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} > 160V
- I_C = 600mA High Collector Current
- Complementary PNP Type Available (NK-ZXTP5401FL)

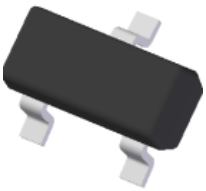
Mechanical Data

- Package: SOT23
- 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 e3
- Weight: 0.008 grams (Approximate)

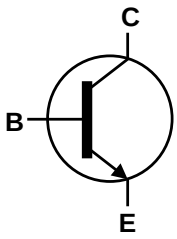
Application

- High voltage amplification

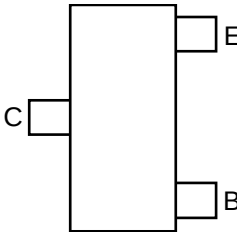
SOT23



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_{CBO}	180	V
Collector-Emitter Voltage	V_{CEO}	160	V
Emitter-Base Voltage	V_{EBO}	6	V
Continuous Collector Current (Note 5)	I_C	600	mA

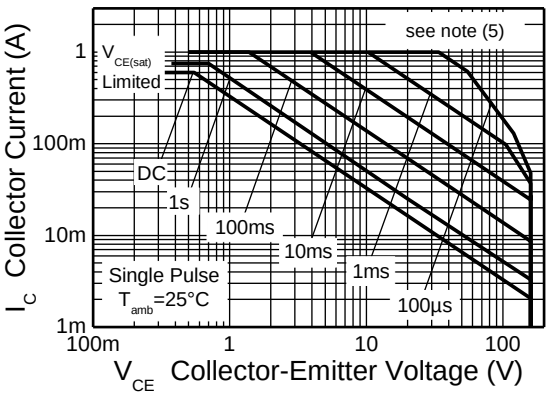
Thermal Characteristics (@ T_A = +25°C unless otherwise specified)

Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	330	mW
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	379	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

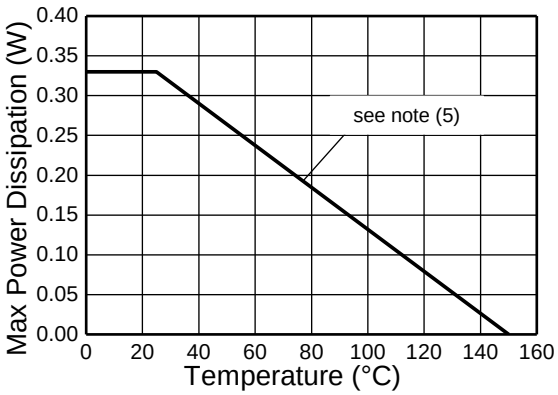
ESD Ratings (Note 6)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Charged Device Model	ESD CDM	1000	V	C3

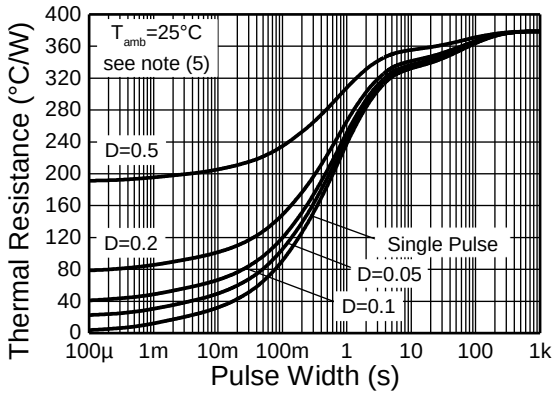
Notes: 5. For a device mounted on 25mm x 25mm pad layout 1oz copper that is on a single-sided FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
6. Refer to JEDEC specification JESD22-A114 and -JESD22-A115.



