

**DATA SHEET**

# AS192-000: PHEMT GaAs IC High-Power SP4T Switch 0.1–2.5 GHz

**Features**

- 4 symmetric RF paths
- Positive voltage control
- High IP3
- Excellent harmonic performance
- Handles GSM power levels
- Available in 100% RF tested chip form
- Available lead (Pb)-free, RoHS-compliant, and Green

**Description**

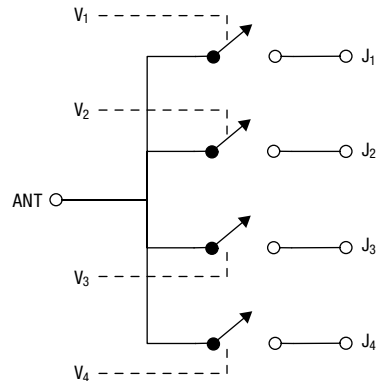
The AS192-000 is a reflective SP4T switch. It is an ideal switch for higher power applications. It can be used for GSM dual-band handset applications where low loss, low current and small size are critical parameters.

**NEW**

Skyworks Green products are lead (Pb)-free, RoHS (Restriction of Hazardous Substances)-compliant, conform to the EIA/EICTA/JEITA Joint Industry Guide (JIG) Level A guidelines, and are free from antimony trioxide and brominated flame retardants.



**Simplified Schematic**



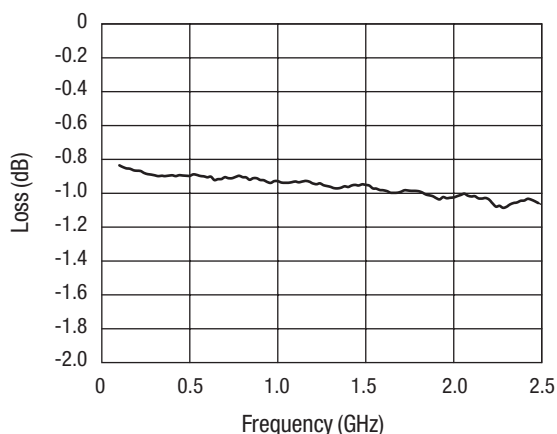
**Electrical Specifications at 25 °C (0, +4.5 V)**

Parameter		Frequency	Min.	Typ.	Max.	Unit
Insertion loss	Ant-J <sub>1</sub> , J <sub>2</sub> , J <sub>3</sub> , J <sub>4</sub>	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 <sub>1</sub> , J <sub>2</sub> , J <sub>3</sub> , J <sub>4</sub>	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		

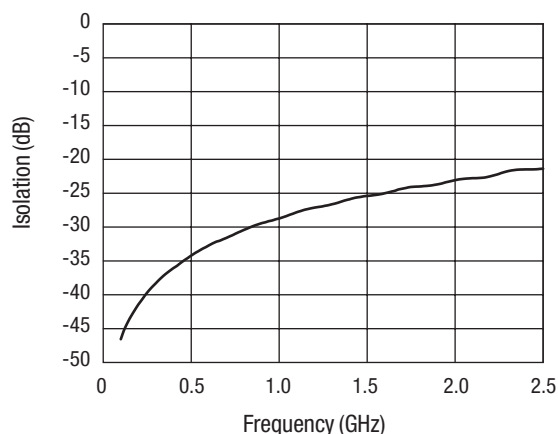
### Operating Characteristics at 25 °C (0, +4.5 V)

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	$V_{LOW} = 0$ $V_{HIGH} = +4.5\text{ V @ }200\text{ mA max. for RF power } > 30\text{ dBm}$ $V_{HIGH} = +3.0\text{ V @ }200\text{ mA max. for RF power } 20\text{--}30\text{ dBm}$ $V_{HIGH} = +2.7\text{ V @ }200\text{ mA max. for RF power } < 20\text{ dBm}$					

