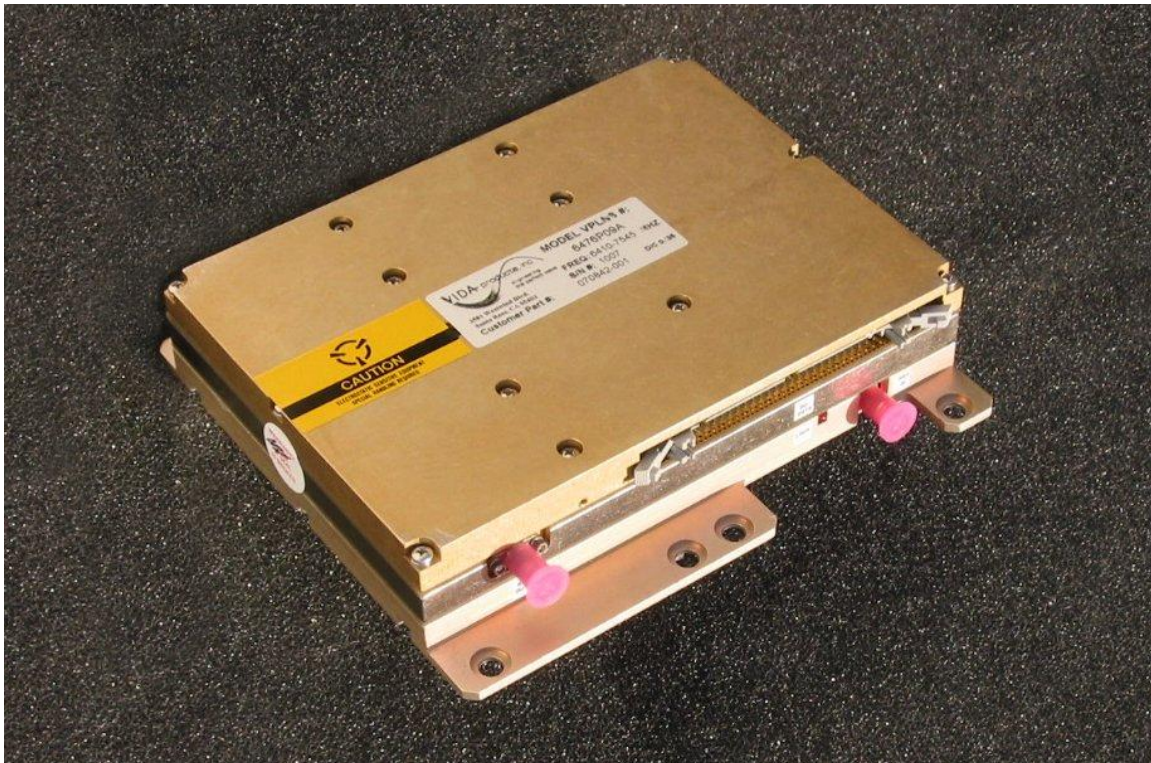


VIDA products, inc.

engineering
the perfect wave

Product Guide

VPLNS Series



High Performance Frequency Synthesizer

VPLNS SERIES
REV 1.1

VIDA Products, Inc.
Sheet 1 of 13

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General Description

The VPLNS series of high performance frequency synthesizers are intended meet a variety of commercial and defense applications where low noise, wide bandwidth and small step size (down to 100 Hz) are essential. They are ideal for S-Band, C-Band, X-Band but due to their exceptional phase noise performance, frequency multiplication can extend the range to over 30 GHz.

Unlike competitor's products, this unit offers our customer uncompromising performance at a moderate cost. VIDA products synthesizers feature proprietary oscillator and system design architecture allowing the most cost effective, manufacturable, high performance designs possible.

Some of the key features of the product line include:

Standard Band Frequency Coverage:

The VPLNS frequency synthesizer family can cover frequency bands ranging from 2 to 12 GHz in 5 bands.

Broad Tuning Range: Tuning ranges of up to 3 GHz are supported.

Small Step Sizes: Standard step sizes of 1 KHz are available with options as low as 100 Hz.

