

Plug-in

Diplexer

DPLC-8510A0+

75Ω DC to 1220 MHz
(DC-85, 102-1220 MHz)



Generic photo used for illustration purposes only
CASE STYLE: QB2223

The Big Deal

- Plug-in design
- Field replaceable
- Low insertion loss
- Excellent return loss, 24 dB typ.
- Low group delay variation in passband
- Mirrored version available for ease of routing
- DOCSIS 3.1 standard

Product Overview

DPLC-8510A0+ is a high performance field replaceable plug-in diplexer with the lowpass port at DC-85 MHz and highpass port at 102-1220 MHz. Excellent return loss combined with high out of channel rejection makes it a 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 DC-85 and 102-1220 MHz	This makes signal transmission with very less reflection 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



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+RoHS Compliant

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

Operating Temperature -40° to 85°C

Storage Temperature	-55°C to 100°C
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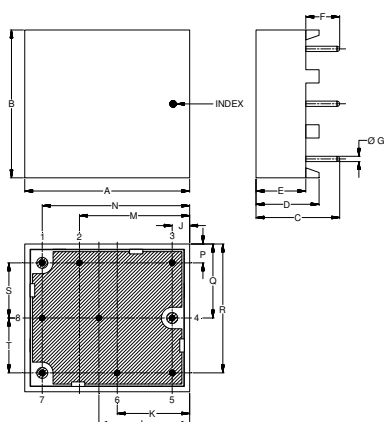
RF Power Input	30dBm Max.
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Permanent damage may occur if any of these limits are exceeded.
These ratings are not intended for continuous normal operation

Pin Connections

HIGH PASS PORT	7
LOW PASS PORT	1
COMMON PORT	4
GROUND	2.3.5.6.8.9

Outline Drawing



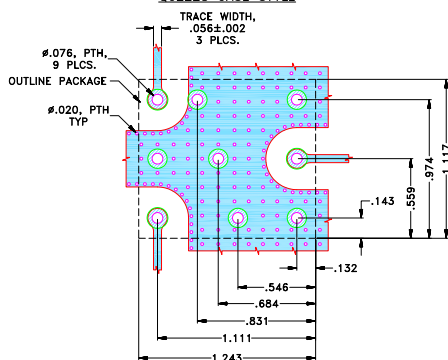
Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	H	J	K
1.243	1.117	.630	.475	.375	.255	.040	--	.132	.546
31.56	28.36	16.00	12.07	9.53	6.48	1.02	--	3.35	13.87
L	M	N	P	Q	R	S	T		Wt.
.684	.831	1.111	.143	.559	.974	.417	.415		grams
17.37	21.10	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-897+
Suggested PCB Layout (PL-485)

**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

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Features

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

Applications

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



CAUTION NOTE: Not designed for reflow process.

