CERAMIC

Power Splitter/Combiner SCG-3-392+

3 Way-0° 50Ω 2700 to 3900 MHz

THE BIG DEAL

- Isolation Resistor, External 150Ω
- Low Insertion Loss, 1.2 dB Typ.
- Excellent Amplitude Unbalance, 0.2 dB Typ.
- Excellent Phase Unbalance, 5 Deg. Typ.
- High Isolation, 18 dB Typ.
- ESD Non-Sensitive
- Temperature Stable LTCC Technology
- Wrap-Around Terminations for Excellent Solderability
- Low Cost



Generic photo used for illustration purposes only

CASE STYLE: GE0805C-1

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

APPLICATIONS

- 5G Sub 6 GHz
- LTE

PRODUCT OVERVIEW

Mini-Circuits' new LTCC 0° Power Splitter, model SCG-3-392+, 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, SCG-3-392+ 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-009562
SCG-3-392+
MCL NY
250630

CERAMIC

Power Splitter/Combiner SCG-3-392+

3 Way-0° 50Ω 2700 to 3900 MHz

ELECTRICAL SPECIFICATIONS AT +25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		2700		3900	MHz
Insertion Loss, Above 4.8 dB	2700-3900		1.2	1.8	dB
Isolation	2700-3900	14	18		dB
Phase Unbalance	2700-3900		5	10	Degree
Amplitude Unbalance	2700-3900		0.2	0.7	dB
Return Loss (Input)	2700-3900		10		dB
Return Loss (Output)	2700-3900		13		dB

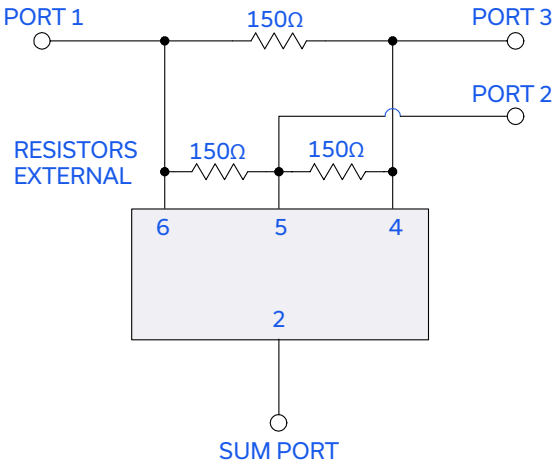
ABSOLUTE MAXIMUM RATINGS

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. Derate linearly to 0.7 W at +125°C ambient, power input as combiner is limited by rating of external resistor 50Ω resistor.

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

ELECTRICAL SCHEMATIC



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Power Splitter/Combiner SCG-3-392+

3 Way-0° 50Ω 2700 to 3900 MHz

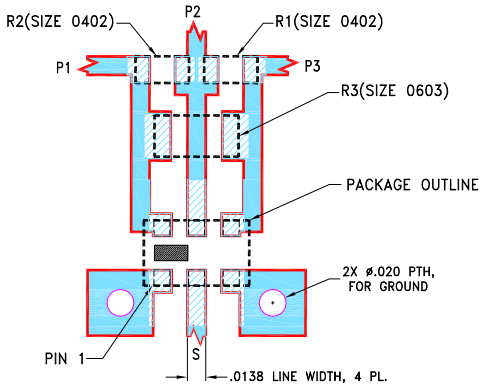
PAD CONNECTIONS

SUM PORT	2
PORT 1	6
PORT 2	5
PORT 3	4
GROUND	1,3
PORT 1-2, 2-3, 1-3	Resistor external 150Ω

PRODUCT MARKING: PP

DEMO BOARD MCL P/N: TB-SCG-3-392+

SUGGESTED PCB LAYOUT (PL-621)

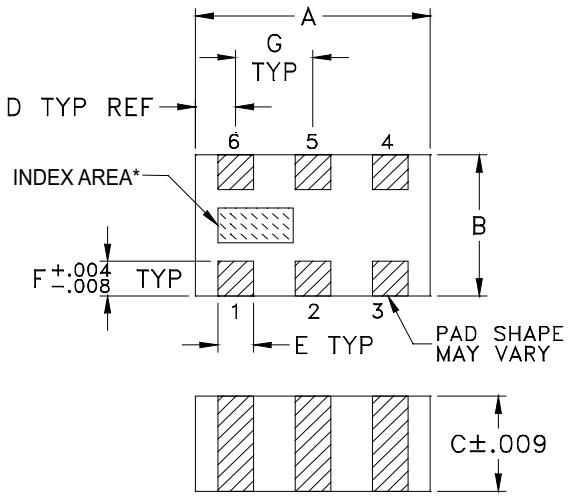


NOTES:
1. LINE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .0066±.0007. COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS LINE WIDTH MAY NEED TO BE MODIFIED.
2. UNIT FOOT PRINT IS OPTIMIZED FOR PERFORMANCE AND IS DIFFERENT FROM CASE STYLE GE0805C-1 RECOMMENDATIONS.
3. CHIP COMPONENT FOOT PRINT IS SHOWN FOR REFERENCE. FOR COMPONENT VALUE REFER TO TB-1018+.
4. 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.

