Plug-in

Diplexer

DPLC-8510A01M+

75Ω 5 to 1225 MHz (5-85, 102-1225 MHz)

Generic photo used for illustration purposes only
CASE STYLE: QC2228

The Big Deal

- Plug-in design
- Field replaceable
- Low insertion loss
- Excellent return loss, 24 dB typ.
- High cross over isolation
- Low group delay variation in passband
- DOCSIS 3.1 standard

Product Overview

DPLC-8510A01M+ is a high performance field replaceable plug-in diplexer with the lowpass port at 5-85 MHz and highpass port at 102-1225 MHz. Excellent return loss combined with high out of channel rejection makes it an ideal part in cable TV and multiband radio systems

Key Features

Feature	Advantages
Low passband insertion loss	Ensures low signal loss through both the channels.
Excellent Stopband rejection	Co-channel rejection of 50dB typical ensures unwanted spurious are eliminated.
Excellent return loss at 5-85 and 102-1225 MHz	This makes signal transmission with very less reflection and well-matched with the adjacent component used in the system.

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75Ω 5 to 1225 MHz (5-85, 102-1225 MHz)

Generic photo used for illustration purposes only

CASE STYLE: QC2228

+RoHS Compliant

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

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

HIGH PASS PORT	1
LOW PASS PORT	7
COMMON PORT	4
GROUND	2,3,5,6,8,9

Features

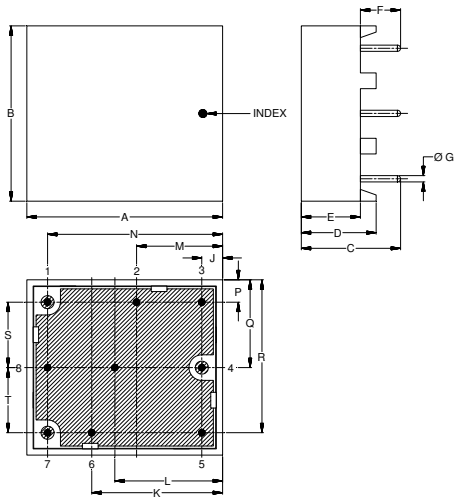
- Low insertion loss
- 75Ω Impedance
- Excellent return loss 24 dB typ.
- Low group delay variation
- High cross over isolation
- High rejection

Applications

- Cable TV systems (DOCSIS 3.1 standard)
- Multiband radio systems

CAUTION NOTE: *Not designed for reflow process.*

Outline Drawing



Outline Dimensions (inch / mm)

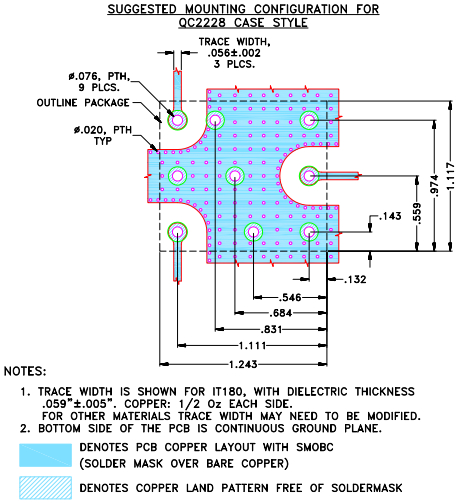
A	B	C	D	E	F	G	H	J	K
1.243	**1.117**	**.630**	**.475**	**.375**	**.255**	**.040**	**--**	**.132**	**.831**
31.56	28.36	16.00	12.07	9.53	6.48	1.02	--	3.35	21.10

L	M	N	P	Q	R	S	T	Wt.
.684	**.546**	**1.111**	**.143**	**.559**	**.974**	**.417**	**.415**	grams
17.37	13.87	28.22	3.63	14.21	24.74	10.58	10.53	7

Note: Please refer to case style drawing for details

Demo Board MCL P/N: TB-929+

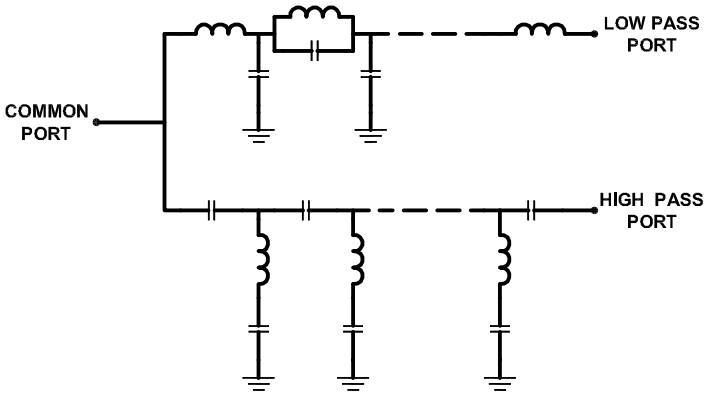
Suggested PCB Layout (PL-495)



