

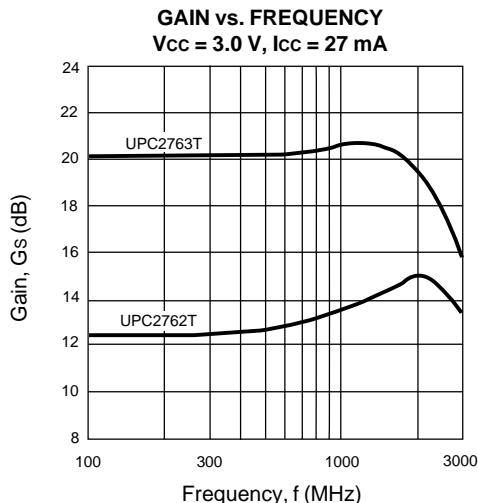
### FEATURES

- 7 dBm P<sub>1dB</sub> TYPICAL AT 1.9 GHz
- **LOW VOLTAGE:** 3 Volts
- **WIDE BANDWIDTH:** 2.9 GHz at -3 dB (UPC2762T)
- **HIGH GAIN:** 20 dB at 1.9 GHz (UPC2763T)
- **SUPER SMALL PACKAGE**
- **TAPE AND REEL PACKAGING OPTION AVAILABLE**

### DESCRIPTION

The UPC2762T and UPC2763T are Silicon Monolithic integrated circuits which are manufactured using the NESAT III process. The NESAT III process produces transistors with  $f_t$  approaching 20 GHz. These amplifiers were designed for 900 MHz and 1.9 GHz receivers in cellular, cordless telephone and PCN applications. Operating on a 3 volt supply these ICs are ideally suited for hand-held, portable designs.

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



### ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C, Z<sub>L</sub> = Z<sub>S</sub> = 50Ω, V<sub>CC</sub> = 3.0 V)

| PART NUMBER<br>PACKAGE OUTLINE |   |              | UPC2762T<br>T06 |            |            | UPC2763T<br>T06 |              |            |
|--------------------------------|---|--------------|-----------------|------------|------------|-----------------|--------------|------------|
| SYMBOLS                        | PARAMETERS AND CONDITIONS   | UNITS        | MIN             | TYP        | MAX        | MIN             | TYP          | MAX        |
| I <sub>CC</sub>                | Circuit Current (no signal)   | mA           |                 | 27         | 35         |                 | 27           | 35         |
| G <sub>s</sub>                 | Small Signal Gain, f = 900 MHz<br>f = 1900 MHz  | dB<br>dB     | 11<br>11.5      | 13<br>14.5 | 16<br>17.5 | 16<br>16.5      | 20<br>19.5   | 23<br>22.5 |
| f <sub>u</sub> <sup>1</sup>    | Upper Limit Operating Frequency<br>(The gain at f <sub>u</sub> is 3 dB down from the gain at 0.1 GHz) | GHz          | 2.7             | 2.9        |            | 2.0             | 2.4          |            |
| P <sub>1dB</sub>               | Output Power at 1 dB Compression Point, f = 900 MHz<br>f = 1900 MHz                                   | dBm<br>dBm   | +5.5<br>+4.5    | +8<br>+7   |            | +7<br>+4        | +9.5<br>+6.5 |            |
| P <sub>SAT</sub>               | Saturated Output Power, f = 900 MHz<br>f = 1900 MHz   | dBm<br>dBm   |                 | 9<br>8.5   |            |                 | 11<br>8      |            |
| NF                             | Noise Figure, f = 900 MHz<br>f = 1900 MHz   | dB<br>dB     |                 | 6.5<br>7   | 8<br>8.5   |                 | 5.5<br>5.5   | 7.0<br>7.0 |
| RL <sub>IN</sub>               | Input Return Loss, f = 900 MHz<br>f = 1900 MHz  | dB<br>dB     | 6<br>5.5        | 9<br>8.5   |            | 8<br>9          | 11<br>12     |            |
| RL <sub>OUT</sub>              | Output Return Loss, f = 900 MHz<br>f = 1900 MHz   | dB<br>dB     | 8<br>9          | 11<br>12   |            | 5<br>6          | 8<br>9       |            |
| ISOL                           | Isolation, f = 900 MHz<br>f = 1900 MHz  | dB<br>dB     | 22<br>20        | 27<br>25   |            | 25<br>24        | 30<br>29     |            |
| OIP <sub>3</sub>               | SSB Output Third Order Intercept Point f = 900, 902 MHz<br>f = 1900, 1902 MHz                         | dBm<br>dBm   |                 | +12<br>+9  |            |                 | +17<br>+11   |            |
| R <sub>TH</sub> (J-A)          | Thermal Resistance (Junction to Ambient)<br>Free Air<br>Mounted on a 50 x 50 x 1.6 mm epoxy glass PWB | °C/W<br>°C/W |                 |            | 620<br>230 |                 |              | 620<br>230 |

