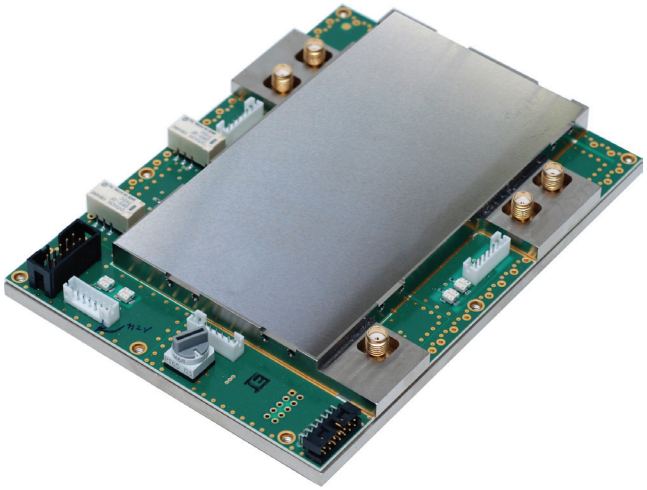
Microwave Frequency Synthesizers with Ultra-low Close In Phase Noise

Model GFS-500M6G
Standard Frequency Range:
500 MHz to 6 GHz



GeoSync Microwave's series of precision, low noise frequency synthesizers cover bands starting at 500 MHz through Ka-band to 31 GHz. Custom versions can be provided to meet critical frequency band and corresponding phase noise requirements.

The GFS-500M6G covers from 500 MHz to 6.0 GHz, settable to any frequency within that band with a frequency resolution to as low as 0.001 Hz. Salient features are superior close in phase noise at offset frequencies specified at 1 Hz, 10 Hz, and 100 Hz offsets. Two independent synthesized frequency outputs either manually switchable with 16 arbitrary selectable combinations or via RS485/RS422 bus and provides, in addition, the capability for ***fixed or stepped frequencies, swept frequency, or frequency hopping outputs*** of the two independent synthesized frequency outputs.

PRINCIPAL FEATURES

- Superior Close In Phase Noise specified at 1 Hz, & 10Hz with no spurs.
- Integrated Phase Noise from 1 Hz to 100 MHz is ≤ 0.416° at Fo = 6 GHz
- Two independent frequency outputs manually switchable with a 16 position switch or controlled via serial RS485/RS488 bus which can be stepped, swept or hopped.
- Single Power Supply, + 6 VDC to +18 VDC, 12 volts nominal and 3 watts.
- Microphonics Immune
- Compact Size; 5.8" x 4.2" x 0.53" high.

APPLICATIONS

- High Speed, Complex Modulation Communications
- Electronic Warfare Systems
- Reconnaissance Systems
- Radar
- Satcom

RF SPECIFICATIONS (Guaranteed Performance Values)

Frequency Range:	500 MHz to 6.0 GHz
Frequency Step Size:	1 KHz standard with optional step sizes to as low as 0.001 Hz
Switch or Bus Selectable	
Frequency Outputs:	Two independent and arbitrary frequencies, chosen via a 16 position manual switch or by RS485/RS422 control.
Continuous Frequency Control:	Two independent frequencies which can be programmed to be stepped, swept from arbitrary frequencies; Fn1 to Fm1 and Fn2 to Fm2, or hopped over a range of frequencies; Fn1, Fn2, Fn3…., & Fm1, Fm2, Fm3, Fm4…, where both Fn & Fm are independent and ≥ 500 MHz and ≤6.0 GHz. **Note:** The RS422/485 serial bus control is required for this feature.
Frequency Stability:	Same as Reference
Output Power:	+13dBm minimum, +15dBm maximum
Output Return Loss:	10 dB minimum
Input Reference Frequency:	10 MHz standard, other references optional
Input Power:	- 5dBm minimum, +5dBm maximum
Harmonics:	- 20dBc maximum
Sub-harmonics:	No Sub-harmonics
Spurious -	In-band: -65dBc Out of band: -65dBc
Switching Speed:	100 ms after receiving command

Phase Noise in dBc/Hz (see figure 1)

Offset	500 Mhz	1.0 GHz	3.0 GHz	6.0 GHz
1Hz	-84	-74	-61	-55
10 Hz	-97	-91	-80	-74
100 Hz	-109	-104	-94	-88
1 KHz	-118	-106	-102	-96
10 KHz	-122	-110	-105	-99
100 KHz	-122	-110	-105	-99
1 MHz	-136	-125	-125	-119
10 MHz	-151	-139	-137	-131