Electrical Specifications at 25°C

Parameter		Port	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Insertion Loss	Low Pass	5	-	-	0.20	dB
			85	-	-	1.30	dB
		High Pass	102	-	-	1.75	dB
			105	-	-	1.30	dB
			130	-	-	0.60	dB
			870	-	-	0.50	dB
			1000	-	-	0.55	dB
			1218	-	-	0.60	dB
			1225	-	-	0.65	dB
	Return Loss	Low Pass	5-85	22	24	-	dB
		High Pass	102-104.9	20	24	-	dB
			105-1225	20	24	-	dB
		Common	5-85	22	24	-	dB
			102-104.9	20	24	-	dB
			105-1225	20	24	-	dB
Stop Band Isolation		High Pass	5-84.9	48	50	-	dB
		Cross over	85-104.9	38	40	-	dB
		Low Pass	105-1225	45	50	-	dB
Group Delay Variation		High Pass	109.275-112.855	-	6	8	ns
			115.275-118.855	-	3	6	ns
			121.2625-124.843	-	2	5	ns
		Low Pass	82-83.5	-	-	6	ns
			83.5-85	-	-	8	ns

Functional Schematic



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.

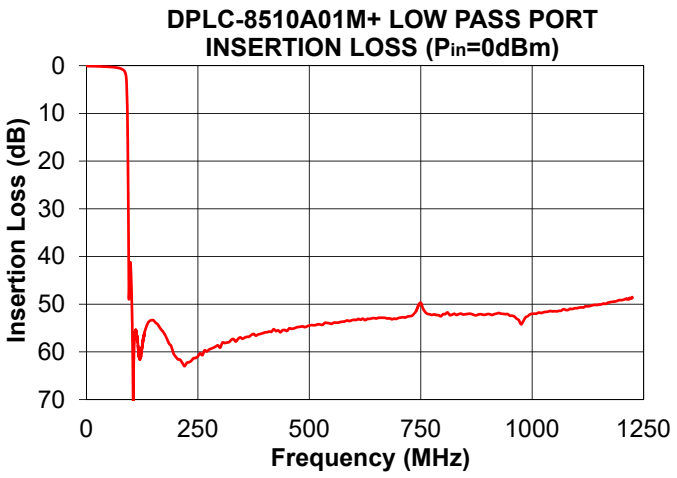
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.

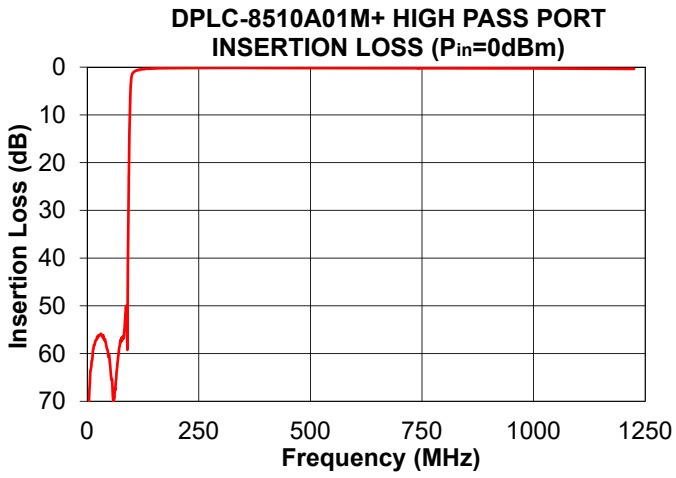
C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp

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
1.000	0.05	80.52	51.36	51.93	0.04
5.000	0.09	67.60	41.87	43.17	0.04
82.000	0.84	56.66	29.63	30.41	0.27
83.500	0.96	54.98	28.57	32.11	0.30
84.900	1.10	52.97	26.73	31.86	0.34
85.000	1.11	52.81	26.58	31.80	0.34
90.000	3.62	59.20	11.19	9.29	0.54
92.000	11.74	33.57	5.37	2.81	0.72
93.500	24.53	21.32	4.11	1.54	1.00
94.500	38.18	15.17	4.04	1.23	1.41
96.000	47.61	8.17	5.28	0.98	2.99
98.000	41.45	3.26	10.97	0.80	8.54
99.000	41.75	2.27	15.63	0.74	12.91
102.000	50.81	1.28	29.72	0.62	33.26
104.900	70.74	0.98	24.85	0.56	24.02
105.000	70.12	0.97	24.78	0.55	23.83
109.275	55.77	0.75	23.25	0.51	22.34
112.855	56.63	0.62	23.41	0.48	23.36
115.275	58.23	0.56	24.00	0.47	24.57
118.855	61.37	0.49	25.46	0.46	26.89
120.000	61.01	0.47	26.05	0.46	27.84
121.263	60.76	0.46	26.77	0.46	28.98
124.843	58.89	0.41	29.24	0.46	33.02
130.000	55.97	0.36	33.02	0.45	40.15
400.000	55.93	0.18	26.66	0.37	25.18
870.000	52.28	0.26	29.23	0.43	30.32
1000.000	52.01	0.28	35.75	0.49	32.78
1218.000	48.96	0.36	24.64	0.60	32.26
1225.000	48.64	0.36	24.40	0.61	31.35