Note:

1. The gain at f<sub>u</sub> is 3 dB down from the gain at 100 MHz.

# UPC2762T, UPC2763T

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

| SYMBOLS          | PARAMETERS                           | UNITS | RATINGS     |
|------------------|--------------------------------------|-------|-------------|
| V <sub>CC</sub>  | Supply Voltage                       | V     | 3.6         |
| I <sub>CC</sub>  | Total Supply Current                 | mA    | 70          |
| P <sub>IN</sub>  | Input Power                          | dBm   | +10         |
| P <sub>T</sub>   | Total Power Dissipation <sup>2</sup> | mW    | 280         |
| T <sub>OP</sub>  | Operating Temperature                | °C    | -40 to +85  |
| T <sub>STG</sub> | Storage Temperature                  | °C    | -55 to +150 |

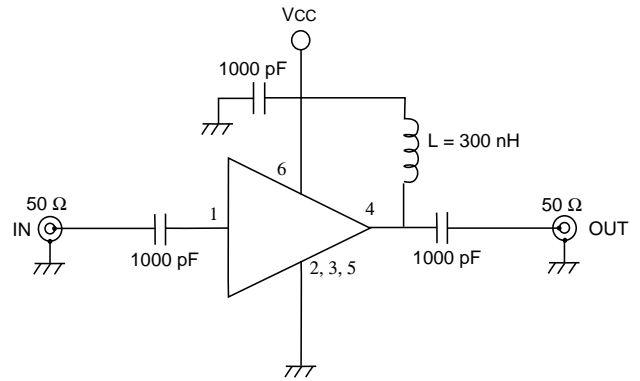
**Notes:**

1. Operation in excess of any one of these parameters may result in permanent damage.
2. Mounted on a 50 x 50 x 1.6 mm epoxy glass PWB (T<sub>A</sub> = 85°C).

## RECOMMENDED OPERATING CONDITIONS

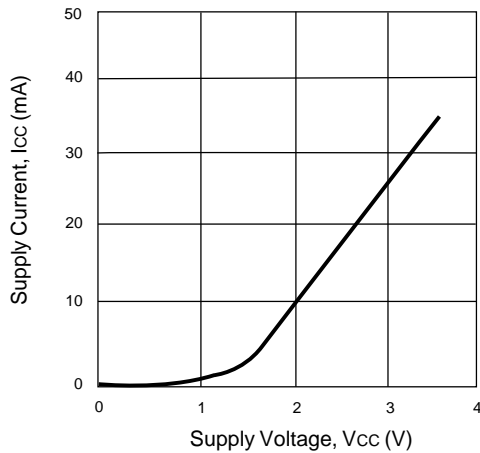
| SYMBOLS         | PARAMETERS            | UNITS | MIN | TYP | MAX |
|-----------------|-----------------------|-------|-----|-----|-----|
| V <sub>CC</sub> | Supply Voltage        | V     | 2.7 | 3   | 3.3 |
| T <sub>OP</sub> | Operating Temperature | °C    | -40 | 25  | 85  |

