优尚

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

- $BV_{CEO} > 60V$
- I_C = 3A High Continuous Collector Current
- I_{CM} up to 6A Peak Pulse Current
- 2W Power Dissipation
- Low Saturation Voltage $V_{CE(sat)} < 300mV$ @ 1A
- Complementary PNP Type: DIODES™ NK-DXT751

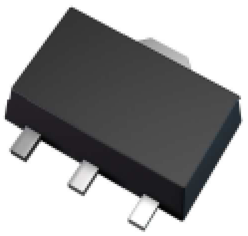
Mechanical Data

- 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 ⓔ3
- Weight: 0.052 grams (Approximate)
  Max Soldering Temperature +260°C for 30 secs as per JEDEC J-STD-020

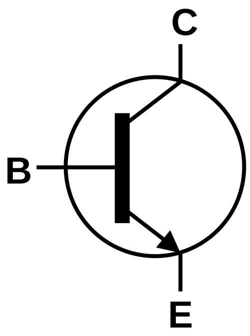
Applications

- Load management functions
- Motor controls
- DC-DC / DC-AC converters

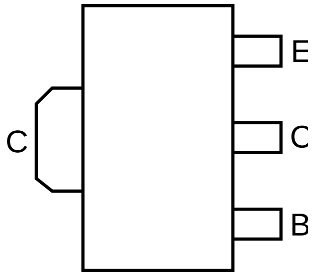
SOT89



Top View



Device Symbol



Top View
Pinout

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

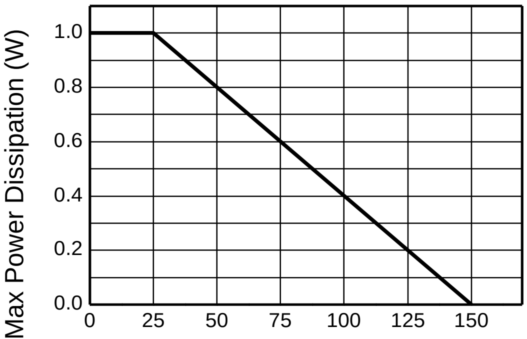
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	80	V
Collector-Emitter Voltage	V_{CEO}	60	V
Emitter-Base Voltage	V_{EBO}	5	V
Collector Current	I_C	3	A
Peak Pulse Collector Current	I_{CM}	6	A
Base Current	I_B	500	mA

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

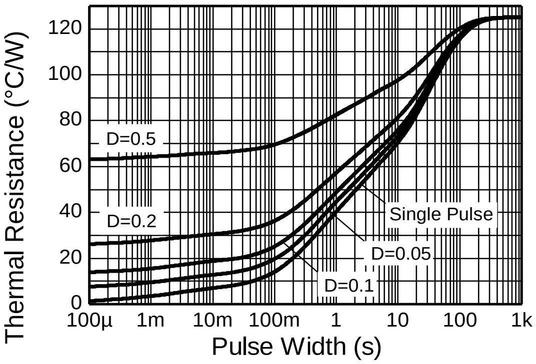
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	1	W
	(Note 6)		2	
Thermal Resistance, Junction to Ambient Air	(Note 5)	$R_{θJA}$	125	°C/W
	(Note 6)		62.5	
Thermal Resistance, Junction to Case	(Note 5)	$R_{θJC}$	26	°C/W
Thermal Resistance, Junction to Leads	(Note 7)	$R_{θJL}$	6	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Notes:
5. For a device surface mounted on 15mm x 15mm x 0.6mm FR4 PCB with high coverage of single sided 1 oz copper, in still air conditions; the device is measured when operating in steady state condition.
6. Same as note (5), except the device is mounted on 40mm x 40mm x 1.6mm FR4 PCB.
7. Thermal resistance from junction to solder-point (on the exposed collector pad).

