

General Purpose SPDT Switch

Description:

CSH210R is a general purpose single-pole, double-throw switch device designed for mobile communications applications such as cellular and PCS mobile phones, ISM bands, GPS receivers, L-band satellite terminals, WLAN and pagers. The device is based on pHEMT technology and exhibits very low insertion loss and high intermodulation performance.

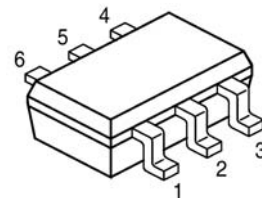
The CSH210R does not need a supply voltage and switching is accomplished with a positive control voltage. The device exhibits excellent VSWRs and isolation and is useable from DC to 2.5 GHz.

Features:

- SPDT Switch for mobile communications:
 - Insertion Loss: 0.4 dB @ 2.0 GHz
 - Isolation: 20 dB @ 2.0 GHz
 - VSWR: 1.3:1
 - P0.1dB: +26 dBm
- RF-frequency range DC – 2.5 GHz
- No supply voltage
- Positive control voltage
- Small SC-70 plastic package

Applications:

- General Purpose SPDT
- Antenna Diversity Switching
- TX-RX Switching
- Mobile Phones
- ISM and WLAN
- L-Band Satellite Terminals



SC-70

Pin Configuration:

- 1: RF1 Port
- 2: GND
- 3: RF2 Port
- 4: Control V2
- 5: RF Common
- 6: Control V1

CSH210R

Maximum Ratings:

Parameter	Symbol	Value		Unit
		min	max	
Control Voltage Range	Vcntrl	-5	5	V
RF Input Power	Pin			W
Junction Temperature @ 30dbm input and 25°C	T _j		50	°C
Storage Temperature	T _{stg}	-55	150	°C

Exceeding any one or combination of these max ratings may cause permanent damage

AC Electrical Characteristics: (T=25°C; Vcntrl=3.0V; Pin=0dBm)**

Parameter	Symbol	Test Condition	min	typ	max	Unit
Insertion Loss RFC-RF1, RFC-RF2	ILRF	0.5-1.0GHz 1.0-2.0GHz		0.3 0.4	0.45 0.6	dB
Isolation RF1-RF2	ISOL	0.5-1.0GHz 1.0-2.0GHz	19 15	24 20		dB
VSWR* (all ports)	VSWR	DC-2.5GHz		1.3:1		
Gate Leakage	I _L				0.1	mA
Trise /Tfall (10% RF to 90%RF)				10		nS
Ton /Toff (50% CNTRL - 90%/10%RF)				20		nS
Output Power for 0.1 dB compression	P0.1dB	DC-2.5GHz		26		dBm
Output Power for 1 dB compression	P1	DC-2.5GHz		30		dBm
Intermodulation Intercept Point	IP3	Pin=25dBm Freq.=1.0GHz		56		dBm

*VSWR defined for insertion loss state only

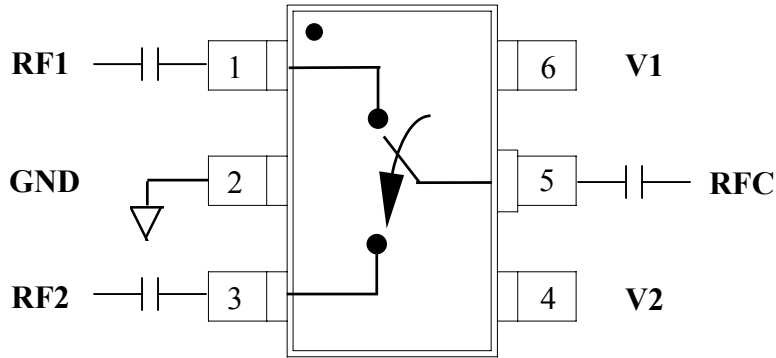
** Performance optimized for 800 MHz to 2GHz operation with 100pF external blocking capacitors in all RF paths

DC Electrical Characteristics

Parameter	min	typ	max	Unit
Logic Level Low (State 0)	0	-	0.2	V
Logic Level High (State 1)	2.5	-	5	V

CSH210R

PIN Assignments & Functional Block Diagram



*External DC blocking capacitors required; 100pF on pins 1,3 & 5.

