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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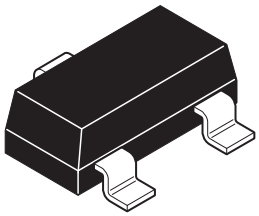
Summary



BV_{CEO} > -12V

h_{FE} > 500

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

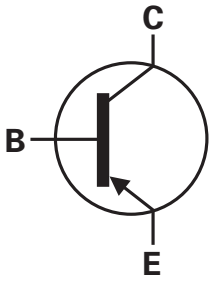
$R_{CE(sat)}$ = 40mΩ

$V_{CE(sat)}$ < -65mV @ 1A

P_D = 1.25W

Complementary part number NK-ZXTN25012EFH

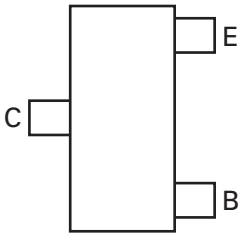
Description



Advanced process capability and package design have been used to maximise 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
- Very high gain, 500 minimum
- Low saturation voltage



Pinout - top view

Applications

- MOSFET and IGBT gate driving
- DC - DC converters
- Motor drive
- High side driver
- Line disconnect switch

Absolute maximum ratings

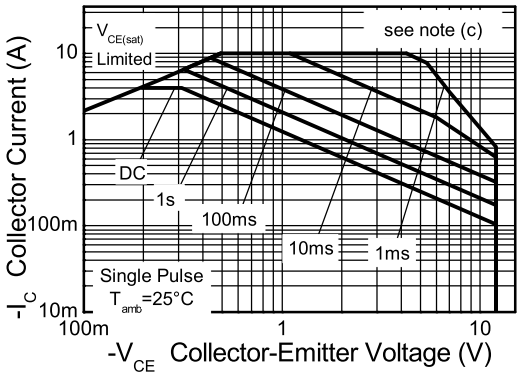
Parameter	Symbol	Limit	Unit
Collector-base voltage	V_{CBO}	-12	V
Collector-emitter voltage	V_{CEO}	-12	V
Emitter-base voltage	V_{EBO}	-7	V
Continuous collector current(b)	I_C	-4	A
Base current	I_B	-1	A
Peak pulse current	I_{CM}	-10	A
Power dissipation at T_{amb} =25°C(a)	P_D	0.73	W
Linear derating factor		5.84	mW/°C
Power dissipation at T_{amb} =25°C(b)	P_D	1.05	W
Linear derating factor		8.4	mW/°C
Power dissipation at T_{amb} =25°C(c)	P_D	1.25	W
Linear derating factor		9.6	mW/°C
Power dissipation at T_{amb} =25°C(d)	P_D	1.81	W
Linear derating factor		14.5	mW/°C
Operating and storage temperature range	T_j, T_{stg}	-55 to 150	°C

Thermal resistance

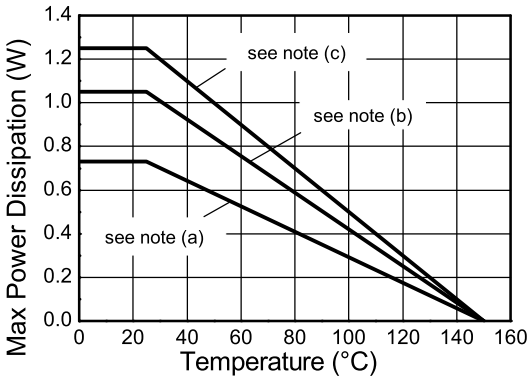
Parameter	Symbol	Limit	Unit
Junction to ambient(a)	$R_{\Theta JA}$	171	°C/W
Junction to ambient(b)	$R_{\Theta JA}$	119	°C/W
Junction to ambient(c)	$R_{\Theta JA}$	100	°C/W
Junction to ambient(d)	$R_{\Theta JA}$	69	°C/W

NOTES:
(a) For a device surface mounted on 15mm x 15mm x 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<5secs

