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

0755-83047638
ysbdt@szyoushang.cn
www.szyoushang.cn

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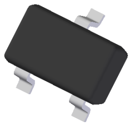
Features

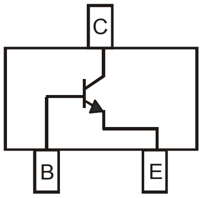
- Epitaxial Planar Die Construction
- Low Collector-Emitter Saturation Voltage, $V_{CE(SAT)}$
- Complementary PNP Type Available (NK-DSS5160U)
- Ultra-Small Surface Mount Package

Mechanical Data

- Case: SOT-323
- Case Material: Molded Plastic, “Green” Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Finish — Matte Tin annealed over Copper Plated Alloy 42 leadframe. Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Marking Information: See Page 4
- Ordering Information: See Page 4
- Weight: 0.006 grams (approximate)



Top View



Device Schematic

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 - Continuous	I_C	1	A
Peak Pulse Collector Current	I_{CM}	2	A
Base Current (DC)	I_B	300	mA
Peak Base Current	I_{BM}	1	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 3) @ T_A = 25°C	P_D	400	mW
Thermal Resistance, Junction to Ambient (Note 3) @ T_A = 25°C	$R_{\theta JA}$	313	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Notes: 1. No purposefully added lead.

Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	80	—	—	V	I_C = 100μA, I_E = 0
Collector-Emitter Breakdown Voltage (Note 4)	$V_{(BR)CEO}$	60	—	—	V	I_C = 10mA, I_B = 0
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5	—	—	V	I_E = 100μA, I_C = 0
Collector Cutoff Current	I_{CBO}	—	—	100 50	nA μA	V_{CB} = 60V, I_E = 0 V_{CB} = 60V, I_E = 0, T_A = 150°C
Collector Cutoff Current	I_{CES}	—	—	100	nA	V_{CE} = 60V, V_{BE} = 0
Emitter Cutoff Current	I_{EBO}	—	—	100	nA	V_{EB} = 5V, I_C = 0
ON CHARACTERISTICS (Note 4)						
DC Current Gain	h_{FE}	250 200 100	— — —	— — —	—	V_{CE} = 5V, I_C = 1mA V_{CE} = 5V, I_C = 500mA V_{CE} = 5V, I_C = 1A
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	— — —	— — —	115 150 280	mV	I_C = 100mA, I_B = 1mA I_C = 500mA, I_B = 50mA I_C = 1A, I_B = 100mA
Collector-Emitter Saturation Resistance	$R_{CE(SAT)}$	—	—	280	mΩ	I_C = 1A, I_B = 100mA
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	—	—	1.1	V	I_C = 1A, I_B = 50mA
Base-Emitter Turn On Voltage	$V_{BE(ON)}$	—	—	0.9	V	V_{CE} = 5V, I_C = 1A
SMALL SIGNAL CHARACTERISTICS						
Output Capacitance	C_{obo}	—	—	10	pF	V_{CB} = 10V, f = 1.0MHz
Current Gain-Bandwidth Product	f_T	150	—	—	MHz	V_{CE} = 10V, I_C = 50mA, f = 100MHz
SWITCHING CHARACTERISTICS						
Turn-On Time	t_{on}	—	63	—	ns	V_{CC} = 10V I_C = 0.5A, I_{B1} = I_{B2} = 25mA
Delay Time	t_d	—	33	—	ns	
Rise Time	t_r	—	30	—	ns	
Turn-Off Time	t_{off}	—	420	—	ns	
Storage Time	t_s	—	380	—	ns	
Fall Time	t_f	—	40	—	ns	

Notes: 4. Measured under pulsed conditions. Pulse width = 300μs. Duty cycle ≤2%.

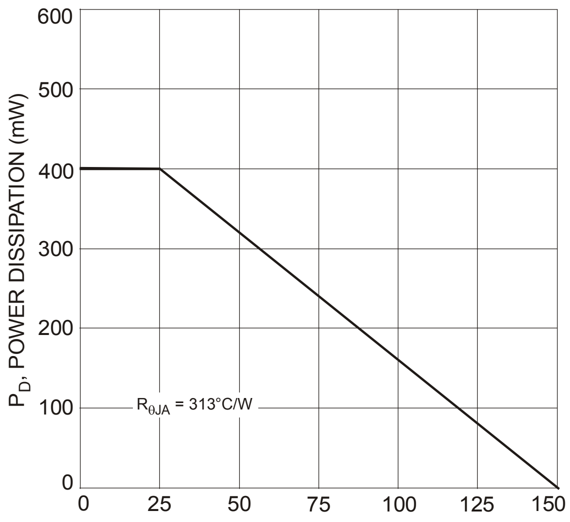


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 3)