Pin Assignments:

PIN	Symbol	Abbreviation	Description
1	RF OUTPUT 1	RF1	RF OUTPUT
2	GND	GND	Circuit common and DC return
3	RF OUTPUT 2	RF2	RF OUTPUT
4	V_CONTROL 2	V2	RF OUTPUT 2 control
5	RF COMMON	RFC	Common RF port
6	V_CONTROL 1	V1	RF OUTPUT 1 control

Truth Table:

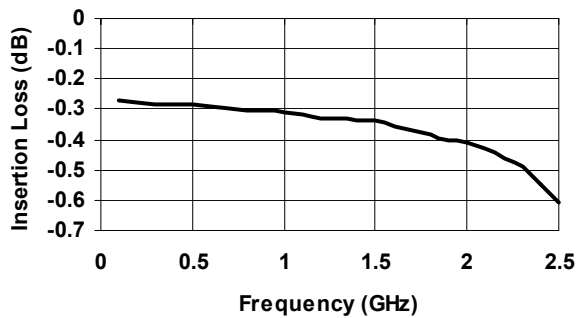
V1	V2	Through Path
0V	3V	RFC – RF1
3V	0V	RFC – RF2

CSH210R

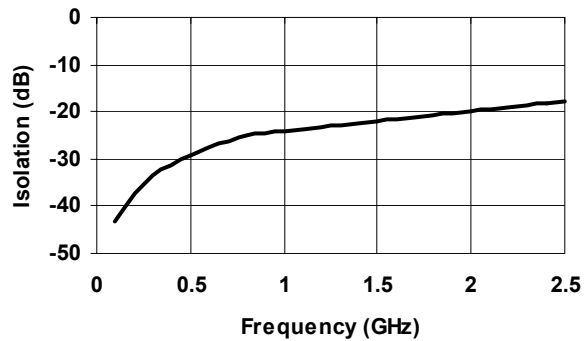
Typical Performance:

(All Ports connected to 50ohms, Pin=0dBm, Vcntrl=3V unless otherwise specified, 100pF blocking capacitors)
Optimized performance can be achieved <0.5GHz by increasing blocking capacitor to >100pF
Optimized performance can be achieved >2.0GHz by decreasing blocking capacitor to <100pF

