NEC

5 V, SUPER MINIMOLD SILICON MMIC WIDEBAND AMPLIFIER

UPC2711TB UPC2712TB

FEATURES

- **HIGH DENSITY SURFACE MOUNTING:**
  6 pin super minimold or SOT- 363 package
- **SUPPLY VOLTAGE:** V_{CC} = 4.5 to 5.5 V
- **WIDEBAND RESPONSE:**
  UPC2711TB: fu = 2.9 GHz TYP
  UPC2712TB: fu = 2.6 GHz TYP
- **POWER GAIN:**
  UPC2711TB: G_P = 13 dB TYP
  UPC2712TB: G_P = 20 dB TYP

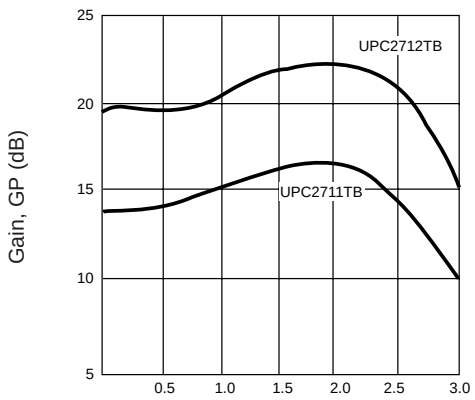
DESCRIPTION

The UPC2711TB and UPC2712TB are Silicon MMIC Wideband Amplifiers manufactured using NEC's 20 GHz f_T NESAT™ III silicon bipolar process. These devices are designed for use as buffer amps in DBS tuners. The UPC2711/12TB are pin compatible and have comparable performance as the larger UPC2711/12T, so they are suitable for use as a replacement to help reduce system size. These IC's are housed in a 6 pin super minimold or SOT-363 package.

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

TYPICAL PERFORMANCE CURVES

GAIN vs. FREQUENCY



ELECTRICAL CHARACTERISTICS (T_A = +25 °C, V_{CC} = 5.0 V, Z_L = Z_S = 50 Ω)

PART NUMBER PACKAGE OUTLINE			UPC2711TB S06			UPC2712TB S06		
SYMBOLS	**PARAMETERS AND CONDITIONS**	**UNITS**	**MIN**	**TYP**	**MAX**	**MIN**	**TYP**	**MAX**
I_{CC}	Circuit Current (no signal)	mA	9	12	15	9	12	15
G_P	Power Gain, f = 1 GHz	dB	11	13	16.5	18	20	23.5
f_U	Upper Limit Operating Frequency (The gain at f_U is 3 dB down from the gain at 100 MHz)	GHz	2.7	2.9		2.2	2.6	
ΔG_P	Gain Flatness, f = 0.1 GHz to 2.5 GHz	dB		±0.8			±0.8	
$P_{O(SAT)}$	Maximum Output Level, f = 1 GHz, P_{IN} = 0 dBm	dBm	-2	+1		0	+3	
NF	Noise Figure, f = 1 GHz	dB		5	6.5		4.5	6
RL_{IN}	Input Return Loss, f = 1 GHz	dB	20	25		9	12	
RL_{OUT}	Output Return Loss, f = 1 GHz	dB	9	12		10	13	
ISOL	Isolation, f = 1 GHz	dB	25	30		28	33	

ABSOLUTE MAXIMUM RATINGS[1] (T_A = 25°C)

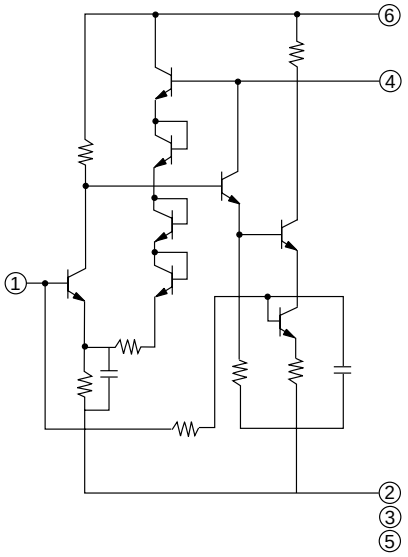
SYMBOLS	PARAMETERS	UNITS	RATINGS
V_{CC}	Supply Voltage (Pin 5, Pin 8)	V	6
P_{IN}	Input Power	dBm	TBD
P_T	Total Power Dissipation[2]	mW	TBD
T_{OP}	Operating Temperature	°C	-45 to +85
T_{STG}	Storage Temperature	°C	-55 to +150

Notes:
1. Operation in excess of any one of these parameters may result in permanent damage.
2. Mounted on double sided copper clad 50 x 50 x 1.6 mm epoxy glass PWB (T_A = +85°C).

