



# NPN SILICON HIGH FREQUENCY TRANSISTOR

## UPA811T

### FEATURES

- **SMALL PACKAGE STYLE:**  
2 NE680 Die in a 2 mm x 1.25 mm package
- **LOW NOISE FIGURE:**  
NF = 1.9 dB TYP at 2 GHz
- **HIGH GAIN:**  
 $IS_{21EI}^2 = 7.5$  dB TYP at 2 GHz
- **EXCELLENT LOW VOLTAGE, LOW CURRENT PERFORMANCE**

### DESCRIPTION

NEC's UPA811T is two NPN high frequency silicon epitaxial transistors encapsulated in an ultra small 6 pin SMT package. Each transistor is independently mounted and easily configured for either dual transistor or cascode operation. The high ft, low voltage bias and small size make this device ideally suited for pager and other hand-held wireless applications.

### ABSOLUTE MAXIMUM RATINGS<sup>1</sup> (TA = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
V <sub>CB0</sub>	Collector to Base Voltage	V	20
V <sub>CEO</sub>	Collector to Emitter Voltage	V	10
V <sub>EBO</sub>	Emitter to Base Voltage	V	1.5
I <sub>C</sub>	Collector Current	mA	35
P <sub>T</sub>	Total Power Dissipation		
	1 Die	mW	110
	2 Die	mW	200
T <sub>J</sub>	Junction Temperature	°C	150
T <sub>STG</sub>	Storage Temperature	°C	-65 to +150

Note:

1. Operation in excess of any one of these parameters may result in permanent damage.

### ELECTRICAL CHARACTERISTICS (TA = 25°C)

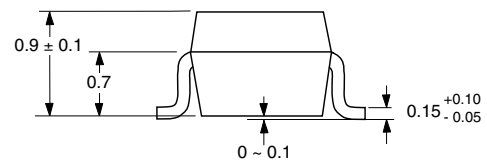
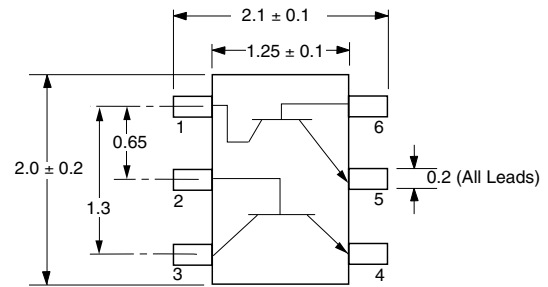
PART NUMBER PACKAGE OUTLINE			UPA811T S06		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX
I <sub>CBO</sub>	Collector Cutoff Current at V <sub>CB</sub> = 10 V, I <sub>E</sub> = 0	μA			1.0
I <sub>EBO</sub>	Emitter Cutoff Current at V <sub>EB</sub> = 1 V, I <sub>C</sub> = 0	μA			1.0
h <sub>FE</sub> <sup>1</sup>	Forward Current Gain at V <sub>CE</sub> = 3 V, I <sub>C</sub> = 5 mA		80	120	200
f <sub>T</sub>	Gain Bandwidth at V <sub>CE</sub> = 3 V, I <sub>C</sub> = 5 mA	GHz	5.5	8.0	
C <sub>re</sub> <sup>2</sup>	Feedback Capacitance at V <sub>CB</sub> = 3 V, I <sub>E</sub> = 0, f = 1 MHz	pF		0.3	0.7
IS <sub>21EI</sub> <sup>2</sup>	Insertion Power Gain at V <sub>CE</sub> = 3 V, I <sub>C</sub> = 5 mA, f = 2 GHz	dB	5.5	7.5	
NF	Noise Figure at V <sub>CE</sub> = 3 V, I <sub>C</sub> = 5 mA, f = 2 GHz	dB		1.9	3.2

Notes:

1. Pulsed measurement, pulse width ≤ 350 μs, duty cycle ≤ 2 %.
  2. The emitter terminal should be connected to the ground terminal of the 3 terminal capacitance bridge.
- For Tape and Reel version use part number UPA811T-T1, 3K per reel.

