



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

0755-83047638

ysbdt@szyoushang.cn

www.szyoushang.cn



企业微信二维码



企业QQ二维码

Features

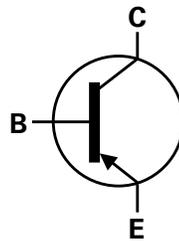
- Ideally Suited for Automatic Insertion
- Complementary NPN Types: NK-BC846 – BC848 Family
- For Switching and AF Amplifier Applications

Mechanical Data

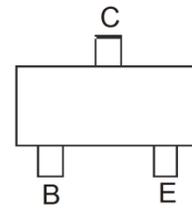
- Package: SOT23
- Package Material: Molded Plastic, “Green” Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 ③
- Weight: 0.008 grams (Approximate)



Top View



Device Symbol



Top View
Pin-Out

Absolute Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Collector-Base Voltage	NK-BC856AQ/BQ	V _{CBO}	-80	V
	NK-BC857BQ		-50	
Collector-Emitter Voltage	NK-BC856AQ/BQ	V _{CEO}	-65	V
	NK-BC857BQ		-45	
Emitter-Base Voltage		V _{EBO}	-5.0	V
Continuous Collector Current		I _C	-100	mA
Peak Collector Current		I _{CM}	-200	mA
Peak Emitter Current		I _{EM}	-200	mA
Peak Base Current		I _{BM}	-200	mA

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P _D	310	mW
	(Note 6)		350	
Thermal Resistance, Junction to Ambient	(Note 5)	R _{θJA}	403	°C/W
	(Note 6)		357	
Thermal Resistance, Junction to Leads	(Note 7)	R _{θJL}	350	°C/W
Operating and Storage Temperature Range		T _J , T _{STG}	-65 to +150	°C

ESD Ratings (Note 8)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
5. For a device mounted on minimum recommended pad layout 1oz copper that is on a single-sided FR-4 PCB; device is measured under still air conditions whilst operating in a steady-state.
 6. Same as note (5), except the device is mounted on 15mm × 15mm 1oz copper.
 7. Thermal resistance from junction to solder-point (at the end of the leads).
 8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information

