

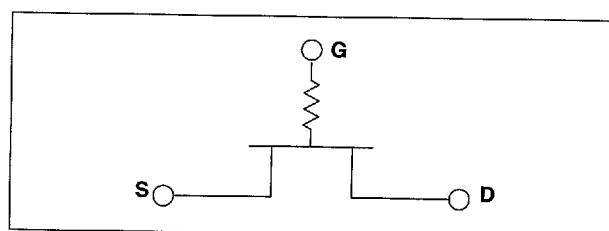
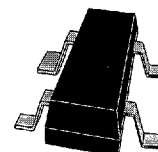
GaAs MMIC Control FET in SOT 143 DC–2.5 GHz



AF002C1–32

Features

- Low Cost
- Small SOT 143 Package
- Series or Shunt Configuration
- Low DC Current Drain
- Ideal Switch Building Block



Description

The AF002C1–32 consists of a single GaAs switching FET that can be used in both series and shunt configurations. A positive control voltage may be used by simply adding 3 DC blocking capacitors.

Isolation performance degrades at higher frequencies due to package parasitics. These parasitics can be tuned out in narrow band applications as shown in a AF002C1–39 data sheet.

Absolute Maximum Ratings

RF Input Power:	2W > 500 MHz 0/–8V
	0.5W @ 50 MHz 0/–8V
Control Voltage:	+0.2V, –10V
Operating Temperature:	–40°C to 85°C
Storage Temperature:	–65°C to 150°C
Θ _{JC} :	25°C/W

Note: Exceeding these parameters may cause irreversible damage.

Operating Characteristics at 25°C

Switching Characteristics			
RISE, FALL (10/90% or 90/10% RF)	3	ns	Typ
ON, OFF (50% CTL to 90/10% RF)	6	ns	Typ
Input Power for 1 dB Compression			
Control Voltages (Vdc)	0/–5	0/–8	
0.5–2.0 GHz	+20	24	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		

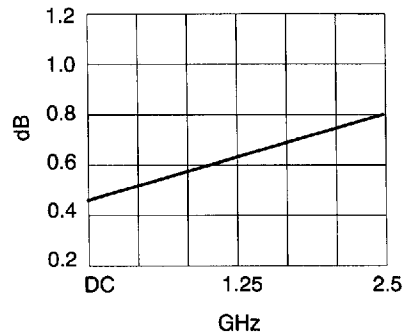
Electrical Specifications at 25°C

R _{ON} ¹	C _{OFF} ²	Insertion Loss 1 GHz ^{3,4}	
		Series	Shunt
6.4	0.13	0.7 dB	0.2

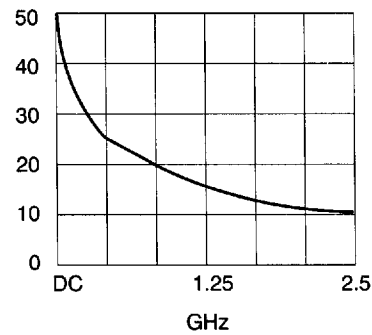
1. R_{ON} – Resistance in ohms in low impedance state when '0' Volts is applied on Gate (G).
2. C_{OFF} – Capacitance (FET) in pF in high impedance state when –5V is applied on Gate (G).
3. Package inductance is 3 nH, package capacitance is 0.17 pF.
4. Insertion loss changes by 0.003 dB/°C.

Typical Performance Data

Series Configuration (Not Tuned)

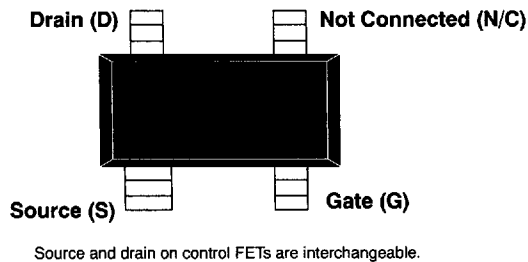


Insertion Loss vs. Frequency



Isolation vs. Frequency

Pin Out

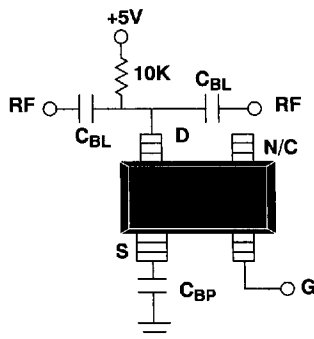


Truth Table (Negative Voltage Operation)

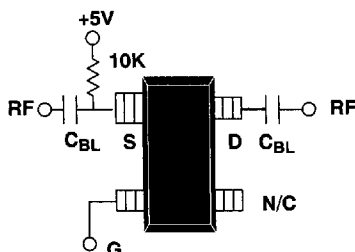
Shunt			
S	D	G	State
GND	RF	−5	Insertion Loss
		0	Isolation
Series			
RF	RF	−5	Isolation
		0	Insertion Loss

Positive Voltage Operation

Shunt



Series



C_{BL} , C_{BP} - Choose value for low impedance at desired operating frequency.

Truth Table (Positive Voltage Operation)

Shunt			
S	D	G	State
GND	RF	0	Insertion Loss
		+5	Isolation
Series			
RF	RF	0	Isolation
		+5	Insertion Loss

RF GaAs MMIC Products in Metal Packages

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