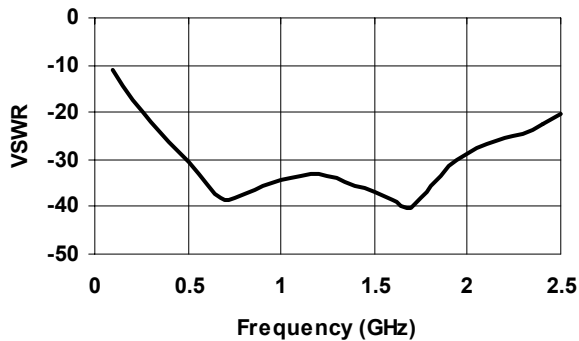
Insertion Loss Versus Frequency



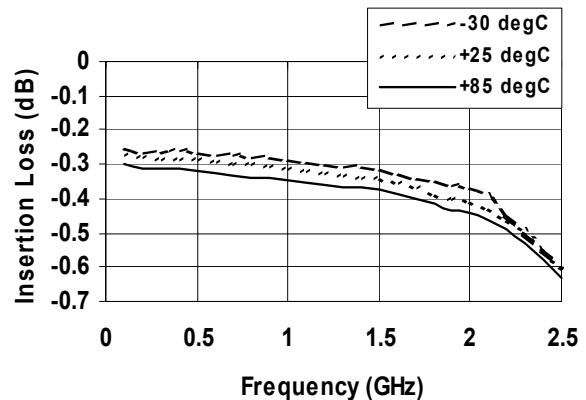
Isolation versus Frequency



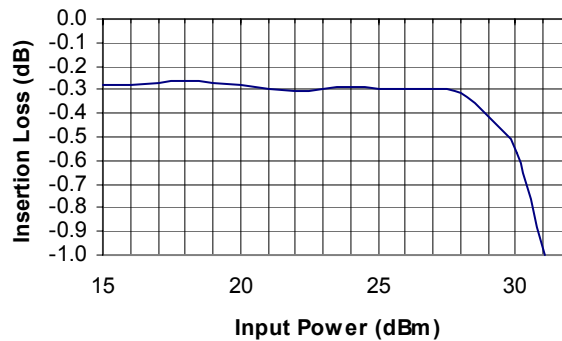
Input VSWR versus Frequency



Insertion Loss versus Frequency and Temperature



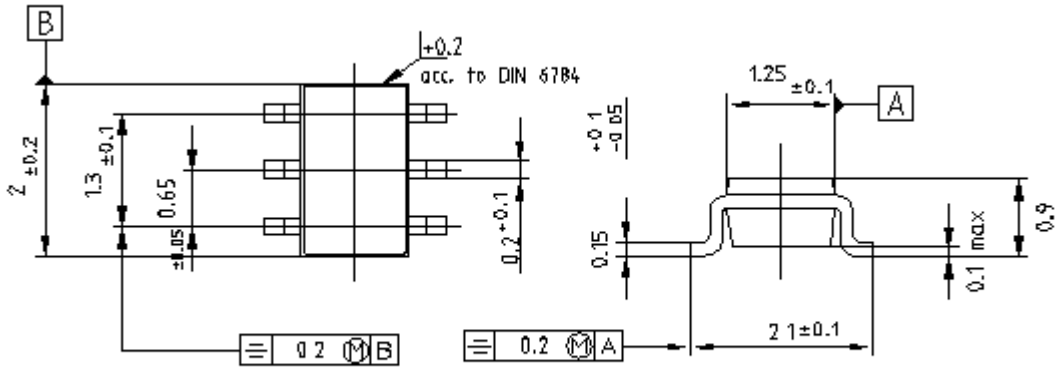
Insertion Loss Versus Input Power



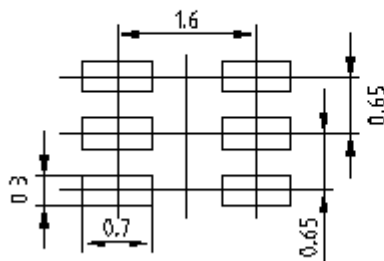
CSH210R

Applications Information:

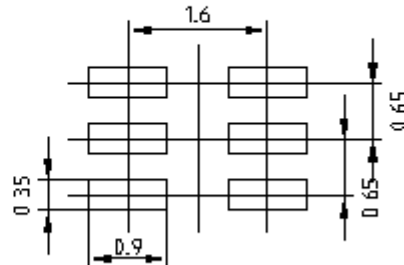
Package Outline – SC-70



Reflow soldering



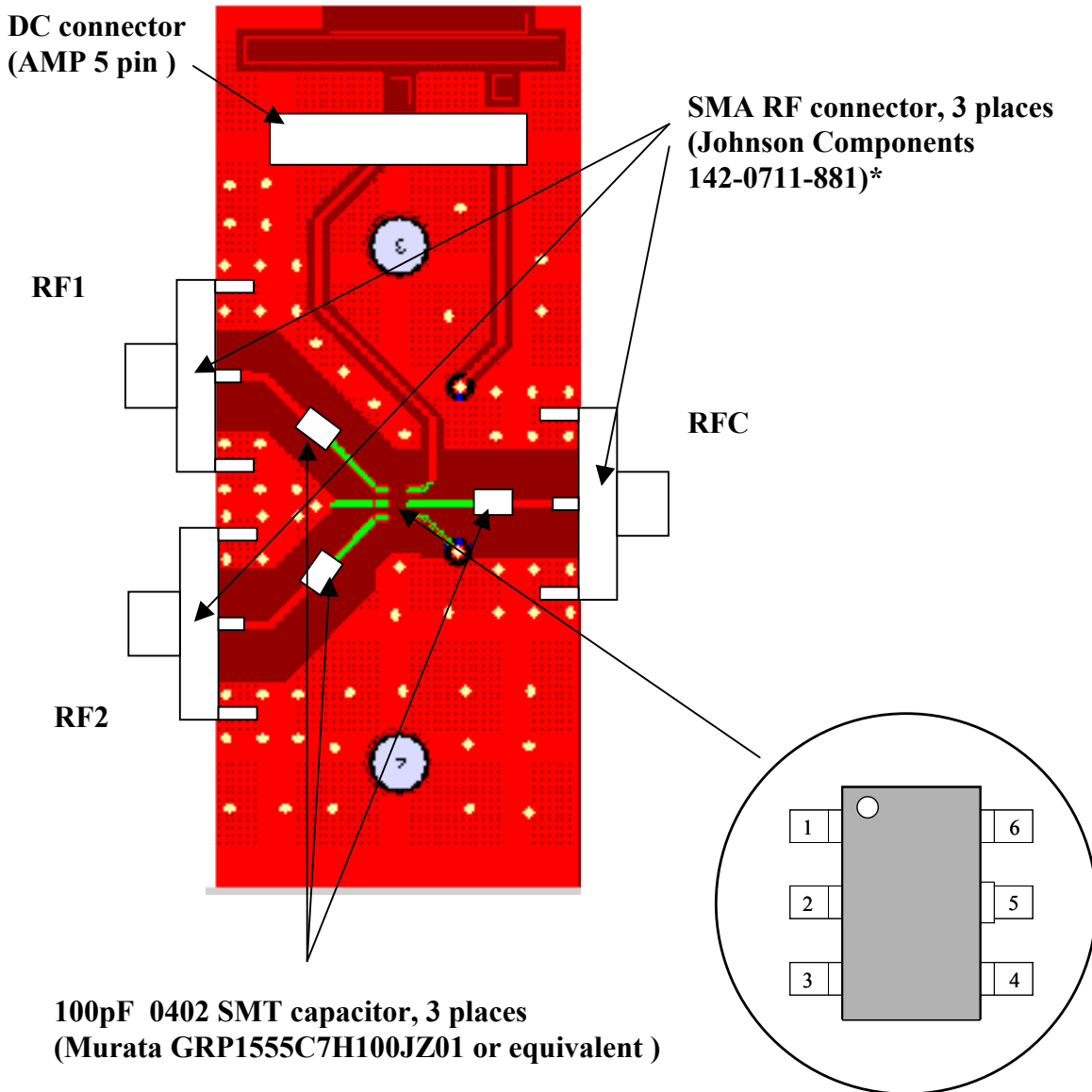
Wave soldering



Evaluation Board Layout

Board Size 0.75" x 1.75"

Board Thickness 0.047", Board Material FR4 Multi-Layer



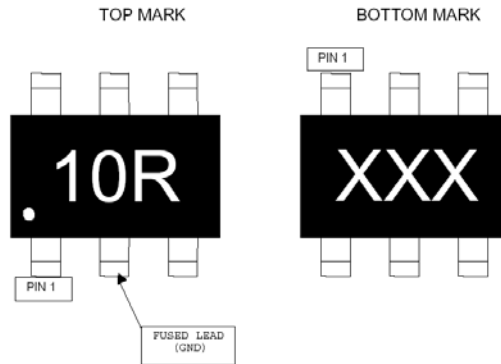
*(All Ports connected to 50ohms, Pin=0dBm, Vcntrl=3V unless otherwise specified, 100pF blocking capacitors)

Optimized performance can be achieved <0.5GHz by increasing blocking capacitor to >100pF

Optimized performance can be achieved >2.0GHz by decreasing blocking capacitor to <100pF

CSH210R

Part Marking:



Part Orientation on Reel:



Ordering Information:

Type	Marking	Package
CSH210R	10R	SC-70

ESD: **E**lectrostatic **d**ischarge 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 © 2003 TriQuint Semiconductor, Inc. All rights reserved.

Revision 5-, December 16, 2003