



Mini-Circuits

ULTRA-SMALL CERAMIC

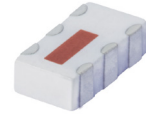
Power Splitter/Combiner

QCN-5AT+

2 Way-90° 50Ω 330 to 580 MHz

FEATURES

- Low insertion loss, 0.4 dB typ.
- High isolation, 22 dB typ.
- Wrap-around terminal for excellent solderability
- Ultra small, 0.12"X0.06"X0.035"
- AEC-Q200 qualified component family



Generic photo used for illustration purposes only

CASE STYLE: FV1206-1

+RoHS Compliant

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

APPLICATIONS

- Automotive

ELECTRICAL SPECIFICATIONS¹ AT +25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		330		580	MHz
Insertion Loss, above 3.0 dB	330-400		0.4	0.6	dB
	400-525		0.55	0.8	
	525-580		0.9	1.3	
Isolation	330-400	18	20		dB
	400-525	15	20		
	525-580	12	16		
Phase Unbalance	330-400		2.5	5	Degree
	400-525		2.5	4	
	525-580		3.0	6	
Amplitude Unbalance	330-400		0.6	1.1	dB
	400-525		0.5	0.9	
	525-580		1.4	1.8	
VSWR	330-400		1.2		(:1)
	400-525		1.3		
	525-580		1.5		

1. Tested on TB-255+ using QCN-5+ with evaluation board losses de-embedded.

2. For applications requiring DC voltage to be applied to the RF ports, add suffix letter "D+" to part no. DC resistance to ground is 100 Mohms min.

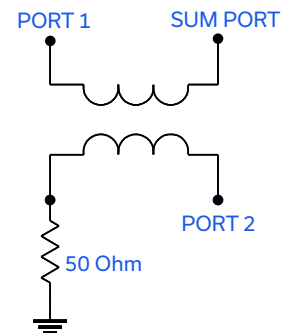
ABSOLUTE MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	-40°C to +105°C
Storage Temperature	-40°C to +105°C
Power Input (as a splitter)*	15 W max. at +25°C

* Derate linearly to 7 W at +105°C ambient.

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

ELECTRICAL SCHEMATIC (NOTE 1)



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REV. A
ECO-025912
QCN-5AT+
MCL NY
250624

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ULTRA-SMALL CERAMIC

Power Splitter/Combiner

QCN-5AT+

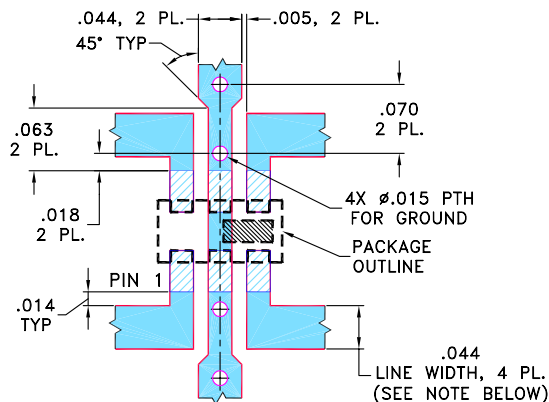
2 Way-90° 50Ω 330 to 580 MHz

PIN CONNECTIONS

SUM PORT	1
PORT 1 (0°)	4
PORT 2 (+90°)	6
GROUND	2,5
50 OHM TERM EXTERNAL	3

PRODUCT MARKING: PL

DEMO BOARD MCL P/N: TB-255+
SUGGESTED PCB LAYOUT (PL-131)



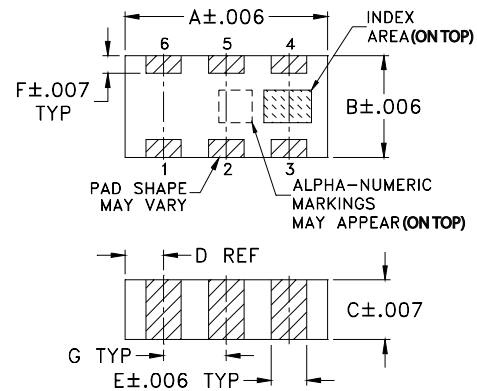
NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS $0.020" \pm 0.0015"$; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.

