



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

0755-83047638

ysbdt@szyoushang.cn

www.szyoushang.cn



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Features

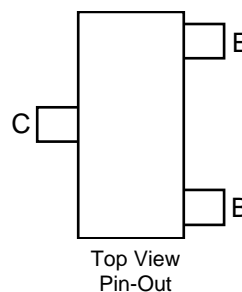
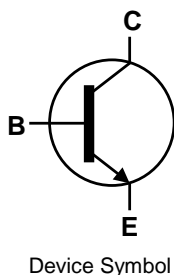
- $BV_{CEO} > 160V$
- $I_C = 600mA$ High Collector Current
- Complementary PNP Type Available (NK-ZXTP5401FLQ)

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 ③
- Weight: 0.008 grams (Approximate)

Application

- High voltage amplification



Absolute Maximum Ratings (@ $T_A = +25^\circ\text{C}$ 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

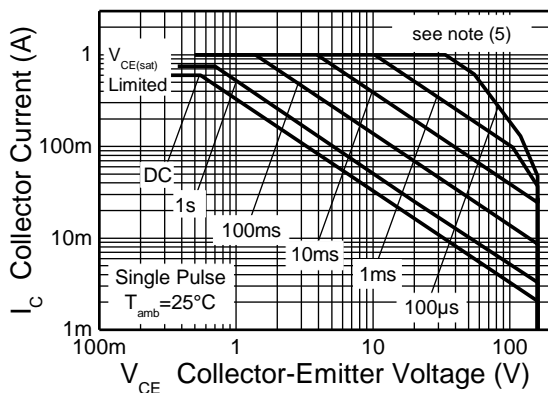
Thermal Characteristics (@ $T_A = +25^\circ\text{C}$ unless otherwise specified)

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

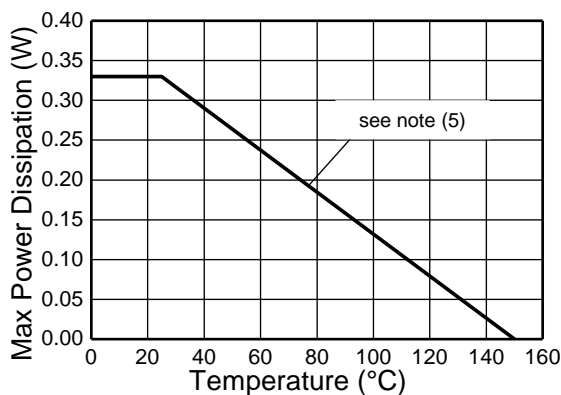
ESD Ratings (Note 6)

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

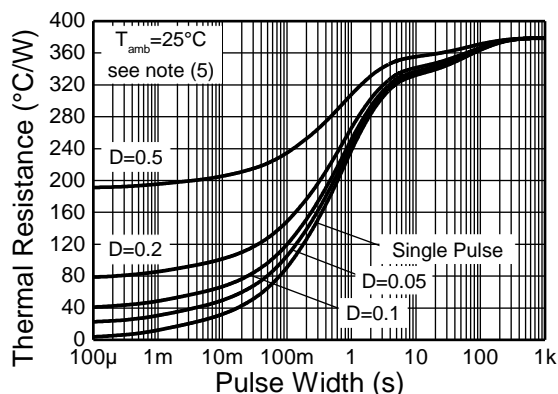
- Notes:
- For a device mounted on 25mm x 25mm pad layout 1oz copper that is on a single-sided FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
 - Refer to JEDEC specification JESD22-A114 and JESD22-A115.



