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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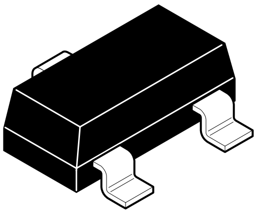
Summary



$V_{(BR)CEX}$ > -160V, $V_{(BR)CEO}$ > -140V

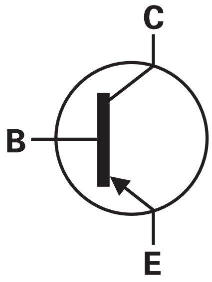
$I_{C(CONT)}$ = -2.5A

$R_{CE(sat)}$ = 76mΩ typical

$V_{CE(sat)}$ < -95mV @ -1A

P_D = 1.25W

Description



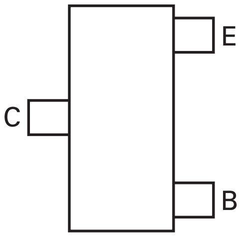
Advanced process capability and package design have been used to maximize the power handling and performance of this small outline transistor. The compact size and ratings of this device make it ideally suited to applications where space is at a premium.

Features

- Higher power dissipation SOT23 package
- High peak current
- Low saturation voltage
- 160V forward blocking voltage

Applications

- DC - DC converters
- Motor drive
- High side switches



Pinout - top view

Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-base voltage	V_{CBO}	-160	V
Collector-emitter voltage	$V_{(BR)CEX}$	-160	V
Collector-emitter voltage	V_{CEO}	-140	V
Emitter-base voltage	V_{EBO}	-7.0	V
Peak pulse current	I_{CM}	-5	A
Continuous collector current (b)	I_C	-2.5	A
Base current	I_B	-1	A
Power dissipation @ T_A=25°C (a) Linear derating factor (a)	P_D	0.73 5.84	W mW/°C
Power dissipation @ T_A=25°C (b) linear derating factor (b)	P_D	1.05 8.4	W mW/°C
Power dissipation @ T_A=25°C (c) linear derating factor (c)	P_D	1.25 9.6	W mW/°C
Power dissipation @ T_A=25°C (d) linear derating factor (d)	P_D	1.81 14.5	W mW/°C
Operating and storage temperature	T_j:T_{stg}	-55 to +150	°C

Thermal resistance

Parameter	Symbol	Limit	Unit
Junction to ambient (a)	$R_{\Theta JA}$	171	°C/W
Junction to ambient (b)	$R_{\Theta JA}$	119	°C/W
Junction to ambient (c)	$R_{\Theta JA}$	100	°C/W
Junction to ambient (d)	$R_{\Theta JA}$	69	°C/W

NOTES:

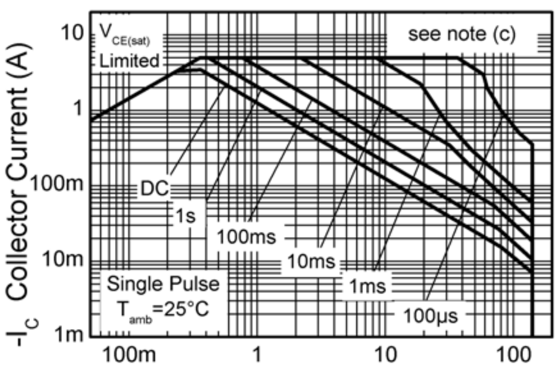
(a) For a device surface mounted on 15mm x 15mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

(b) Mounted on 25mm x 25mm x 1.6mm FR4 PCB with a high coverage of single sided 2 oz copper in still air conditions.

