ULTRA-SMALL CERAMIC

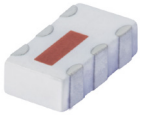
Power Splitter/Combiner

SCN-2-10+

2 Way-0° 50Ω 600 to 1000 MHz

THE BIG DEAL

- Industry leading combination of size/power handling
- Isolation resistor, external 100 ohms
- Low insertion loss, 0.5 dB typ.
- High isolation, 15 dB typ.
- Small size, 0.12"X0.06"X0.035"
- ESD non-sensitive
- Temperature stable LTCC technology
- Wrap around terminations for excellent solderability
- Low cost



Generic photo used for illustration purposes only

CASE STYLE: FV1206-1

+RoHS Compliant
The +Suffix identifies RoHS Compliance.
See our website for methodologies and qualifications

APPLICATIONS

- GSM
- ISM
- Cellular
- LTE

PRODUCT OVERVIEW

Mini-Circuits new LTCC 0° Power Splitter, model SCN-2-10+, offers industry leading combination of operating performance and size; in a miniature EIA-1206 form factor. The outstanding phase and amplitude unbalance make this component a versatile building block for use in a variety of systems and sub-system designs.

KEY FEATURES

Feature	Advantages
Small Size	Offered in the EIA-1206 package size, SCN-2-10+ offers an industry leading combination of size, power handling, and frequency. The small footprint (3.2 mm x 1.6 mm) allows for reduced parasitics in systems with improved performance and simplified layout.
Low Phase and Amplitude Unbalance	Supporting 2 deg. and 0.1 dB unbalance make this 0° hybrid applicable for use in higher level integrated components such as image reject mixers and I & Q modulators.

REV. D
ECO-023234
SCN-2-10+
MCL NY
241010

ELECTRICAL SPECIFICATIONS AT 25°C

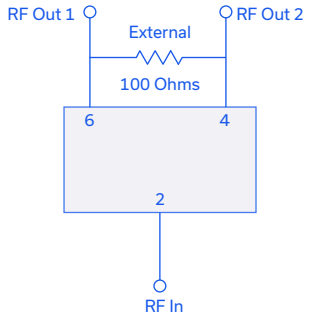
Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		600		1000	MHz
Insertion Loss, above 3.0 dB	600-1000	—	0.5	1.3	dB
Isolation	600-1000	11	15	—	dB
Phase Unbalance	600-1000	—	1.7	3.0	Degree
Amplitude Unbalance	600-1000	—	0.1	0.4	dB
Return Loss (Input)	600-1000	9.5	14	—	dB
Return Loss (Output)	600-1000	14	19	—	dB

MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
Power Input (as a splitter)	1W max.

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

ELECTRICAL SCHEMATIC



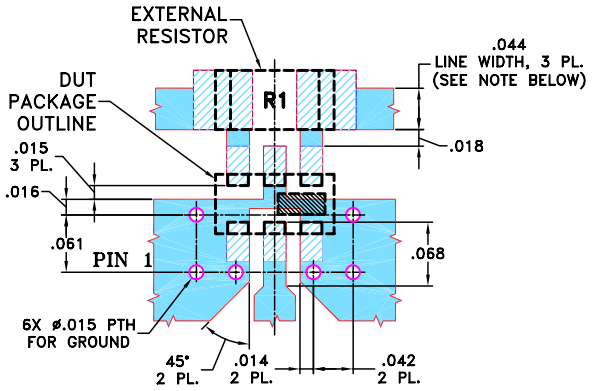
Power Splitter/Combiner SCN-2-10+

PIN CONNECTIONS

SUM PORT	2
PORT 1	6
PORT 2	4
GROUND	1,3,5
PORT 1-2	resistor external 100 ohms

PRODUCT MARKING: P6

DEMO BOARD MCL P/N: TB-252
SUGGESTED PCB LAYOUT (PL-129)



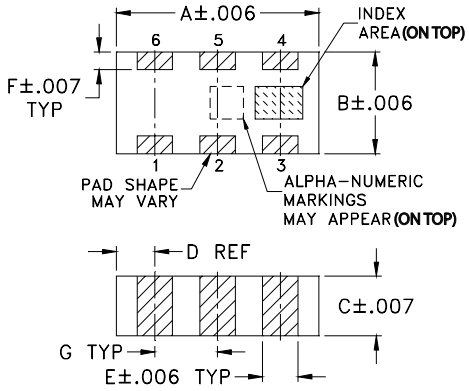
RESISTOR R1: 100 Ohm, 1206 SIZE

NOTES: 1.TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.020" ± 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.

