CERAMIC

Power Splitter/Combiner SCW-2-722+

2 Way-0° 50Ω 4800 to 7200 MHz

THE BIG DEAL

- Isolation Resistor, External 100Ω
- Small Size, 1.6 × 0.8 mm
- ESD Non-Sensitive
- Temperature Stable LTCC Technology
- Wrap-Around Terminations for Excellent Solderability
- Low Cost

Generic photo used for illustration purposes only

CASE STYLE: JC0603C

+RoHS Compliant

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

APPLICATIONS

- WLAN
- 5G Sub 6 GHz

PRODUCT OVERVIEW

Mini-Circuits' new LTCC 0° Power Splitter SCW-2-722+, offers industry leading combination of operating performance and size. The outstanding phase and amplitude unbalance make this component a versatile building block for use in a variety of systems and sub-system designs.

KEY FEATURES

Feature	Advantages
Small Size	Offered in the package size, SCW-2-722+ offers an industry leading combination of size, power handling, and frequency. The small footprint allows for reduced parasitics in systems with improved performance and simplified layout.
Wrap-Around Terminations	Provides excellent solderability and easy visual inspection.
LTCC Construction	Provides repeatable performance in the rugged, ceramic package well suited for tough environments such as high humidity and temperature extremes.

REV. A
ECO-030244
SCW-2-722+
MCL NY
260630

Power Splitter/Combiner SCW-2-722+

ELECTRICAL SPECIFICATIONS AT +25 °C

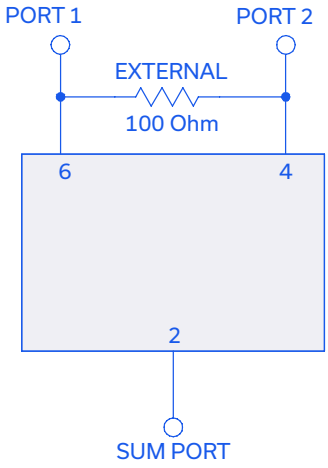
Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		4800		7200	MHz
Average Insertion Loss, Above 3.0 dB	4800–7200	–	1.2	1.6	dB
Isolation	4800–7200	12	16	–	dB
Phase Unbalance	4800–7200	–	4	7	Degree
Amplitude Unbalance	4800–7200	–	0.1	0.5	dB
Return Loss (Input)	4800–7200	–	13	–	dB
Return Loss (Output)	4800–7200	–	13	–	dB

ABSOLUTE MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	-55 °C to +125 °C
Storage Temperature	-55 °C to +125 °C
Power Input (as a Splitter)	2 W[1] max.

1. Power input as combiner is limited by rating of external resistor 100Ω resistor. Permanent damage may occur if any of these limits are exceeded.