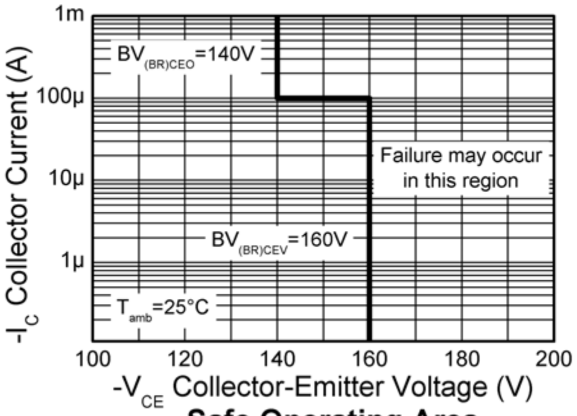
(c) Mounted on 50mm x 50mm x 1.6mm FR4 PCB with a high coverage of single sided 2 oz copper in still air conditions.

(d) As (c) above measured at t<5sec.

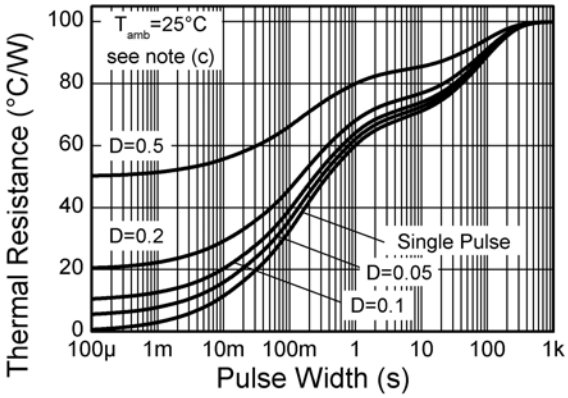
Characteristics



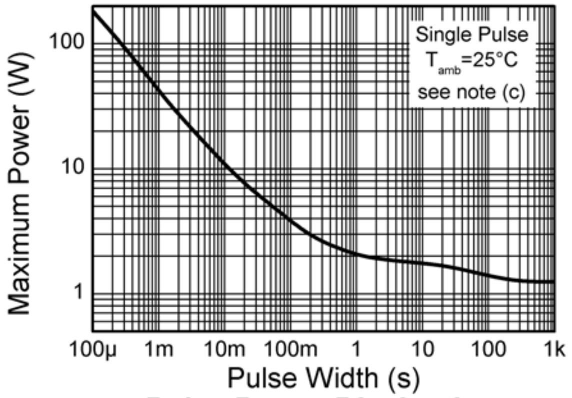
Safe Operating Area



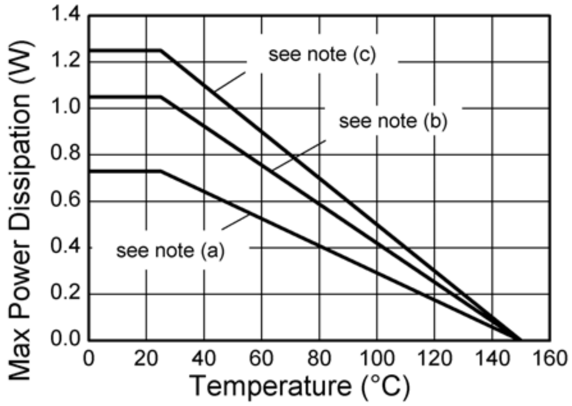
Safe Operating Area



Transient Thermal Impedance



Pulse Power Dissipation



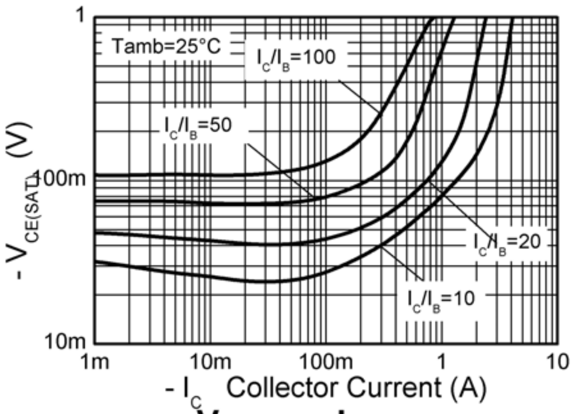
Derating Curve

ELECTRICAL CHARACTERISTICS (at T_{AMB} = 25°C unless otherwise stated)

