10 TO 15 GHz SATELLITE I/Q TEST MODULATOR

MODEL: SDM1015LI3CDQ

FEATURES

- **Tri-band, Ku**
  Downlink ..... 10.75 to 12.75 GHz
  Uplink ..... 14 to 14.5 GHz
- **Direct linear I/Q modulation..... DC to 1000 MHz**
- **Carrier/sideband rejection ..... 25 dB**
- **Harmonic rejection ..... 30 dB**
- **Packaging ..... Hermetically sealed**

Microwave QAM signals are traditionally generated by linearly mixing or modulating a VHF or UHF carrier oscillator with band limited I and Q information. The resulting phase and/or amplitude states of the carrier are then multiplied or upconverted by another mixer, local oscillator and sideband filter to the actual transmitted frequency. I/Q modulation has traditionally been done in this manner because lower frequency high-isolation mixers tend to yield the best carrier and sideband rejection. The latter qualities are most important for accurate I/Q phase states or transmitted signal constellations. More recently at MITEQ, the electrical and physical symmetry of microwave baluns have been improved to yield mixers with LO-to-RF isolations of 45 dB up to 18 GHz. This unit uses these new mixers to achieve direct I/Q modulation of a microwave carrier without the costly lower frequency upconversion.

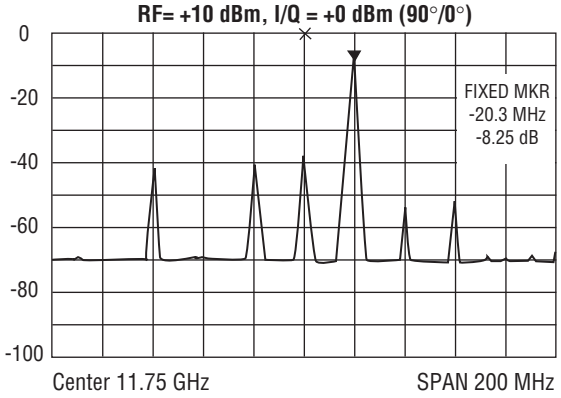
ELECTRICAL SPECIFICATIONS

INPUT PARAMETERS	CONDITION	UNITS	MIN.	TYP.	MAX.
Carrier frequency range		GHz	10		15
Carrier VSWR (RF = +16 dBm)		Ratio		1.5:1	
Carrier power		dBm	+8	+10	+12
Modulation frequency range	I/Q @ -3 dB	MHz	DC		1000
Modulation power	I/Q (50 ohms)	dBm	Noise	0	+6
TRANSFER CHARACTERISTICS	**CONDITION**	**UNITS**	**MIN.**	**TYP.**	**MAX.**
Conversion loss (IF = 100 MHz) (desired output relative to I/Q input)	RF = +10 dBm I/Q = 0 dBm	dB		8	9
Carrier rejection (relative to desired output)	IF = +6 dBm	dB	20	30	
Upper or lower sideband	$f_o \pm$ IF	dB	20	25	
Second-harmonic sideband	$f_o \pm 2$ IF	dB		30	
Third-harmonic sideband	$f_o \pm 3$ IF	dB		30	
Insertion loss (I/Q switch mode)	I/Q = +10 mA	dB		9	
OUTPUT PARAMETERS	**CONDITION**	**UNITS**	**MIN.**	**TYP.**	**MAX.**
RF frequency range		GHz	10		15
RF VSWR (RF = +16 dBm)		Ratio		2.5:1	

