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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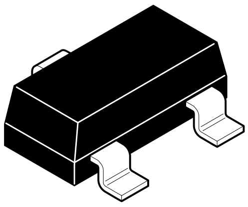
Summary



$V_{(BR)CEV} > -130V$, $V_{(BR)CEO} > -100V$

$I_{C(cont)} = -3A$

$R_{CE(sat)} = 45m\Omega$ typical

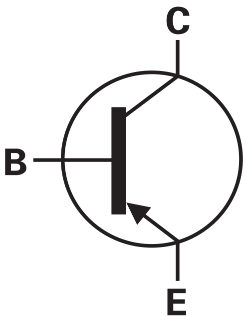
$V_{CE(sat)} < -80mV$ @ $-1A$

$P_D = 1.2W$

Complementary part number NK-ZXTN2020F

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.

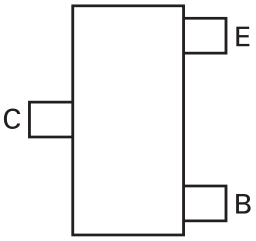


Features

- Higher power dissipation SOT23 package
- High peak current
- Low saturation voltage
- 130V forward blocking voltage

Applications

- MOSFET and IGBT gate driving
- Motor drive
- DC-DC converters
- High side switches



Pinout - top view

Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-base voltage	V_{CBO}	-130	V
Collector-emitter voltage	$V_{(BR)CEV}$	-130	V
Collector-emitter voltage	V_{CEO}	-100	V
Emitter-base voltage	V_{EBO}	-7.0	V
Peak pulse current	I_{CM}	-5	A
Continuous collector current$^{(a)}$	I_C	-3	A
Base current	I_B	-1	A
Power dissipation @ T_A=25°C$^{(a)}$ Linear derating factor	P_D	1.0 8.0	W mW/°C
Power dissipation @ T_A=25°C$^{(b)}$ Linear derating factor	P_D	1.2 9.6	W mW/°C
Power dissipation @ T_A=25°C$^{(c)}$ Linear derating factor	P_D	1.56 12.5	W mW/°C
Operating and storage temperature	T_j:T_{stg}	-55 to +150	°C

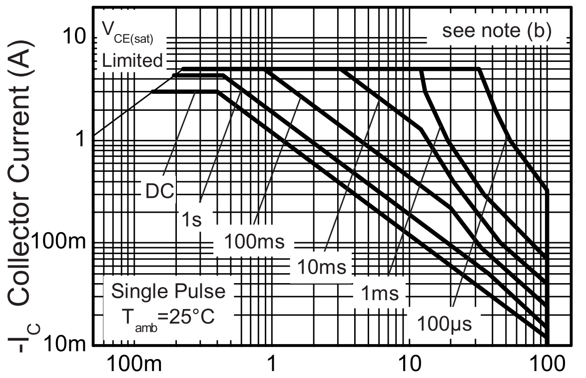
Thermal resistance

Parameter	Symbol	Value	Unit
Junction to ambient $^{(a)}$	$R\theta_{JA}$	125	°C/W
Junction to ambient $^{(b)}$	$R\theta_{JA}$	104	°C/W
Junction to ambient $^{(c)}$	$R\theta_{JA}$	80	°C/W

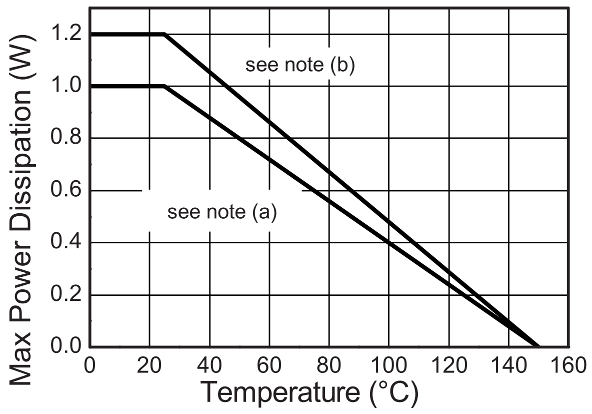
NOTES:

(a) Mounted on 18mm x 18mm x 1.6mm FR4 PCB with a very high coverage of 2 oz weight copper in still air conditions.
(b) Mounted on 30mm x 30mm x 1.6mm FR4 PCB with a very high coverage of 2 oz weight copper in still air conditions.
(c) As (b) above measured at t<5secs.

