LTCC SMT

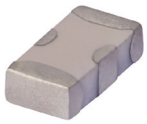
Band Pass Filter

BFCN-2700+

50Ω 2600 to 2800 MHz

THE BIG DEAL

- Good Rejection, 25 dB Typ.
- 1206 Surface Mount Footprint
- Power Handling: 1.5 Watts



Generic photo used for illustration purposes only

CASE STYLE: FV1206

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

APPLICATIONS

- Harmonic Rejection
- Transmitters / Receivers
- WiMAX

PRODUCT OVERVIEW

Mini-Circuits' BFCN-2700+ LTCC Band Pass Filter is constructed with multiple layers in order to achieve a miniature size and high repeatability of performance. Wrap-around terminations minimize variations in performance due to parasitics. Covering 200 MHz passband, these units offer low insertion loss and good rejection.

KEY FEATURES

Feature	Advantages
Small Size, 1206	Allows for high layout density of circuit boards, while minimizing the effects of parasitics
Wrap around termination	Provides excellent solderability and easy visual inspection capability.
LTCC construction	Provides a rugged package that is well suited for tough environments including high humidity and high temperature extremes.
Rugged Power handling	Handles up to 1.5 Watts in a small package.

REV. B
ECO-016659
BFCN-2700+
URJ
230202

Band Pass Filter

BFCN-2700+

ELECTRICAL SPECIFICATIONS[1,2] AT 25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Units
Passband	Center Frequency	—	—	—	2700	—	MHz
	Insertion Loss	F1-F2	2600 - 2800	—	—	5	dB
	Return Loss	F1-F2	2600 - 2800	6.5	12.7	—	dB
Stop Band, Lower	Rejection	DC-F3	DC - 1400	—	25	—	dB
		DC-F4	DC - 1500	20	—	—	
Stop Band, Upper	Rejection	F5-F6	4150 - 4200	20	—	—	dB
		F6-F7	4200 - 5600	—	25	—	

1 This component should not be used as a DC-block. In applications where DC voltage and/or current is present at either the input or output ports, external DC blocking capacitors are required.

2 Measured on Mini-Circuits Characterization Test Board TB-270.

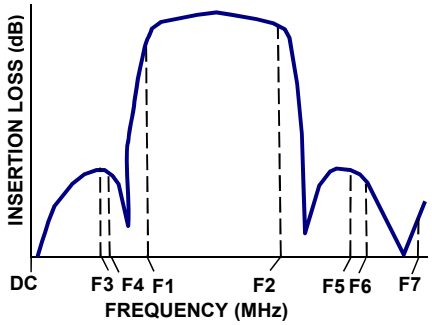
ABSOLUTE MAXIMUM RATINGS[1]

Parameter	Ratings
Operating temperature	-55°C to 100°C
Storage temperature	-55°C to 100°C
RF Power Input[2]	1.5W @25°C

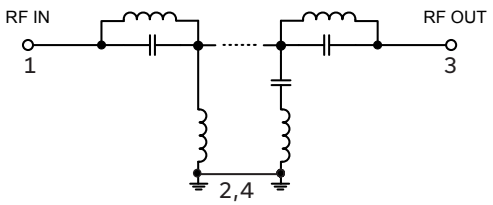
1. Permanent damage may occur if any of these limits are exceeded.

2. Power rating applies only to signals within the passband. Power rating above +25°C operating temperature decreases linearly to 0.25W at +100°C.

TYPICAL FREQUENCY RESPONSE



FUNCTIONAL DIAGRAM



Band Pass Filter

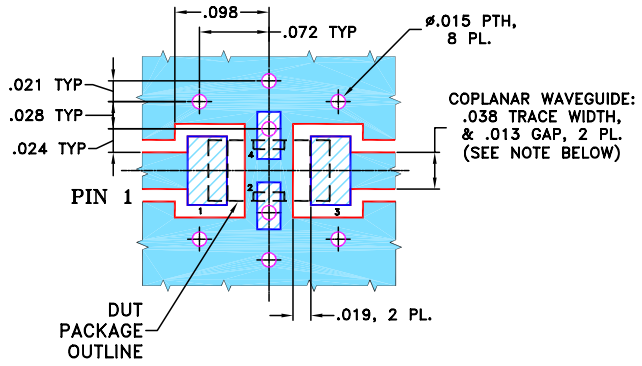
BFCN-2700+

PAD CONNECTIONS

RF IN	1
RF OUT	3
GROUND	2,4

PRODUCT MARKING: NN

DEMO BOARD MCL P/N: TB-270
SUGGESTED PCB LAYOUT (PL-137)

