



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

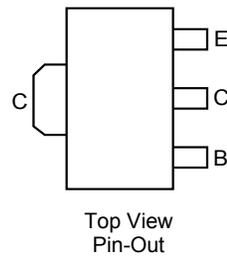
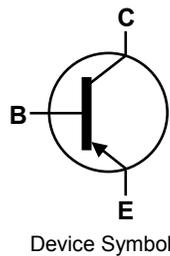
- $BV_{CEO} > -60V$ & $-80V$
- $I_C = -1A$ Continuous Collector Current
- $I_{CM} = -2A$ Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)} < -500mV @ -0.5A$
- Complementary NPN Type: NK-BCX5616Q

Mechanical Data

- Case: SOT89
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
Terminals: Finish - Matte Tin Finish Leads.
- Solderable per MIL-STD-202 Method 208 Ⓔ③
- Weight: 0.055 grams (Approximate)

Applications

- Automotive Applications
- Medium Power Switching or Amplification Applications
- AF Drivers and Output Stages



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

Characteristic	Symbol	NK-BCX5216	NK-BCX5316	Unit
Collector-Base Voltage	V_{CBO}	-60	-100	V
Collector-Emitter Voltage	V_{CEO}	-60	-80	V
Emitter-Base Voltage	V_{EBO}	-5		V
Continuous Collector Current	I_C	-1		A
Peak Pulse Collector Current (Single Pulse)	I_{CM}	-2		
Continuous Base Current	I_B	-100		mA
Peak Pulse Base Current (Single Pulse)	I_{BM}	-200		

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

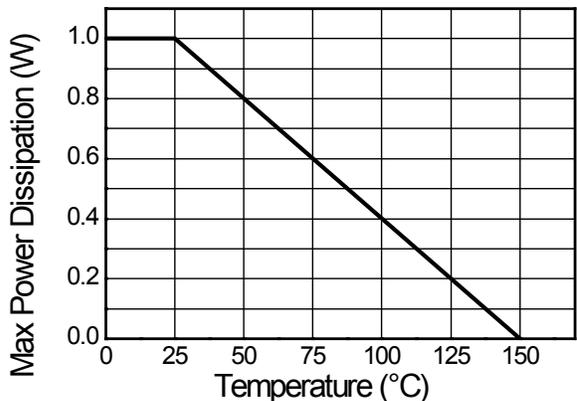
Characteristic	Symbol	Value	Unit
Power Dissipation	P_D	1	W
		1.5	
		2.0	
Thermal Resistance, Junction to Ambient Air	$R_{\theta JA}$	125	$^\circ\text{C/W}$
		83	
		60	
Thermal Resistance, Junction to Lead	$R_{\theta JL}$	13	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

ESD Ratings (Note 9)

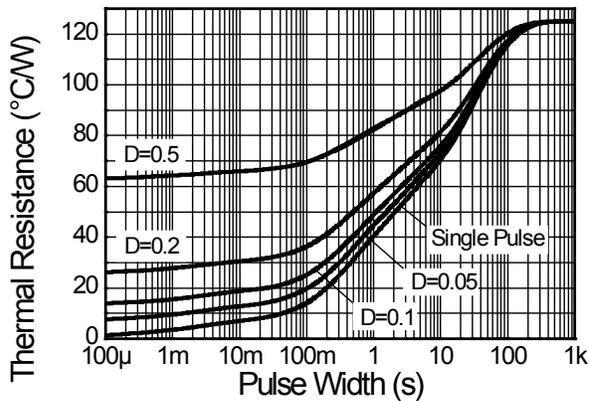
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
- For a device mounted with the exposed collector pad on 15mm x 15mm 1oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
 - Same as Note 5, except the device is mounted on 25mm x 25mm 1oz copper.
 - Same as Note 5, except the device is mounted on 50mm x 50mm 1oz copper.
 - Thermal resistance from junction to solder-point (on the exposed collector pad).
 - Refer to JEDEC specification JESD22-A114 and JESD22-A115.

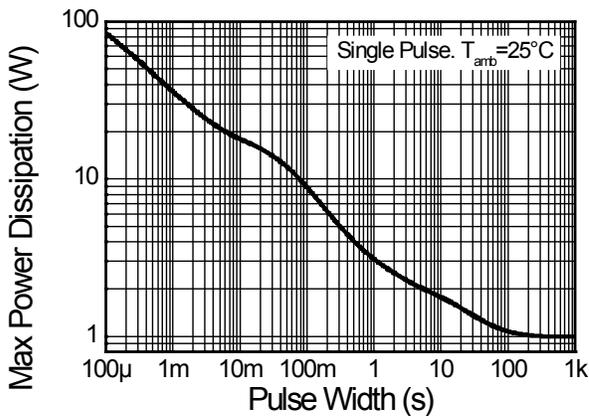
Thermal Characteristics and Derating Information



