*Surface Mount*

# Frequency Mixer

# ADE-2M+

## Level 7 (LO Power +7 dBm) 5 to 1000 MHz

CASE STYLE: CD542
PRICE: $ 2.19 ea. QTY. (100)

*+ RoHS compliant in accordance with EU Directive (2002/95/EC)*

*The +Suffix has been added in order to identify RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications.*

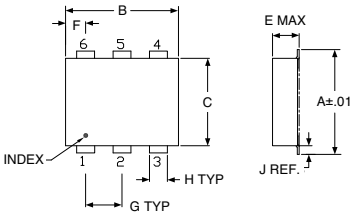
### Maximum Ratings

| | |
|---|---|
| Operating Temperature | -40°C to 85°C |
| Storage Temperature | -55°C to 100°C |
| RF Power | 200mW |
| IF Current | 40mA |

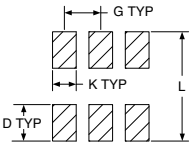
### Pin Connections

| | Config. 1 | Config. 2 |
|---|---|---|
| LO | 6 | 3 |
| RF | 3 | 6 |
| IF 1 | 2 | 2 |
| IF 2 | — | 5 |
| GROUND | 1,4,5 | 1,4 |

### Outline Drawing




**PCB Land Pattern**



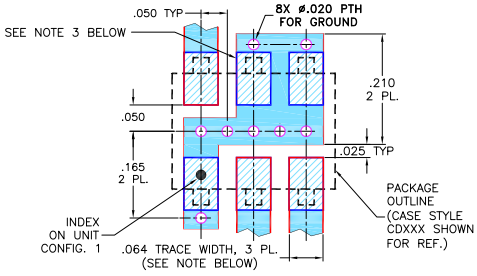

Suggested Layout
Tolerance to be within ±.002

### Outline Dimensions ( inch / mm )

| A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|
| .272 | .310 | .220 | .100 | .112 | .055 | .100 |
| 6.91 | 7.87 | 5.58 | 2.54 | 2.84 | 1.40 | 2.54 |

| H | J | K | L | wt |
|---|---|---|---|---|
| .030 | .026 | .065 | .300 | grams |
| 0.76 | 0.66 | 1.65 | 7.62 | .20 |

***Demo Board MCL P/N: TB-03***
***Suggested PCB Layout (PL-052)***




NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030"± .002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
3. ISOLATE THIS PORT TO USE FOR IF 2 IN CONFIGURATION 2.

DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

### Features

- excellent L-R isolation, 40 dB typ.
- low profile package
- can be used as BI-PHASE MODULATOR for switching between 0° to 180°
- aqueous washable

### Applications

- cellular
- GSM
- ISM

### Electrical Specifications

| FREQUENCY (MHz) | | CONVERSION LOSS (dB) | | | | LO-RF ISOLATION (dB) | | | | | | LO-IF ISOLATION (dB) | | | | | | IP3 at center band (dBm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Mid-Band m | | | Total Range | L | | M | | U | | L | | M | | U | | |
| LO/RF $f_L$-$f_U$ | IF | $\bar{X}$ | σ | Max. | Max. | Typ. | Min. | Typ. | Min. | Typ. | Min. | Typ. | Min. | Typ. | Min. | Typ. | Min. | Typ. |
| 5 - 1000 | DC - 1000 | 6.67 | 0.26 | 8.0 | 9.5 | 60 | 40 | 40 | 20 | 25 | 18 | 55 | 30 | 30 | 20 | 20 | 12 | 17 |

1 dB COMP.: +1 dBm typ.

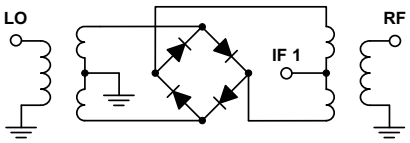
L = low range [$f_L$ to 10 $f_L$] M = mid range [10 $f_L$ to $f_U$/2] U = upper range [$f_U$/2 to $f_U$]
m= mid band [2$f_L$ to $f_U$/2]

### Typical Performance Data

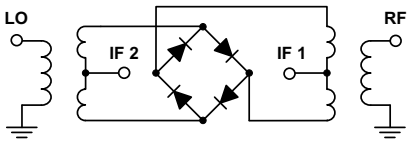
| Frequency (MHz) | | Conversion Loss (dB) | Isolation L-R (dB) | Isolation L-I (dB) | VSWR RF PORT (:1) | VSWR LO PORT (:1) |
|---|---|---|---|---|---|---|
| RF | LO | LO +7dBm | LO +7dBm | LO +7dBm | LO +7dBm | LO +7dBm |
| 5.00 | 35.10 | 7.33 | 76.58 | 70.39 | 1.69 | 2.60 |
| 10.10 | 40.10 | 6.80 | 70.62 | 64.79 | 1.48 | 2.68 |
| 30.21 | 60.21 | 6.89 | 60.39 | 55.08 | 1.33 | 3.00 |
| 50.32 | 80.32 | 6.98 | 55.64 | 51.36 | 1.31 | 2.90 |
| 70.44 | 100.44 | 6.95 | 53.15 | 48.76 | 1.33 | 2.69 |
| 90.55 | 120.55 | 6.89 | 51.84 | 47.23 | 1.32 | 2.62 |
| 100.00 | 130.00 | 6.87 | 50.75 | 46.08 | 1.33 | 2.53 |
| 171.00 | 201.00 | 6.85 | 46.14 | 43.37 | 1.33 | 2.65 |
| 231.34 | 261.34 | 6.92 | 43.86 | 41.46 | 1.34 | 2.78 |
| 291.67 | 321.67 | 6.88 | 42.30 | 40.64 | 1.36 | 2.68 |
| 352.01 | 382.01 | 6.90 | 40.84 | 38.95 | 1.38 | 2.79 |
| 412.35 | 442.35 | 6.94 | 39.66 | 37.67 | 1.40 | 2.84 |
| 500.00 | 530.00 | 6.90 | 38.38 | 36.26 | 1.41 | 2.86 |
| 593.36 | 623.36 | 6.98 | 36.51 | 34.08 | 1.42 | 2.96 |
| 673.81 | 703.81 | 7.03 | 35.33 | 32.01 | 1.46 | 3.03 |
| 714.03 | 744.03 | 7.08 | 34.92 | 30.96 | 1.47 | 3.12 |
| 774.37 | 804.37 | 7.13 | 34.42 | 29.99 | 1.51 | 3.15 |
| 834.71 | 864.71 | 7.21 | 33.93 | 28.70 | 1.54 | 3.22 |
| 955.38 | 985.38 | 7.20 | 32.76 | 26.96 | 1.58 | 3.33 |
| 1000.00 | 1030.00 | 7.31 | 32.41 | 25.92 | 1.57 | 3.45 |