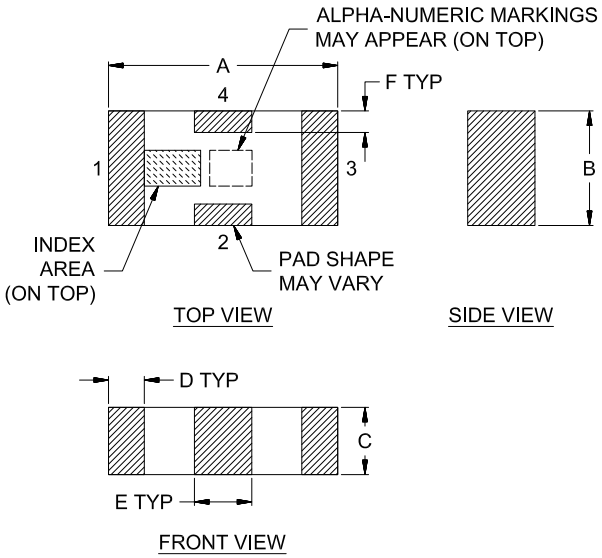


NOTES:
1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH THICKNESS .020" ± .0015". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH & GAP MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

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

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

OUTLINE DRAWING



OUTLINE DIMENSIONS (Inches / mm)

A	B	C	D	E	F	Wt.
.126	**.063**	**.037**	**.020**	**.032**	**.009**	grams
3.20	1.60	0.94	0.51	0.81	0.23	.020

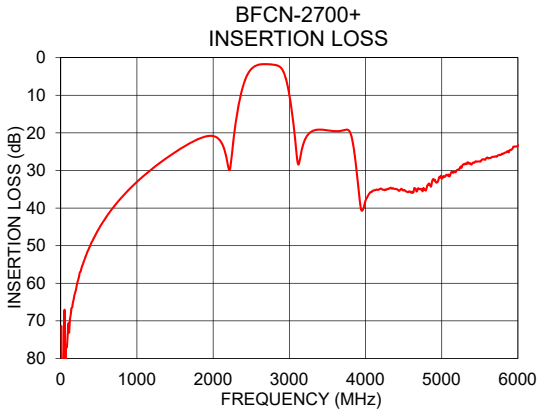
LTCC SMT

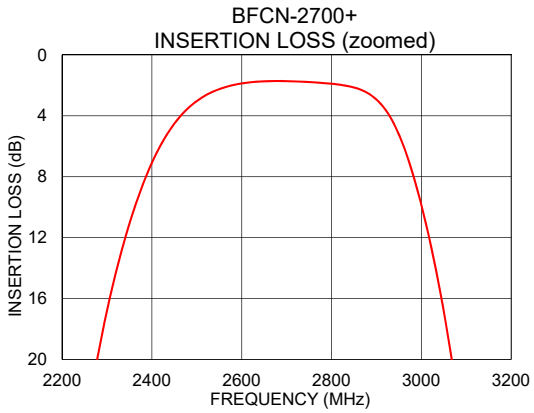
Band Pass Filter

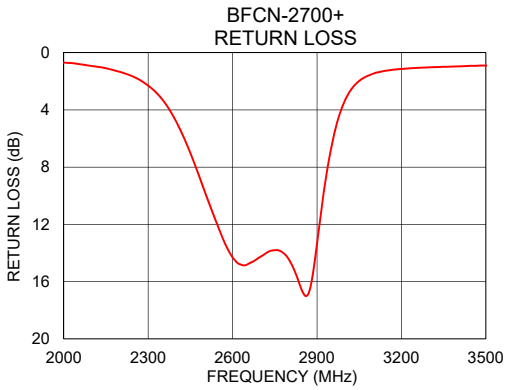
BFCN-2700+

TYPICAL PERFORMANCE DATA AT 25°C

Frequency (MHz)	Insertion Loss (dB)	Return Loss (dB)
10	71.43	0.10
500	45.53	0.19
1400	26.54	0.29
1500	25.18	0.32
2270	21.37	1.91
2500	3.03	9.65
2600	1.87	14.31
2650	1.73	14.82
2700	1.72	14.25
2750	1.78	13.81
2800	1.89	14.45
2900	2.93	13.34
3070	20.48	1.71
4150	35.09	0.48
4200	34.82	0.47
5600	26.56	0.15