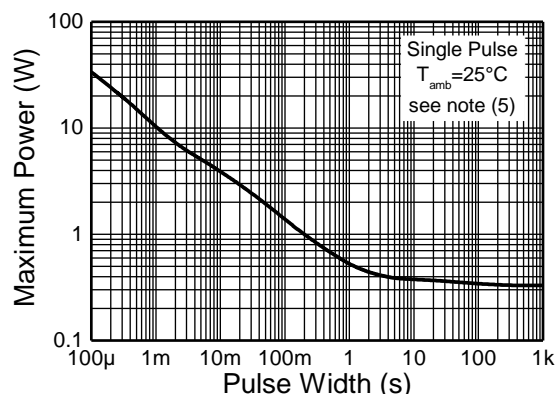
Safe Operating Area



Derating Curve



Transient Thermal Impedance



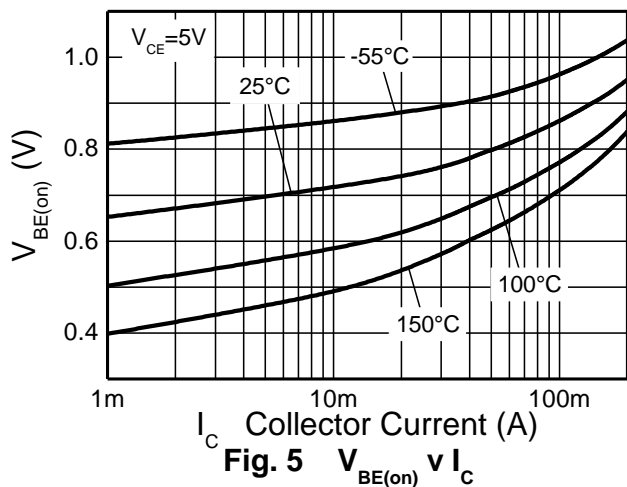
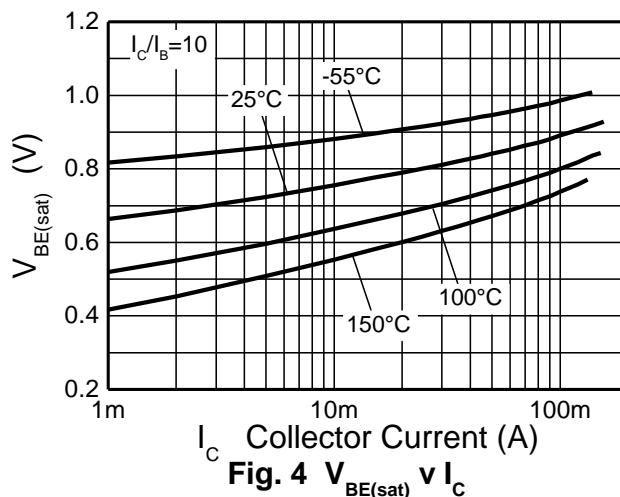
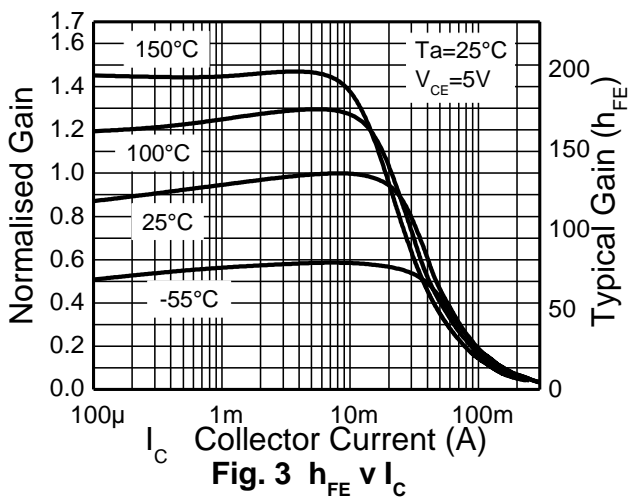
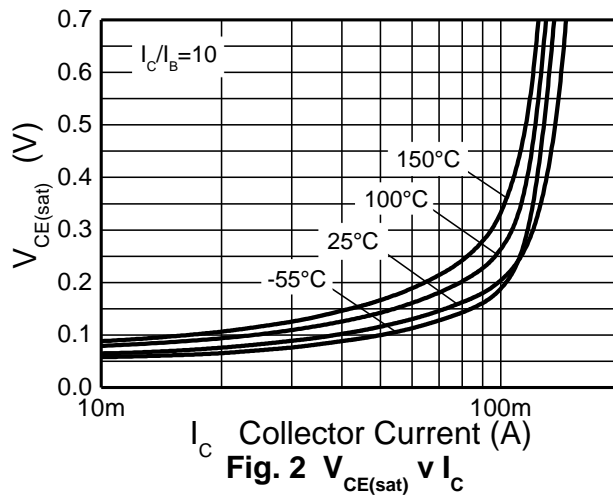
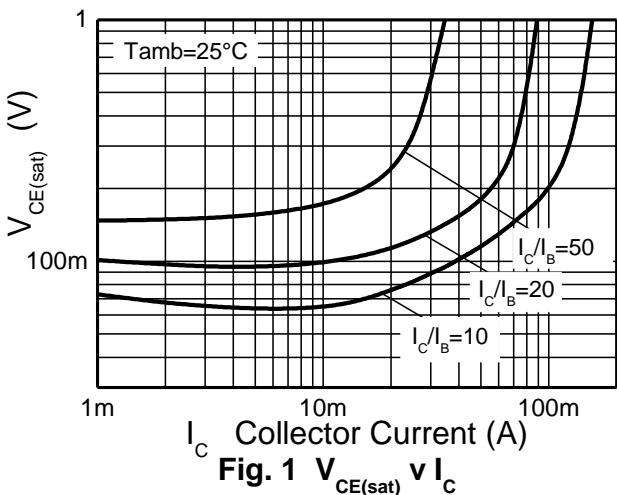
Pulse Power Dissipation

