

VIDA products, inc.

engineering
the perfect wave

Product Guide

VPBBS Series



High Value Frequency Synthesizer

VPBBS SERIES
REV 1

VIDA Products, Inc.
Sheet 1 of 10

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General Description

The VPBBS frequency synthesizer is a low cost, high performance unit typically used in ruggedized broadband radio applications. In addition to a small footprint, low power consumption, and excellent operating characteristics, the modular design is extremely flexible, allowing it to be quickly adapted to various radio designs. Synthesizers using this basic product configuration are currently in use in several successful commercial radio products.

The VPBBS series is designed to meet the demanding environmental requirements of commercial and defense applications where extended temperature ranges, vibration resistance, low noise performance, and wide bandwidth capabilities are essential.

These units are ideal for C and X-Band applications but due to their good phase noise performance, frequency multiplication can extend their frequency range to over 30 GHz.

In contrast with other wide tuning range alternatives, the VPBBS offers the system designer breakthrough performance at a moderate cost. VIDA synthesizers feature proprietary oscillator and system design architectures, allowing the most cost effective, manufacturable, high performance designs possible.

Key Features:

Vibration resistance: This is a key performance parameter for many system applications. Due to exceptional oscillator performance, the VPBBS is ideal for demanding field applications for off-road vehicles and remote antenna sites.

Lower power consumption: VIDA Products has significantly lowered power consumption for their synthesizers. VIDA's oscillator technology consumes 20% less power than competing designs.

Extended temperature performance: The standard VPBBS series is designed to operate from -20 to $+70$ C with options for extended ranges to -35 to $+85$ C

Wide tuning range: Each unit has a typical tuning range of 1 GHz eliminating the need for multiple switched oscillators.

Standard Band Frequency Coverage: The VPBBS frequency synthesizer family covers frequencies from 6 to 14 GHz in 5 bands.

Tuning Range: Tuning ranges of 1 GHz or greater are supported.

Small Step Sizes: Standard step size is 625 KHz with options to as small as 100 kHz.

Excellent Phase noise: The VPBBS synthesizer product offers instrument grade phase noise performance. Typical C-Band phase noise performance is -85 dBc/Hz at 10 kHz and -130 dBc/Hz at 1 MHz offsets. Refer to the phase noise plot for details.

Very Low non-harmonic spurious: The VPBBS provides -70 dBc performance at offsets greater than 20 KHz.

Typical Applications

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

- **Satellite uplinks and downlinks**
- **Field portable terminals**
- **Radar**
- **Control links for unmanned aerial vehicles**
- **Multi-band converters**
- **Point-to-Point broadband radios**

Product Selector Guide

Frequency Range	Frequency Span	Step Size
6 – 14 GHz Standard	Up to 1 GHz	625 kHz Standard 100 kHz Available

Options

Standard step size is 625 KHz, optional step size of 100 kHz can be ordered with a reduction in vibration performance. The communications interface is specified as 3 wire parallel/serial load TTL compatible logic (RS-422.). Other specification variants are available upon request

Standard Models

<u>Model</u>	<u>Frequency Range</u>	<u>Step Size</u>	<u>Output Power</u>	Satellite Frequency Band
VPBBS –7080	7-8 GHz	625 kHz std	16 dBm	C Band
VPBBS –1112	11-12 <u>GHz</u>	625 k >100 kHz std	16 <u>dBm</u>	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 4 Band 5	7 to 10 GHz 10 to 12 GHz Other Custom Frequency available
Frequency Tuning Span	GHz	1 Typ.
Tuning Step Size	KHz	625 kHz Standard Smaller step sizes available
Power Level	dBm (min/max)	10 (±2dBm)
Power Variation	dBm (over freq, temp, max)	3.0
Switching Speed	millisecond (max)	50
Nominal Impedance	Ohms (typ)	50
Load VSWR	(max)	2:0:1
Harmonic Level	dBc	< -15
Non-Harmonic Spurious	$100\text{Hz} \leq F_{\text{offset}} \leq 10\text{kHz}$, dBc	< -55
	$10\text{kHz} \leq F_{\text{offset}} \leq 100\text{kHz}$, dBc	< -65
	$100\text{kHz} \leq F_{\text{offset}}$, dBc	< -70
Phase Noise (Typical)		Band
		4 5
	100 Hz, dBc/Hz	-65 -60
	1 kHz, dBc/Hz	-85 -80
	10 kHz, dBc/Hz	-102 -100
	100 kHz, dBc/Hz	-120 -120
	1 MHz, dBc/Hz	-140 -140
	10 MHz, dBc/Hz	-150 -150
Phase Error	Degrees, peak	5
Connector Type		SMA Jack