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

Ceramic Band Pass Filter BFCN-2700+

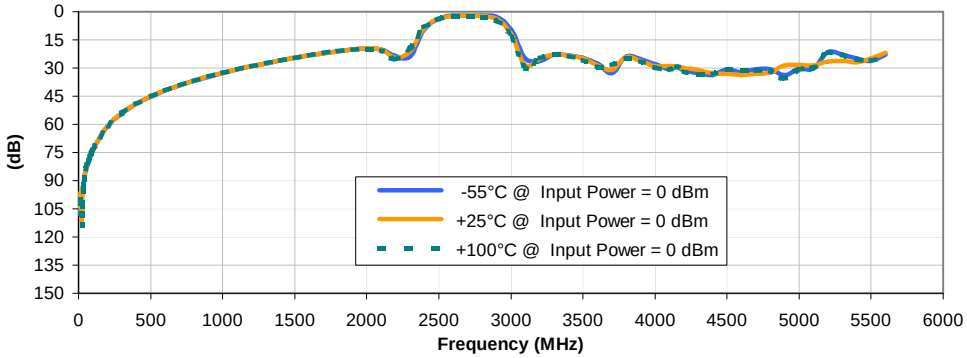
Typical Performance Data

FREQ. (MHz)	INSERTION LOSS (dB)			INPUT RETURN LOSS (dB)			OUTPUT RETURNLOSS (dB)		
	@ -55° C	@ +25° C	@ +100° C	@ -55° C	@ +25° C	@ +100° C	@ -55° C	@ +25° C	@ +100° C
10	104.25	104.09	102.41	0.02	0.03	0.04	0.00	0.00	0.00
15	107.81	96.76	99.73	0.02	0.04	0.04	0.00	0.00	0.00
20	98.54	112.31	114.06	0.03	0.04	0.05	0.00	0.00	0.00
25	96.02	96.96	104.48	0.03	0.04	0.05	0.00	0.00	0.00
30	93.18	92.72	93.53	0.03	0.05	0.06	0.00	0.00	0.00
40	88.56	89.66	89.36	0.04	0.05	0.06	0.00	0.00	0.00
50	84.51	84.58	83.99	0.04	0.06	0.07	0.00	0.00	0.00
60	81.90	81.44	80.52	0.04	0.06	0.08	0.00	0.00	0.00
70	79.25	78.73	78.87	0.05	0.07	0.08	0.00	0.00	0.00
80	76.96	76.47	76.24	0.05	0.08	0.09	0.00	0.00	0.00
90	74.96	74.38	74.63	0.06	0.08	0.10	0.00	0.00	0.00
100	72.84	72.93	72.74	0.06	0.09	0.10	0.00	0.00	0.00
200	61.09	61.01	60.86	0.10	0.13	0.15	0.00	0.00	0.01
300	54.07	54.03	53.91	0.12	0.16	0.18	0.01	0.01	0.02
400	49.11	49.05	48.98	0.13	0.18	0.20	0.01	0.02	0.03
500	45.19	45.13	45.07	0.13	0.19	0.21	0.01	0.02	0.04
600	41.97	41.91	41.85	0.14	0.20	0.23	0.02	0.04	0.06
700	39.25	39.18	39.13	0.14	0.21	0.24	0.05	0.06	0.08
800	36.73	36.72	36.66	0.16	0.23	0.27	0.06	0.07	0.10
900	34.63	34.57	34.48	0.16	0.24	0.28	0.08	0.09	0.11
1000	32.67	32.60	32.54	0.17	0.25	0.29	0.10	0.11	0.13
1100	30.78	30.78	30.68	0.18	0.26	0.31	0.12	0.12	0.15
1200	29.05	29.06	28.96	0.19	0.27	0.32	0.14	0.14	0.18
1300	27.46	27.49	27.35	0.19	0.28	0.34	0.16	0.16	0.20
1400	26.03	26.04	25.92	0.20	0.30	0.37	0.18	0.19	0.22
1500	24.69	24.65	24.56	0.22	0.34	0.41	0.20	0.22	0.26
1600	23.29	23.28	23.17	0.25	0.38	0.46	0.23	0.25	0.29
1700	22.08	22.06	21.98	0.29	0.42	0.51	0.26	0.30	0.34
1800	20.98	20.97	20.92	0.35	0.49	0.59	0.31	0.36	0.42
1900	20.07	20.05	20.06	0.44	0.59	0.70	0.35	0.42	0.48
2000	19.56	19.58	19.72	0.57	0.74	0.87	0.39	0.49	0.55
