Surface Mount

Diplexer

RDP-272+

50Ω DC to 2700 MHz
(DC-950, 1700-2700 MHz)

The Big Deal

- Low insertion loss
- High isolation
- Miniature shielded package



CASE STYLE: CK605

Product Overview

RDP-272+ is a low-pass + high-pass combination device. Low pass port is designed for DC to 950 MHz and high pass port is designed for 1700 to 2700 MHz. This diplexer can be used in satellite systems, vehicle tracking, communication test sets and other multiband radio systems.

Key Features

Feature	Advantages
Low passband insertion loss	Suitable for high performance application.
Extended stopband rejection	Spurious rejection and avoids using additional filters.
Miniature shielded package	Reduced interference with the surrounding components.

Notes: 1. Performance and quality attributes and conditions not expressly stated in this specification sheet are intended to be excluded and do not form a part of this specification sheet. **2.** Electrical specifications and performance data contained herein are based on Mini-Circuit's applicable established test performance criteria and measurement instructions. **3.** The parts covered by this specification sheet 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.

Surface Mount

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RDP-272+

50Ω DC to 2700 MHz (DC-950, 1700-2700 MHz)



Generic photo used for illustration purposes only

CASE STYLE: CK605

+RoHS Compliant

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

Maximum Ratings

Operating Temperature	-40C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	0.5W at 25°C

Permanent damage may occur if any of these limits are exceeded. These ratings are not intended for continuous normal operation

Pin Connections

HIGH PASS PORT	14
LOW PASS PORT	10
COMMON PORT	2
GROUND	1,3-9,11-13,15,16

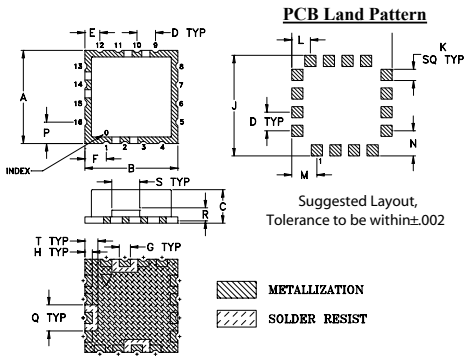
Features

- Low insertion loss
- 50Ω Impedance
- Combination of Low pass and High pass filters
- Miniature shielded package
- Aqueous washable

Applications

- Satellite systems
- Vehicle tracking
- Multiband radio systems

Outline Drawing

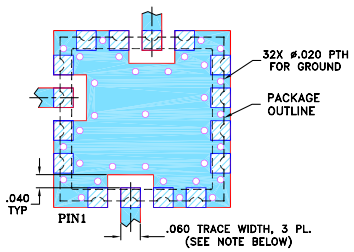


Outline Dimensions (inch / mm)

A	B	C	D	E	F	G	H	J	K
.500	.500	.180	.100	.080	.115	.060	.040	.540	.060
12.7	12.7	4.572	2.54	2.032	2.921	1.524	1.016	13.72	1.524

L	M	N	P	Q	R	S	T	wt.
.100	.135	.135	.115	.140	.070	.150	.070	grams
2.54	3.429	3.429	2.921	3.556	1.778	3.81	1.778	1.0

Demo Board MCL P/N: TB-10+
Suggested PCB Layout (PL-012)



NOTES: 1. TRACE WIDTH IS SHOWN FOR FR4 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

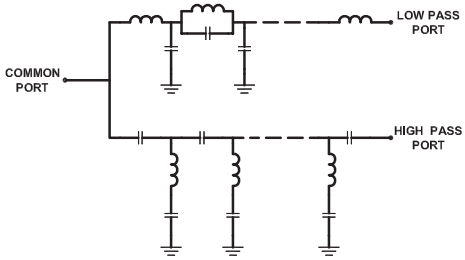
Electrical Specifications at 25°C

Parameter		Port	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Insertion Loss	Low Pass	DC-950	-	0.7	2.5	dB
		High Pass	1700-2700	-	0.7	1.5	
	Return Loss	Low Pass	DC-950	12	18	-	dB
		High Pass	1700-2700	12	17	-	
		Common	DC-950	12	20	-	
			1700-2700	12	17	-	
Stop Band Isolation		Low Pass	1360-2700	20	31	-	dB
			1700-2700	36	48	-	
		High Pass	DC-980	-	30	-	dB
			DC-950	20	35	-	