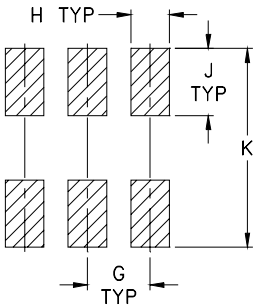
DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

OUTLINE DRAWING



PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

OUTLINE DIMENSIONS (Inches / mm)

A	B	C	D	E	F
.126	.063	.035	.024	.022	.011
3.20	1.60	0.89	0.61	0.56	0.28

G	H	J	K		wt
.039	.024	.042	.123		grams
0.99	0.61	1.07	3.12		.020

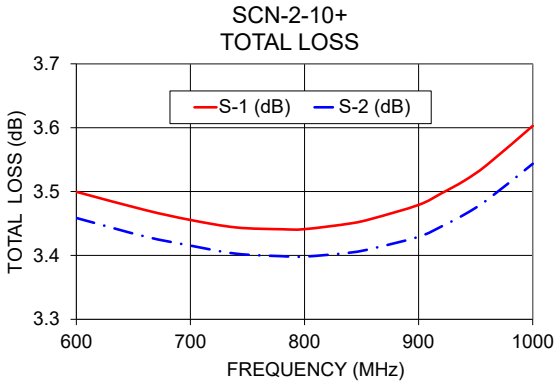
TAPE & REEL INFORMATION: F75

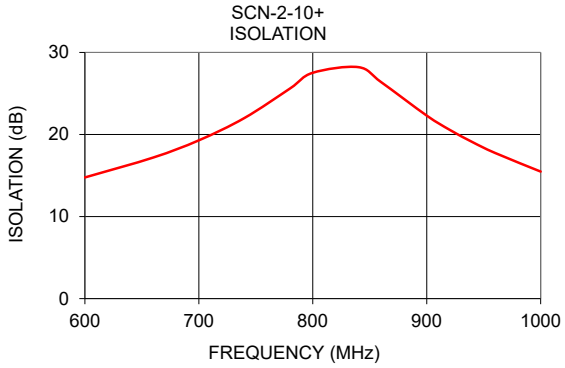
Power Splitter/Combiner SCN-2-10+

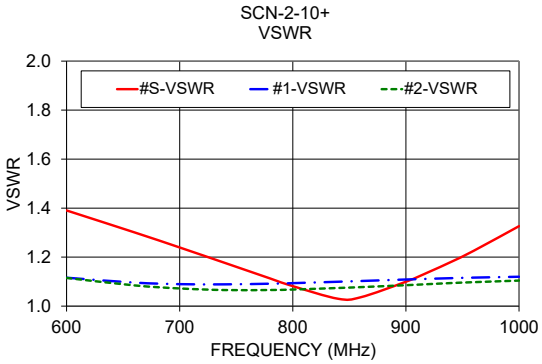
TYPICAL PERFORMANCE DATA

Frequency (MHz)	Total Loss[1] (dB)		Amplitude Unbalance (dB)	Isolation (dB)	Phase Unbalance (deg.)	Return Loss (dB)		
	S-1	S-2				S	1	2
600	3.50	3.46	0.04	14.77	0.44	1.39	1.12	1.12
660	3.47	3.43	0.04	17.19	0.54	1.30	1.10	1.08
700	3.46	3.42	0.04	19.29	0.62	1.24	1.09	1.07
740	3.44	3.40	0.04	22.01	0.68	1.18	1.09	1.07
780	3.44	3.40	0.04	25.60	0.76	1.11	1.09	1.07
800	3.44	3.40	0.04	27.52	0.79	1.08	1.09	1.07
840	3.45	3.40	0.05	28.21	0.86	1.03	1.10	1.07
860	3.46	3.41	0.05	26.38	0.89	1.04	1.10	1.08
900	3.48	3.43	0.05	22.30	0.96	1.10	1.11	1.09
920	3.50	3.45	0.05	20.58	1.00	1.14	1.11	1.09
940	3.52	3.46	0.05	19.08	1.03	1.18	1.11	1.09
960	3.54	3.49	0.06	17.75	1.07	1.23	1.12	1.10
1000	3.60	3.54	0.06	15.48	1.12	1.33	1.12	1.10