2100	20.00	20.21	20.53	0.76	0.98	1.13	0.43	0.56	0.64
2200	23.48	24.40	25.19	1.05	1.33	1.54	0.54	0.72	0.83
2300	23.72	21.22	19.35	1.62	2.04	2.36	0.91	1.20	1.44
2400	9.63	8.86	8.24	3.26	3.97	4.60	2.42	3.06	3.68
2500	3.77	3.74	3.69	7.11	8.06	8.85	6.97	8.14	9.26
2600	2.15	2.34	2.49	10.47	11.18	11.52	12.49	13.48	14.15
2700	1.95	2.20	2.40	10.77	11.30	11.47	12.02	12.49	12.68
2800	2.01	2.32	2.59	10.98	11.94	12.19	12.72	14.52	15.57
2900	2.84	3.71	4.57	10.70	9.39	8.26	19.27	14.11	11.64
3000	9.47	11.77	13.71	2.83	2.69	2.60	3.32	3.01	2.77
3100	24.90	28.56	29.83	1.26	1.44	1.58	1.19	1.34	1.35
3200	26.12	24.96	24.51	0.98	1.17	1.32	0.79	0.95	0.99
3300	22.79	22.92	22.87	0.90	1.07	1.22	0.71	0.80	0.88
3400	23.14	23.41	23.64	0.84	1.03	1.16	0.60	0.76	0.84
3500	24.54	25.02	25.44	0.78	0.97	1.10	0.61	0.81	0.94
3600	27.63	28.52	29.42	0.73	0.90	1.01	0.93	1.35	1.71
3700	32.85	30.91	28.41	0.67	0.84	0.95	3.61	6.28	10.05
3800	23.79	24.14	24.60	0.64	0.83	0.91	6.27	4.46	3.56
3900	25.39	26.18	26.11	0.60	0.80	0.88	1.24	1.21	1.25
4000	27.82	28.84	29.52	0.56	0.76	0.82	0.58	0.63	0.76
4100	30.72	29.14	30.64	0.51	0.77	0.74	0.35	0.53	0.53
4150	28.98	29.15	29.33	0.50	0.69	0.76	0.31	0.46	0.55
4200	31.35	30.09	31.54	0.45	0.65	0.67	0.28	0.39	0.44
4300	32.78	31.15	33.26	0.36	0.58	0.62	0.21	0.33	0.41
4400	33.61	32.56	33.20	0.33	0.53	0.65	0.22	0.33	0.48
4500	30.72	33.08	30.84	0.39	0.53	0.66	0.29	0.34	0.48
4600	32.45	33.60	31.47	0.29	0.50	0.59	0.18	0.29	0.44
4700	30.76	32.96	31.40	0.31	0.50	0.55	0.17	0.28	0.37
4800	30.79	32.24	31.36	0.30	0.50	0.54	0.18	0.33	0.38
4900	33.77	28.48	35.29	0.28	0.53	0.52	0.19	0.42	0.32
5000	30.22	28.33	30.84	0.31	0.50	0.59	0.24	0.37	0.41
5100	30.26	28.58	29.76	0.27	0.51	0.58	0.29	0.38	0.48
5200	21.39	26.72	21.92	0.64	0.51	0.90	0.74	0.37	0.88
5300	22.94	26.12	22.86	0.18	0.40	0.52	0.29	0.39	0.55
5400	25.04	26.85	25.32	0.20	0.36	0.48	0.37	0.44	0.56
5500	26.37	24.91	25.88	0.13	0.50	0.44	0.24	0.69	0.47
5600	22.84	21.97	24.65	0.29	0.65	0.55	0.47	0.93	0.64