Excellent Phase noise: The VPLNS synthesizer product offers instrument grade phase noise performance. Typical C-Band phase noise performance is -95 at 1kHz and -130 at 1 MHz offsets. Please refer to the phase noise plot sections for details.

Very Low non-harmonic spurious:

The unit offers -80 dBc at offsets greater than 20 KHZ .

Typical Application

The VLNS is ideally suited as the frequency source for both commercial and defense applications including:

- **Satellite uplink and down links**
- **Field portable terminals**
- **Radar**
- **Control links for unmanned aerial vehicles**
- **multi-band converters**

Product Selector Guide

Frequency Range	Frequency Span	Step Size
2.0 – 12 GHz Standard	Up to 3 GHz	1 KHz Standard 100 Hz Available

Options

Standard step size is 1 KHz, optional step size of 1 Hz can be ordered. The communications interface can be specified as parallel or serial load TTL compatible logic (RS-422.). Other modified specification variants are available upon request.

Standard Models

Model	Frequency Range	Step Size	Output Power	Satellite Frequency Band
VPLNS –2535	2.5 - 3.5 GHz	1 KHz std	14/18 dBm	S-Band
VPLNS –3050	3.0 – 5.0 GHz	1 KHz std	14/18 dBm	S-Band
VPLNS –5080	5.0- 8.0 GHz	1 KHz std	14/18 dBm	C-Band
VPLNS –7090	7.0 – 9.0 GHz	1 KHz std	14/18 dBm	C-Band
VPLNS – 8012	8.0-12 GHz	1 KHz std	14/18 dBm	X-Band

Standard models are provided for evaluation purposes. Actual customer models may be custom configured within the specification parameters provided. Please contact VIDA Products to determine which best meets your requirements.

Specifications

Parameter	Range / Units	Specification
Frequency Coverage	Band 1 Band 2 Band 3 Band 4 Band 5	2.5 to 3.5 GHz 3.0 to 5.0 GHz 5.0 to 8.0 GHz 7.0 to 10.0GHz 10 to 12.0 GHz Other Custom Frequency available
Frequency Tuning Span	GHz	2 Typ.
Tuning Step Size	KHz	1 kHz Standard Smaller step size available
Power Level	dBm (min/max)	+14 / +18
Power Variation	dBm (over freq, temp, max)	3.0
Switching Speed	Msec (max)	150
Nominal Impedance	Ohms (typ)	50
Load VSWR	(max)	2:0:1
Harmonic Level	DBc	< -15
Non-Harmonic Spurious	100Hz<foff<10kHz, dBc	< -65
	10kHz<foff<100kHz, dBc	< -75
	100KHz<foff, dBc	< -80
Phase Noise		Band
		1 2 3 4
	100 Hz, dBc/Hz	-84 -80 -77 -75
	1 kHz, dBc/Hz	-94 -95 -87 -85
	10 kHz, dBc/Hz	-100 --110 -92 -95
	100 kHz, dBc/Hz	-120 -115 -110 -100
	1 MHz, dBc/Hz	-130 -130 -125 -110
	10 MHz, dBc/Hz	-140 -135 -130 -125
Phase Error	Degrees, peak	20
Connector Type		SMA Jack

Alarm Output

Level	Open Collector, Low=Locked	Locked=<0.7v
Indicator	Red LED, On=Unlocked	Unlocked=Hi-Z

Inputs

Frequency	MHz	5 or10
Power Level	dBm	0, +/- 3dB
Nominal Impedance	ohms	50
Voltages/Currents:		
+VDC = 15.6 – 20.0	Amps (max)	0.75
+VDC = 5.25 – 5.50	Amps (max)	1.2
Connector Type		SMA Jack

