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} > -40V
- I_C = -1.5A Continuous Collector Current
- I_{CM} = -4A Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)}$ < -220mV @ -1A
- $R_{CE(SAT)}$ = 163mΩ for a low equivalent on-resistance
- 625mW power dissipation
- h_{FE} characterised up to -3A for high current gain hold-up
- Complementary NPN Type: NK-FMMT619

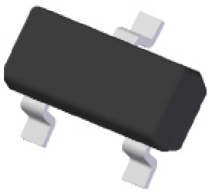
Mechanical Data

- 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)

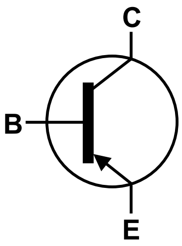
Applications

- Gate Driving MOSFETs and IGBTs
- DC-DC Converters
- Charging circuit
- Power switches

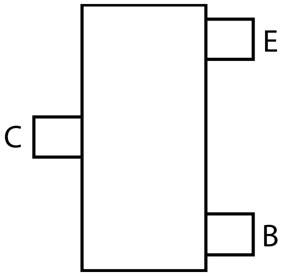
SOT23



Top View



Device Symbol



Top View
Pin-Out

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}	-7	V
Continuous Collector Current	I_C	-1.5	A
Peak Pulse Current	I_{CM}	-4	A
Base Current	I_B	-500	mA

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

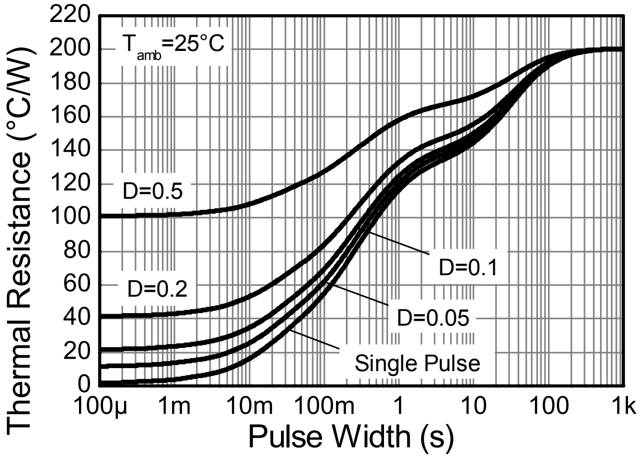
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	P_D	625	mW
Power Dissipation (Note 7)	P_D	806	mW
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	200	°C/W
Thermal Resistance, Junction to Ambient (Note 7)	$R_{\theta JA}$	155	°C/W
Thermal Resistance, Junction to Leads (Note 8)	$R_{\theta JL}$	194	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 9)

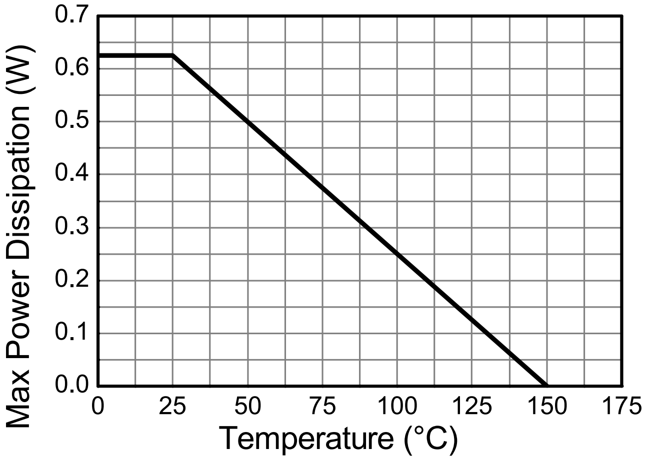
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	≥ 400	V	C

Notes:
6. For a device surface mounted on 25mm X 25mm FR4 PCB with high coverage of single sided 1 oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
7. Same as note 6, except the device is measured at t ≤ 5 sec.
8. Thermal resistance from junction to solder-point (at the end of the collector lead).
9. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

