

Surface Mount Diplexer

RDP-2150+

50Ω DC to 2150 MHz
(DC-10, 40-2150 MHz)

The Big Deal

- Low insertion loss
- Extended stopband rejection
- Miniature shielded package



CASE STYLE: CK605

Product Overview

RDP-2150+ is a low-pass + high-pass combination device. Low pass port is designed for DC to 10 MHz and high pass port is designed for 40 to 2150 MHz. This diplexer can be used in satellite, CATV, set-top box, modem, video equipment 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

- 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



Surface Mount Diplexer

RDP-2150+

50Ω DC to 2150 MHz (DC-10, 40-2150 MHz)

Maximum Ratings

Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
Max. DC Voltage	25V
Max. Input Current	100 mA
Max. RF Power Input	350mW

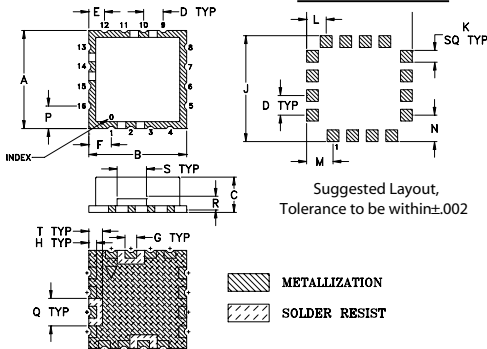
1. Exceeding any one or combination of these limits may cause permanent damage.
2. Sustained operation near these survivability limits is not recommended.

Pin Connections

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

Outline Drawing

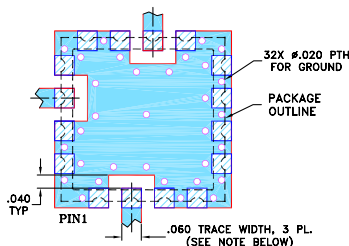
PCB Land Pattern



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

Features

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

Applications

- Set-top box
- Satellite
- CATV
- Multiband radio systems

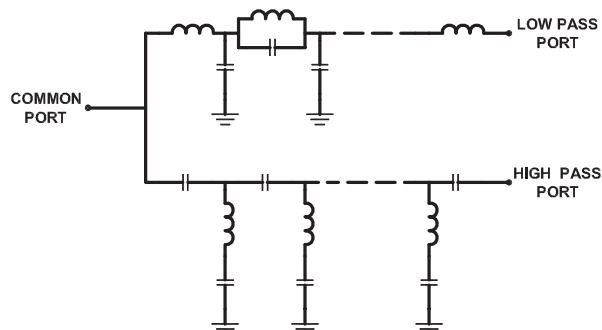
Electrical Specifications at 25°C

Parameter	Port	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Insertion Loss	Low Pass	DC-10	-	0.5	1.0
		High Pass	40-2150	-	0.9	1.5
	Return Loss	Low Pass	DC-10	16	29	-
		High Pass	40-2150	12	16	-
		Common	DC-10	16	23	-
Stop Band Isolation	Low Pass	40-2200	20	31	-	dB
		50-2150	30	44	-	dB
	High Pass	DC-18	20	33	-	dB
		DC-10	30	61	-	dB

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
1	0.36	100.14	29.01	29.46	0.05
10	0.49	61.27	24.22	35.22	0.16
18	0.82	33.52	24.77	24.20	0.61
19	0.91	30.63	20.83	20.30	0.72
24	2.09	20.07	9.93	9.19	2.09
26	3.18	15.02	8.34	6.98	3.87
30	10.47	3.27	14.35	2.09	21.03
35	20.82	1.41	18.71	0.78	16.53
40	28.46	0.94	22.53	0.53	21.28
42	31.18	0.83	24.48	0.48	23.62
50	40.41	0.58	31.95	0.36	26.67
100	70.27	0.22	34.43	0.14	26.71
250	75.32	0.12	38.09	0.05	37.16
500	78.57	0.13	32.71	0.07	33.02
600	75.89	0.14	30.70	0.08	31.08
700	72.50	0.15	29.18	0.10	29.28
800	69.32	0.16	27.65	0.11	27.79
1000	64.63	0.19	25.21	0.14	25.16
1500	56.38	0.28	20.97	0.21	21.23
2000	50.44	0.48	17.81	0.26	19.06
2150	49.68	0.69	19.89	0.26	25.50
2200	48.90	0.55	20.83	0.27	25.25

