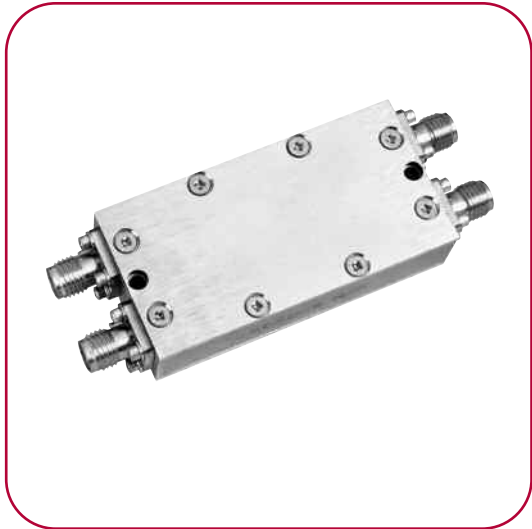


# 6 TO 18 GHz SINGLE-SIDEBAND UPCONVERTER

## MODEL: SSM0618(\*)C2MD(\*\*)

### FEATURES

- RF output/carrier input ..... 6 to 18 GHz
- IF bandwidth ..... DC to 500 MHz (Q)
- Linear RF input ..... Up to +5 dBm
- IF input power ..... +10 to +13 dBm
- Sideband suppression ..... 20 dB
- Carrier rejection ..... 25 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 IF 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 IF driven unit is used when the RF input has a wide dynamic range, such as for military and commercial Doppler frequency or phase-shift generation.

### ELECTRICAL SPECIFICATIONS

| INPUT PARAMETERS                                | UNITS           | MIN.        | TYP.              | MAX.              |
|---|-----------------|-------------|-------------------|-------------------|
| RF carrier                                      | GHz             | 6           |                   | 18                |
| RF VSWR (RF = -10 dBm, IF modulation = +10 dBm) | Ratio           |             | 1.5:1             |                   |
| RF power at 1 dB compression (IF = +10 dBm)     | dBm             |             | +5                |                   |
| IF frequency range (Note 3)                     | MHz             | DC          |                   | 500               |
| IF power range (50 ohm input)                   | dBm             | +10         |                   | +13               |
| TRANSFER CHARACTERISTICS                        | UNITS           | MIN.        | TYP.              | MAX.              |
| Conversion loss (Note 1)                        | dB              |             | 8                 | 12                |
| Carrier suppression                             | dBc             | 20          | 25                |                   |
| Sideband suppression (Note 2)                   |                 |             |                   |                   |
| Carrier – fundamental IF                        | dBc             | 18          | 20                |                   |
| Carrier ±2 IF, 4 IF, etc.                       | dBc             |             | 35                |                   |
| Carrier ±3 IF                                   | dBc             |             | 13                |                   |
| Truth table                                     | SSM0618(*)C2MDQ | <b>PORT</b> | <b>RF &lt; LO</b> | <b>RF &gt; LO</b> |
|   |                 | I           | 0                 | -90               |
|   |                 | Q           | -90               | 0                 |
| OUTPUT PARAMETERS                               | UNITS           | MIN.        | TYP.              | MAX.              |
| RF frequency range                              | GHz             | 6           |                   | 18                |
| RF VSWR (RF = -10 dBm, IF modulation = +10 dBm) | Ratio           |             | 2.5:1             |                   |



