

GaAs PIN IC SPDT Switch

2–18 GHz



AP218R2-00

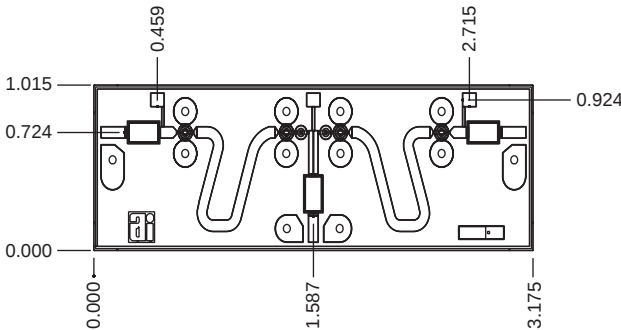
Features

- Low Loss <2.0 dB
- High Isolation >50 dB
- Good Return Loss <-9 dB
- Broadband 2–18 GHz
- Fast Switching <2 ns
- High Power Handling Capability 40 dBm
Peak 27 dBm CW

Description

The AP218R2-00 GaAs PIN IC SPDT switch chip is ideal for low loss, high isolation applications, especially where broadband, high power handling is required. The GaAs IC employs two shunt and one series PIN diode per arm to achieve low loss, high isolation switching with exceptional power handling characteristics. Typical switching speed is 2 ns. Power consumption is low, typically 75 mA total at -5 V.

Chip Outline



Dimensions indicated in mm.
All DC (V) pads are 0.1 x 0.1 mm and RF In, Out pads are 0.07 mm wide.
Chip thickness = 0.1 mm.

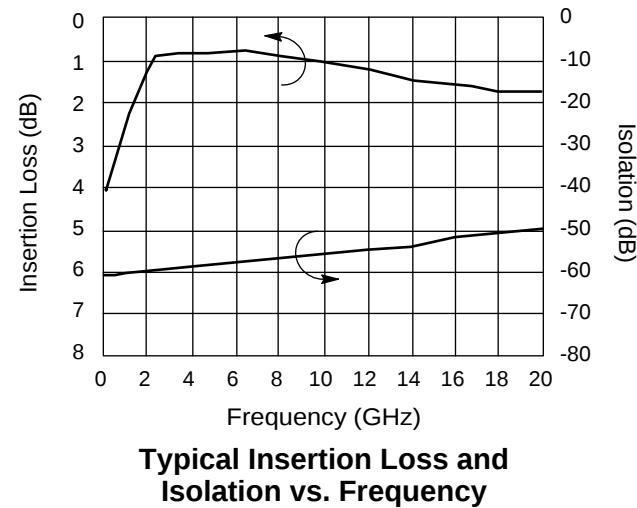
Electrical Specifications at 25°C

Parameter	Frequency	Min.	Typ.	Max.	Unit
Frequency Range	2–18 GHz				
Insertion Loss			2.0		dB
VSWR			-12	-9	dB
Isolation			50		dB

Operating Characteristics at 25°C

Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Speed	Rise, Fall (10/90% or 90/10% RF)			2		nS
Switching Current	On Arm			24		mA
	Off Arm			48		mA
	V _{OFF}			-5		V
Input Power for 1 dB Compression	+25mA/-3.5 V			33		dBm
Control Voltages	V _{Low}			-5		V
	V _{High}			+5		V

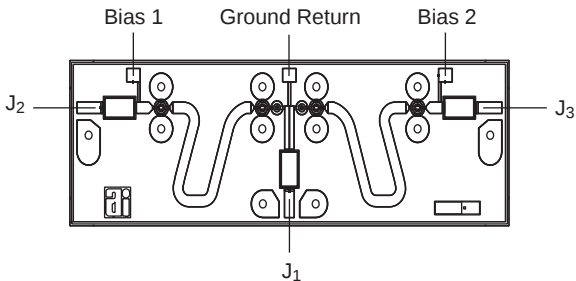
Typical Performance Data



Absolute Maximum Ratings

Characteristic	Value
Operating Temperature (T _{OP})	-55°C to +125°C
Storage Temperature (T _{ST})	-65°C to +150°C
DC Reverse Bias	-70 V (-10 μA)
DC Forward Bias	1.3 V (50 mA)
P _{IN}	10 W

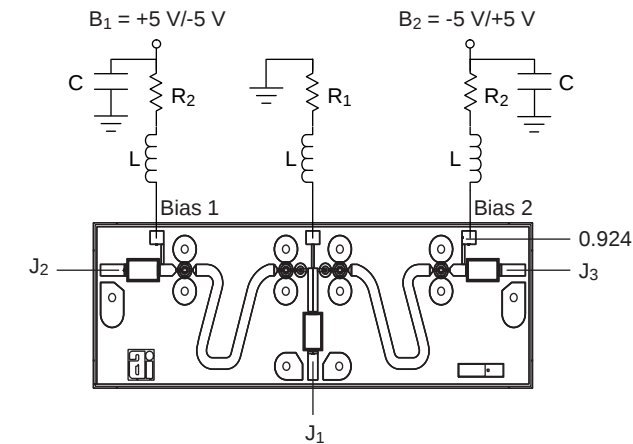
Chip Layout



Truth Table

B ₁	B ₂	J ₁ –J ₂	J ₁ –J ₃
+5 V	-5 V	Isolation	Insertion Loss
-5 V	+5 V	Insertion Loss	Isolation

Suggested External Bias Scheme



L = 5–10 turn 0.7 mil gold wire air core
C = 5–20 pF
R₁ = 820 Ω
R₂ = 180 Ω