CEL California Eastern Laboratories

*Evaluation Board Document*

# µPG2185T6R-EVAL-A

# Evaluation Board

- Description
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- Performance Data Plots
- Assembly Drawing

## Description:

The uPG2185T6R-EVAL-A evaluation board provides a quick and convenient means of evaluating the performance of the NEC uPG2185T6R 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, a 6pF capacitor is used for this purpose. The chosen capacitance value minimizes the mismatch effect associated with the serial capacitor over a relatively wide frequency range (2 to 6GHz). For a narrow band application or an application where the operating frequency is outside the specific frequency range, the user may select a different capacitance value. Generally the performance of the switch circuit is not sensitive, to a certain extent, to the value of DC block capacitors.

A 1000pF capacitor is used for DC bypass 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 $V_{cont2}$ and pins P3 and P4 are the ground.
$V_{cont1}$ and $V_{cont2}$ 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 OUTPUT1 port, J2 is connected to the OUTPUT2 port and J3 is connected to the INPUT 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 | INPUT – OUTPUT1 | INPUT – OUTPUT2 |
|---|---|---|---|
| H | L | OFF | ON |
| L | H | ON | OFF |

## Insertion Loss of Through Board:

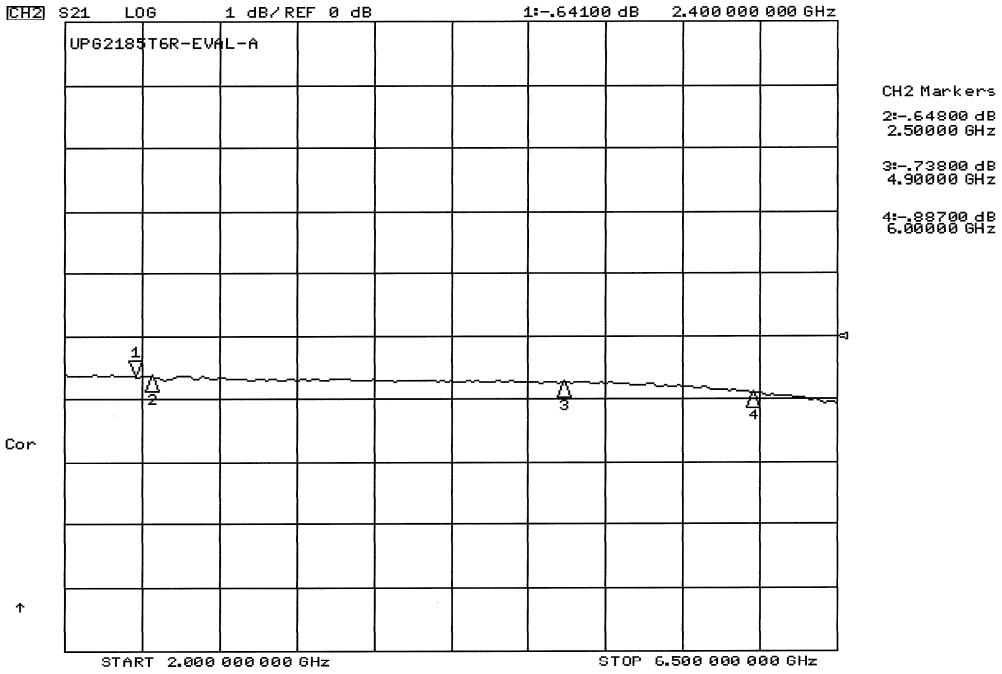
The insertion loss plot shown below is from direct measurement on an evaluation board. It is necessary to take the loss through the connectors and PCB trace into account in assessing the insertion loss through the switch alone. To this end a through board was characterized to determine the board/connector loss. The table below lists the board loss at different frequencies.