## TEST CIRCUIT

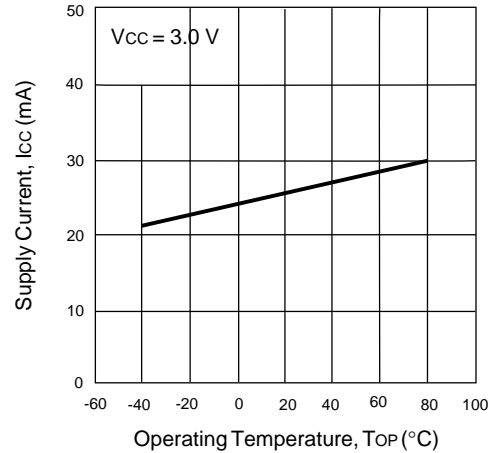


## TYPICAL PERFORMANCE CURVES (T<sub>A</sub> = 25°C)

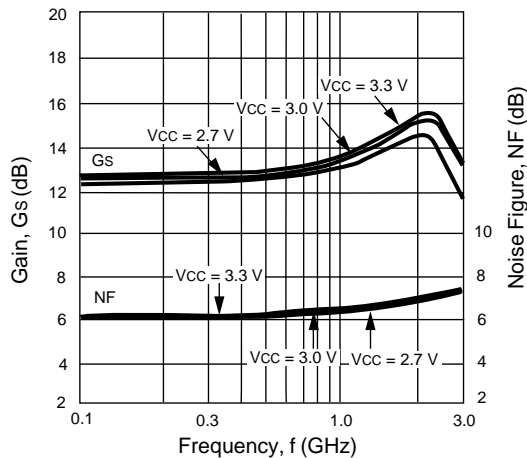
**UPC2762T/63T  
SUPPLY CURRENT vs.  
SUPPLY VOLTAGE**



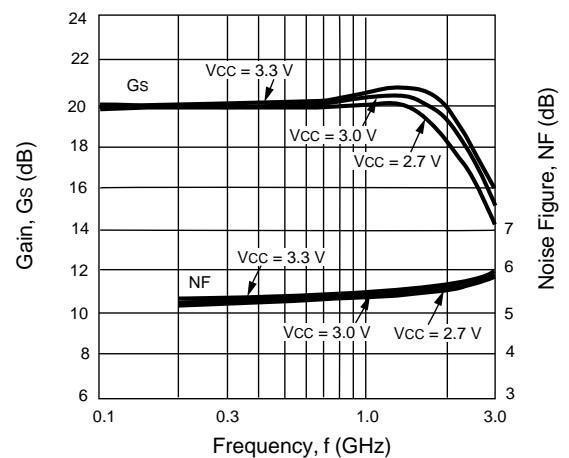
**UPC2762T/63T  
SUPPLY CURRENT vs.  
OPERATING TEMPERATURE**



**UPC2762T  
NOISE FIGURE AND GAIN vs.  
FREQUENCY AND VOLTAGE**

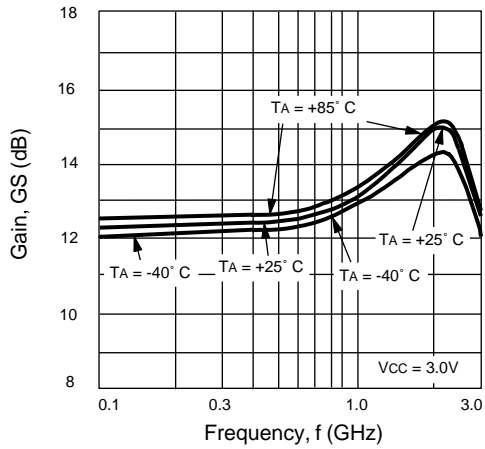


**UPC2763T  
NOISE FIGURE AND GAIN vs.  
FREQUENCY AND VOLTAGE**

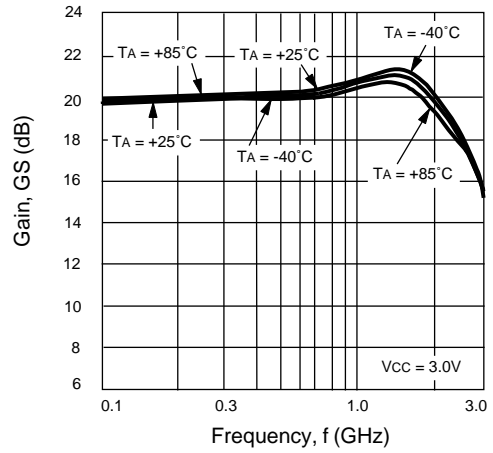


TYPICAL PERFORMANCE CURVES (TA = 25°C)

