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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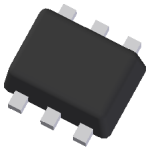
Features

- Ultra-Small Surface Mount Package
- Current Gain Matching
- Base-Emitter Voltage Matching

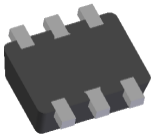
Mechanical Data

- 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 Finish. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.003 grams (Approximate)

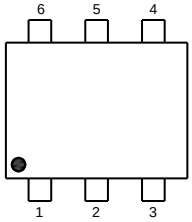
SOT563

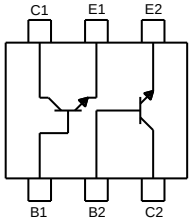


Top View



Bottom View





Device Schematic
Top View

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	50	V
Collector-Emitter Voltage	V_{CEO}	45	V
Emitter-Base Voltage	V_{EBO}	6	V
Collector Current	I_C	100	mA
Peak Collector Current	I_{CM}	200	mA

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

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5 & 6)	P_D	265	mW
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	470	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 7)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge – Machine Model	ESD MM	300	V	C

Notes:
5. For a device mounted with the collector lead on minimum recommended pad layout 1oz copper that is on a single-sided 1.6mm FR-4 PCB; device is measured under still air conditions whilst operating in a steady-state.
6. For a matched device with one active die.
7. Refer to JEDEC specification JS-001-2017 and JESD22-A115.

Thermal Characteristics and Derating Information (Note 6)

