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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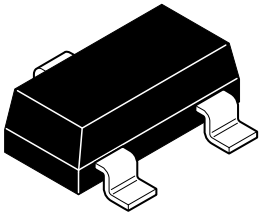
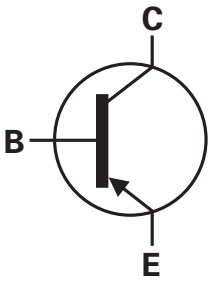
Summary



$V_{(BR)CES}$ > -15V, $V_{(BR)CEO}$ > -15V
$V_{(BR)ECO}$ > -6V
$I_{C(CONT)}$ = -6A
$R_{CE(SAT)}$ = 20mΩ typical
$V_{CE(SAT)}$ < -36mV @ -1A
P_D = 1.25W

Complementary part number NK-ZXTN23015CFH

Description



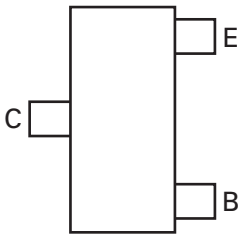
Advanced process capability and package design have been used to maximize the power handling and performance of this small outline transistor. The compact size and ratings of this device make it ideally suited to applications where space is at a premium.

Feature

- Higher power dissipation SOT23 package
- High peak current
- Low saturation voltage
- 15V forward blocking voltage
- 6V reverse blocking voltage

Applications

- High side disconnect switches
- DC - DC converters
- MOSFET and IGBT gate driving
- Motor drive
- Relay, lamp, and solenoid drive



Pinout - top view

Absolute maximum ratings

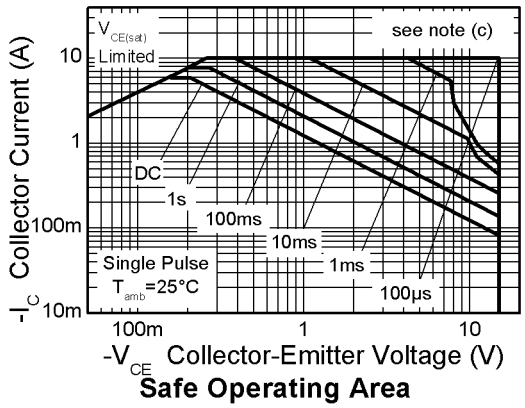
Parameter	Symbol	Limit	Unit
Collector-base voltage	V_{CBO}	-15	V
Collector-emitter voltage	$V_{(BR)CES}$	-15	V
Collector-emitter voltage	V_{CEO}	-15	V
Emitter-base voltage	V_{EBO}	-7.0	V
Emitter-collector voltage	V_{ECO}	-6.0	V
Peak pulse current	I_{CM}	-10	A
Continuous collector current (c)	I_C	-5	A
Continuous collector current (d)	I_C	-6	A
Base current	I_B	-1.2	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

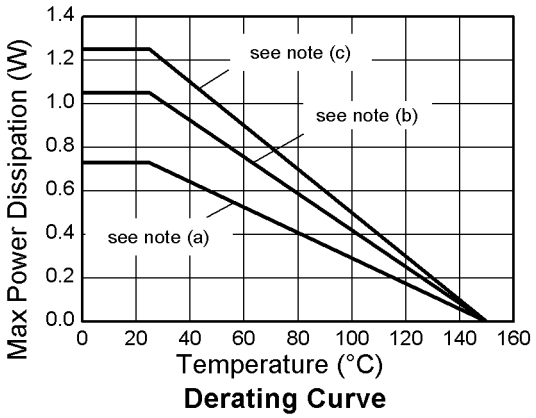
Parameter	Symbol	Value	Unit
Junction to ambient (a)	$R\Theta_{JA}$	171	°C/W
Junction to ambient (b)	$R\Theta_{JA}$	119	°C/W
Junction to ambient (c)	$R\Theta_{JA}$	100	°C/W
Junction to ambient (d)	$R\Theta_{JA}$	69	°C/W

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.