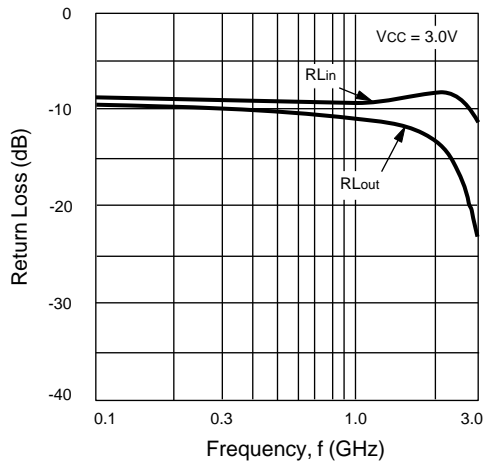
**UPC2762T**  
GAIN vs. FREQUENCY AND TEMPERATURE



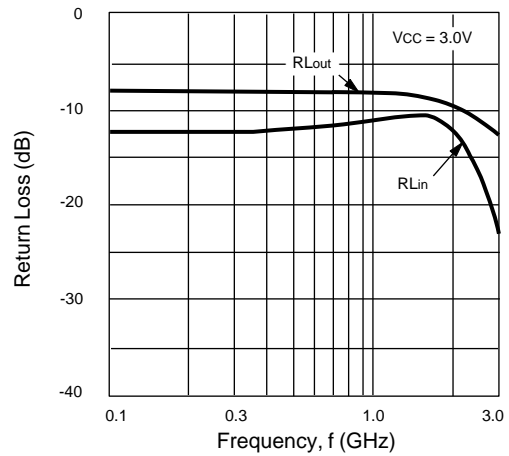
**UPC2763T**  
GAIN vs. FREQUENCY AND TEMPERATURE



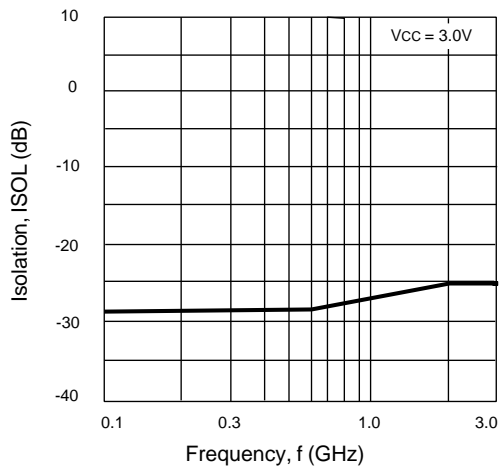
**UPC2762T**  
INPUT AND OUTPUT  
RETURN LOSS vs. FREQUENCY



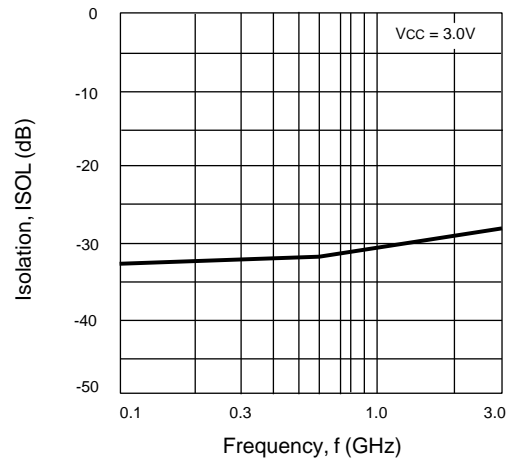
**UPC2763T**  
INPUT AND OUTPUT  
RETURN LOSS vs. FREQUENCY



