

# Engineering Development Model

## Power Splitter/Combiner

## JYPS-ED11697/1

### 2 Way-180°

#### Important Note

This model has been designed, built and tested in our engineering department. Performance data represents model capability. At present it is a non-catalog model. On request, we can supply a final specification sheet, part number and price/delivery information.



Please click "Back", and then click "Contact Us" for Applications support.

**CASE STYLE : BJ293**

ELECTRICAL SPECIFICATIONS 50Ω @ +25°C					
Parameter		Min.	Typ.	Max.	Units
Frequency		500		2300	MHz
Isolation	500-2300		19		dB
Insertion Loss Above 3 dB	500-2300		1.30		dB
Phase Unbalance	500-2300		0.500		deg.
Amplitude Unbalance	500-2300		0.300		dB
VSWR	SUM Ports		1.34		(:1)
	OUT Ports		1.25		(:1)

MAXIMUM RATINGS	
Operating Temperature	-40°C to +85°C
Storage Temperature	-55°C to +100°C

PIN CONNECTIONS	
SUM PORT	1
PORT 1	4
PORT 2	5
GND EXT	2,3,6,7,8
CASE GND	2,3,6,7,8

#### Functional Diagram



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RF/MICROWAVE COMPONENTS



REV. X1  
JYPS-ED11697/1  
12/15/2008  
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# 2 Way-180° Power Splitter/Combiner JYPS-ED11697/1

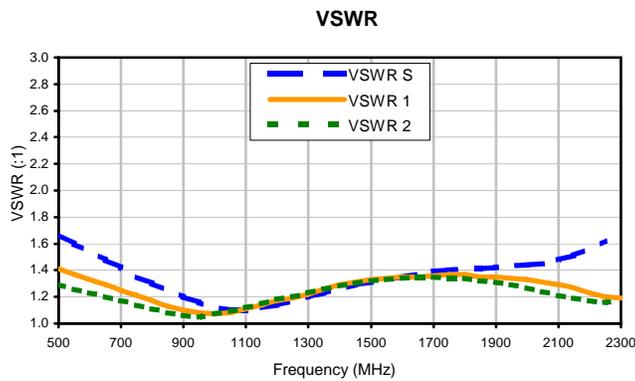
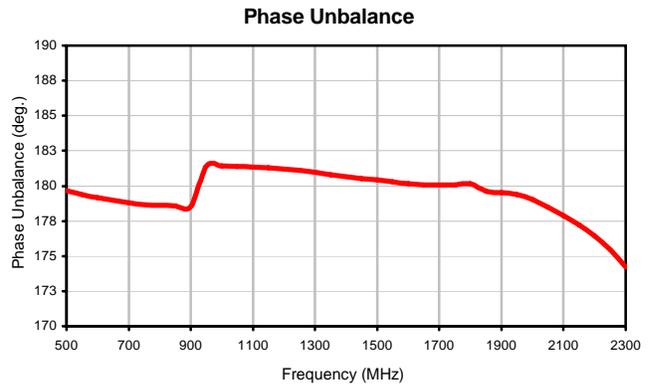
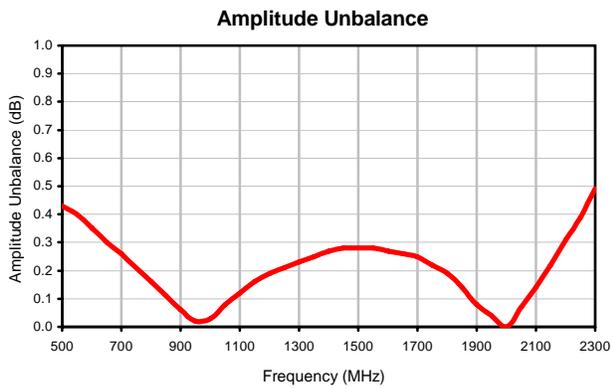
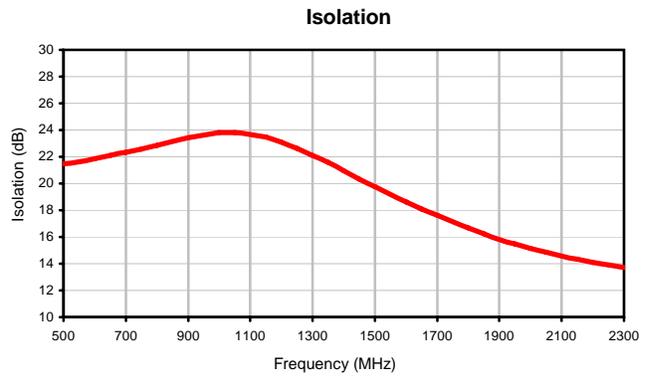
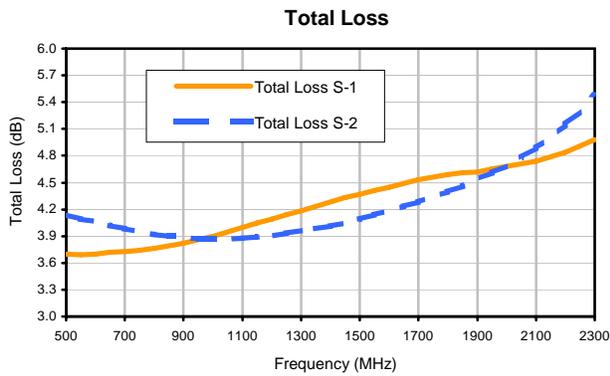
## Typical Performance Data

