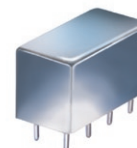


# Attenuator/Switch

50Ω Bi-Phase 1 to 200 MHz

PAS-3+



## Maximum Ratings

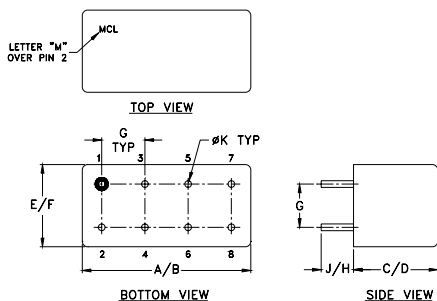
|                                                                 |                |
|-----------------------------------------------------------------|----------------|
| Operating Temperature                                           | -55°C to 100°C |
| Storage Temperature                                             | -55°C to 100°C |
| Control Current                                                 | 30mA           |
| Permanent damage may occur if any of these limits are exceeded. |                |

## Pin Connections

|             |         |
|-------------|---------|
| INPUT       | 1       |
| OUTPUT      | 8       |
| CONTROL     | 3,4^    |
| GROUND      | 2,5,6,7 |
| CASE GROUND | 2       |

^ pins must be connected together externally

## Outline Drawing



## Outline Dimensions (inch/mm)

| A     | B     | C    | D     | E    | F     |
|-------|-------|------|-------|------|-------|
| .770  | .800  | .385 | .400  | .370 | .400  |
| 19.56 | 20.32 | 9.78 | 10.16 | 9.40 | 10.16 |
| G     | H     | J    | K     |      |       |
| .200  | .20   | .14  | .031  |      |       |
| 5.08  | 5.08  | 3.56 | 0.79  |      |       |
|       |       |      |       |      | wt    |
|       |       |      |       |      | grams |
|       |       |      |       |      | 5.2   |

## Features

- wideband, 1 to 200 MHz
- hermetic case
- low insertion loss, 1.6 typ.
- excellent amplitude and phase unbalance

## Applications

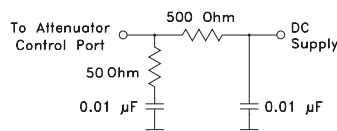
- military hi-rel applications
- bi-phase modulator
- electronic attenuator

## Attenuator/Switch Electrical Specifications

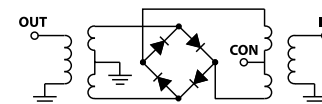
| FREQUENCY (MHz) | CON     | INSERTION LOSS (dB) |     |             |     | MAX. INPUT PWR (dBm) |           | IN-OUT ISOLATION (dB) |      |      |      |      |      | BI-PHASE $\bar{X}$ ( $\pm 20$ mA) Typ. |                                  |             |             |
|-----------------|---------|---------------------|-----|-------------|-----|----------------------|-----------|-----------------------|------|------|------|------|------|----------------------------------------|----------------------------------|-------------|-------------|
|                 |         | Mid-Band m          |     | Total Range |     | 1 dB compr.          | no damage | L                     | M    | U    |      |      |      | $\Delta$ AMP (dB)                      | Phase (deg.) deviation from 180° | Total Range | Total Range |
| 1-200           | DC-0.05 | 1.4                 | 2.0 | 1.6         | 2.5 | 15                   | 29        | Typ.                  | Min. | Typ. | Min. | Typ. | Min. | m                                      |                                  | m           |             |

L = low range [ $f_L$  to  $10 f_L$ ] M = mid range [ $10 f_L$  to  $f_U/2$ ] U = upper range [ $f_U/2$  to  $f_U$ ] m = [ $2 f_L$  to  $f_U/2$ ]  
Performance specifications apply for input power up to 10 dB below stated 1 dB compression.