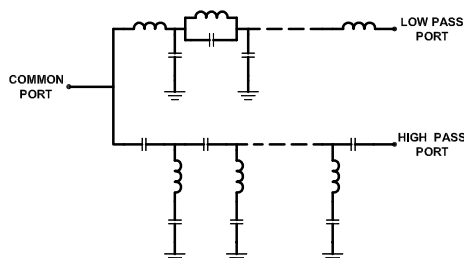
Electrical Specifications at 25°C

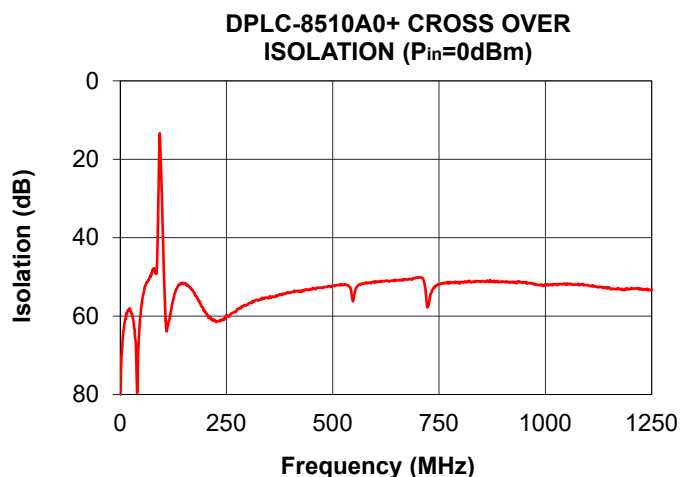
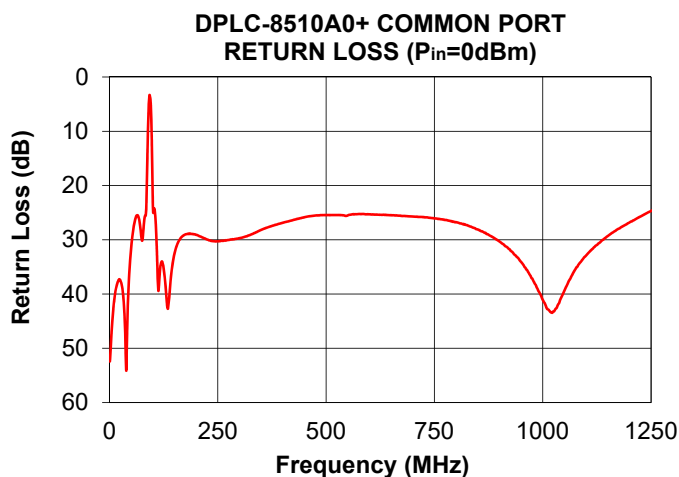
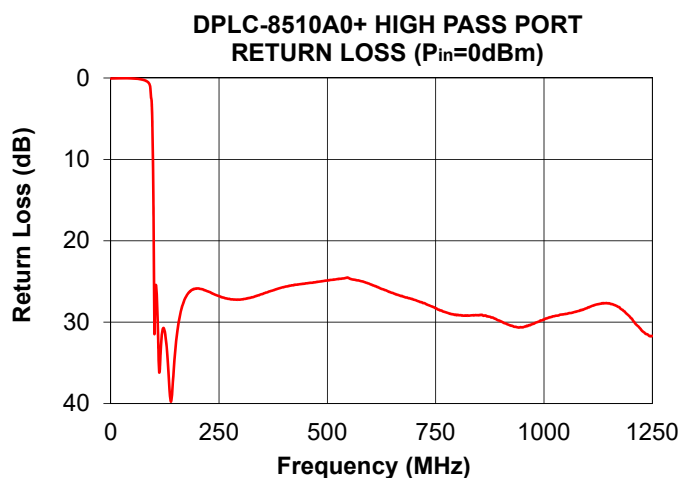
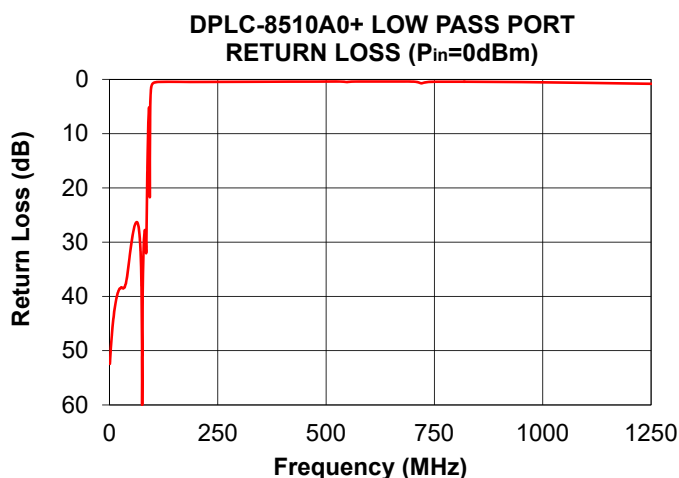
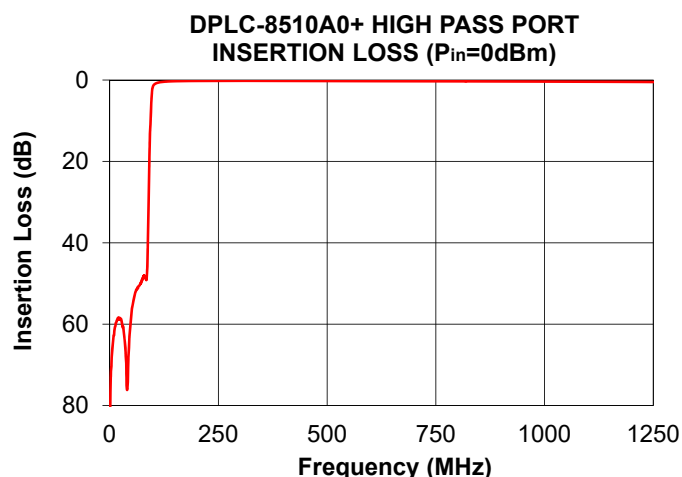
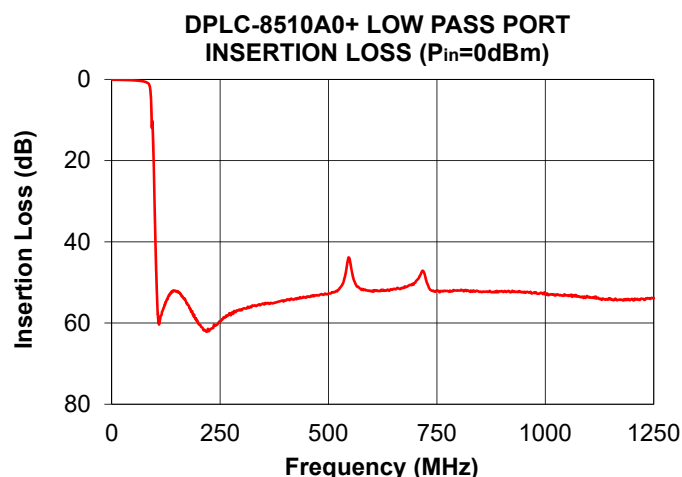
Parameter		Port	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Insertion Loss	Low Pass	DC-85	-	1.1	1.4	dB
		High Pass	102-1220	-	1.4	1.7	
	Return Loss	Low Pass	DC-85	20	24	-	dB
		High Pass	102-1220	20	24	-	
		Common	DC-85	20	24	-	
			102-1220	20	24	-	
Stop Band Isolation		Low Pass	102-1220	42	50	-	dB
		High Pass	DC-85	45	50	-	
		Cross over	85-102	-	15	-	