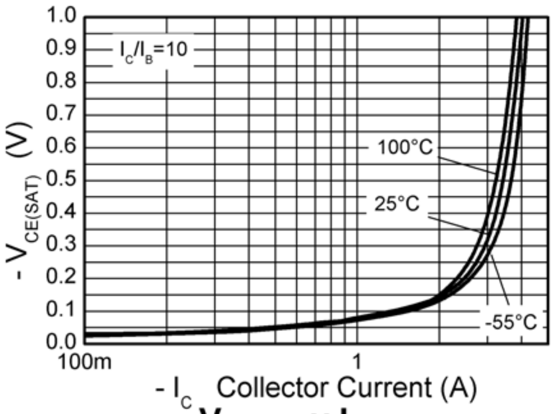
Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Collector-base breakdown voltage	$V_{(BR)CBO}$	-160	-180		V	I_C=-100μA
Collector-emitter breakdown voltage	$V_{(BR)CEX}$	-160	-180		V	I_C =-100μA, $R_{BE} \leq$ 1kΩ OR -0.25V < V_{BE} < 1V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	-140	-160		V	I_C=-10mA (*)
Emitter-base breakdown voltage	$V_{(BR)EBO}$	-7.0	-8.2		V	I_E=-100μA
Collector-emitter cut-off current	I_{CEX}		-	-100	nA	V_{CE} =-130V; $R_{BE} \leq$ 1kΩ OR -0.25V < V_{BE} < 1V
Collector-base cut-off current	I_{CBO}		<1	-20	nA	V_{CB}=-130V
Emitter-base cut-off current	I_{EBO}		<1	-10	nA	V_{EB}=-6V
Static forward current transfer ratio	H_{FE}	100	200			I_C= -10mA, V_{CE}=-5V (*)
		100	180	300		I_C=-1A, V_{CE}=-5V (*)
		40	100			Ic=-2.5A, V_{CE}=-5V
Collector-emitter saturation voltage	$V_{CE(sat)}$		-45	-55	mV	I_C=-100mA, I_B=-5mA (*)
			-80	-95	mV	I_C=-1A, I_B=-100mA (*)
			-190	-280	mV	I_C=-2.5A, I_B=-250mA (*)
Base-emitter saturation voltage	$V_{BE(sat)}$		-0.89	-1.00	V	I_C=-2.5A, I_B=-250mA (*)
Base-emitter turn-on voltage	$V_{BE(on)}$		-0.78	-0.90	V	I_C=-2.5A, V_{CE}=-5V (*)
Transition frequency	f_T		130		MHz	Ic=-100mA, V_{CE}=-10V, f=50MHz
Output capacitance	C_{obo}		30.9		pF	V_{CB}=-10V, f=1MHz
Turn–on time	$t_{(on)}$		132.4		ns	V_{CC}=-10V, I_C=-2A, I_{B1}=I_{B2}=-200mA
Turn-off time	$t_{(off)}$		345.5		ns	

NOTES:
(*) Measured under pulsed conditions. Pulse width=300μS. Duty cycle ≤2%.