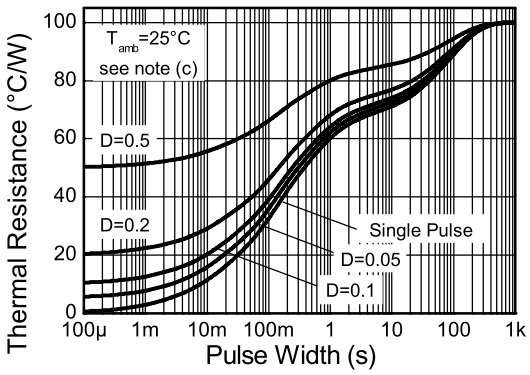
Characteristics



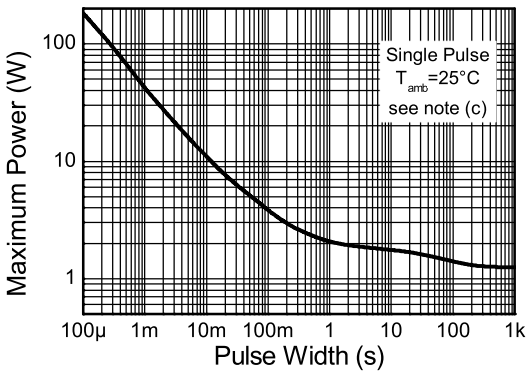
Safe Operating Area



Derating Curve



Transient Thermal Impedance



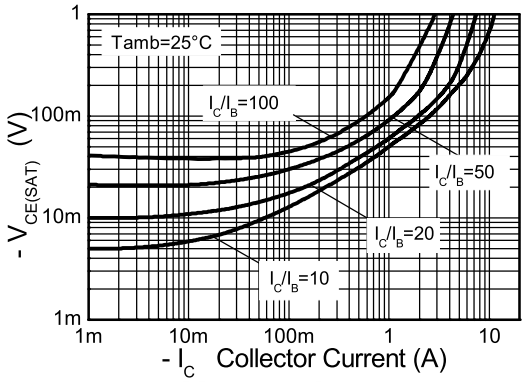
Pulse Power Dissipation

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

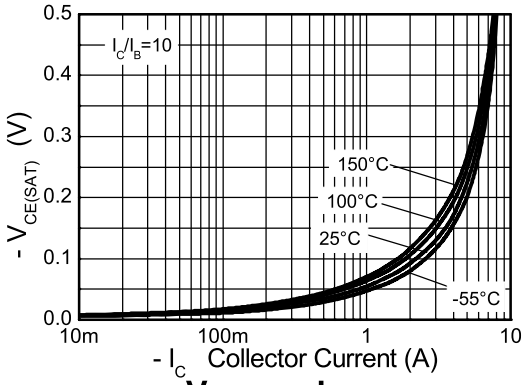
Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	-12	-35		V	I_C = -100μA
Collector-emitter breakdown voltage (base open)	BV_{CEO}	-12	-25		V	I_C = -10mA (*)
Emitter-base breakdown voltage	BV_{EBO}	-7	-8.5		V	I_E = -100μA
Collector-base cut-off current	I_{CBO}		<-1	-50	nA	V_{CB} = -12V
				-0.5	μA	V_{CB} = -12V, T_{amb}= 100°C
Emitter-base cut-off current	I_{EBO}		<-1	-50	nA	V_{EB} = -5.6V
Collector-emitter saturation voltage	$V_{CE(sat)}$		-50	-65	mV	I_C = -1A, I_B = -100mA(*)
			-150	-260	mV	I_C = -1A, I_B = -10mA(*)
			-175	-350	mV	I_C = -2A, I_B = -40mA(*)
			-160	-210	mV	I_C = -4A, I_B = -400mA(*)
Base-emitter saturation voltage	$V_{BE(sat)}$		-970	-1050	mV	I_C = -4A, I_B = -400mA(*)
Base-emitter turn-on voltage	$V_{BE(on)}$		-825	-950	mV	I_C = -4A, V_{CE} = -2V(*)
Static forward current transfer ratio	h_{FE}	500	800	1500		I_C = -10mA, V_{CE} = -2V(*)
		300	450			I_C = -1A, V_{CE} = -2V(*)
		50	100			I_C = -4A, V_{CE} = -2V(*)
Transition frequency	f_T		310		MHz	I_C = -50mA, V_{CE} = -10V f = 100MHz
Output capacitance	C_{obo}		16.9		pF	V_{CB} = -10V, f = 1MHz(*)
Delay time	t_d		41		ns	V_{CC} = -10V I_C = -1A, I_{B1} = I_{B2}= -10mA
Rise time	t_r		62		ns	
Storage time	t_s		179		ns	
Fall time	t_f		65		ns	