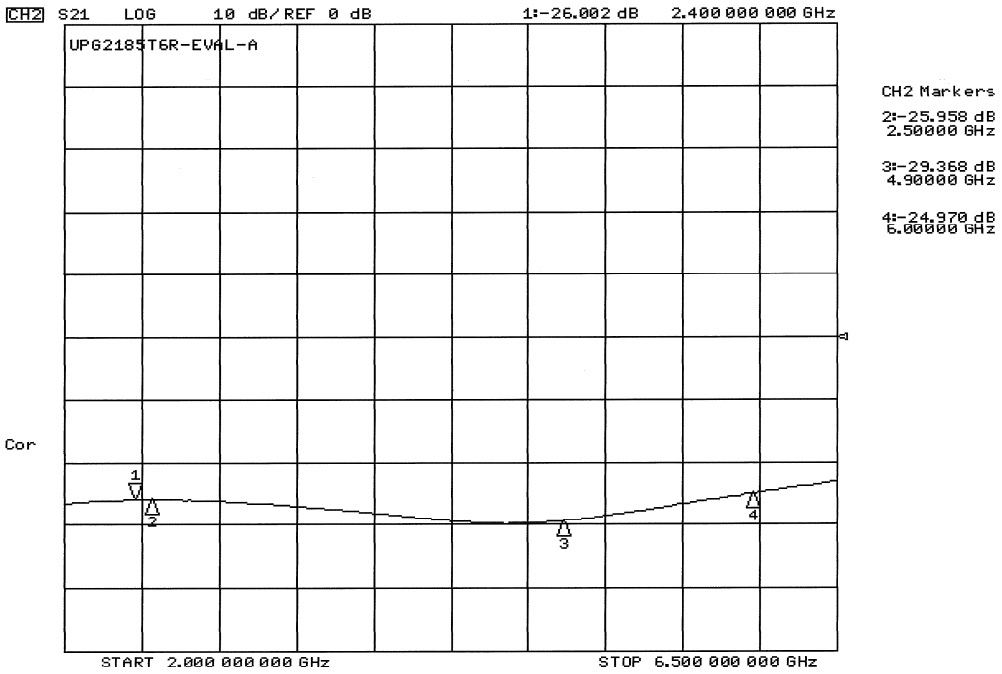
| INPUT FREQUENCY (GHz) | BOARD LOSS (dB) |
|---|---|
| 2.4 | 0.14 |
| 2.5 | 0.15 |
| 4.9 | 0.20 |
| 6.0 | 0.26 |

## Performance Plots:

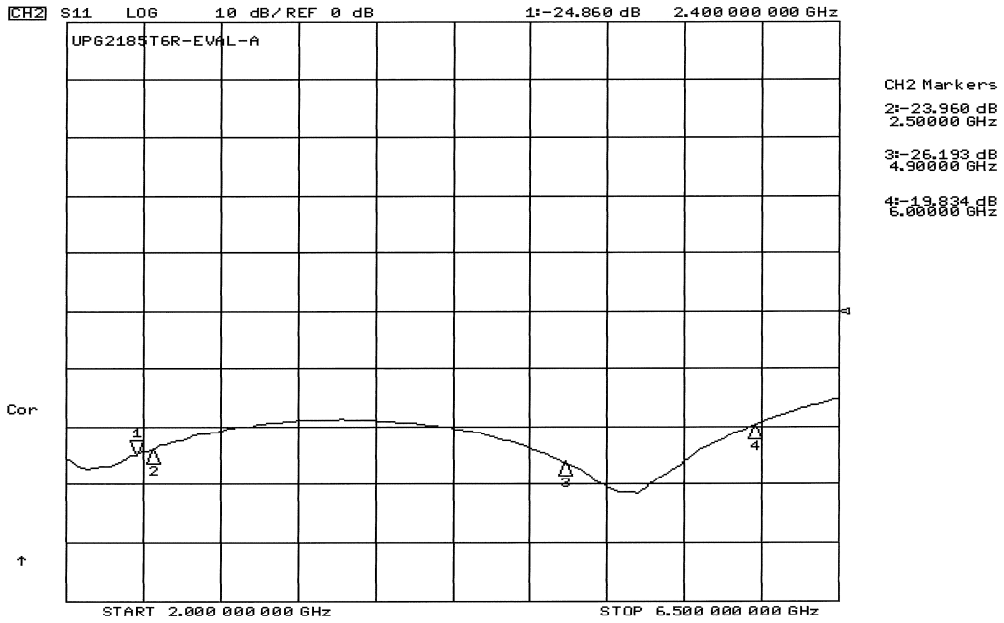
The following plots show typical data on insertion loss, isolation and return losses for the condition of INPUT to OUTPUT1 path being ON. The data for condition of INPUT to OUTPUT2 being ON is similar.