ELECTRICAL SCHEMATIC

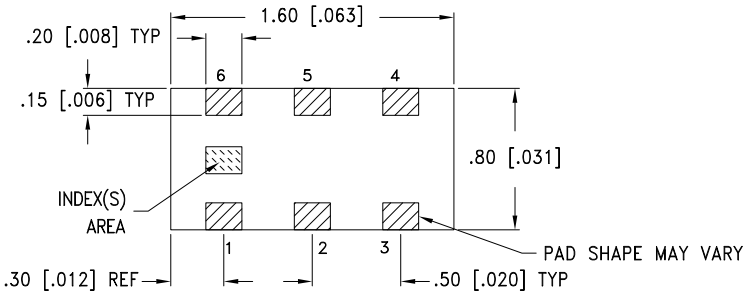


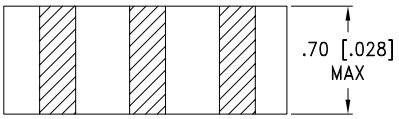
Power Splitter/Combiner SCW-2-722+

PAD CONNECTIONS

SUM PORT	2
PORT 1	6
PORT 2	4
GROUND	1,3,5
PORT 1-2	Resistor external 100Ω

OUTLINE DRAWING



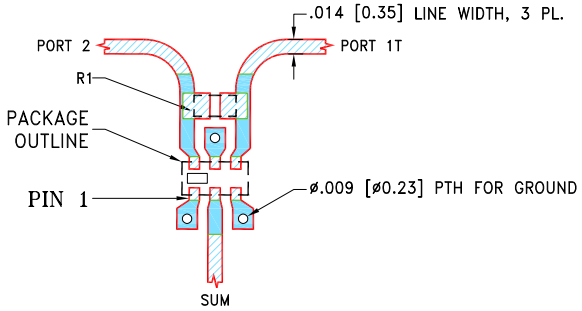


METALLIZATION

Weight: .005 grams
Dimensions are in mm [inch]. Tolerances: ±0.13 mm

PRODUCT MARKING: 2

DEMO BOARD MCL P/N: TB-SCW-2-722+
SUGGESTED PCB LAYOUT (PL-727)



COMPONENT	SIZE
R1	0402

NOTES:
1. LINE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .0066±.0007"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS LINE WIDTH MAY NEED TO BE MODIFIED.
2. CHIP COMPONENT FOOT PRINTS SHOWN FOR REFERENCE. FOR COMPONENT VALUES REFER TO TB-1224+.
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 SOLDER MASK.

TAPE & REEL INFORMATION: F114

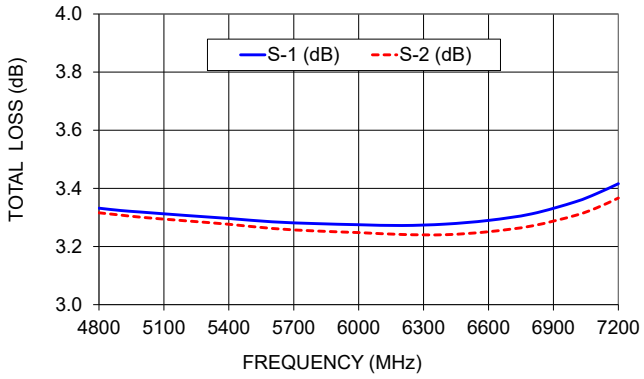
Power Splitter/Combiner SCW-2-722+

TYPICAL PERFORMANCE DATA

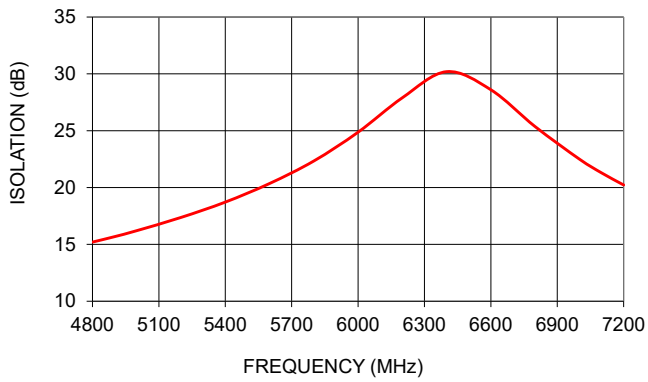
Frequency (MHz)	Total Loss[2] (dB)		Amplitude Unbalance (dB)	Isolation (dB)	Phase Unbalance (deg.)	Return Loss (dB)		
	S-1	S-2				S	1	2
4800	3.39	3.36	0.03	14.06	2.73	14.49	33.56	33.80
4900	3.37	3.34	0.03	14.71	2.83	14.99	34.75	34.83
5000	3.36	3.33	0.03	15.40	2.92	15.49	36.07	37.99
5200	3.35	3.32	0.03	16.14	3.03	16.01	37.85	39.77
5400	3.34	3.30	0.04	16.92	3.12	16.51	38.73	45.93
5600	3.33	3.29	0.04	17.77	3.21	17.09	37.47	45.07
5800	3.33	3.28	0.04	18.69	3.29	17.59	35.63	42.75
6000	3.32	3.28	0.04	19.67	3.37	18.14	33.38	39.02
6200	3.32	3.27	0.05	20.68	3.45	18.57	31.39	35.69
6400	3.32	3.27	0.05	21.72	3.53	18.94	29.40	33.39
6600	3.32	3.27	0.05	22.72	3.61	19.13	27.66	31.06
6800	3.33	3.27	0.06	23.65	3.69	19.21	26.03	29.27
7000	3.34	3.28	0.06	24.27	3.76	19.09	24.54	27.50
7100	3.35	3.28	0.06	24.46	3.83	18.78	23.20	25.80
7200	3.39	3.31	0.07	23.39	3.98	17.54	20.82	22.84