2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

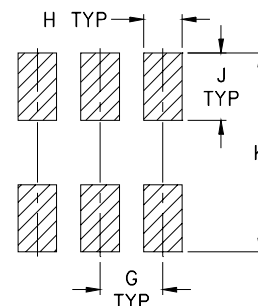
 DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

 DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

OUTLINE DRAWING



PCB Land Pattern



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

OUTLINE DIMENSIONS (Inches/mm)

A	B	C	D	E	F
.126	.063	.035	.024	.022	.011
3.20	1.60	0.89	0.61	0.56	0.28
G	H	J	K		wt
.039	.024	.042	.123		grams
0.99	0.61	1.07	3.12		.020

TAPE & REEL INFORMATION: F75

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ULTRA-SMALL CERAMIC

Power Splitter/Combiner

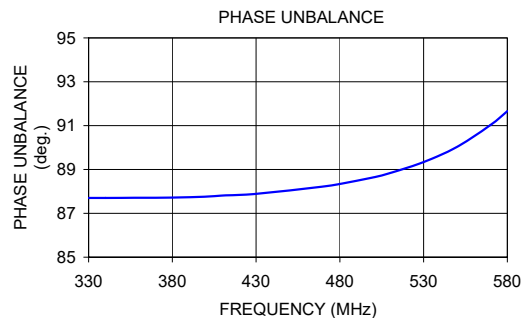
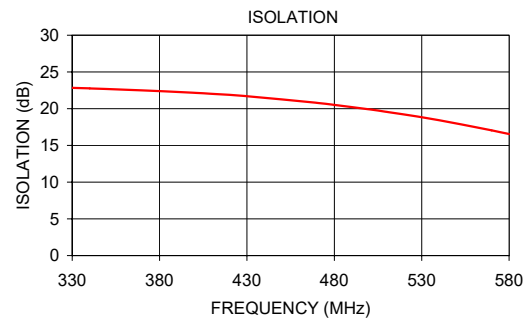
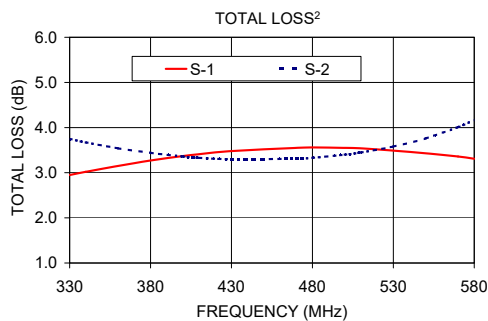
QCN-5AT+

2 Way-90° 50Ω 330 to 580 MHz

TYPICAL PERFORMANCE DATA

Frequency (MHz)	Total Loss ² (dB)		Amplitude Unbalance (dB)	Isolation (dB)	Phase Unbalance (deg.)	VSWR (:1)		
	S-1	S-2				S	1	2
330	2.95	3.75	0.81	22.84	87.70	1.15	1.20	1.13
340	3.02	3.67	0.66	22.76	87.70	1.15	1.20	1.14
360	3.15	3.54	0.39	22.58	87.71	1.15	1.20	1.14
380	3.27	3.44	0.17	22.39	87.72	1.15	1.21	1.15
400	3.37	3.36	0.01	22.16	87.76	1.15	1.22	1.16
410	3.41	3.33	0.08	22.02	87.81	1.15	1.22	1.17
430	3.48	3.30	0.18	21.70	87.89	1.16	1.23	1.19
470	3.55	3.31	0.24	20.79	88.22	1.17	1.26	1.23
480	3.56	3.33	0.22	20.51	88.34	1.18	1.27	1.24
500	3.55	3.40	0.15	19.91	88.64	1.20	1.30	1.28
510	3.54	3.45	0.08	19.57	88.84	1.21	1.31	1.30
530	3.49	3.58	0.09	18.83	89.34	1.23	1.34	1.34
550	3.43	3.76	0.33	17.98	90.03	1.26	1.39	1.39
570	3.36	4.01	0.66	17.04	91.03	1.31	1.44	1.46
580	3.31	4.17	0.85	16.55	91.66	1.33	1.48	1.50