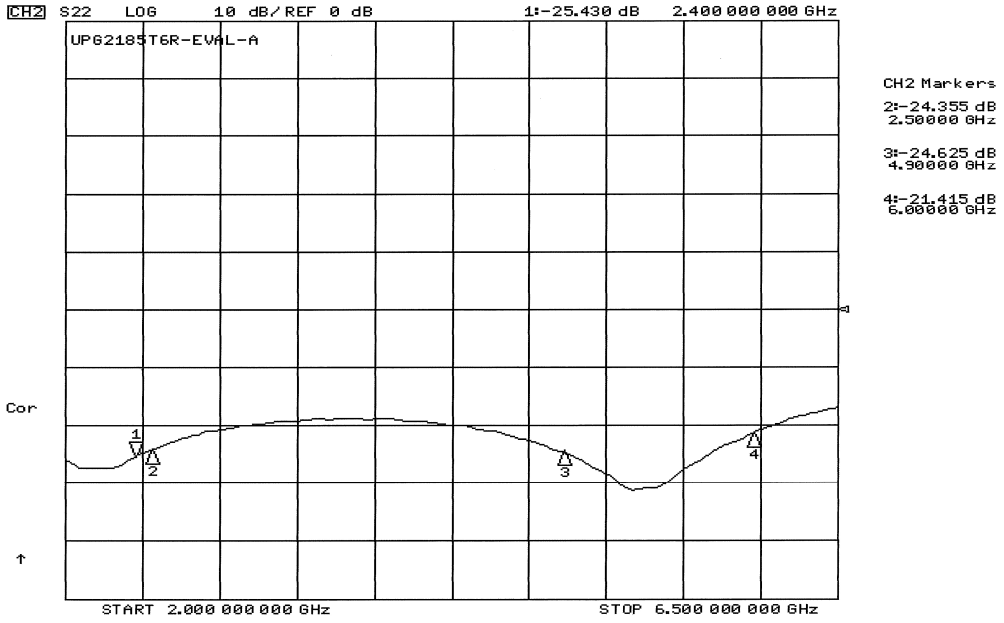
# Insertion Loss and Isolation (Input-Output1)