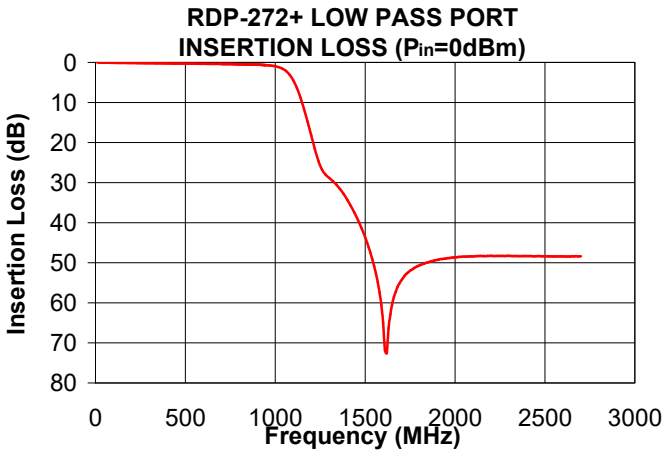
Typical Performance Data at 25°C

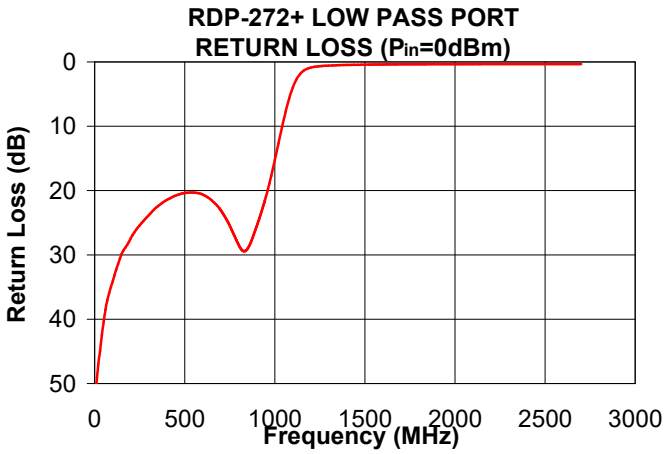
FREQUENCY (MHz)	INSERTION LOSS (dB)		RETURN LOSS (dB)		
	Low Pass Port	High Pass Port	Common Port	Low Pass Port	High Pass Port
10	0.03	102.79	48.98	50.10	0.00
30	0.06	104.68	43.87	44.92	0.00
120	0.12	81.00	30.90	32.24	0.02
360	0.24	54.54	21.45	22.24	0.08
858	0.50	51.81	29.28	28.58	0.40
950	0.69	36.22	22.33	21.02	0.53
980	0.82	31.11	19.06	17.73	0.59
1020	1.19	24.62	13.78	12.67	0.70
1080	3.09	14.94	6.79	5.63	1.10
1120	6.38	9.96	4.28	2.71	1.72
1140	8.79	8.14	3.78	1.88	2.16
1200	18.17	4.57	4.36	0.87	4.04
1220	21.58	3.79	5.01	0.76	4.88
1360	31.58	1.16	14.42	0.50	15.38
1480	41.41	0.76	33.54	0.43	30.23
1550	50.81	0.70	22.97	0.40	21.17
1620	72.56	0.68	19.66	0.38	18.57
1700	54.49	0.66	18.29	0.37	17.63
1850	49.88	0.62	18.09	0.35	18.03
2000	48.64	0.57	18.82	0.34	19.62
2450	48.35	0.56	17.23	0.33	19.06
2700	48.38	0.59	15.66	0.33	16.99

