DATA SHEET

AS204-80, AS204-80LF: GaAs IC SP4T Nonreflective Switch With Driver 300 kHz–3.5 GHz

Features

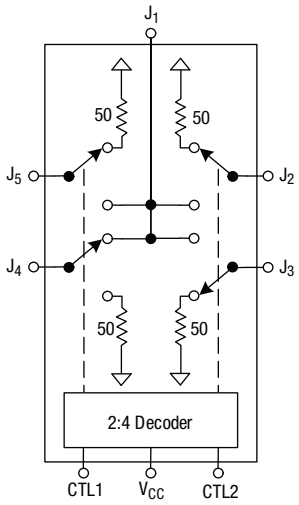
- Integrated driver 5 V supply voltage
- High isolation (45 dB @ 0.9 GHz)
- Low insertion loss (0.5 dB @ 0.9 GHz)
- SSOP-16 plastic package
- Nonreflective all ports
- ESD rated at class 1A HBM
- Available lead (Pb)-free and RoHS-compliant MSL-1 @ 260 °C per JEDEC J-STD-020

Description

The AS204-80 is a high-isolation SP4T FET IC nonreflective switch with driver. The insertion loss is 0.5 dB and isolation is 45 dB at 0.9 GHz. The switch is ideal for cellular base station switch matrices.

NEW Skyworks offers lead (Pb)-free, RoHS (Restriction of Hazardous Substances)-compliant packaging.

Simplified Block Diagram



Electrical Specifications at 25 °C

V_{CC} = 5 V, Z_0 = 50 Ω, unless otherwise noted

Parameter[1]	Frequency	Min.	Typ.	Max.	Unit
Insertion loss[2]	300 kHz–1.0 GHz		0.4	0.6	dB
	300 kHz–2.0 GHz		0.6	0.8	dB
	300 kHz–2.5 GHz		0.7	0.9	dB
	300 kHz–3.5 GHz		0.9	1.2	dB
Isolation	300 kHz–1.0 GHz	40	45		dB
	300 kHz–2.0 GHz	30	38		dB
	300 kHz–2.5 GHz	28	32		dB
	300 kHz–3.5 GHz	22	25		dB
VSWR[3] on state	300 kHz–3.5 GHz		1.3:1		
VSWR[3] off state	0.5 GHz–3.5 GHz		1.5:1		

1. All measurements made in a 50 Ω system, unless otherwise specified.
2. Insertion loss changes by 0.003 dB/°C.
3. Input/Output.

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Operating Characteristics at 25 °C

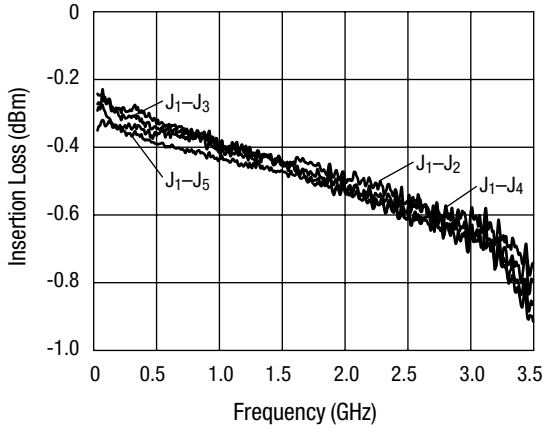
V_{CC} = 5 V, Z_0 = 50 Ω, unless otherwise noted

Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching characteristics						
Rise, fall	10/90% or 90/10% RF			75		ns
On, off	50% CTL to 90/10% RF			125		ns
Video feedthru	T_{RISE} = 1 ns, BW = 500 MHz			50		mV
Input power for 1 dB compression		0.5–2 GHz		26		dBm
Intermodulation intercept point (IP3)	For two-tone input power 13 dBm	0.5–2 GHz		40		dBm
		0.05 GHz		29		dBm
Thermal resistance				30		°C/W
Control voltages[1]	CTL1, 2 low		0		0.5	V
	CTL1, 2 high		2.4		5.0	V
Supply voltage, V_{CC}[1]			4.8		5.2	
Supply current	V_{CC} = 5 V			500		µA

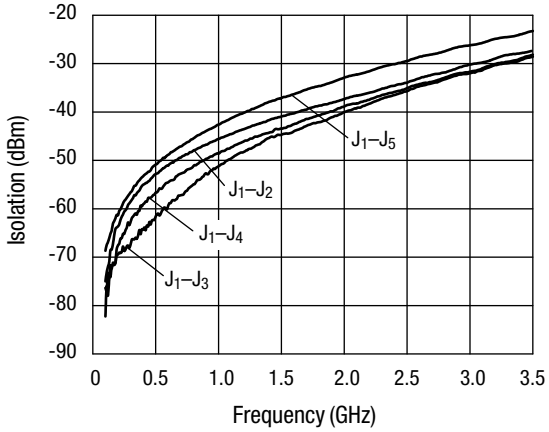
1. V_{CC} must be powered on by a minimum of 10 ns prior to V_{CTL}.