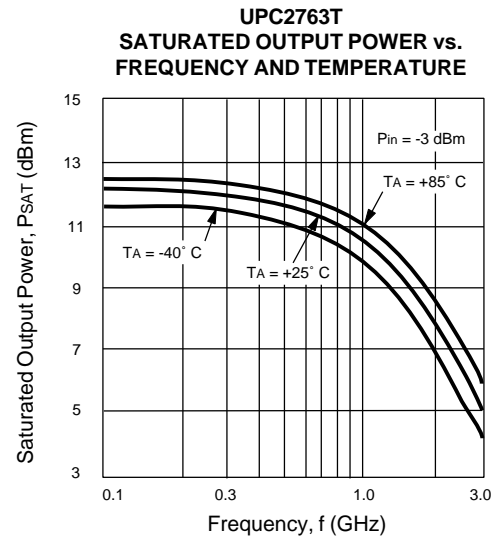
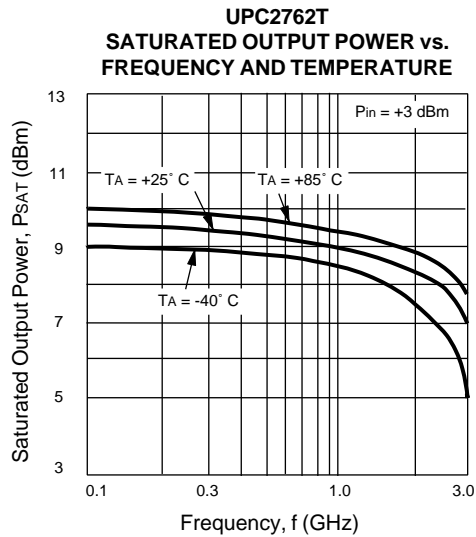
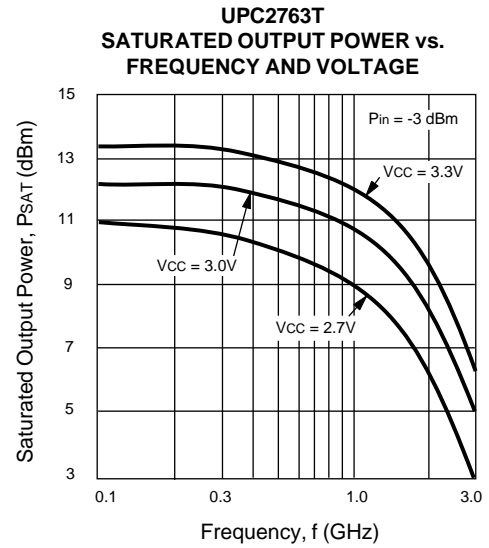
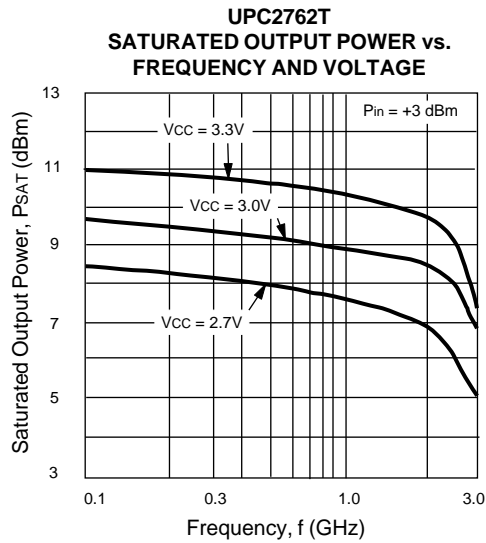
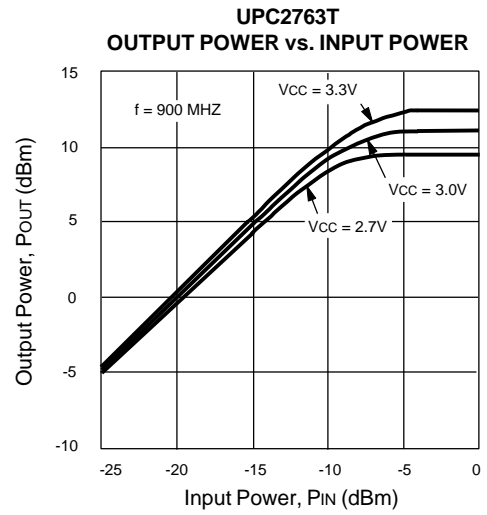
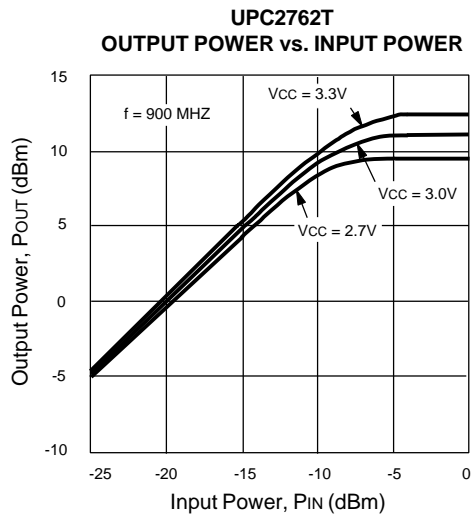
**UPC2762T**  
ISOLATION vs. FREQUENCY



