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PRODUCT CHANGE NOTICE PCN Form (D4-E000-73)

PCN#21-045

NOTIFICATION DATE: October 4, 2021

MODELS AFFECTED:

Existing Model:	Replacement Model:
TCM2-672X+	TCM2-672AX+

EXTENT OF CHANGE:

Change of ferrite core adding approximately 0.002" to overall height

EFFECT OF CHANGE:

Change to **FUNCTION** (Performance/Specification) and **FIT** (Dimensions) No change to FORM (Appearance)

REASON FOR CHANGE:

Discontinuation of existing supplied core replaced by alternate qualified core

EFFECTIVE DATE OF CHANGE:

Immediate based on consumption of limited stock of existing core

ATTACHMENTS:

AN-20-006 Replacement Guide for TCM2-672X+ Spec Sheet for TCM2-672AX+

QUESTIONS?

PLEASE CONTACT US.

AS9100 ISO9001 ISO14001 Certified to QMS and EMS

PCN21-045 TCM2-672X.doc Rev.: A M135112 (01/16/12) File: PCN21-045 TCM2-672X.doc This document and its contents are the property of Mini-Circuits.

Refer to Procedure: D3-E040

SURFACE MOUNT TO Phate RF Transformer

TCM2-672AX+

Mini-Circuits

50Ω 1500 to 6700 MHz

THE BIG DEAL

- Wideband, 1500 to 6700 MHz
- Balanced transmission line
- Low insertion loss 0.8 dB at 4 GHz
- Flat insertion loss, 0.6 dB typ.
- Good input return loss, 15 dB typ.
- Low phase and amplitude unbalance, 6°, 0.8 dB at 4 GHz
- Aqueous washable

APPLICATIONS

- PCS
- Wideband push-pull amplifiers
- Cellular



CASE STYLE: DB1627 Generic photo used for illustration purposes only

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

PRODUCT OVERVIEW

Mini-Circuits' TCM2-672AX+ is a surface-mount transmission line core and wire transformer covering a very wide frequency range from 1500 to 6700 MHz. The transformer provides low insertion loss with excellent flatness over its entire frequency range. It achieves low phase and amplitude unbalance and excellent input return loss performance. Featuring core and wire construction on a 6-lead plastic base with tin over nickel termination finish, the unit measures 0.16 x 0.15 x 0.16", accommodating dense circuit board layouts. It also incorporates Mini-Circuits' Top Hat® feature for faster, more accurate pick-andplace assembly and easy visual inspection.

KEY FEATURES

Feature	Advantages
Wide band, 1500 to 6700 MHz	Very wide frequency range covers bandwidth requirements for many broadband applications.
Low insertion loss, 0.8 dB at 4 GHz	TCM2-672AX+ provides excellent signal transmission from input to output with consistent performance across its entire frequency range.
Good input return loss, 15 dB typ.	Provides good matching with minimal signal reflection.
Small footprint (0.16 x 0.15 x 0.16")	Accommodates tight space requirements for dense PCB layouts.
Top Hat [®] feature	Improves speed and accuracy of pick and place assembly and provides clear device marking for visual inspection.



SURFACE MOUNT TO HAT® RF Transformer

TCM2-672AX+

Mini-Circuits

ELECTRICAL SPECIFICATIONS AT 25°C

Parameter	Frequency (MHz)	equency (MHz) Min.		Max.	Units	
Impedance Ratio (secondary/primary)			2			
Frequency Range		1500		6700	dB	
Insertion Loss ¹	1500-4000	-	0.8	1.5	ЯР	
	4000-6700	-	2.1	3.2	uв	
Amplitude Unbalance	1500-4000	-	0.8	-	dB	
	4000-6700	-	1.0	-		
Phase Unbalance	1500-4000	-	6	-	Degree	
	4000-6700	-	9	-		
Return Loss	1500-6700	-	15	-	dB	

1. Referenced to nominal loss of 0.2 dB typ.



MAXIMUM RATINGS

Parameter	Ratings		
Operating temperature	-40°C to 85°C		
Storage temperature	-55°C to 100°C		
RF Power	0.4 W		
DC Current	30 mA		

CONFIGURATION G





Mini-Circuits

top hat® SURFACE MOUNT **RF** Transformer

TCM2-672AX+

PAD CONNECTIONS

Function	Pad Number
PRIMARY DOT	3
PRIMARY (GND)	2
SECONDARY DOT	4
SECONDARY	5
NOT USED	1,6

PRODUCT MARKING: YL

DEMOBOARD MCL P/N: TB-TCM-672AX+ SUGGESTED PCB LAYOUT (PL-422)



NOTES:

- Inclear: 1. TRACE WIDTH PARAMETERS ARE SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .0133"±.001". COPPER: 1/2 0Z. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED. 2. CHIP COMPONENT FOOT PRINTS SHOWN FOR REFERENCE.
- FOR COMPONENT VALUES REFER TO TB-742+. 3. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.



DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

OUTLINE DRAWING



PCB Land Pattern



Suggested Layout, Tolerance to be within $\pm .002$

OUTLINE DIMENSIONS (Inches)

E	D	C	B	A
.040	.050	.160	.150	.160
1.02	1.27	4.06	3.81	4.06
	K	J	H	G
	.030	.190	.065	.028
	0.76	4 83	1.65	0.71
	E .040 1.02	D E .050 .040 1.27 1.02 K .030 0.76	C D E .160 .050 .040 4.06 1.27 1.02 J K .190 .030 4.83 0.76	B C D E .150 .160 .050 .040 3.81 4.06 1.27 1.02 H J K .065 .190 .030 1.65 4.83 0.76



SURFACE MOUNT TO hat RF Transformer



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TYPICAL PERFORMANCE DATA

Frequency (MHz)	Insertion Loss (dB)	Return Loss (dB)	Amplitude Unbalance (dB)	Phase Unbalance (deg)	
1500	0.48	15.53	0.65	3.09	
2200	0.44	26.48	0.36	6.70	
2500	0.52	19.67	0.11	7.81	
3100	0.75	13.84	0.23	6.93	
3400	0.76	13.79	0.23	6.76	
4000	0.79	15.56	0.53	4.59	
4600	0.96	14.00	0.26	0.16	
5200	1.11	13.17	0.13	3.39	
6100	1.56	12.13	0.46	6.60	
6700	2.05	10.36	0.64	4.57	



TCM2-672AX+ INPUT RETURN LOSS





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





APPLICATION NOTE

<u>REPLACEMENT PART REFERENCE GUIDE, TCM2-672X+</u> AN-20-006

ORIGINAL PART: REPLACEMENT PART: TCM2-672X+ TCM2-672AX+



Replacement Part has been judged by Mini-Circuits Engineering as a close replacement to Original Parta

MECHANICAL DIMENSIONS & PCB LAND PATTERN



a. Suitability for model replacement within a particular system must be determined by and is solely the responsibility of the customer based on, among other things, electrical performance criteria, stimulus conditions, application, compatibility with other components and environmental conditions and stresses.

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APPLICATION NOTE

ORIGINAL PART: TCM2-672X+

REPLACEMENT PART: TCM2-672AX+

Application Circuit: No Change to Application circuit

Electrical Schematic



Pin Connections: No Change to Pin Connections

Function	Pad Number
PRIMARY DOT	3
PRIMARY (GND)	2
SECONDARY DOT	4
SECONDARY	5
NOT USED	1,6

Notes:

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APPLICATION NOTE

ORIGINAL PART: TCM2-672X+

REPLACEMENT PART: TCM2-672AX+

Guaranteed Electrical Performance:

RF Performance Comparison	Frequency (MHz)		TCM2-672X+ Specifications			TCM2-672AX+ Specifications		
	From	То	Min.	Тур.	Max.	Min.	Тур.	Max.
Insertion Loss (Average)	1500	1700	-	-	-	-	0.8	1.5
(dB)	1700	4000	-	1.1	2.5	-	0.8	1.5
	4000	6700	-	1.1	2.5	-	2.1	3.2
Amplitude Unbalance	1500	1700	-	-	-		0.8	-
(dB)	1700	4000	-	0.8	-		0.8	
	4000	6700	-	0.8	-		1.0	
Phase Unbalance	1500	1700	-	-	-	-	6	-
(Degree)								
	1700	4000	-	6	-	-	6	-
	4000	6700	-	6	-	-	9	-
				•	-	-	•	•

Notes:

A Suitability for model replacement within a particular system must be determined by and is solely the responsibility of the customer based on, among other things, electrical performance criteria, stimulus conditions, application, compatibility with other components and environmental conditions and stresses.



APPLICATION NOTE

CONCLUSIONS:

1) FORM-FIT-FUNCTION COMPATIBLEa:

Replacement part is Fit compatible. A change in form is due to the change in marking. See page 3 for functional changes.



APPLICATION NOTE

2) PERFORMANCE COMPARISON ON ORIGINAL VS.REPLACEMENT: RF In = -10 dBm





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