



THE BIG DEAL

- Low loss, less than 1 dB max at 20 GHz
- Return loss, 14 dB typical below 20 GHz
- Standard 1812 (4.5mm x 3.2mm) case style
- Suited for very high-volume production



Generic photo used for illustration purposes only

CASE STYLE: NM1812C-3

APPLICATIONS

- Test and Measurement
- EW, Radar and ECM Defense Systems
- 5G MIMO and Back Haul Radio
- Satellite Communications

+RoHS Compliant
 The +Suffix identifies RoHS Compliance.
 See our website for methodologies and qualifications

PRODUCT OVERVIEW

The TPHK-3002+ is a 50 Ohm transmission line which can pass signals with low insertion loss typ 1.3 dB up to 30 GHz. This can be used as a place holder in system boards in the absence of LTCC filters. In addition, this low loss device provides excellent matching between devices.

KEY FEATURES

Feature	Advantages
Cost effective	LTCC is scalable technology that is cost effective due to ease of production in high quantities.
Small size (4.5mm x 3.2mm)	Allows for high layout density of circuit boards, while minimizing effects of parasitics.
Surface Mountable	Suitable for very high volume automated assembly process.

REV. OR
 ECO-014838
 TPHK-3002+
 WY/CP/AM
 220913



ELECTRICAL SPECIFICATIONS¹ AT 25°C

Parameter	F#	Frequency (GHz)	Min.	Typ.	Max.	Units
Passband	Insertion Loss	DC-F1	—	0.2	0.5	dB
		F1-F2	—	0.6	1	
		F2-F3	—	1.3	2.0	
Passband	Return Loss	DC-F1	—	20	—	dB
		F1-F2	—	14	—	
		F2-F3	—	7	—	

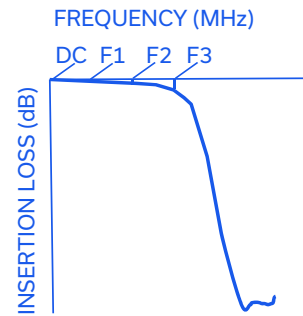
1. Measured on Mini-Circuits Test Board TB-TPHK-3002C+ with connectors and feedlines de-embedded.

MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	-55°C to 125°C
Storage Temperature	-55°C to 125°C
RF Power Input	1 W max.

Permanent damage may occur if any of these limits are exceeded

TYPICAL FREQUENCY RESPONSE



FUNCTIONAL SCHEMATIC





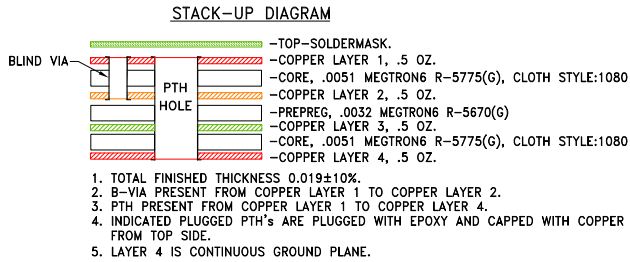
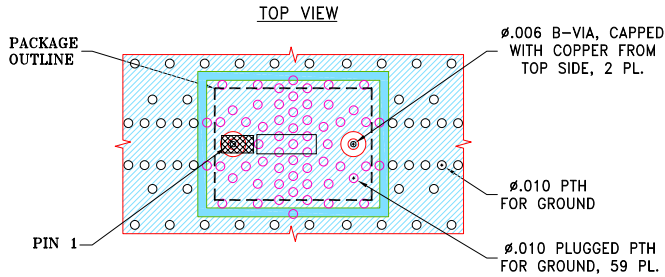
CERAMIC

Thru-Line

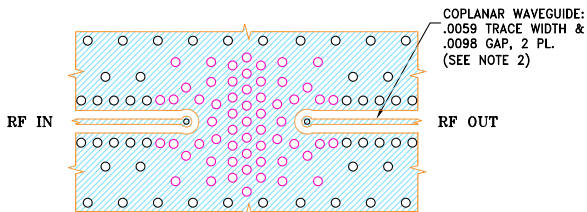
TPHK-3002+

50Ω DC to 30 GHz

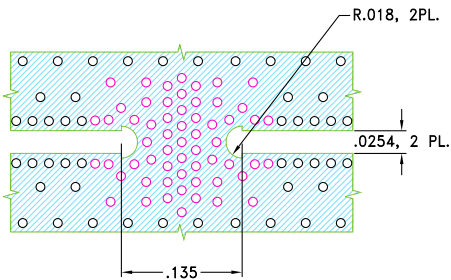
DEMO BOARD MCL P/N: TB-TPHK-3002C+ SUGGESTED PCB LAYOUT (PL-730)