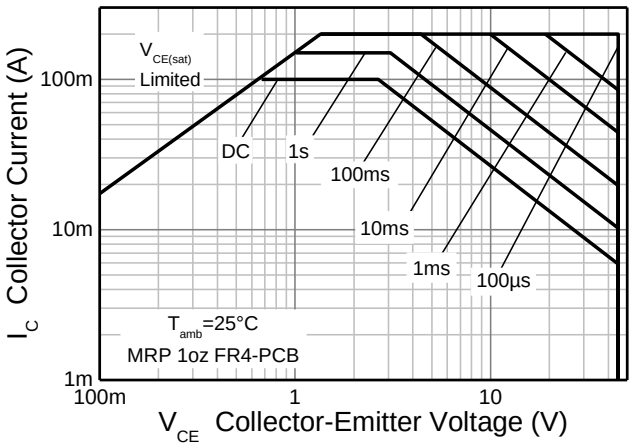


Figure 1. Safe Operating Area

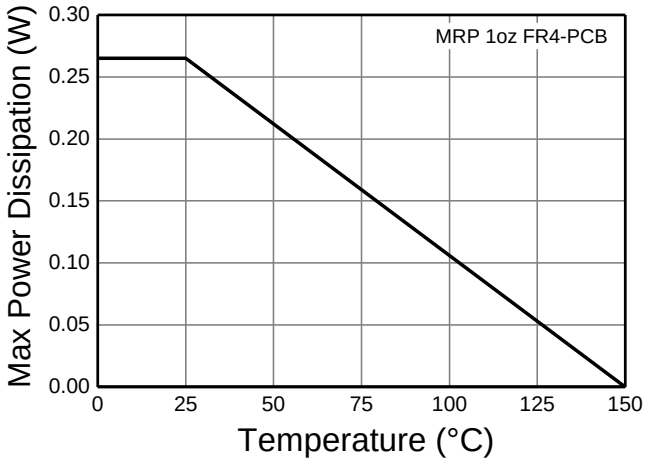


Figure 2. Derating Curve

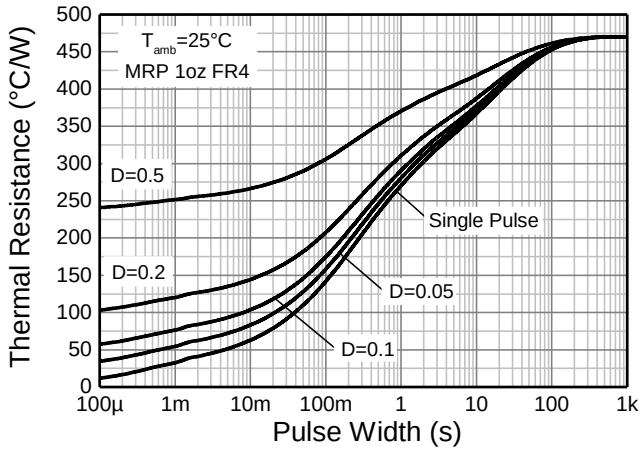


Figure 3. Transient Thermal Impedance

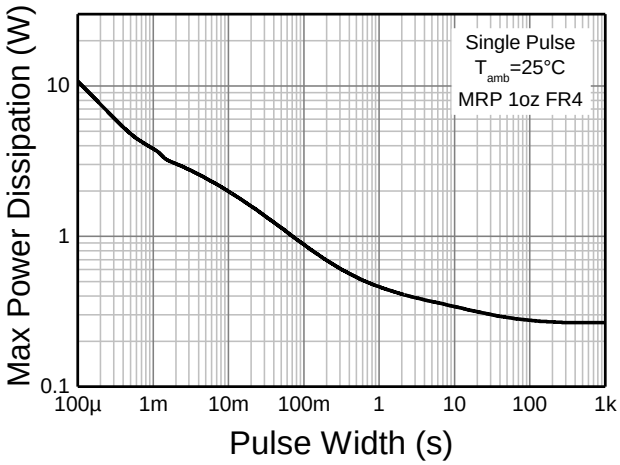


Figure 4. Pulse Power Dissipation

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

Characteristic (Note 8)	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	50	—	—	V	I_C = 100μA
Collector-Emitter Breakdown Voltage	BV_{CEO}	45	—	—	V	I_C = 10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	6	—	—	V	I_E = 100μA
DC Current Gain	h_{FE}	—	250	—	—	V_{CE} = 5V, I_C = 10uA
		200	290	450	—	V_{CE} = 5V, I_C = 2mA
DC Current Gain Matching (Note 9)	h_{FE1}/h_{FE2}	0.95	1	—	—	V_{CE} = 5V, I_C = 2mA
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	90 200	200 400	mV	I_C = 10mA, I_B = 0.5mA I_C = 100mA, I_B = 5mA
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	—	700	—	mV	I_C = 10mA, I_B = 0.5mA
		—	900	—	mV	I_C = 100mA, I_B = 5mA
Base-Emitter Voltage	$V_{BE(on)}$	610	660	710	mV	V_{CE} = 5V, I_C = 2mA
		—	—	770	mV	V_{CE} = 5V, I_C = 10mA
Base-Emitter Voltage Matching (Note 10)	$V_{BE1(on)}$ - $V_{BE2(on)}$	—	—	2	mV	V_{CE} = 5V, I_C = 2mA
Collector-Cutoff Current	I_{CBO}	— —	— —	15 5	nA μA	V_{CB} = 30V V_{CB} = 30V, T_A = +150°C
Emitter-Cutoff Current	I_{EBO}	—	—	100	nA	V_{EB} = 5V
Current Gain-Bandwidth Product	f_T	100	300	—	MHz	V_{CE} = 5V, I_C = 10mA, f = 100MHz
Input Capacitance	C_{IBO}	—	7.1	—	pF	V_{EB} = 0.5V, f = 1MHz
Output Capacitance	C_{OBO}	—	—	1.5	pF	V_{CB} = 10V, f = 1MHz
Delay Time	$t_{(d)}$	—	4.8	—	ns	V_{CC} =5V, I_C = 10mA, I_{B1} = -I_{B2} = 1mA
Rise Time	$t_{(r)}$	—	4.8	—	ns	
Storage Time	$t_{(s)}$	—	314	—	ns	
Fall Time	$t_{(f)}$	—	51	—	ns	

Notes: 8. Short duration pulse test used to minimize self-heating effect.
9. The smaller of the two values is taken as the numerator.
10. The smaller of the two values is subtracted from the larger value.