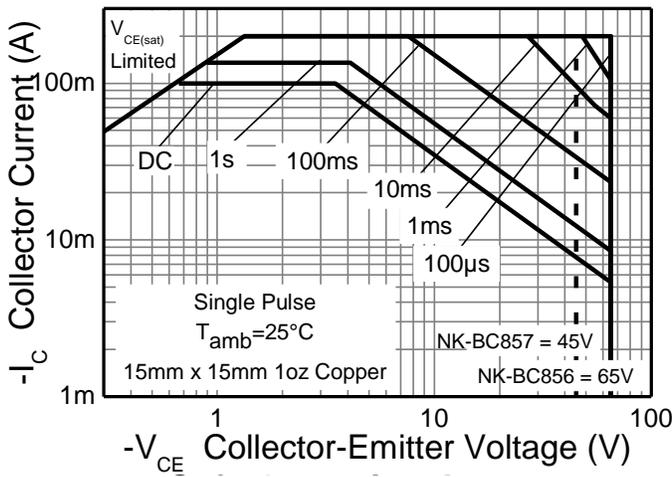


Figure 1. Safe Operating Area

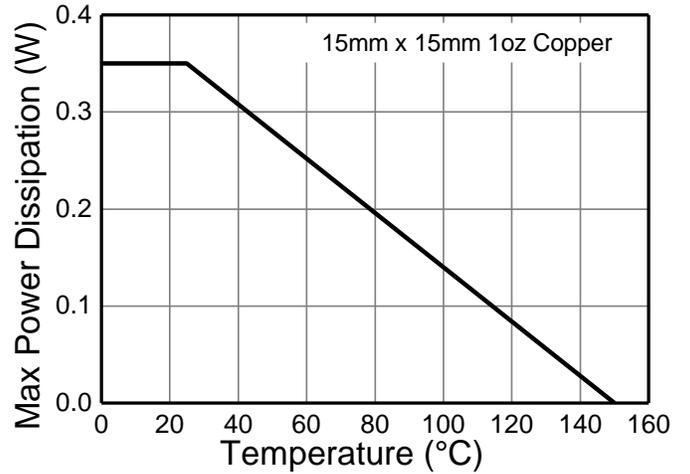


Figure 2. Derating Curve

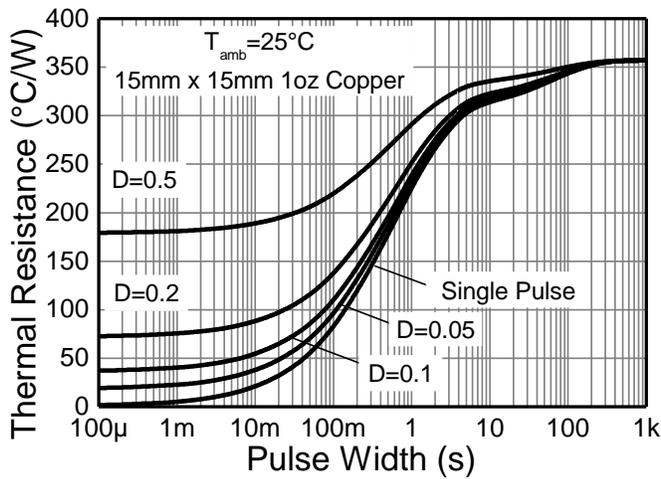


Figure 3. Transient Thermal Impedance

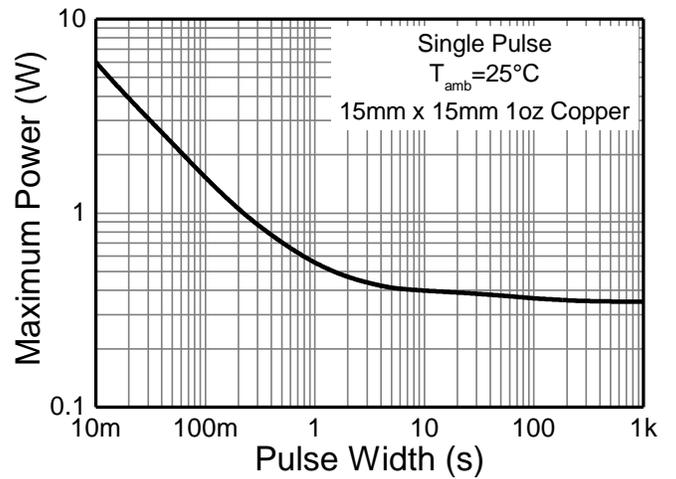


Figure 4. Pulse Power Dissipation

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

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition	
Collector-Base Breakdown Voltage	NK-BC856AQ/BQ	BV_{CBO}	-80	—	—	V	$I_C = -10\mu\text{A}$	
	NK-BC857BQ		-50					
Collector-Emitter Breakdown Voltage (Note 9)	NK-BC856AQ/BQ	BV_{CEO}	-65	—	—	V	$I_C = -10\text{mA}$	
	NK-BC857BQ		-45					
Emitter-Base Breakdown Voltage		BV_{EBO}	-5	—	—	V	$I_E = -1\mu\text{A}$	
Collector Cutoff Current		I_{CBO}	—	—	-15	nA	$V_{CB} = -30\text{V}$	
					-4	μA	$V_{CB} = -30\text{V}, T_J = +150^\circ\text{C}$	
Collector Emitter Cutoff Current	NK-BC856AQ/BQ	I_{CES}	—	—	-15	nA	$V_{CE} = -80\text{V}$	
	NK-BC857BQ				-15		$V_{CE} = -50\text{V}$	
Emitter-Base Cutoff Current		I_{EBO}	—	—	-100	nA	$V_{EB} = -5\text{V}$	
Small Signal Current Gain	NK-BC856AQ	h_{fe}	—	200	—	—	$I_C = -2.0\text{mA}, V_{CE} = -5\text{V}$ $f = 1.0\text{kHz}$	
	NK-BC856BQ/BC857BQ			330				
Input Impedance	NK-BC856AQ	h_{ie}	—	2.7	—	k Ω		
