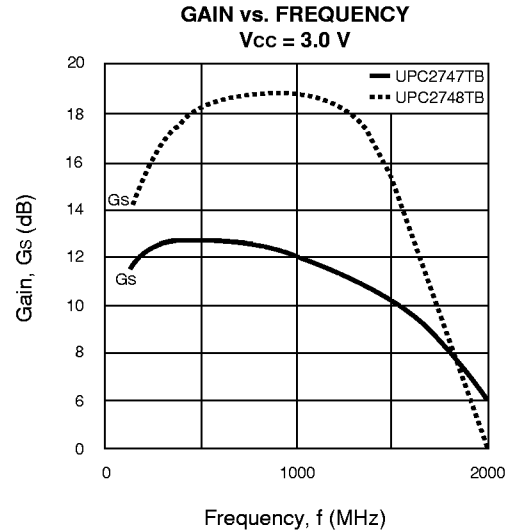


FEATURES

- **HIGH DENSITY SURFACE MOUNTING:**
6 pin super minimold or SOT-363 package
- **GAIN:**
UPC2747TB: $G_s = 12$ dB TYP
UPC2748TB: $G_s = 19$ dB TYP
- **NOISE FIGURE:**
UPC2747TB: NF = 3.3 dB TYP
UPC2748TB: NF = 2.8 dB TYP
- **SUPPLY VOLTAGE:**
 $V_{CC} = 2.7$ to 3.3 V

DESCRIPTION

The UPC2747TB and UPC2748TB are Silicon RFIC's which are manufactured using the NESAT III process. These devices are suitable as buffer amplifiers for cellular radio and other communication receivers. The UPC2747TB/48TB are pin compatible and have comparable performance as the larger UPC2747T/48T, so they are suitable for use as a replacement to help reduce system size. The IC's are housed in a 6 pin super minimold or SOT-363 package. NEC's stringent quality assurance and test procedures ensure the highest reliability and performance.



ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, $Z_L = Z_S = 50 \Omega$)

PART NUMBER PACKAGE OUTLINE			UPC2747TB SO6			UPC2748TB SO6		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX	MIN	TYP	MAX
I_{CC}	Circuit Current (no signal) $V_{CC} = 3.0$ V $V_{CC} = 1.8$ V	mA mA	3.8	5.0 3.0	7.0	4.5	6.0 3.5	8.0
G_s	Small Signal Gain, $f = 900$ MHz, $V_{CC} = 3.0$ V $f = 900$ MHz, $V_{CC} = 1.8$ V	dB dB	9	12 5.5	14	16	19 11.5	21
f_{L1}	Lower Limit Operating Frequency, $V_{CC} = 3.0$ V $V_{CC} = 1.8$ V	GHz GHz					0.2 0.2	0.4
f_{U2}	Upper Limit Operating Frequency, $V_{CC} = 3.0$ V $V_{CC} = 1.8$ V	GHz GHz	1.5	1.8 1.8		1.2	1.5 1.5	
P_{SAT}	Saturated Output Power, $f = 900$ MHz, $V_{CC} = 3.0$ V $f = 900$ MHz, $V_{CC} = 1.8$ V	dBm dBm	-9.5	-7 -14		-6	-3.5 -10	
NF	Noise Figure, $f = 900$ MHz, $V_{CC} = 3.0$ V $f = 900$ MHz, $V_{CC} = 1.8$ V	dB dB		3.3 5.2	4.5		2.8 4.5	4.0
RLIN	Input Return Loss, $f = 900$ MHz, $V_{CC} = 3.0$ V $f = 900$ MHz, $V_{CC} = 1.8$ V	dB dB	11	14 11		8.5	11.5 10	
RLOUT	Output Return Loss, $f = 900$ MHz, $V_{CC} = 3.0$ V $f = 900$ MHz, $V_{CC} = 1.8$ V	dB dB	7	10 13		5.5	8.5 12	
ISOL	Isolation, $f = 900$ MHz, $V_{CC} = 3.0$ V $f = 900$ MHz, $V_{CC} = 1.8$ V	dB dB	35	40 34		35	40 34	
OIP3	SSB Output Third Order Intercept, $P_{OUT} = -20$ dBm $f_1 = 900$ MHz, $f_2 = 902$ MHz, $V_{CC} = 3.0$ V $f_1 = 900$ MHz, $f_2 = 902$ MHz, $V_{CC} = 1.8$ V	dBm dBm		-3 -10			-1 -6	
RTH (J-A)	Thermal Resistance (Junction to Ambient) Mounted on a 50 x 50 x 1.6 mm epoxy glass PWB	$^\circ\text{C/W}$			325			325