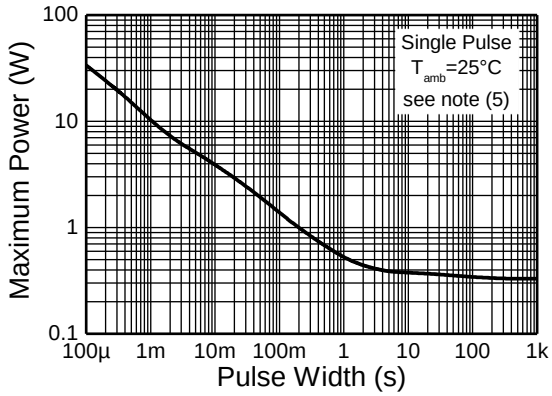
Safe Operating Area



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation

Electrical Characteristics @ T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Collector-Base Breakdown Voltage	BV_{CBO}	180	270	—	V	I_C = 100μA
Collector-Emitter Breakdown Voltage	BV_{CEO}	160	200	—	V	I_C = 1mA
Emitter-Base Breakdown Voltage	BV_{EBO}	6	7	—	V	I_E = 100μA
Collector Cutoff Current	I_{CBO}	— —	<1 —	50 50	nA μA	V_{CB} = 120V V_{CB} = 120V, T_A = 100°C
ON CHARACTERISTICS (Note 7)						
DC Current Gain	h_{FE}	80 80 30	135 145 65	— 250 —	—	I_C = 10mA, V_{CE} = 5V I_C = 10mA, V_{CE} = 5V I_C = 50mA, V_{CE} = 5V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	65 115	150 200	mV	I_C = 10mA, I_B = 1mA I_C = 50mA, I_B = 5mA
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	—	760 840	1000 1200	mV	I_C = 10mA, I_B = 1mA I_C = 50mA, I_B = 5mA
SMALL SIGNAL CHARACTERISTICS						
Output Capacitance	C_{obo}	—		6	pF	V_{CB} = 10V, f = 1.0MHz
Small Signal Current Gain	h_{fe}	50	—	260	—	V_{CE} = 10V, I_C = 1mA, f = 1kHz
Transition Frequency	f_T	—	130	—	MHz	V_{CE} = 10V, I_C = 10mA, f = 1kHz
Delay time	t_d	—	95	—	nS	V_{CC} = 10V, I_C = 10mA, I_{B1} =-I_{B2} = 1mA
Rise Time	t_r	—	64	—	nS	
Storage Time	t_s	—	1256	—	nS	
Fall Time	t_f	—	140	—	nS	