FREQUENCY (MHz)	TOTAL LOSS <sup>1</sup> (dB)		AMPLITUDE UNBALANCE (dB)	ISOLATION (dB) 1-2	PHASE UNBALANCE (deg.)	FREQUENCY (MHz)	VSWR (:1)		
	S-1	S-2					S	1	2
500.0	3.70	4.14	0.43	21.47	179.67	500.0	1.67	1.41	1.29
550.0	3.69	4.09	0.40	21.64	179.41	550.0	1.60	1.37	1.26
600.0	3.70	4.06	0.35	21.86	179.18	600.0	1.54	1.33	1.23
650.0	3.72	4.02	0.30	22.08	178.98	650.0	1.48	1.29	1.20
700.0	3.73	3.98	0.26	22.32	178.81	700.0	1.42	1.25	1.17
750.0	3.74	3.95	0.21	22.59	178.68	750.0	1.35	1.21	1.14
800.0	3.76	3.92	0.16	22.87	178.60	800.0	1.30	1.17	1.11
850.0	3.79	3.90	0.11	23.14	178.55	850.0	1.25	1.13	1.08
900.0	3.82	3.89	0.06	23.41	178.53	900.0	1.20	1.10	1.06
950.0	3.86	3.87	0.02	23.63	181.45	950.0	1.16	1.08	1.05
1000.0	3.90	3.87	0.03	23.79	181.42	1000.0	1.12	1.07	1.07
1050.0	3.95	3.87	0.08	23.80	181.38	1050.0	1.10	1.08	1.09
1100.0	4.00	3.88	0.12	23.68	181.33	1100.0	1.10	1.11	1.12
1150.0	4.05	3.89	0.16	23.46	181.28	1150.0	1.12	1.14	1.15
1200.0	4.09	3.90	0.19	23.11	181.21	1200.0	1.14	1.17	1.18
1250.0	4.14	3.93	0.21	22.63	181.12	1250.0	1.17	1.19	1.20
1300.0	4.18	3.96	0.23	22.10	180.96	1300.0	1.20	1.22	1.23
1350.0	4.23	3.98	0.25	21.56	180.79	1350.0	1.23	1.26	1.26
1400.0	4.28	4.01	0.27	20.96	180.65	1400.0	1.26	1.29	1.28
1450.0	4.33	4.05	0.28	20.33	180.52	1450.0	1.29	1.31	1.30
1500.0	4.37	4.09	0.28	19.75	180.41	1500.0	1.31	1.33	1.32
1550.0	4.41	4.14	0.28	19.18	180.28	1550.0	1.33	1.34	1.33
1600.0	4.45	4.18	0.27	18.62	180.17	1600.0	1.35	1.35	1.34
1650.0	4.49	4.23	0.26	18.10	180.06	1650.0	1.37	1.35	1.35
1700.0	4.53	4.28	0.25	17.61	180.05	1700.0	1.39	1.36	1.35
1750.0	4.56	4.34	0.22	17.14	180.07	1750.0	1.40	1.37	1.34
1800.0	4.59	4.40	0.19	16.67	180.16	1800.0	1.41	1.37	1.34
1850.0	4.61	4.46	0.14	16.24	179.62	1850.0	1.41	1.35	1.32
1900.0	4.62	4.54	0.08	15.83	179.52	1900.0	1.42	1.35	1.31
1950.0	4.65	4.61	0.04	15.48	179.38	1950.0	1.43	1.34	1.29
2000.0	4.68	4.69	0.00	15.16	179.03	2000.0	1.44	1.33	1.27
2050.0	4.71	4.78	0.07	14.85	178.48	2050.0	1.45	1.31	1.24
2100.0	4.74	4.89	0.14	14.58	177.91	2100.0	1.48	1.29	1.21
2150.0	4.79	5.01	0.22	14.33	177.22	2150.0	1.51	1.27	1.19
2200.0	4.84	5.15	0.31	14.09	176.44	2200.0	1.56	1.23	1.17
2250.0	4.91	5.30	0.39	13.89	175.43	2250.0	1.62	1.20	1.16
2300.0	4.98	5.47	0.49	13.70	174.20	2300.0	1.69	1.19	1.18