Functional Schematic



CASE STYLE: CK605

+RoHS Compliant

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

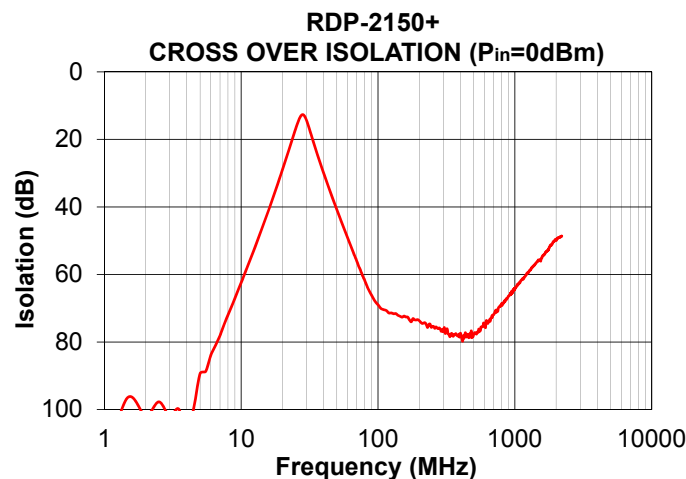
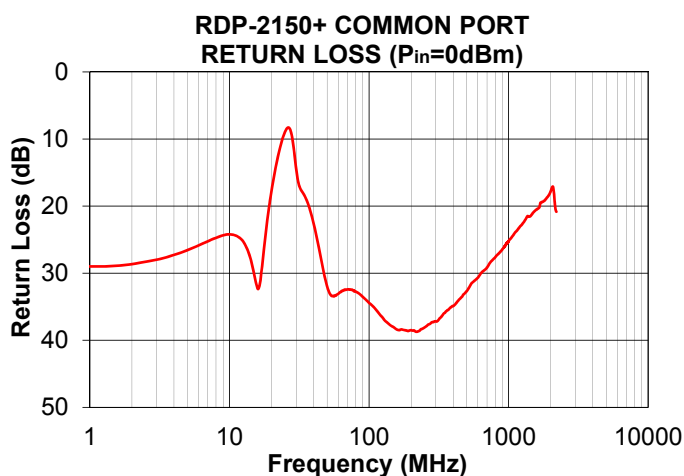
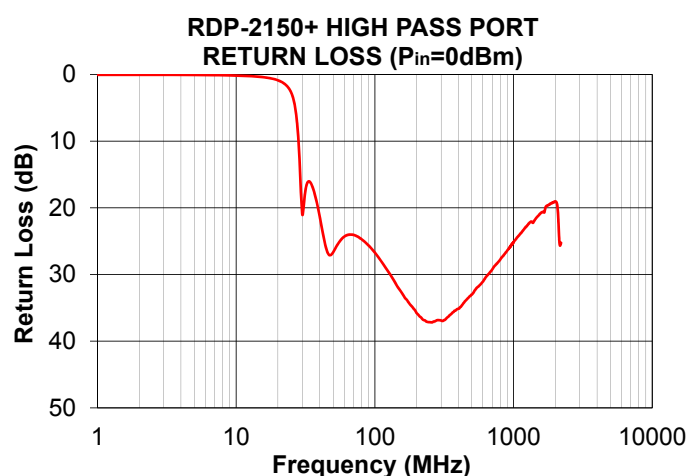
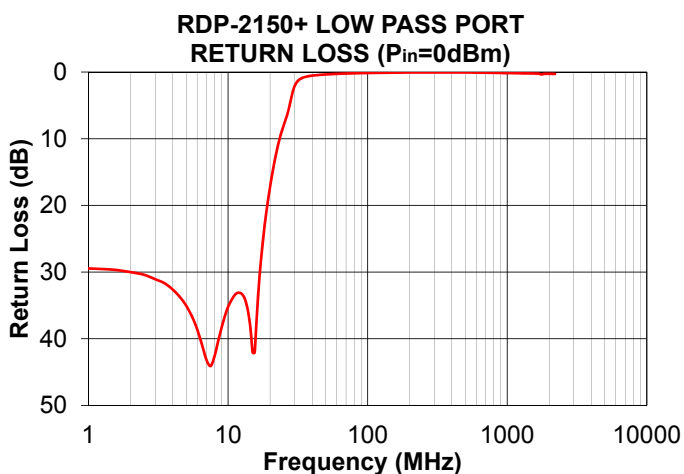
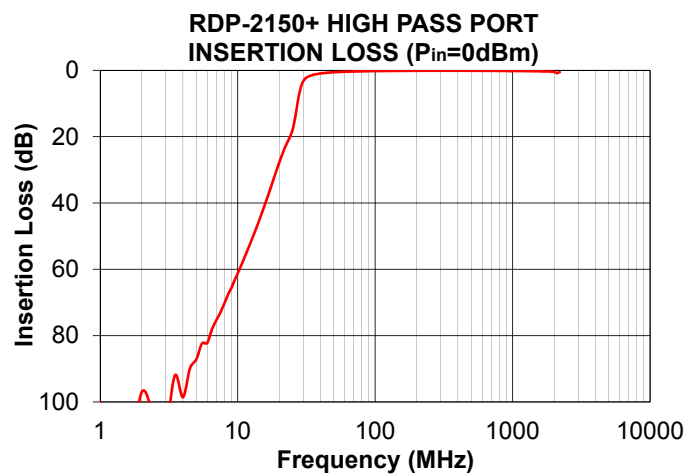
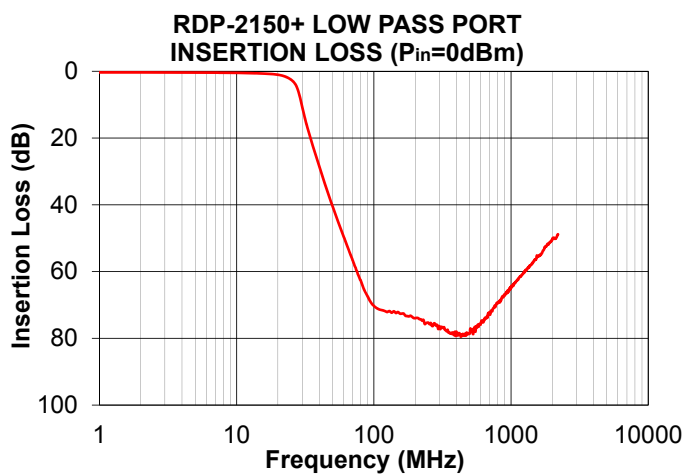
Notes