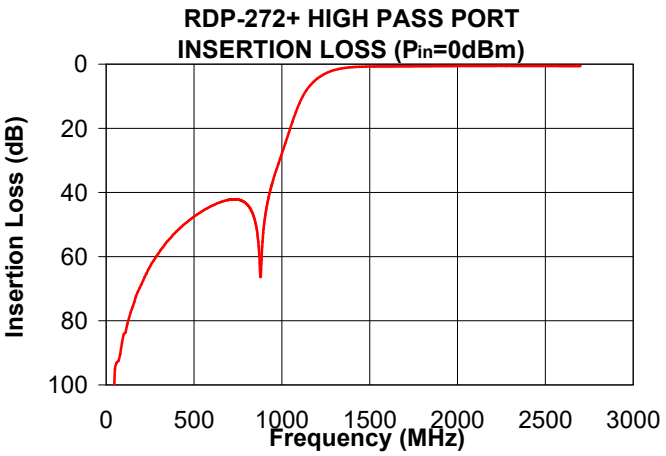
Functional Schematic

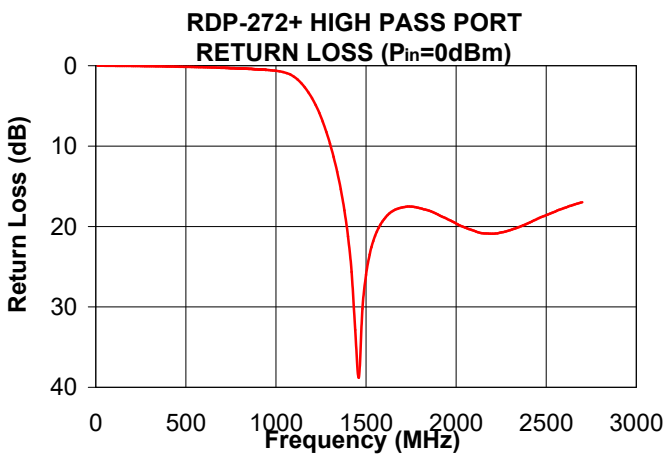


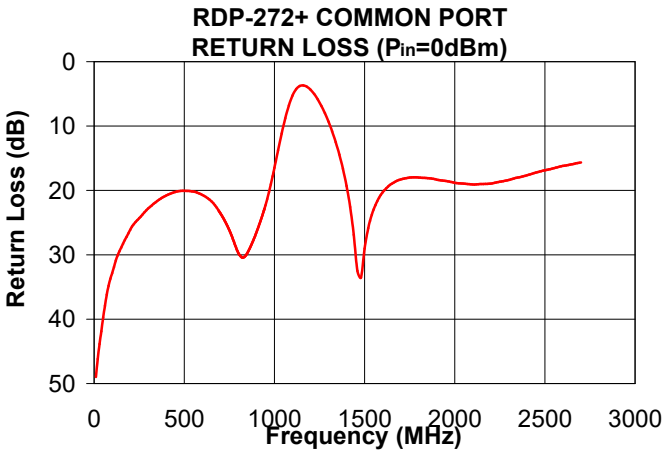
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Surface Mount Diplexer RDP-272+

