DATA SHEET

AS212-93: GaAs IC 4 x 2 Switch Matrix 0.7–3.0 GHz

Applications:

- DBS switching applications, cable modems, cable TV

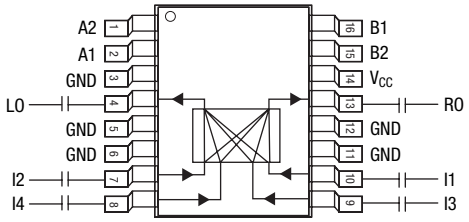
Features

- Four inputs, two output switches
- Any input can be directed to either output
- Requires only four control lines
- Low DC power consumption
- Small low-cost TSSOP-16 plastic package
- High isolation between ports

Description

The AS212-93 is an IC FET 4 x 2 matrix switch in a low-cost TSSOP-16 exposed paddle plastic package. The exposed paddle should be grounded. The AS212-93 enables 16 states directing any of the four inputs to any of the two outputs. DC block capacitors are required at each RF port. States are selected by 4 positive controls. All ports are absorptive. The AS212-93 switch is suitable for DBS switching applications.

Pin Out



Unused leads and package bottom should be well grounded.
All paths are bidirectional.

Electrical Specifications at 25 °C (0, 5 V)

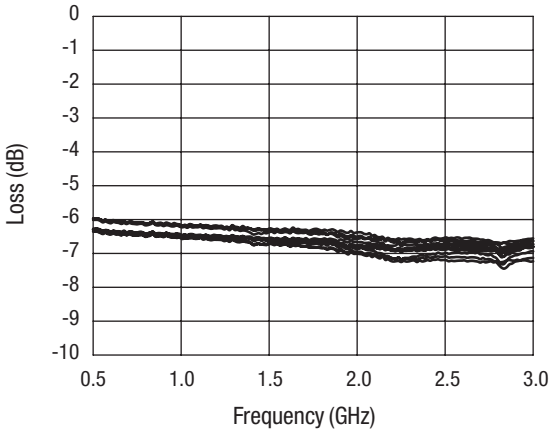
Parameter[1]	Frequency	Min.	Typ.	Max.	Unit
Insertion loss	0.70–0.95		6.50	7.0	dB
	0.95–1.45		6.50	7.0	dB
	1.45–2.15		6.75	7.3	dB
	2.15–3.00		7.00	7.5	dB
Insertion loss flatness	0.70–3.00		1	2	dB
Isolation	0.70–0.95	25.0	33.0		dB
	0.95–1.45	23.0	28.5		dB
	1.45–2.15	22.5	28.5		dB
	2.15–3.00	19.5	25.5		dB
Return loss insertion loss state	0.70–3.00	9	11		dB
Return loss isolation state	0.70–3.00	9	11		dB

Operating Characteristics at 25 °C (0, 5 V)

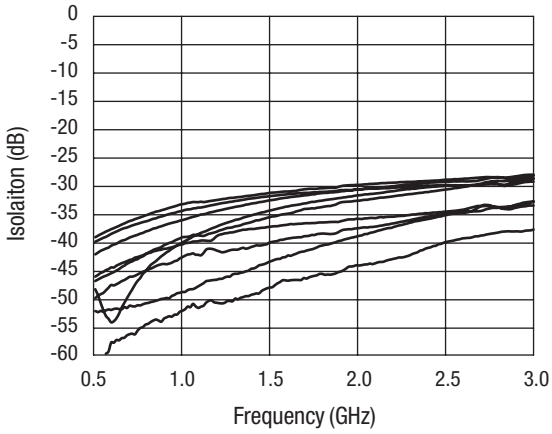
Parameter	Condition	Min.	Typ.	Max.	Unit
$P_{-1\ dB}$	0, 5 V		12		dBm
V_{CC}	@ 400 µA max.	4.5		5.5	V
Control voltages V_1, V_2, V_3, V_4	Low @ 50 µA max.	0		0.2	V
	High @ 50 µA max.	2.5		V_{CC}	V

