

GaAs MMIC SPDT FET Switch Chip

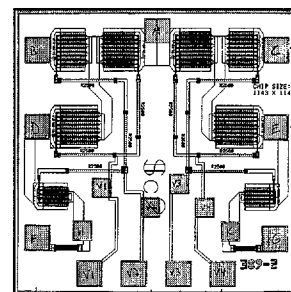
DC–6 GHz With Independent Bias Control

Alpha

AS006R2–00, AS006M2–00

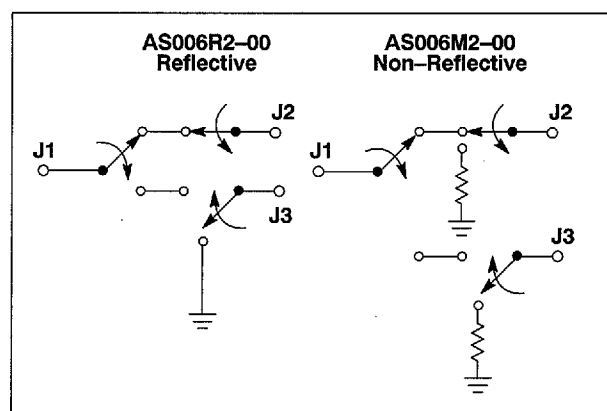
Features

- Individual Bias Control of Series and Shunt FETs
- Broadband DC to 6 GHz
- High Isolation
- Non–Reflective or Reflective (Short or Open)
- Low D.C. Power Consumption
- Excellent Intermodulation Products and Temperature Stability
- Chip Size 45 x 45 x 8 Mils
- Capable of Meeting MIL–STD–883 Screening Requirements



Description

The SPDT DC to 6 GHz switch chip can be used as a reflective or non–reflective switch. In addition, with the proper selection of bonding pads, the reflective version may have the off arm shorted or open. Also, the FETs are independently biased so that both arms of the switch can be turned on or off.



Electrical Specifications at 25°C

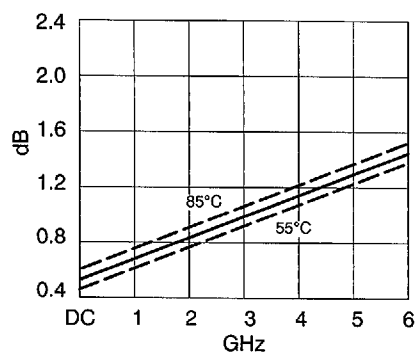
Option		A ¹	B ¹	C ¹	
Insertion Loss ²	DC–0.5 GHz	0.8	0.9	0.8	dB Max
	DC–1 GHz	0.9	1.0	0.9	dB Max
	DC–2 GHz	1.0	1.1	1.0	dB Max
	DC–4 GHz	1.3	1.4	1.3	dB Max
	DC–6 GHz	1.6	1.7	1.6	dB Max
Isolation	DC–0.5 GHz	60	63	57	dB Min
	DC–1 GHz	55	57	51	dB Min
	DC–2 GHz	49	50	45	dB Min
	DC–4 GHz	43	45	38	dB Min
	DC–6 GHz	37	40	30	dB Min
VSWR ³	DC–1 GHz	1.2:1	1.2:1	1.2:1	Max
	DC–2 GHz	1.3:1	1.3:1	1.3:1	Max
	DC–4 GHz	1.5:1	1.5:1	1.5:1	Max
	DC–6 GHz	1.5:1	1.6:1	1.5:1	Max

Operating Characteristics at 25°C

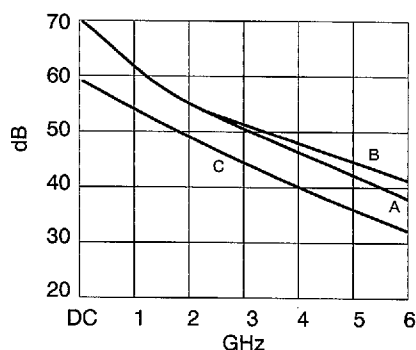
Impedance	50Ω Nominal			
Switching Characteristics				
RISE, FALL (10/90% or 90/10% RF)	3	ns	Typ	
ON, OFF (50% CTL to 90/10% RF)	6	ns	Typ	
Video Feedthru ⁴	20	mV	Typ	
Input Power for 1 dB Compression				
Control Voltages (Vdc)	0/–5	0/–8		
0.5–6 GHz	+24	+30	dBm	Typ
0.001 GHz	+16	+20	dBm	Typ
Intermodulation Intercept Point (For Two–Tone Input Power up to +13 dBm)				
Intercept Points	IP2	IP3		
0.5–6 GHz	+68	+46	dBm	Typ
0.001 GHz	+57	+35	dBm	Typ
Control Voltages				
V _O (Low)	0 to –0.2V @ 20 μA Max			
V _O (High)	–5V @ 50 μA to –9V @ 200 μA Max			

1. A = Reflective Short; B = Non–Reflective; C = Reflective Open.
2. Insertion Loss changes by 0.003 dB/°C.
3. VSWR for Input and Output, Option B only.
4. Measured in 500 MHz bandwidth with 1 ns risetime pulse.

