

Plug-In Attenuator/Switch

50Ω Bi-Phase 2 to 400 MHz

TFAS-1+ TFAS-1



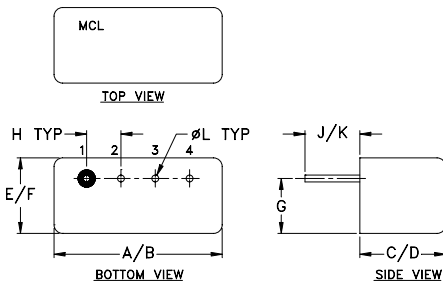
Maximum Ratings

| | |
|-----------------------|----------------|
| Operating Temperature | -55°C to 100°C |
| Storage Temperature | -55°C to 100°C |
| Control Current | 30mA |

Pin Connections

| | |
|-------------|---|
| INPUT | 1 |
| OUTPUT | 4 |
| CONTROL | 2 |
| GROUND | 3 |
| CASE GROUND | 3 |

Outline Drawing



Outline Dimensions (inch/mm)

| A | B | C | D | E | F |
|-------|-------|------|------|------|-------|
| .480 | .500 | .240 | .255 | .210 | .230 |
| 12.19 | 12.70 | 6.10 | 6.48 | 5.33 | 5.84 |
| G | H | J | K | L | wt |
| .16 | .100 | .14 | .20 | .020 | grams |
| 4.06 | 2.54 | 3.56 | 5.08 | 0.51 | 1.9 |

Features

- wideband, 2 to 400 MHz
- excellent amplitude and phase unbalance
- low conversion loss, 1.6 dB typ.

Applications

- electronic attenuator

CASE STYLE: B02

PRICE: \$16.20 ea. QTY. (1-9)

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

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

Attenuator/Switch Electrical Specifications

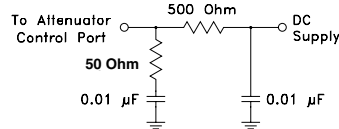
| FREQUENCY (MHz) | INSERTION LOSS (dB) ±20 mA | MAX. INPUT PWR (dBm) ±20 mA | IN-OUT ISOLATION (dB) 0 mA | | | BI-PHASE X (±20 mA) Typ. | | | |
|--------------------------------------|----------------------------|-----------------------------|----------------------------|-----------|-------------------|--------------------------|----------------------------------|-------------|-------------|
| | | | L | M | U | Δ AMP (dB) | Phase (deg.) deviation from 180° | | |
| IN f _L -f _U | Mid-Band m Typ. Max. | Total Range Typ. Max. | 1 dB compr. | no damage | Typ. Min. | Typ. Min. | Typ. Min. | Total Range | Total Range |
| 2-400 | DC-0.05 | 1.4 2.0 1.6 3.0 | 20* | 25 | 65 45 45 33 35 25 | 0.1 0.1 0.1 | 0.1 2.0 | | |

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]

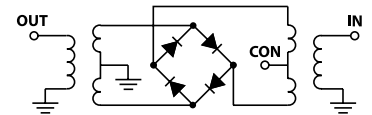
* 15 dBm from 2-10 MHz.

Performance specifications apply for input power up to 10 dB below stated 1 dB compression.

suggested control port biasing configuration

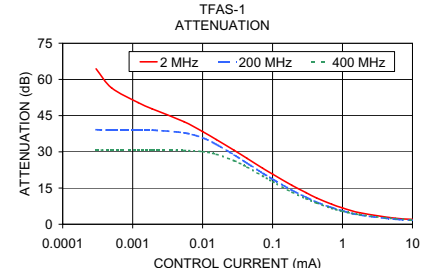
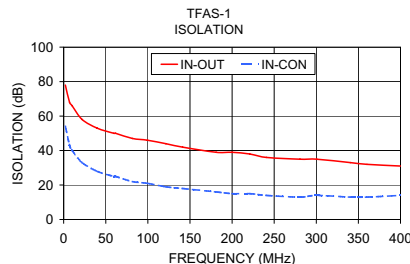
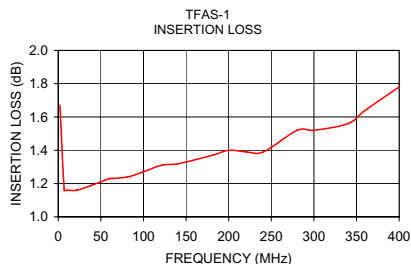