2. Total Loss = Insertion Loss + 3 dB splitter loss.

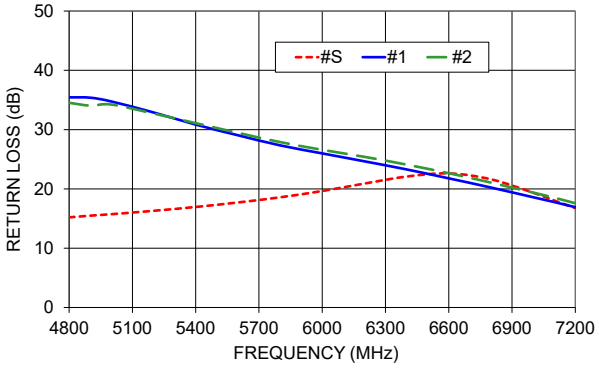
TOTAL LOSS



ISOLATION



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-Circuits' applicable established test performance criteria and measurement instructions.
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2 Way-0° Power Splitter/Combiner SCW-2-722+

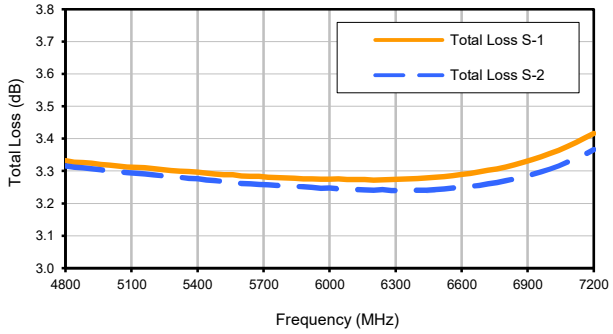
Typical Performance Data

FREQUENCY (MHz)	TOTAL LOSS[1] (dB)		AMPLITUDE UNBALANCE (dB)	ISOLATION (dB)	PHASE UNBALANCE (deg.)	FREQUENCY (MHz)	VSWR (:1)		
	S-1	S-2		1-2			S	1	2
4800	3.33	3.32	0.02	15.20	1.74	4800	1.42	1.03	1.04
4840	3.33	3.31	0.01	15.39	1.75	4840	1.41	1.03	1.04
4880	3.33	3.31	0.02	15.59	1.76	4880	1.41	1.03	1.04
4920	3.32	3.31	0.02	15.79	1.77	4920	1.40	1.04	1.04
4960	3.32	3.30	0.02	16.00	1.79	4960	1.40	1.04	1.04
5000	3.32	3.30	0.02	16.21	1.81	5000	1.39	1.04	1.04
5040	3.31	3.30	0.02	16.43	1.82	5040	1.38	1.04	1.04
5080	3.31	3.30	0.02	16.66	1.83	5080	1.38	1.04	1.04
5120	3.31	3.29	0.02	16.89	1.84	5120	1.37	1.04	1.05
5160	3.31	3.29	0.02	17.13	1.86	5160	1.37	1.04	1.05
5200	3.31	3.29	0.02	17.37	1.88	5200	1.36	1.05	1.05
5240	3.30	3.29	0.02	17.63	1.89	5240	1.35	1.05	1.05
5280	3.30	3.28	0.02	17.89	1.90	5280	1.35	1.05	1.05
5320	3.30	3.28	0.02	18.15	1.91	5320	1.34	1.05	1.05
5360	3.30	3.28	0.02	18.43	1.93	5360	1.34	1.06	1.06
5400	3.30	3.28	0.02	18.72	1.93	5400	1.33	1.06	1.06
5440	3.29	3.27	0.02	19.02	1.96	5440	1.32	1.06	1.06
5480	3.29	3.27	0.02	19.36	1.97	5480	1.32	1.06	1.06
5520	3.29	3.27	0.02	19.67	1.98	5520	1.31	1.07	1.06
5560	3.29	3.27	0.02	19.99	2.00	5560	1.31	1.07	1.07
5600	3.29	3.26	0.02	20.36	2.01	5600	1.30	1.07	1.07
5640	3.28	3.26	0.02	20.70	2.03	5640	1.29	1.08	1.07
5680	3.28	3.26	0.02	21.08	2.04	5680	1.29	1.08	1.07
5720	3.28	3.26	0.02	21.48	2.05	5720	1.28	1.08	1.08
5760	3.28	3.26	0.02	21.90	2.06	5760	1.27	1.09	1.08
5800	3.28	3.25	0.03	22.34	2.08	5800	1.27	1.09	1.08