Integrated Phase Noise; 1 Hz to 100 MHz:	0.416° maximum at Fo = 6 GHz

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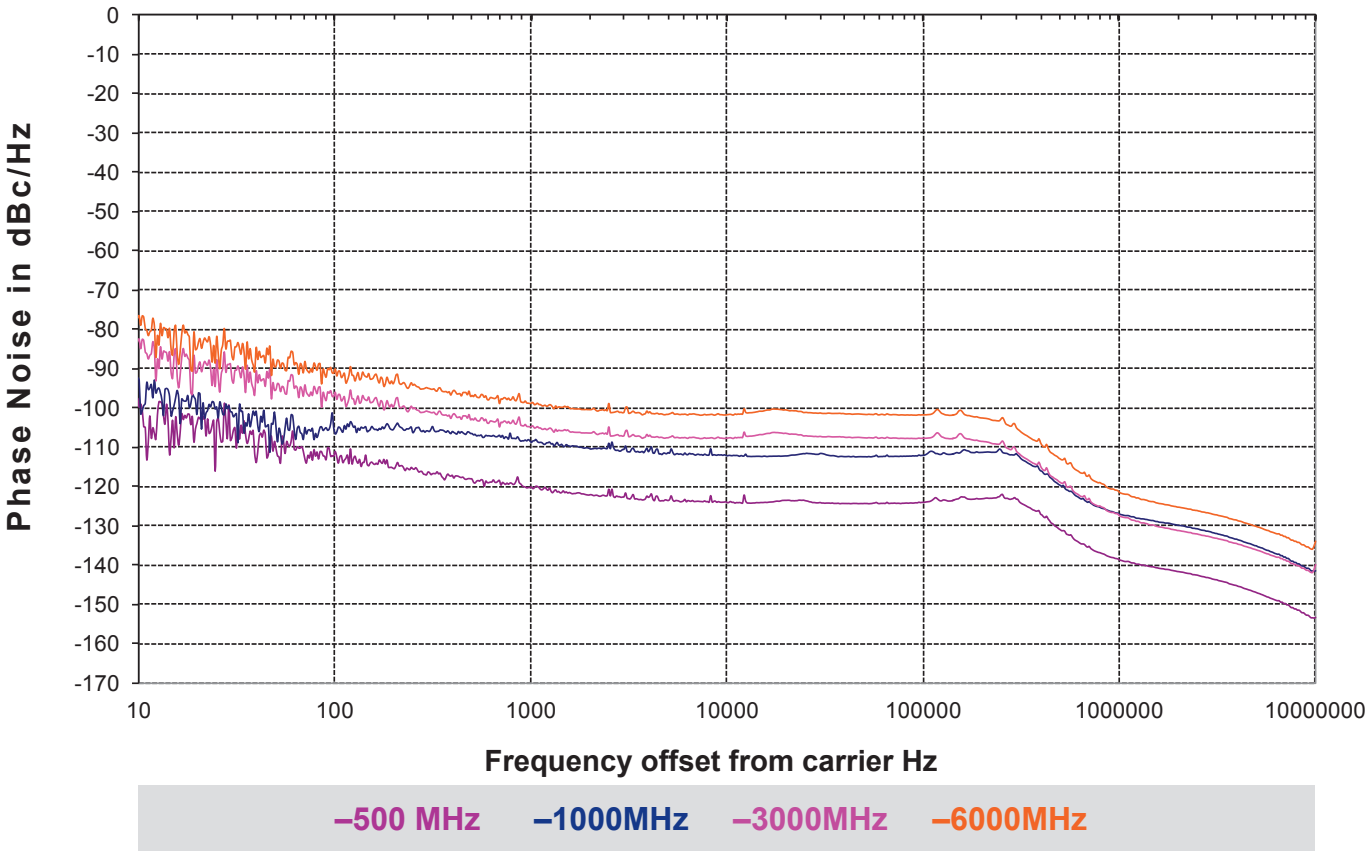
FIGURE 1: PHASE NOISE IN dBc/Hz



CONTROL, ELECTRICAL, MECHANICAL, & ENVIRONMENT

(A) Control

Serial Port Type; RS485/RS422, Rotary switch 3M D2500 series

(B) Electrical

Supply Voltage..... + 12 Volts DC, typical. Range: +6 VDC min., + 18 VDC max.
Supply Current..... 250 ma, typical at 12 volts
Power Consumption ..... 3 watts

(C) Mechanical

Size ..... 4.5” x 6.0” x 0.5”
Weight..... 0.771 lbs. (350 g)

