

**NPN SILICON HIGH
FREQUENCY TRANSISTOR**

UPA808TC

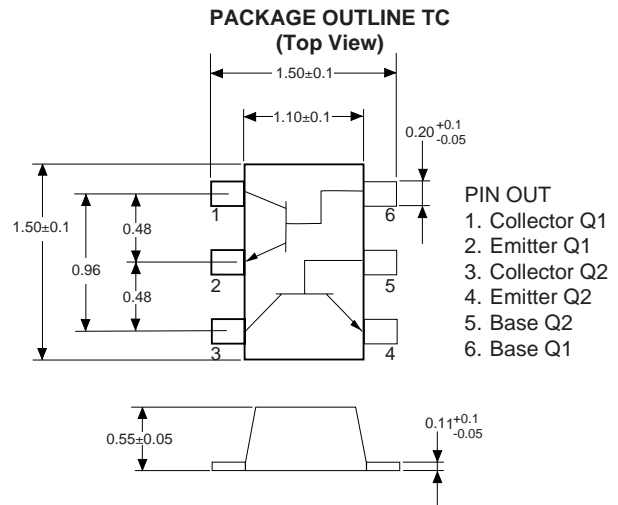
FEATURES

- **SMALL PACKAGE OUTLINE:**
1.5 mm x 1.1 mm, 33% smaller than conventional SOT-363 package
- **LOW HEIGHT PROFILE**
Just 0.55 mm high
- **FLAT LEAD STYLE:**
Reduced lead inductance improves electrical performance
- **HIGH COLLECTOR CURRENT:**
IC MAX = 65 mA

DESCRIPTION

The UPA808TC contains two NE687 NPN high frequency silicon bipolar chips. NEC's new ultra small TC package is ideal for all portable wireless applications where reducing board space is a prime consideration. Each transistor chip is independently mounted and easily configured for two stage cascode LNAs and other applications.

OUTLINE DIMENSIONS (Units in mm)



ABSOLUTE MAXIMUM RATINGS¹ (TA = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
V _{CB0}	Collector to Base Voltage	V	20
V _{CEO}	Collector to Emitter Voltage	V	10
V _{EB0}	Emitter to Base Voltage	V	1.5
I _c	Collector Current	mA	65
PT	Total Power Dissipation 1 Die 2 Die	mW mW	TBD TBD
T _J	Junction Temperature	°C	150
T _{STG}	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			UPA808TC TC		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX
I _{CBO}	Collector Cutoff Current at V _{CB} = 10 V, I _E = 0	μA			0.1
I _{EBO}	Emitter Cutoff Current at V _{EB} = 1 V, I _C = 0	μA			0.1
h _{FE}	Forward Current Gain ¹ at V _{CE} = 3 V, I _C = 7 mA		70	100	140
f _T	Gain Bandwidth at V _{CE} = 3 V, I _C = 7 mA	GHz	9	11	
C _{re}	Feedback Capacitance ² at V _{CB} = 3 V, I _E = 0, f = 1 MHz	pF		0.4	0.8
S _{21E} ²	Insertion Power Gain at V _{CE} = 3 V, I _C = 7 mA, f = 1 GHz	dB	7	8.5	
NF	Noise Figure at V _{CE} = 3 V, I _C = 7 mA, f = 1 GHz	dB		1.3	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 UPA808TC-T1, 3K per reel.

NONLINEAR MODEL

BJT NONLINEAR MODEL PARAMETERS ⁽¹⁾

Parameters	Q1, Q2	Parameters	Q1, Q2
IS	8e-17	MJC	0.53
BF	128	XCJC	1
NF	1	CJS	0
VAF	17	VJS	0.75
IKF	0.18	MJS	0
ISE	3.3e-15	FC	0.37
NE	1.48	TF	8e-12
BR	9.05	XTF	11.9
NR	1.05	VTF	9.55
VAR	4.3	ITF	1.78
IKR	0.009	PTF	69.1
ISC	4e-15	TR	1e-9
NC	1.5	EG	1.11
RE	0.8	XTB	0
RB	11.1	XTI	3
RBM	2.46	KF	0
IRB	0.017	AF	1
RC	7.5		
CJE	0.415e-12		
VJE	0.68		
MJE	0.53		
CJC	0.102e-12		
VJC	0.29		

(1) Gummel-Poon Model

Note:

This nonlinear model utilized the latest data available.
See our Design Parameter Library at www.cel.com for this data.