Note:

1. The gain at f_L is 3 dB down from the gain at 900 MHz.
2. The gain at f_U is 3 dB down from the gain at 900 MHz.

UPC2747TB, UPC2748TB

ABSOLUTE MAXIMUM RATINGS¹ (T_A = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
V _{CC}	Supply Voltage	V	4.0
I _{CC}	Total Supply Current	mA	15
P _{IN}	Input Power	dBm	0
P _T	Total Power Dissipation ²	mW	200
T _{OP}	Operating Temperature	°C	-40 to +85
T _{STG}	Storage Temperature	°C	-55 to +150

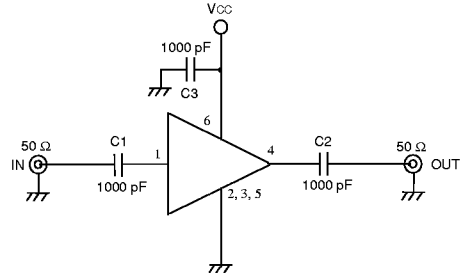
Notes:

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

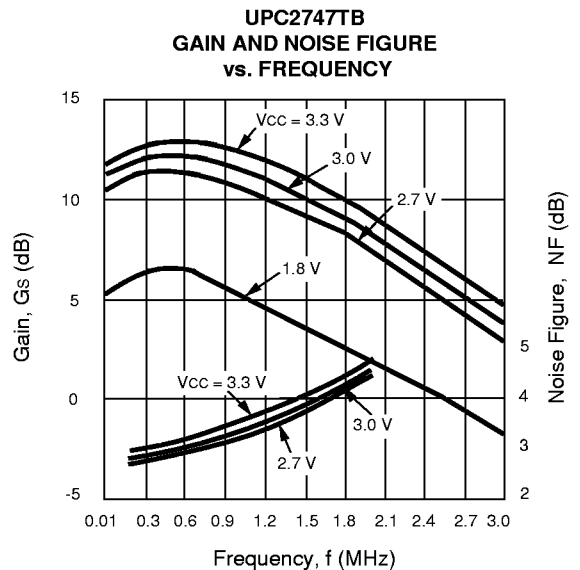
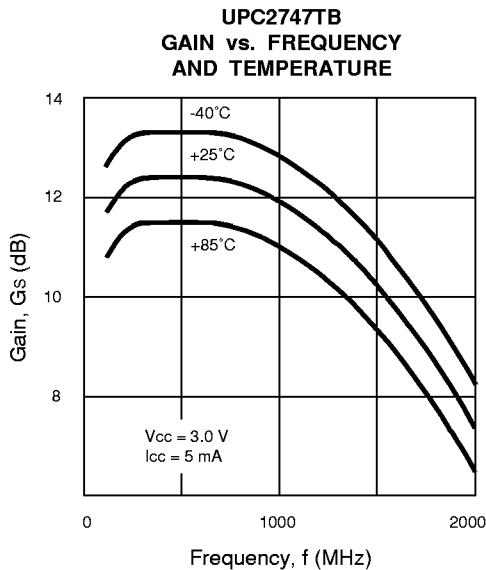
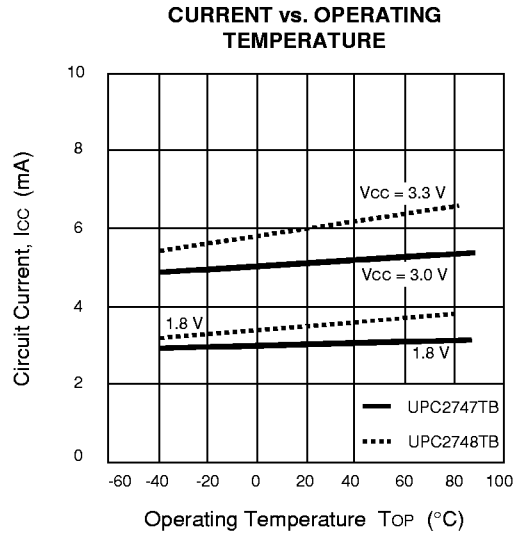
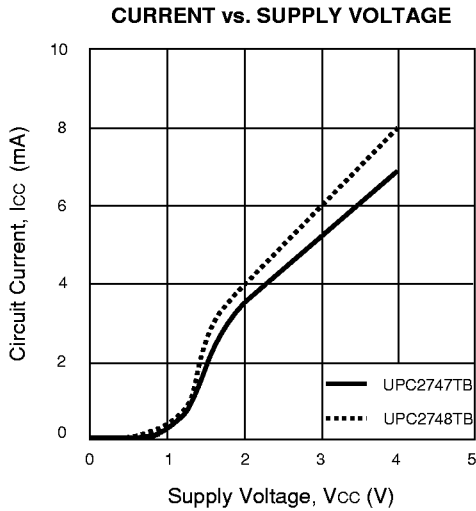
RECOMMENDED OPERATING CONDITIONS

SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
V _{CC}	Supply Voltage	V	2.7	3	3.3
T _{OP}	Operating Temperature	°C	-40	25	85

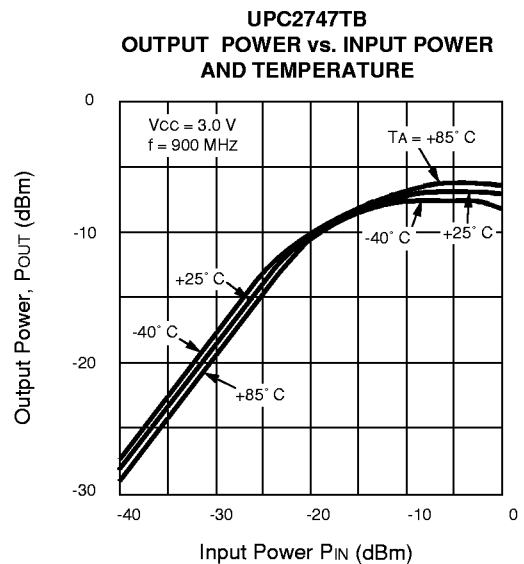
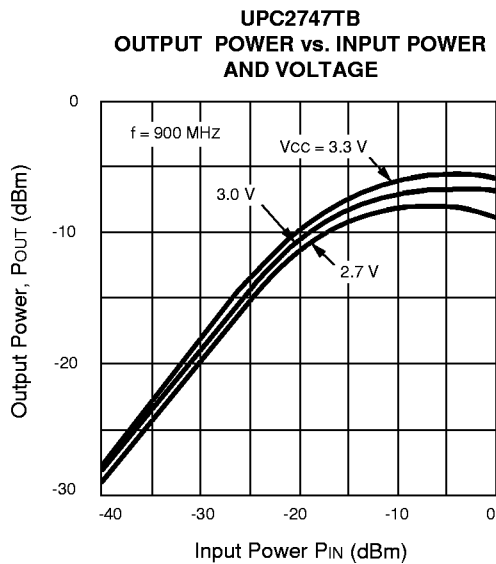
