

Surface Mount

# Power Splitter/Combiner

**SYPS-2-33+**

2 Way-0° 50Ω 400 to 3000 MHz



CASE STYLE: AH202

## The Big Deal

- Low amplitude unbalance, 0.1 dB typ.
- Low phase unbalance, 1° typ.
- Low insertion loss, 0.7 dB typ.

## Product Overview

Mini-Circuits SYPS-2-33+ is a wideband, 2 way, 0° surface mount splitter/combiner. This model provides very low amplitude and phase unbalance with good isolation and insertion loss over the full frequency range. It handles up to 0.5W of input power and comes in a small plastic case with excellent thermal performance (- 40°C to 85°C operating).

## Key Features

Feature	Advantages
Wideband	Wide frequency coverage from 400 to 3000 MHz supports many applications.
Low AU and PU	SYPS-2-33+ produces nearly equal output signals.
Good insertion loss: • 0.6 dB typ, 700 – 2700 MHz • 1.0 dB typ., 400 – 3000 MHz	Well matched for 50Ω systems.
Good isolation • 21 dB typ., 400 – 3000 MHz	Good isolation over the entire band minimizes effect of load changes at one output port on another output port.
0.5W max. input power	High power handling accommodates a wide range of system power requirements.
Small size, 0.38 x 0.50 x 0.25 in.	Accommodates dense PCB layouts.

\*Does not include coupling loss

### 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](http://www.minicircuits.com/MCLStore/terms.jsp)



# Surface Mount Power Splitter/Combiner

## SYPS-2-33+

2 Way-0° 50Ω 400 to 3000 MHz

### Maximum Ratings

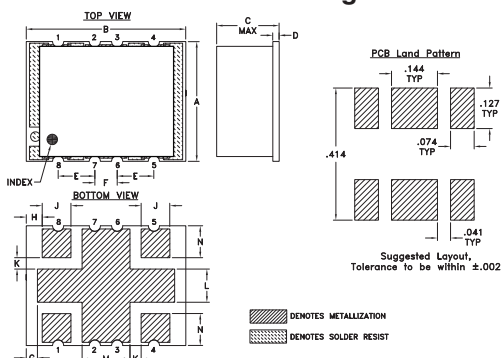
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
Power Input (as a splitter)	0.5W max.
Internal Dissipation	0.05W max.

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

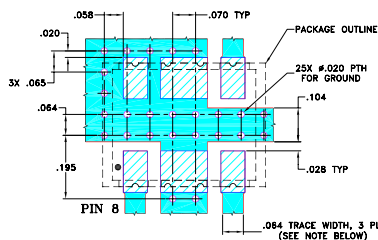
### Outline Drawing



### Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	H	
.38	.50	.25	.020	.115	.070	.035	.050	
9.65	12.70	6.35	0.51	2.92	1.78	0.89	1.27	
J	K	L	M	N				wt
.090	.040	.105	.140	.095				grams
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.  
■ DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)  
■ DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

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### Features

- wideband, 400 to 3000 MHz
- low amplitude unbalance, 0.1 dB typ.
- low phase unbalance, 1.0 deg. typ.
- low insertion loss, 0.7dB typ.

### Applications

- VHF/UHF
- cellular, GPS, PCS
- communication systems
- receivers & transmitters
- instrumentation
- CATV



Generic photo used for illustration purposes only

CASE STYLE: AH202

+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

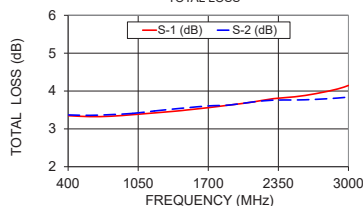
### Electrical Specifications at 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
<b>Frequency</b>		400		3000	MHz
<b>Insertion Loss (above theoretical 3.0 dB)</b>	700-2700 400-3000	—	0.6 1.0	1.6 2.1	dB
<b>Isolation</b>	400-3000	14	21	—	dB
<b>Phase Unbalance</b>	700-2700 400-3000	—	1.0 2.0	6 7	Degree
<b>Amplitude Unbalance</b>	700-2700 400-3000	—	0.1 0.3	0.6 0.9	dB
<b>VSWR (Port S)</b>	700-2700 400-3000	—	1.4 1.4	1.75 1.85	:1
<b>VSWR (Port 1-2)</b>	700-2700 400-3000	—	1.2 1.25	1.5 1.6	:1

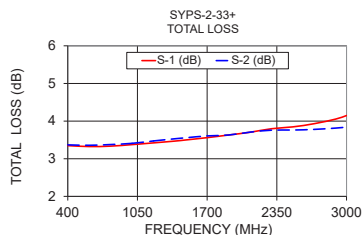
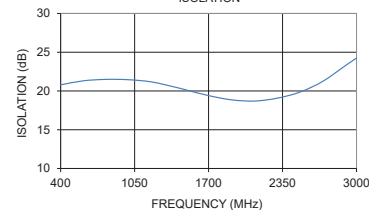
### Typical Performance Data

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						
400	3.35	3.37	0.02	20.79	0.32	1.43	1.35	1.34
600	3.32	3.36	0.03	21.31	0.46	1.31	1.25	1.25
800	3.33	3.38	0.04	21.49	0.67	1.25	1.21	1.19
1000	3.38	3.41	0.03	21.45	0.45	1.24	1.18	1.17
1200	3.42	3.47	0.05	21.16	0.46	1.25	1.15	1.15
1400	3.47	3.53	0.06	20.51	0.32	1.27	1.13	1.13
1500	3.50	3.56	0.06	20.14	0.26	1.29	1.11	1.12
1700	3.56	3.61	0.05	19.40	0.18	1.32	1.10	1.09
1900	3.63	3.63	0.00	18.86	0.20	1.37	1.10	1.10
2100	3.70	3.71	0.00	18.70	0.65	1.38	1.11	1.10
2300	3.80	3.76	0.04	19.06	0.74	1.35	1.12	1.07
2500	3.85	3.76	0.08	19.84	1.00	1.30	1.11	1.04
2700	3.93	3.78	0.15	21.21	1.25	1.19	1.09	1.03
2900	4.05	3.81	0.24	23.24	1.39	1.05	1.08	1.10
3000	4.15	3.84	0.31	24.25	1.46	1.04	1.09	1.15

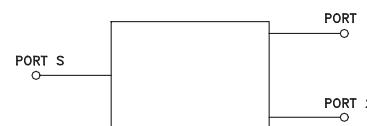
SYPS-2-33+ TOTAL LOSS 1. Total Loss = Insertion Loss + 3dB splitter theoretical loss.



SYPS-2-33+ ISOLATION



### Electrical Schematic



**Mini-Circuits**

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REV. D  
M154722  
SYPS-2-33+  
ED-14458A  
JC/CP/AM  
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