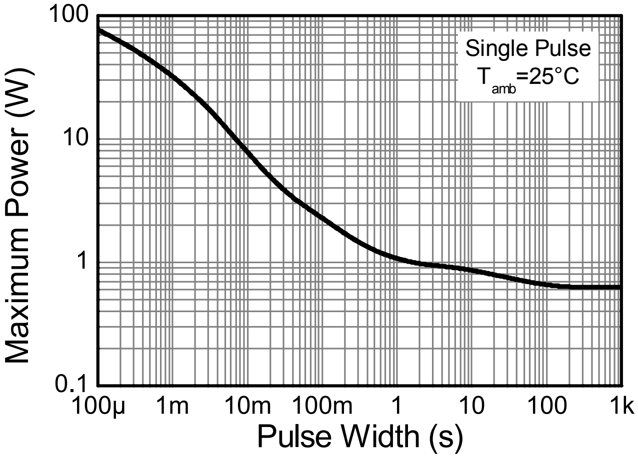
Thermal Characteristics and Derating information



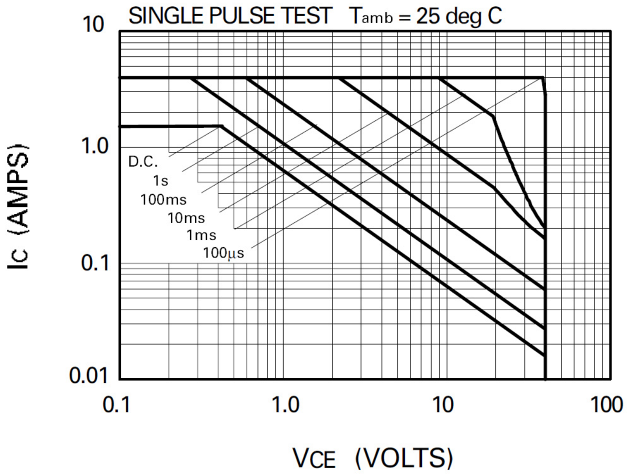
Transient Thermal Impedance



Derating Curve



Pulse Power Dissipation



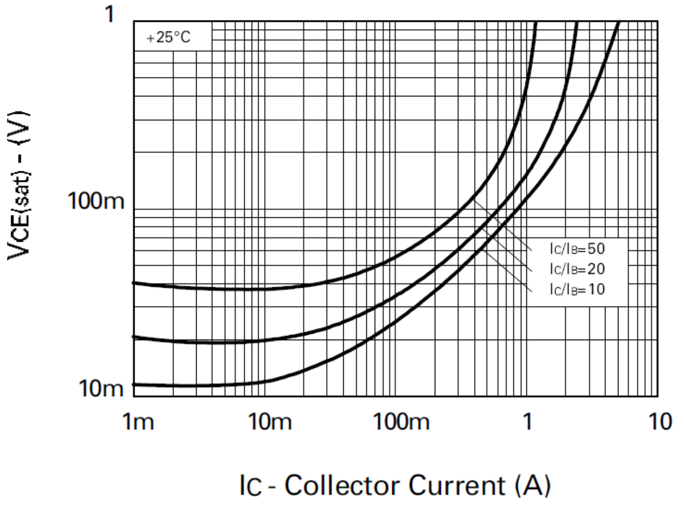
Safe Operating Area

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

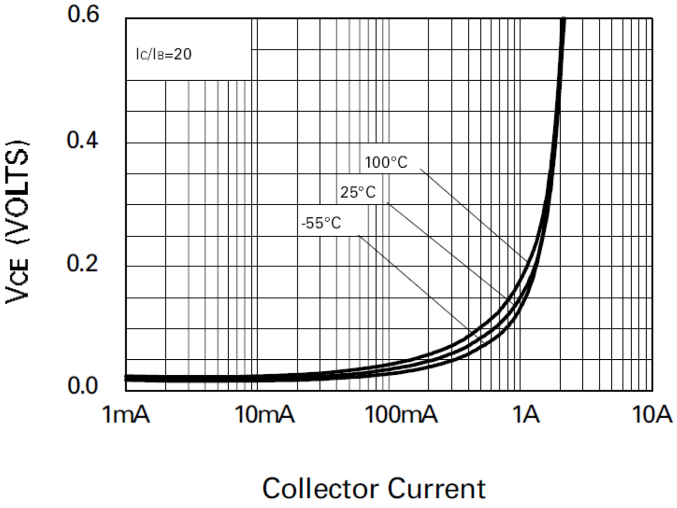
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-40	-95	-	V	I_C = -100μA
Collector-Emitter Breakdown Voltage (Note 10)	BV_{CEO}	-40	-85	-	V	I_C = -10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8.8	-	V	I_E = -100μA
Collector Cutoff Current	I_{CBO}	-	<1	-100	nA	V_{CB} = -35V
Emitter Cutoff Current	I_{EBO}	-	<1	-100	nA	V_{EB} = -5.6V
Collector Emitter Cutoff Current	I_{CES}	-	<1	-100	nA	V_{CE}= -35V
Static Forward Current Transfer Ratio (Note 10)	h_{FE}	300	480	-	-	I_C = -10mA, V_{CE} = -2V
		300	450	-		I_C = -0.1A, V_{CE} = -2V
