SURFACE MOUNT top hat

Power Splitter/Combiner TCP-2-23-75X+

75Ω (2 Way-0°) 5 to 2150 MHz

KEY FEATURES

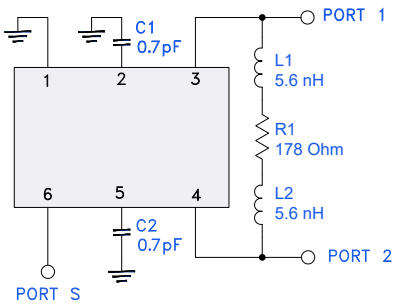
- Wideband 5 to 2150 MHz
- Low Insertion Loss 1.0 dB typ.
- External resistor, capacitors, inductors required

Generic photo used for illustration purposes only

APPLICATIONS

- DOCSIS® 4.0 Systems
- VHF/UHF
- CATV

FUNCTIONAL DIAGRAM



PRODUCT OVERVIEW

Mini-Circuits' TCP-2-23-75X+ is a 75Ω 2-way 0˚ surface-mount power splitter/combiner covering the 5 to 2150 MHz frequency range, supporting bandwidth requirements for DOCSIS® 4.0 systems and equipment, as well as other broadband applications. This model can handle up to 0.5W RF input power as a splitter, and provides low insertion loss and low phase and amplitude unbalance. It features core and wire construction mounted on a 6-pad printed laminate base with gold over nickel termination finish. The unit measures .166" x .166" x .140" with Mini-Circuits' TopHat® feature to improve speed and accuracy of pick and place assembly. This design requires external capacitors, resistor and inductors for impedance matching and cycling isolation between the output signals (refer to electrical schematic).

ELECTRICAL SPECIFICATIONS[1] AT +25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Units
Frequency Range		5		2150	MHz
Insertion Loss (above 3 dB)	5 – 870	--	0.8	1.0	dB
	870 – 1218	--	0.9	1.3	
	1218 – 1800	--	1.2	1.9	
	1800 - 2150	--	1.6	2.7	
Isolation	5 – 1000	23	30	--	dB
	1000 – 1218	20	33	--	
	1218 – 1800	16	23	--	
	1800 - 2150	12	18	--	
Phase Unbalance	5 – 1000	--	1.0	3.0	Degree
	1000 – 1800	--	2.0	4.0	
	1800 - 2150	--	3.0	8.0	
Amplitude Unbalance	5 – 1000	--	0.2	0.4	dB
	1000 – 1218	--	0.2	0.5	
	1218 – 1800	--	0.3	0.6	
	1800 - 2150	--	0.5	0.9	

REV. OR
ECO-023904
TCP-2-23-75X+
MCL NY
241202

ELECTRICAL SPECIFICATIONS[1] AT +25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Units
Return Loss (Port S)	5 – 1000	22	30	--	dB
	1000 – 1600	18	22	--	
	1600 – 1800	16	20	--	
	1800 - 2150	11	15	--	
Return Loss (Port 1)	5 – 50	14	18	--	dB
	50 – 1218	18	22	--	
	1218 – 1800	14	18	--	
	1800 - 2150	11	16	--	
Return Loss (Port 2)	5 – 50	14	18	--	dB
	50 – 1218	18	22	--	
	1218 – 1800	14	20	--	
	1800 - 2150	11	16	--	

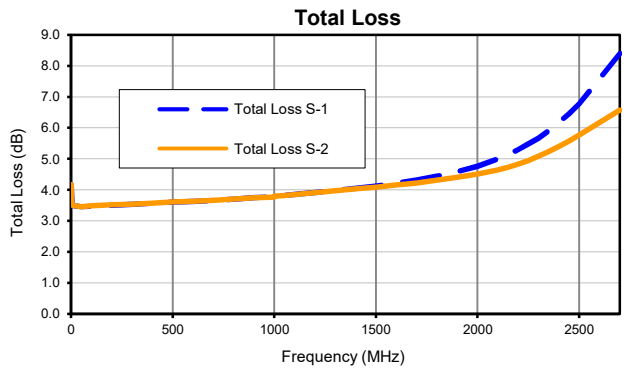
1. Bi-directional can function as a splitter or as a combiner. Refer to S-Parameters for actual performance.

