

FEATURES

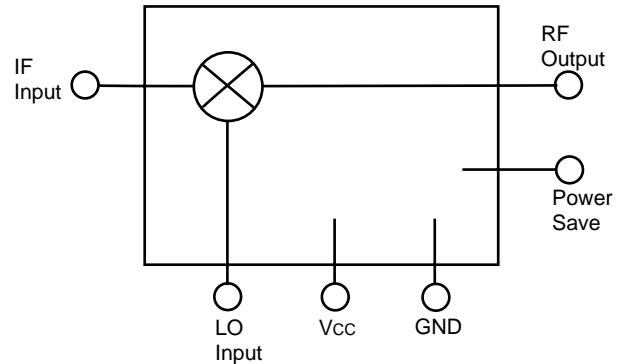
- **WIDE BAND OPERATION:**
IF Input: 3 dB BW: 50 ~ 400 MHz Typical
RF Output: 3 dB BW: 0.1~2 GHz Typical
- **LOW VOLTAGE OPERATION:** 2.7 V Minimum
- **POWER SAVE FUNCTION**
- **SUPER SMALL PACKAGE**
- **TAPE AND REEL PACKAGING OPTION AVAILABLE**

DESCRIPTION

The UPC8106T is an L-Band Frequency Up-Converter manufactured using the NESAT III MMIC process. The UPC8106T was designed for low distortion. Operation from a 3 volt supply voltage makes this device ideal for handheld cellular, PCN and wireless LAN applications.

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

INTERNAL BLOCK DIAGRAM



ELECTRICAL CHARACTERISTICS (TA = 25°C, VCC = 3 V, fIF = 240 MHz, PLO = -5 dBm, VPS ≥ 2.5V)

PART NUMBER PACKAGE OUTLINE			UPC8106T T06		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX
I _{CC}	Circuit Current, V _{PS} ≥ 2.5 V V _{PS} = 0 V	mA μA	4.5	9	13.5 10
CG	Conversion Gain ¹ , f _{RF} = 900 MHz f _{RF} = 1.9 GHz	dB dB	7 4	10 7	13 10
NF	SSB Noise Figure, f _{RF} = 900 MHz	dB		8.5	
P _{SAT}	Saturated Output Power ² , f _{RF} = 900 MHz f _{RF} = 1.9 GHz	dBm dBm	-4 -6.5	-2 -4	
OIP ₃	Output 3rd Order Intercept Point ³ , f _{RF} = 900, 900.4 MHz f _{RF} = 1.9, 1.9004 GHz	dBm dBm		+5.5 +2.0	
T _{PS}	Power Save Response Time, V _{P/S} : GND → V _{CC} V _{P/S} : V _{CC} → GND	μs μs		2.0 2.0	
R _{TH} (J-A)	Thermal Resistance (Junction to Ambient) Free Air Mounted on a 50 x 50 x 1.6 mm epoxy glass PWB	°C/W °C/W			620 230

Notes:

1. P_{IF} = -30 dBm.
2. P_{IF} = -10 dBm.
3. f_{IF1} = 240.0 MHz, f_{IF2} = 240.4 MHz

ABSOLUTE MAXIMUM RATINGS¹ (T_A = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
V _{CC}	Supply Voltage	V	6.0
V _{PS}	Power Save Voltage	V	6.0
P _T	Total Power Dissipation ²	mW	280
T _{OP}	Operating Temperature	°C	-40 to +85
T _{STG}	Storage Temperature	°C	-55 to +150

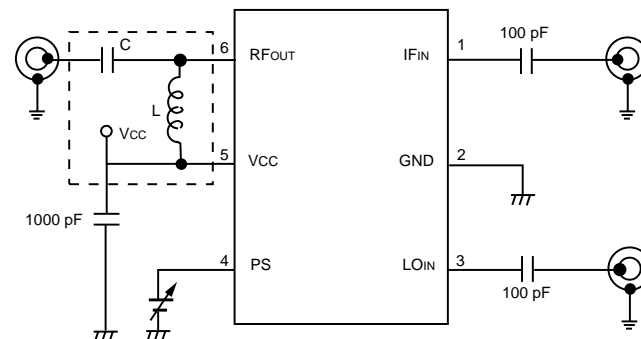
Notes:

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	3.0	5.5
T _{OP}	Operating Temperature	°C	-40	+25	+85
P _{LO}	LO Input Level	dBm	-10	-5	0

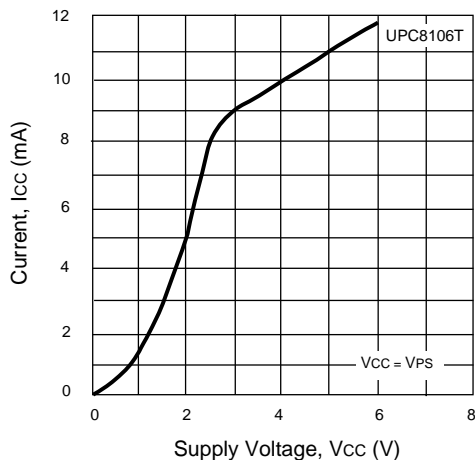
TEST CIRCUIT



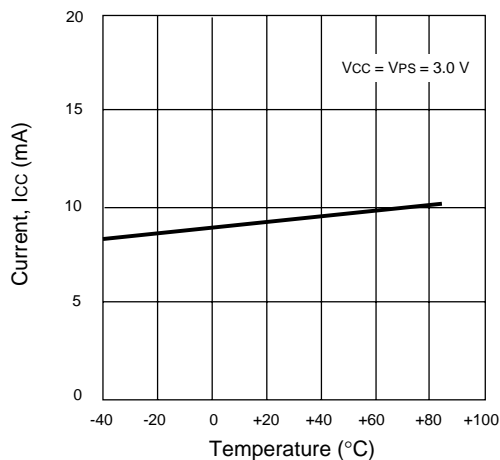
Recommended Values	900 MHz	1.9 GHz
C	1.0 pF	1.8 pF
L	8.2 nH	18 nH

TYPICAL PERFORMANCE CURVES (T_A = 25°C unless otherwise specified)