Specifications Continued

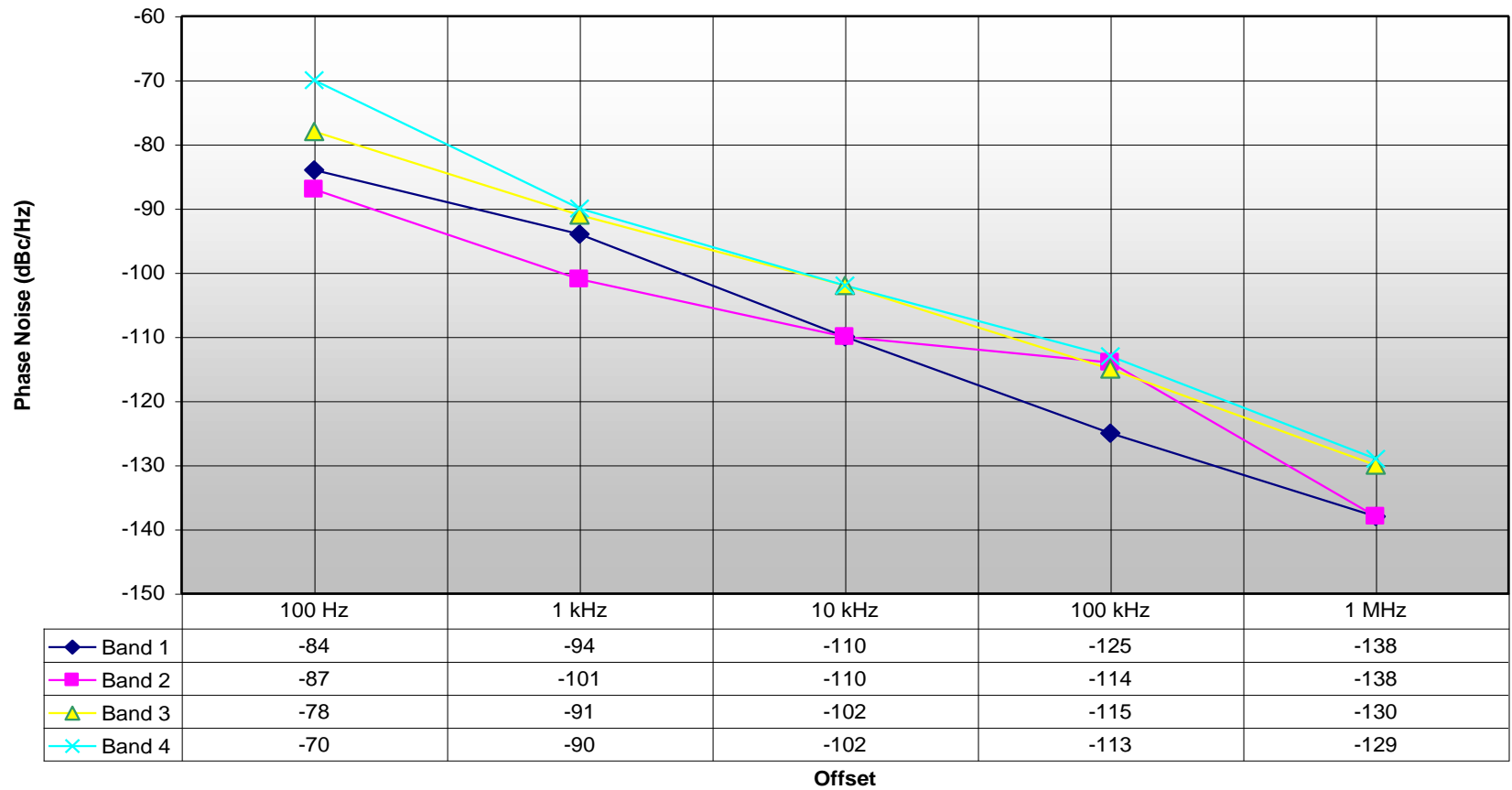
Digital Tuning

	SERIAL RS-422	PARALLEL
Connector	16 Pin (See Table 2)	50 Pin (See Table 1)
Number of BITS	Depends upon res.	N/A
Level	RS-422	TTL, Inverted

Environmental

Operating Temperature	Centigrade	0 to +60
Storage Temperature	Centigrade	-40 to +75
Humidity	Relative Humidity	5 – 100, Non-Condensing
Altitude	Feet above sea level	-120 to 20,000

Typical Phase Noise Performance Chart



Communication Interface

The communications interface has been design to be compatible with variety industry standard interfaces for frequency programming. See section on Allowable Frequencies for step sizes. A standard TTL compatible Serial (RS-422) or Parallel interface can be ordered. A standard bit rate of 2400 bps is supported on the Serial interface. Other data rates are available as options.

