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

BV_{CEO} > -20V

BV_{ECO} > -4V

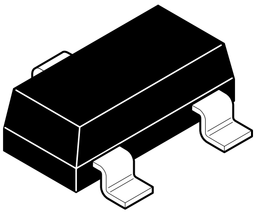
$I_{C(cont)}$ = 4A

$V_{CE(sat)}$ < 60 mV @ 1A

$R_{CE(sat)}$ = 39 mΩ

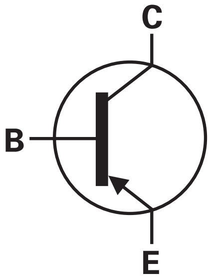
P_D = 1.25W

Complementary part number NK-ZXTN25020DFH



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.

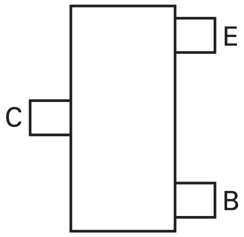


Features

- High power dissipation SOT23 package
- High peak current
- High gain
- Low saturation voltage

Applications

- MOSFET gate drivers
- Power switches
- Motor control



Pinout - top view

Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-base voltage	V_{CBO}	-25	V
Collector-emitter voltage (forward blocking)	V_{CEO}	-20	V
Emitter-collector voltage (reverse blocking)	V_{ECO}	-4	V
Emitter-base voltage	V_{EBO}	-7	V
Continuous collector current(c)	I_C	-4	A
Base current	I_B	-1	A
Peak pulse current	I_{CM}	-10	A
Power dissipation at T_{amb} =25°C(a) Linear derating factor	P_D	0.73 5.84	W mW/°C
Power dissipation at T_{amb} =25°C(b) Linear derating factor	P_D	1.05 8.4	W mW/°C
Power dissipation at T_{amb} =25°C(c) Linear derating factor	P_D	1.25 9.6	W mW/°C
Power dissipation at T_{amb} =25°C(d) Linear derating factor	P_D	1.81 14.5	W mW/°C
Operating and storage temperature range	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:

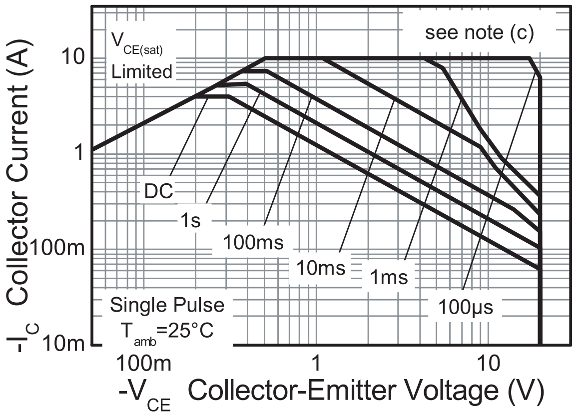
(a) For a device surface mounted on 15mm x 15mm x 0.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

(b) For a device surface mounted on 25mm x 25mm x 0.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

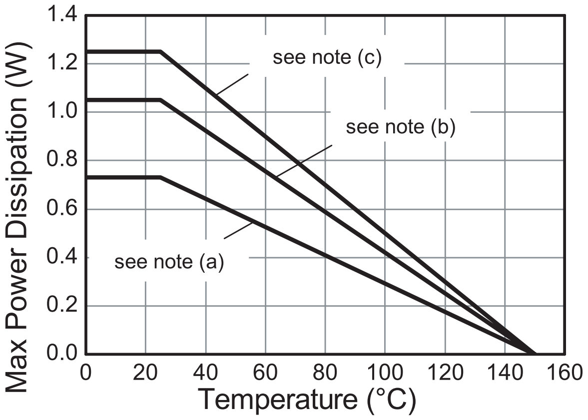
(c) For a device surface mounted on 50mm x 50mm x 0.6mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions.

