Surface Mount

Phase Shifter

JSPHS-23+

50Ω 180° Voltage Variable 1700 to 2000 MHz

Generic photo used for illustration purposes only

CASE STYLE: BK276

+RoHS Compliant

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

Maximum Ratings

Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Input Power	20 dBm max.
Control Voltage	28V

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

Pin Connections

IN	1
OUT	7
BIAS	4,6^
GROUND	2,3,5,8,9,10,11,12,13,14

^ proper operation is achieved with pins 4 or 6 or both connected to BIAS.

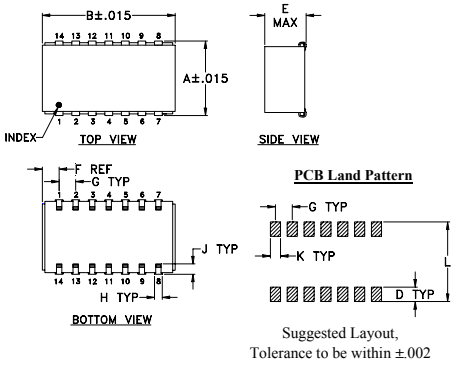
Features

- low insertion loss, 2.0 dB typ.
- good VSWR, 1.5:1 typ.
- J-leads for excellent solderability and strain relief
- aqueous washable

Applications

- cellular
- PCS
- DCS

Outline Drawing

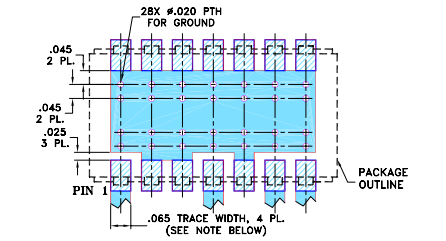


Outline Dimensions (inch / mm)

A	B	C	D	E	F	G
.450	.803	--	.100	.250	.102	.100
11.43	20.40	--	2.54	6.35	2.59	2.54

H	J	K	L	wt
.047	.065	.065	.470	grams
1.19	1.65	1.65	11.94	3.0

Demo Board MCL P/N: TB-122
Suggested PCB Layout (PL-030)



NOTE: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B 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

Phase Shifter Electrical Specifications

FREQUENCY (MHz)	PHASE RANGE (Degrees)	INSERTION LOSS (dB)		CONTROL VOLTAGE (V)	CONTROL BANDWIDTH (kHz)	VSWR (:1)	
	Min.	Typ.	Max.		Typ.	Typ.	Max.
1700-2000	180	2.0	3.5	0-15	DC-50	1.5	2.9

Maximum operating power, 0 dBm

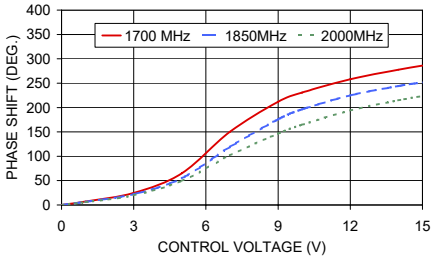
DC input resistance at Control port: 2000 ohms typ.

Typical Performance Data

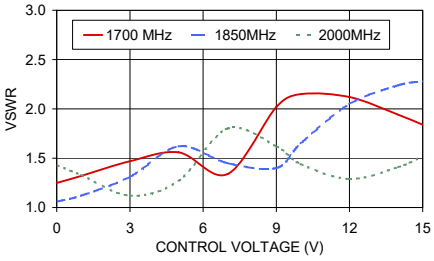
Control Voltage (V)	Phase Shift* (Degrees)			VSWR (:1)			Insertion Loss (dB)		
	1700 MHz	1850 MHz	2000 MHz	1700 MHz	1850 MHz	2000 MHz	1700 MHz	1850 MHz	2000 MHz
0.0	0.02	0.01	0.02	1.25	1.06	1.43	1.64	1.60	1.74
1.0	7.14	6.46	5.81	1.32	1.12	1.33	1.73	1.66	1.73
3.0	24.81	22.12	19.98	1.47	1.31	1.12	1.98	1.85	1.76
5.0	65.00	55.13	49.59	1.56	1.62	1.27	2.41	2.31	2.03
7.0	150.40	119.13	101.78	1.34	1.45	1.80	2.86	2.56	2.60
9.0	211.72	175.86	146.54	2.02	1.40	1.62	3.13	2.59	2.49
10.0	230.78	196.14	164.75	2.15	1.65	1.44	3.01	2.70	2.38
12.0	258.19	224.89	193.95	2.12	2.05	1.29	2.60	2.84	2.29
14.0	277.70	243.96	214.97	1.94	2.24	1.41	2.20	2.84	2.35
15.0	285.95	251.62	223.46	1.84	2.28	1.52	2.04	2.80	2.40

* Normalized at control voltage = 0V

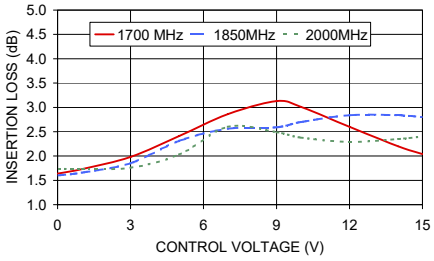
JSPHS-23+
PHASE SHIFT



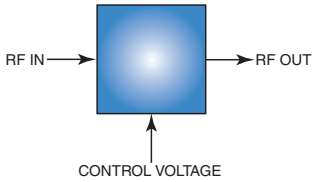
JSPHS-23+
VSWR



JSPHS-23+
INSERTION LOSS



electrical schematic



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/MCLStore/terms.jsp