



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

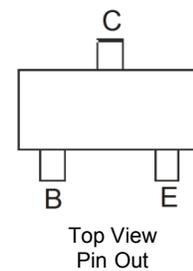
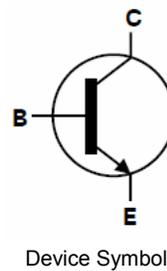
This Bipolar Junction Transistor (BJT) is designed to meet the stringent requirements of automotive applications.

Features

- $BV_{CEO} > 45V$
- $I_C = 0.5A$ Continuous Collector Current
- $I_{CM} = 1A$ Peak Pulse Current
- Complementary PNP Types: NK-BC807-xxQ
- Ideally Suited for Automatic Insertion
- Epitaxial Planar Die Construction
- For Switching and AF Amplifier Applications

Mechanical Data

- Case: SOT23
- 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 
- Weight 0.008 grams (Approximate)



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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	50	V
Collector-Emitter Voltage	V_{CEO}	45	V
Emitter-Base Voltage	V_{EBO}	5.0	V
Collector Current	I_C	0.5	A
Peak Pulse Collector Current (single pulse)	I_{CM}	1.0	A
Peak Pulse Base Current (single pulse)	I_{BM}	200	mA

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

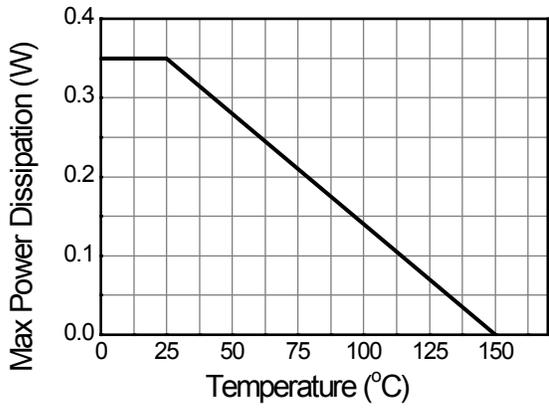
Characteristic	Symbol	Value	Unit
Power Dissipation	P_D	(Note 5) 310	mW
		(Note 6) 350	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	(Note 5) 403	$^\circ\text{C/W}$
		(Note 6) 357	
Thermal Resistance, Junction to Leads	$R_{\theta JL}$	350	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +150	$^\circ\text{C}$

ESD Ratings (Note 8)

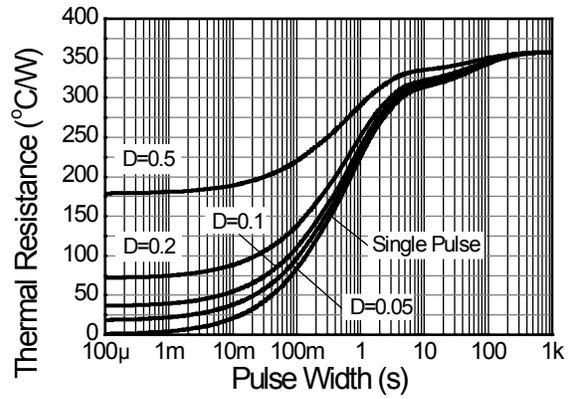
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	8,000	V	3B
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

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

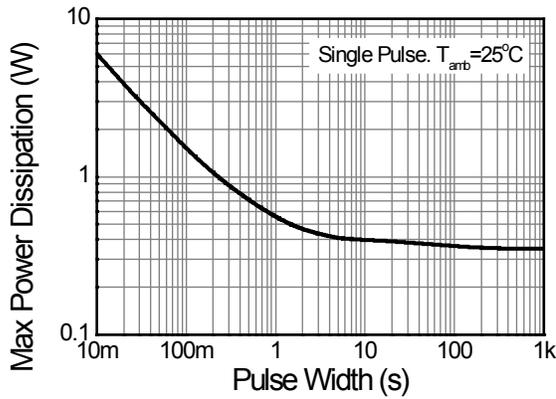
Thermal Characteristics and Derating Information



