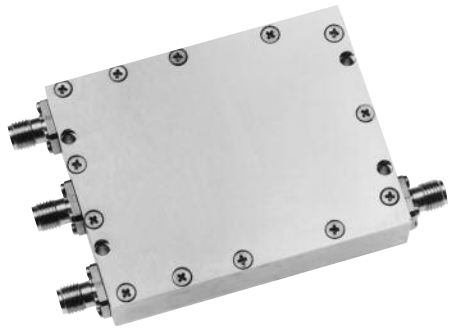
1 TO 2 GHz SINGLE-SIDEBAND UPCONVERTER

MODEL: SDM0102LC1CD_*_ (Carrier Driven)

FEATURES

- **RF output/carrier input ..... 1 to 2 GHz**
- **IF bandwidth ..... DC to 500 MHz (Q)**
- **Linear IF input..... Up to +5 dBm**
- **Carrier input power ..... +7 to +13 dBm**
- **Sideband suppression..... 25 dB**
- **Carrier isolation..... 23 dB**
- **Modulation options:**
  Single sideband..... A, B and C (internal hybrid)
  Multioctave IFs ..... Q (separate inputs)



All modulators and SSB upconverters require that at least one of the input frequency bands (carrier or IF) has sufficient power to turn on the semiconductors. This model employs carrier drive. SSB upconverters employ an internal IF 90° hybrid to yield only one RF sideband output. This is offset above or below the input LO by the IF frequency (test data is recorded for the upper sideband only). Schottky diode (standard) upconverters have the greatest speed and bandwidths, but yield RF output powers of typically less than 0 dBm. PIN diode (optional) designs can only be driven at modulation rates of less than 30 MHz, but will yield output RF powers exceeding +5 dBm. This carrier driven unit is used when the IF input has a wide dynamic range and high linearity is required.

ELECTRICAL SPECIFICATIONS

INPUT PARAMETERS	UNITS	MIN.	TYP.	MAX.
RF carrier	GHz	1		2
RF VSWR (RF = +10 dBm, IF modulation = 0 dBm)	Ratio		1.5:1	
RF carrier power range (50 ohm input)	dBm	+7	+10	+13
IF power at 1 dB compression (RF = +10 dBm)	dBm		+5	
IF frequency range (Note 3)	MHz	DC		500
TRANSFER CHARACTERISTICS	**UNITS**	**MIN.**	**TYP.**	**MAX.**
Conversion loss (Note 1)	dB		8	10
Carrier isolation (IF = +5 dBm)	dBc	25	30	
Sideband suppression (Note 2)				
Carrier – fundamental IF	dBc	15	20	
Carrier ±2 IF, 4 IF, etc.	dBc		45	
Carrier ±3 IF	dBc		10	
OUTPUT PARAMETERS	**UNITS**	**MIN.**	**TYP.**	**MAX.**
RF frequency range	GHz	1		2
RF VSWR (RF = +10 dBm, IF modulation = 0 dBm)	Ratio		2.5:1	

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SDM0102LC1CDC CARRIER DRIVEN OUTPUT SPECTRUM TABLE

SSB UPCONVERTER (RF = +10 dBm, IF = 0 dBm total, IF = 150 MHz)

Frequency (GHz)	f_0 + IF (I.L., dB) Note 1	f_0 - IF (dBc)	f_0 (dBc)	f_0 - 2 IF (dBc)	f_0 + 2 IF (dBc)	f_0 - 3 IF (dBc)	f_0 + 3 IF (dBc)
1	-9.3	-24.9	-13.3	-40.9	-45.6	-50.6	-45.3
1.1	-9.5	-25.2	-20.3	-27.8	-41.7	-46.8	-39.2
1.2	-9.6	-25	-19.5	-23.2	-38.9	-50.2	-41.6
1.3	-7.4	-26.9	-23	-39.6	-45.7	-56	-43.4
1.4	-7	-22.1	-22.8	-40.6	-45.6	-62.7	-61
1.5	-6.9	-26.6	-22.2	-44.5	-63.1	-64.2	-62.2
1.6	-6.5	-25.3	-21.8	-43.5	-57.9	-63.9	-63.4
1.7	-6.2	-24.2	-22.4	-42	-54.9	-64.6	-62.9
1.8	-5.9	-22.5	-23.1	-38	-55.5	-63.5	-63.9
1.9	-5.4	-24.6	-36.1	-38.5	-60.5	-63	-62.7
2	-7.2	-33.5	-22.6	-39.2	-50.2	-63.3	-61.7

MAXIMUM RATINGS

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

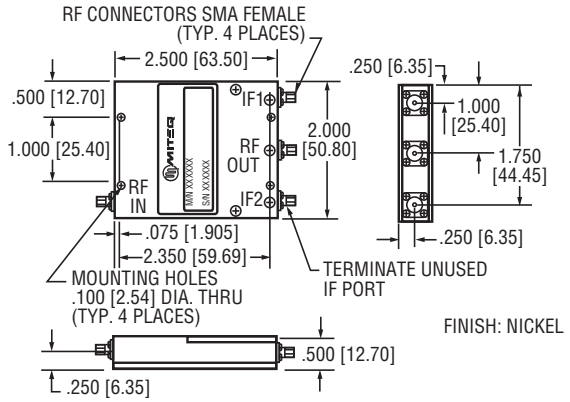
GENERAL NOTES

1. Insertion loss relative to 0 dBm IF input. All other outputs are relative to the desired upper ($f_0 + f_m$) output.
2. Standard SSB units with IF hybrids are aligned for upper sideband operation. For lower sideband or selectable sideband, contact MITEQ.

*3. Available part numbers: SDM0102LC1CD $\frac{*}{}$
A = 20–40 MHz
B = 40–80 MHz
C = 100–200 MHz
Q = DC–500 MHz

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

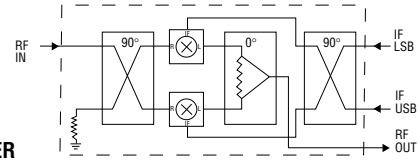
OUTLINE DRAWING



BLOCK DIAGRAMS

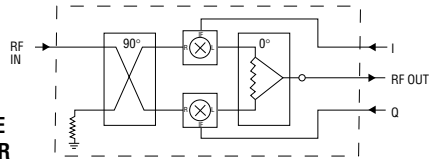
SDM0102LC1CDA, B and C

SSB UPCONVERTER



SDM0102LC1CDQ

QUADRATURE UPCONVERTER



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

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