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.

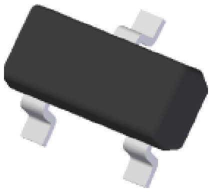
Feature

- BV_{CEO} > 60V
- I_C = 1A Continuous Collector Current
- I_{CM} = 2A Peak Pulse Current
- $R_{CE(SAT)}$ = 195mΩ for a Low Equivalent On-Resistance
- 500mW Power Dissipation
- h_{FE} Characterized up to 2A for High Current Gain Hold Up
- Complementary PNP Type: NK-FMMT591Q

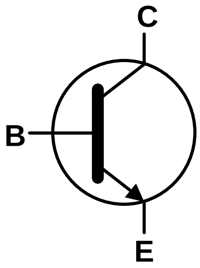
Mechanical Data

- Case: SOT23
- Case 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 0.008 grams (Approximate)

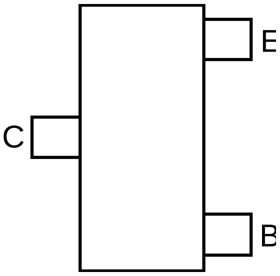
SOT23 (Type DN)



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}	80	V
Collector-Emitter Voltage	V_{CEO}	60	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	1	A
Peak Pulse Current	I_{CM}	2	A
Base Current	I_B	200	mA

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

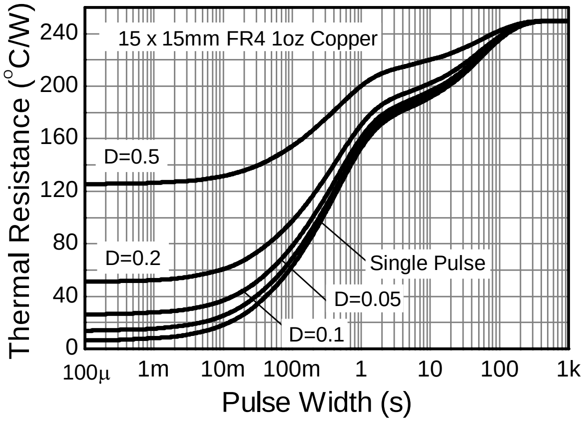
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	P_D	500	mW
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	250	°C/W
Thermal Resistance, Junction to Lead (Note 7)	$R_{\theta JL}$	197	°C/W
Operating and Storage Temperature Range	$T_{J,}$ T_{STG}	-55 to +150	°C

ESD Ratings (Note 8)

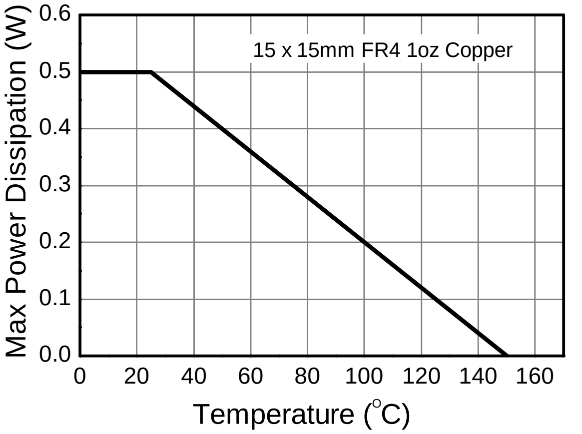
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge – Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge – Machine Model	ESD MM	400	V	C

Notes:
6. For a device mounted with the collector lead on 15mm x 15mm 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.
7. Thermal resistance from junction to solder-point (at the end of the collector lead).
8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

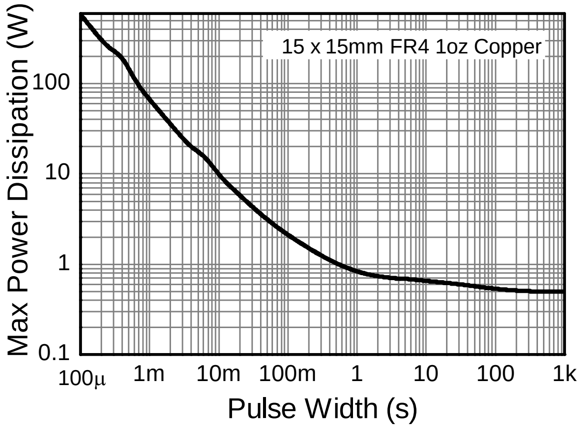
Thermal Characteristics and Derating Information