electrical schematic



Typical Performance Data

| Freq. (MHz) | I. Loss (dB) at 20mA | ±Control Δ AMP (dB) | 20mA Δ Phase (deg.) | Isolation (dB) | | Input R. Loss (dB) | Control Current (mA) | Attenuation (dB) | | | Phase Δ ref at 15mA Ctrl | | | Input VSWR | | | |
|-------------|----------------------|---------------------|---------------------|----------------|----------|--------------------|----------------------|------------------|----------|----------|--------------------------|----------|----------|------------|----------|----------|-----|
| | | | | (in-out) | (in-con) | | | 100 MHz | 1000 MHz | 2000 MHz | 100 MHz | 1000 MHz | 2000 MHz | 100 MHz | 1000 MHz | 2000 MHz | |
| 2.0 | 1.67 | 0.000 | 0.01 | 179.9 | 78 | 54 | 18.1 | 0.0000 | 72.7 | 39.0 | 30.6 | 27.2 | -87.7 | -95.3 | 7.7 | 7.2 | 4.4 |
| 7.0 | 1.16 | 0.001 | 0.00 | 180.0 | 68 | 43 | 15.4 | 0.0003 | 64.4 | 39.2 | 30.7 | 22.2 | -86.0 | -94.6 | 7.7 | 7.2 | 4.4 |
| 10.0 | 1.16 | 0.001 | 0.00 | 180.0 | 66 | 40 | 27.6 | 0.0005 | 56.5 | 39.0 | 30.8 | 28.6 | -84.3 | -93.7 | 7.6 | 7.2 | 4.4 |
| 21.9 | 1.16 | 0.001 | 0.00 | 180.0 | 58 | 33 | 31.0 | 0.0012 | 50.4 | 39.0 | 30.7 | 17.6 | -80.5 | -92.0 | 7.6 | 7.2 | 4.4 |
| 39.8 | 1.19 | 0.001 | 0.00 | 180.1 | 53 | 28 | 31.9 | 0.0019 | 47.8 | 39.0 | 30.7 | 14.1 | -77.4 | -90.3 | 7.5 | 7.2 | 4.4 |
| 59.7 | 1.23 | 0.001 | 0.00 | 180.1 | 50 | 25 | 32.1 | 0.0054 | 42.5 | 37.9 | 30.6 | 8.2 | -56.2 | -79.9 | 7.4 | 7.0 | 4.3 |
| 61.7 | 1.23 | 0.001 | 0.00 | 180.1 | 50 | 25 | 32.1 | 0.0100 | 38.4 | 35.8 | 30.1 | 7.6 | -37.3 | -67.6 | 7.2 | 6.9 | 4.3 |
| 81.6 | 1.24 | 0.001 | 0.00 | 180.2 | 47 | 22 | 32.2 | 0.0157 | 35.1 | 33.1 | 29.0 | 8.8 | -25.3 | -55.1 | 7.1 | 6.7 | 4.2 |
| 99.5 | 1.27 | 0.001 | 0.00 | 180.2 | 46 | 21 | 32.3 | 0.0284 | 30.6 | 28.7 | 26.3 | 8.8 | -12.8 | -37.6 | 6.7 | 6.3 | 4.0 |
| 121.4 | 1.31 | 0.001 | 0.01 | 180.3 | 44 | 19 | 32.4 | 0.0433 | 27.3 | 25.3 | 23.7 | 9.2 | -7.2 | -26.9 | 6.3 | 5.9 | 3.8 |
| 141.3 | 1.32 | 0.001 | 0.01 | 180.4 | 42 | 18 | 32.4 | 0.0722 | 23.2 | 21.2 | 20.0 | 9.3 | -3.1 | -17.7 | 5.6 | 5.3 | 3.5 |
| 181.1 | 1.37 | 0.001 | 0.01 | 180.6 | 39 | 16 | 32.2 | 0.1012 | 20.7 | 18.6 | 17.6 | 9.0 | -1.4 | -13.2 | 5.2 | 4.9 | 3.3 |
| 200.0 | 1.40 | 0.001 | 0.01 | 180.6 | 39 | 15 | 32.0 | 0.1898 | 16.1 | 14.1 | 13.3 | 8.2 | 0.4 | -8.0 | 4.1 | 3.9 | 2.8 |
| 220.9 | 1.39 | 0.001 | 0.01 | 180.8 | 38 | 15 | 31.6 | 0.3008 | 13.1 | 11.2 | 10.6 | 7.4 | 0.9 | -5.5 | 3.4 | 3.2 | 2.4 |
| 240.8 | 1.39 | 0.001 | 0.01 | 180.9 | 36 | 14 | 30.3 | 0.4259 | 10.9 | 9.2 | 8.8 | 6.7 | 1.1 | -4.2 | 2.9 | 2.7 | 2.1 |
| 280.6 | 1.52 | 0.001 | 0.05 | 181.1 | 35 | 13 | 26.6 | 0.7017 | 8.3 | 6.9 | 6.6 | 5.4 | 1.1 | -2.8 | 2.2 | 2.1 | 1.7 |
| 300.5 | 1.52 | 0.001 | 0.04 | 181.1 | 35 | 14 | 24.8 | 0.9968 | 6.8 | 5.6 | 5.4 | 4.4 | 0.9 | -2.1 | 1.9 | 1.8 | 1.5 |
| 340.3 | 1.56 | 0.001 | 0.03 | 181.4 | 33 | 13 | 21.4 | 1.7486 | 4.8 | 3.9 | 4.0 | 3.0 | 0.7 | -1.3 | 1.5 | 1.5 | 1.3 |
| 360.2 | 1.64 | 0.002 | 0.06 | 181.6 | 32 | 13 | 19.8 | 5.6920 | 2.5 | 2.1 | 2.3 | 0.9 | 0.2 | -0.3 | 1.2 | 1.1 | 1.2 |
| 400.0 | 1.78 | 0.003 | 0.09 | 181.7 | 31 | 14 | 17.1 | 15.1258 | 1.8 | 1.5 | 1.8 | 0.0 | 0.0 | 0.1 | 1.3 | 1.1 | 1.3 |



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