



# SPI Frequency Synthesizer Module, Phase Locked Loop (PLL), 5.5 GHz to 10.5 GHz Output, SMA

## Synthesizers Technical Data Sheet

PE11S1001

### Features

- Wideband Output Frequency
- 5.5 GHz to 10.5 GHz
- Integer and Fractional operating modes
- Female SMA output
- Small compact package size
- Downloadable User Manual

### Applications

- Signal Generators
- Test & Measurement Equipment
- RF System Integration
- Lab Instrumentation
- Communication Systems
- Military Radar, EW & ECM
- Systems
- Frequency Conversion
- Industrial/Medical Equipment

### Description

The PE11S1001 is a Frequency Synthesizer Module that covers a wide frequency band from 5.5 GHz to 10.5 GHz with an average output power of +17 dBm, exceptional spurious rejection and phase noise performance. The module features fully integrated low noise regulators and an output buffer amplifier with superior pushing and pulling performance. The design utilizes high performance SiGe, GaAs pHEMT, and InGaP HBT MMIC semiconductor technologies into one compact hermetic package. Frequency resolution of the module is available in integer and fractional operating modes with externally applied reference. The module can achieve step sizes of 1.2 Hz in Fractional-N mode. The module uses an external 10 MHz Reference.

### Electrical Specifications (TA= 25°C, Vd1 = 3.6 V, Vd2 = 20 V, Vd3 = 6 V, Id1 = 100 mA, Id2 = 20 mA, Id3 = 300 mA)

Mode	Integer/Fractional
Reference	External
Option(s)	Phase Lock Indicator
Control Interface	Serial, TTL
Prescaler Coefficient	2

Description	Minimum	Typical	Maximum	Units
Frequency Range	5.5		10.5	GHz
Output Power		+21		dBm
Phase Locked Speed (< 3 Deg, 20 MHz Step)		150		µs
Phase Locked Speed (< 3 Deg, 5 GHz Step)		15		ms
Phase Noise @100Hz Offset		-78		dBc/Hz
Phase Noise @1kHz Offset		-85		dBc/Hz
Phase Noise @10kHz Offset		-87		dBc/Hz
Phase Noise @100kHz Offset		-90		dBc/Hz
Phase Noise @1MHz Offset		-117		dBc/Hz
2nd Harmonic		-20		dBc
3rd Harmonic		-25		dBc
Output Return Loss		13		dB
Phase Detector Frequency		150		kHz

Click the following link (or enter part number in "SEARCH" on website) to obtain additional part information including price, inventory and certifications: [SPI Frequency Synthesizer Module, Phase Locked Loop \(PLL\), 5.5 GHz to 10.5 GHz Output, SMA PE11S1001](#)





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Reference Frequency		10		MHz
Reference Power (CW)	-6	+0	+12	dBm
Reference Spurious		-55	-45	dBc
Operating DC Voltage 1	3.3	3.6	12	V
Operating DC Current 1		100	125	mA
Operating DC Voltage 2	19	20	20.5	V
Operating DC Current 2		20	25	mA
Operating DC Voltage 3	5.5	6	12	V
Operating DC Current 3		300	375	mA
Power Dissipation		2.5	6.5	Watts

**Mechanical Specifications**

**Size**

Weight 0.093 lbs [42.18 g]

Body Material and Plating  
Finish

Nickel  
Gold

**Configuration**

Reference Connector  
Output Connector  
Control Connector

Field Replacable SMA  
Field Replacable SMA  
Solder Pins

**Environmental Specifications**

**Temperature**

Operating Range -40 to +85 deg C  
Storage Range -55 to +125 deg C

**Compliance Certifications** (see [product page](#) for current document)

**Plotted and Other Data**

Notes:

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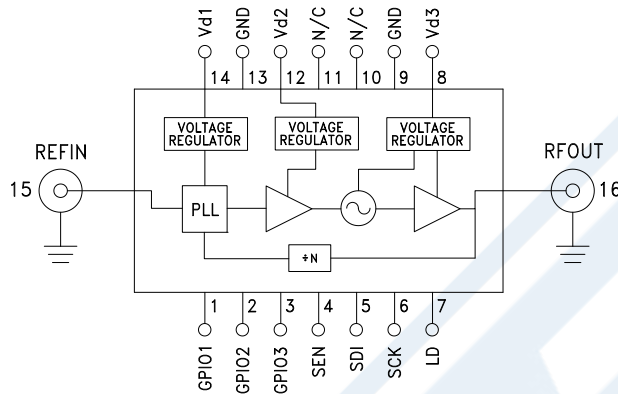


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Functional Block Diagram



Pin Descriptions

Pin Number	Function	Description	Interface Schematic
1 - 3	GPIO1, GPIO2, GPIO3	General Purpose I/O with Tristate, 3.3 V Logic	See operating guide. [1]
4	SEN	Serial port Enable Input, 3.3 V Logic	See operating guide. [1]
5	SDI	Serial port Data input, 3.3 V Logic	See operating guide. [1]
6	SCK	Serial port Clock input, 3.3 V Logic	See operating guide. [1]
7	LD	Lock Detect, 3.3 V Logic	See operating guide. [1]
8, 12, 14	Vd3, Vd2, Vd1	Voltage Supply Pins	
9, 13	GND	These pins must be connected to RF/DC ground.	
10, 11	N/C	Please leave these pins open as they are reserved for future product improvements.	
15	REFIN	Reference input, 10 MHz nominal, 220 MHz maximum. Note: the comparison frequency (reference freq./R) may not exceed 75 MHz and the module performance is not specified at comparison frequencies other than 10 MHz.	
16	RFOUT	Synthesizer RF output.	

