

Surface Mount

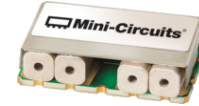
Diplexer

CDPL-1710A+

50Ω 1176, 1590 MHz

The Big Deal

- Low insertion loss
- High rejection
- Good return loss



CASE STYLE: NT1997

Product Overview

CDPL-1710A+ is a 50Ω high performance diplexer with the channel-1 at 1176 MHz and channel-2 at 1590 MHz. Good return loss combined with high out of channel rejection makes it a ideal component in differential GPS.

Key Features

Feature	Advantages
Low passband insertion loss	Passband insertion loss 1dB ensures low signal loss through both the channels.
Excellent Stopband rejection	Co-channel rejection 47 dB typical ensures unwanted spurious are eliminated.
Good return loss	This makes signal transmission with very less rejection and well-matched with the adjacent component used in the system.

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

50Ω 1176, 1590 MHz

Maximum Ratings

Operating Temperature -40° to 85°C

Storage Temperature -55°C to 100°C

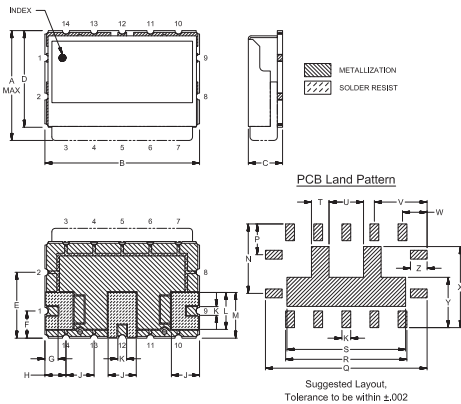
RF Power Input 30dBm Max.

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

Pin Connections

CHANNEL-1	9
CHANNEL-2	1
COMMON PORT	12
GROUND	2-8,10,11,13,14

Outline Drawing

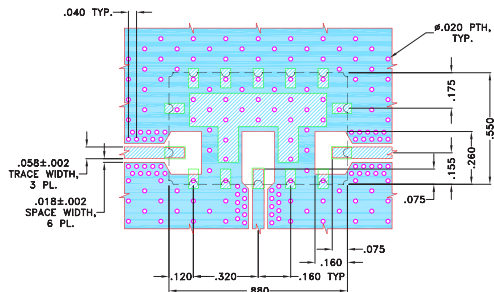


Outline Dimensions (inch mm)

A	B	C	D	E	F	G	H	J	K
Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
.625	.880	.200	.215	.550	.375	.155	.075	.120	.160
15.88	22.35	5.10	5.47	13.97	9.53	3.94	1.91	3.05	4.06
L	M	N	P	Q	R	S	T	U	V
Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
.210	.260	.395	.175	.920	.690	.675	.100	.196	.300
5.33	6.60	10.03	4.45	23.37	17.53	17.15	2.54	4.98	7.62
W	X	Y	Z	Wt.					
Min	Max	Min	Max	grams					
.140	4.61	.286	.095	3.8					
3.56	11.71	7.26	2.41						

Demo Board MCL P/N: TB-814+ Suggested PCB Layout (PL-432)

SUGGESTED MOUNTING CONFIGURATION FOR
NT1997 CASE STYLE "14DP02" PIN CODE



NOTES:

- TRACE WIDTH IS SHOWN FOR OAK-602 WITH DIELECTRIC THICKNESS .022±.0015". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
- 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

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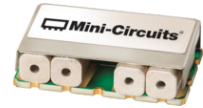
Features