OUTLINE DRAWING



*Shape of index marking may vary

OUTLINE DIMENSIONS (Inch / mm)

A	B	C	D	E	F	G	wt
.079	.049	.033	.014	.012	.012	.026	grams
2.01	1.24	0.84	0.36	0.30	0.30	0.65	.008

TAPE & REEL INFORMATION: F74

CERAMIC

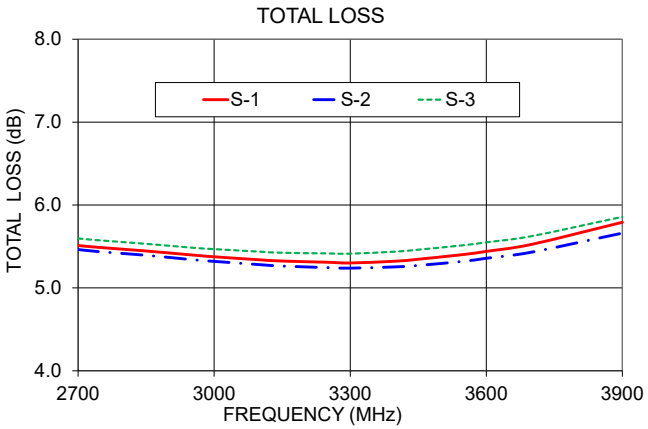
Power Splitter/Combiner SCG-3-392+

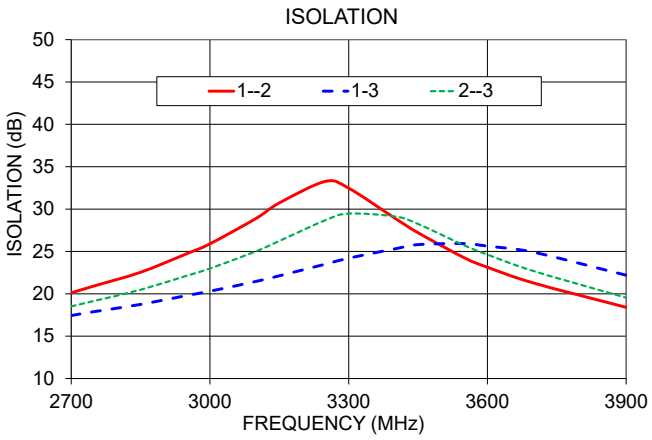
3 Way-0° 50Ω 2700 to 3900 MHz

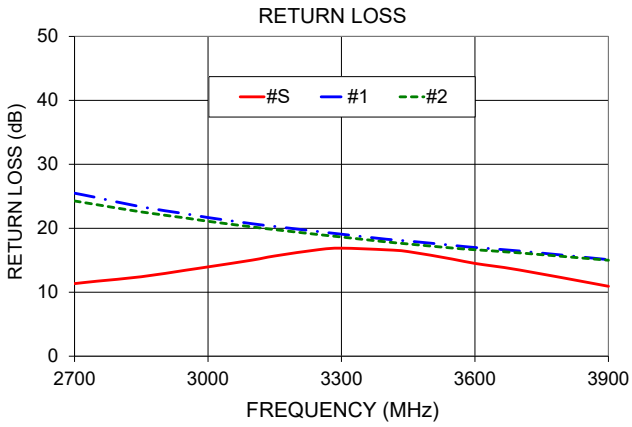
TYPICAL PERFORMANCE DATA

Frequency (MHz)	Total Loss[2] (dB)			Amplitude Unbalance (dB)	Isolation (dB)			Phase Unbalance (deg.)	Return Loss (dB)		
	S-1	S-2	S-3		1-2	1-3	2-3		S	1	2
2700	5.51	5.46	5.60	0.13	20.12	17.43	18.52	2.44	11.35	25.49	24.27
2750	5.49	5.44	5.57	0.14	20.93	17.90	19.17	2.50	11.73	24.80	23.69
2850	5.45	5.39	5.53	0.14	22.54	18.75	20.48	2.60	12.42	23.35	22.56
2950	5.40	5.34	5.49	0.14	24.74	19.80	22.14	2.73	13.45	22.26	21.61
3000	5.38	5.32	5.47	0.15	25.90	20.30	22.99	2.78	13.96	21.68	21.09
3100	5.34	5.28	5.44	0.16	28.91	21.47	25.03	2.90	15.03	20.71	20.20
3150	5.32	5.26	5.42	0.16	30.72	22.13	26.24	2.98	15.67	20.29	19.79
3250	5.31	5.25	5.42	0.17	33.27	23.50	28.70	3.08	16.67	19.47	19.01
3300	5.30	5.24	5.41	0.17	32.46	24.21	29.47	3.13	16.89	19.08	18.64
3400	5.32	5.25	5.44	0.18	28.92	25.31	29.13	3.21	16.64	18.29	17.88
3450	5.35	5.27	5.46	0.19	27.21	25.81	28.24	3.24	16.35	18.01	17.55
3550	5.40	5.32	5.51	0.19	24.25	25.93	25.71	3.34	15.17	17.33	16.91
3600	5.44	5.36	5.55	0.19	23.13	25.62	24.62	3.34	14.51	16.99	16.65
3700	5.53	5.43	5.62	0.19	21.27	24.90	22.68	3.39	13.48	16.45	16.16
3900	5.79	5.66	5.86	0.20	18.40	22.19	19.54	3.65	10.93	15.10	15.01

2. Total Loss = Insertion Loss + 4.8 dB splitter 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/terms/viewterm.html

3 Way-0° Power Splitter/Combiner SCG-3-392+

Typical Performance Data

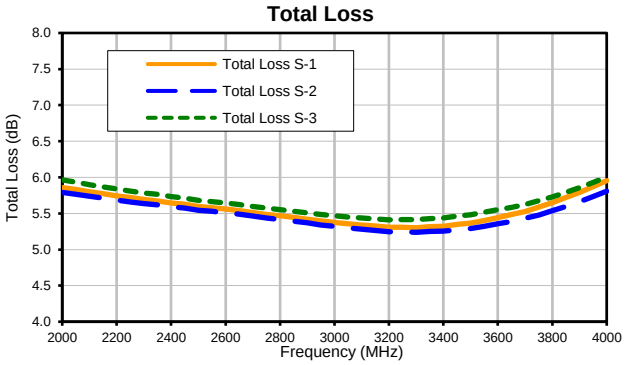
FREQ. (MHz)	TOTAL LOSS[1] (dB)			AMP. UNBAL. (dB)	ISOLATION (dB)			PHASE UNBAL. (deg.)
	S-1	S-2	S-3		1-2	1-3	2-3	
