

Surface Mount

Power Splitter/Combiner

SYMT-122-75+

2 Way-0°/180° 75Ω 5 to 1218 MHz



CASE STYLE:AH202-1

The Big Deal

- Low amplitude unbalance, 0.3 dB typ.
- Low phase unbalance, ±3° typ.

Product Overview

Mini-Circuits SYMT-122-75+ is a wideband, 2 way, 0°/180° surface mount magic T splitter/combiner. This model provides very low amplitude and phase unbalance with good isolation over the full frequency range. It handles up to 0.5W of input power and comes in a small case with excellent thermal performance (- 40°C to 85°C operating).

Key Features

Feature	Advantages
Wideband	Wide frequency coverage from 5 to 1218 MHz supports many applications DOCSIS 3.1
Low amplitude unbalance and phase unbalance 0.3 dB typ. for amplitude unbalance ±3° typ. for phase unbalance	0.3 dB typ for amplifier unbalance ±3° typ. for phase unbalance produces nearly equal output signals.
Good return loss: • 18 dB typ., for all ports	Well matched for 75Ω systems.
Good isolation • 20 dB typ., for ports 1 & 2 • 30 dB typ., for S, J - ports	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

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Generic photo used for illustration purposes only

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+RoHS Compliant

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

Maximum Ratings

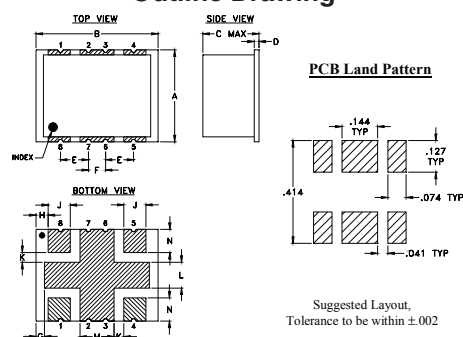
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
Power Input (as a splitter)	0.5W max.

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

Pin Connections

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

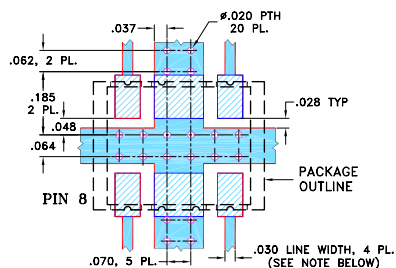
Outline Drawing



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-361+ Suggested PCB Layout (PL-229)



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.
- 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

- very good input VSWR, 1.3:1 typ. for all ports
- excellent amplitude unbalance, 0.3 dB typ.
- excellent phase unbalance, ±3° deg. typ.
- high isolation S-J ports, 30 dB typ.

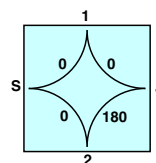
Applications

- DOCSIS 3.1 system
- cellular
- CATV
- VHF/UHF

Electrical Specifications at 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit	
Frequency		5		1218	MHz	
Insertion Loss (above theoretical 3.0 dB)	S-1, S-2	5-684 684-1218	— —	0.8 1.8	1.3 3.3	dB
	J-1, J-2	5-684 684-1218	— —	2.3 3.6	2.9 4.2	
Isolation	S-J	5-684 684-1218	25 20	35 25	— —	dB
	1-2	5-684 684-1218	20 13	30 18	— —	
Phase Unbalance (°) ±	5-1218	—	3.0	7.0	Degree	
Amplitude Unbalance (dB) ±	5-1218	—	0.3	0.6	dB	
VSWR (Port J)	5-1218	—	1.40	—	:1	
VSWR (Port 1-2, Port S)	5-1218	—	1.30	—	:1	