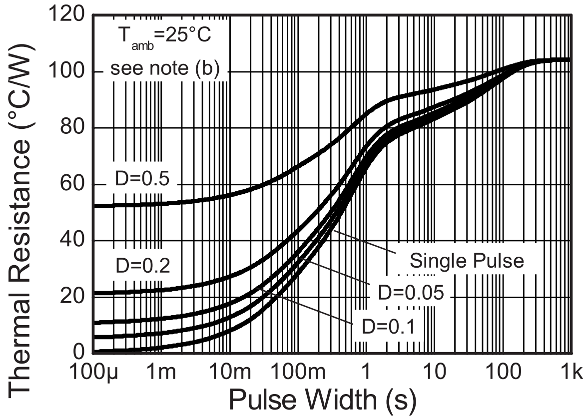
Characteristics



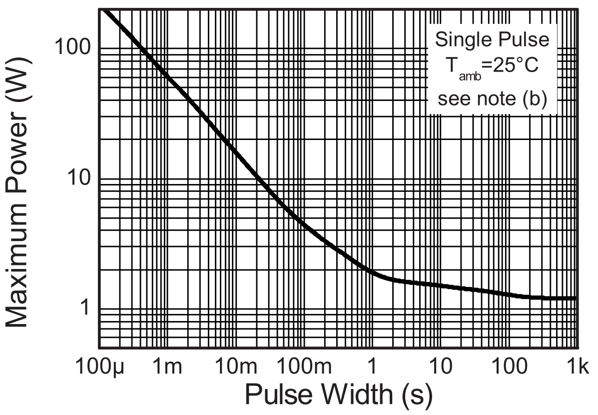
Safe Operating Area



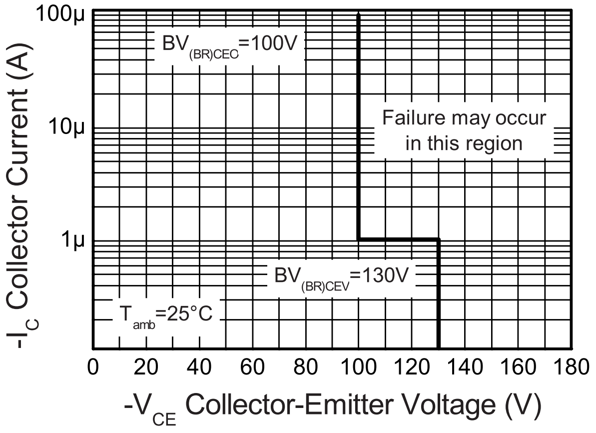
Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation



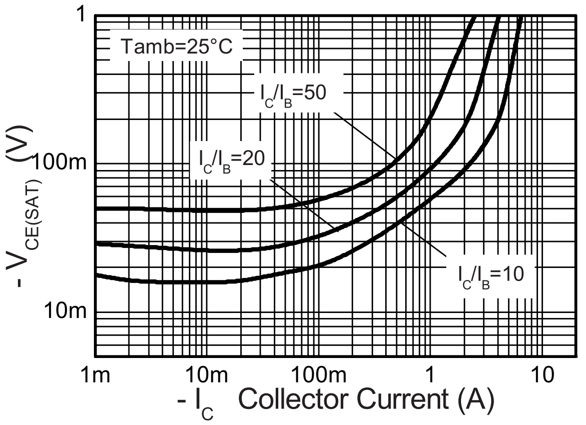
Safe Operating Area

Electrical characteristics (at T_{amb} = 25°C unless otherwise stated)

