PRELIMINARY DATA SHEET

CEL

UPC2791TB, UPC2792TB

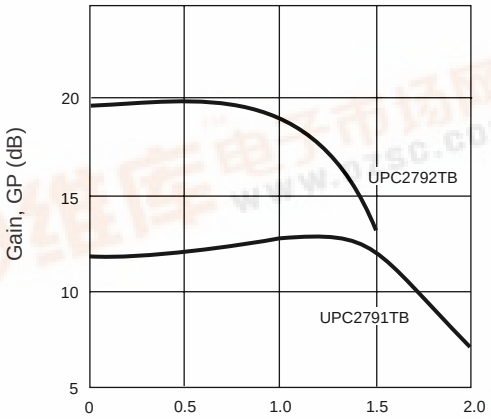
5 V, SUPER MINIMOLD SILICON MMIC WIDEBAND AMPLIFIER

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:**
  UPC2791TB: fu = 1.9 GHz TYP
  UPC2792TB: fu = 1.2 GHz TYP
- **POWER GAIN:**
  UPC2791TB: G_P = 12 dB TYP
  UPC2792TB: G_P = 20 dB TYP

TYPICAL PERFORMANCE CURVES

GAIN vs. FREQUENCY



DESCRIPTION

NEC's UPC2791TB and UPC2792TB are Silicon MMIC Wideband Amplifiers manufactured using NEC's 10 GHz f_T NESAT™ II silicon bipolar process. These devices are designed for use as second IF buffer amps in DBS tuners. The UPC2791/92TB are pin compatible and their performance is comparable to the larger UPC1675/76G, 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.

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

PART NUMBER PACKAGE OUTLINE			UPC2791TB S06			UPC2792TB S06		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX	MIN	TYP	MAX
I_{CC}	Circuit Current (no signal)	mA	12	17	22	14	19	24
G_P	Power Gain, f = 500 MHz	dB	10	12	14	17	20	22
fu	Upper Limit Operating Frequency (The gain at fu is 3 dB down from the gain at 100 MHz)	GHz	1.6	1.9		1.0	1.2	
$P_{O(SAT)}$	Maximum Output Level, f = 500 MHz, P_{IN} = 0 dBm	dBm	+2	+4		+3	+5	
NF	Noise Figure, f = 500 MHz	dB		5.5	7.0		3.5	6
RL_{IN}	Input Return Loss, f = 500 MHz	dB	9	12		12	15	
RL_{OUT}	Output Return Loss, f = 500 MHz	dB	8	11		9	12	
ISOL	Isolation, f = 500 MHz	dB	20	24		24	28	

The information in this document is subject to change without notice. Before using this document, please confirm that this is the latest version.

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

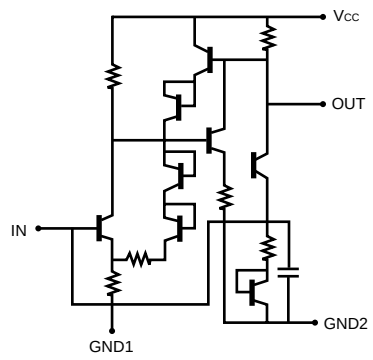
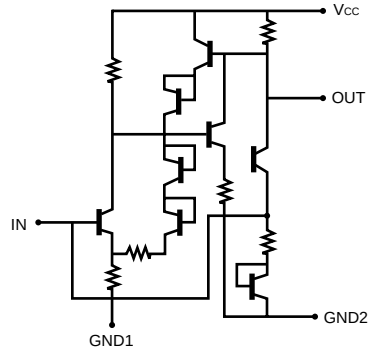
SYMBOLS	PARAMETERS	UNITS	RATINGS
V_{CC}	Supply Voltage	V	6
P_{IN}	Input Power	dBm	+10
P_T	Total Power Dissipation[2]	mW	200
T_{OP}	Operating Temperature	°C	-40 to +85
T_{STG}	Storage Temperature	°C	-55 to +150

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

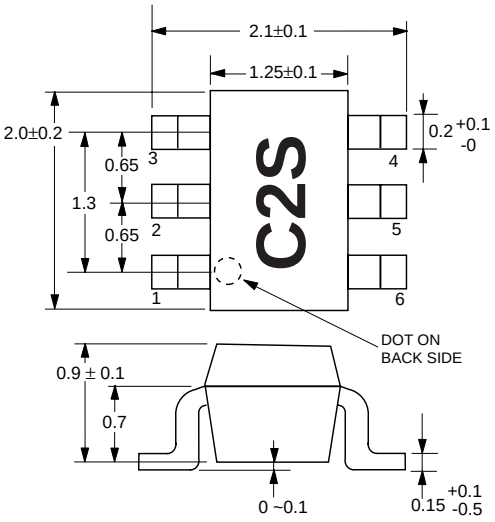
SYMBOL	PARAMETER	UNITS	MIN	TYP	MAX
V_{CC}	Supply Voltage	V	4.5	5.0	5.5
T_{OP}	Operating Temperature	˚C	-40	+25	+85

