

Voltage Variable Attenuator

824 - 960 MHz

V 1.00

AT65-0009

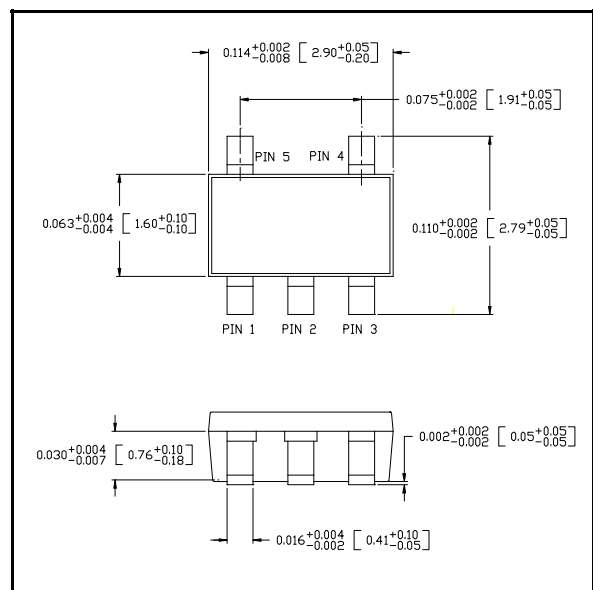
Features

- 25 dB Attenuation Range
- High IP3
- Excellent Linearity Performance
- Surface Mount SOT-25 Package
- Low Cost/High Performance
- 50 Ohm Nominal Impedance

Description

M/A-COM's AT65-0009 is an integrated assembly containing two PIN diodes and a passive glass quadrature hybrid. This device is packaged in a 5 leaded SOT plastic surface mount package. The diodes are biased to +3.5V for maximum attenuation using the suggested Bias Circuit. The AT65-0009 is ideally suited for GSM communication applications requiring variable attenuation in the 824 to 960 MHz bandwidth.

SOT-25



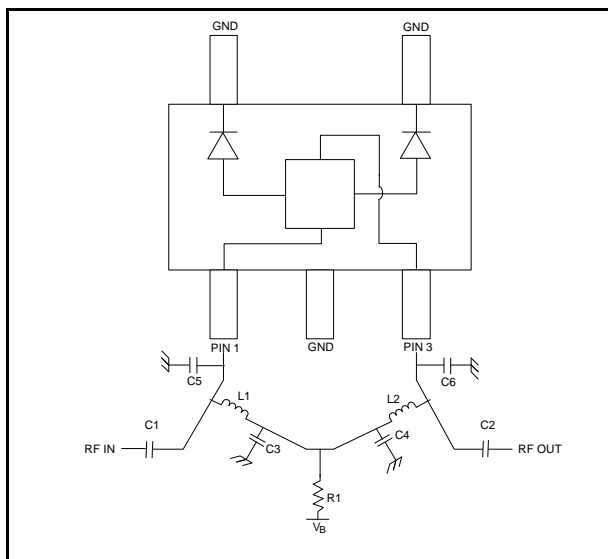
Electrical Specifications: $T_A = 25^\circ\text{C}$, $Z_0 = 50\Omega$

| Parameter | Test Conditions | Units | Min. | Typ. | Max. |
|------------------------------------|--|-----------------|------|------|------|
| Insertion Loss | $V_B = 0V$ | dB | — | 1.7 | 2.1 |
| VSWR | | Ratio | — | 1.7 | 2.2 |
| Attenuation Flatness vs. Frequency | 0 - 10 dB | dB | — | 0.5 | 1.3 |
| | 0 - 20 dB | dB | — | 0.5 | 1.3 |
| | 0 - 30 dB | dB | — | 1.0 | 2.5 |
| Switching Speed | 50% control to 90%/10% RF | μSec | — | 5.0 | 7.0 |
| Input IP3 | Two Tones 900 MHz, 905 MHz, +5 dBm $V_B = 0V$ | dB | — | 40 | — |
| Input IP2 | Two Tones 900 MHz, 905 MHz, +5 dBm $V_B = 0V$ | dB | — | 34 | — |
| Attenuation | $V_B = 3.7V$ | dB | 25 | 28 | — |

