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) has been designed to meet the stringent requirements of Automotive Applications.

Features

- BV_{CEO} > 100V
- I_C = 900mA High Continuous Collector Current
- I_{CM} = 5A Peak Pulse Current
- 625mW Power Dissipation
- h_{FE} > 5k up to 2A for High Current Gain Hold up
- Complementary PNP Type: NK-FMMT734Q

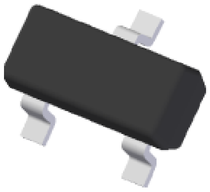
Mechanical Data

- 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)

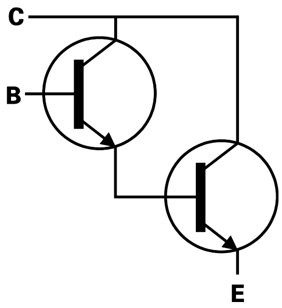
Applications

- Automotive
- Lamp
- Relay
- Solenoid Driving

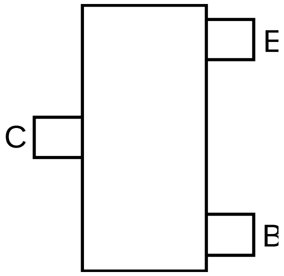
SOT23



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}	120	V
Collector-Emitter Voltage	V_{CEO}	100	V
Emitter-Base Voltage	V_{EBO}	12	V
Continuous Collector Current	I_C	900	mA
Peak Pulse Current	I_{CM}	5	A

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

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	625	mW
Power Dissipation (Note 6)	P_D	806	mW
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	200	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	155	°C/W
Thermal Resistance, Junction to Leads (Note 7)	$R_{\theta JL}$	194	°C/W
Operating and Storage Temperature Range	T_{J}, T_{STG}	-55 to +150	°C

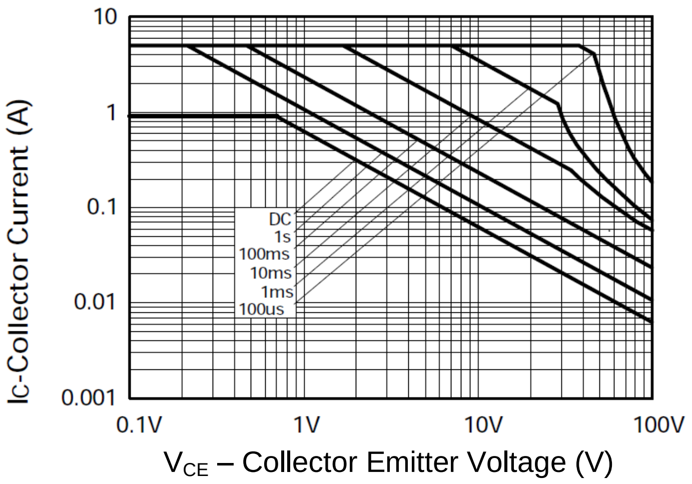
ESD Ratings (Note 8)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	2,000	V	2
Electrostatic Discharge - Machine Model	ESD MM	200	V	B

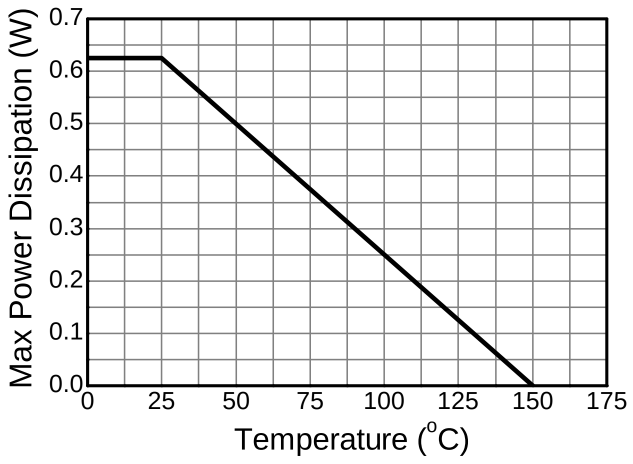
Notes:

5. For a device mounted with the exposed collector pad on 25mm × 25mm 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. Same as note (5), except the device is measured at t ≤ 5s.
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.

