HMC252AQS24E

v01.0316

GaAs MMIC SP6T NON-REFLECTIVE SWITCH, DC - 3 GHz

Typical Applications

The HMC252AQS24E is ideal for:

- Base Station
- CATV / DBS
- MMDS & WirelessLAN
- Test Equipment

Features

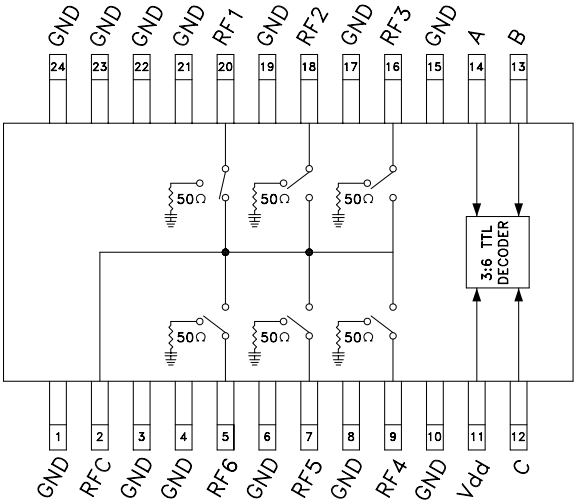
Low Insertion Loss (2 GHz): 1.0 dB

Single Positive Supply: V_{DD} = +3V to +5V

Integrated 3:6 TTL Decoder

24 Lead QSOP Package

Functional Diagram



General Description

The HMC252AQS24E is low-cost non-reflective SP6T switches in 24-lead QSOP packages featuring wideband operation from DC to 3.0 GHz. The switch offers a single positive bias and true TTL/CMOS compatibility. A 3:6 decoder is integrated on the switch requiring only 3 control lines and a positive bias to select each path. The HMC252AQS24E SP6T replaces multiple configurations of SP4T and SPDT MMIC switches and logic drivers.

Electrical Specifications, T_A = +25°C, For TTL Control and V_{DD} = +3.3V, 5V in a 50 Ohm System

Parameter	Frequency	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
		Vdd = +3.3V			Vdd = +5V			
Insertion Loss	DC - 1.0 GHz DC - 2.0 GHz DC - 2.5 GHz DC - 3.0 GHz		0.8 1.0 1.2 1.4			0.8 1.0 1.2 1.4	1.2 1.3 1.5 1.8	dB
Isolation	DC - 1.0 GHz DC - 2.0 GHz DC - 2.5 GHz DC - 3.0 GHz		45 40 38 32		38 32 29 26	45 40 38 32		dB
Return Loss "On State"	DC - 1 GHz DC - 2.5 GHz DC - 3.0 GHz		23 18 12		14 14 7	23 18 12		dB
Return Loss RF1-6 "Off State"	0.3 - 1 GHz 0.3 - 3.0 GHz 0.5 - 2.5 GHz		11 12 15		8 8 11	11 12 15		dB
Input Power for 1dB Compression	0.1 - 1.0 GHz 0.3 - 3.0 GHz		24 24		 21	30 28		dBm
Input Third Order Intercept (Two-Tone Input Power = +10 dBm Each Tone)	0.3 - 3.0 GHz		47		42	47		dBm
Switching Characteristics tRISE, tFALL (10/90% RF) tON, tOFF (50% CTL to 10/90% RF)	0.3 - 3.0 GHz		 20 70			 25 90		ns

For price, delivery, and to place orders: Analog Devices, Inc., One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106
Phone: 781-329-4700 • Order online at www.analog.com
Application Support: Phone: 1-800-ANALOG-D

HMC252A* Product Page Quick Links

Last Content Update: 11/01/2016

Comparable Parts

View a parametric search of comparable parts

Evaluation Kits

- HMC252A Evaluation Board

Documentation

Data Sheet

- HMC252A: GaAs MMIC SP6T Non-Reflective Switch, DC - 3 GHz Data Sheet

Design Resources

- HMC252A Material Declaration
- PCN-PDN Information
- Quality And Reliability
- Symbols and Footprints

