

# Surface Mount Image Reject Mixer

Level 10 (LO Power +10dBm) 80 to 168 MHz

RCIR-161LH+



CASE STYLE: HU1416

## Maximum Ratings

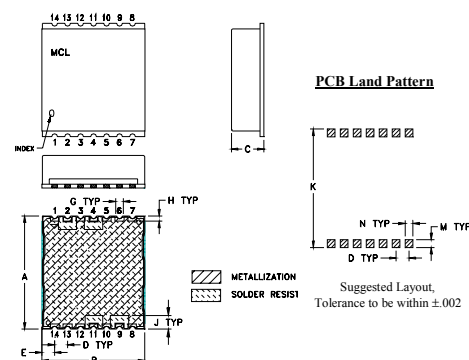
|                       |                |
|-----------------------|----------------|
| Operating Temperature | -40°C to 85°C  |
| Storage Temperature   | -55°C to 100°C |
| RF Power              | 100mW          |
| IF Current            | 40mA           |

Permanent damage may occur if any of these limits are exceeded.

## Pad Connections

|                      |                           |
|----------------------|---------------------------|
| LO                   | 2                         |
| RF                   | 9                         |
| IF                   | 4                         |
| GROUND               | 1,3,4,5,6,7,8,10,12,13,14 |
| 50 OHM TERM EXTERNAL | 11                        |

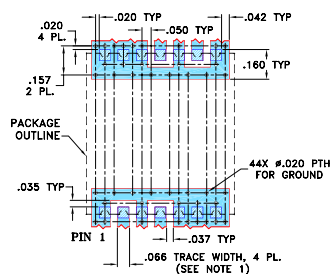
## Outline Drawing



## Outline Dimensions (inch)

| A     | B     | C    | D    | E    | F  | G     | H    |
|-------|-------|------|------|------|----|-------|------|
| .870  | .800  | .25  | .100 | .097 | -- | .060  | .040 |
| 22.10 | 20.32 | 6.35 | 2.54 | 2.46 | -- | 1.52  | 1.02 |
| J     | K     | L    | M    | N    | P  | wt    |      |
| .105  | .910  | --   | .060 | .060 | -- | grams |      |
| 2.67  | 23.11 | --   | 1.52 | 1.52 | -- | 2.85  |      |

## Demo Board MCL P/N: TB-516+ Suggested PCB Layout (PL-298)



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.

■ 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

- excellent image rejection, 32 dB typ.
- low conversion loss, 6.1 dB typ.
- aqueous washable

## Applications

- VHF
- military and avionics

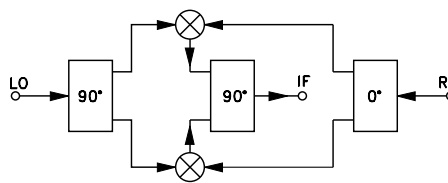
## Electrical Specifications at 25°C

| Parameter               | Condition (MHz) | Min. | Typ. | Max. | Unit |
|-------------------------|-----------------|------|------|------|------|
| Frequency Range, RF     |                 | 80   | —    | 168  | MHz  |
| Frequency Range, LO     |                 | 100  | —    | 188  | MHz  |
| Frequency Range, IF     |                 | 18   | —    | 22   | MHz  |
| Conversion Loss (RF<LO) | 80-168          | —    | 6.1  | 7.3  | dB   |
| Image Rejection (RF>LO) | 120-208         | 18   | 31   | —    | dBc  |
| LO to RF Isolation      | 100-188         | 45   | 58   | —    | dB   |
| LO to IF Isolation      | 100-188         | 32   | 48   | —    | dB   |
| RF to IF Isolation      | 80-168          | 18   | 31   | —    | dB   |
| IP3                     | 80-168          | —    | 17   | —    | dBm  |
| RF Input Power at 1 dB  | 80-168          | —    | +1   | —    | dBm  |

## Typical Performance Data

| Frequency (MHz) |        | Conversion Loss (dB) | Image Rejection (dBc) | Isolation (dB) |       |       | VSWR RF Port (:1) | VSWR LO Port (:1) |
|-----------------|--------|----------------------|-----------------------|----------------|-------|-------|-------------------|-------------------|
| RF              | LO     |                      |                       | L-R            | L-I   | R-I   |                   |                   |
| 80.00           | 100.60 | 6.06                 | 40.21                 | 61.96          | 56.69 | 34.44 | 1.93              | 1.42              |
| 86.00           | 106.60 | 6.01                 | 37.10                 | 61.63          | 56.38 | 34.17 | 1.96              | 1.39              |
| 92.00           | 112.60 | 6.00                 | 36.09                 | 61.41          | 56.14 | 33.77 | 1.97              | 1.37              |
| 98.00           | 118.60 | 6.03                 | 34.82                 | 61.21          | 55.74 | 33.29 | 1.99              | 1.35              |
| 104.00          | 124.60 | 6.03                 | 34.01                 | 60.72          | 55.24 | 32.99 | 2.00              | 1.33              |
| 110.00          | 130.60 | 6.03                 | 33.39                 | 60.36          | 54.69 | 32.62 | 2.00              | 1.31              |
| 116.00          | 136.60 | 6.05                 | 33.10                 | 59.93          | 53.65 | 32.21 | 1.99              | 1.30              |
| 119.40          | 140.00 | 6.06                 | 32.84                 | 59.91          | 53.00 | 32.07 | 1.99              | 1.30              |
| 122.80          | 143.40 | 6.07                 | 32.71                 | 59.73          | 52.26 | 31.96 | 2.00              | 1.29              |
| 126.20          | 146.80 | 6.09                 | 32.72                 | 59.64          | 51.62 | 31.85 | 2.01              | 1.29              |
| 129.60          | 150.20 | 6.11                 | 33.02                 | 59.36          | 51.11 | 31.73 | 2.02              | 1.29              |
| 133.00          | 153.60 | 6.13                 | 33.32                 | 59.35          | 51.02 | 31.63 | 2.02              | 1.29              |
| 136.40          | 157.00 | 6.13                 | 33.86                 | 59.43          | 51.64 | 31.59 | 2.03              | 1.29              |
| 139.80          | 160.40 | 6.13                 | 34.40                 | 59.19          | 53.46 | 31.61 | 2.03              | 1.29              |
| 143.20          | 163.80 | 6.12                 | 34.77                 | 58.99          | 56.74 | 31.71 | 2.03              | 1.30              |
| 146.60          | 167.20 | 6.12                 | 35.26                 | 58.84          | 62.35 | 32.08 | 2.02              | 1.31              |
| 150.00          | 170.60 | 6.09                 | 35.48                 | 58.58          | 74.54 | 32.83 | 2.02              | 1.32              |
| 156.00          | 176.60 | 6.05                 | 34.92                 | 58.22          | 63.49 | 35.45 | 2.03              | 1.35              |
| 162.00          | 182.60 | 6.05                 | 34.60                 | 57.89          | 58.54 | 36.68 | 2.05              | 1.39              |
| 168.00          | 188.60 | 6.10                 | 30.83                 | 57.62          | 56.10 | 34.30 | 2.07              | 1.45              |

