

Indirect Synthesizers

Features

- ◆ Frequencies to 14 GHz standard (in bands)
- ◆ Bandwidths up to 17%
- ◆ Low phase noise
- ◆ Low power consumption
- ◆ Low cost
- ◆ 3-Wire serial frequency control
- ◆ Re-programmable power-up frequency
- ◆ High immunity to phase hits
- ◆ Meets INTELSAT specification for phase noise @ C-band
- ◆ Compact package
- ◆ Ideal for Digital Radio applications

Options

- ◆ Single DC supply operation
- ◆ Custom digital control interfaces
- ◆ Optimization of weighted integrated phase noise
- ◆ Phase hit testing

Description

Herley-CTI (HCTI) series VSS are compact low noise microwave synthesizers designed for low cost, high data rate digital radio, VSAT and SatCom applications. Its very small package is suitable for mounting in space-limited up/down converter integrated assemblies. The synthesizers are optimized for use in LMDS and digital radio systems where low cost and high flexibility are priorities. The series VSS provides the very low phase noise at high offsets that is required in high symbol rate systems. For example, a 10 to 10.8 GHz VSS with a 100 kHz step size has typical phase noise of -116 dBc/Hz at 100 kHz offset and -93 dBc/Hz at 10 kHz offset.

The VSS is ideal for DC power-limited applications, typically dissipating between 1 and 2 watts. In addition, the frequency band and step size can be customized for specific requirements.



The synthesizer has an on-board microcontroller which provides a simple 3-wire serial interface. The VSS also contains an EEPROM where the customer can save any desired start-up frequency, eliminating the need for external control in fixed frequency applications. The design also includes Herley-CTI proven techniques for phase hit suppression and can be specially configured to pass BER tests in 256 QAM systems up to 38 GHz. Herley-CTI can custom tailor the VSS for particular system requirements such as dual synthesizer configurations and extended frequency ranges.

In addition, Herley-CTI's extensive in-house test capabilities, including automated temperature testing, phase noise measurement instrumentation, phase hit test equipment and vibration testing facilities are employed to ensure that the synthesizer is fully compliant with customer requirements.

Typical Performance Specifications

Frequency Range	0.5 GHz to 14 GHz (in bands)
Custom Bandwidths	5% to 8% standard.; Up to 17%, consult factory
Step Size	from 10 kHz depending on output frequency band, consult factory
Switching Speed	<100 milliseconds
Output Power	+12 dBm to +17 dBm
Output Power Flatness	+/-1.5 dB
Supply Voltage**	+5 Vdc @ 275 mA typ; 80 mA for 500 - 2000 MHz +15 Vdc @ 40 mA typ
Spurious	<-65 dBc for offsets >30 kHz typical
Harmonics	<-15 dBc
Alarm	TTL Hi - Locked
External Reference	10 MHz @ +3 dBm standard; other references optional
Frequency Accuracy	Same as reference
Frequency Control	3-wire serial TTL binary; Enable/Clock/Data Re-programmable power-up frequency using EEPROM
Phase Noise	See table
Operating Temperature	-10° C to +70° C standard, consult factory for extended ranges
Connectors:	
RF Out and Ref In	SMA-F
Frequency Control, Alarm, Supply Voltage	10 pin 2 mm dual row protected header

