

## Engineering Development Model

# Power Splitter/Combiner

# SY4PS-ED13919/3

## 4 Way-0°

### Important Note

This model has been designed, built and tested in our engineering department. Performance data represents model capability. At present it is a non-catalog model. On request, we can supply a final specification sheet, part number and price/delivery information.



Please click "Back", and then click "Contact Us" for Applications support.

CASE STYLE : 99-01-1482

### ELECTRICAL SPECIFICATIONS 75Ω @ +25°C

| Parameter                   |               | Min. | Typ. | Max. | Units |
|-----------------------------|---------------|------|------|------|-------|
| Frequency                   |               | 5    |      | 3000 | MHz   |
| Isolation                   | 5-50 MHz      |      | 23   |      | dB    |
|                             | 50-1500 MHz   |      | 20   |      | dB    |
|                             | 1500-3000 MHz |      | 18   |      | dB    |
| Insertion Loss Above 6.0 dB | 5-50 MHz      |      | 2.0  |      | dB    |
|                             | 50-1500 MHz   |      | 1.8  |      | dB    |
|                             | 1500-3000 MHz |      | 3.5  |      | dB    |
| Phase Unbalance             | 5-50 MHz      |      | 0.5  |      | deg.  |
|                             | 50-1500 MHz   |      | 1.0  |      | deg.  |
|                             | 1500-3000 MHz |      | 10.0 |      | deg.  |
| Amplitude Unbalance         | 5-50 MHz      |      | 0.10 |      | dB    |
|                             | 50-1500 MHz   |      | 0.10 |      | dB    |
|                             | 1500-3000 MHz |      | 0.60 |      | dB    |
| VSWR                        | SUM Port      |      | 1.30 |      | (:1)  |
|                             | OUT Ports     |      | 1.60 |      | (:1)  |

### MAXIMUM RATINGS

|                       |                |
|-----------------------|----------------|
| Operating Temperature | -40°C to 85°C  |
| Storage Temperature   | -55°C to 100°C |

### PIN CONNECTIONS

|          |                                |
|----------|--------------------------------|
| SUM PORT | 4                              |
| PORT 1   | 10                             |
| PORT 2   | 12                             |
| PORT 3   | 14                             |
| PORT 4   | 16                             |
| GND      | 1,2,3,5,6,7,8,9,11,13,15,17,18 |

### Functional Diagram



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  
The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: [www.minicircuits.com](http://www.minicircuits.com)

