

SPDT High Power 2.5V GSM Antenna Switch

Features:

- SLIM-7 Packaged PHEMT GaAs MMIC Die
- Smallest Available GSM SPDT Switch
- 1.3 x 2.0 mm Footprint
- Thin Package: 0.4mm for LTCC Modules
- Excellent Harmonic Performance
 - -74dBc 2nd Harmonic at GSM 850/900, +35dBm
 - -81dBc 2nd Harmonic at DCS/PCS, +33 dBm
 - -77dBc 3rd Harmonic at GSM 850/900, +35dBm
 - -78dBc 3rd Harmonic at DCS/PCS, +33 dBm
- Highly Linear Control Voltage, to +2.0V
- High Isolation: -27dB typ 0.5 to 2 GHz
- Low Insertion Loss: 0.39 dB typ at GSM850/900
0.51 dB typ at DCS/PCS
- Very Low Control Current

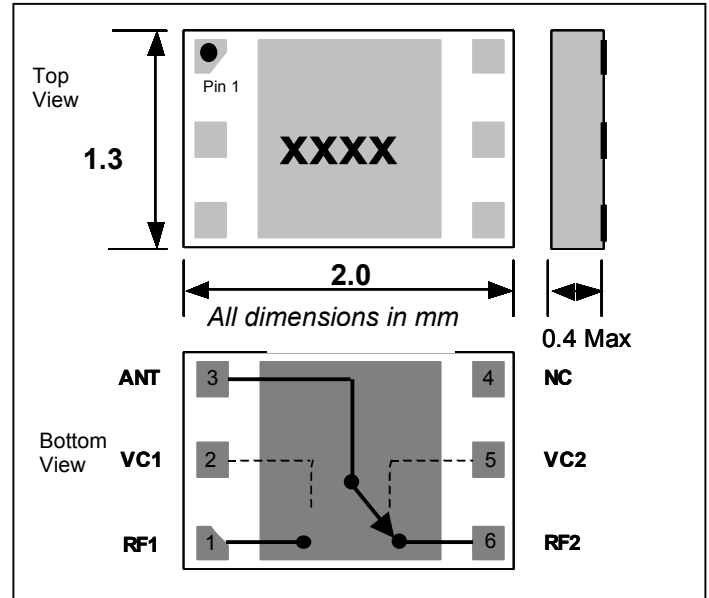
Application:

- GSM Handset Antenna Switch Modules (ASM) and Front End Modules (FEM)

Description:

TriQuint's TQP4M4003 is a high power antenna switch in a single pole double throw (SPDT) configuration. The die utilizes TriQuint's PHEMT MMIC switch process to provide optimized performance for use in GSM applications. The SLIM-7 package is 0.4mm thick with a 1.3 x 2.0 mm footprint, which is ideally suited to replace package PIN diodes on height critical LTCC modules. PHEMT Switches are a very low DC current replacement for classic PIN diode based switches.

SLIM-7 Package Outline:



Electrical Performance: Ta = 25°C, Zo=50 Ohms, Vcontrol = 0V / 2.5V¹

Parameter	Test Conditions	Units	Min	Typ	Max
Insertion Loss	GSM850/900	dB		0.40	
Insertion Loss	DCS/PCS	dB		0.50	
Isolation RF1 to RF2	One port on.	dB		-27	
2 nd Harmonic	GSM850/900, Pin = +35 dBm	dBc		-74	
2 nd Harmonic	DCS/PCS, Pin = +33 dBm	dBc		-81	
3 rd Harmonic	GSM850/900, Pin = +35 dBm	dBc		-77	
3 rd Harmonic	DCS/PCS, Pin = +33 dBm	dBc		-78	
Return Loss	0.5 to 2.0GHz	dB		-20	
Leakage Current	-	µA			100
Trise, Tfall	10% to 90% RF, 90% to 10% RF	µS			1
Ton, Toff	50% control to 90% RF, and 50% control to 10% RF	µS			1

Truth Table: ^{2, 3}

VC1	VC2	ANT-RF1	ANT-RF2
0	1	Off	On
1	0	On	Off

Notes:

1. External DC blocking capacitors are required at all RF ports
2. State 1 = +2.0V to +5.0V, State 0 = 0V to +0.2V
3. Differential voltage from State 1 to State 2 must be a minimum of 2.0V
4. Exceeding any parameter either individually or in combination may cause permanent damage.