Discussions

View all HMC252A EngineerZone Discussions

Sample and Buy

Visit the product page to see pricing options

Technical Support

Submit a technical question or find your regional support number

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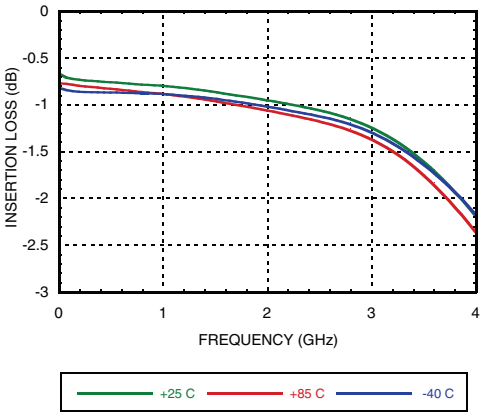
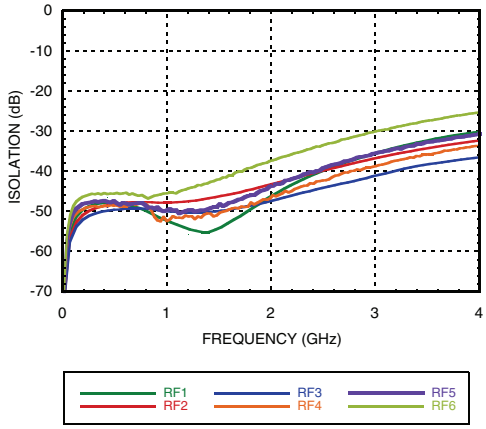
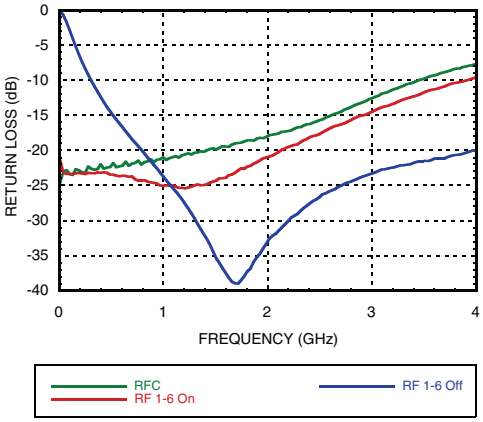
Insertion Loss [1]



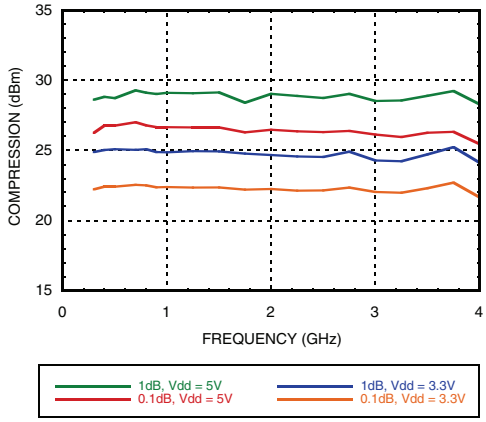
Isolation [1]



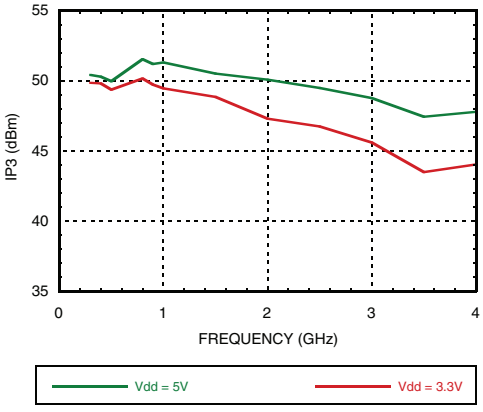
Return Loss [1]



Input Compression



Input Third Order Intercept Point



Bias Voltages & Currents

V_{DD} (V)	Idd (Typ.) (mA)	Idd (Max.) (mA)
+3.3 (Vdc ± 5%)	3.3	7
+5.0 (Vdc ± 10%)	3.5	7

TTL/CMOS Control Voltages

V_{DD} (V)	State	Bias Condition
+3.3	Low	0 to +0.8 Vdc @ 1µA Typ.
	High	+2.0 to +3.3 Vdc @ 50 µA Typ.
+5.0	Low	0 to +0.8 Vdc @ 2µA Typ.
	High	+2.0 to +5 Vdc @ 60 µA Typ.