LAYER 2, B-VIA & PTH



LAYER 3 & PTH

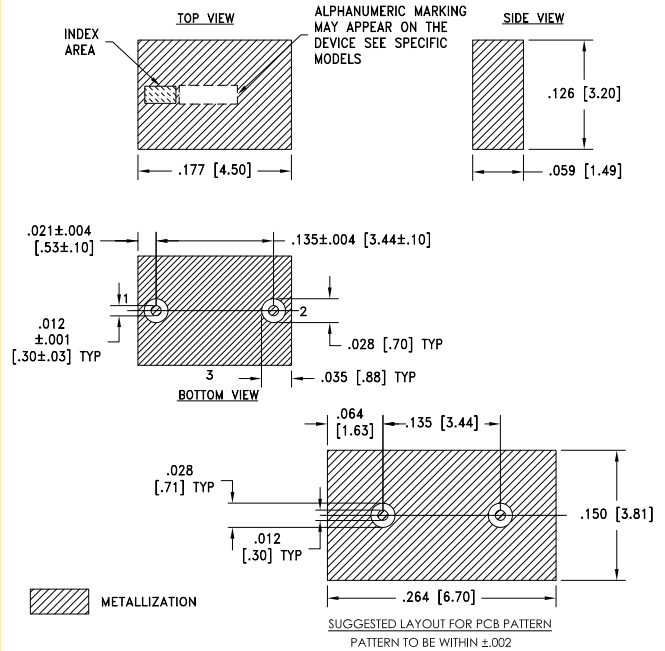


PAD CONNECTIONS

INPUT	1
OUTPUT	2
GROUND	3

PRODUCT MARKING : F446

OUTLINE DRAWING





CERAMIC

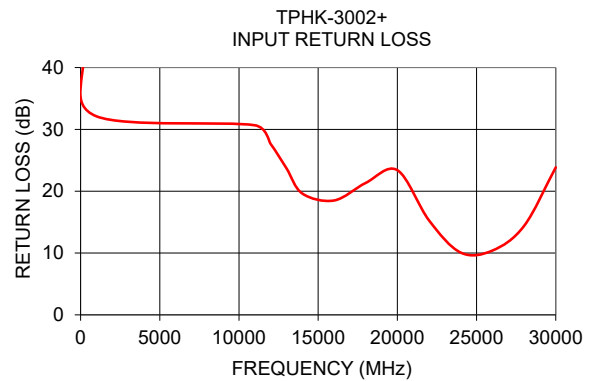
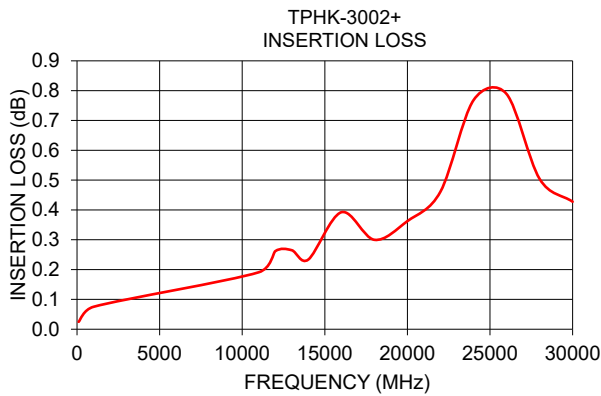
Thru-Line

TPHK-3002+

50Ω DC to 30 GHz

TYPICAL PERFORMANCE DATA AT 25°C

Frequency (MHz)	Insertion Loss (dB)	Return Loss (dB)
100	0.02	41.80
1000	0.08	32.12
11000	0.19	30.66
12000	0.26	27.64
13000	0.26	23.70
14000	0.23	19.62
16000	0.39	18.50
18000	0.30	21.34
20000	0.36	23.40
22000	0.46	15.27
24000	0.77	10.07
26000	0.79	10.40
28000	0.50	14.38
30000	0.43	23.85



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/terms/viewterm.html