5840	3.28	3.25	0.02	22.79	2.09	5840	1.26	1.09	1.09
5880	3.28	3.25	0.02	23.27	2.11	5880	1.25	1.10	1.09
5920	3.28	3.25	0.03	23.77	2.12	5920	1.25	1.10	1.09
5960	3.27	3.25	0.03	24.30	2.14	5960	1.24	1.10	1.09
6000	3.28	3.25	0.03	24.86	2.15	6000	1.23	1.11	1.10
6040	3.28	3.24	0.03	25.42	2.16	6040	1.23	1.11	1.10
6080	3.27	3.24	0.03	26.02	2.18	6080	1.22	1.11	1.10
6120	3.27	3.24	0.03	26.64	2.20	6120	1.21	1.12	1.11
6160	3.27	3.24	0.03	27.26	2.21	6160	1.20	1.12	1.11
6200	3.27	3.24	0.03	27.90	2.22	6200	1.20	1.12	1.11
6240	3.27	3.24	0.03	28.53	2.24	6240	1.19	1.13	1.12
6280	3.27	3.24	0.03	29.09	2.26	6280	1.19	1.13	1.12
6320	3.27	3.24	0.03	29.55	2.27	6320	1.18	1.14	1.12
6360	3.28	3.24	0.04	29.95	2.29	6360	1.18	1.14	1.13
6400	3.28	3.24	0.04	30.20	2.30	6400	1.17	1.15	1.13
6440	3.28	3.24	0.04	30.17	2.32	6440	1.17	1.15	1.14
6480	3.28	3.24	0.04	30.01	2.33	6480	1.16	1.16	1.14
6520	3.28	3.24	0.04	29.66	2.35	6520	1.16	1.16	1.14
6560	3.29	3.25	0.04	29.19	2.36	6560	1.16	1.17	1.15
6600	3.29	3.25	0.04	28.60	2.38	6600	1.16	1.18	1.16
6640	3.29	3.25	0.04	27.99	2.39	6640	1.16	1.18	1.16
6680	3.30	3.26	0.04	27.31	2.40	6680	1.16	1.19	1.17
6720	3.30	3.26	0.04	26.63	2.42	6720	1.17	1.20	1.18
6760	3.31	3.26	0.04	25.98	2.44	6760	1.17	1.21	1.18
6800	3.31	3.27	0.04	25.36	2.45	6800	1.18	1.22	1.19
6840	3.32	3.28	0.04	24.73	2.47	6840	1.19	1.22	1.20
6880	3.33	3.28	0.04	24.14	2.48	6880	1.20	1.23	1.21
6920	3.34	3.29	0.05	23.57	2.51	6920	1.21	1.24	1.22
6960	3.34	3.30	0.05	23.03	2.53	6960	1.23	1.25	1.23
7000	3.35	3.31	0.05	22.50	2.53	7000	1.24	1.27	1.24
7040	3.36	3.32	0.05	22.01	2.55	7040	1.26	1.28	1.25
7080	3.38	3.33	0.05	21.52	2.56	7080	1.28	1.29	1.26
7120	3.39	3.34	0.05	21.07	2.58	7120	1.30	1.30	1.27
7160	3.40	3.35	0.05	20.64	2.60	7160	1.32	1.32	1.29
7200	3.42	3.37	0.05	20.22	2.61	7200	1.34	1.33	1.30

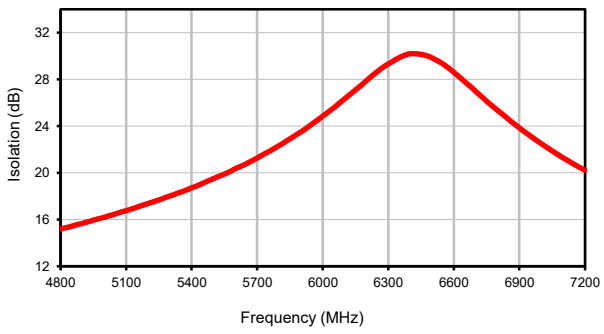
2 Way-0° Power Splitter/Combiner SCW-2-722+

