



THE BIG DEAL

- Ultra-wideband DC to 30 GHz Performance
- Return Loss, 16 dB typical
- Standard 1210 Case Style
- Suitable for High-Volume Production



Generic photo used for illustration purposes only

APPLICATIONS

- RF Signal Routing and Interconnection
- Placeholder Element for JV1210C-14 Footprint Components
- Broadband Signal Transmission Paths from DC to 30 GHz
- Prototyping and Evaluation of RF Signal Chains

FUNCTIONAL DIAGRAM



PRODUCT OVERVIEW

The TPCV-3002+ is a low temperature co-fired ceramic (LTCC) 50 Ω transmission line with low insertion loss through 30 GHz acting as a placeholder for Mini-Circuits JV1210C-14 package style. This transmission line is ideal for dense signal chain PCB layouts. The LTCC fabrication process assures minimal RF performance variation while delivering a product that is well suited for environmental extremes of high humidity and temperature.

KEY FEATURES

Features	Advantages
Surface Mountable	Suitable for very high volume automated assembly process.
Small Size, 1210	Allows for high layout density of circuit boards, while minimizing effects of parasitics.
Cost Effective	LTCC is scalable technology that is cost effective due to ease of product in high quantities.



LTCC SURFACE MOUNT

Thru-Line

TPCV-3002+

Mini-Circuits

50Ω DC to 30 GHz

ELECTRICAL SPECIFICATIONS^{1,2} AT +25 °C, $Z_0 = 50\Omega$

Parameter		F#	Frequency (GHz)	Min.	Typ.	Max.	Units
Passband	Insertion Loss	DC-F1	DC-10	-	0.4	0.7	dB
		F1-F2	10-20	-	1.2	1.6	
		F2-F3	20-30	-	1.4	1.9	
	Return Loss	DC-F1	DC-10	10	16	-	dB
		F1-F2	10-20	10	15	-	
		F2-F3	20-30	-	11	-	
	Group Delay	DC-F3	DC-30	-	60	-	psec

1. Tested in Evaluation Board P/N TB-TPCV-3002C+ with the connector and feedline effects de-embedded using the 2X Thru IEEE P370 method.

2. Bi-directional, RF1 and RF2 ports can be interchanged, see S-Parameters for performance.

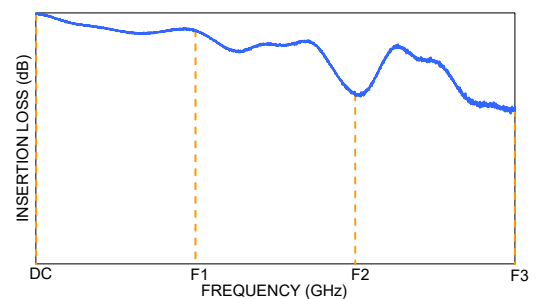
ABSOLUTE MAXIMUM RATINGS³

Parameter	Ratings
Operating Temperature	-55 °C to +125 °C
Storage Temperature	-55 °C to +125 °C
Input Power ⁴	10 W

3. Permanent damage may occur if any of these limits are exceeded.

4. Power rating applies only to signals within the passband. Power rating above +25 °C operating temperature decreases linearly to 4 W at +125 °C.