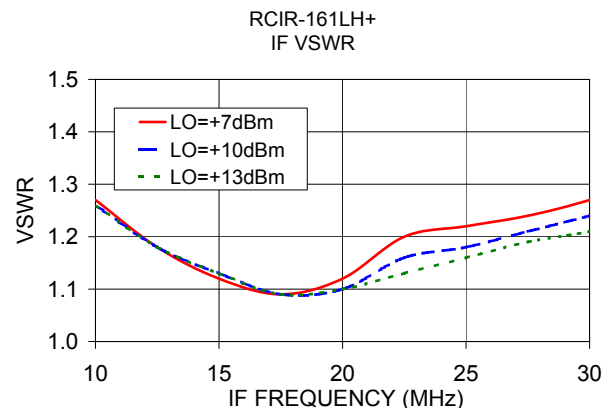
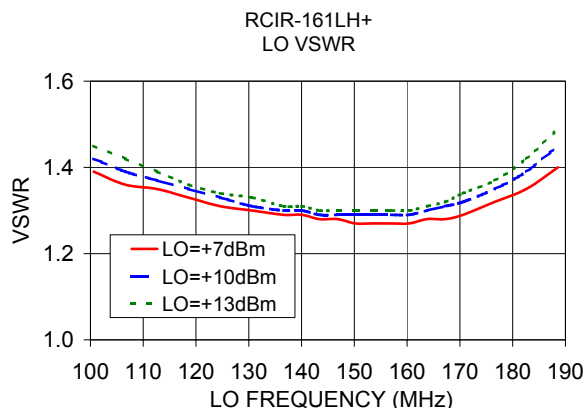
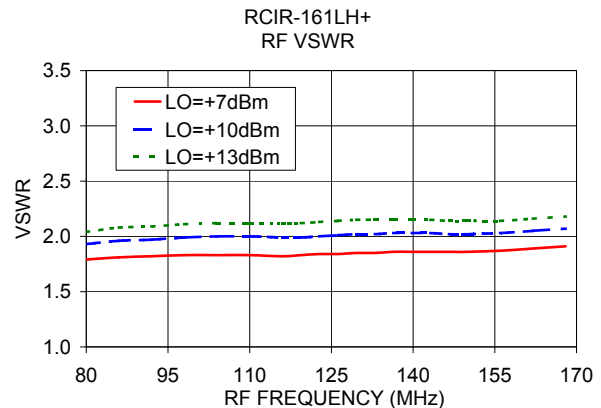
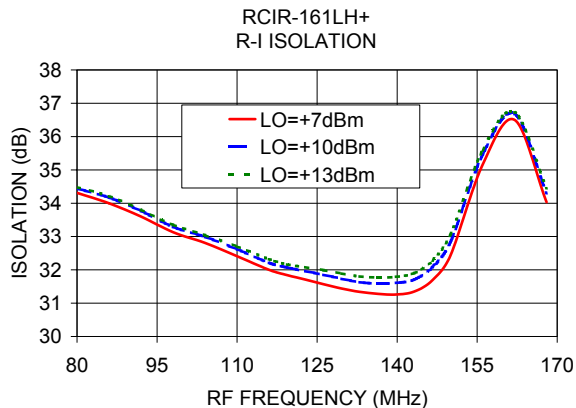
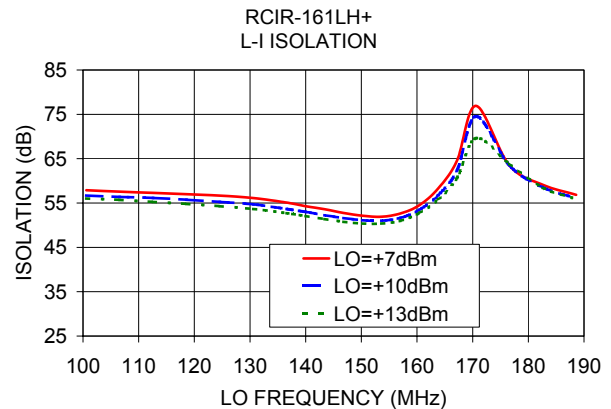
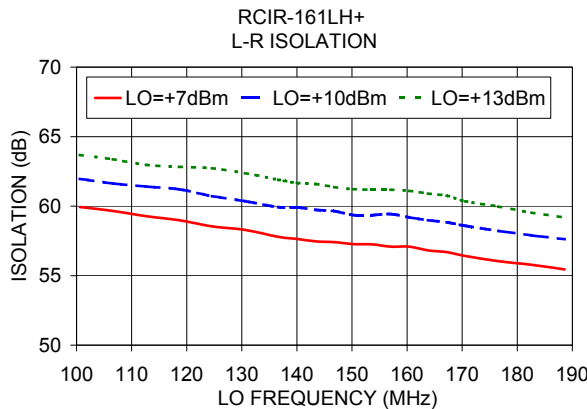
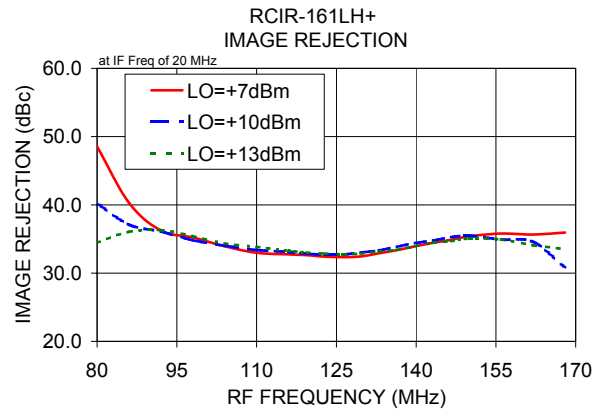
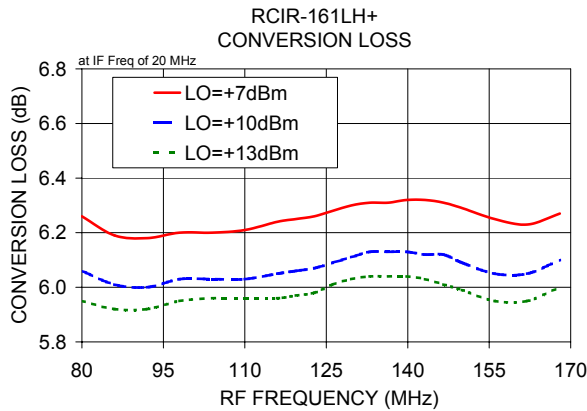
## Electrical Schematic



