

Power Splitter/Combiner

3 Way-0° 50Ω 700 to 3000 MHz

SEPS-3-33+



Generic photo used for illustration purposes only

CASE STYLE: JF1258

+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 125

Maximum Ratings

Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
Power Input (as a splitter)	4W max.
Internal Dissipation	0.5W max.
DC Current	2.25 A(750mA for each port)

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

Pin Connections

SUM PORT	17
PORT 1	4
PORT 2	6
PORT 3	8
GROUND	all others

Features

- wide frequency band, 700-3000 MHz
- good isolation, 18 dB typ.
- good output matching, VSWR 1.1 typ.
- good coplanarity
- low unbalance
- shielded case
- aqueous washable

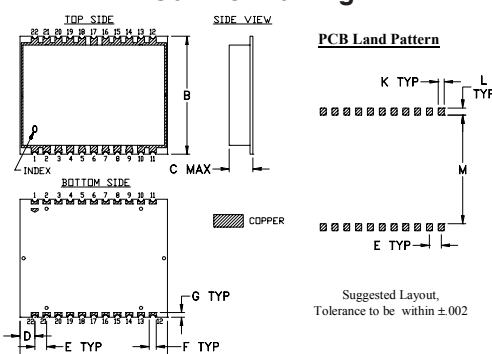
Applications

- cellular
- GPS
- PCS
- L Band

Electrical Specifications at 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		700		3000	MHz
Insertion Loss Above 4.8 dB	700 - 800	—	0.5	1.0	dB
	800 - 2200	—	0.9	1.5	
	2200 - 2700	—	1.1	1.6	
	2700 - 3000	—	1.2	1.7	
Isolation	700 - 800	14	17	—	dB
	800 - 2200	16	20	—	
	2200 - 2700	14	18	—	
	2700 - 3000	14	18	—	
Phase Unbalance	700 - 800	—	1.0	3.0	Degree
	800 - 2200	—	2.0	5.0	
	2200 - 2700	—	2.5	7.0	
	2700 - 3000	—	4.0	9.0	
Amplitude Unbalance	700 - 800	—	0.2	0.5	dB
	800 - 2200	—	0.2	0.5	
	2200 - 2700	—	0.1	0.5	
	2700 - 3000	—	0.3	0.8	
VSWR (Port S)	700 - 800	—	1.5	1.8	:1
	800 - 2200	—	1.2	1.8	
	2200 - 2700	—	1.6	2.0	
	2700 - 3000	—	1.5	2.0	
VSWR (Port 1-3)	700 - 800	—	1.3	1.5	:1
	800 - 2200	—	1.3	1.5	
	2200 - 2700	—	1.4	1.65	
	2700 - 3000	—	1.4	1.65	

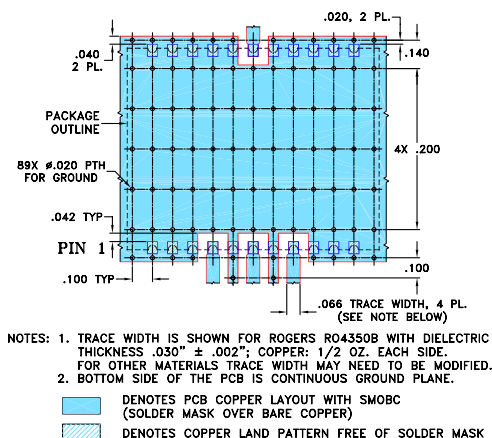
Outline Drawing



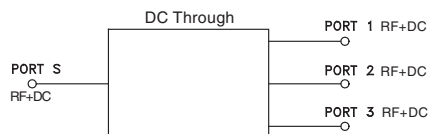
Outline Dimensions (inch/mm)

A	B	C	D	E	F	G
1.250	1.000	.200	.125	.100	.060	.040
31.75	25.40	5.08	3.18	2.54	1.52	1.02
H	J	K	L	M		wt
—	—	.050	.060	.920		grams
—	—	1.27	1.52	23.37		4.4

Demo Board MCL P/N: TB-513+
Suggested PCB Layout (PL-309)