# SSM0618LC2MDA IF DRIVEN OUTPUT SPECTRUM TABLE

## SSB UPCONVERTER (RF = 0 dBm, IF = +10 dBm total, IF = 30 MHz)

| Frequency (GHz) | $f_0 + \text{IF}$ (I.L., dB)<br>Note 1 | $f_0 - \text{IF}$ (dBc) | $f_0$ (dBc) | $f_0 - 2 \text{ IF}$ (dBc) | $f_0 + 2 \text{ IF}$ (dBc) | $f_0 - 3 \text{ IF}$ (dBc) | $f_0 + 3 \text{ IF}$ (dBc) |
|-----------------|--|-------------------------|-------------|----------------------------|----------------------------|----------------------------|----------------------------|
| 6               | -9.6                                   | -25.7                   | -26.1       | -40.4                      | -33.1                      | -13.8                      | -35.6                      |
| 6.5             | -8.8                                   | -27.5                   | -27.2       | -36.6                      | -33                        | -13.9                      | -29.9                      |
| 7               | -7.8                                   | -24.8                   | -27.1       | -34.9                      | -36                        | -14.6                      | -32.2                      |
| 7.5             | -8.5                                   | -22.9                   | -23         | -34.4                      | -34.8                      | -13.3                      | -27.7                      |
| 8               | -7.7                                   | -20.5                   | -26.4       | -37.2                      | -32.4                      | -12.5                      | -27                        |
| 8.5             | -5.3                                   | -20.4                   | -26         | -37.9                      | -32.3                      | -11.8                      | -29.7                      |
| 9               | -7                                     | -21.7                   | -28.4       | -38.6                      | -32.3                      | -12.2                      | -34.8                      |
| 9.5             | -8                                     | -24.7                   | -31.6       | -34.7                      | -32.8                      | -13.3                      | -27.9                      |
| 10              | -5.1                                   | -32.4                   | -31.8       | -33                        | -35.4                      | -14.2                      | -27.4                      |
| 10.5            | -9.2                                   | -28.1                   | -29.2       | -32.5                      | -34.9                      | -13.9                      | -29.1                      |
| 11              | -7.3                                   | -23.7                   | -27.5       | -32                        | -37.3                      | -14.2                      | -32.7                      |
| 11.5            | -6.7                                   | -21                     | -26.6       | -31.9                      | -32.6                      | -11.7                      | -38                        |
| 12              | -7.6                                   | -21.9                   | -25.9       | -37.1                      | -30                        | -11.8                      | -34.8                      |
| 12.5            | -7.6                                   | -23.2                   | -24.8       | -40.1                      | -28.7                      | -12                        | -28.7                      |
| 13              | -8.2                                   | -34                     | -23.4       | -34.3                      | -30.5                      | -12.2                      | -30.4                      |
| 13.5            | -8.8                                   | -25.9                   | -22.7       | -35                        | -31.8                      | -12.2                      | -31.7                      |
| 14              | -8.6                                   | -21.8                   | -23.1       | -33.7                      | -30.4                      | -13                        | -33.7                      |
| 14.5            | -8.7                                   | -20.8                   | -24.8       | -30.8                      | -30.9                      | -13.8                      | -31.1                      |
| 15              | -9.9                                   | -19.6                   | -27.8       | -28.7                      | -33.5                      | -15.2                      | -35.9                      |
| 15.5            | -9.6                                   | -20.1                   | -33.2       | -28.2                      | -34.7                      | -14.5                      | -31.9                      |
| 16              | -8.4                                   | -20.7                   | -37.2       | -28.7                      | -31.7                      | -13.9                      | -30.3                      |
| 16.5            | -9.1                                   | -21.7                   | -29.1       | -29.9                      | -28.5                      | -12                        | -33.3                      |
| 17              | -8.9                                   | -24.9                   | -28.3       | -34.4                      | -26.5                      | -11.7                      | -31.9                      |
| 17.5            | -8.8                                   | -32.5                   | -26.3       | -42.1                      | -27.5                      | -13.1                      | -31.3                      |
| 18              | -8.6                                   | -19.2                   | -26.9       | -35.7                      | -30.3                      | -13.7                      | -37.4                      |

### 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 RF input. All other outputs, including  $f_0$ , are relative to the desired upper ( $f_0 + f_{\text{IF}}$ ) output.
2. Standard SSB units with IF hybrids are aligned for upper sideband operation. For lower sideband or selectable sideband, contact MITEQ.

\*3.

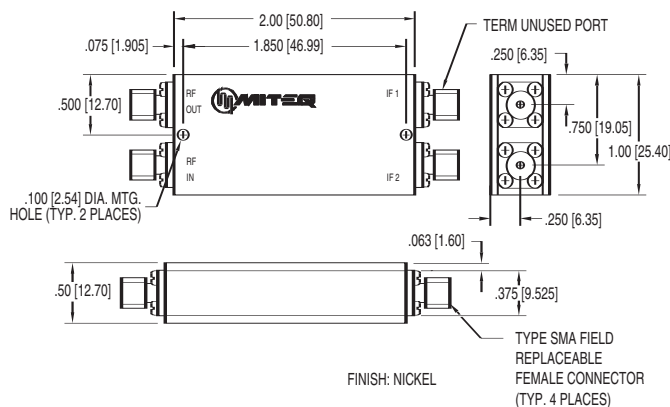
Model Number Option Table

| (*) Add Letter | LO Power Range (dBm) | P1 (dBm) | (**) Add Letter | IF Frequency (MHz) |
|----------------|----------------------|----------|-----------------|--------------------|
| L              | 10-13                | +6       | A               | 20-40              |
| M              | 13-16                | +10      | B               | 40-80              |
| H              | 17-20                | +15      | C               | 100-200            |
|                |                      |          | Q               | DC-500(I/Q)        |

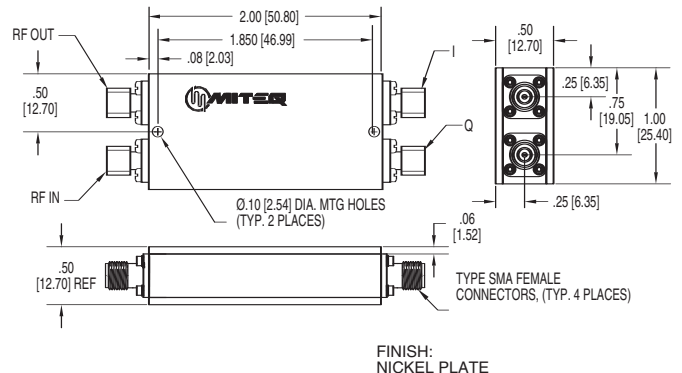
NOTE: Test data supplied at 25°C; per spectrum table.

## OUTLINE DRAWINGS

SSM0618(\*)C2MDA, B and C



SSM0618(\*)C2MDQ



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