Transient Thermal Impedance



Derating Curve



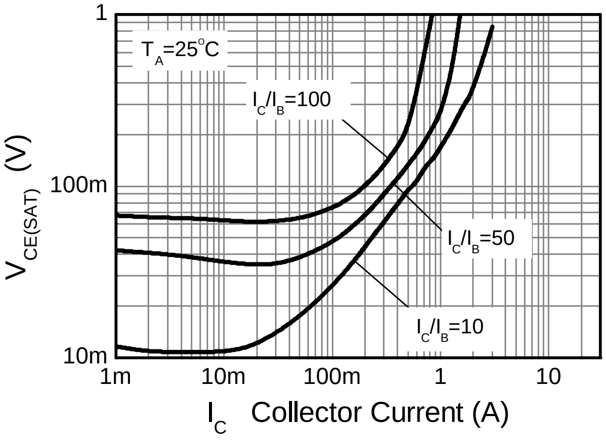
Pulse Power Dissipation

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

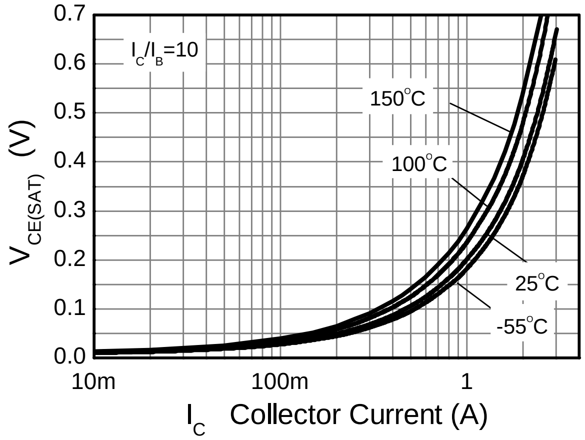
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	80	—	—	V	$I_C = 100\mu A$
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	60	—	—	V	$I_C = 10mA$
Emitter-Base Breakdown Voltage	BV_{EBO}	7	8.1	—	V	$I_E = 100\mu A$
Collector Cutoff Current	I_{CBO}	—	<1	100	nA	$V_{CB} = 60V$
Emitter Cutoff Current	I_{EBO}	—	<1	100	nA	$V_{EB} = 5.6V$
Collector Emitter Cutoff Current	I_{CES}	—	<1	100	nA	$V_{CE} = 60V$, $V_{CES} = 60V$
Static Forward Current Transfer Ratio (Note 9)	h_{FE}	100	140	—	—	$I_C = 1mA$, $V_{CE} = 5V$
		100	150	300		$I_C = 500mA$, $V_{CE} = 5V$
		80	120	—		$I_C = 1A$, $V_{CE} = 5V$
		30	40	—		$I_C = 2A$, $V_{CE} = 5V$
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(SAT)}$	—	100	150	mV	$I_C = 500mA$, $I_B = 50mA$
		—	160	250		$I_C = 1A$, $I_B = 100mA$
Base-Emitter Turn-On Voltage (Note 9)	$V_{BE(ON)}$	—	830	1,000	mV	$I_C = 1A$, $V_{CE} = 5V$
Base-Emitter Saturation Voltage (Note 9)	$V_{BE(SAT)}$	—	965	1,100	mV	$I_C = 1A$, $I_B = 100mA$
Output Capacitance	C_{OBO}	—	—	10	pF	$V_{CB} = 10V$, f = 1MHz
Transition Frequency	f_T	150	—	—	MHz	$V_{CE} = 10V$, $I_C = 50mA$, f = 100MHz

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

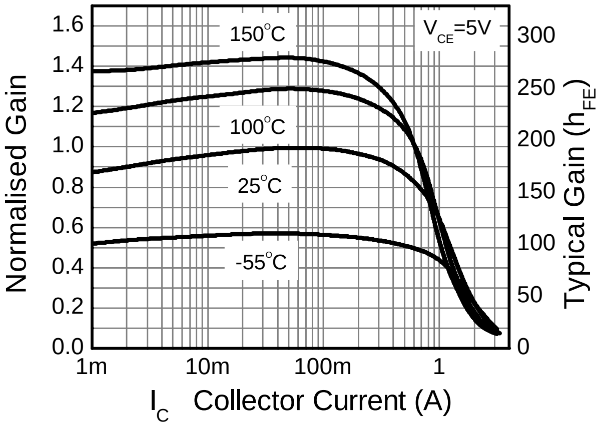
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