**UPC2763T**  
ISOLATION vs. FREQUENCY

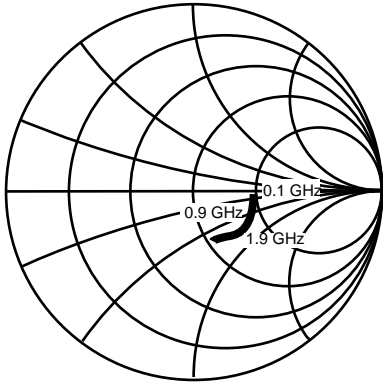


TYPICAL PERFORMANCE CURVES (TA = 25°C)

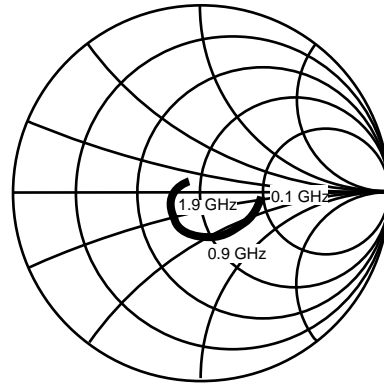


TYPICAL SCATTERING PARAMETERS (T<sub>A</sub> = 25°C)

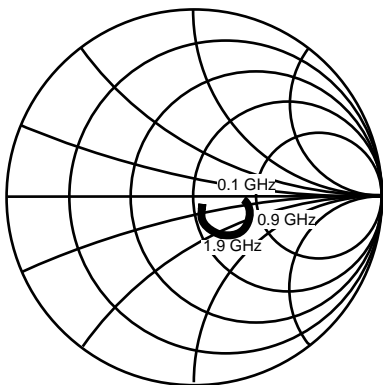
UPC2762T  
S<sub>11</sub> vs. FREQUENCY  
(V<sub>CC</sub> = 3.0 V)



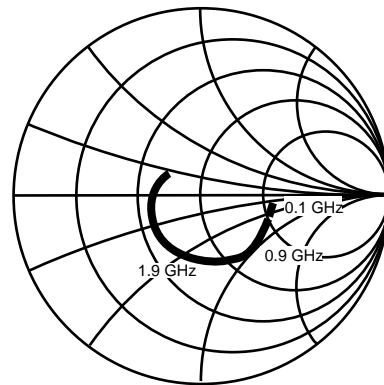
UPC2762T  
S<sub>22</sub> vs. FREQUENCY  
(V<sub>CC</sub> = 3.0 V)



UPC2763T  
S<sub>11</sub> vs. FREQUENCY  
(V<sub>CC</sub> = 3.0 V)

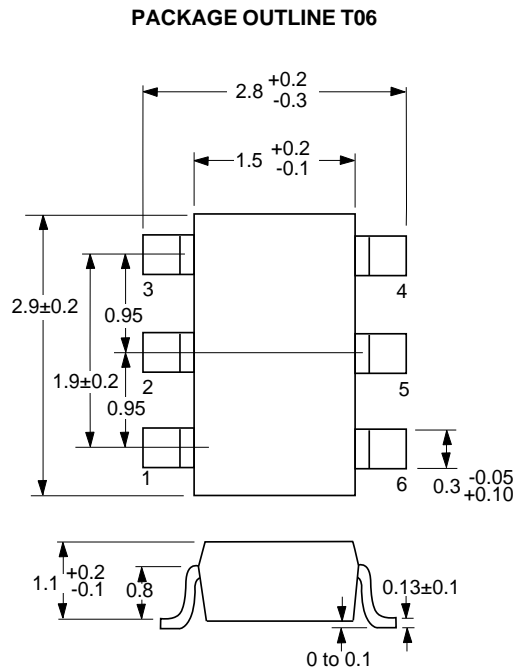


UPC2763T  
S<sub>22</sub> vs. FREQUENCY  
(V<sub>CC</sub> = 3.0 V)



