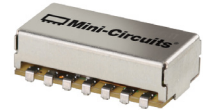


# Narrow Band Phase Shifter

50Ω 180° Voltage Variable 366 to 446 MHz

JSPHS-446+  
JSPHS-446



CASE STYLE: BK276

## Maximum Ratings

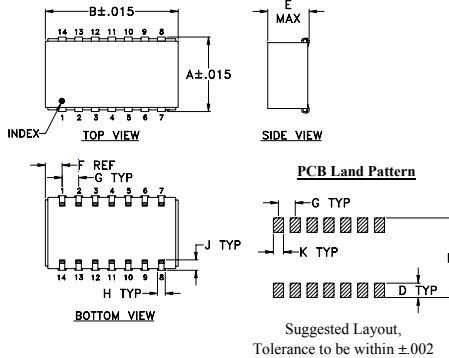
|                                                                 |                |
|-----------------------------------------------------------------|----------------|
| Operating Temperature                                           | -40°C to 85°C  |
| Storage Temperature                                             | -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     | 14                      |
| OUT    | 8                       |
| BIAS   | 1,7 <sup>^</sup>        |
| GROUND | 2,3,4,5,6,9,10,11,12,13 |

<sup>^</sup> proper operation is achieved with pins 1 or 7 or both connected to BIAS.

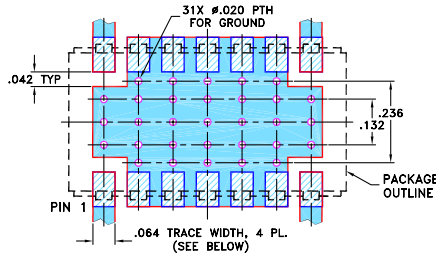
## Outline Drawing



## 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-152+ Suggested PCB Layout (PL-214)



NOTE: 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.

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

## Features

- low insertion loss, 1.4 dB typ.
- good VSWR, 1.3:1 typ.
- solder-plated 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.      | Max. |
| 366-446         | 180                   | 1.2                 | 2.5  | 0-12                | DC-50                   | 1.2       | 1.7  |

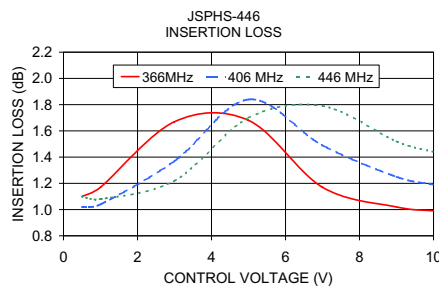
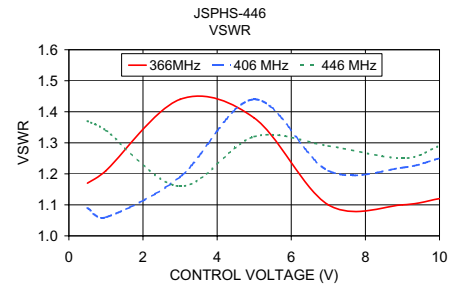
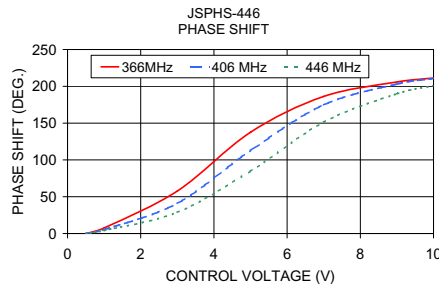
Maximum operating power, 0 dBm

DC input resistance at Control port: 6600 ohms typ.

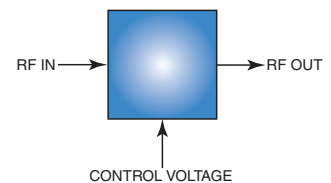
## Typical Performance Data

| Control Voltage (V) | Phase Shift* (Degrees) |         |         | VSWR (:1) |         |         | Insertion Loss (dB) |         |         |
|---------------------|------------------------|---------|---------|-----------|---------|---------|---------------------|---------|---------|
|                     | 366 MHz                | 406 MHz | 446 MHz | 366 MHz   | 406 MHz | 446 MHz | 366 MHz             | 406 MHz | 446 MHz |
| 0.50                | 0.05                   | 0.03    | 0.01    | 1.17      | 1.09    | 1.37    | 1.10                | 1.02    | 1.10    |
| 1.00                | 7.65                   | 5.43    | 4.14    | 1.21      | 1.06    | 1.34    | 1.17                | 1.04    | 1.08    |
| 3.00                | 57.73                  | 41.01   | 29.01   | 1.44      | 1.19    | 1.16    | 1.67                | 1.37    | 1.22    |
| 5.00                | 137.57                 | 112.81  | 84.75   | 1.38      | 1.44    | 1.32    | 1.68                | 1.84    | 1.70    |
| 7.00                | 186.22                 | 174.91  | 151.47  | 1.10      | 1.21    | 1.29    | 1.17                | 1.49    | 1.79    |
| 9.00                | 205.93                 | 203.06  | 189.91  | 1.10      | 1.22    | 1.25    | 1.02                | 1.25    | 1.52    |
| 10.00               | 211.22                 | 210.59  | 200.96  | 1.12      | 1.25    | 1.29    | 0.99                | 1.19    | 1.44    |

\* Normalized at control voltage = 0.5V



## electrical schematic



## Notes

- 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.
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