

Surface Mount High Pass Filter

THP-1050+

50Ω 1050 to 4000 MHz

The Big Deal

- Small size (0.25" x 0.25" x 0.10")
- Good matching
- Low insertion loss



Generic photo used for illustration purposes only
CASE STYLE: GQ1018

Product Overview

THP-1050+ is a 50Ω high pass filter fabricated using SMT technology. This high pass filter covers from 1050-4000 MHz. This series of filters are constructed in a tiny package offering dual advantage of superior lumped element filter performance in a space saving SMT package. These models are suitable for mass production without losing flexibility of small volume requirements. It has repeatable performance across lots and consistent performance across temperature.

Key Features

Feature	Advantages
Low insertion loss	Can be used in high performance applications.
Good rejection	This enables the filter to attenuate spurious signals and reject harmonics for broad frequency band.
Small size, 0.25" x 0.25" x 0.10"	The small surface mount package enables the THP-1050+ to be used in compact designs.

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 High Pass Filter

50Ω 1050 to 4000 MHz

THP-1050+



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CASE STYLE: GQ1018

Features

- Low insertion loss
- Good matching
- Small size (0.25" x 0.25" x 0.10")

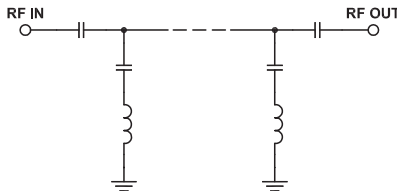
Electrical Specifications at 25°C

Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Stop Band	Rejection Loss	DC-F1	DC-620	20	30	- dB
	VSWR	DC-F1	DC-620	-	20	- :1
Pass Band	Insertion Loss	F2-F3	1050-4000	-	0.6	2.0 dB
	VSWR	F2-F3	1050-4000	-	1.2	1.67 :1

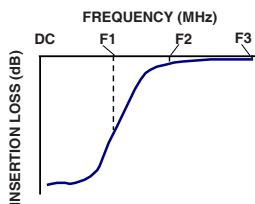
Applications

- Radio navigation satellite
- Space research

Functional Schematic



Typical Frequency Response

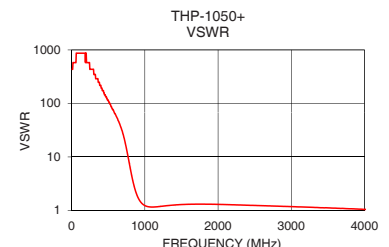
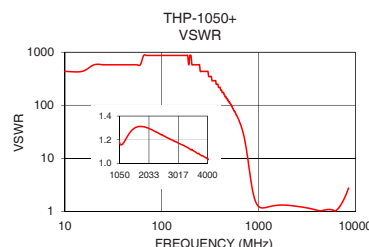
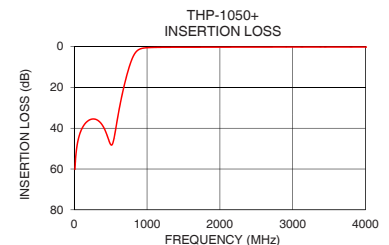
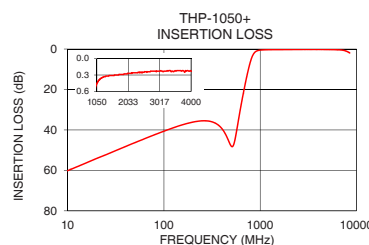


Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)
10	60.15	434.30
620	30.10	51.10
710	15.63	23.81
770	8.31	10.19
810	4.75	5.30
840	2.97	3.40
915	1.02	1.66
1050	0.46	1.17
1150	0.37	1.16
1300	0.33	1.22
1550	0.31	1.30
1620	0.30	1.31
1830	0.29	1.31
2000	0.28	1.30
2220	0.26	1.27
2500	0.25	1.24
2860	0.23	1.19
3100	0.23	1.16
3600	0.22	1.10
4000	0.23	1.04

+RoHS Compliant

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



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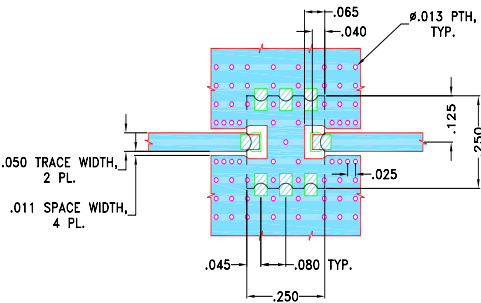
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REV. B
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THP-1050+
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Pad Connections