- Low insertion loss
- 50Ω Impedance
- Good return loss
- High rejection

Applications

- Differential GPS
- Aeronautical Radio navigation

CDPL-1710A+



CASE STYLE: NT1997

+RoHS Compliant

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

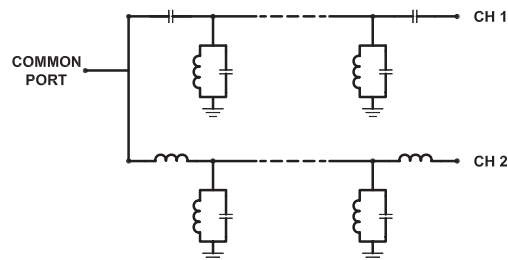
Electrical Specifications at 25°C

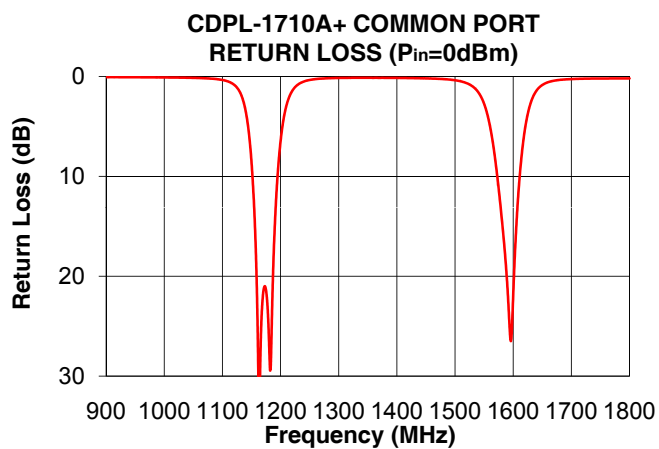
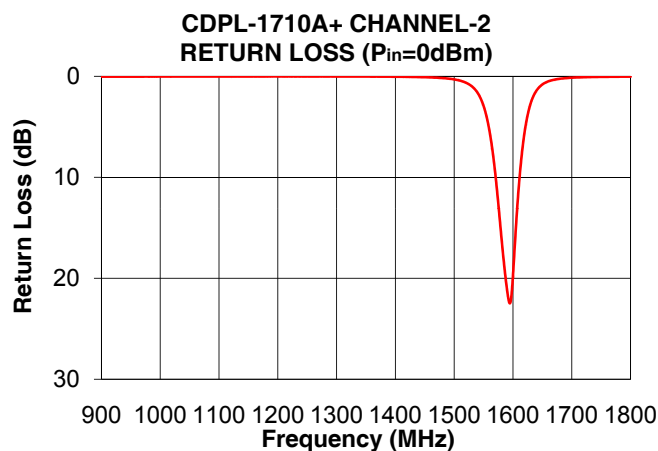
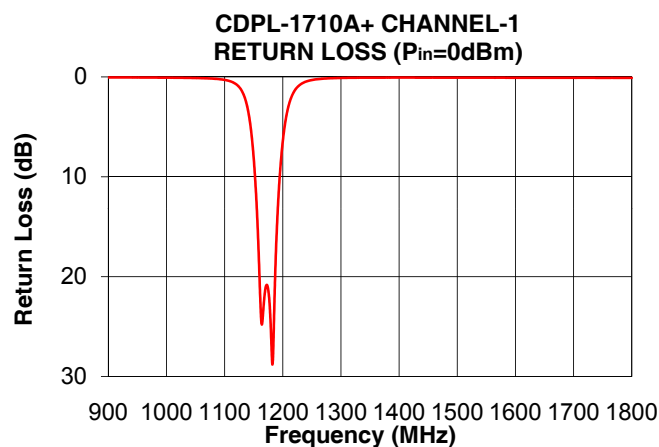
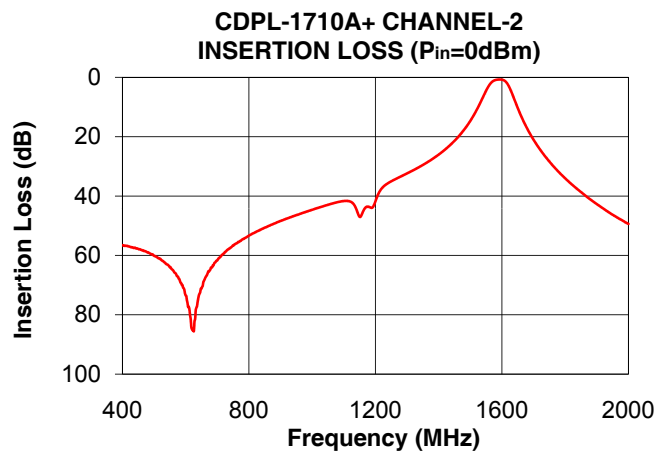
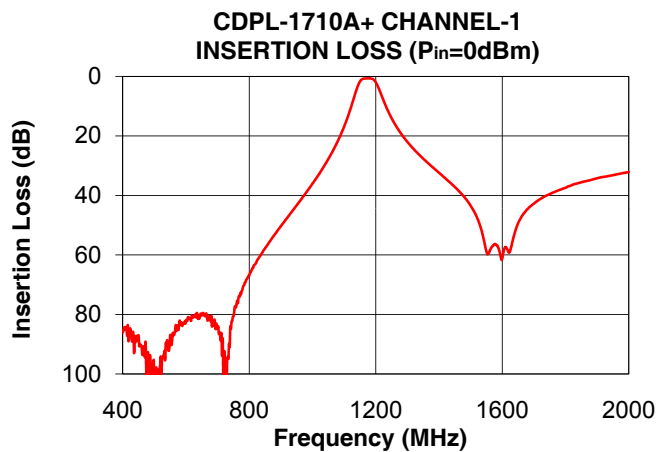
Parameter	Port	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Insertion Loss	Channel-1	1176	-	0.8	1.0
		Channel-2	1590	-	0.8	1.0
	3 dB Bandwidth	Channel-1	1176	-	60	-
		Channel-2	1590	-	60	-
	Return Loss	Channel-1	1176	-	10.9	-
		Channel-2	1590	-	10.9	-
		Common	1176	-	10.9	-
		Common	1590	-	10.9	-
Stop Band Isolation	Channel-1	1590	30	50.6	-	dB
	Channel-2	1176	30	39.7	-	dB