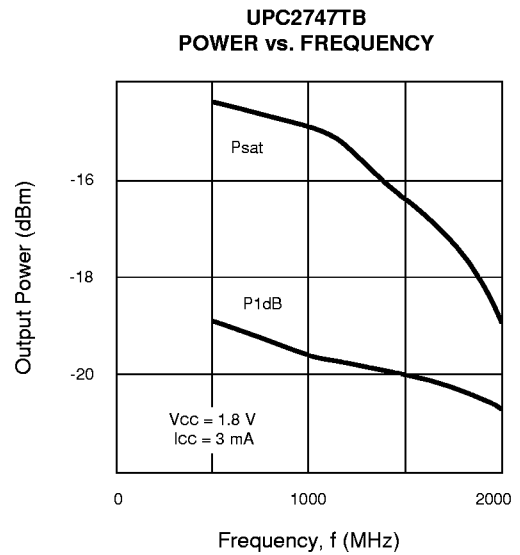
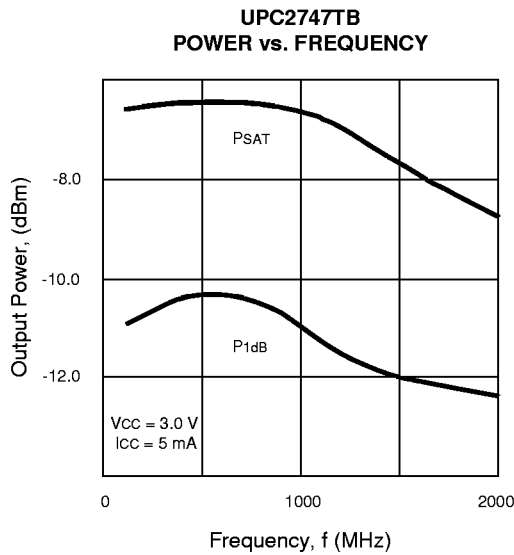
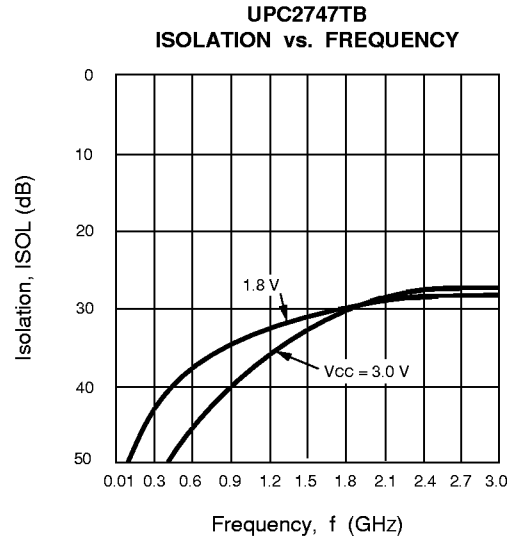
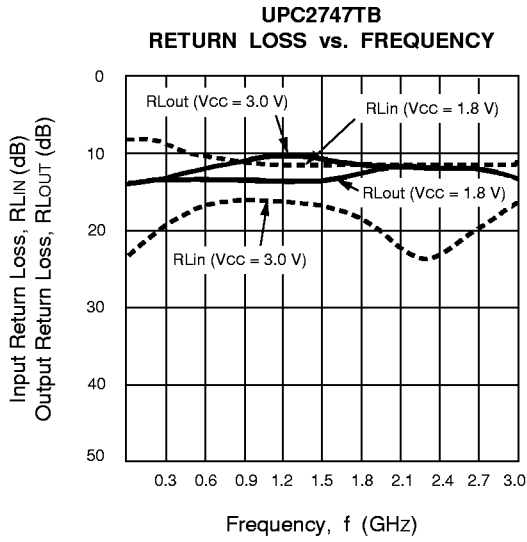
TEST CIRCUIT