Typical Performance Curves

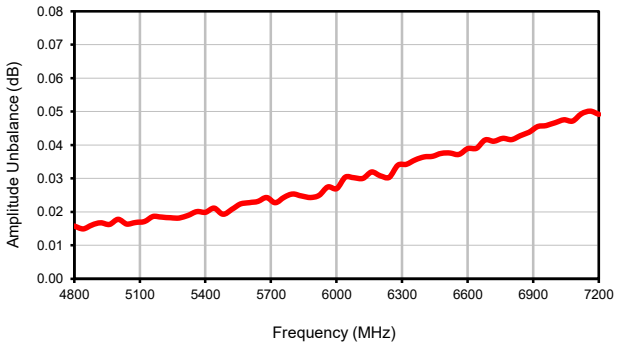
Total Loss at 25(Deg C)



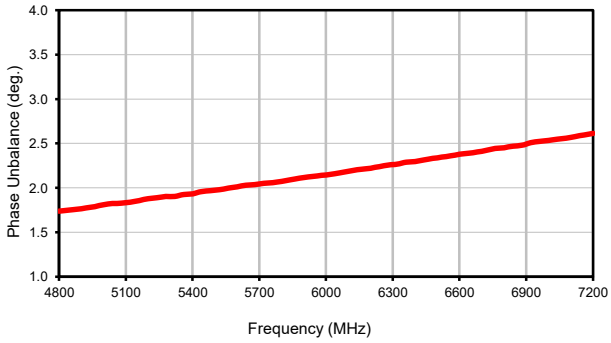
Isolation at 25(Deg C)



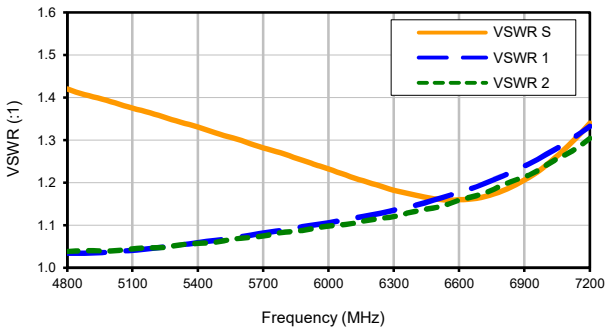
Amplitude Unbalance at 25(Deg C)



Phase Unbalance at 25(Deg C)