Performance Charts





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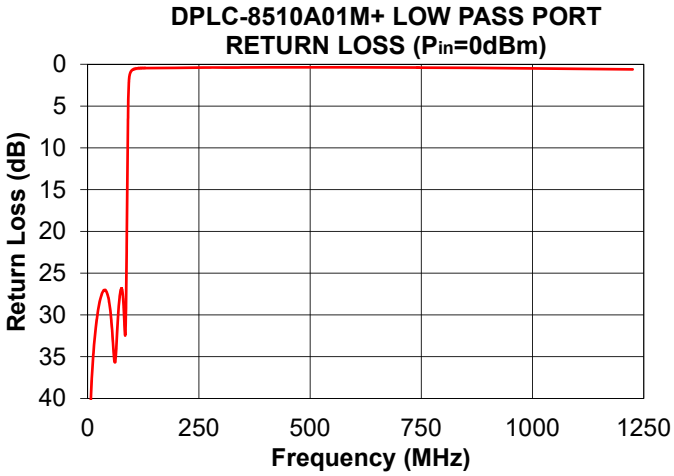

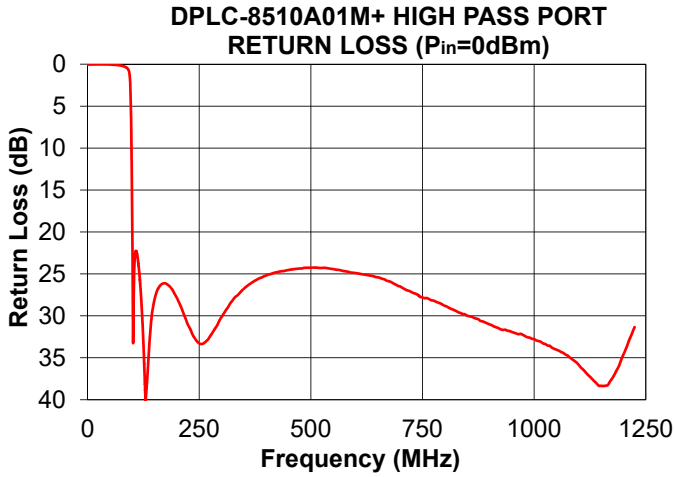

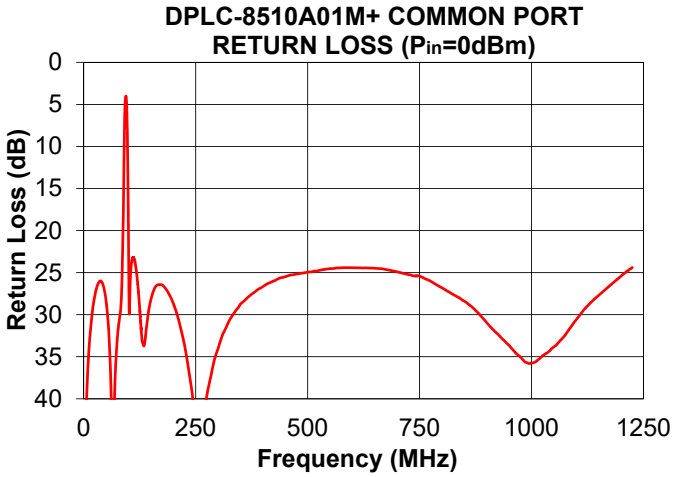

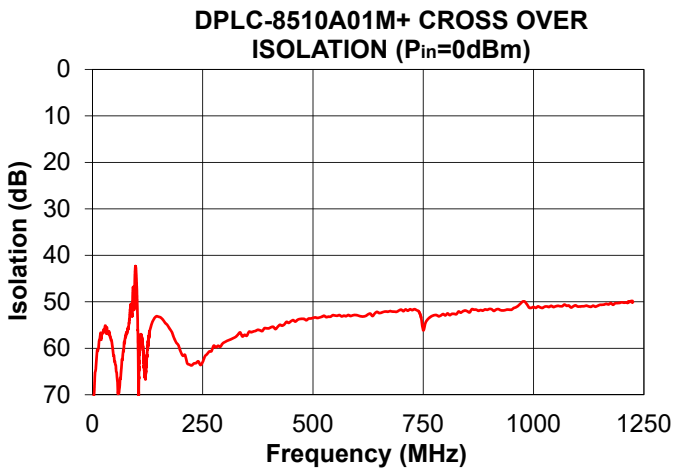

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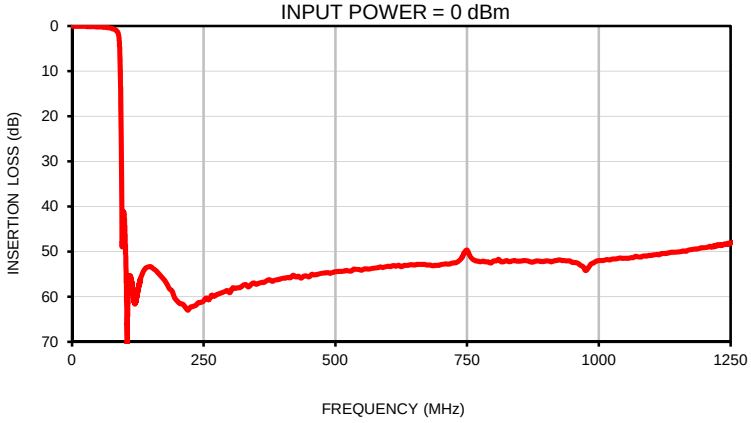
Plug-in Diplexer DPLC-8510A01M+

