



Mini-Circuits

ULTRA-SMALL CERAMIC

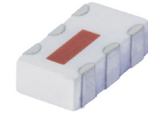
Power Splitter/Combiner

QCN-27AT+

2 Way-90° 50Ω 1700 to 2700 MHz

FEATURES

- Low insertion loss, 0.4 dB typ.
- High isolation, 26 dB typ.
- Wrap-around terminal for excellent solderability
- Ultra small, 0.12"x0.06"x0.035"
- Patent pending
- 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		1700		2700	MHz
Insertion Loss, above 3.0 dB	1700-1800		0.4	0.7	dB
	1800-2000		0.4	0.7	
	2000-2400		0.4	0.7	
	2400-2700		0.5	0.9	
Isolation	1700-1800	18	21		dB
	1800-2000	18	22		
	2000-2400	20	30		
	2400-2700	20	30		
Phase Unbalance	1700-1800		3	6	Degree
	1800-2000		2	6	
	2000-2400		3	6	
	2400-2700		3	6	
Amplitude Unbalance	1700-1800		0.5	1.0	dB
	1800-2000		0.3	0.8	
	2000-2400		0.2	0.8	
	2400-2700		0.6	1.0	
VSWR	1700-1800		1.2		(:1)
	1800-2000		1.2		
	2000-2400		1.2		
	2400-2700		1.2		

1. Tested on TB-255+ using QCN-27+ 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.

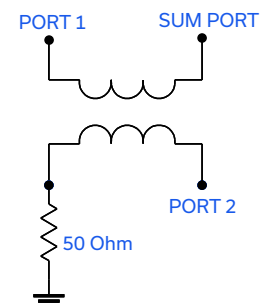
ABSOLUTE MAXIMUM RATINGS

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-27AT+
ED-10849/5
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ULTRA-SMALL CERAMIC

Power Splitter/Combiner

QCN-27AT+

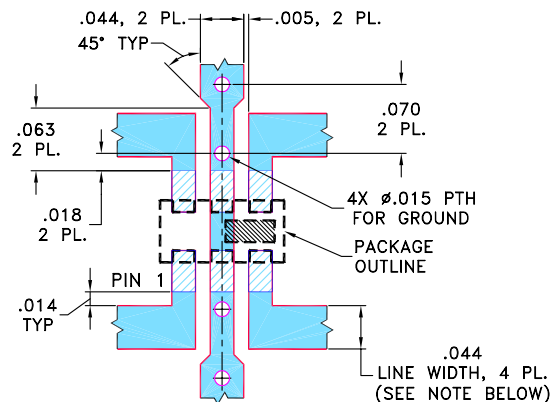
2 Way-90° 50Ω 1700 to 2700 MHz

PIN CONNECTIONS

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

PRODUCT MARKING: P4

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

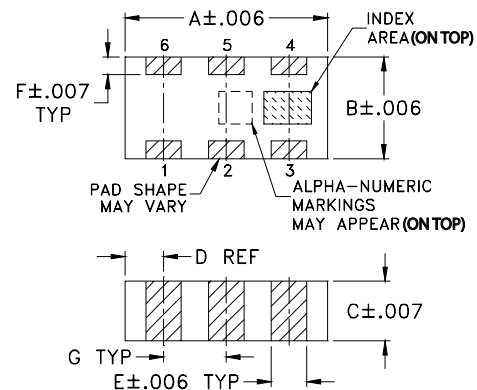


NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS $0.020" \pm 0.0015"$; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.

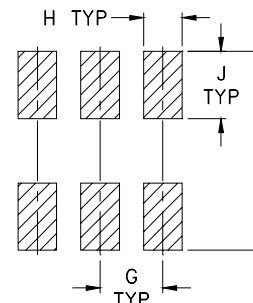
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

-  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 ± 0.002

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

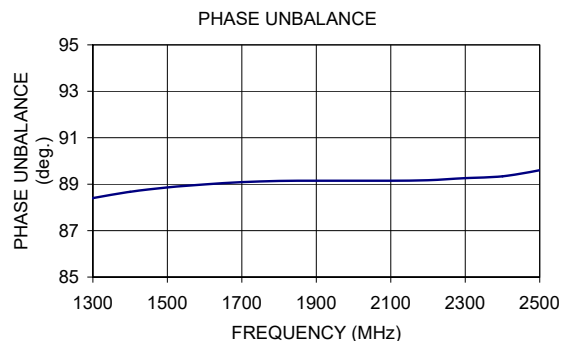
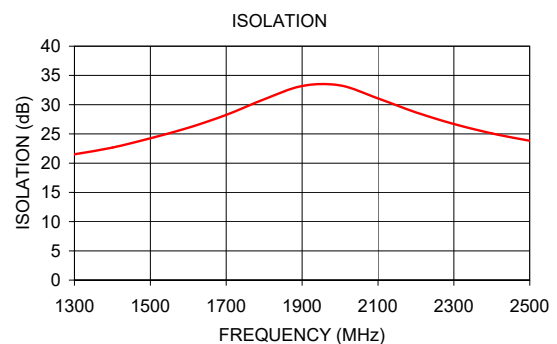
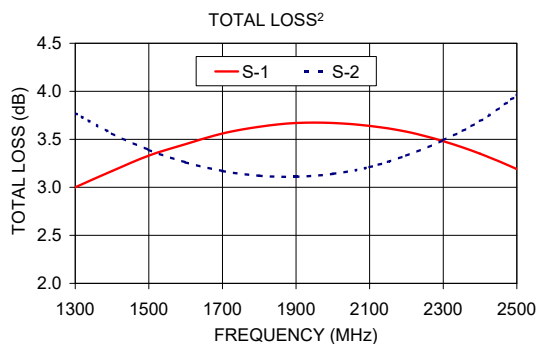
QCN-27AT+