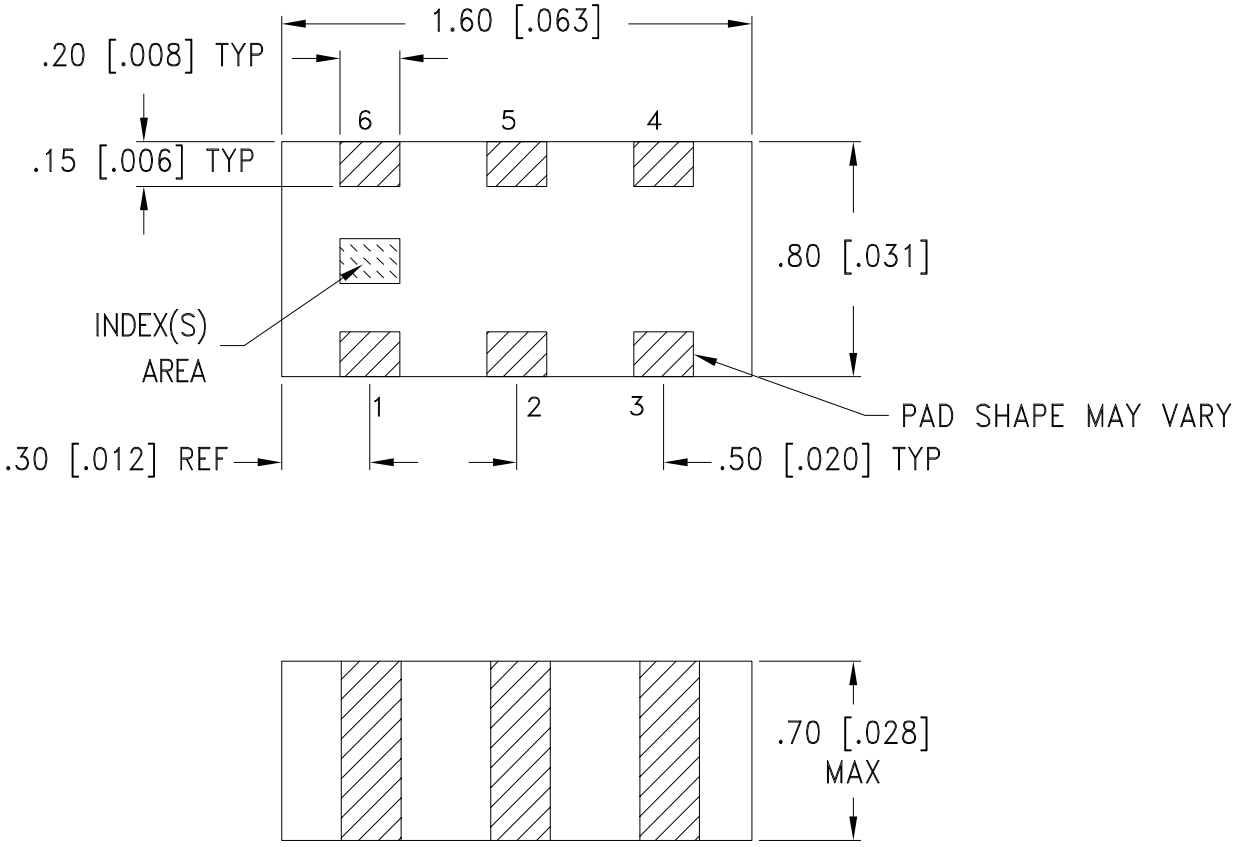


VSWR at 25(Deg C)



Case Style JC

Outline Dimensions JC0603C



METALLIZATION

Weight: .005 grams

Dimensions are in mm [inch]. Tolerances: ±0.13 mm

Notes:

1. Open style, ceramic base.
2. Termination finish:
   For RoHS Case Styles: Tin plate over Nickel plate. All models, (+) suffix.

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RF/IF MICROWAVE COMPONENTS

Tape & Reel Packaging TR-F114

DEVICE ORIENTATION IN T&R

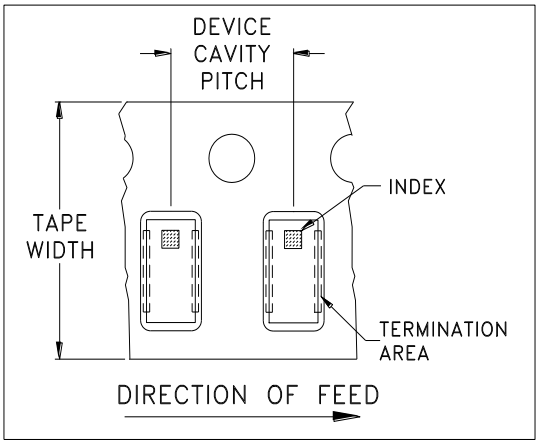

ILLUSTRATION 1

Applicable Case Styles	
GE0805C	JC0603C
GE0805C-1	JC0603C-4
GE0805C-1AP	JC0603C-6
GE0805C-7	
GE0805C-9	
GE0805C-10	
GE0805C-11	
GE0805C-12	

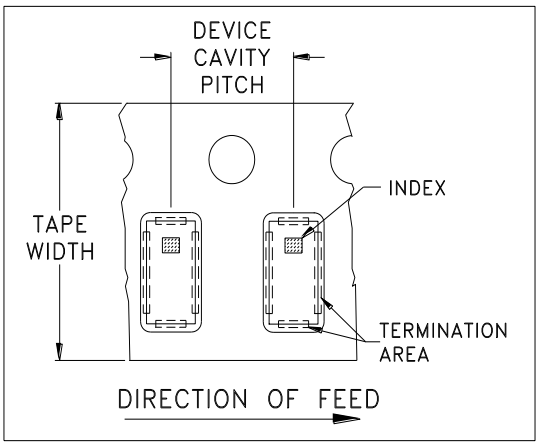

ILLUSTRATION 2

Applicable Case Styles	
GE0805C-2	JC0603C-1
GE0805C-3	JC0603C-2
GE0805C-4	JC0603C-3
GE0805C-5	JC0603C-5
GE0805C-6	JC0603C-7
GE0805C-8	
GE0805C-15	

Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel	
8	4	7	Small quantity standards (see note)	20
				50
				100
				200
				500
				1000
			Standard	4000

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.