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	0.04	83.91	51.62	52.59	0.02
20.0	0.10	59.04	35.41	47.28	0.01
40.0	0.16	75.08	32.59	36.79	0.03
82.0	0.77	47.51	43.46	39.40	0.33
83.0	0.83	47.70	40.81	33.16	0.36
83.4	0.86	47.77	35.93	30.86	0.37
85.0	1.01	48.32	25.12	23.43	0.42
90.0	2.54	34.93	9.29	8.96	0.70
91.4	3.68	26.90	6.95	6.90	0.89
93.0	5.99	17.87	5.49	8.58	1.47
94.0	11.13	11.77	4.67	15.66	2.45
94.6	15.35	9.42	4.41	5.73	2.83
98.2	25.98	2.64	11.18	1.06	9.93
101.0	38.94	1.40	21.56	0.75	20.90
102.0	43.48	1.24	24.80	0.70	24.60
105.0	56.10	0.94	28.32	0.59	27.13
109.2	58.08	0.73	28.70	0.52	27.71
113.0	54.97	0.61	28.88	0.48	29.54
115.0	54.60	0.57	29.23	0.47	30.70
118.0	54.09	0.51	30.18	0.46	32.98
121.0	53.87	0.47	31.61	0.46	36.00
125.0	53.88	0.42	33.58	0.46	41.81
600.0	52.73	0.30	27.97	0.37	27.92
900.0	52.86	0.39	37.92	0.47	32.59
1002.0	52.02	0.43	43.85	0.52	30.22
1100.0	52.22	0.47	31.30	0.61	28.03
1200.0	51.79	0.51	27.12	0.69	28.12
1218.0	51.14	0.53	26.61	0.69	28.83
1220.0	50.97	0.53	26.54	0.70	28.80

