



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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Features

- Ideally Suited for Automatic Insertion
- Complementary PNP Type: NK-BC857BWQ
- For Switching and AF Amplifier Applications

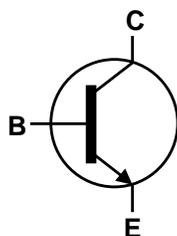
Mechanical Data

- Package: SOT323
- 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 
- Weight: 0.006 grams (Approximate)

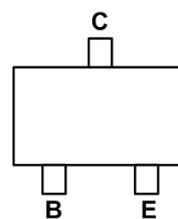
SOT323



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-BC846BWQ	V_{CBO}	80	V
	NK-BC847BWQ/BC847CWQ		50	
Collector-Emitter Voltage	NK-BC846BWQ	V_{CEO}	65	V
	NK-BC847BWQ/BC847CWQ		45	
Emitter-Base Voltage		V_{EBO}	6	V
Continuous Collector Current		I_C	100	mA
Peak Collector Current		I_{CM}	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	200	mW
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	625	°C/W
Thermal Resistance, Junction to Case	(Note 5)	$R_{\theta JC}$	115	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-65 to +150	°C

ESD Ratings (Note 6)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Charged Device Model	ESD CDM	1,000	V	C3
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

Notes: 5. For a device mounted on minimum recommended pad layout 1oz weight copper that is on a single-sided FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
 6. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristic and Derating Information

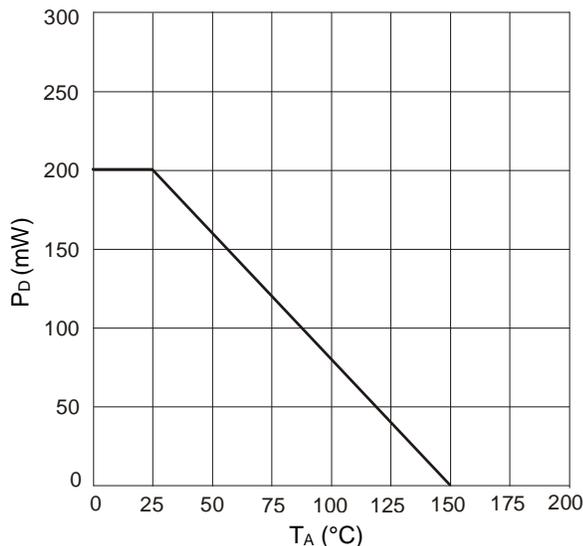


Figure 1. P_D v T_A

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

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	NK-BC846BWQ	BV _{CBO}	80	—	—	V	I _C = 100μA
	NK-BC847BWQ/BC847CWQ		50				
Collector-Emitter Breakdown Voltage (Note 7)	NK-BC846BWQ	BV _{CEO}	65	—	—	V	I _C = 10mA
	NK-BC847BWQ/BC847CWQ		45				
Emitter-Base Breakdown Voltage		BV _{EBO}	6	—	—	V	I _E = 100μA
DC Current Gain (Note 7)	Current Gain Group	—	200	290	450	—	V _{CE} = 5.0V, I _C = 2.0mA
			420	520	800		
Collector Cutoff Current		I _{CBO}	—	—	20	nA	V _{CB} = 30V
					5	μA	V _{CB} = 30V, T _A = +150°C
Collector-Emitter Saturation Voltage (Note 7)		V _{CE(sat)}	—	90	250	mV	I _C = 10mA, I _B = 0.5mA
				200	600		I _C = 100mA, I _B = 5.0mA
Base-Emitter Turn-on Voltage (Note 7)		V _{BE(on)}	580	660	700	mV	I _C = 2mA, V _{CE} = 5V
			—	—	770		I _C = 10mA, V _{CE} = 5V
Base-Emitter Saturation Voltage (Note 7)		V _{BE(sat)}	—	700	—	mV	I _C = 10mA, I _B = 0.5mA
				900			I _C = 100mA, I _B = 5mA
Output Capacitance		C _{obo}	—	3	4.5	pF	V _{CB} = 10V, f = 1.0MHz
Transition Frequency		f _T	100	300	—	MHz	V _{CE} = 5V, I _C = 10mA f = 100MHz
Noise Figure		NF	—	—	10	dB	V _{CE} = 5V, I _C = 200μA R _S = 2kΩ, f = 1kHz Δf = 200Hz