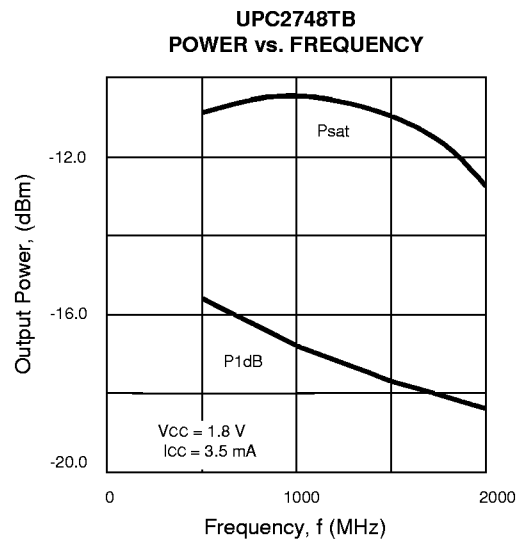
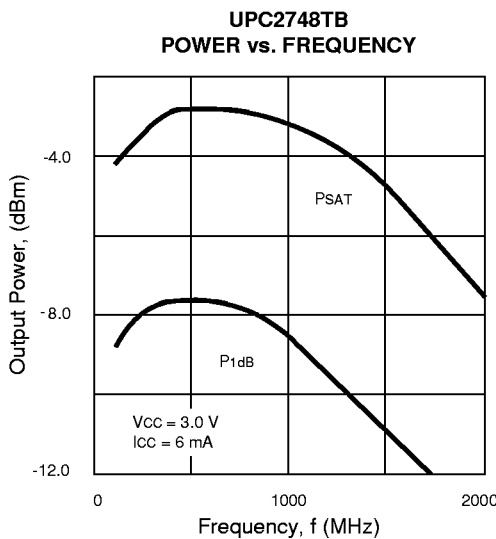
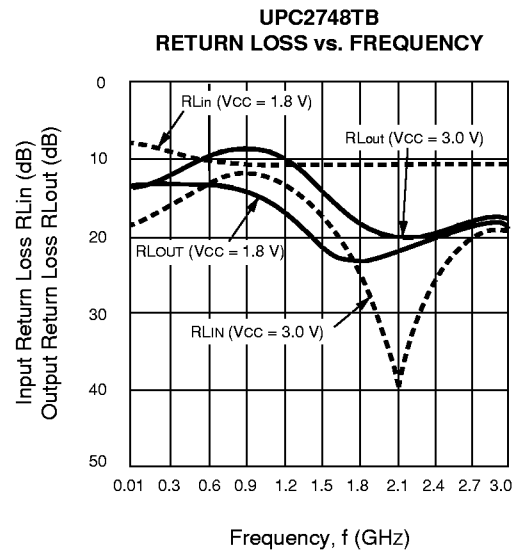
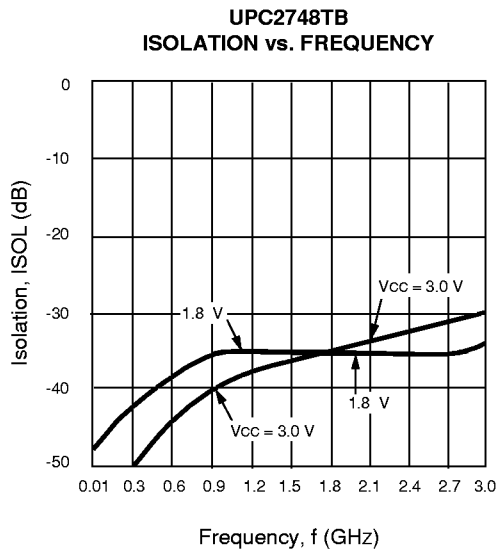
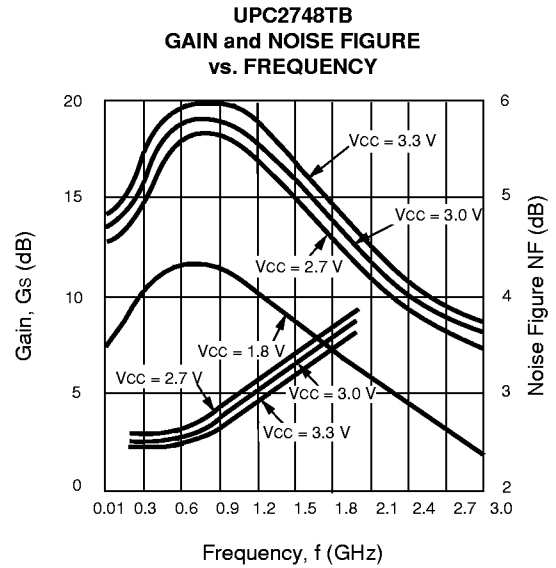
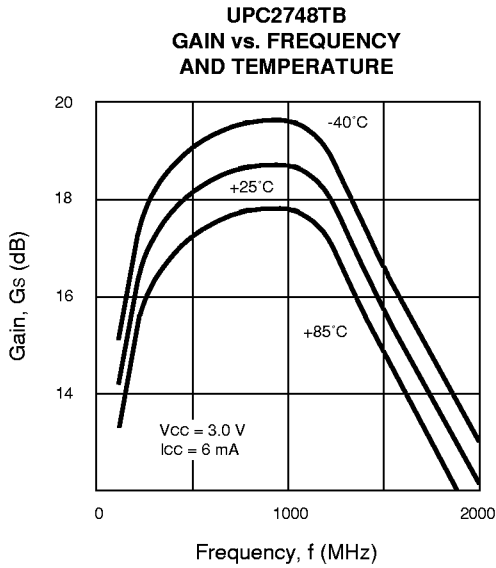
TYPICAL PERFORMANCE CURVES (T_A = 25°C)



