Metal Shield

Dual Low Pass Filter

LPFD-3040+

50Ω Passband DC to 30 MHz & DC to 40 MHz

Maximum Ratings*

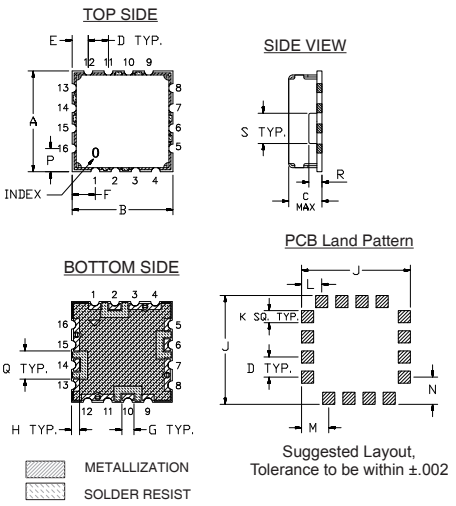
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	0.5W Max

*Ratings are for each of the two filters in the package.
Permanent damage may occur if any of these limits are exceeded.

Pin Connections

RF IN 1	2 (Filter 1)
RF OUT 1	14 (Filter 1)
RF IN 2	6 (Filter 2)
RF OUT 2	10 (Filter 2)
GROUND	1,3,4,5,7,8,9,11,12,13,15,16

Outline Drawing



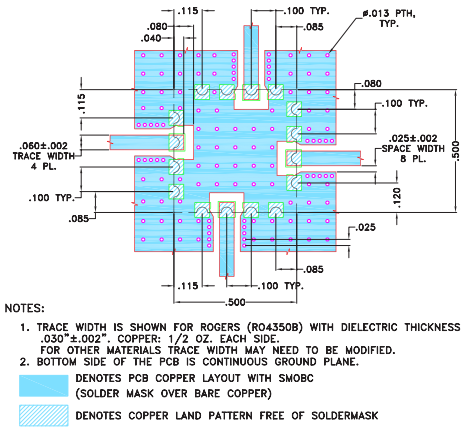
Suggested Layout,
Tolerance to be within ±.002

Outline Dimensions (inch / mm)

A	B	C	D	E	F	G	H	J
.500	.500	.195	.100	.080	.115	.060	.040	.540
12.70	12.70	4.95	2.54	2.03	2.92	1.52	1.02	13.72

K	L	M	N	P	Q	R	S	wt.
.060	.100	.135	.135	.115	.140	.070	.150	grams
1.52	2.54	3.43	3.43	2.92	3.56	1.78	3.81	1.0

Demo Board MCL P/N: TB-686
Suggested PCB Layout (PL-374)



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 SOLDERMASK

Features

- High rejection
- Sharp insertion loss roll off
- Good VSWR, 1.2:1 typ.@ passband
- Small size dual filter, 0.5" x 0.5"
- Aqueous washable

Applications

- Wireless communications
- Receivers / Transmitters

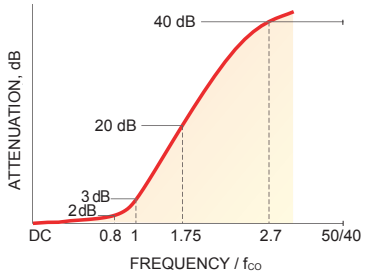
CASE STYLE: DV874

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

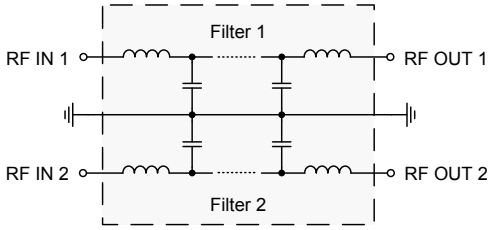
Low Pass Filter Electrical Specifications (T_{AMB}= 25°C)

STRUCTURE	PASSBAND (MHz) (Loss < 2dB)	fco, MHz Nom. (Loss 3dB)	STOPBAND (MHz) (Loss > 20dB)	STOPBAND (MHz) (Loss > 40dB)	CROSS OVER ISOLATION (dB) Typ.	VSWR (:1) Passband Typ.	VSWR (:1) Stopband Typ.
Filter 1	DC - 30	40	70 - 110	110 - 2000	60	1.2	20
Filter 2	DC - 40	49	85 - 130	130 - 2000		1.2	20

Typical Frequency Response (for each of filter)