TYPICAL FREQUENCY RESPONSE





LTCC SURFACE MOUNT

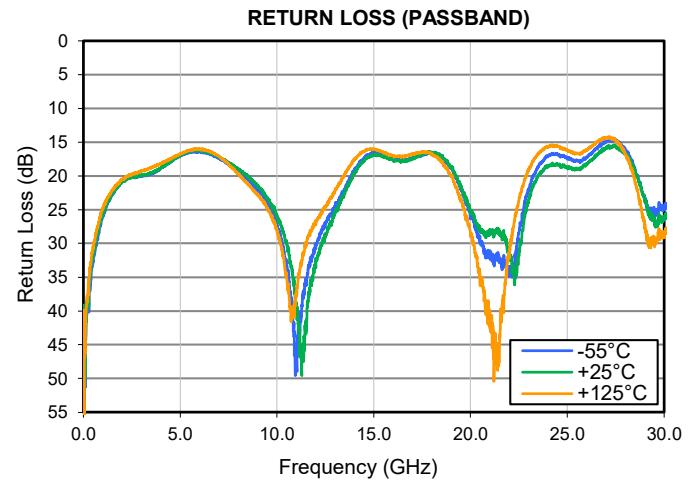
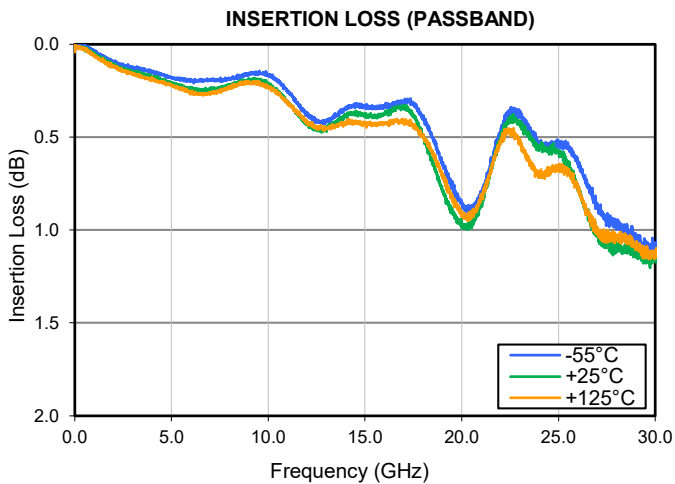
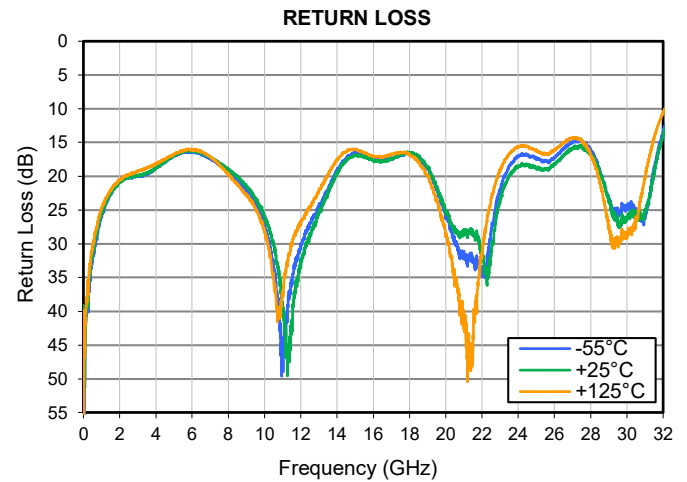
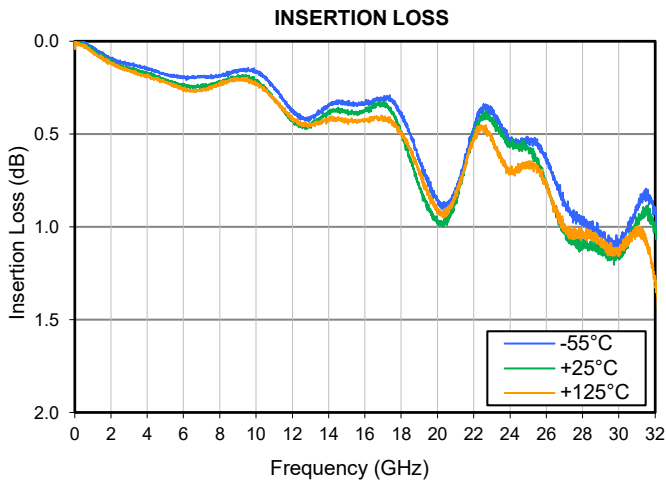
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TYPICAL PERFORMANCE GRAPHS