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REV. OR
M163544
EDU2741/1
RDP-2150+
URJ
171025
Page 2 of 3



Notes

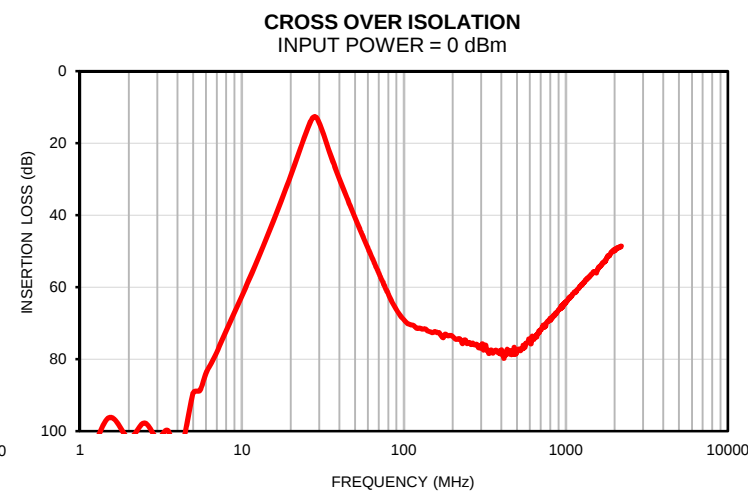
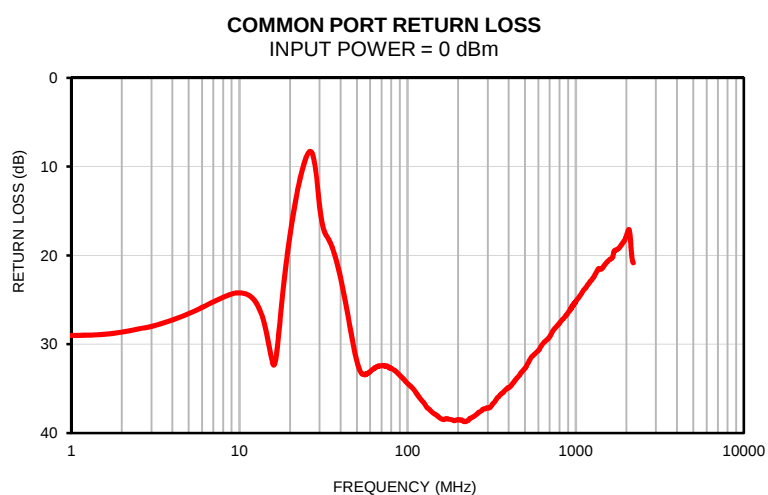
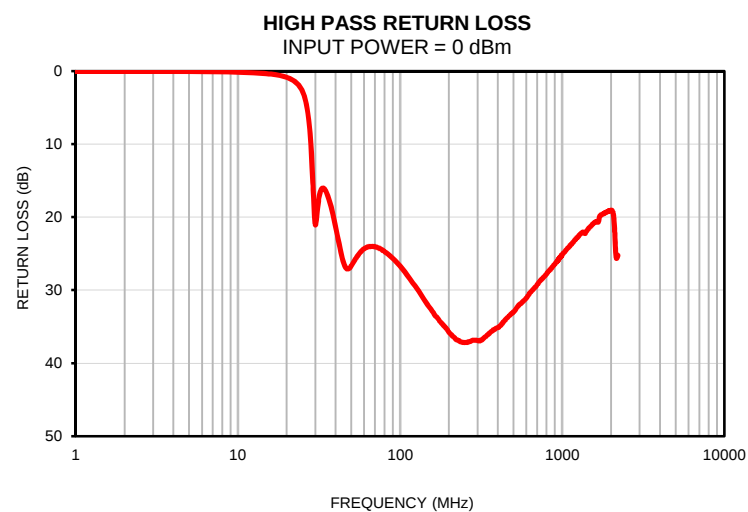
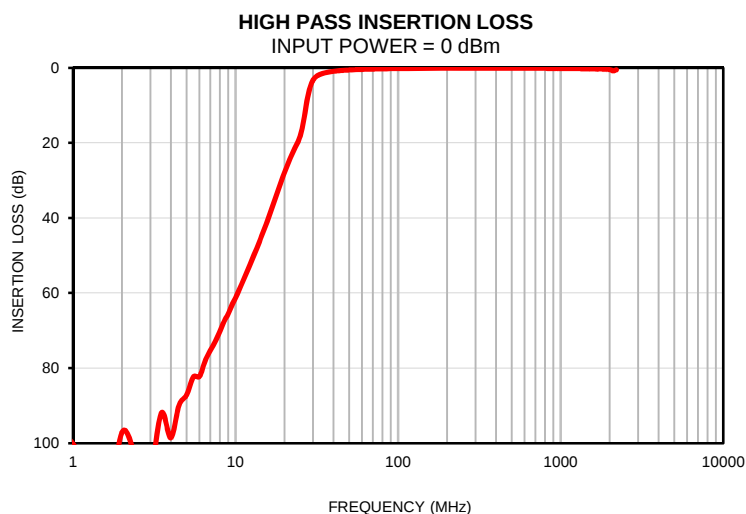
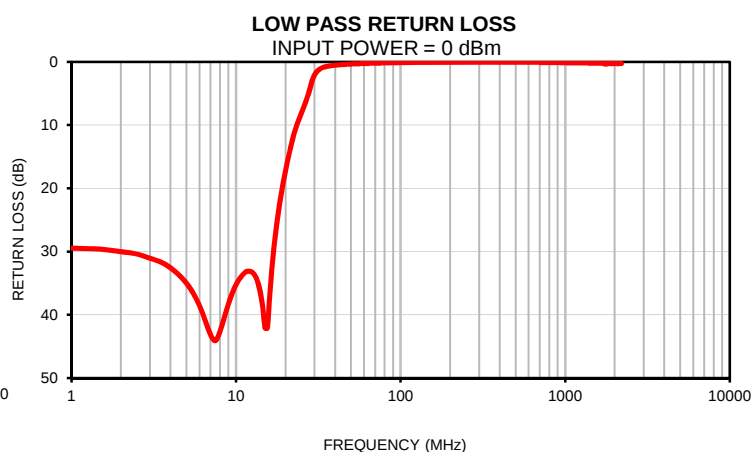
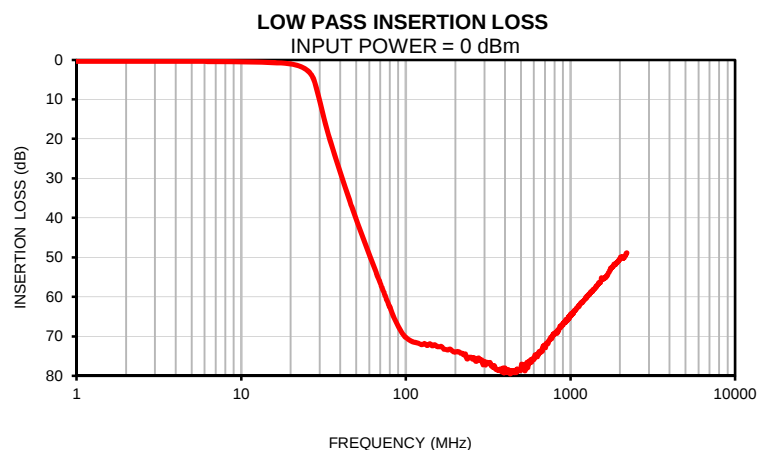
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Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS (dB)		Cross over isolation (dB) (between LPF and HPF)	RETURN LOSS (dB)		
	Lowpass port	Highpass port		Common port	Lowpass port	Highpass port
1.0	0.36	100.14	108.54	29.01	29.46	0.05
3.0	0.37	107.03	101.97	28.01	31.07	0.05
5.0	0.39	87.18	89.39	26.57	35.01	0.07
10.0	0.49	61.27	62.48	24.22	35.22	0.16
12.0	0.55	53.49	54.20	24.84	33.10	0.22
14.0	0.62	46.40	47.00	27.53	36.28	0.31
15.0	0.66	43.04	43.68	30.12	42.06	0.36
16.0	0.70	39.76	40.51	32.36	37.25	0.43
18.0	0.82	33.52	34.56	24.77	24.20	0.61
19.0	0.91	30.63	31.74	20.83	20.30	0.72
