

Typical Applications

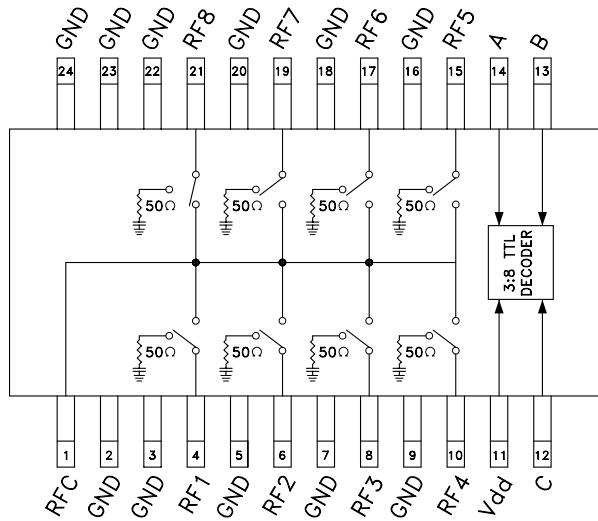
The HMC253AQS24 / HMC253AQS24E is ideal for DC - 2.5 GHz applications:

- CATV/DBS
- CDMA
- Cellular/PCS

Features

- Low Insertion Loss (2 GHz): 1.1dB
- Single Positive Supply: Vdd = +5V
- Integrated 3:8 TTL Decoder
- 24 Lead QSOP Package

Functional Diagram



General Description

The HMC253AQS24 & HMC253AQS24E are low-cost non-reflective SP8T switches in 24-lead QSOP packages featuring wideband operation from DC to 2.5 GHz. The switch offers a single positive bias and true TTL/CMOS compatibility. A 3:8 decoder is integrated on the switch requiring only 3 control lines and a positive bias to select each path. The HMC253AQS24 & HMC253AQS24E SP8T will replace multiple configurations of SP4T and SPDT MMIC switches.

Electrical Specifications,

$T_A = +25^\circ C$, For TTL Control and $Vdd = +5V$ in a 50 Ohm system

Parameter	Frequency	Min.	Typ.	Max.	Units
Insertion Loss	DC - 1.0 GHz DC - 2.0 GHz DC - 2.5 GHz		1.0 1.1 1.4	1.5 1.7 2.1	dB
Isolation	DC - 1.0 GHz DC - 2.0 GHz DC - 2.5 GHz	35 30 28	40 35 33		dB
Return Loss	"On State"	DC - 1.0 GHz DC - 2.0 GHz DC - 2.5 GHz		21 20 16	dB
Return Loss (RF1-8)	"Off State"	0.3 - 2.5 GHz 0.5 - 2.5 GHz		8 13	dB
Input Power for 1 dB Compression	0.3 - 2.5 GHz	20	23		dBm
Input Third Order Intercept (Two-Tone Input Power = +10 dBm Each Tone)	0.3 - 2.5 GHz	41	46		dBm
Switching Characteristics tRISE, tFALL (10/90% RF) tON, tOFF (50% CTL to 10/90% RF)	0.3 - 2.5 GHz			20 90	ns ns

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HMC253AQS24* PRODUCT PAGE QUICK LINKS

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COMPARABLE PARTS

View a parametric search of comparable parts.

EVALUATION KITS

- HMC253AQS24 Evaluation Board

DOCUMENTATION

Data Sheet

- HMC253AQS24: GaAs MMIC SP8T Non-Reflective Switch, DC-2.5 GHz Data Sheet

DESIGN RESOURCES

- HMC253AQS24 Material Declaration
- PCN-PDN Information
- Quality And Reliability
- Symbols and Footprints

DISCUSSIONS

View all HMC253AQS24 EngineerZone Discussions.

SAMPLE AND BUY

Visit the product page to see pricing options.

