CEL California Eastern Laboratories

Evaluation Board Document

μPG2406TK-EVAL-A

Evaluation Board

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Description:

The uPG2406TK-EVAL-A evaluation board provides a quick and convenient means of evaluating the performance of the NEC uPG2406TK 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.

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	RFC – RF1	RFC – RF2
Н	L	ON	OFF
L	Н	OFF	ON

Insertion Loss of Through Board:

The measured insertion loss (S21) of the board is from three contributions: the switch insertion loss, the loss in the DC block capacitors and the insertion loss of the through board. To accurately estimate the insertion loss due to the switch circuit, the board loss should be subtracted from the measured S21 value. The table below lists the board loss at different frequencies. The effect of the capacitor loss is not corrected since in real applications DC block capacitors are required. Nevertheless the capacitor loss can be significant, particularly at high frequencies. For applications where insertion loss is critically important, the DC block capacitor should be carefully chosen to minimize its loss at operation frequency.

INPUT FREQUENCY (GHz)	BOARD LOSS (dB)
0.5	0.05
1.0	0.07
1.5	0.11
2.0	0.12
2.5	0.13
3.0	0.15
4.0	0.19

