

# PHEMT GaAs IC Dual Band Dual Tx/Rx Diversity Switch

AS161-86

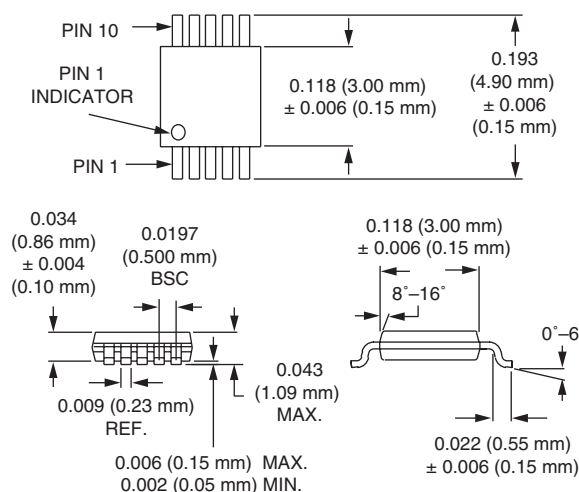
## Features

- Six RF Ports
- Ideal for Dual PA Line-Ups
- Ideal for Dual Rx Systems
- Differential Biasing for High Linearity

## Description

The AS161-86 PHEMT FET IC is a dual transfer switch. It is ideal for dual band application where Tx/Rx diversity is required. The switch has 4 control lines that may be positive, negative or a combination of both (differential biasing). This switch is designed for commercial wireless applications such as GSM, DCS and PCS systems. It requires DC blocks on the RF ports when positive voltage is used.

## MSOP-10



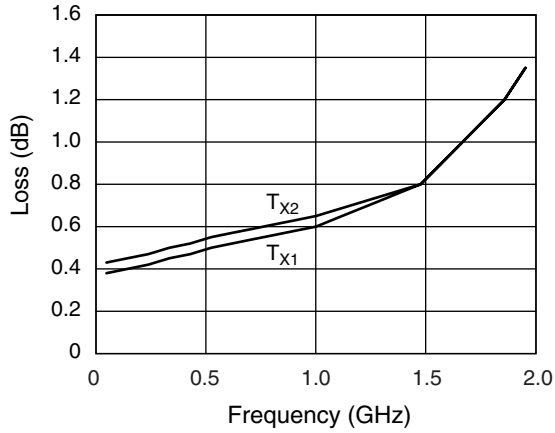
## Electrical Specifications at 25°C (+2.75 V, -4.5 V)

Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Insertion Loss	Tx1-Ant. 1, Ant. 2	0.5-1.0 GHz		0.60	0.70	dB
		1.0-2.0 GHz		1.35	1.45	dB
	Tx2-Ant. 1, Ant. 2	0.5-1.0 GHz		0.65	0.75	dB
		1.0-2.0 GHz		1.35	1.45	dB
Isolation	Rx1, Rx2-Ant. 1	0.5-1.0 GHz		0.65	0.75	dB
		1.0-2.0 GHz		1.40	1.50	dB
	Rx1, Rx2-Ant. 2	0.5-1.0 GHz		0.75	0.85	dB
		1.0-2.0 GHz		1.50	1.60	dB
Isolation	Rx1, Rx2-Ant. 1 (During Tx Mode)	0.5-1.0 GHz	20	23		dB
		1.0-2.0 GHz	14	17		dB
Isolation	Rx1, Rx2-Ant. 2 (During Tx Mode)	0.5-1.0 GHz	14	17		dB
		1.0-2.0 GHz	10	12		dB
VSWR	Insertion Loss States	0.5-1.0 GHz		1.25:1		
		1.0-2.0 GHz		1.45:1		