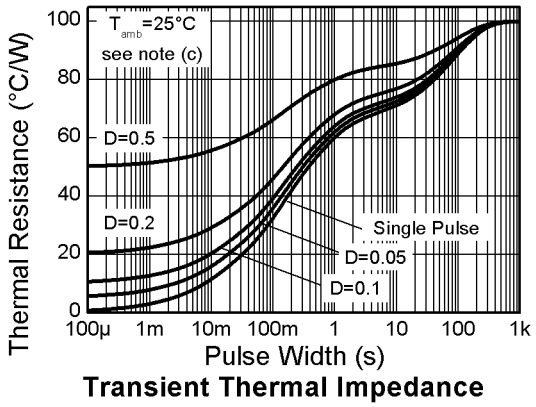
Characteristics



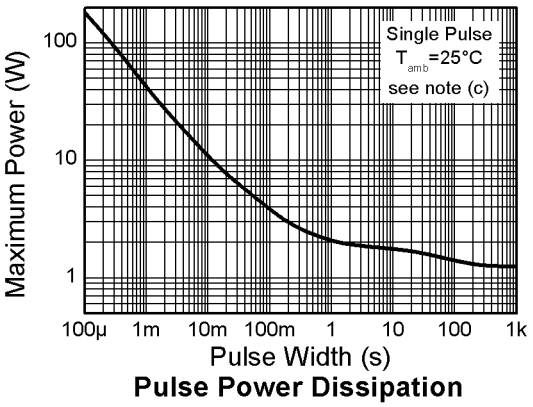
Safe Operating Area



Derating Curve



Transient Thermal Impedance



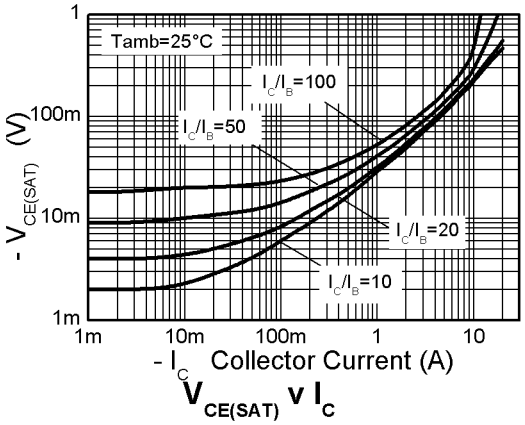
Pulse Power Dissipation

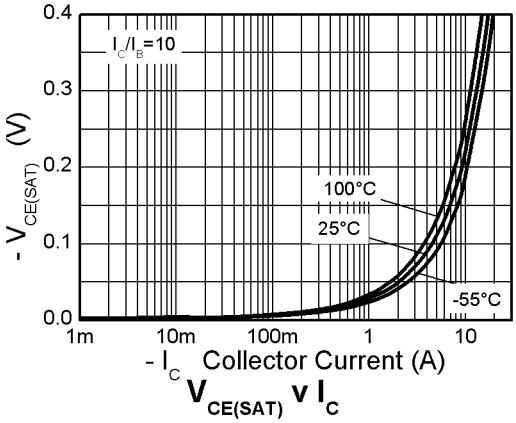
ELECTRICAL CHARACTERISTICS (at T_{AMB} = 25°C unless otherwise stated)

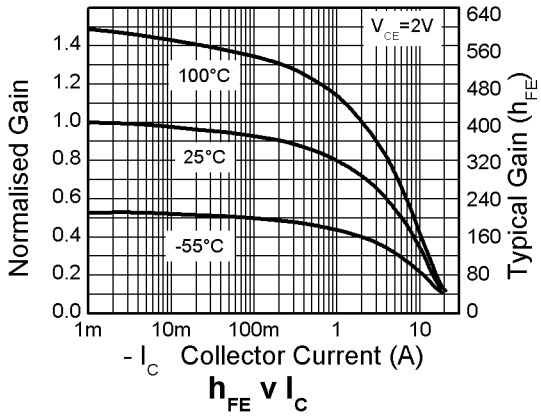
Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Collector-base breakdown voltage	$V_{(BR)CBO}$	-15	-40		V	I_C=-100μA
Collector-emitter breakdown voltage	$V_{(BR)CES}$	-15	-40		V	I_C =-100μA
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	-15	-25		V	I_C=-10mA(*)
Emitter-base breakdown voltage	$V_{(BR)EBO}$	-7.0	-8.2		V	I_E=-100μA
Emitter-collector breakdown voltage	$V_{(BR)ECO}$	-6.0	-8.5		V	I_E=-100μA
Collector-emitter cut-off current	I_{CES}			-20	nA	V_{CE}=-12V
Collector-base cut-off current	I_{CBO}			-20	nA	V_{CB}=-12V
Emitter-base cut-off current	I_{EBO}			-10	nA	V_{EB}=-6V
Static forward current transfer ratio	H_{FE}	200 200 140	380 350 220	 560 		I_C=-10mA, V_{CE}=-2V (*) I_C=-500mA, V_{CE}=-2V Ic=-6A, V_{CE}=-2V
Collector-emitter saturation voltage	$V_{CE(sat)}$		-6 -27 -90 -140	-10 -36 -120 -190	mV mV mV mV	I_C=-100mA, I_B=-10mA(*) I_C=-1A, I_B=-100mA(*) I_C=-3A, I_B=-60mA(*) I_C=-6A, I_B=-240mA(*)
Base-emitter saturation voltage	$V_{BE(sat)}$		-0.83 -0.93	-0.93 -1.03	V V	I_C=-3A, I_B=-60mA(*) I_C=-6A, I_B=-240mA(*)
Base-emitter turn-on voltage	$V_{BE(on)}$		-0.83	-0.93	V	I_C=-6A, V_{CE}=-2V(*)
Transition frequency	f_T		270		MHz	Ic=-500mA, V_{CE}=-2V, f=50MHz
Output capacitance	C_{obo}		78.4		pF	V_{CB}=-10V, f=1MHz
Delay time	$t_{(d)}$		16		ns	V_{CC}=-5V, I_C=-3A, I_{B1}=I_{B2}=-150mA
Rise time	$t_{(r)}$		13		ns	
Storage time	$t_{(stg)}$		123		ns	
Fall time	$t_{(f)}$		9		ns	