20.0	1.04	27.95	29.02	17.71	17.18	0.87
22.0	1.43	23.43	23.86	13.05	12.42	1.30
23.0	1.72	21.65	21.41	11.31	10.63	1.63
24.0	2.09	20.07	19.08	9.93	9.19	2.09
25.0	2.55	18.15	16.87	8.91	8.02	2.77
26.0	3.18	15.02	14.88	8.34	6.98	3.87
27.0	4.12	10.93	13.35	8.44	5.82	5.81
28.0	5.66	7.21	12.67	9.57	4.38	9.33
29.0	7.89	4.69	13.08	11.77	3.02	15.29
30.0	10.47	3.27	14.34	14.35	2.09	21.03
32.0	15.24	2.06	17.80	17.29	1.21	16.76
33.0	17.25	1.78	19.55	17.80	1.01	16.08
34.0	19.09	1.57	21.25	18.22	0.88	16.10
35.0	20.82	1.41	22.87	18.71	0.78	16.53
38.0	25.56	1.08	27.29	20.77	0.60	19.07
40.0	28.46	0.94	29.94	22.53	0.53	21.28
41.0	29.84	0.88	31.19	23.48	0.51	22.45
41.5	30.52	0.86	31.80	23.98	0.49	23.04
42.0	31.18	0.83	32.40	24.48	0.48	23.62
45.0	34.93	0.71	35.78	27.55	0.42	26.39
50.0	40.41	0.58	40.80	31.95	0.36	26.67
75.0	59.74	0.32	59.24	32.46	0.20	24.31
100.0	70.27	0.22	68.99	34.43	0.14	26.71
200.0	73.97	0.13	73.68	38.49	0.06	35.78
250.0	75.32	0.12	75.36	38.09	0.05	37.16
