PRELIMINARY DATA SHEET

CEL

SILICON TRANSISTOR

UPA810T

NPN SILICON HIGH FREQUENCY TRANSISTOR

FEATURES

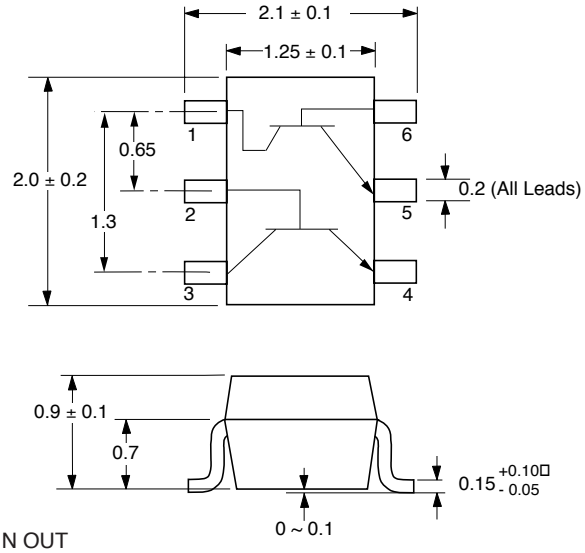
- **SMALL PACKAGE STYLE:**
  2 NE856 Die in a 2 mm x 1.25 mm package
- **LOW NOISE FIGURE:**
  NF = 1.2 dB TYP at 1 GHz
- **HIGH GAIN:**
  $|S_{21E}|^2$ = 9.0 dB TYP at 1 GHz
- **EXCELLENT LOW VOLTAGE, LOW CURRENT PERFORMANCE**
- **HIGH COLLECTOR CURRENT:** 100 mA

DESCRIPTION

NEC's UPA810T 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 f_T, low voltage bias and small size make this device suited for various hand-held wireless applications.

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.

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

PART NUMBER PACKAGE OUTLINE			UPA810T S06		
SYMBOLS	**PARAMETERS AND CONDITIONS**	**UNITS**	**MIN**	**TYP**	**MAX**
I_{CBO}	Collector Cutoff Current at V_{CB} = 10 V, I_E = 0	μA			1.0
I_{EBO}	Emitter Cutoff Current at V_{EB} = 1 V, I_C = 0	μA			1.0
h_{FE}[1]	Forward Current Gain at V_{CE} = 3 V, I_C = 7 mA		70	120	250
f_T	Gain Bandwidth at V_{CE} = 3 V, I_C = 7 mA	GHz	3.0	4.5	
Cre[2]	Feedback Capacitance at V_{CB} = 3 V, I_E = 0, f = 1 MHz	pF		0.7	1.5
$\|S_{21E}\|^2$	Insertion Power Gain at V_{CE} = 3 V, I_C =7 mA, f = 1 GHz	dB	7	9	
NF	Noise Figure at V_{CE} = 3 V, I_C = 7 mA, f = 1 GHz	dB		1.2	2.5
h_{FE1}/h_{FE2}	h_{FE} Ratio: h_{FE1} = Smaller Value of Q_1, or Q_2 h_{FE2} = Larger Value of Q_1 or Q_2		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 UPA810T-T1, 3K per reel.

The information in this document is subject to change without notice. Before using this document, please confirm that this is the latest version.

Date Published: June 28, 2005

ABSOLUTE MAXIMUM RATINGS[1] (T_A = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
V_{CBO}	Collector to Base Voltage	V	20
V_{CEO}	Collector to Emitter Voltage	V	12
V_{EBO}	Emitter to Base Voltage	V	3
I_C	Collector Current	mA	100
P_T	Total Power Dissipation 1 Die 2 Die	 mW mW	 110 200
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.

ORDERING INFORMATION (Solder Contains Lead)

PART NUMBER	QUANTITY	PACKAGING
UPA810T	Loose Products (50 pcs)	Embossed tape 8mm wide. Pin 6 (Q1 Base), Pin 5 (Q1 Emmitter) Pin 4 (Q2 Emitter) face to perforation side of tape
UPA810T-T1	Taping products (3 KPCS/Reel)	

ORDERING INFORMATION (Pb-Free)

PART NUMBER	QUANTITY	PACKAGING
UPA810T-A	Loose Products (50 pcs)	Embossed tape 8mm wide. Pin 6 (Q1 Base), Pin 5 (Q1 Emmitter) Pin 4 (Q2 Emitter) face to perforation side of tape
UPA810T-T1-A	Taping products (3 KPCS/Reel)	

Life Support Applications
These NEC products are not intended for use in life support devices, appliances, or systems where the malfunction of these products can reasonably be expected to result in personal injury. The customers of CEL using or selling these products for use in such applications do so at their own risk and agree to fully indemnify CEL for all damages resulting from such improper use or sale.

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Subject: Compliance with EU Directives

CEL certifies, to its knowledge, that semiconductor and laser products detailed below are compliant with the requirements of European Union (EU) Directive 2002/95/EC Restriction on Use of Hazardous Substances in electrical and electronic equipment (RoHS) and the requirements of EU Directive 2003/11/EC Restriction on Penta and Octa BDE.

CEL Pb-free products have the same base part number with a suffix added. The suffix –A indicates that the device is Pb-free. The –AZ suffix is used to designate devices containing Pb which are exempted from the requirement of RoHS directive (*). In all cases the devices have Pb-free terminals. All devices with these suffixes meet the requirements of the RoHS directive.

This status is based on CEL's understanding of the EU Directives and knowledge of the materials that go into its products as of the date of disclosure of this information.

Restricted Substance per RoHS	Concentration Limit per RoHS (values are not yet fixed)	Concentration contained in CEL devices	
Lead (Pb)	< 1000 PPM	-A	-AZ
		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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