



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

- Epitaxial Planar Die Construction
- Complementary PNP Type Available (NK-DSS5240V)
- Low Collector-Emitter Saturation Voltage, $V_{CE(SAT)}$
- Surface Mount Package Suited for Automated Assembly
- Ultra-Small Surface Mount Package

Mechanical Data

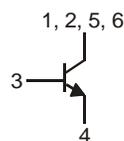
- Case: SOT-563
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Finish — Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Marking Information: See Page 4
- Ordering Information: See Page 4
- Weight: 0.003 grams (approximate)



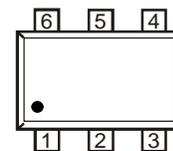
Top View



Bottom View



Device Schematic



Pin Out Configuration

Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	40	V
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter-Base Voltage	V_{EBO}	5	V
Collector Current - Continuous	I_C	2	A
Peak Pulse Collector Current	I_{CM}	3	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) @ $T_A = 25^\circ\text{C}$	P_D	600	mW
Thermal Resistance, Junction to Ambient (Note 3) @ $T_A = 25^\circ\text{C}$	$R_{\theta JA}$	208	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

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	$V_{(BR)CBO}$	40	—	—	V	$I_C = 100\mu\text{A}, I_E = 0$
Collector-Emitter Breakdown Voltage (Note 5)	$V_{(BR)CEO}$	40	—	—	V	$I_C = 10\text{mA}, I_B = 0$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5	—	—	V	$I_E = 100\mu\text{A}, I_C = 0$
Collector Cutoff Current	I_{CBO}	—	—	100	nA	$V_{CB} = 40\text{V}, I_E = 0$
Collector Cutoff Current	I_{CES}	—	—	100	nA	$V_{CE} = 40\text{V}, V_{EB} = 0$
Emitter Cutoff Current	I_{EBO}	—	—	100	nA	$V_{EB} = 5\text{V}, I_C = 0$
ON CHARACTERISTICS (Note 5)						
DC Current Gain	h_{FE}	300	—	—	—	$V_{CE} = 5\text{V}, I_C = 1\text{mA}$
		300	—	900		$V_{CE} = 5\text{V}, I_C = 500\text{mA}$
		200	—	—		$V_{CE} = 5\text{V}, I_C = 1\text{A}$
		75	—	—		$V_{CE} = 5\text{V}, I_C = 2\text{A}$
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	—	—	75	mV	$I_C = 100\text{mA}, I_B = 1\text{mA}$
		—	—	100		$I_C = 500\text{mA}, I_B = 50\text{mA}$
		—	—	190		$I_C = 1\text{A}, I_B = 100\text{mA}$
		—	—	400		$I_C = 2\text{A}, I_B = 200\text{mA}$
Collector-Emitter Saturation Resistance	$R_{CE(SAT)}$	—	—	190	m Ω	$I_C = 1\text{A}, I_B = 100\text{mA}$
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	—	—	1.2	V	$I_C = 1\text{A}, I_B = 100\text{mA}$
Base-Emitter Turn On Voltage	$V_{BE(ON)}$	—	—	1.1	V	$V_{CE} = 5\text{V}, I_C = 1\text{A}$
SMALL SIGNAL CHARACTERISTICS						
Output Capacitance	C_{obo}	—	—	10	pF	$V_{CB} = 10\text{V}, f = 1.0\text{MHz}$
Current Gain-Bandwidth Product	f_T	150	—	—	MHz	$V_{CE} = 10\text{V}, I_C = 50\text{mA}, f = 100\text{MHz}$
SWITCHING CHARACTERISTICS						
Turn-On Time	t_{on}	—	70	—	ns	$V_{CC} = 10\text{V}, I_C = 1\text{A}, I_{B1} = I_{B2} = 50\text{mA}$
Delay Time	t_d	—	20	—	ns	
Rise Time	t_r	—	50	—	ns	
Turn-Off Time	t_{off}	—	310	—	ns	
Storage Time	t_s	—	270	—	ns	
Fall Time	t_f	—	40	—	ns	