Pin Configuration

| Pin # | Function |
|-------|-------------|
| 1 | RFIN V_B |
| 2 | GND |
| 3 | RFOUT V_B |
| 4 | GND |
| 5 | GND |

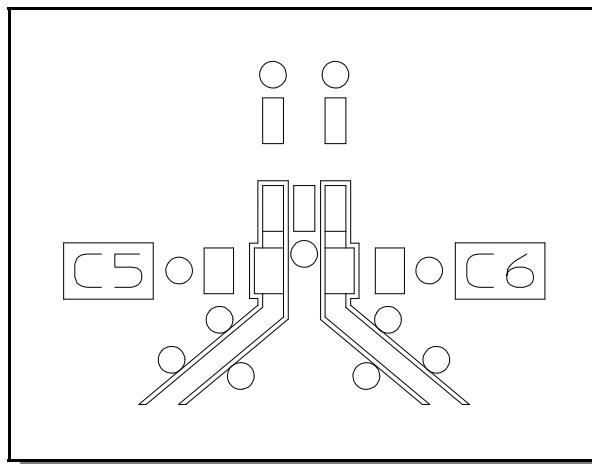
Functional Diagram and Bias Circuitry

External Circuitry Parts ⁴

| Part | Value | Purpose |
|-----------------|---------|------------------|
| C1 | 390 pF | DC Block |
| C2 | 390 pF | DC Block |
| C3 | 390 pF | By-pass |
| C4 | 390 pF | By-pass |
| L1 | 180 nH | RF Choke |
| L2 | 180 nH | RF Choke |
| R1 | 10 kOhm | Current Limiting |
| C5 ⁵ | 1.5 pF | RF Tune |
| C6 ⁵ | 1.5 pF | RF Tune |

4. All external circuitry parts are readily available, low cost surface mount components (.060 in. x .030 in or .080 in x .050 in.).
5. See Application Note MA-C-05010008A for external tuning capacitor values to suit specific Communication Bandwidths.

Recommended PCB Configuration



1. Circuit Material = FR-4, TETRA II, 0.031 inches thick.
2. Line Width = 0.025 inches, Line Spacing = 0.0056 inches.

Absolute Maximum Ratings ³

| Parameter | Absolute Maximum |
|-----------------------|------------------|
| Max Input Power | +27 dBm |
| Operating Voltage | +5 V |
| Operating Temperature | -40°C to +85°C |
| Storage Temperature | -65°C to +125°C |

3. Operation of this device above any one of these parameters may cause permanent damage.

Ordering Information

| Part Number | Package |
|--------------|-----------------------------|
| AT65-0009 | Bulk Packaging |
| AT65-0009TR | Tape and Reel (1K Reel) |
| AT65-0009-TB | Units Mounted on Test Board |

Specifications subject to change without notice.