Functional Schematic

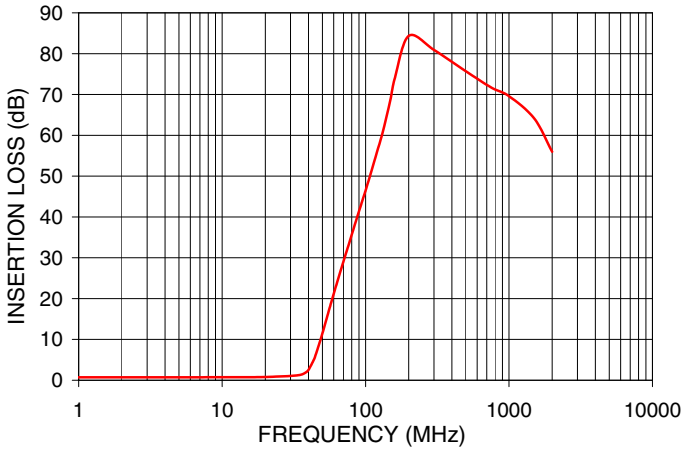


Typical Performance Data at 25°C

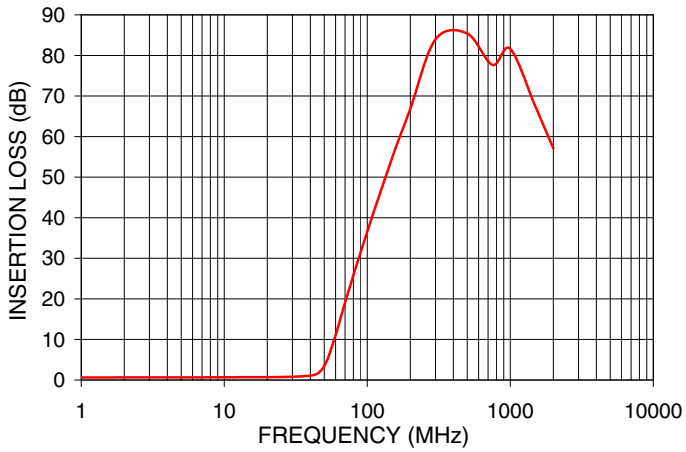
Freq. (MHz)	Filter 1 I. Loss (dB) x̄	Filter 1 I. Loss (dB) σ	Filter 1 R. Loss (dB)	Filter 2 I. Loss (dB) x̄	Filter 2 I. Loss (dB) σ	Filter 2 R. Loss (dB)	Cross Over Isolation (dB) between filters 1 & 2	Freq. (MHz)	Filter 1 Group Delay (nSec)	Filter 2 Group Delay (nSec)
0.5	0.71	0.01	21.67	0.63	0.01	22.54	80.24	1.0	14.71	12.17
10.0	0.75	0.01	19.88	0.67	0.01	19.99	73.62	2.0	13.93	11.46
30.0	1.07	0.01	23.26	0.81	0.01	35.64	63.30	5.0	14.00	11.53
40.0	2.57	0.07	8.77	1.09	0.02	26.26	57.61	7.0	14.05	11.53
45.0	6.32	0.11	3.19	1.65	0.05	12.68	57.41	9.0	14.11	11.53
49.0	10.44	0.11	1.68	2.98	0.10	6.81	58.93	10.0	14.19	11.54
55.0	16.57	0.10	0.92	7.00	0.17	2.67	62.72	12.0	14.38	11.67
60.0	21.14	0.09	0.68	11.21	0.19	1.46	65.96	14.0	14.60	11.80
70.0	29.00	0.08	0.47	19.20	0.18	0.74	70.46	18.0	15.16	12.10
85.0	38.54	0.08	0.33	28.96	0.17	0.46	73.12	20.0	15.47	12.29
100.0	46.46	0.09	0.25	36.77	0.18	0.34	73.34	22.0	15.81	12.48
110.0	51.21	0.09	0.22	41.25	0.20	0.29	73.38	26.0	16.61	12.95
130.0	59.96	0.07	0.18	48.97	0.27	0.23	73.52	28.0	17.17	13.23
300.0	79.56	1.05	0.10	92.38	7.91	0.09	70.87	30.0	18.01	13.53
500.0	77.31	1.78	0.12	84.66	1.62	0.09	70.89	32.0	19.19	13.89
1000.0	70.18	0.57	0.21	81.14	1.79	0.18	64.31	34.0	20.85	14.38
1500.0	65.33	1.24	0.26	70.79	2.35	0.25	49.52	38.0	24.94	15.78
2000.0	57.08	1.20	0.26	58.56	1.29	0.29	42.45	40.0	26.03	16.83