Derating Curve



Transient Thermal Impedance



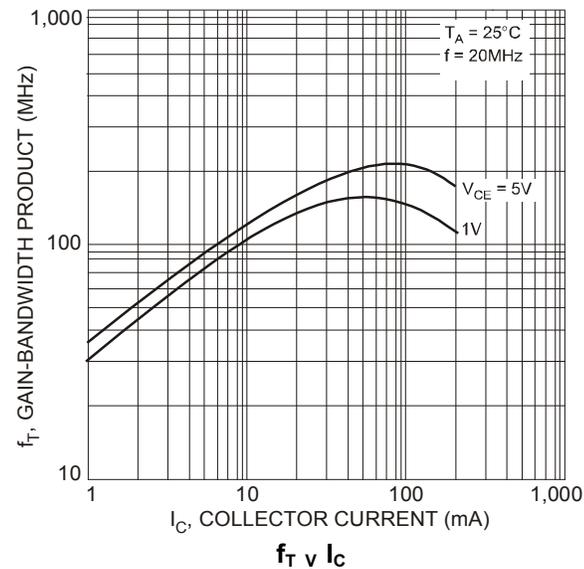
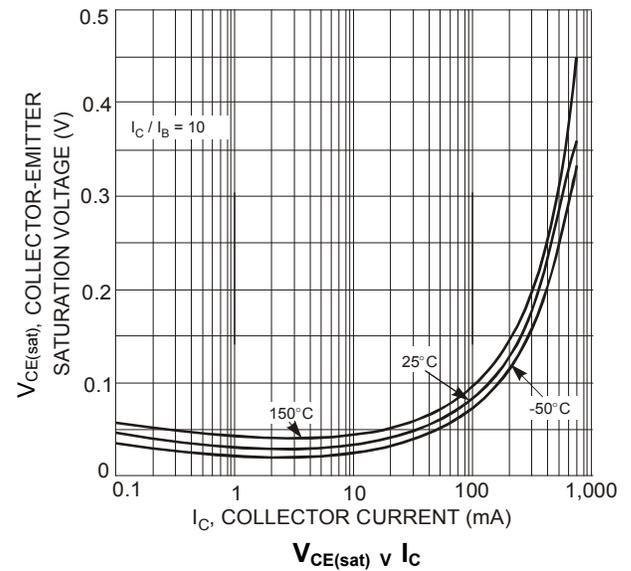
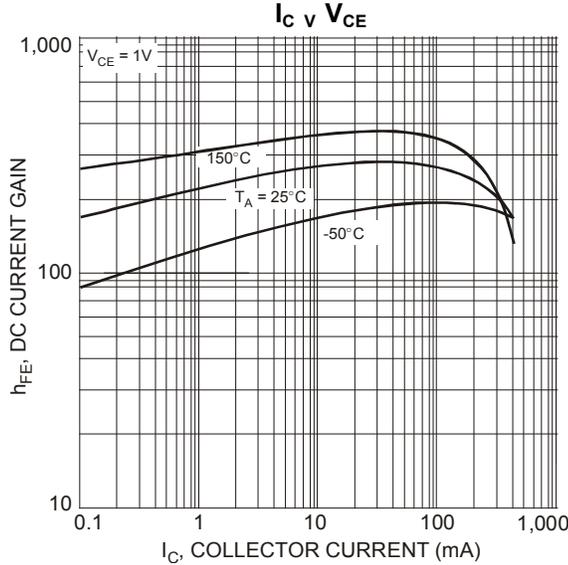
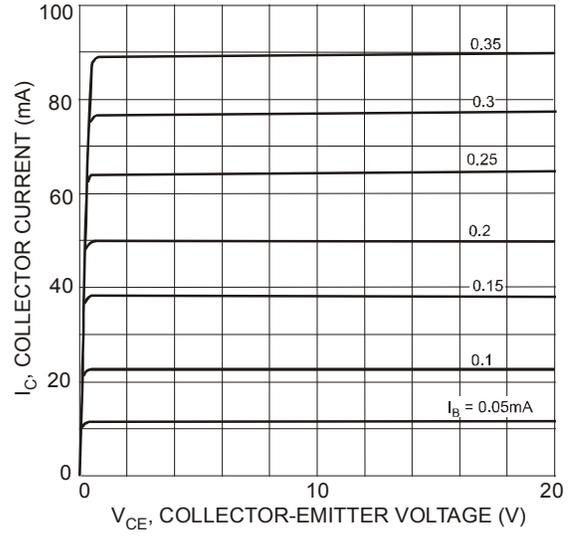
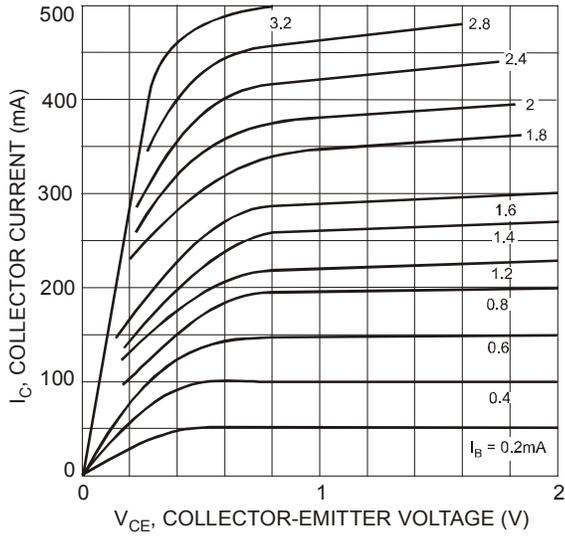
Pulse Power Dissipation