<sup>1</sup>Total Loss = Insertion Loss + 3dB Splitter Loss

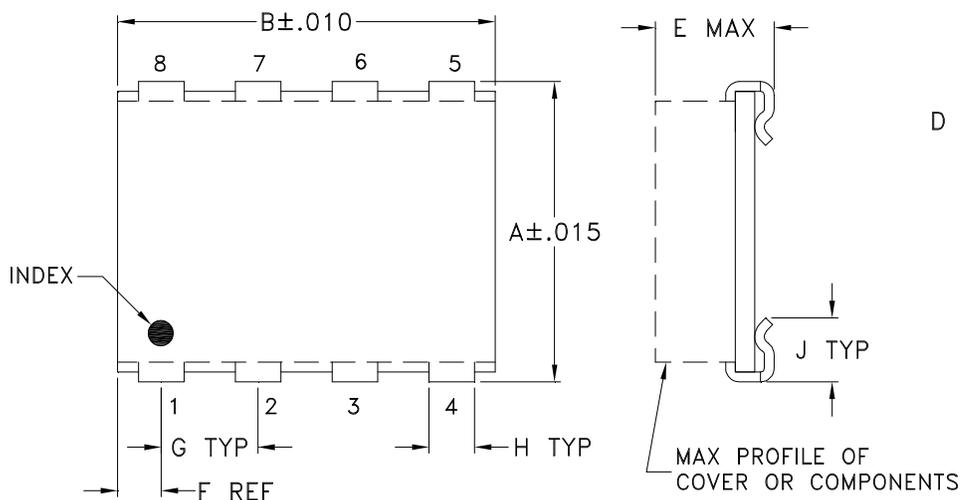


## Typical Performance Curves

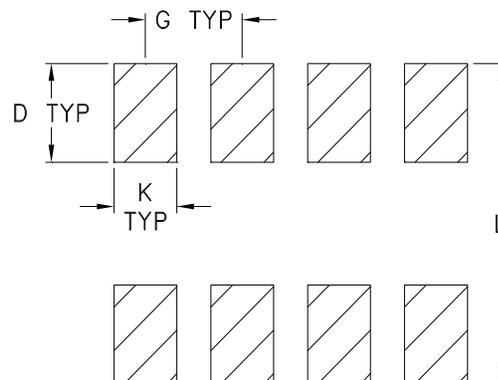


## Outline Dimensions

BJ293  
BJ398



## PCB Land Pattern



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

CASE#	A	B	C	D	E	F	G	H	J	K	L	WT. GRAMS
BJ293	.395 (10.03)	.500 (12.70)	-- --	.100 (2.54)	.230 (5.84)	.100 (2.54)	.100 (2.54)	.047 (1.19)	.065 (1.65)	.065 (1.65)	.425 (10.80)	.80
BJ398	.305 (7.75)	.390 (9.91)	-- --	.100 (2.54)	.105 (2.67)	.045 (1.14)	.100 (2.54)	.047 (1.19)	.065 (1.65)	.065 (1.65)	.325 (8.26)	.20

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

### Notes:

- Case material: Plastic.
- Base material: Printed wiring laminate.
- Termination finish:
  - For RoHS Case Styles: Tin plate over Nickel plate. All models, (+) suffix.
  - For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.



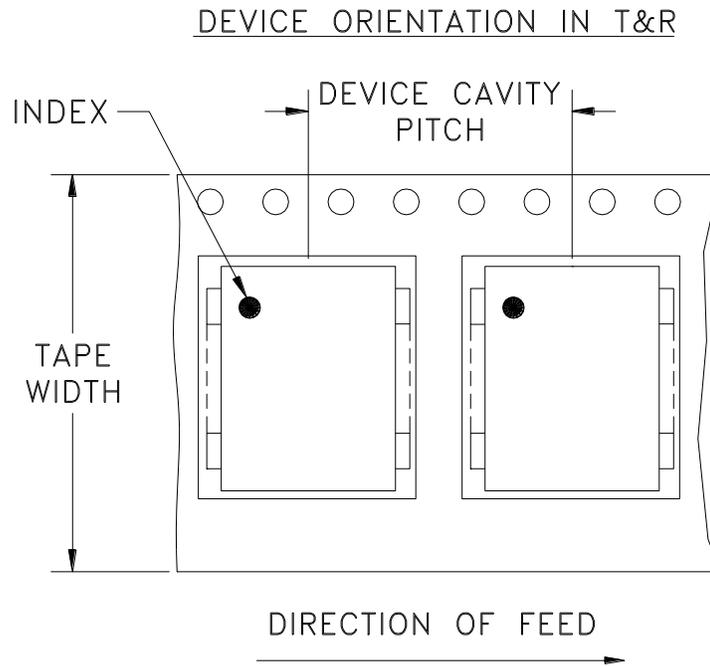
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# Tape & Reel Packaging TR-F10



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel
24	16	7	10,20,50,100
		13	200,500

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](http://www.minicircuits.com/pages/pdfs/tape.pdf)

Note: Please consult individual model data sheet to determine device per reel availability.



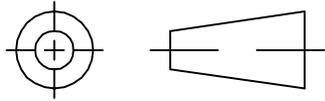
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THIRD ANGLE PROJECTION