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

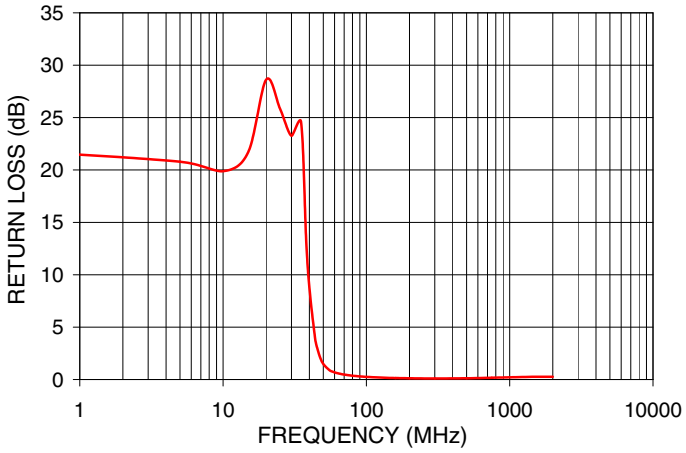
LOW PASS FILTER 1
INSERTION LOSS



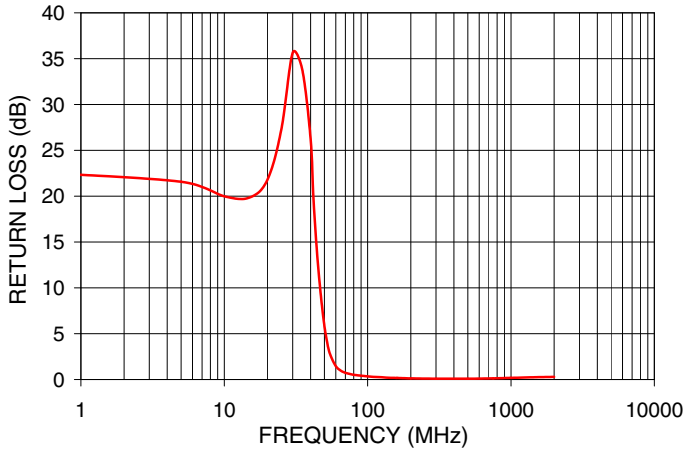
LOW PASS FILTER 2
INSERTION LOSS



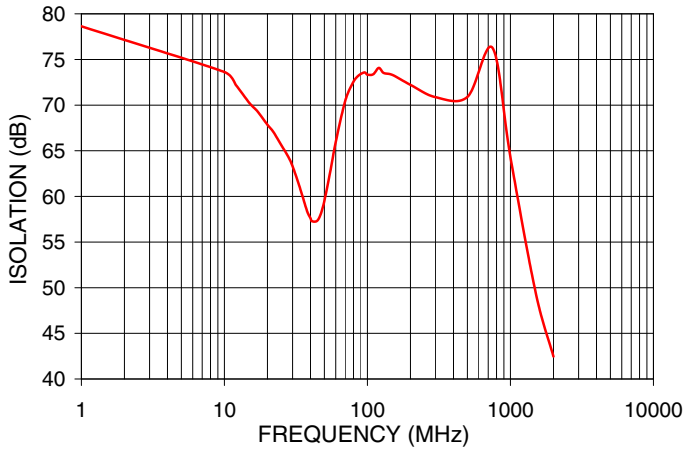
LOW PASS FILTER 1
RETURN LOSS



LOW PASS FILTER 2
RETURN LOSS



CROSS OVER ISOLATION
BETWEEN FILTERS 1 & 2



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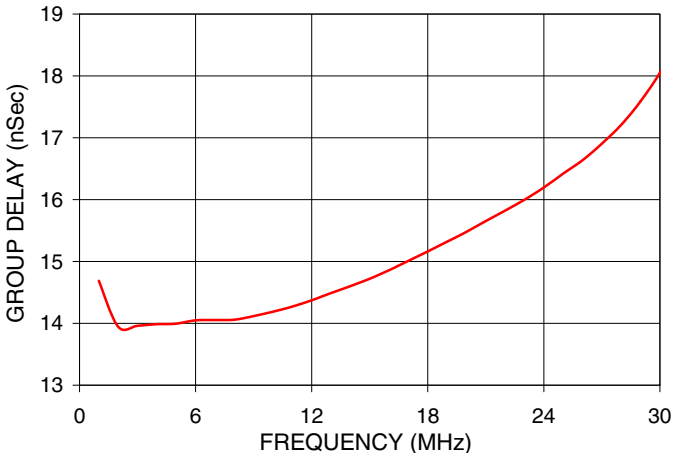
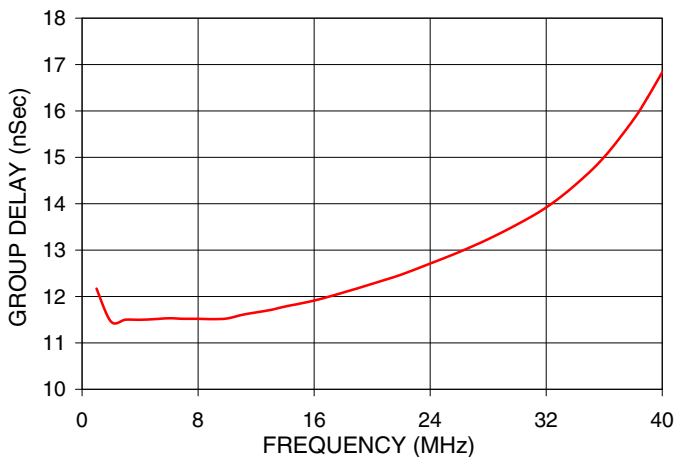
LOW PASS FILTER 1
GROUP DELAY



