

# Frequency Mixer

MCA-3851FH+

Level 17 (LO Power+17 dBm) 1670 to 3850 MHz

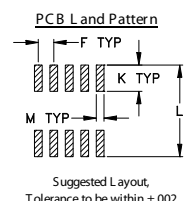
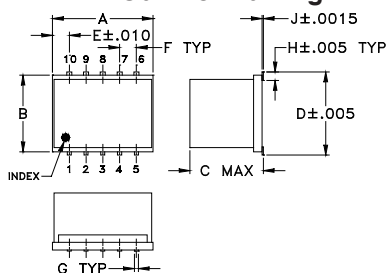
## Maximum Ratings

|                                                                 |                |
|-----------------------------------------------------------------|----------------|
| Operating Temperature                                           | -55°C to 100°C |
| Storage Temperature                                             | -55°C to 100°C |
| LO & RF Power                                                   | 20 dBm         |
| Permanent damage may occur if any of these limits are exceeded. |                |

## Pin Connections

|        |               |
|--------|---------------|
| LO     | 10            |
| RF     | 5             |
| IF     | 3             |
| GROUND | 1,2,4,6,7,8,9 |

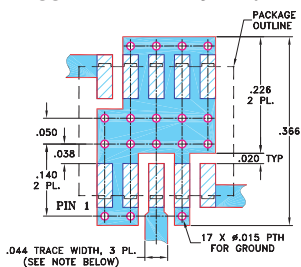
## Outline Drawing



## Outline Dimensions (inch)

| A    | B    | C    | D    | E    | F    | G     |
|------|------|------|------|------|------|-------|
| .30  | .250 | .190 | .266 | .050 | .050 | .012  |
| 7.62 | 6.35 | 4.83 | 6.76 | 1.27 | 1.27 | 0.30  |
| H    | J    | K    | L    | M    | N    | wt    |
| .029 | .004 | .085 | .296 | .030 |      | grams |
| 0.74 | 0.10 | 2.16 | 7.52 | 0.76 |      | 0.5   |

## Demo Board MCL P/N: TB-144 Suggested PCB Layout (PL-045)



- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .020" ± .0015"; 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.
- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)  
■ DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

### Notes

- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.  
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.  
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## Features

- wideband
- excellent IP3, 30 dBm typ.
- excellent L-R isolation, 40 dB typ.
- excellent 1dB compression
- industry standard foot print
- LTCC design for excellent temperature stability, performance repeatability and small size
- aqueous washable
- double balanced mixer
- low price
- protected by US Patent 6,959,180

## Applications

- line of sight links
- satellite communications
- GSM
- DECT
- WiMAX

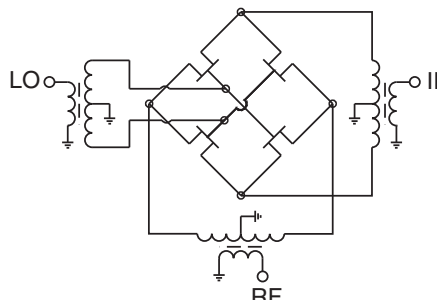
## Electrical Specifications (T<sub>AMB</sub>=-55°C to 100°C)

| FREQUENCY (MHz) |           |         | IP3 (dBm) | RF in at 1 dB compr. (dBm) | CONVERSION LOSS (dB) | LO-RF ISOLATION (dB) | LO-IF ISOLATION (dB) |
|-----------------|-----------|---------|-----------|----------------------------|----------------------|----------------------|----------------------|
| RF              | LO        | IF      | Typ.      | Min.                       | Typ. Max.            | Typ. Min.            | Typ. Min.            |
| 1670-3850       | 1420-3290 | 250-550 | 30        | 17                         | 7.5 9.2              | 40 23                | 35 20                |