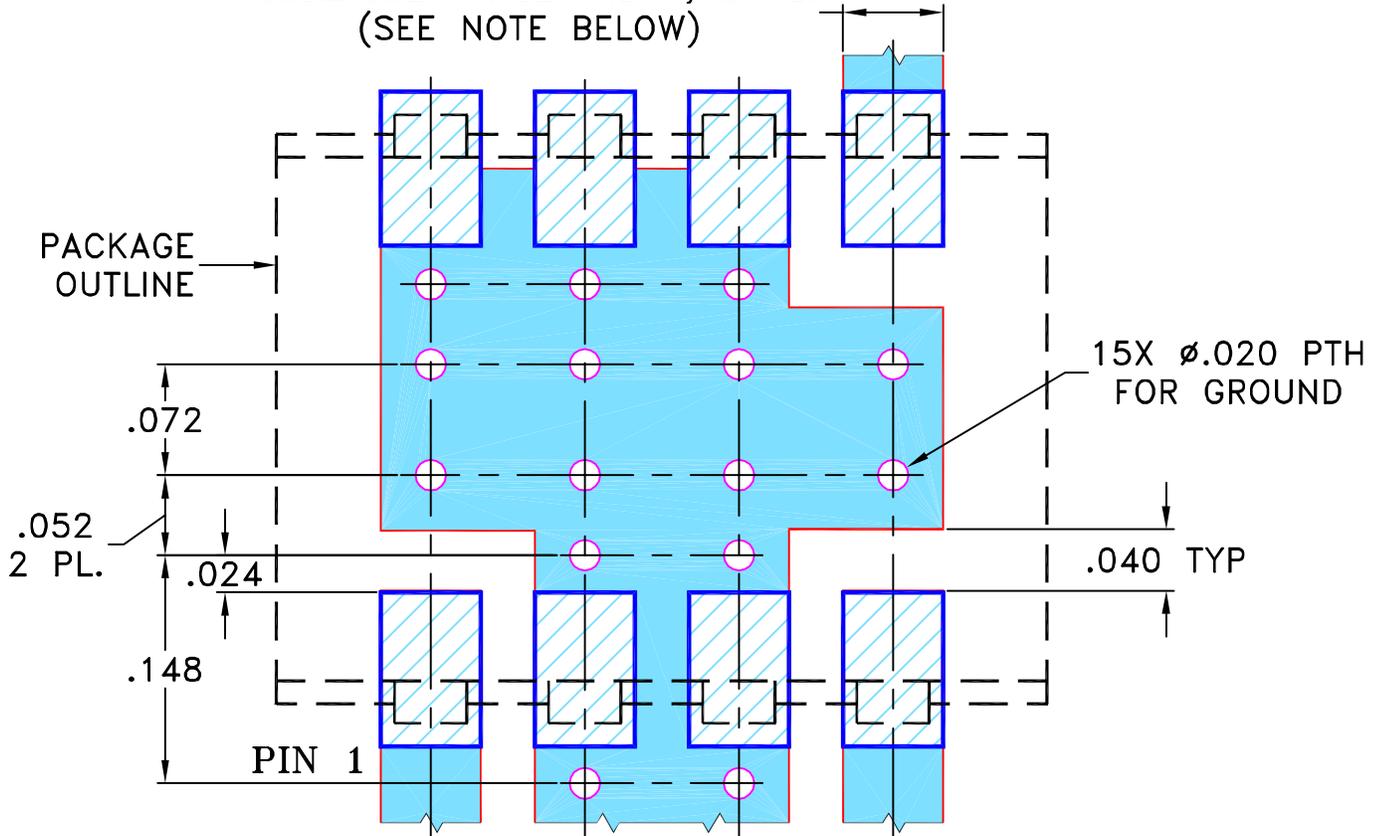


REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M93753	NEW RELEASE	08/27/04	MMG	HY
A	M102713	ADDED "...WITH SMOBC"	01/12/06	GF	IL

**SUGGESTED MOUNTING CONFIGURATION  
FOR BJ293 CASE STYLE, "qa" PIN CONNECTION.**

.065±.002 TRACE WIDTH, 3 PL.  
(SEE NOTE BELOW)



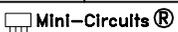
- NOTE: 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS 0.030" ± 0.002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.  
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

 DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)  
 DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

UNLESS OTHERWISE SPECIFIED	INITIALS	DATE
DIMENSIONS ARE IN INCHES	DRAWN MMG	08/12/04
TOLERANCES ON:	CHECKED AV	08/28/04
2 PL DECIMALS ±	APPROVED HY	08/27/04
3 PL DECIMALS ± .005		
ANGLES ±		
FRACTIONS ±		

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PL, qa, BJ293, JYPJ-2, TB-290

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

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-167	A
FILE:	98PL167	SCALE: 8:1	SHEET: 1 OF 1

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	-40° to 85°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° 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
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Solder Reflow Heat	Sn-Pb Eutetic Process: 225°C peak Pb-Free Process 245° - 250°C peak	J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1
Solderability	10X Magnification	J-STD-002, 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
Marking Resistance to Solvents	Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C	MIL-STD-202, Method 215