	NK-BC856BQ/BC857BQ			4.5				
Output Admittance	NK-BC856AQ	h_{oe}	—	18	—	μS		
	NK-BC856BQ/BC857BQ			30				
Reverse Voltage Transfer Ratio	NK-BC856AQ	h_{re}	—	1.5×10^{-4}	—	—		
	NK-BC856BQ/BC857BQ			2×10^{-4}				
DC Current Gain (Note 9)	NK-BC856AQ	h_{FE}	125	180	250	—		$I_C = -2.0\text{mA}, V_{CE} = -5\text{V}$
	NK-BC856BQ/BC857BQ		220	290	475			
Collector-Emitter Saturation Voltage (Note 9)		$V_{CE(sat)}$	—	-75	-300	mV	$I_C = -10\text{mA}, I_B = -0.5\text{mA}$	
				-250	-650		$I_C = -100\text{mA}, I_B = -5.0\text{mA}$	
Base-Emitter Turn-On Voltage (Note 9)		$V_{BE(on)}$	—	-600	-650	mV	$I_C = -2\text{mA}, V_{CE} = -5\text{V}$	
				—	-820		$I_C = -10\text{mA}, V_{CE} = -5\text{V}$	
Base-Emitter Saturation Voltage (Note 9)		$V_{BE(sat)}$	—	-700	—	mV	$I_C = -10\text{mA}, I_B = -0.5\text{mA}$	
				-850	-1100		$I_C = -100\text{mA}, I_B = -5\text{mA}$	
Output Capacitance		C_{obo}	—	3	—	pF	$V_{CB} = -10\text{V}, f = 1.0\text{MHz}$	
Transition Frequency		f_T	100	200	—	MHz	$V_{CE} = -5\text{V}, I_C = -10\text{mA}, f = 100\text{MHz}$	
Noise Figure		NF	—	2	10	dB	$V_{CE} = -5\text{V}, I_C = -200\mu\text{A}$ $R_S = 2\text{k}\Omega, f = 1\text{kHz}$ $\Delta f = 200\text{Hz}$	

 Note: 9. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.