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

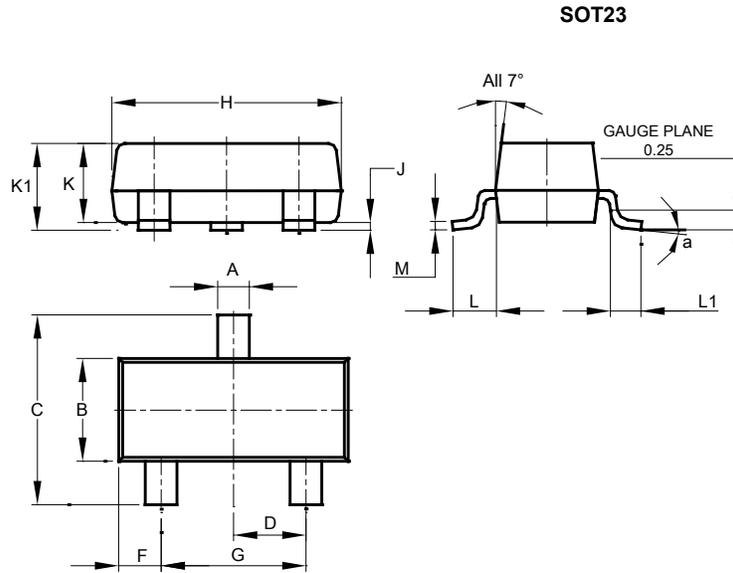
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	50	—	—	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	45	—	—	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	5	—	—	V	$I_C = 100\mu\text{A}$
Collector-Emitter Cut-Off Current	I_{CES}	—	—	100 5.0	nA μA	$V_{CE} = 45\text{V}$ $V_{CE} = 25\text{V}, T_J = +150^\circ\text{C}$
Emitter-Base Cut-Off Current	I_{EBO}	—	—	100	nA	$V_{EB} = 5.0\text{V}$
DC Current Gain (Note 9)	NK-BC817-16Q	100	—	250	—	$V_{CE} = 1.0\text{V}, I_C = 100\text{mA}$
	NK-BC817-25Q	160		400		
	NK-BC817-40Q	250		600		
	NK-BC817-16Q	60		—		$V_{CE} = 1.0\text{V}, I_C = 300\text{mA}$
NK-BC817-25Q	100					
NK-BC817-40Q	170					
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(sat)}$	—	—	0.7	V	$I_C = 500\text{mA}, I_B = 50\text{mA}$
Base-Emitter Voltage (Note 9)	V_{BE}	—	—	1.2	V	$V_{CE} = 1.0\text{V}, I_C = 300\text{mA}$
Transition frequency	f_T	100	—	—	MHz	$V_{CE} = 5.0\text{V}, I_C = 10\text{mA}, f = 50\text{MHz}$
Collector-Base Capacitance	C_{CBO}	—	—	12	pF	$V_{CB} = 10\text{V}, f = 1.0\text{MHz}$

 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.)

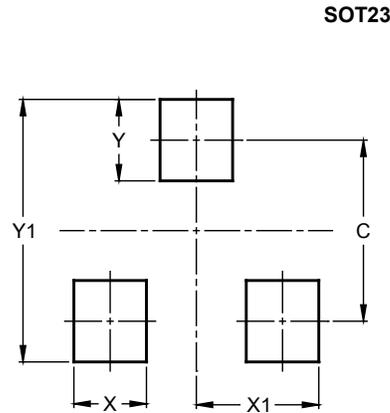


Package Outline Dimensions



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



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