1. All measurements made in a 50 Ω system.

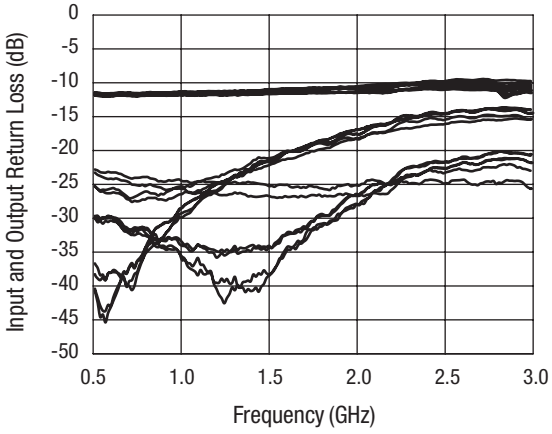
Typical Performance Data (0, 3 V)



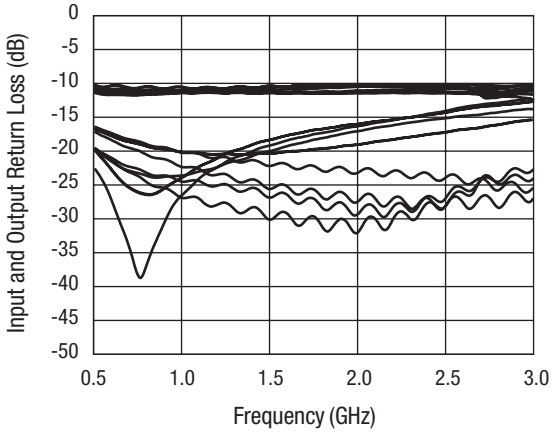
Typical Insertion Loss (Various States Shown)



Typical Isolation (Including Worst Case)



Return Loss Insertion Loss State



Return Loss Isolation State

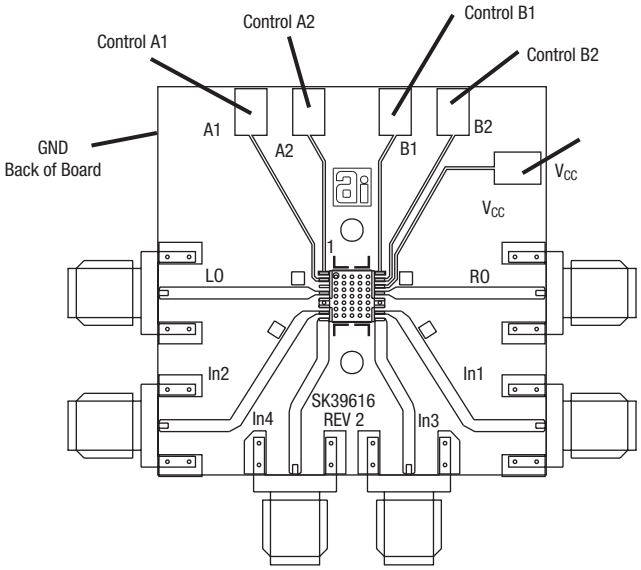
Absolute Maximum Ratings

Characteristic	Value
RF input power	15 dBm
Supply voltage	6 V
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, 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.*

Test Board



Bias V_{CC} before applying bias to control lines.
Control lines need to be grounded for 0 V.
Control lines can not be left open circuit.

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

		Controls			
		For LO (Left Output)		For RO (Right Output)	
State #	Signal Path (Insertion Loss Path)(1)	SW A1	SW A2	SW B1	SW B2
0	I1->LO & I1->RO	0	0	0	0
1	I1->LO & I2->RO	0	0	0	1
2	I1->LO & I3->RO	0	0	1	0
3	I1->LO & I4->RO	0	0	1	1
4	I2->LO & I1->RO	0	1	0	0
5	I2->LO & I2->RO	0	1	0	1
6	I2->LO & I3->RO	0	1	1	0
7	I2->LO & I4->RO	0	1	1	1
8	I3->LO & I1->RO	1	0	0	0
9	I3->LO & I2->RO	1	0	0	1
10	I3->LO & I3->RO	1	0	1	0
11	I3->LO & I4->RO	1	0	1	1
12	I4->LO & I1->RO	1	1	0	0
13	I4->LO & I2->RO	1	1	0	1
14	I4->LO & I3->RO	1	1	1	0
15	I4->LO & I4->RO	1	1	1	1

1. All other paths are in isolation.
"1" = 5 V.
"0" = 0 V.

TSSOP-16