

FEATURES

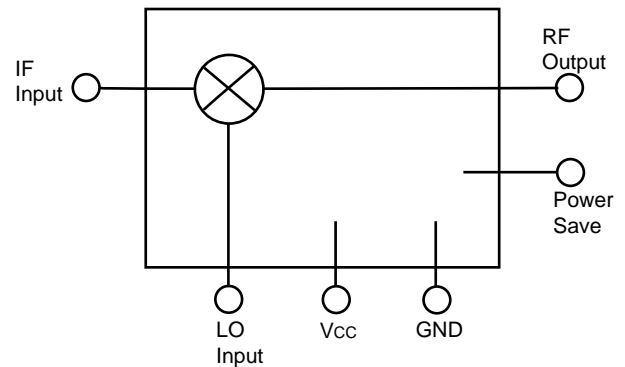
- **WIDE BAND OPERATION:**
IF Input: 3 dB BW: 50 ~ 400 MHz Typical
RF Output: 3 dB BW: 0.1~2 GHz Typical
- **LOW VOLTAGE OPERATION:** 2.7 V Minimum
- **LOW POWER CONSUMPTION:** 15 mW (UPC8109T)
- **POWER SAVE FUNCTION**
- **SUPER SMALL PACKAGE**
- **TAPE AND REEL PACKAGING OPTION AVAILABLE**

DESCRIPTION

The UPC8106T and UPC8109T are L-Band Frequency Up-Converters manufactured using the NESAT III MMIC process. The UPC8106T was designed for low distortion while the UPC8109T was designed for low current consumption. 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			UPC8109T T06		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX	MIN	TYP	MAX
Icc	Circuit Current, VPS ≥ 2.5 V VPS = 0 V	mA μA	4.5	9	13.5 10	2.5	5	8
CG	Conversion Gain ¹ , fRF = 900 MHz fRF = 1.9 GHz	dB dB	7 4	10 7	13 10	4 2	7 5	10 8
NF	Single Standard Noise Figure, fRF = 900 MHz	dB		8.5			8.5	
PSAT	Saturated Output Power ² , fRF = 900 MHz fRF = 1.9 GHz	dBm dBm	-4 -6.5	-2 -4		-7.5 -10	-6 -8	
OIP3	Output 3rd Order Intercept Point ³ , fRF = 900, 900.4 MHz fRF = 1.9, 1.9004 GHz	dBm dBm		+7 +6.5			+5 +1.5	
RTH (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			620 230

Notes:

1. PIF = -30 dBm.
2. PIF = -10 dBm.
3. fIF1 = 240.0 MHz, fIF2 = 240.4 MHz

UPC8106T, UPC8109T

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

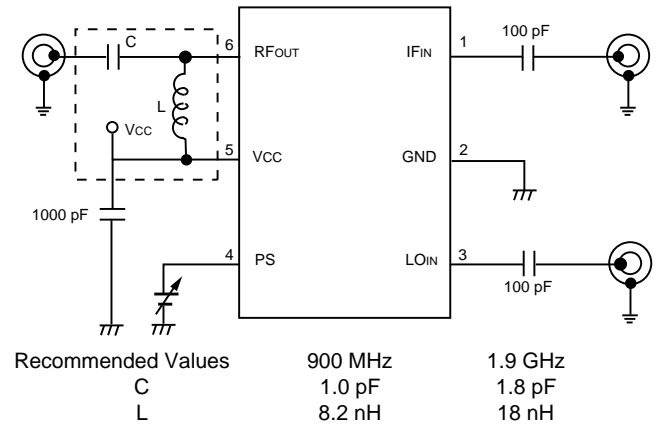
Notes:

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

RECOMMENDED OPERATING CONDITIONS

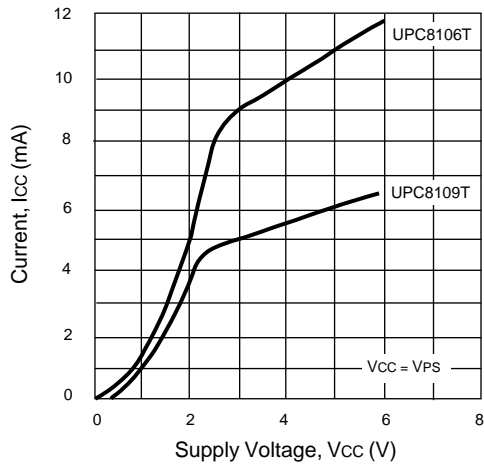
SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
V _{CC}	Supply Voltage	V	2.7	3.0	5.5
T _{OP}	Operating Temperature	°C	-40	+25	+85
P _{LO}	LO Input Level	dBm	-10	-5	0

TEST CIRCUIT

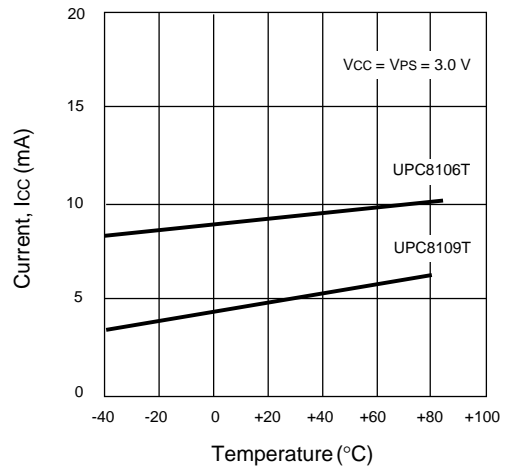


TYPICAL PERFORMANCE CURVES (T_A = 25°C unless otherwise specified)