Electrical Schematic



Notes

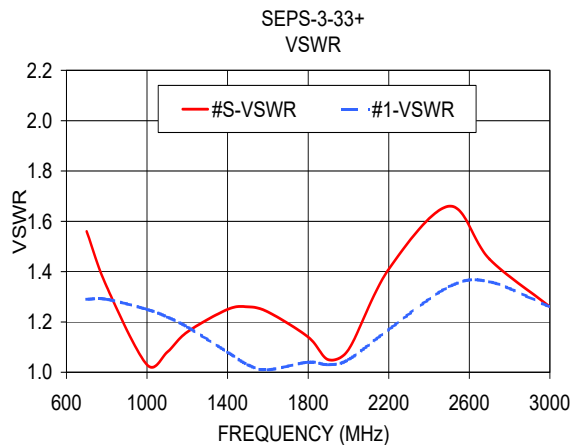
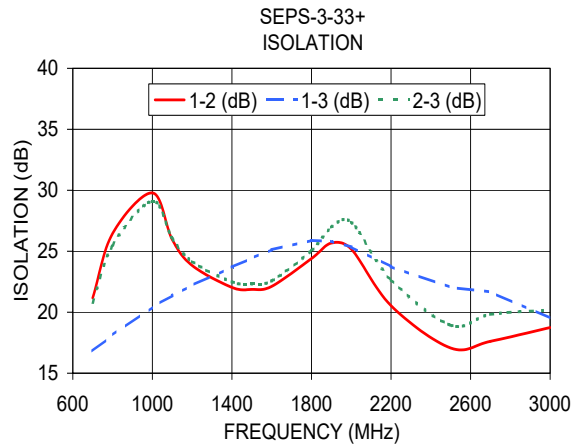
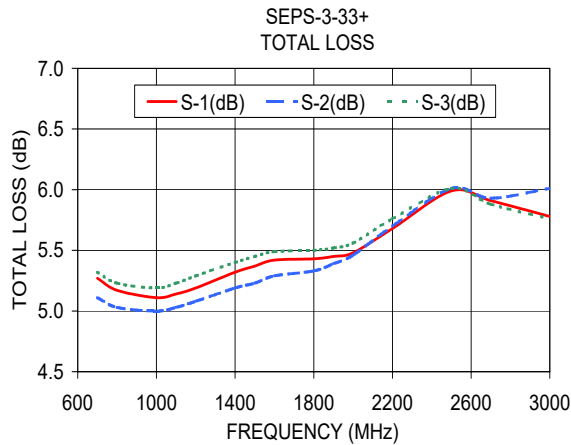
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Typical Performance Data

Freq. (MHz)	Total Loss ¹ (dB)			Amp. Unbal. (dB)	Isolation (dB)			Phase Unbal. (deg.)	VSWR S	VSWR 1	VSWR 2	VSWR 3
	S-1	S-2	S-3		1-2	1-3	2-3					
700.00	5.27	5.11	5.32	0.22	21.17	16.82	20.80	0.61	1.56	1.29	1.18	1.28
800.00	5.17	5.03	5.23	0.20	26.47	18.13	25.50	0.76	1.34	1.29	1.16	1.28
1000.00	5.11	5.00	5.19	0.19	29.79	20.42	29.11	1.11	1.03	1.25	1.09	1.26
1100.00	5.14	5.03	5.23	0.20	25.96	21.37	26.05	1.24	1.08	1.22	1.08	1.24
1200.00	5.19	5.08	5.29	0.21	23.83	22.20	24.15	1.36	1.16	1.18	1.09	1.20
1400.00	5.32	5.19	5.40	0.22	22.04	23.70	22.49	1.40	1.25	1.08	1.13	1.11
1500.00	5.37	5.23	5.45	0.22	21.87	24.43	22.32	1.37	1.26	1.03	1.13	1.06
1600.00	5.42	5.29	5.49	0.21	22.12	25.13	22.58	1.29	1.24	1.01	1.13	1.02
1800.00	5.43	5.33	5.50	0.16	24.40	25.89	25.06	1.20	1.14	1.04	1.11	1.00
1900.00	5.45	5.39	5.52	0.13	25.68	25.82	26.98	1.19	1.05	1.03	1.10	1.01
2000.00	5.48	5.46	5.56	0.11	25.17	25.35	27.38	1.21	1.09	1.05	1.10	1.05
2200.00	5.68	5.70	5.76	0.08	20.54	23.74	22.65	1.21	1.41	1.17	1.13	1.15
2500.00	5.99	6.01	6.01	0.02	17.07	22.04	18.94	0.92	1.66	1.34	1.09	1.30
2700.00	5.91	5.93	5.88	0.06	17.62	21.67	19.83	1.16	1.45	1.36	1.06	1.33
3000.00	5.78	6.01	5.76	0.25	18.75	19.52	20.18	3.61	1.26	1.26	1.36	1.26

