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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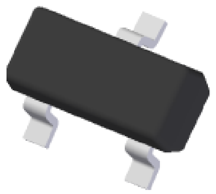
Features

- BV_{CEO} > -400V
- I_C = -150mA High Continuous Collector Current
- I_{CM} = -500mA Peak Pulse Current
- 500mW Power Dissipation
- Excellent h_{FE} Characteristics Up to -100mA
- Complementary NPN Type: NK-FMMT458

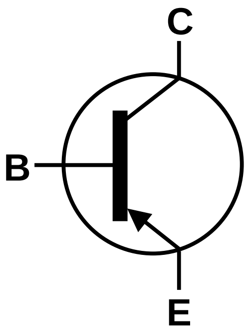
Mechanical Data

- 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 e3
- Weight: 0.008 grams (Approximate)

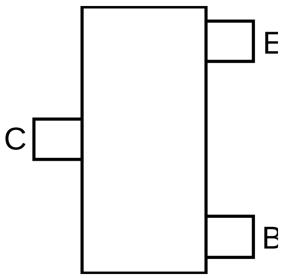
SOT23 (Type DN)



Top View



Device Symbol



Top View
Pin-Out

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-400	V
Collector-Emitter Voltage	V_{CEO}	-400	V
Emitter-Base Voltage	V_{EBO}	-7	V
Continuous Collector Current	I_C	-150	mA
Peak Pulse Current	I_{CM}	-500	mA
Base Current	I_B	-200	mA

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

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	500	mW
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	250	°C/W
Thermal Resistance, Junction to Lead (Note 6)	$R_{\theta JL}$	197	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Notes: 5. For a device surface mounted on 15mm X 15mm X 1.6mm FR4 PCB with high coverage of single sided 1 oz copper, in still air conditions.
6. Thermal resistance from junction to solder-point (at the end of the collector lead).