Typical Performance Data

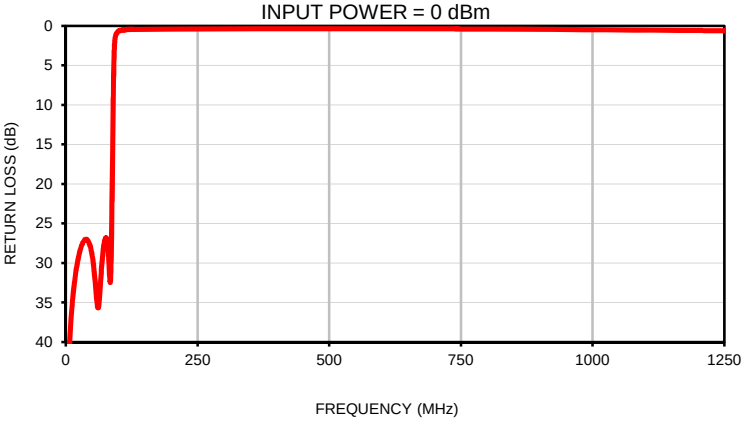
FREQUENCY (MHz)	INSERTION LOSS (dB)		Cross over isolation (dB) (between LPF and HPF)	RETURN LOSS (dB)		
	Lowpass port	Highpass port		Common port	Lowpass port	Highpass port
1.000	0.05	80.52	84.75	51.36	51.93	0.04
5.000	0.09	67.60	67.43	41.87	43.17	0.04
10.000	0.10	61.55	61.44	35.56	36.98	0.03
15.000	0.11	58.26	58.63	31.80	33.22	0.03
20.000	0.12	57.18	58.14	29.31	30.68	0.03
30.000	0.15	56.00	55.18	26.59	27.78	0.02
40.000	0.19	57.04	57.54	26.13	27.02	0.02
50.000	0.24	60.97	62.83	28.37	29.13	0.04
60.000	0.30	69.47	69.67	37.23	35.56	0.07
70.000	0.43	60.23	60.47	37.67	28.90	0.12
80.000	0.73	56.88	56.16	30.39	28.30	0.23
82.000	0.84	56.66	55.44	29.63	30.41	0.27
82.500	0.88	56.22	54.96	29.32	31.05	0.28
83.000	0.92	55.42	54.55	28.99	31.61	0.29
84.000	1.00	54.49	53.97	28.06	32.38	0.31
84.500	1.06	53.64	53.14	27.39	32.29	0.32
84.900	1.10	52.97	52.77	26.73	31.86	0.34
85.000	1.11	52.81	52.79	26.58	31.80	0.34
85.500	1.18	52.00	51.81	25.65	30.80	0.35
86.000	1.26	51.36	51.54	24.57	29.34	0.37
87.000	1.46	50.32	50.90	22.04	25.32	0.40
87.500	1.59	50.16	50.53	20.57	22.89	0.42
88.000	1.77	50.26	50.47	18.97	20.23	0.44
89.000	2.35	52.41	51.73	15.28	14.63	0.49
90.000	3.62	59.20	53.04	11.19	9.29	0.54
92.000	11.74	33.57	47.05	5.37	2.81	0.72
92.400	14.57	29.82	46.88	4.85	2.29	0.77
93.000	19.56	24.91	47.44	4.35	1.80	0.88
94.000	30.55	18.09	50.57	4.01	1.36	1.17
94.300	34.88	16.31	51.09	4.02	1.28	1.30
95.000	47.03	12.54	50.54	4.24	1.13	1.77
96.000	47.61	8.17	45.79	5.28	0.98	2.99
98.000	41.45	3.26	42.40	10.97	0.80	8.54
99.000	41.75	2.27	43.30	15.63	0.74	12.91
100.000	43.86	1.75	45.31	21.39	0.69	18.35
102.000	50.81	1.28	51.69	29.72	0.62	33.26
103.000	55.52	1.15	56.06	27.51	0.59	28.90
104.000	62.87	1.05	62.98	25.84	0.57	25.58
104.500	68.63	1.01	67.10	25.23	0.56	24.59
104.900	70.74	0.98	69.35	24.85	0.56	24.02
105.000	70.12	0.97	69.48	24.78	0.55	23.83
109.275	55.77	0.75	57.45	23.25	0.51	22.34
112.855	56.63	0.62	58.66	23.41	0.48	23.36
115.275	58.23	0.56	60.76	24.00	0.47	24.57
118.855	61.37	0.49	65.49	25.46	0.46	26.89
120.000	61.01	0.47	65.47	26.05	0.46	27.84
121.263	60.76	0.46	65.37	26.77	0.46	28.98
124.843	58.89	0.41	59.58	29.24	0.46	33.02
130.000	55.97	0.36	56.28	33.02	0.45	40.15
250.000	60.93	0.17	62.95	43.11	0.39	33.29
500.000	54.46	0.20	53.47	24.93	0.36	24.27
750.000	49.70	0.25	56.12	25.40	0.40	27.81
870.000	52.28	0.26	51.69	29.23	0.43	30.32
900.000	52.07	0.26	51.54	30.96	0.45	31.02
1000.000	52.01	0.28	51.11	35.75	0.49	32.78
1100.000	50.85	0.31	51.01	30.59	0.54	35.87
1150.000	50.06	0.33	50.67	27.71	0.57	38.34
1200.000	49.15	0.35	50.11	25.42	0.60	34.62
1218.000	48.96	0.36	49.99	24.64	0.60	32.26
1225.000	48.64	0.36	50.09	24.40	0.61	31.35