1. Total Loss = Insertion Loss + 4.8dB splitter theoretical loss.



Notes

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3 Way-0° Power Splitter/Combiner

SEPS-3-33+

Typical Performance Data

FREQ. (MHz)	TOTAL LOSS ¹			AMP UNBAL. (dB)	ISOLATION			PHASE UNBAL. (Deg)	FREQ. (MHz)	VSWR			
	S1	S2	S3		1-2	1-3	2-3			S	1	2	3
50	6.05	6.01	6.07	0.06	6.56	6.28	6.58	0.80	50	2.94	2.75	2.62	2.74
75	6.06	5.98	6.08	0.11	7.05	6.52	7.07	1.00	75	2.92	2.57	2.36	2.56
100	6.07	5.95	6.09	0.15	7.59	6.84	7.61	1.07	100	2.89	2.38	2.13	2.38
200	6.04	5.82	6.07	0.25	9.59	8.66	9.62	0.92	200	2.74	1.79	1.54	1.79
300	5.93	5.69	5.97	0.28	11.25	10.60	11.28	0.65	300	2.55	1.48	1.29	1.48
400	5.79	5.55	5.83	0.28	12.95	12.35	12.94	0.47	400	2.32	1.34	1.20	1.33
500	5.64	5.42	5.68	0.26	15.08	13.97	15.01	0.44	500	2.07	1.29	1.19	1.28
600	5.44	5.25	5.49	0.23	17.56	15.49	17.40	0.47	600	1.81	1.29	1.19	1.28
700	5.27	5.11	5.32	0.22	21.17	16.82	20.80	0.61	700	1.56	1.29	1.18	1.28
750	5.21	5.06	5.27	0.21	23.56	17.48	22.98	0.68	750	1.45	1.29	1.17	1.28
800	5.17	5.03	5.23	0.20	26.47	18.13	25.50	0.76	800	1.34	1.29	1.16	1.28
900	5.11	4.99	5.19	0.20	32.78	19.35	30.36	0.93	900	1.17	1.27	1.12	1.28
1000	5.11	5.00	5.19	0.19	29.79	20.42	29.11	1.11	1000	1.03	1.25	1.09	1.26
1100	5.14	5.03	5.23	0.20	25.96	21.37	26.05	1.24	1100	1.08	1.22	1.08	1.24
1200	5.19	5.08	5.29	0.21	23.83	22.20	24.15	1.36	1200	1.16	1.18	1.09	1.20
1300	5.25	5.13	5.35	0.21	22.63	22.95	23.05	1.40	1300	1.22	1.13	1.11	1.16
1400	5.32	5.19	5.40	0.22	22.04	23.70	22.49	1.40	1400	1.25	1.08	1.13	1.11
1500	5.37	5.23	5.45	0.22	21.87	24.43	22.32	1.37	1500	1.26	1.03	1.13	1.06
1600	5.42	5.29	5.49	0.21	22.12	25.13	22.58	1.29	1600	1.24	1.01	1.13	1.02
1700	5.43	5.31	5.50	0.19	22.98	25.61	23.46	1.23	1700	1.21	1.03	1.12	1.00
1800	5.43	5.33	5.50	0.16	24.40	25.89	25.06	1.20	1800	1.14	1.04	1.11	1.00
1900	5.45	5.39	5.52	0.13	25.68	25.82	26.98	1.19	1900	1.05	1.03	1.10	1.01
2000	5.48	5.46	5.56	0.11	25.17	25.35	27.38	1.21	2000	1.09	1.05	1.10	1.05
2100	5.55	5.56	5.64	0.09	22.90	24.58	25.22	1.24	2100	1.24	1.10	1.11	1.09
2200	5.68	5.70	5.76	0.08	20.54	23.74	22.65	1.21	2200	1.41	1.17	1.13	1.15
2300	5.82	5.85	5.89	0.07	18.77	22.99	20.71	1.20	2300	1.55	1.23	1.14	1.21
2400	5.93	5.96	5.98	0.05	17.63	22.41	19.49	1.10	2400	1.65	1.29	1.13	1.26
2500	5.99	6.01	6.01	0.02	17.07	22.04	18.94	0.92	2500	1.66	1.34	1.09	1.30
2600	5.98	5.99	5.97	0.02	17.08	21.84	19.04	0.89	2600	1.59	1.36	1.03	1.33
2700	5.91	5.93	5.88	0.06	17.62	21.67	19.83	1.16	2700	1.45	1.36	1.06	1.33
2800	5.83	5.88	5.78	0.10	18.55	21.38	21.10	1.72	2800	1.28	1.34	1.16	1.32
2900	5.77	5.89	5.73	0.16	19.25	20.71	21.71	2.64	2900	1.17	1.30	1.26	1.29
3000	5.78	6.01	5.76	0.25	18.75	19.52	20.18	3.61	3000	1.26	1.26	1.36	1.26
3100	5.85	6.23	5.86	0.38	17.00	17.96	17.56	4.64	3100	1.44	1.22	1.42	1.24
3200	5.97	6.54	6.01	0.57	15.06	16.12	15.21	5.65	3200	1.63	1.23	1.44	1.25
3300	6.09	6.91	6.17	0.82	13.41	14.14	13.38	6.55	3300	1.79	1.31	1.41	1.31
3400	6.19	7.30	6.32	1.12	12.10	12.10	12.00	7.26	3400	1.91	1.48	1.35	1.46
3500	6.28	7.74	6.40	1.46	11.07	10.19	10.98	7.77	3500	1.99	1.73	1.27	1.69

