

PHEMT GaAs IC High Power SP4T Switch 0.1–2.5 GHz



AS192-000

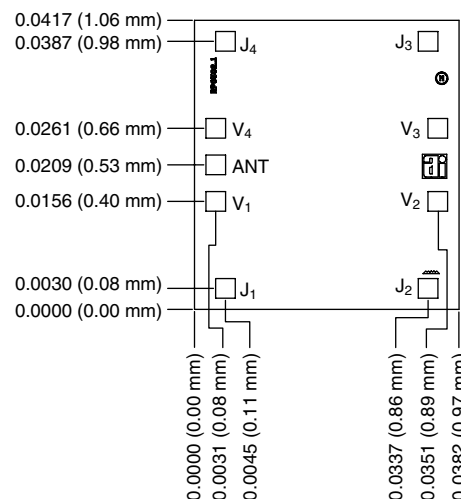
Features

- 4 Symmetric RF Paths
- Positive Voltage Control
- High IP3
- Excellent Harmonic Performance
- Handles GSM Power Levels
- Available in 100% RF Tested Chip Form

Description

The AS192-000 is a reflective SP4T switch. It is an ideal switch for higher power applications. It can be used for GSM dual-band handset applications where both low loss, low current and small size are critical parameters.

Outline Drawing



Chip thickness 0.008 ± 0.001 (0.203 ± 0.025).

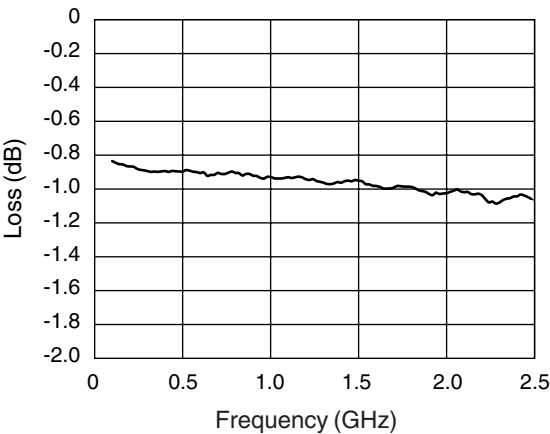
Electrical Specifications at 25°C (0, +4.5 V)

Parameter		Frequency	Min.	Typ.	Max.	Unit
Insertion Loss	Ant-J ₁ , J ₂ , J ₃ , J ₄	0.1–0.5 GHz		0.90	1.1	dB
		0.5–1.0 GHz		0.95	1.1	dB
		1.0–2.0 GHz		1.00	1.2	dB
		2.0–2.5 GHz		1.10	1.3	dB
Isolation	Ant-J ₁ , J ₂ , J ₃ , J ₄	0.1–0.5 GHz	30	34		dB
		0.5–1.0 GHz	25	29		dB
		1.0–2.0 GHz	19	23		dB
		2.0–2.5 GHz	18	21		dB
VSWR		0.1–1.0 GHz		1.3:1		
		1.0–2.5 GHz		1.4:1		

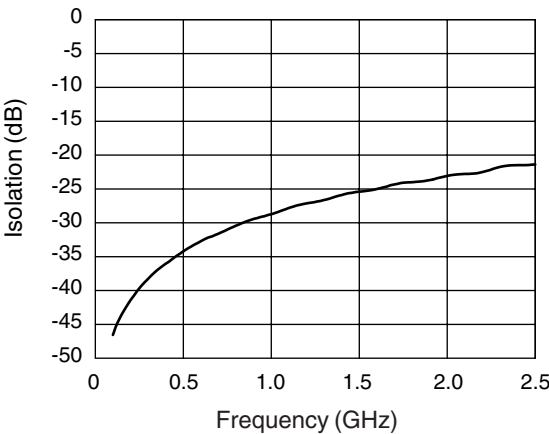
Operating Characteristics at 25°C (0, +4.5 V)

Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics	Rise, Fall (10/90% or 90/10% RF)			50		ns
	On, Off (50% CTL to 90/10% RF)			100		ns
	Video Feedthru			50		mV
IP3	13 dBm/Tone			+55		dBm
2nd and 3rd Harmonics	34 dBm Input 900 MHz			+65		dBc
Control Voltages	$V_{Low} = 0$ $V_{High} = +4.5\text{ V @ }200\text{ }\mu\text{A Max. for RF power} > 30\text{ dBm}$ $V_{High} = +3.0\text{ V @ }200\text{ }\mu\text{A Max. for RF power } 20\text{--}30\text{ dBm}$ $V_{High} = +2.7\text{ V @ }200\text{ }\mu\text{A Max. for RF power} < 20\text{ dBm}$					

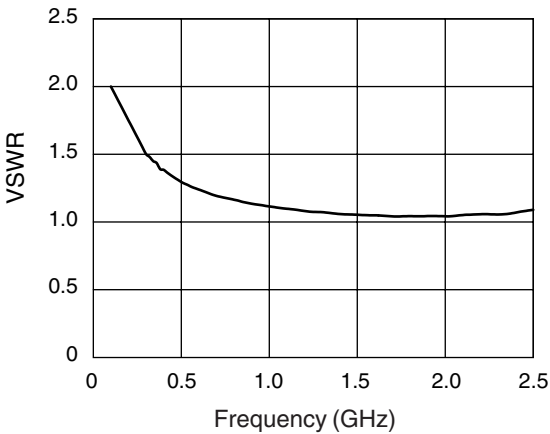
Typical Performance Data



Typical Insertion Loss vs. Frequency



Typical Isolation vs. Frequency



Typical VSWR

Truth Table

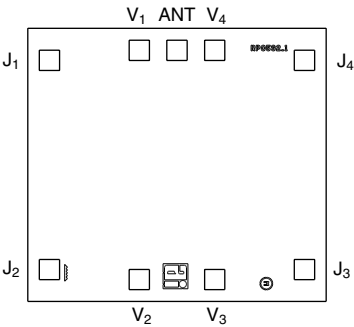
V ₁	V ₂	V ₃	V ₄	Ant-J ₁	Ant-J ₂	Ant-J ₃	Ant-J ₄
V _{High}	V _{Low}	V _{Low}	V _{Low}	Ins. Loss	Isolation	Isolation	Isolation
V _{Low}	V _{High}	V _{Low}	V _{Low}	Isolation	Ins. Loss	Isolation	Isolation
V _{Low}	V _{Low}	V _{High}	V _{Low}	Isolation	Isolation	Ins. Loss	Isolation
V _{Low}	V _{Low}	V _{Low}	V _{High}	Isolation	Isolation	Isolation	Ins. Loss

V_{Low} = 0.
 V_{High} = 4.5 to 5.0 V for RF power > 30 dBm.
 V_{High} = 3.0 to 5.0 V for RF power 20–30 dBm.
 V_{High} = 2.7 to 5.0 V for RF power < 20 dBm.

Absolute Maximum Ratings

Characteristic	Value
RF Input Power	4 W > 0.5 GHz 0/+6 V Control
Control Voltage	+6 V
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

Pin Out



Notes:
 DC blocking caps required on RF lines for positive voltage operation
 bond pad metalization: gold
 backside metalization: none
 bond pad dimensions: 0.003 (0.075 mm) x 0.003 (0.075 mm)
 See application note, Handling GaAs MMIC Die.