2000	5.86	5.79	5.96	0.17	12.94	12.53	12.22	1.62
2050	5.83	5.77	5.93	0.17	13.29	12.80	12.54	1.69
2100	5.80	5.74	5.90	0.16	13.68	13.09	12.88	1.76
2150	5.77	5.71	5.87	0.16	14.06	13.39	13.24	1.85
2200	5.74	5.68	5.84	0.15	14.49	13.70	13.61	1.92
2250	5.72	5.66	5.81	0.15	14.93	14.03	14.01	1.98
2300	5.69	5.64	5.78	0.14	15.39	14.35	14.43	2.04
2350	5.67	5.62	5.76	0.14	15.87	14.70	14.85	2.10
2400	5.65	5.59	5.73	0.14	16.38	15.05	15.29	2.15
2450	5.63	5.57	5.71	0.14	16.94	15.43	15.80	2.21
2500	5.60	5.55	5.68	0.14	17.53	15.83	16.29	2.25
2550	5.58	5.53	5.67	0.13	18.11	16.21	16.80	2.31
2600	5.56	5.51	5.64	0.14	18.72	16.59	17.33	2.34
2650	5.54	5.49	5.62	0.13	19.38	16.99	17.89	2.41
2700	5.51	5.46	5.60	0.13	20.12	17.43	18.52	2.44
2750	5.49	5.44	5.57	0.14	20.93	17.90	19.17	2.50
2800	5.47	5.42	5.55	0.13	21.71	18.33	19.82	2.54
2850	5.45	5.39	5.53	0.14	22.54	18.75	20.48	2.60
2900	5.42	5.37	5.51	0.14	23.56	19.25	21.26	2.67
2950	5.40	5.34	5.49	0.14	24.74	19.80	22.14	2.73
3000	5.38	5.32	5.47	0.15	25.90	20.30	22.99	2.78
3050	5.36	5.30	5.45	0.15	27.24	20.83	23.92	2.86
3100	5.34	5.28	5.44	0.16	28.91	21.47	25.03	2.90
3150	5.32	5.26	5.42	0.16	30.72	22.13	26.24	2.98
3200	5.31	5.24	5.41	0.17	32.40	22.80	27.43	3.04
3250	5.31	5.25	5.42	0.17	33.27	23.50	28.70	3.08
3300	5.30	5.24	5.41	0.17	32.46	24.21	29.47	3.13
3350	5.32	5.25	5.43	0.18	30.63	24.81	29.54	3.18
3400	5.32	5.25	5.44	0.18	28.92	25.31	29.13	3.21
3450	5.35	5.27	5.46	0.19	27.21	25.81	28.24	3.24
3500	5.37	5.29	5.48	0.19	25.61	26.00	27.03	3.28
3550	5.40	5.32	5.51	0.19	24.25	25.93	25.71	3.34
3600	5.44	5.36	5.55	0.19	23.13	25.62	24.62	3.34
3650	5.48	5.39	5.59	0.20	22.19	25.32	23.62	3.41
3700	5.53	5.43	5.62	0.19	21.27	24.90	22.68	3.39
3750	5.59	5.48	5.68	0.20	20.38	24.23	21.69	3.51
3800	5.65	5.54	5.73	0.19	19.63	23.46	20.86	3.51
3850	5.72	5.60	5.79	0.20	19.00	22.82	20.18	3.62
3900	5.79	5.66	5.86	0.20	18.40	22.19	19.54	3.65
3950	5.87	5.73	5.93	0.19	17.89	21.55	18.93	3.80
4000	5.95	5.81	6.01	0.20	17.44	20.98	18.45	3.82