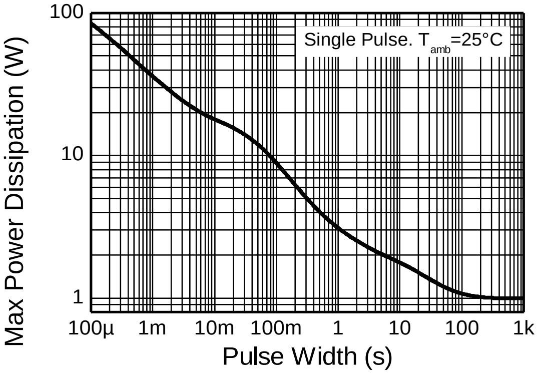
Thermal Characteristics and Derating Information



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV_{CBO}	80	—	—	V	$I_C = 100\mu A$
Collector-Emitter Breakdown Voltage (Note 8)	BV_{CEO}	60	—	—	V	$I_C = 10mA$
Emitter-Base Breakdown Voltage	BV_{EBO}	5	—	—	V	$I_E = 100\mu A$
Collector-Base Cutoff Current	I_{CBO}	—	—	0.1 10	µA	$V_{CB} = 60V$ $V_{CB} = 60V$, $T_A = +100°C$
Emitter-Base Cutoff Current	I_{EBO}	—	—	0.1	µA	$V_{EB} = 4V$
ON CHARACTERISTICS (Note 8)						
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	0.08 0.23	0.3 0.6	V V	$I_C = 1A$, $I_B = 100mA$ $I_C = 3A$, $I_B = 300mA$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	—	0.85	1.25	V	$I_C = 1A$, $I_B = 100mA$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$	—	0.8	1	V	$V_{CE} = 2V$, $I_C = 1A$
DC Current Gain	h_{FE}	70 100 80 40	200 200 185 120	— 300 — —	—	$V_{CE} = 2V$, $I_C = 50mA$ $V_{CE} = 2V$, $I_C = 500mA$ $V_{CE} = 2V$, $I_C = 1A$ $V_{CE} = 2V$, $I_C = 2A$
SMALL-SIGNAL CHARACTERISTICS						
Transition Frequency	f_T	140	200	—	MHz	$V_{CE} = 5V$, $I_C = 100mA$, f = 100MHz
Output Capacitance	C_{obo}	—	—	30	pF	$V_{CB} = 10V$, f = 1MHz
Switching Times	t_{on} t_{off}	— —	35 230	— —	ns ns	$V_{CC} = 10V$, $I_C = 500mA$, $I_{B1} = -I_{B2} = 50mA$

Note: 8. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%.