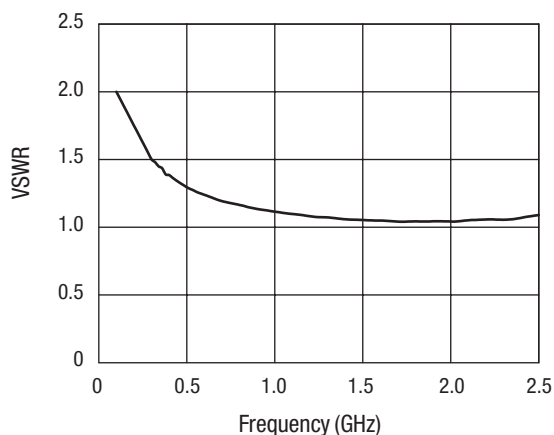
### Typical Performance Data



Typical Insertion Loss vs. Frequency



Typical Isolation vs. Frequency



Typical VSWR

### 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

Performance is guaranteed only under the conditions listed in the specifications table and is not guaranteed under the full range(s) described by the Absolute Maximum specifications. Exceeding any of the absolute maximum/minimum specifications may result in permanent damage to the device and will void the warranty.

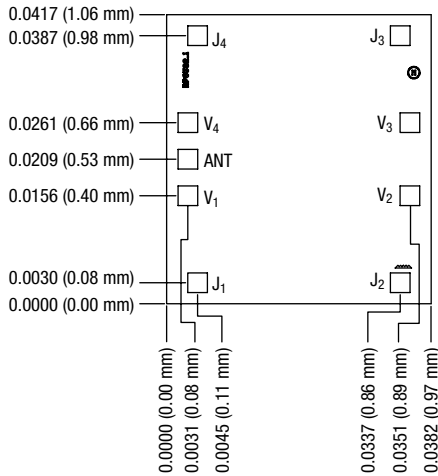
**CAUTION:** Although this device is designed to be as robust as possible, Electrostatic Discharge (ESD) can damage this device. This device must be protected at all times from ESD. Static charges may easily produce potentials of several kilovolts on the human body or equipment, which can discharge without detection. Industry-standard ESD precautions must be employed at all times.

**Truth Table**

V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	Ant-J <sub>1</sub>	Ant-J <sub>2</sub>	Ant-J <sub>3</sub>	Ant-J <sub>4</sub>
V <sub>HIGH</sub>	V <sub>LOW</sub>	V <sub>LOW</sub>	V <sub>LOW</sub>	Ins. loss	Isolation	Isolation	Isolation
V <sub>LOW</sub>	V <sub>HIGH</sub>	V <sub>LOW</sub>	V <sub>LOW</sub>	Isolation	Ins. loss	Isolation	Isolation
V <sub>LOW</sub>	V <sub>LOW</sub>	V <sub>HIGH</sub>	V <sub>LOW</sub>	Isolation	Isolation	Ins. loss	Isolation
V <sub>LOW</sub>	V <sub>LOW</sub>	V <sub>LOW</sub>	V <sub>HIGH</sub>	Isolation	Isolation	Isolation	Ins. loss

V<sub>LOW</sub> = 0.  
 V<sub>HIGH</sub> = 4.5 to 5.0 V for RF power > 30 dBm.  
 V<sub>HIGH</sub> = 3.0 to 5.0 V for RF power 20–30 dBm.  
 V<sub>HIGH</sub> = 2.7 to 5.0 V for RF power < 20 dBm.  
 All other conditions not recommended.

**Outline Drawing**

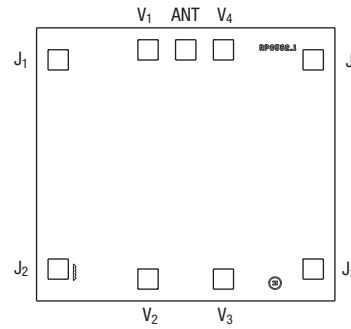


Chip thickness 0.008 ± 0.001 (0.203 ± 0.025).

**Ordering Information**

Model Name	Operating Temperature Range	Ordering Part Number	Package Description
AS192-000 GaAs SP4T switch	-40 °C to +85 °C	AS192-000	Wafer on plastic-ring film frame

**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.

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