Typical Performance Curves

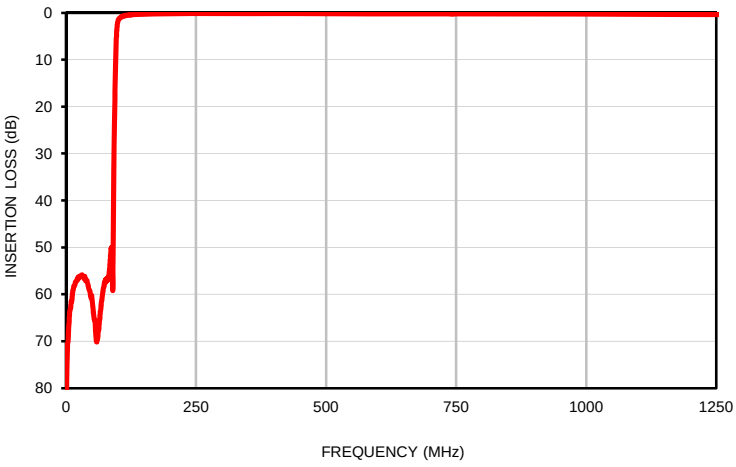
LOWPASS INSERTION LOSS
INPUT POWER = 0 dBm



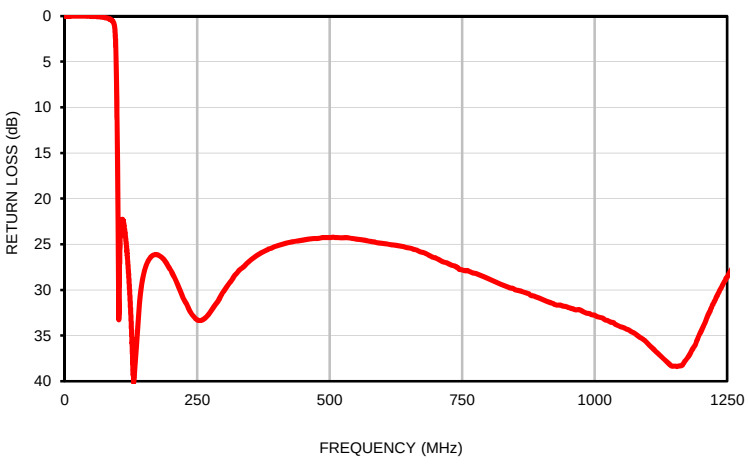
LOWPASS RETURN LOSS
INPUT POWER = 0 dBm



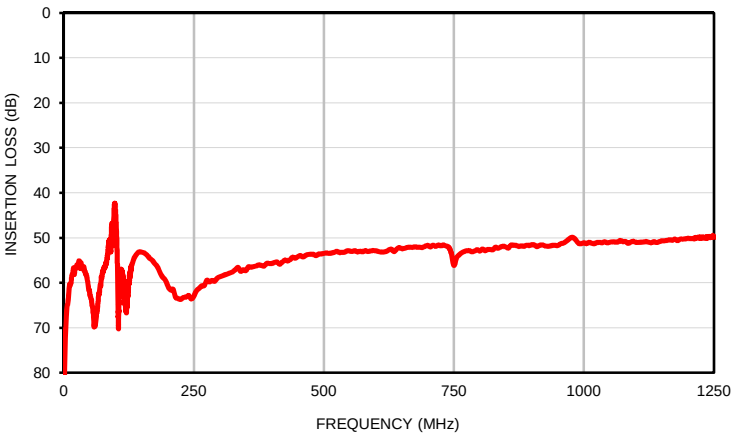
HIGHPASS INSERTION LOSS
INPUT POWER = 0 dBm



