

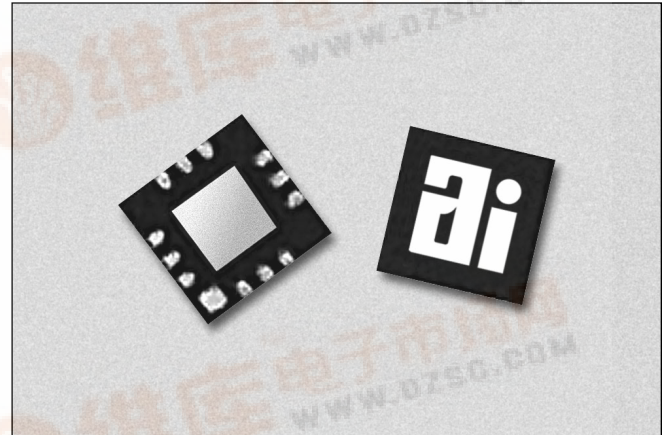
GaAs IC 25 dB Voltage Variable Attenuator 2.7–4.0 GHz



AV141-321

Features

- Power Control for 3.5 GHz Fixed Wireless Applications
- Minimum 25 dB Attenuation
- Positive 0.2–1.2 V Control Voltage
- QFN-12 3 x 3 mm Package
- Low Cost
- No External Components Needed



Description

The AV141-321 is a GaAs IC PHEMT voltage variable attenuator that has been designed for WLAN applications. Operating from 2.7–4.0 GHz, the AV141-321 is ideal for low cost applications such as 3.5 GHz fixed wireless LAN power control applications.

Absolute Maximum Ratings

| Characteristic | Value |
|-----------------------|--------------------|
| RF Input Power | 1 W Max. > 500 MHz |
| Control Voltage | -0.2 V, +6 V |
| Operating Temperature | -40°C to +85°C |
| Storage Temperature | -65°C to +150°C |

1. All measurements made in a 50 Ω system, unless otherwise specified.
2. For worst case state.

Electrical Specifications at 25°C

| Parameter | Frequency | Min. | Typ. | Max. | Unit |
|--------------------------------------|-------------|------|------|------|------|
| Insertion Loss ($V_C = 1.2$ V) | 2.7–4.0 GHz | | 0.7 | 1.0 | dB |
| Maximum Attenuation ($V_C = 0.2$ V) | 2.7–4.0 GHz | 25 | 30 | | dB |
| VSWR — All Ports | 2.7–4.0 GHz | | 1.5 | 1.8 | |

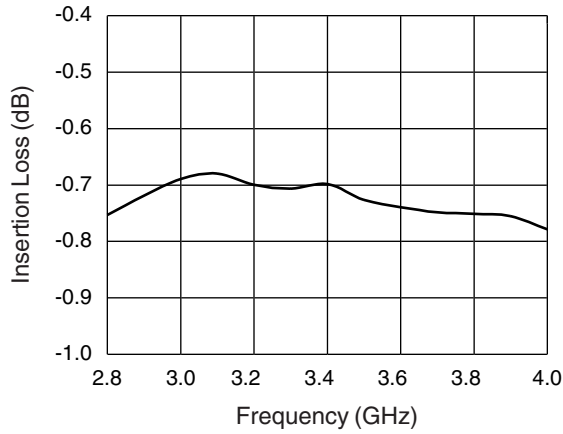
Operating Characteristics at 25°C (0, +1.2 V)

| Parameter | Condition | Frequency | Min. | Typ. | Max. | Unit |
|--|----------------------------------|-------------|------|------|------|------|
| Switching Characteristics | Rise, Fall (10/90% or 90/10% RF) | | 80 | 50 | | ns |
| | On, Off (50% CTL to 90/10% RF) | | | 150 | | ns |
| | Video Feedthru | | | 25 | | mV |
| Maximum Input Power for < 1 dB Attenuation Variation | | 2.7–4.0 GHz | | 13 | | dBm |
| Input 3rd Order Intercept Point (IIP3) | | 2.7–4.0 GHz | | 20 | | dBm |
| Control Voltage | | | 0.2 | | 1.2 | V |