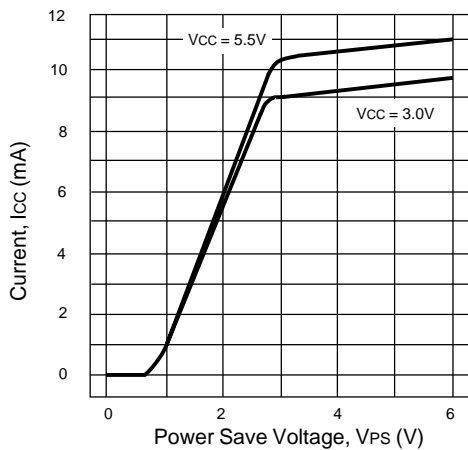
CURRENT vs. VOLTAGE



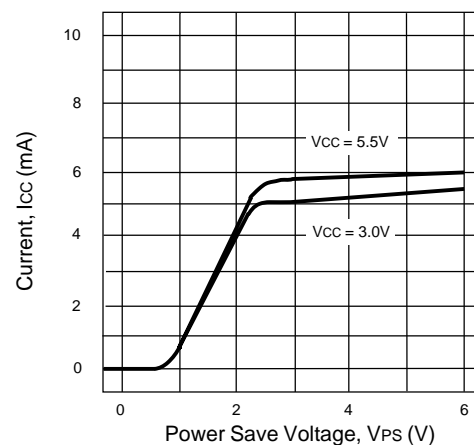
CURRENT vs. TEMPERATURE



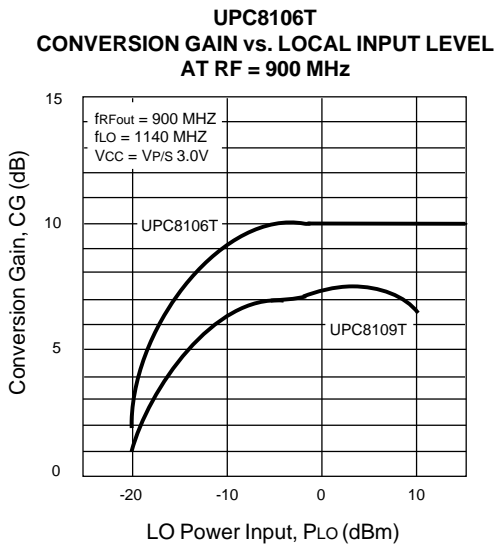
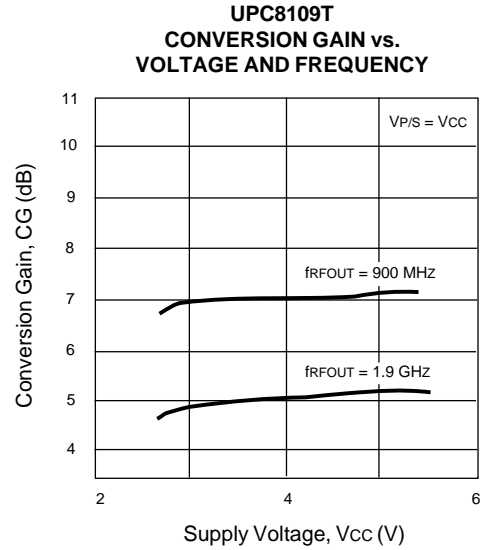
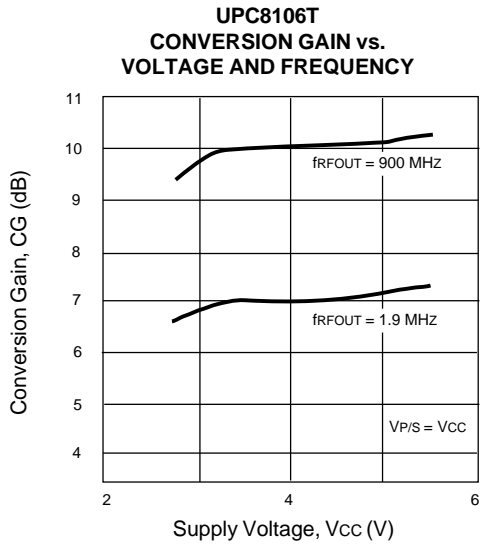
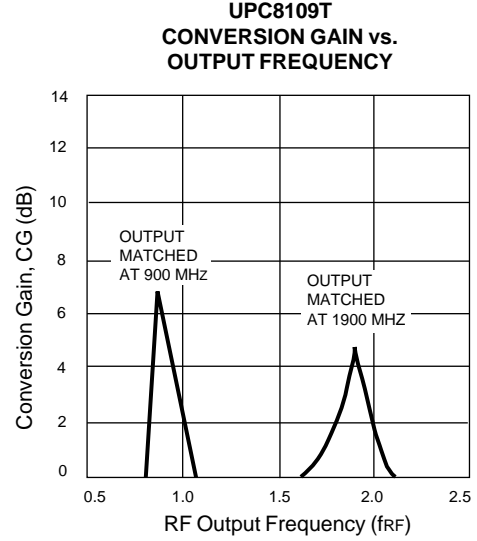
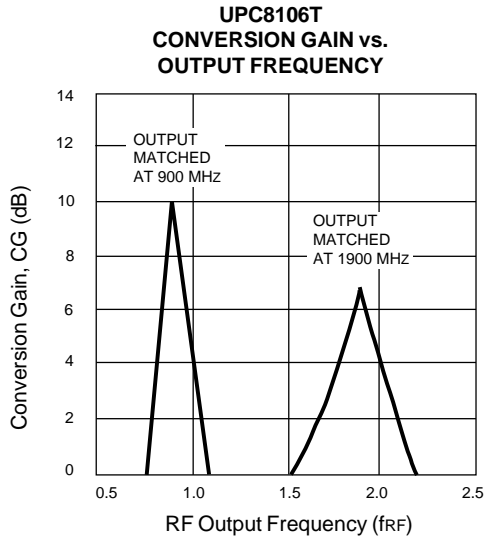
UPC8106T CURRENT vs. POWER SAVE PIN INPUT VOLTAGE



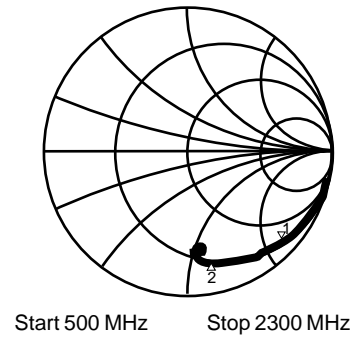
UPC8109T CURRENT vs. POWER SAVE PIN INPUT VOLTAGE