Typical Performance Data at 25°C

FREQUENCY (MHz)	INSERTION LOSS (dB)			RETURN LOSS (dB)	
	Channel-1	Channel-2	Common Port	Channel-1	Channel-2
400	86.04	56.56	0.11	0.03	0.11
600	81.91	73.45	0.06	0.02	0.08
750	80.68	56.60	0.05	0.04	0.05
800	66.89	53.34	0.05	0.04	0.04
950	43.33	46.44	0.07	0.07	0.03
1000	36.06	44.64	0.09	0.08	0.03
1036	30.26	43.41	0.12	0.10	0.02
1084	20.82	41.98	0.23	0.20	0.02
1100	16.85	41.69	0.35	0.30	0.02
1144	3.03	45.66	4.93	4.71	0.02
1148	2.10	46.72	7.10	6.79	0.02
1150	1.73	46.99	8.54	8.15	0.02
1176	0.68	43.60	21.87	21.81	0.02
1202	2.36	41.23	5.51	5.47	0.01
1208	3.69	39.59	3.41	3.38	0.02
1290	20.69	32.91	0.16	0.12	0.02
1380	30.54	27.54	0.14	0.08	0.03
1590	58.34	0.76	21.04	0.09	21.18
1650	49.35	10.32	0.85	0.09	0.81
1770	38.63	30.81	0.19	0.10	0.05
1900	34.24	42.72	0.19	0.11	0.01
2000	32.18	49.39	0.20	0.12	0.01