### Electrical Schematic

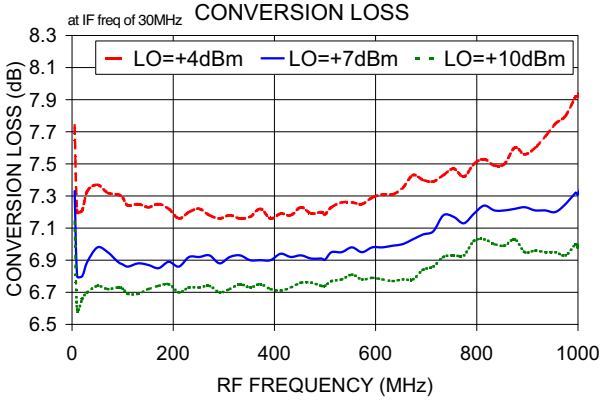
**Mixer (Config. 1)**



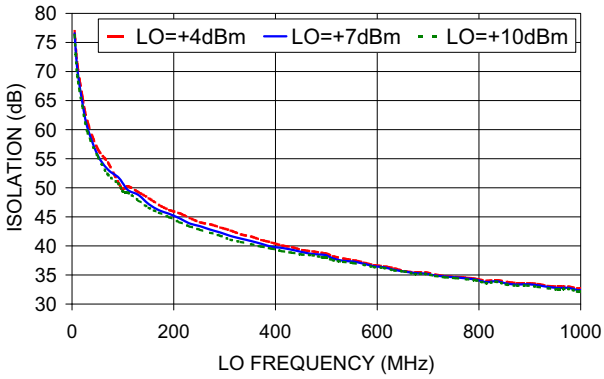

**Bi-Phase Modulator (Config. 2)**



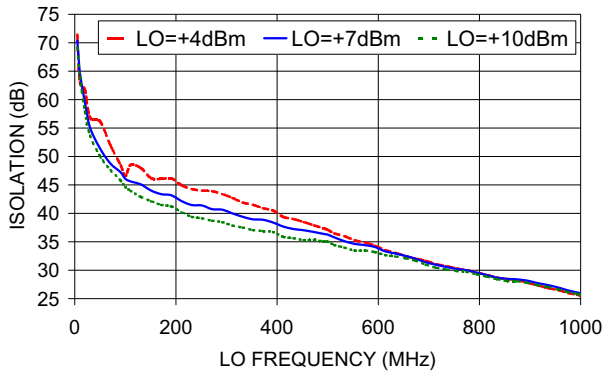
ADE-2M+
CONVERSION LOSS
at IF freq of 30MHz



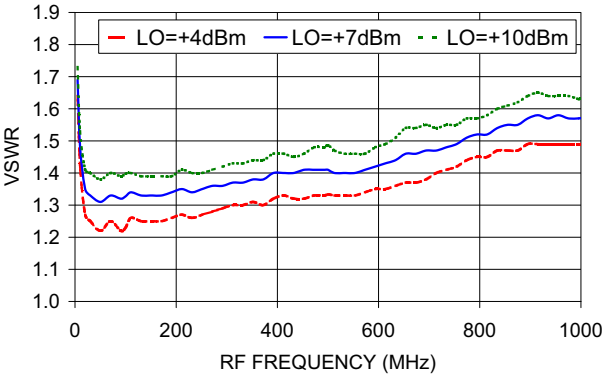

ADE-2M+
L-R ISOLATION



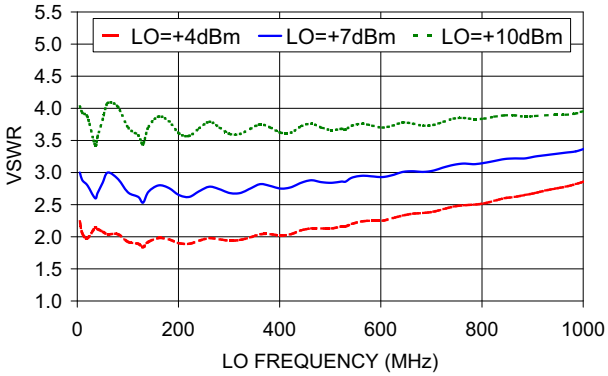

ADE-2M+
L-I ISOLATION




ADE-2M+
RF VSWR




ADE-2M+
LO VSWR




ADE-2M+
IF VSWR