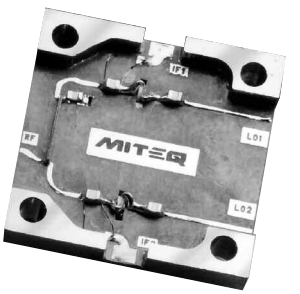
EVEN-HARMONIC, SUPPRESSED CARRIER MODULATOR

MODEL: SML0711LM8CDQ (Carrier Driven)

FEATURES

- **Modulated output frequency range..... 7 to 12 GHz**
- **Carrier input frequency..... 3.5 to 6 GHz**
- **Carrier rejection..... 45 dB typical**
- **Linear modulation rates (I/Q) ..... DC to 200 MHz**
- **Carrier power required (at 1/2 frequency)..... +6 dBm**



An increasingly popular design technique for digital communication exciters and receivers is to use even-harmonic mixers. The principal performance advantages are low LO reradiation for the receiver and ultra-high carrier rejection for the transmitter modulator. The latter feature is necessary to achieve low BER (bit error rates). MITEQ Model SML0711LM8Q combines two 1/2 LO mixers and a 90° RF hybrid on one miniature drop-in substrate, thus reducing system size and LO cost. This unit is available with an integrated LO power divider or with separate individually adjustable inputs.

ELECTRICAL SPECIFICATIONS

INPUT PARAMETERS	CONDITION	UNITS	MIN.	TYP.	MAX.
Carrier frequency range	Dual LO inputs	GHz	3.55		5.85
Carrier VSWR		Ratio		2.5:1	
Carrier power into both ports	Approx. in phase	dBm	+5		+7
Modulation frequency range	Linear I/Q	MHz	DC		200
Modulation power into both ports	90° phase difference	dBm			-3
Modulation VSWR	-3 dBm	Ratio		2.5:1	
TRANSFER CHARACTERISTICS	**CONDITION**	**UNITS**	**MIN.**	**TYP.**	**MAX.**
Conversion loss* (desired output relative to I/Q input)	100 MHz	dB		9	11
Carrier rejection (relative to desired output)	-3 dBm mod. power	dBc	35	45	
Upper or lower sideband*	Optimized at midband	dBc	18	30	
Second-harmonic sideband*	I/Q level dependent	dBc		45	
Third-harmonic sideband*	I/Q level dependent	dBc		25	
Other harmonic sideband*	I/Q level dependent	dBc		30	
OUTPUT PARAMETERS	**CONDITION**	**UNITS**	**MIN.**	**TYP.**	**MAX.**
RF frequency range		GHz	7.1		11.7
RF VSWR (output RF/input carrier)	RF = -10/LO = +7 dBm	Ratio		2.5:1	

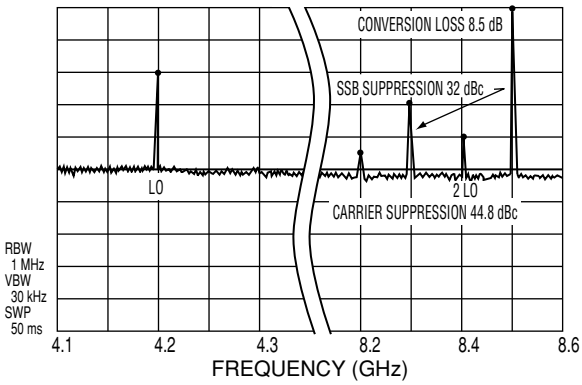
* Data measured with external LO and IF hybrid.

MITEQ 100 Davids Drive, Hauppauge, NY 11788 • TEL: (631) 439-9220 • FAX: (631) 436-7430 • www.miteq.com

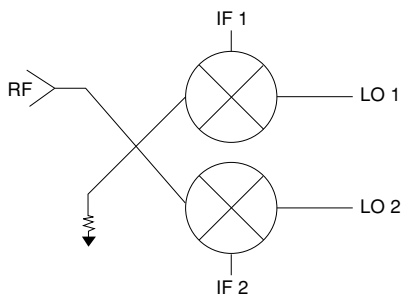
SML0711LM8CDQ CARRIER DRIVEN TYPICAL TEST DATA

CARRIER SUPPRESSION

TYPICAL OPERATING POINTS 10 dB/DIV.



BLOCK DIAGRAM



SML0711LM8CDQ MODULATION DRIVEN OUTPUT SPECTRUM TABLE

DYNAMIC MODULATION SPECTRUM (f_O = +7 dBm, I/Q = 100 MHz, 0 dBm)

Frequency (GHz)	f_O + IF (I.L., dB) 10 dB Max. Note 1	f_O - IF (dBc) 20 dBc Min.	f_O (dBc) 35 dBc Min.	f_O - 2 IF (dBc) 30 dBc Min.	f_O + 2 IF (dBc) 30 dBc Min.	f_O - 3 IF (dBc) 20 dBc Min.	f_O + 3 IF (dBc) 20 dBc Min.
7	9	20	45	60	50	27	40
7.5	9.4	20	45	60	48	25	49
8	8.6	24	40	55	48	24	38
8.5	8.5	32	38	55	50	24	33
9	8.2	31	37	50	48	23	35
9.5	8.2	29	38	50	48	23	42
10	8.6	25	37	50	47	24	44
10.5	9.5	23	38	52	45	23	40
11	10	22	39	55	45	22	35

Note: Upper sideband is desired output (conversion loss relative to total I/Q power of 0 dBm).

MAXIMUM RATINGS

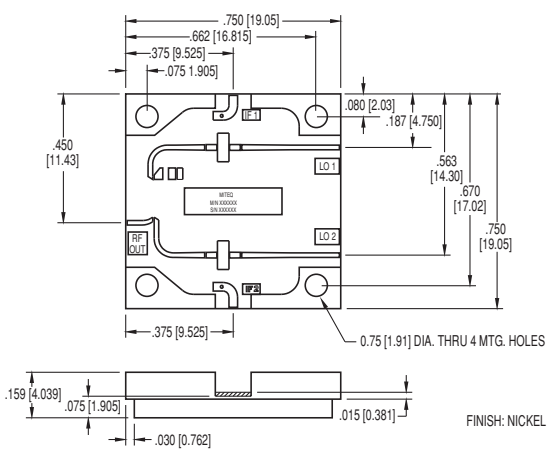
Specification temperature..... 25°C
Operating temperature ..... -50 to +85°C
Storage temperature ..... -65 to +125°C

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

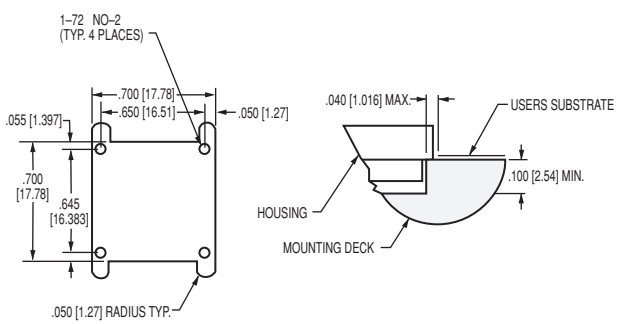
GENERAL NOTE

1. Insertion loss is relative to lowest power input (f_O or f_{IF}). All other outputs (including f_O) are relative to the desired upper (f_O + f_{IF}) output.

OUTLINE DRAWING



MOUNTING DIAGRAM



MACHINING DATA

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