INPUT	8
OUTPUT	4
GROUND	1, 2, 3, 5, 6, 7

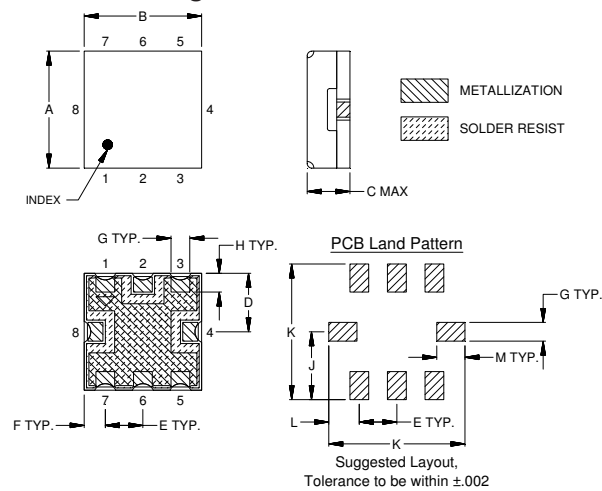
Demo Board MCL P/N: TB-680
Suggested PCB Layout (PL-372)



- NOTES:
1. TRACE WIDTH IS SHOWN FOR OAK (OAK-602) WITH DIELECTRIC THICKNESS .022"±.0015". 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

Outline Drawing



Outline Dimensions (inch)

A	B	C	D	E	F	G
.25	.25	.10	.125	.080	.045	.040
6.35	6.35	2.54	3.18	2.03	1.14	1.02
H	J	K	L	M	Wt.	
.040	.145	.290	.065	.060	grams	
1.02	3.68	7.37	1.65	1.52	.25	

Note: Please refer to case style drawing for details

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Typical Performance Data

FREQ.	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
(MHz)	(dB)			(dB)			(dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
10	60.20	60.15	60.06	0.04	0.04	0.04	0.04	0.04	0.04
25	52.22	52.25	52.21	0.03	0.03	0.03	0.03	0.03	0.03
50	46.33	46.28	46.26	0.03	0.03	0.03	0.02	0.03	0.03
70	43.55	43.45	43.43	0.02	0.03	0.03	0.02	0.02	0.02
100	40.71	40.62	40.56	0.02	0.02	0.02	0.02	0.02	0.02
180	36.75	36.63	36.53	0.01	0.03	0.03	0.01	0.02	0.03
250	35.50	35.49	35.42	0.02	0.04	0.04	0.02	0.04	0.04
325	36.07	36.19	36.22	0.04	0.06	0.07	0.03	0.05	0.07
395	38.85	39.04	39.16	0.06	0.08	0.10	0.05	0.08	0.09
415	40.19	40.38	40.52	0.07	0.10	0.11	0.06	0.09	0.11
480	46.27	46.46	46.65	0.11	0.15	0.16	0.10	0.14	0.16
500	47.81	47.99	48.18	0.12	0.16	0.18	0.12	0.15	0.18
510	48.17	48.27	48.38	0.13	0.17	0.19	0.13	0.16	0.19
550	44.36	44.25	44.16	0.17	0.22	0.24	0.17	0.21	0.23
570	40.40	40.22	40.09	0.20	0.25	0.27	0.19	0.23	0.26
620	30.27	30.10	29.96	0.27	0.34	0.37	0.26	0.32	0.36
675	20.89	20.74	20.61	0.43	0.51	0.55	0.41	0.49	0.54
725	13.77	13.62	13.51	0.75	0.87	0.95	0.74	0.85	0.93
750	10.65	10.53	10.42	1.09	1.25	1.34	1.07	1.22	1.32
775	7.89	7.80	7.71	1.66	1.86	1.99	1.64	1.83	1.96
810	4.78	4.75	4.70	3.04	3.32	3.52	3.02	3.28	3.50
840	2.93	2.97	2.94	4.94	5.26	5.56	4.90	5.22	5.53
855	2.27	2.34	2.33	6.12	6.46	6.81	6.08	6.42	6.78
885	1.40	1.49	1.51	8.84	9.19	9.65	8.79	9.15	9.61
930	0.77	0.88	0.92	13.27	13.61	14.24	13.23	13.58	14.21
1000	0.45	0.55	0.60	19.17	19.58	20.25	19.19	19.60	20.28
1015	0.42	0.51	0.56	20.08	20.51	21.12	20.10	20.53	21.16
1050	0.36	0.46	0.51	21.54	22.00	22.39	21.58	22.05	22.44
1100	0.31	0.40	0.46	22.35	22.77	22.75	22.29	22.76	22.71
1200	0.27	0.35	0.41	21.49	21.61	21.00	21.36	21.54	20.91
1260	0.25	0.34	0.39	20.70	20.58	19.83	20.60	20.51	19.74
1300	0.24	0.33	0.39	20.23	19.94	19.15	20.15	19.88	19.08
1400	0.22	0.32	0.38	19.24	18.71	17.91	19.28	18.74	17.92
1500	0.21	0.31	0.37	18.47	17.96	17.16	18.56	18.01	17.19
1600	0.20	0.30	0.37	18.26	17.55	16.77	18.40	17.64	16.84
1700	0.19	0.30	0.37	18.49	17.41	16.65	18.61	17.48	16.70
1800	0.18	0.29	0.36	18.42	17.41	16.71	18.52	17.46	16.75
1900	0.18	0.28	0.35	18.09	17.50	16.91	18.19	17.56	16.95
2000	0.17	0.28	0.34	18.28	17.73	17.23	18.37	17.76	17.25
2100	0.16	0.27	0.33	18.87	18.00	17.59	18.96	18.03	17.61
2200	0.15	0.26	0.33	19.20	18.36	18.05	19.26	18.36	18.04
2300	0.15	0.26	0.32	19.07	18.71	18.52	19.12	18.71	18.51
2400	0.15	0.25	0.31	19.07	19.11	19.06	19.10	19.09	19.05
2500	0.14	0.25	0.31	19.19	19.45	19.58	19.19	19.37	19.50
2600	0.14	0.24	0.30	19.32	19.98	20.29	19.25	19.84	20.13
2700	0.14	0.24	0.30	19.28	20.43	20.91	19.18	20.26	20.74
2800	0.13	0.23	0.30	19.40	20.89	21.52	19.29	20.73	21.36
2900	0.13	0.23	0.30	19.78	21.39	22.19	19.66	21.25	22.04
3000	0.12	0.23	0.30	20.17	21.87	22.81	20.01	21.70	22.68
3100	0.12	0.23	0.30	20.79	22.52	23.47	20.65	22.36	23.36
3200	0.11	0.23	0.31	21.52	23.07	24.03	21.33	22.89	23.92
3300	0.09	0.22	0.30	22.59	23.78	24.60	22.43	23.64	24.59
3400	0.10	0.23	0.31	24.00	24.76	25.20	23.87	24.68	25.32
3450	0.11	0.24	0.32	24.90	25.40	25.83	24.59	25.11	25.68
3500	0.08	0.22	0.31	25.51	25.62	25.81	24.95	25.24	25.65
3600	0.08	0.22	0.31	27.25	26.79	26.52	26.40	26.20	26.25
3700	0.08	0.23	0.33	29.40	27.84	27.33	28.33	27.17	27.05
3800	0.09	0.25	0.32	33.78	30.05	28.25	32.06	29.12	27.91
3900	0.06	0.22	0.32	49.96	31.60	28.83	38.78	30.48	28.57
4000	0.08	0.23	0.33	39.64	34.61	29.99	39.98	33.15	29.83