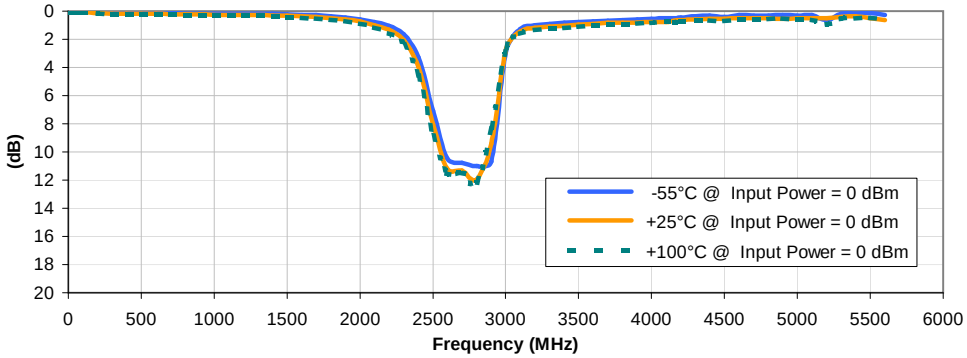
Ceramic Band Pass Filter BFCN-2700+

Typical Performance Curves

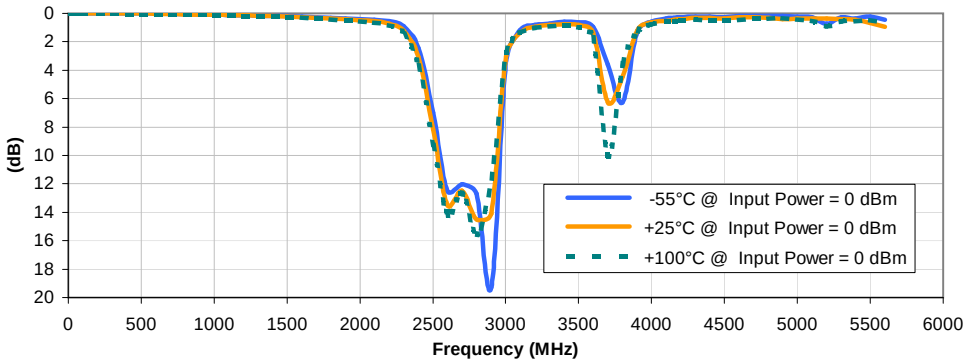
INSERTION LOSS vs. TEMPERATURE



INPUT RETURN LOSS vs. TEMPERATURE



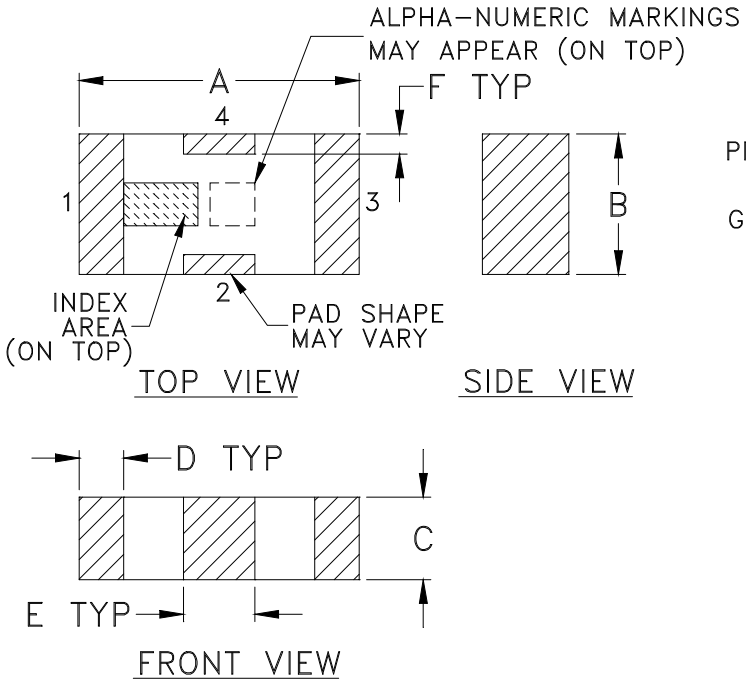
OUTPUT RETURN LOSS vs. TEMPERATURE



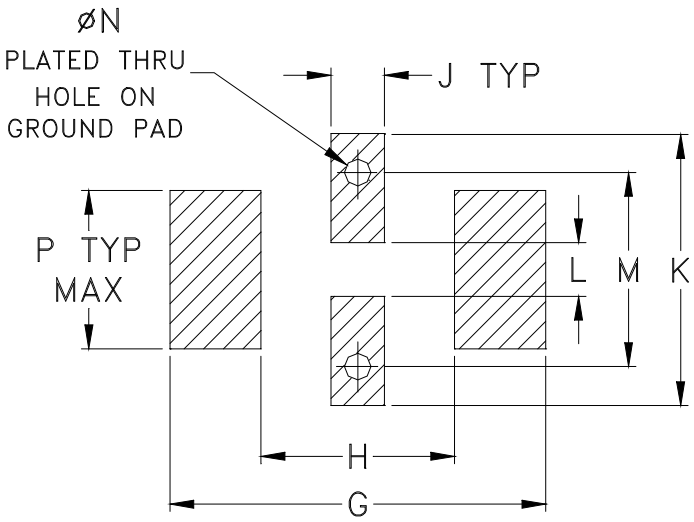
Case Style FV

FV1206

