

QuickSyn Lite mmW Frequency Synthesizer

FSL-2740, FSL-5067, FSL-7682

Features

- mmW frequency
- Fast switching speed
- Low phase noise
- Reference locking of multiple modules
- Soft front panel
- Frequency sweep & 32K-point LIST mode
- Interfaces: USB & SPI
- Size: 4 x 4 x 1.8 in. (102 x 102 x 46 mm)



Applications

- Test and measurement
- Automotive radar
- Satcom
- Point-to-point radios
- 5G cellular
- Wireless applications (i.e., IEEE802.11ad)

Overview

The FSL-2740, FSL-5067, and FSL-7682 are QuickSyn Lite frequency synthesizer modules extended to mmW in three popular bands (27 to 40 GHz, 50 to 67 GHz, and 76 to 82 GHz). These new synthesizers are comprised of our popular 20 GHz QuickSyn Lite synthesizer and a high-performance frequency multiplier. Power and synthesizer control are enabled through the QuickSyn Lite unit, which makes integration and control simple for the user. A soft front panel allows the user to access frequency control and frequency sweep plus 32K-point LIST

mode settings. Additionally, embedded firmware enables these modules to be integrated into automated test solutions. The phase-refining technology inherent in all QuickSyn products, provides an unmatched combination of fast switching speed, low phase-noise performance, and medium power consumption in a compact format. These new products provide an excellent solution for applications requiring a stable and clean CW mmW source.

Specifications

Model		FSL-2740			FSL-5067			FSL-7682		
Parameter	Unit	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.
Frequency range	GHz	27		40	50		67	76		82
Resolution	Hz		1			1			1	
Frequency switching	ms		1			1			1	
Frequency switching w/opt 3	µs		100			100			100	
LIST mode	points		32K			32K			32K	
Power	dBm	+17	+18	+24	+16	+19	+22	+10	+11	+14
Output retrun loss	dB		10			10			10	

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Specifications (continued)

Model		FSL-2740			FSL-5067			FSL-7682		
Parameter	Unit	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.
Internal ref. freq. output	MHz		10			10			10	
Internal ref. pwr output	dBm	+3	+5	+7	+3	+5	+7	+3	+5	+7
Internal ref. mute	dBm			-60			-60			-60
Freq. temp. stability	ppm		±1			±1			±1	
Aging❶	ppm/year		±1			±1			±1	
Locking range	ppm		±5			±5			±5	
Output impedance	ohms		50			50			50	
External freq. input	MHz		10			10			10	
External pwr input	dBm	-10	+5	+10	-10	+5	+10	-10	+5	+10
Input level (absolute max.)	dBm			+15			+15			+15