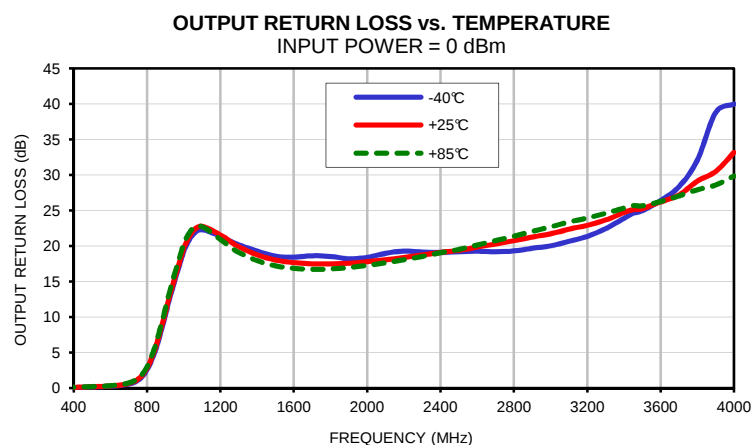
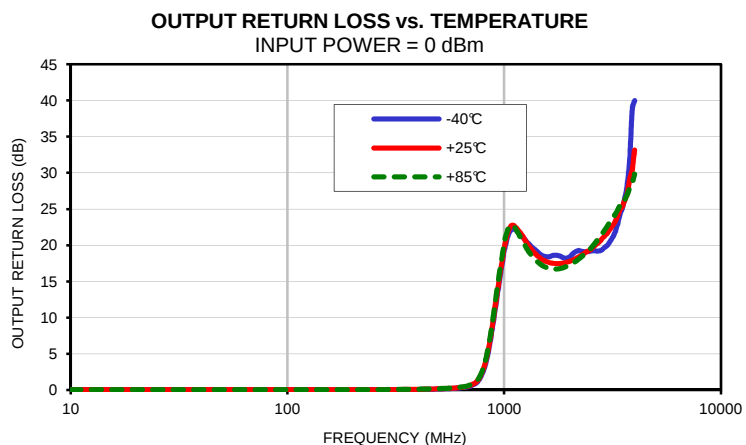
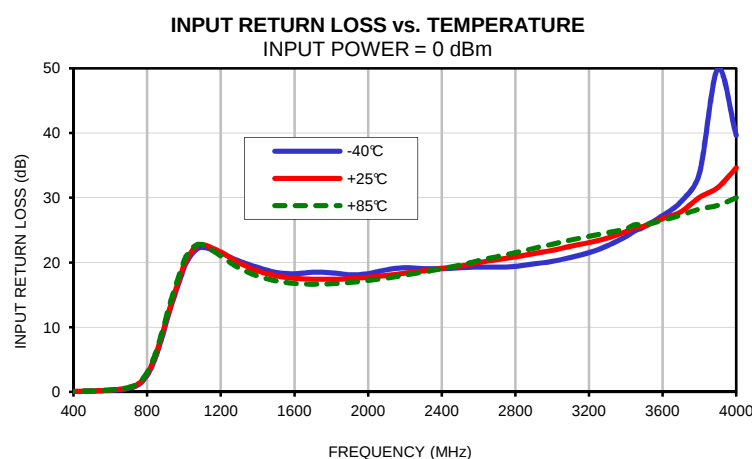
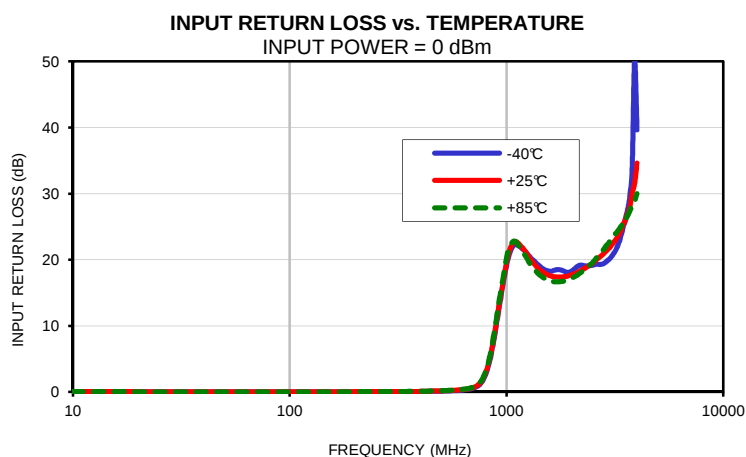
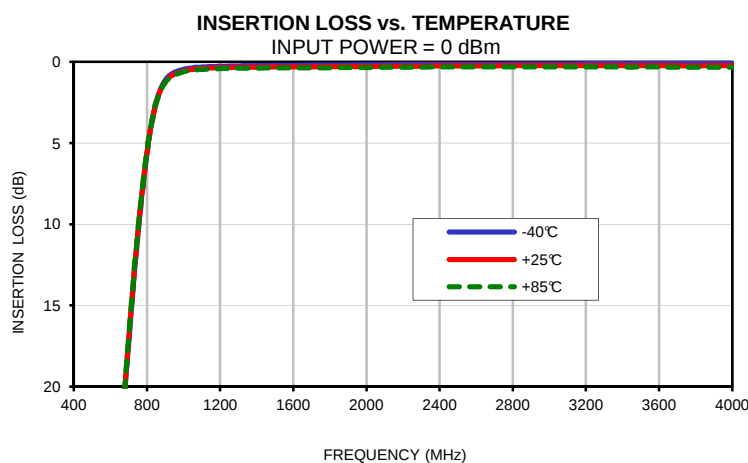
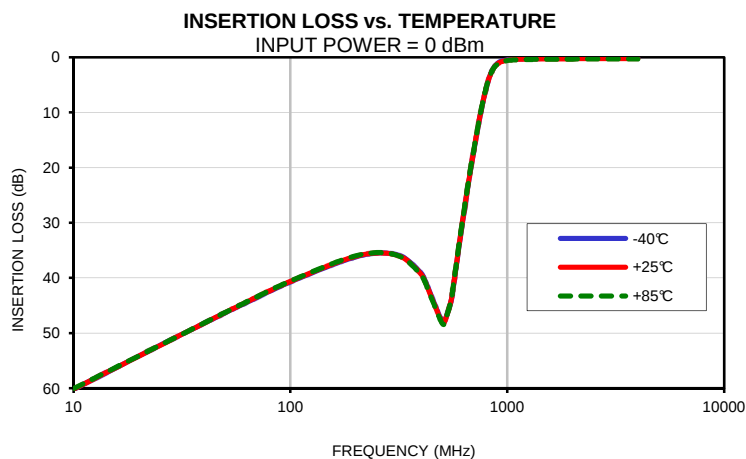
Typical Performance Data