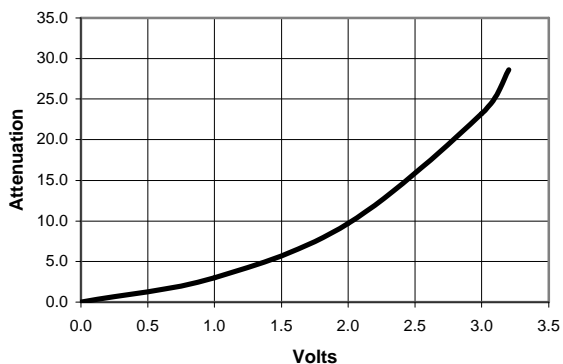
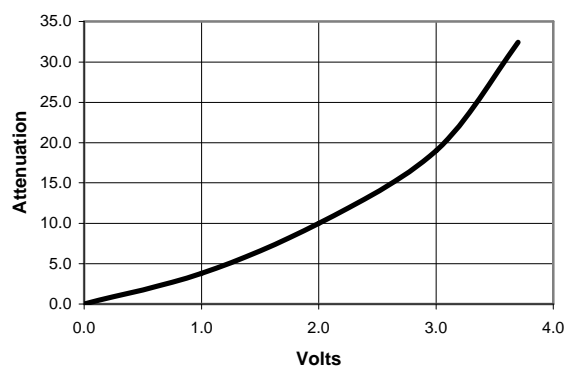
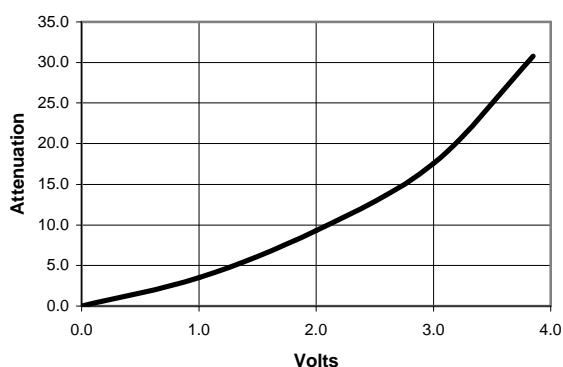
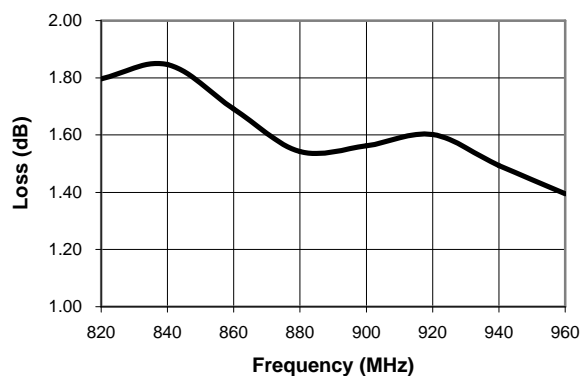
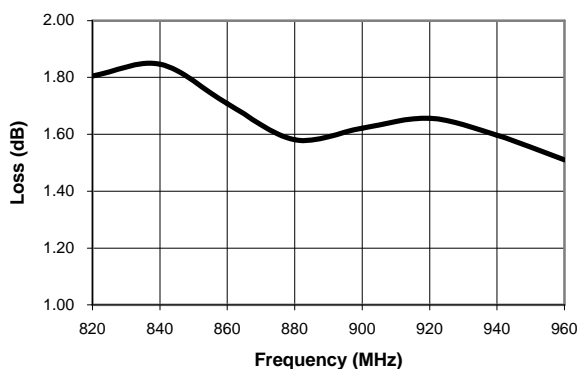
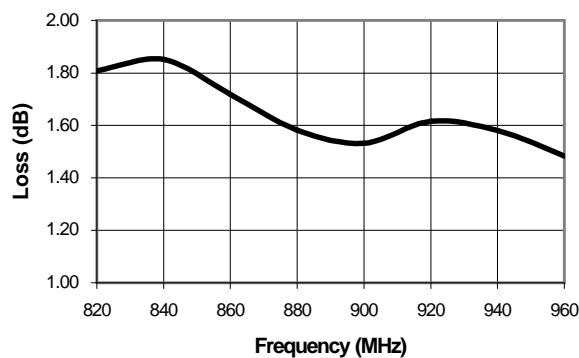
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- Asia/Pacific: Tel.+81-44-844-8296, Fax +81-44-844-8298
- Europe: Tel. +44 (1344) 869 595, Fax+44 (1344) 300 020

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Typical Performance Curves

Attenuation vs. Voltage with 1.5 pF
Tuning Cap @ -40°CAttenuation vs. Voltage with 1.5 pF
Tuning Cap @ +85°CAttenuation vs. Voltage with 1.5 pF
Tuning Cap @ +25°CLoss vs. Frequency @ -40°C
No Tuning CapLoss vs. Frequency @ +85°C
No Tuning CapLoss vs. Frequency @ +25°C
No Tuning Cap