PIN DESCRIPTION

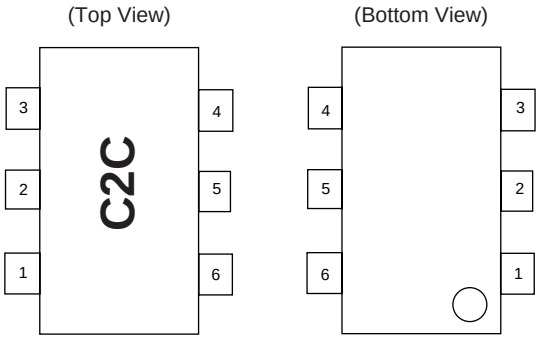
Pin No.	Pin Name	Applied Voltage (V)	Description	Internal Equivalent Circuit
1 2 5	GND	0	Ground pin. This pin should be connected to system ground with minimum inductance. Ground pattern on the board should be formed as wide as possible. All the ground pins must be connected together with wide ground pattern to minimize impedance difference.	UPC2791TB 
3	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.	
4	V_{CC}	4.5 to 5.5	Power supply pin. This pin should be externally equipped with a bypass capacitor to minimize ground impedance.	UPC2792TB 
6	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.	

OUTLINE DIMENSIONS (Units in mm)

PACKAGE OUTLINE S06



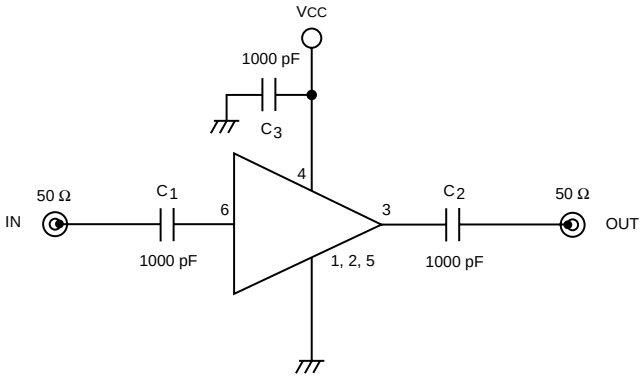
PIN CONNECTIONS



Marking is an example of UPC2791TB

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

TEST CIRCUIT



ORDERING INFORMATION (Solder Contains Lead)

PART NUMBER	MARKING	QTY
UPC2791TB-E3	C2S	3K/reel
UPC2792TB-E3	C2T	3K/reel

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

ORDERING INFORMATION (Pb-Free)

PART NUMBER	MARKING	QTY
UPC2791TB-E3-A	C2S	3K/reel
UPC2792TB-E3-A	C2T	3K/reel

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

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Subject: Compliance with EU Directives

CEL certifies, to its knowledge, that semiconductor and laser products detailed below are compliant with the requirements of European Union (EU) Directive 2002/95/EC Restriction on Use of Hazardous Substances in electrical and electronic equipment (RoHS) and the requirements of EU Directive 2003/11/EC Restriction on Penta and Octa BDE.

CEL Pb-free products have the same base part number with a suffix added. The suffix –A indicates that the device is Pb-free. The –AZ suffix is used to designate devices containing Pb which are exempted from the requirement of RoHS directive (*). In all cases the devices have Pb-free terminals. All devices with these suffixes meet the requirements of the RoHS directive.

This status is based on CEL's understanding of the EU Directives and knowledge of the materials that go into its products as of the date of disclosure of this information.

Restricted Substance per RoHS	Concentration Limit per RoHS (values are not yet fixed)	Concentration contained in CEL devices	
Lead (Pb)	< 1000 PPM	-A	-AZ
		Not Detected	(*)
Mercury	< 1000 PPM	Not Detected	
Cadmium	< 100 PPM	Not Detected	
Hexavalent Chromium	< 1000 PPM	Not Detected	
PBB	< 1000 PPM	Not Detected	
PBDE	< 1000 PPM	Not Detected	

If you should have any additional questions regarding our devices and compliance to environmental standards, please do not hesitate to contact your local representative.