IF/RF MICROWAVE COMPONENTS

REV. X1  
SY4PS-ED13919/3  
10/7/2011  
Page 1 of 1

# 4 Way-0° Power Splitter/Combiner

SY4PS-ED13919/3

## Typical Performance Data

| FREQ.<br>(MHz) | TOTAL LOSS <sup>1</sup><br>(dB) |      |      |      | AMP.<br>UNBAL.<br>(dB) | ISOLATION<br>(dB) |       |       | PHASE<br>UNBAL.<br>(deg.) | FREQ.<br>(MHz) | VSWR<br>(:1) |      |      |      |      |
|----------------|---------------------------------|------|------|------|------------------------|-------------------|-------|-------|---------------------------|----------------|--------------|------|------|------|------|
|                | S-1                             | S-2  | S-3  | S-4  |                        | 1-2               | 1-3   | 3-4   |                           |                | S            | 1    | 2    | 3    | 4    |
| 5.0            | 7.82                            | 7.81 | 7.92 | 7.93 | 0.11                   | 23.88             | 27.86 | 24.03 | 0.49                      | 5.0            | 1.33         | 1.89 | 1.90 | 1.94 | 1.94 |
| 7.0            | 7.74                            | 7.74 | 7.83 | 7.84 | 0.10                   | 24.10             | 30.05 | 23.99 | 0.34                      | 7.0            | 1.26         | 1.75 | 1.75 | 1.78 | 1.78 |
| 9.0            | 7.70                            | 7.70 | 7.80 | 7.79 | 0.10                   | 24.23             | 31.79 | 24.03 | 0.28                      | 9.0            | 1.22         | 1.67 | 1.68 | 1.69 | 1.69 |
| 10.0           | 7.70                            | 7.68 | 7.78 | 7.78 | 0.10                   | 24.32             | 32.41 | 24.04 | 0.26                      | 10.0           | 1.21         | 1.65 | 1.65 | 1.67 | 1.67 |
| 40.0           | 7.72                            | 7.71 | 7.80 | 7.80 | 0.09                   | 24.90             | 41.89 | 24.44 | 0.20                      | 40.0           | 1.16         | 1.57 | 1.56 | 1.57 | 1.57 |
| 70.0           | 7.75                            | 7.74 | 7.82 | 7.82 | 0.08                   | 24.99             | 43.97 | 24.61 | 0.16                      | 70.0           | 1.16         | 1.56 | 1.56 | 1.56 | 1.56 |
| 100.0          | 7.76                            | 7.75 | 7.83 | 7.83 | 0.08                   | 24.93             | 44.86 | 24.54 | 0.20                      | 100.0          | 1.15         | 1.55 | 1.55 | 1.56 | 1.56 |
| 400.0          | 7.82                            | 7.81 | 7.88 | 7.89 | 0.08                   | 21.95             | 42.15 | 21.72 | 0.25                      | 400.0          | 1.13         | 1.45 | 1.46 | 1.47 | 1.46 |
| 700.0          | 7.90                            | 7.89 | 7.96 | 7.96 | 0.07                   | 19.71             | 37.75 | 19.44 | 0.58                      | 700.0          | 1.08         | 1.30 | 1.31 | 1.34 | 1.32 |
| 1000.0         | 7.97                            | 7.97 | 8.03 | 8.03 | 0.06                   | 19.15             | 34.77 | 18.86 | 0.76                      | 1000.0         | 1.01         | 1.15 | 1.16 | 1.16 | 1.14 |
| 1100.0         | 8.00                            | 8.00 | 8.06 | 8.06 | 0.06                   | 19.42             | 34.35 | 19.13 | 0.83                      | 1100.0         | 1.01         | 1.11 | 1.12 | 1.11 | 1.09 |
| 1200.0         | 8.04                            | 8.03 | 8.11 | 8.10 | 0.07                   | 19.73             | 34.05 | 19.39 | 0.95                      | 1200.0         | 1.03         | 1.07 | 1.08 | 1.07 | 1.07 |
| 1300.0         | 8.09                            | 8.08 | 8.14 | 8.13 | 0.07                   | 20.40             | 34.04 | 20.00 | 1.14                      | 1300.0         | 1.05         | 1.05 | 1.03 | 1.04 | 1.06 |