¹Total Loss = Insertion Loss + 4.8dB Splitter Loss



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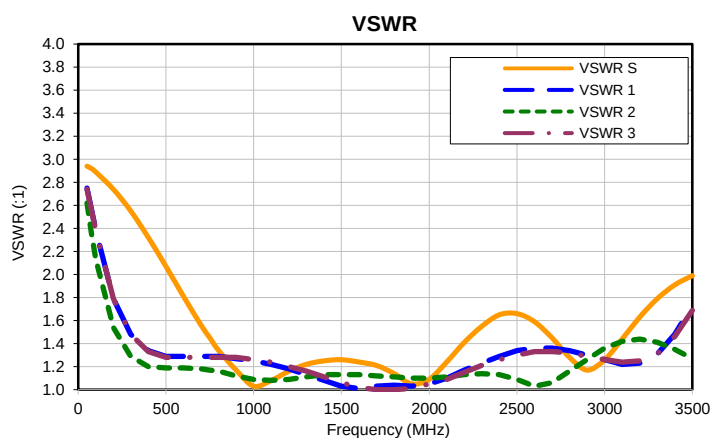
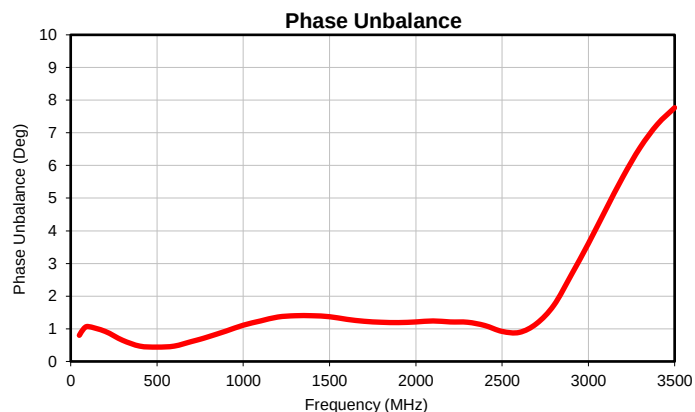
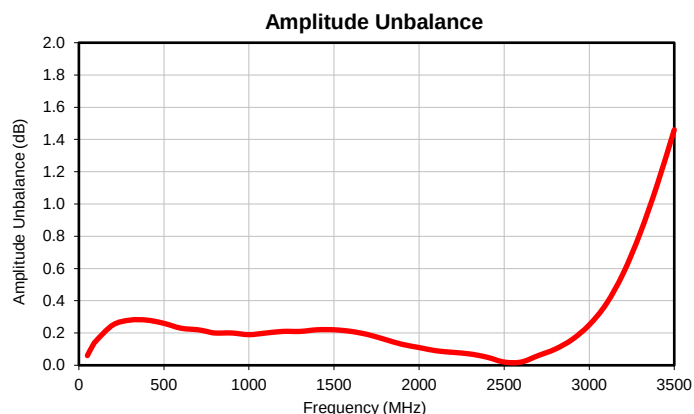
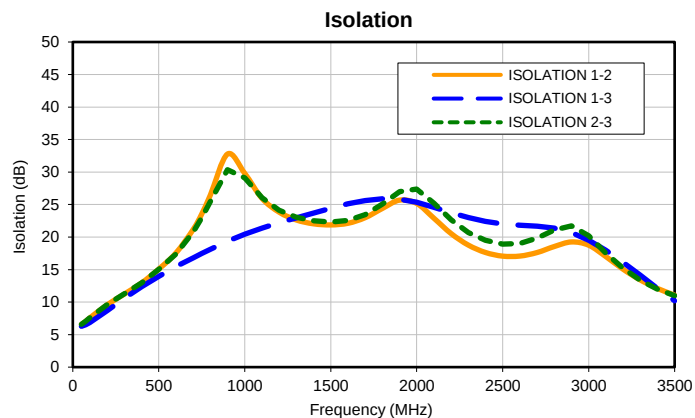
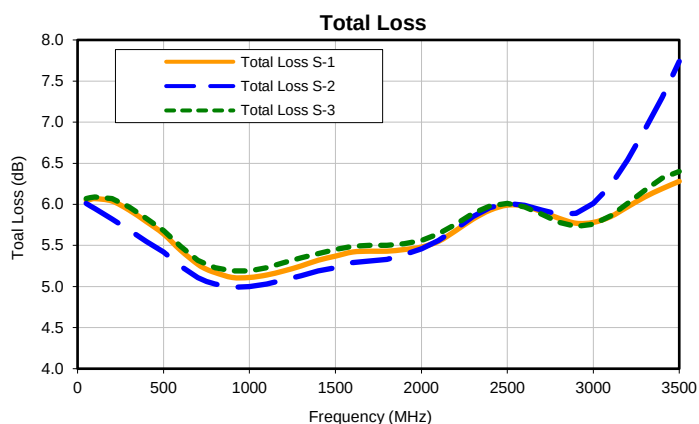