FREQ.	GROUP DELAY		
(MHz)	(nsec)		
	@-40°C	@+25°C	@+85°C
1050	0.73	0.71	0.70
1055	0.71	0.70	0.69
1060	0.70	0.69	0.68
1065	0.69	0.67	0.67
1070	0.68	0.66	0.65
1075	0.67	0.65	0.64
1080	0.66	0.64	0.63
1085	0.65	0.63	0.62
1090	0.64	0.62	0.61
1095	0.63	0.61	0.61
1100	0.62	0.60	0.59
1110	0.60	0.58	0.58
1115	0.59	0.58	0.57
1120	0.58	0.57	0.56
1125	0.57	0.56	0.55
1130	0.56	0.55	0.54
1140	0.55	0.53	0.53
1145	0.54	0.52	0.52
1150	0.53	0.51	0.51
1160	0.52	0.50	0.50
1170	0.51	0.49	0.49
1180	0.50	0.48	0.48
1190	0.49	0.47	0.47
1200	0.48	0.46	0.46
1210	0.47	0.45	0.45
1220	0.46	0.44	0.44
1230	0.45	0.43	0.43
1240	0.44	0.42	0.42
1250	0.43	0.41	0.41
1260	0.42	0.41	0.40
1270	0.41	0.40	0.39
1280	0.40	0.39	0.38
1290	0.39	0.38	0.38
1320	0.37	0.36	0.35
1330	0.36	0.35	0.35
1350	0.35	0.34	0.33
1370	0.34	0.33	0.32
1380	0.33	0.32	0.32
1410	0.32	0.31	0.30
1450	0.30	0.29	0.28
1460	0.29	0.28	0.28
1500	0.28	0.27	0.26
1510	0.27	0.26	0.26
1560	0.26	0.25	0.24
1570	0.25	0.24	0.24
1610	0.24	0.23	0.22
1670	0.23	0.22	0.21
1770	0.21	0.20	0.19
1880	0.19	0.18	0.17
1890	0.18	0.17	0.17
2040	0.17	0.15	0.15
2050	0.16	0.15	0.15
2280	0.15	0.13	0.13
2290	0.14	0.13	0.13
2590	0.13	0.12	0.11
2600	0.12	0.11	0.11
2620	0.13	0.11	0.11
2840	0.12	0.11	0.10
2850	0.11	0.11	0.10
4000	0.10	0.08	0.08