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REV. B  
M166133  
RCIR-161LH+  
ED-13600/2  
WL/CP/AM  
180206  
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# Image Reject Mixer

RCIR-161LH+

## Typical Performance Data

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>IF FIXED<br>@IF(OUT)=20.6 MHz<br>(dB) |      |      | RF<br>(IN)<br>(MHz) | LO<br>(MHz) | IMAGE REJECTION<br>IF FIXED<br>@IF(OUT)=20.6 MHz<br>(dBc) |       |       | RF<br>(IN)<br>(MHz) | LO<br>(MHz) | IP3 INPUT<br>(dBm) |       |       | RF<br>(IN)<br>(MHz) | LO<br>(MHz) | COMPRESSION<br>@RF=+1dBm<br>(dB) |      |      |
|---------------------|-------------|----------------------------------------------------------|------|------|---------------------|-------------|-----------------------------------------------------------|-------|-------|---------------------|-------------|--------------------|-------|-------|---------------------|-------------|----------------------------------|------|------|
|                     |             | @LO (dBm)                                                |      |      |                     |             | @LO (dBm)                                                 |       |       |                     |             | @LO (dBm)          |       |       |                     |             | @LO (dBm)                        |      |      |
|                     |             | +7                                                       | +10  | +13  |                     |             | +7                                                        | +10   | +13   |                     |             | +7                 | +10   | +13   |                     |             | +7                               | +10  | +13  |
| 80.0                | 100.6       | 6.26                                                     | 6.06 | 5.95 | 80.0                | 100.6       | 48.55                                                     | 40.21 | 34.46 | 80.0                | 100.6       | 17.18              | 20.71 | 24.73 | 80.0                | 100.6       | 0.22                             | 0.12 | 0.06 |
| 86.0                | 106.6       | 6.19                                                     | 6.01 | 5.92 | 86.0                | 106.6       | 40.30                                                     | 37.10 | 36.06 | 86.0                | 106.6       | 18.01              | 21.01 | 21.60 | 86.0                | 106.6       | 0.24                             | 0.13 | 0.08 |
| 92.0                | 112.6       | 6.18                                                     | 6.00 | 5.92 | 92.0                | 112.6       | 36.23                                                     | 36.09 | 36.30 | 92.0                | 112.6       | 18.46              | 20.24 | 20.70 | 92.0                | 112.6       | 0.22                             | 0.12 | 0.07 |
| 98.0                | 118.6       | 6.20                                                     | 6.03 | 5.95 | 98.0                | 118.6       | 35.22                                                     | 34.82 | 35.39 | 98.0                | 118.6       | 19.02              | 19.91 | 20.49 | 98.0                | 118.6       | 0.21                             | 0.10 | 0.06 |
| 104.0               | 124.6       | 6.20                                                     | 6.03 | 5.96 | 104.0               | 124.6       | 33.94                                                     | 34.01 | 34.34 | 104.0               | 124.6       | 18.16              | 19.31 | 20.10 | 104.0               | 124.6       | 0.23                             | 0.12 | 0.07 |
| 110.0               | 130.6       | 6.21                                                     | 6.03 | 5.96 | 110.0               | 130.6       | 32.99                                                     | 33.39 | 33.84 | 110.0               | 130.6       | 18.35              | 19.57 | 20.12 | 110.0               | 130.6       | 0.23                             | 0.12 | 0.06 |
| 116.0               | 136.6       | 6.24                                                     | 6.05 | 5.96 | 116.0               | 136.6       | 32.75                                                     | 33.10 | 33.27 | 116.0               | 136.6       | 19.13              | 19.67 | 19.82 | 116.0               | 136.6       | 0.22                             | 0.12 | 0.07 |
| 119.4               | 140.0       | 6.25                                                     | 6.06 | 5.97 | 119.4               | 140.0       | 32.63                                                     | 32.84 | 33.01 | 119.4               | 140.0       | 19.12              | 19.01 | 19.44 | 119.4               | 140.0       | 0.22                             | 0.12 | 0.07 |
| 122.8               | 143.4       | 6.26                                                     | 6.07 | 5.98 | 122.8               | 143.4       | 32.40                                                     | 32.71 | 32.85 | 122.8               | 143.4       | 18.58              | 18.44 | 18.93 | 122.8               | 143.4       | 0.23                             | 0.14 | 0.09 |
| 126.2               | 146.8       | 6.28                                                     | 6.09 | 6.01 | 126.2               | 146.8       | 32.35                                                     | 32.72 | 32.78 | 126.2               | 146.8       | 18.31              | 18.12 | 18.83 | 126.2               | 146.8       | 0.22                             | 0.12 | 0.07 |
| 129.6               | 150.2       | 6.30                                                     | 6.11 | 6.03 | 129.6               | 150.2       | 32.44                                                     | 33.02 | 32.85 | 129.6               | 150.2       | 18.10              | 18.09 | 18.84 | 129.6               | 150.2       | 0.23                             | 0.14 | 0.09 |
| 133.0               | 153.6       | 6.31                                                     | 6.13 | 6.04 | 133.0               | 153.6       | 32.91                                                     | 33.32 | 33.17 | 133.0               | 153.6       | 17.97              | 17.96 | 18.66 | 133.0               | 153.6       | 0.22                             | 0.13 | 0.08 |
| 136.4               | 157.0       | 6.31                                                     | 6.13 | 6.04 | 136.4               | 157.0       | 33.37                                                     | 33.86 | 33.41 | 136.4               | 157.0       | 17.87              | 17.81 | 18.56 | 136.4               | 157.0       | 0.25                             | 0.15 | 0.10 |
| 139.8               | 160.4       | 6.32                                                     | 6.13 | 6.04 | 139.8               | 160.4       | 33.94                                                     | 34.40 | 33.94 | 139.8               | 160.4       | 17.74              | 17.85 | 18.69 | 139.8               | 160.4       | 0.21                             | 0.12 | 0.07 |
| 143.2               | 163.8       | 6.32                                                     | 6.12 | 6.03 | 143.2               | 163.8       | 34.45                                                     | 34.77 | 34.43 | 143.2               | 163.8       | 17.59              | 17.64 | 18.54 | 143.2               | 163.8       | 0.21                             | 0.12 | 0.08 |
| 146.6               | 167.2       | 6.31                                                     | 6.12 | 6.01 | 146.6               | 167.2       | 34.88                                                     | 35.26 | 34.69 | 146.6               | 167.2       | 17.31              | 17.56 | 18.40 | 146.6               | 167.2       | 0.19                             | 0.10 | 0.06 |
| 150.0               | 170.6       | 6.29                                                     | 6.09 | 5.99 | 150.0               | 170.6       | 35.40                                                     | 35.48 | 35.04 | 150.0               | 170.6       | 16.82              | 17.22 | 18.20 | 150.0               | 170.6       | 0.20                             | 0.11 | 0.06 |
| 156.0               | 176.6       | 6.25                                                     | 6.05 | 5.95 | 156.0               | 176.6       | 35.80                                                     | 34.92 | 34.92 | 156.0               | 176.6       | 16.23              | 16.92 | 18.01 | 156.0               | 176.6       | 0.18                             | 0.08 | 0.04 |
| 162.0               | 182.6       | 6.23                                                     | 6.05 | 5.95 | 162.0               | 182.6       | 35.66                                                     | 34.60 | 34.07 | 162.0               | 182.6       | 16.17              | 16.93 | 17.94 | 162.0               | 182.6       | 0.21                             | 0.10 | 0.05 |
| 168.0               | 188.6       | 6.27                                                     | 6.10 | 6.00 | 168.0               | 188.6       | 35.95                                                     | 30.83 | 33.53 | 168.0               | 188.6       | 15.96              | 17.06 | 18.20 | 168.0               | 188.6       | 0.18                             | 0.08 | 0.04 |