1. Total Loss = Insertion Loss + 3dB splitter 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/terms/viewterm.html

2 Way-0° Power Splitter/Combiner SCN-2-10+

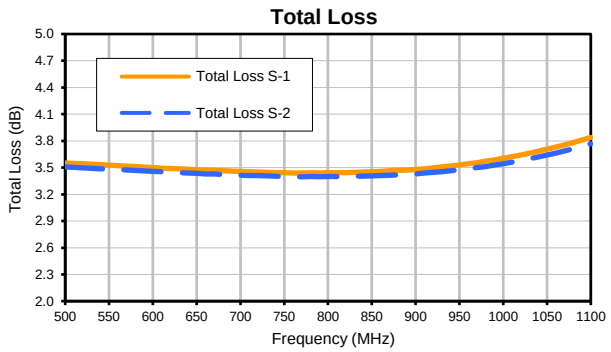
Typical Performance Data

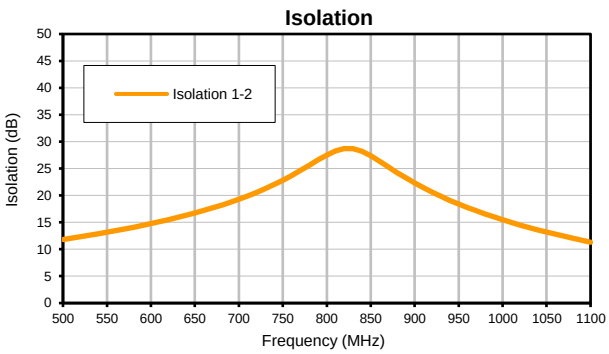
FREQUENCY (MHz)	TOTAL LOSS[1] (dB) S-1	TOTAL LOSS[1] (dB) S-2	AMPLITUDE UNBALANCE (dB)	ISOLATION (dB) 1-2	PHASE UNBALANCE (deg.)	FREQUENCY (MHz)	VSWR (:1) S	VSWR (:1) 1	VSWR (:1) 2
500	3.55	3.51	0.04	11.79	0.27	500	1.53	1.18	1.19
520	3.54	3.50	0.04	12.32	0.30	520	1.50	1.16	1.17
540	3.53	3.49	0.04	12.87	0.33	540	1.48	1.15	1.16
560	3.52	3.48	0.04	13.46	0.36	560	1.45	1.14	1.14
580	3.51	3.47	0.04	14.09	0.40	580	1.42	1.13	1.13
600	3.50	3.46	0.04	14.77	0.07	600	1.39	1.12	1.12
610	3.49	3.45	0.04	15.13	0.08	610	1.38	1.11	1.11
620	3.49	3.45	0.04	15.50	0.08	620	1.36	1.11	1.10
630	3.49	3.44	0.04	15.89	0.08	630	1.35	1.10	1.10
640	3.48	3.44	0.04	16.31	0.09	640	1.33	1.10	1.09
650	3.48	3.43	0.04	16.74	0.09	650	1.32	1.10	1.09
660	3.47	3.43	0.04	17.19	0.10	660	1.30	1.10	1.08
670	3.47	3.43	0.04	17.67	0.10	670	1.29	1.09	1.08
680	3.46	3.42	0.04	18.18	0.11	680	1.27	1.09	1.08
690	3.46	3.42	0.04	18.71	0.13	690	1.25	1.09	1.07
700	3.46	3.42	0.04	19.29	0.16	700	1.24	1.09	1.07
710	3.45	3.41	0.04	19.90	0.16	710	1.22	1.09	1.07
720	3.45	3.41	0.04	20.56	0.14	720	1.21	1.09	1.07
730	3.45	3.41	0.04	21.26	0.12	730	1.19	1.09	1.07
740	3.44	3.40	0.04	22.01	0.14	740	1.18	1.09	1.07
750	3.44	3.40	0.04	22.82	0.22	750	1.16	1.09	1.07
760	3.44	3.40	0.04	23.69	0.31	760	1.14	1.09	1.07
