

LTCC Coupler

50Ω 2400 to 2500 MHz 6dB Coupling

CPJC-6-252R+



Generic photo used for illustration purposes only

CASE STYLE: JC0603C

+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" | 20, 50, 100, 200, 500, 1000, 4000 |

Maximum Ratings

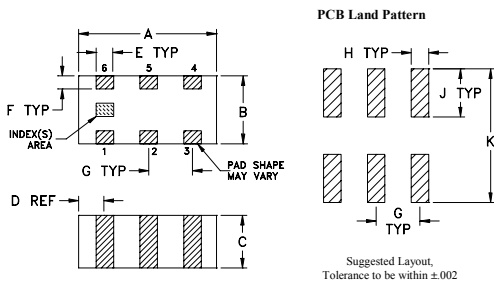
| | |
|-----------------------|---------------|
| Operating Temperature | -40°C to 85°C |
| Storage Temperature* | -40°C to 85°C |

*Refer to product storage temperature after installation.
Suggestion for T&R unused product storage condition: +5--+35°C, Humidity 45-75%RH, 12 Month max.
Permanent damage may occur if any of these limits are exceeded.

Pad Connections

| | |
|-------------|---|
| Input | 1 |
| GND | 2 |
| Coupled | 3 |
| Termination | 4 |
| GND | 5 |
| Output | 6 |

Outline Drawing

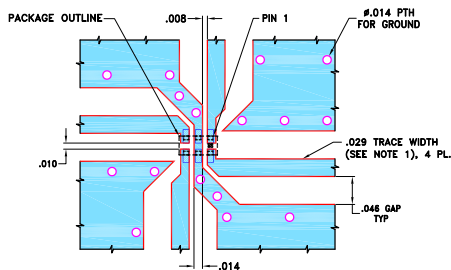


Outline Dimensions (inch/mm)

| A | B | C | D | E | F |
|------|------|------|------|------|------|
| .063 | .031 | .024 | .012 | .008 | .006 |
| 1.60 | 0.79 | 0.61 | 0.30 | 0.20 | 0.15 |

| G | H | J | K | wt |
|------|------|------|------|-------|
| .020 | .010 | .022 | .053 | grams |
| 0.51 | 0.25 | 0.56 | 1.35 | 0.005 |

Evaluation Board MCL P/N: TB-1031+ Suggested PCB Layout (PL-572)



- NOTES:
- TRACE WIDTH & GAP ARE SHOWN FOR FR4, GRADE IT-180TC (ITEQ CORP.) WITH DIELECTRIC THICKNESS .016±.0015. COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH & GAP MAY NEED TO BE MODIFIED.
 - BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
 - REFER TO MODEL DATASHEET FOR PIN OUTS.

DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER).
 DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

Notes

- 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.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- The parts covered by this specification document are subject to Mini-Circuit's standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuit's website at www.minicircuits.com/WCLStore/terms.jsp

Features

- miniature size 0603
- low cost
- aqueous washable

Applications

- ISM Band
- WLAN
- Bluetooth
- Zigbee

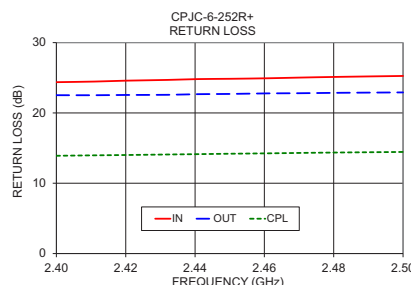
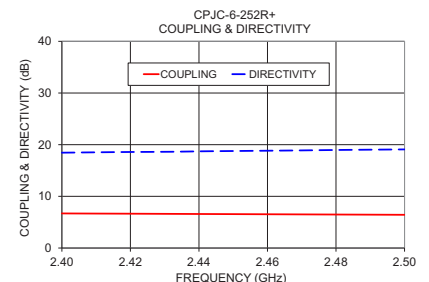
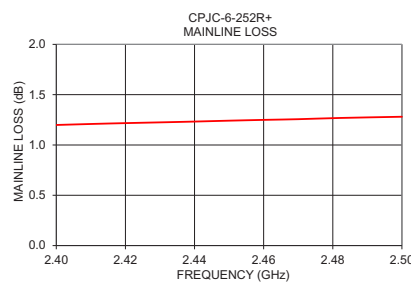
Electrical Specifications at 25°C