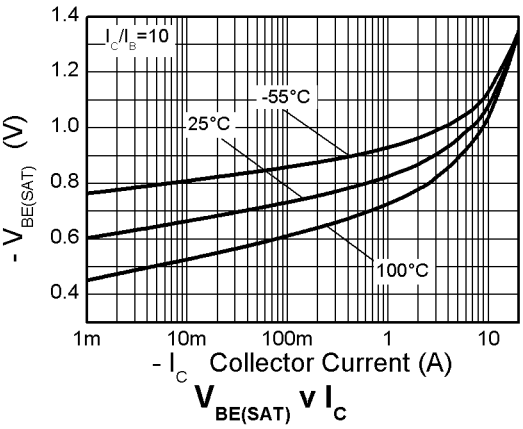
NOTES:
(*) Measured under pulsed conditions. Pulse width = 300μS. Duty cycle ≤2%.

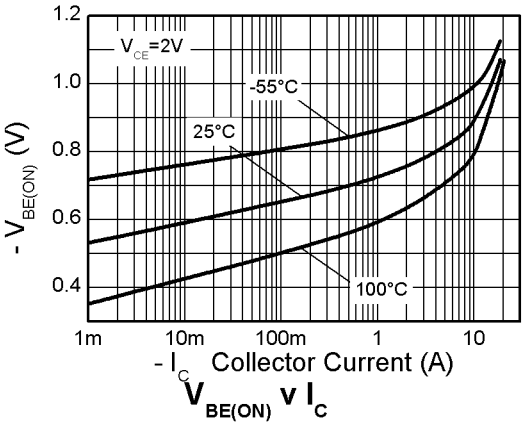
Typical characteristics



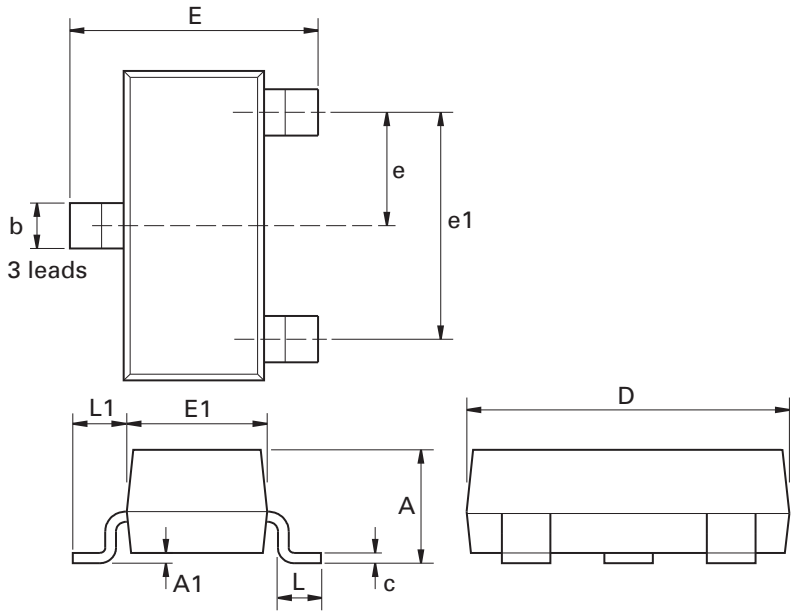








Package outline - SOT23



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