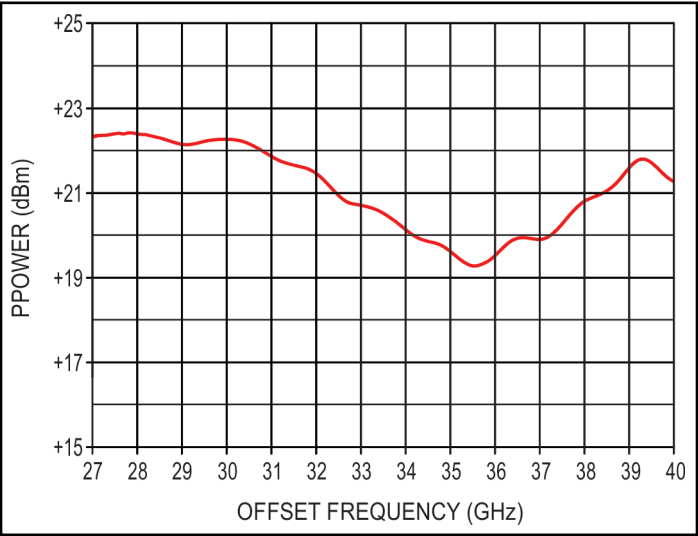


Figure 1. FSL-2740 Typical Power

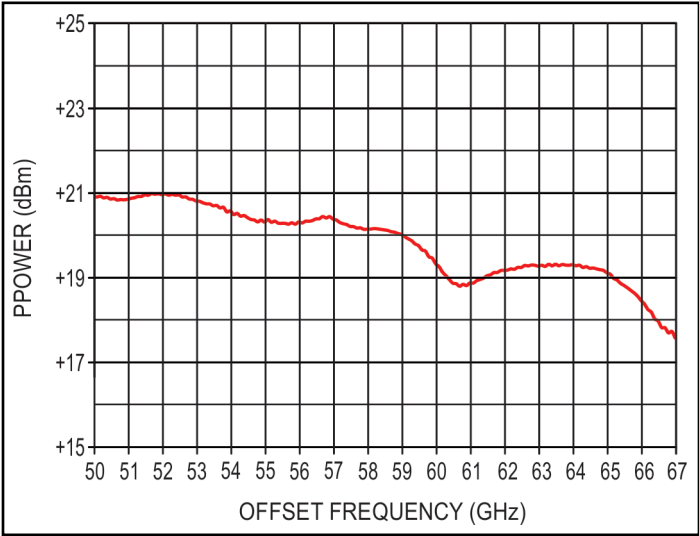


Figure 2. FSL-5067 Typical Power

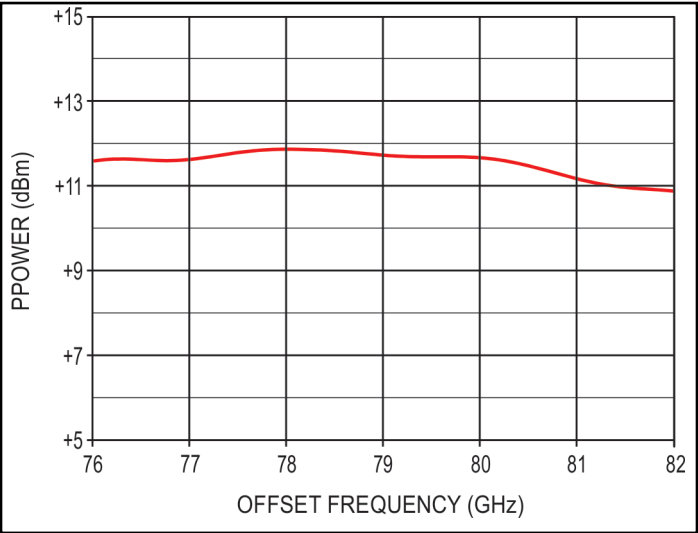


Figure 3. FSL-7682 Typical Power

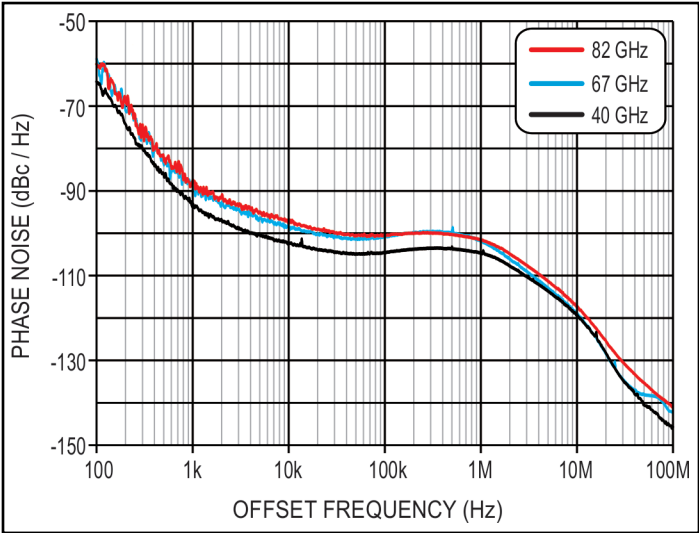


Figure 4. Typical Phase Noise Performance

QuickSyn Lite mmW Frequency Synthesizer

Specifications (continued)