### OUTLINE DIMENSIONS (Units in mm)

PACKAGE OUTLINE S06 (Top View)



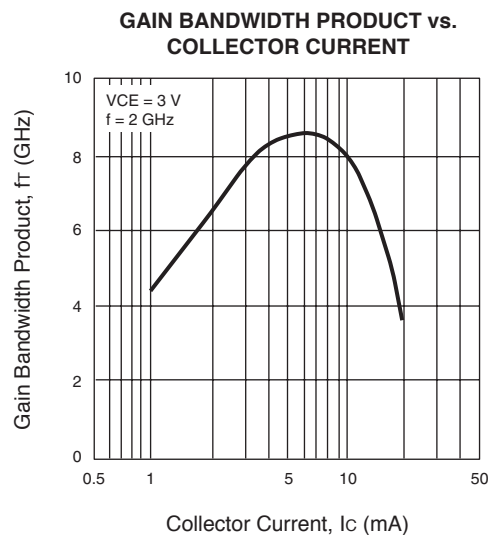
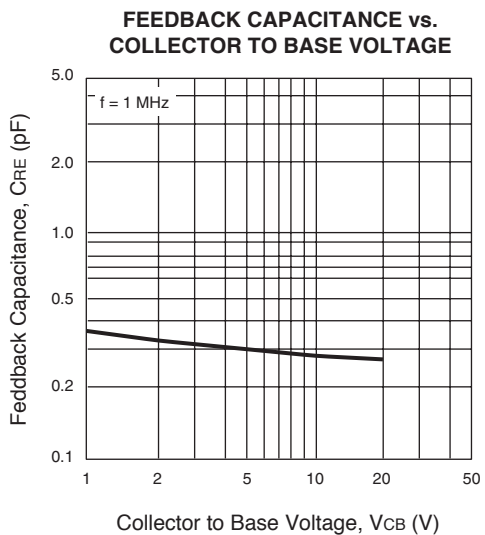
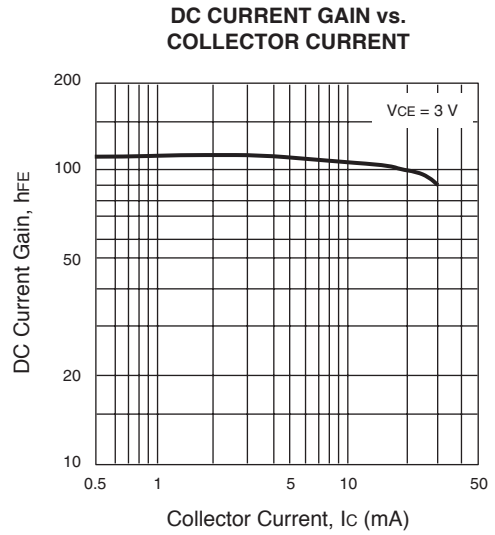
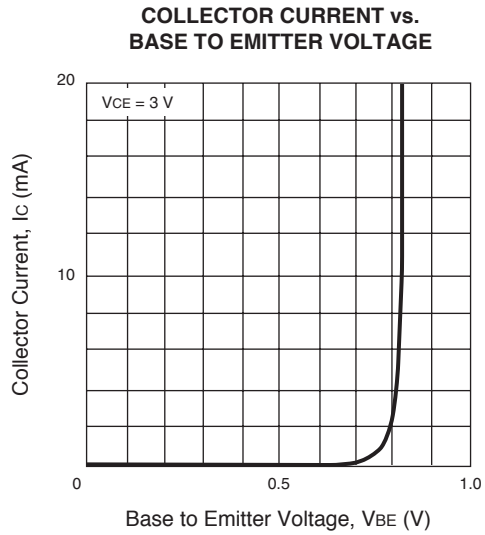
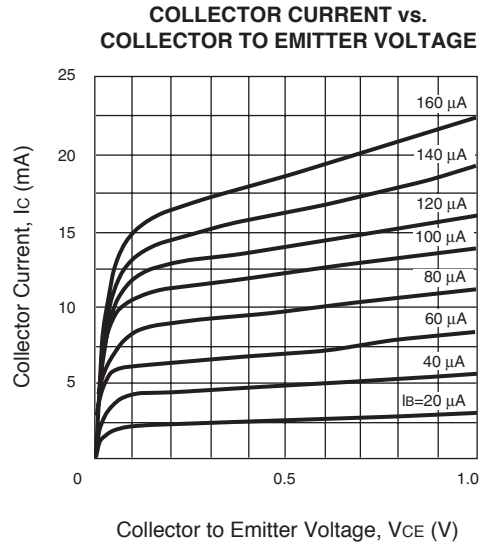
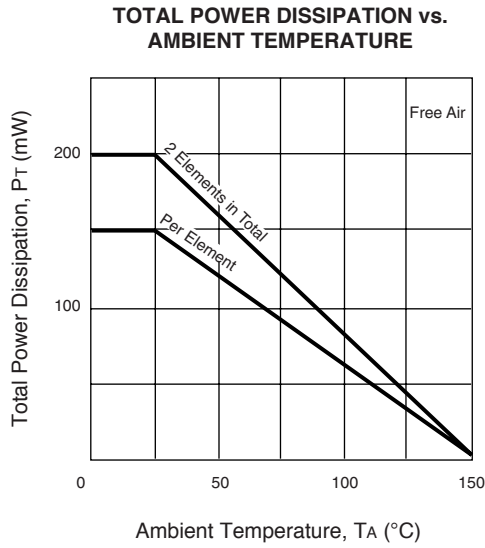
### PIN OUT