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

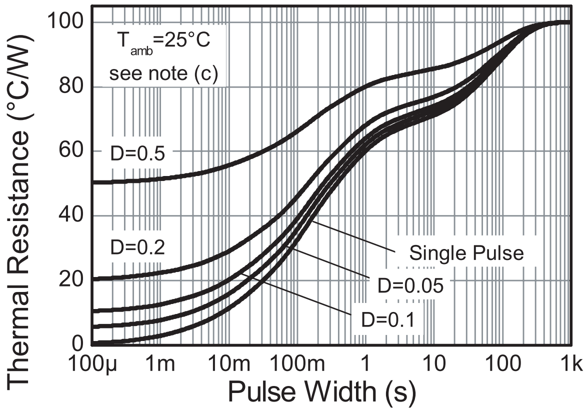
Characteristics



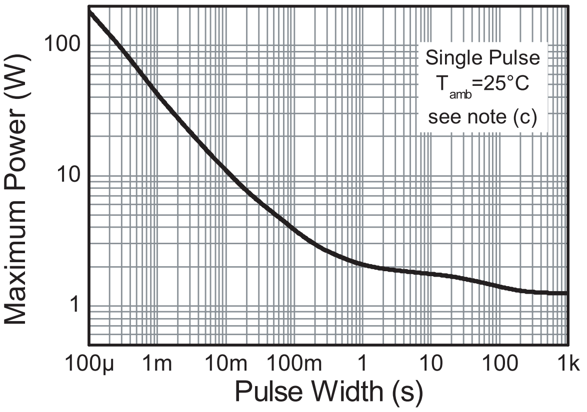
Safe Operating Area



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation

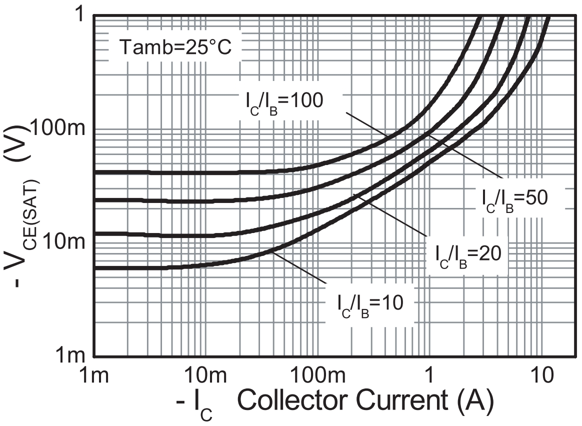
Electrical characteristics (at T_{amb} = 25°C unless otherwise stated)

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	-25	-55		V	I_C = -100µA
Collector-emitter breakdown voltage (base open)	BV_{CEO}	-20	-45		V	I_C = -10mA (*)
Emitter-base breakdown voltage	BV_{EBO}	-7	-8.3		V	I_E = -100µA
Emitter-collector breakdown voltage (reverse blocking)	BV_{ECO}	-4	-8.5		V	I_C = -100µA(*)
Collector cut-off current	I_{CBO}		<-1	-50	nA	V_{CB} = -20V
				-20	µA	V_{CB} = -20V, T_{amb}= 100°C
Emitter cut-off current	I_{EBO}		<-1	-50	nA	V_{EB} = -5.6V
Collector-emitter saturation voltage	$V_{CE(sat)}$		-50	-60	mV	I_C = -1A, I_B = -100mA(*)
			-150	-210	mV	I_C = -1A, I_B = -10mA(*)
			-180	-240	mV	I_C = -2A, I_B = -40mA(*)
			-155	-180	mV	I_C = -4A, I_B = -400mA(*)
Base-emitter saturation voltage	$V_{BE(sat)}$		-960	-1050	mV	I_C = -4A, I_B = -400mA(*)
Base-emitter turn-on voltage	$V_{BE(on)}$		-815	-900	mV	I_C = -4A, V_{CE} = -2V(*)
Static forward current transfer ratio	h_{FE}	300	450	900		I_C = -10mA, V_{CE} = -2V(*)
		200	310			I_C = -1A, V_{CE} = -2V(*)
		70	100			I_C = -4A, V_{CE} = -2V(*)
			20			I_C = -10A, V_{CE} = -2V(*)
Transition frequency	f_T		290		MHz	I_C = -50mA, V_{CE} = -10V f = 50MHz
Output capacitance	C_{OBO}		21	30	pF	V_{CB} = -10V, f = 1MHz(*)
Delay time	$t_{(d)}$		14.2			V_{CC} = -10V. I_C = -1A, I_{B1} = I_{B2}= -50mA.
Rise time	$t_{(r)}$		16.3			
Storage time	$t_{(s)}$		186			
Fall time	$t_{(f)}$		32.7			

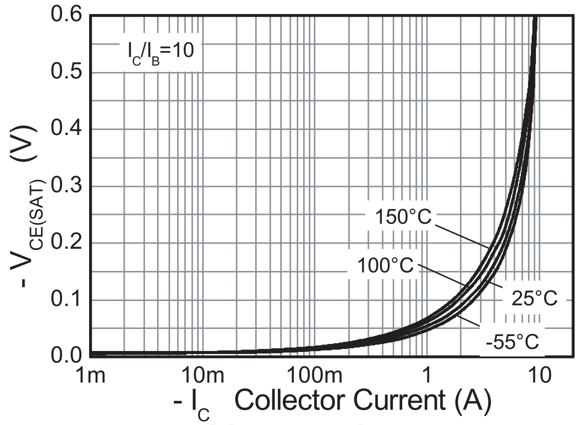
NOTES:

(*) Measured under pulsed conditions. Pulse width ≤300µs; duty cycle ≤2%.