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	.126 (3.20)	.063 (1.60)	.037 (0.94)	.020 (0.51)	.032 (0.81)	.009 (0.23)	.169 (4.29)	.087 (2.21)	.024 (0.61)	.122 (3.10)	.024 (0.61)	.087 (2.21)	.012 (0.30)	.071 (1.80)	.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-F71

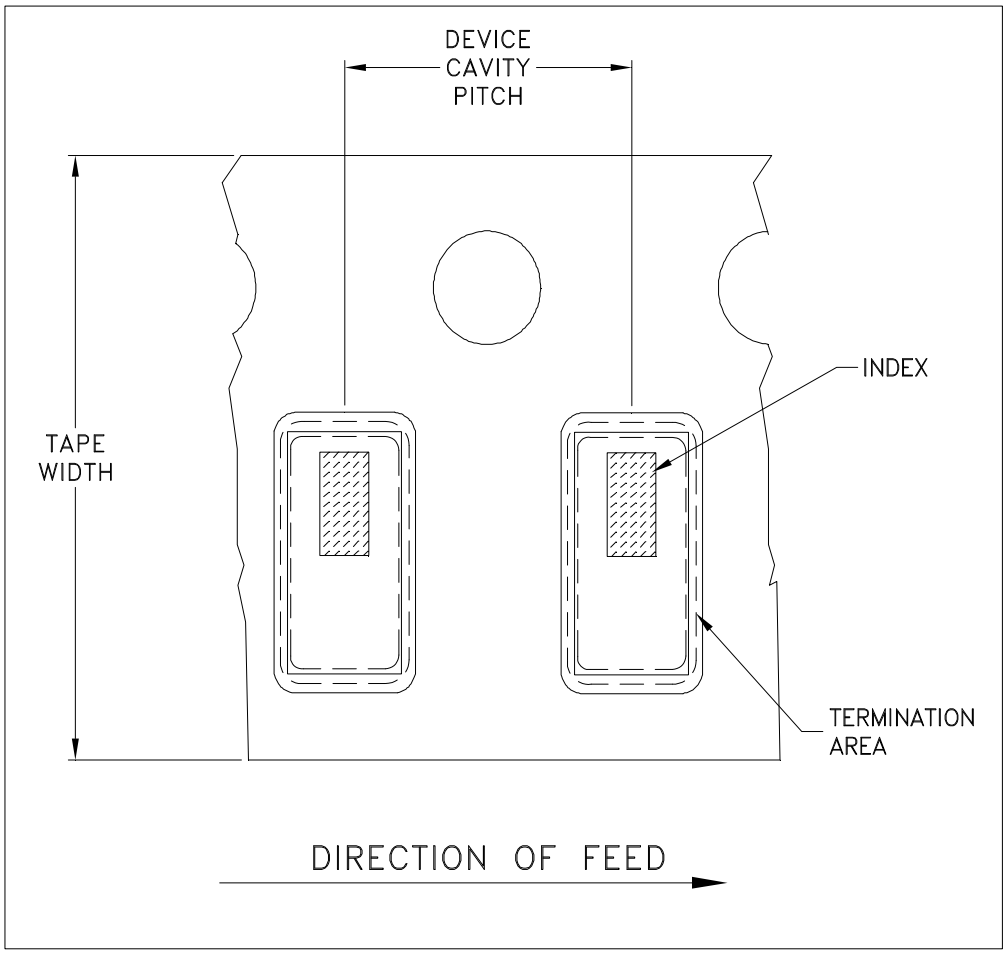


ILLUSTRATION 1

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.