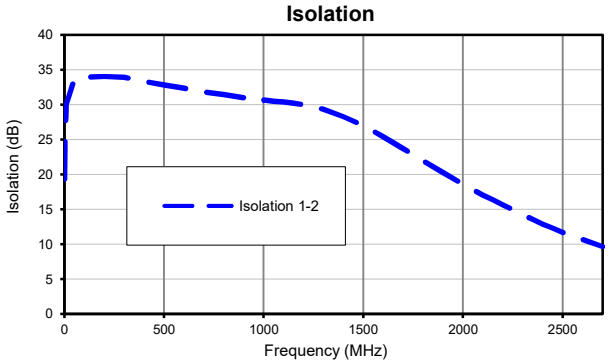
ABSOLUTE MAXIMUM RATINGS[2]

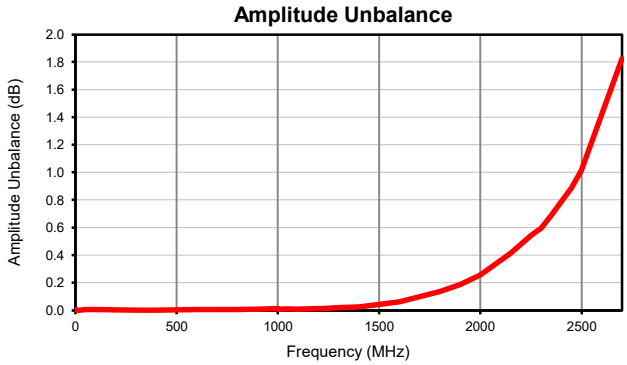
Operating Case Temperature		-40° C to +85° C
Storage Temperature		-55° C to +100° C
Input Power	**as splitter**	0.5 W
	as combiner per port	0.25 W

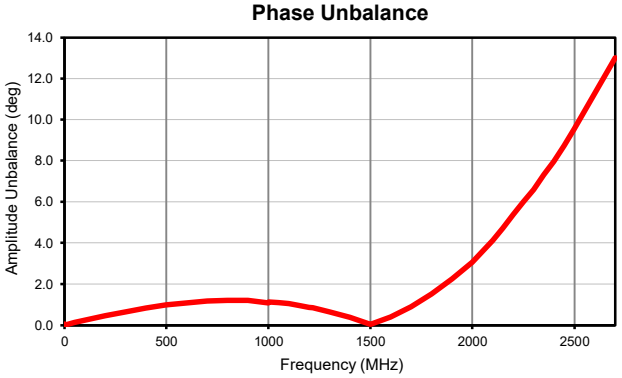
2. Permanent damage may occur if any of these limits are exceeded.

