CEL California Eastern Laboratories

Evaluation Board Document

µPG2150T5L-EVAL-A

Evaluation Board

- Description
- Insertion Loss of Through Board
- Assembly Drawing

Description:

The uPG2150T5L-EVAL-A evaluation board provides a quick and convenient means of evaluating the performance of the NEC uPG2150T5L switch. In addition to the device, the board provides DC block capacitors, power supply bypass capacitors, and RF and DC connectors.

A DC block capacitor is required at all RF ports. On this board, two parallel capacitors of 22pF are used for this purpose. This configuration minimizes the mismatch effect associated with the serial capacitors over a wide frequency range. In a real application where the operation frequency range is relatively narrow, one DC block capacitor usually is sufficient. The user should select the appropriate capacitor value according to the operation frequencies and the type of capacitor selected. Generally the performance of the switch circuit is not sensitive, to a certain extent, to the value of DC block capacitors.

A 1000pF DC bypass capacitor is used on all control lines. For high speed applications the user may choose smaller capacitance or no capacitor at all.

DC supply connectors:

P1 is control voltage V_{cont1}, P2 is V_{cont2}, P3 is V_{cont3}, and P4 is the ground.
V_{cont1}, V_{cont2} and V_{cont3} should be connected to separate power supplies to provide the required control logic.

RF connectors:

As indicated on the board, J1 is connected to the RF1 port, J2 is connected to the RF2 port, J3 is connected to the RF3 port and J4 is connected to the ANT port.

Information on Board Material:

The board material is 20 mil thick Duroid 6002. Its dielectric constant is 2.94.

Switch Logic Table:

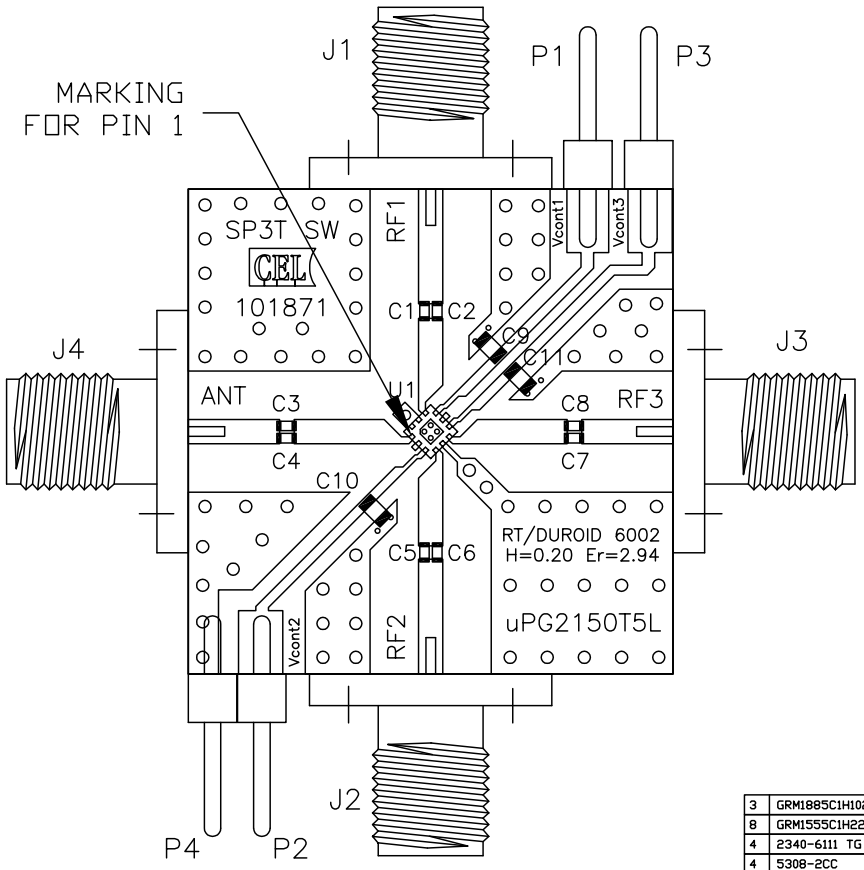
The following table lists the logic table for switch states.

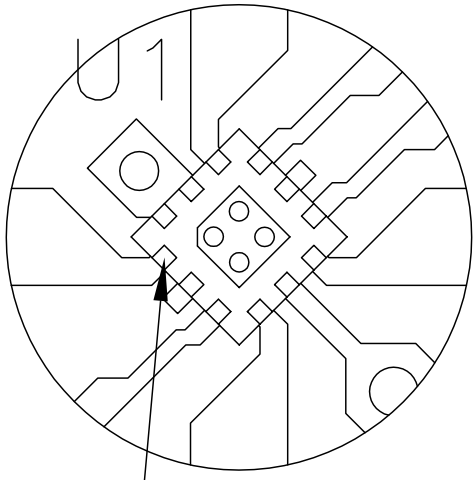
Vcont1	Vcont2	Vcont3	ANT – RF1	ANT – RF2	ANT – RF3
H	L	L	ON	OFF	OFF
L	H	L	OFF	ON	OFF
L	L	H	OFF	OFF	ON

Insertion Loss of Through Board:

In assessing the insertion loss of the switch by measuring S21 of the evaluation board, it is necessary to take into account the loss through the connectors and PCB trace. To this end a through board was characterized to determine the board/connector loss. The table below lists the board loss at different frequencies.

INPUT FREQUENCY (GHz)	BOARD LOSS (dB)
0.5	0.12
1.0	0.12
1.5	0.17
2.0	0.23
2.5	0.30
3.0	0.40





REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED

QTY	PART NUMBER OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL/SPECIFICATION	ITEM NO.
3	GRM1885C1H102JA01D	C9,C10,C11	0603 1000pF CAP MURATA	6
8	GRM1555C1H220JZ01D	C1 THRU C8	0402 22pF CAP MURATA	5
4	2340-6111 TG	P1,P2,P3,P4	PIN HEADER 3M	4
4	5308-2CC	J1,J2,J3,J4	SMA FEMALE CONNECTOR TENSOLITE	3
1	uPG2150T5L	U1	NEC GaAs Switch uPG2150T5L	2
1	CL-101871	DRAWING	COMPONENT LAYOUT DRAWING	1

PARTS LIST

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES
DECIMALS .XX± .01 .XXX± .005
ANGULAR ± 1°
DO NOT SCALE DRAWING

MATERIAL

FINISH

APPROVALS		
Drawing by:	Hugues de Saint Salvy	2005/06/03
Designed by:	Hugues de Saint Salvy	2005/06/03
Checked by:		
Project Engineer:		
Quality Control:		

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TITLE:
uPG2150T5L-EVAL-A
ASSEMBLY DRAWING

SIZE	FSCM NO.	DWG NO.	REV
C		AD-101871	-

SCALE 2:1 | RELEASE DATE PROTOTYPE | SHEET 1 OF 1