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

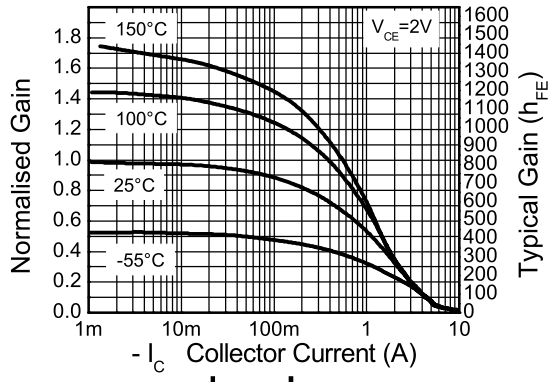
Typical characteristics



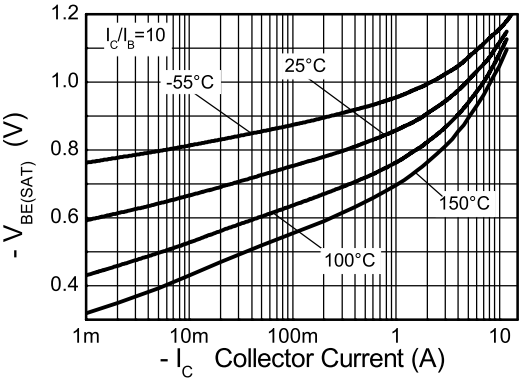
$V_{CE(SAT)}$ v I_C



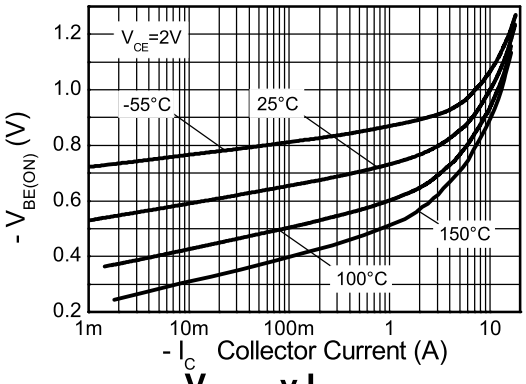
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C

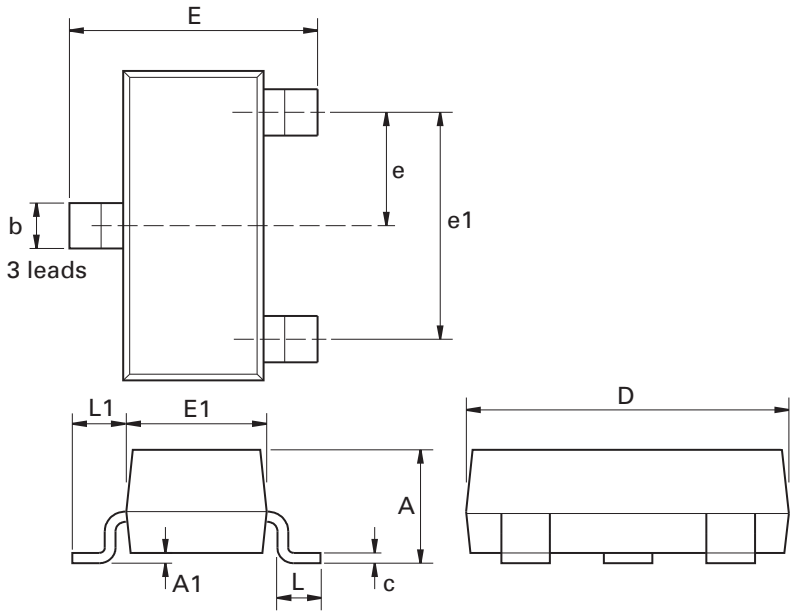


$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

Package outline - SOT23



Dim	Millimeters		Inches		Dim	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Max	Max
A	-	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	0.120	0.003	0.008	L	0.25	0.62	0.018	0.024
D	2.80	3.04	0.110	0.120	L1	0.45	0.62	0.018	0.024
e	0.95 NOM		0.0375 NOM		-	-	-	-	-

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