Note: 7. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

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

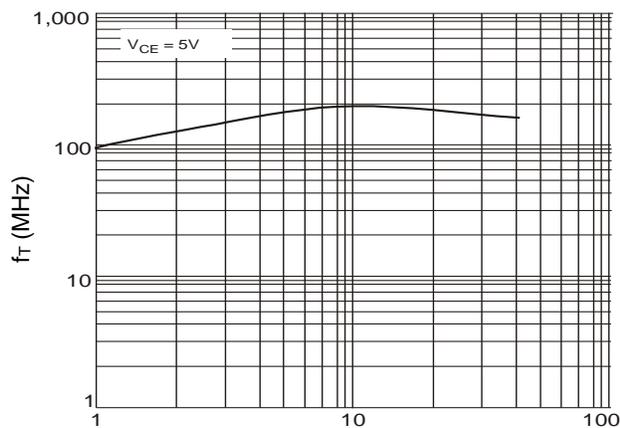


Figure 2. f_T v I_C

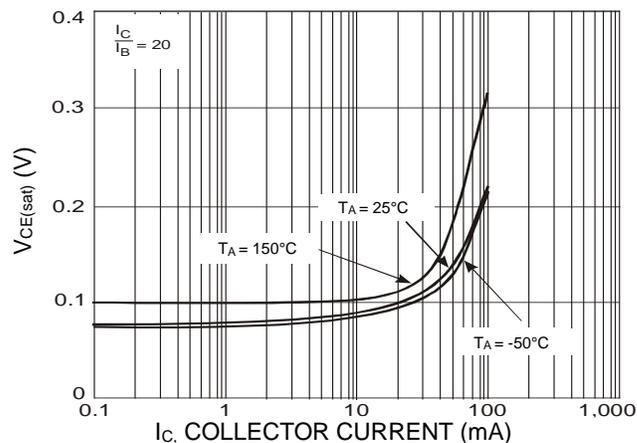


Figure 3. $V_{CE(sat)}$ v I_C

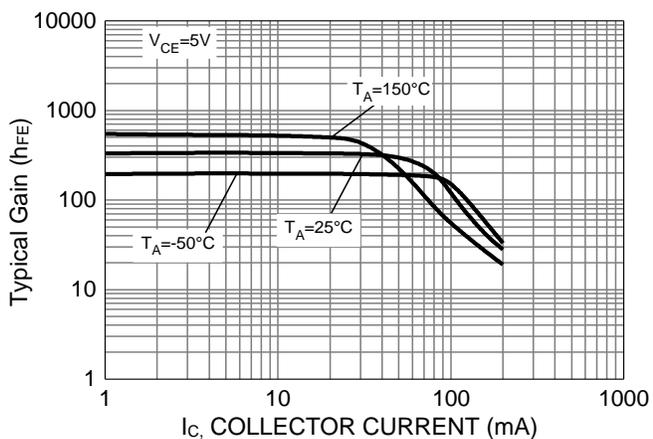


Figure 4. h_{FE} v I_C
(Band B Group Gain)

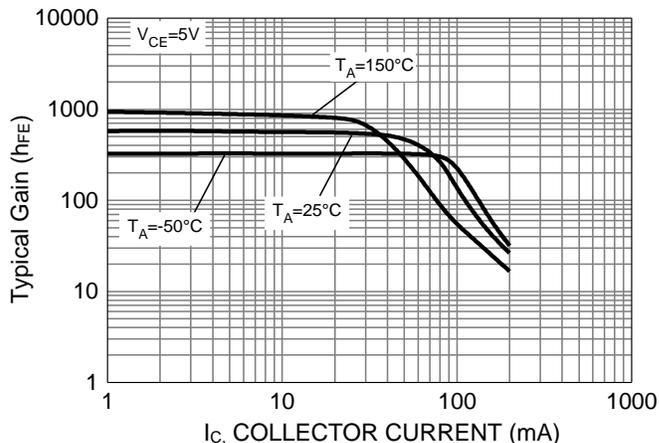
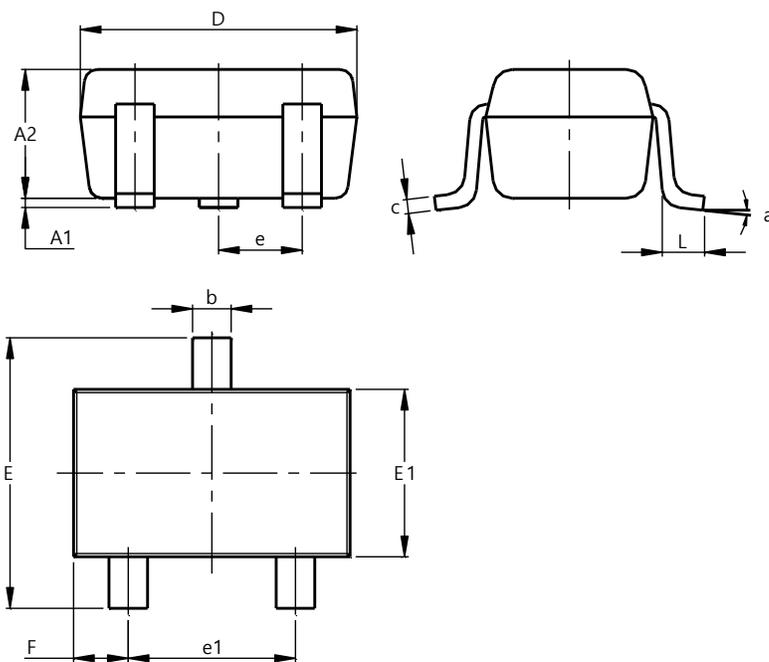


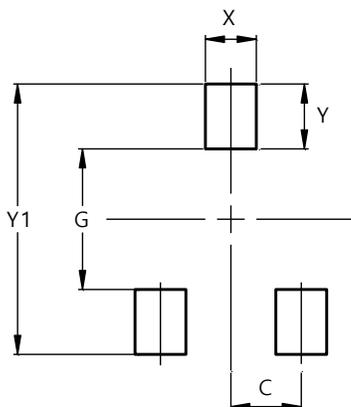
Figure 5. h_{FE} v I_C
(Band C Group Gain)

Package Outline Dimensions

SOT323


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

SOT323


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