770	3.44	3.40	0.04	24.63	0.33	770	1.13	1.09	1.07
780	3.44	3.40	0.04	25.60	0.30	780	1.11	1.09	1.07
790	3.44	3.40	0.04	26.61	0.24	790	1.10	1.09	1.07
800	3.44	3.40	0.04	27.52	0.21	800	1.08	1.09	1.07
810	3.44	3.40	0.04	28.27	0.24	810	1.07	1.10	1.07
820	3.44	3.40	0.04	28.71	0.31	820	1.05	1.10	1.07
830	3.45	3.40	0.04	28.70	0.37	830	1.04	1.10	1.07
840	3.45	3.40	0.05	28.21	0.35	840	1.03	1.10	1.07
850	3.45	3.41	0.05	27.39	0.32	850	1.03	1.10	1.08
860	3.46	3.41	0.05	26.38	0.28	860	1.04	1.10	1.08
870	3.46	3.42	0.05	25.32	0.28	870	1.05	1.10	1.08
880	3.47	3.42	0.05	24.26	0.28	880	1.06	1.11	1.08
890	3.47	3.42	0.05	23.26	0.31	890	1.08	1.11	1.08
900	3.48	3.43	0.05	22.30	0.37	900	1.10	1.11	1.09
910	3.49	3.44	0.05	21.42	0.50	910	1.12	1.11	1.09
920	3.50	3.45	0.05	20.58	0.59	920	1.14	1.11	1.09
930	3.51	3.46	0.05	19.81	0.54	930	1.16	1.11	1.09
940	3.52	3.46	0.05	19.08	0.33	940	1.18	1.11	1.09
950	3.53	3.47	0.05	18.39	0.26	950	1.20	1.12	1.10
960	3.54	3.49	0.06	17.75	0.45	960	1.23	1.12	1.10
970	3.56	3.50	0.06	17.14	0.76	970	1.25	1.12	1.10
980	3.57	3.51	0.06	16.55	0.99	980	1.27	1.12	1.10
990	3.59	3.53	0.06	16.00	0.84	990	1.30	1.12	1.10
1000	3.60	3.54	0.06	15.48	0.51	1000	1.33	1.12	1.10
1020	3.64	3.58	0.06	14.51	1.16	1020	1.38	1.12	1.11
1040	3.68	3.62	0.06	13.61	1.18	1040	1.44	1.12	1.11
1060	3.73	3.66	0.07	12.79	1.23	1060	1.50	1.12	1.11
1080	3.78	3.71	0.07	12.02	1.26	1080	1.57	1.12	1.11
1100	3.84	3.77	0.07	11.31	1.28	1100	1.64	1.13	1.12

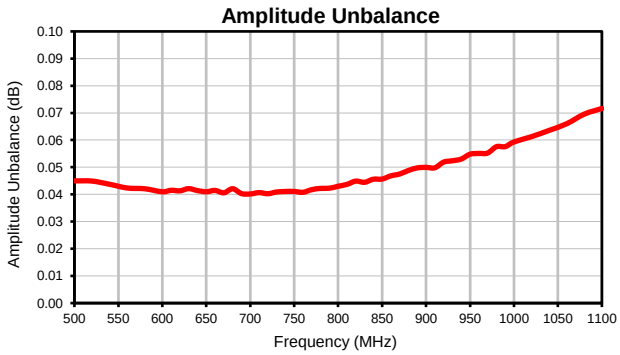
[1]Total Loss = Insertion Loss + 3dB Splitter Loss