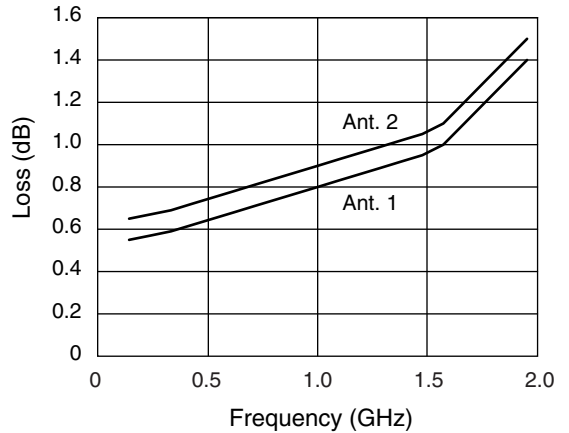
## Operating Characteristics at 25°C (+2.75 V, -4.5 V)

Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics	Rise, Fall (10/90% or 90%/10% RF)			50		nS
	On, Off (50% CTL to 90%/10% RF)			100		nS
	Video Feedthru			50		mV
Intermodulation Intercept Point (IP3)	For Two-tone Input Power +13 dBm			50		dBm
2nd and 3rd Harmonic	34 dBm @ 900 MHz			65		dBc
Control Voltages	$V_{Low} = -5 < V_{Low} < -2.75 \text{ V @ } 50 \mu\text{A Typ.}$ $V_{High} = -.2 < V_{High} < +5 \text{ V @ } 50 \mu\text{A Typ.}$ Differential = $2.75 < (V_{High} - V_{Low}) < 10 \text{ V @ } 100 \mu\text{A Typ.}$					

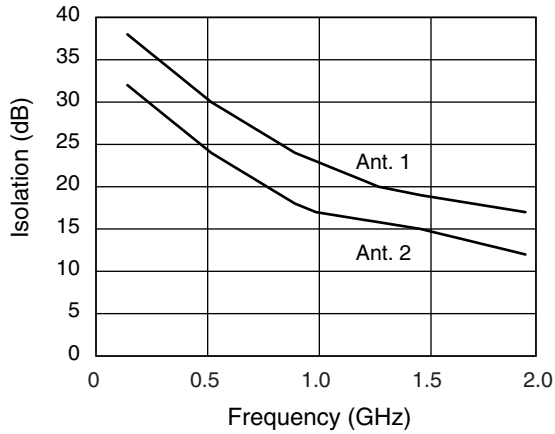
**Typical Performance Data (+2.75 V, -4.5 V)**



**T<sub>X</sub>-Ant. Insertion Loss**



**R<sub>X</sub>-Ant. Insertion Loss**

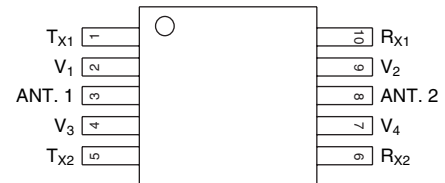


**R<sub>X</sub>-Ant. Isolation**

**Truth Table**

V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	T <sub>X1</sub> -Ant. 1 R <sub>X1</sub> -Ant. 2	T <sub>X1</sub> -Ant. 2 R <sub>X1</sub> -Ant. 1	T <sub>X2</sub> -Ant. 1 R <sub>X2</sub> -Ant. 2	T <sub>X2</sub> -Ant. 2 R <sub>X2</sub> -Ant. 1
V <sub>High</sub>	V <sub>Low</sub>	V <sub>Low</sub>	V <sub>Low</sub>	Ins. Loss	Isol.	Isol.	Isol.
V <sub>Low</sub>	V <sub>High</sub>	V <sub>Low</sub>	V <sub>Low</sub>	Isol.	Ins. Loss	Isol.	Isol.
V <sub>Low</sub>	V <sub>Low</sub>	V <sub>High</sub>	V <sub>Low</sub>	Isol.	Isol.	Ins. Loss	Isol.
V <sub>Low</sub>	V <sub>Low</sub>	V <sub>Low</sub>	V <sub>High</sub>	Isol.	Isol.	Isol.	Ins. Loss

**Pin Out**



**Switch Schematic**