| 1400.0         | 8.13                            | 8.11 | 8.18 | 8.17 | 0.07                   | 21.03             | 34.18 | 20.57 | 1.34                      | 1400.0         | 1.07         | 1.05 | 1.02 | 1.04 | 1.08 |
| 1500.0         | 8.18                            | 8.15 | 8.22 | 8.20 | 0.07                   | 21.95             | 34.88 | 21.40 | 1.61                      | 1500.0         | 1.07         | 1.07 | 1.06 | 1.07 | 1.10 |
| 1600.0         | 8.26                            | 8.21 | 8.26 | 8.24 | 0.05                   | 22.68             | 35.56 | 22.05 | 1.77                      | 1600.0         | 1.07         | 1.09 | 1.09 | 1.09 | 1.11 |
| 1700.0         | 8.31                            | 8.27 | 8.29 | 8.27 | 0.05                   | 23.53             | 36.21 | 22.78 | 2.01                      | 1700.0         | 1.08         | 1.11 | 1.12 | 1.12 | 1.12 |
| 1800.0         | 8.35                            | 8.28 | 8.29 | 8.26 | 0.10                   | 24.10             | 36.36 | 23.31 | 2.15                      | 1800.0         | 1.09         | 1.13 | 1.16 | 1.14 | 1.12 |
| 1900.0         | 8.35                            | 8.27 | 8.26 | 8.22 | 0.13                   | 24.73             | 36.02 | 23.92 | 2.29                      | 1900.0         | 1.11         | 1.15 | 1.20 | 1.19 | 1.15 |
| 2000.0         | 8.37                            | 8.28 | 8.25 | 8.20 | 0.17                   | 24.88             | 35.65 | 24.24 | 2.38                      | 2000.0         | 1.12         | 1.18 | 1.22 | 1.24 | 1.18 |
| 2100.0         | 8.44                            | 8.32 | 8.29 | 8.23 | 0.21                   | 24.84             | 35.32 | 24.42 | 2.43                      | 2100.0         | 1.14         | 1.21 | 1.23 | 1.28 | 1.20 |
| 2200.0         | 8.55                            | 8.41 | 8.36 | 8.29 | 0.25                   | 24.09             | 34.84 | 23.90 | 2.48                      | 2200.0         | 1.15         | 1.24 | 1.24 | 1.32 | 1.23 |
| 2300.0         | 8.65                            | 8.48 | 8.44 | 8.37 | 0.28                   | 23.35             | 34.87 | 23.34 | 2.52                      | 2300.0         | 1.15         | 1.27 | 1.25 | 1.36 | 1.26 |
| 2400.0         | 8.74                            | 8.56 | 8.54 | 8.45 | 0.29                   | 22.33             | 34.08 | 22.48 | 2.55                      | 2400.0         | 1.14         | 1.30 | 1.26 | 1.39 | 1.29 |
| 2500.0         | 8.89                            | 8.69 | 8.66 | 8.58 | 0.31                   | 21.71             | 33.41 | 21.92 | 2.56                      | 2500.0         | 1.12         | 1.32 | 1.27 | 1.42 | 1.31 |
| 2600.0         | 9.08                            | 8.85 | 8.80 | 8.72 | 0.35                   | 20.86             | 32.18 | 21.12 | 2.64                      | 2600.0         | 1.11         | 1.35 | 1.28 | 1.43 | 1.32 |
| 2700.0         | 9.20                            | 8.96 | 8.89 | 8.82 | 0.38                   | 20.34             | 30.93 | 20.58 | 2.81                      | 2700.0         | 1.09         | 1.37 | 1.29 | 1.42 | 1.31 |
| 2800.0         | 9.30                            | 9.02 | 8.96 | 8.90 | 0.40                   | 19.67             | 29.68 | 19.88 | 2.96                      | 2800.0         | 1.11         | 1.37 | 1.31 | 1.40 | 1.29 |
| 2900.0         | 9.40                            | 9.11 | 9.02 | 8.97 | 0.44                   | 18.96             | 28.71 | 19.06 | 3.24                      | 2900.0         | 1.16         | 1.35 | 1.32 | 1.37 | 1.28 |
| 3000.0         | 9.57                            | 9.25 | 9.13 | 9.09 | 0.48                   | 18.40             | 28.07 | 18.26 | 3.48                      | 3000.0         | 1.24         | 1.33 | 1.29 | 1.33 | 1.26 |