Functional Schematic





Notes

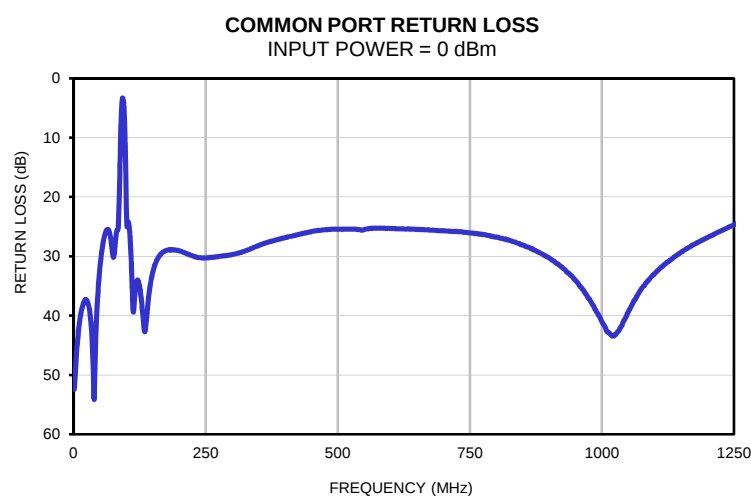
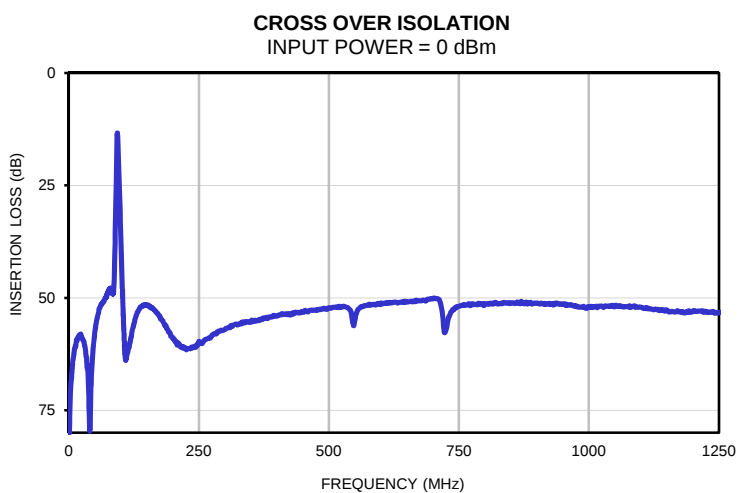
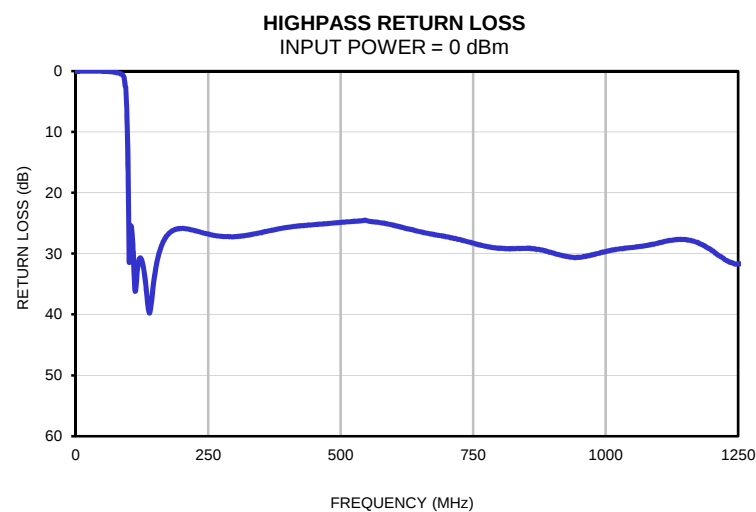
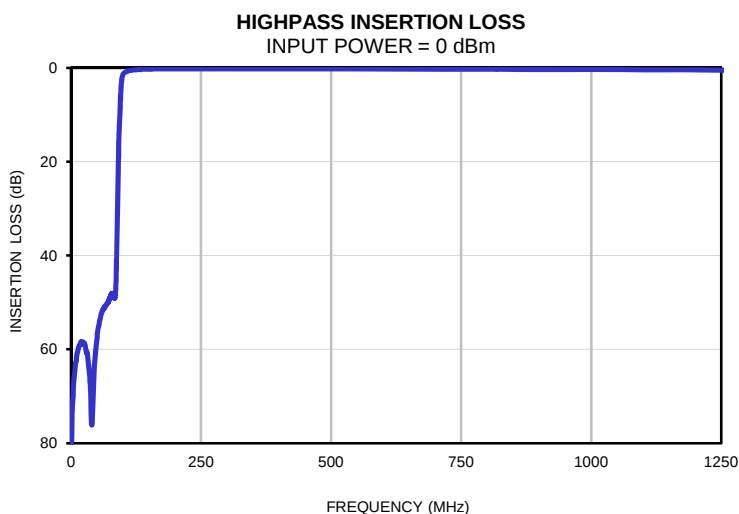
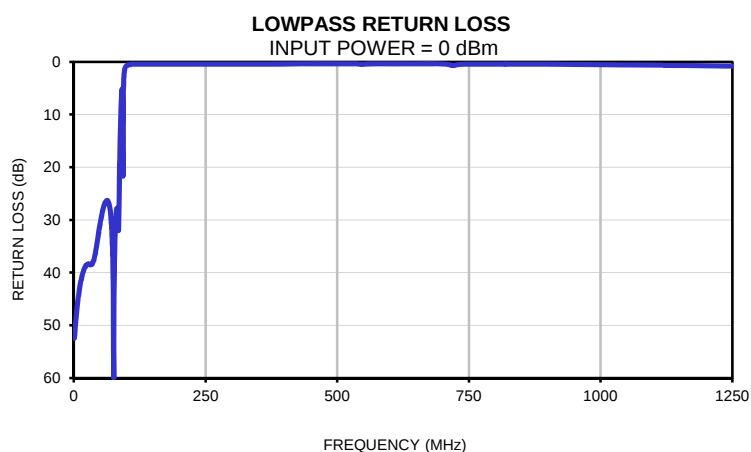
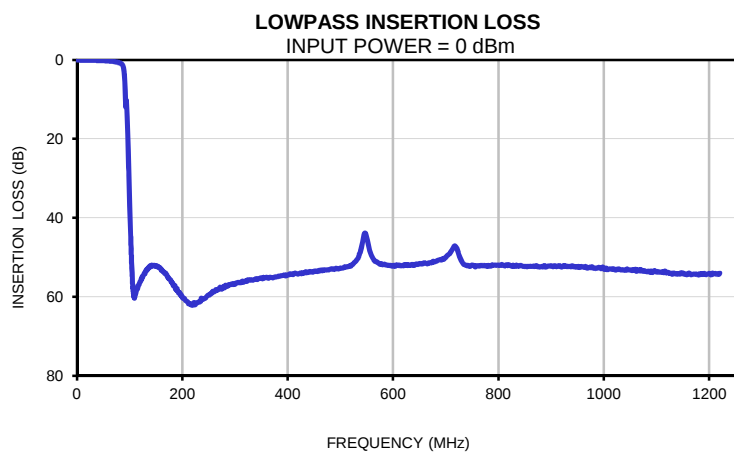
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Typical Performance Data