| Parameter | Frequency (MHz) | Min. | Typ. | Max. | Unit |
|--------------------------|-----------------|------|---------|------|------|
| Frequency Range | | 2400 | | 2500 | MHz |
| Mainline Loss | 2400 - 2500 | — | 1.27 | 1.83 | dB |
| Coupling | 2400 - 2500 | — | 6.5±1.0 | — | dB |
| Directivity | 2400 - 2500 | 13.5 | 18 | — | dB |
| Return Loss (Input) | 2400 - 2500 | 13.9 | 21 | — | dB |
| Return Loss (Output) | 2400 - 2500 | 13.9 | 21 | — | dB |
| Input Power ¹ | 2400 - 2500 | — | — | 2 | W |

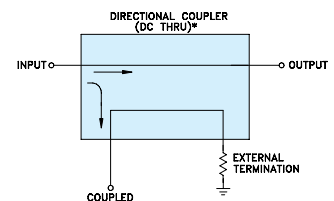
1. Derate linearly to 1W at 85°C.

Typical Performance Data

| Frequency (GHz) | Mainline Loss (dB) In-Out | Coupling (dB) In-Cpl | Directivity (dB) | Return Loss (dB) | | |
|-----------------|---------------------------|----------------------|------------------|------------------|-------|-------|
| | | | | In | Out | Cpl |
| 2.400 | 1.20 | 6.70 | 18.45 | 24.38 | 22.52 | 13.91 |
| 2.411 | 1.21 | 6.67 | 18.53 | 24.46 | 22.52 | 13.97 |
| 2.420 | 1.22 | 6.64 | 18.59 | 24.59 | 22.56 | 14.02 |
| 2.432 | 1.23 | 6.61 | 18.63 | 24.70 | 22.58 | 14.09 |
| 2.441 | 1.23 | 6.58 | 18.72 | 24.82 | 22.67 | 14.14 |
| 2.450 | 1.24 | 6.56 | 18.77 | 24.85 | 22.70 | 14.20 |
| 2.461 | 1.25 | 6.53 | 18.84 | 24.93 | 22.78 | 14.25 |
| 2.470 | 1.26 | 6.51 | 18.89 | 25.03 | 22.80 | 14.31 |
| 2.482 | 1.27 | 6.48 | 18.99 | 25.13 | 22.87 | 14.38 |
| 2.491 | 1.27 | 6.45 | 19.04 | 25.22 | 22.91 | 14.41 |
| 2.500 | 1.28 | 6.43 | 19.08 | 25.26 | 22.92 | 14.45 |



Electrical Schematic



* ELECTRICAL SCHEMATIC FOR DIRECTIONAL COUPLERS REQUIRING EXTERNAL TERMINATION THAT IS DESIGNED WITHOUT INTERNAL TRANSFORMERS.