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	nA	V _{CB} = 120V
		—	—	50	μA	V _{CB} = 120V, T _A = 100°C
ON CHARACTERISTICS (Note 7)						
DC Current Gain	h _{FE}	80	135	—	—	I _C = 10mA, V _{CE} = 5V
		80	145	250	—	I _C = 10mA, V _{CE} = 5V
		30	65	—	—	I _C = 50mA, V _{CE} = 5V
Collector-Emitter Saturation Voltage	V _{CE(sat)}	—	65	150	mV	I _C = 10mA, I _B = 1mA
			115	200		I _C = 50mA, I _B = 5mA
Base-Emitter Saturation Voltage	V _{BE(sat)}	—	760	1000	mV	I _C = 10mA, I _B = 1mA
			840	1200		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	

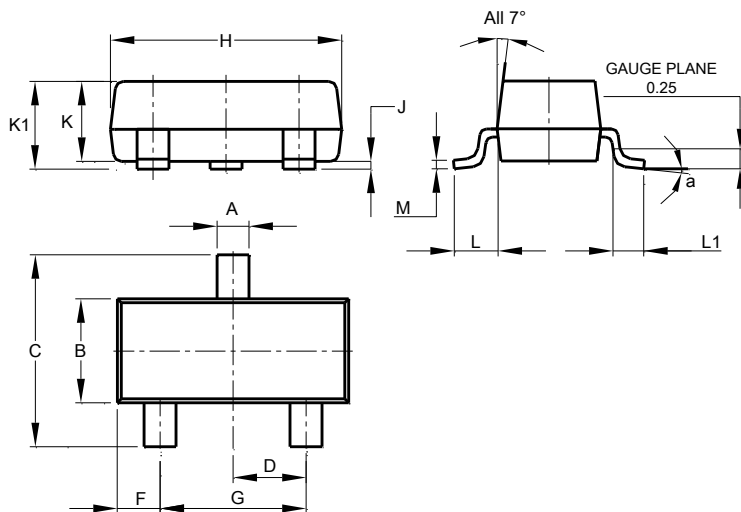
Note: 7. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

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



Package Outline Dimensions

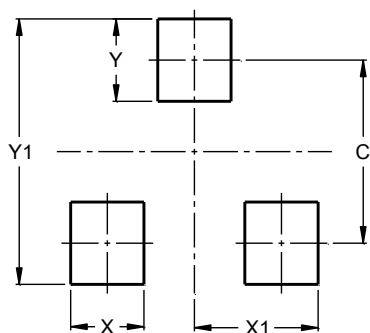
SOT23



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