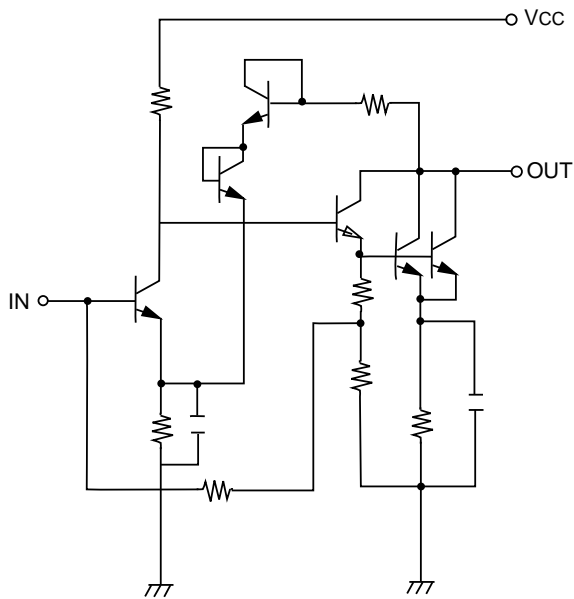
# UPC2762T, UPC2763T

## OUTLINE DIMENSIONS (Units in mm)

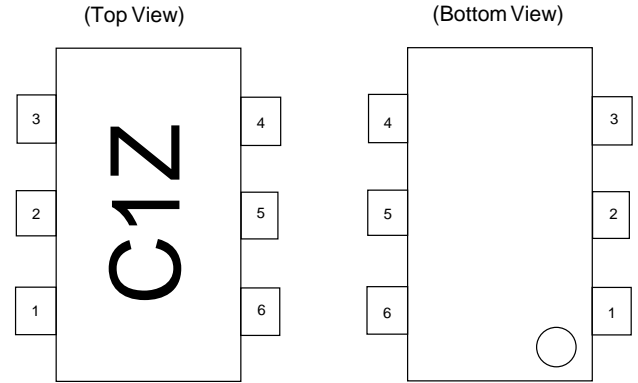


Note:  
All dimensions are typical unless otherwise specified.

## EQUIVALENT CIRCUIT



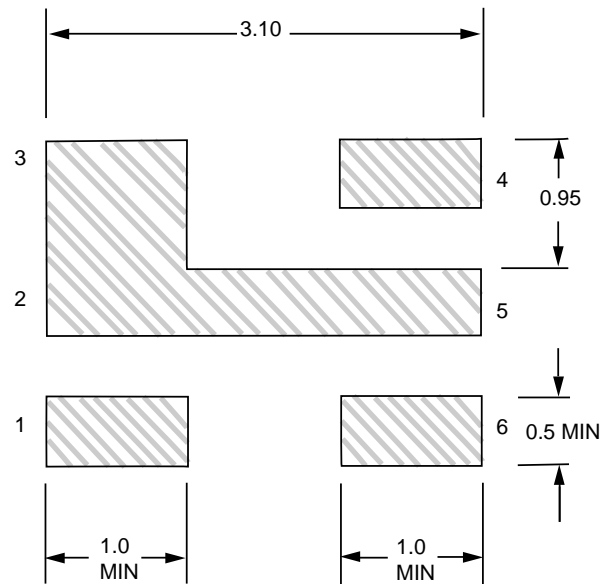
## LEAD CONNECTIONS



1. INPUT
2. GND
3. GND
4. OUTPUT
5. GND
6. Vcc

Note: Package Marking  
C1Z: UPC2762T  
C2A: UPC2763T

## RECOMMENDED P.C.B. LAYOUT (Units in mm)



## ORDERING INFORMATION

| PART NUMBER | QTY     |
|-------------|---------|
| UPC2762T-E3 | 3K/Reel |
| UPC2763T-E3 | 3K/Reel |

Note:  
Embossed Tape, 8 mm wide.

EXCLUSIVE AGENT FOR **NEC Corporation** RF & MICROWAVE SEMICONDUCTOR PRODUCTS - U.S. & CANADA

CALIFORNIA EASTERN LABORATORIES, INC. ▪ 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