PASTERNACK®
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SPI Frequency Synthesizer Module, Phase Locked Loop (PLL), 2 GHz to 6 GHz Output, SMA

Synthesizers Technical Data Sheet PE11S1002

Features

- Wideband Output Frequency
- 2 GHz to 6 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 PE11S1002 is a Frequency Synthesizer Module that covers a wide frequency band from 2 GHz to 6 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 0.6 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, Vd4 = -2 V, Id1 = 110 mA, Id2 = 7 mA, Id3 = 330 mA, Id4 = 7 mA)

Mode	Integer/Fractional
Reference	External
Option(s)	Phase Lock Indicator
Control Interface	Serial, TTL
Prescaler Coefficient	1

Description	Minimum	Typical	Maximum	Units
Frequency Range	2		6	GHz
Output Power	+14	+17		dBm
Phase Locked Speed (< 3 Deg, 10 MHz Step)		500		us
Phase Locked Speed (< 3 Deg, 4 GHz Step)		15		ms
Phase Noise @100Hz Offset		-83		dBc/Hz
Phase Noise @1kHz Offset		-88		dBc/Hz
Phase Noise @10kHz Offset		-92		dBc/Hz
Phase Noise @100kHz Offset		-94		dBc/Hz
Phase Noise @1MHz Offset		-122		dBc/Hz
2nd Harmonic		-22		dBc
3rd Harmonic		-25		dBc
Output Return Loss		13		dB

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), 2 GHz to 6 GHz Output, SMA PE11S1002

Pasternack Enterprises, Inc. • P.O. Box 16759, Irvine, CA 92623
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Phase Detector Frequency		150		kHz
Reference Frequency		10		MHz
Reference Power (CW)	-6	+0	+12	dBm
Reference Spurious		-50	-45	dBc
Operating DC Voltage 1	3.3	3.6	12	V
Operating DC Current 1		110	125	mA
Operating DC Voltage 2	19	20	20.5	V
Operating DC Current 2		7	15	mA
Operating DC Voltage 3	5.5	6	12	V
Operating DC Current 3		330	375	mA
Operating DC Voltage 4	-6	-2	375	V
Operating DC Current 4		7	15	mA
Power Dissipation		2.5	6.5	Watts

Mechanical Specifications

Size

Weight	0.09 lbs [40.82 g]
Body Material and Plating	Nickel
Finish	Gold

Configuration

Reference Connector	Field Replacable SMA Female
Output Connector	Field Replacable SMA Female
Control Connector	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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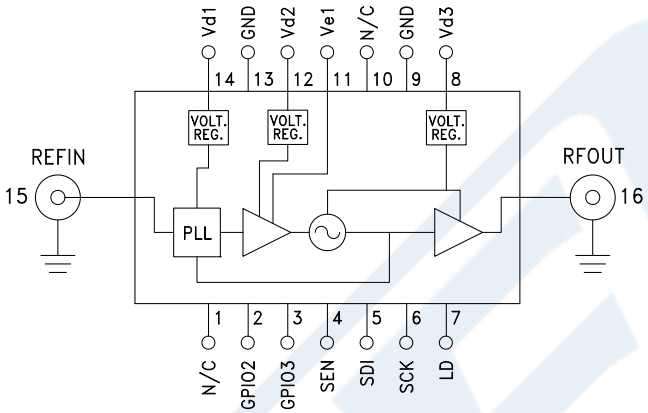
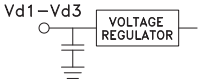
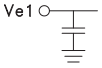
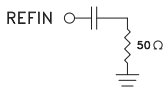
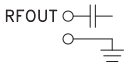
Functional Block Diagram



Pin Descriptions

Pin Number	Function	Description	Interface Schematic
1, 10	N/C	The pins are not connected internally; however, all data shown herein was measured with these pins connected to RF/DC ground externally.	
2 - 3	GPIO2, GPIO3	General Purpose I/O with Tristate	See operating guide. [1]
4	SEN	Serial port Enable Input	See operating guide. [1]
5	SDI	Serial port Data input	See operating guide. [1]
6	SCK	Serial port Clock input	See operating guide. [1]
7	LD	Lock Detect	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.	
11	Ve1	Note: Voltage supply pin may be grounded if operation 2.1 - 6.0 GHz is acceptable.	
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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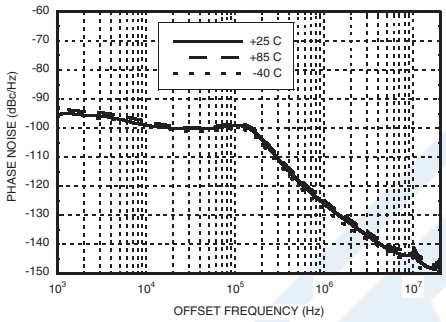
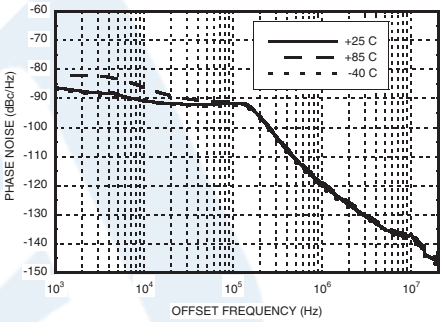
Typical Performance Data