LOW PASS FILTER 2
GROUP DELAY



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Low Pass Filter LPFD-3040+

Typical Performance Data

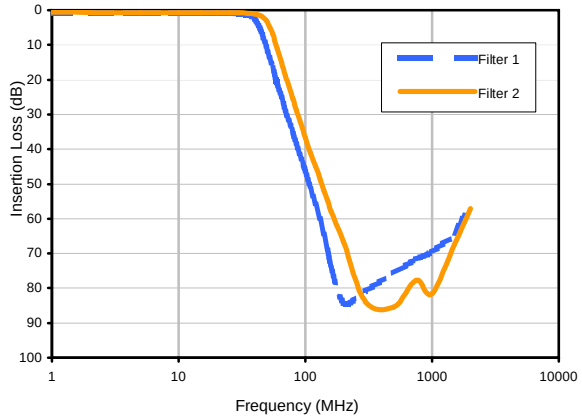
FREQUENCY (MHz)	INSERTION LOSS		RETURN LOSS		Cross Over Isolation
	Filter 1 (dB)	Filter 2 (dB)	Filter 1 (dB)	Filter 2 (dB)	between F1 & F2 (dB)
0.5	0.71	0.63	21.67	22.54	80.24
10.0	0.75	0.67	19.88	19.99	73.62
30.0	1.07	0.81	23.26	35.64	63.30
40.0	2.57	1.09	8.77	26.26	57.61
45.0	6.32	1.65	3.19	12.68	57.41
49.0	10.44	2.98	1.68	6.81	58.93
55.0	16.57	7.00	0.92	2.67	62.72
60.0	21.14	11.21	0.68	1.46	65.96
70.0	29.00	19.20	0.47	0.74	70.46
85.0	38.54	28.96	0.33	0.46	73.12
100.0	46.46	36.77	0.25	0.34	73.34
110.0	51.21	41.25	0.22	0.29	73.38
130.0	59.96	48.97	0.18	0.23	73.52
300.0	79.56	92.38	0.10	0.09	70.87
500.0	77.31	84.66	0.12	0.09	70.89
1000.0	70.18	81.14	0.21	0.18	64.31
1500.0	65.33	70.79	0.26	0.25	49.52
2000.0	57.08	58.56	0.26	0.29	42.45

FREQUENCY (MHz)	GROUP DELAY	
	Filter 1 (nsec)	Filter 2 (nsec)
1.0	14.71	12.17
2.0	13.93	11.46
5.0	14.00	11.53
7.0	14.05	11.53
9.0	14.11	11.53
10.0	14.19	11.54
12.0	14.38	11.67
14.0	14.60	11.80
18.0	15.16	12.10
20.0	15.47	12.29
22.0	15.81	12.48
26.0	16.61	12.95
28.0	17.17	13.23
30.0	18.01	13.53
32.0	19.19	13.89
34.0	20.85	14.38
38.0	24.94	15.78
40.0	26.03	16.83