[1] V_{DD}= 5V

NOTE:
1. DC Blocking capacitors are required at ports RFC and RF1, 2, 3, 4, 5, 6.
2. Input is reflective when “ALL OFF” state is selected.

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Absolute Maximum Ratings

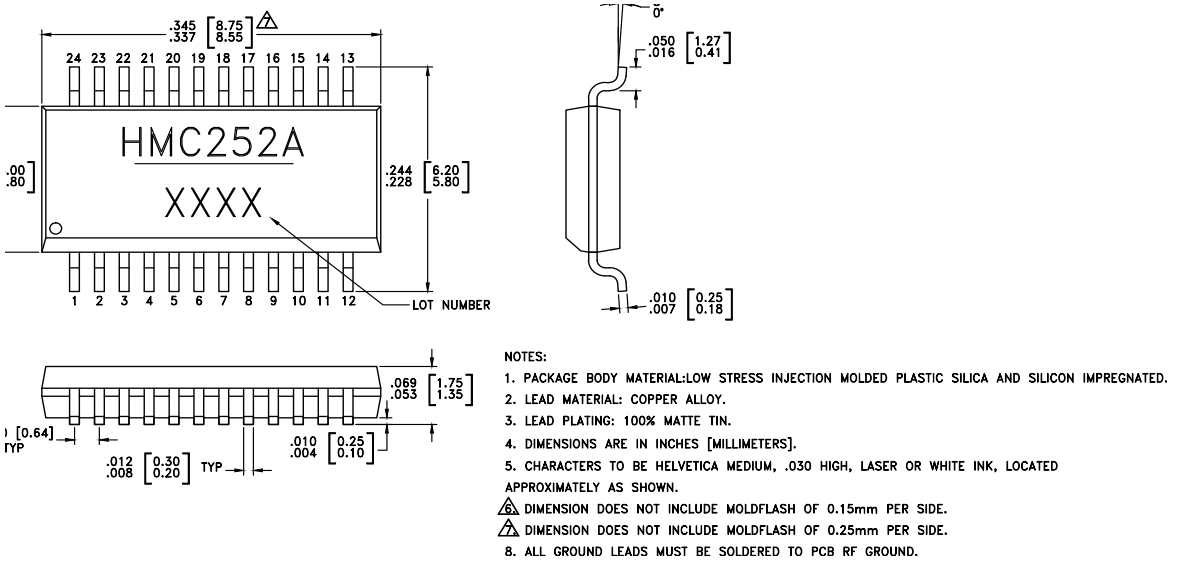
Bias Voltage Range (Port Vdd)	+7 Vdc
Control Voltage Range (A, B, C)	-0.5V to Vdd +1 Vdc
Channel Temperature	150 °C
Thermal Resistance Insertion Loss Path Terminated Path	 130 °C/W 236 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C
Maximum Input Power Vdd = +5 Vdc Insertion Loss Path Terminated Path	 +29.8 dBm +24.4 dBm
ESD Sensitivity (HBM)	Class 1A

Truth Table

Control Input			Signal Path State
A	B	C	RFCOM to:
LOW	LOW	LOW	RF1
HIGH	LOW	LOW	RF2
LOW	HIGH	LOW	RF3
HIGH	HIGH	LOW	RF4
LOW	LOW	HIGH	RF5
HIGH	LOW	HIGH	RF6
LOW	HIGH	HIGH	ALL OFF
HIGH	HIGH	HIGH	ALL OFF

ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

Outline Drawing



NOTES:

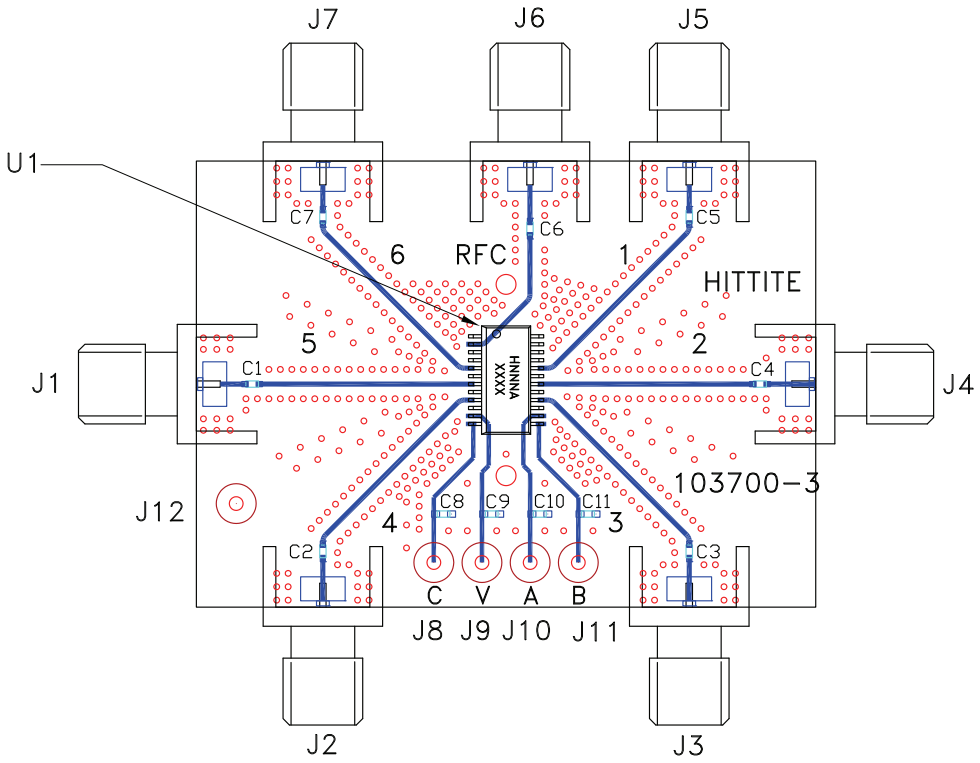
1. PACKAGE BODY MATERIAL:LOW STRESS INJECTION MOLDED PLASTIC SILICA AND SILICON IMPREGNATED.
2. LEAD MATERIAL: COPPER ALLOY.
3. LEAD PLATING: 100% MATTE TIN.
4. DIMENSIONS ARE IN INCHES [MILLIMETERS].
5. CHARACTERS TO BE HELVETICA MEDIUM, .030 HIGH, LASER OR WHITE INK, LOCATED APPROXIMATELY AS SHOWN.
6. DIMENSION DOES NOT INCLUDE MOLDFLASH OF 0.15mm PER SIDE.
7. DIMENSION DOES NOT INCLUDE MOLDFLASH OF 0.25mm PER SIDE.
8. ALL GROUND LEADS MUST BE SOLDERED TO PCB RF GROUND.

Package Information

Part Number	Package Body Material	Lead Finish	MSL Rating	Package Marking [2]
HMC252AQS24E	RoHS-compliant Low Stress Injection Molded Plastic	100% matte Sn	MSL1 [1]	HMC252A XXXX

[1] Max peak reflow temperature of 260 °C
[2] 4-Digit lot number XXXX

Evaluation Circuit Board



List of Materials for Evaluation PCB EV1HMC252AQS24 [1]

Item	Description
J1 - J7	PCB Mount SMA Connector
J8 - J12	DC Pin
C1 - C7	100 pF Capacitor, 0402 Pkg.
C8 - C11	10,000 pF Capacitor, 0603 Pkg.
U1	HMC252AQS24E SP6T Switch
PCB [2]	103700 Eval Board

[1] Reference this number when ordering complete evaluation PCB

[2] Circuit Board Material: Rogers 4350

The circuit board used in the application should be generated with proper RF circuit design techniques. Signal lines at the RF ports should have 50 ohm impedance while the package ground leads should be connected directly to the ground plane similar to that shown above. A sufficient number of via holes should be used to connect the top and bottom ground planes. The evaluation circuit board shown above is available from Analog Devices Inc. upon request.