## Typical Performance Data

| Frequency (MHz) |         | Conversion Loss (dB) | Isolation L-R (dB) | Isolation L-I (dB) | VSWR RF Port (:1) | VSWR LO Port (:1) | IP3 (dBm) |
|-----------------|---------|----------------------|--------------------|--------------------|-------------------|-------------------|-----------|
| RF              | LO      | LO +17dBm            | LO +17dBm          | LO +17dBm          | LO +17dBm         | LO +17dBm         | LO +17dBm |
| 1670.00         | 1421.50 | 7.71                 | 39.50              | 35.73              | 1.76              | 2.89              | 22.46     |
| 1780.00         | 1516.00 | 7.55                 | 52.16              | 35.14              | 1.68              | 2.78              | 24.27     |
| 1890.00         | 1610.50 | 7.45                 | 45.64              | 34.26              | 1.57              | 2.65              | 25.04     |
| 2000.00         | 1705.00 | 7.84                 | 40.82              | 34.32              | 1.54              | 2.54              | 24.54     |
| 2110.00         | 1799.50 | 7.69                 | 37.11              | 34.63              | 1.76              | 2.49              | 24.91     |
| 2220.00         | 1894.00 | 7.41                 | 33.06              | 34.07              | 1.79              | 2.52              | 26.54     |
| 2330.00         | 1988.50 | 7.23                 | 28.06              | 30.94              | 1.75              | 2.49              | 25.46     |
| 2440.00         | 2083.00 | 7.52                 | 32.10              | 30.06              | 1.54              | 2.59              | 28.00     |
| 2550.00         | 2177.50 | 7.22                 | 36.84              | 32.11              | 1.49              | 2.90              | 33.16     |
| 2660.00         | 2272.00 | 6.97                 | 40.12              | 34.01              | 1.49              | 3.14              | 34.07     |
| 2770.00         | 2366.50 | 7.03                 | 41.35              | 36.03              | 1.43              | 3.32              | 28.54     |
| 2880.00         | 2461.00 | 6.96                 | 41.67              | 34.27              | 1.36              | 3.49              | 26.46     |
| 2990.00         | 2555.50 | 7.46                 | 45.75              | 31.50              | 1.33              | 3.96              | 28.52     |
| 3100.00         | 2650.00 | 7.33                 | 51.69              | 30.84              | 1.31              | 4.54              | 29.43     |
| 3210.00         | 2744.50 | 7.05                 | 57.06              | 31.22              | 1.35              | 4.91              | 30.37     |
| 3430.00         | 2933.50 | 7.42                 | 47.34              | 30.46              | 1.63              | 4.50              | 31.66     |
| 3540.00         | 3028.00 | 7.59                 | 44.13              | 30.39              | 1.89              | 3.59              | 31.75     |
| 3650.00         | 3122.50 | 7.58                 | 43.37              | 28.16              | 2.17              | 2.77              | 33.93     |
| 3760.00         | 3217.00 | 7.64                 | 44.78              | 26.53              | 2.33              | 2.30              | 29.49     |
| 3848.00         | 3292.60 | 7.97                 | 44.26              | 27.11              | 2.49              | 1.97              | 26.63     |

## Electrical Schematic



CASE STYLE: DZ883

### +RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications



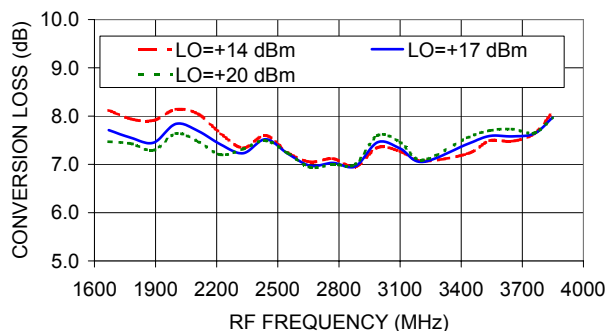
Available Tape and Reel at no extra cost

| Reel Size | Devices/Reel         |
|-----------|----------------------|
| 7"        | 10, 20, 50, 100, 200 |
| 13"       | 500, 1000            |