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# Image Reject Mixer

# RCIR-161LH+

## Typical Performance Data

| LO<br><br>(MHz) | LO-RF ISOLATION<br>(dB) |       |       | LO-IF ISOLATION<br>(dB) |       |       | IMAGE<br>REJECT<br>ION<br>IF<br>FIXED<br>@IF(OUT)=20.6 | LO<br><br>(MHz) | RF-IF ISOLATION<br>(dB) |       |       |
|-----------------|-------------------------|-------|-------|-------------------------|-------|-------|--------------------------------------------------------|-----------------|-------------------------|-------|-------|
|                 | @LO (dBm)               |       |       | @LO (dBm)               |       |       |                                                        |                 | @LO (dBm)               |       |       |
|                 | +7                      | +10   | +13   | +7                      | +10   | +13   |                                                        |                 | +7                      | +10   | +13   |
| 100.6           | 59.94                   | 61.96 | 63.68 | 57.90                   | 56.69 | 56.02 | 80.0                                                   | 100.6           | 34.31                   | 34.44 | 34.48 |
| 106.6           | 59.65                   | 61.63 | 63.37 | 57.57                   | 56.38 | 55.69 | 86.0                                                   | 106.6           | 34.00                   | 34.17 | 34.21 |
| 112.6           | 59.28                   | 61.41 | 62.97 | 57.28                   | 56.14 | 55.24 | 92.0                                                   | 112.6           | 33.60                   | 33.77 | 33.80 |
| 118.6           | 58.99                   | 61.21 | 62.83 | 57.00                   | 55.74 | 54.81 | 98.0                                                   | 118.6           | 33.13                   | 33.29 | 33.35 |
| 124.6           | 58.54                   | 60.72 | 62.72 | 56.66                   | 55.24 | 54.27 | 104.0                                                  | 124.6           | 32.81                   | 32.99 | 33.04 |
| 130.6           | 58.29                   | 60.36 | 62.37 | 56.11                   | 54.69 | 53.65 | 110.0                                                  | 130.6           | 32.41                   | 32.62 | 32.70 |
| 136.6           | 57.79                   | 59.93 | 61.90 | 55.10                   | 53.65 | 52.70 | 116.0                                                  | 136.6           | 32.00                   | 32.21 | 32.32 |
| 140.0           | 57.64                   | 59.91 | 61.67 | 54.28                   | 53.00 | 52.06 | 119.4                                                  | 140.0           | 31.84                   | 32.07 | 32.16 |
| 143.4           | 57.47                   | 59.73 | 61.59 | 53.60                   | 52.26 | 51.39 | 122.8                                                  | 143.4           | 31.71                   | 31.96 | 32.08 |
| 146.8           | 57.41                   | 59.64 | 61.37 | 52.76                   | 51.62 | 50.77 | 126.2                                                  | 146.8           | 31.57                   | 31.85 | 31.99 |
| 150.2           | 57.27                   | 59.36 | 61.22 | 52.13                   | 51.11 | 50.37 | 129.6                                                  | 150.2           | 31.44                   | 31.73 | 31.89 |
| 153.6           | 57.25                   | 59.35 | 61.19 | 51.92                   | 51.02 | 50.36 | 133.0                                                  | 153.6           | 31.34                   | 31.63 | 31.80 |
| 157.0           | 57.09                   | 59.43 | 61.18 | 52.64                   | 51.64 | 50.99 | 136.4                                                  | 157.0           | 31.28                   | 31.59 | 31.77 |
| 160.4           | 57.09                   | 59.19 | 61.10 | 54.51                   | 53.46 | 52.73 | 139.8                                                  | 160.4           | 31.26                   | 31.61 | 31.79 |
| 163.8           | 56.82                   | 58.99 | 60.90 | 58.28                   | 56.74 | 55.76 | 143.2                                                  | 163.8           | 31.35                   | 31.71 | 31.90 |
| 167.2           | 56.69                   | 58.84 | 60.75 | 64.58                   | 62.35 | 60.68 | 146.6                                                  | 167.2           | 31.69                   | 32.08 | 32.28 |
| 170.6           | 56.41                   | 58.58 | 60.35 | 76.91                   | 74.54 | 69.62 | 150.0                                                  | 170.6           | 32.43                   | 32.83 | 33.05 |
| 176.6           | 56.04                   | 58.22 | 59.97 | 63.50                   | 63.49 | 63.83 | 156.0                                                  | 176.6           | 35.15                   | 35.45 | 35.59 |
| 182.6           | 55.78                   | 57.89 | 59.53 | 59.10                   | 58.54 | 58.43 | 162.0                                                  | 182.6           | 36.50                   | 36.68 | 36.73 |
| 188.6           | 55.45                   | 57.62 | 59.18 | 56.85                   | 56.10 | 55.89 | 168.0                                                  | 188.6           | 34.03                   | 34.30 | 34.45 |