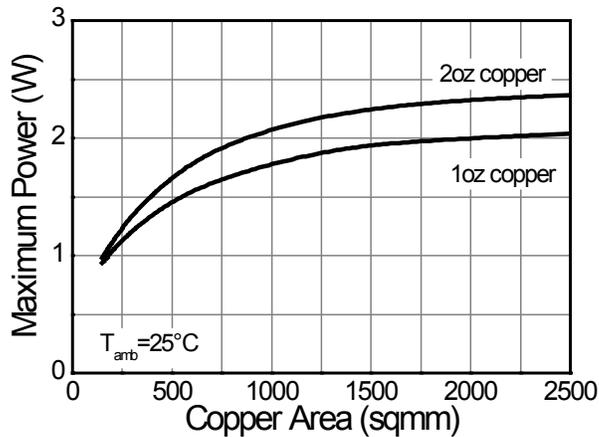
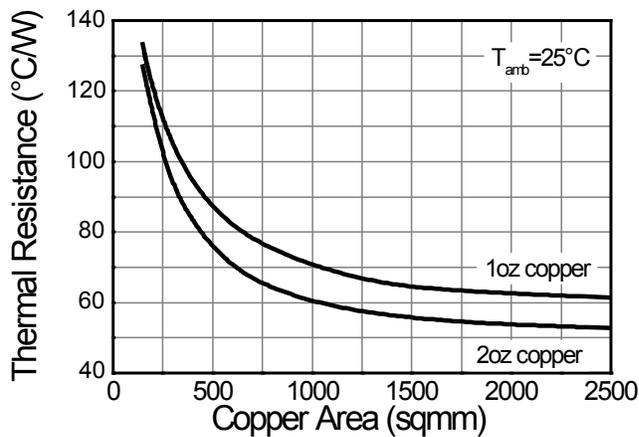
Derating Curve



Transient Thermal Impedance



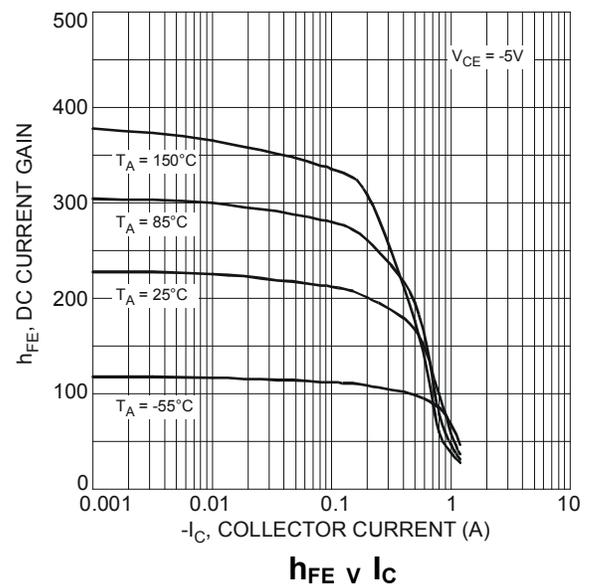
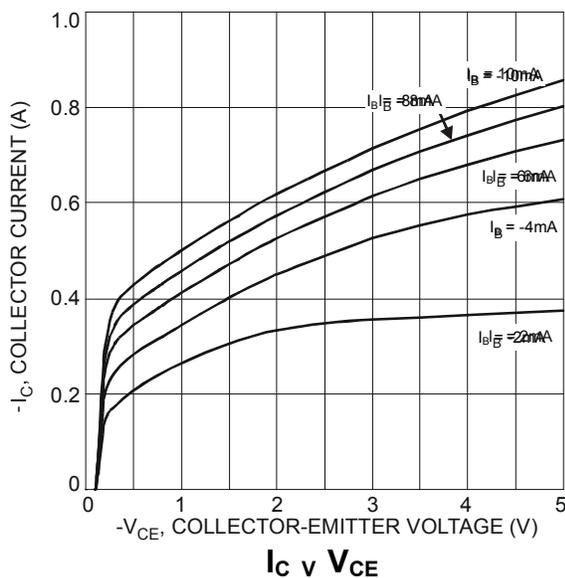
Pulse Power Dissipation

