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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Description

This bipolar junction transistor (BJT) is designed to meet the stringent requirements of automotive applications.

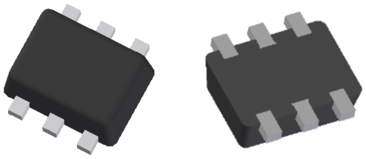
Features

- BV_{CEO} > -40V
- I_C = -1.8A High Continuous Collector Current
- I_{CM} = -3A Peak Pulse Current
- Low Collector-Emitter Saturation Voltage

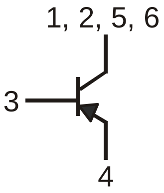
Mechanical Data

- Package: SOT563
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification 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 0.003 grams (Approximate)

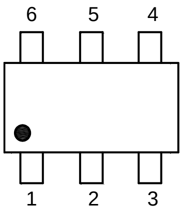
SOT563



Top View Bottom View



Device Schematic



Pin-Out Configuration

Absolute Maximum Ratings (@T_A = +25°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	-1.8	A
Peak Repetitive Collector Current (Note 6)	I_{CRP}	-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 (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	600	mW
Thermal Resistance, Junction to Ambient Air (Note 7)	$R_{\theta JA}$	208	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 8)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge—Human Body Model	ESD HBM	4000	V	3A
Electrostatic Discharge—Charged Device Model	ESD CDM	1000	V	C3

Notes:

5. For a device mounted on the minimum recommended pad layout on a single-sided 1.6mm FR-4 PCB; device is measured under still air conditions whilst operating in a steady-state.
6. Operated under pulse conditions: duty cycle ⩽ 20%, pulse width tp ⩽ 30ms.
7. Thermal resistance from junction to solder-point (at the end of the collector lead).
8. Refer to JEDEC specification JS-001 and JS-002.

