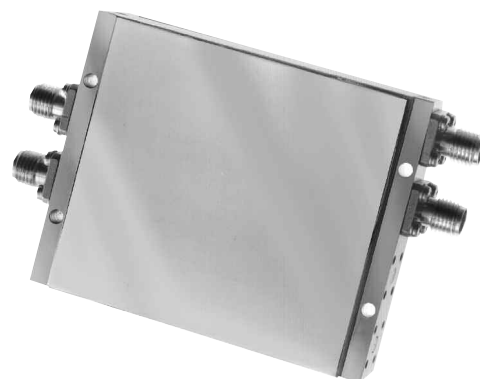


## 3.7 TO 6.4 GHz DIRECT SATELLITE I/Q TEST MODULATOR

### MODEL: SDM0307LI1CDQ (Carrier Driven)

#### FEATURES

- Tri-band, C  
Downlink ..... 3.7 to 4.2 GHz  
Uplink ..... 5.9 to 6.4 GHz
- Direct linear I/Q modulation ..... DC to 500 MHz
- Carrier/sideband rejection..... 25 dB
- Harmonic rejection..... 30 dB
- Packaging ..... Hermetically sealed



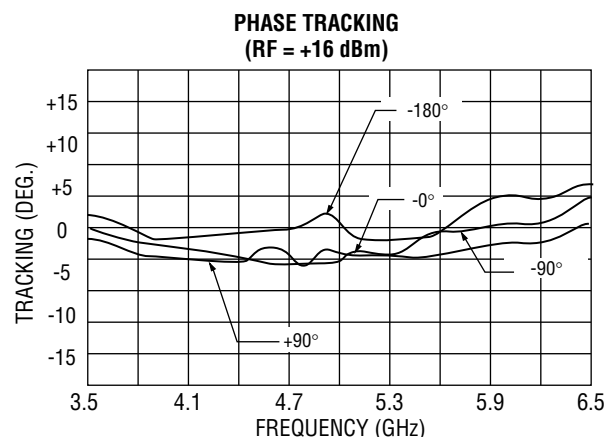
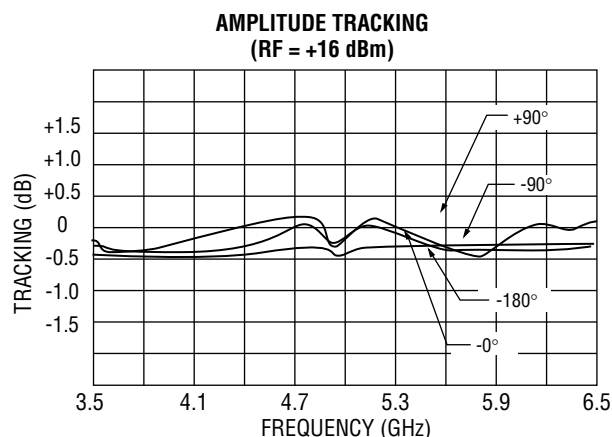
Microwave QAM signals are traditionally generated by linearly mixing or modulating a VHF or UHF carrier oscillator with band limited I and Q information. The resulting phase and/or amplitude states of the carrier are then multiplied or upconverted by another mixer, local oscillator and sideband filter 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 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	3.5		6.5
Carrier VSWR	RF = +16 dBm	Ratio		1.5:1	
Carrier power		dBm	+130		
Modulation frequency range	I/Q	MHz	DC		500
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	11
Carrier rejection (relative to desired output)	IF = +6 dBm	dB	22	30	
Upper or lower sideband	$f_0 \pm IF$	dB	22	25	
Second-harmonic sideband	$f_0 \pm 2 IF$	dB	30	45	
Third-harmonic sideband	$f_0 \pm 3 IF$	dB	35	40	
Insertion loss (I/Q switch mode)	I/Q = +10 mA	dB	10	7	
OUTPUT PARAMETERS	CONDITION	UNITS	MIN.	TYP.	MAX.
RF frequency range		GHz	3.5		6.5
RF VSWR (RF = -10 dBm, LO = +10 dBm)		Ratio		2.5:1	

# CARRIER DRIVEN TYPICAL TEST DATA

## SDM0307LC1CDQ



**f<sub>0</sub> LEVEL: +16 dBm, I/Q LEVEL: +4 dBm (20 MHz)**

Frequency (GHz)	f <sub>0</sub> + IF (I.L., dB)	f <sub>0</sub> - IF (dBc)	f <sub>0</sub> (dBc)	f <sub>0</sub> - 2 IF (dBc)	f <sub>0</sub> - 2 IF (dBc)	f <sub>0</sub> - 3 IF (dBc)	f <sub>0</sub> + 3 IF (dBc)
3.5	-8	-30.2	-42.2	-48.6	-47.5	-45.9	-50.4
4	-8.6	-24.5	-30.8	-48.2	-48.6	-48.6	-51.8
4.5	-8.8	-24.1	-27.8	-47.8	-48.1	-45.8	-52.2
5	-8.9	-27.6	-28.2	-47.6	-48.9	-42.4	-51.7
5.5	-8	-25	-28.7	-46.7	-48.5	-45.6	-51.7
6	-7.6	-30.2	-28.9	-47	-49	-41	-52.6
6.5	-7.7	-28.2	-34.3	-47.2	-49.4	-42.7	-51.6

Note: Upper sideband is desired output, IL is relative to total I/Q input power.

### MAXIMUM RATINGS

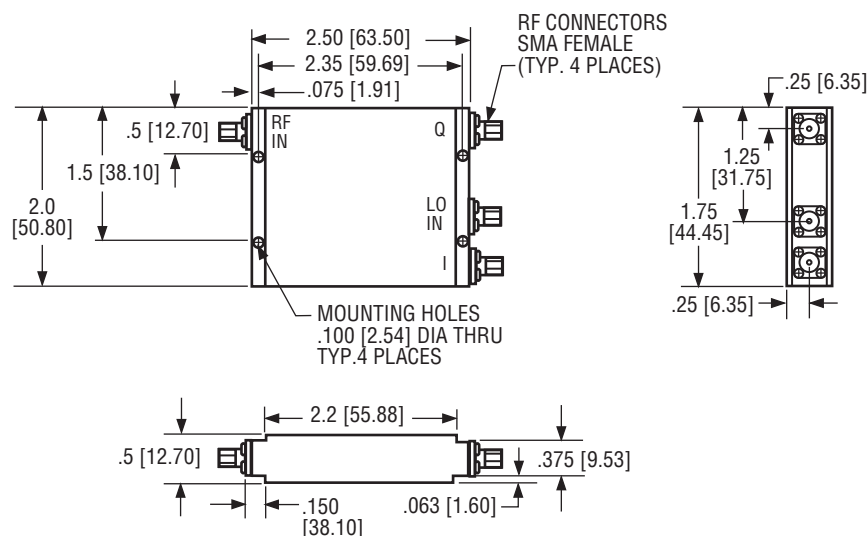
Specification temperature ..... +25°C  
Operating temperature ..... -54 to +85°C  
Storage temperature ..... -65 to +125°C

### GENERAL NOTE

1. Higher output power and I/Q TTL drive circuit available.

NOTE: Test data supplied at 25°C; phase and amplitude tracking.

## OUTLINE DRAWING



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