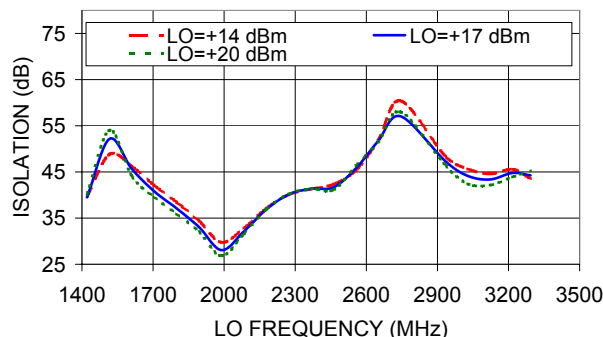
# Performance Charts

# MCA-3851FH+

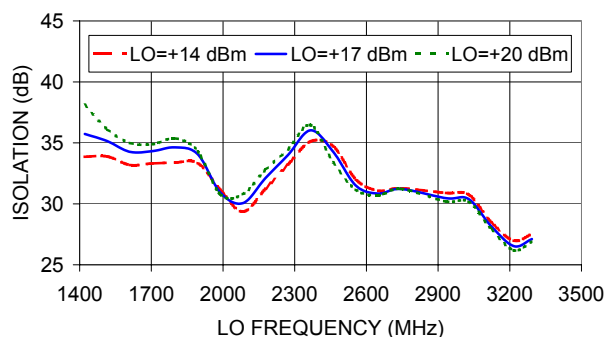
MCA-3851FH+  
CONVERSION LOSS



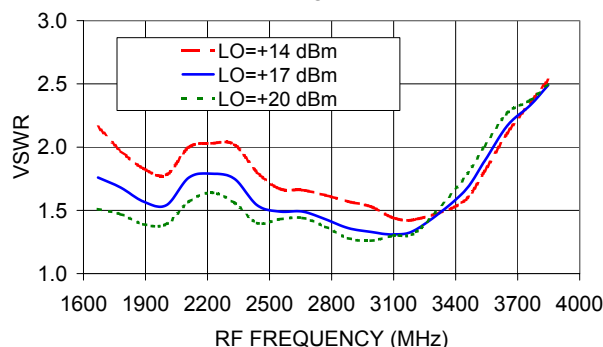
MCA-3851FH+  
L-R ISOLATION



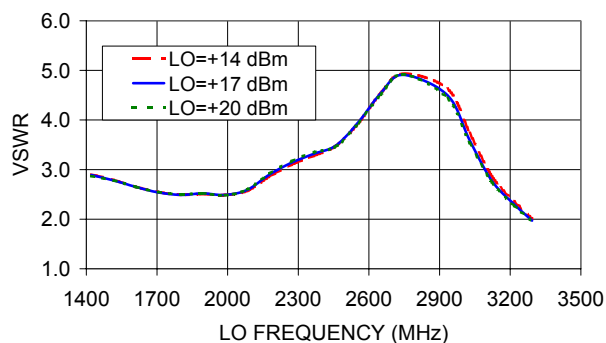
MCA-3851FH+  
L-I ISOLATION



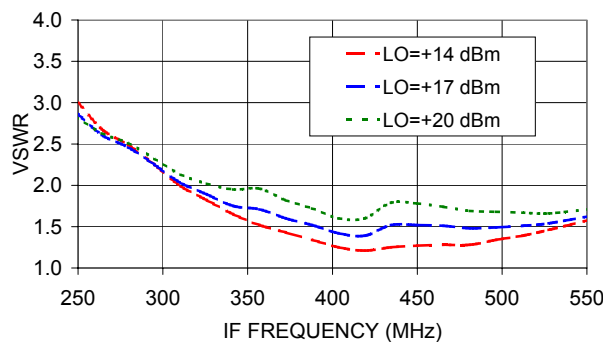
MCA-3851FH+  
RF VSWR



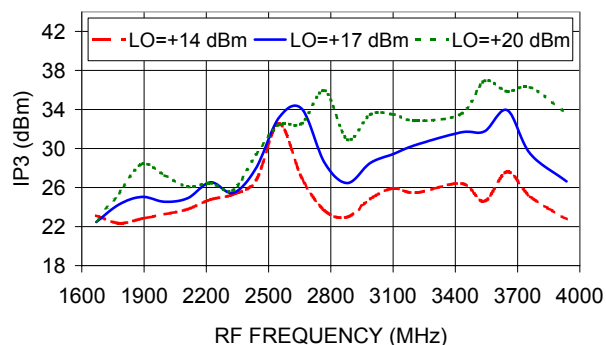
MCA-3851FH+  
LO VSWR



MCA-3851FH+  
IF VSWR



MCA-3851FH+  
IP3



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