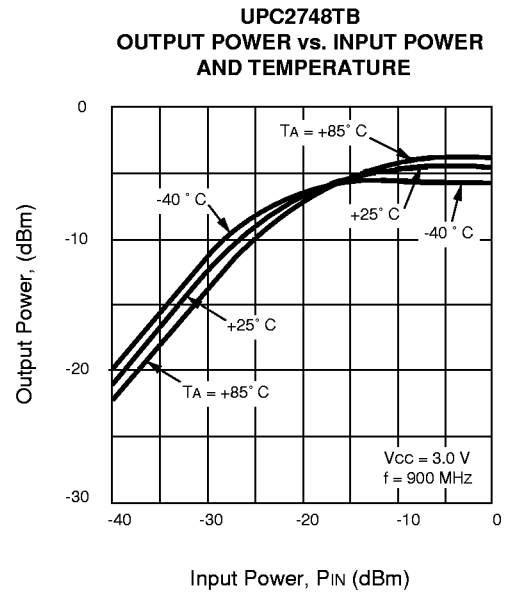
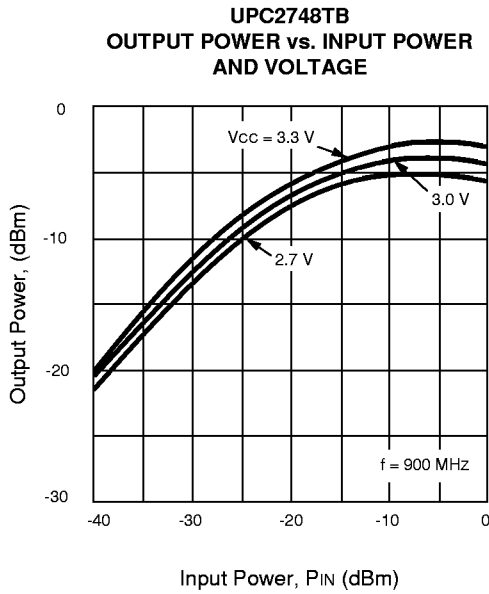
TYPICAL PERFORMANCE CURVES ($T_A = 25^\circ\text{C}$)