RECOMMENDED OPERATING CONDITIONS

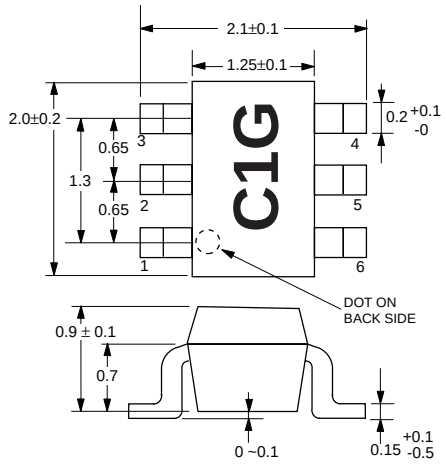
SYMBOL	PARAMETER	UNITS	MIN	TYP	MAX
V_{CC}	Supply Voltage	V	4.5	5.0	5.5
T_{OP}	Operating Temperature	˚C	-40	+25	+85

PIN DESCRIPTION

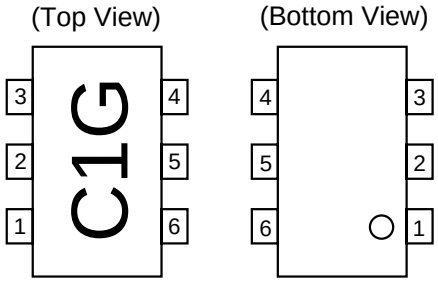
Pin No.	Pin Name	Applied Voltage (V)	Description	Internal Equivalent Circuit
1	Input		Signal input pin. An internal matching circuit, configured with resistors, enables 50 Ω connection over a wide bandwidth. A multi-feedback circuit is designed to cancel the deviations of h_{FE} and resistance. This pin must be coupled to the signal source with a blocking capacitor.	
4	Output		Signal output pin. An internal matching circuit, configured with resistors, enables 50 Ω connection over a wide bandwidth. This pin must be coupled to the output load with a blocking capacitor.	
6	V_{CC}	4.5 to 5.5	Power supply pin. This pin should be externally equipped with a bypass capacitor to minimize ground impedance.	
2 3 5	GND	0	Ground pin. This pin should be connected to system ground with minimum inductance. Ground pattern on the board should be formed as wide as possible. All the ground pins must be connected together with wide ground pattern to minimize impedance difference.	

OUTLINE DIMENSIONS (Units in mm)

PACKAGE OUTLINE S06



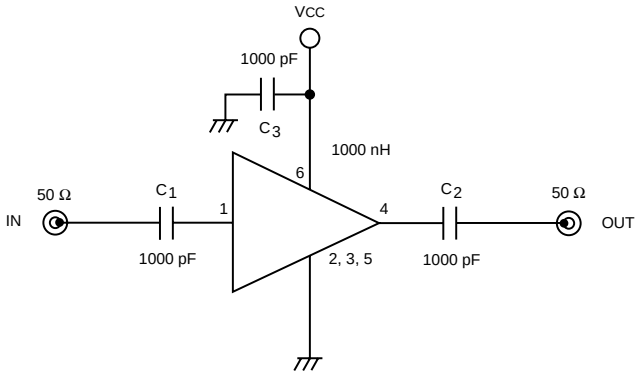
PIN CONNECTIONS



Marking is an example of UPC2711TB

1. Input
2. GND
3. GND
4. Output
5. GND
6. V_{CC}

TEST CIRCUIT



ORDERING INFORMATION

PART NUMBER	MARKING	QTY
UPC2711TB-E3	C1G	3K/reel
UPC2712TB-E3	C1H	3K/reel

Note: Embossed tape, 8 mm wide. Pins 1, 2, and 3 face perforated side of tape.