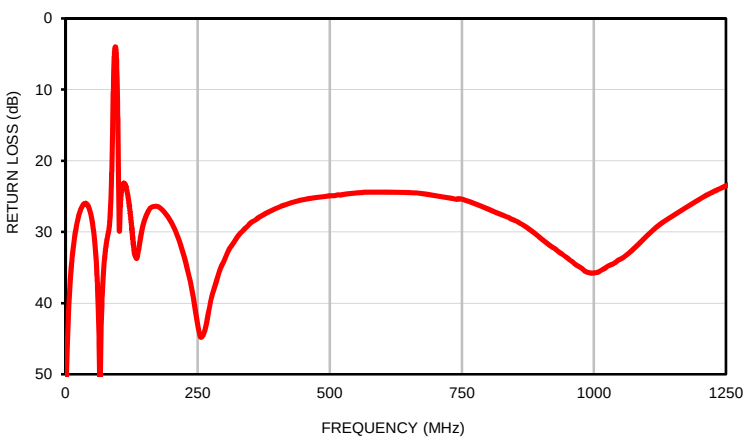
HIGHPASS RETURN LOSS
INPUT POWER = 0 dBm

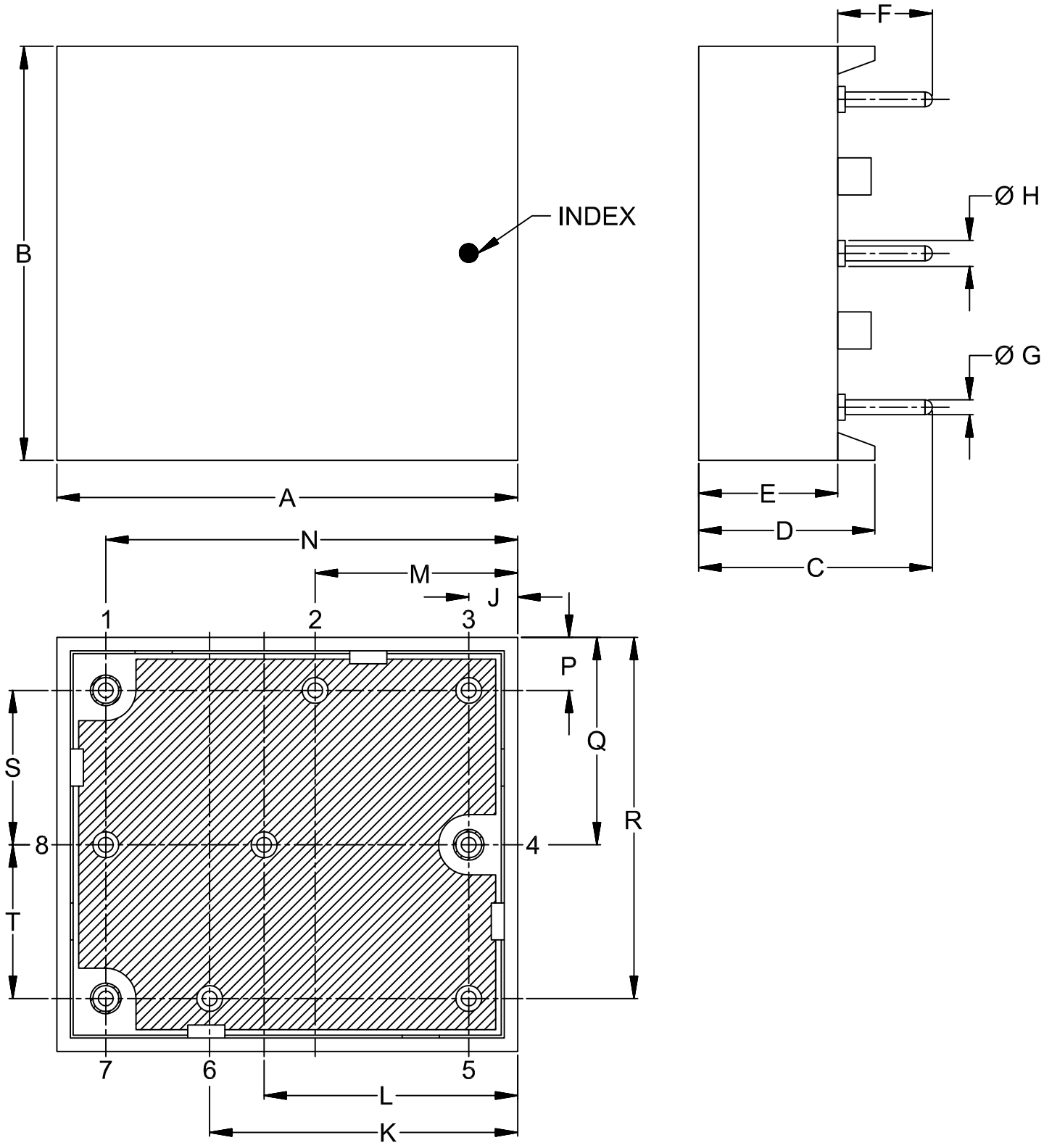


CROSS OVER ISOLATION
INPUT POWER = 0 dBm



COMMON PORT RETURN LOSS
INPUT POWER = 0 dBm

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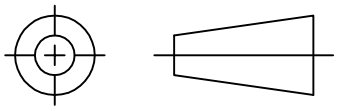
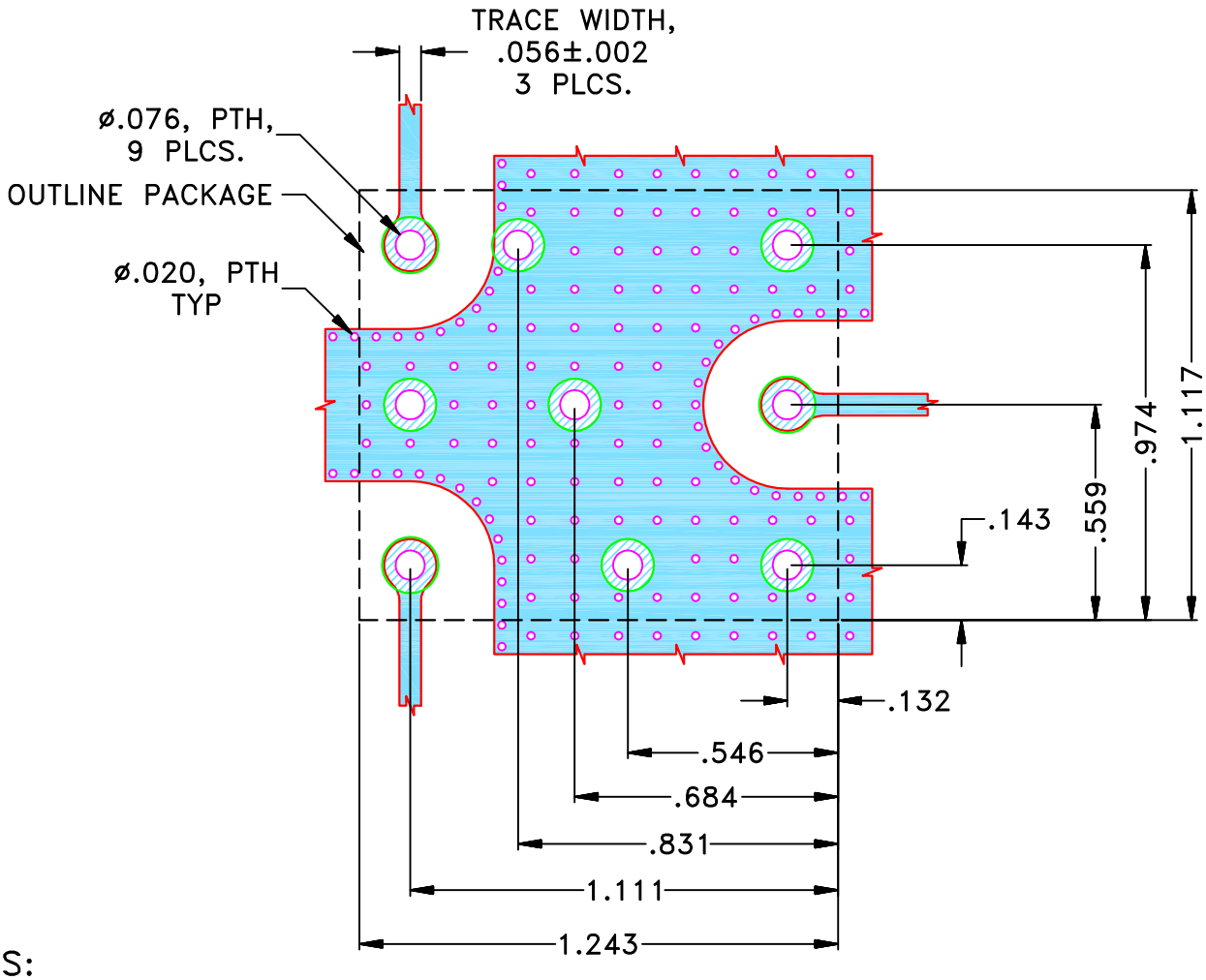
THIRD ANGLE PROJECTION



REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M158901	NEW RELEASE	NOV 16	TM	MD

SUGGESTED MOUNTING CONFIGURATION FOR QC2228 CASE STYLE



NOTES:

1. TRACE WIDTH IS SHOWN FOR IT180, WITH DIELECTRIC THICKNESS .059"±.005". 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

UNLESS OTHERWISE SPECIFIED		INITIALS	DATE
DIMENSIONS ARE IN INCHES	DRAWN	TM	19 MAR 18
TOLERANCES ON:	CHECKED	MD	19 MAR 18
2 PL DECIMALS ± .005"	APPROVED	SR	19 MAR 18
3 PL DECIMALS ±			
ANGLES ±			
FRACTIONS ±			