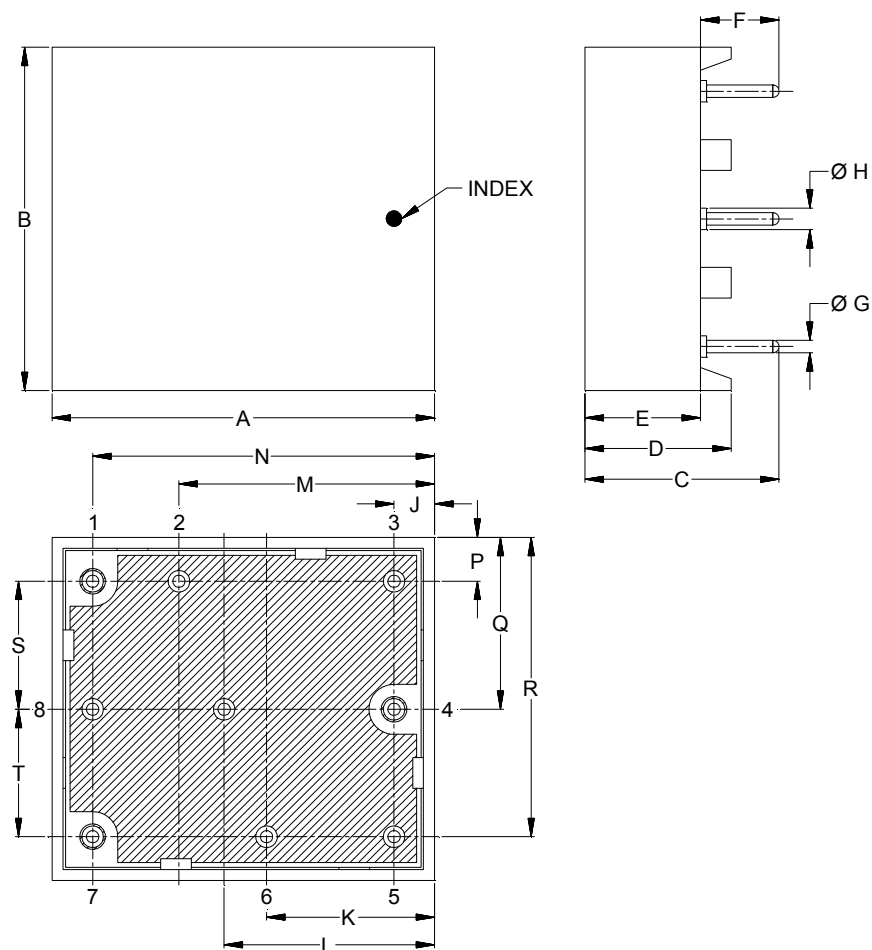
FREQUENCY (MHz)	INSERTION LOSS (dB)		Cross over isolation (dB) (between LPF and HPF)	RETURN LOSS (dB)		
	Lowpass port	Highpass port		Common port	Lowpass port	Highpass port
1.0	0.06	81.58	80.00	52.42	52.43	0.06
3.0	0.08	71.49	70.58	49.84	49.80	0.06
5.0	0.08	67.54	68.01	47.05	47.66	0.05
10.0	0.09	62.69	62.11	41.78	43.62	0.04
15.0	0.10	59.59	59.28	38.98	40.82	0.04
20.0	0.12	58.87	58.64	37.66	39.21	0.03
25.0	0.13	58.65	58.80	37.45	38.53	0.03
30.0	0.14	60.82	60.56	39.01	38.47	0.03
35.0	0.16	64.56	65.53	44.27	38.35	0.03
40.0	0.17	76.16	79.59	50.10	36.69	0.03
45.0	0.20	63.67	64.07	37.42	33.74	0.04
50.0	0.22	57.73	57.47	31.62	30.59	0.05
55.0	0.26	53.99	54.19	28.11	28.09	0.07
60.0	0.30	51.97	52.04	26.06	26.59	0.09
65.0	0.36	51.13	51.17	25.47	26.48	0.12
70.0	0.43	50.14	50.09	26.91	29.14	0.16
75.0	0.53	49.03	48.85	30.10	47.21	0.22
80.0	0.71	48.11	47.95	26.66	29.13	0.31
81.0	0.76	48.24	48.03	26.01	28.07	0.33
82.0	0.81	48.57	48.45	25.63	27.77	0.36
83.4	0.91	48.94	48.79	25.55	29.11	0.40
85.0	1.06	48.85	49.10	24.07	31.72	0.46
86.0	1.21	47.21	48.49	20.89	25.67	0.50
88.0	1.83	38.84	42.37	13.06	14.43	0.62
90.0	3.68	26.93	30.62	6.91	7.49	0.82
90.6	4.78	23.42	26.86	5.58	6.16	0.94
92.0	9.52	15.91	18.08	3.56	5.62	1.52
94.0	10.49	10.20	14.77	3.77	6.25	2.60
95.0	13.13	7.32	18.01	4.53	2.78	3.47
98.0	26.32	2.23	28.79	12.95	0.99	12.40
100.0	36.10	1.42	36.83	22.57	0.76	24.95
102.0	44.86	1.13	44.66	24.72	0.64	28.41
105.0	54.78	0.90	54.95	24.91	0.55	25.62
109.2	60.35	0.70	63.69	31.45	0.49	31.41
110.0	59.73	0.67	63.60	33.33	0.48	33.10
112.0	58.86	0.62	62.55	38.35	0.47	36.18
115.0	57.96	0.55	61.14	37.50	0.45	33.93
119.0	56.44	0.49	58.96	34.33	0.44	31.16
121.0	56.01	0.46	57.75	33.99	0.44	30.76
125.0	54.87	0.42	55.77	35.17	0.44	31.22
150.0	52.22	0.29	51.62	32.61	0.45	32.90
200.0	60.17	0.22	59.07	29.09	0.46	25.86
250.0	59.51	0.20	59.72	30.27	0.45	26.79
300.0	56.82	0.20	57.06	29.72	0.44	27.21
500.0	52.72	0.24	52.20	25.46	0.40	24.88
650.0	51.59	0.28	50.83	25.46	0.38	26.40
700.0	50.04	0.30	50.23	25.72	0.41	27.25
750.0	51.95	0.31	51.90	26.06	0.43	28.28
800.0	52.01	0.33	51.32	26.75	0.43	29.10
850.0	52.27	0.34	51.09	28.09	0.44	29.16
900.0	52.14	0.35	51.16	30.30	0.46	29.90
950.0	52.46	0.36	51.45	34.08	0.50	30.64
1000.0	52.98	0.38	52.14	41.05	0.54	29.68
1002.0	53.02	0.38	52.08	41.39	0.54	29.61
1050.0	53.17	0.39	51.95	39.38	0.59	28.98
1100.0	53.71	0.41	52.09	32.89	0.64	28.25
1150.0	53.95	0.43	52.71	29.31	0.70	27.68
1200.0	54.05	0.46	53.07	26.81	0.75	29.48
1218.0	54.31	0.47	52.89	26.01	0.77	30.53
1220.0	54.04	0.47	53.19	25.93	0.77	30.67