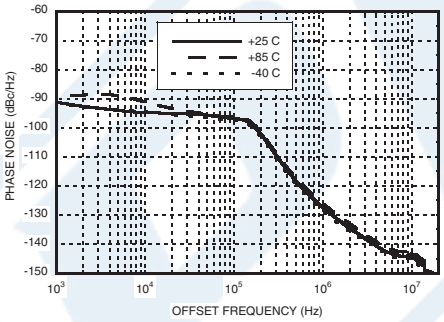
Phase Noise @ 2 GHz, Integer Mode



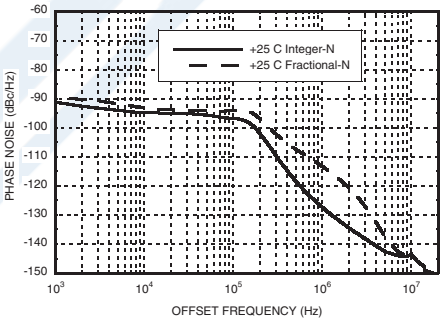
Phase Noise @ 6 GHz, Integer Mode



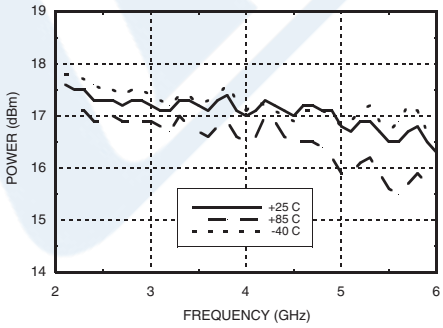
Phase Noise @ 4 GHz, Integer Mode



Phase Noise @ 4 GHz Integer vs. Fractional Mode



Output Power vs. Frequency



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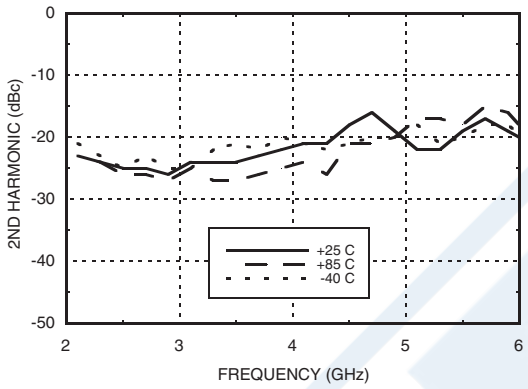
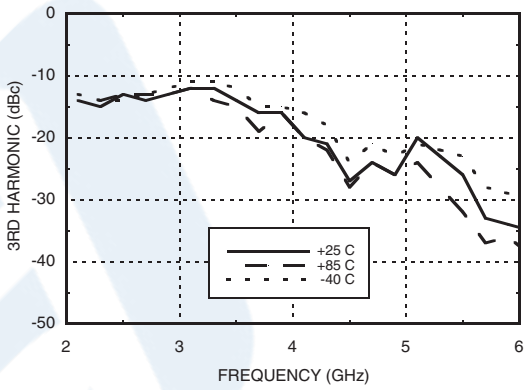
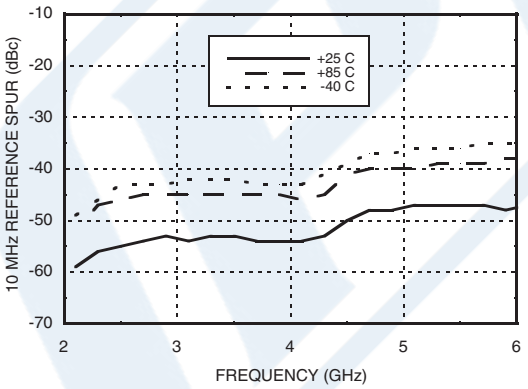
Second Harmonic vs. Frequency