High Pass Filter

THP-1050+

Typical Performance Curves



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IF/RF MICROWAVE COMPONENTS

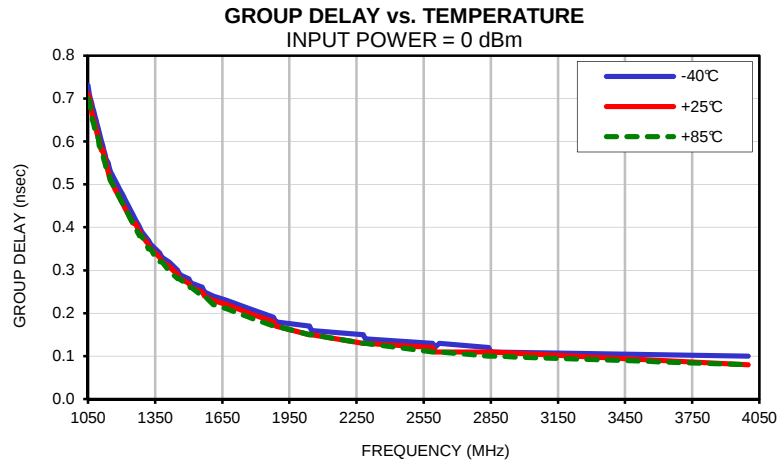


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High Pass Filter

THP-1050+

Typical Performance Curves



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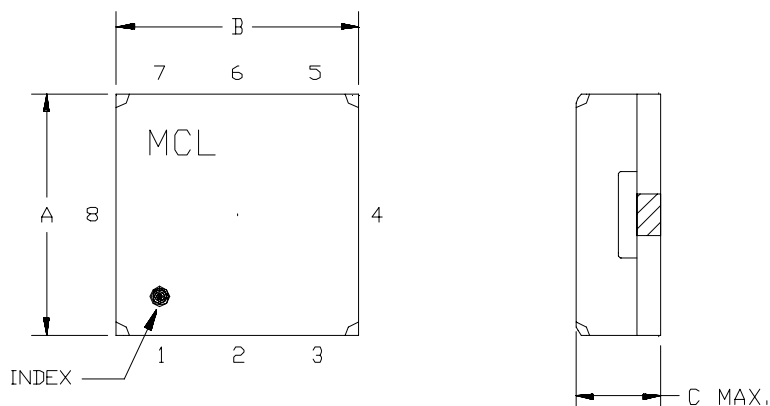
IF/RF MICROWAVE COMPONENTS



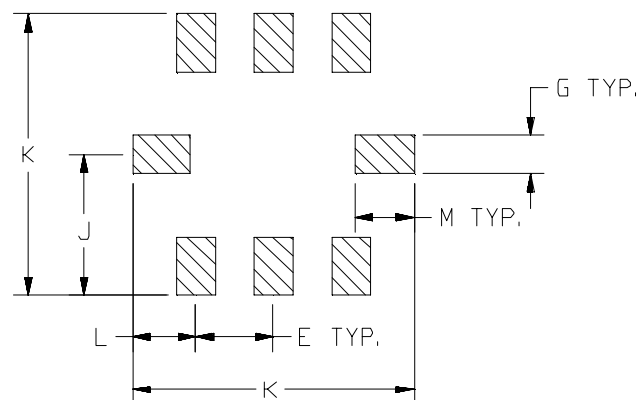
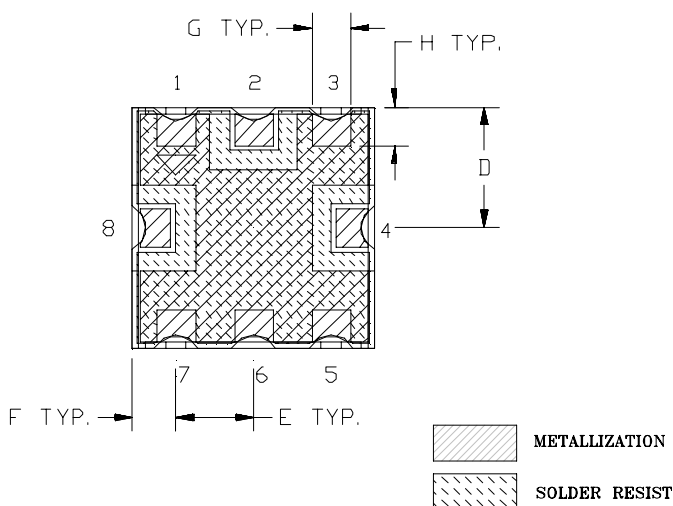
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Outline Dimensions

