



YOUSHANG SEMICONDUCTOR

**设计研发新型功率器件**

**各类小信号开关**

**中低压及高压大电流等场效应管**

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## Description

NK-AC857CWQ Bipolar Junction Transistor (BJT) is designed to meet the stringent requirements of Automotive Applications.

## Features

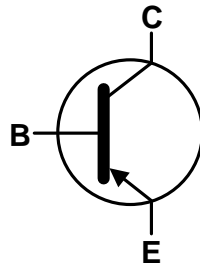
- Ideally Suited for Automatic Insertion
- Complementary NPN Types Available (NK-AC847CWQ)
- For switching and AF Amplifier Applications

## Mechanical Data

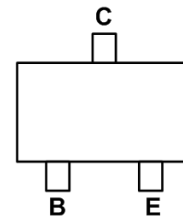
- Case: SOT323
- Case Material: Molded Plastic, "Green" Molding compound
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208<sup>③</sup>
- Weight: 0.006 grams (Approximate)



Top View



Device Symbol



Top View  
Pin-Out

**Absolute Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CB0</sub>	-50	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-45	V
Emitter-Base Voltage	V <sub>EBO</sub>	-5.0	V
Continuous Collector Current	I <sub>C</sub>	-100	mA
Peak Collector Current	I <sub>CM</sub>	-200	mA
Peak Emitter Current	I <sub>EM</sub>	-200	mA

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	P <sub>D</sub>	200	mW
Thermal Resistance, Junction to Ambient (Note 6)	R <sub>θJA</sub>	625	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-65 to +150	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CB0</sub>	-50	-	-	V	I <sub>C</sub> = -100nA
Collector-Emitter Breakdown Voltage (Note 7)	BV <sub>CEO</sub>	-45	-	-	V	I <sub>C</sub> = -10mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	-5	-	-	V	I <sub>E</sub> = -100nA
DC Current Gain (Note 7)	h <sub>FE</sub>	420	520	800	-	V <sub>CE</sub> = -5.0V, I <sub>C</sub> = -2.0mA
Collector Cutoff Current	I <sub>CBO</sub>	-	-	-15	nA	V <sub>CB</sub> = -30V
				-4	μA	V <sub>CB</sub> = -30V, T <sub>A</sub> = +150°C
Collector-Emitter Saturation Voltage (Note 7)	V <sub>CE(sat)</sub>	-	-75	-300	mV	I <sub>C</sub> = -10mA, I <sub>B</sub> = -0.5mA
			-250	-650	mV	I <sub>C</sub> = -100mA, I <sub>B</sub> = -5.0mA
Base-Emitter Turn-On Voltage (Note 7)	V <sub>BE(on)</sub>	-600	-650	-750	mV	I <sub>C</sub> = -2mA, V <sub>CE</sub> = -5V
			-	-	mV	I <sub>C</sub> = -10mA, V <sub>CE</sub> = -5V
Base-Emitter Saturation Voltage (Note 7)	V <sub>BE(sat)</sub>	-	-700	-	mV	I <sub>C</sub> = -10mA, I <sub>B</sub> = -0.5mA
			-850	-950	mV	I <sub>C</sub> = -100mA, I <sub>B</sub> = -5mA
Output Capacitance	C <sub>obo</sub>	-	3	4.5	pF	V <sub>CB</sub> = -10V, f = 1.0MHz
Transition Frequency	f <sub>T</sub>	100	200	-	MHz	V <sub>CE</sub> = -5V, I <sub>C</sub> = -10mA, f = 100MHz
Noise Figure	NF	-	-	10	dB	V <sub>CE</sub> = -5V, I <sub>C</sub> = -200μA R <sub>S</sub> = 2kΩ, f = 1kHz Δf = 200Hz

- Notes:
6. For a device mounted on minimum recommended pad layout 1oz copper that is on a single-sided FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
  7. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%

**Typical Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

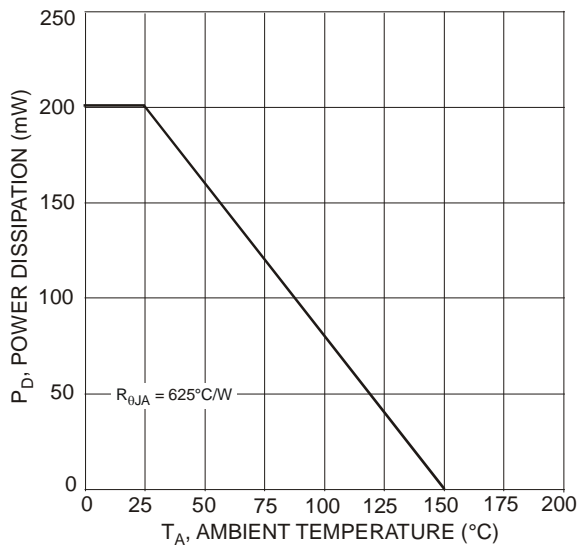


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 5)