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

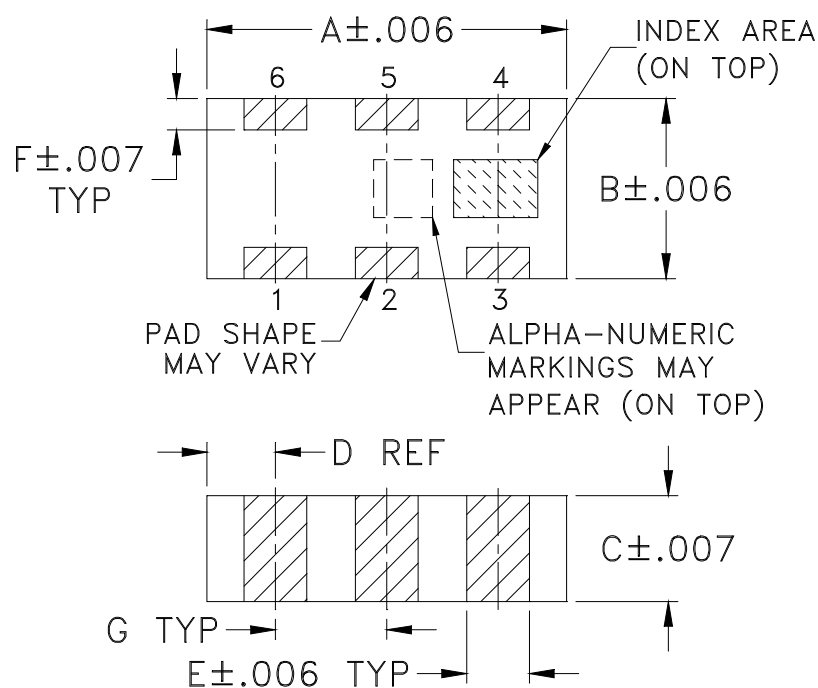


NOTES

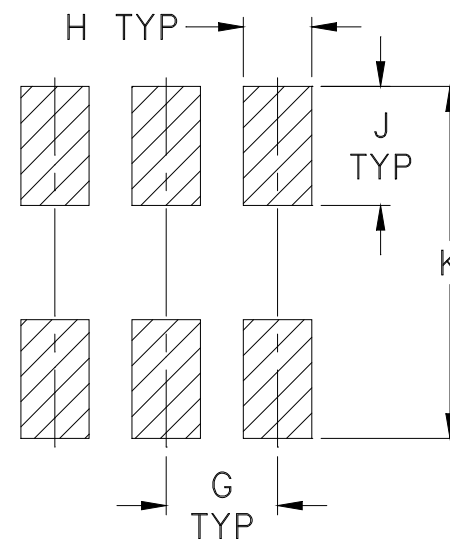
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Outline Dimensions



PCB Land Pattern



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

CASE #	A	B	C	D	E	F	G	H	J	K	L	M	N	P	WT. GRAM
FV1206-1	.126 (3.20)	.063 (1.60)	.035 (0.89)	.024 (0.61)	.022 (0.56)	.011 (0.28)	.039 (0.99)	.024 (0.61)	.042 (1.07)	.123 (3.12)	--	--	--	--	.020

Dimensions are in inches (mm). Tolerances: 2 PL. $\pm .01$; 3 PL. $\pm .005$

Notes:

- Open style, ceramic base.
- Termination finish: **as shown below or indicated on Data Sheet.**
For RoHS Case Styles: Tin plate over Nickel plate. All models, (+) suffix.
For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.