IF/RF MICROWAVE COMPONENTS

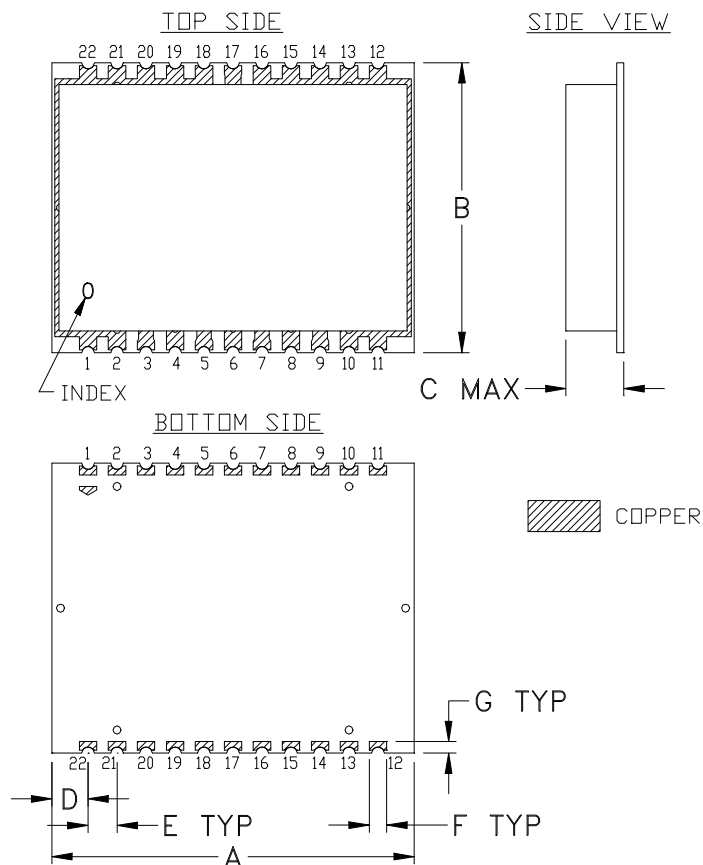


REV. OR
SEPS-3-33+
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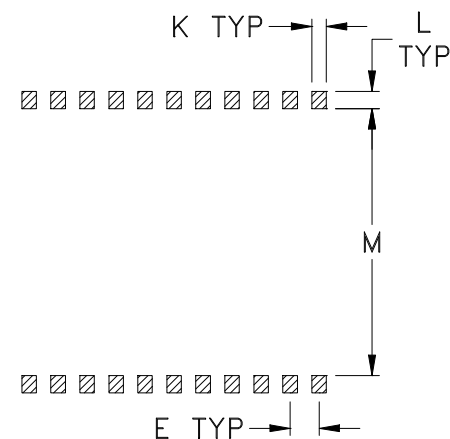
Typical Performance Curves