Typical Performance Data

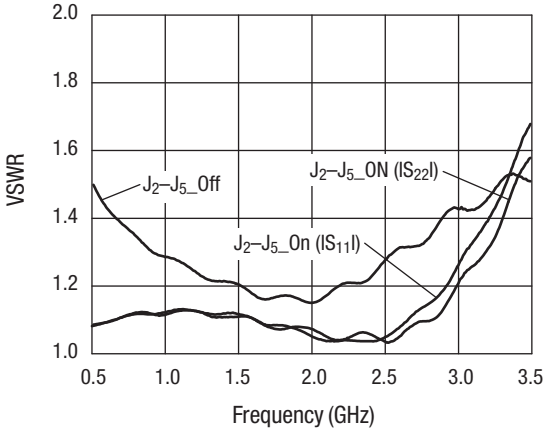
V_{CC} = 5 V, Z_0 = 50 Ω, unless otherwise noted



Insertion Loss vs. Frequency

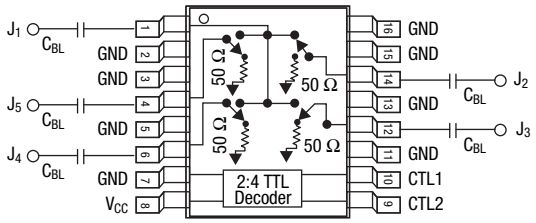


Isolation vs. Frequency



VSWR vs. Frequency

Pin Out



DC blocking capacitors (C_{BL}) required for positive voltage operation.
C_{BL} = 47 pF for operation frequency >500 MHz.

Absolute Maximum Ratings

Characteristic	Value
RF input power	0.8 W > 500 MHz 0.2 W @ 50 MHz
Supply voltage	6 V
Control voltage	-0.2 V, +6 V
Operating temperature	-40 °C to +85 °C
Storage temperature	-65 °C to +150 °C
ESD human body model	Class 1A

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, ESD (Electrostatic Discharge) 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.*

Recommended Solder Reflow Profiles

Refer to the *"Recommended Solder Reflow Profile"* Application Note.

Tape and Reel Information

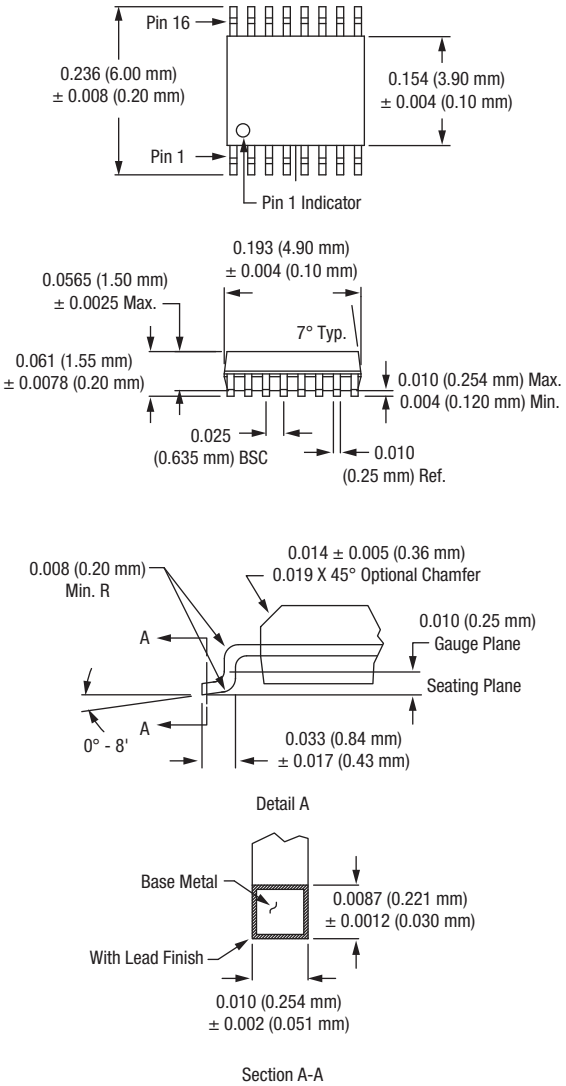
Refer to the *"Discrete Devices and IC Switch/Attenuators Tape and Reel Package Orientation"* Application Note.

Truth Table

Insertion Loss Path J_1 to:	Control Input	
	CTL1	CTL2
J_2	0	0
J_3	1	0
J_4	0	1
J_5	1	1

"0" = 0 to 0.5 V.
"1" = 2.4 to 5 V.

SSOP-16 (-80)



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