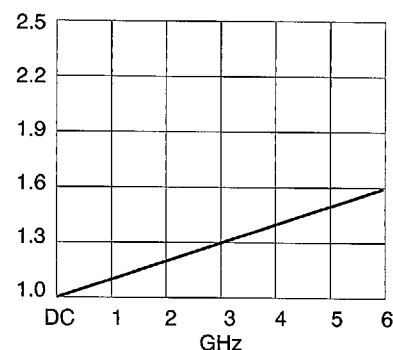
Performance Data



Insertion Loss vs. Frequency

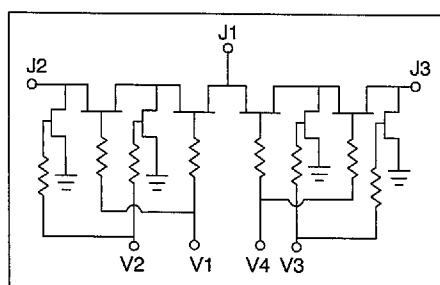
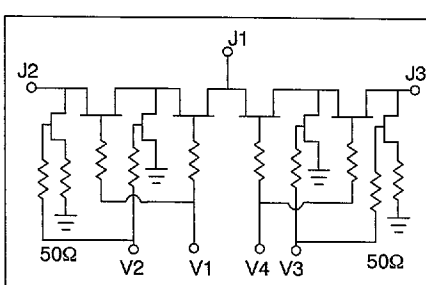
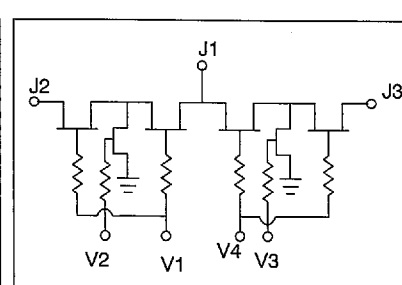


Isolation vs. Frequency



VSWR vs. Frequency

Switch Schematics

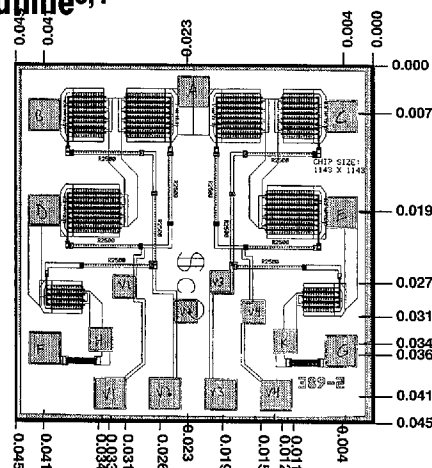
AS006R2–00 (A)
Reflective ShortAS006M2–00 (B)
Non-ReflectiveAS006R2–00 (C)
Reflective Open

Truth Table

Option	V1	V2	V3	V4	J1–J2	J1–J3
AS006R2–00 Reflective Short	0	–5	0	–5	Insertion Loss	Isolation
	–5	0	–5	0	Isolation	Insertion Loss
AS006M2–00 Non- Reflective	0	–5	0	–5	Insertion Loss	Isolation
	–5	0	–5	0	Isolation	Insertion Loss
AS006R2–00 Reflective Open	0	–5	0	–5	Insertion Loss	Isolation
	–5	0	–5	0	Isolation	Insertion Loss

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

Chip Outline^{3,4}Bonding Options^{1,2}

Option	A	B	C	D	E	F	G	H	K
AS006R2–00 Reflective (A)	J1	GND	GND	J2	J3	NC	NC	GND	GND
AS006M2–00 Non Reflective (B)	J1	GND	GND	J2	J3	GND	GND	NC	NC
AS006R2–00 Reflective Open (C)	J1	GND	GND	J2	J3	NC	NC	NC	NC

1. NC = no connection.

2. GND = Ground.

3. Dimensions are in inches. All bond pads are 4x4 mils.

4. Refer to the Application Notes section for chip handling procedure.

RF GaAs MMIC Products in Metal Packages

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