Thermal Characteristics and Derating information

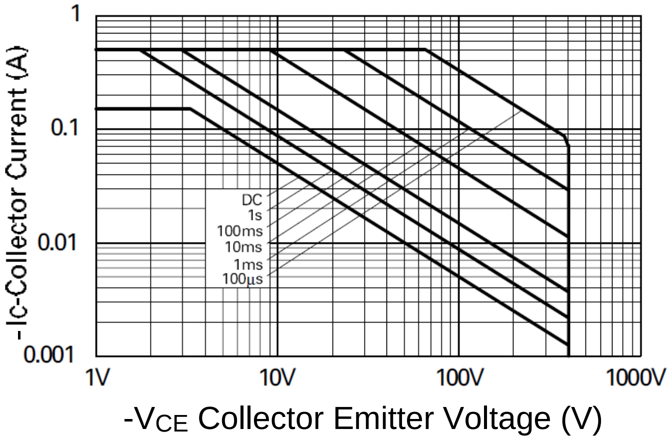


Figure 1. Safe Operating Area

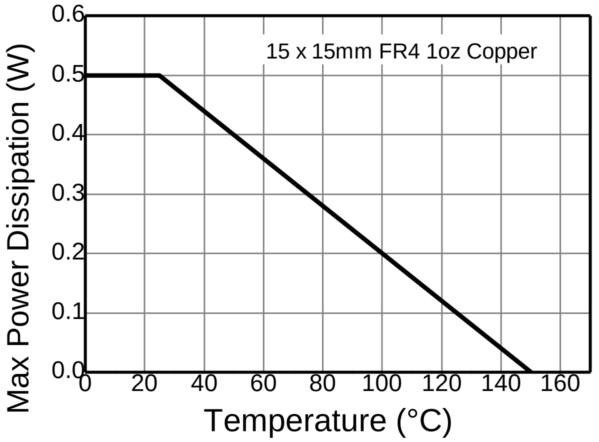


Figure 2. Derating Curve

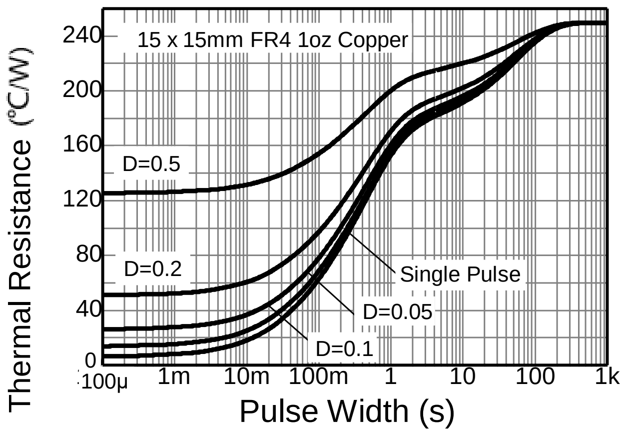


Figure 3. Transient Thermal Impedance

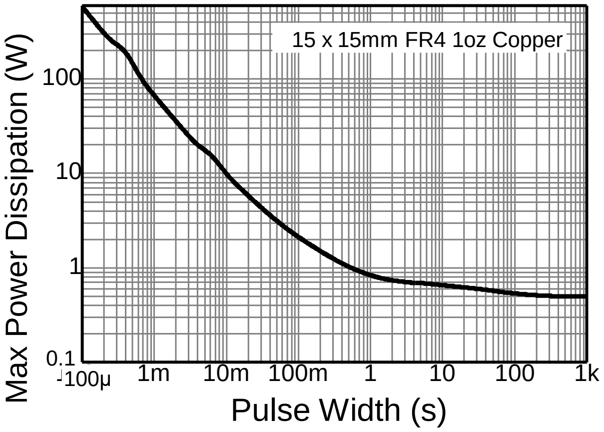


Figure 4. Pulse Power Dissipation

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-400	—	—	V	I_C = -100µA
Collector-Emitter Breakdown Voltage (Note 7)	BV_{CEO}	-400	—	—	V	I_C = -1mA
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	—	—	V	I_E = -100µA
Collector Cutoff Current	I_{CBO}	—	—	-100	nA	V_{CB} = -320V
Emitter Cutoff Current	I_{EBO}	—	—	-100	nA	V_{EB} = -5.6V
Collector Emitter Cutoff Current	I_{CES}	—	—	-100	nA	V_{CE} = -320V
Static Forward Current Transfer Ratio (Note 7)	h_{FE}	100 100 15	— — —	— 300 —	—	I_C = -1mA, V_{CE} = -10V I_C = -50mA, V_{CE} = -10V I_C = -100mA, V_{CE} = -10V
Collector-Emitter Saturation Voltage (Note 7)	$V_{CE(sat)}$	— —	— —	-200 -500	mV mV	I_C = -20mA, I_B = -2mA I_C = -50mA, I_B = -6mA
Base-Emitter Turn-On Voltage (Note 7)	$V_{BE(on)}$	—	—	-0.9	V	I_C = -50mA, V_{CE} = -10V
Base-Emitter Saturation Voltage (Note 7)	$V_{BE(sat)}$	—	—	-0.9	V	I_C = -50mA, I_B = -5mA
Output Capacitance	C_{obo}	—	—	5	pF	V_{CB} = -20V, f = 1MHz
Transition Frequency	f_T	50	—	—	MHz	V_{CE} = -20V, I_C = -10mA, f = 20MHz
Turn-On Time	t_{on}	—	95	—	ns	V_{CE} = -100V, I_C = -50mA I_{B1} = 5mA, I_{B2} = -10mA
Turn-Off Time	t_{off}	—	1600	—	ns	