<sup>1</sup>Total Loss = Insertion Loss + 6dB Splitter Loss



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  
 The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: [www.minicircuits.com](http://www.minicircuits.com)

IF/RF MICROWAVE COMPONENTS

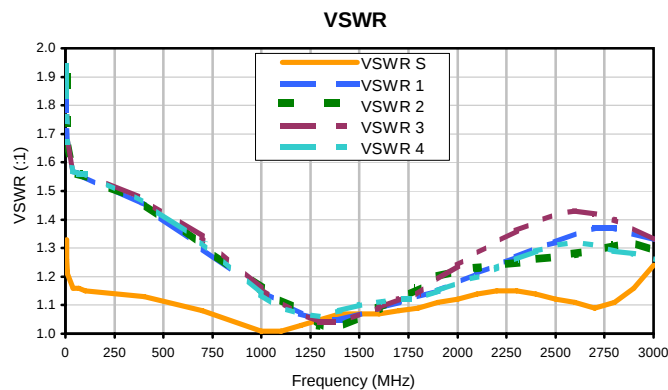
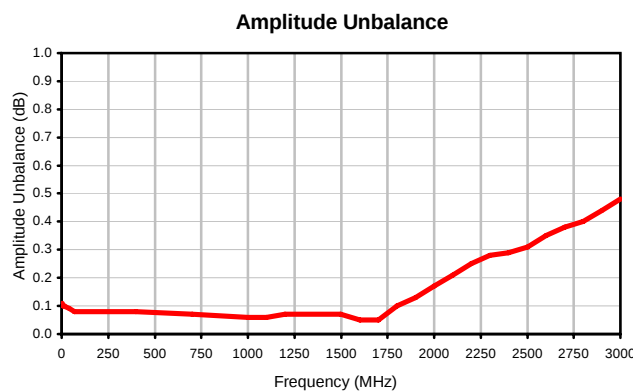
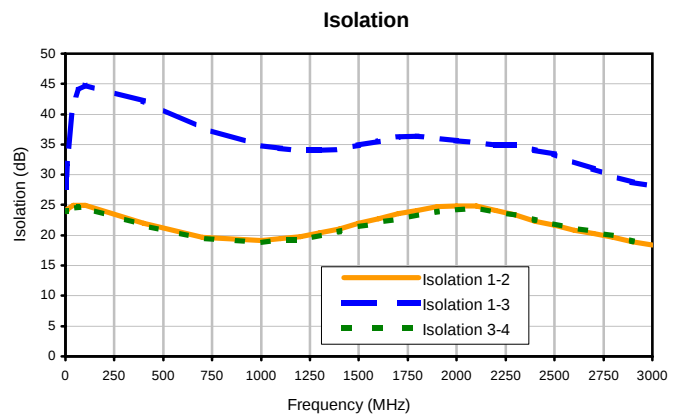
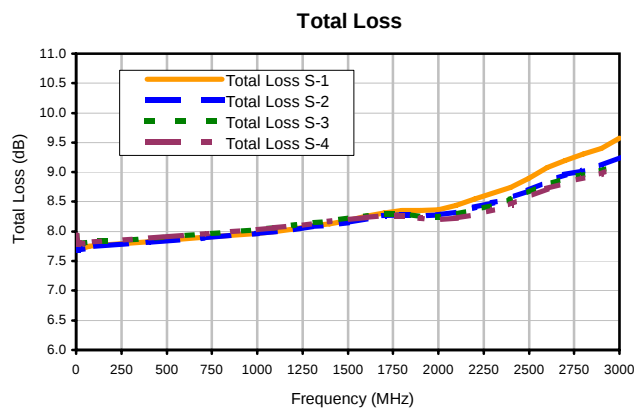