Electrical Schematic



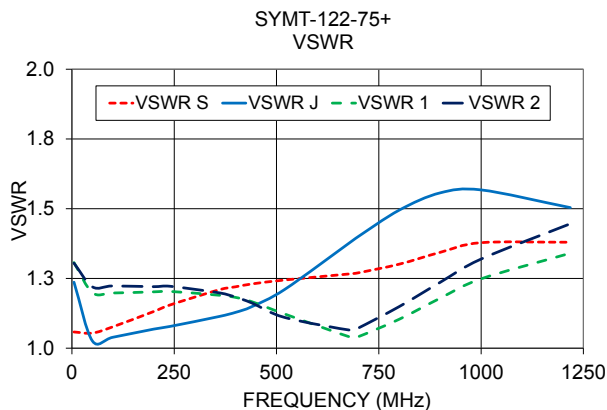
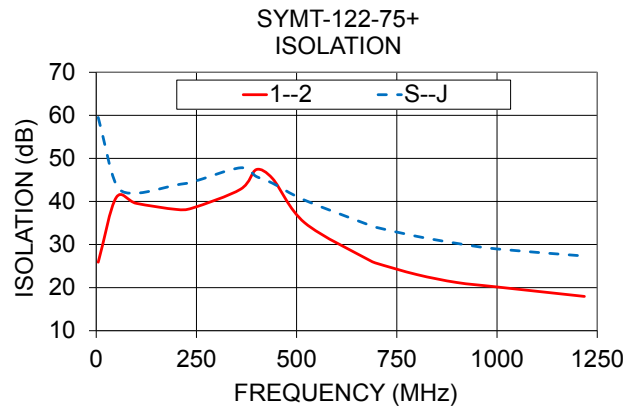
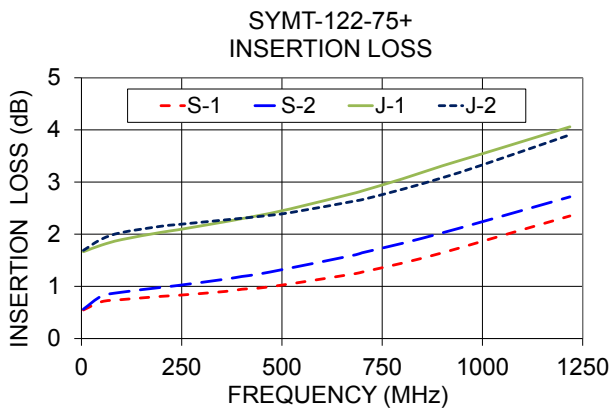
- S-J ports, isolation 30 typical
- Inphase ports, S-1 and S-2 insertion loss 1.5 dB typical
- Amplitude unbalance defined by input S or J ports to output 1 and 2



Typical Performance Data

Frequency (MHz)	Insertion Loss ¹ (dB)				Amplitude Unbalance (dB)			Isolation (dB)		Phase Unbalance (deg.)	VSWR S	VSWR J	VSWR 1	VSWR 2
	S-1	S-2	J-1	J-2	S1-S2	J1-J2	1-2	S-J	(S-1)-(S-2)					
5	0.55	0.56	1.66	1.69	0.02	0.03	25.90	59.52	0.08	179.84	1.06	1.24	1.31	1.30
50	0.71	0.81	1.79	1.90	0.11	0.11	40.93	43.88	0.32	179.33	1.05	1.03	1.20	1.22
100	0.75	0.89	1.90	2.03	0.14	0.14	39.57	41.94	0.18	179.17	1.08	1.04	1.20	1.22
200	0.81	0.98	2.04	2.15	0.17	0.12	38.15	43.84	0.02	178.73	1.13	1.07	1.20	1.22
240	0.83	1.02	2.08	2.19	0.19	0.10	38.47	44.52	0.06	178.55	1.15	1.08	1.20	1.22
360	0.90	1.14	2.24	2.28	0.24	0.03	42.84	47.82	0.31	178.02	1.21	1.11	1.19	1.20
400	0.94	1.19	2.30	2.31	0.24	0.01	47.43	45.77	0.36	177.86	1.22	1.13	1.18	1.18
440	0.96	1.23	2.35	2.34	0.27	0.02	45.32	44.24	0.51	177.77	1.23	1.15	1.17	1.16
520	1.05	1.35	2.48	2.41	0.30	0.07	35.06	40.31	0.72	177.48	1.24	1.21	1.12	1.11
684	1.25	1.61	2.79	2.64	0.36	0.15	26.24	34.43	1.36	177.23	1.27	1.38	1.04	1.06
700	1.27	1.64	2.83	2.66	0.37	0.17	25.63	33.96	1.45	177.19	1.27	1.40	1.04	1.07
800	1.45	1.83	3.06	2.86	0.38	0.20	23.02	31.90	1.86	177.14	1.30	1.49	1.10	1.15
900	1.64	2.03	3.31	3.08	0.38	0.23	21.18	30.26	2.13	177.13	1.34	1.56	1.18	1.24
1000	1.87	2.24	3.54	3.33	0.38	0.21	20.15	28.97	2.38	177.25	1.38	1.57	1.25	1.32
1218	2.35	2.72	4.06	3.91	0.37	0.15	17.95	27.33	2.72	177.09	1.38	1.50	1.34	1.45

1. Insertion Loss = Total Loss - splitter theoretical loss.



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