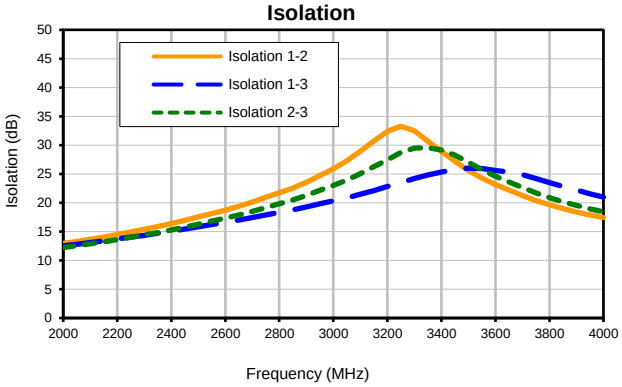
FREQ. (MHz)	VSWR (:1)			
	S	1	2	3
2000	2.28	1.12	1.16	1.16
2050	2.25	1.11	1.15	1.13
2100	2.20	1.09	1.13	1.12
2150	2.16	1.08	1.12	1.10
2200	2.12	1.07	1.11	1.08
2250	2.08	1.07	1.10	1.06
2300	2.04	1.06	1.10	1.05
2350	2.01	1.06	1.10	1.05
2400	1.97	1.07	1.10	1.04
2450	1.93	1.07	1.10	1.05
2500	1.89	1.08	1.10	1.06
2550	1.85	1.09	1.11	1.07
2600	1.82	1.09	1.12	1.08
2650	1.79	1.10	1.12	1.09
2700	1.74	1.11	1.13	1.10
2750	1.70	1.12	1.14	1.11
2800	1.66	1.13	1.15	1.13
2850	1.63	1.15	1.16	1.14
2900	1.58	1.16	1.17	1.15
2950	1.54	1.17	1.18	1.17
3000	1.50	1.18	1.19	1.18
3050	1.47	1.19	1.21	1.19
3100	1.43	1.20	1.22	1.21
3150	1.39	1.21	1.23	1.22
3200	1.37	1.23	1.24	1.23
3250	1.34	1.24	1.25	1.24
3300	1.33	1.25	1.26	1.26
3350	1.34	1.26	1.28	1.27
3400	1.35	1.28	1.29	1.29
3450	1.36	1.29	1.31	1.30
3500	1.38	1.30	1.32	1.32
3550	1.42	1.31	1.33	1.33
3600	1.46	1.33	1.34	1.35
3650	1.50	1.34	1.36	1.37
3700	1.54	1.35	1.37	1.38
3750	1.59	1.37	1.38	1.40
3800	1.66	1.39	1.40	1.43
3850	1.73	1.41	1.42	1.45
3900	1.79	1.43	1.43	1.47
3950	1.87	1.45	1.45	1.50
4000	1.95	1.47	1.47	1.53