Typical Performance Curves



Outline Dimensions

QB2223



CASE#	A	B	C	D	E	F	G	H	J	K
QB2223	1.243 (31.56)	1.117 (28.36)	.630 (16.00)	.475 (12.07)	.375 (9.53)	.255 (6.48)	.040 (1.02)	.070 (1.78)	.132 (3.35)	.546 (13.87)

CASE#	L	M	N	P	Q	R	S	T	WT.GRAMS
QB2223	.684 (17.37)	.831 (21.10)	1.111 (28.22)	.143 (3.63)	.559 (14.21)	.974 (24.74)	.417 (10.58)	.415 (10.53)	7

Dimensions are in inches (mm). Tolerances: 2 Pl. $\pm .015$; 3 Pl. $\pm .030$

Notes:

1. Cover material: Fortan PPS
2. Pin material: Brass alloy [C3604]
3. Pin finish: Gold flash
4. Tolerance on pin diameter $\pm .001$
5. Base: Printed wiring laminate.

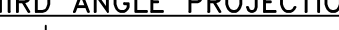


P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site

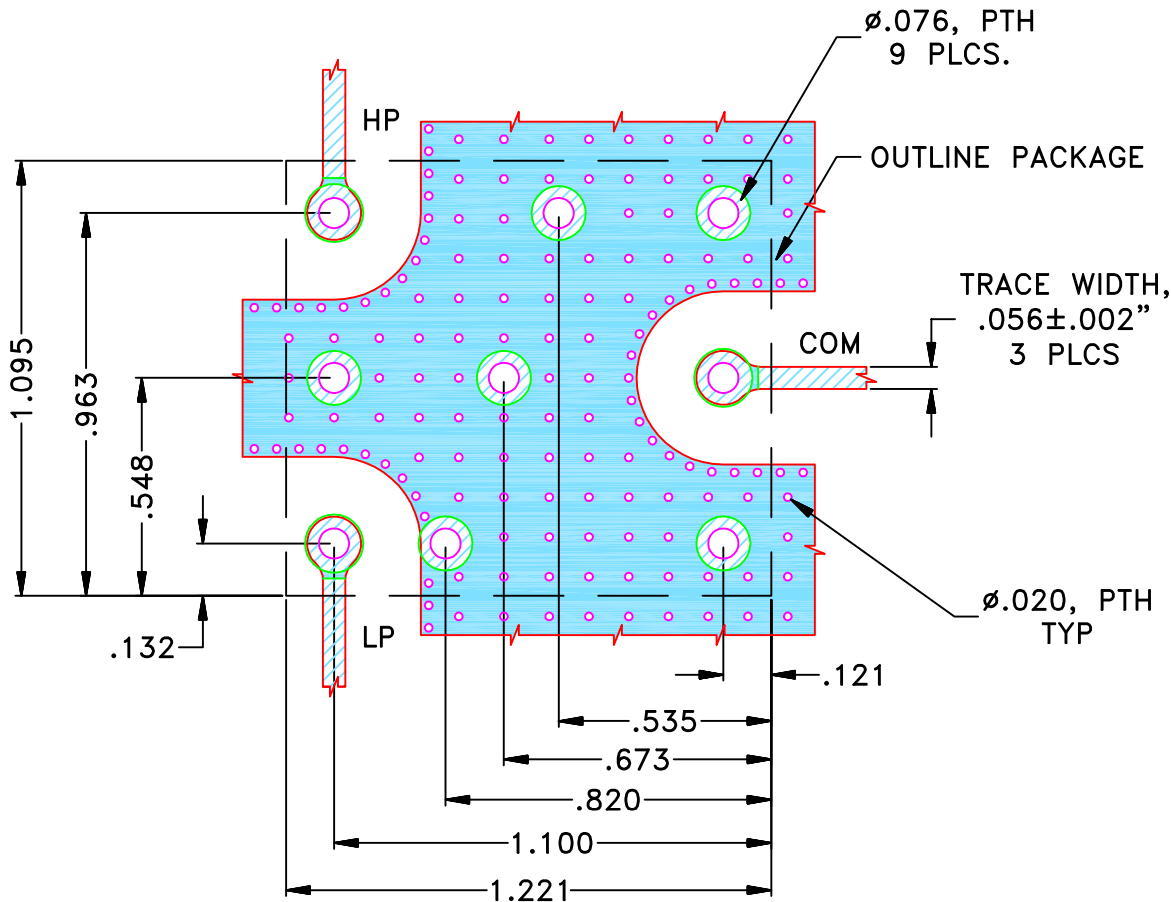


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RF/IF MICROWAVE COMPONENTS

THIRD ANGLE PROJECTION		REVISIONS					
		REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
		OR	M156280	NEW RELEASE	MAY 16	SSA	MD