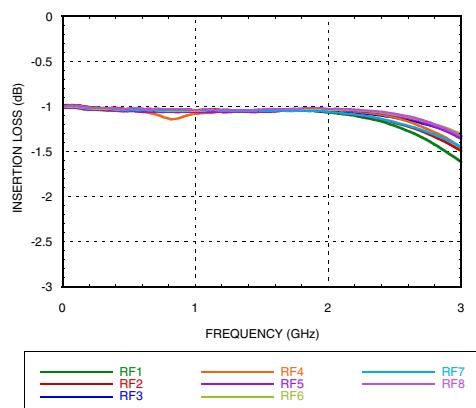
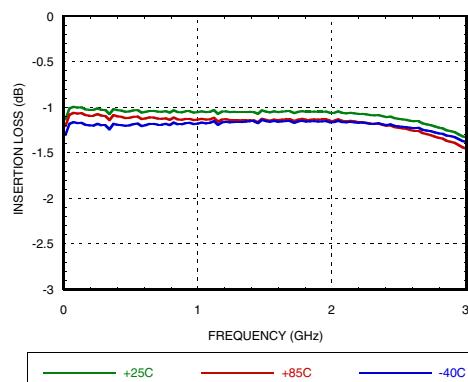
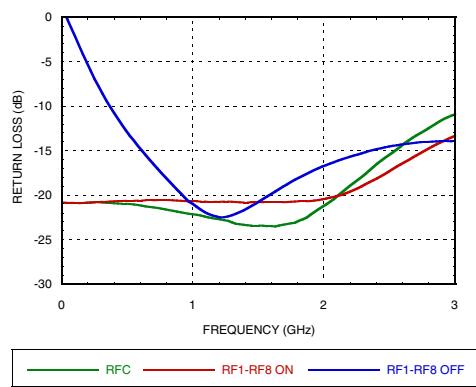
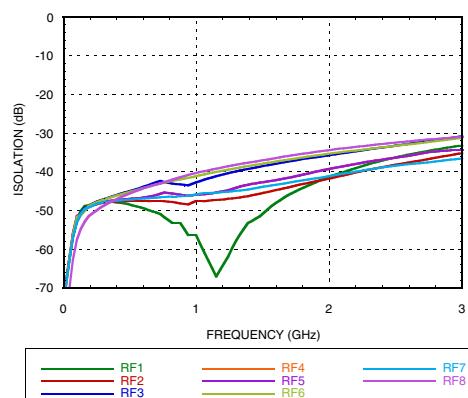
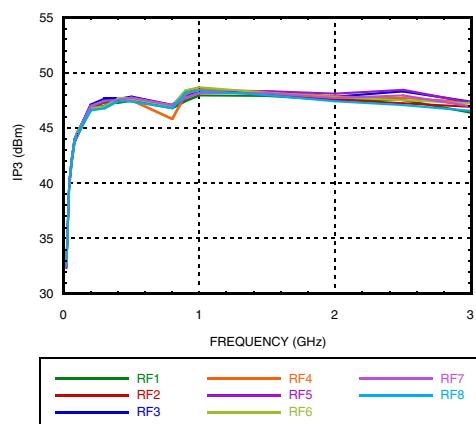
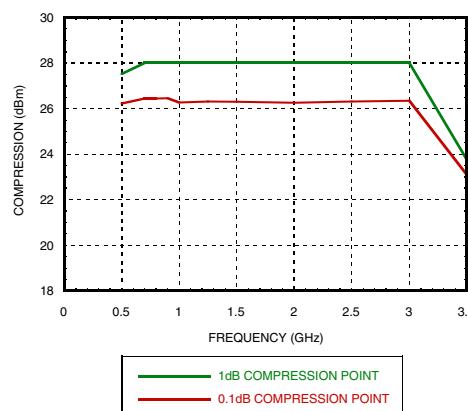
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Insertion Loss

Insertion Loss vs. Temperature

Return Loss

Isolation

Input IP3

Input Compression


**GAAS MMIC SP8T NON-REFLECTIVE
SWITCH, DC - 2.5 GHz**
Bias Voltage & Current

Vdd Range = +5 Vdc \pm 10%		
Vdd (Vdc)	Idd (Typ.) (mA)	Idd (Max.) (mA)
+5	4.5	7.5

TTL/CMOS Control Voltages

State	Bias Condition
Low	0 to +0.8 Vdc @ <1 μ A Typ.
High	+2.0 to +5 Vdc @ 60 μ A Typ.

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	RF7
High	High	High	RF8

NOTE:

DC Blocking capacitors are required at ports RFC and RF1, 2, 3, 4, 5, 6, 7, 8.