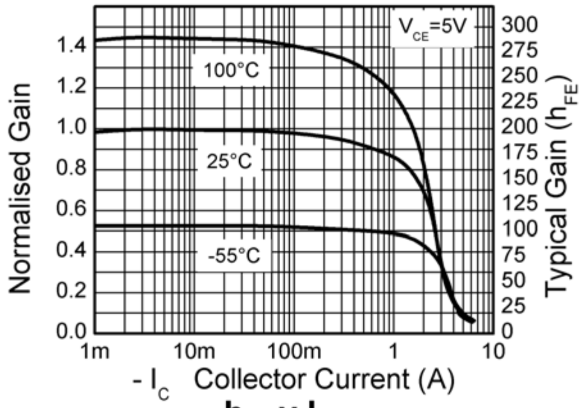
Typical characteristics



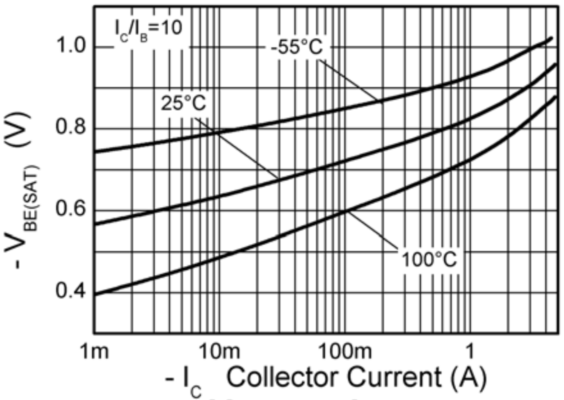
$V_{CE(SAT)}$ v I_C



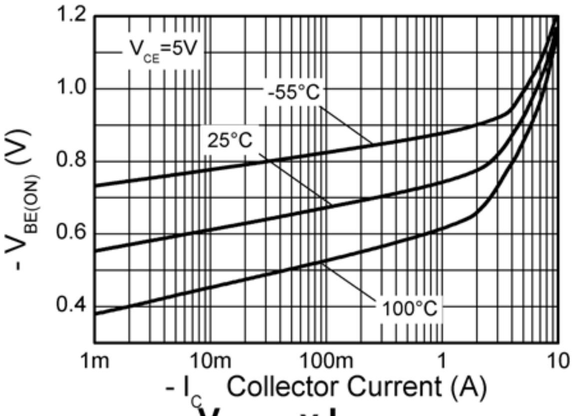
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C

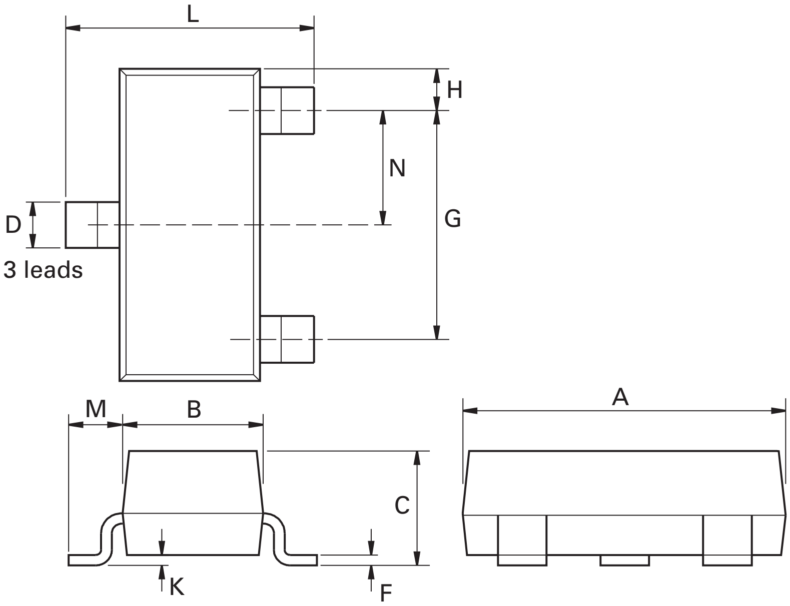


$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

Package outline - SOT23



Dim	Millimeters		Inches		Dim	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Max	Max
A	2.67	3.05	0.105	0.120	H	0.33	0.51	0.013	0.020
B	1.20	1.40	0.047	0.055	K	0.01	0.10	0.0004	0.004
C	-	1.10	-	0.043	L	2.10	2.50	0.083	0.0985
D	0.37	0.53	0.015	0.021	M	0.45	0.64	0.018	0.025
F	0.085	0.15	0.0034	0.0059	N	0.95 NOM		0.0375 NOM	
G	1.90 NOM		0.075 NOM		-	-	-	-	-

Note: Controlling dimensions are in millimeters. Approximate dimensions are provided in inches