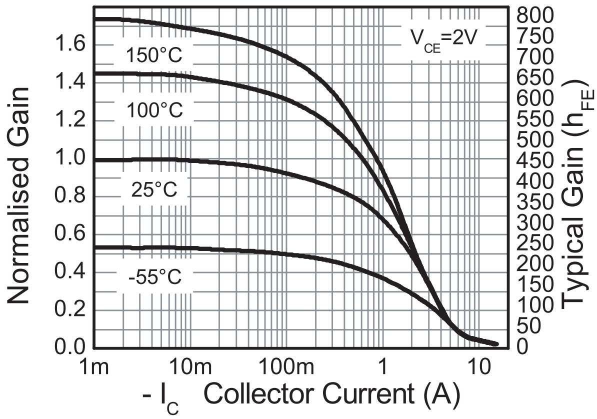
Typical characteristics



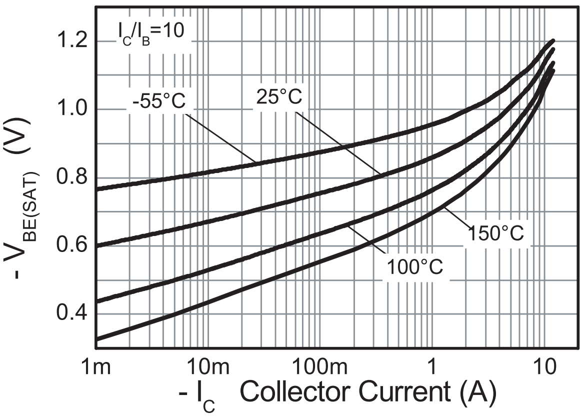
$V_{CE(SAT)}$ v I_C



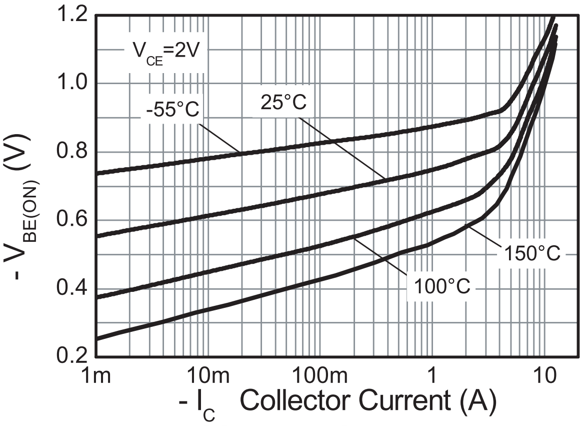
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C

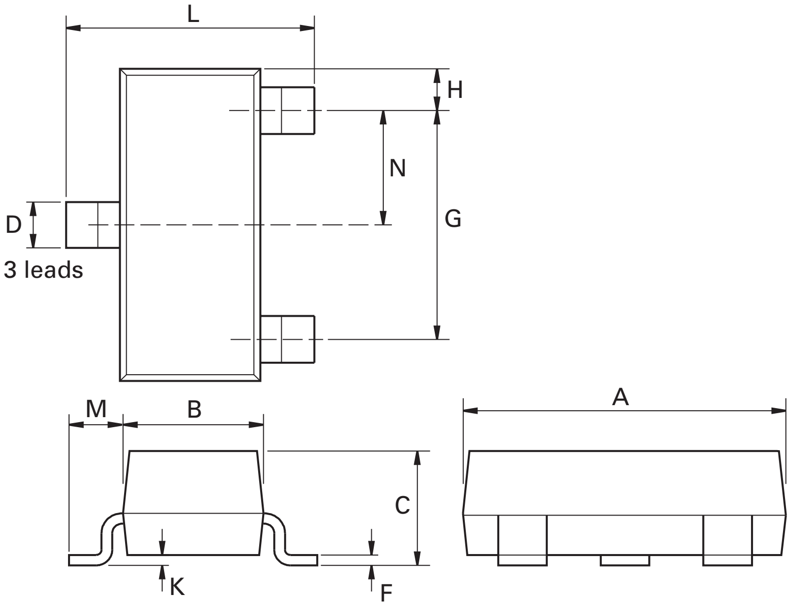


$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ 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