

Narrow Band Phase Shifter

50Ω 180° Voltage Variable 400 to 660 MHz

JSPHS-661+



CASE STYLE: BK276
PRICE: \$32.95 ea. QTY (1-9)

+ RoHS compliant in accordance with EU Directive (2002/95/EC)

The +Suffix has been added in order to identify 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 | 20V |

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 |

^ pins must be connected together externally

Features

- low insertion loss, 1.2 dB typ.
- good VSWR, 1.2:1 typ.
- J-leads for excellent solderability and strain relief
- aqueous washable

Applications

- signal processing

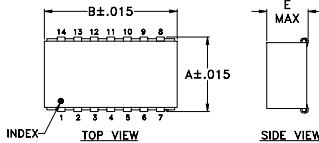
Phase Shifter Electrical Specifications

| FREQUENCY (MHz) | PHASE RANGE (Degrees) | INSERTION LOSS (dB) | | CONTROL VOLTAGE (V) | CONTROL BANDWIDTH (kHz) | VSWR (:1) | |
|-----------------|-----------------------|---------------------|------|---------------------|-------------------------|-----------|------|
| | Min. | Typ. | Max. | | Typ. | Typ. | Max. |
| 400-660 | 180 | 1.2 | 2.5 | 0-12 | DC-50 | 1.2 | 2.2 |

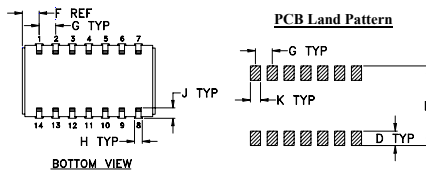
Maximum operating power, 0 dBm

DC input resistance at Control port: 2000 ohms typ.

Outline Drawing



PCB Land Pattern

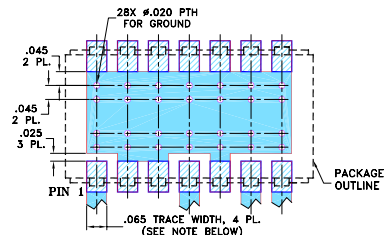


Suggested Layout, Tolerance to be within ±.002

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)

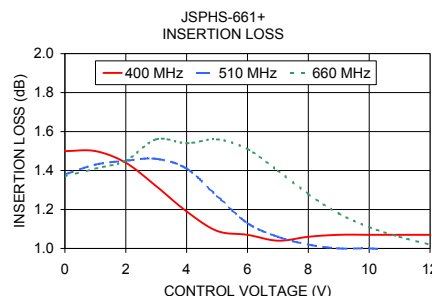
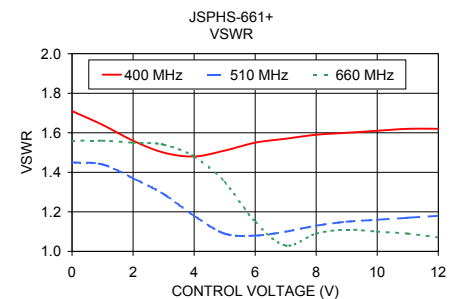
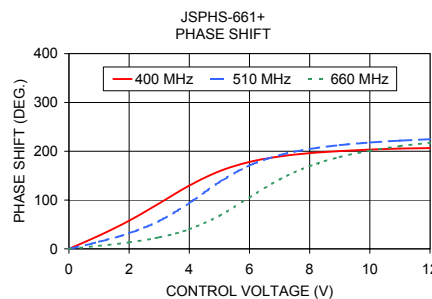


- NOTE: 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS 0.030" ± 0.002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
 - DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

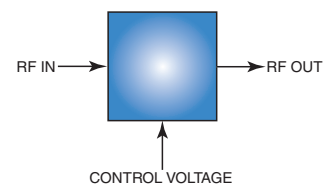
Typical Performance Data

| Control Voltage (V) | Phase Shift* (Degrees) | | | VSWR (:1) | | | Insertion Loss (dB) | | |
|---------------------|------------------------|---------|---------|-----------|---------|---------|---------------------|---------|---------|
| | 400 MHz | 510 MHz | 660 MHz | 400 MHz | 510 MHz | 660 MHz | 400 MHz | 510 MHz | 660 MHz |
| 0.0 | 0.01 | 0.01 | 0.02 | 1.71 | 1.45 | 1.56 | 1.50 | 1.38 | 1.37 |
| 1.0 | 27.08 | 14.39 | 6.14 | 1.64 | 1.44 | 1.56 | 1.50 | 1.43 | 1.41 |
| 2.0 | 57.73 | 32.00 | 13.34 | 1.56 | 1.37 | 1.55 | 1.44 | 1.45 | 1.45 |
| 3.0 | 93.24 | 57.12 | 23.57 | 1.50 | 1.29 | 1.54 | 1.32 | 1.46 | 1.56 |
| 4.0 | 129.69 | 93.86 | 40.22 | 1.48 | 1.18 | 1.48 | 1.19 | 1.41 | 1.54 |
| 5.0 | 159.07 | 136.75 | 67.58 | 1.51 | 1.09 | 1.35 | 1.09 | 1.27 | 1.56 |
| 6.0 | 178.10 | 170.91 | 105.08 | 1.55 | 1.08 | 1.15 | 1.07 | 1.13 | 1.51 |
| 7.0 | 189.31 | 192.06 | 141.95 | 1.57 | 1.10 | 1.03 | 1.04 | 1.06 | 1.40 |
| 8.0 | 196.02 | 204.60 | 169.46 | 1.59 | 1.13 | 1.09 | 1.06 | 1.02 | 1.28 |
| 9.0 | 200.35 | 212.48 | 188.21 | 1.60 | 1.15 | 1.11 | 1.07 | 1.00 | 1.18 |
| 10.0 | 203.35 | 217.84 | 201.16 | 1.61 | 1.16 | 1.10 | 1.07 | 1.00 | 1.11 |
| 11.0 | 205.58 | 221.75 | 210.54 | 1.62 | 1.17 | 1.09 | 1.07 | 0.99 | 1.06 |
| 12.0 | 207.31 | 224.74 | 217.61 | 1.62 | 1.18 | 1.07 | 1.07 | 0.99 | 1.02 |

* Normalized at control voltage = 0V



electrical schematic



For detailed performance specs & shopping online see web site

Mini-Circuits
ISO 9001 ISO 14001 AS 9100 CERTIFIED

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