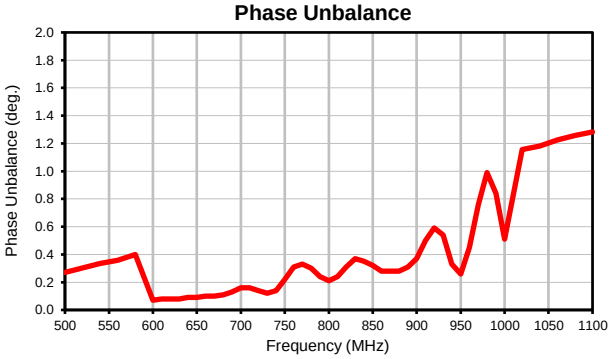
2 Way-0° Power Splitter/Combiner SCN-2-10+

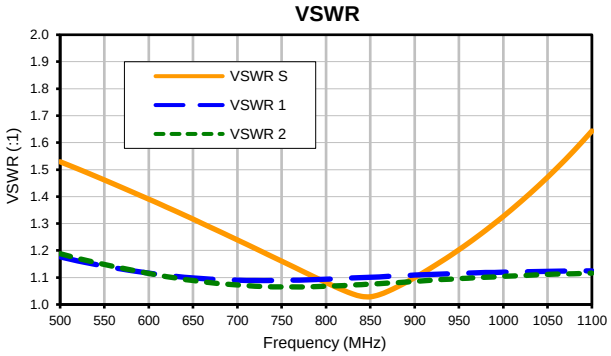
Typical Performance Curves







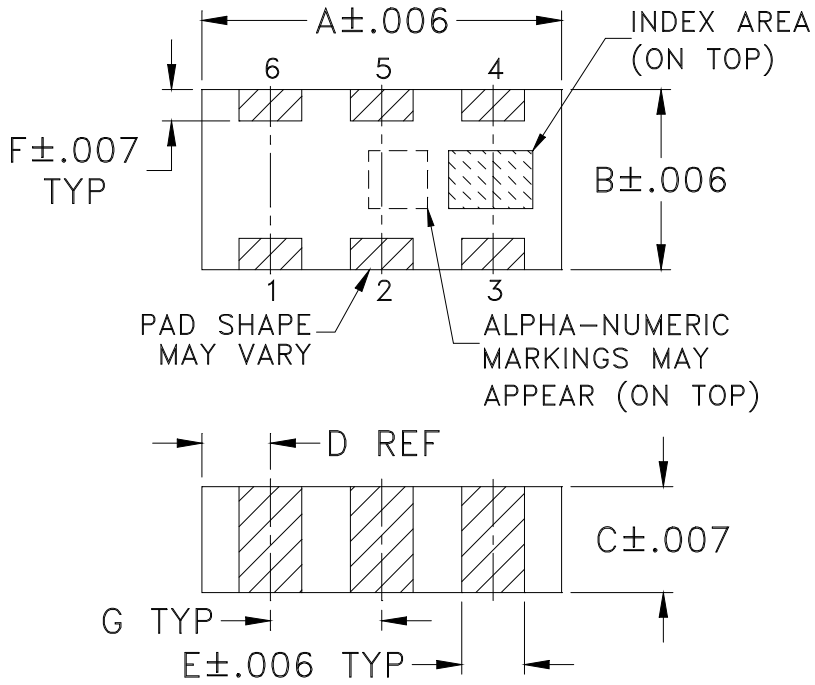




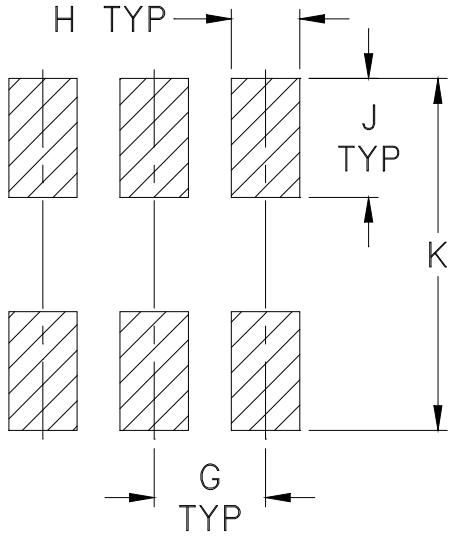
Case Style FV

FV1206-1

Outline Dimensions



PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

CASE #	A	B	C	D	E	F	G	H	J	K	L	M	N	P	WT. GRAM
FV1206-1	.126 (3.20)	.063 (1.60)	.035 (0.89)	.024 (0.61)	.022 (0.56)	.011 (0.28)	.039 (0.99)	.024 (0.61)	.042 (1.07)	.123 (3.12)	-- --	-- --	-- --	-- --	.020

Dimensions are in inches (mm). Tolerances: 2 Pl. ± .01; 3 Pl. ± .005

Notes:

1. Open style, ceramic base.
2. Termination finish: **as shown below or indicated on Data Sheet.**
   For RoHS Case Styles: Tin plate over Nickel plate. All models, (+) suffix.