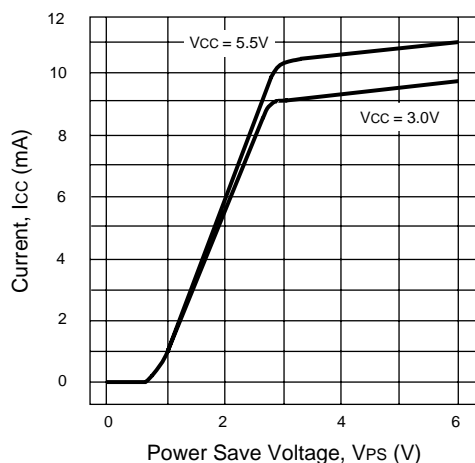
CURRENT vs. VOLTAGE



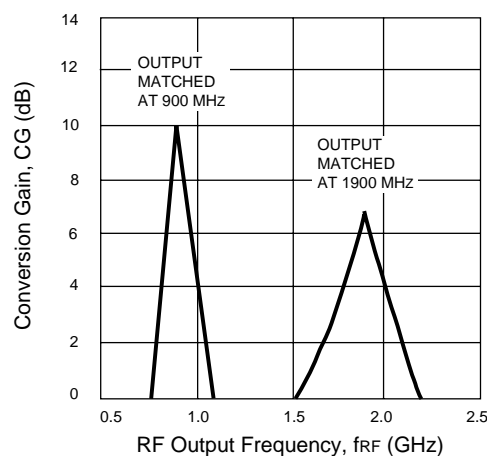
CURRENT vs. TEMPERATURE



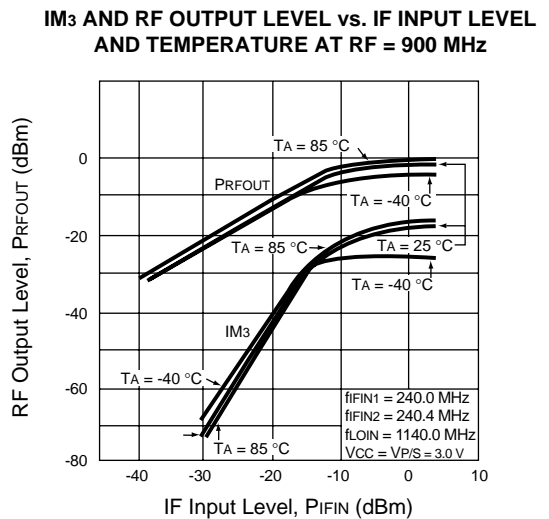
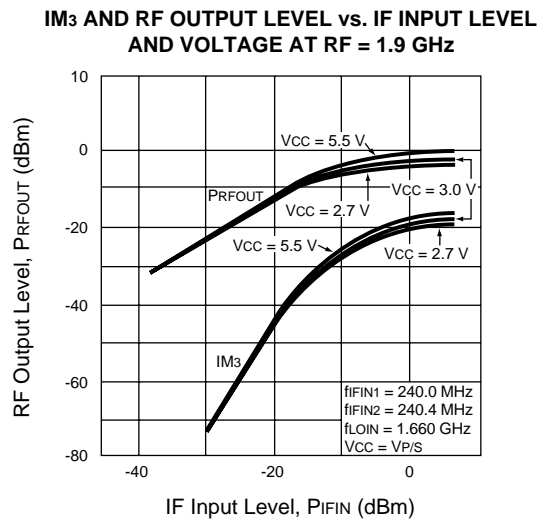
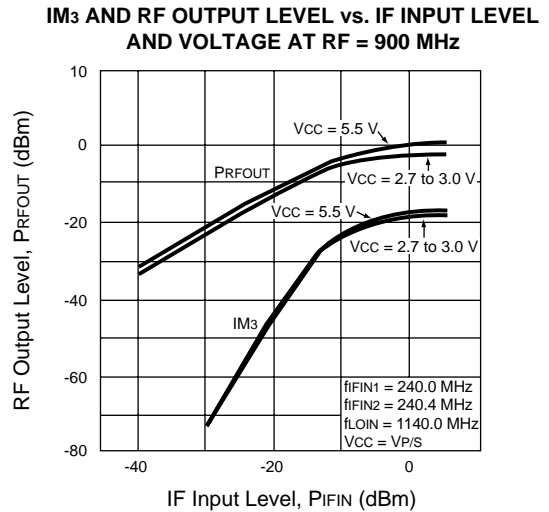
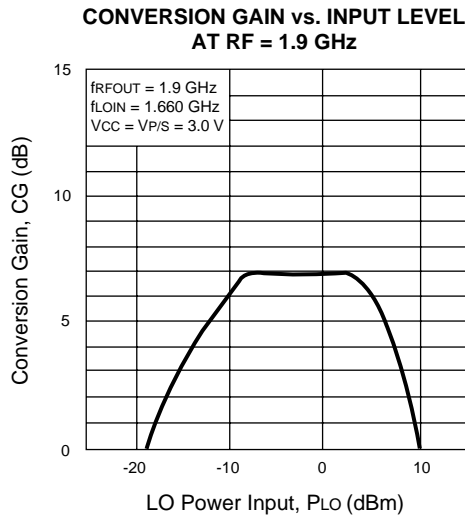
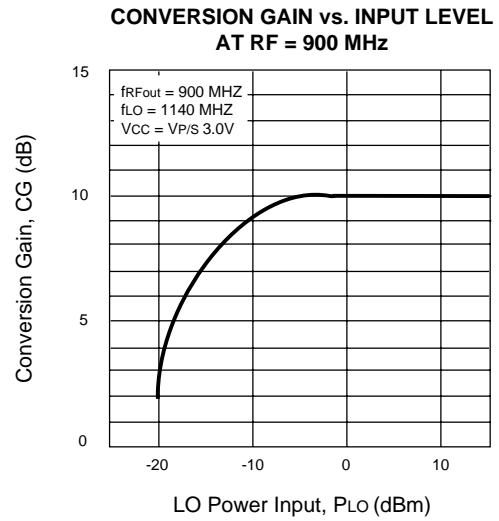
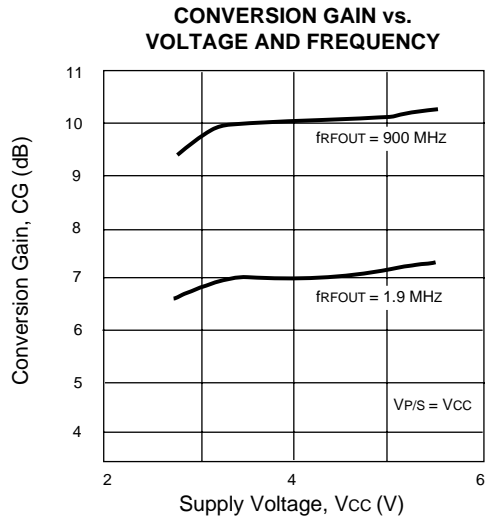
CURRENT vs. POWER SAVE PIN INPUT VOLTAGE