Outline Dimensions



PCB Land Pattern



Suggested Layout,
Tolerance to be within $\pm .002$

CASE #	A	B	C	D	E	F	G	H	J	K	L	M	WT. GRAM
JF1258	1.250 (31.75)	1.000 (25.40)	.200 (5.08)	.125 (3.17)	.100 (2.54)	.060 (1.52)	.040 (1.02)	-	-	.050 (1.27)	.060 (1.52)	.920 (23.37)	4.4

Dimensions are in inches (mm). Tolerances: 2 Pl. $\pm .03$; 3Pl. $\pm .015$

Notes:

- Case material: Nickel-Silver alloy.
- Base: Printed wiring laminate.
- Termination finish:
For RoHS Case Styles: 3-5 μ inch (.08-.13 μ m) Gold over 120-240 μ inch (3-6 μ m) Nickel plate.
All models, (+) suffix.



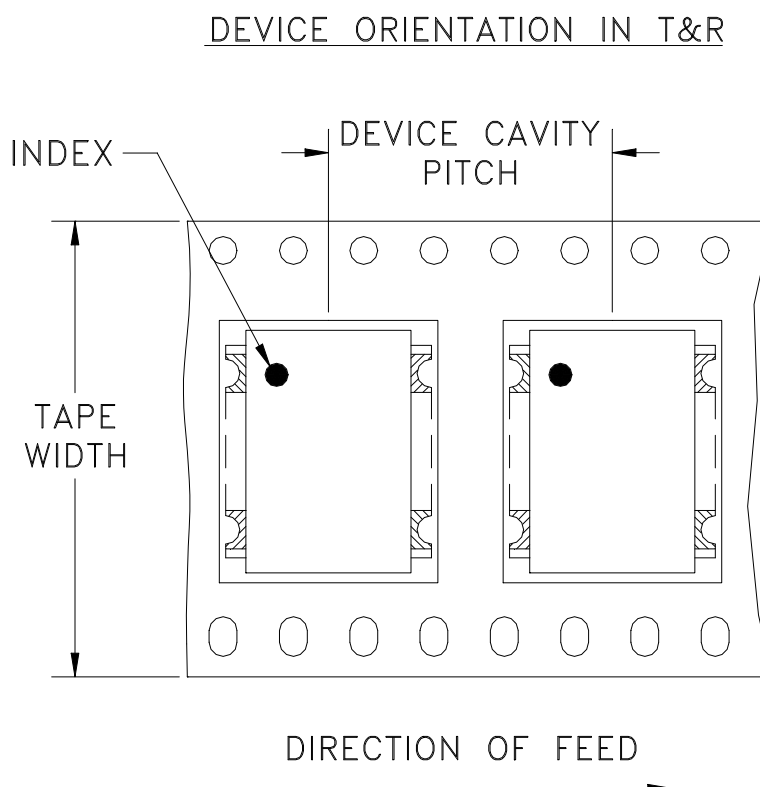
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Tape & Reel Packaging TR-F27



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel
44	32	13	125

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

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OR	M123526	NEW RELEASE	07/09/09	MMG	ABD

Figure 1: Pin Grid Array (PGA) layout. The diagram shows a square array of pins on a substrate. Key dimensions include: .020, 2 PL. (top edge), .040 2 PL. (left edge), .140 (top pin pitch), .200 (pin pitch, 4X), .042 TYP (left edge), .100 TYP (bottom edge), .066 TRACE WIDTH, 4 PL. (bottom edge), and .100 (bottom pin pitch). The package outline is indicated by a dashed line. The pins are labeled PIN 1.