SPDT High Power 2.5V GSM Antenna Switch

Absolute Maximum Ratings⁴:

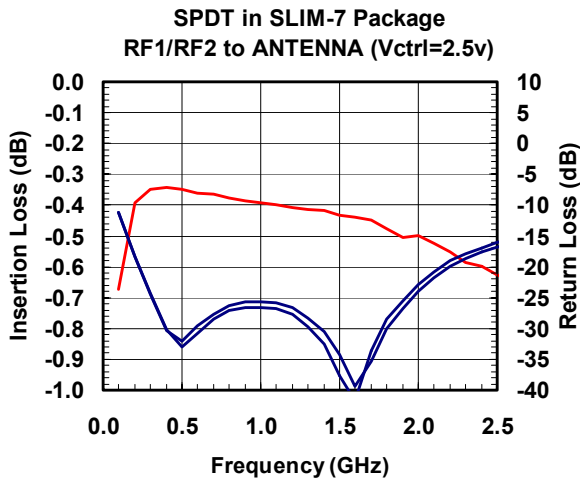
Parameter	Absolute Maximum
Max Input Power	+37dBm
Control Voltage	+/-5V
Operating Temp	-40°C to +85°C
Storage Temp	-65°C to +150°C

Pin Descriptions:

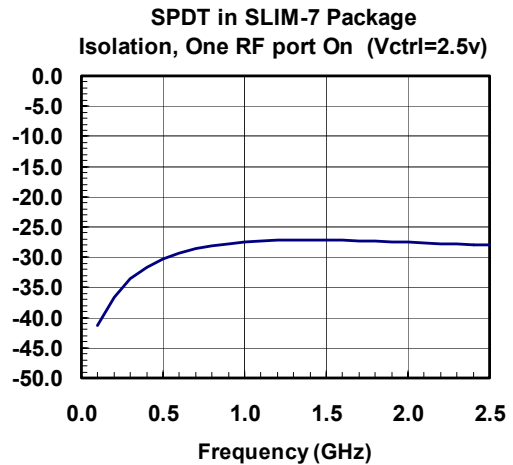
Pad Number	Pin Name	Description
1	RF1	RF Port 1
2	VC1	Control RF Port 1
3	ANT	ANTENNA Port
4	NC	No Connection
5	VC2	Control RF Port 2
6	RF2	RF Port 2

Typical Performance Curves:

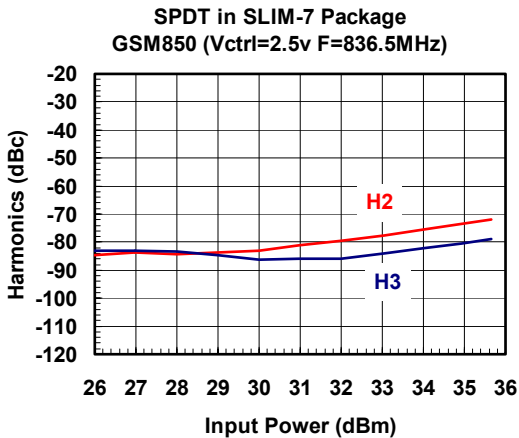
Insertion Loss and Match



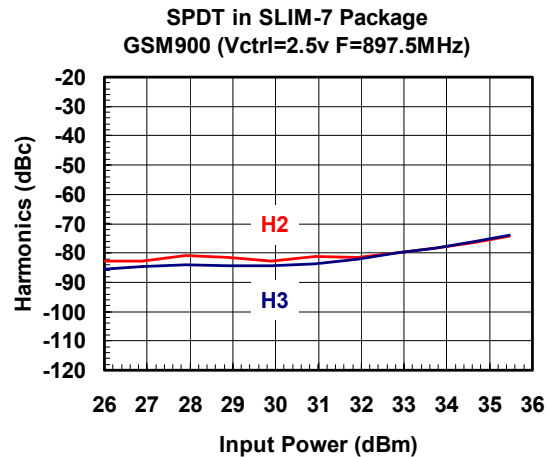
Isolation



Harmonics GSM850

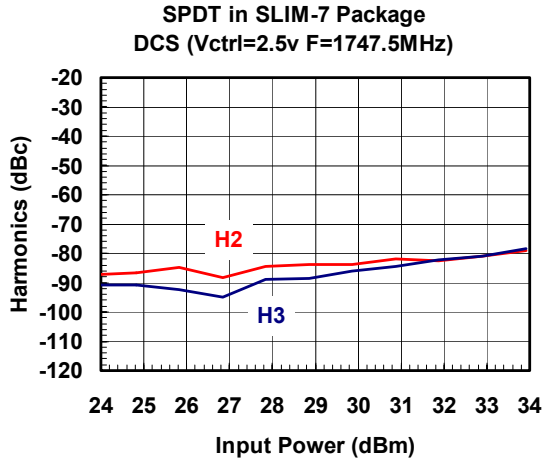


Harmonics GSM900

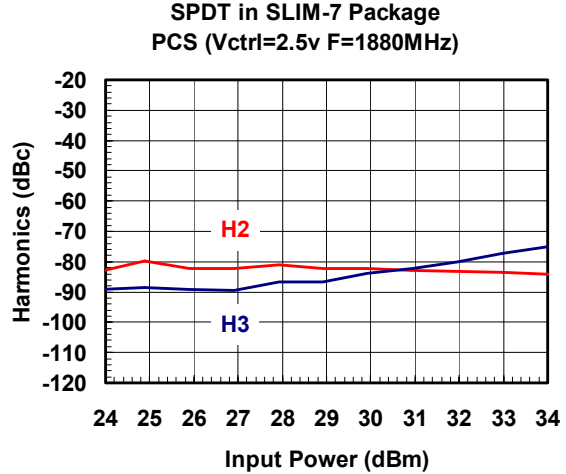


SPDT High Power 2.5V GSM Antenna Switch

Harmonics DCS

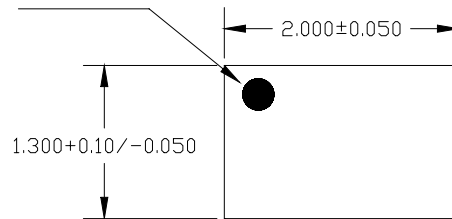


Harmonics PCS

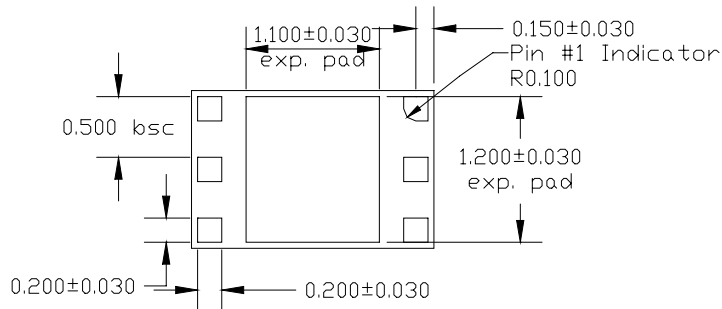


SLIM-7 Package

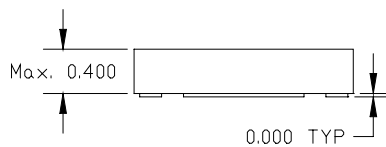
Pin 1 Dot
By marking



Top View



Bottom View



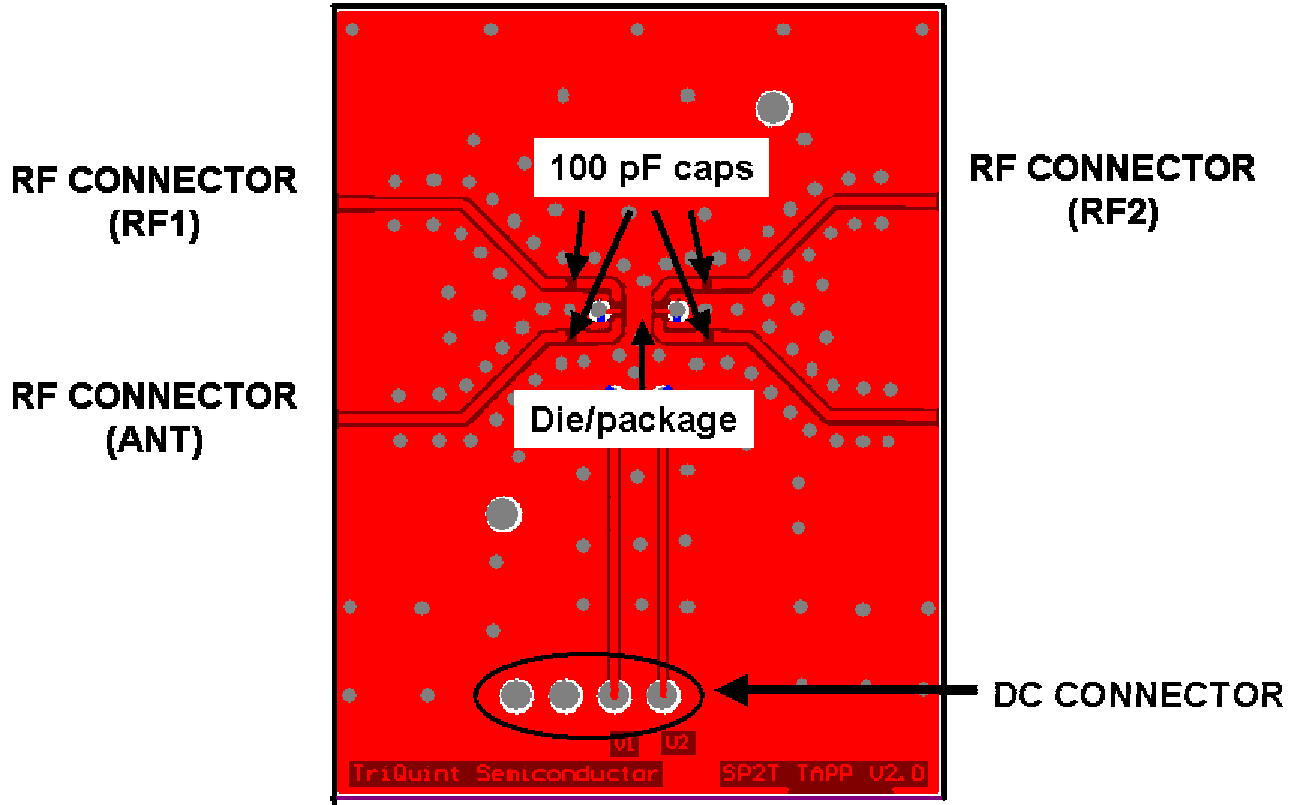
Side View

NOTES

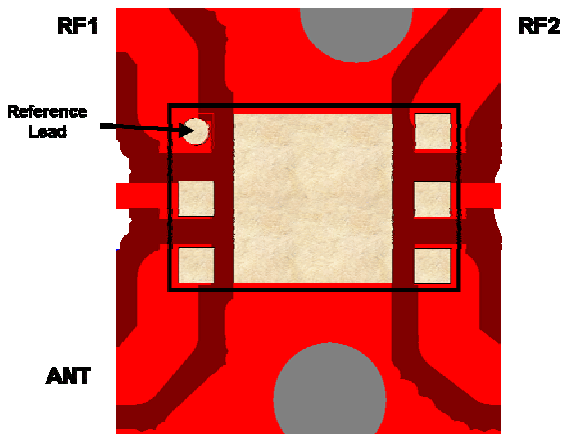
- 1.1 All dimensions are in Millimeter (mm)
- 1.2 Package surface is mirror finish.
- 1.3 Dimensions are exclusive of mold flash and gate burr.
- 1.4 Lead finish is gold.

SPDT High Power 2.5V GSM Antenna Switch

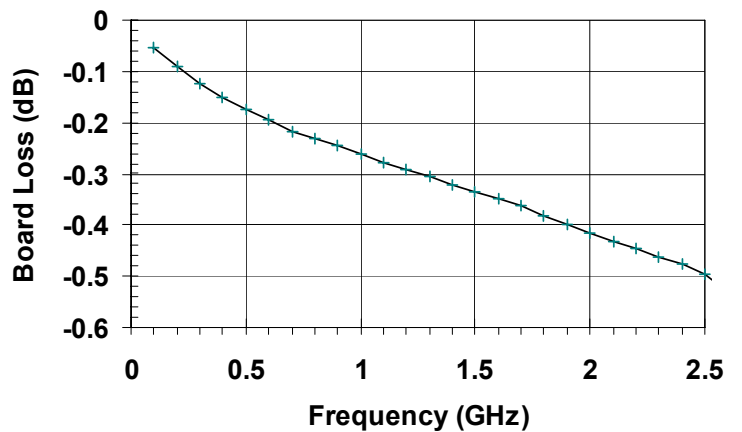
Application Board:



Package Configuration On Board:

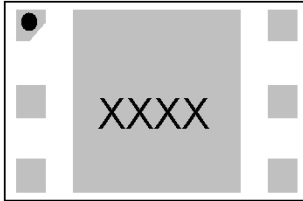


Application Board Loss De-Embedding Curve: FR4



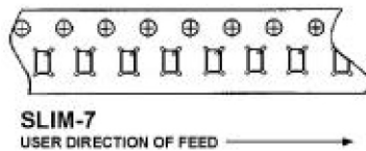
SPDT High Power 2.5V GSM Antenna Switch

Part Marking:



where XXXX = last four digits of batch

Part Orientation on Reel:



Ordering Information:

Type	Marking	Package
TQP4M4003	XXXX	SLIM-7

ESD: Electrostatic Discharge Sensitive Device: Observe Handling Precautions!

Additional Information

For latest specifications, additional product information, worldwide sales and distribution locations, and information about TriQuint:

Web: www.triquint.com

Tel: (503) 615-9000

Email: info_wireless@tqs.com

Fax: (503) 615-8902

For technical questions and additional information on specific applications:

Email: info_wireless@tqs.com

The information provided herein is believed to be reliable; TriQuint assumes no liability for inaccuracies or omissions. TriQuint assumes no responsibility for the use of this information, and all such information shall be entirely at the user's own risk. Prices and specifications are subject to change without notice. No patent rights or licenses to any of the circuits described herein are implied or granted to any third party.

TriQuint does not authorize or warrant any TriQuint product for use in life-support devices and/or systems.

Copyright © 2004 TriQuint Semiconductor, Inc. All rights reserved.

Revision 0.2 January 7, 2004