Thermal Characteristics and Derating Information

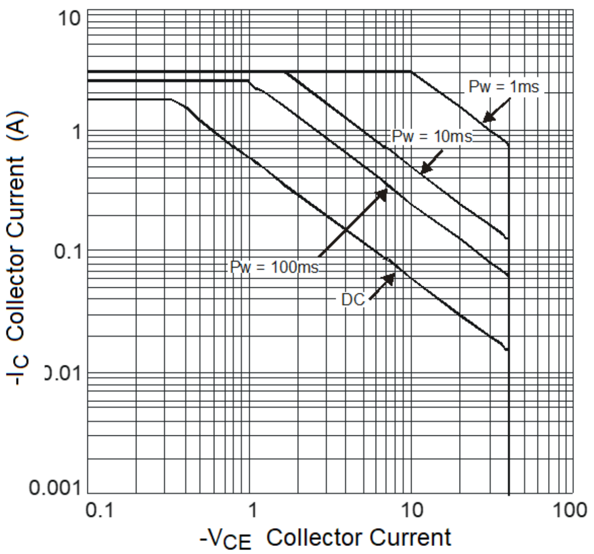


Fig.1 Safe Operating Area

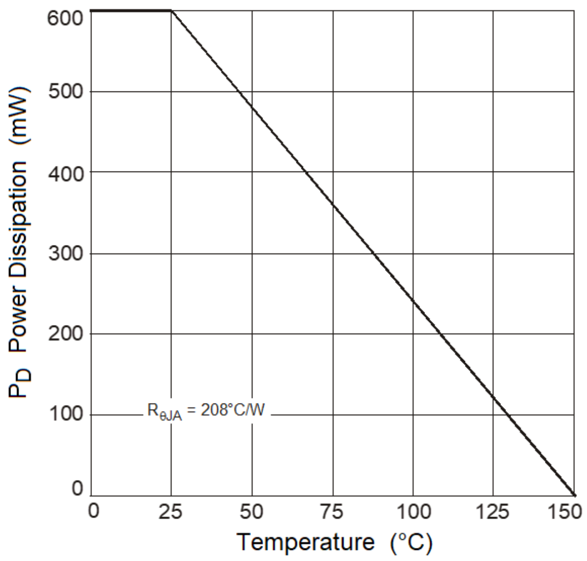


Fig.2 Derating Curve

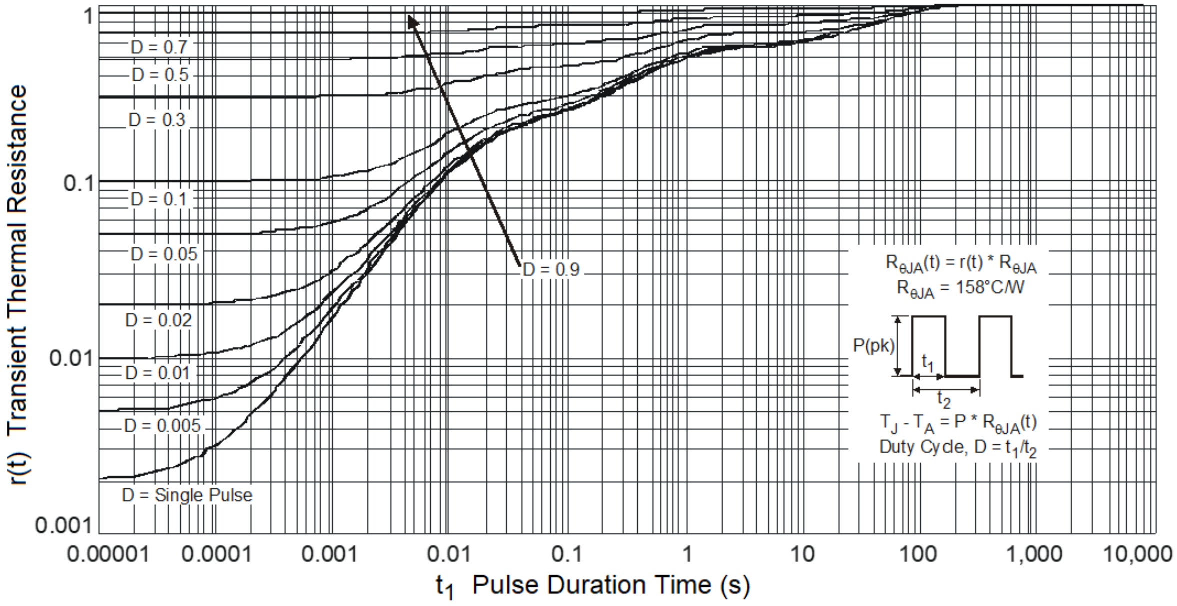


Fig.3 Transient Thermal Response (Note 5)

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}	-40	—	—	V	I_C = -100µA
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	-40	—	—	V	I_C = -10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	-5	—	—	V	I_E = -100µA
Collector-Base Cutoff Current	I_{CBO}	—	—	-100	nA	V_{CB} = -40V, I_E = 0
		—	—	-50	µA	V_{CB} = -40V, I_E = 0, T_A = 150°C
Collector Cutoff Current	I_{CES}	—	—	-100	nA	V_{CB} = -40V, V_{BE} = 0
Emitter-Base Cutoff Current	I_{EBO}	—	—	-100	nA	V_{EB} = -5V, I_C = 0
ON CHARACTERISTICS (Note 9)						
DC Current Gain	h_{FE}	300	—	—	—	V_{CE} = -5V, I_C = -1mA
		300	—	800		V_{CE} = -5V, I_C = -100mA
		250	—	—		V_{CE} = -5V, I_C = -500mA
		160	—	—		V_{CE} = -5V, I_C = -1A
		50	—	—		V_{CE} = -5V, I_C = -2A
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	—	-120	mV	I_C = -100mA, I_B = -1mA
		—	—	-145		I_C = -500mA, I_B = -50mA
		—	—	-250		I_C = -1A, I_B = -100mA
		—	—	-530		I_C = -2A, I_B = -200mA
Equivalent On-Resistance	$R_{CE(sat)}$	—	—	250	mΩ	I_C = -1A, I_B = -100mA
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	—	—	-1.1	V	I_C = -1A, I_B = -100mA
Base-Emitter Turn-on Voltage	$V_{BE(on)}$	—	—	-1	V	V_{CE} = -5V, I_C = -1A
SMALL SIGNAL CHARACTERISTICS						
Transition Frequency	f_T	150	—	—	MHz	V_{CE} = -10V, I_C = -50mA, f = 100MHz
Output Capacitance	C_{obo}	—	—	15	pF	V_{CB} = -10V, f = 1MHz
SWITCHING CHARACTERISTICS						
Turn-On Time	t_{on}	—	60	—	ns	V_{CC} = -10V I_C = -1A, I_{B1} = I_{B2} = -50mA
Delay Time	t_d	—	20	—	ns	
Rise Time	t_r	—	40	—	ns	
Turn-Off Time	t_{off}	—	167	—	ns	
Storage Time	t_s	—	140	—	ns	
Fall Time	t_f	—	27	—	ns	