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

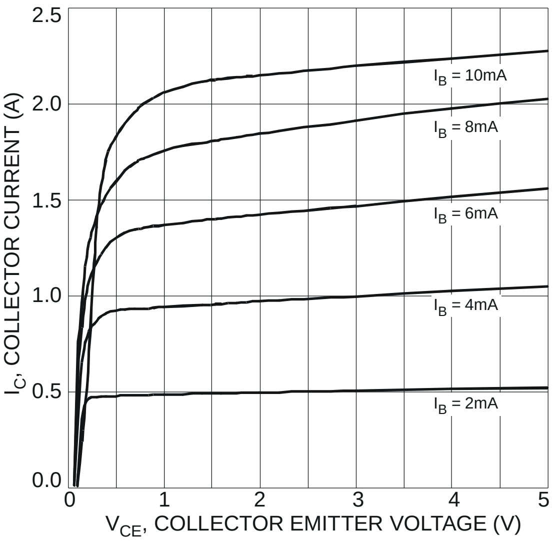


Figure 1 Typical Collector Current vs. Collector-Emitter Voltage

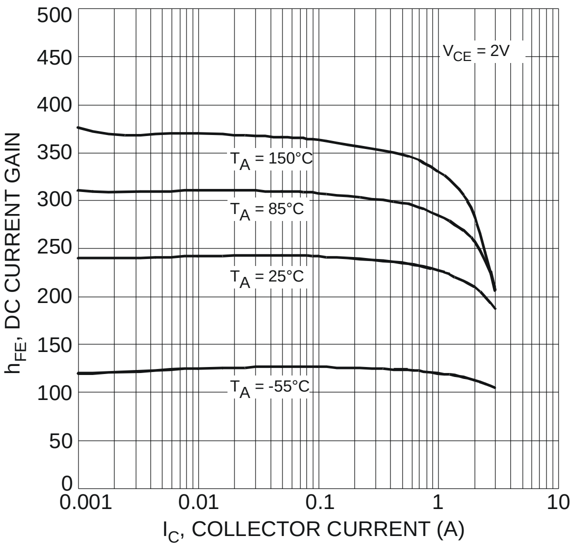


Figure 2 Typical DC Current Gain vs. Collector Current

Typical Electrical Characteristics (Continued)