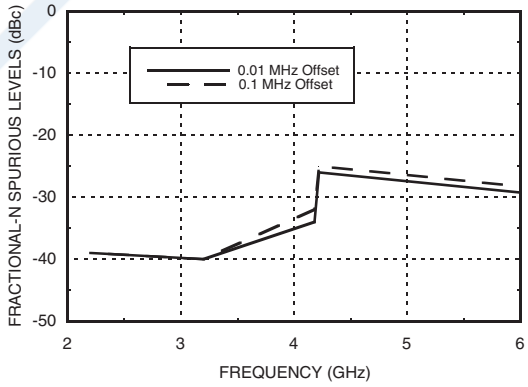
Third Harmonic vs. Frequency



Reference Spur



Fractional Spur Levels



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URL: https://www.pasternack.com/frequency-synthesizer-module-pll-2-6-ghz-sma-pe11s1002-p.aspx

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PE11S1002 CAD Drawing

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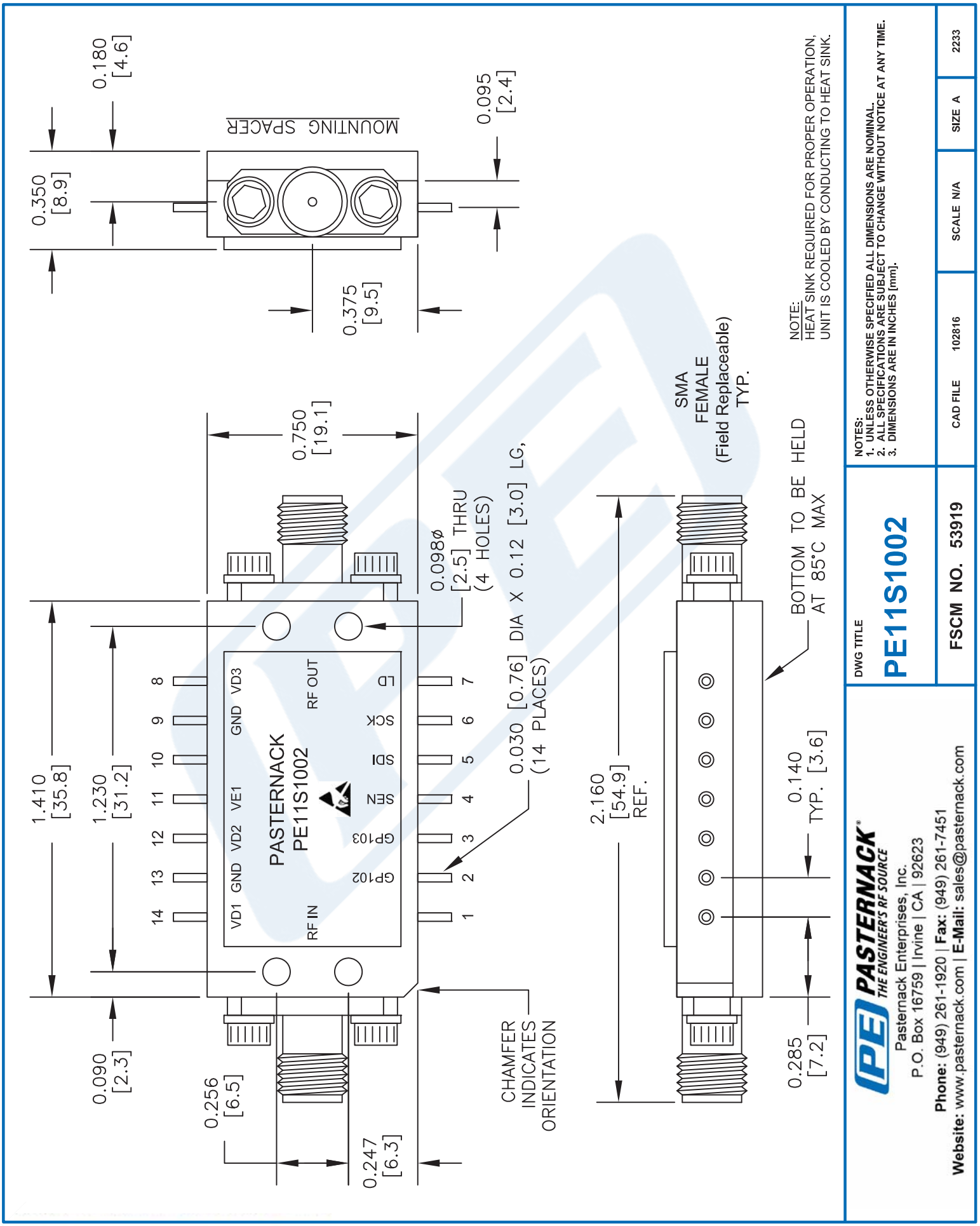

NOTES:
1. UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE NOMINAL.
2. ALL SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE AT ANY TIME.
3. DIMENSIONS ARE IN INCHES [mm].

CAD FILE	102816	SCALE N/A	SIZE A	2233

DWG TITLE: **PE11S1002**

FSCM NO. 53919

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