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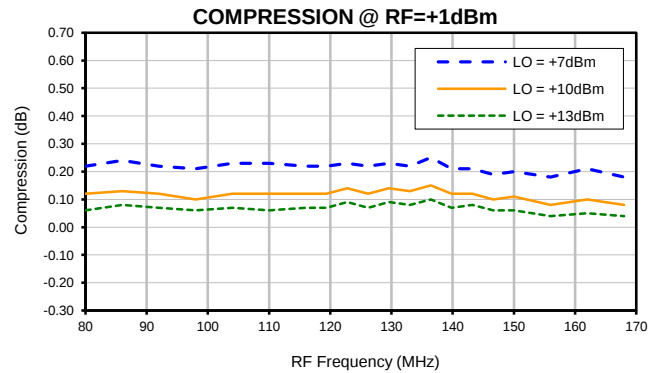
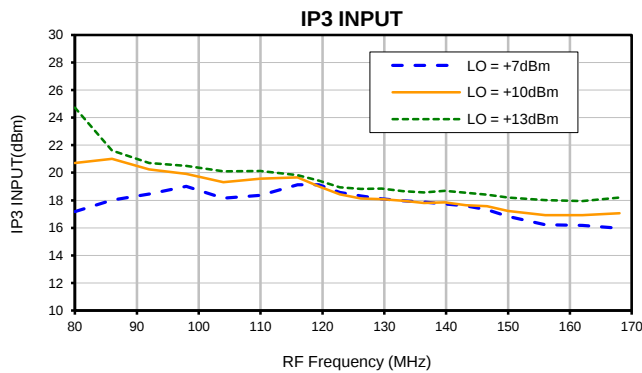
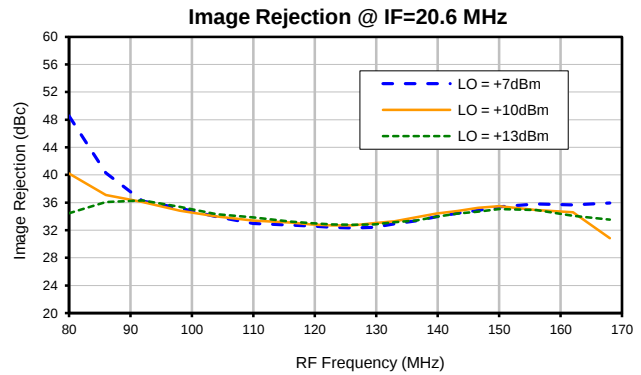
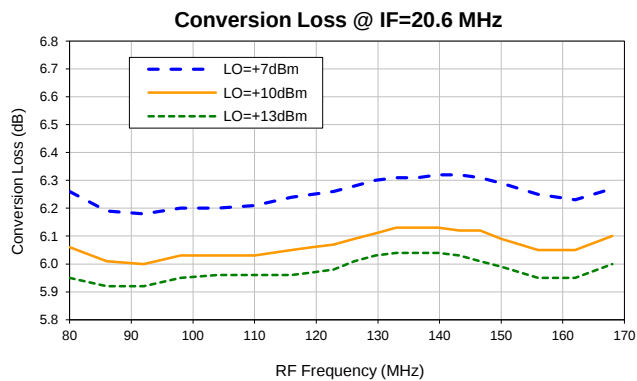
| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | RF VSWR<br>(:1) |      |      | LO<br>(MHz) | LO VSWR<br>(:1) |      |      | IF<br>(OUT)<br>(MHz) | IF VSWR<br>(:1) |      |      |
|---------------------|-------------|-----------------|------|------|-------------|-----------------|------|------|----------------------|-----------------|------|------|
|                     |             | @LO (dBm)       |      |      |             | @LO (dBm)       |      |      |                      | @LO (dBm)       |      |      |
|                     |             | +7              | +10  | +13  |             | +7              | +10  | +13  |                      | +7              | +10  | +13  |
| 80.0                | 100.6       | 1.79            | 1.93 | 2.04 | 100.6       | 1.39            | 1.42 | 1.45 | 10.0                 | 1.27            | 1.26 | 1.26 |
| 86.0                | 106.6       | 1.81            | 1.96 | 2.08 | 106.6       | 1.36            | 1.39 | 1.42 | 12.5                 | 1.18            | 1.18 | 1.18 |
| 92.0                | 112.6       | 1.82            | 1.97 | 2.09 | 112.6       | 1.35            | 1.37 | 1.39 | 15.0                 | 1.12            | 1.13 | 1.13 |
| 98.0                | 118.6       | 1.83            | 1.99 | 2.11 | 118.6       | 1.33            | 1.35 | 1.36 | 17.5                 | 1.09            | 1.09 | 1.09 |
| 104.0               | 124.6       | 1.83            | 2.00 | 2.12 | 124.6       | 1.31            | 1.33 | 1.34 | 20.0                 | 1.12            | 1.10 | 1.10 |
| 110.0               | 130.6       | 1.83            | 2.00 | 2.12 | 130.6       | 1.30            | 1.31 | 1.33 | 22.5                 | 1.20            | 1.16 | 1.13 |
| 116.0               | 136.6       | 1.82            | 1.99 | 2.12 | 136.6       | 1.29            | 1.30 | 1.31 | 25.0                 | 1.22            | 1.18 | 1.16 |
| 119.4               | 140.0       | 1.83            | 1.99 | 2.12 | 140.0       | 1.29            | 1.30 | 1.31 | 27.5                 | 1.24            | 1.21 | 1.19 |
| 122.8               | 143.4       | 1.84            | 2.00 | 2.13 | 143.4       | 1.28            | 1.29 | 1.30 | 30.0                 | 1.27            | 1.24 | 1.21 |
| 126.2               | 146.8       | 1.84            | 2.01 | 2.14 | 146.8       | 1.28            | 1.29 | 1.30 | 34.0                 | 1.33            | 1.29 | 1.25 |
| 129.6               | 150.2       | 1.85            | 2.02 | 2.15 | 150.2       | 1.27            | 1.29 | 1.30 | 38.0                 | 1.37            | 1.32 | 1.28 |
| 133.0               | 153.6       | 1.85            | 2.02 | 2.15 | 153.6       | 1.27            | 1.29 | 1.30 | 42.0                 | 1.41            | 1.35 | 1.31 |
| 136.4               | 157.0       | 1.86            | 2.03 | 2.15 | 157.0       | 1.27            | 1.29 | 1.30 | 46.0                 | 1.44            | 1.37 | 1.33 |
| 139.8               | 160.4       | 1.86            | 2.03 | 2.15 | 160.4       | 1.27            | 1.29 | 1.30 | 50.0                 | 1.47            | 1.40 | 1.35 |
| 143.2               | 163.8       | 1.86            | 2.03 | 2.15 | 163.8       | 1.28            | 1.30 | 1.31 | 55.0                 | 1.50            | 1.42 | 1.36 |
| 146.6               | 167.2       | 1.86            | 2.02 | 2.14 | 167.2       | 1.28            | 1.31 | 1.32 | 60.0                 | 1.53            | 1.44 | 1.38 |
| 150.0               | 170.6       | 1.86            | 2.02 | 2.14 | 170.6       | 1.29            | 1.32 | 1.34 | 65.0                 | 1.55            | 1.45 | 1.39 |
| 156.0               | 176.6       | 1.87            | 2.03 | 2.14 | 176.6       | 1.32            | 1.35 | 1.37 | 70.0                 | 1.57            | 1.47 | 1.40 |
| 162.0               | 182.6       | 1.89            | 2.05 | 2.16 | 182.6       | 1.35            | 1.39 | 1.42 | 75.0                 | 1.58            | 1.48 | 1.41 |
| 168.0               | 188.6       | 1.91            | 2.07 | 2.18 | 188.6       | 1.40            | 1.45 | 1.49 | 80.0                 | 1.59            | 1.49 | 1.42 |