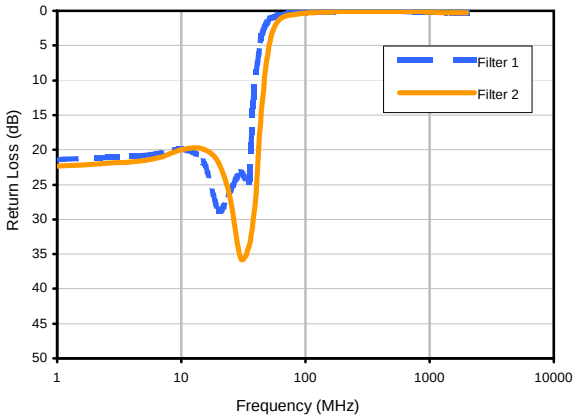
Low Pass Filter LPFD-3040+

Typical Performance Data

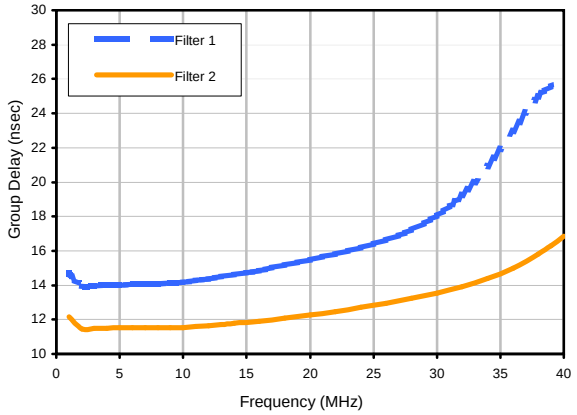
Insertion Loss



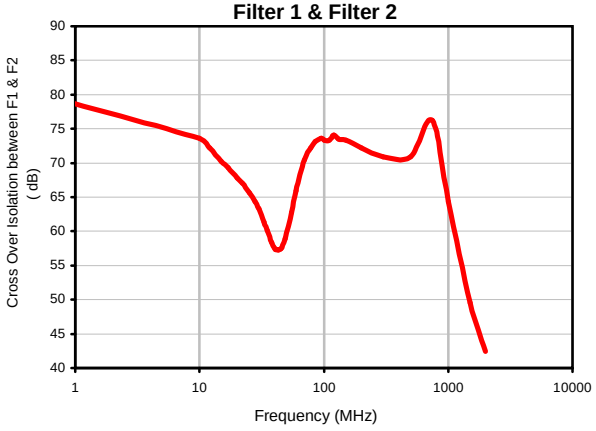
Return Loss



Group Delay

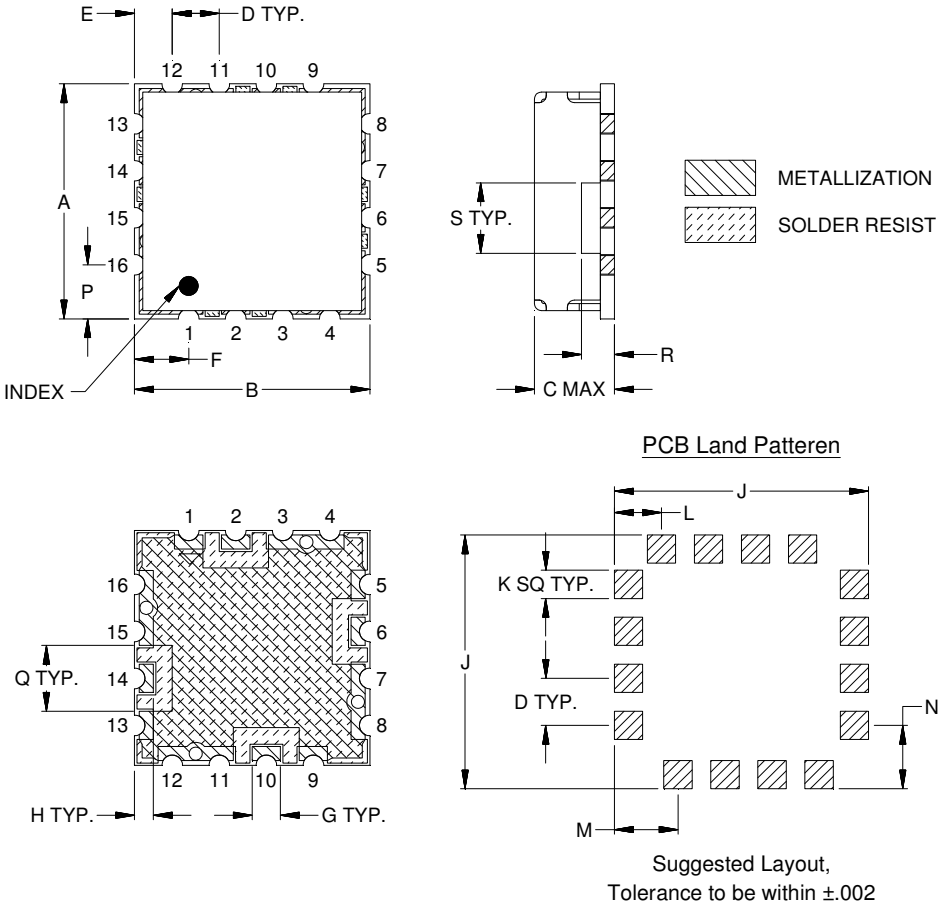


Cross Over Isolation between Filter 1 & Filter 2



Case Style DV

Outline Dimensions DV874



CASE#	A	B	C	D	E	F	G	H	J	K	L	M
DV874	.500 (12.70)	.500 (12.70)	.195 (4.95)	.100 (2.54)	.080 (2.03)	.115 (2.92)	.060 (1.52)	.040 (1.02)	.540 (13.72)	.060 (1.52)	.100 (2.54)	.135 (3.43)