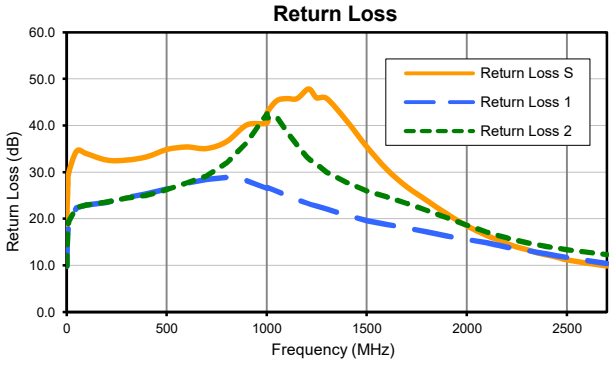
TYPICAL PERFORMANCE GRAPHS











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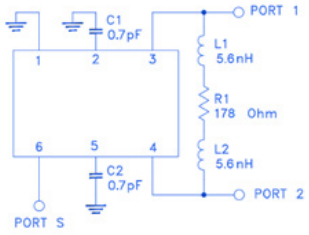
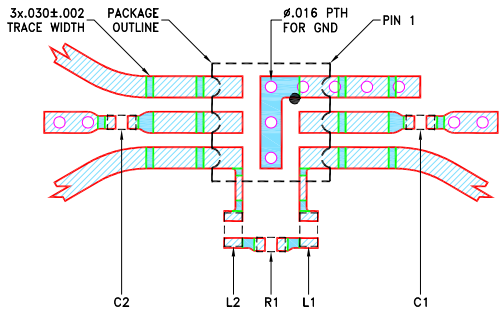


Figure 1. TCP-2-23-75X+ Functional Diagram

PAD DESCRIPTION

Function	Pad Number
SUM PORT	6
PORT 1	3
PORT 2	4
GROUND	1
EXT. CAPACITOR 0.7 pF	2 TO GROUND
EXT. CAPACITOR 0.7 pF	5 TO GROUND
EXT. COMPONENTS (INDUCTOR 5.6nH, RESISTOR 178Ω, INDUCTOR 5.6nH IN SERIES)	3,4

SUGGESTED PCB LAYOUT (PL-802)



COMPONENT	SIZE
C1, C2	0402
L1, L2	0402
R1	0402

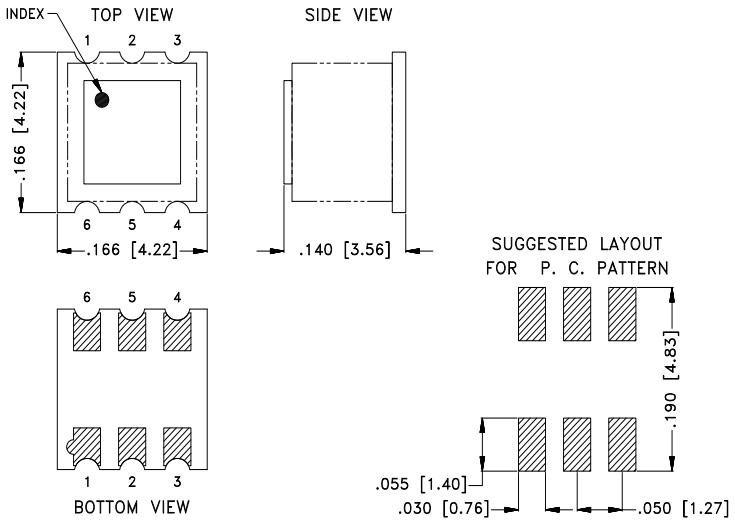
NOTES:
1. TRACE WIDTH IS SHOWN FOR ROGERS (RO4350B) WITH DIELECTRIC THICKNESS .030±.002 COPPER: 1/2 Oz ON EACH SIDE.
   FOR OTHER MATERIALS TRACE WIDTH AND GAP MAY NEED TO BE MODIFIED.
2. CHIP COMPONENT FOOT PRINTS SHOWN FOR REFERENCE. FOR COMPONENT VALUES REFER TO TB-1300.
3. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

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

DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK.

Figure 2. Suggested PCB Layout PL-802

CASE STYLE DRAWING



Weight: .1 grams
Dimensions are in inches [mm]. Tolerances: 2 Pl.±.01; 3 Pl. ±.005

PRODUCT MARKING*: BK

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

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ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASHBOARD CLICK HERE

Performance Data & Graphs	Data Graphs S-Parameter (S3P Files) Data Set (.zip file) De-embedded to device pads
Case Style	TT3651 Lead Finish: Gold over Nickel
RoHS Status	Compliant
Tape and Reel	F017
Suggested Layout for PCB Design	PL-802
Evaluation Board	TB-TCP-2-2375X+ Gerber File
Environmental Rating	ENV02T1

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-Circuits' 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