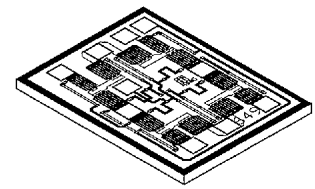
GaAs MMIC FET Transfer Switch DC–4 GHz

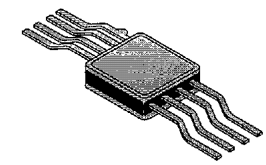
AD004T2–00, AD004T2–11

Features

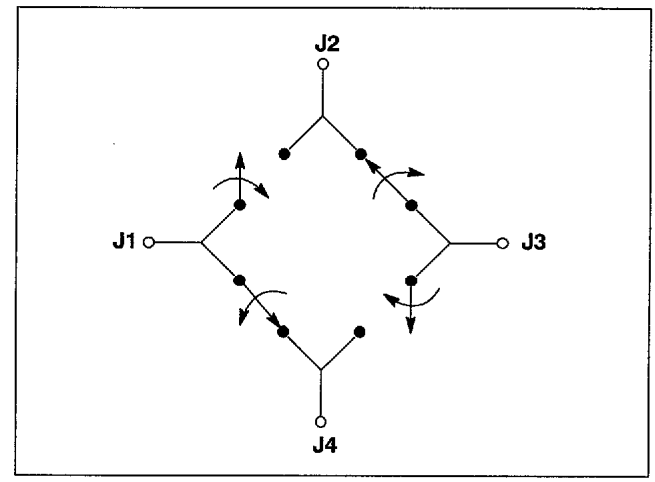
- Broad Bandwidth
- Low DC Power Dissipation (< 20 μA)
- Low Differential Phase Between Paths
- Meets MIL–STD–883 Screening Requirements
- Chip Size 30 x 39 x 8 Mils



AD004T2–00



AD004T2–11



Description

The AD004T2–00 is a GaAs 4 Port FET switch configured as a transfer switch. The device is useful for low power transfer switching functions in radar and ECM applications. The AD004T2–11 is the same chip mounted in the 8 Lead Gull Wing flat pack for convenience of surface mounting.

Electrical Specifications at 25 °C

		–00	–11		
Insertion Loss[1]	DC–0.5 GHz	1.0	1.3	dB	Max
	DC–1.0 GHz	1.2	1.5	dB	Max
	DC–2.0 GHz	1.4	1.7	dB	Max
	DC–4.0 GHz	1.6	1.7	dB	Max
Isolation	DC–0.5 GHz	55	47	dB	Min
	DC–1.0 GHz	50	42	dB	Min
	DC–2.0 GHz	45	37	dB	Min
	DC–4.0 GHz	35	30	dB	Min
VSWR I/O	DC–0.5 GHz	1.2:1	1.2:1		Max
	DC–1 GHz	1.3:1	1.4:1		Max
	DC–2 GHz	1.5:1	1.6:1		Max
	DC–4 GHz	1.8:1	2.0:1		Max

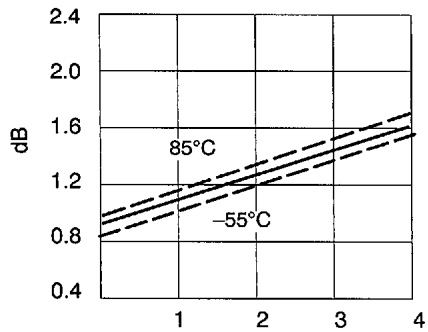
1. Insertion Loss changes by 0.003 dB/°C.
2. Measured in 500 MHz bandwidth with 1 ns risetime pulse.

Operating Characteristics at 25 °C

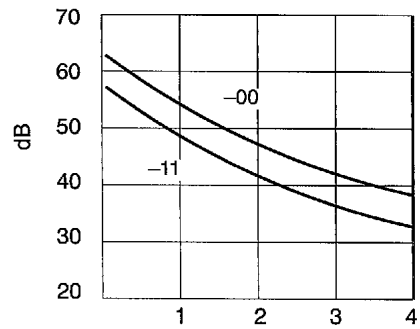
Impedance			50Ω Nominal	
Switching Characteristics				
RISE, FALL (10/90% or 90/10% RF)		7	ns	Typ
ON, OFF (50% CTL to 90/10% RF)		14	ns	Typ
Video Feedthru[2]		20	mV	Typ
Input Power for 1 dB Compression				
Control Voltages (Vdc)	**0/–5**	**0/–8**		
0.5–4 GHz	+24	+30	dBm	Typ
0.001 GHz	+16	+20	dBm	Typ
Intermodulation Intercept Point for Two–tone Input Power up to +13 dBm				
Intercept Points	**IP2**	**IP3**		
0.5–4 GHz	+68	+46	dBm	Typ
0.001 GHz	+57	+35	dBm	Typ
Control Voltages				
V_0 (Low)	0 to –0.2V @ 20 μA Max			
V_0 (High)	–5V @ 50 μA to –9V @ 200 μA Max			