Model		FSL-2740			FSL-5067			FSL-7682		
Parameter	Unit	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.
Phase Noise		40 GHz			67 GHz			82 GHz		
100 Hz	dBc/Hz		-61	-55		-59	-53		-57	-51
1 kHz	dBc/Hz		-84	-90		-89	-83		-87	-81
10 kHz	dBc/Hz		-94	-100		-100	-94		-99	-92
100 kHz	dBc/Hz		-97	-103		-101	-95		-101	-93
1 MHz	dBc/Hz		-99	-105		-103	-97		-100	-95
10 MHz	dBc/Hz		-110	-116		-117	-111		-115	-109
Floor	dBc/Hz		-145	-145		-141	-135		-141	-135
Harmonics	dBc		-20	-15		-30	-25		-30	
Out of Band Sub-Harmonics (F/2 & 3F/2)	dBc		-40	-15		-60	-50		-60	-50
In-Band Sub-Harmonics (3F/4 & 5F/4)	dBc		-40	-35		-60	-50		-60	-50
Spurious	dBc		-60	-55		-60	-50		-60	-50
Supply voltage	V	+11.4	+12	+12.6	+11.4	+12	+12.6	+11.4	+12	+12.6
Supply voltage (absolute max.)	V			+15			+15			+15
Supply current	mA		1350	1500		1350	1500		1450	1600
Operating temp. range ②	°C	0		+40	0		+40	0		+40
Storage temp. range	°C	-40		+70	-40		+70	-40		+70
Overall size	in/mm	4 x 4 x 1.8 / 102 x 102 x 46			4 x 4 x 1.8 / 102 x 102 x 46			4 x 4 x 1.8 / 102 x 102 x 46		
Weight	Lb / Kg	1.6 / 0.73			1.6 / 0.73			1.6 / 0.73		
RF OUT connector	Type	K			V			WR12		
REF IN connector	Type	SMA			SMA			SMA		
REF OUT connector	Type	SMA			SMA			SMA		
USB connector	Type	Mini-AB receptacle (USB 2.0)			Mini-AB receptacle (USB 2.0)			Mini-AB receptacle (USB 2.0)		
POWER/SPI ③	Type	30 pin, 0.05 in. spaced two-row header			30 pin, 0.05 in. spaced two-row header			30 pin, 0.05 in. spaced two-row header		

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Specifications (continued)

POWER/SPI Interface Pin Assignment

Signal	Pin	Description
SPI_CLK	20	SPI clock. Supplied by the controlling computer (not the synthesizer). The controlling computer is the SPI master; the synthesizer is the SPI slave.
SPI_SS	18	SPI Slave Select. This signal is an active low input to the synthesizer. It frames command communications. For each command, SPI_SS goes low before the first bit is sent and goes high after the last bit is sent.
SPI_MISO	24	Master In/Slave Out. Status and other returned information from the synthesizer to the controlling computer.
SPI_MOSI	22	Master Out/Slave In. Command data from the controlling computer to the synthesizer.
TRIGGER	14	Rising edge active input. When enabled, the trigger signal of +3.3 V can initiate freq. change or step through lists or sweeps.
LOCK	16	Output indicates the synthesizer is locked on its current setting (+3.3 V locked, 0 V unlocked).
REF_LOCK	13	Output indicates the synthesizer has detected an external or internal reference signal and locked on that signal (+3.3 V locked, 0 V unlocked).
RESET	1	Internally pulled up to +3.3 V with 100 k Ω resistor. Active “low” signal, which has a minimum width of 1 ms, will reset the synthesizer to a default state.
PWR_+12V	26, 28, 30	External +12V DC supply.
GND	2, 15, 25, 27, 29	Ground.
N/C	3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 17, 19, 21, 23	Do not use. Reserved for factory use.