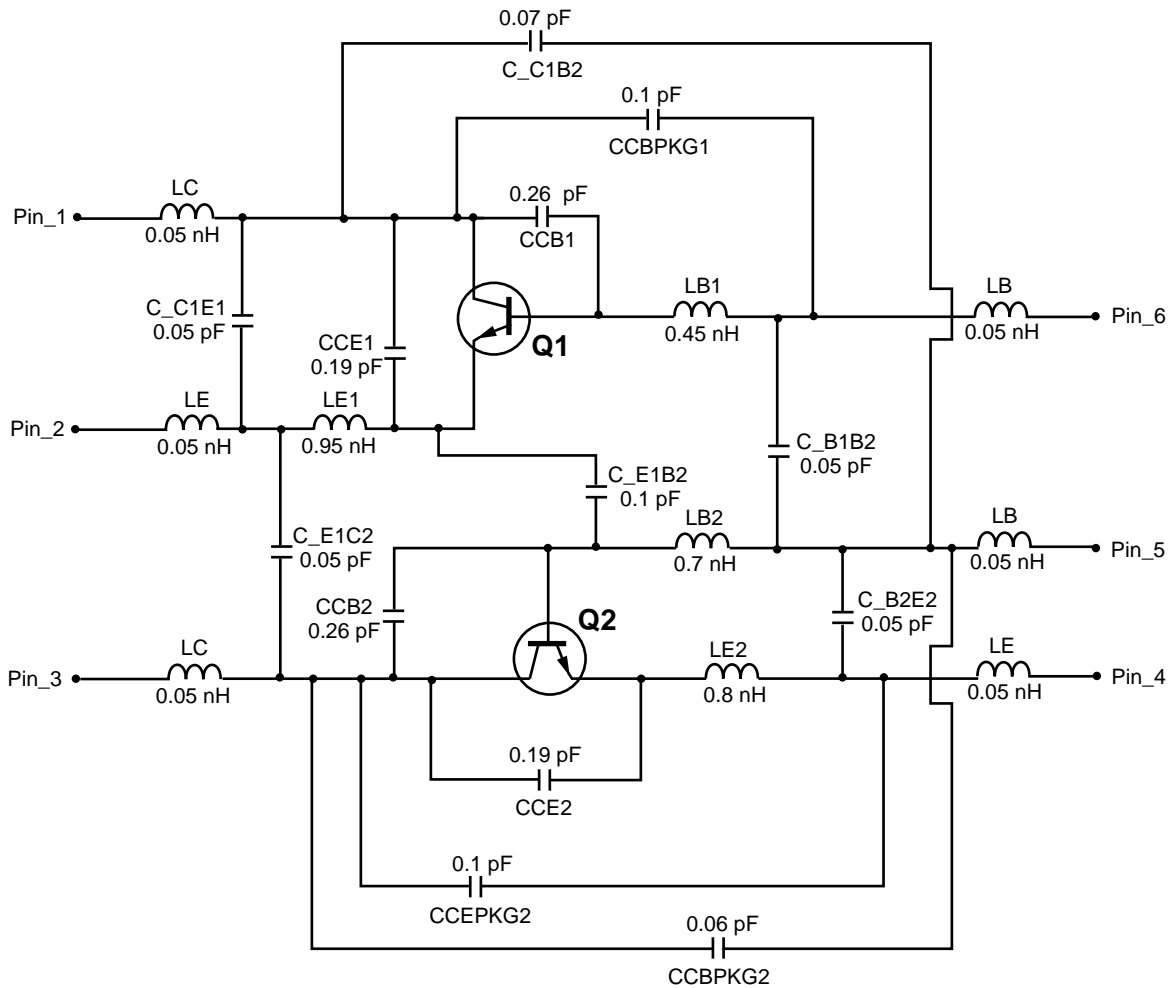
UNITS

Parameter	Units
time	seconds
capacitance	farads
inductance	henries
resistance	ohms
voltage	volts
current	amps

MODEL RANGE

Frequency: 0.1 to 7.0 GHz
Bias: $V_{CE} = 0.5 \text{ V to } 2 \text{ V}$, $I_c = 0.5 \text{ mA to } 10 \text{ mA}$
Date: 02/01

SCHEMATIC



MODEL RANGE

Frequency: 0.1 to 7.0 GHz
 Bias: $V_{CE} = 0.5\text{ V to }2\text{ V}$, $I_c = 0.5\text{ mA to }10\text{ mA}$
 Date: 02/01

Life Support Applications

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