

## 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.

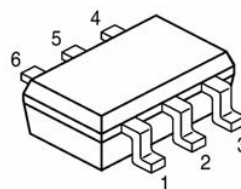
### Features

- 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
- RoHS compliant (2002/95/EC), Pb-free

### Applications

- General Purpose SPDT
- Antenna Diversity Switching
- TX-RX Switching
- Switched Split Band Filters in CDMA Handsets
- ISM and WLAN
- L-Band Satellite Terminals

### Package Outline



#### 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		2	W
Operating Temperature		-40	85	°C
Storage Temperature	Tstg	-55	150	°C

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

## AC Electrical Characteristics

Operating Conditions (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 <sub>L</sub>				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

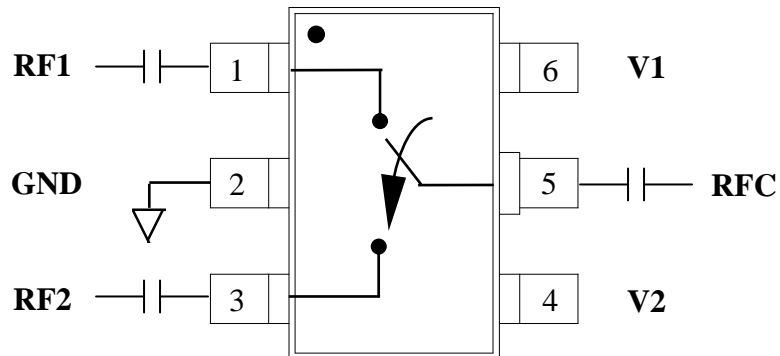
Parameter	min	typ	max	Unit
Logic Level Low (State 0)	0	-	0.2	V
Logic Level High (State 1)	2.5	-	5	V

For additional information and latest specifications, see our website: [www.triquint.com](http://www.triquint.com)

Revision F, April 22, 2008

# 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:

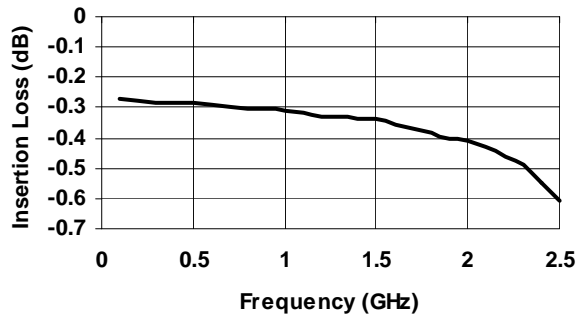
V1	V2	Through Path
0V	3V	RFC – RF1
3V	0V	RFC – RF2

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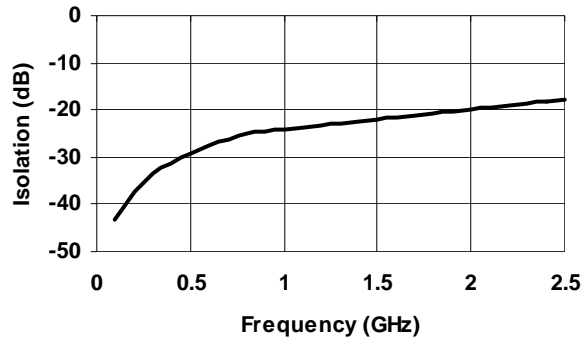
## Typical Performance