		180	290	-		I_C = -1A, V_{CE} = -2V
		60	130	-		I_C = -1.5A, V_{CE} = -2V
		12	22	-		I_C = -3A, V_{CE} = -2V
Collector-Emitter Saturation Voltage (Note 10)	$V_{CE(sat)}$	-	-26	-40	mV	I_C =- 0.1A, I_B = -10mA
		-	-150	-220	mV	I_C = -1A, I_B = -50mA
		-	-245	-330	mV	I_C = -1.5A, I_B = -100mA
Base-Emitter Turn-On Voltage(Note 10)	$V_{BE(on)}$	-	-0.80	-1.0	V	I_C = -1.5A, V_{CE} = -2V
Base-Emitter Saturation Voltage(Note 10)	$V_{BE(sat)}$	-	-0.89	-1.0	V	I_C = -1.5A, I_B = -75mA
Output Capacitance	C_{obo}	-	19	25	pF	V_{CB} = -10V, f = 1MHz
Transition Frequency	f_T	150	180	-	MHz	V_{CE} = -10V, I_C = -50mA, f = 100MHz
Turn-On Time	t_{on}	-	40	-	ns	V_{CC} = -15V, I_C = -0.75A I_{B1} = I_{B2} = -15mA
Turn-Off Time	t_{off}	-	435	-	ns	

Notes: 10. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%

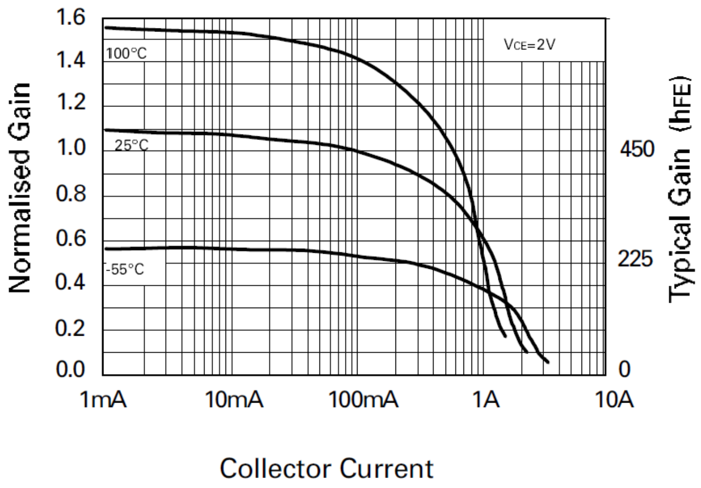
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