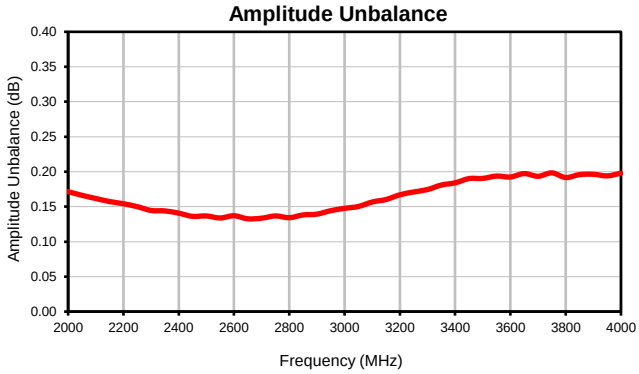
[1]Total Loss = Insertion Loss + 4.8dB Splitter Loss

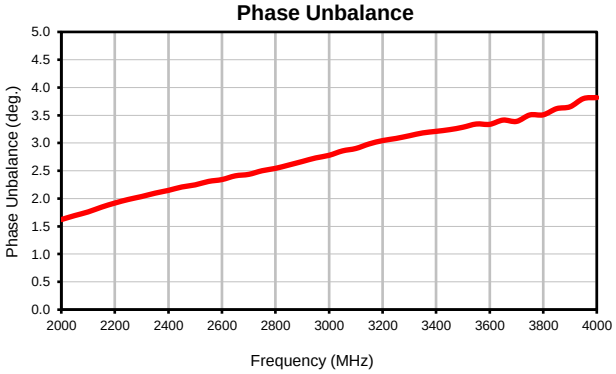
3 Way-0° Power Splitter/Combiner SCG-3-392+

