

Surface Mount Phase Detector

50Ω High Output 10 to 200 MHz

SYPD-2+ SYPD-2



CASE STYLE: TTT167
PRICE: \$18.95 ea. QTY (1-9)

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

Maximum Ratings

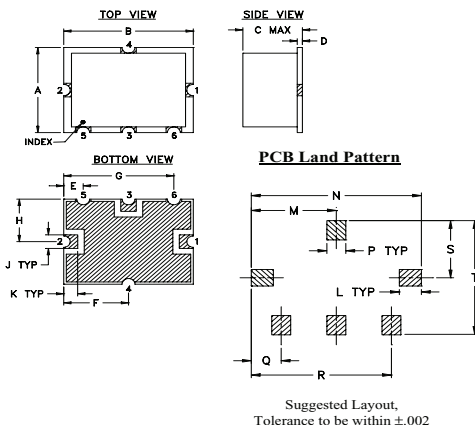
| | |
|-----------------------|----------------|
| Operating Temperature | -40°C to 85°C |
| Storage Temperature | -55°C to 100°C |
| Input Power | 50mW |
| Peak IF current | 20mA |

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

Pin Connections

| | |
|--------------|-------|
| RF REF (RF2) | 2 |
| RF IN (RF1) | 1 |
| DC OUT (I) | 3 |
| GROUND | 4,5,6 |

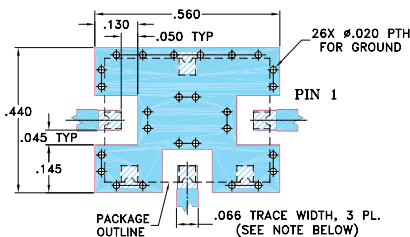
Outline Drawing



Outline Dimensions (inch/mm)

| A | B | C | D | E | F | G | H | J | K |
|------|-------|-------|------|------|-------|-------|-------|------|------|
| .38 | .50 | .23 | .020 | .075 | .250 | .425 | .187 | .050 | .050 |
| 9.65 | 12.70 | 5.84 | 0.51 | 1.91 | 6.35 | 10.80 | 4.75 | 1.27 | 1.27 |
| L | M | N | P | Q | R | S | T | wt. | |
| .070 | .270 | .540 | .060 | .095 | .445 | .208 | .415 | | |
| 1.78 | 6.86 | 13.72 | 1.52 | 2.41 | 11.30 | 5.28 | 10.54 | | 0.8 |

Demo Board MCL P/N: TB-12 Suggested PCB Layout (PL-079)



NOTE:

- 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.
 - THE USE OF SOLDER MASK OVER THE GROUND AREA UNDER THE UNIT AS SHOWN IS RECOMMENDED TO PREVENT POTENTIAL SHORTING. IF USER CHOOSES TO EXPOSE METAL UNDER THE ENTIRE UNIT GROUND PAD FOR IMPROVED GROUNDING, IT IS RECOMMENDED A SOLDER MASK DAM BE APPLIED AROUND EACH GROUND PAD TO ENSURE FILLET AND CONNECTION AT GROUND PADS.
 - BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER), SEE NOTE 2.

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.
C. The parts covered by this specification document are subject to Mini-Circuits 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-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp

Features

- wideband, 10 to 200 MHz
- low DC offset, 0.3 mV typ.
- high DC output, 1000 mV typ.
- high isolation, 40 dB min.