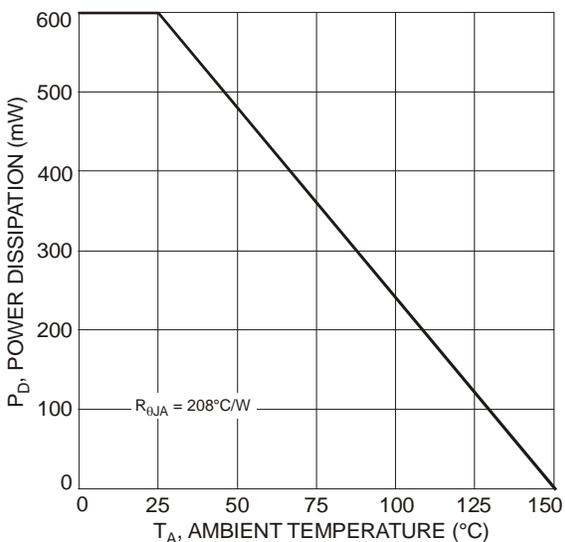
 Notes: 5. Measured under pulsed conditions. Pulse width = 300 μs . Duty cycle $\leq 2\%$.


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

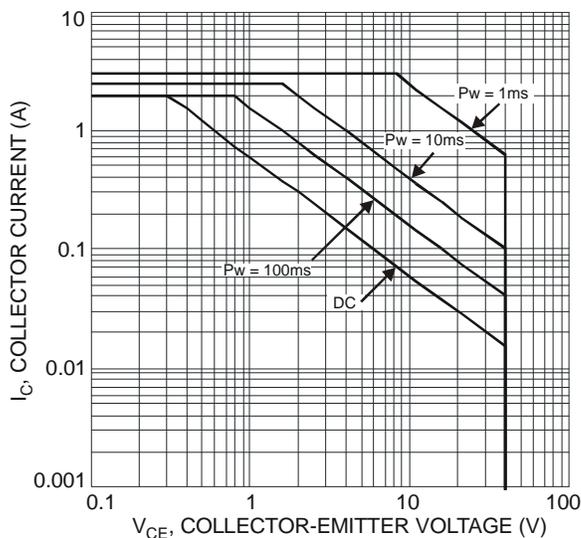


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage (Note 3)