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

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

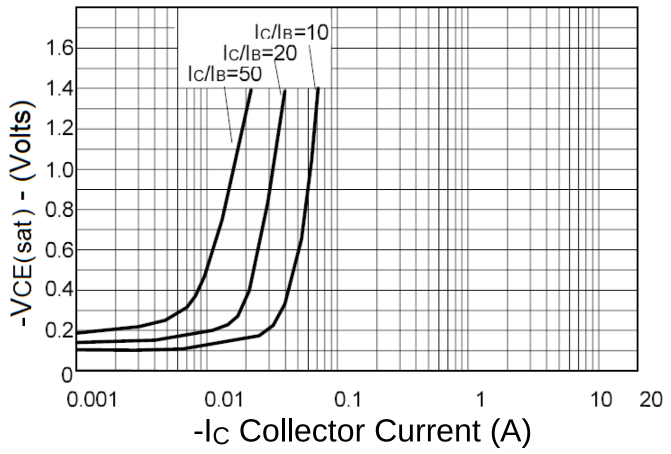


Figure 5. $V_{CE(sat)}$ v I_C

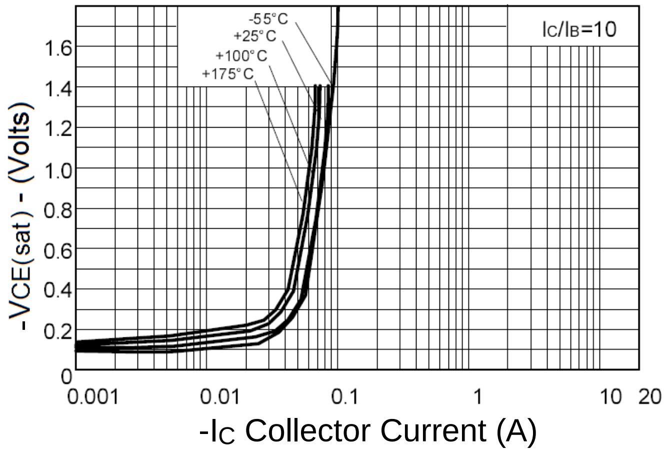


Figure 6. $V_{CE(sat)}$ v I_C

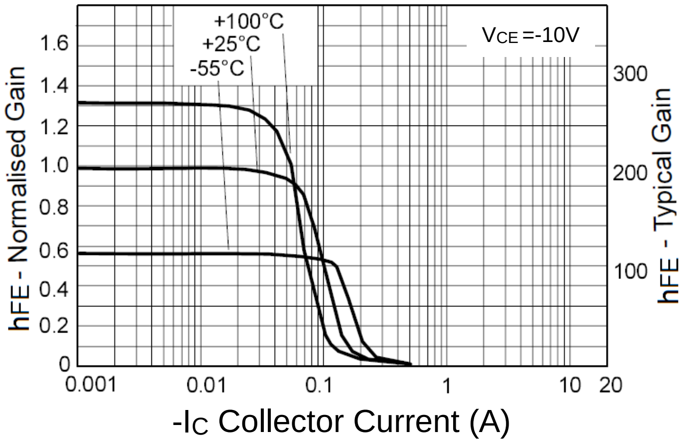


Figure 7. h_{FE} v I_C

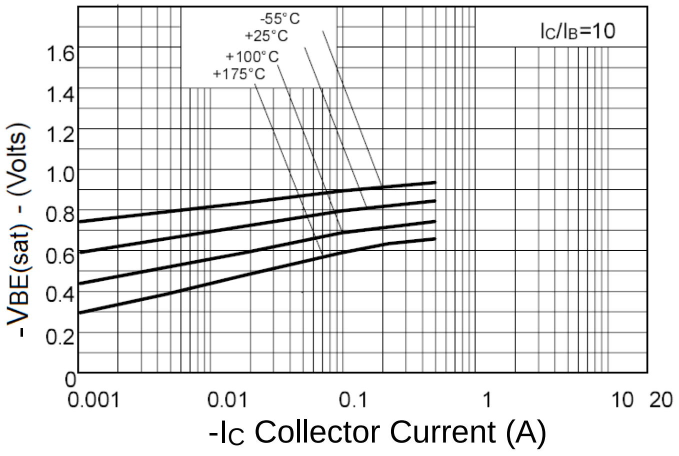


Figure 8. $V_{BE(sat)}$ v I_C

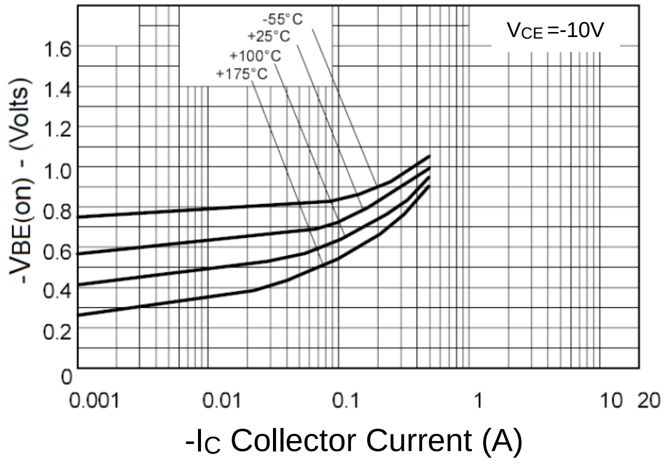
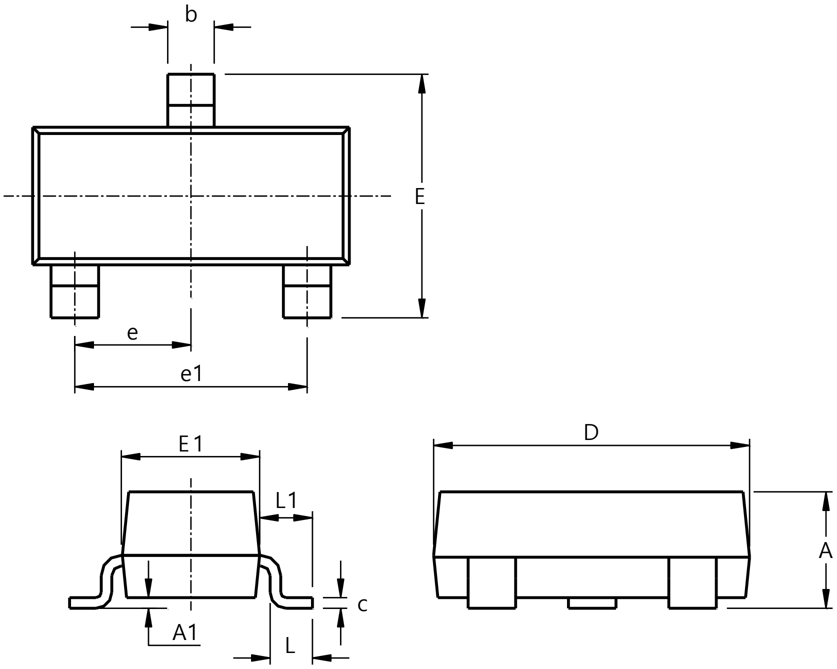


Figure 9. $V_{BE(on)}$ v I_C

Package Outline Dimensions

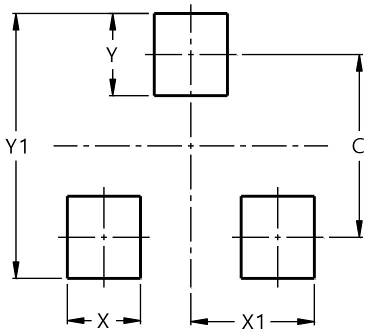
SOT23 (Type DN)



SOT23 Type DN			
Dim	**Min**	**Max**	**Typ**
A	0.89	1.12	1.00
A1	0.01	0.10	0.05
b	0.30	0.51	0.45
c	0.08	0.20	0.10
D	2.80	3.04	3.00
E	2.10	2.64	2.42
E1	1.20	1.40	1.37
e	0.95 REF		
e1	1.90 REF		
L	0.25	0.60	0.30
L1	0.45	0.62	0.54
All Dimensions in mm			

Suggested Pad Layout

SOT23 (Type DN)



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9