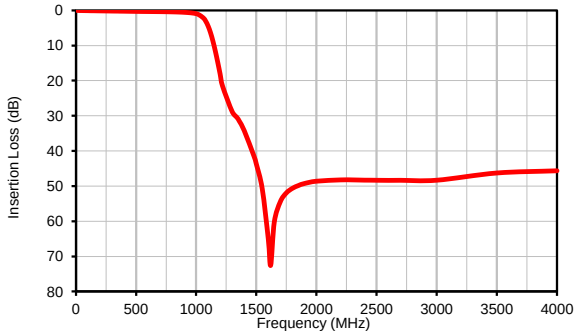
Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS (dB)		CROSS OVER ISOLATION (dB)	RETURN LOSS (dB)		
	Low Pass port	High Pass port	(between LPF and HPF)	Common port	Low Pass port	High Pass port
10.0	0.03	102.79	102.61	48.98	50.10	0.00
20.0	0.04	103.15	100.10	46.19	47.03	0.00
30.0	0.06	104.68	100.82	43.87	44.92	0.00
40.0	0.07	107.39	93.44	41.88	42.45	0.00
50.0	0.07	95.03	99.52	39.75	40.40	0.01
60.0	0.08	93.06	90.47	37.92	38.50	0.01
80.0	0.09	90.37	92.43	34.83	35.97	0.01
100.0	0.10	84.19	88.89	32.84	34.13	0.01
120.0	0.12	81.00	81.94	30.90	32.24	0.02
150.0	0.13	75.81	76.71	28.88	29.83	0.02
200.0	0.16	68.70	69.50	26.12	27.44	0.04
260.0	0.19	62.02	62.59	24.03	25.07	0.05
300.0	0.21	58.81	59.01	22.80	23.85	0.07
350.0	0.23	55.14	55.19	21.65	22.45	0.08
360.0	0.24	54.54	54.50	21.45	22.24	0.08
400.0	0.26	52.17	52.01	20.79	21.46	0.10
500.0	0.31	47.53	46.98	20.06	20.38	0.14
600.0	0.35	44.20	43.38	20.70	20.62	0.20
700.0	0.38	42.26	41.47	23.54	23.06	0.26
800.0	0.44	43.63	42.77	29.73	28.46	0.34
858.0	0.50	51.81	48.36	29.28	28.58	0.40
900.0	0.57	49.43	47.91	26.53	25.49	0.45
950.0	0.69	36.22	36.35	22.33	21.02	0.53
960.0	0.73	34.44	34.66	21.33	19.99	0.54
980.0	0.82	31.11	31.62	19.06	17.73	0.59
990.0	0.88	29.50	30.26	17.80	16.52	0.61
1000.0	0.96	27.89	28.95	16.48	15.26	0.64
1020.0	1.19	24.62	26.56	13.78	12.67	0.70
1060.0	2.15	18.01	22.62	8.79	7.72	0.92
1080.0	3.09	14.94	21.19	6.79	5.63	1.10
1100.0	4.48	12.22	20.22	5.27	3.94	1.37
1120.0	6.38	9.96	19.74	4.28	2.71	1.72
1140.0	8.79	8.14	19.71	3.78	1.88	2.16
1160.0	11.62	6.69	20.04	3.69	1.36	2.69
1180.0	14.79	5.52	20.63	3.90	1.05	3.32
1200.0	18.17	4.57	21.41	4.36	0.87	4.04
1220.0	21.58	3.79	22.34	5.01	0.76	4.88
1300.0	28.85	1.81	27.09	9.31	0.57	9.68
1340.0	30.51	1.33	29.98	12.50	0.52	13.20
1360.0	31.58	1.16	31.53	14.42	0.50	15.38
1400.0	34.23	0.94	34.87	19.30	0.47	21.23
1480.0	41.41	0.76	42.87	33.54	0.43	30.23
1500.0	43.67	0.74	45.36	29.03	0.42	26.01
1550.0	50.81	0.70	53.60	22.97	0.40	21.17
1600.0	65.06	0.69	68.21	20.29	0.39	19.09
1620.0	72.56	0.68	61.42	19.66	0.38	18.57
1650.0	60.30	0.67	55.99	18.97	0.38	18.05
1700.0	54.49	0.66	52.20	18.29	0.37	17.63
1750.0	51.98	0.64	50.48	18.00	0.36	17.52
1800.0	50.68	0.63	49.62	17.99	0.36	17.73
1850.0	49.88	0.62	49.11	18.09	0.35	18.03
1900.0	49.30	0.60	48.87	18.32	0.35	18.52
2000.0	48.64	0.57	48.71	18.82	0.34	19.62
2200.0	48.27	0.55	48.77	18.93	0.33	20.89
2300.0	48.27	0.54	48.81	18.37	0.33	20.46
2400.0	48.34	0.55	48.87	17.65	0.33	19.59
2450.0	48.35	0.56	48.84	17.23	0.33	19.06
2500.0	48.37	0.56	48.90	16.87	0.33	18.59
2600.0	48.40	0.58	49.05	16.19	0.33	17.70
2700.0	48.38	0.59	49.23	15.66	0.33	16.99
3000.0	48.36	0.64	50.10	14.47	0.33	15.39
3500.0	46.30	0.87	48.69	13.76	0.33	13.75
4000.0	45.67	1.04	47.99	10.40	0.37	10.54