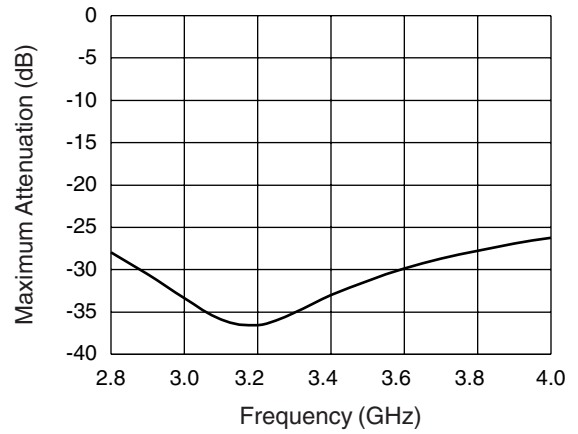
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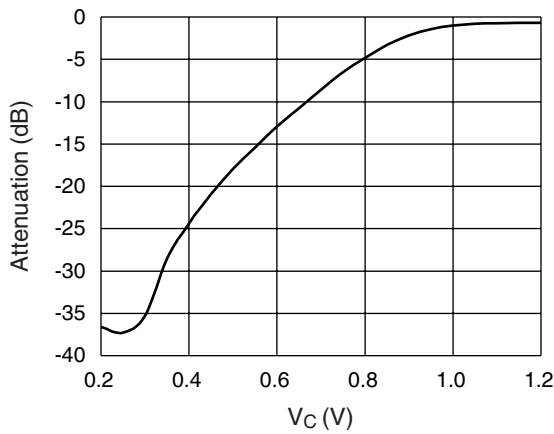
Typical Performance Data at 25°C