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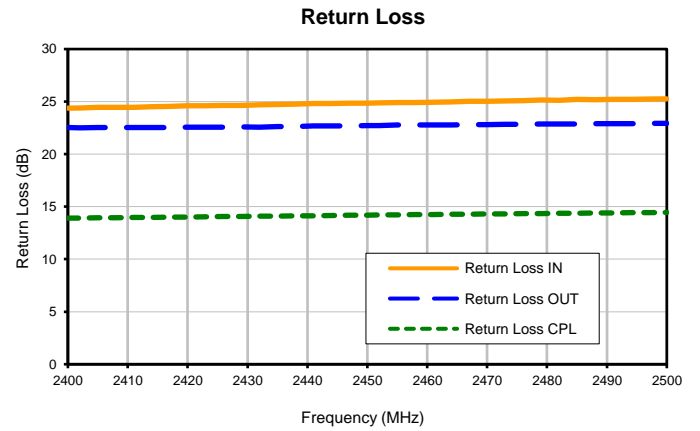
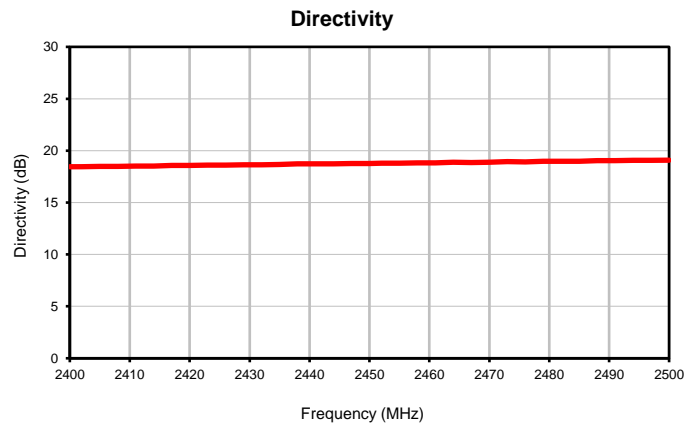
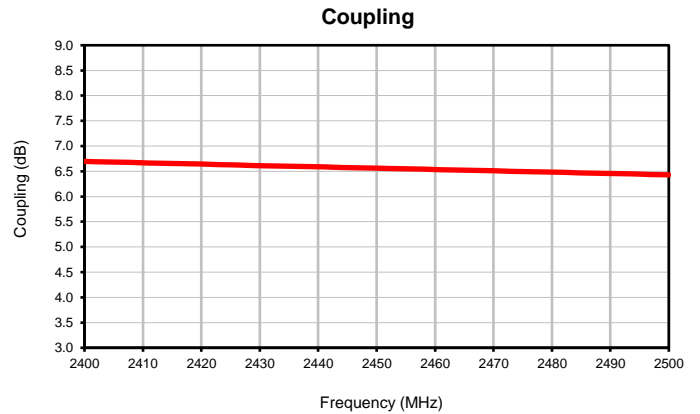
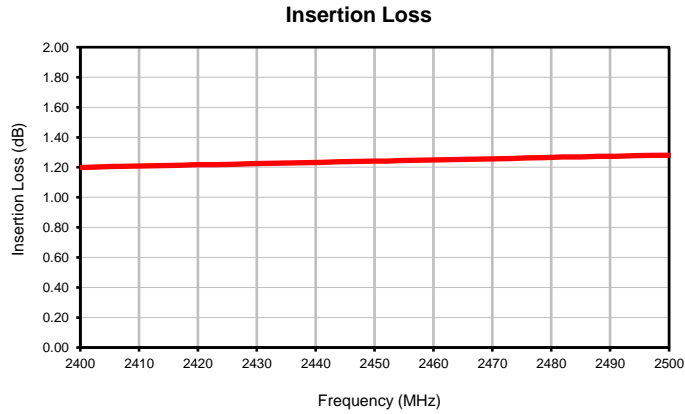
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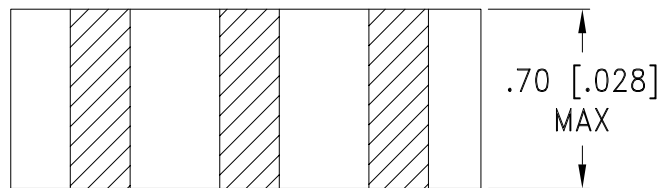
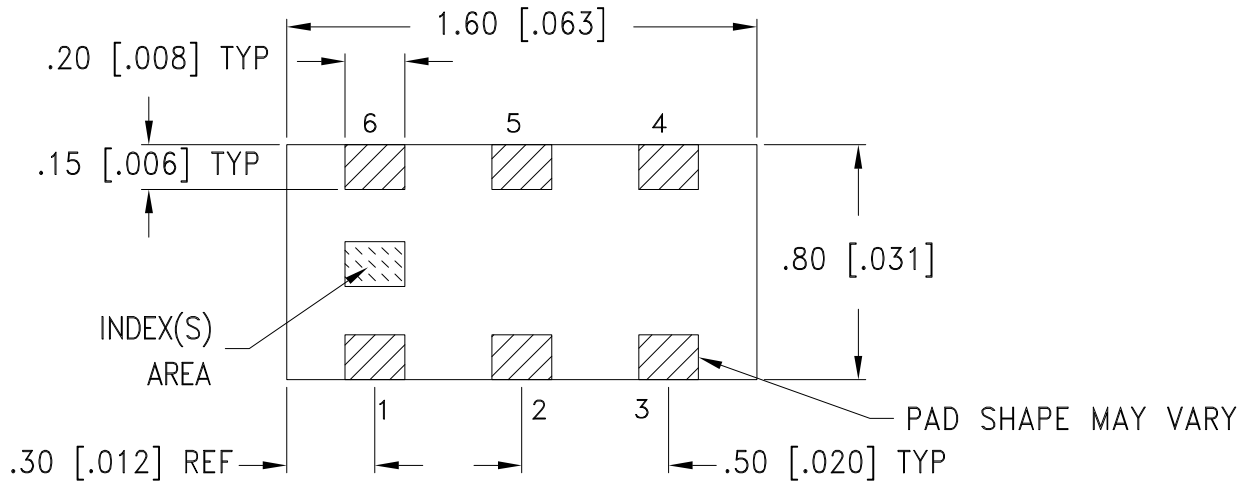
REV. A
ECO-005220
CPJC-6-252R+
SL/CP/AM
201203
Page 1 of 1

