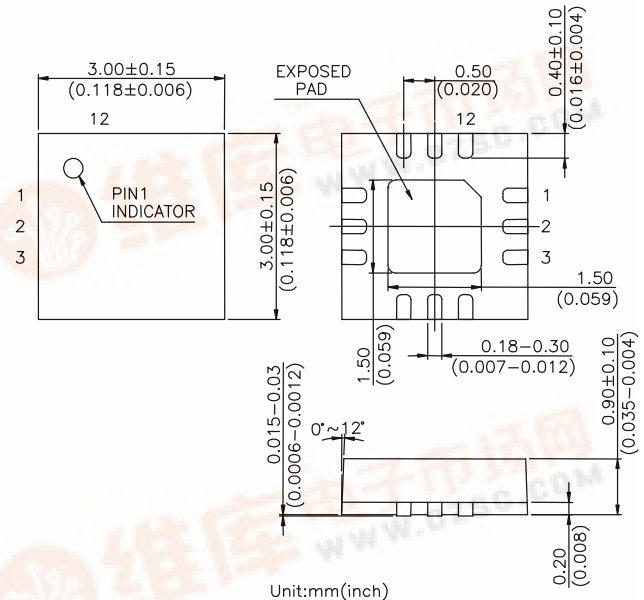




## Features

- **Low Insertion Loss** : 0.9 dB @ 2.50 GHz  
1.0 dB @ 3.5 GHz
- **Isolation**: 22 dB @ 2.50 GHz  
20 dB @ 3.5GHz
- **Low DC Power Consumption**
- **Miniature QFN12L (3x3 mm) Plastic Lead (Pb) Free Package, RoHS Compliant**
- **PHEMT process**

## QFN12L (3 x 3 mm)



## Description

The HWS499 is a GaAs PHEMT MMIC DPDT switch operating at DC-4 GHz in a low cost miniature QFN12L (3 x 3 mm) plastic lead (Pb) free package. The HWS499 features low insertion loss and high isolation with very low DC power consumption. This switch can be used in WiMAX or IEEE 802.11b/g WLAN systems for combination of transmit/receive and antenna diversity functions.

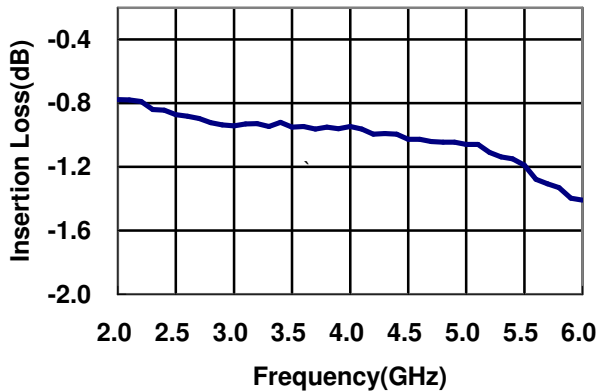
## Electrical Specifications at 25 °C with 0, +3V Control Voltages

| Parameter                        | Test Conditions | Min. | Typ. | Max. | Unit |
|----------------------------------|-----------------|------|------|------|------|
| Insertion Loss                   | 2.30-2.70 GHz   |      | 0.9  | 1.1  | dB   |
|                                  | 3.30-3.90GHz    |      | 1.0  | 1.3  | dB   |
|                                  |                 |      |      |      | dB   |
| Isolation<br>(on-off or off-on)  | 2.30-2.70 GHz   | 20.0 | 22   |      | dB   |
|                                  | 3.30-3.90 GHz   | 17.0 | 20   |      | dB   |
|                                  |                 |      |      |      | dB   |
| Input Power for 1 dB Compression | 2.00-4.00 GHz   | 37   | 38   |      | dBm  |
| Control Current                  |                 |      | 5    | 200  | uA   |