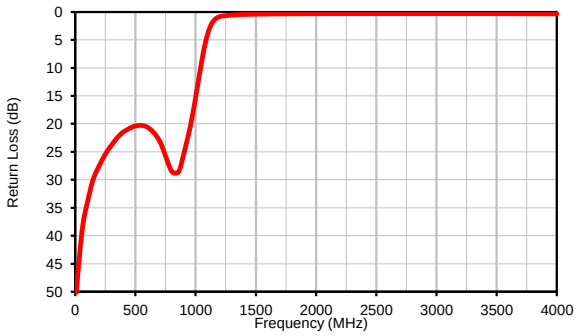
Surface Mount Diplexer RDP-272+

Typical Performance Curves

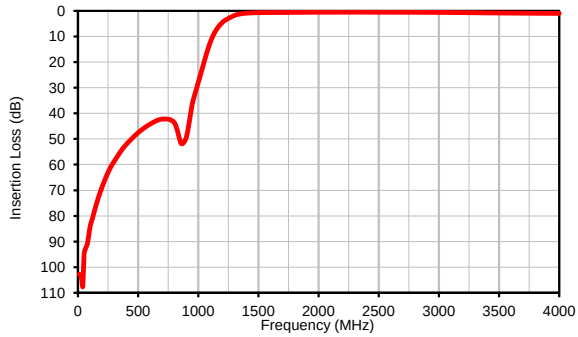
Low Pass Port Insertion Loss



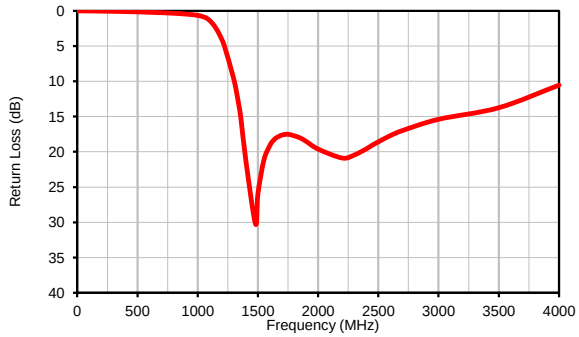
Low Pass Port Return Loss



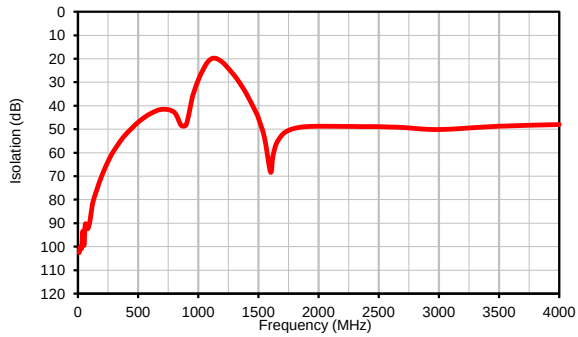
High Pass Port Insertion Loss



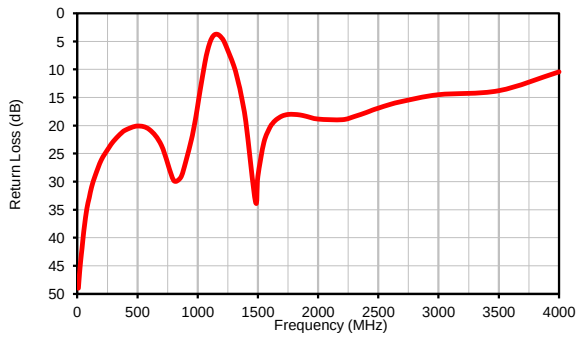
High Pass Port Return Loss



Cross over Isolation



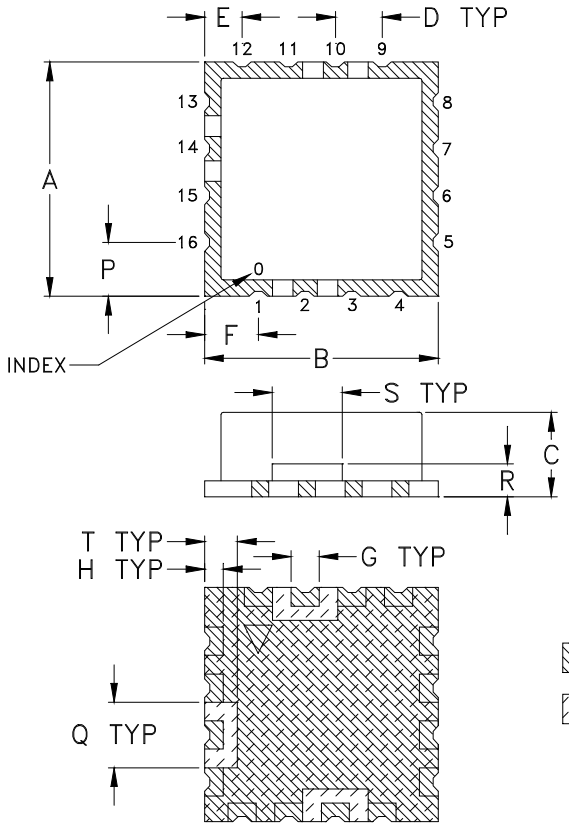