Functional Schematic





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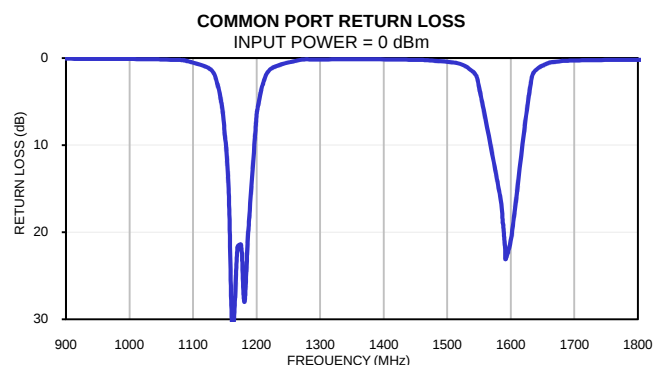
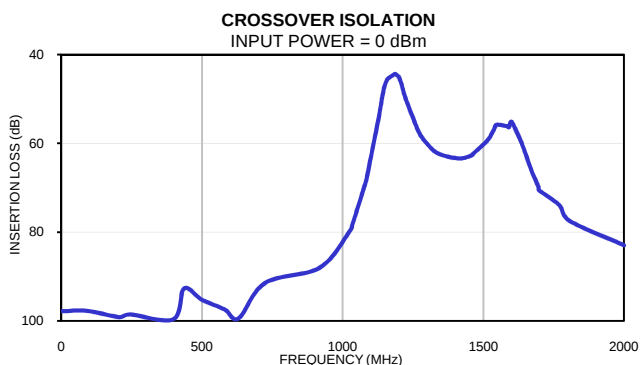
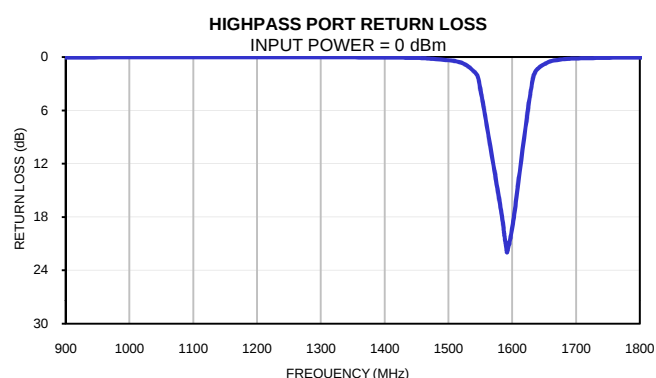
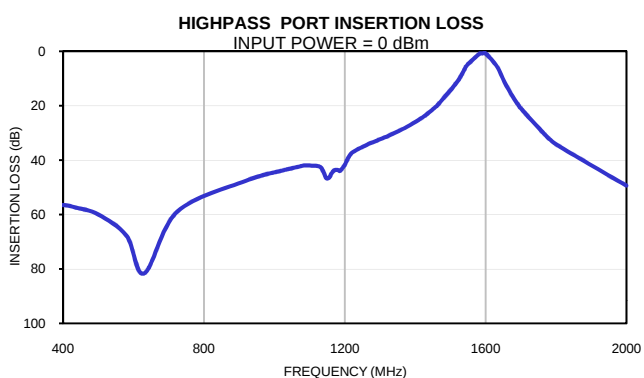
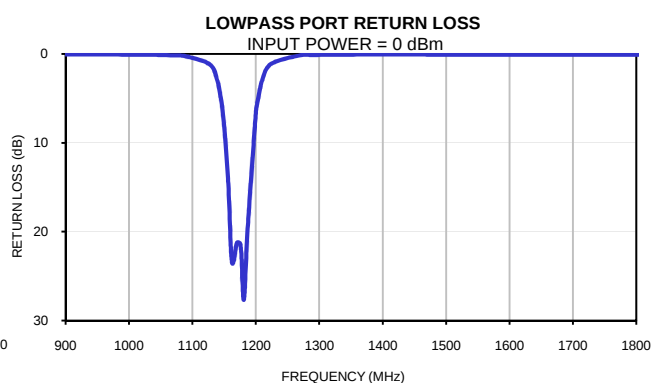
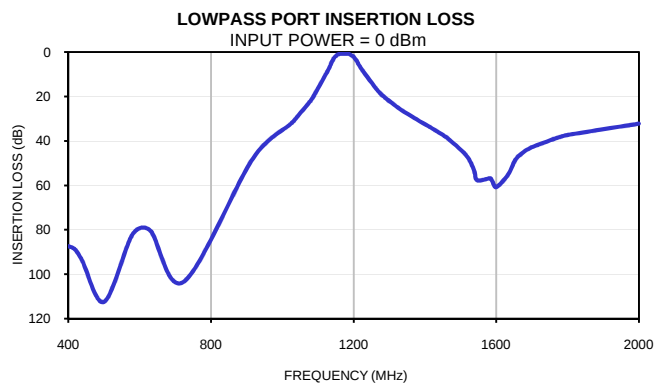
Surface Mount Diplexer