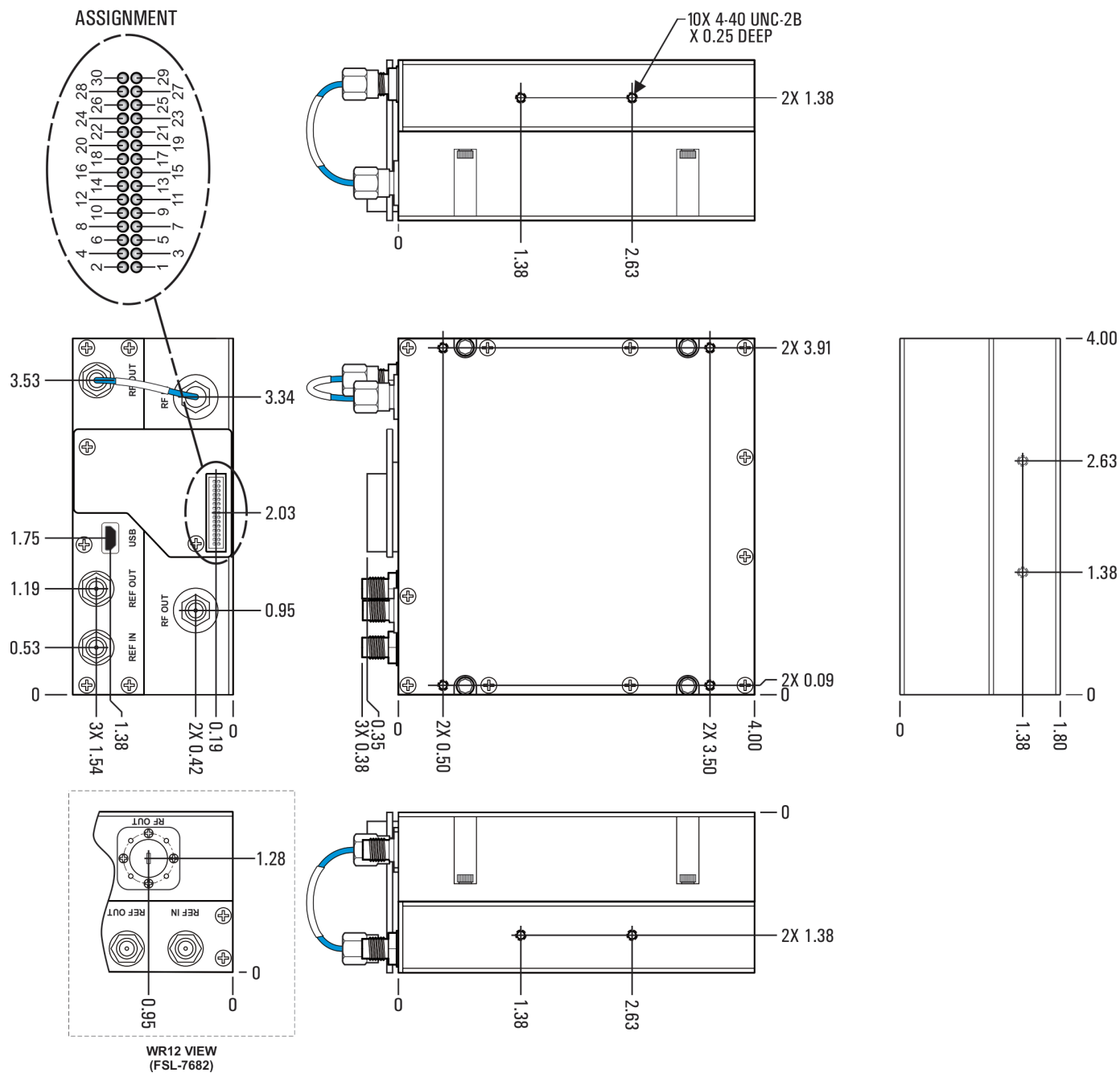
Notes:

- ❶ Self-calibration with USB command is available for in-field calibration.
- ❷ Adequate heat sinking must be provided in order to prevent permanent damage.
- ❸ Use Samtec manufactured mating socket assembly SFSD-15-28-G-XXX series.
- ❹ “Typ.” means approximately 2/3 of all units meet these characteristics at room temperature. Characteristics identified by typ. and nom. are by design and are not normally verified on every unit during production.
- ❺ Communication specifications are available online at www.nimcirowavecomponents.com.

QuickSyn Lite mmW Frequency Synthesizer

Specifications (continued)

Mechanical Dimensions



All dimensions are in inches unless otherwise specified.

QuickSyn Lite mmW Frequency Synthesizer

Ordering Information

Model

27 to 40 GHz QuickSyn Lite mmW Module	FSL-2740
50 to 67 GHz QuickSyn Lite mmW Module	FSL-5067
76 to 82 GHz QuickSyn Lite mmW Module	FSL-7682

Options

100 μ s switching speed	Option 3
Two-year warranty extension (total three years)	Option 8

Accessories

Test report.	MFSLMMW-ACC04
Quick-start kit	MFSLMMW-ACC06
Heatsink kit.	MFSLMMW-ACC10

BUY NOW

For complete product specifications, pricing, and accessory information, call 408 610 6810 (U.S.) or email us at microwavecomponents@ni.com



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