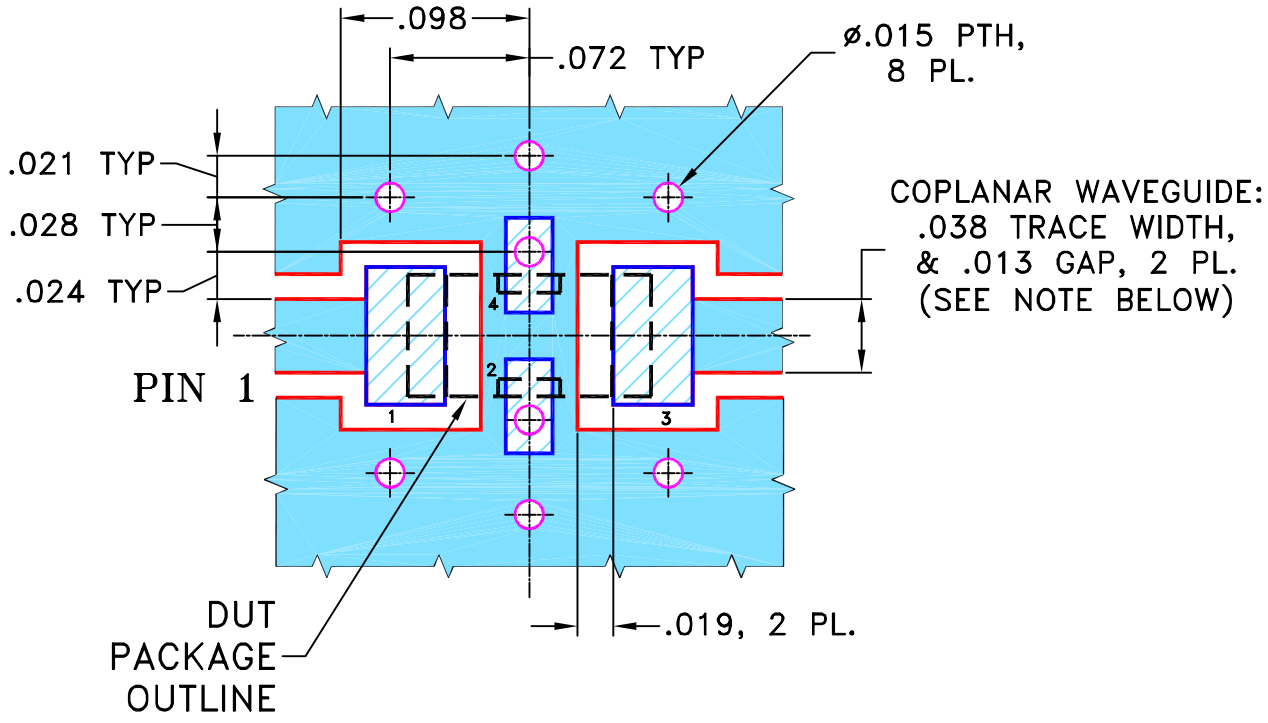
Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

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

THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M88634	NEW RELEASE	08/28/03	GF	ABD
A	M102713	ADDED "...WITH SMOBC"	01/17/06	MMG	IL

SUGGESTED MOUNTING CONFIGURATION FOR FV1206 CASE STYLE, "nx" PIN CONNECTION



NOTES:
1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH THICKNESS .020" ± .0015".
   COPPER: 1/2 OZ. EACH SIDE.
   FOR OTHER MATERIALS TRACE WIDTH & GAP 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	08/27/03
TOLERANCES ON:	CHECKED	AV	08/28/03
2 PL DECIMALS ±	APPROVED	ABD	08/28/03
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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