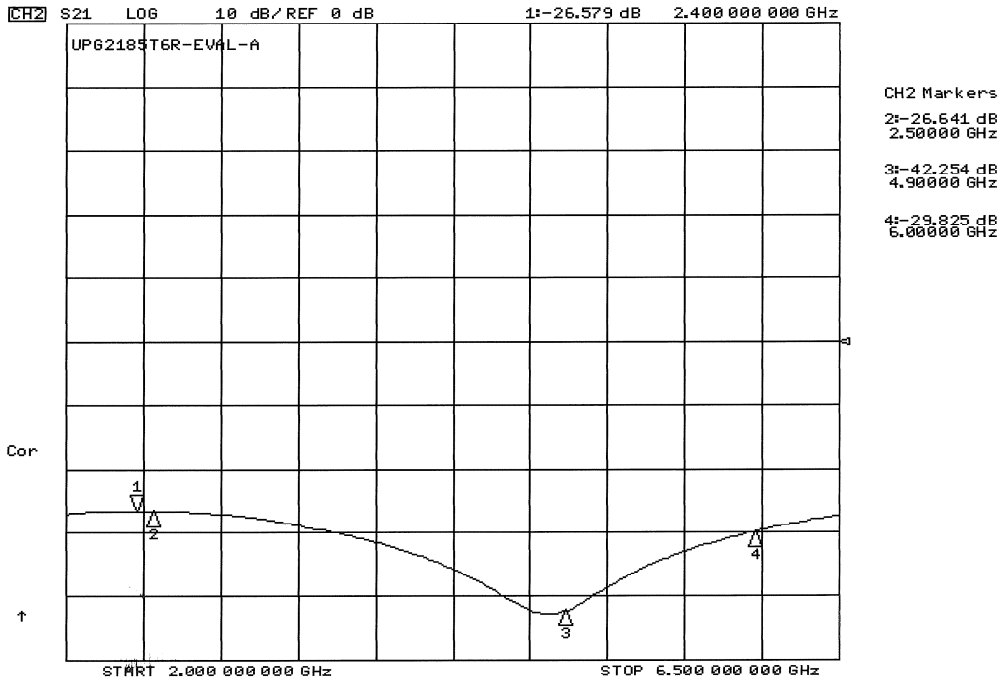



# Input and Output Return Loss (Input-Outputl)

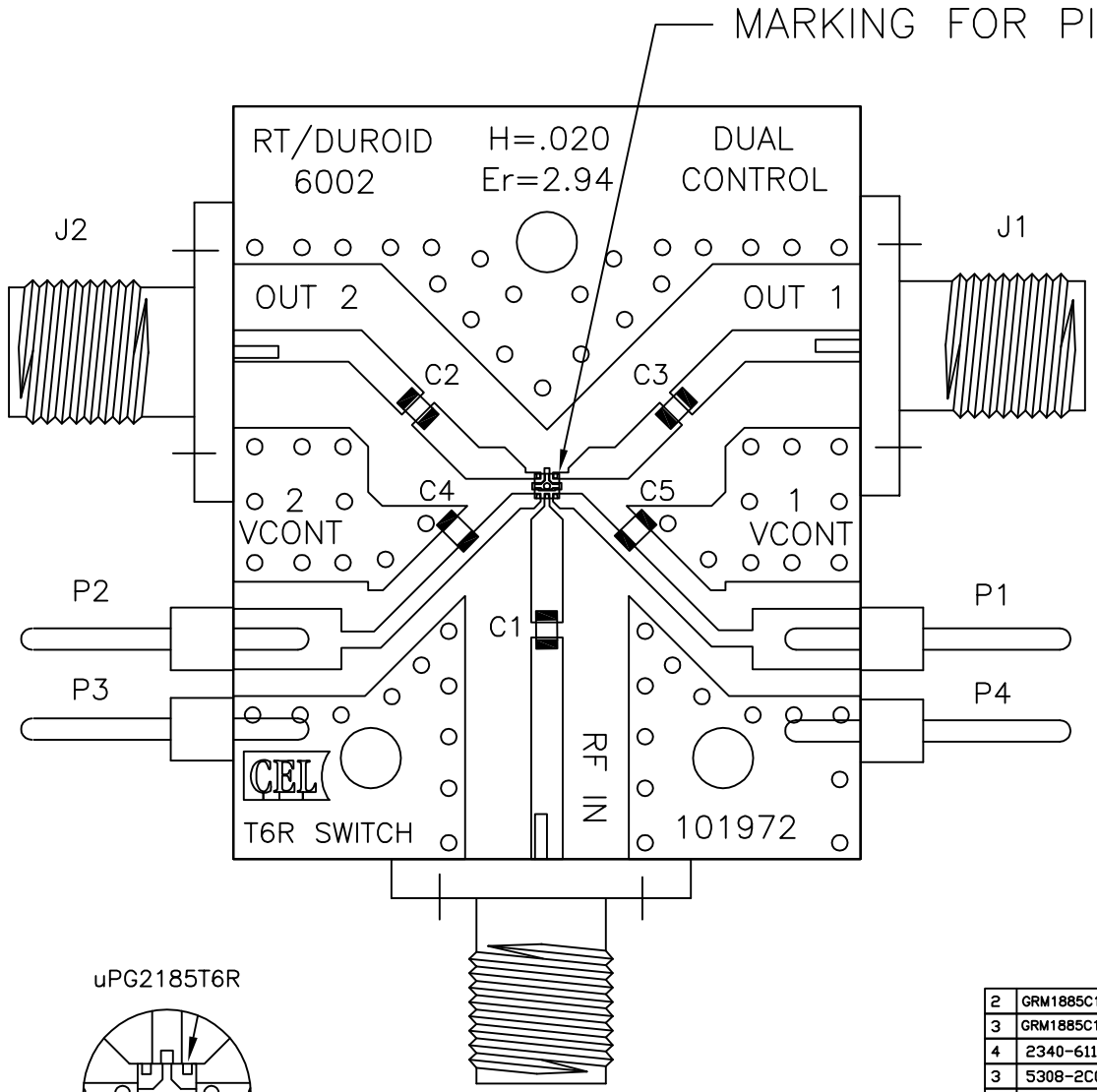


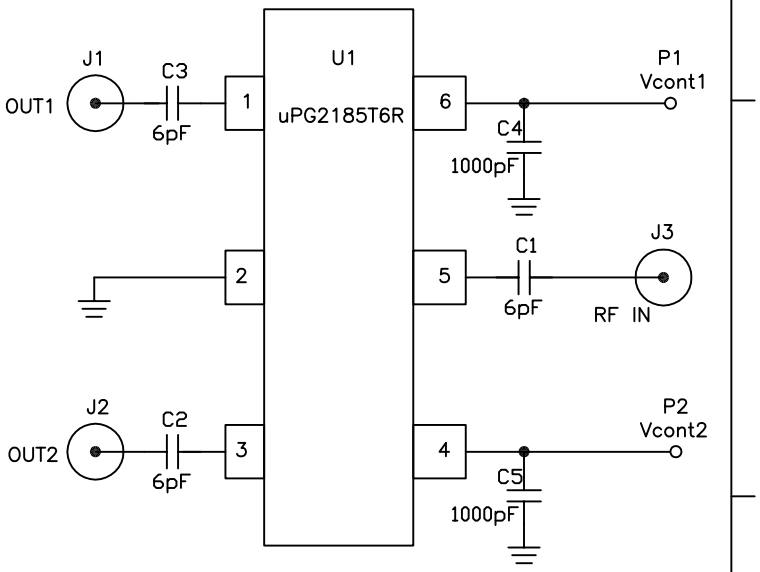



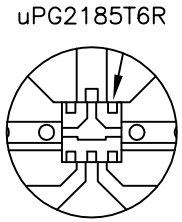
# Isolation (Output1-Output2)



| REVISIONS | | | | |
|---|---|---|---|---|
| ZONE | LTR | DESCRIPTION | DATE | APPROVED |




MARKING FOR PIN1
IS ON TOP OF CHIP

PACKAGE MARKING: G6

| QTY | PART OR IDENTIFYING NO. | NOMENCLATURE OR DESCRIPTION | MATERIAL/SPECIFICATION | ITEM NO. |
|---|---|---|---|---|
| 2 | GRM1885C1H102JA01D | C4,C5 | 0603 1000pF CAP MURATA | 6 |
| 3 | GRM1885C1H6R0DZ01D | C1,C2,C3 | 0603 6pF CAP MURATA | 5 |
| 4 | 2340-6111 TG | P1,P2,P3,P4 | PIN HEADER 3M | 4 |
| 3 | 5308-2CC | J1,J2,J3 | SMA FEMALE CONNECTOR TENSOLITE | 3 |
| 1 | uPG2185T6R | U1 | IC NEC uPG2185T6R GaAs Switch | 2 |
| 1 | CL-101972 | DRAWING | COMPONENT LAYOUT DRAWING | 1 |

PARTS LIST

| NEXT ASSY | USED ON |
|---|---|
| APPLICATION | |

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES
DECIMALS ANGULAR
.XX± XXTOL ± ANGLE
.XXX± XXXTOL
DO NOT SCALE DRAWING

MATERIAL
MATL1STL
MATL2NDL

FINISH
FINISH

| APPROVALS | | |
|---|---|---|
| Drawing by: | Bernard Urborg | 03/27/2008 |
| Designed by: | Bernard Urborg | 03/27/2008 |
| Checked by: | | |
| Project Engineer: | | |
| Quality Control: | | |

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TITLE:
UPG2185T6R-EVAL-A
ASSEMBLY DRAWING

| SIZE | FSCM NO. | DWG NO. | REV |
|---|---|---|---|
| C | | AD101972 | |

SCALE SCALE | RELEASE DATE RELDATE | SHEET SHNO OF NOSH

Общество с ограниченной ответственностью «МосЧип» ИНН 7719860671 / КПП 771901001
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Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

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