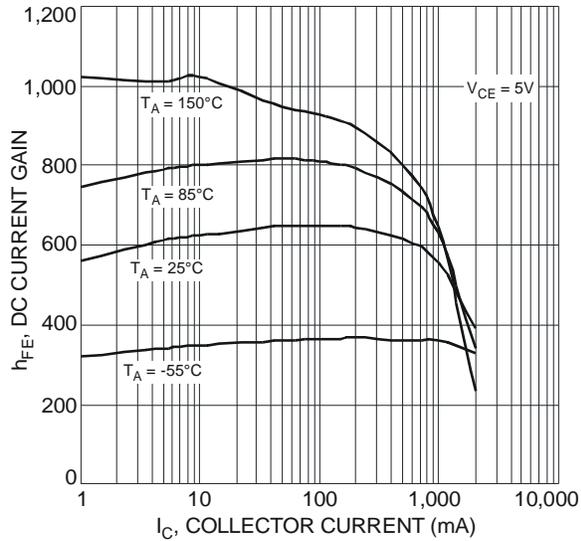


Fig. 3 Typical DC Current Gain vs. Collector Current

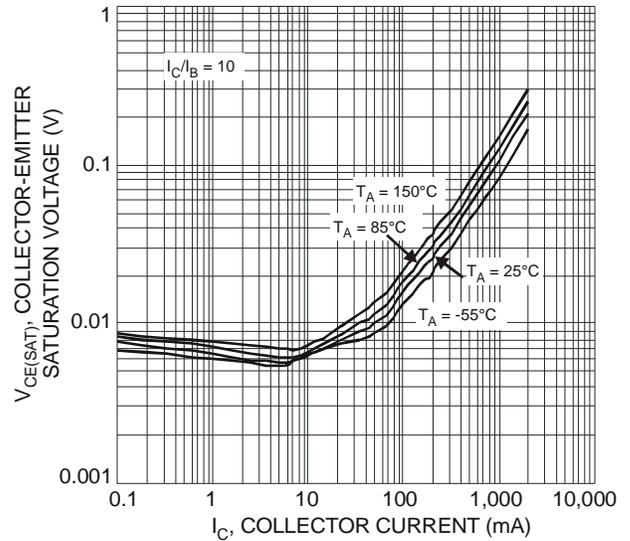


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

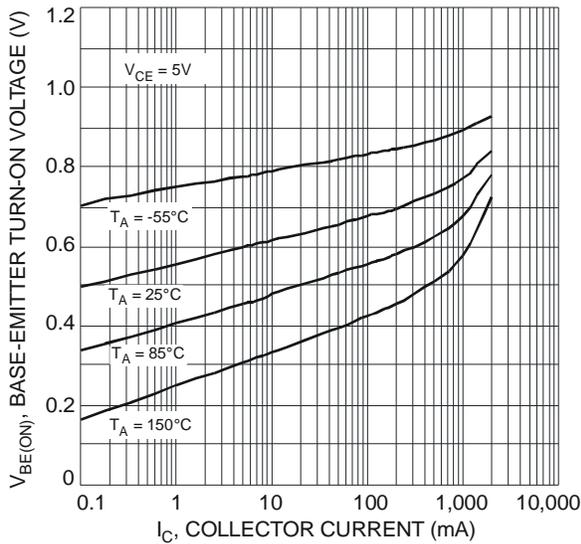


Fig. 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

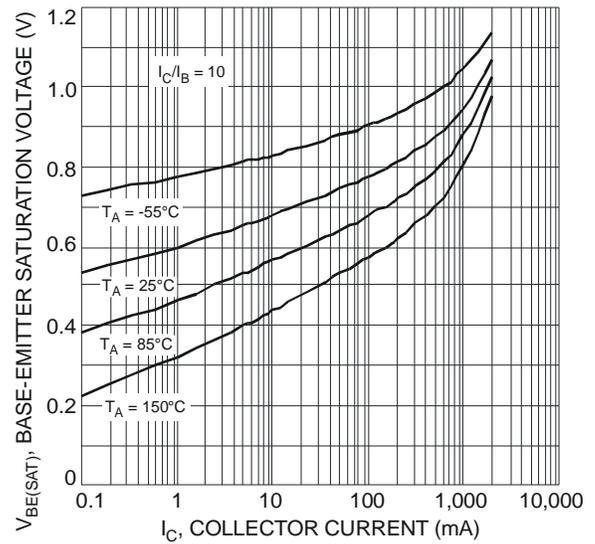


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

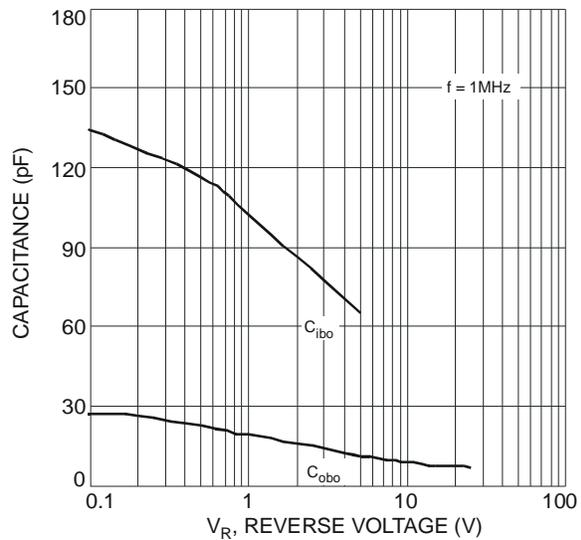


Fig. 7 Typical Capacitance Characteristics