GQ1018



PCB Land Pattern



Suggested Layout,
Tolerance to be within ± 0.002

CASE #	A	B	C	D	E	F	G	H	J	K	L	M	WT. GRAMS
GQ1018	.25 (6.35)	.25 (6.35)	.10 (2.54)	.125 (3.18)	.080 (2.03)	.045 (1.14)	.040 (1.02)	.040 (1.02)	.145 (3.68)	.290 (7.37)	.065 (1.65)	.060 (1.52)	.25

Dimensions are in inches (mm). Tolerances: 2 Pl. ± 0.01 "; 3 Pl. ± 0.005 "

Notes:

- Case material: Nickel-Silver alloy.
- Base: Printed wiring laminate.
- Termination finish:
For RoHS Case Styles: 3-5 μ inch Gold over 120-240 μ inch Nickel plate.
For RoHS-5 Case Styles: Tin-Lead plate.



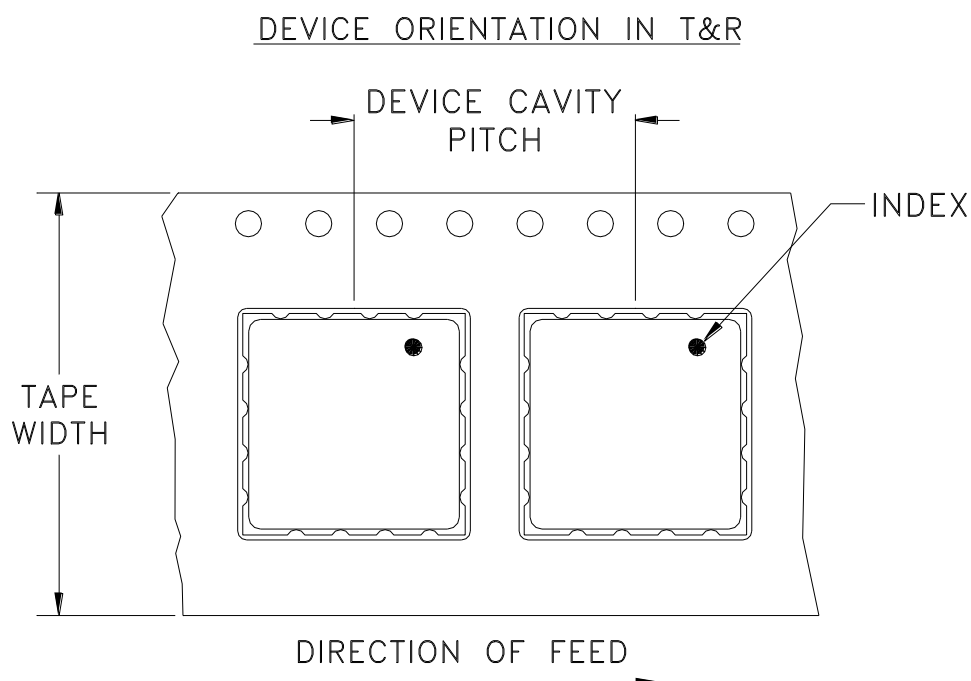
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RF/IF MICROWAVE COMPONENTS

Tape & Reel Packaging TR-F78



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel see note
16	12	7	10
			20
			50
			100
			200
		13	500, 1000

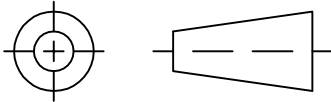
Note: Please consult individual model data sheet to determine device per reel availability.

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.

