

PRELIMINARY DATA SHEET



NEC's L,S BAND ULTRA SMALL SPDT GaAs MMIC SWITCH

UPG2008TK

FEATURES

- **ULTRA SMALL 6 PIN RECESSED LEAD MINI-MOLD PACKAGE:**
Size: 1.5 x 1.1 x 0.55 mm
- **LOW INSERTION LOSS:**
L_{INS} = 0.40 dB TYP at f = 1 GHz
L_{INS} = 0.60 dB TYP at f = 2.5 GHz
- **HIGH ISOLATION:**
IsOL = 25 dB TYP at f = 2.5 GHz

DESCRIPTION

NEC's UPG2008TK is a Single Pole Double Throw (SPDT) GaAs MMIC switch, developed for applications in the 0.5 to 2.5 GHz frequency range. This device is housed in NEC's ultra small "TK" plastic surface mount package. This 6 pin recessed lead mini mold package has a footprint that is over 50% smaller than conventional small size SOT-363 package types. Package height is also reduced by 39% by incorporating a flat lead style. These tremendous size reductions make this switch an ideal device for small size portable applications and modules.

NEC's stringent quality assurance and test procedures assure the highest performance, consistency and reliability.

APPLICATION

- L, S band digital cellular or cordless handsets
- PCS, Bluetooth, WLAN, and WLL applications

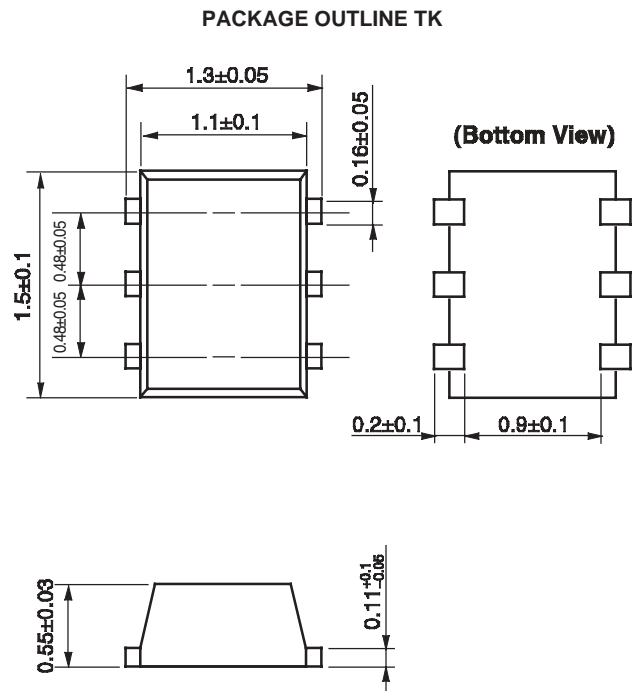
ELECTRICAL CHARACTERISTICS (Unless Otherwise Specified, T_A = 25°C, V_{CONT1} = 2.8 V and V_{CONT2} = 0 V or V_{CONT1} = 0V and V_{CONT2} = 2.8 V, Z_o = 50Ω, off chip DC blocking capacitor value, 51pF)

PART NUMBER			UPG2008TK			
PACKAGE OUTLINE			TK			
SYMBOLS	PARAMETERS AND CONDITIONS		UNITS	MIN	TYP	MAX
L _{INS}	Insertion Loss	f = 0.5 to 1.0 GHz	dB		0.40	0.70
		f = 1.0 to 2.0 GHz	dB		0.50	0.80
		f = 2.0 to 2.5 GHz	dB		0.60	0.85
ISOL	Isolation	f = 0.5 to 2.5 GHz	dB	22	25	
RL _{IN}	Input Return Loss	f = 0.5 to 2.5 GHz	dB	13	20	
RL _{OUT}	Output Return Loss	f = 0.5 to 2.5 GHz	dB	13	20	
P _{IN(0.1dB)}	Input Power at 0.1 dB Compression	f = 1.0 GHz ¹	dBm		20	
P _{IN(1dB)}	Input Power at 1 dB Compression	f = 1.0 GHz ¹	dBm	20	25	
t _{sw}	Switching Speed		ns		50	
I _{CONT}	Control Current, at V _{CONT} = 2.8 V/0 V, no RF signal		μA		0.5	10

Note:

1. P_{IN(0.1dB)} or P_{IN(1dB)} measured the input power level when the insertion loss increases to more than that of the linear range. All other characteristics are measured in the the linear range.