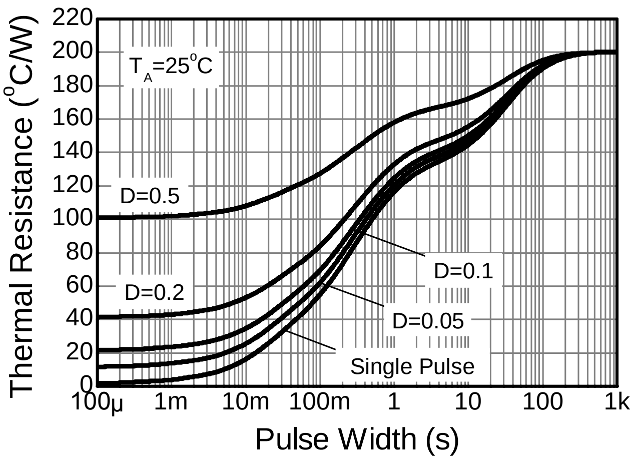
Thermal Characteristics and Derating information



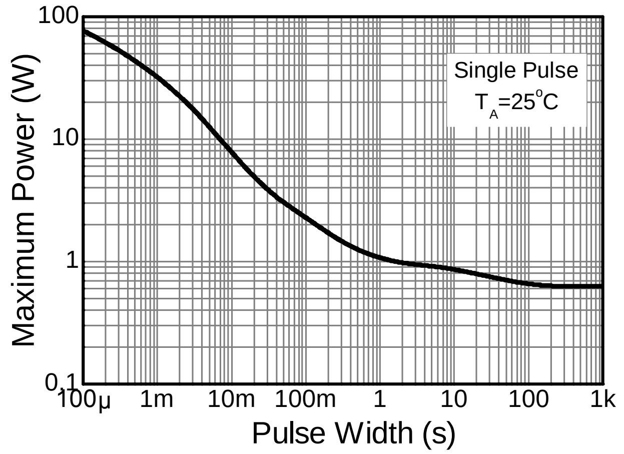
Safe Operating Area



Derating Curve



Transient Thermal Impedance



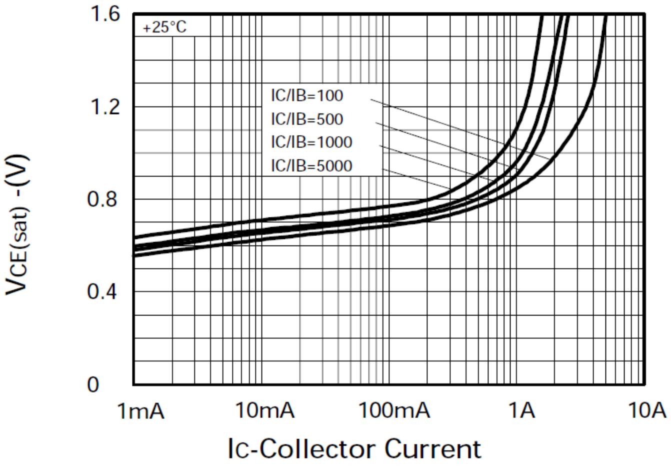
Pulse Power Dissipation

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

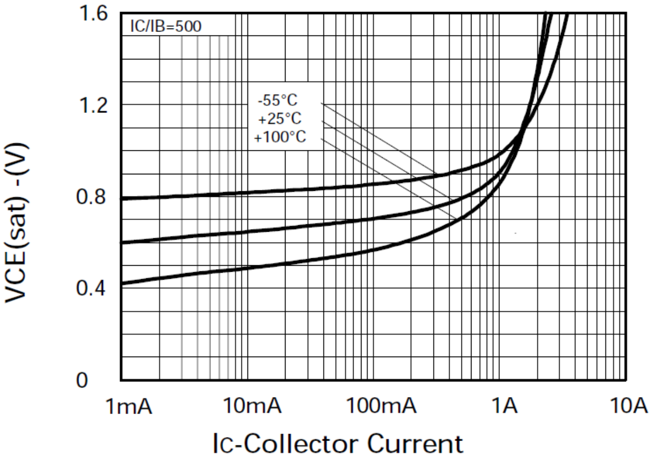
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	120	170	—	V	I_C = 100µA
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	100	115	—	V	I_C = 10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	12	16	—	V	I_E = 100µA
Collector Cut-Off Current	I_{CBO}	—	<1	10	nA	V_{CB} = 80V
Emitter Cut-Off Current	I_{EBO}	—	<1	10	nA	V_{EB} = 7V
Collector Emitter Cut-Off Current	I_{CES}	—	<1	100	nA	V_{CES} = 80V
Static Forward Current Transfer Ratio (Note 9)	h_{FE}	— 20k 15k 5k — —	50k 60k 40k 14k 24k 600	— — — — — —	—	I_C = 10mA, V_{CE} = 5V I_C = 100mA, V_{CE} = 5V I_C = 1A, V_{CE} = 5V I_C = 2A, V_{CE} = 5V I_C = 1A, V_{CE} = 2V I_C = 5A, V_{CE} = 5V