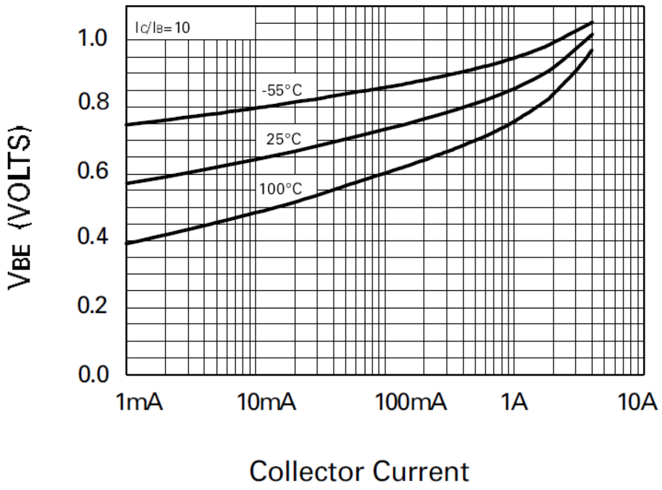
$V_{CE(SAT)}$ v I_C



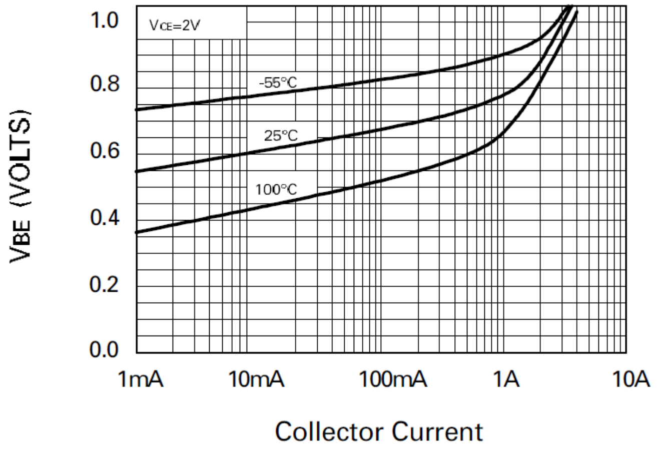
$V_{CE(SAT)}$ vs I_C



h_{FE} vs I_C

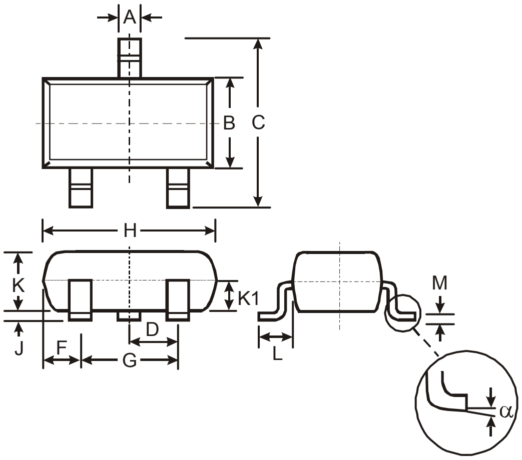


$V_{BE(SAT)}$ vs I_C



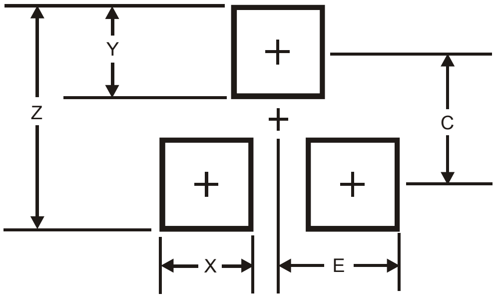
$V_{BE(ON)}$ vs I_C

Package Outline Dimensions



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	0.903	1.10	1.00
K1	-	-	0.400
L	0.45	0.61	0.55
M	0.085	0.18	0.11
α	0°	8°	-
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35