Typical Performance Data

| FREQ. (MHz) | INSERTION LOSS (dB) | COUPLING (dB) | DIRECTIVITY (dB) | RETURN LOSS | | |
|----------------|------------------------|------------------|---------------------|-------------|-------|-------|
| | | | | IN | OUT | CPL |
| 2400 | 1.20 | 6.70 | 18.45 | 24.38 | 22.52 | 13.91 |
| 2402 | 1.20 | 6.69 | 18.46 | 24.40 | 22.50 | 13.92 |
| 2405 | 1.20 | 6.68 | 18.48 | 24.46 | 22.52 | 13.93 |
| 2408 | 1.21 | 6.67 | 18.50 | 24.44 | 22.52 | 13.95 |
| 2411 | 1.21 | 6.67 | 18.53 | 24.46 | 22.52 | 13.97 |
| 2414 | 1.21 | 6.66 | 18.52 | 24.52 | 22.54 | 13.98 |
| 2417 | 1.21 | 6.65 | 18.57 | 24.54 | 22.53 | 14.00 |
| 2420 | 1.22 | 6.64 | 18.59 | 24.59 | 22.56 | 14.02 |
| 2423 | 1.22 | 6.63 | 18.60 | 24.62 | 22.56 | 14.03 |
| 2426 | 1.22 | 6.63 | 18.60 | 24.64 | 22.57 | 14.06 |
| 2429 | 1.22 | 6.62 | 18.64 | 24.65 | 22.58 | 14.08 |
| 2432 | 1.23 | 6.61 | 18.63 | 24.70 | 22.58 | 14.09 |
| 2435 | 1.23 | 6.60 | 18.67 | 24.72 | 22.62 | 14.10 |
| 2438 | 1.23 | 6.59 | 18.72 | 24.74 | 22.63 | 14.13 |
| 2441 | 1.23 | 6.58 | 18.72 | 24.82 | 22.67 | 14.14 |
| 2444 | 1.24 | 6.58 | 18.75 | 24.81 | 22.68 | 14.16 |
| 2447 | 1.24 | 6.57 | 18.77 | 24.84 | 22.68 | 14.19 |
| 2450 | 1.24 | 6.56 | 18.77 | 24.85 | 22.70 | 14.20 |
| 2452 | 1.24 | 6.56 | 18.80 | 24.88 | 22.71 | 14.21 |
| 2455 | 1.25 | 6.55 | 18.79 | 24.90 | 22.76 | 14.22 |
| 2458 | 1.25 | 6.54 | 18.83 | 24.90 | 22.78 | 14.24 |
| 2461 | 1.25 | 6.53 | 18.84 | 24.93 | 22.78 | 14.25 |
| 2464 | 1.25 | 6.52 | 18.88 | 24.97 | 22.78 | 14.28 |
| 2467 | 1.26 | 6.52 | 18.87 | 25.02 | 22.80 | 14.29 |
| 2470 | 1.26 | 6.51 | 18.89 | 25.03 | 22.80 | 14.31 |
| 2473 | 1.26 | 6.50 | 18.94 | 25.07 | 22.83 | 14.32 |
| 2476 | 1.26 | 6.49 | 18.93 | 25.09 | 22.84 | 14.33 |
| 2479 | 1.26 | 6.48 | 18.98 | 25.14 | 22.87 | 14.35 |
| 2482 | 1.27 | 6.48 | 18.99 | 25.13 | 22.87 | 14.38 |
| 2485 | 1.27 | 6.47 | 18.98 | 25.21 | 22.87 | 14.38 |
| 2488 | 1.27 | 6.46 | 19.04 | 25.18 | 22.89 | 14.40 |
| 2491 | 1.27 | 6.45 | 19.04 | 25.22 | 22.91 | 14.41 |
| 2494 | 1.28 | 6.45 | 19.06 | 25.22 | 22.91 | 14.43 |
| 2497 | 1.28 | 6.44 | 19.08 | 25.25 | 22.93 | 14.44 |
| 2500 | 1.28 | 6.43 | 19.08 | 25.26 | 22.92 | 14.45 |