275.0	75.50	0.12	76.05	37.51	0.05	36.96
300.0	76.34	0.12	76.93	37.18	0.05	36.90
350.0	78.27	0.12	78.07	35.89	0.05	36.03
400.0	78.01	0.12	77.41	34.91	0.06	35.13
450.0	78.99	0.12	77.79	33.77	0.06	33.95
500.0	78.57	0.13	77.76	32.71	0.07	33.02
550.0	78.01	0.13	76.94	31.39	0.07	31.88
600.0	75.89	0.14	74.70	30.70	0.08	31.08
700.0	72.50	0.15	71.91	29.18	0.10	29.28
800.0	69.32	0.16	68.64	27.65	0.11	27.79
900.0	66.96	0.17	66.44	26.47	0.13	26.43
950.0	66.03	0.18	65.10	25.79	0.14	25.78
1100.0	62.79	0.20	62.03	24.08	0.16	24.08
1200.0	61.02	0.21	60.28	23.11	0.17	23.09
1300.0	59.46	0.24	58.69	22.21	0.19	22.26
1400.0	58.02	0.27	57.03	21.58	0.20	22.06
1500.0	56.38	0.28	55.84	20.97	0.21	21.23
1600.0	55.31	0.29	54.51	20.46	0.22	20.66
1700.0	53.95	0.35	53.15	19.46	0.26	19.92
1800.0	52.50	0.34	51.72	19.20	0.29	19.52
1900.0	51.44	0.38	50.42	18.64	0.25	19.26
2000.0	50.44	0.48	49.82	17.81	0.26	19.06
2100.0	50.13	0.84	49.03	17.53	0.26	21.55
2150.0	49.68	0.69	48.82	19.89	0.26	25.50
2200.0	48.90	0.55	48.61	20.83	0.27	25.25