TYPICAL PERFORMANCE CURVES (TA = 25°C)



TYPICAL PERFORMANCE CURVES (TA = 25°C)



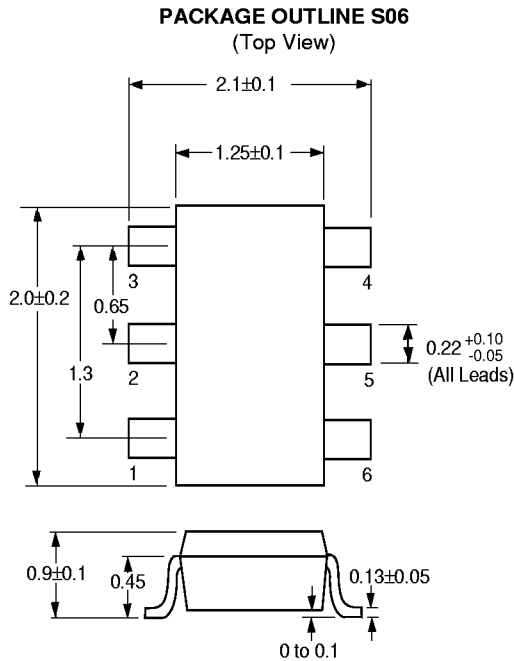
PIN DESCRIPTION

Pin No.	Pin Name	Applied Voltage (V)	Description	Internal Equivalent Circuit
1	Input	0.8 ¹ 0.8 ²	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 hFE and resistance. This pin must be coupled to the signal source with a blocking capacitor.	
4	Output	2.79 ¹ 2.72 ²	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	Vcc	2.7 to 3.3	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.	

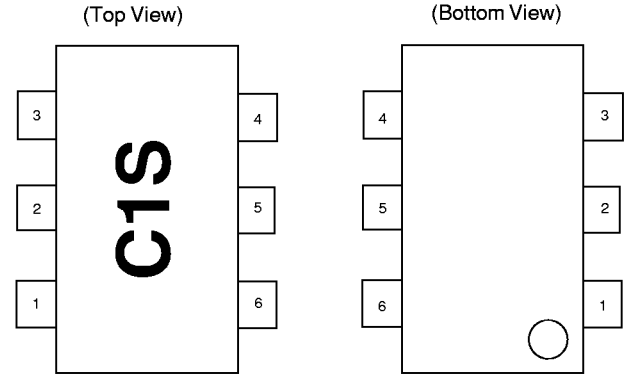
Notes:
 1. UPC2747TB.
 2. UPC2748TB.

UPC2747TB, UPC2748TB

OUTLINE DIMENSIONS (Units in mm)



PIN CONNECTIONS



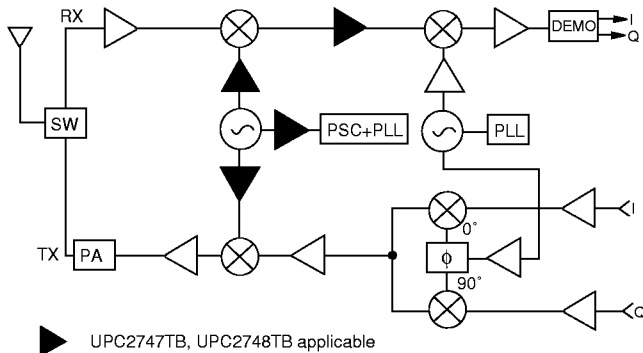
*Marking is an example of UPC2747TB

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

SYSTEM APPLICATION EXAMPLE

DIGITAL CELLULAR SYSTEM BLOCK DIAGRAM

Example of 900 MHz Band Digital Cellular Phone



ORDERING INFORMATION

PART NUMBER	MARKING	QTY
UPC2747TB-E3	C1S	3K/Reel
UPC2748TB-E3	C1T	3K/Reel

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

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