PRELIMINARY DATA SHEET

NEC

NPN SILICON EPITAXIAL TWIN TRANSISTOR

UPA839TF

FEATURES

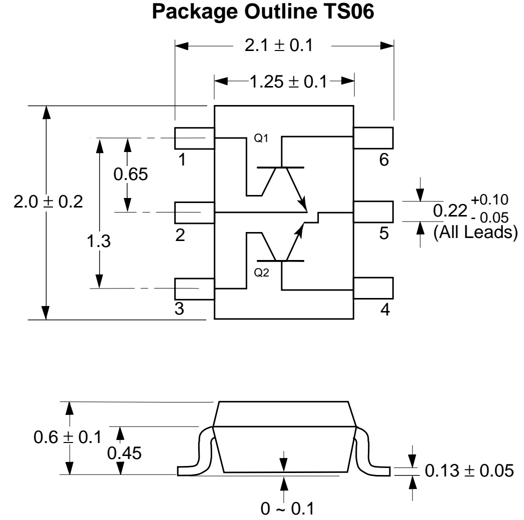
- **SMALL PACKAGE OUTLINE:** SOT-363 package measures just 2.0 mm x 1.25 mm
- **LOW HEIGHT PROFILE:** Just 0.60 mm high
- **TWO DIFFERENT DIE TYPES:**
  Q1 - Ideal oscillator transistor
  Q2 - Ideal buffer amplifier transistor

DESCRIPTION

The UPA839TF contains one NE680 and one NE856 NPN high frequency silicon bipolar chip. 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 oscillator/buffer amplifier and other applications.

OUTLINE DIMENSIONS (Units in mm)

Package Outline TS06



PIN CONNECTIONS
1. Collector (Q1)
2. Emitter (Q1)
3. Collector (Q2)
4. Base (Q2)
5. Emitter (Q2)
6. Base (Q1)

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

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

	PART NUMBER PACKAGE OUTLINE			UPA839TF TS06		
	SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX
Q1	I_{CBO}	Collector Cutoff Current at V_{CB} = 10 V, I_E = 0	µA			1.0
Q1	I_{EBO}	Emitter Cutoff Current at V_{EB} = 1 V, I_C = 0	µA			1.0
Q1	h_{FE}	DC Current Gain[1] at V_{CE} = 3 V, I_C = 5 mA		80	120	200
Q1	f_T	Gain Bandwidth at V_{CE} = 3 V, I_C = 5 mA	GHz	5.5	8.0	
Q1	Cre	Feedback Capacitance[2] at V_{CB} = 3 V, I_E = 0, f = 1 MHz	pF		0.3	0.7
Q1	$\|S_{21E}\|^2$	Insertion Power Gain at V_{CE} = 3 V, I_C =5 mA, f = 2 GHz	dB	5.5	7.5	
Q1	NF	Noise Figure at V_{CE} = 3 V, I_C = 5 mA, f = 2 GHz	dB		1.9	3.2
Q2	I_{CBO}	Collector Cutoff Current at V_{CB} = 10 V, I_E = 0	µA			1.0
Q2	I_{EBO}	Emitter Cutoff Current at V_{EB} = 1 V, I_C = 0	µA			1.0
Q2	h_{FE}	DC Current Gain[1] at V_{CE} = 3 V, I_C = 7 mA		100		145
Q2	f_T	Gain Bandwidth at V_{CE} = 3 V, I_C = 7 mA, f = 1 GHz	GHz	3.0	4.5	
Q2	Cre	Feedback Capacitance[2] at V_{CB} = 3 V, I_E = 0, f = 1 MHz	pF		0.7	1.5
Q2	$\|S_{21E}\|^2$	Insertion Power Gain at V_{CE} = 3 V, I_C = 7 mA, f = 1 GHz	dB	7	9	
Q2	NF	Noise Figure at V_{CE} = 3 V, I_C = 7 mA, f = 1 GHz	dB		1.2	2.5

Notes: 1. Pulsed measurement, pulse width ≤ 350 µs, duty cycle ≤ 2 %.
2. Collector to base capacitance when measured with capacitance meter (automatic balanced bridge method), with emitter connected to guard pin of capacitances meter.

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

SYMBOLS	PARAMETERS	UNITS	RATINGS	
			Q1	Q2
V_{CBO}	Collector to Base Voltage	V	20	20
V_{CEO}	Collector to Emitter Voltage	V	10	12
V_{EBO}	Emitter to Base Voltage	V	1.5	3
I_C	Collector Current	mA	35	100
P_T	Total Power Dissipation	mW	110	110
			200	
T_J	Junction Temperature	°C	150	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

PART NUMBER	QUANTITY	PACKAGING
UPA839TF-T1	3000	Tape & Reel