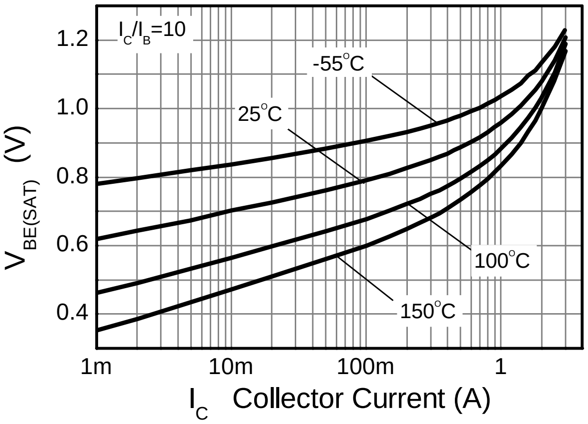
$V_{CE(SAT)}$ v I_C



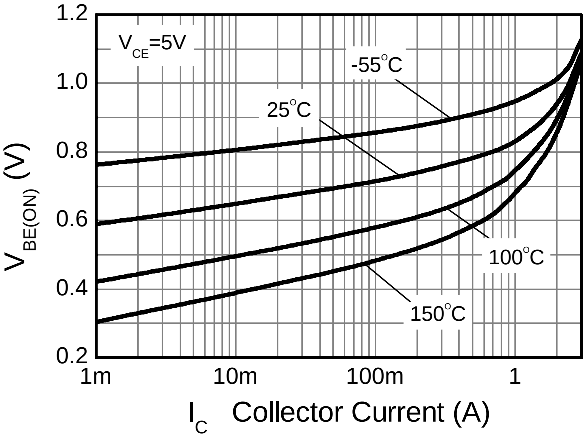
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C



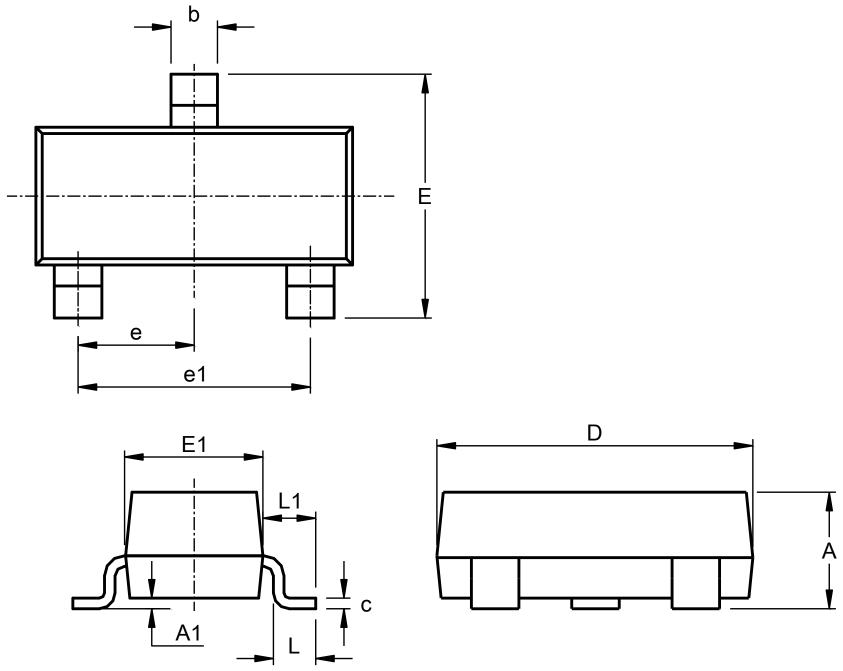
$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

Package Outline Dimensions

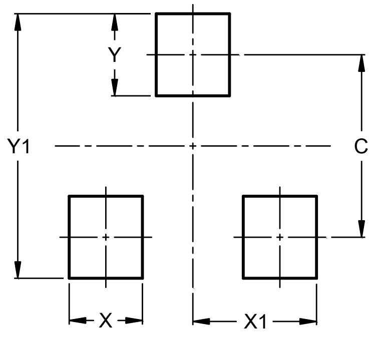
SOT23 (Type DN)



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