



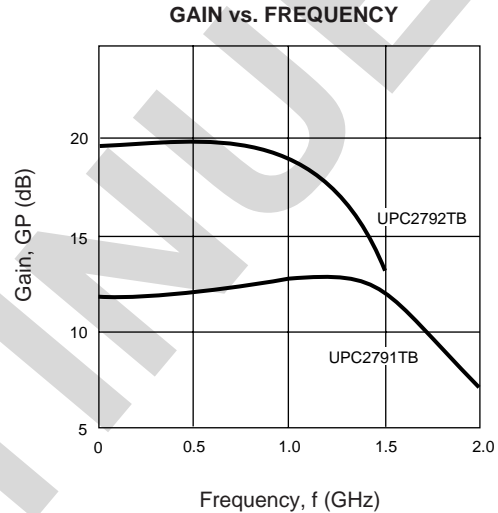
UPC2791TB, UPC2792TB

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

TYPICAL PERFORMANCE CURVES



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 |
| f_u | Upper Limit Operating Frequency (The gain at f_u 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.

ABSOLUTE MAXIMUM RATINGS¹ (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 |

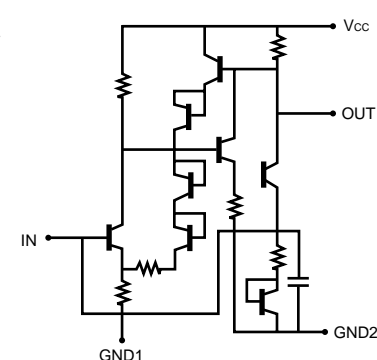
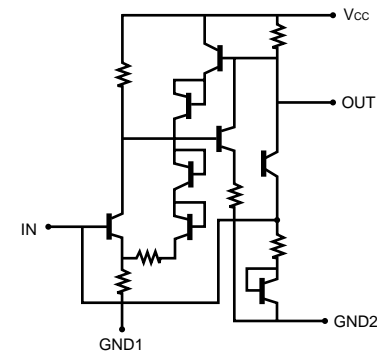
Notes:

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).

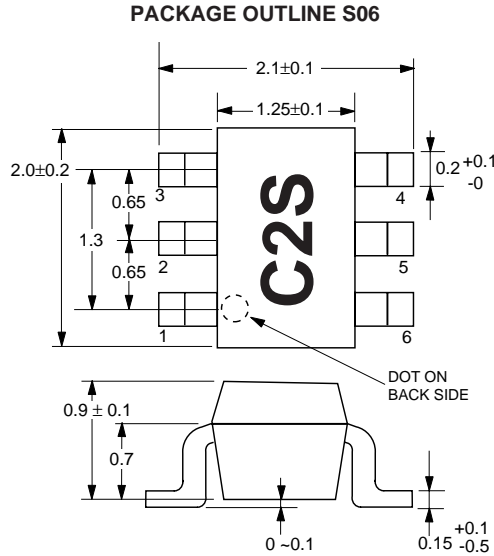
RECOMMENDED OPERATING CONDITIONS

| 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 |

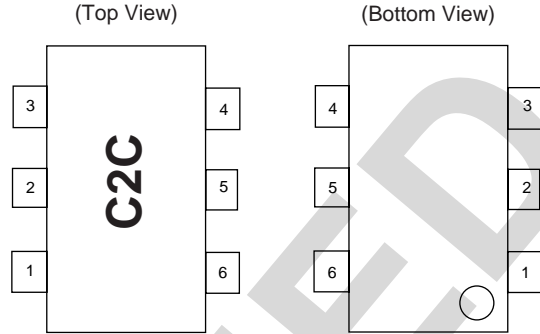
PIN DESCRIPTION

| 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)



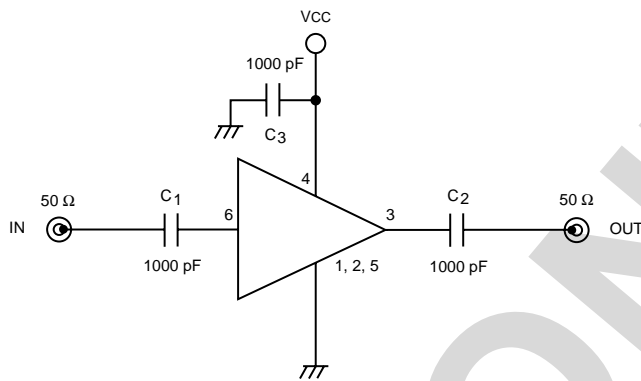
PIN CONNECTIONS



Marking is an example of UPC2791TB

- 1. GND
- 2. GND
- 3. Output
- 4. Vcc
- 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.

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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Subject: Compliance with EU Directives

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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 | |
|-------------------------------|---|--|-----|
| | | -A | -AZ |
| Lead (Pb) | < 1000 PPM | 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 | |

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