FUNCTIONAL DIAGRAM

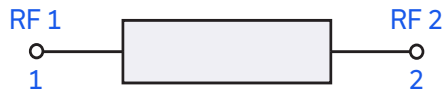
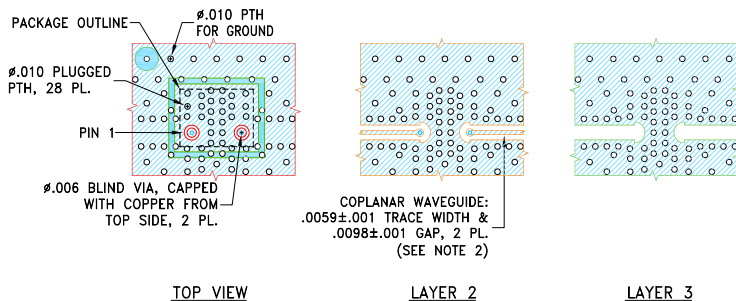
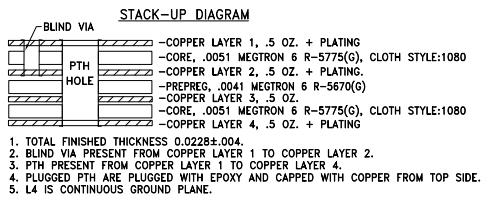


Figure 1. TPCV-3002+ Functional Diagram

PAD DESCRIPTION

Function	Pad Number	Description
RF1 ²	1	Connects to RF Input Port
RF2 ²	2	Connects to RF Output Port
GROUND	3	Connects to Ground on PCB, (See drawing PL-822)

SUGGESTED PCB LAYOUT (PL-822)



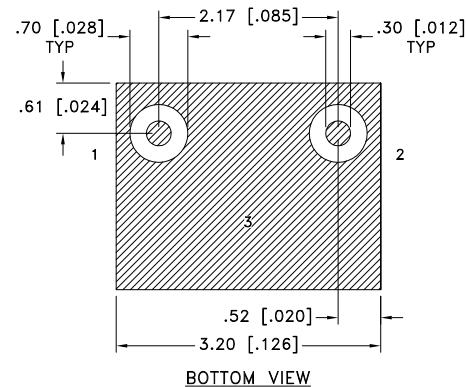
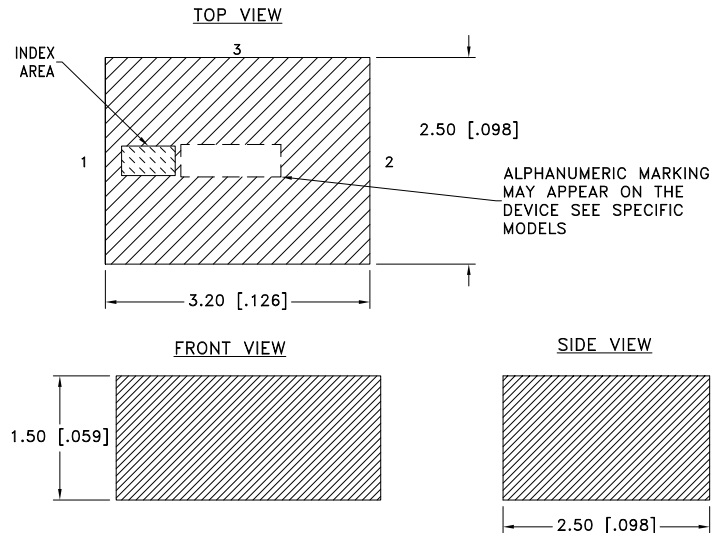
NOTES:

1. PCB IS MULTILAYER PCB, SEE STACK-UP DIAGRAM.
2. TRACE WIDTH & GAP ARE SHOWN FOR .0051 MEGTRON-6 R5775(G), CLOTH STYLE:1080, COPPER: 1/2 OZ. EACH LAYER. FOR OTHER MATERIALS TRACE WIDTH & GAP MAY NEED TO BE MODIFIED.

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

 DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

CASE STYLE DRAWING

 DENOTES METALLIZATION

Weight: .040 grams

Dimensions are in mm [inches]. Tolerances: 2 Pl.± 0.05 mm

PRODUCT MARKING*: U9

*Marking may contain other features or characters for internal lot control.

Figure 2. Suggested PCB Layout PL-822



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ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASHBOARD.

[CLICK HERE](#)

Performance Data & Graphs	Data	
	Graphs	
	S-Parameter (S2P Files) Data Set (.zip file) De-embedded to device pads	
Case Style	JV1210C-14	Lead Finish: Tin plate over nickel plating
RoHS Status	Compliant	
Tape and Reel	TR-F74	
Suggested Layout for PCB Design	PL-822	
Evaluation Board	TB-TPCV-3002C+	
	Gerber File	
Environmental Rating	ENV06T10	

NOTES

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