P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

RF/IF MICROWAVE COMPONENTS

DEVICE ORIENTATION IN T&R

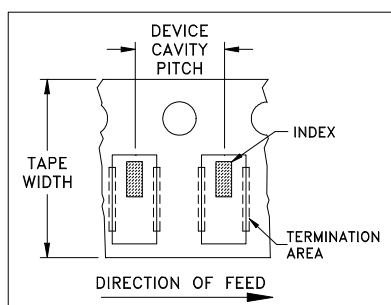


ILLUSTRATION 1

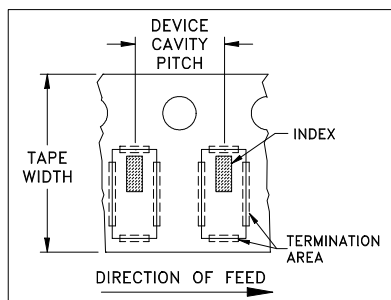


ILLUSTRATION 2

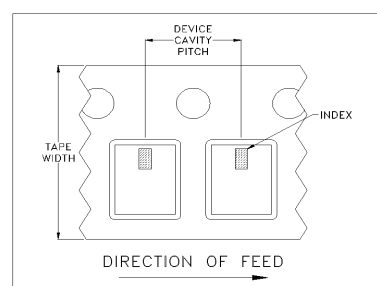


ILLUSTRATION 3

Applicable Case Styles

FV1206-1
FV1206-3

Applicable Case Styles

FV1206-4
FV1206-5
FV1206-6
FV1206-7
FV1206-9

Applicable Case Styles

FV1206-11
FV1206-12
GE0805C-18
NL1008C-6
NL1008C-7
NL1008C-9
NL1008C-10
NL1008C-12

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	3000

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

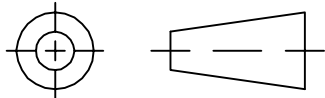


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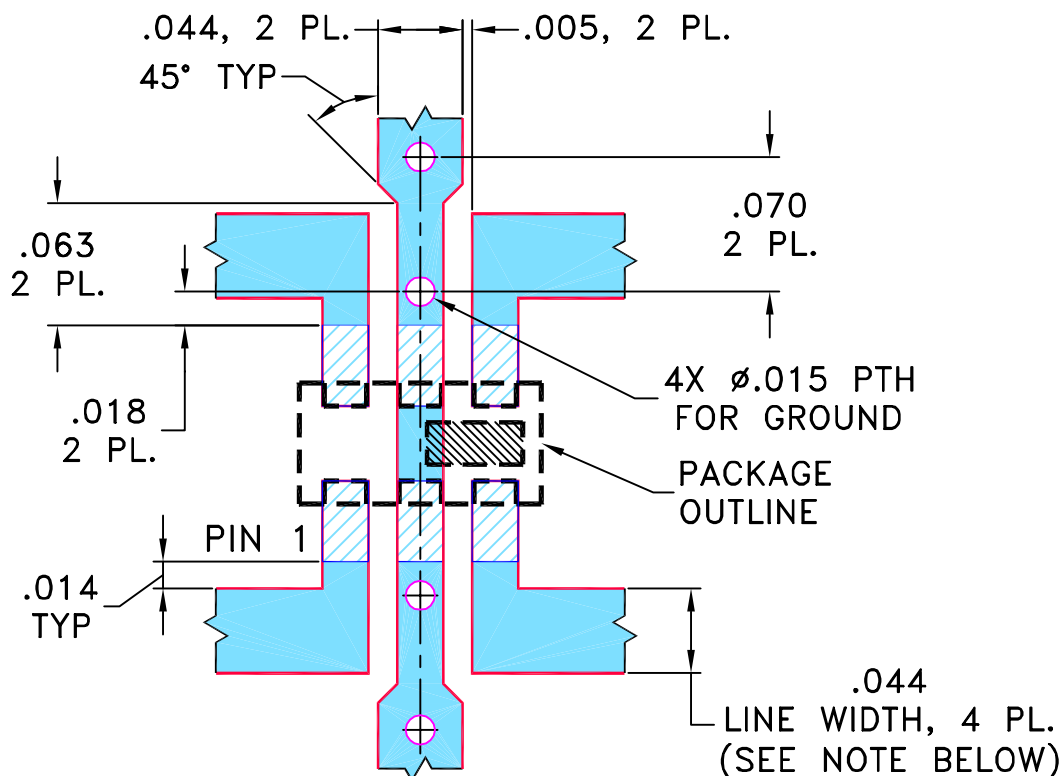
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M87001	NEW RELEASE	05/20/03	MMG	ABD
A	M87231	CORRECTED DWG.	05/28/03	MMG	ABD
B	M91636	ADDED "pn" PIN CONNECTION	04/07/04	AV	ABD
C	M102713	ADDED "...WITH SMOBC"	01/16/06	GF	IL

SUGGESTED MOUNTING CONFIGURATION
FOR FV1206-1 CASE STYLE, "pb/pn" PIN CONNECTIONS

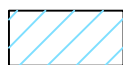


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2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.



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

MMG

05/14/03

TOLERANCES ON:

CHECKED

AV

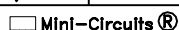
05/19/03

2 PL DECIMALS $\pm$

APPROVED

ABD

05/20/03

3 PL DECIMALS $\pm$.005ANGLES $\pm$ FRACTIONS $\pm$ 

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



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13 Neptune Avenue
Brooklyn NY 11235

PL, pb/pn, FV1206-1, QCN/BDCN, TB-255

SIZE

CODE IDENT

DRAWING NO:

REV:

A

15542

98-PL-131

C

FILE:

98PL131

SCALE:

10:1

SHEET:

1 OF 1