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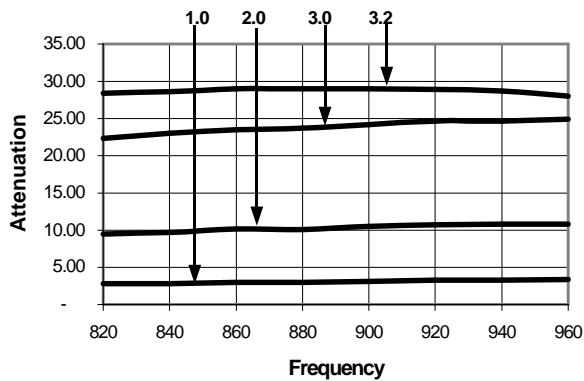
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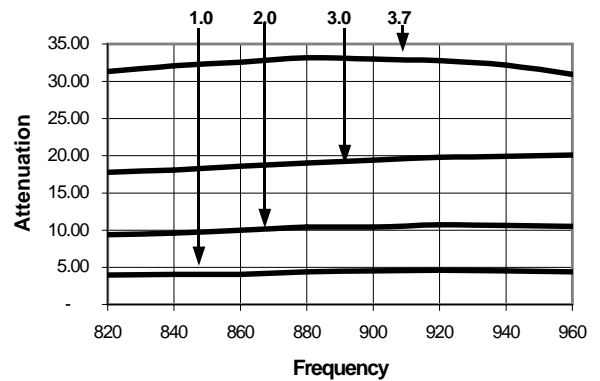
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Typical Performance Curves

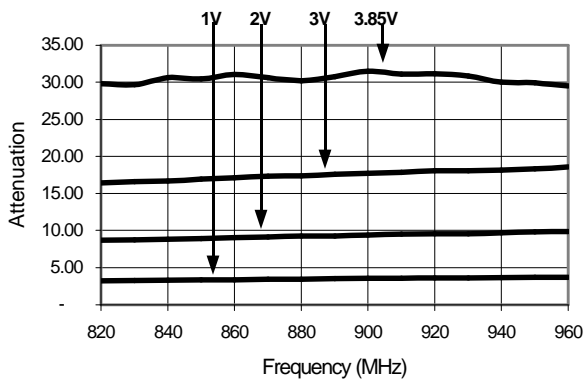
Attenuation vs. Freq. With 1.5 pF Tuning Cap @ -40°C



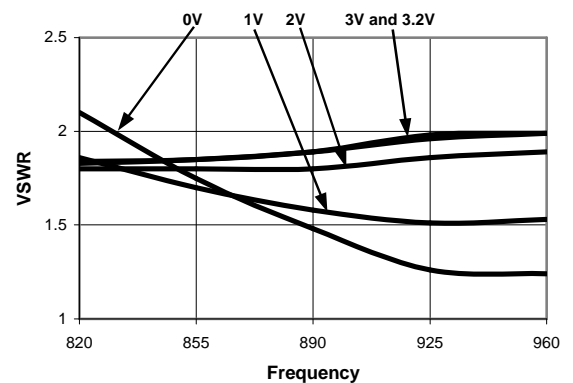
Attenuation vs. Freq. With 1.5 pF Tuning Cap @ +85°C



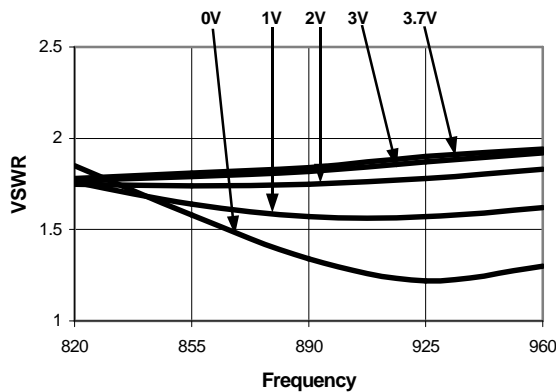
Attenuation vs. Freq. With 1.5 pF Tuning Cap @ +25°C



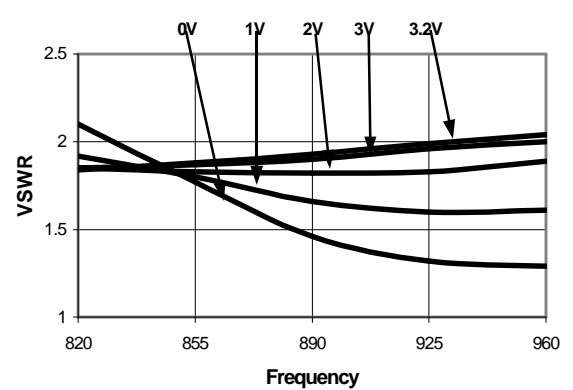
Input VSWR vs. Freq. With 1.5 pF Tuning Cap @ -40°C



Input VSWR vs. Freq. With 1.5 pF Tuning Cap @ +85°C



Input VSWR vs. Freq. With 1.5 pF Tuning Cap @ +25°C



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