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

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

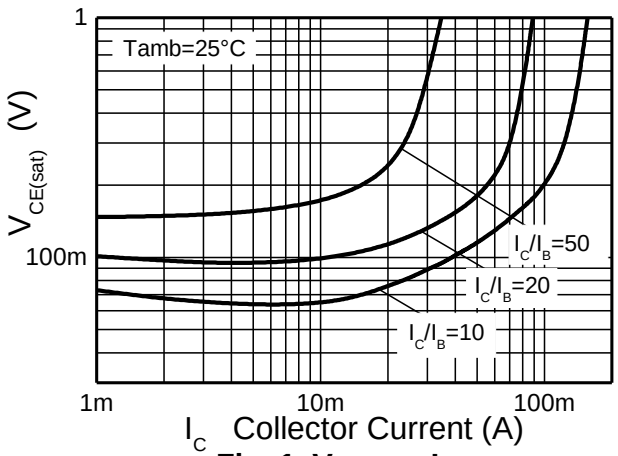


Fig. 1 $V_{CE(sat)}$ v I_C

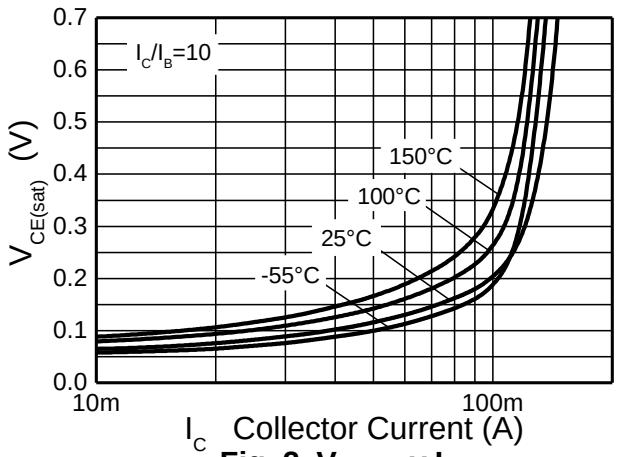


Fig. 2 $V_{CE(sat)}$ v I_C

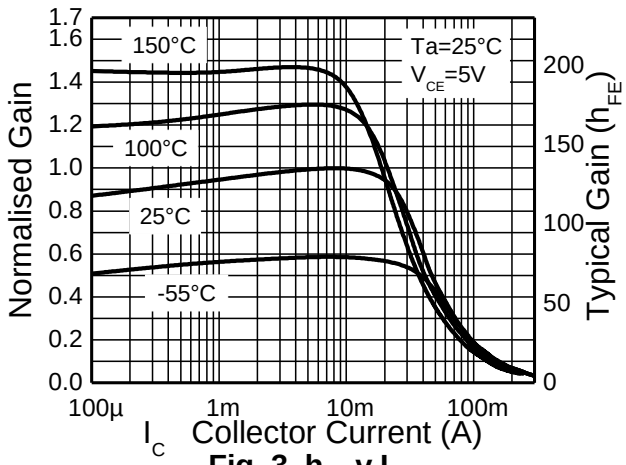


Fig. 3 h_{FE} v I_C

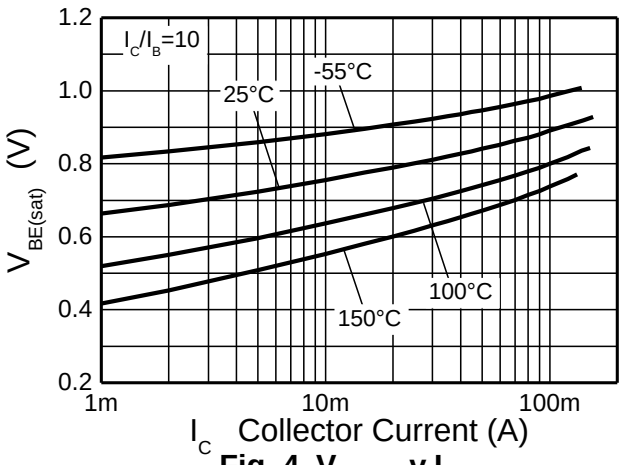


Fig. 4 $V_{BE(sat)}$ v I_C

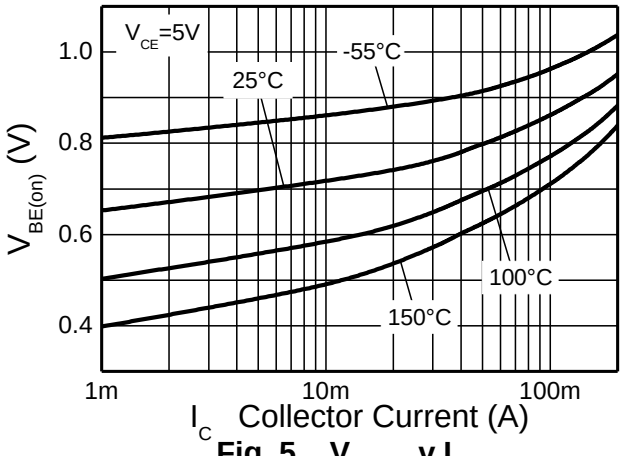
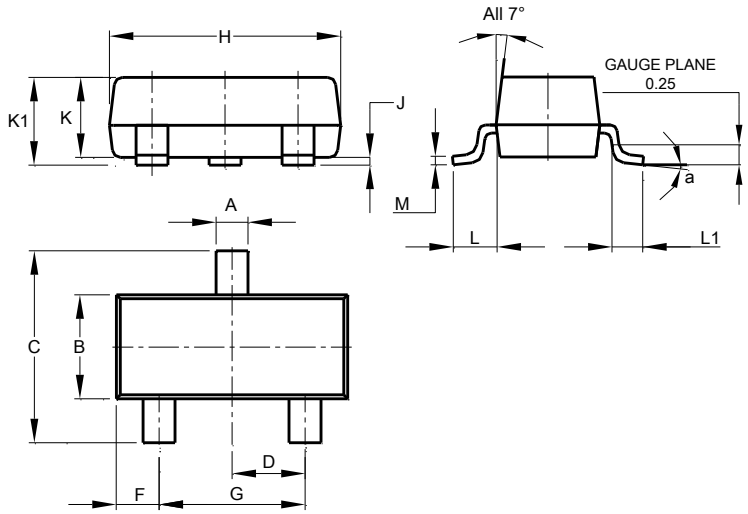


Fig. 5 $V_{BE(on)}$ v I_C

Package Outline Dimensions

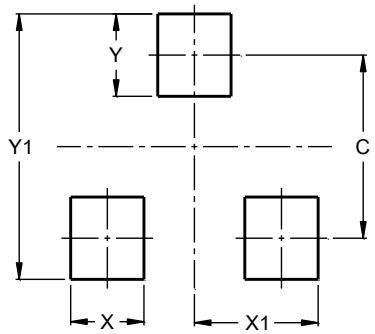
SOT23



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

SOT23



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