(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

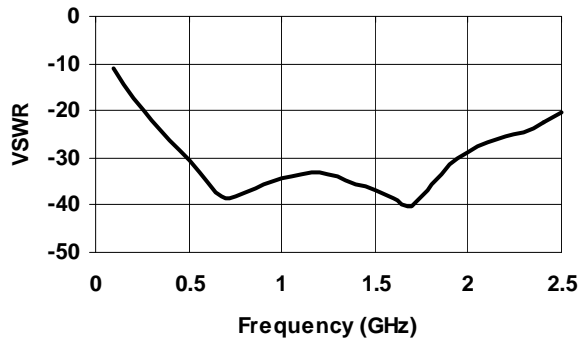
### Insertion Loss Versus Frequency



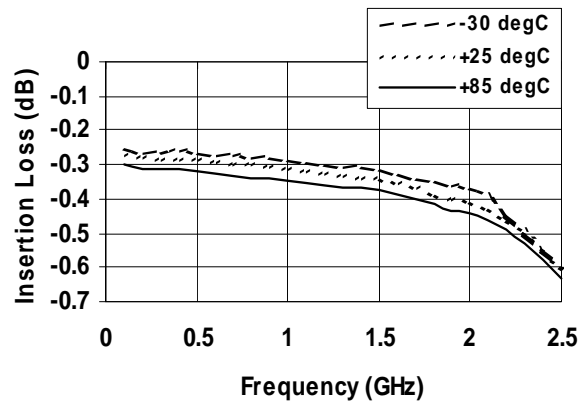
### Isolation versus Frequency



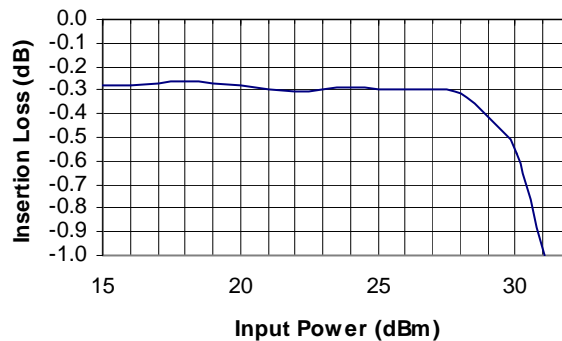
### Input VSWR versus Frequency



### Insertion Loss versus Frequency and Temperature



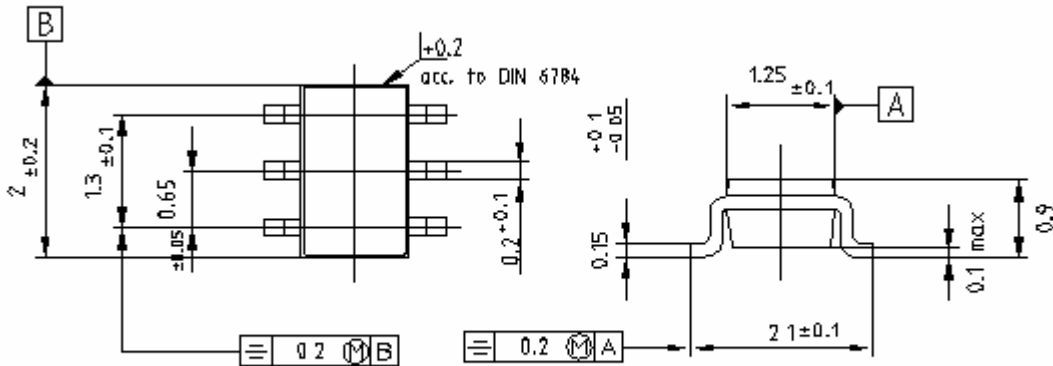
### Insertion Loss Versus Input Power



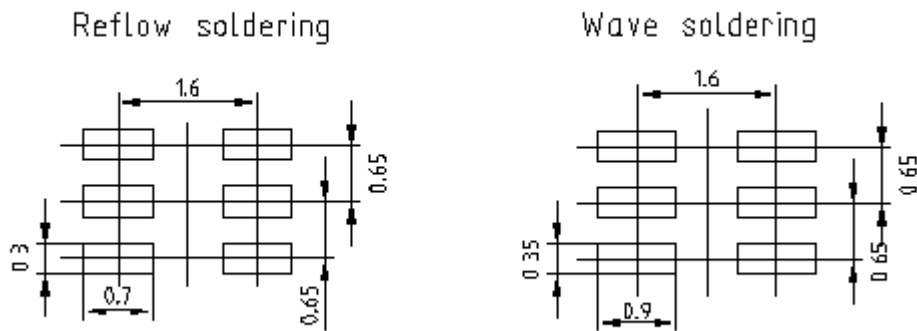
# CSH210R

## Applications Information

### Package Outline – SC-70



### Recommended SC-70 Solder Footprint

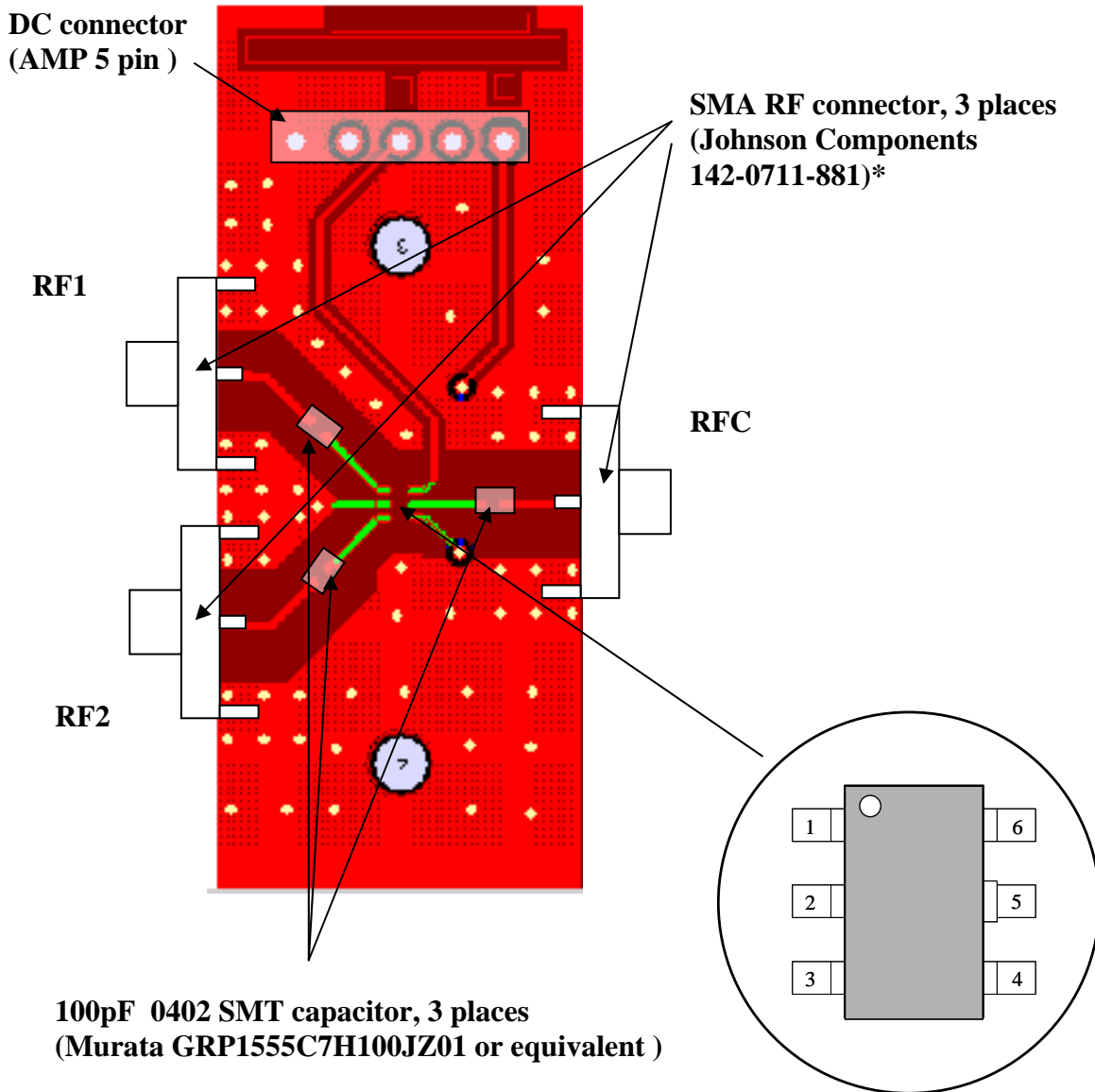


# CSH210R

## Evaluation Board Layout

Board Size 0.75" x 1.75"

Board Thickness 0.047", Board Material FR4 Multi-Layer



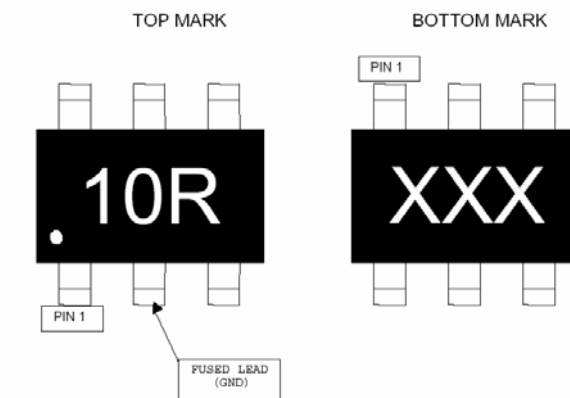
\*(All Ports connected to 50ohms, Pin=0dBm, Vcntrl=3V unless otherwise specified, 100pF blocking capacitors)

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

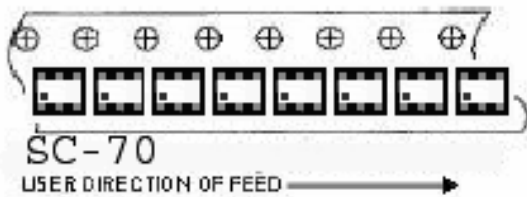
Optimized performance can be achieved >2.0GHz by decreasing blocking capacitor to <100pF

# CSH210R

## Part Marking



## Part Orientation on Reel



## Ordering Information

Type	Marking	Package
CSH210R	10R	SC-70

## Additional Information

This part is compliant with RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment).

The part is rated Moisture Sensitivity Level 1 at 260°C per JEDEC standard IPC/JEDEC J-STD-020.

ESD: **E**lectro**s**tatic **d**ischarge sensitive device. Observe handling Precautions.

# CSH210R

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