REV. X1  
 SY4PS-ED13919/3  
 10/7/2011  
 Page 1 of 1

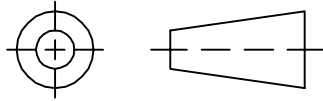
# 4 Way-0° Power Splitter/Combiner

SY4PS-ED13919/3

## Typical Performance Curves



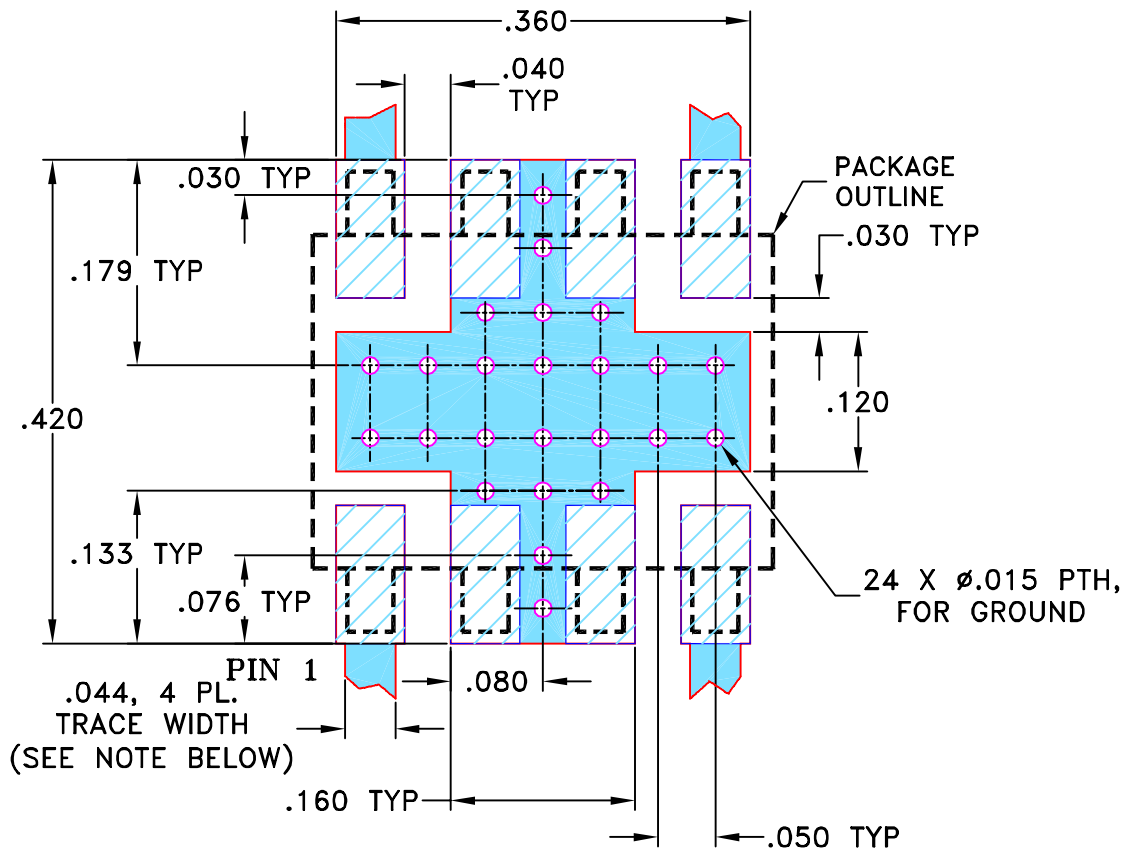
## THIRD ANGLE PROJECTION



## REVISIONS

| REV | ECN No. | DESCRIPTION                          | DATE     | DR | AUTH |
|-----|---------|--------------------------------------|----------|----|------|
| OR  | M82272  | NEW RELEASE                          | 08/06/02 | GF | DJ   |
| A   | M102713 | UPDATED NOTES, ADDED "...WITH SMOBC" | 01/16/06 | GT | IL   |
|     |         |                                      |          |    |      |
|     |         |                                      |          |    |      |

### SUGGESTED MOUNTING CONFIGURATION FOR CJ725 CASE STYLE, "ma", "nf" PIN CONNECTIONS



NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS  $0.020'' \pm 0.0015''$ . 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

DRAWN

GF

07/18/02

TOLERANCES ON:

CHECKED

HY

08/01/02

2 PL DECIMALS  $\pm$ 

APPROVED

DJ

08/06/02

3 PL DECIMALS  $\pm$  .005ANGLES  $\pm$ FRACTIONS  $\pm$ 
 Mini-Circuits®

THIS DOCUMENT AND ITS CONTENTS ARE THE PROPERTY OF MINI-CIRCUITS. EXCEPT FOR USE EXPRESSLY GRANTED, IN WRITING, TO ITS VENDORS, VENDEE AND THE UNITED STATES GOVERNMENT, MINI-CIRCUITS RESERVES ALL PROPRIETARY DESIGN, USE, MANUFACTURING AND REPRODUCTION RIGHTS THERETO. THESE CONTENTS SHALL NOT BE USED, DUPLICATED OR DISCLOSED TO ANY OUTSIDE PARTY, IN WHOLE OR IN PART, WITHOUT WRITTEN PERMISSION OF MINI-CIRCUITS.

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



Mini-Circuits®

13 Neptune Avenue  
Brooklyn NY 11235

PL, ma/nf, CJ725, AD3PS/ADQ, TB-83

SIZE  
ACODE IDENT  
15542DRAWING NO:  
98-PL-063REV:  
A

FILE: 98PL063

SCALE: 6:1

SHEET: 1 OF 1



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                                                                              |