

OPERATING INSTRUCTIONS
VDS-6001-1007 L-Band Frequency Synthesizer

1. PRODUCT DESCRIPTION

The VDS-6001-1007 is a remote controlled frequency synthesizer designed to operate from 1200 MHz to 1600 MHz with 500 kHz steps. This unit is based on our VDS-6000 family of Phase Lock Loop (PLL) synthesizers that combines a traditional PLL with a unique patent pending Arithmetic Lock Loop (ALL) design. The PLL section covers the overall operating range of the unit in 10 MHz steps and the ALL circuitry adds the remaining resolution. Due to the frequency range, the use of the ALL circuitry improves the close-in phase noise performance by 20 dB over a traditional single loop design while maintaining a cost effective solution.

2. PERFORMANCE/SPECIFICATIONS

Frequency

Range 1,200 MHz to 1,600 MHz
Resolution 500 kHz
Control 12 bits, Parallel Positive-true BCD TTL logic

Main Output

Level +10 dBm into 50_
Flatness ±2 dB

Spectral Purity

Harmonics <-20 dBc
Spurious <-60 dBc
Phase Noise
1 kHz offset <-65 dBc/Hz
10 kHz offset <-80 dBc/Hz

Frequency Ref 10.000 MHz, internal

Accuracy/Aging ±1 ppm/year

Alarm TTL LOW for Out-of-Lock plus visual UNLOCK indication

Connectors

REF Out SMA female (J4) — must be buffered before using
RF Out SMA female (J2)
Freq Control 25-pin subminiature “D” (J1)
Power Supply same as frequency control

Power Supply +5V @ 500 mA; +24V @ 100 mA

Environmental

Operating Temp 0°C to +50°C
Dimensions 4.48" x 4.74" x 1.125" (metal module plus base plate)



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Weight<2 lbs, net; 6 lbs, shipping

3. MECHANICAL CONFIGURATION

The VDS-6001-1007 is manufactured in a single module with a 25-pin (male) connector located on the 4.74" x 1.125" face. All RF and digital connectors are accessed on one side of the module (4.74" x 1.125" face) with the following table describing each of the inputs and outputs:

Designator	Function	Connector	Mating Connector
J1	Frequency Control	25-pin Submini "D"	Amphenol 117DB-25S or equivalent
J2	RF Out	SMA female	SMA male
J4	10 MHz REF Out	SMA female	SMA male

4. POWER SUPPLY CONNECTIONS

Power is supplied to the following pins on the 25-pin subminiature "D" connector:

Power Supply	Pin Numbers
+5V	11, 23
+24V	13, 25

5. FREQUENCY CONTROL

All control lines should be driven with standard TTL levels ("0" = 0V to 0.4V for "low" and "1" =2.4V to 5.5V for "high".) No registration of the signal is provided so the logic levels at each pin must be maintained in order for correct operation of the synthesizer. In addition, pull -up resistors are not provided so each control line must be controlled to either a TTL "HIGH" or TTL "LOW" depending on the frequency desired.

Frequency control is programmed as a true-BCD number from 200 MHz to 600 MHz (the 1,000 MHz weight is pulled HIGH internally) plus an additional bit for the 500 kHz digit. Since BCD control is used, the maximum value for each BCD digit (Pins 6-9 & 15-18) is 9 and 9, respectively. The maximum value for pins 2-5 is 6. Note that pin 20 is used to control the 500 kHz step.

All pin out designations for the frequency control are listed below:



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Pin No.	Description	Pin No.	Description	Pin No.	Description
1	GND	9	10 MHz	18	1 MHz
2	800 MHz	10	NC	19	Lock Indicator
3	400 MHz	11	+5V	20	500 kHz
4	200 MHz	12	GND	21	NC
5	100 MHz	13	+24V	22	NC
6	80 MHz	14	GND	23	+5V
7	40 MHz	15	8 MHz	24	GND
8	20 MHz	16	4 MHz	25	+24V
		17	2 MHz		

Frequency Control Programming Lines (J1)

6. ALARM (Lock Indicator)

Pin 19 of the 25-pin subminiature “D” connector (J1) contains the lock indicator control line. This line provides access to the status of the PLL loop. The signal is a TTL level voltage. The following table contains the logic state for Lock/Out-of-Lock indication. A red LED is also provided to allow visual indication of a Out-Of-Lock condition. It is located just to the right of the REF IN SMA connector (J4).

INDICATION	LOCK LINE LEVEL
PLL Locked	TTL HIGH
PLL Out-of-Lock	TTL LOW

Lock Indicator Logic

7. PROGRAMMING EXAMPLES

Several examples will be presented to assist the user in determining the pin configurations for a desired frequency. The pin numbers shown in the examples should be pulled "HIGH" and all remaining pins must be pulled "LOW".

Desired Frequency	Programmed Frequency	Active Pins ("HIGH")
1,200.0 MHz	200.0 MHz	Pin 4 only
1,345.5 MHz	345.5 MHz	Pins 4, 5, 7, 16, 18 & 20
1,549.5 MHz	549.5 MHz	Pins 3, 5, 7, 15, 18 & 20
1,600.0 MHz	600.0 MHz	Pins 3 & 4



8. WARRANTY

All Meret products are warranted against defects in material and workmanship for a period of one year after initial shipment. Meret will repair or replace any circuit or component that is found to be defective during this period if in Meret's sole opinion the product is deemed defective.

Any modifications or options performed by Meret during the initial one year period shall be included under the initial warranty, and such secondary warranties shall terminate one year after the initial shipment. Shipment of the product to Meret (San Diego, CA) shall be made prepaid and shall not be made without prior authorization by Meret.

This warranty is voided if the product is abused or if unauthorized modifications are made by the user.

This warranty is in lieu of all other warranties, expressed or implied, and no person is authorized to represent or assume for Meret any liability in connection with the sales of our products other than stated within this warranty.

Serial Number

QC by _____ Date: _____