# Image Reject Mixer

# RCIR-161LH+

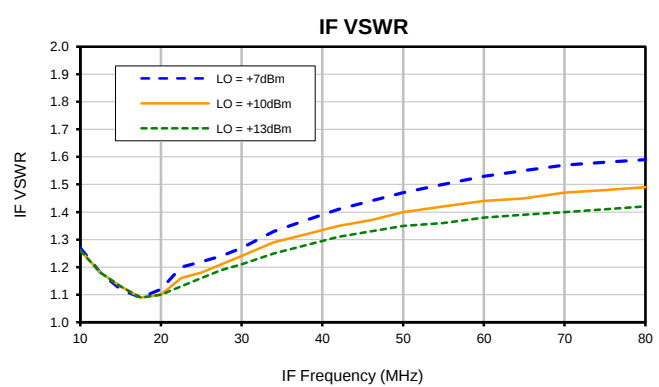
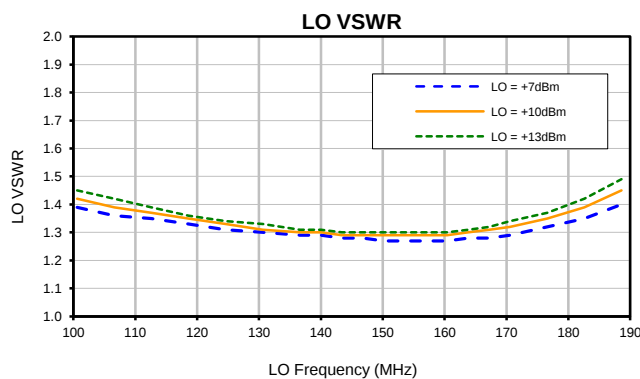
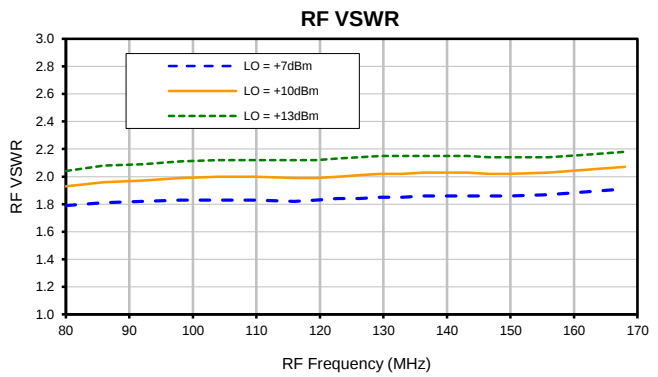
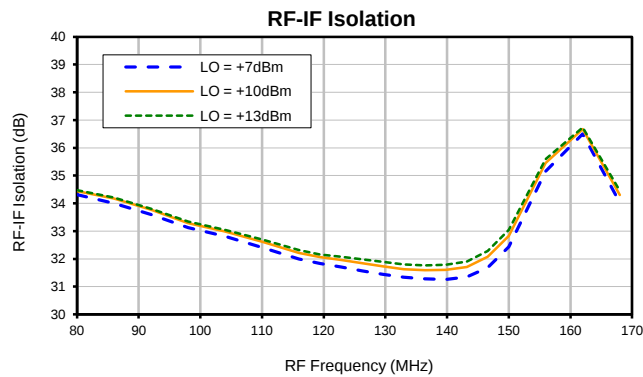
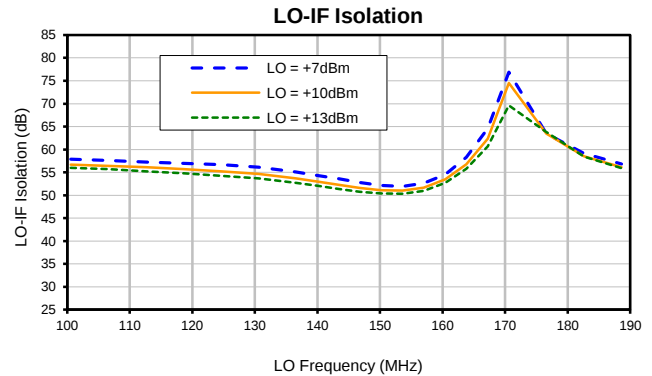
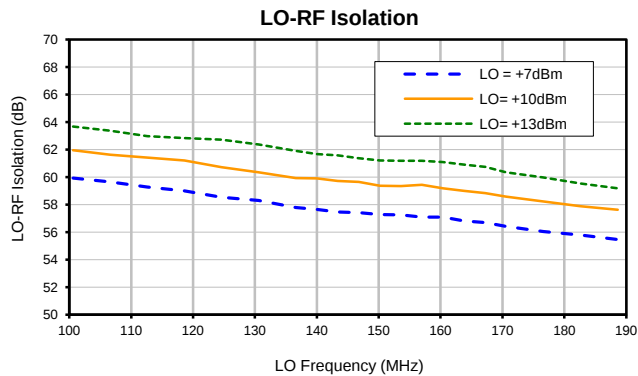
## Typical Performance Curves



