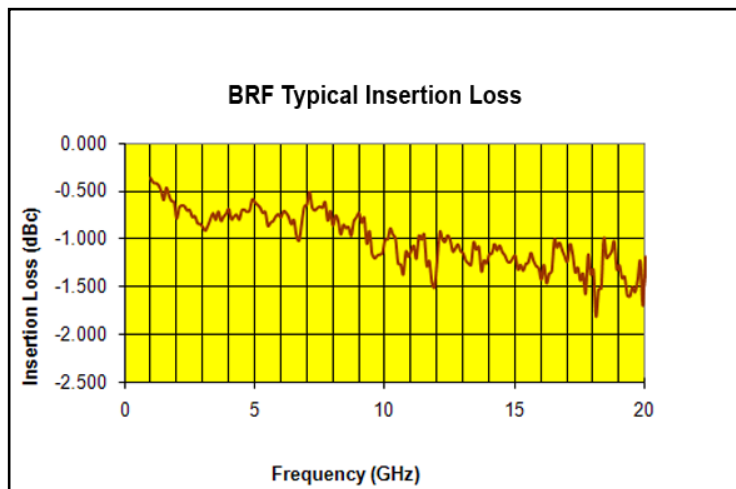
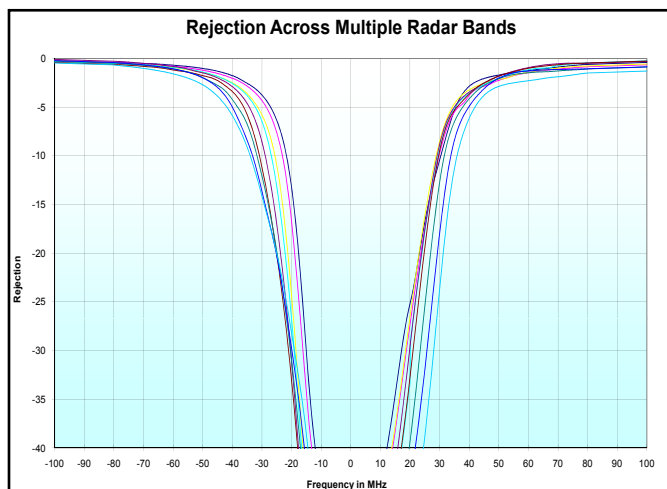
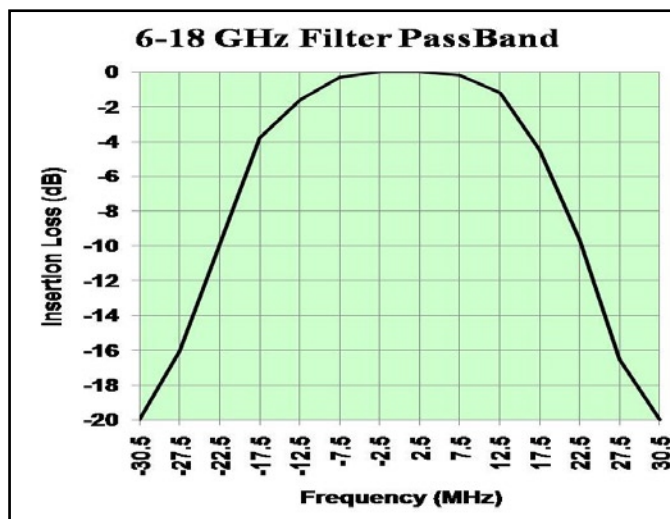
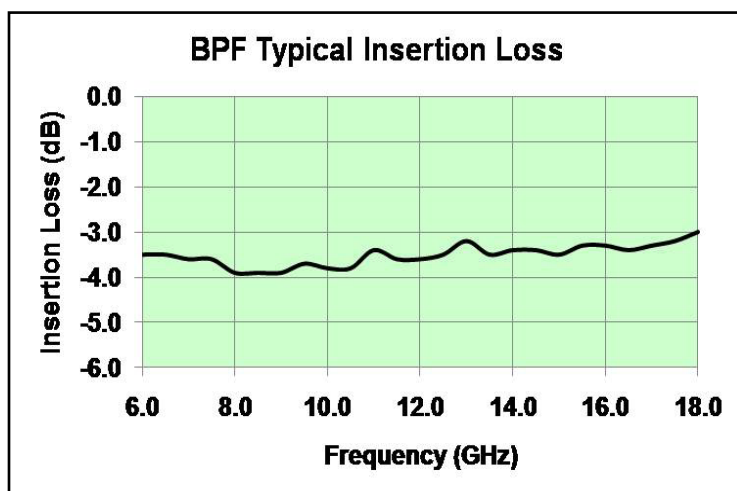