Note: 9. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%.

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

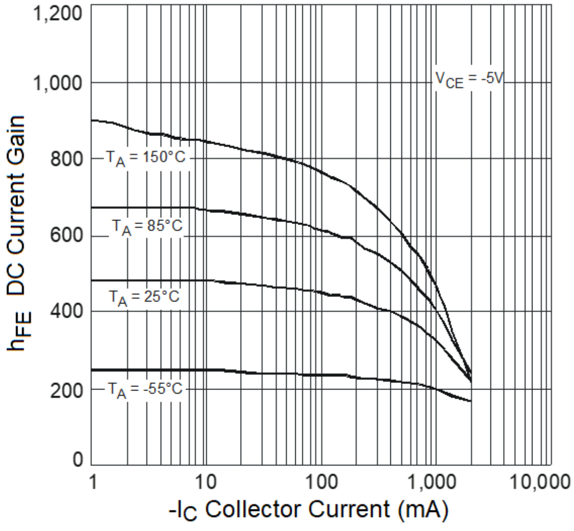


Fig.4 h_{FE} v I_C

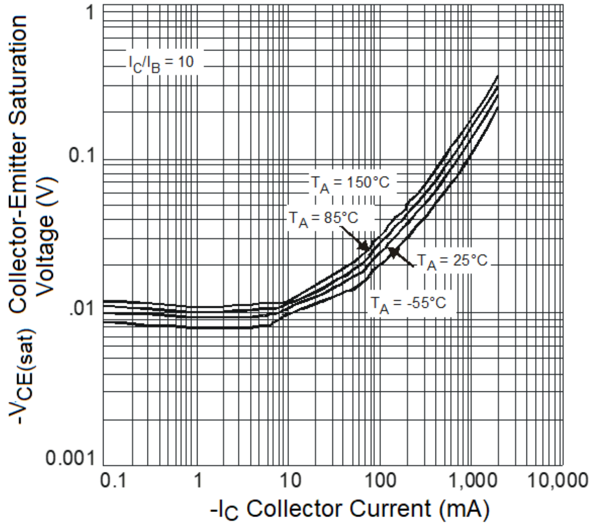


Fig.5 $V_{CE(sat)}$ v I_C

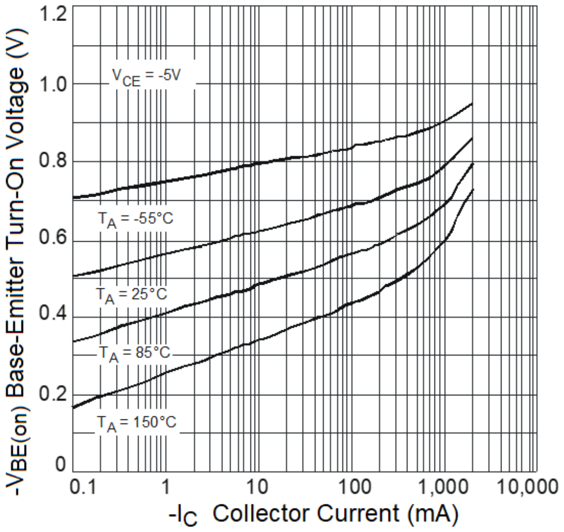


Fig.6 $V_{BE(on)}$ v I_C

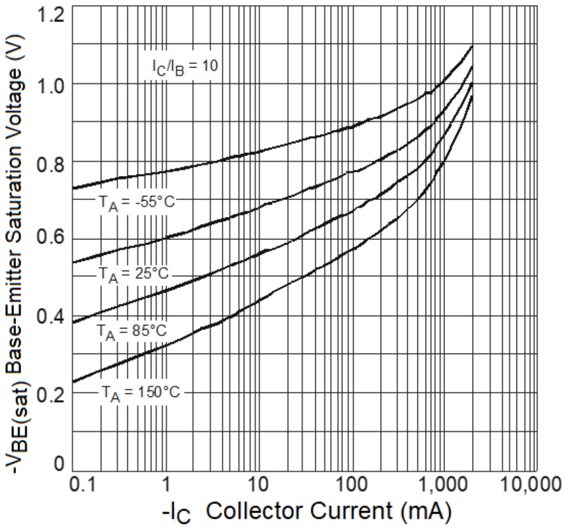


Fig.7 $V_{BE(sat)}$ v I_C

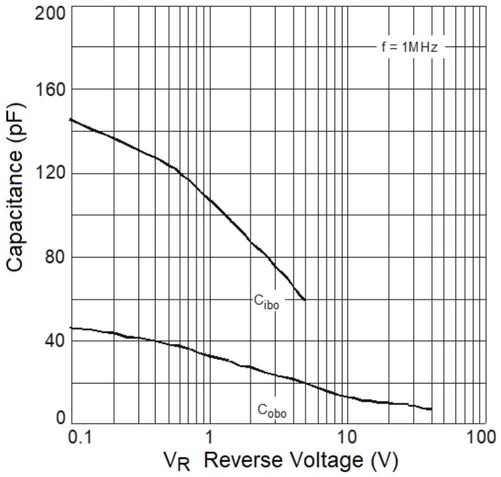
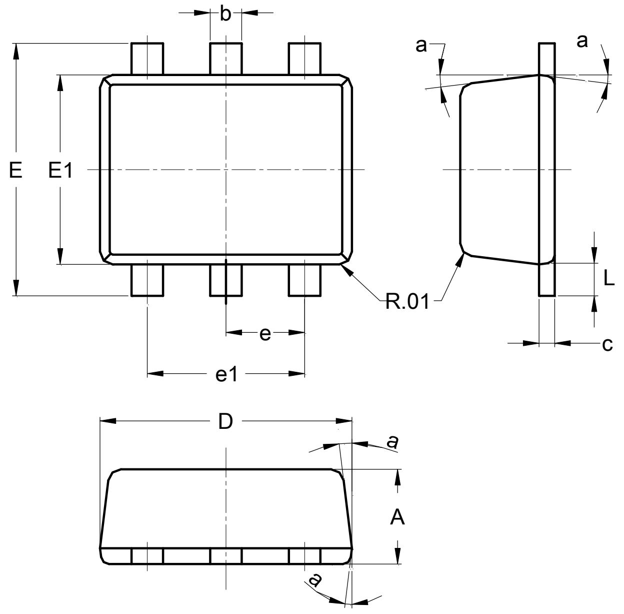


Fig.8 Typical Capacitance Characteristics

Package Outline Dimensions

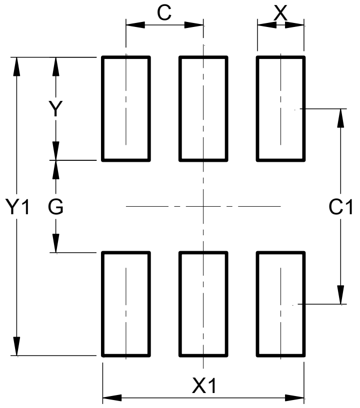
SOT563



SOT563			
Dim	**Min**	**Max**	**Typ**
A	0.55	0.60	--
b	0.15	0.30	0.20
c	0.10	0.18	0.11
D	1.50	1.70	1.60
E	1.55	1.70	1.60
E1	1.10	1.25	1.20
e	--	--	0.50
e1	0.90	1.10	1.00
L	0.10	0.30	0.20
a	8°	9°	7°
All Dimensions in mm			

Suggested Pad Layout

SOT563



Dimensions	**Value (in mm)**
C	0.500
C1	1.270
G	0.600
X	0.300
X1	1.300
Y	0.670
Y1	1.940