CONVERSION GAIN vs. OUTPUT FREQUENCY

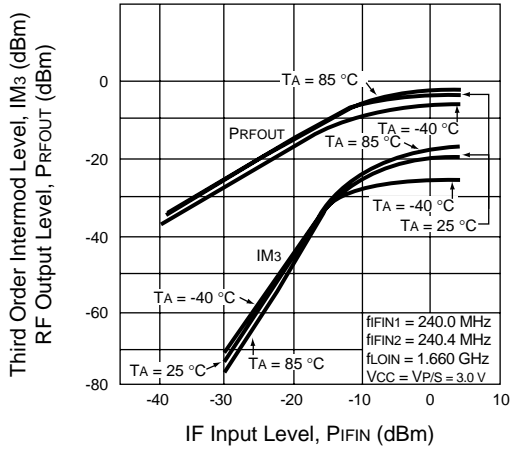


TYPICAL PERFORMANCE CURVES (TA = 25°C)

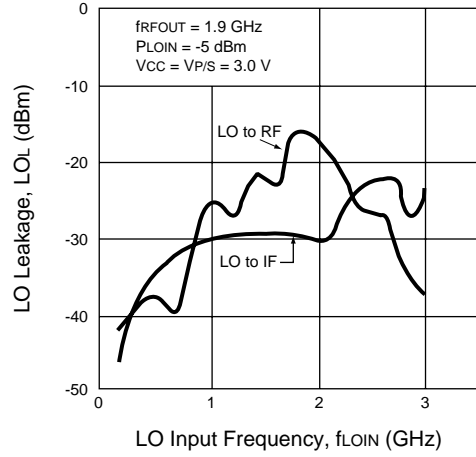


TYPICAL PERFORMANCE CURVES (TA = 25°C)

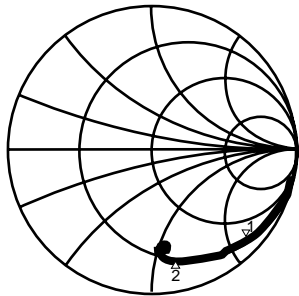
IM3 AND RF OUTPUT LEVEL vs. IF INPUT LEVEL AND TEMPERATURE AT RF = 1.9 GHz



LO LEAKAGE AT RF AND IF PINS vs. LO INPUT FREQUENCY AT RF = 1.9 GHz



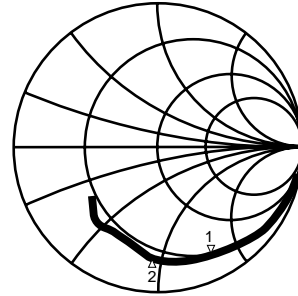
S11 - RF OUTPUT PORT



Start 500 MHz Stop 2300 MHz

2: 13.845 Ω -77.34 Ω 1.0850 pF
 1: 20.633 Ω -144.74 Ω 1.2218 pF
 Marker 1 - 900 MHz
 Marker 2 - 1.9 GHz