SUGGESTED MOUNTING CONFIGURATION FOR
QB2223 CASE STYLE



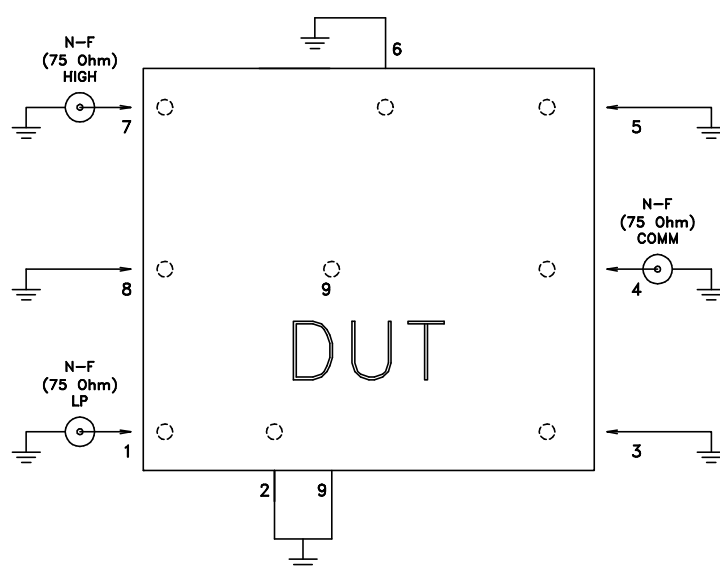
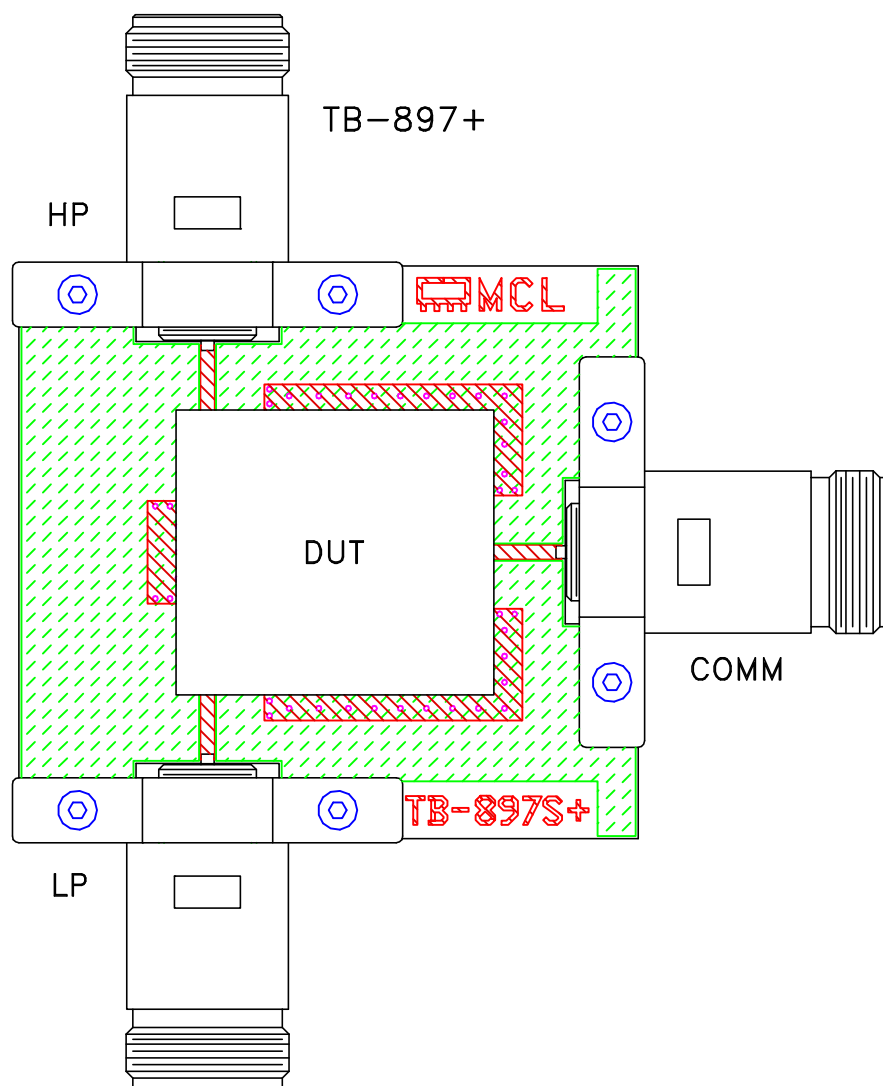
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- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
- DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

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	CHECKED	MD	05 MAY 16			
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					PL, QB2223, DPLC, 75 Ohm	
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					REV:	OR
					FILE:	98PL485
					SCALE:	3:1
					SHEET:	1 OF 1
ASHEETA1.DWG REV:A DATE:01/12/95						

Evaluation Board and Circuit



Schematic Diagram

Notes:

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

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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