



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

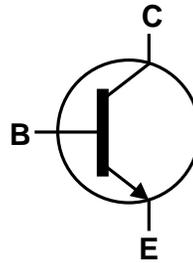
- $BV_{CEO} > 160V$
- $I_C = 600mA$ High Collector Current
- Complementary PNP Type: NK-DXT5401
- Ideal for Medium Power Switching or Amplification Applications

Mechanical Data

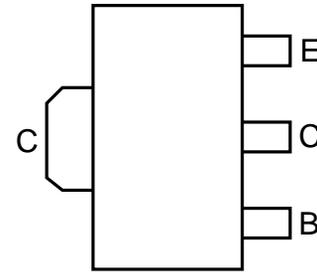
- Package: SOT89
- Package Material: Molded Plastic, "Green" Molding Compound
UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per
MIL-STD-202, Method 208 
- Weight: 0.052 grams (Approximate)



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	V _{CB0}	180	V
Collector-Emitter Voltage	V _{CE0}	160	V
Emitter-Base Voltage	V _{EB0}	6	V
Collector Current	I _C	600	mA

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

Characteristic	Symbol	Value	Unit
Power Dissipation	P _D	(Note 5)	0.75
		(Note 6)	1.2
Thermal Resistance, Junction to Ambient Air	R _{θJA}	(Note 5)	166
		(Note 6)	104
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 7)

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 with the exposed collector pad on minimum recommended pad layout 1oz copper that is on a single-sided 1.6mm 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 with the exposed collector pad on 25mm x 25mm 1oz copper.
 7. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV_{CBO}	180	—	—	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 8)	BV_{CEO}	160	—	—	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	6.0	—	—	V	$I_E = 100\mu\text{A}$
Collector Cut-off Current	I_{CBO}	—	—	50	nA	$V_{CB} = 120\text{V}$
				50	μA	$V_{CB} = 120\text{V}, T_A = +100^\circ\text{C}$
Emitter Cut-off Current	I_{EBO}	—	—	50	nA	$V_{EB} = 4\text{V}$
ON CHARACTERISTICS (Note 8)						
Static Forward Current Transfer Ratio	h_{FE}	80	—	—	—	$I_C = 1\text{mA}, V_{CE} = 5\text{V}$
		80		250		$I_C = 10\text{mA}, V_{CE} = 5\text{V}$
		30		—		$I_C = 50\text{mA}, V_{CE} = 5\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	—	0.15	V	$I_C = 10\text{mA}, I_B = 1\text{mA}$
				0.20		$I_C = 50\text{mA}, I_B = 5\text{mA}$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	—	—	1.0	V	$I_C = 10\text{mA}, I_B = 1\text{mA}$
				—		$I_C = 50\text{mA}, I_B = 5\text{mA}$
SMALL SIGNAL CHARACTERISTICS						
Transition Frequency	f_T	100	—	300	MHz	$I_C = 10\text{mA}, V_{CE} = 10\text{V}, f = 100\text{MHz}$
Output Capacitance	C_{obo}	—	—	6	pF	$V_{CB} = 10\text{V}, I_E = 0, f = 1\text{MHz}$
Small Signal Current Gain	h_{fe}	50	—	200	—	$V_{CB} = 10\text{V}, I_C = 1\text{mA}, f = 1\text{kHz}$
Noise Figure	NF	—	—	8	dB	$V_{CB} = 5\text{V}, I_C = 200\mu\text{A}, R_S = 1\text{k}\Omega, f = 1\text{kHz}$

 Note: 8. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.

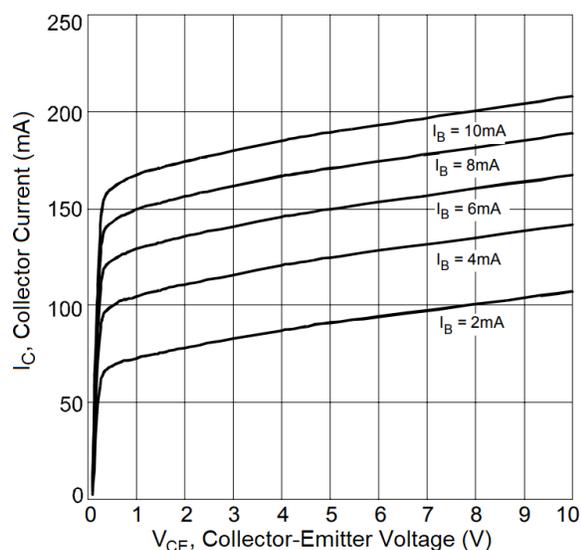
Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)