Go to: www.minicircuits.com/pages/pdfs/tape.pdf

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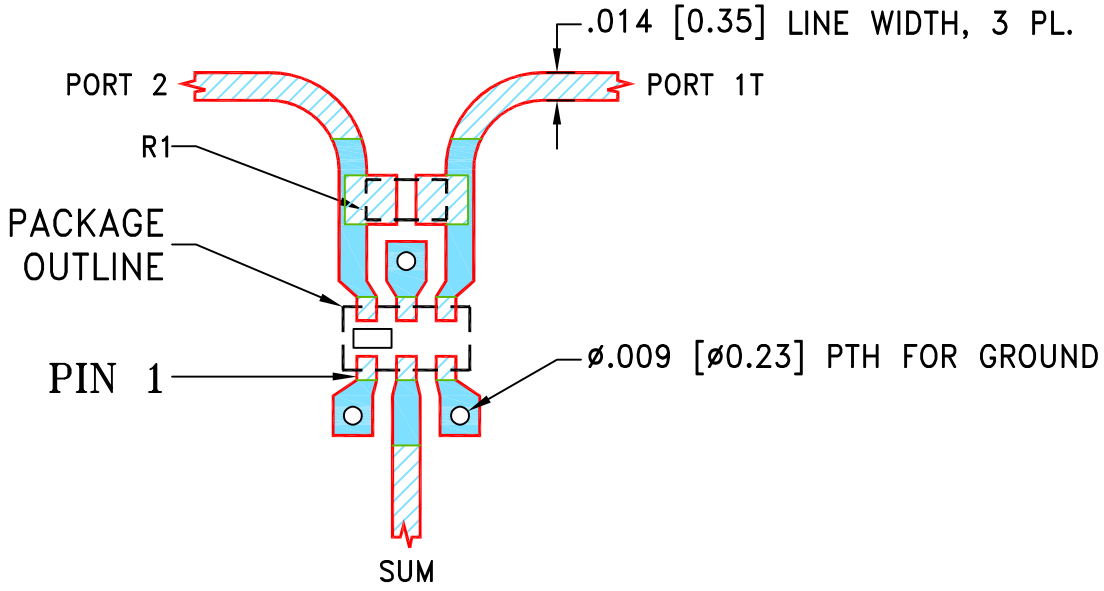
THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	ECO-011925	NEW RELEASE	02/17/22	ITG	IL

SUGGESTED MOUNTING CONFIGURATION FOR JC0603C CASE STYLE



COMPONENT	SIZE
R1	0402

NOTES:

1. LINE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .0066±.0007";
   COPPER: 1/2 OZ. EACH SIDE.
   FOR OTHER MATERIALS LINE WIDTH MAY NEED TO BE MODIFIED.
2. CHIP COMPONENT FOOT PRINTS SHOWN FOR REFERENCE. FOR COMPONENT VALUES REFER TO TB-1224+.
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 SOLDER MASK.

UNLESS OTHERWISE SPECIFIED		INITIALS	DATE
DIMENSIONS ARE IN INCHES	DRAWN	ITG	02/17/22
TOLERANCES ON:	CHECKED	GF	02/17/22
2 PL DECIMALS ±	APPROVED	IL	02/17/22
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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ASHEETA1.DWG REV:A DATE:01/12/95