- A YIG-tuned filter consists of multiple YIG spheres as filter elements. The number of spheres (stages) determines the filter bandwidth and tuning range.
- Giga-tronics has different configurations covering many microwave frequency bands in a variety of package styles with many driver options.
- Both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



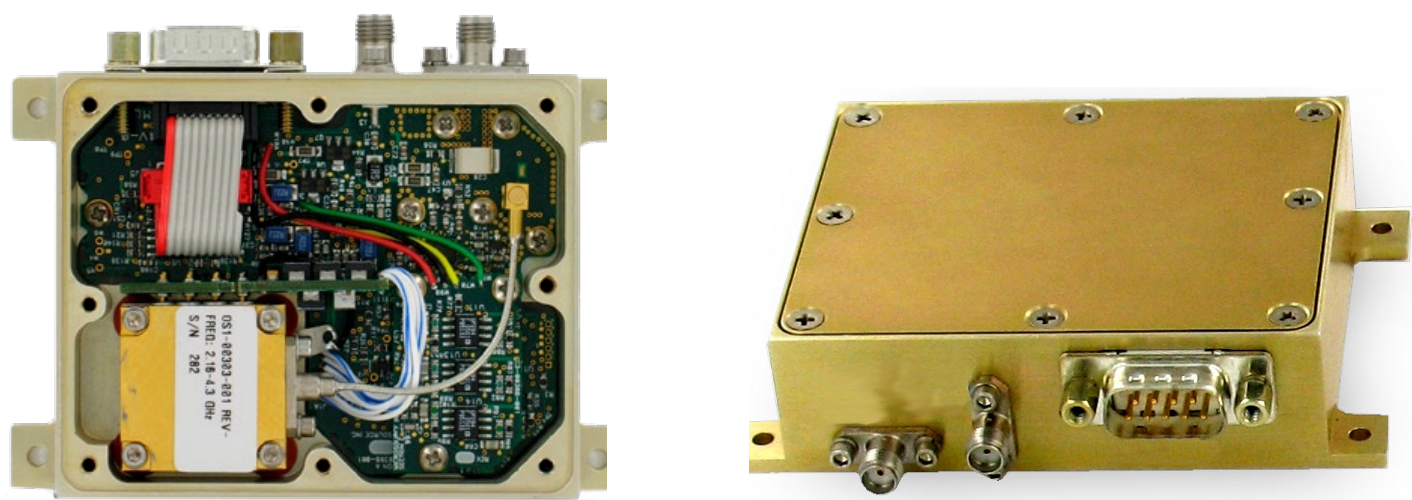
- Giga-tronics offers two standard product series of YIG-tuned frequency synthesizer modules. The SNY series provides simple phase locking in a compact size with a frequency resolution of 125 kHz or 250 kHz. The SNP series has more advanced phase locking circuitry and allows tuning to a 1 Hz resolution.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

Selection Table:

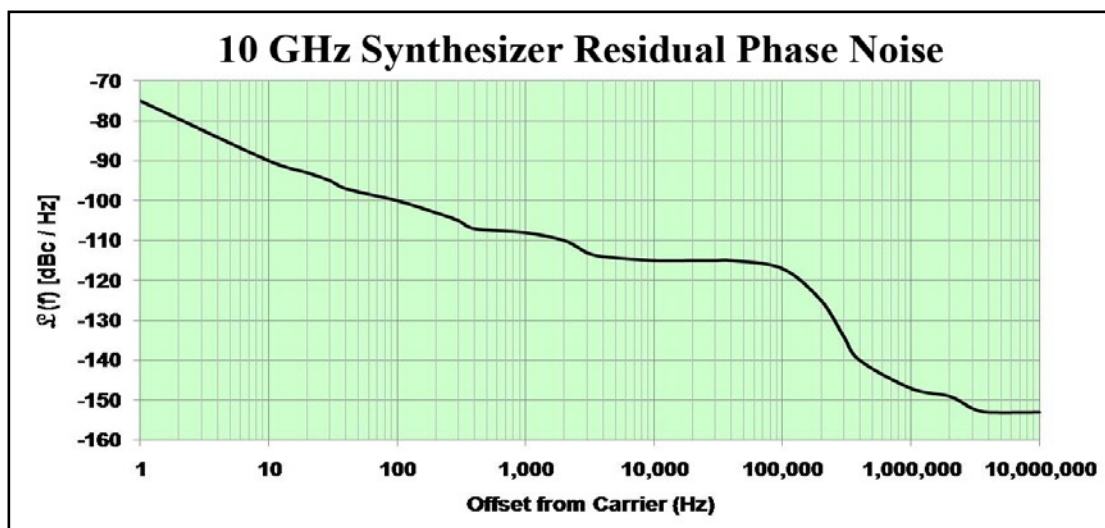
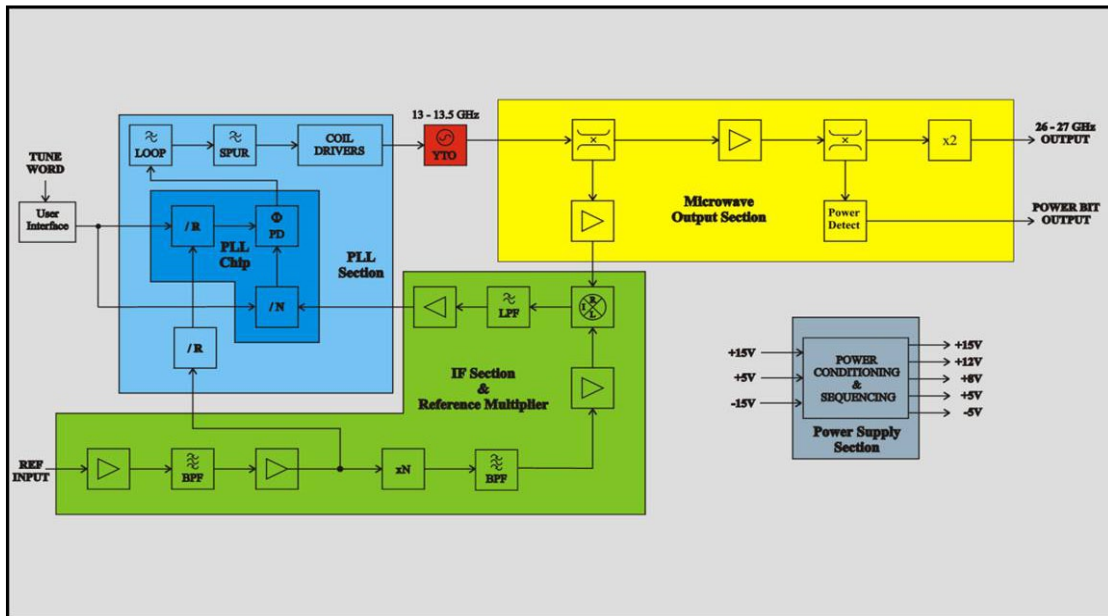
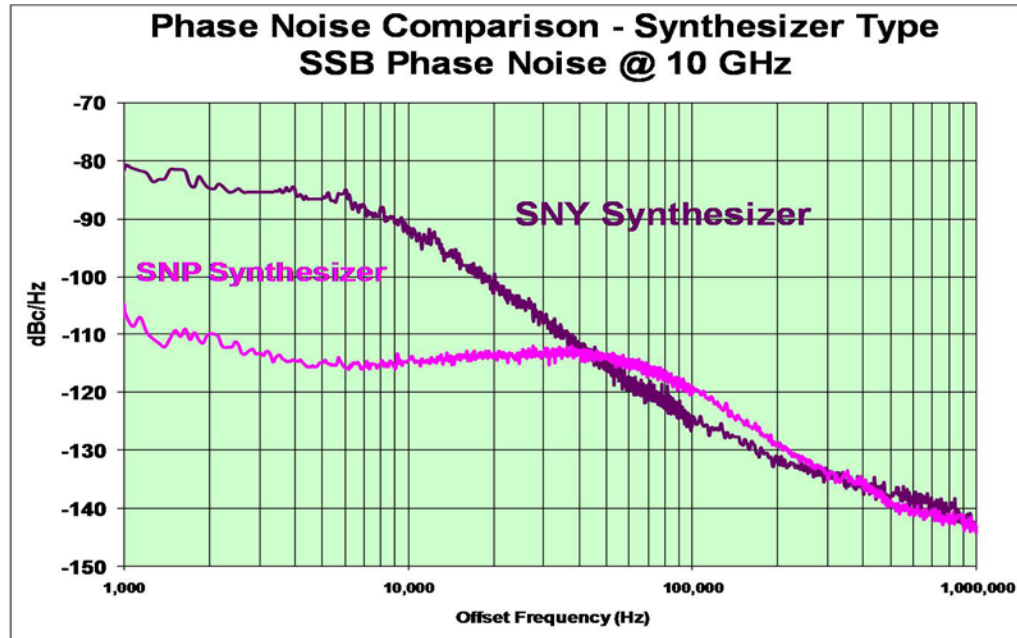
Model No.	Freq. Coverage (GHz)	Phase Noise (dBc/Hz)				RF Power (dBm)	Step Size (kHz)	Spurious (dBc)	Ext. Ref. (MHz)	Dim. (in.)
		1 kHz	10 kHz	100 kHz	1 MHz					
SNY-0205-510-01	2.1 - 5.0	-80	-100	-125	-146	+17	125	-70	10	2.56 x 3.8 x 0.94
SNY-410-510-01	4.0 - 10.0	-80	-94	-120	-143	+14	250	-70	10	2.56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

