

GaAs Dual Antenna T/R Switch

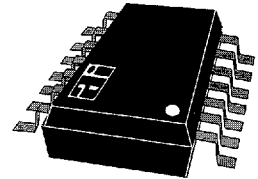
DC–2.5 GHz



AS113–24

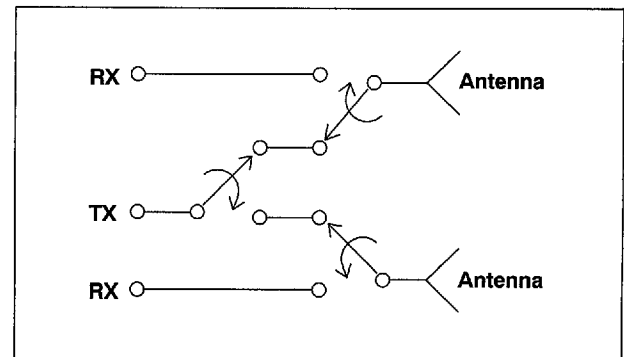
Features

- Transmit to either of Two Antenna Ports
- Receive from both Antenna Ports
- Operates with 0, –5 Volts
- Low DC Power Consumption
- Low Cost Plastic Package



Description

Alpha's new GaAs MMIC T/R switch is packaged in a SOIC 14 lead plastic package and is designed for low cost commercial applications.



Electrical Specifications at 25°C

Parameter		Min	Typ	Max	
Path: TX Mode					
Insertion Loss (Tx to Ant.)	DC–1 GHz	–	0.9	1.1	dB
	DC–2 GHz	–	0.95	1.1	dB
	DC–2.5 GHz	–	1.5	1.7	dB
Isolation (Ant. to Rx)	DC–1 GHz	25	27		dB
	DC–2 GHz	17	20		dB
	DC–2.5 GHz	16	19		dB
VSWR	DC–1 GHz			1.25:1	
	DC–2 GHz			1.5:1	
	DC–2.5 GHz			1.6	
Path: RX Mode					
Insertion Loss (Ant. to Rx)	DC–1 GHz		0.6	0.9	dB
	DC–2 GHz		0.95	1.0	dB
	DC–2.5 GHz		0.9	1.2	dB
Isolation (Ant. to Tx)	DC–1 GHz	30	33		dB
	DC–2 GHz	24	27		dB
	DC–2.5 GHz	20	25		dB
VSWR	DC–1 GHz			1.25:1	
	DC–2 GHz			1.6:1	
	DC–2.5 GHz			1.7:1	

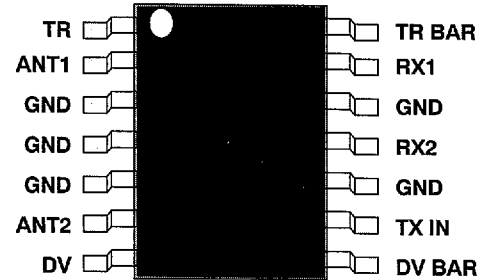
Operating Characteristics at 25°C

Impedance	50 Ohms Nominal		
Switching Characteristics (Tx/Rx Mode)			
RISE, FALL (10/90% or 90/10% RF)	50	ns	Typ
ON, OFF (50% CTL to 90/10% RF)	100	ns	Typ
Video Feedthru	50	mV	Typ
Intermodulation Intercept Point for two–tone input power up to +13 dBm @ Vlow = 0V, Vhigh = –5V (Tx/Rx Mode)			
Intercept Points	IP3		
1.9 GHz	44	dBm	Typ
Input Power for 1 dB Compression (Tx) @ 1.9 GHz			
Control Voltages	0/–6V		
Tx to Ant.	34	dBm	Typ
Ant. to Rx	30	dBm	Typ
Control Voltages			
Low (0)	–0.2/0V @ 20 μ A Max		
High (1)	–6/–3V @ 300 μ A Max		

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Truth Table

TR	TR Bar	DV	DV Bar	Function
0	-5	0	-5	TX-ANT2 Ins
0	-5	-5	0	TX-ANT1 Ins
-5	0	X	X	Both Antennas Receive

Pin Out**Absolute Maximum Ratings**

RF Input Power:

Tx Mode $4W \geq 800 \text{ MHz}$,Rx Mode $2W \geq 800 \text{ MHz}$

Control Voltage: +0.2, -8.0V

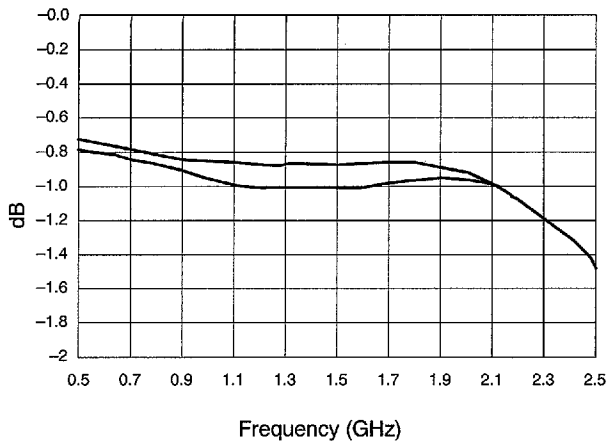
Operating Temperature: -40°C to +85 °C

Storage Temperature: -65 °C to 150 °C

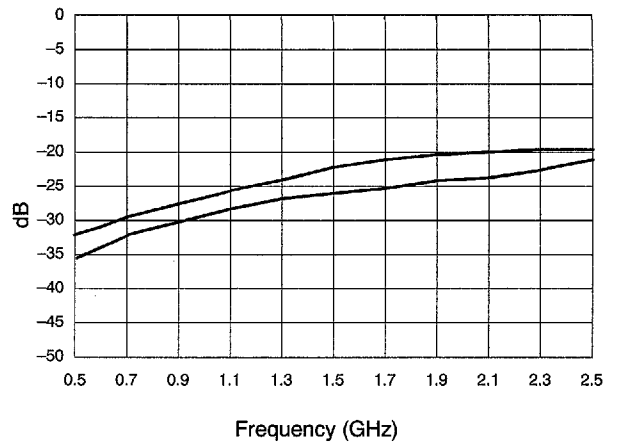
 Θ_{JC} : 25 °C/W

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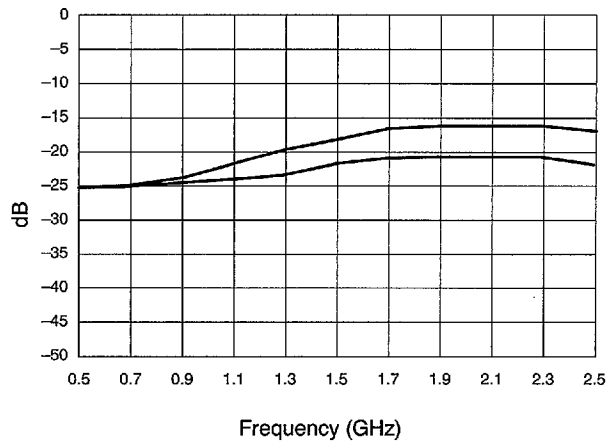
Typical Performance Data



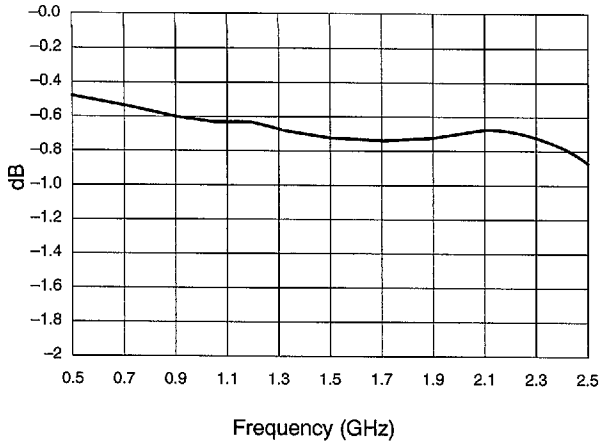
**Figure 1. Transmit Insert Loss
TX-ANT1, TX-ANT2**



**Figure 2. Receive Isolation During Transmit
RX1 Isolation, RX2 Isolation**



**Figure 3. Transmit Return Loss
TX-ANT1, TX-ANT2**



**Figure 4. Receive Insertion Loss
ANT1-RX1, ANT2-RX2**

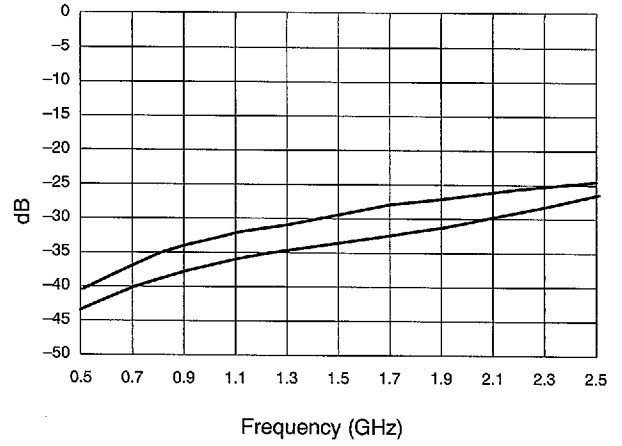
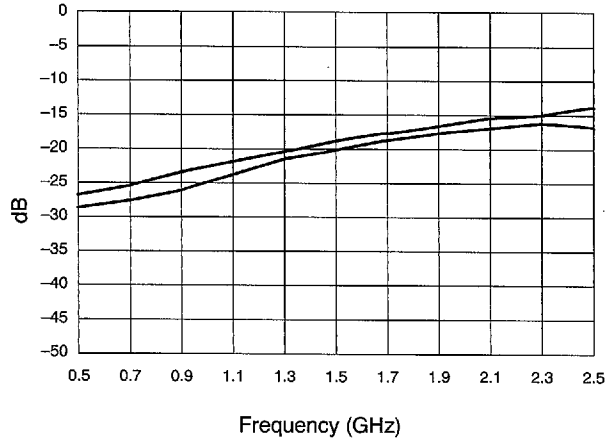
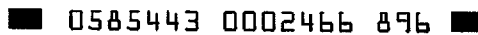


Figure 5. Transmit Isolation During Receive



**Figure 6. Receive Return Loss
ANT1-RX1, ANT2-RX2**



RF GaAs MMIC Products in Metal Packages

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