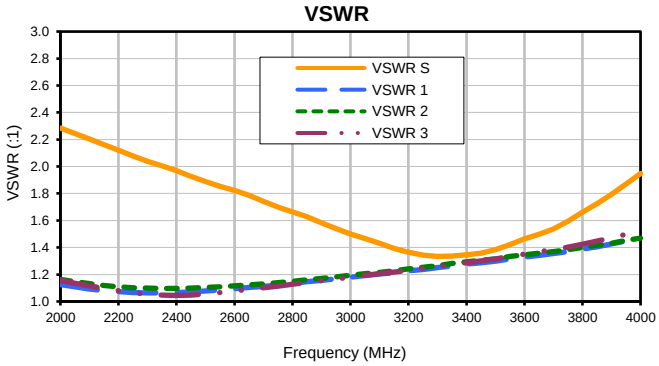
Typical Performance Curves





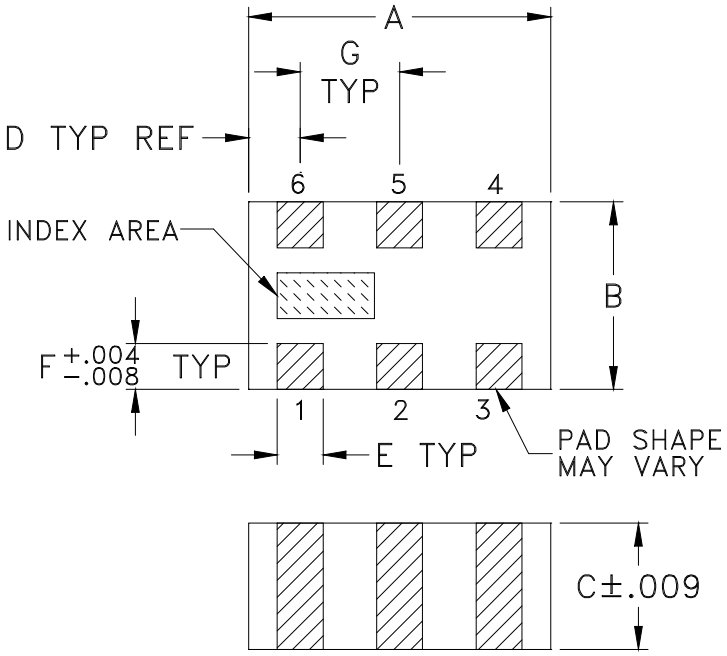




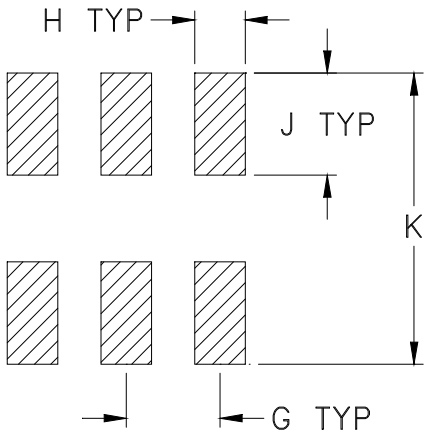


GE0805C-1

Outline Dimensions



PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

CASE #	A	B	C	D	E	F	G	H	J	K	WT. GRAM
GE0805C-1	.079 (2.00)	.049 (1.25)	.033 (0.84)	.014 (0.35)	.012 (0.30)	.012 (0.30)	.026 (0.65)	.014 (0.35)	.039 (1.00)	.110 (2.80)	.008

Dimensions are in inches (mm). Tolerances: 2Pl. ± .01; 3 Pl. ± .005

Notes:

1. Open style, ceramic base.
2. Termination finish: For RoHS Case Styles: Tin plate over Nickel plate. All models, (+) suffix.
   For RoHS-5 Case Style: Tin-lead plate. All models, no (+) suffix.

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Tape & Reel Packaging TR-F74

DEVICE ORIENTATION IN T&R

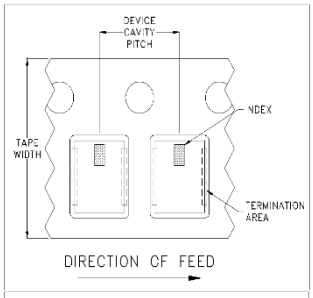


ILLUSTRATION 1

Applicable Case Styles
GE0805C-1
GE0805C-1AP
JV1210C-1
GU2939

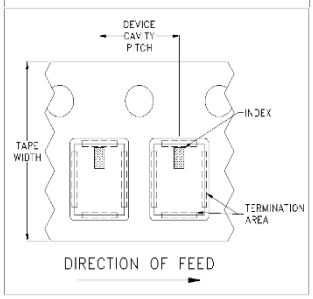


ILLUSTRATION 2

Applicable Case Styles
JV1210C
JV1210C-2
JV1210C-3
JV1210C-4
JV1210C-5
JV1210C-6
JV1210C-11

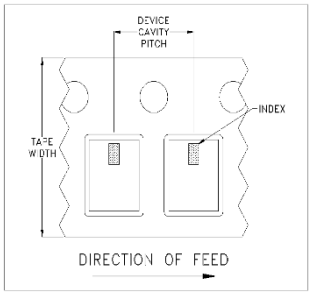


ILLUSTRATION 3

Applicable Case Styles
JC0603C-8
JC0603C-9
JV1210C-7
JV1210C-8
JV1210C-9
JV1210C-10
JV1210C-13
GE0805C-13
GE0805C-19
GE0805C-20

Tape Width, mm	Device Cavity Pitch, mm	Real Size, inches	Devices per Reel	
8	4	7	Small quantity standards **(see note)**	20
				50
				100
				200
				500
				1000
			Standard	2000
				4000

Note: Small reel availability varies by model. Refer to pricing and availability on individual model dashboard.