Common Port Return Loss



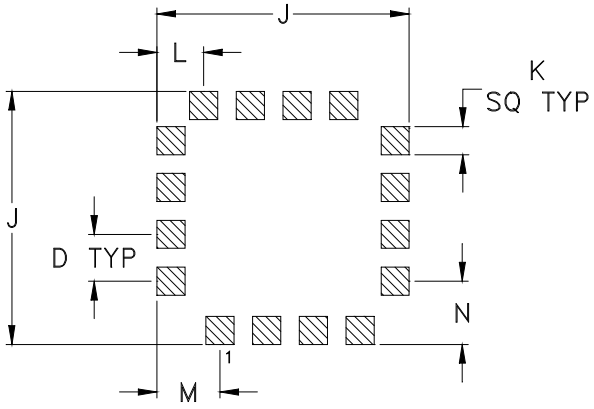
Case Style CK

CK605

Outline Dimensions



PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

CASE #	A	B	C	D	E	F	G	H	J	K
CK605	.500 (12.70)	.500 (12.70)	.180 (4.57)	.100 (2.54)	.080 (2.03)	.115 (2.92)	.060 (1.52)	.040 (1.02)	.540 (13.72)	.060 (1.52)

CASE #	L	M	N	P	Q	R	S	T	WT. GRAM	
CK605	.100 (2.54)	.135 (3.43)	.135 (3.43)	.115 (2.92)	.140 (3.56)	.070 (1.78)	.150 (3.81)	.070 (1.78)	1.2	+0.5 -0.0