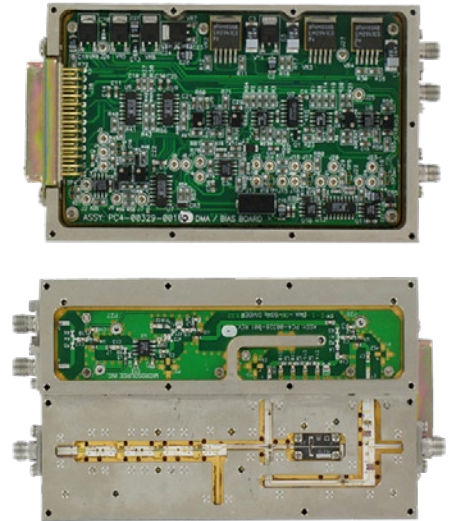
SNP models are available with a connection for an external reference source (SNP-xxxx-520-02). No internal reference is supplied with the -02 model.



Frequency Synthesizer Module



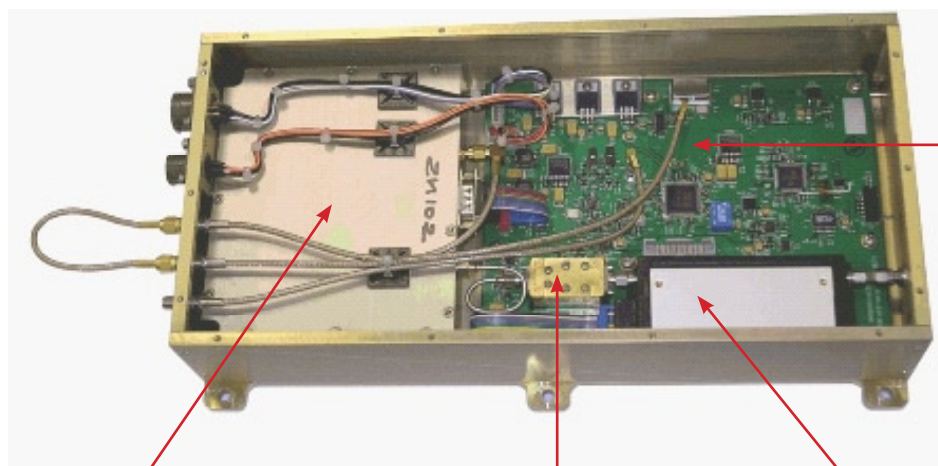
- ## Custom Synthesized Assembly



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



Ka-Band Synthesizer with Pulse Modulation and Amplitude Control



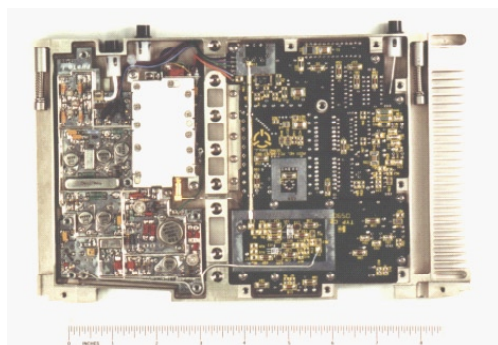
Synthesizer Module
SNP-1012-520-01

Pulse Modulator

Step Attenuator

Control PCB

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

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