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

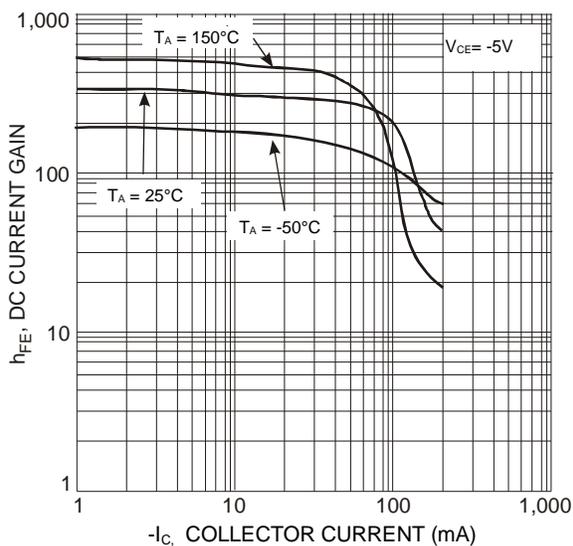


Figure 5. Typical DC Current Gain vs. Collector Current

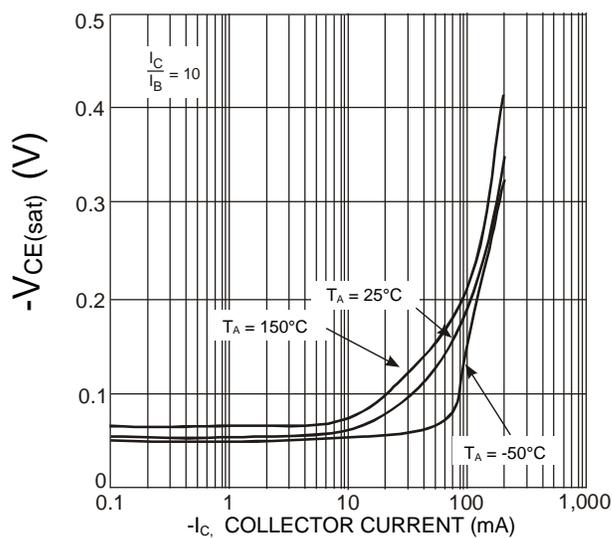


Figure 6. Typical Collector-Emitter Saturation Voltage vs. Collector Current

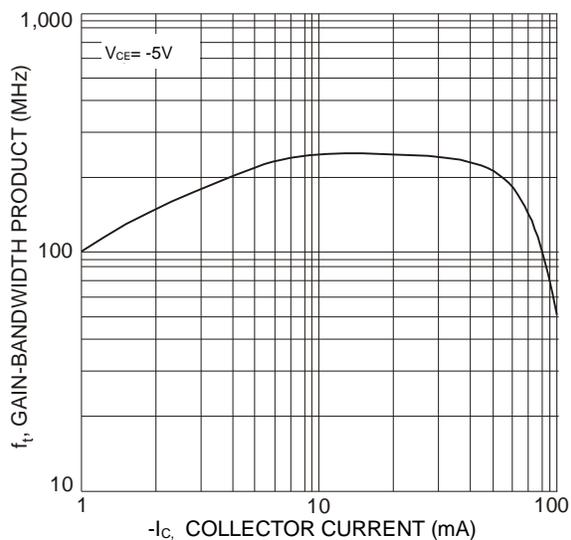
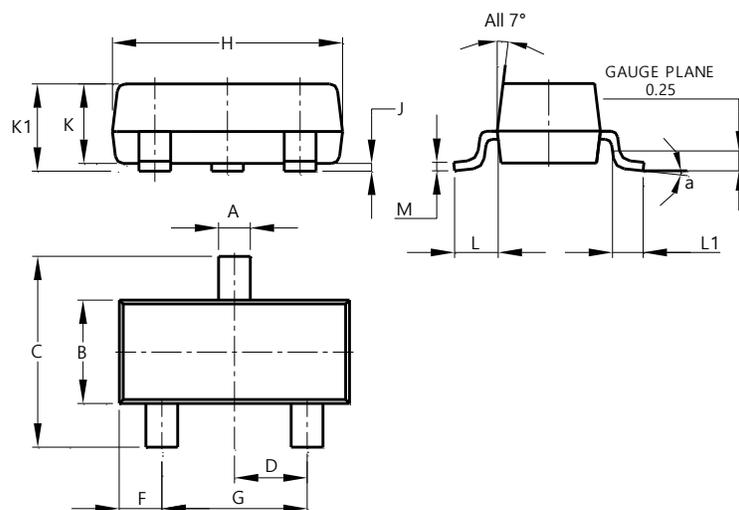


Figure 7. Gain-Bandwidth Product vs. Collector Current

Package Outline Dimensions

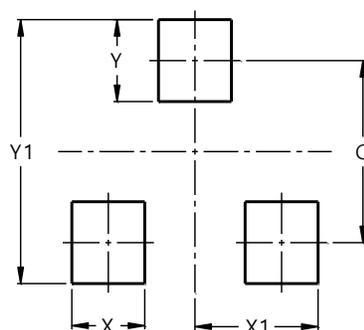
SOT23



SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

SOT23



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9