

# Surface Mount Power Splitter/Combiner

## TCP-2-122-75X+

2 Way-0° 75Ω 5 to 1250 MHz

### Features

- operates over both upstream and downstream bands
- low insertion, 0.8 dB typ.
- excellent amplitude unbalance, 0.3 dB typ.
- very good phase unbalance, 1.0 deg. typ.
- external resistor & capacitor required
- aqueous washable
- leads for excellent solderability
- low cost

### Applications

- DOCSIS® 3.1 Systems
- VHF/UHF
- CATV
- cellular



Generic photo used for illustration purposes only

CASE STYLE: DB1627

**+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 |
| 13"                                      | 1000, 2000            |

### Electrical Specifications at 25°C

| Parameter                   | Frequency (MHz) | Min. | Typ. | Max. | Unit   |
|-----------------------------|-----------------|------|------|------|--------|
| Frequency Range             |                 | 5    |      | 1250 | MHz    |
| Insertion Loss Above 3.0 dB | 5-50            | —    | 0.5  | 0.7  | dB     |
|                             | 50-1000         | —    | 0.8  | 1.3  |        |
|                             | 1000-1250       | —    | 1.0  | 1.9  |        |
| Isolation                   | 5-1000          | 19   | 25   | —    | dB     |
|                             | 1000-1250       | 17   | 23   | —    |        |
| Phase Unbalance             | 5-1000          | —    | 1.0  | 3    | Degree |
|                             | 1000-1250       | —    | 2.0  | 5    |        |
| Amplitude Unbalance         | 5-1000          | —    | 0.3  | 0.6  | dB     |
|                             | 1000-1250       | —    | 0.5  | 0.8  |        |
| VSWR (Port S)               | 5-1000          | —    | 1.3  | 1.6  | :1     |
|                             | 1000-1250       | —    | 1.6  | 1.9  |        |
| VSWR (Port 1-2)             | 5-1000          | —    | 1.3  | 1.8  | :1     |
|                             | 1000-1250       | —    | 1.6  | 1.9  |        |

### Maximum Ratings

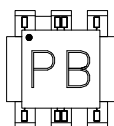
| Parameter                   | Ratings        |
|-----------------------------|----------------|
| Operating Temperature       | -40°C to 85°C  |
| Storage Temperature         | -55°C to 100°C |
| Power Input (as a splitter) | 0.5W max.      |

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

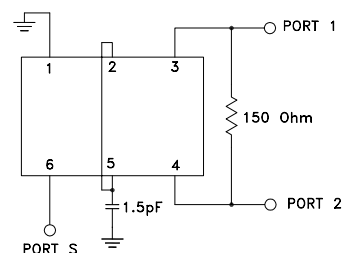
### Pin Connections

| Function             | Pin Number    |
|----------------------|---------------|
| SUM PORT             | 6             |
| PORT 1               | 3             |
| PORT 2               | 4             |
| GROUND               | 1             |
| CONNECT              | 2,5           |
| EXT. RESISTOR 150Ω   | 3,4           |
| EXT. CAPACITOR 1.5pF | 2 OR 5 TO GND |

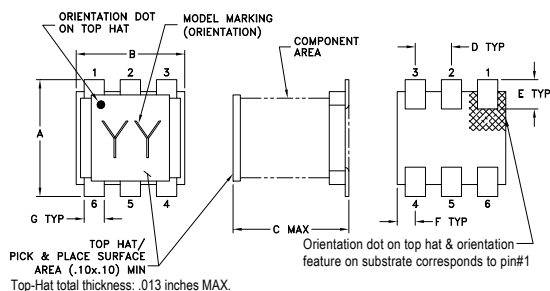
### Product Marking



### Electrical Schematic



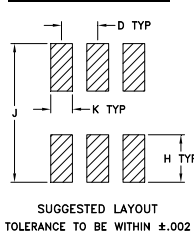
## Outline Drawing



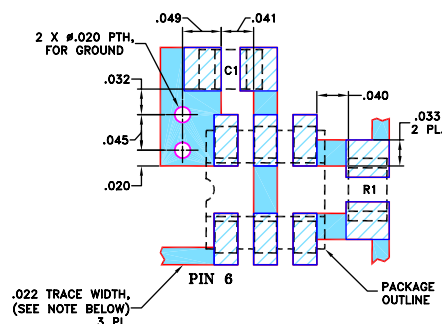
## Outline Dimensions (inch)

| A    | B    | C    | D    | E    | F     |
|------|------|------|------|------|-------|
| .160 | .150 | .160 | .050 | .040 | .025  |
| 4.06 | 3.81 | 4.06 | 1.27 | 1.02 | 0.64  |
| G    | H    | J    | K    | L    | wt    |
| .028 | .065 | .190 | .030 |      | grams |
| 0.71 | 1.65 | 4.83 | 0.76 |      | 0.15  |