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

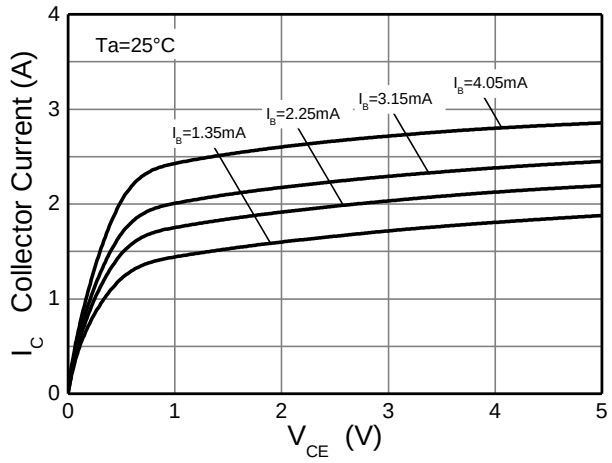


Figure 5. I_C v V_{CE}

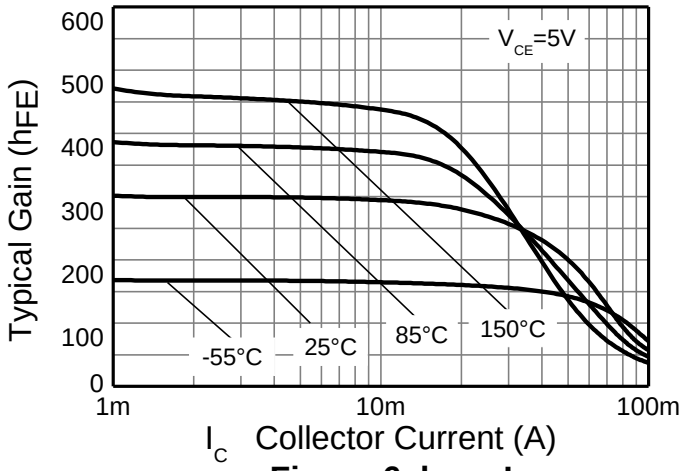


Figure 6. h_{FE} v I_C

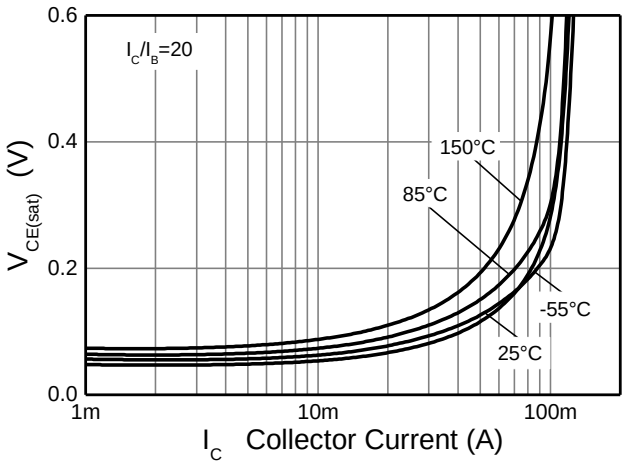


Figure 7. $V_{CE(sat)}$ v I_C

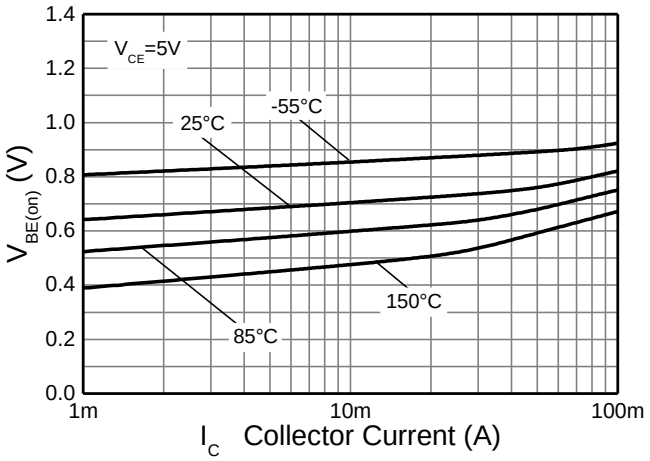


Figure 8. $V_{BE(on)}$ v I_C

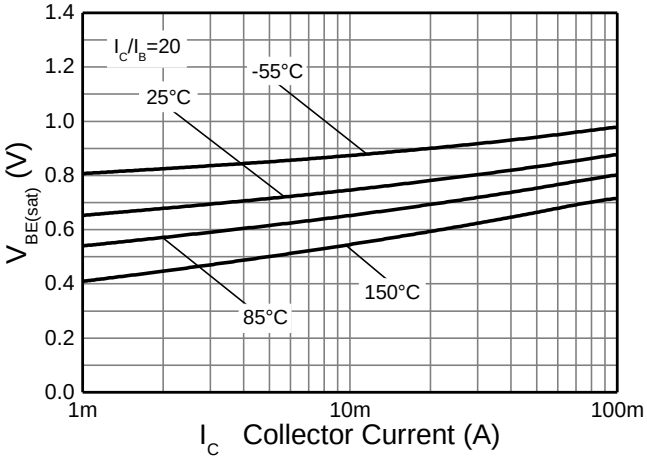
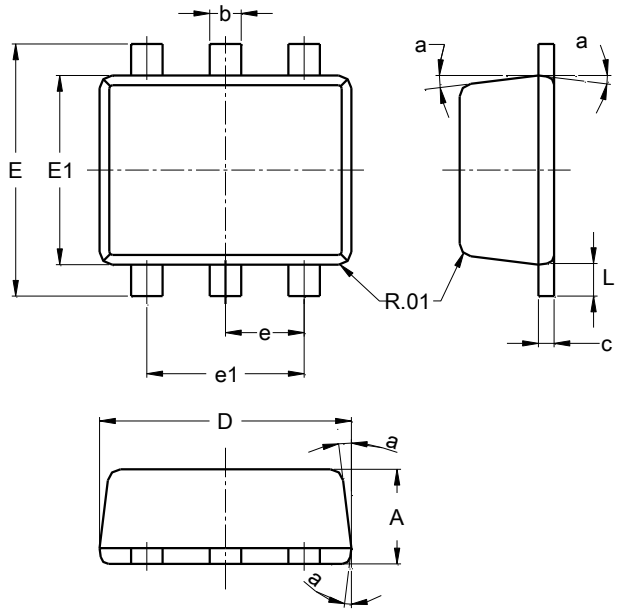


Figure 9. $V_{BE(sat)}$ v I_C

Package Outline Dimensions

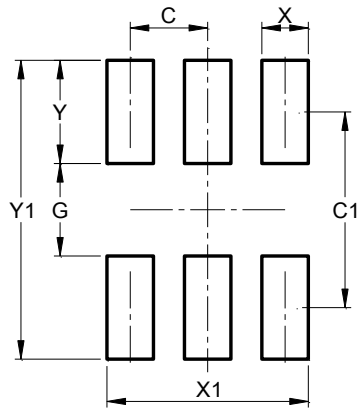
SOT563



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