OUTLINE DIMENSIONS (Units in mm)



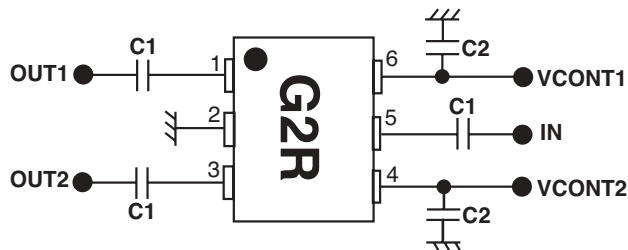
ABSOLUTE MAXIMUM RATINGS¹ (T_A = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
V _{CONT}	Control Voltage	V	-6.0 to +6.0 ²
P _{IN}	Input Power	dBm	28
P _T	Total Power Dissipation	W	0.15
T _{OP}	Operating Temperature	°C	-45 to +85
T _{STG}	Storage Temperature	°C	-55 to +150

Notes:

- Operation in excess of any one of these parameters may result in permanent damage.
- |V_{CONT1} - V_{CONT2}| ≤ 6.0 V

TEST CIRCUIT¹



Note:

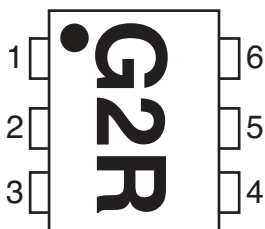
- V_{CONT1} = 2.8 V, V_{CONT2} = 0V or V_{CONT2} = 0 V, V_{CONT1} = 2.8V, off chip DC blocking capacitors value C1=51pF, C2 = 1000pF (Bypass), Using NEC standard evaluation board.

PIN CONNECTIONS & INTERNAL BLOCK DIAGRAM

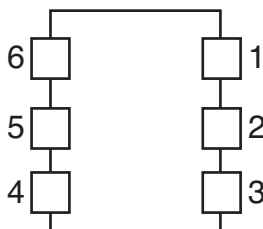
PIN CONNECTION DIAGRAM

PIN NO.	CONNECTION
1	OUT1
2	GND
3	OUT2
4	VCONT2
5	IN
6	VCONT1

(Top View)



(Bottom View)



Life Support Applications

These NEC products are not intended for use in life support devices, appliances, or systems where the malfunction of these products can reasonably be expected to result in personal injury. The customers of CEL using or selling these products for use in such applications do so at their own risk and agree to fully indemnify CEL for all damages resulting from such improper use or sale.

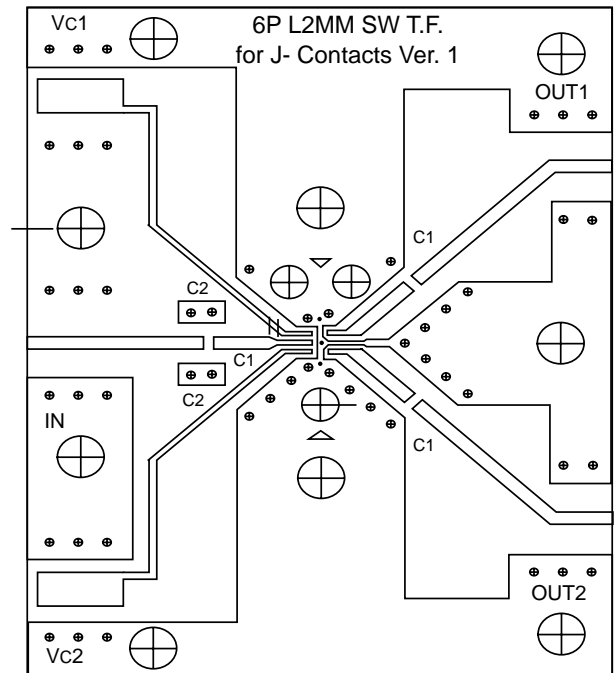
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DATA SUBJECT TO CHANGE WITHOUT NOTICE

RECOMMENDED OPERATING CONDITIONS (T_A = 25°C)

SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
V _{CONT(H)}	Control Voltage High	V	+2.5	+3.0	+5.3
V _{CONT(L)}	Control Voltage Low	V	-0.2	0	+0.2

EVALUATION BOARD



TRUTH TABLE OF SWITCHING BY CONDITION OF VOLTAGE

V _{CONT1}	V _{CONT2}	IN-OUT1	IN-OUT2
LOW	HIGH	ON	OFF
HIGH	LOW	OFF	ON

ORDERING INFORMATION

PART NUMBER	MARKING	QTY
UPG2008TK-E2	G2R	5 kpcs Per Reel

Note:

- Embossed tape, 8 mm wide, Pins 1,2,3 face perforation side.