PHEMT GaAs IC High Power SP4T Switch 0.1–2.5 GHz

AS166-300

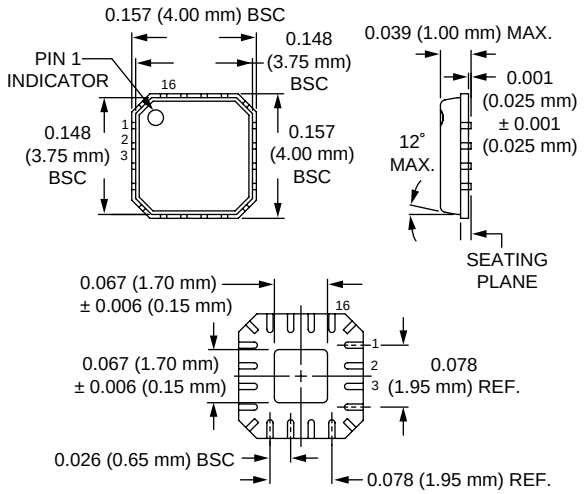
Features

- 2 T_X Paths and 2 R_X Paths
- Positive Voltage Control
- High IP3
- Excellent Harmonic Performance
- Handles GSM Power Levels
- Available in MLF-16 (4 x 4 mm) Package

Description

The AS166-300 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.

MLF-16 (4 x 4 mm)



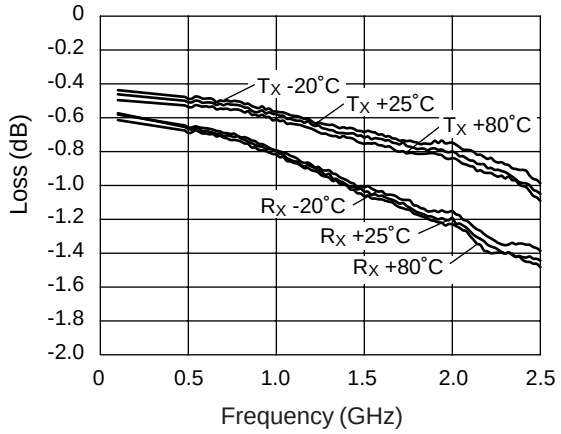
Electrical Specifications at 25°C (0, +3 V)

Parameter		Frequency	Min.	Typ.	Max.	Unit
Insertion Loss	T_X-Ant	0.1–0.5 GHz		0.55	0.75	dB
		0.5–1.0 GHz		0.55	0.75	dB
		1.0–2.0 GHz		0.80	1.00	dB
		2.0–2.5 GHz		1.00	1.20	dB
	R_X-Ant	0.1–0.5 GHz		0.75	0.95	dB
		0.5–1.0 GHz		0.80	1.00	dB
		1.0–2.0 GHz		1.20	1.40	dB
		2.0–2.5 GHz		1.40	1.60	dB
Isolation	T_X-Ant	0.1–0.5 GHz	20	22		dB
		0.5–1.0 GHz	17	20		dB
		1.0–2.0 GHz	14	16		dB
		2.0–2.5 GHz	13	14.5		dB
	R_X-Ant	0.1–0.5 GHz	24	26		dB
		0.5–1.0 GHz	23	25		dB
		1.0–2.0 GHz	21	23		dB
		2.0–2.5 GHz	21	23		dB
VSWR		0.1–1.0 GHz		1.4:1		
		1.0–2.0 GHz		1.5:1		
		2.0–2.5 GHz		1.55:1		

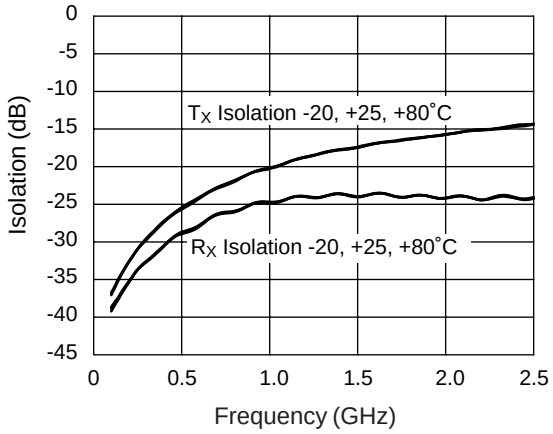
Operating Characteristics at 25°C (0, +3 V)

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 Harmonic	34 dBm Input 900 MHz		65	70		dBc
3rd Harmonic	34 dBm Input 900 MHz		55	65		dBc
Control Voltages	V_{Low} = 0 V_{High} = 2.7 to 5 V @ 100 µA Max.					

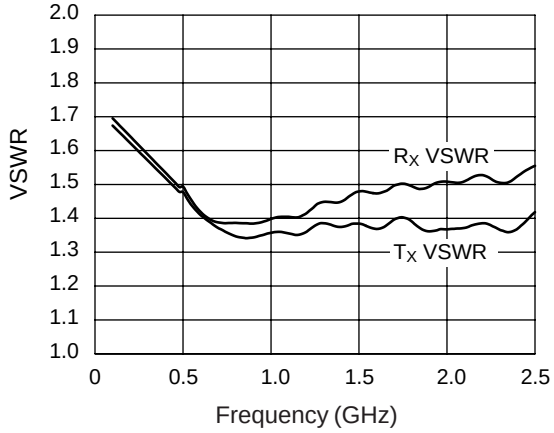
Typical Performance Data



Insertion Loss vs. Frequency



Isolation vs. Frequency



VSWR vs. Frequency

Absolute Maximum Ratings

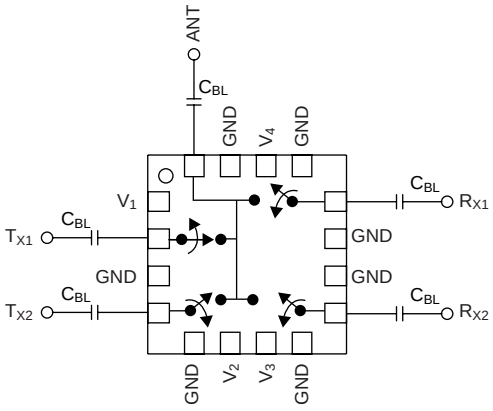
Characteristic	Value
RF Input Power	4 W > 0.5 GHz 0/+6 V Control
Control Voltage	+6 V
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C
Θ_{JC}	25°C/W

Truth Table

V_1	V_2	V_3	V_4	Ant-T_{X1}	Ant-T_{X2}	Ant-R_{X2}	Ant-R_{X1}
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.
V_{High} = 2.7 to 5 V.

Pin Out



DC blocking capacitors (C_{BL}) must be supplied externally.
C_{BL} = 47 pF for operating frequencies >500 MHz.