Alarm Output

Level	TTL	Locked=>3.0 v
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Inputs

Frequency	MHz	50
Power Level	dBm	0, +/- 3dB
Nominal Impedance	Ohms	50
Voltages	VDC	9-12
Current	Amps (max)	0.75
Connector Type		SMA Jack

Specifications Continued

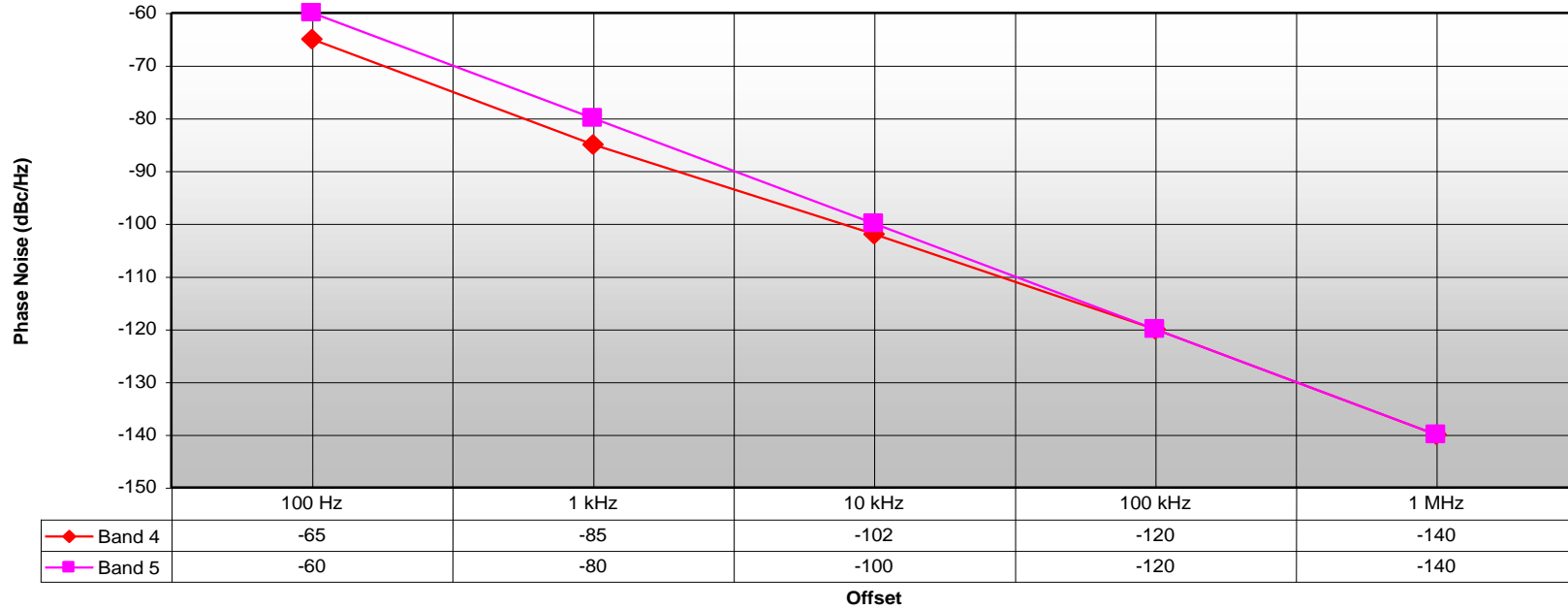
Digital Tuning

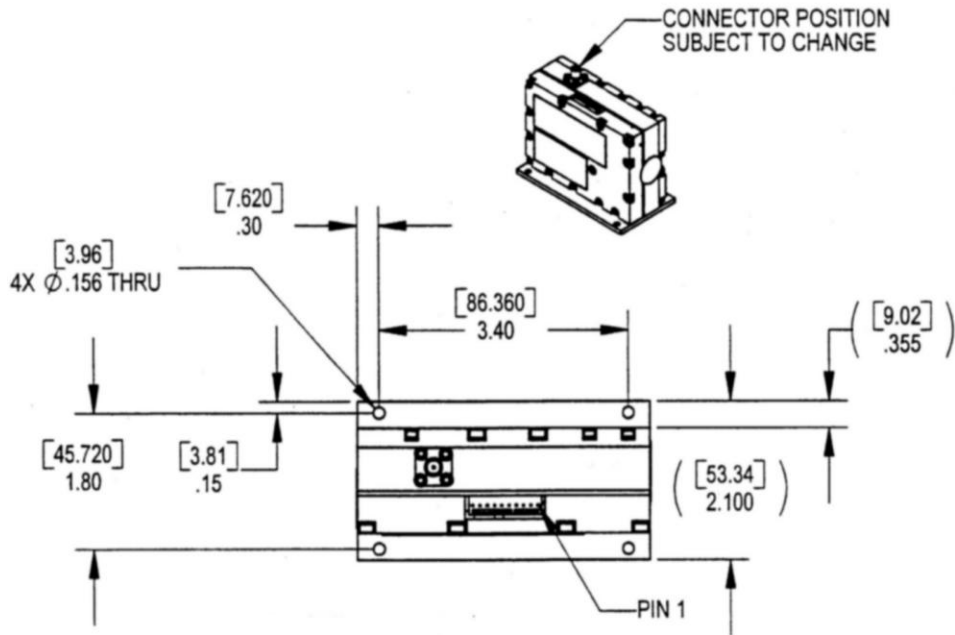
	3 LINE TTL/ PARALLEL
Connector	8 Pins (See Table 1)
Level	RS-422

Environmental

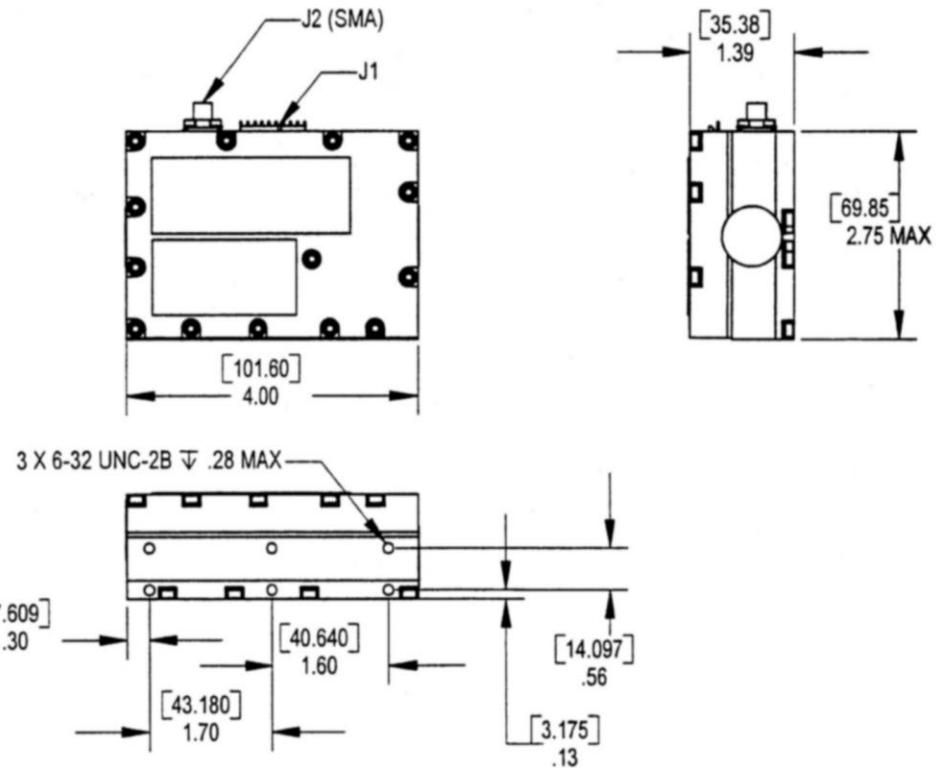
Operating Temperature	Degrees Centigrade	-20 to +70
Storage Temperature	Degrees Centigrade	-40 to +80
Humidity	% Relative Humidity	5 – 90, Non-Condensing
Altitude	Feet above sea level	-120 to 20,000

Typical Phase Noise Performance Chart





VPBBS ENVELOPE DRAWING Rev A



Communication Interface

The communication interface has been design to be compatible with an industry standard three wire serial load interface for frequency programming. Contact VIDA Product for application information.

3 WIRE SERIAL INTERFACE:

Table 1

STANDARD PRODUCT CONNECTOR TABULATION	
PIN	DESCRIPTION
J1-1	+ 8V (OPT)
J1-2	+ 12V
J1-3	GND
J1-4	GND
J1-5	DATA
J1-6	CLOCK
J1-7	ENABLE
J1-8	PLL LOCK

Ordering Information

To place an order, contact the VIDA Products Sales Department at (707) 541-7000.