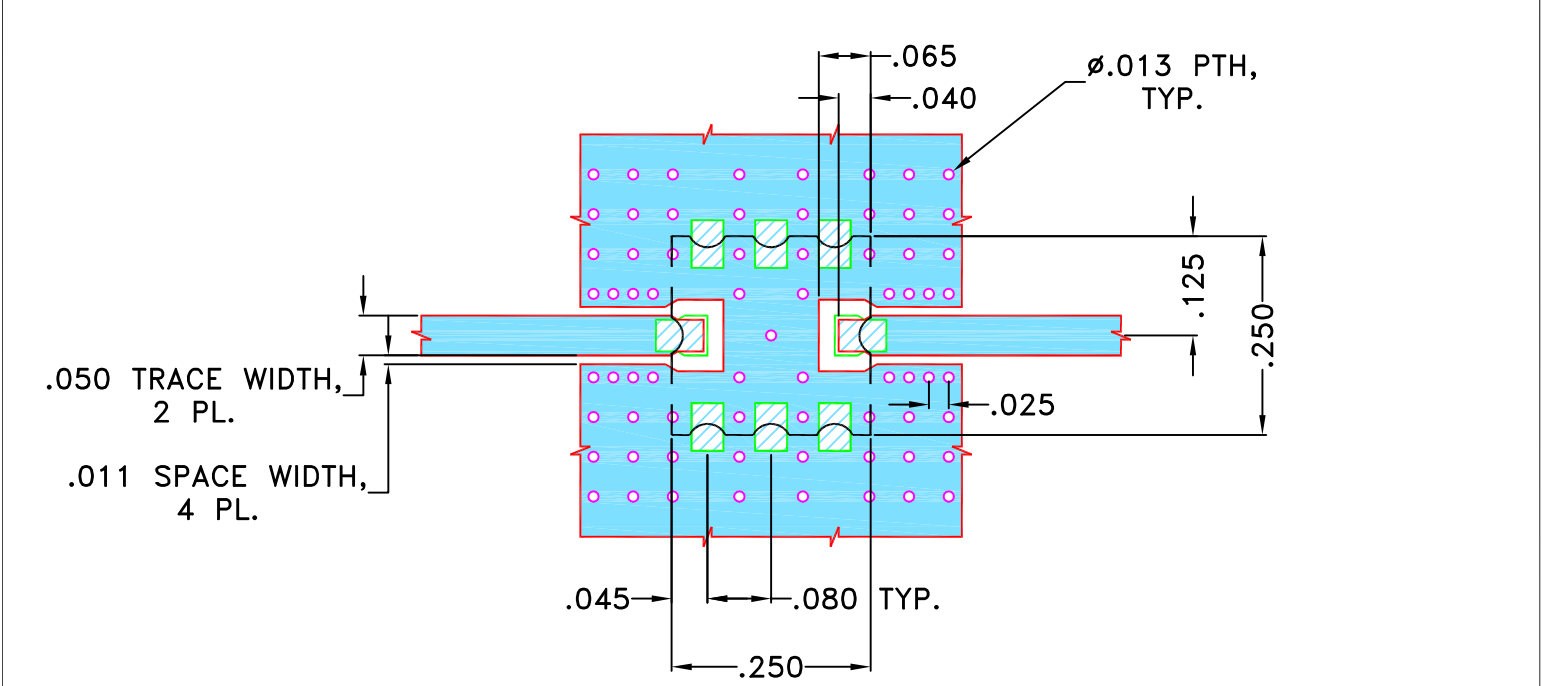
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THIRD ANGLE PROJECTION		REVISIONS					
		REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
		OR	M135450	NEW RELEASE	JUN 12	DDR	KG

SUGGESTED MOUNTING CONFIGURATION FOR
GQ1018 CASE STYLE "08FL04" PIN CODE



NOTES:

- TRACE WIDTH IS SHOWN FOR OAK (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.