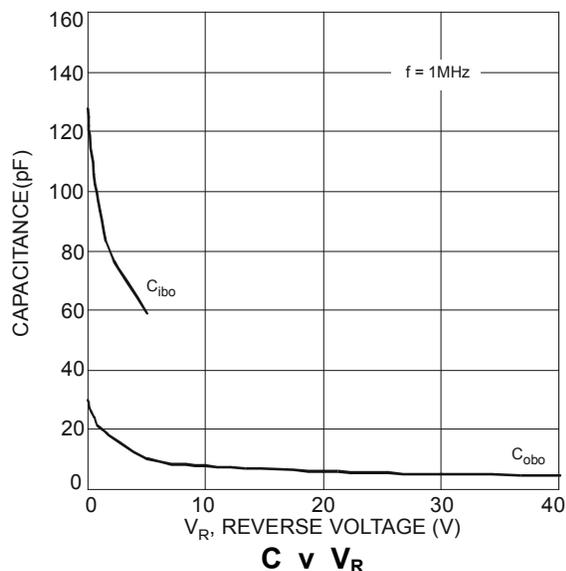
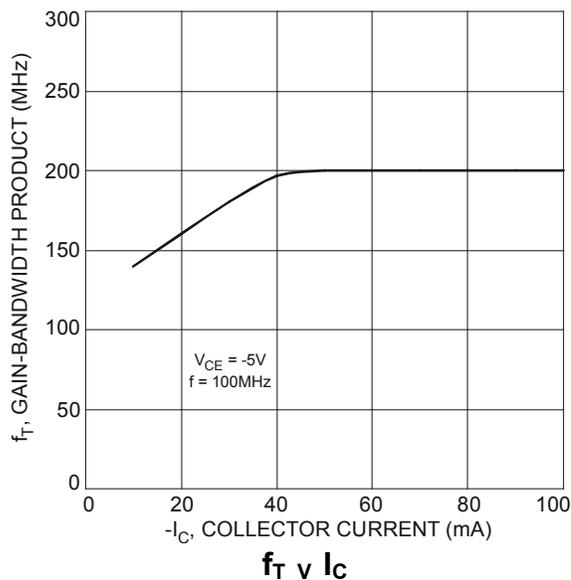
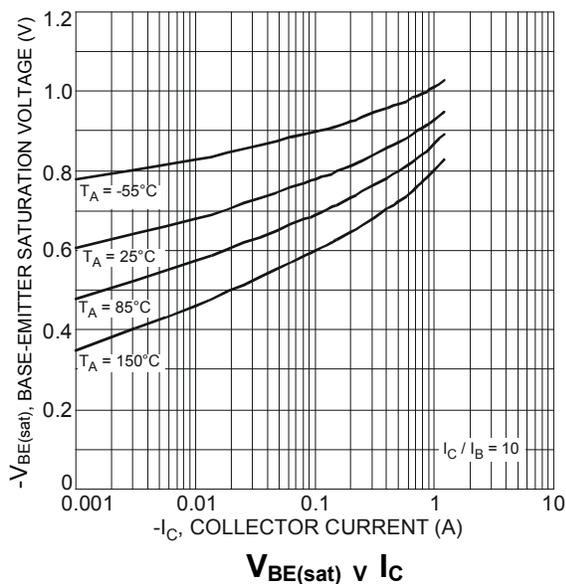
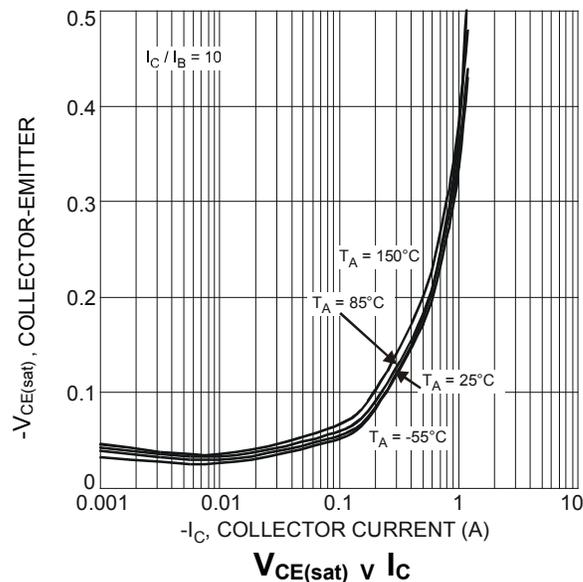
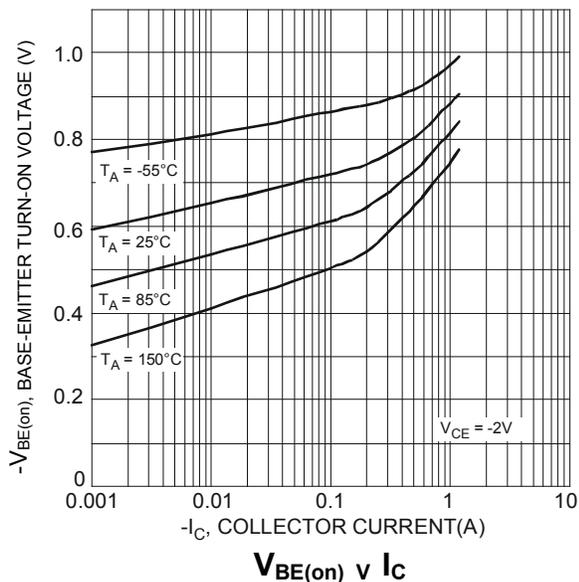


Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	NK-BCX5216	-60	—	—	V	$I_C = -100\mu\text{A}$
	NK-BCX5316	-100				
Collector-Emitter Breakdown Voltage (Note 10)	NK-BCX5216	-60	—	—	V	$I_C = -10\text{mA}$
	NK-BCX5316	-80				
Emitter-Base Breakdown Voltage	BV_{EBO}	-5	—	—	V	$I_E = -10\mu\text{A}$
Collector Cut-Off Current	I_{CBO}	—	—	-0.1 -20	μA	$V_{CB} = -30\text{V}$ $V_{CB} = -30\text{V}, T_J = +150^\circ\text{C}$
Emitter Cut-Off Current	I_{EBO}	—	—	-20	nA	$V_{EB} = -5\text{V}$
DC Current Gain (Note 10)	h_{FE}	25	—	—	—	$I_C = -5\text{mA}, V_{CE} = -2\text{V}$
		100	—	250		$I_C = -150\text{mA}, V_{CE} = -2\text{V}$
		25	—	—		$I_C = -500\text{mA}, V_{CE} = -2\text{V}$
Collector-Emitter Saturation Voltage (Note 10)	$V_{CE(sat)}$	—	—	-0.5	V	$I_C = -500\text{mA}, I_B = -50\text{mA}$
Base-Emitter Turn-On Voltage (Note 10)	$V_{BE(on)}$	—	—	-1.0	V	$I_C = -500\text{mA}, V_{CE} = -2\text{V}$
Transition frequency	f_T	150	—	—	MHz	$I_C = -50\text{mA}, V_{CE} = -10\text{V}$ $f = 100\text{MHz}$
Output Capacitance	C_{obo}	—	—	25	pF	$V_{CB} = -10\text{V}, f = 1\text{MHz}$

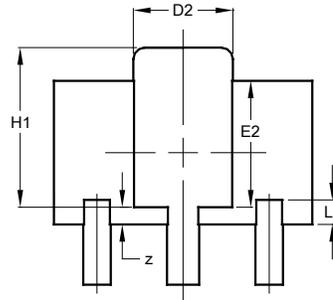
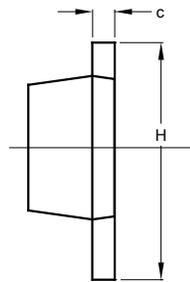
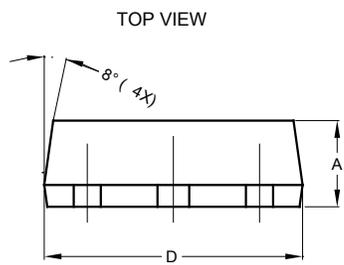
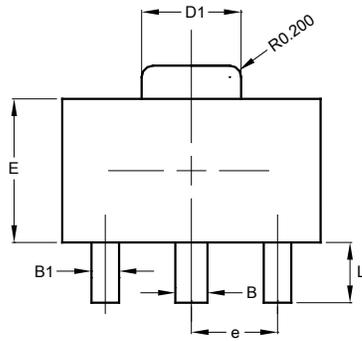
 Note: 10. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.

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




Package Outline Dimensions

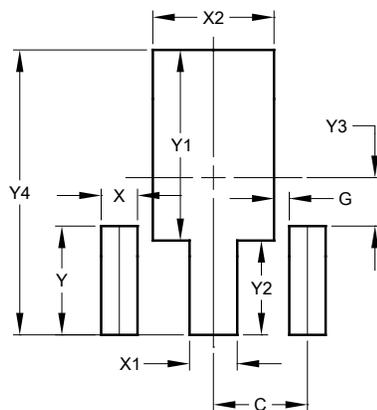
SOT89



SOT89			
Dim	Min	Max	Typ
A	1.40	1.60	1.50
B	0.50	0.62	0.56
B1	0.42	0.54	0.48
c	0.35	0.43	0.38
D	4.40	4.60	4.50
D1	1.62	1.83	1.733
D2	1.61	1.81	1.71
E	2.40	2.60	2.50
E2	2.05	2.35	2.20
e	-	-	1.50
H	3.95	4.25	4.10
H1	2.63	2.93	2.78
L	0.90	1.20	1.05
L1	0.327	0.527	0.427
z	0.20	0.40	0.30
All Dimensions in mm			

Suggested Pad Layout

SOT89



Dimensions	Value (in mm)
C	1.500
G	0.244
X	0.580
X1	0.760
X2	1.933
Y	1.730
Y1	3.030
Y2	1.500
Y3	0.770
Y4	4.530