Fig.1 Typical Collector Current vs. Collector-Emitter Voltage

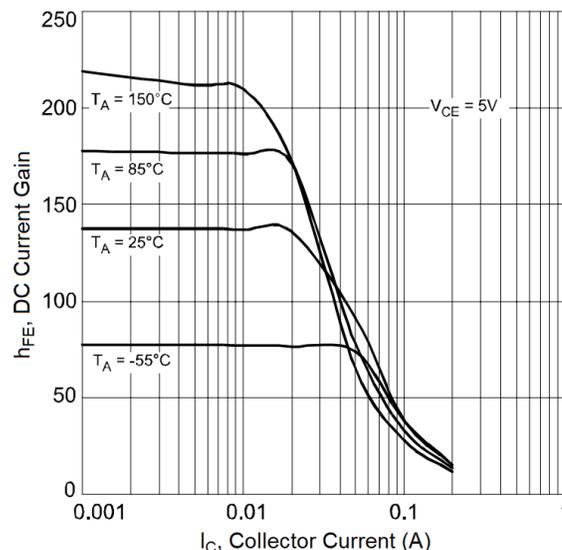


Fig.2 Typical DC Current Gain vs. Collector Current

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

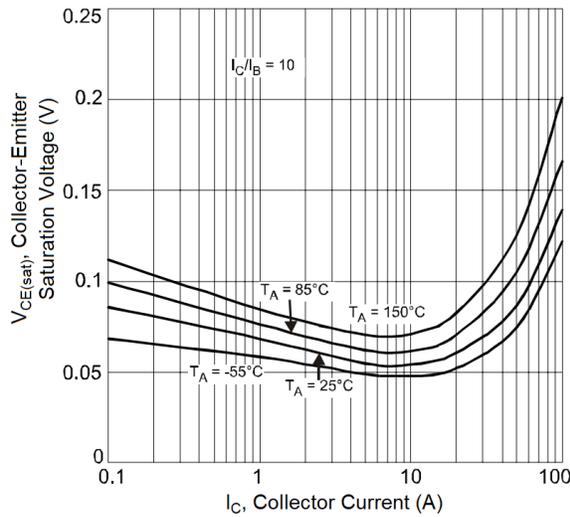


Fig. 3 Typical Collector-Emitter Saturation Voltage vs. Collector Current

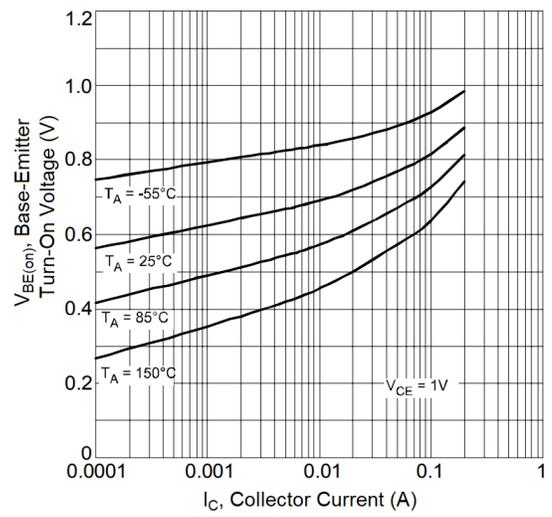


Fig. 4 Typical Base-Emitter Turn-On Voltage vs. Collector Current

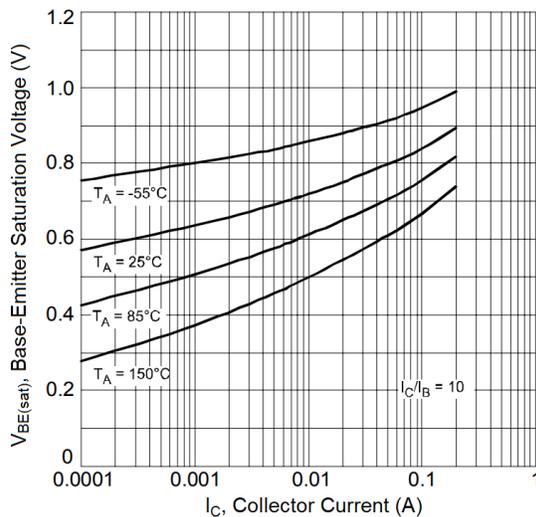


Fig. 5 Typical Base-Emitter Saturation Voltage vs. Collector Current