Applications

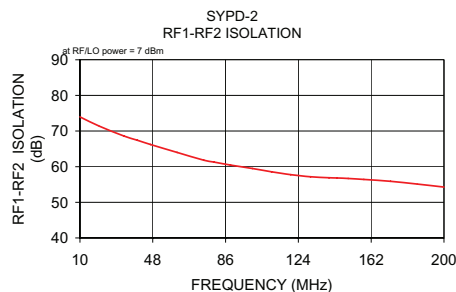
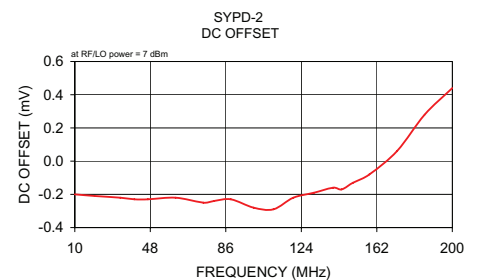
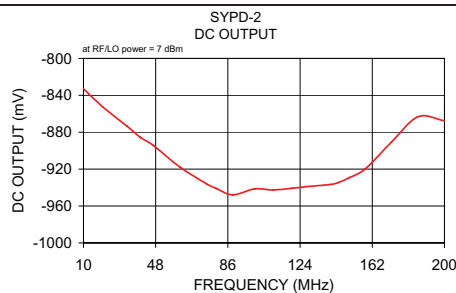
- monitoring circuits
- leveling circuits
- PLL

Phase Detector Electrical Specifications

| FREQUENCY (MHz) | POWER IN RF1 RF2 (dBm) | SCALE FACTOR mV/deg. | IMPEDANCE (ohms) Output Load I | ISOLATION (dB) RF1/RF2 Min. | OUTPUT POLARITY RF1/RF2 In-Phase | DC OUTPUT (mV) | | FIGURE OF MERIT Typ. | |
|-----------------|------------------------------|-------------------------|-----------------------------------|-----------------------------------|--|----------------|------------------|-------------------------|-----|
| | | | | | | Max. Typ. | Offset Typ. Max. | | |
| 10-200 | DC-50 | 7 | 8 | 500 | 40 | neg. | 1000 700 | 0.3 1 | 143 |

Typical Performance Data

| Frequency (MHz) | DC Output mV | | DC Offset mV | | RF1-RF2 Isolation (dB) |
|-----------------|--------------|----------|--------------|----------|------------------------|
| | \bar{X} | σ | \bar{X} | σ | |
| 10.00 | -832.85 | 8.84 | -0.20 | 0.31 | 73.96 |
| 20.00 | -852.33 | 8.56 | -0.21 | 0.32 | 71.39 |
| 32.86 | -873.37 | 8.31 | -0.22 | 0.33 | 68.61 |
| 40.00 | -885.64 | 8.09 | -0.23 | 0.33 | 67.41 |
| 46.79 | -894.39 | 7.95 | -0.23 | 0.33 | 66.22 |
| 60.71 | -917.70 | 7.62 | -0.22 | 0.35 | 64.00 |
| 74.64 | -935.82 | 7.73 | -0.25 | 0.37 | 61.81 |
| 80.00 | -941.09 | 7.83 | -0.24 | 0.37 | 61.28 |
| 88.57 | -947.91 | 8.28 | -0.23 | 0.38 | 60.45 |
| 100.00 | -941.46 | 8.44 | -0.28 | 0.40 | 59.49 |
| 110.00 | -942.62 | 8.94 | -0.29 | 0.41 | 58.55 |
| 120.00 | -940.69 | 9.51 | -0.22 | 0.40 | 57.75 |
| 130.36 | -938.41 | 10.59 | -0.19 | 0.39 | 57.17 |
| 140.00 | -936.70 | 11.75 | -0.16 | 0.37 | 56.90 |
| 144.29 | -934.52 | 12.34 | -0.17 | 0.36 | 56.82 |
| 150.00 | -929.14 | 12.91 | -0.13 | 0.38 | 56.68 |
| 158.21 | -919.94 | 13.74 | -0.08 | 0.40 | 56.42 |
| 172.14 | -890.67 | 15.14 | 0.06 | 0.41 | 55.90 |
| 186.07 | -863.24 | 17.28 | 0.28 | 0.31 | 55.11 |
| 200.00 | -867.58 | 20.41 | 0.44 | 0.24 | 54.28 |



electrical schematic