ALPHA INDUSTRIES, INC. • 20 SYLVAN ROAD, WOBURN, MA 01801
TEL: (617) 935–5150 • FAX: (617) 824–4579

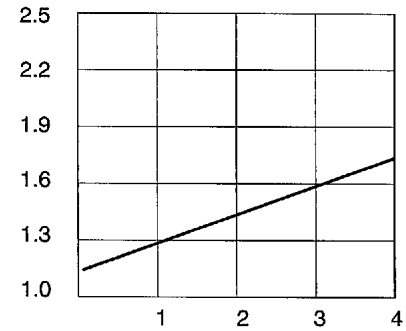
Typical Performance Data



Insertion Loss vs. Frequency

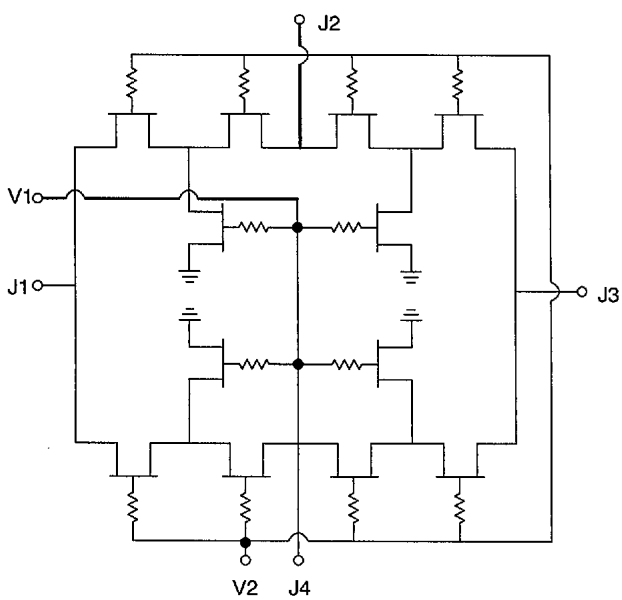


Isolation vs. Frequency



VSWR vs. Frequency

Schematic Diagram



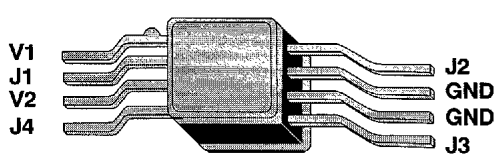
Truth Table

V1	V2	J1–J2	J3–J2	J3–J4	J1–J4
0	–5	Isolation	Insertion Loss	Isolation	Insertion Loss
–5	0	Insertion Loss	Isolation	Insertion Loss	Isolation

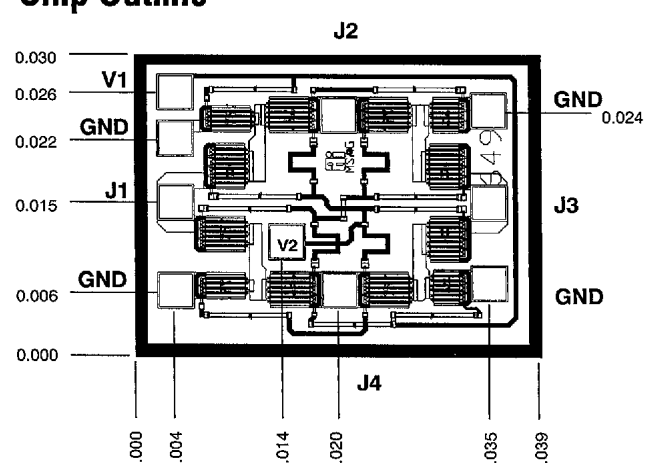
Absolute Maximum Ratings

RF Input Power:	2W > 500 MHz 0/–8V 0.5W @ 50 MHz 0/–8V
Control Voltage:	+0.2V, –10V
Operating Temperature:	–55°C to 125°C
Storage Temperature:	–65°C to 150°C
Thermal Resistance:	25°C/W

Pin Out



Chip Outline[1,2]



1. Dimensions are in inches. All bond pads are 3.5x3.5 mils.
2. Refer to the Application Notes section for chip handling procedure.