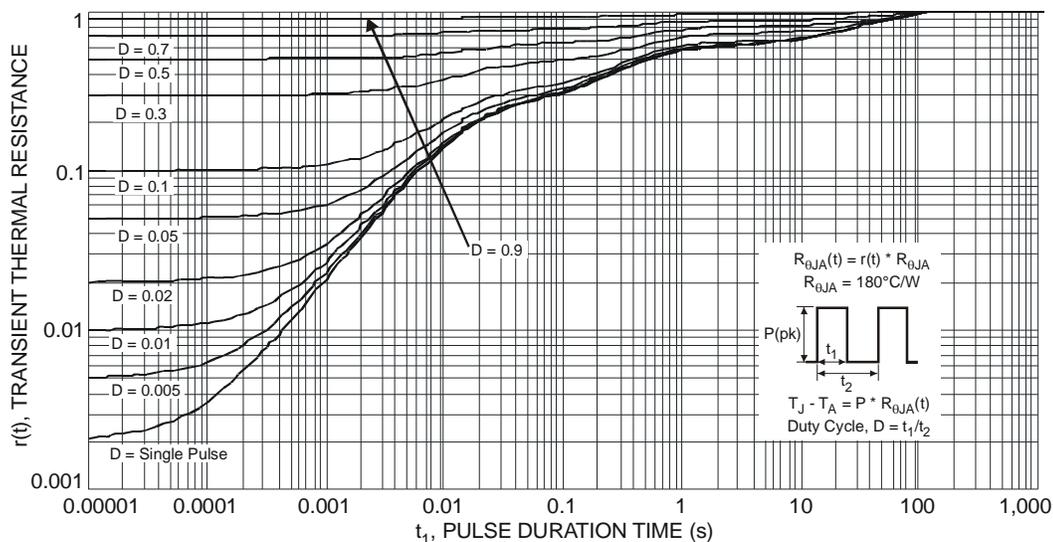
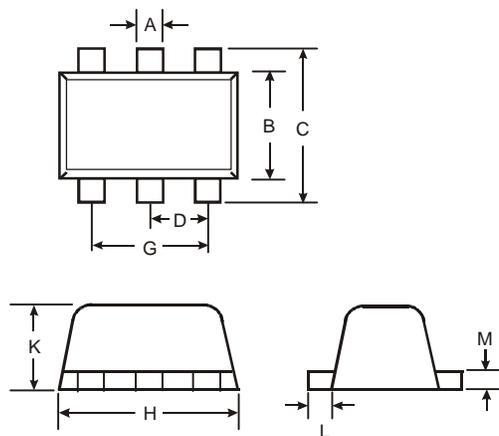


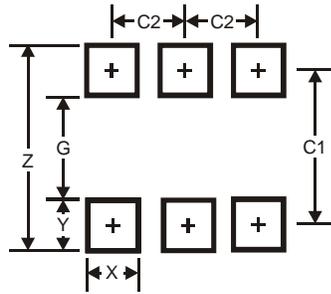
Fig. 8 Transient Thermal Response (Note 3)

Package Outline Dimensions



SOT-563			
Dim	Min	Max	Typ
A	0.15	0.30	0.20
B	1.10	1.25	1.20
C	1.55	1.70	1.60
D	-	-	0.50
G	0.90	1.10	1.00
H	1.50	1.70	1.60
K	0.55	0.60	0.60
L	0.10	0.30	0.20
M	0.10	0.18	0.11
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
Z	2.2
G	1.2
X	0.375
Y	0.5
C1	1.7
C2	0.5