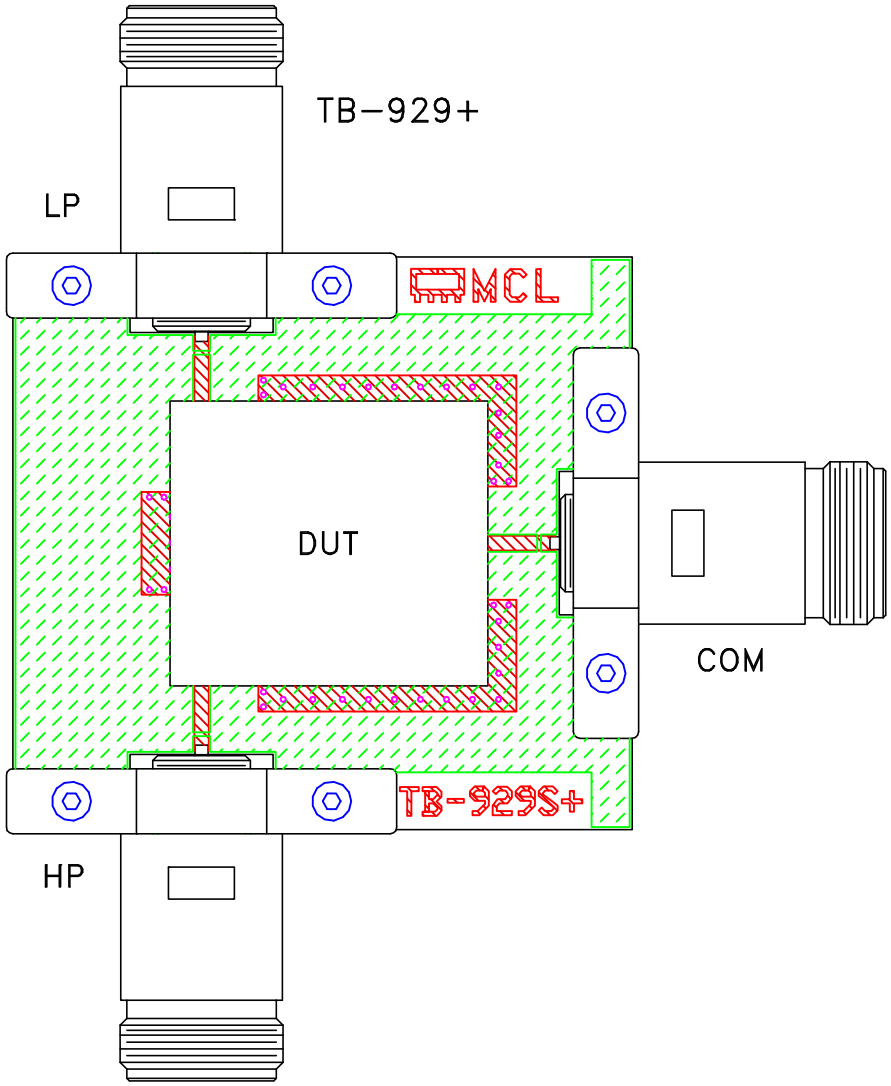
ASHEETA1.DWG REV:A DATE:01/12/95

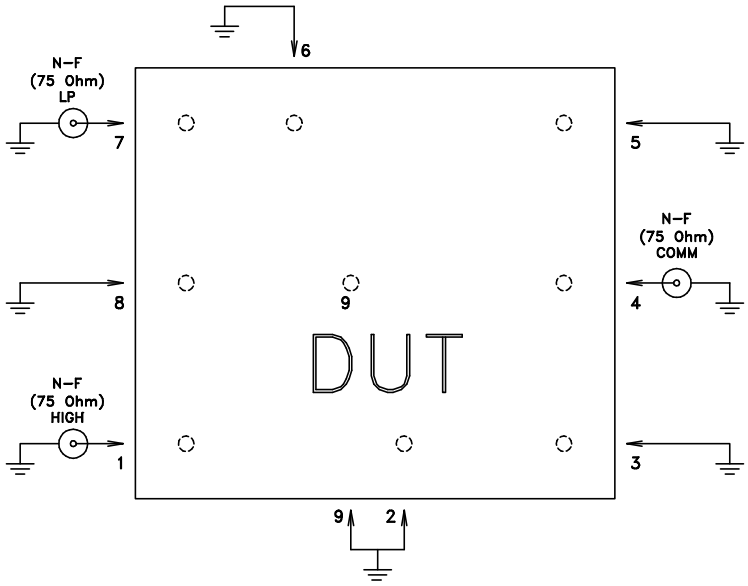
Mini-Circuits®
13 Neptune Avenue
Brooklyn NY 11235

PL, QC2228, DPLC, TB-929+, 75 OHM

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-495	OR
FILE: 98PL495		SCALE: 2:1	SHEET: 1 OF 1

Evaluation Board and Circuit





Schematic Diagram

Notes:

1. PCB Material: FR4, GADE IT-180A OR Equivalent
   Dielectric Constant=4.7, Thickness=.059 inch.

Mini-Circuits®

Mini-Circuits

Environmental Specifications **ENV85**

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
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