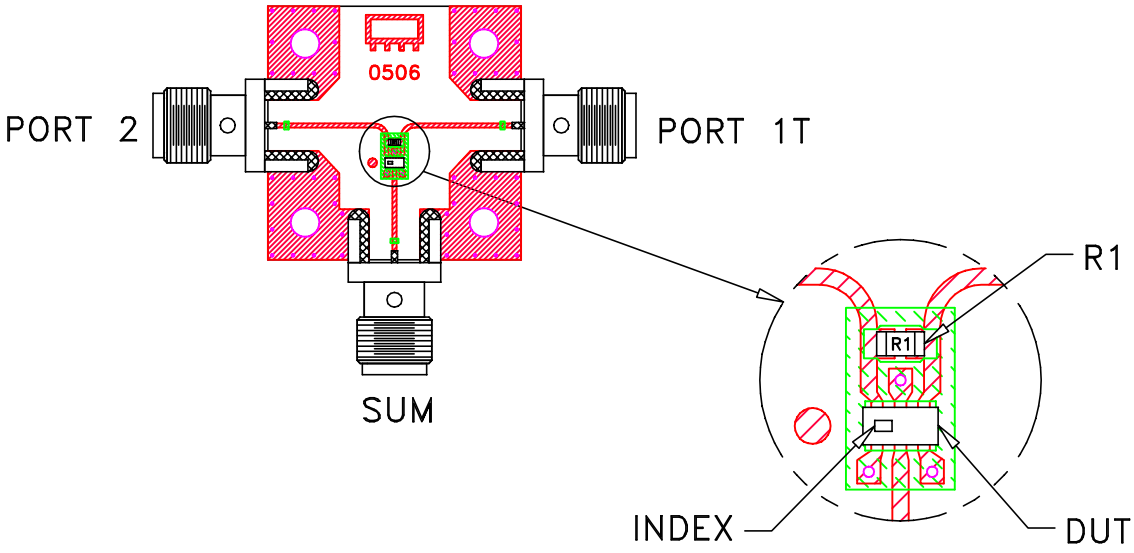
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, SCW-2series, JC0603C, TB-1224+

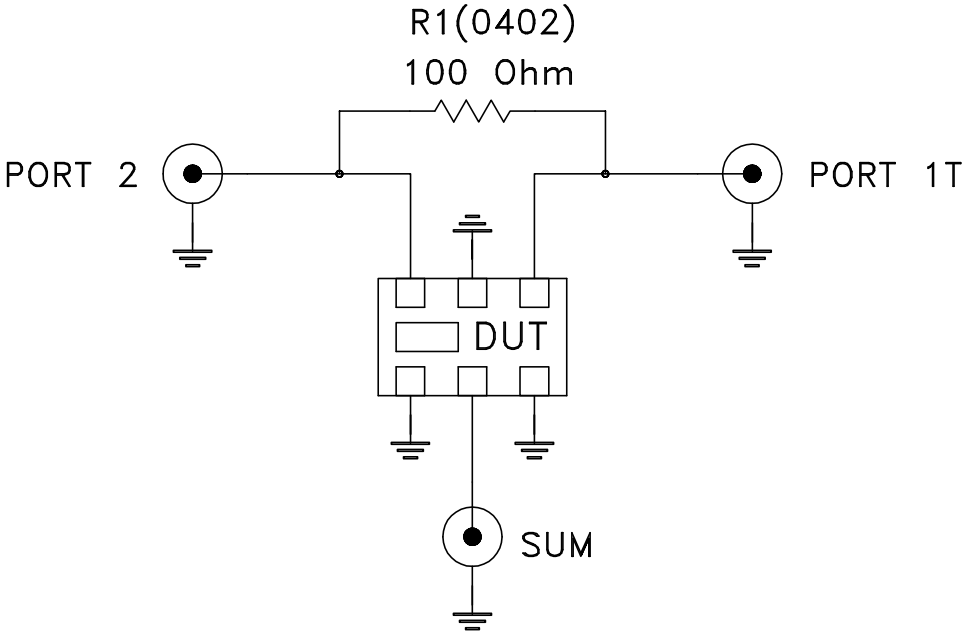
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-727	OR

FILE:	SCALE:	SHEET:
98PL727	10:1	1 OF 1

Evaluation Board and Circuit



TB-1224+



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: RO4350 or equivalent, Dielectric Constant=3.5, Thickness=.0066 inch.

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Environmental Specifications ENV06T9

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	-55° to 125° C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 125° C Ambient Environment	Individual Model Data Sheet
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
Solder Reflow Heat	Sn-Pb Eutectic Process: 225°C peak Pb-Free Process: 250°C peak	J-STD-020C, 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, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)	MIL-STD-202, Method 204, Condition D
Mechanical Shock	50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A

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