(D) Environmental

Operating Temperature..... -40^0 C to $+60^0$ C
Storage Temperature ..... -60^0 C to + 70^0 C
Humidity..... 98% Non-condensing
Altitude..... Up to 40,000 ft.
Shock, Non-operating ..... 50 g, 10ms pulse, 10 sec.
Vibration..... 20 Hz to 2 KHz random profile with peak of 0.05 g^2/Hz

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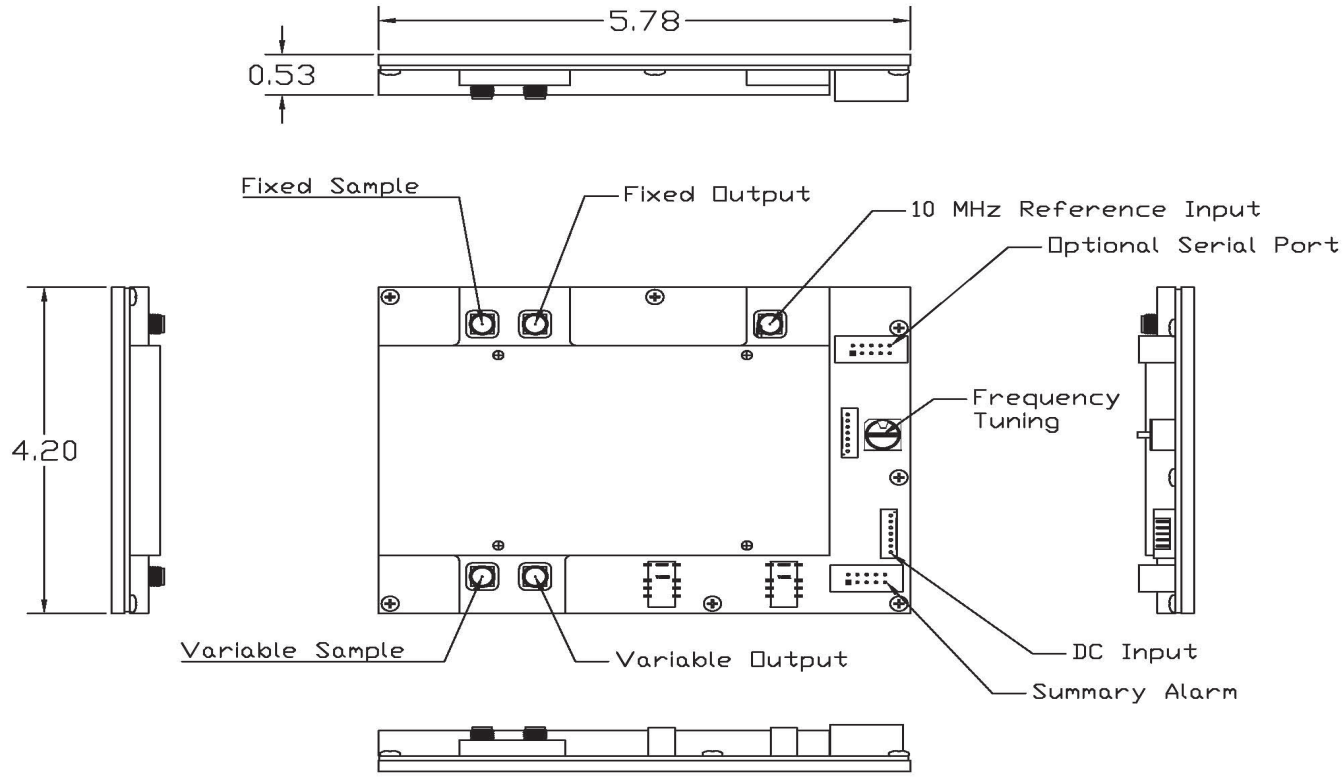
OUTLINE DRAWING: DWG # 2001045, *see figure 2*



MODEL NUMBERS FOR OPTIONS:

Basic Model Number: GFS-500M6G (1KHz step size)

- With Ethernet Option: GFS-500M6G-E

- Different frequency band: GFS-XXXMYYYG, any frequencies with the range, where XXX ≥ 500 MHz is the lowest, and YYY≤ 6.00 GHz is the highest.

- Optional Frequency Step Size (1 KHz is standard):
  Any frequency step size ≥ 0.001Hz. GFS-XXXMYYYG- - ZZZZ, where ZZZZ is the step size in Hz, i.e. step size of 100 Hz is – 100.0.

- Optional Input Reference Frequency (10 MHz is standard):
  50 MHz.....GFS-XXXMYYYG- - ZZZZ50
  100 MHz.....GFS-XXXMYYYG- - ZZZZ100
  12.88 MHz.....GFS-XXXMYYYG- - ZZZZ12.88

Special Requirements: Please consult factory.

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