

# High Power Bi-Directional Coupler

## SYBD-18-172HP+

50Ω 18dB Coupling DC Pass 1400 to 1750 MHz



CASE STYLE: JB1233

**+RoHS Compliant**

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

### Maximum Ratings

Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
DC Current	2A

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

### Pin Connections

INPUT	1
OUTPUT	2
COUPLED (forward)	4
COUPLED (reverse)	3
GROUND	5

### Features

- high power handling, 25 watts typ.
- low mainline loss 0.1 dB typ.
- excellent VSWR, 1.1:1 typ.
- excellent directivity, 28 dB typ.
- wideband frequency, 1400 to 1750 MHz

### Applications

- GPS
- instrumentation
- defense communications
- federal communications

### Bi-Directional Coupler Electrical Specifications

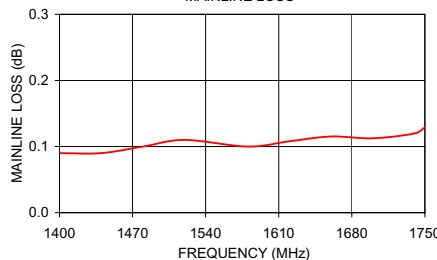
FREQ. (MHz)	COUPLING (dB)		MAINLINE LOSS <sup>1</sup> (dB)		DIRECTIVITY (dB)		VSWR (:1)	POWER INPUT (W)
	Nom.	Flatness	Typ.	Max.	Typ.	Min.		
$f_L$ - $f_U$								
1400-1750			0.10	0.35	28	18	1.10	
1400-1580	19.5±0.7	±0.7	0.10	0.30	28	18	1.10	50
1580-1750	18.5±0.7	±0.6	0.12	0.35	30	18	1.05	25

1. Mainline loss includes theoretical power loss at coupled port.

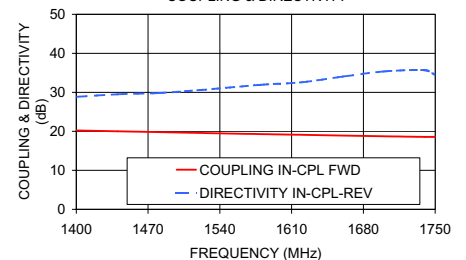
### Typical Performance Data

Frequency (MHz)	Mainline Loss (dB)		Coupling (dB)		Directivity (dB)		Return Loss (dB)		
	In-Out	In-Cpl Fwd	Out-Cpl Rev	Out-Cpl Fwd	In-Cpl Rev	In	Out	Cpl Fwd	Cpl Rev
1400.00	0.09	20.22	20.26	27.67	28.84	28.48	27.90	32.21	32.39
1440.00	0.09	20.00	20.05	28.01	29.49	28.94	28.32	32.71	32.94
1480.00	0.10	19.80	19.84	28.35	29.81	29.44	28.82	33.10	33.27
1520.00	0.11	19.59	19.63	28.66	30.56	30.03	29.41	33.86	34.17
1580.00	0.10	19.29	19.33	29.70	31.92	31.34	30.60	35.70	35.73
1620.00	0.11	19.11	19.15	29.91	32.58	32.35	31.44	36.32	36.64
1660.00	0.12	18.92	18.97	30.98	34.03	33.79	32.99	38.29	38.60
1700.00	0.11	18.74	18.78	31.68	35.36	35.46	34.62	40.80	40.38
1740.00	0.12	18.58	18.61	31.49	35.67	37.37	36.34	42.30	42.58
1750.00	0.13	18.57	18.58	30.54	34.47	38.33	37.11	43.29	43.72

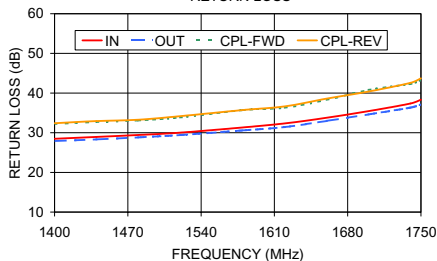
SYBD-18-172HP+  
MAINLINE LOSS



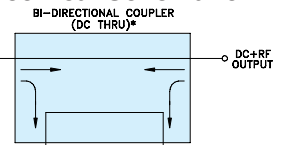
SYBD-18-172HP+  
COUPLING & DIRECTIVITY



SYBD-18-172HP+  
RETURN LOSS

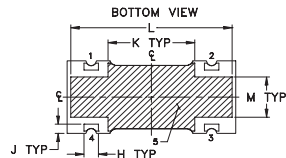
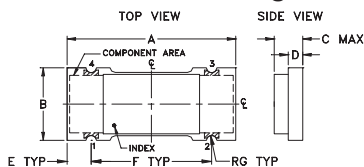


### Electrical Schematic

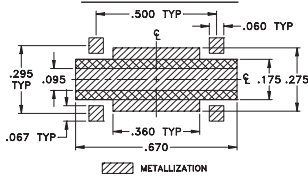


\* ELECTRICAL SCHEMATIC IS FOR BI-DIRECTIONAL COUPLER WITHOUT INTERNAL TRANSFORMERS AND RESISTORS.

### Outline Drawing



### PCB Land Pattern

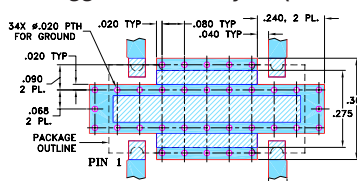


Suggested Layout,  
Tolerance to be within ±0.02

### Outline Dimensions (inch/mm)

A	B	C	D	E	F	G
.70	.32	.13	.060	.100	.500	.022
17.78	8.13	3.30	1.52	2.54	12.70	0.56
H	J	K	L	M	wt	
.060	.040	.360	.670	.175	grams	
1.52	1.02	9.14	17.02	4.45	0.68	

### Demo Board MCL P/N: TB-398 Suggested PCB Layout (PL-260)



- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030" ± .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.  
3. DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)  
4. DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

### 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.  
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