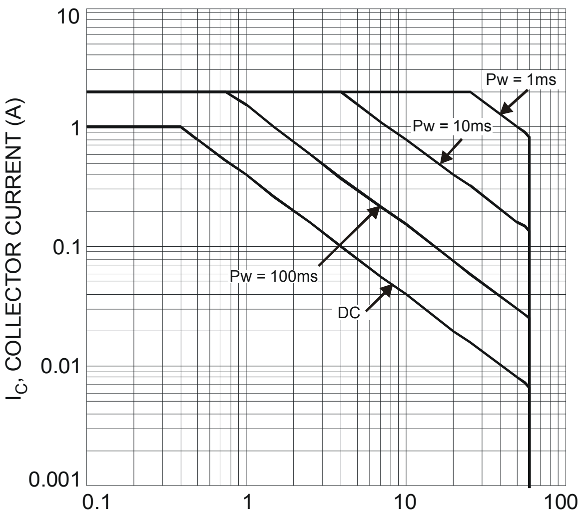


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage (Note 3)

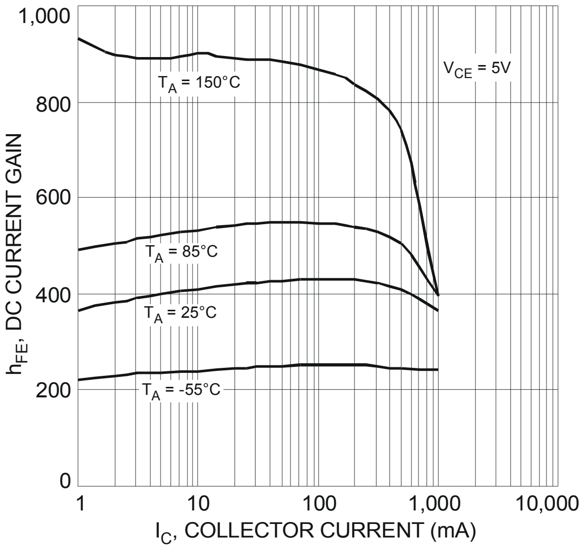


Fig. 3 Typical DC Current Gain vs. Collector Current

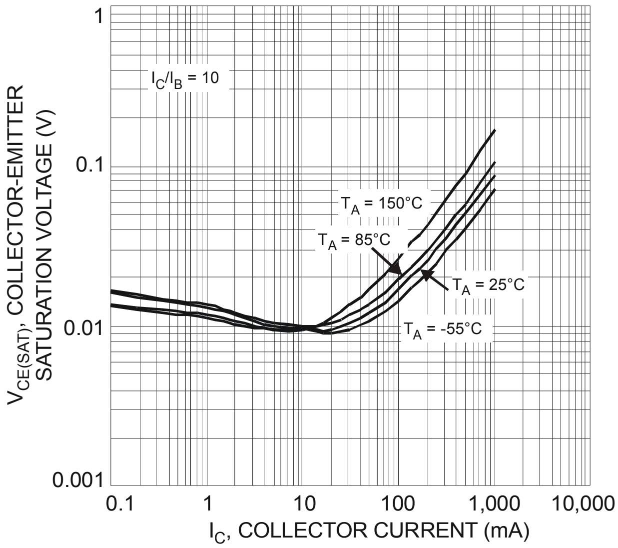


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

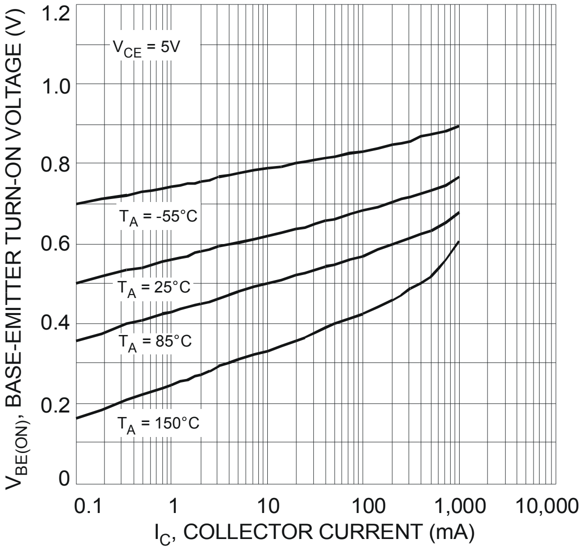


Fig. 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

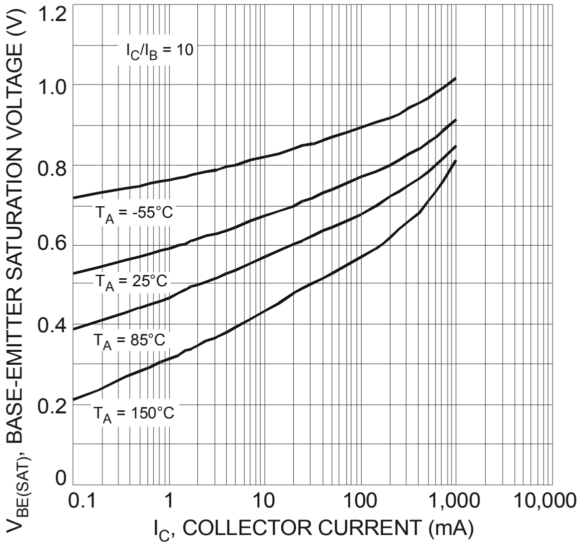


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

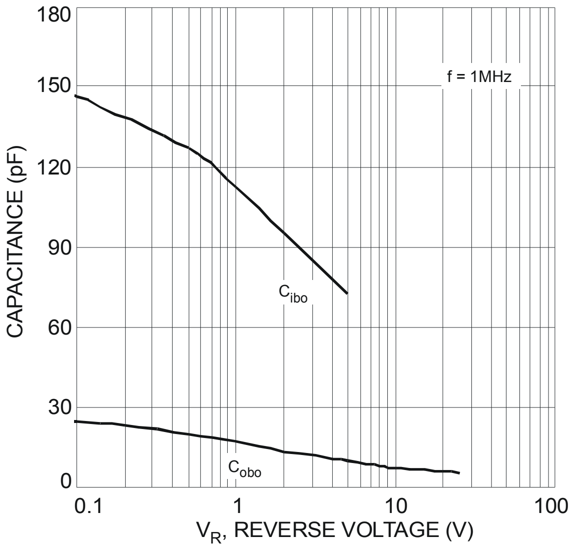