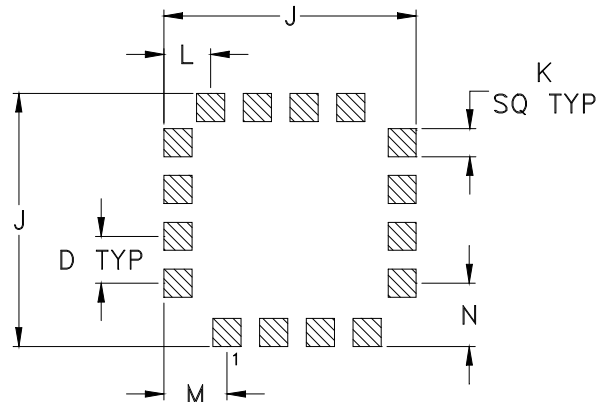
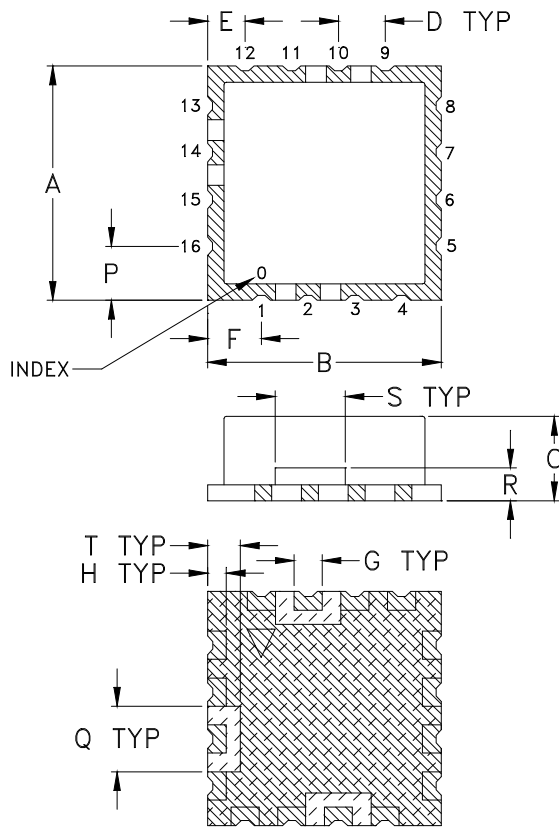
Typical Performance Curves