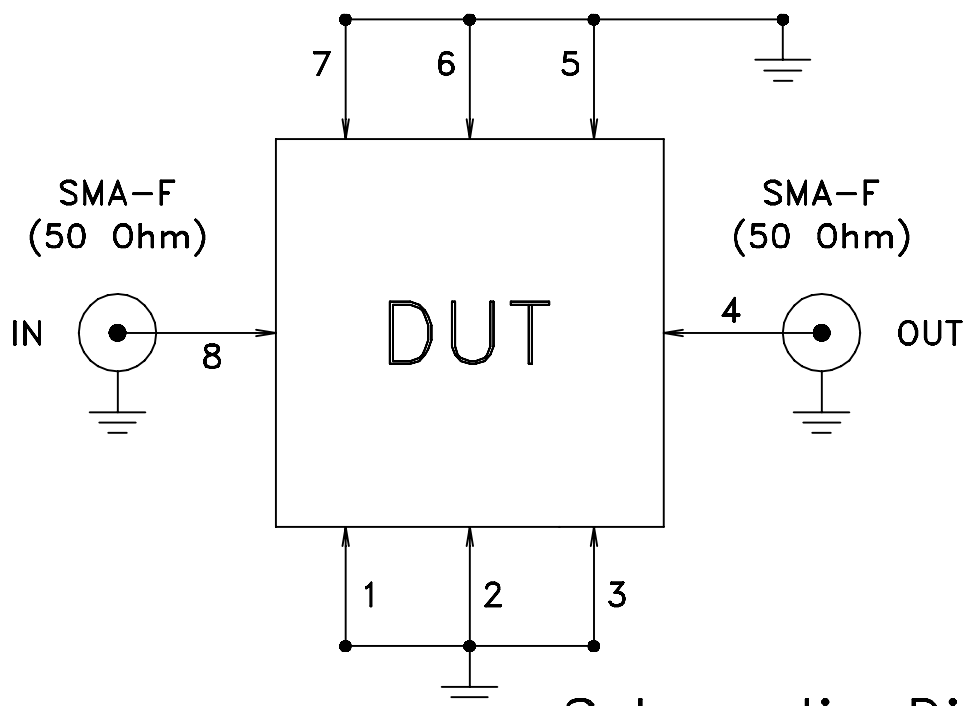
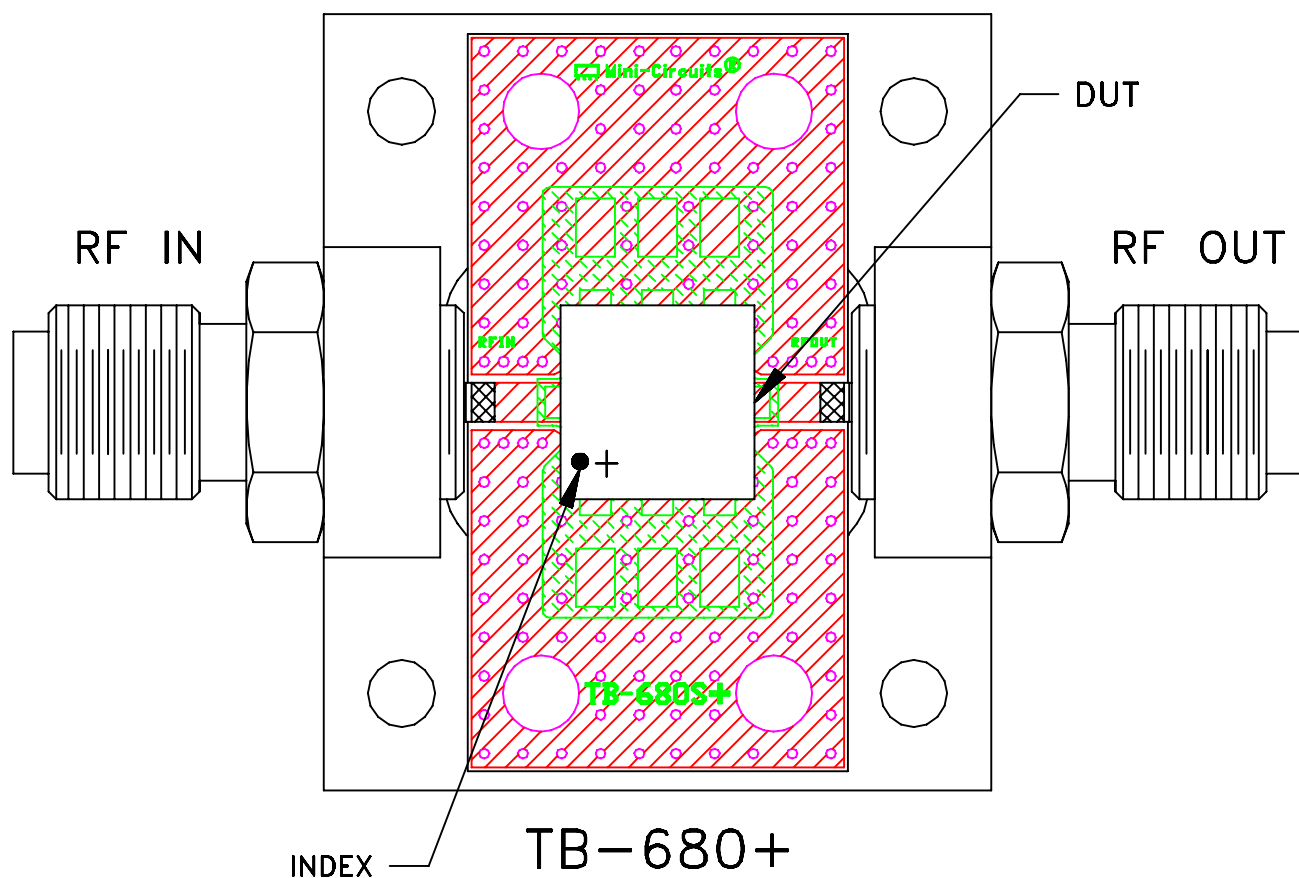
DENOTES PCB COPPER LAYOUT WITH SMOBC
(SOLDER MASK OVER BARE COPPER)



DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

UNLESS OTHERWISE SPECIFIED		INITIALS		DATE		 Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235							
DIMENSIONS ARE IN INCHES TOLERANCES ON: 2 PL DECIMALS ± 3 PL DECIMALS ± .005" ANGLES ± FRACTIONS ± 		DRAWN	DDR	07 JUN 12									
		CHECKED	MD	07 JUN 12									
		APPROVED	GM	07 JUN 12									
						PL, 08FL04, GQ1018, THP, TB-680+, 50 Ohm							
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						FILE: 98PL372		SCALE: 4:1		SHEET: 1 OF 1			
ASHEETA1.DWG REV:A DATE:01/12/95													

Evaluation Board and Circuit



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: OAK-602 OR Equivalent
Dielectric Constant=2.50±.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
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