PE4210/4220/4230

EVALUATION KIT

USER'S MANUAL

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Peregrine Semiconductor Corp. Life Support Policy

Peregrine Semiconductor Corp. products are not intended for use in life-critical situations, or as critical components in life-support devices or systems.

Life-support devices or systems are defined as devices or systems that are intended for surgical implant into the body, or that support or sustain life, and whose failure to perform when used in accordance with the instructions provided by the manufacturer, might result in injury to the user.

This device is intended for use only in a research and development environment. It has not been tested for compliance with FCC regulations regarding interference with radio frequency energy. It might cause harmful interference with radio communications. The user assumes responsibility for any interference caused by this device.

Applications Support

If you have a problem with your evaluation kit or the software, or if you have applications questions call (858) 455-0660 and ask for applications support.

You may also contact us by fax or e-mail:

Fax: (858) 455-0770
E-Mail: help@peregrine-semi.com

FCC Labeling Requirement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation.

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Special Handling

The following precautions should be taken when handling these devices to prevent ESD/EOS damage:
- These devices are ESD sensitive and should be handled using acceptable ESD handling procedures.
- The PE4210, PE4220 & PE4230 were designed to operate with a 3.0V DC supply. Care should be taken to avoid operating the part below 2.7V and above 3.3V.
- RF power levels should be restricted to below 33dBm maximum available power for the PE4230, 23dBm for the PE4220 and 17dBm for the PE4210.
- Testing must be restricted to above 50MHz.

DC Bias Requirements

The switch has three DC connections described in the following table.

When the device is powered up V_{DD} current should be between 20-40uA for the PE4230 and PE4220 and $< 1uAmp$ for the PE4210.

Table 1 below describes how to DC bias the PE42XX RF Switch samples. Voltages should be restricted to 2.7-3.3 Volts for V_{DD}. Voltages should be 0 or V_{DD} for the Ctl voltage. All attached RF data is for V_{DD}=3.0Volts (nominal supply)

Table 1: DC Input Bias Conditions

DC Connection	Where	Voltage
V_{DD}	V_{DD} on PCB	3.0Volts at (20-40uAmps for the 4230 and 4220...) (<1uAmp for the 4210)
Ctl	Ctl on PCB	3.0Volts for RFin to RF1 0.0Volts for RFin to RF2 (Less than 1uAmp) RFin is J1 on PCB RF1 is J3 on PCB RF2 is J4 on PCB
GND	Even number pins on J2 (connector J2 is clearly marked on the PCB)	0.0Volts or ground.

RF Connection and Attached Data

The 42XX switches have three RF connections. Table 2 below describes how to connect RF to the SMA connectors of the PCB. Note that RFin is connected to RF1 for Ctl= V_{DD} and RFin is connected to RF2 for Ctl=0.0Volts.

Table 2: RF Inputs

RF Connection	Where
RFin	SMA connector J1
RF1	SMA connector J3
RF2	SMA connector J4

Calibration

When the test fixture is calibrated the thru on the demo board should be used (J6 & J8 in Figure 1). In the attached data all small signal parameters and the 1dB compression point were determined using standard calibration with the demo board used as the thru.

Figure 1: 42XX SPDT RF Switch Evaluation Board
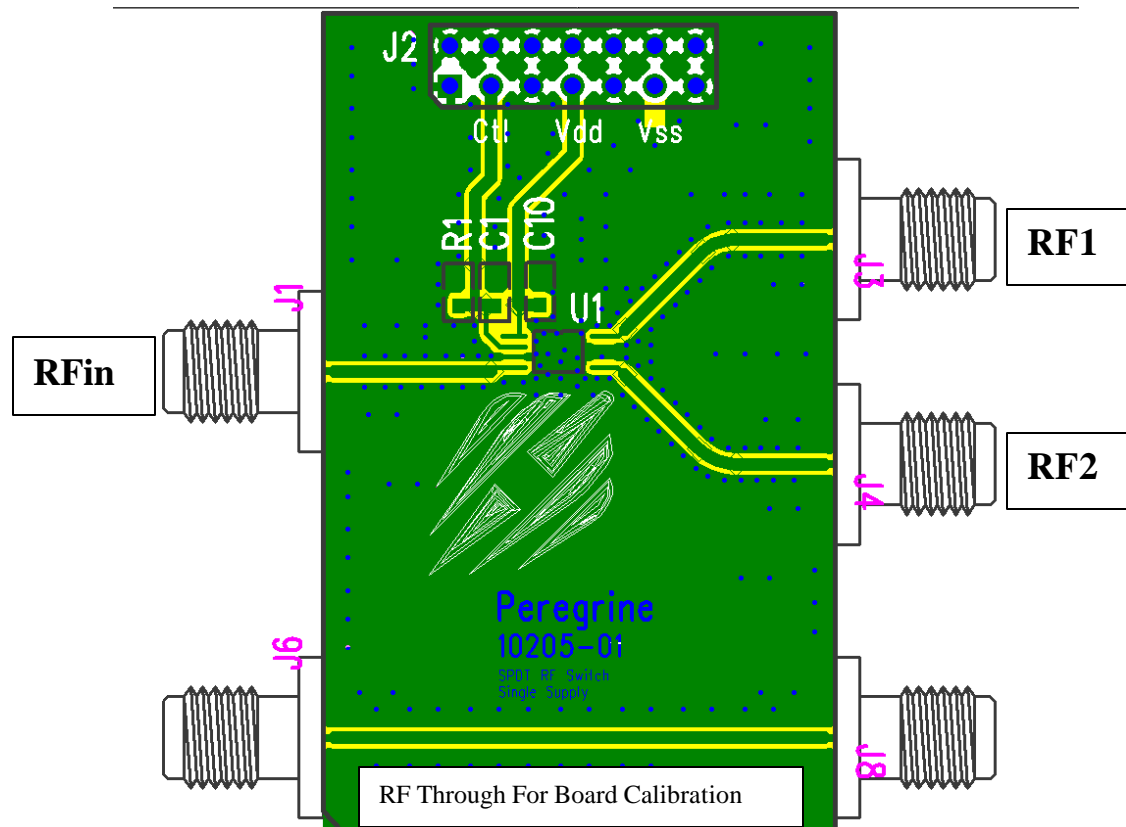
Switch Test Setup

Figure 3 below shows the test configuration used by Peregrine to evaluate the 42XX. The data included with the 42XX evaluation kit was taken using the test configuration below.

RFIC Tester Matrix Switch

Anritsu Dual
Power Meter

CH 1 CH 2

HP 8563E
Spectrum
Analyzer

RF In

HP ESG-4000
RF Source 1

HP ESG-4000
RF Source 2

RF SPST
Switch

1 C 2

Power
Sensor
CH 2

.5W Power Amp
.01-4.2 GHz

.5W Power Amp
.01-4.2 GHz

10dB

20dB

RF 1   RF 2

Resistive
Power Divider

DUT

RF SPST
Switch

2 C 1

**RF
Common**

**RF SP4T
Switch**

SS3

10W Power Amp
.001-1.0 GHz

10W Power Amp
.8-4.2 GHz

10dB
Coupler

3dB

6dB

10dB

**RF SP4T
Switch**

SS4

Power
Sensor
CH 1

**RF Common
VNA Port 1**