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(sat)}$	— — — — — — —	0.67 0.72 0.78 0.75 0.82 0.68 0.85	0.75 0.80 1 0.85 0.93 — 0.96	V	I_C = 100mA, I_B = 1mA I_C = 250mA, I_B = 1mA I_C = 500mA, I_B = 1mA I_C = 500mA, I_B = 5mA I_C = 900mA, I_B = 5mA I_C = 900mA, I_B = 5mA, T_J = +150°C I_C = 1A, I_B = 5mA
Base-Emitter Saturation Voltage (Note 9)	$V_{BE(sat)}$	—	1.5	1.65	V	I_C = 1A, I_B = 5mA
Base-Emitter Turn-On Voltage (Note 9)	$V_{BE(on)}$	—	1.33	1.50	V	I_C = 1A, V_{CE} = 5V
Transition Frequency	f_T	—	140	—	MHz	I_C = 50mA, V_{CE} = 10V, f = 100MHz
Output Capacitance	C_{obo}	—	9	20	pF	V_{CB} = 10V, f = 1MHz
Turn-On Time	$t_{(on)}$	—	290	—	ns	V_{CC} = 20V, I_C = 500mA, I_{B1} = -I_{B2} = 1mA
Turn-Off Time	$t_{(off)}$	—	2,400	—	ns	

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

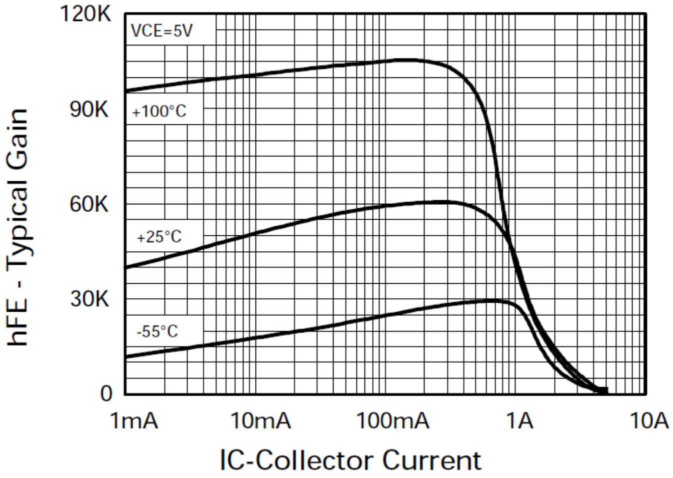
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