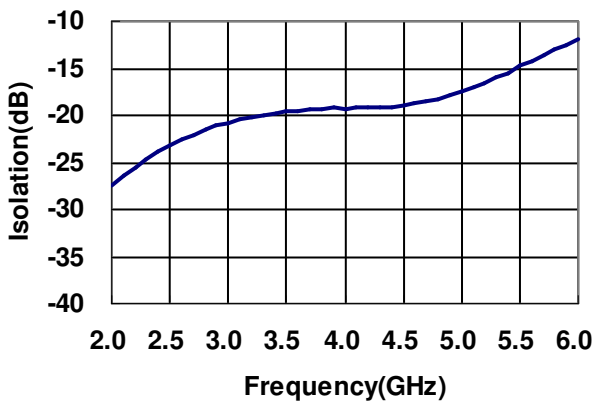
Note: All measurements made in a 50 Ohm system with 0/+3.0V control voltages, unless otherwise specified.

## Typical Performance Data with 8pF Capacitors @ +25 °C

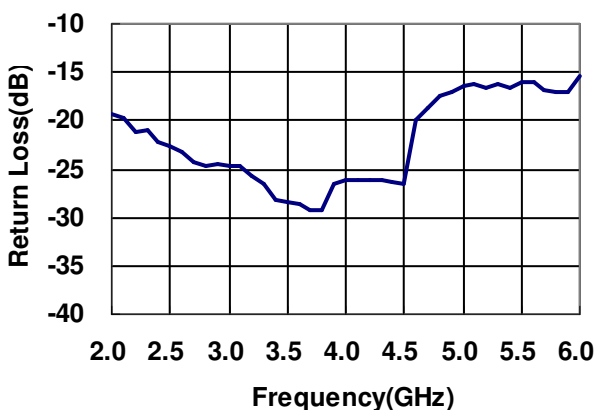
### Insertion Loss vs Frequency



### Isolation vs Frequency



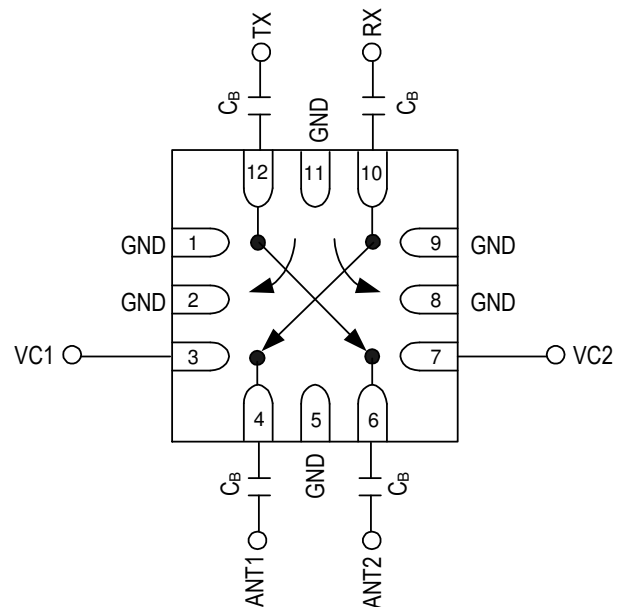
### Return Loss vs Frequency



## Absolute Maximum Ratings

| Parameter             | Absolute Maximum  |
|-----------------------|-------------------|
| RF Input Power        | +36 dBm @ +3V     |
| Control Voltage       | +6V               |
| Operating Temperature | -40 °C to +85 °C  |
| Storage Temperature   | -65 °C to +150 °C |

## Pin Out (Top View)



Note:

- DC blocking capacitors  $C_B=8\text{pF}$  are required on all RF ports.
- Exposed pad in the bottom must be connected to ground by via holes.
- TX and RX ports can be used interchangeably.

## Logic Table for Switch On-Path

| VC1 | VC2 | ANT1-RX | ANT1-TX | ANT2-TX | ANT2-RX |
|-----|-----|---------|---------|---------|---------|
| 1   | 0   | On      | Off     | On      | Off     |
| 0   | 1   | Off     | On      | Off     | On      |
| 1   | 1   | Off     | Off     | Off     | Off     |
| 0   | 0   | Off     | Off     | Off     | Off     |

'1' = +3V to +5V

'0' = 0V to +0.2V