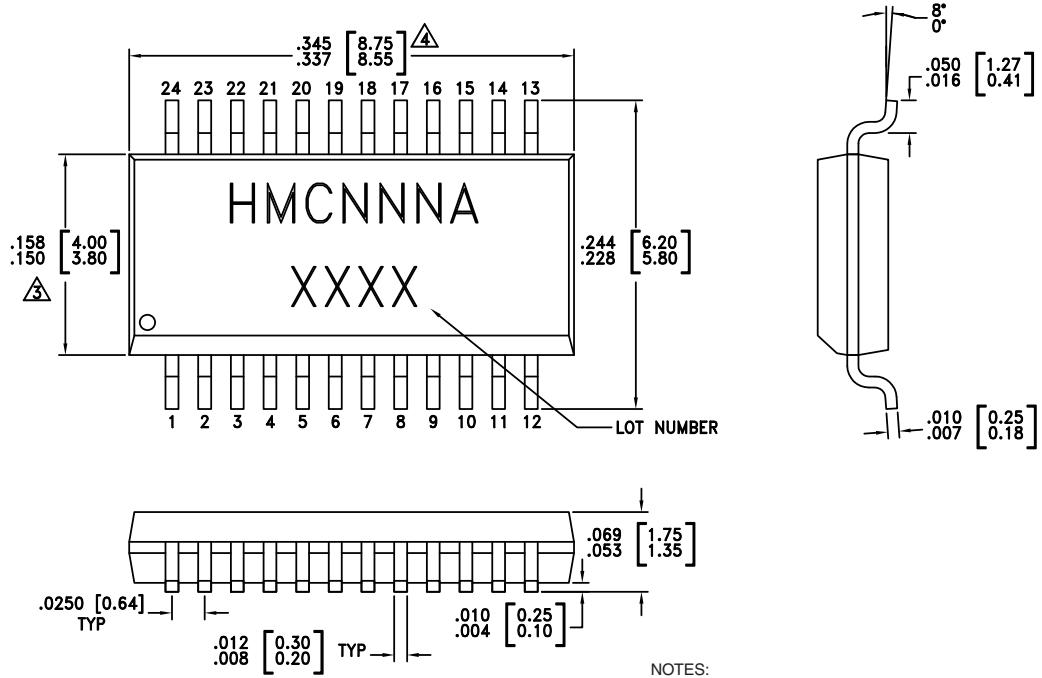

**ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS**
Absolute Maximum Ratings

Bias Voltage Range (Port Vdd)	+7.0 Vdc
Control Voltage Range (A, B, C)	-0.5V to Vdd +1Vdc
Channel Temperature	150 °C
Thermal Resistance (channel to package ground paddle)	
Through Path	183 °C/W
Termination Path	274 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C
Maximum Input Power (Vdd = +5V)	
Through Path	+20 dBm (0.05 - 0.5 GHz) +25 dBm (0.5 - 2.5 GHz)
Terminated Path	+20 dBm (0.05 - 0.5 GHz) +23.5 dBm (0.5 - 2.5 GHz)
ESD Sensitivity (HBM)	Class 1A

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Outline Drawing



Package Information

Part Number	Package Body Material	Leadframe Plating	MSL Rating	Package Marking ^[3]
HMC253AQS24	Low Stress Injection Molded Plastic Silica and Silicon Impregnated	Sn/Pb Solder	MSL1 ^[1]	HMC253A XXXX
HMC253AQS24E	RoHS-compliant Low Stress Injection Molded Plastic Silica and Silicon Impregnated	100% Matte Tin	MSL1 ^[2]	HMC253A XXXX

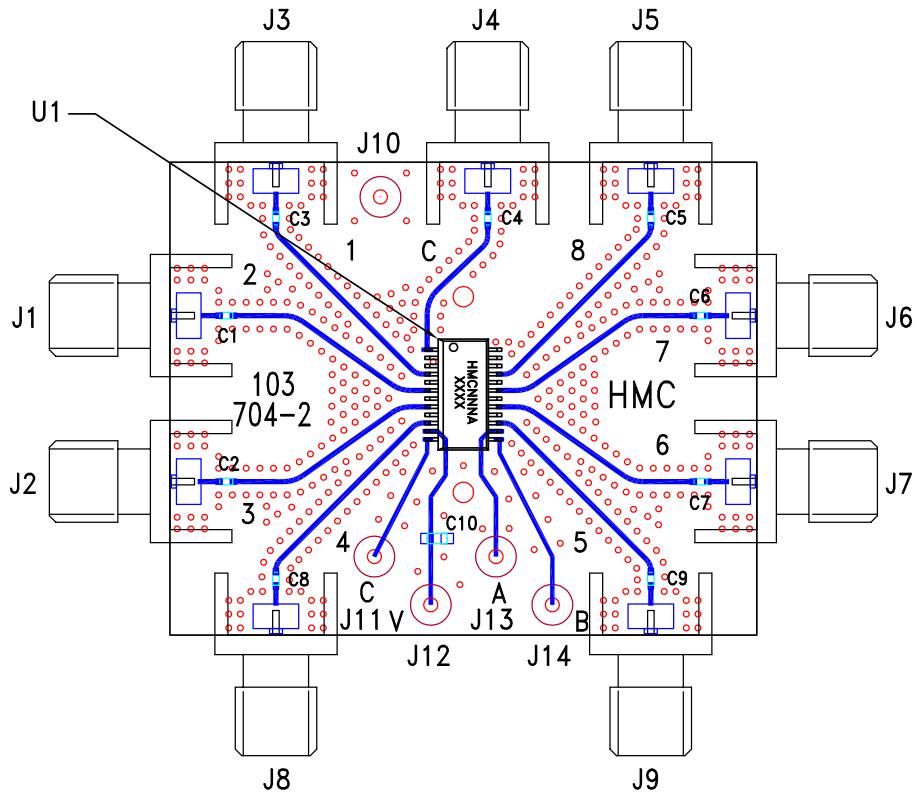
[1] Max peak reflow temperature of 235 °C

[2] Max peak reflow temperature of 260 °C

[3] 4-Digit lot number XXXX

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Evaluation Circuit Board

List of Materials for Evaluation PCB EV1HMC253AQS24^[1]

Item	Description
J1 - J9	PCB Mount SMA Connector
J10 - J14	DC Pin
C1 - C9	100 pF Capacitor, 0402 Pkg.
C10	0.01 uF Capacitor, 0603 Pkg.
U1	HMC253AQS24 / HMC253AQS24E SP8T Switch
PCB [2]	103704 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 upon request.