**HE X A WAVE**

## Features

- **Two Inputs, Two Outputs Switch Matrix**
- **High Isolation**
- **Low DC Power Consumption**
- **Small TSSOP-16 Plastic Lead(Pb) Free Package**
- **PHEMT process**
- **Lead Free and RoHS Compliant Version of HWS417**

## TSSOP-16



## Description

The HWS433 is a GaAs PHEMT 2x2 switch matrix operating at 0.95 to 2.15 GHz in a low cost TSSOP-16 plastic lead (Pb) free package. Any of the two inputs can be directed to any of the two outputs. The HWS433 is suitable for use in Direct Broadcast Satellite (DBS) switching system or CATV applications.
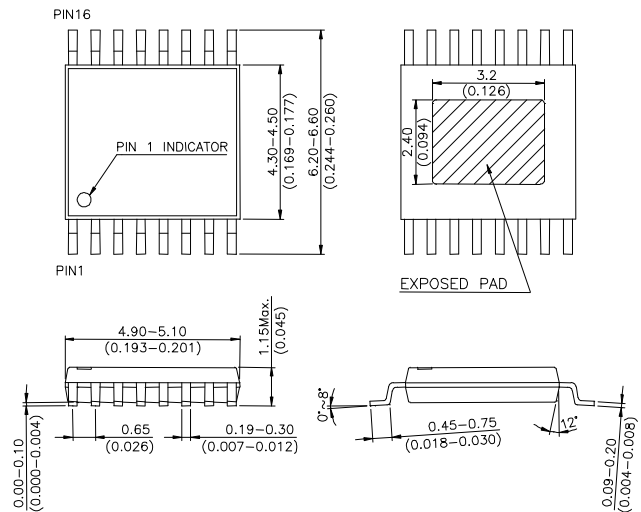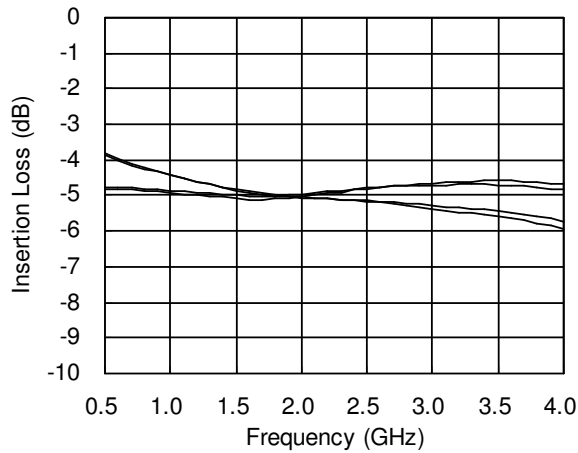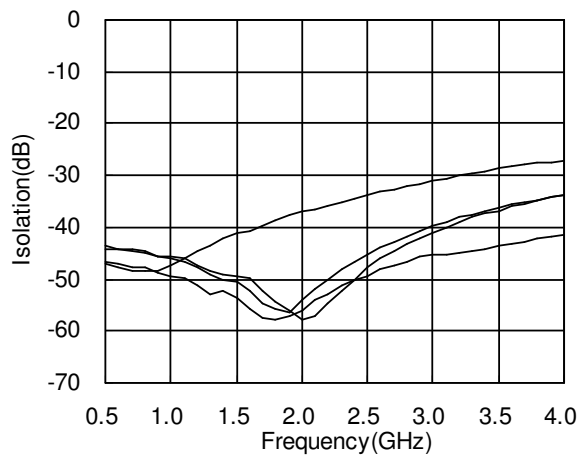
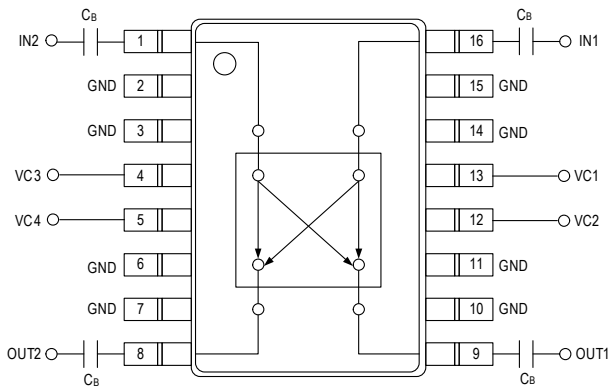## Electrical Specifications at 25°C with 0V/+5V Control Voltages and 0 dBm Pin

| Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| Insertion Loss | 0.95-2.15 GHz | | 5.0 | 7.0 | dB |
| Insertion Loss Flatness | 0.95-1.70 GHz<br>0.95-2.15 GHz | | 0.5<br>0.8 | | dB<br>dB |
| Isolation (Above Insertion Loss) | 0.95-1.70 GHz<br>1.70-2.15 GHz | 33<br>30 | 39<br>36 | | dB<br>dB |
| Output Return Loss | 0.95-2.15 GHz | | 13 | | dB |
| Control Current | | | | 200 | uA |

Note: 1. All measurements made in a 50 ohm system with 0/+5.0V control voltages, unless otherwise specified.

2. 'Isolation (Above Insertion Loss)' = │ 'isolation (off-state)' – 'insertion loss (on-state)' │

## Typical Performance Data of Various States @ +25℃

### Insertion Loss vs Frequency

### Input Return Loss

Input Selected
------- Input Deselected
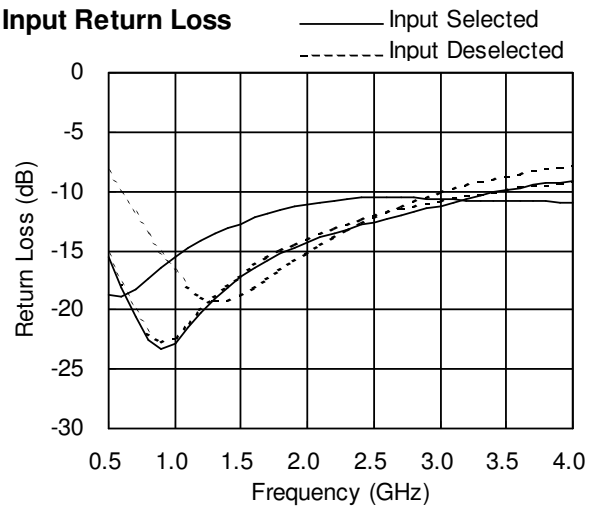
### Isolation* vs Frequency

### Output Return Loss
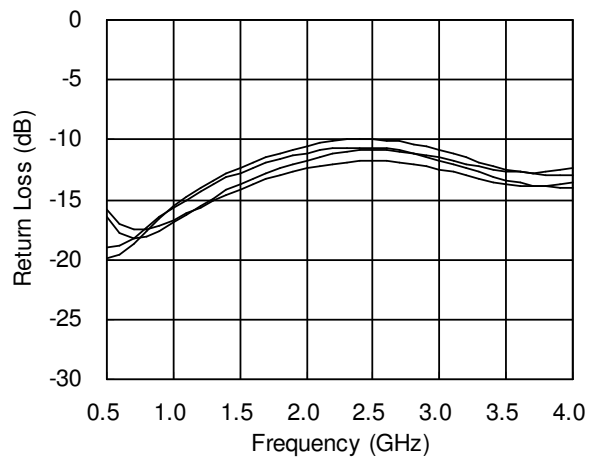
* Isolation is recorded above insertion loss.

## Pin Out (Top View)



Note:
1. DC blocking capacitors $C_B$=51pF are required on all RF ports.
2. Exposed pad in the bottom must be connected to ground by via holes.

## Absolute Maximum Ratings

| Parameter | Absolute Maximum |
|---|---|
| RF Input Power | +15 dBm @ +6V |
| Control Voltage | +6V |
| Operating Temperature | -40°C to +85°C |
| Storage Temperature | -65°C to +150°C |

## Logic Table for Switch On-Path

| On Path | | Control Pins | | | |
|---|---|---|---|---|---|
| OUT1 | OUT2 | VC1 | VC2 | VC3 | VC4 |
| IN1 | - | 0 | 1 | - | - |
| IN2 | - | 1 | 0 | - | - |
| - | IN1 | - | - | 1 | 0 |
| - | IN2 | - | - | 0 | 1 |

'1' = +5V
'0' = 0V

## Recommended Operating Conditions ($T_A$=+25$^o$C)

| Parameter | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|
| Control Voltage (1) | +4.5 | +5.0 | +5.5 | V |
| Control Voltage (0) | -0.5 | 0 | +0.5 | V |