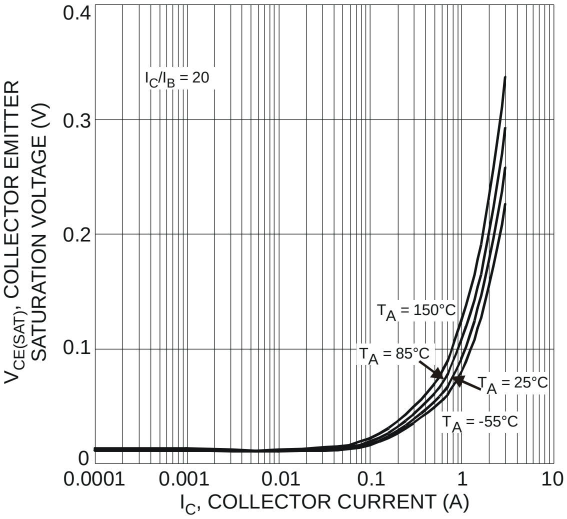


Figure 3 Typical Collector-Emitter Saturation Voltage vs. Collector Current

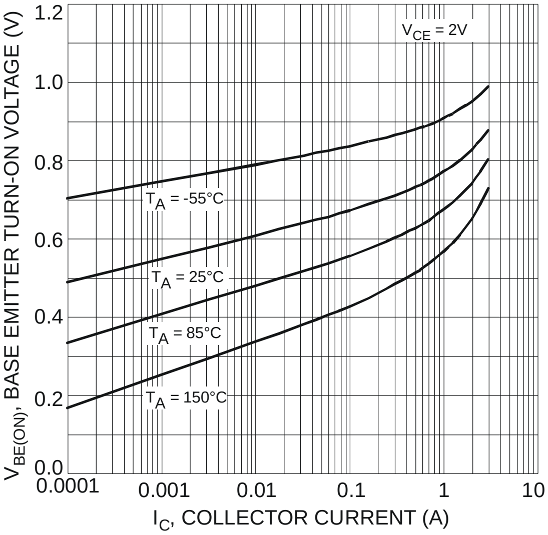


Figure 4 Typical Base-Emitter Turn-On Voltage vs. Collector Current

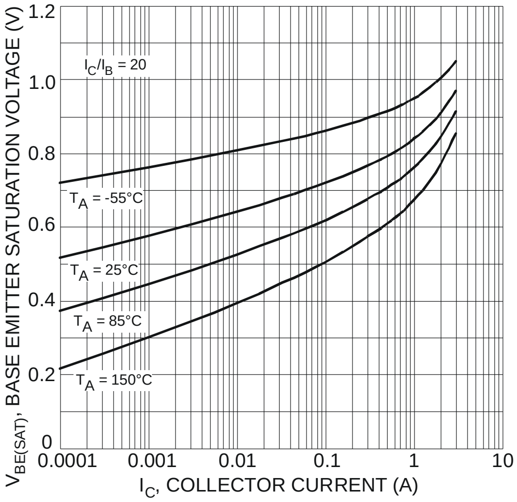


Figure 5 Typical Base-Emitter Saturation Voltage vs. Collector Current

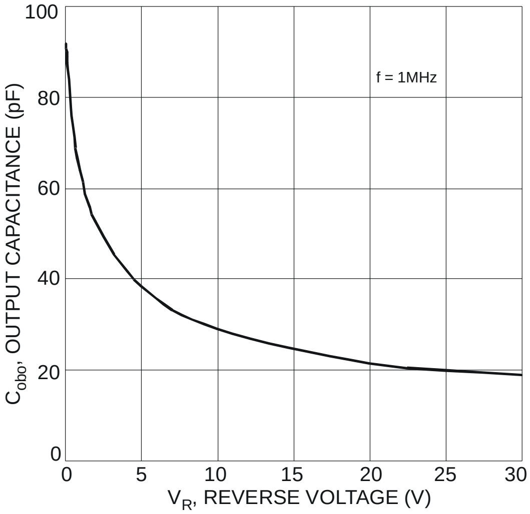


Figure 6 Typical Output Capacitance Characteristics

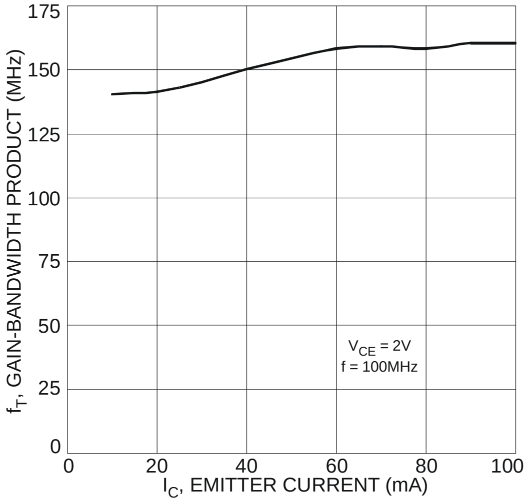
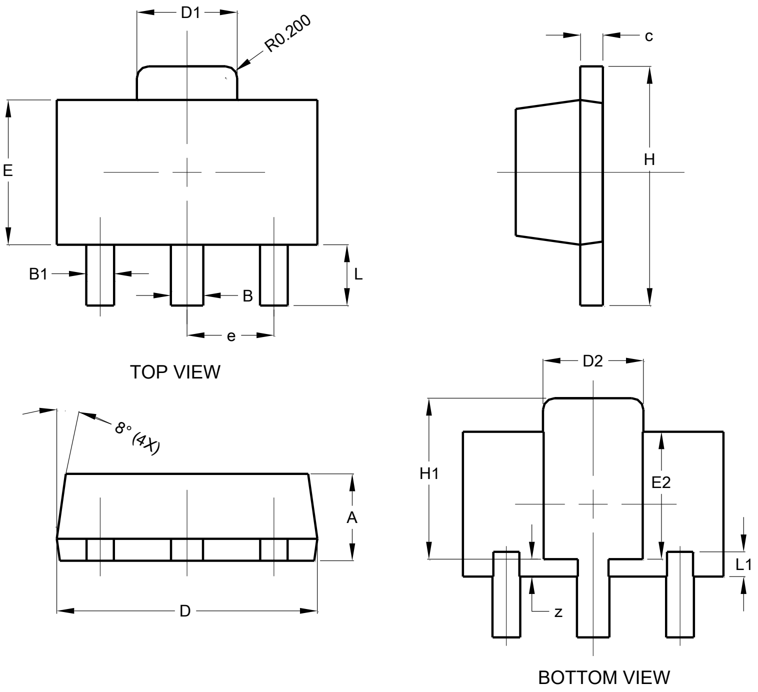


Figure 7 Typical Gain-Bandwidth Product vs. Emitter Current

Package Outline Dimensions

SOT89



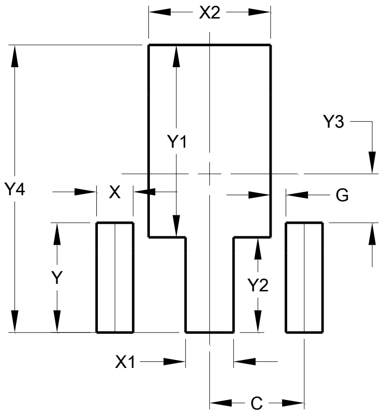
TOP VIEW

BOTTOM VIEW

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