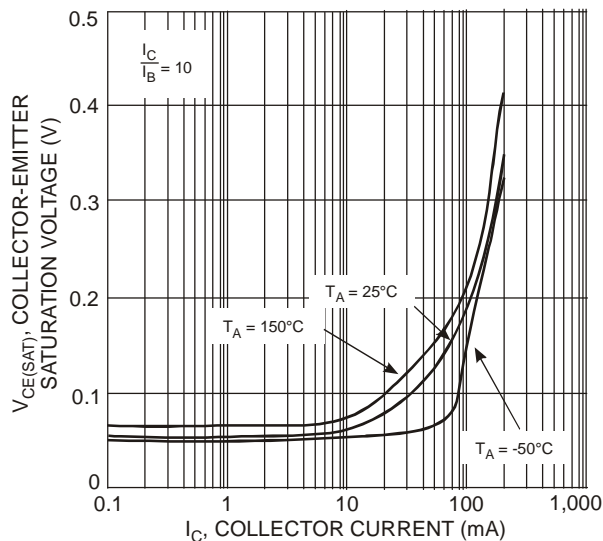


Fig. 2 Typical Collector-Emitter Saturation Voltage vs. Collector Current

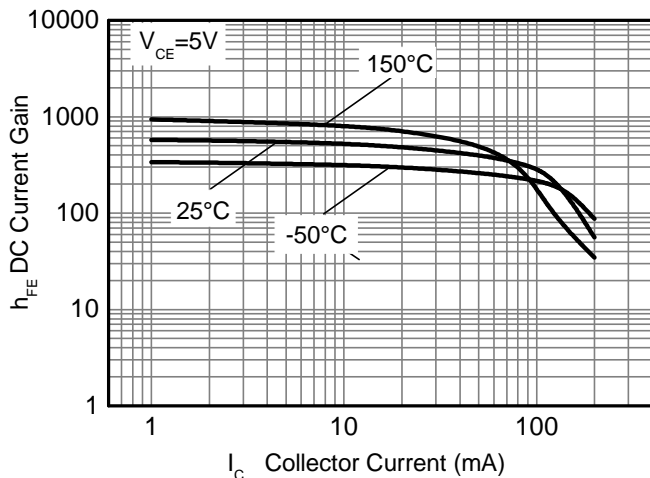


Fig. 3 Typical DC Current Gain (Group C) vs. Collector Current (mA)

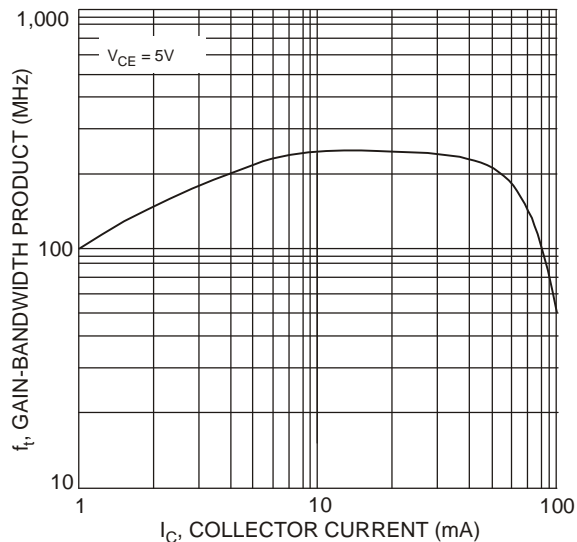
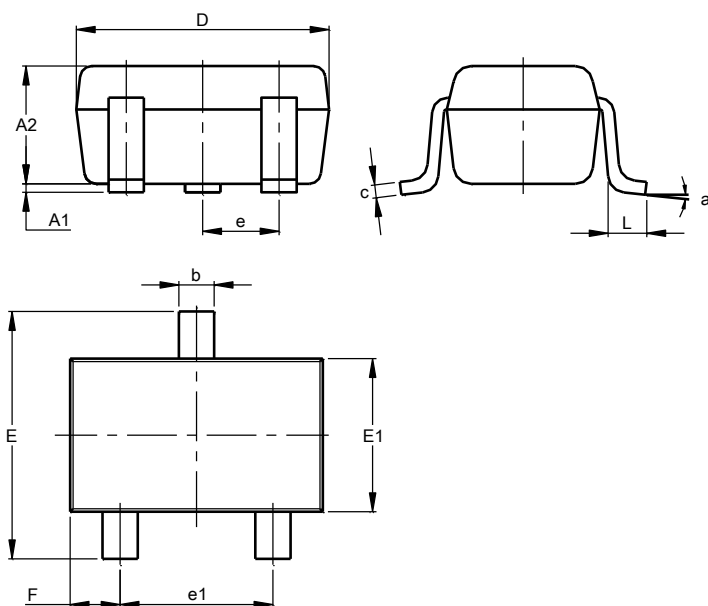


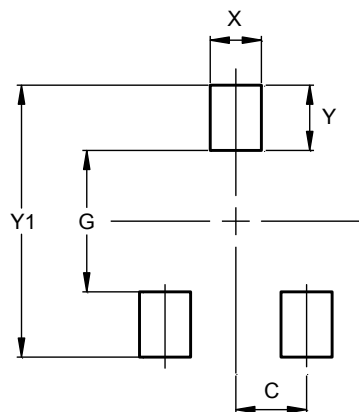
Fig. 4 Typical Gain-Bandwidth Product vs. Collector Current

### Package Outline Dimensions



SOT323			
Dim	Min	Max	Typ
A1	0.00	0.10	0.05
A2	0.90	1.00	0.95
b	0.25	0.40	0.30
c	0.10	0.18	0.11
D	1.80	2.20	2.15
E	2.00	2.20	2.10
E1	1.15	1.35	1.30
e	0.650 BSC		
e1	1.20	1.40	1.30
F	0.375	0.475	0.425
L	0.25	0.40	0.30
a	0°	8°	--
All Dimensions in mm			

### Suggested Pad Layout



Dimensions	Value (in mm)
C	0.650
G	1.300
X	0.470
Y	0.600
Y1	2.500