# Image Reject Mixer

## Typical Performance Curves

RCIR-161LH+



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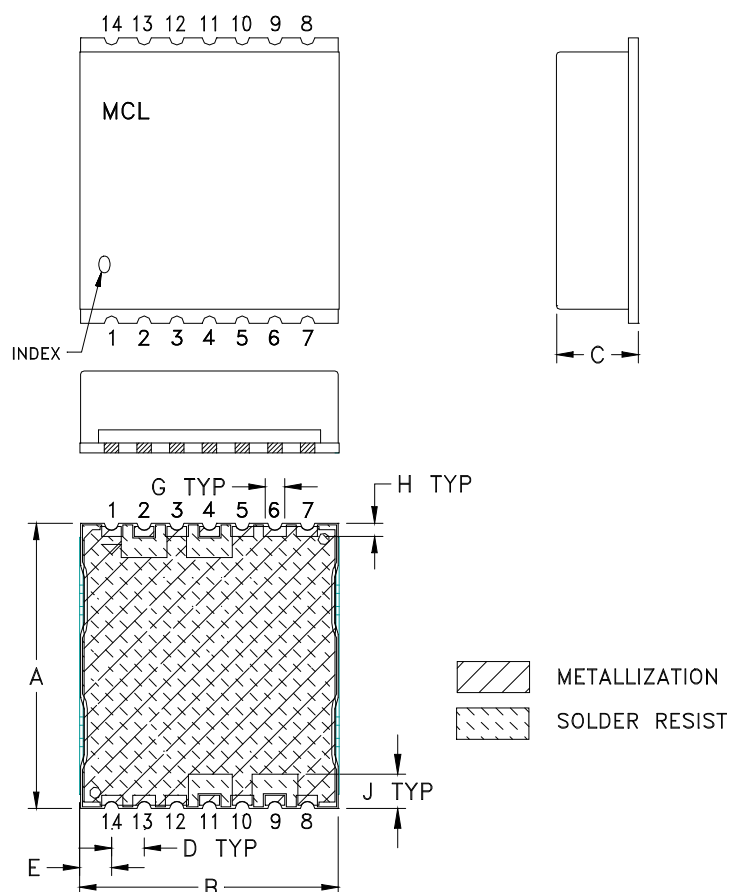
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REV. OR  
RCIR-161LH+  
11/29/2012  
Page 2 of 2

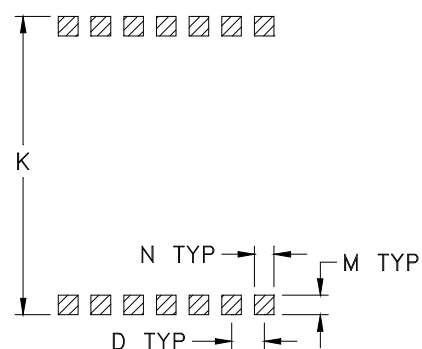
IF/RF MICROWAVE COMPONENTS

## Outline Dimensions

HU1416



## PCB Land Pattern



Suggested Layout,  
Tolerance to be within  $\pm .002$

| CASE#  | A               | B               | C             | D              | E              | F | G              | H              | J              | K               | L | M              | N              | P | WT, GRAM |
|--------|-----------------|-----------------|---------------|----------------|----------------|---|----------------|----------------|----------------|-----------------|---|----------------|----------------|---|----------|
| HU1416 | .870<br>(22.10) | .800<br>(20.32) | .25<br>(6.35) | .100<br>(2.54) | .097<br>(2.46) | - | .060<br>(1.52) | .040<br>(1.02) | .105<br>(2.67) | .910<br>(23.11) | - | .060<br>(1.52) | .060<br>(1.52) | - | 2.85     |

Dimensions are in inches (mm). Tolerances: 2PL. +/- .03; 3PL. +/- .015

### Notes:

1. Case material: Nickel-Silver alloy.
2. Base: Printed wiring laminate.
3. Termination finish:

For RoHS Case Styles: 2-5  $\mu$  inch (.05-.13 microns) Gold over .120-.240  $\mu$  inch (3.05-6.10 microns) Nickel plate. All models (+) suffix.

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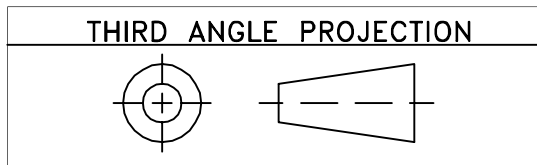
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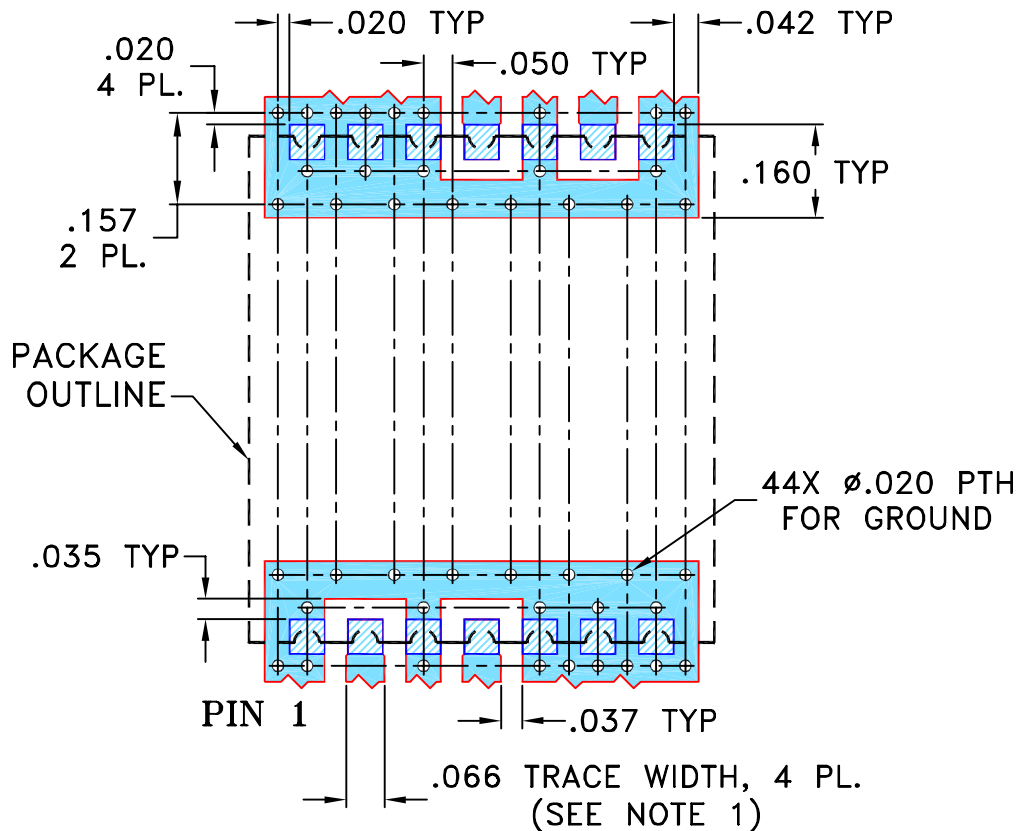
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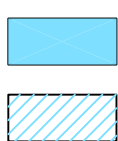


| REVISIONS |         |             |          |     |      |
|-----------|---------|-------------|----------|-----|------|
| REV OR    | ECN No. | DESCRIPTION | DATE     | DR  | AUTH |
|           | M122600 | NEW RELEASE | 04/28/09 | MMG | WL   |
|           |         |             |          |     |      |
|           |         |             |          |     |      |
|           |         |             |          |     |      |

## SUGGESTED MOUNTING CONFIGURATION FOR HU1416 CASE STYLE, "14MX01" PIN CODE



- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030"  $\pm$  .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.