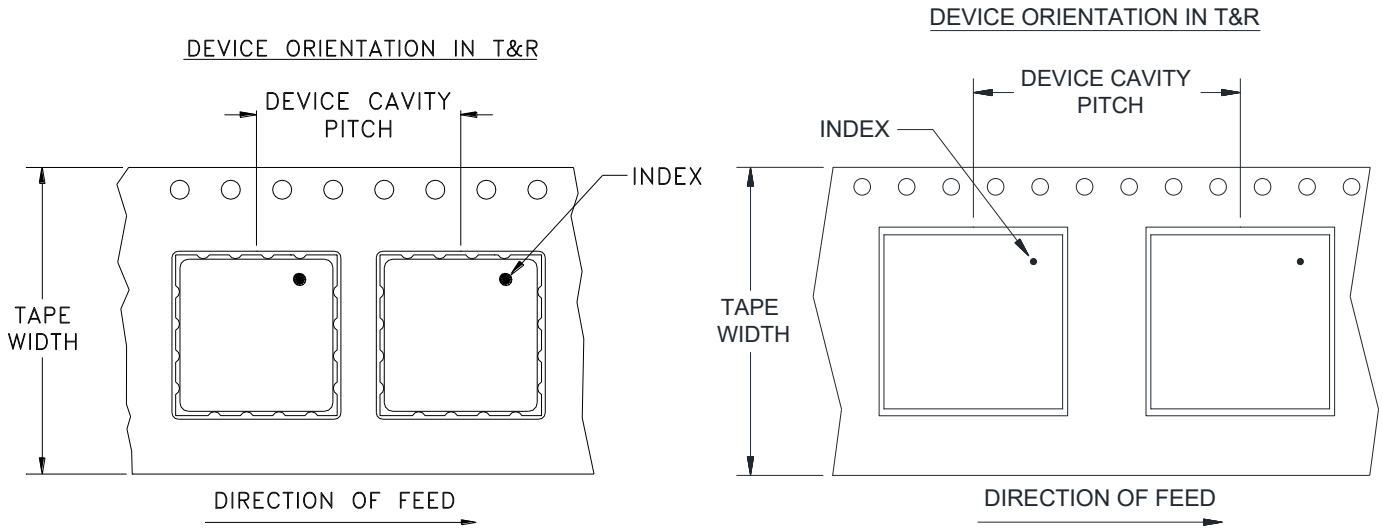
Dimensions are in inches (mm). Tolerances: 2 Pl. ± .03; 3Pl. ± .015

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. All models, (+) suffix.

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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.

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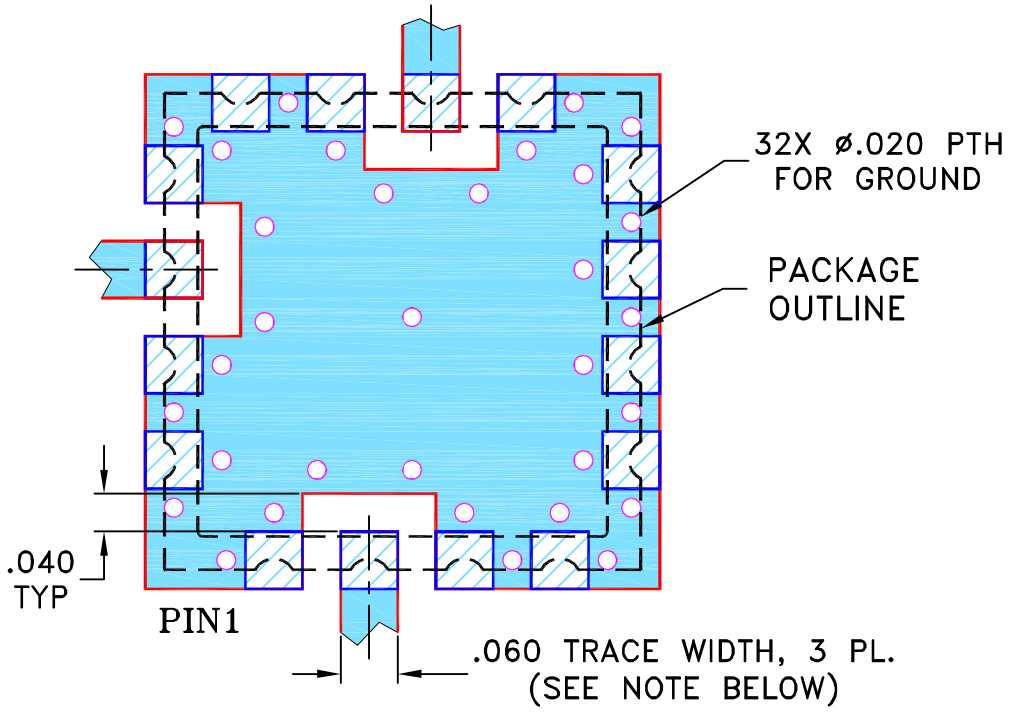
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THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
E	M105563	ADDED "rl" PIN CONNECTION	06/02/06	MMG	DJ
F	M105640	CORRECTED NOTE 2	06/08/06	MMG	MM
G	M124395	ADDED "RAMP"	09/09	EM	HH
G	R77589	ADDED "RAMP"	09/09	EM	HH