2 Way-90° 50Ω 1700 to 2700 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
1700	3.12	3.68	0.56	21.52	88.45	1.23	1.26	1.19
1800	3.24	3.55	0.31	22.55	88.66	1.21	1.24	1.17
1900	3.33	3.44	0.12	23.84	88.92	1.18	1.23	1.14
2000	3.40	3.37	0.03	25.33	88.93	1.16	1.21	1.12
2100	3.45	3.33	0.12	26.85	88.95	1.14	1.20	1.10
2200	3.48	3.32	0.16	28.90	89.07	1.12	1.19	1.09
2300	3.48	3.33	0.15	31.22	89.25	1.10	1.18	1.09
2400	3.45	3.37	0.08	34.26	89.24	1.08	1.17	1.10
2500	3.40	3.44	0.04	38.56	89.27	1.06	1.17	1.11
2600	3.33	3.54	0.22	45.07	89.20	1.04	1.16	1.12
2650	3.28	3.61	0.33	52.09	89.34	1.03	1.16	1.13
2700	3.23	3.68	0.45	57.17	89.32	1.01	1.16	1.14

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

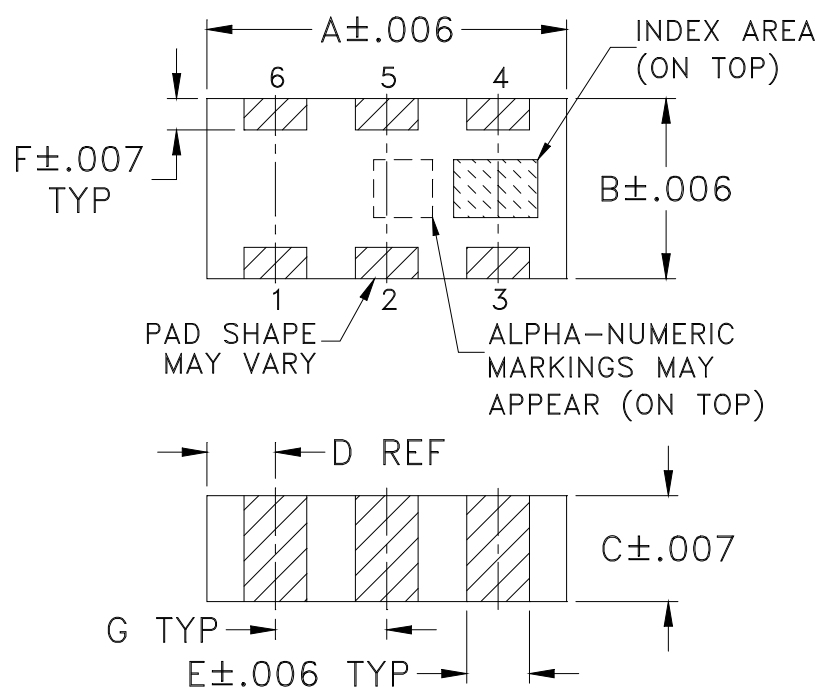


NOTES

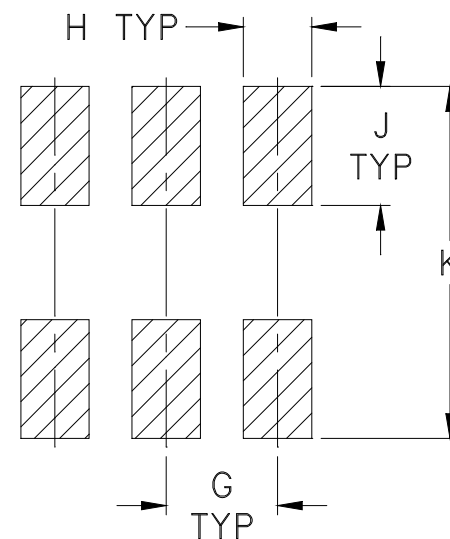
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- B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
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Outline 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.