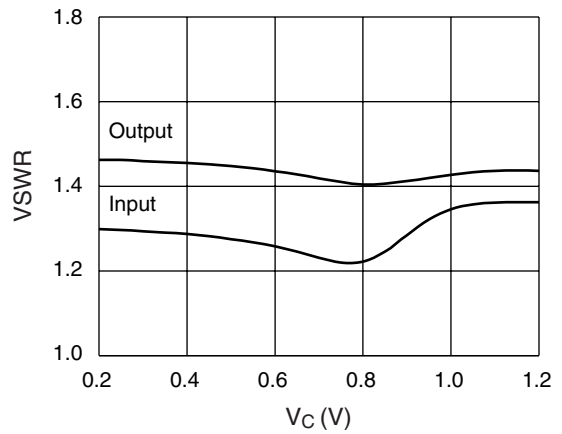
Insertion Loss vs. Frequency



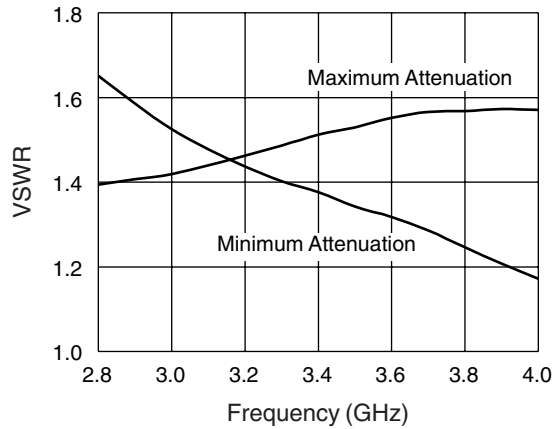
Maximum Attenuation vs. Frequency



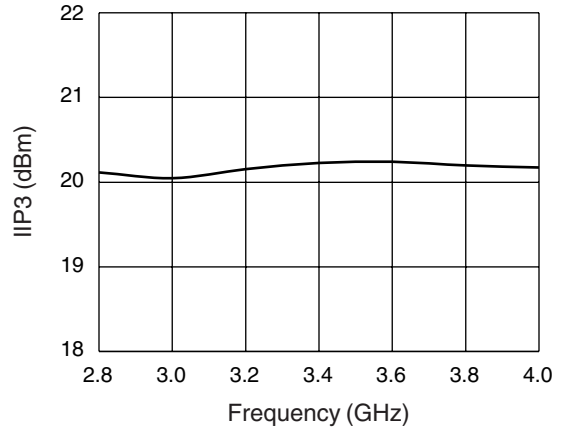
Attenuation vs. Control Voltage



VSWR vs. Control Voltage

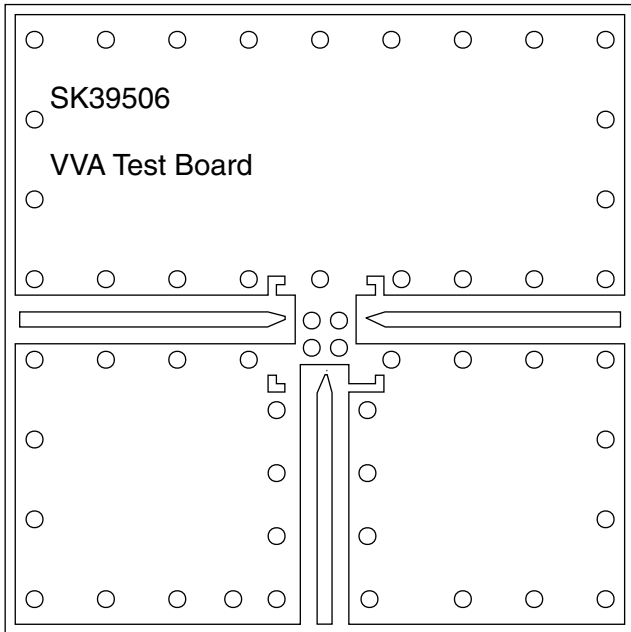


Output VSWR vs. Frequency

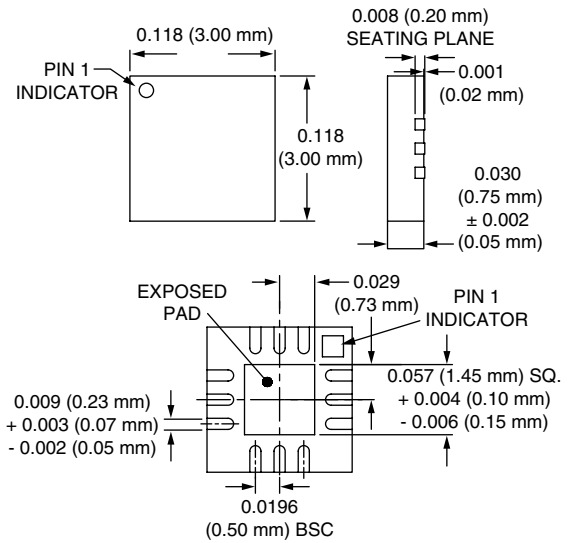


Input IP3 vs. Frequency

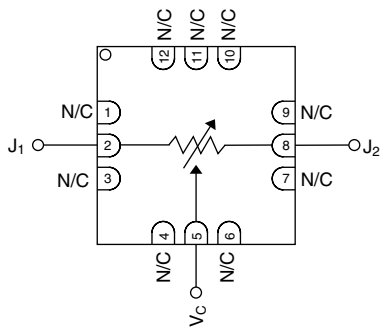
Evaluation Board Layout



QFN-12



Pin Out



Ground is connected to paddle on bottom.

Typical S-Parameters (Control Voltage 0/+1.2 V)

| Insertion Loss State # GHZ S MA R 50 | | | | | | | | | High Attenuation State # GHZ S MA R 50 | | | | | | | |
|---|-----------------|------------------|-----------------|------------------|-----------------|------------------|-----------------|------------------|---|------------------|-----------------|------------------|-----------------|------------------|-----------------|------------------|
| Freq. (GHz) | S ₁₁ | S _{11a} | S ₂₁ | S _{21a} | S ₁₂ | S _{12a} | S ₂₂ | S _{22a} | S ₁₁ | S _{11a} | S ₂₁ | S _{21a} | S ₁₂ | S _{12a} | S ₂₂ | S _{22a} |
| 2.5 | 0.330 | 66.05 | 0.887 | -135.38 | 0.913 | -135.67 | 0.312 | 45.02 | 0.160 | 5.13 | 0.074 | 126.57 | 0.074 | 126.20 | 0.161 | -18.79 |
| 3.0 | 0.242 | 18.19 | 0.914 | -175.58 | 0.946 | -175.25 | 0.210 | -22.04 | 0.129 | -40.89 | 0.021 | 46.26 | 0.021 | 46.12 | 0.172 | -71.10 |
| 3.5 | 0.165 | -33.76 | 0.913 | 144.77 | 0.951 | 144.79 | 0.145 | -94.37 | 0.152 | -97.28 | 0.026 | -107.80 | 0.026 | -107.54 | 0.209 | -118.44 |
| 4.0 | 0.070 | -68.30 | 0.916 | 103.60 | 0.959 | 103.52 | 0.080 | -152.16 | 0.134 | -151.61 | 0.046 | -178.59 | 0.047 | -179.41 | 0.224 | -161.45 |

Measured S-Parameters include the evaluation board.