

μPG2162T5N-EVAL-A

Evaluation Board

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Description:

The uPG2162T5N-EVAL-A evaluation board provides a quick and convenient means of evaluating the performance of the NEC uPG2162T5N 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 6.8pF 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 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} 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 ANT1 port, J2 is connected to the ANT2 port, J3 (OUT1) is connected to the TX, and J4 (OUT2) is connected to the RX 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.

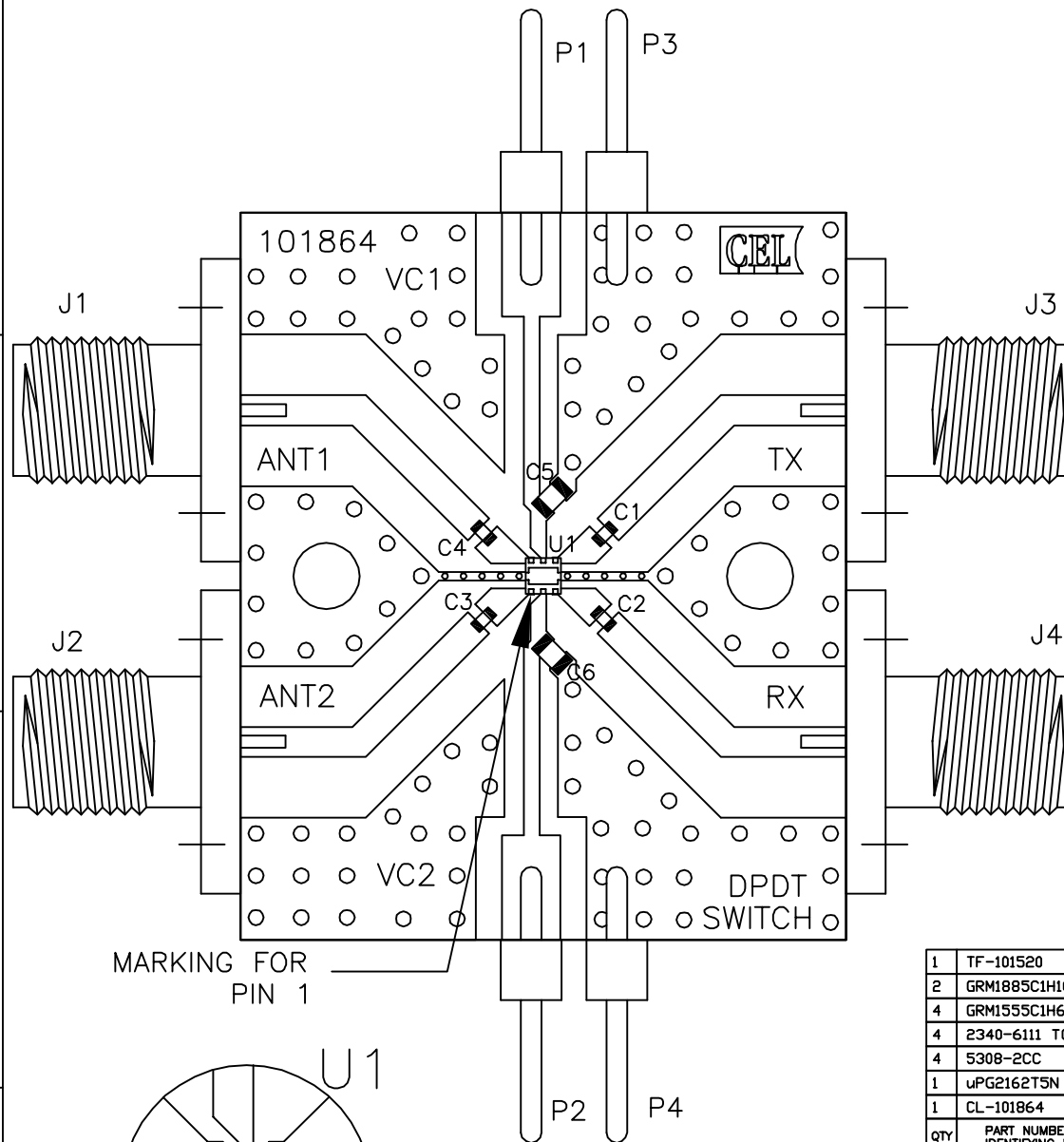
| Vcont1 | Vcont2 | ANT1 – OUT1(TX) | ANT1 – OUT2(RX) | ANT2 – OUT1(TX) | ANT2 – OUT2(RX) | ANT1 – ANT2 | TX – RX |
|--------|--------|--------------------|--------------------|--------------------|--------------------|-------------------|-------------------|
| H | L | measure ISOL | measure IL | measure IL | measure ISOL | measure ISOL2* | measure ISOL2* |
| L | H | measure IL | measure ISOL | measure ISOL | measure IL | | |

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) |
|-----------------------|-----------------|
| 2.4 | 0.15 |
| 2.5 | 0.16 |
| 4.9 | 0.26 |
| 5.8 | 0.30 |
| 6.0 | 0.32 |

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



MARKING FOR
PIN 1

U1

MARKING
FOR PIN 1

| 1 | TF-101520 | DRAWING | TEST BLOCK | 7 |
|-----|--------------------------------|-----------------------------|--------------------------------|----------|
| 2 | GRM1885C1H102JA01B | C5,C6 | 0603 1000pF CAP MURATA | 6 |
| 4 | GRM1555C1H6R8CZ01B | C1,C2,C3,C4 | 0402 6.8pF 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 | uPG2162T5N | U1 | NEC GaAs Switch uPG2162T5N | 2 |
| 1 | CL-101864 | DRAWING | COMPONENT LAYOUT DRAWING | 1 |
| QTY | PART NUMBER OR IDENTIFYING NO. | NOMENCLATURE OR DESCRIPTION | MATERIAL/SPECIFICATION | ITEM NO. |

PARTS LIST

| | | | | | | | | | | |
|-------------|---------|---|---------------------------------------|-------------------|---|-----------|--------------|----------------------|--------------|--|
| | | UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES DECIMALS ANGULAR .XX± .01 ± 1° .XXX± .005 DO NOT SCALE DRAWING | APPROVALS | | <div>CEL CALIFORNIA EASTERN LABS</div> 4590 PATRICK HENRY DR. SANTA CLARA CA. 95054 | | | | | |
| | | | Drawing by: Hugues de Saint Salvy | 2005/04/22 | TITLE: uPG2162T5N-EVAL-A ASSEMBLY DRAWING | | | | | |
| | | | Designed by: Hugues de Saint Salvy | 2005/04/22 | | | | | | |
| | | | Checked by: | | | | | | | |
| | | | MATERIAL | Project Engineer: | | SIZE C | FSCM NO. | DWG NO. AD-101864 | REV — | |
| | | FINISH | Quality Control: | | SCALE NONE | | RELEASE DATE | PROTOTYPE | SHEET 1 OF 1 | |
| NEXT ASSY | USED ON | | | | | | | | | |
| APPLICATION | | | | | | | | | | |

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