Typical Performance Curves





Weight: .005 grams

Dimensions are in mm [inch]. Tolerances: ± 0.13 mm

Notes:

1. Open style, ceramic base.
2. Termination finish:

For RoHS Case Styles: Tin plate over Nickel plate. All models, (+) suffix.



P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



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RF/IF MICROWAVE COMPONENTS

Tape & Reel Packaging TR-F114

DEVICE ORIENTATION IN T&R



ILLUSTRATION 1

| Applicable Case Styles | |
|------------------------|-----------|
| GE0805C | JC0603C |
| GE0805C-1 | JC0603C-4 |
| GE0805C-1AP | JC0603C-6 |
| GE0805C-7 | |
| GE0805C-9 | |
| GE0805C-10 | |
| GE0805C-11 | |
| GE0805C-12 | |

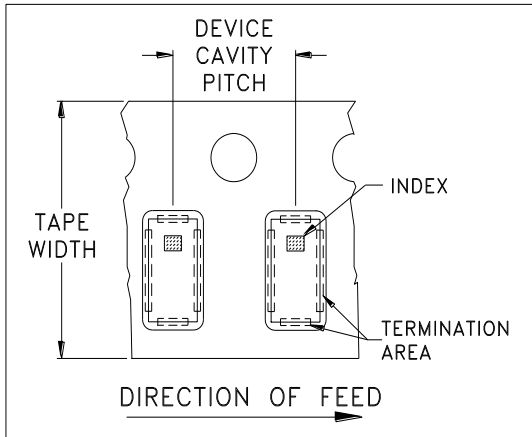


ILLUSTRATION 2

| Applicable Case Styles | |
|------------------------|-----------|
| GE0805C-2 | JC0603C-1 |
| GE0805C-3 | JC0603C-2 |
| GE0805C-4 | JC0603C-3 |
| GE0805C-5 | JC0603C-5 |
| GE0805C-6 | JC0603C-7 |
| GE0805C-8 | |
| GE0805C-15 | |

| Tape Width, mm | Device Cavity Pitch, mm | Reel Size, inches | Devices per Reel | |
|----------------|-------------------------|-------------------|-------------------------------------|------|
| 8 | 4 | 7 | Small quantity standards (see note) | 20 |
| | | | | 50 |
| | | | | 100 |
| | | | | 200 |
| | | | | 500 |
| | | | | 1000 |
| | | | Standard | 4000 |

Note: Please Consult individual model data sheet to determine device per reel availability.