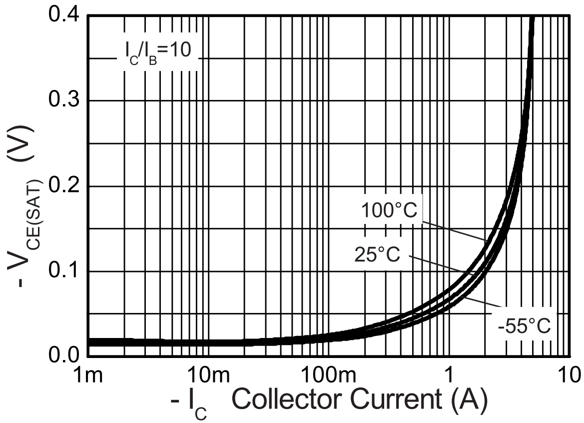
Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Collector-base breakdown voltage	$V_{(BR)CBO}$	-130	-160		V	I_C=-100μA
Collector-emitter breakdown voltage	$V_{(BR)CEV}$	-130	-160		V	I_C =–1μA, 1V> V_{BE}>-0.3V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	-100	-120		V	I_C=-10mA [a]
Emitter-base breakdown voltage	$V_{(BR)EBO}$	-7.0	-8.3		V	I_E=-100μA
Collector-emitter cut-off current	I_{CEV}			-20	nA	V_{CE}=-100V, V_{BE} = 1V
Collector-base cut-off current	I_{CBO}			-20	nA	V_{CB}=-100V
Emitter-base cut-off current	I_{EBO}			-10	nA	V_{EB}=-6V
Static forward current transfer ratio	H_{FE}	100 100 40	220 200 75	 300 		I_C=-10mA, V_{CE}=-2V[a] I_C=-1A, V_{CE}=-2V[a] Ic=-3A, V_{CE}=-2V
Collector-emitter saturation voltage	$V_{CE(sat)}$		-20 -60 -135 -180	-30 -80 -180 -250	mV mV mV mV	I_C=-100mA, I_B=-10mA[a] I_C=-1A, I_B=-100mA[a] I_C=-3A, I_B=-300mA[a] I_C=-4A, I_B=-400mA[a]
Base-emitter saturation voltage	$V_{BE(sat)}$		-0.90	-1.00	V	I_C=-3A, I_B=-300mA[a]
Base-emitter turn-on voltage	$V_{BE(on)}$		-0.81	-0.90	V	I_C=-3A, V_{CE}=-2V[a]
Transition frequency	f_T		150		MHz	Ic=-100mA, V_{CE}=-10V, f=50MHz
Output capacitance	C_{obo}		39		pF	V_{CB}=-10V, f=1MHz
Delay timetime	$t_{(d)}$		21		ns	V_{CC}=-10V, I_C=-1A, I_{B1}=I_{B2}=-100mA
Rise time	$t_{(r)}$		12		ns	
Storage time	$t_{(stg)}$		410		ns	
Fall time	$t_{(f)}$		35		ns	