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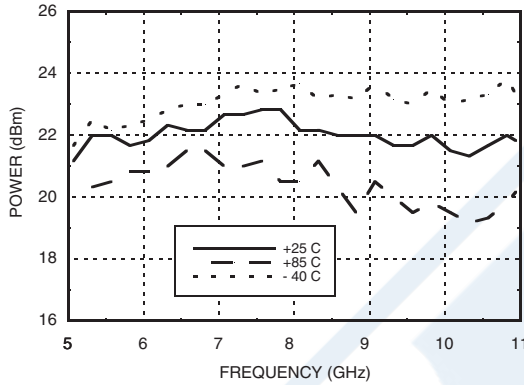
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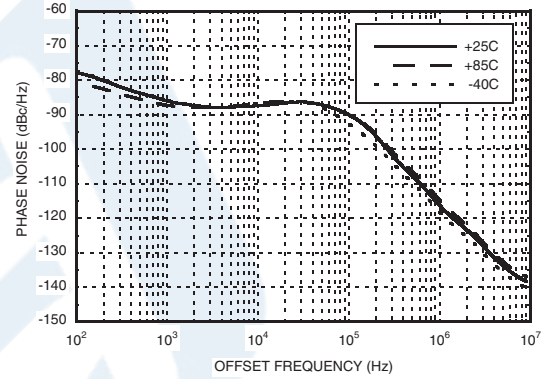
PE11S1001

Typical Performance Data

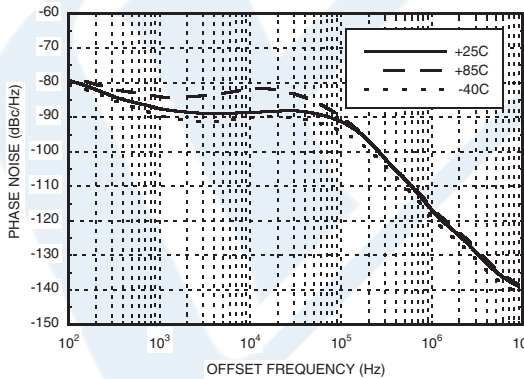
Output Power vs. Frequency



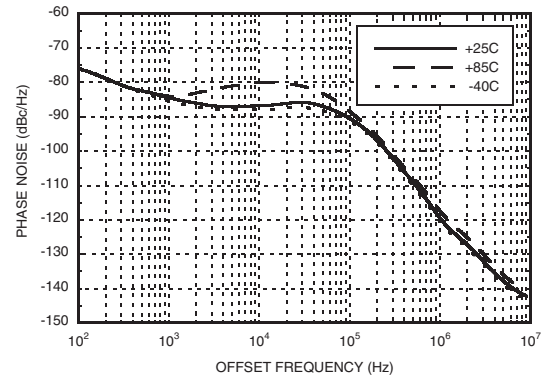
Phase Noise @ 5.5 GHz, Integer Mode



Phase Noise @ 7.5 GHz, Integer Mode



Phase Noise @ 10 GHz, Integer Mode



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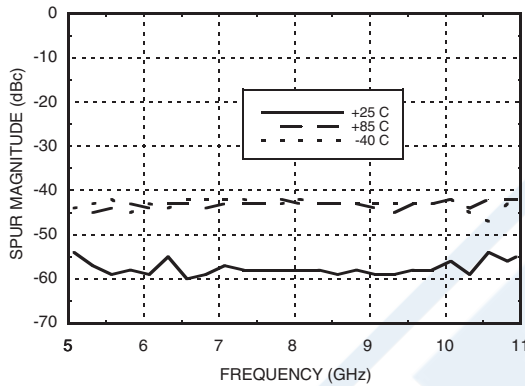


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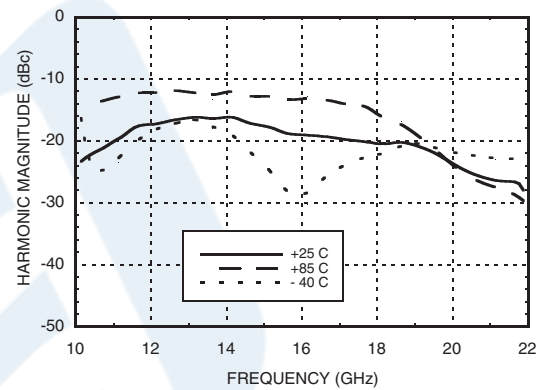
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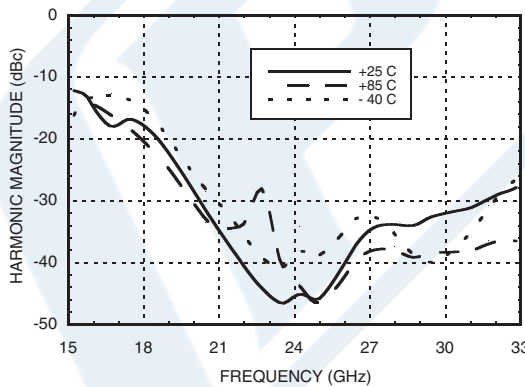
Reference Spur