TYPICAL PERFORMANCE CURVES (TA = 25°C)



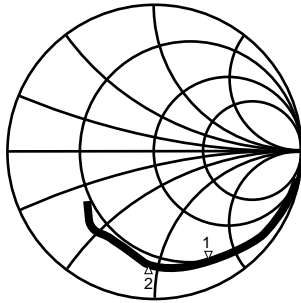
S11 - RF OUTPUT PORT



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

TYPICAL PERFORMANCE CURVES (TA = 25°C)

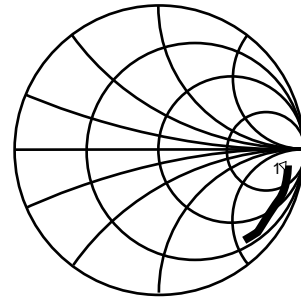
S11 - LO INPUT PORT



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

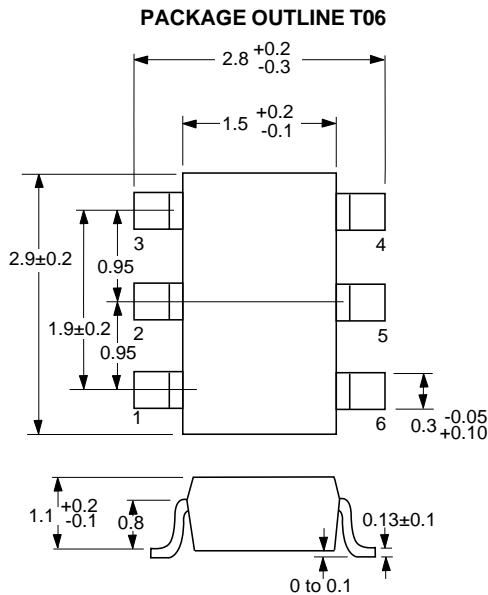
S11 - IF INPUT PORT



Start 50 MHz Stop 1000 MHz

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

OUTLINE DIMENSIONS (Units in mm)



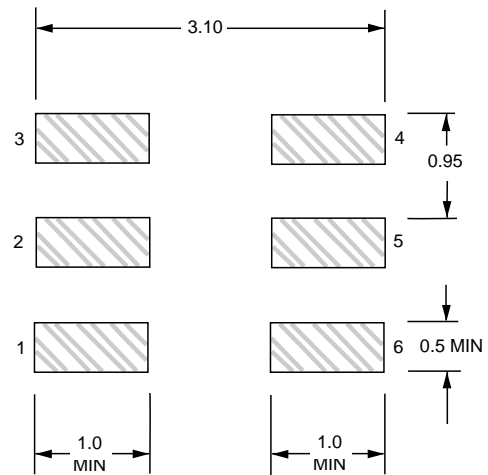
Note:
 All dimensions are typical unless otherwise specified.

ORDERING INFORMATION

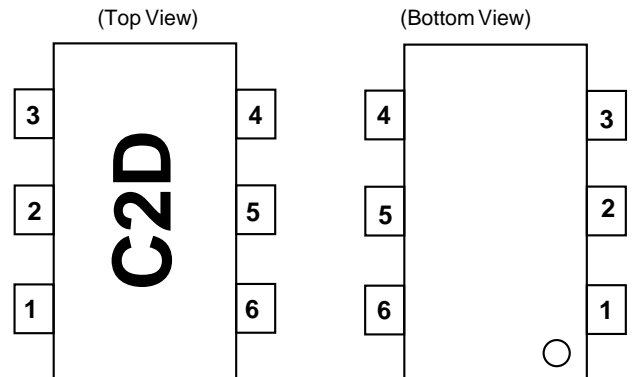
PART NUMBER	QTY
UPC8106T-E3	3K/Reel
UPC8109T-E3	3K/Reel

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

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



LEAD CONNECTIONS



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

Note: Package Markings
 C2D: UPC8106T
 C2G: UPC8109T

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

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