CDPL-1710A+

Typical Performance Data

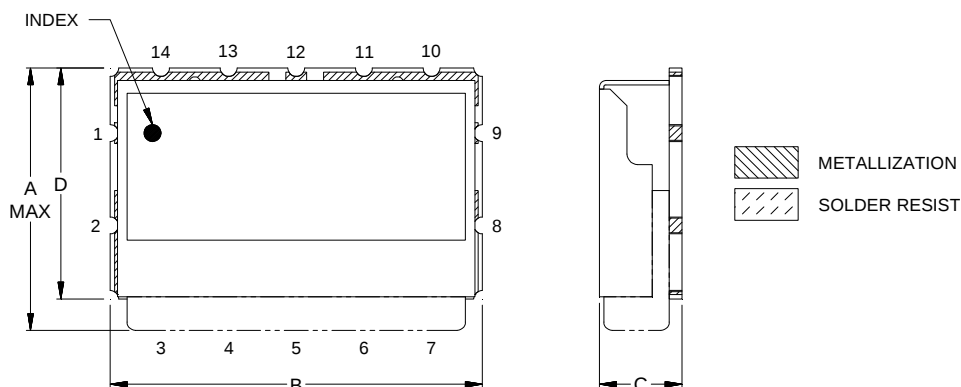
FREQUENCY (MHz)	INSERTION LOSS (dB)		Cross over isolation (dB) (between CH-1 and CH-2)	RETURN LOSS (dB)		
	Lowpass port CH-1	Highpass port CH-2		Common port	Lowpass port CH-1	Highpass port CH-2
1	106.15	91.01	97.90	0.05	0.05	0.04
90	98.67	62.34	97.79	0.12	0.04	0.09
204	86.96	56.97	99.20	0.14	0.03	0.11
244	85.45	56.18	98.61	0.14	0.03	0.11
398	87.24	56.50	99.70	0.11	0.03	0.11
436	92.99	57.47	92.73	0.10	0.02	0.11
500	112.45	60.01	95.32	0.09	0.02	0.10
580	82.06	67.81	97.47	0.07	0.02	0.08
630	80.30	81.65	99.47	0.06	0.03	0.07
724	103.35	58.97	91.49	0.05	0.03	0.06
918	47.81	47.65	88.08	0.07	0.06	0.03
1024	32.28	43.78	79.90	0.11	0.09	0.02
1036	30.26	43.40	77.99	0.12	0.10	0.02
1080	21.72	42.09	69.09	0.21	0.18	0.02
1084	20.82	41.99	68.29	0.23	0.20	0.02
1086	20.35	41.97	67.56	0.24	0.21	0.02
1127	8.56	42.31	54.49	1.26	1.17	0.02
1139	4.49	44.25	50.00	3.17	3.01	0.02
1144	3.03	45.68	48.37	4.93	4.71	0.02
1148	2.10	46.72	47.29	7.10	6.79	0.02
1156	1.02	46.44	45.86	15.04	14.04	0.02
1162	0.76	44.99	45.38	31.31	23.36	0.02
1170	0.70	43.75	44.99	21.72	21.24	0.02
1175	0.68	43.58	44.78	21.39	21.33	0.02
1176	0.68	43.57	44.75	21.87	21.81	0.02
1177	0.68	43.57	44.71	22.54	22.49	0.02
1181	0.67	43.67	44.55	28.00	27.63	0.02
1187	0.75	43.95	44.39	19.91	19.65	0.02
1200	1.99	41.79	45.10	6.49	6.44	0.01
1201	2.17	41.52	45.25	5.98	5.93	0.02
1208	3.69	39.59	46.47	3.41	3.38	0.02
1209	3.94	39.33	46.68	3.16	3.12	0.02
1223	7.69	37.08	49.78	1.20	1.17	0.02
1268	17.35	34.06	57.19	0.22	0.19	0.02
1288	20.41	33.02	59.27	0.16	0.13	0.02
1290	20.69	32.92	59.43	0.16	0.12	0.02
1330	25.56	30.74	62.01	0.13	0.09	0.02
1376	30.17	27.83	63.07	0.13	0.08	0.03
1410	33.32	25.21	63.40	0.14	0.07	0.05
1432	35.41	23.24	63.32	0.17	0.08	0.06
1460	38.23	20.27	62.69	0.21	0.08	0.11
1462	38.45	20.04	62.47	0.21	0.08	0.11
1516	46.47	11.84	59.21	0.58	0.08	0.54
1538	53.25	7.19	56.81	1.43	0.08	1.48
1547	57.69	5.18	55.83	2.30	0.08	2.46
1583	56.74	0.84	56.15	15.83	0.09	17.55
1587	57.46	0.78	56.25	18.55	0.09	19.74
1589	58.01	0.77	56.27	20.14	0.09	20.72
1590	58.34	0.75	56.42	21.04	0.09	21.18
1591	58.72	0.75	56.30	22.03	0.09	21.59
1592	59.07	0.75	56.25	23.08	0.09	21.97
1601	60.68	0.83	55.23	20.45	0.09	18.79
1633	55.17	5.71	59.57	2.18	0.09	2.20
1654	48.45	11.36	63.13	0.72	0.09	0.66
1676	45.03	16.47	67.03	0.37	0.09	0.27
1696	43.08	20.33	69.89	0.27	0.09	0.15
1698	42.90	20.68	70.61	0.26	0.09	0.15
1770	38.63	30.79	73.97	0.19	0.10	0.05
1806	37.11	34.64	77.49	0.19	0.11	0.03
2000	32.18	49.39	83.03	0.20	0.12	0.01