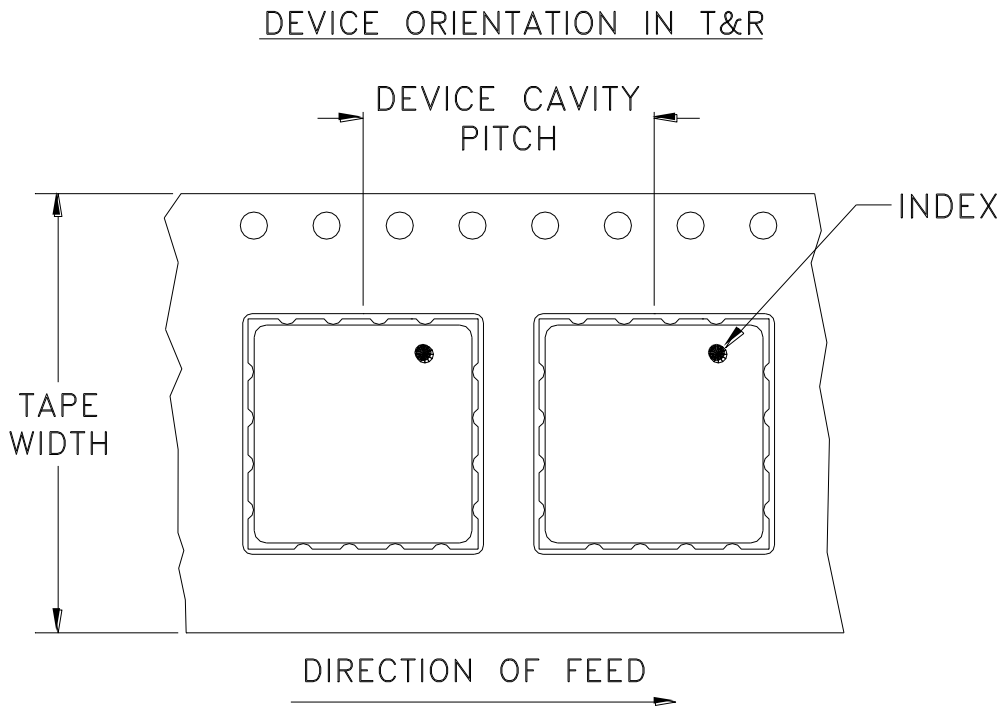
CASE#	N	P	Q	R	S	WT.GRAM
DV874	.135 (3.43)	.115 (2.92)	.140 (3.56)	.070 (1.78)	.150 (3.81)	1.0

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

Notes:

1. Case material: Nickel-Silver alloy.
2. Base: Printed wiring laminate.
3. Termination finish:
   For RoHS Case Styles: 3-5 µ inch (.08-.13 microns) Gold over 120-240 µ inch (3.05-6.10 microns) Nickel plate.
   For RoHS-5 Case Styles: Tin-Lead plate.

Tape & Reel Packaging TR-F37



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel	
24	16	7	Small quantity standards (see note)	10
				20
				50
				100
		13	Standard	200
				500