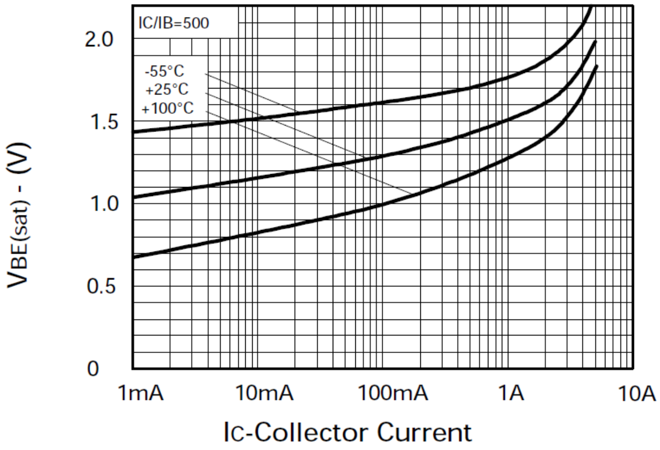
$V_{CE(sat)}$ v I_C



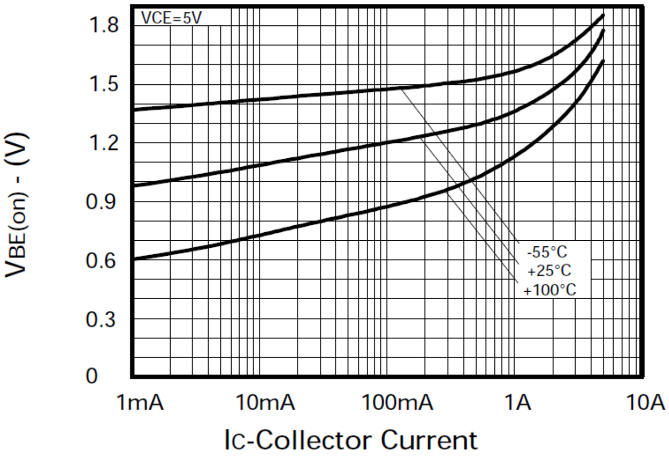
$V_{CE(sat)}$ v I_C



hFE V IC



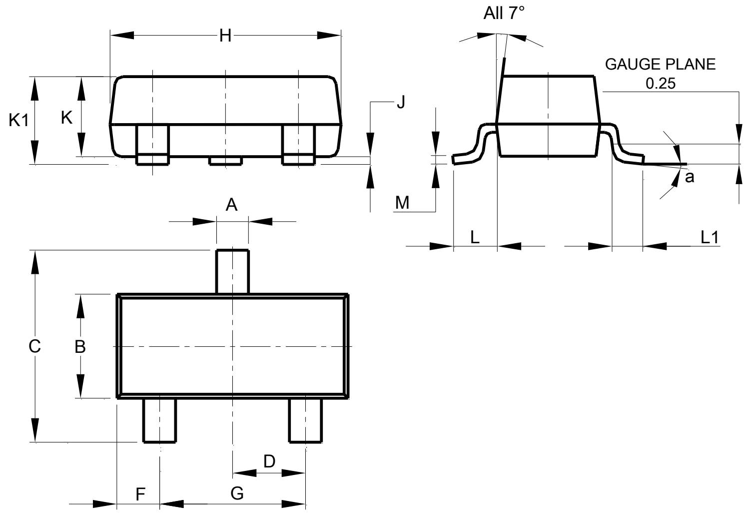
$V_{BE(sat)}$ v I_C



$V_{BE(on)}$ v I_C

Package Outline Dimensions

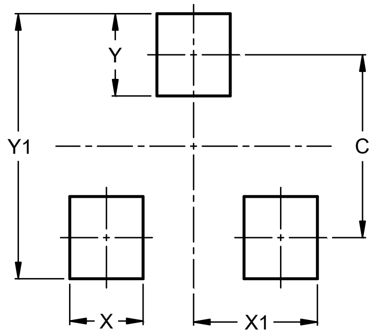
SOT23



SOT23			
Dim	**Min**	**Max**	**Typ**
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

SOT23



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

Note: For high voltage applications, the appropriate industry sector guidelines should be considered with regards to creepage and clearance distances between device Terminals and PCB tracking.