   For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.

Tape & Reel Packaging TR-F75

DEVICE ORIENTATION IN T&R

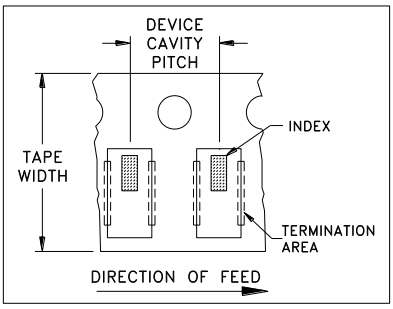


ILLUSTRATION 1

Applicable Case Styles
FV1206-1
FV1206-3

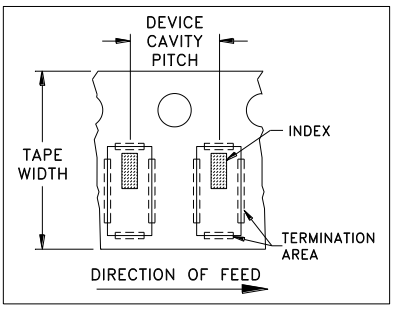


ILLUSTRATION 2

Applicable Case Styles
FV1206-4
FV1206-5
FV1206-6
FV1206-7
FV1206-9

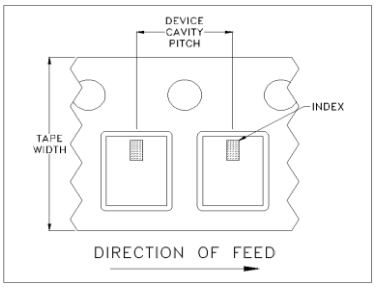


ILLUSTRATION 3

Applicable Case Styles
FV1206-12
GE0805C-18
NL1008C-6
NL1008C-7
NL1008C-9
NL1008C-10

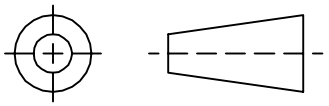
Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel	
8	4	7	Small quantity standards (see note)	20
				50
				100
				200
				500
				1000
			Standard	3000

Note: Please consult individual model data sheet to determine device per reel availability.

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.