Outline Dimensions

CK605

PCB Land Pattern



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

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. $\pm .03$; 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 microns) Gold over 120-240 μ inch (3.05-6.10 microns) Nickel plate.
All models, (+) suffix.



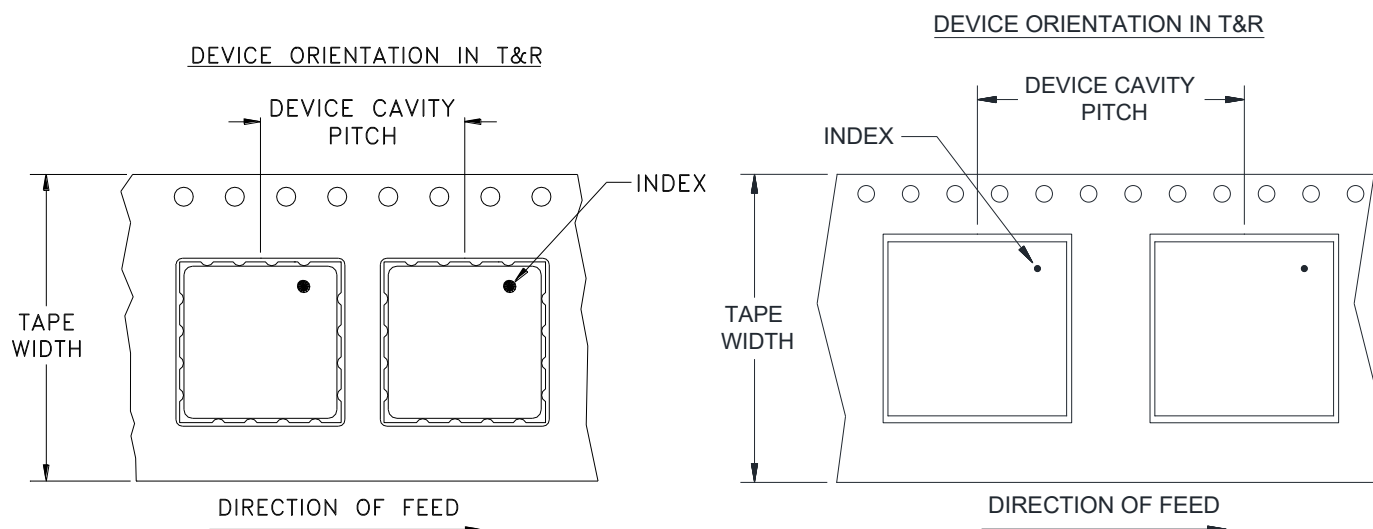
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