## suggested control port biasing configuration



## electrical schematic



## Typical Performance Data

| Freq.<br>(MHz) | I. Loss<br>(dB)<br>at 20mA |          | ±Control<br>ΔΔAMP<br>(dB) | 20mA<br>ΔΔPhase<br>(deg.) | Isolation (dB)<br>(in-out) (in-con) |           | Input<br>R. Loss<br>(dB) | Control<br>Current<br>(mA) | Attenuation (dB) |            |            | Phase Δ ref at 15mA Ctrl |            |            | Input VSWR |            |            |
|----------------|----------------------------|----------|---------------------------|---------------------------|-------------------------------------|-----------|--------------------------|----------------------------|------------------|------------|------------|--------------------------|------------|------------|------------|------------|------------|
|                |                            |          |                           |                           |                                     |           |                          |                            | 1<br>MHz         | 100<br>MHz | 200<br>MHz | 1<br>MHz                 | 100<br>MHz | 200<br>MHz | 1<br>MHz   | 100<br>MHz | 200<br>MHz |
|                | $\bar{X}$                  | $\sigma$ | $\bar{X}$                 | $\bar{X}$                 | $\bar{X}$                           | $\bar{X}$ | $\bar{X}$                |                            |                  |            |            | deg.                     | deg.       | deg.       |            |            |            |
| 1.0            | 1.28                       | 0.002    | 0.01                      | 180.0                     | 78                                  | 52        | 23.5                     | 0.0000                     | 50.3             | 47.8       | 41.7       | 26.3                     | 69.1       | 69.7       | 13.6       | 11.6       | 8.1        |
| 2.0            | 1.14                       | 0.002    | 0.01                      | 180.0                     | 75                                  | 45        | 28.1                     | 0.0004                     | 47.0             | 47.3       | 41.2       | 19.0                     | 65.6       | 65.4       | 13.5       | 11.6       | 8.1        |
| 5.0            | 1.08                       | 0.002    | 0.01                      | 180.0                     | 69                                  | 38        | 35.4                     | 0.0013                     | 43.6             | 45.7       | 40.5       | 10.3                     | 50.0       | 58.2       | 13.3       | 11.5       | 8.0        |
| 10.0           | 1.09                       | 0.002    | 0.01                      | 180.0                     | 65                                  | 32        | 43.0                     | 0.0032                     | 40.7             | 43.3       | 39.0       | 5.7                      | 36.8       | 46.4       | 12.9       | 11.3       | 7.9        |
| 16.4           | 1.12                       | 0.002    | 0.01                      | 179.9                     | 63                                  | 28        | 42.7                     | 0.0085                     | 34.7             | 38.0       | 35.6       | 6.3                      | 20.9       | 29.7       | 12.5       | 10.9       | 7.7        |
| 24.9           | 1.16                       | 0.002    | 0.01                      | 179.9                     | 62                                  | 24        | 37.5                     | 0.0162                     | 33.0             | 33.5       | 32.0       | 6.6                      | 12.3       | 19.1       | 11.7       | 10.3       | 7.4        |
| 31.8           | 1.18                       | 0.002    | 0.01                      | 179.9                     | 61                                  | 22        | 35.2                     | 0.0336                     | 28.2             | 27.9       | 27.0       | 7.2                      | 7.0        | 10.3       | 10.5       | 9.2        | 6.8        |
| 46.8           | 1.23                       | 0.001    | 0.02                      | 179.8                     | 59                                  | 19        | 31.6                     | 0.0567                     | 24.5             | 23.9       | 23.1       | 7.5                      | 4.7        | 6.0        | 9.3        | 8.1        | 6.1        |
| 49.8           | 1.24                       | 0.001    | 0.02                      | 179.8                     | 59                                  | 19        | 31.0                     | 0.0807                     | 22.0             | 21.2       | 20.5       | 7.7                      | 3.9        | 4.3        | 8.3        | 7.3        | 5.6        |
| 62.2           | 1.26                       | 0.002    | 0.02                      | 179.8                     | 58                                  | 17        | 28.7                     | 0.1215                     | 19.1             | 18.2       | 17.5       | 7.5                      | 3.0        | 2.9        | 7.1        | 6.2        | 4.9        |
| 77.6           | 1.30                       | 0.001    | 0.02                      | 179.7                     | 57                                  | 15        | 26.4                     | 0.1860                     | 16.1             | 15.2       | 14.6       | 7.1                      | 2.4        | 1.8        | 5.8        | 5.1        | 4.2        |
| 93.0           | 1.32                       | 0.001    | 0.02                      | 179.6                     | 56                                  | 14        | 24.4                     | 0.2459                     | 14.2             | 13.3       | 12.8       | 6.5                      | 2.1        | 1.4        | 5.0        | 4.5        | 3.7        |
| 100.0          | 1.34                       | 0.001    | 0.02                      | 179.6                     | 55                                  | 13        | 23.5                     | 0.3285                     | 12.5             | 11.5       | 11.1       | 6.3                      | 1.8        | 1.1        | 4.3        | 3.8        | 3.2        |
| 108.0          | 1.35                       | 0.001    | 0.02                      | 179.6                     | 55                                  | 13        | 22.6                     | 0.4365                     | 10.8             | 9.9        | 9.6        | 5.7                      | 1.6        | 0.9        | 3.6        | 3.3        | 2.8        |
| 123.4          | 1.39                       | 0.001    | 0.02                      | 179.5                     | 54                                  | 12        | 21.0                     | 0.5714                     | 9.3              | 8.5        | 8.2        | 5.1                      | 1.4        | 0.7        | 3.1        | 2.8        | 2.5        |
| 138.8          | 1.46                       | 0.001    | 0.02                      | 179.5                     | 53                                  | 12        | 19.5                     | 1.3114                     | 5.6              | 5.2        | 5.1        | 3.3                      | 0.8        | 0.3        | 2.0        | 1.9        | 1.7        |
| 154.2          | 1.54                       | 0.001    | 0.02                      | 179.4                     | 52                                  | 11        | 18.2                     | 2.0989                     | 4.2              | 3.9        | 3.9        | 2.3                      | 0.6        | 0.3        | 1.6        | 1.6        | 1.5        |
| 169.2          | 1.62                       | 0.001    | 0.02                      | 179.5                     | 51                                  | 11        | 17.0                     | 3.7220                     | 2.9              | 2.8        | 2.9        | 1.3                      | 0.3        | 0.1        | 1.3        | 1.3        | 1.3        |
| 184.6          | 1.73                       | 0.001    | 0.02                      | 179.5                     | 51                                  | 11        | 15.9                     | 7.0357                     | 2.0              | 2.0        | 2.2        | 0.5                      | 0.2        | 0.0        | 1.2        | 1.2        | 1.2        |
| 200.0          | 1.84                       | 0.002    | 0.03                      | 179.6                     | 50                                  | 11        | 14.8                     | 15.1415                    | 1.4              | 1.5        | 1.8        | 0.0                      | 0.0        | 0.0        | 1.1        | 1.1        | 1.1        |