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

UNLESS OTHERWISE SPECIFIED

INITIALS

DATE _____

DIMENSIONS ARE IN INCHES

DRAWN

MMG

07/06/09

TOLERANCES ON:

01500150

07 / 09 / 09

2 PL DECIMALS $\pm$

CHECKED

01/08/08
01/08/08

3 PL DECIMAL ANGLES ±

APPROVED

07/09/09

FRACTIONS $\pm$

111

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PL, 22SP02, JF1258, SEPS-3, TB-513+

SIZE
A

CODE IDENT
15542

DRAWING NO:
98-PL-309

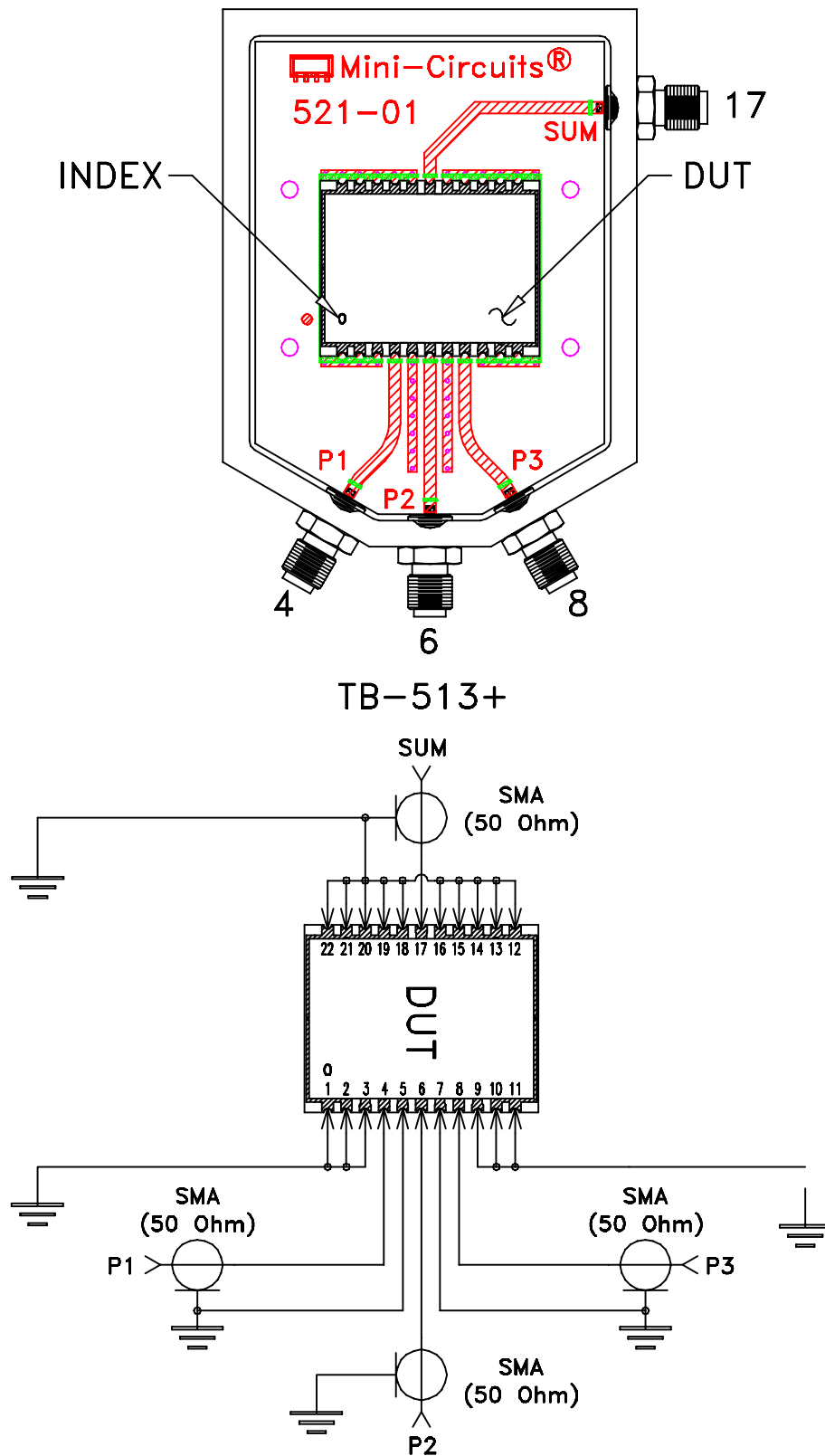
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Evaluation Board and Circuit



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: Rogers R04350 or equivalent,
Dielectric Constant=3.5, Thickness=.030 inch.

 Mini-Circuits®



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 Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C 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 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; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C	MIL-STD-202, Method 215