Second Harmonic vs. Frequency



Third Harmonic vs. Frequency



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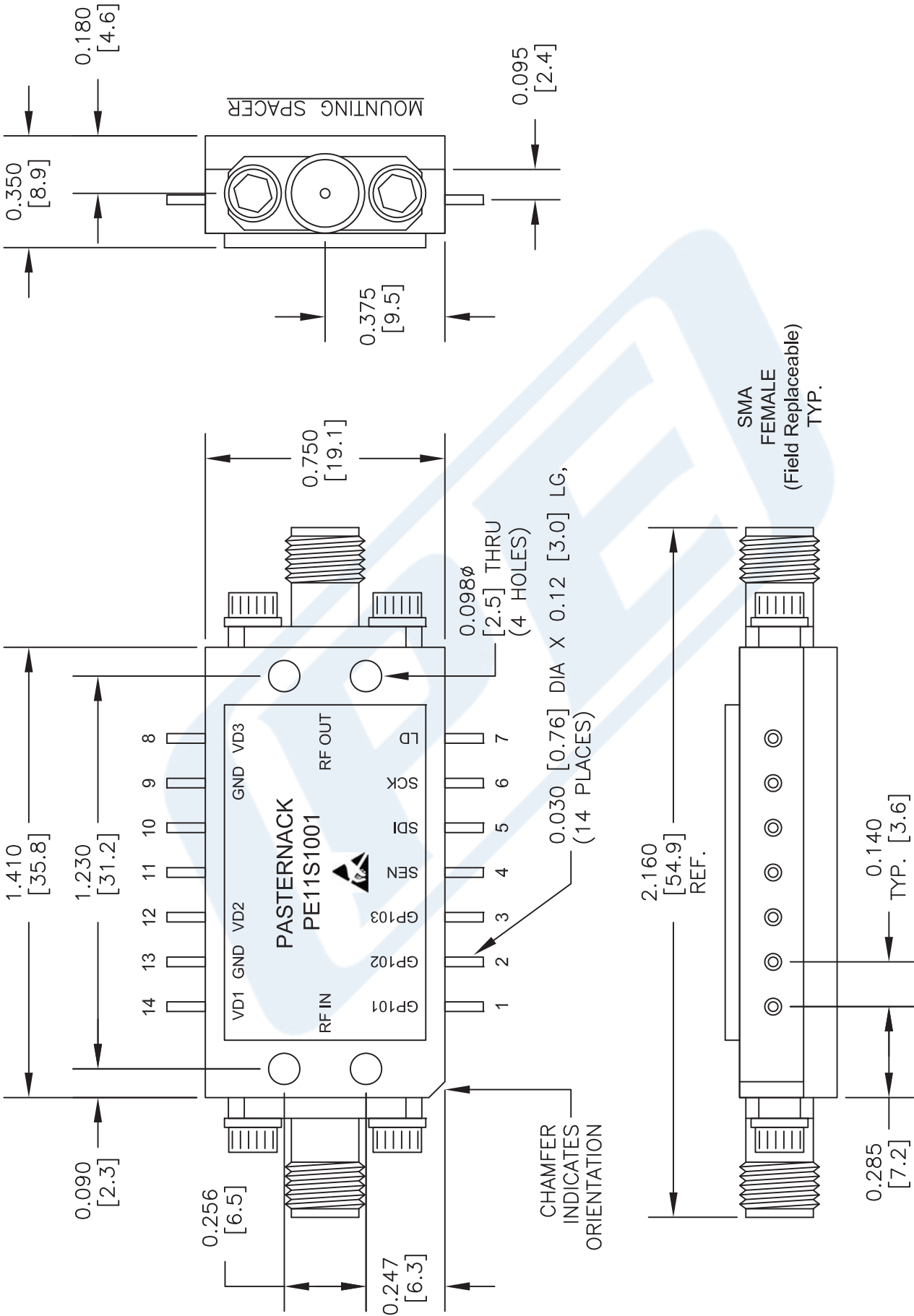
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URL: <https://www.pasternack.com/spi-frequency-synthesizer-module-pll-5.5-10.5-ghz-sma-pe11s1001-p.aspx>



# PE11S1001 CAD Drawing

SPI Frequency Synthesizer Module, Phase Locked Loop (PLL), 5.5 GHz to 10.5 GHz Output, SMA



NOTES:

1. UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE NOMINAL.
2. ALL SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE AT ANY TIME.
3. DIMENSIONS ARE IN INCHES [mm].

CAD FILE	102816	SCALE	N/A	SIZE	A	2233
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DWG TITLE  
**PE11S1001**  
 FSCM NO. 53919

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