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

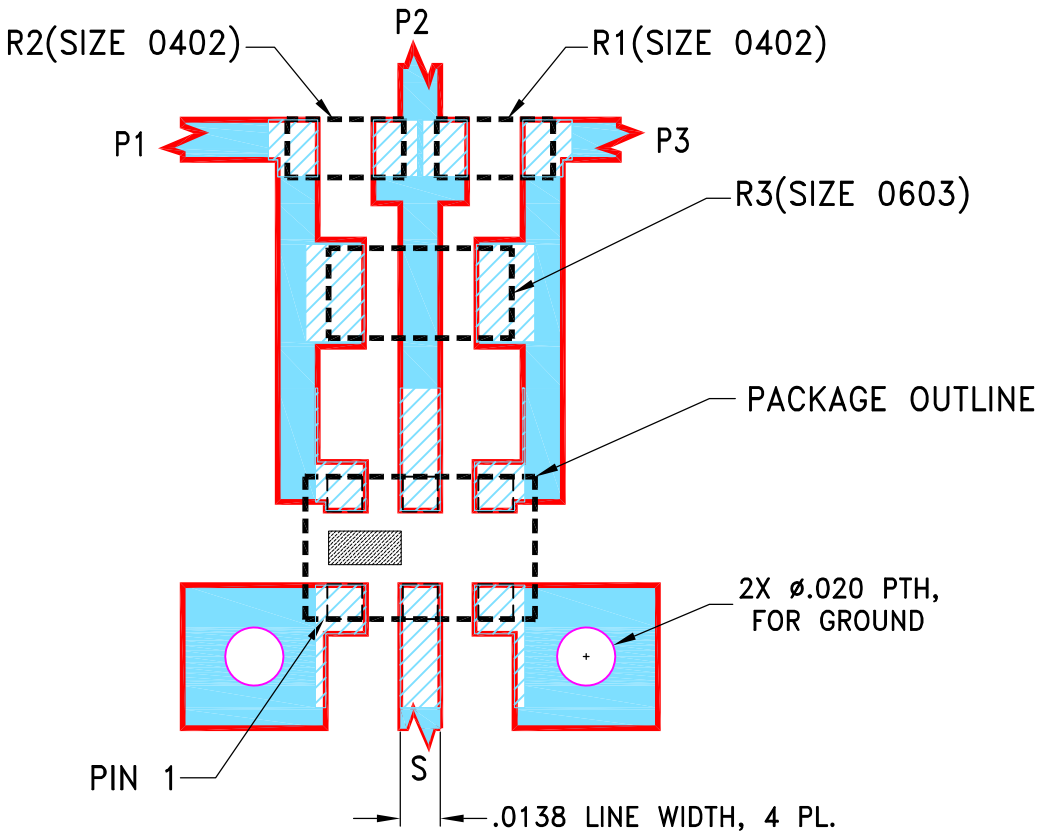
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THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
0R	M173097	NEW RELEASE	03/12/19	ITG	SL

SUGGESTED MOUNTING CONFIGURATION
FOR GE0805C-1 CASE STYLE, "06SP17" PIN CODE



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. UNIT FOOT PRINT IS OPTIMIZED FOR PERFORMANCE AND IS DIFFERENT FROM CASE STYLE GE0805C-1 RECOMMENDATIONS.
3. CHIP COMPONENT FOOT PRINT IS SHOWN FOR REFERENCE. FOR COMPONENT VALUE REFER TO TB-1018+.
4. 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	03/06/19
TOLERANCES ON:	CHECKED	GF	03/07/19
2 PL DECIMALS ±	APPROVED	SL	03/12/19
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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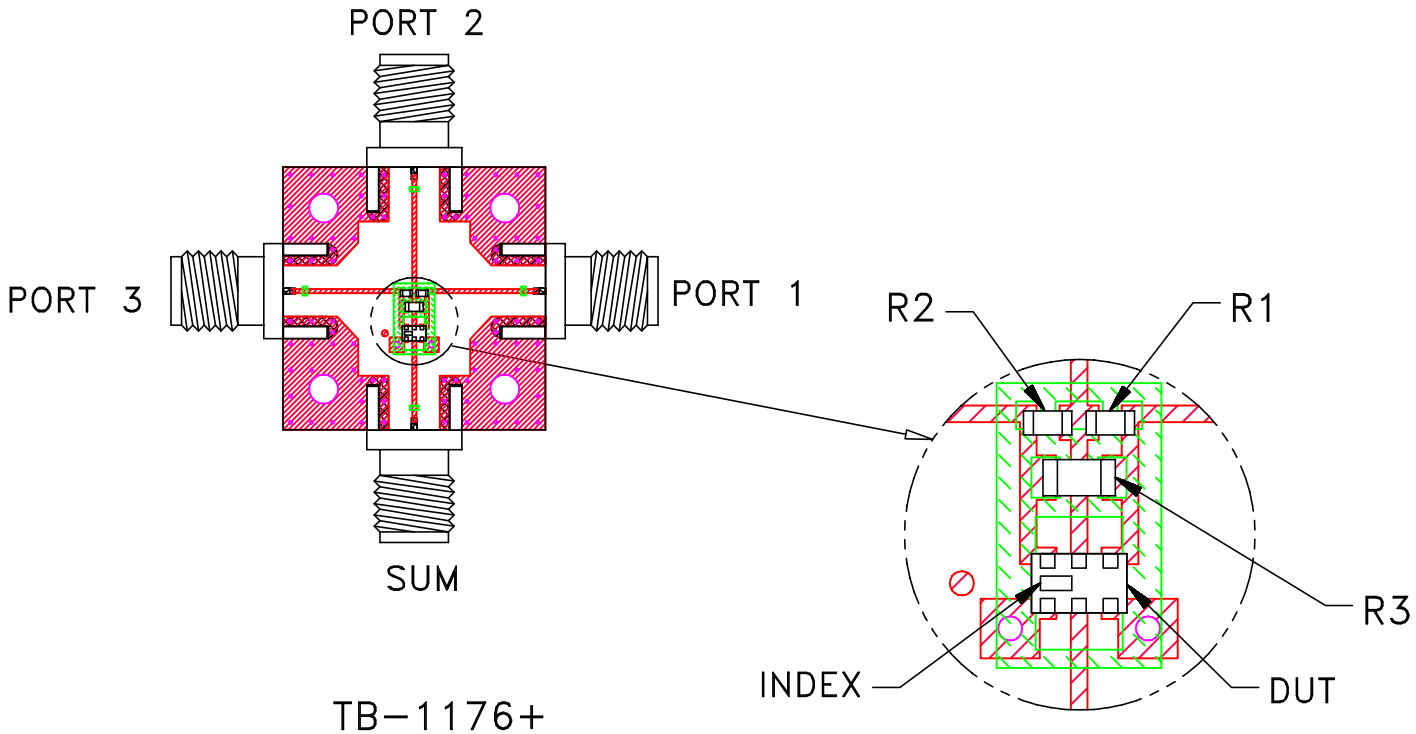
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PL, 06SP17, GE0805C-1, TB-1018+