Typical Performance Curves

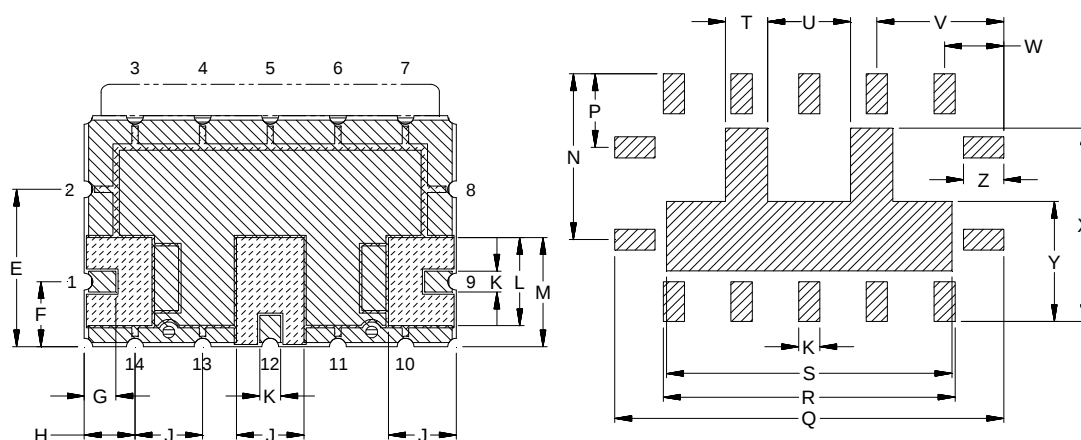


Outline Dimensions

NT1997



PCB Land Pattern



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

CASE#	A	B	C		D	E	F	G	H	J	K	L	M	N
			Min	Max										
NT1997	.625 (15.88)	.880 (22.35)	.200 (5.10)	.215 (5.47)	.550 (13.97)	.375 (9.53)	.155 (3.94)	.075 (1.91)	.120 (3.05)	.160 (4.06)	.050 (1.27)	.210 (5.33)	.260 (6.60)	.395 (10.03)

CASE#	P	Q	R	S	T	U	V	W	X	Y	Z	WT.GRAMS
NT1997	.175 (4.45)	.920 (23.37)	.690 (17.53)	.675 (17.15)	.100 (2.54)	.196 (4.98)	.300 (7.62)	.140 (3.56)	.461 (11.71)	.286 (7.26)	.095 (2.41)	3.8

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

Notes:

- Case material: Nickel-Silver alloy.
- Base: Printed wiring laminate.
- Termination finish:

For RoHS Case Styles: 2-5 μ inch (.05-.13 microns) Gold over 120-240 μ inch (3.05-6.10) 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