SUGGESTED MOUNTING CONFIGURATION FOR CK605 CASE STYLE, "kg/rl/16AM01" PIN CONNECTION



NOTES:

1. TRACE WIDTH IS SHOWN FOR FR4 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 BOTTOM 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	AV	08/07/00
TOLERANCES ON:	CHECKED	SK	08/08/00
2 PL DECIMALS ±	APPROVED	DB	08/08/00
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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

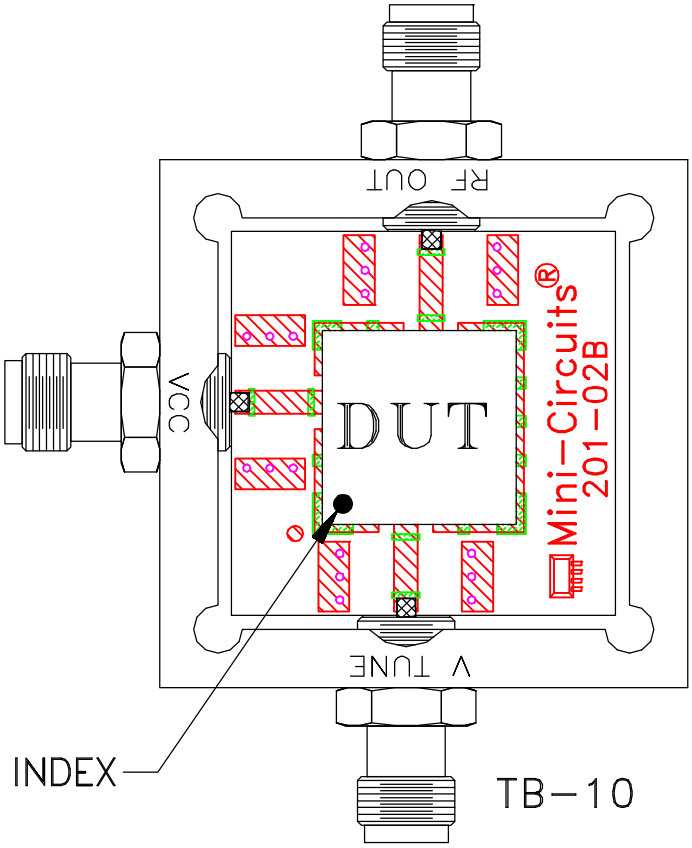
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

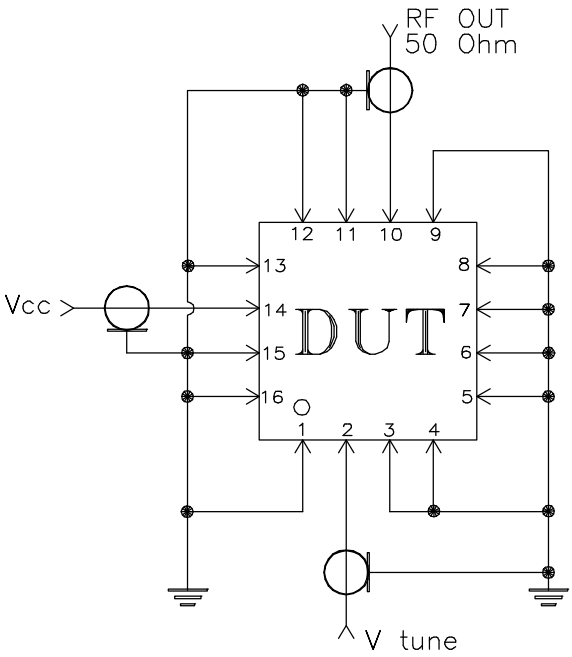
PL,kg/rl/16AM01,CK605,ROS/LAVI/RAMP

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-012	G

FILE:	SCALE:	SHEET:
98PL012	5:1	1 OF 1

Evaluation Board and Circuit





Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: Rogers RO4350 or equivalent, Dielectric Constant=3.5, Thickness=.030 inch.

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Mini-Circuits

Environmental Specifications ENV03

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 100° 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

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