

### FEATURES

- **SMALL PACKAGE OUTLINE:**  
SOT-363 package measures just 2 mm x 1.25 mm
- **LOW HEIGHT PROFILE:**  
Just 0.60 mm high
- **HIGH COLLECTOR CURRENT:**  
Ic MAX = 100 mA

### DESCRIPTION

The UPA809TF contains two NE688 NPN high frequency silicon bipolar chips. NEC's new low profile TF package is ideal for all portable wireless applications where reducing component height is a prime consideration. Each transistor chip is independently mounted and easily configured for two stage cascade LNAs and other similar applications.

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

SYMBOLS	PARAMETERS	UNITS	RATINGS
V <sub>CB0</sub>	Collector to Base Voltage	V	9
V <sub>CE0</sub>	Collector to Emitter Voltage	V	6
V <sub>EB0</sub>	Emitter to Base Voltage	V	2
I <sub>c</sub>	Collector Current	mA	100
PT	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.

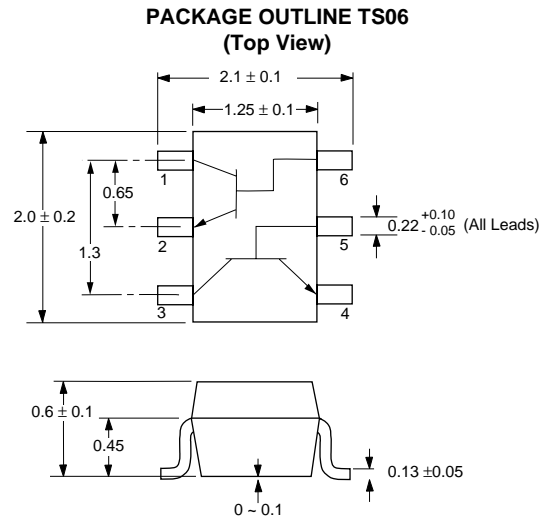
### ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)

PART NUMBER PACKAGE OUTLINE			UPA809TF TS06		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX
I <sub>CB0</sub>	Collector Cutoff Current at V <sub>CB</sub> = 5V, I <sub>E</sub> = 0	μA			0.1
I <sub>EB0</sub>	Emitter Cutoff Current at V <sub>EB</sub> = 1V, I <sub>C</sub> = 0	μA			0.1
h <sub>FE</sub>	Forward Current Gain <sup>1</sup> at V <sub>CE</sub> = 1V, I <sub>C</sub> = 3mA		80	110	160
f <sub>T</sub>	Gain Bandwidth at V <sub>CE</sub> = 3V, I <sub>C</sub> = 20mA, f = 2GHz	GHz		9.0	
C <sub>re</sub>	Feedback Capacitance <sup>2</sup> at V <sub>CB</sub> = 1V, I <sub>E</sub> = 0, f = 1MHz	pF		0.75	0.85
S <sub>21E</sub>   <sup>2</sup>	Insertion Power Gain at V <sub>CE</sub> = 3V, I <sub>C</sub> = 20mA, f = 2GHz	dB		6.5	
NF	Noise Figure at V <sub>CE</sub> = 3V, I <sub>C</sub> = 7mA, f = 2GHz	dB		1.5	
h <sub>FE1</sub> /h <sub>FE2</sub>	h <sub>FE</sub> Ratio: h <sub>FE1</sub> = Smaller Value of Q <sub>1</sub> , or Q <sub>2</sub> h <sub>FE2</sub> = Larger Value of Q <sub>1</sub> or Q <sub>2</sub>		0.85		

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 UPA809TF-T1, 3K per reel.

### OUTLINE DIMENSIONS (Units in mm)



#### PIN OUT

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

#### Note:

Pin 1 is the lower left most pin as the package lettering is oriented and read left to right.