

Surface Mount

Power Splitter/Combiner

SYPS-2-22HP+

2 Way-0° 50Ω 2 to 200 MHz 5 Watt

The Big Deal

- High power handling, 5W as a splitter
- High IP2 (+80 dB) and IP3 (+60 dB) at 1W input
- Low insertion loss, 0.5 dB
- Low unbalance, 0.1 dB / 1°
- Good isolation, 22 dB



CASE STYLE: AH202-1

Product Overview

Mini-Circuits' SYPS-2-22HP+ is a surface-mount 2-way 0° splitter/combiner covering the 2 to 200 MHz frequency range, supporting bandwidth requirements for a wide range of RF/microwave systems. This model can handle up to 5W RF input power as a splitter and provides low insertion loss, high isolation, low amplitude unbalance, and low phase unbalance. The unit comes housed in a miniature, shielded, 8-lead package (0.38 x 0.50 x 0.25") with wrap-around terminations for excellent solderability.

Key Features

| Feature | Advantages |
|---|--|
| High power handling, 5W | Supports a wide range of power requirements in a miniature package, minimizing space requirements. |
| High IP2, +80 dBm High IP3, +60 dBm | Minimizes second harmonic and third order intermodulation where multiple carriers may be present. |
| Low insertion loss, 0.5 dB (above 3 dB theoretical loss) | The combination of 5W power handling and low insertion loss makes this model a suitable candidate for distributing signals while maintaining excellent transmission of signal power. |
| High isolation, 22 dB | Minimizes interference between ports. |
| Low unbalance, 0.1 dB / 1° | Low unbalance provides nearly equal output signals, ideal for parallel path/multichannel systems. |
| Small size, 0.38 x 0.50 x 0.25" | Saves space in dense PCB layouts. |

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.
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



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Maximum Ratings

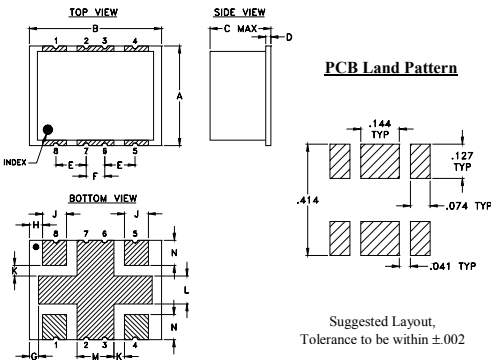
| | |
|-----------------------------|----------------|
| Operating Temperature | -40°C to 85°C |
| Storage Temperature | -55°C to 100°C |
| Power Input (as a splitter) | 5W max. |
| Internal Dissipation | 0.25W max. |

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

Pin Connections

| | |
|----------|-----------|
| SUM PORT | 8 |
| PORT 1 | 5 |
| PORT 2 | 4 |
| GROUND | 1,2,3,6,7 |

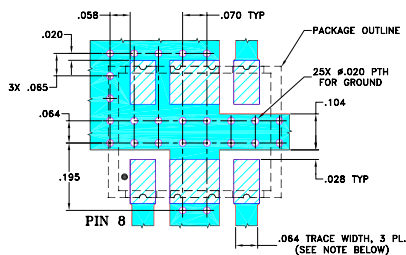
Outline Drawing



Outline Dimensions (inch/mm)

| A | B | C | D | E | F | G |
|------|-------|------|------|------|------|-------|
| .38 | .50 | .25 | .020 | .115 | .070 | .035 |
| 9.65 | 12.70 | 6.35 | 0.51 | 2.92 | 1.78 | 0.89 |
| H | J | K | L | M | N | wt |
| .050 | .090 | .040 | .105 | .140 | .095 | grams |
| 1.27 | 2.29 | 1.02 | 2.67 | 3.56 | 2.41 | 0.80 |

Demo Board MCL P/N: TB-427+ Suggested PCB Layout (PL-274)



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

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Features

- high IP2, +80 dBm typ., IP3, +60 dBm at 1watt input
- low amplitude unbalance, 0.1 dB typ.
- low phase unbalance, 1.0 deg. typ.
- low insertion loss, 0.5 dB typ.