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

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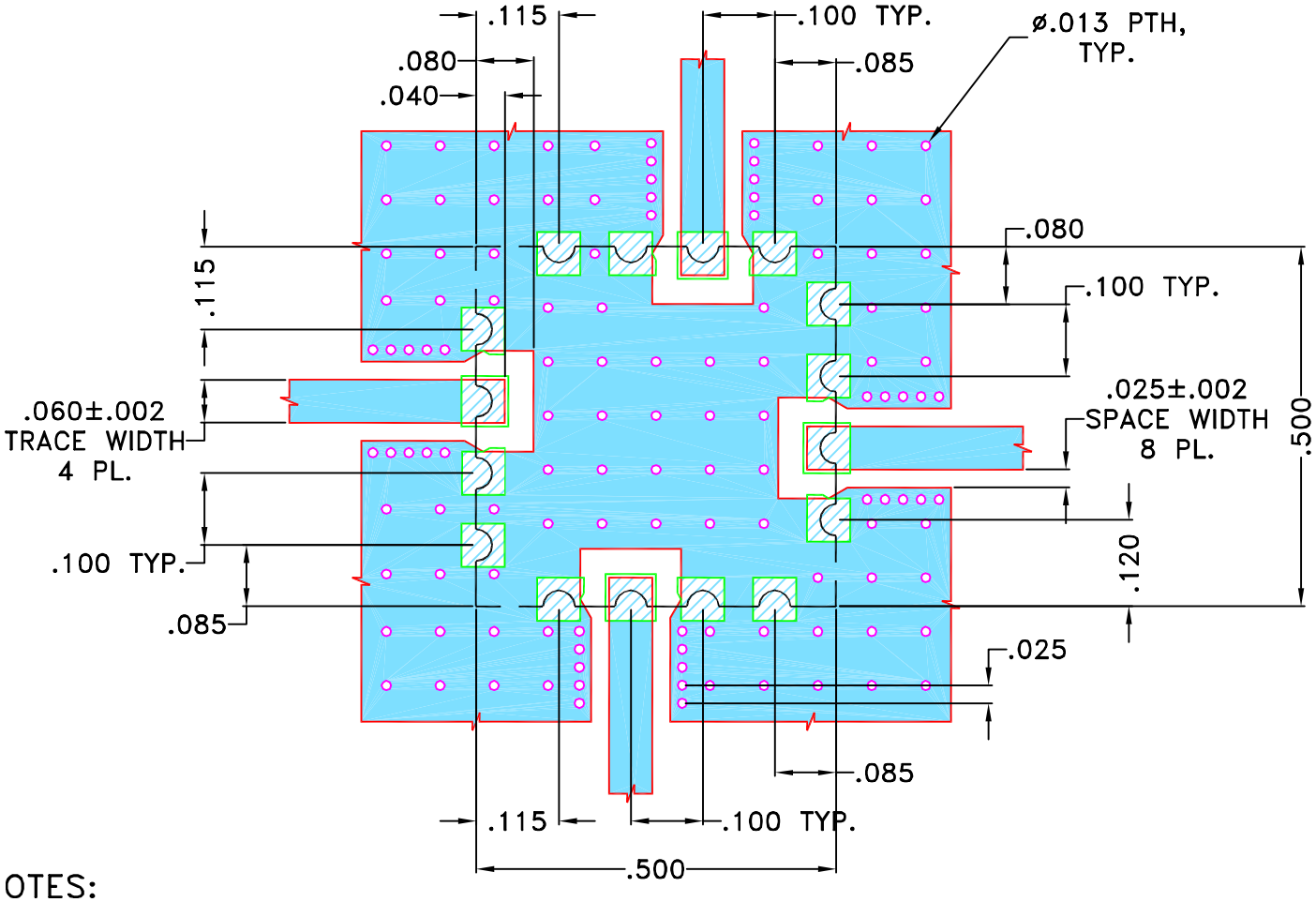
Mini-Circuits ISO 9001 & ISO 14001 Certified

THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M137753	NEW RELEASE	JUN 12	DDR	KG
A	M142821	ADDED PIN CODE "16FL01"	08/07/13	GF	IL

SUGGESTED MOUNTING CONFIGURATION FOR DV874 CASE STYLE, 16AV01/16FL01 PIN CODES



NOTES:

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   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 SOLDERMASK

UNLESS OTHERWISE SPECIFIED		INITIALS	DATE
DIMENSIONS ARE IN INCHES	DRAWN	DDR	26 JUN 12
TOLERANCES ON:	CHECKED	MD	26 JUN 12
2 PL DECIMALS ±	APPROVED	ASJ	26 JUN 12
3 PL DECIMALS ± .005"			
ANGLES ±			
FRACTIONS ±			