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

Go to: www.minicircuits.com/pages/pdfs/tape.pdf



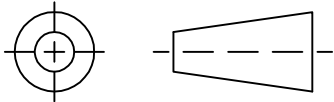
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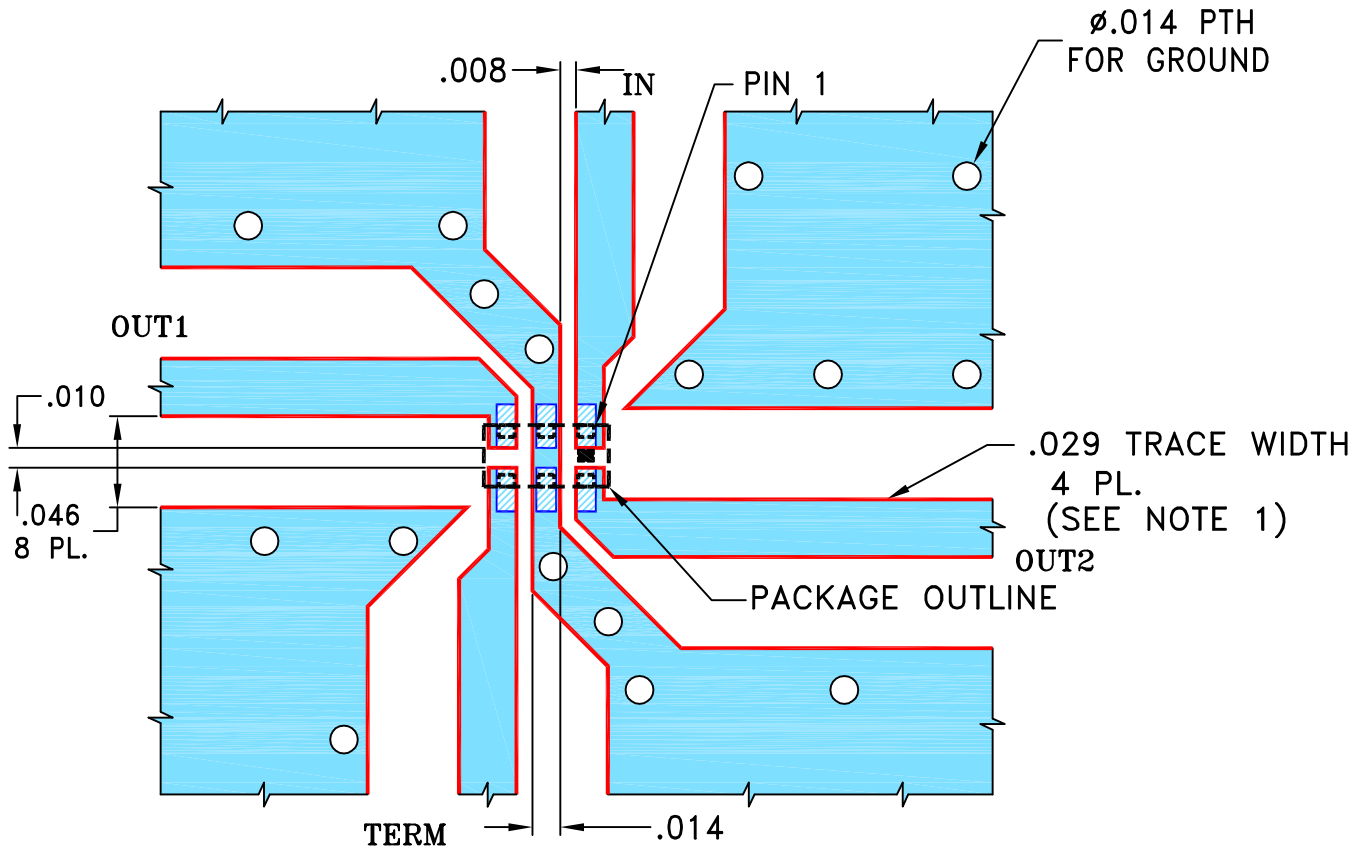
THIRD ANGLE PROJECTION