1. Collector Transistor 1
2. Base Transistor 2
3. Collector Transistor 2
4. Emitter Transistor 2
5. Emitter Transistor 1
6. Base Transistor 1

Note:

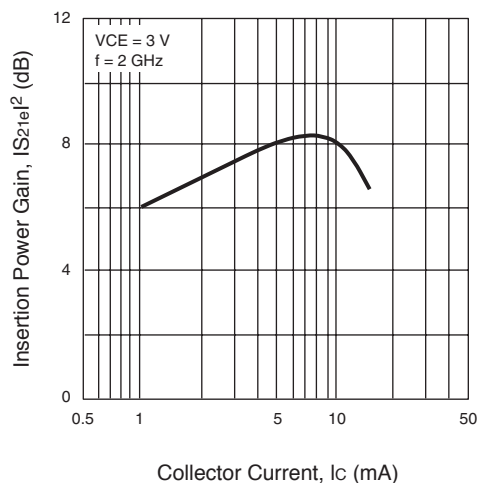
Pin 3 is identified with a circle on the bottom of the package.

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

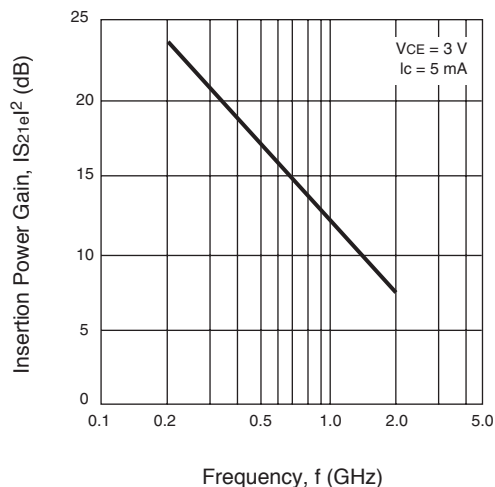


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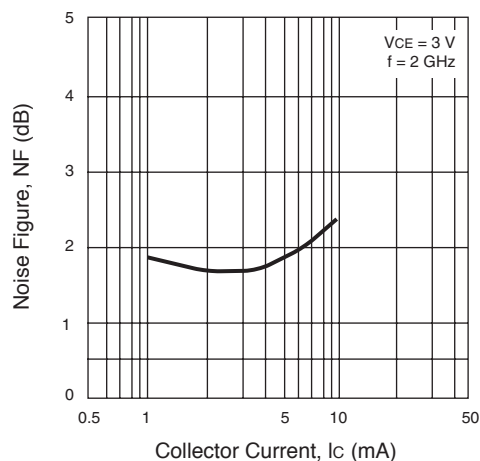
INSERTION POWER GAIN vs.  
COLLECTOR CURRENT



INSERTION POWER GAIN vs.  
FREQUENCY



NOISE FIGURE vs.  
COLLECTOR CURRENT



## ORDERING INFORMATION

PART NUMBER	QUANTITY	PACKAGING
UPA811T-T1-A	3000	Tape & Reel

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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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