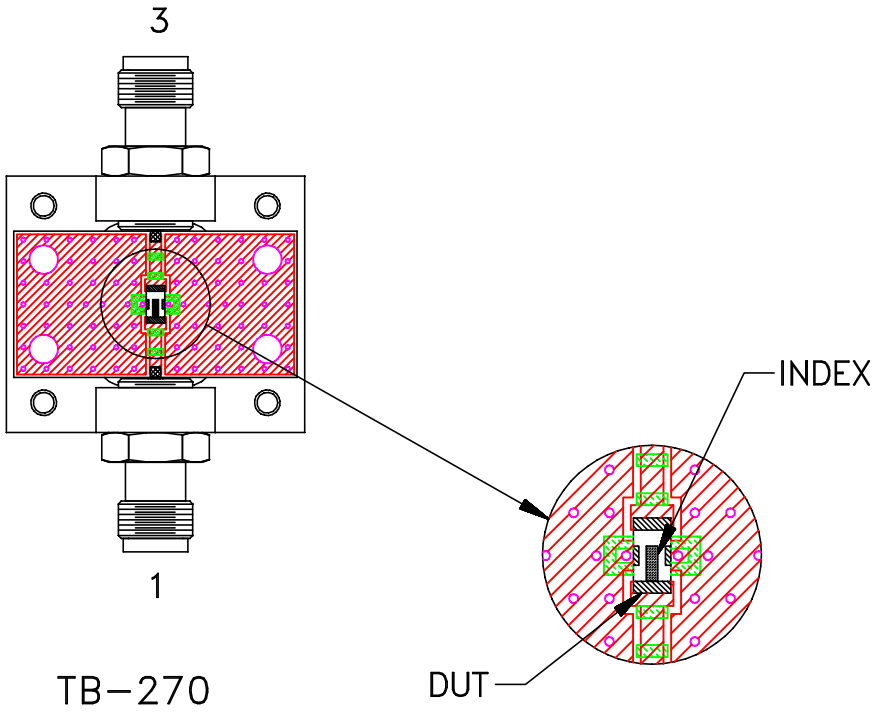
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, nx, FV1206, LFCN/HFCN, TB-270

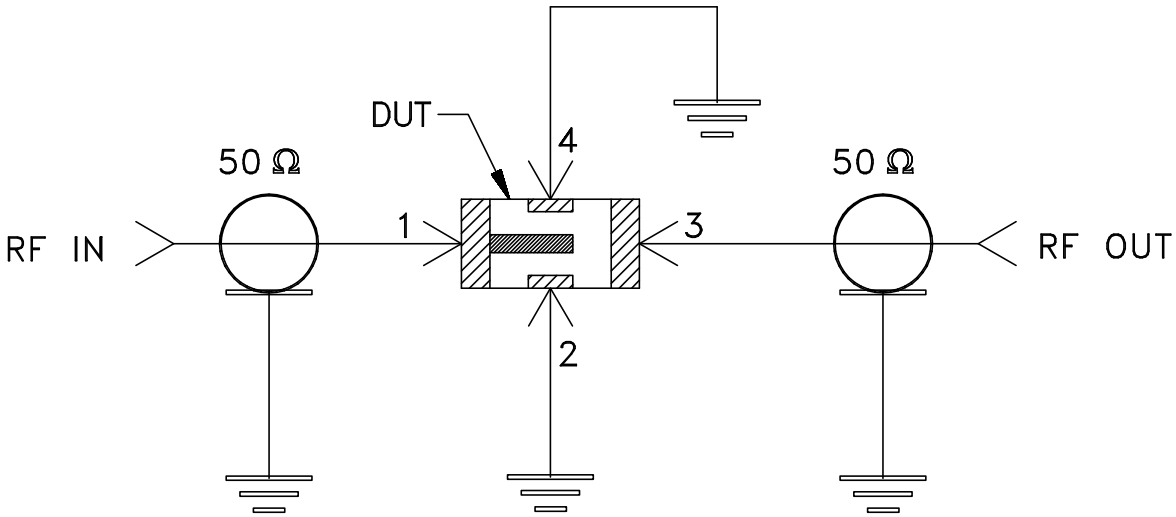
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-137	A

FILE:	SCALE:	SHEET:
98PL137	10:1	1 OF 1

Evaluation Board and Circuit



TB-270



Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: ROGERS RO4350 or equivalent, Dielectric Constant=3.5, Thickness=.020 inch.

Mini-Circuits®

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