Applications

- VHF/UHF
- cellular, GPS, PCS
- communication systems
- instrumentation



Generic photo used for illustration purposes only

CASE STYLE: AH202-1

+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 13" Devices/Reel 200

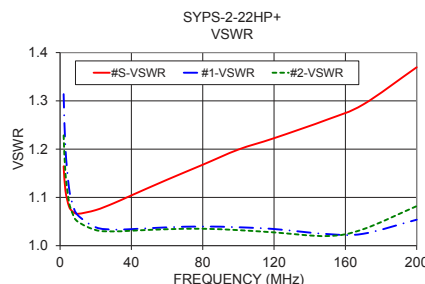
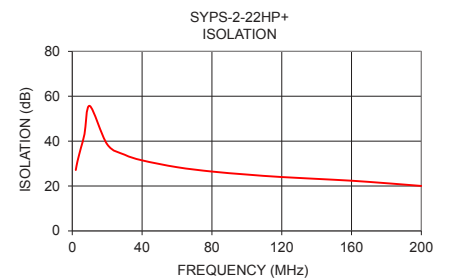
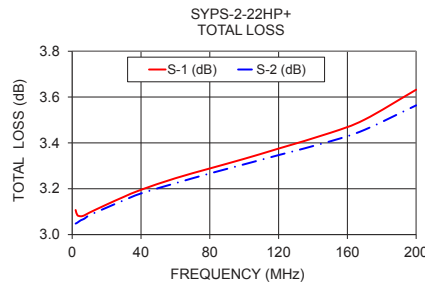
Electrical Specifications at 25°C

| Parameter | Frequency (MHz) | Min. | Typ. | Max. | Unit |
|--|-----------------|------|------|------|--------|
| Frequency | | 2 | | 200 | MHz |
| Insertion Loss (above theoretical 3.0 dB) | 5-150 | — | 0.4 | 0.6 | dB |
| | 2-200 | — | 0.6 | 0.9 | |
| Isolation | 2-200 | 18 | 22 | — | dB |
| Phase Unbalance | 5-150 | — | 0.1 | 1.5 | Degree |
| | 2-200 | — | 1.5 | 4 | |
| Amplitude Unbalance | 2-200 | — | 0.1 | 0.25 | dB |
| VSWR (Port S) | 5-150 | — | 1.15 | 1.35 | :1 |
| | 2-200 | — | 1.25 | 1.45 | |
| VSWR (Port 1-2) | 5-150 | — | 1.00 | 1.25 | :1 |
| | 2-200 | — | 1.20 | 1.45 | |

Typical Performance Data

| Frequency (MHz) | Total Loss ¹ (dB) | | Amplitude Unbalance (dB) | Isolation (dB) | Phase Unbalance (deg.) | VSWR S | VSWR 1 | VSWR 2 |
|-----------------|------------------------------|------|--------------------------|----------------|------------------------|--------|--------|--------|
| | S-1 | S-2 | | | | | | |
| 2 | 3.11 | 3.05 | 0.06 | 27.13 | 1.91 | 1.16 | 1.31 | 1.23 |
| 3 | 3.08 | 3.05 | 0.03 | 31.11 | 1.29 | 1.11 | 1.20 | 1.15 |
| 5 | 3.08 | 3.06 | 0.02 | 37.15 | 0.78 | 1.08 | 1.12 | 1.09 |
| 7 | 3.08 | 3.07 | 0.01 | 43.15 | 0.56 | 1.07 | 1.09 | 1.07 |
| 10 | 3.10 | 3.08 | 0.01 | 55.69 | 0.37 | 1.07 | 1.06 | 1.05 |
| 20 | 3.13 | 3.12 | 0.01 | 38.59 | 0.14 | 1.07 | 1.04 | 1.03 |
| 30 | 3.16 | 3.15 | 0.01 | 33.95 | 0.06 | 1.09 | 1.03 | 1.03 |
| 40 | 3.20 | 3.18 | 0.02 | 31.44 | 0.01 | 1.10 | 1.03 | 1.03 |
| 60 | 3.25 | 3.22 | 0.02 | 28.39 | 0.02 | 1.14 | 1.04 | 1.03 |
| 80 | 3.29 | 3.27 | 0.02 | 26.45 | 0.03 | 1.17 | 1.04 | 1.04 |
| 100 | 3.33 | 3.31 | 0.02 | 25.12 | 0.04 | 1.20 | 1.04 | 1.03 |
| 120 | 3.38 | 3.35 | 0.03 | 24.00 | 0.02 | 1.22 | 1.03 | 1.03 |
| 150 | 3.44 | 3.41 | 0.04 | 22.79 | 0.14 | 1.26 | 1.02 | 1.02 |
| 170 | 3.50 | 3.46 | 0.04 | 21.84 | 0.28 | 1.29 | 1.02 | 1.03 |
| 200 | 3.63 | 3.56 | 0.07 | 20.03 | 0.60 | 1.37 | 1.05 | 1.08 |

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



Electrical Schematic