REVISIONS



| REV | ECN No. | DESCRIPTION | DATE | DR | AUTH |
|-----|---------|-------------|----------|----|------|
| OR | M168200 | NEW RELEASE | 05/31/18 | NP | SL |
| | | | | | |
| | | | | | |

SUGGESTED MOUNTING CONFIGURATION
FOR JC0603C CASE STYLE, "06DC12" PIN CODE




NOTES:

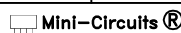
1. TRACE WIDTH IS SHOWN FOR FR4, GRADE IT-180TC (ITEQ CORP.) WITH DIELECTRIC THICKNESS $.016 \pm .0015$. COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH & GAP MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

 DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER).
 DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

| UNLESS OTHERWISE SPECIFIED | INITIALS | DATE |
|----------------------------|----------|----------|
| DRAWN | NP | 05/30/18 |
| CHECKED | GF | 05/30/18 |
| APPROVED | SL | 05/31/18 |

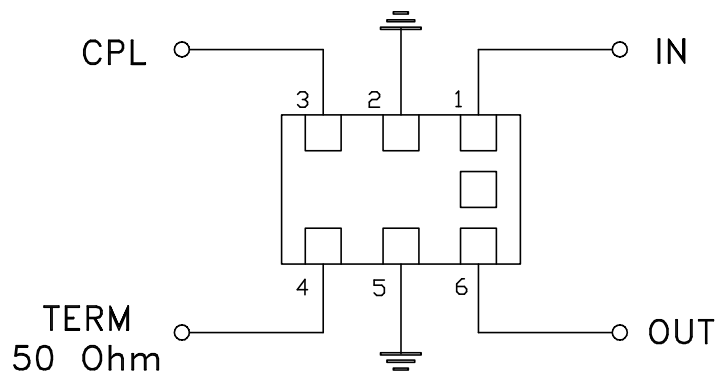
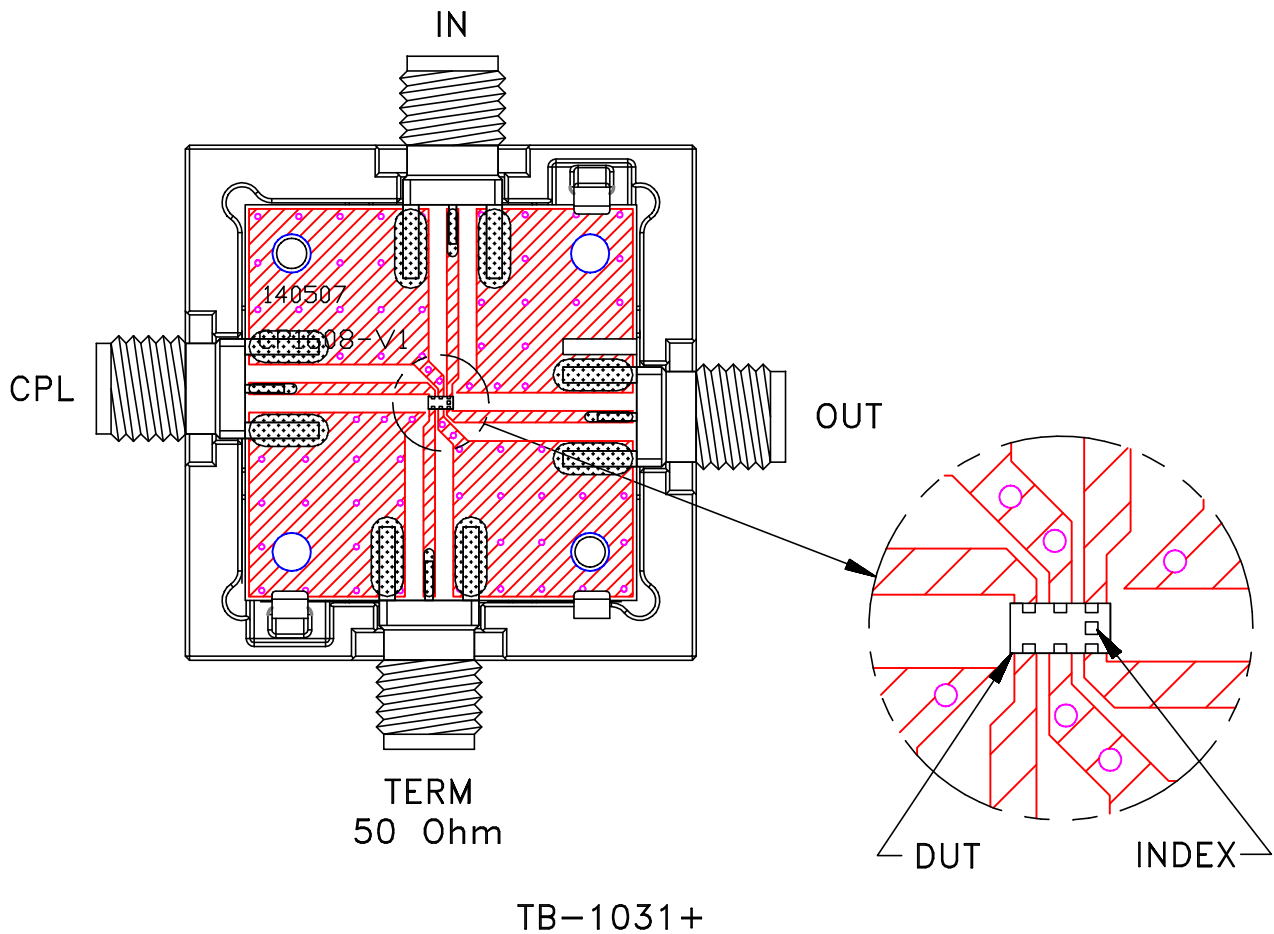
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PL, 06DC12, JC0603C, TB-1031+

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