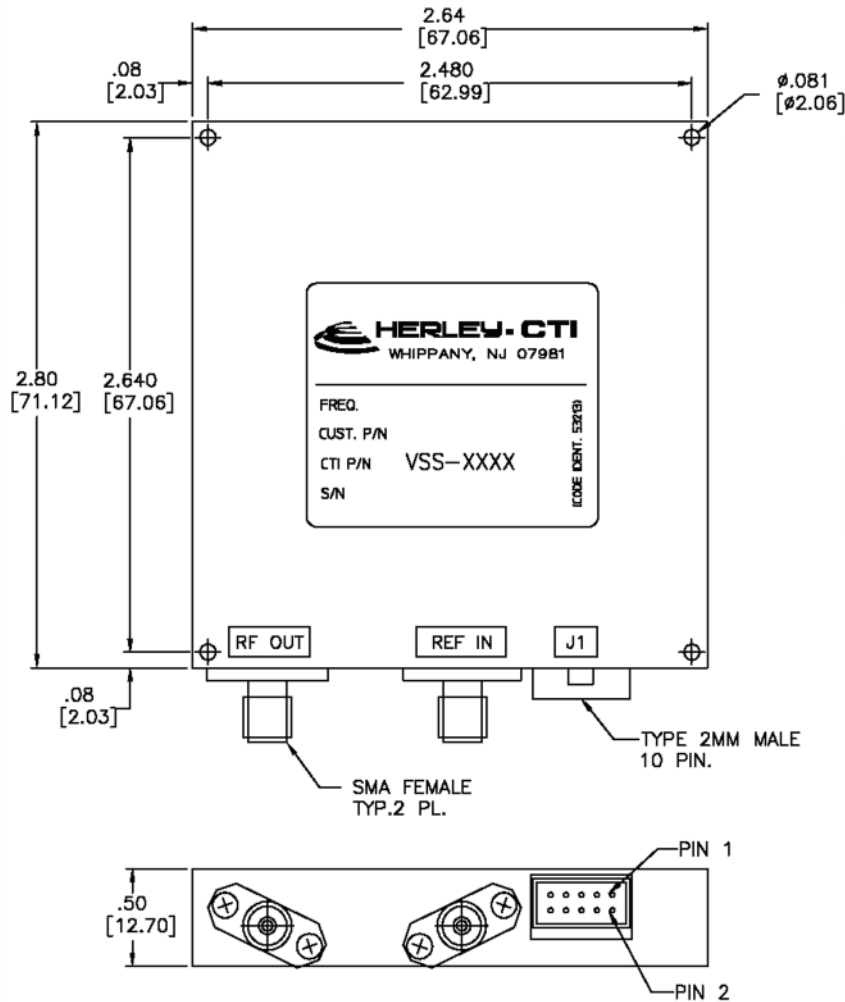
** Measured at the J1 connector of the synthesizer

Typical Phase Noise Performance Bandwidth 5% to 8%

Frequency Offset from Carrier	Output Frequency 900 MHz	Output Frequency 5 GHz	Output Frequency 10 GHz	Output Frequency 14 GHz
10 kHz	-115 dBc/Hz	-99 dBc/Hz	-93 dBc/Hz	-90 dBc/Hz
100 kHz	-137 dBc/Hz	-122 dBc/Hz	-116 dBc/Hz	-113 dBc/Hz
1 MHz	-145 dBc/Hz	-142 dBc/Hz	-136 dBc/Hz	-133 dBc/Hz

Note: All specifications subject to change without notice.

Outline Drawing



J1 PROGRAM CONN.			
PIN NO.	FUNCTION	PIN NO.	FUNCTION
1	GND	2	GND
3	+xVDC	4	+xVDC
5	+xxVDC	6	RESERVED
7	ALARM	8	CLOCK
9	ENABLE	10	DATA

J1 CONNECTOR IS 10 PIN 2MM.
 MOLEX P/N:87333-1031. RECOMMENDED MATING CONN. IS
 MOLEX P/N 511101060 AND PINS P/N 50394-8100

Dimensions are in Inches/mm, Tol. .xx=+/-0.02, .xxx=+/-0.005

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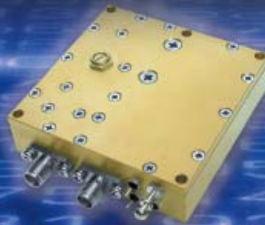
Indirect Synthesizers

Microwave and MMwave Signal Generation Products for Commercial and Military Applications

Broad Band Fast Switching Direct Synthesizers
Indirect Synthesizers · MMwave Down Converters
Phase Locked DROs · Free Running Sources · Integrated Assemblies



MMwave
Down Converter



Phase Locked DROs
to 45 GHz



Low Noise X-B
Synthesizer



Low Noise VSS
Synthesizer



Broad Band
Indirect Synthesizers



10 MHz - 20 GHz
300 nsec Switching
Direct Synthesizer