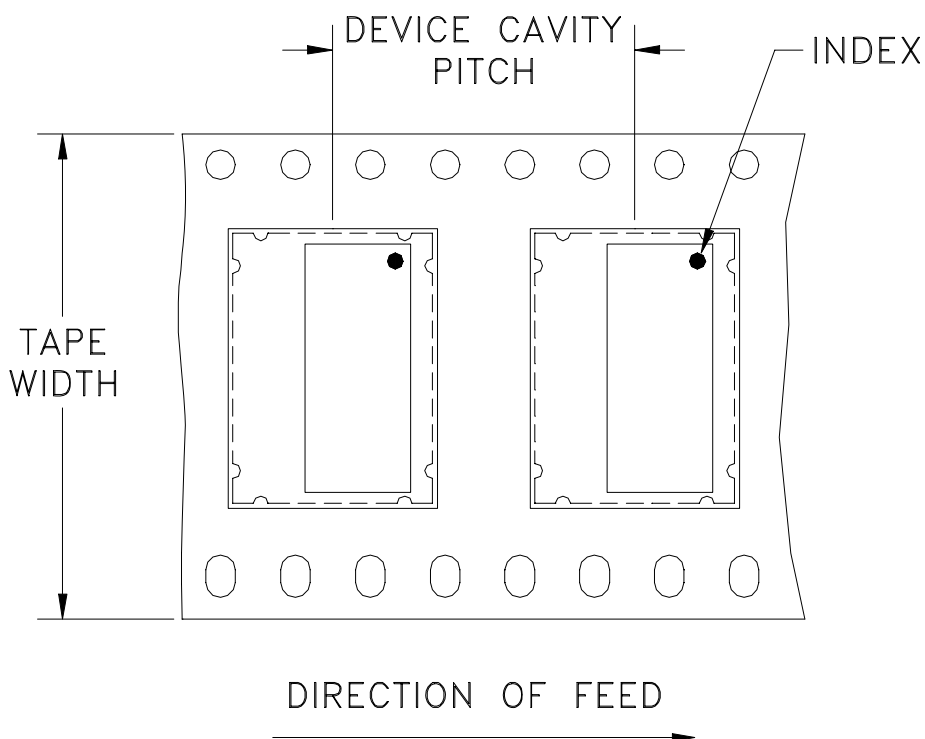


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RF/IF MICROWAVE COMPONENTS

Tape & Reel Packaging TR-F106

DEVICE ORIENTATION IN T&R



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel
44	24	13	250

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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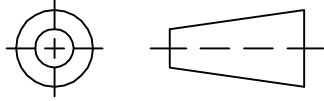
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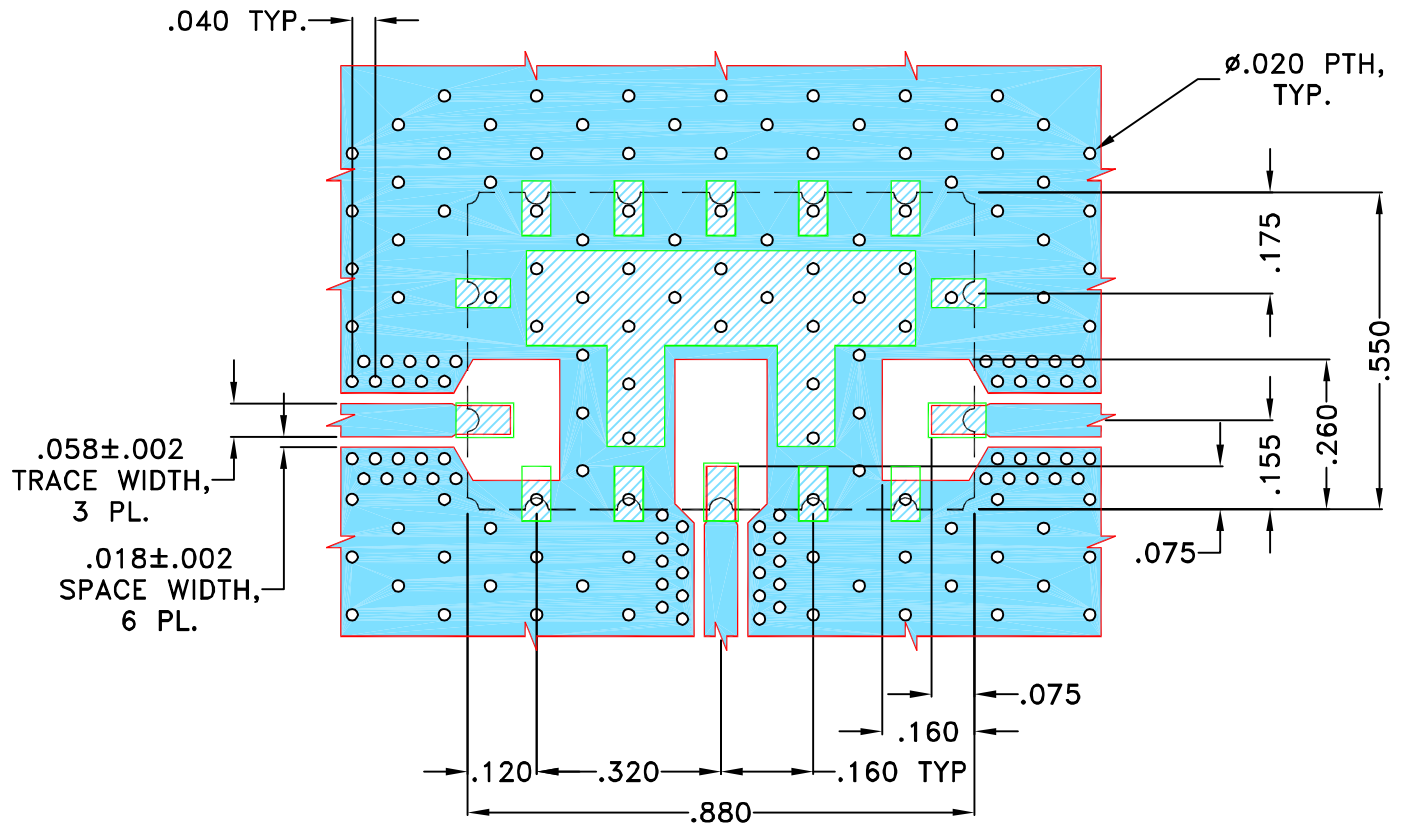
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M148003	NEW RELEASE	MAR 15	DDR	MD

**SUGGESTED MOUNTING CONFIGURATION FOR
NT1997 CASE STYLE "14DP02" PIN CODE**



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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