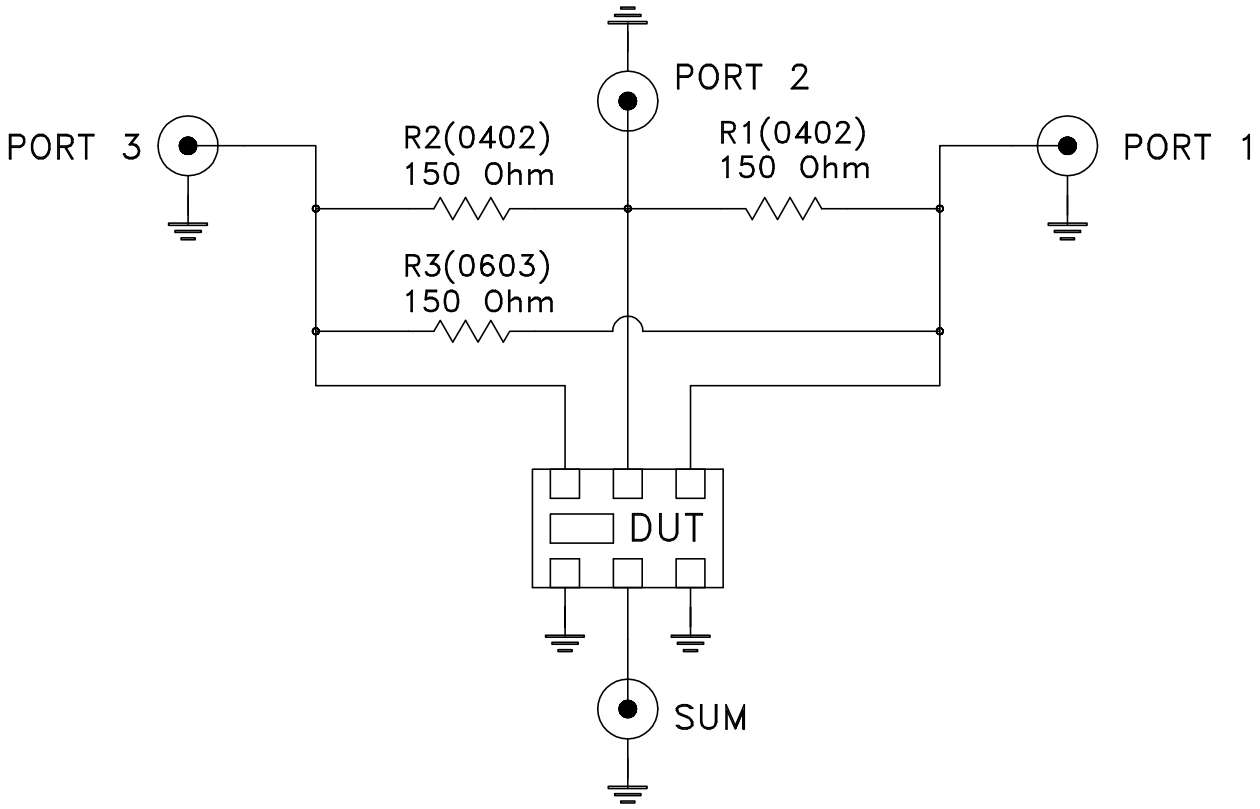
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A	15542	98-PL-621	0R

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98PL621	15:1	1 OF 1

Evaluation Board and Circuit



TB-1176+



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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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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