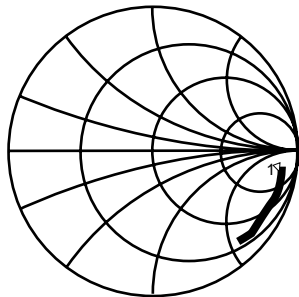
S11 - LO INPUT PORT



Start 0.3 MHz Stop 3000 MHz

2: 12.050 Ω -45.695 Ω 2.1780 pF
 1: 13.961 Ω -76.158 Ω 1.8332 pF
 Marker 1 - 1.14 GHz
 Marker 2 - 1.66 GHz

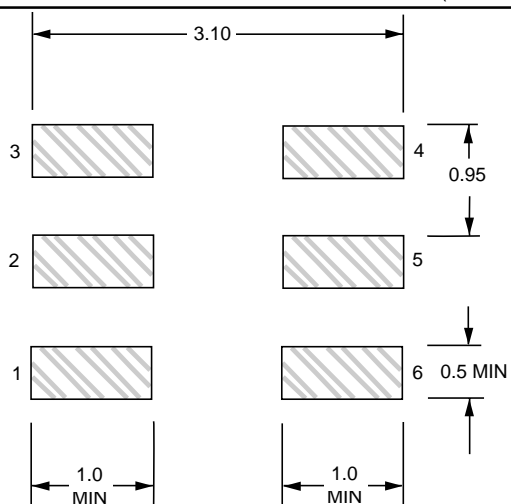
S11 - IF INPUT PORT



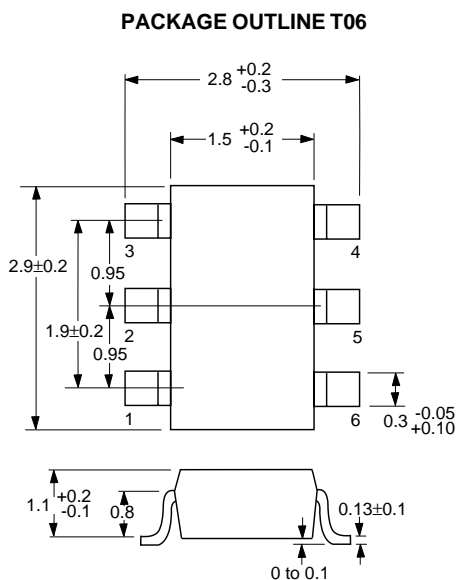
Start 50 MHz Stop 1000 MHz

1: 154.64 Ω -494.41 Ω 1.2876 pF
 Marker 1 - 250 MHz

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

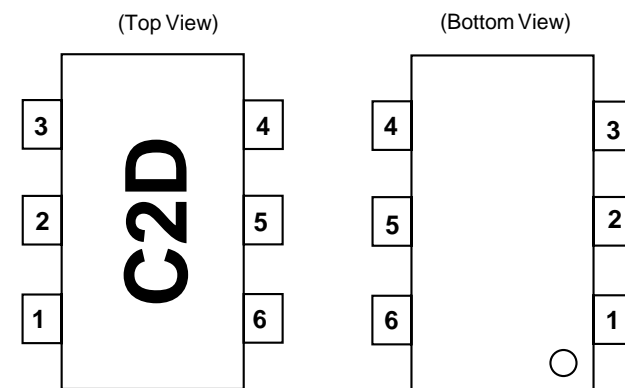


OUTLINE DIMENSIONS (Units in mm)



Note:
All dimensions are typical unless otherwise specified.

LEAD CONNECTIONS



- 1. IF INPUT
- 2. GND
- 3. LO INPUT
- 4. POWER SAVE
- 5. Vcc
- 6. RF OUTPUT

ORDERING INFORMATION

PART NUMBER	QTY
UPC8106T-E3	3K/Reel

Note:
Embossed Tape, 8 mm wide,
Pins 1, 2, 3 are in tape pull-out direction.

EXCLUSIVE NORTH AMERICAN AGENT FOR **NEC** RF, MICROWAVE & OPTOELECTRONIC SEMICONDUCTORS

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