| SIZE | CODE IDENT | DRAWING NO: | REV: |
|-------|------------|-------------|---------------|
| A | 15542 | 98-PL-572 | OR |
| FILE: | 98PL572 | SCALE: 10:1 | SHEET: 1 OF 1 |

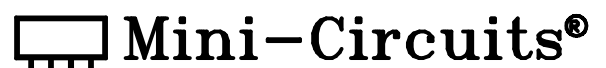
Evaluation Board and Circuit



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: FR4 or equivalent,
Dielectric Constant=4.5, Thickness=.016 inch.





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 Ambient Environment | Individual Model Data Sheet |
| Storage Temperature | -40° to 85° C Ambient Environment | Individual Model Data Sheet |
| Thermal Shock | -40° to 125°C, 100 cycles | MIL-STD-202 Method 107, Condition A-3 except -40°C instead of -55° C and +125° C instead of -85° C |
| Solder Reflow Heat | Pb-Free Process 245° -250°C peak, | J-STD-020, 4-2 and 5-2, Figure 5-1 |
| Solderability | 10X Magnification | J-STD-002, Para 4.2.5, Test S, 95% Coverage |
| Shelf Life | Shelf life is 12 months when kept in sealed bags. Unused parts are to be resealed to preserve shelf life for proper solderability. | |