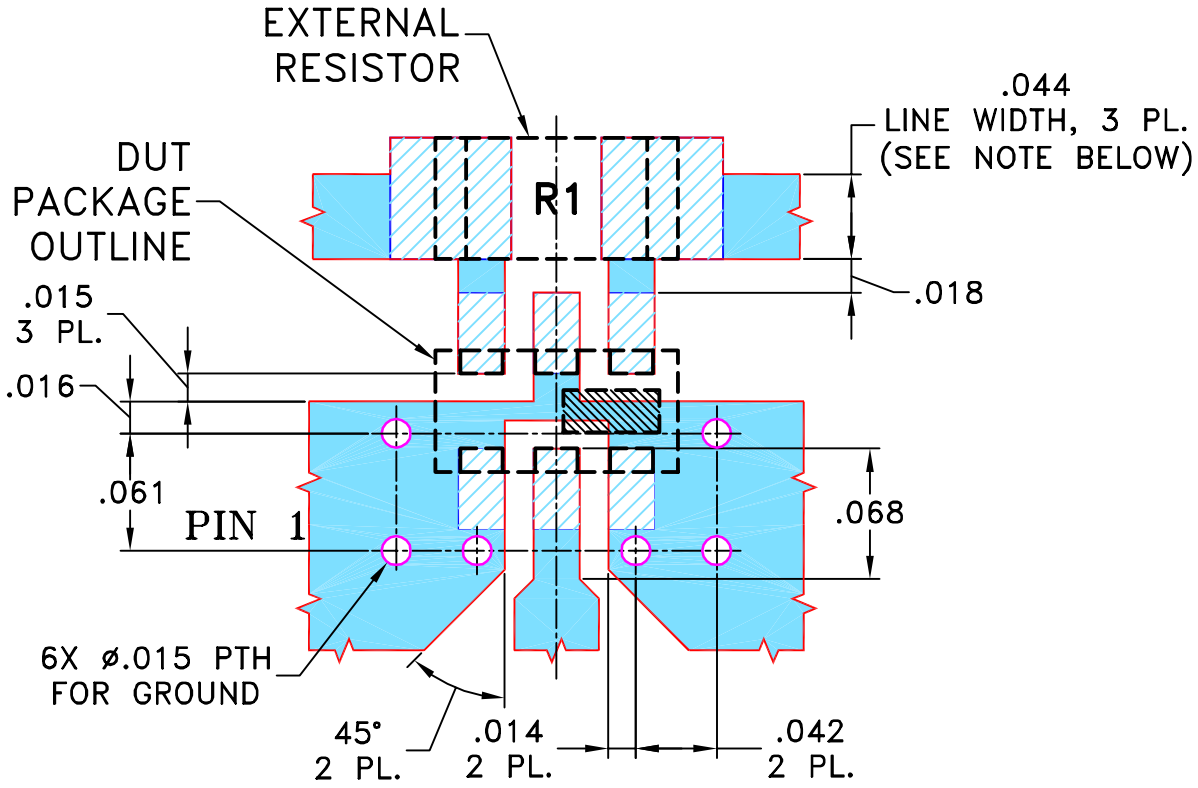
Go to: www.minicircuits.com/pages/pdfs/tape.pdf

THIRD ANGLE PROJECTION



REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
A	M86650	UPDATED NOTE 2	04/18/03	GF	DJ
B	M86880	CHANGED APPEARANCE	05/05/03	IL	ABD
C	M91639	REMOVED NOTE 2, UPDATED DIMENSIONS	04/14/04	AV	DJ
D	M102713	ADDED"...WITH SMOBC"	01/16/06	GF	IL

SUGGESTED MOUNTING CONFIGURATION FOR FV1206-1 CASE STYLE, "pa" PIN CONNECTION.



RESISTOR R1: 100 Ohm, 1206 SIZE

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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	04/11/03
TOLERANCES ON:	CHECKED	IL	04/15/03
2 PL DECIMALS ±	APPROVED	ABD	04/15/03
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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

Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, pa, FV1206-1, SCN, TB-252

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-129	D

FILE:	SCALE:	SHEET:
98PL129	10:1	1 OF 1

Mini-Circuits

Environmental Specifications ENV06

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	-55° to 100°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
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, Para 4.2.5, Test S, 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