## PCB Land Pattern



Demo Board MCL P/N: TB-124  
Suggested PCB Layout (PL-002)



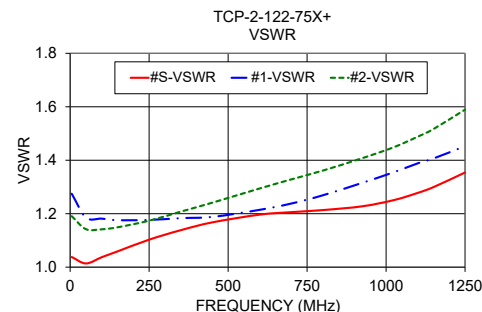
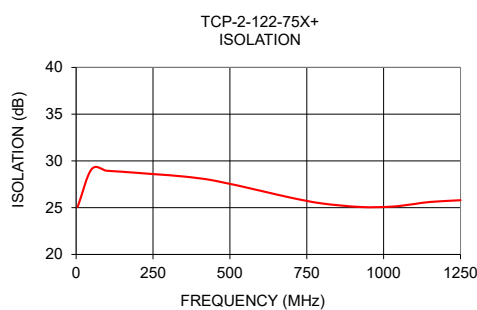
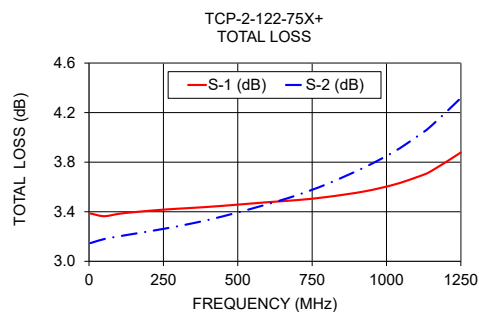
RESISTOR R1: 150 Ohm, 0805 SIZE  
CAPACITOR C1: 1.5 pF, 0805 SIZE

- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS  $0.030 \pm 0.002$ ; COPPER: 1 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

## Typical Performance Data

| Frequency (MHz) | Total Loss <sup>1</sup> (dB) | Amplitude Unbalance (dB) | Isolation (dB) | Phase Unbalance (deg.) | VSWR S | VSWR 1 | VSWR 2 |
|-----------------|------------------------------|--------------------------|----------------|------------------------|--------|--------|--------|
|                 | S-1                          | S-2                      |                |                        |        |        |        |
| 5               | 3.39                         | 3.15                     | 0.24           | 25.09                  | 1.29   | 1.04   | 1.27   |
| 50              | 3.36                         | 3.18                     | 0.19           | 29.10                  | 0.06   | 1.01   | 1.19   |
| 100             | 3.38                         | 3.20                     | 0.18           | 28.95                  | 0.10   | 1.04   | 1.18   |
| 150             | 3.40                         | 3.22                     | 0.17           | 28.84                  | 0.21   | 1.06   | 1.18   |
| 250             | 3.42                         | 3.26                     | 0.16           | 28.59                  | 0.39   | 1.10   | 1.18   |
| 350             | 3.43                         | 3.31                     | 0.12           | 28.33                  | 0.53   | 1.14   | 1.18   |
| 450             | 3.45                         | 3.36                     | 0.09           | 27.89                  | 0.64   | 1.17   | 1.19   |
| 600             | 3.48                         | 3.46                     | 0.02           | 26.81                  | 0.72   | 1.20   | 1.21   |
| 700             | 3.49                         | 3.53                     | 0.04           | 26.06                  | 0.67   | 1.21   | 1.24   |
| 800             | 3.52                         | 3.62                     | 0.10           | 25.45                  | 0.51   | 1.21   | 1.27   |
| 925             | 3.56                         | 3.76                     | 0.19           | 25.07                  | 0.09   | 1.23   | 1.32   |
| 1025            | 3.62                         | 3.88                     | 0.27           | 25.11                  | 0.42   | 1.25   | 1.36   |
| 1100            | 3.68                         | 4.00                     | 0.32           | 25.39                  | 0.90   | 1.28   | 1.39   |
| 1150            | 3.73                         | 4.09                     | 0.36           | 25.61                  | 1.30   | 1.30   | 1.41   |
| 1250            | 3.88                         | 4.32                     | 0.44           | 25.80                  | 1.99   | 1.35   | 1.45   |

1. Total Loss = Insertion Loss + 3dB splitter loss.



## Additional 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-Circuits' applicable established test performance criteria and measurement instructions.
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