PARALLEL INTERFACE (-0001)

(Pins J1-3,4,5,6 and 10; See notes 1 and 2 below)

Parallel I/O connector

PIN	DESCRIPTION
J1-1	GND
J1-2	GND
J1-3	+15.6 V (+20V MAX)
J1-4	+15.6 V (+20V MAX)
J1-5	+5.25 V (+5.5V MAX)
J1-6	+5.25 V (+5.5V MAX)
J1-7	GND
J1-8	RESET / GND
J1-9	STROBE
J1-10	LOCK ALARM
J1-11	CMD9 (1)
J1-12	CMD9 (2)
J1-13	CMD9 (4)
J1-14	CMD9 (8)
J1-15	CMD8 (1)
J1-16	CMD8 (2)
J1-17	CMD8 (4)
J1-18	CMD8 (8)
J1-19	CMD7 (1)
J1-20	CMD7 (2)
J1-21	CMD7 (4)
J1-22	CMD7 (8)

PIN	FUNCTION
J1-1	GND
J1-2	GND
J1-3	+15.6 V (+20V MAX)
J1-4	+15.6 V (+20V MAX)
J1-5	+5.25 V (+5.5V MAX)
J1-6	+5.25 V (+5.5V MAX)
J1-7	GND
J1-8	RESET / GND
J1-9	STROBE
J1-10	LOCK ALARM
J1-11	CMD9 (1)
J1-12	CMD9 (2)
J1-13	CMD9 (4)
J1-14	CMD9 (8)
J1-15	CMD8 (1)
J1-16	CMD8 (2)
J1-17	CMD8 (4)
J1-18	CMD8 (8)

General control bit format cmdx(y)

x=digit 9=msd
y=binary weight
logic 0: > 3.5 v
logic 1: < 0.8 v

Digit 9 is the 1 GHz digit for units
tuning less than 10 GHz
Digit 9 is the 10 GHz digit for units
tuning greater than 10 GHz

Unlock (j1-10) is an open collector output
logic 0: < 0.7 v locked
logic 1: hi-z unlocked
(other options available)

Note 1.

All unused pins should be left open
command change initiated by falling
edge of negative-going strobe. strobe
pulse width > 1.2 u sec

Note 2.

+15.6 supply must be applied before
+5.25 supply.

SERIAL INTERFACE: (-0002)

Table 2

STANDARD PRODUCT CONNECTOR TABULATION	
PIN	DESCRIPTION
J1-1	GND (ID1)
J1-2	GND (ID2)
J1-3	+15.6 V (+20V MAX)
J1-4	+15.6 V (+20V MAX)
J1-5	+5.25 V (+5.5V MAX)
J1-6	+5.25 V (+5.5V MAX)
J1-7	GND
J1-8	RESET / GND
J1-9	GND (ID3)
J1-10	LOCK ALARM
J1-11	Rx +
J1-12	Rx -
J1-13	N / C
J1-14	GND
J1-15	N / C
J1-16	N / C

E1A RS-422 standard hardware interface
standard baud rate: 2400 (other rates available as options)

communication protocol:

the tuning word can be sent in 2 different formats:

- 1) each tuning word will consist of: 1) 1 address byte
- 2) 4 data bytes
- 3) 1 end byte

Address byte: ASCII "A" in binary

Data bytes

- : frequency (KHz) in 4 bytes (binary or packed bcd format)
- : bit 6 of 4th (most significant) byte = 1 for bcd
- : " " " " byte = 0 for binary

End byte : ASCII "K" in binary (for KHz)

Each byte will consist of 10 bits: a start bit (0)

- 8 data bits
- a stop bit (1)

Each byte shall be separated by a 1 msec delay

Each byte to be sent LSB first

Data bytes to be sent least significant byte first

example: freq = 10539720 KHz

in bcd, send 20 97 53 50 (add 4 to the most significant digit)

in binary, send c8 d2 a0 00

In both cases, send each byte with LSB first

Unlock (j1 - 10) is an open collector output

logic 0: <0.7 v locked

logic 1: hi-z unlocked

(other options available)

All Unused Pins Should Be Left Open