ISO 9001 ISO 14001 CERTIFIED

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



The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

RF/IF MICROWAVE COMPONENTS

DEVICE ORIENTATION IN T&R

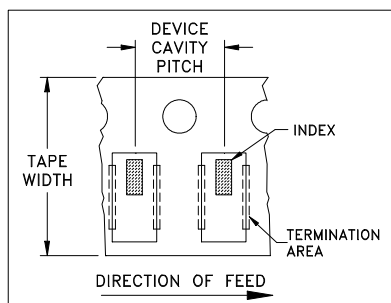


ILLUSTRATION 1

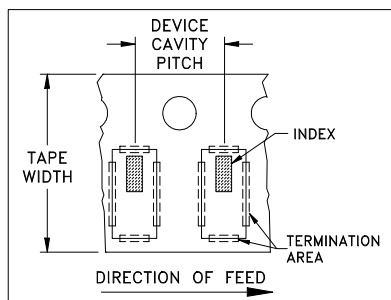


ILLUSTRATION 2

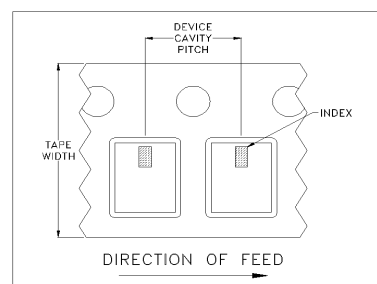


ILLUSTRATION 3

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

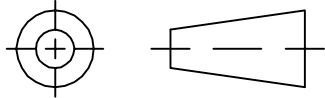


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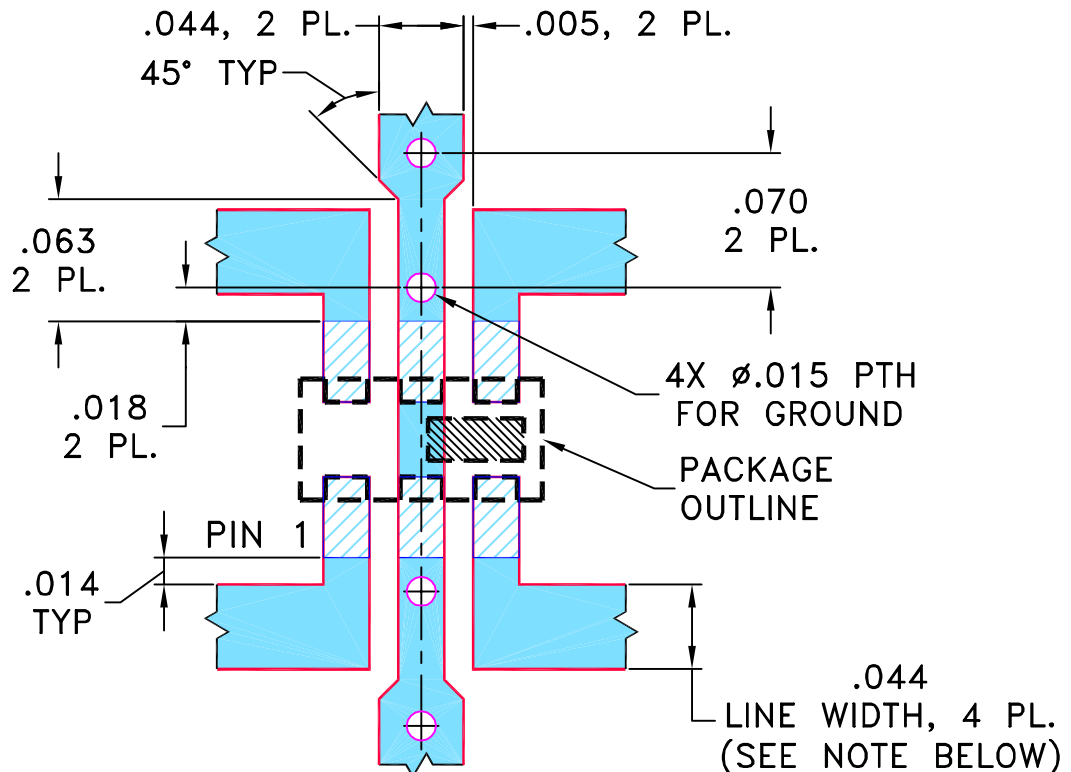
THIRD ANGLE PROJECTION



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

TOLERANCES ON:

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

DRAWN

MMG

05/14/03

CHECKED

AV

05/19/03

APPROVED

ABD

05/20/03



Mini-Circuits®

13 Neptune Avenue
Brooklyn NY 11235

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

SIZE

A

CODE IDENT

15542

DRAWING NO:

98-PL-131

REV:

C

FILE:

98PL131

SCALE:

10:1

SHEET:

1 OF 1

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