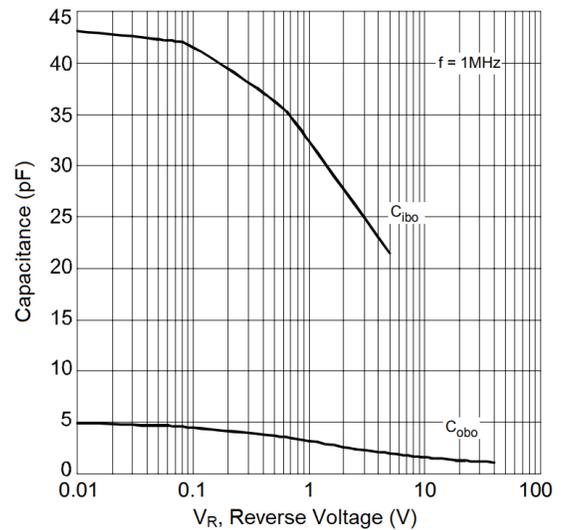


Fig. 6 Typical Capacitance Characteristics

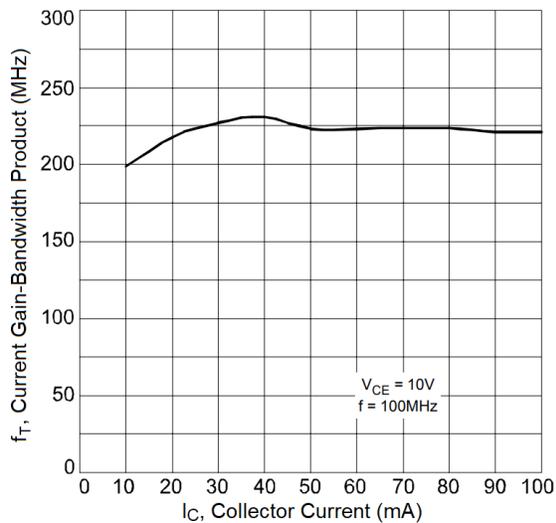
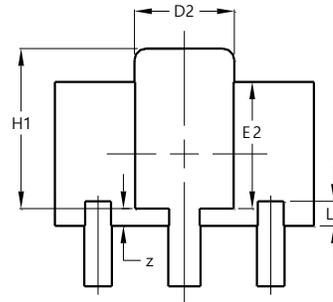
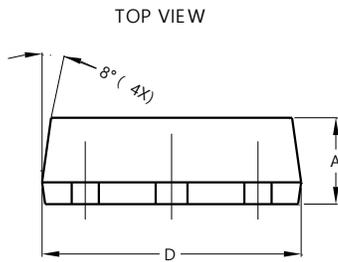
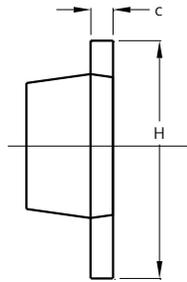
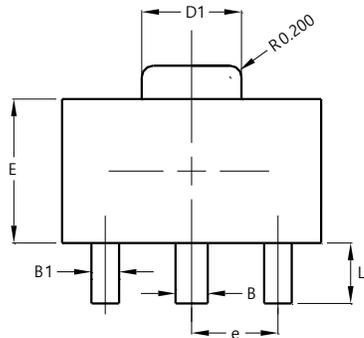


Fig. 7 Typical Gain-Bandwidth Product vs. Collector Current

Package Outline Dimensions

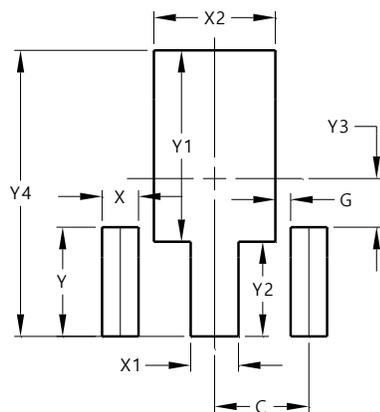
SOT89



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