RF/IF MICROWAVE COMPONENTS

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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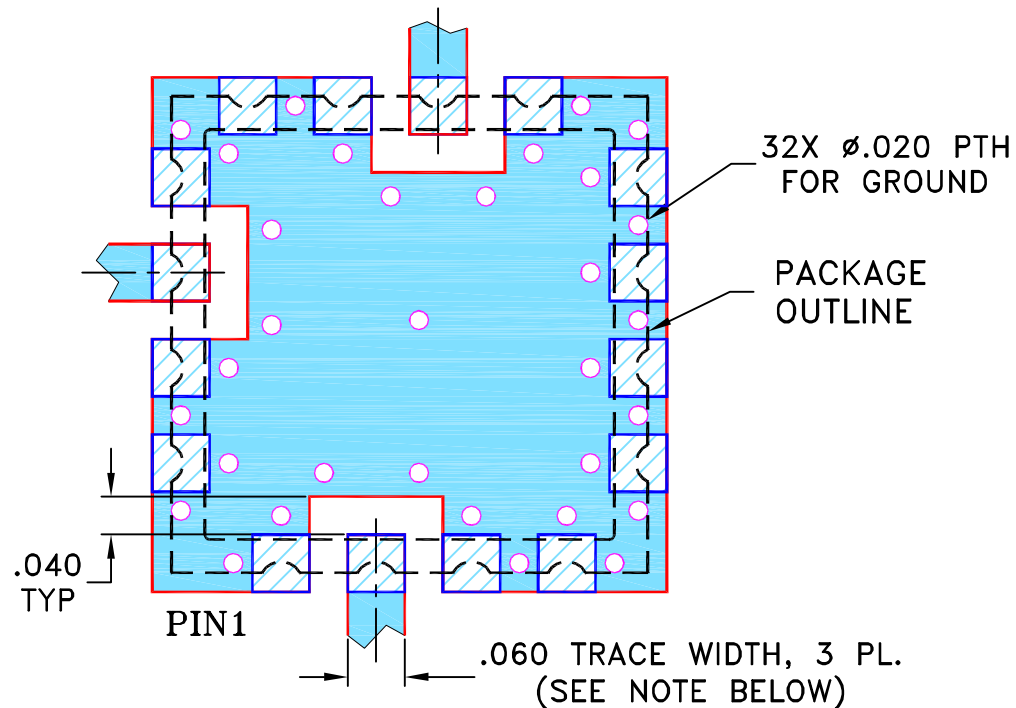
THIRD ANGLE PROJECTION



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

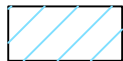
SUGGESTED MOUNTING CONFIGURATION FOR
CK605 CASE STYLE, "kg/rl/16AM01" PIN CONNECTION

NOTES:

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- 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

TOLERANCES ON:

2 PL DECIMALS $\pm$ 3 PL DECIMALS $\pm$.005ANGLES $\pm$ FRACTIONS $\pm$

DRAWN

AV

08/07/00

CHECKED

SK

08/08/00

APPROVED

DB

08/08/00

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



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Brooklyn NY 11235

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

SIZE
A

CODE IDENT
15542

DRAWING NO:
98-PL-012

REV:
G

FILE: 98PL012

SCALE: 5:1

SHEET: 1 OF 1

Evaluation Board and Circuit



Schematic Diagram

Notes:

1. 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