TOLERANCES ON:
2 PL DECIMALS $\pm$
3 PL DECIMALS $\pm$.005"
ANGLES $\pm$
FRACTIONS $\pm$

DRAWN

DDR

04 MAR 15

CHECKED

MD

04 MAR 15

APPROVED

ASJ

04 MAR 15

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



Mini-Circuits® 13 Neptune Avenue
Brooklyn NY 11235

**PL, 14DP02, NT1997, DPLX,
TB-814+, 50 OHM**

SIZE
A

CODE IDENT
15542

DRAWING NO:
98-PL-432

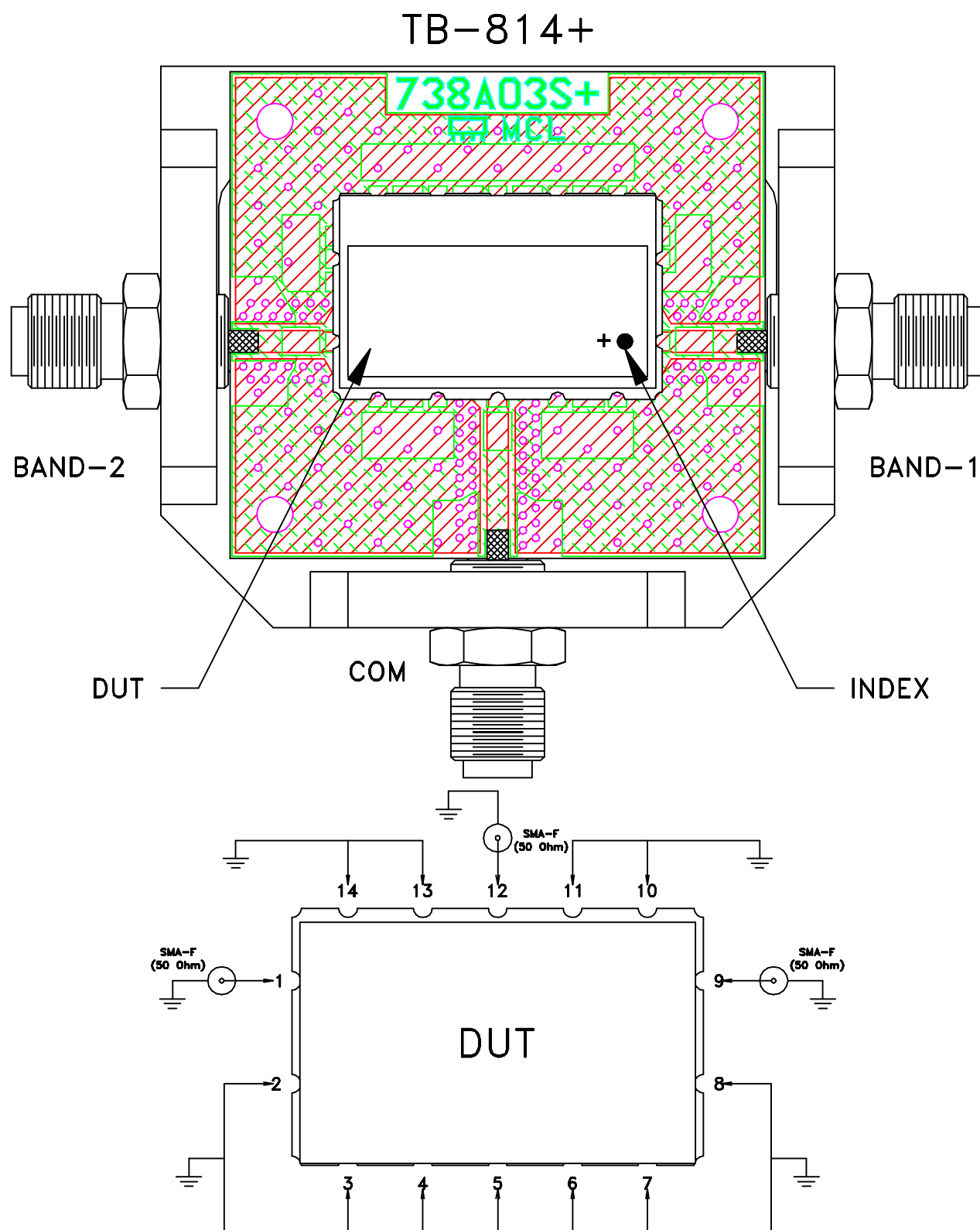
REV:
OR

FILE: 98PL432

SCALE: 3:1

SHEET: 1 OF 1

Evaluation Board and Circuit



Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: OAK-602 OR Equivalent
Dielectric Constant= $2.50 \pm .04$, Thickness=.022 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, 96 hours, 40°C	MIL-STD-202, Method 103B, Condition B, Except 50°C
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, 10-2000 Hz, 4 times in each of three axes (total 12)	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