

### FEATURES

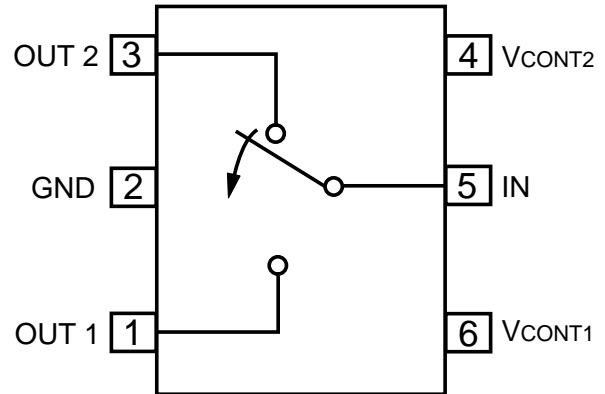
- **WIDE FREQUENCY RANGE:** 100 MHz to 2.5 GHz
- **LOW INSERTION LOSS:** 0.5 dB Typical at 2.0 GHz
- **HIGH P<sub>1dB</sub>:** +30 dBm typ. @ 2 GHz
- **LOW CONTROL VOLTAGE:** +3V or 0V
- **SUPER SMALL SURFACE MOUNT PACKAGE:** SOT-26
- **AVAILABLE ON TAPE AND REEL**

### DESCRIPTION

The UPG152TA is an L-Band Single Pole Double Throw (SPDT) GaAs MMIC switch developed for digital cellular, cordless, and PCS handset, WLAN, and other RF control applications. The device features low insertion loss, high P<sub>1dB</sub>, and low voltage operation. It is housed in a super small, low-cost SOT-26 package and is also available on tape-and-reel.

NEC's stringent quality assurance and test procedures ensure the highest reliability and performance.

### INTERNAL BLOCK DIAGRAM



### ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C, V<sub>CONT</sub> = 3V/0V)

PART NUMBER PACKAGE OUTLINE			UPG152TA T06		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX
IL	Insertion Loss f = 0.1 - 2 GHz f = 2.0 - 2.5 GHz	dB dB		0.5 0.8	1.0
ISOL	Isolation f = 0.1 - 2 GHz f = 2.0 - 2.5 GHz	dB dB	20	22 20	
RLIN	Input Return Loss f = 0.1 - 2 GHz	dB	11		
RLOUT	Output Return Loss f = 0.1 - 2 GHz	dB	11		
P <sub>1dB</sub>	Input Power at 1 dB Compression f = 0.1 - 2 GHz	dBm	27	30	
I <sub>IP3</sub>	Input IP3 at f = 900 MHz, V <sub>CONT</sub> = +3 V f = 1900 MHz, V <sub>CONT</sub> = +3 V	dBm dBm		+48 +44	
t <sub>SW</sub>	Switching Speed f = 0.1 - 2 GHz	ns		30	
I <sub>CONT</sub>	Control Current f = 0.1 - 2 GHz, V <sub>CONT</sub> = 3V/0V, no RF signal	μA			5

# UPG152TA

## ABSOLUTE MAXIMUM RATINGS<sup>1</sup> (T<sub>A</sub> = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS UPG152TA
V <sub>CONT 1,2</sub>	Control Voltage 1 and 2	V	-6.0 to +6.0 2.7 ≤  V <sub>CONT1</sub> - V <sub>CONT2</sub>   ≤ 6.0V
P <sub>IN</sub>	Input Power	dBm	31
P <sub>TOT</sub>	Total Power Dissipation	W	0.4
T <sub>OPT</sub>	Operating Case Temperature	°C	-50 to +90
T <sub>STG</sub>	Storage Temperature	°C	-65 to +150

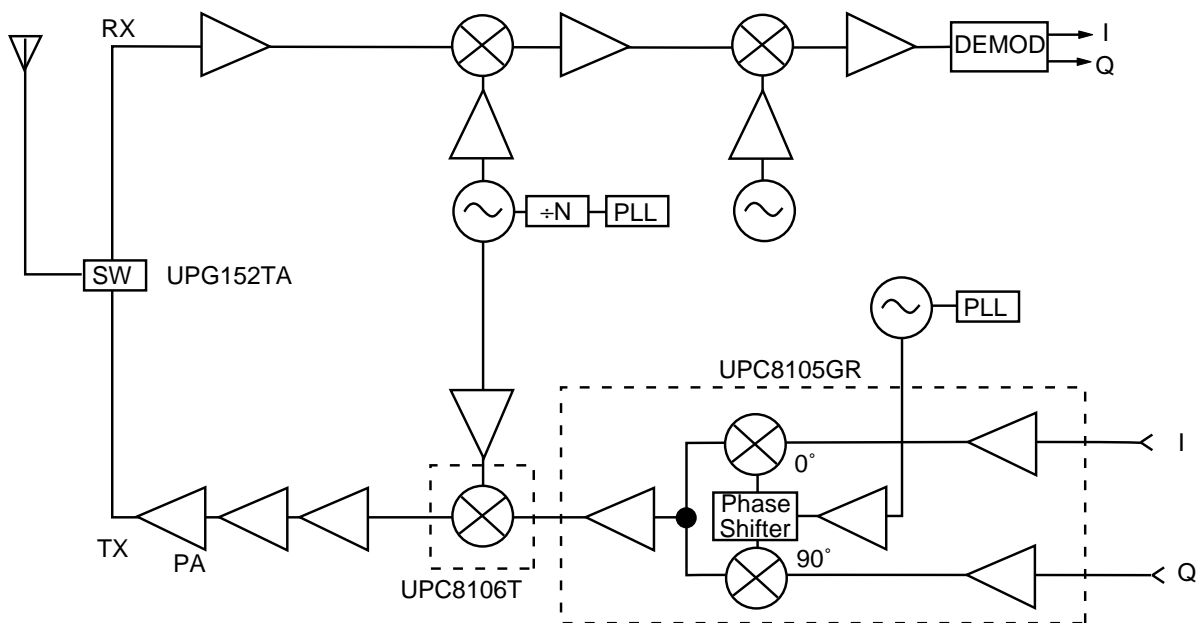
Note:

1. Operation in excess of any one of these parameters may result in permanent damage.

## RECOMMENDED OPERATING CONDITIONS

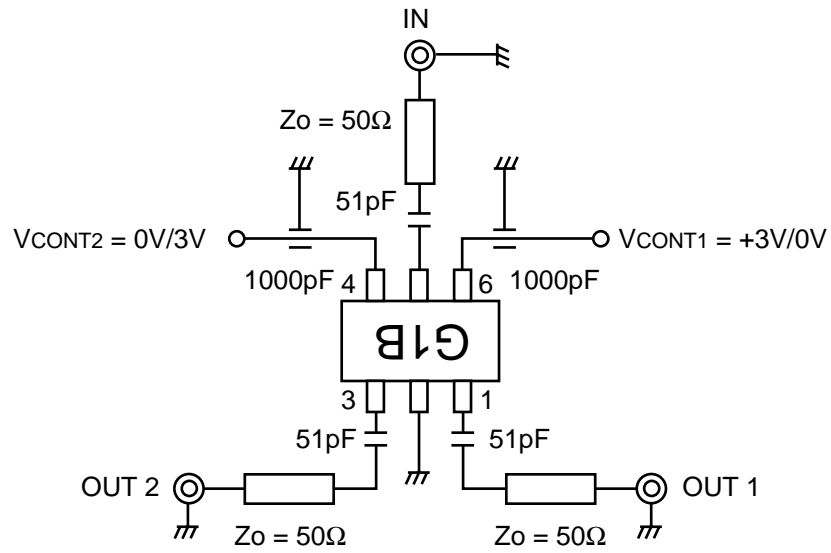
SYMBOL	PARAMETER	UNITS	UPG152TA		
			MIN	TYP	MAX
V <sub>CONT</sub>	Control Voltage (ON)	V	+2.7	+3.0	+5.3
V <sub>CONT</sub>	Control Voltage (OFF)	V	-0.2	0	+0.2
P <sub>IN</sub>	Input Power Level (V <sub>CONT</sub> = 3V/0V)	dBm		+27	+29

## APPLICATION EXAMPLE (PCS Handset)



TEST CIRCUIT

UPG152TA



SWITCH LOGIC TABLE

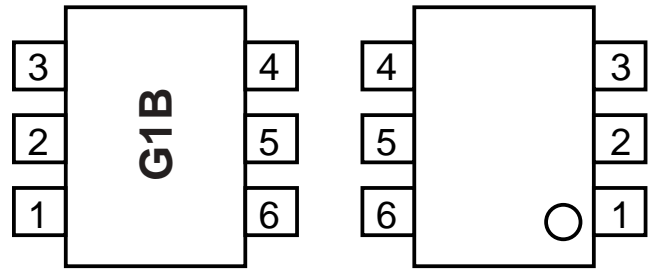
CONTROL INPUTS (V)		CONDITION OF OUTPUT PORTS <sup>1</sup>	
$V_{CONT1}$	$V_{CONT2}$	OUT <sub>1</sub>	OUT <sub>2</sub>
0	0	OFF	OFF
0	+3	ON	OFF
+3	0	OFF	ON
+3	+3	OFF	OFF

Note:

1. Impedance of the output port in the "OFF" state is reflective.

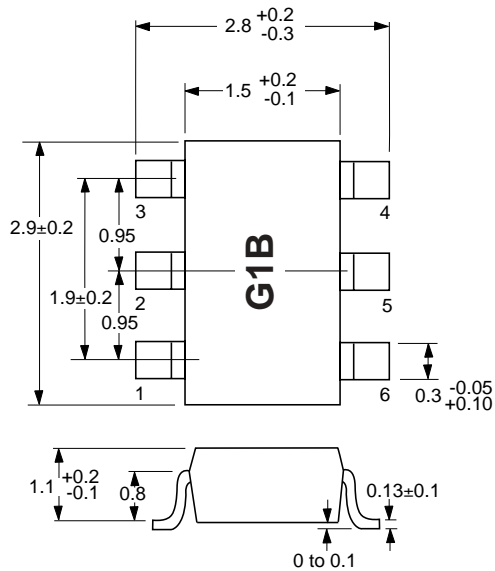
**PIN CONNECTION DIAGRAM**

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



**OUTLINE DIMENSIONS** (Units in mm)

UPG152TA  
PACKAGE OUTLINE T06



All dimensions are typical unless otherwise specified.

**ORDERING INFORMATION**

PART NUMBER	QTY
UPG152TA-E3	3000/Reel

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.

EXCLUSIVE NORTH AMERICAN AGENT FOR **NEC** RF, MICROWAVE & OPTOELECTRONIC SEMICONDUCTORS

**CEL** CALIFORNIA EASTERN LABORATORIES • Headquarters • 4590 Patrick Henry Drive • Santa Clara, CA 95054-1817 • (408) 988-3500 • Telex 34-6393 • FAX (408) 988-0279

DATA SUBJECT TO CHANGE WITHOUT NOTICE

Internet: <http://WWW.CEL.COM>

12/7/2001