Fig. 7 Typical Capacitance Characteristics

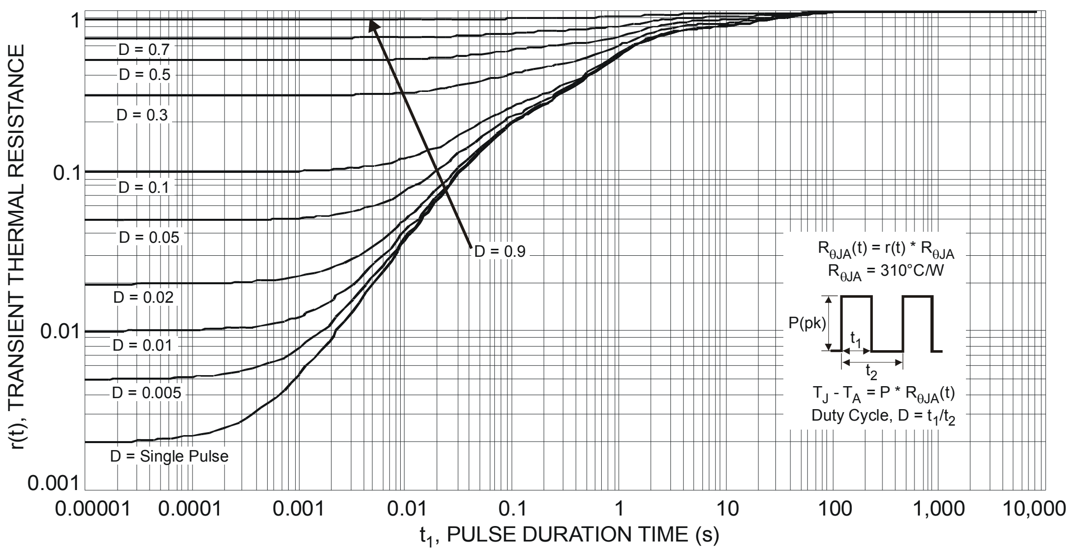
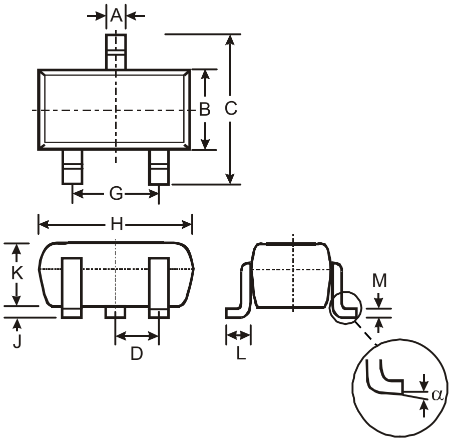


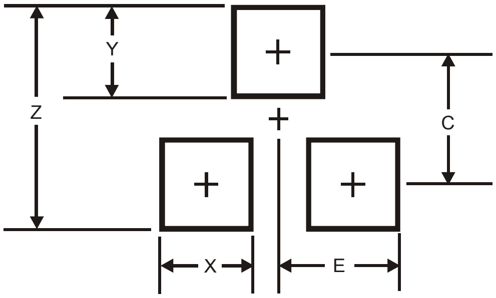
Fig. 8 Transient Thermal Response (Note 3)

Package Outline Dimensions



SOT-323			
Dim	**Min**	**Max**	**Typ**
A	0.25	0.40	0.30
B	1.15	1.35	1.30
C	2.00	2.20	2.10
D	-	-	0.65
G	1.20	1.40	1.30
H	1.80	2.20	2.15
J	0.0	0.10	0.05
K	0.90	1.00	1.00
L	0.25	0.40	0.30
M	0.10	0.18	0.11
α	0°	8°	-
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
Z	2.8
X	0.7
Y	0.9
C	1.9
E	1.0