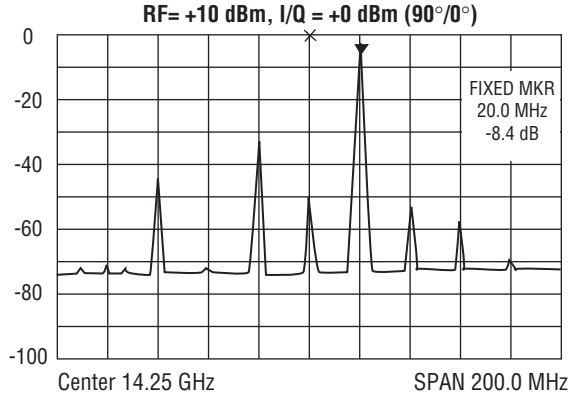
Revised: 03/19/12

SDM1015LI3CDQ TYPICAL SPECTRUM DATA

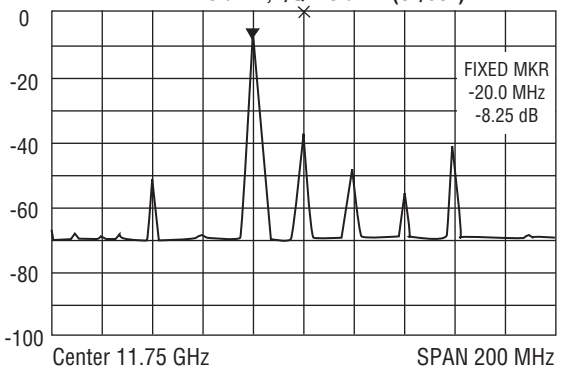
LOWER BAND EDGE SPECTRUM AND UPPER SIDEBAND OUTPUT
RF= +10 dBm, I/Q = +0 dBm (90°/0°)



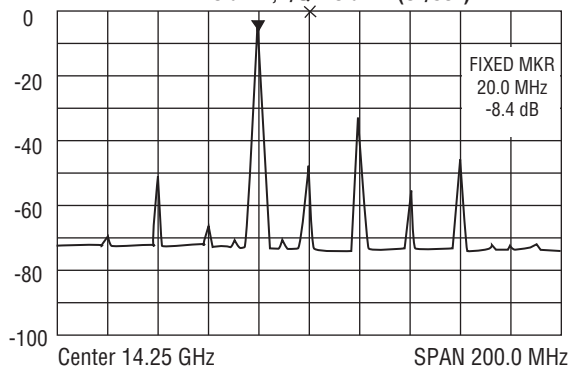
UPPER BAND EDGE SPECTRUM AND UPPER SIDEBAND OUTPUT
RF= +10 dBm, I/Q = +0 dBm (90°/0°)



LOWER BAND EDGE SPECTRUM AND LOWER SIDEBAND OUTPUT
RF= +10 dBm, I/Q = 0 dBm (0°/90°)



UPPER BAND EDGE SPECTRUM AND LOWER SIDEBAND OUTPUT
RF= +10 dBm, I/Q = 0 dBm (0°/90°)



MAXIMUM RATINGS

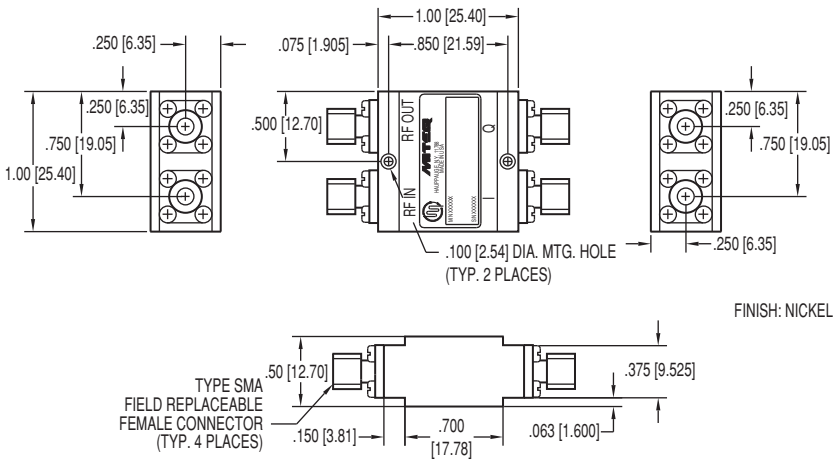
Specification temperature..... +25°C
Operating temperature ..... -54 to +85°C
Storage temperature ..... -65 to +125°C

GENERAL NOTES

1. Input/output RF amplifiers optional.
2. Filtered digital inputs available.

NOTE: Test data supplied at 25°C; per spectrum data.

OUTLINE DRAWING



NOTE: All dimensions shown in brackets [ ] are in millimeters.