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

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

| UNLESS OTHERWISE SPECIFIED                                                                                                       | INITIALS |     | DATE     |
|----------------------------------------------------------------------------------------------------------------------------------|----------|-----|----------|
| DIMENSIONS ARE IN INCHES<br>TOLERANCES ON:<br>2 PL DECIMALS $\pm$<br>3 PL DECIMALS $\pm$ .005<br>ANGLES $\pm$<br>FRACTIONS $\pm$ | DRAWN    | MMG | 04/28/09 |
|                                                                                                                                  | CHECKED  | AY  | 04/28/09 |
|                                                                                                                                  | APPROVED | WL  | 04/28/09 |
|                                                                                                                                  |          |     |          |



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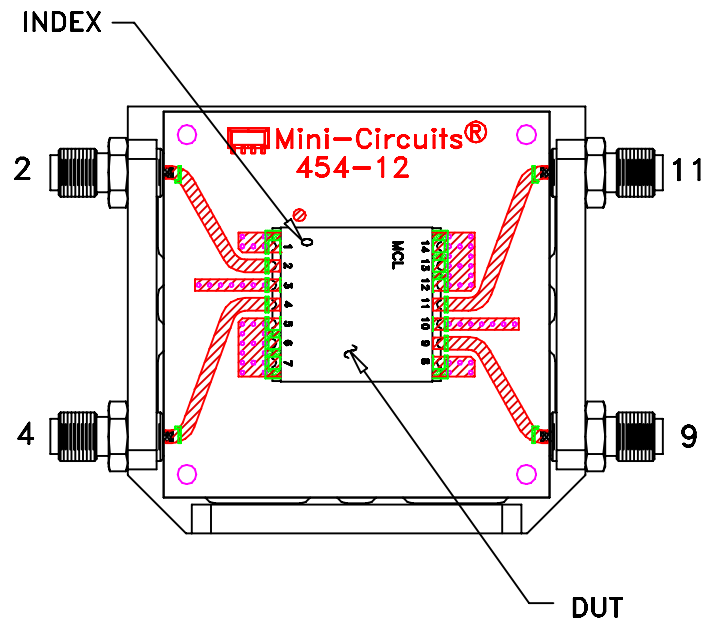
PL, 14MX01, HU1416, TB-516+

|                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |  |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|
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| ASHEETA1.DWG REV:A DATE:01/12/95                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  |

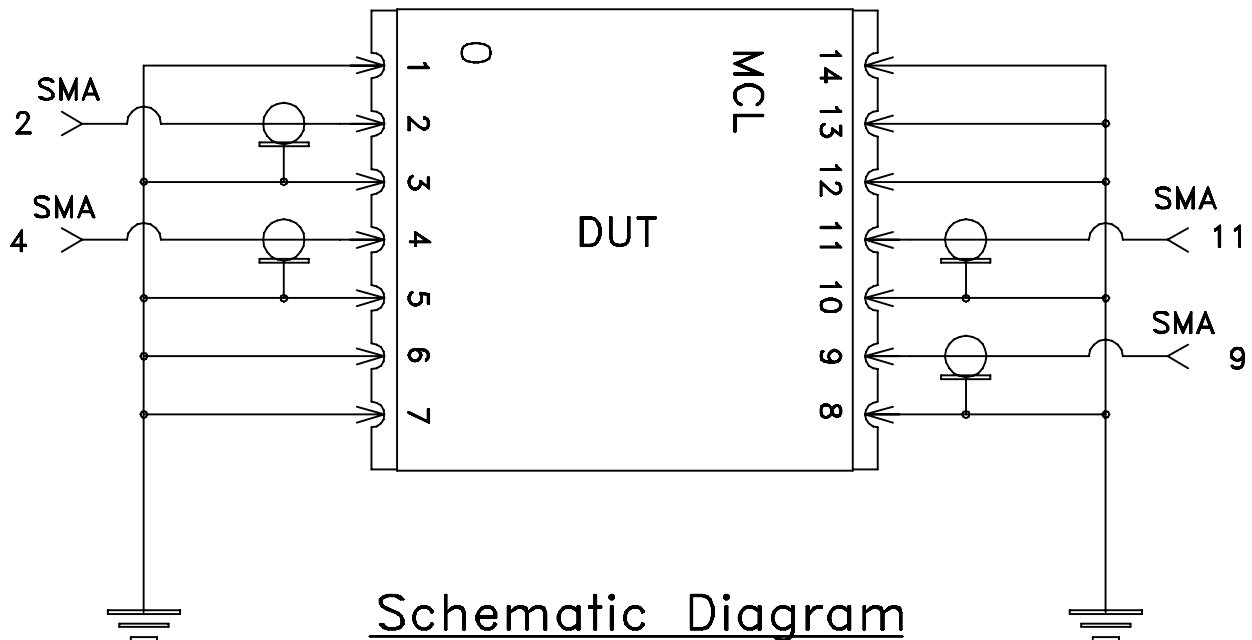
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|-------|------------|-------------|--------|
| A     | 15542      | 98-PL-298   | OR     |
| FILE: | 98PL298    | SCALE:      | SHEET: |
|       |            | 3:1         | 1 OF 1 |

# Evaluation Board and Circuit

For Pin Connections refer to Data Sheet of the DUT



TB-516+



Schematic Diagram

## Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: Rogers R04350 or equivalent,  
Dielectric Constant=3.5, Thickness=.030 inch.

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All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

| Specification                  | Test/Inspection Condition                                                                                                                                       | Reference/Spec                                                                                       |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Operating Temperature          | -40° to 85°C<br>Ambient Environment                                                                                                                             | Individual Model Data Sheet                                                                          |
| Storage Temperature            | -55° to 100° C<br>Ambient Environment                                                                                                                           | Individual Model Data Sheet                                                                          |
| Humidity                       | 90 to 95% RH, 240 hours, 50°C                                                                                                                                   | MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours |
| Thermal Shock                  | -55° to 100°C, 100 cycles                                                                                                                                       | MIL-STD-202, Method 107, Condition A-3, except +100°C                                                |
| Solder Reflow Heat             | Sn-Pb Eutetic Process: 225°C peak<br>Pb-Free Process 245° - 250°C peak                                                                                          | J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1                                                        |
| Solderability                  | 10X Magnification                                                                                                                                               | J-STD-002, 95% Coverage                                                                              |
| Vibration (High Frequency)     | 20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)                                                                             | MIL-STD-202, Method 204, Condition D                                                                 |
| Mechanical Shock               | 50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes                                                                                               | MIL-STD-202, Method 213, Condition A                                                                 |
| Marking Resistance to Solvents | Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C;<br>distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C | MIL-STD-202, Method 215                                                                              |