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

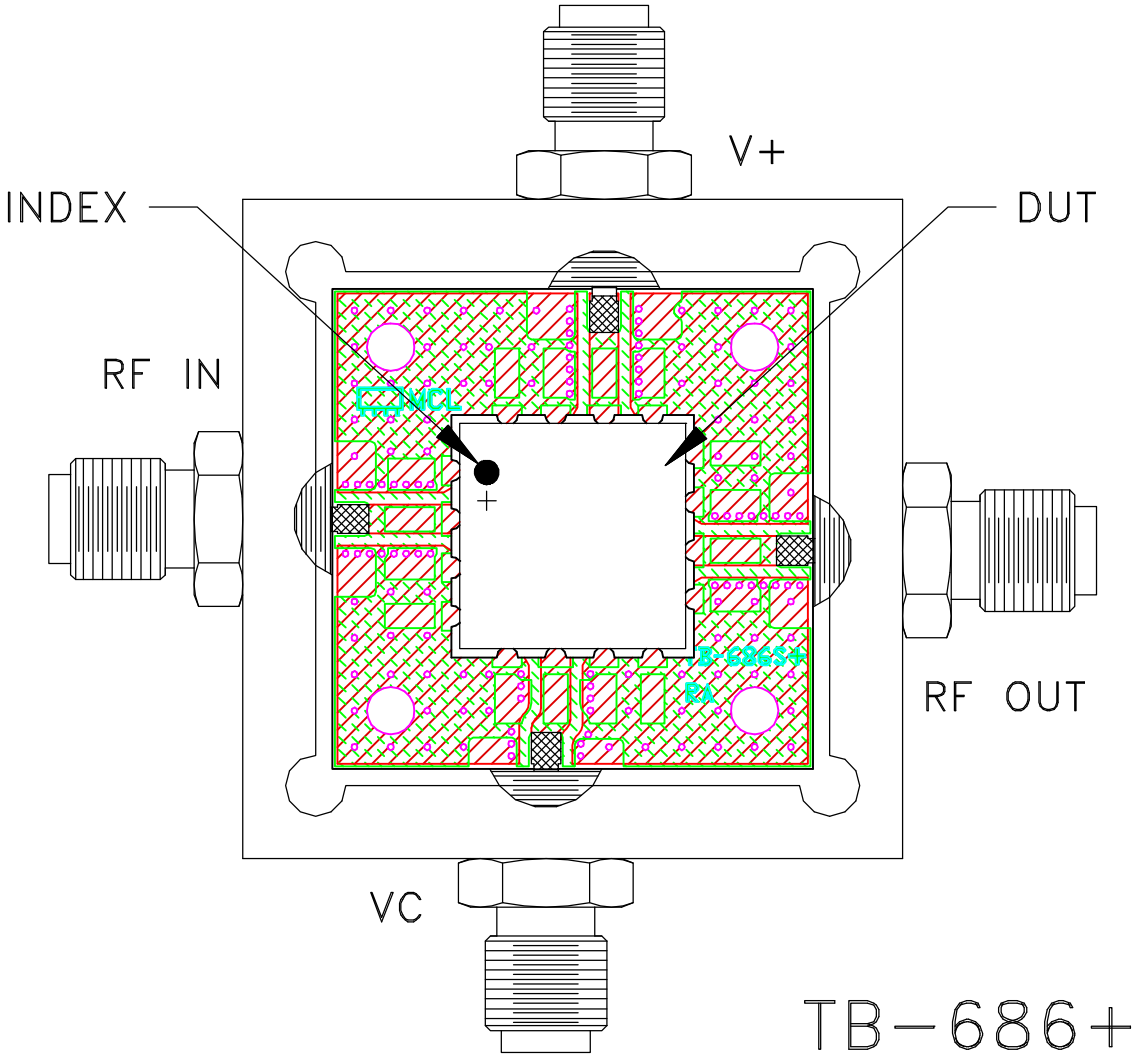
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, 16AV01/16FL01, DV874, TB-686+

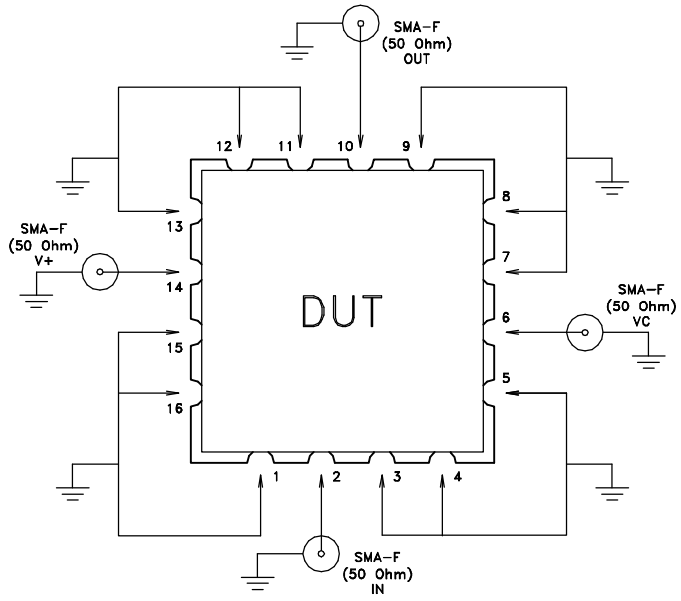
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-374	A

FILE:	SCALE:	SHEET:
98PL374	4:1	1 OF 1

Evaluation Board and Circuit



TB-686+



Schematic Diagram

Notes:
1. 50 Ohm SMA Female connectors.
2. PCB Material: ROGERS (RO4350B) OR Equivalent
   Dielectric Constant=3.48±.05, Thickness=.030 inch.

Mini-Circuits®

Mini-Circuits

Environmental Specifications ENV03T3

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 85°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 85° C Ambient Environment	Individual Model Data Sheet
HAST	130°C, 85% RH, 96 hours	JESD22-A110
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 Eutectic Process: 225°C peak Pb-Free Process, 245°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, 20-2000 Hz, 4 times in each of three axes (total 12)	MIL-STD-883, Method 2007.3, Condition A
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