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

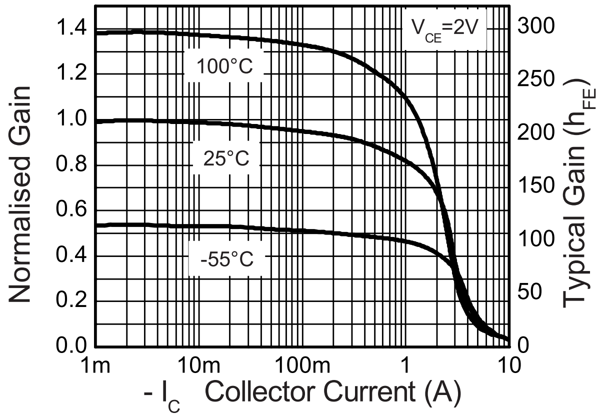
Typical characteristics



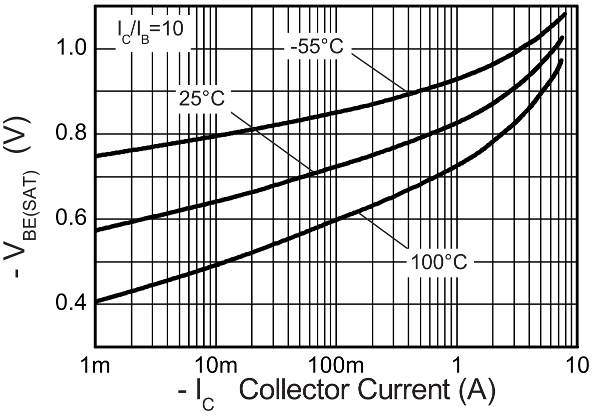
$V_{CE(SAT)}$ v I_C



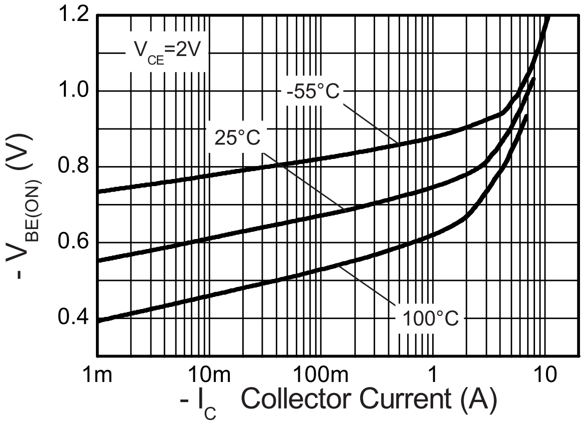
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C

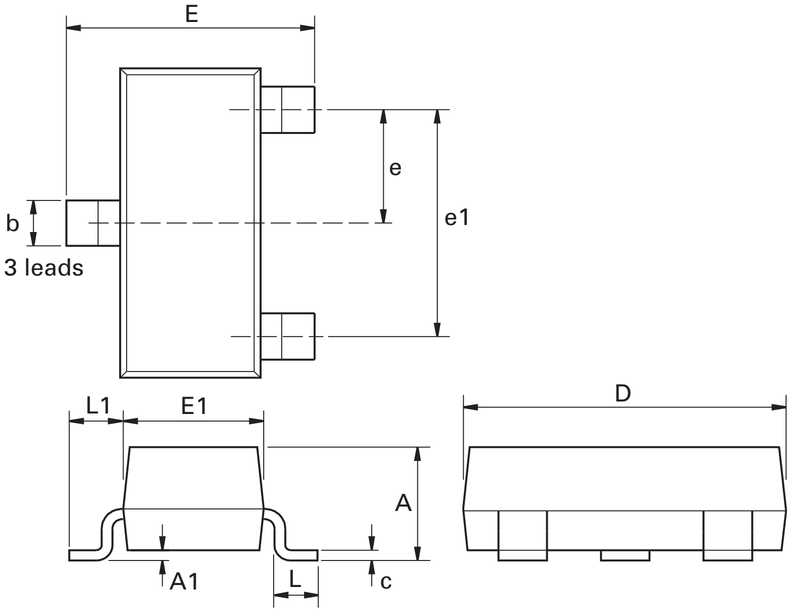


$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

Package outline - SOT23



Dim	Millimeters		Inches		Dim	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Min	Max
A	-	1.12	-	0.044	e1	1.90 NOM		0.075 NOM	
A1	0.01	0.10	0.0004	0.004	E	2.10	2.64	0.083	0.104
b	0.30	0.50	0.012	0.020	E1	1.20	1.40	0.047	0.055
c	0.085	0.20	0.003	0.008	L	0.25	0.60	0.0098	0.0236
D	2.80	3.04	0.110	0.120	L1	0.45	0.62	0.018	0.024
e	0.95 NOM		0.037 NOM		-	-	-	-	-

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