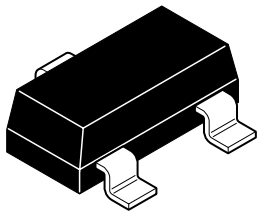
ZXTN25015DFH
15V, SOT23, NPN medium power transistor

Summary



BV_{CEX} > 30V

BV_{CEO} > 15V

BV_{ECO} > 4.5V

$I_{C(cont)}$ = 5A

$V_{CE(sat)}$ < 40 mV @ 1A

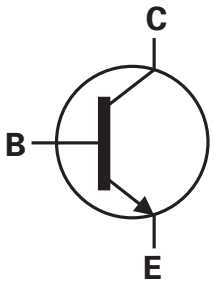
$R_{CE(sat)}$ = 25 mΩ

P_D = 1.25W

Complementary part number ZXTP25015DFH

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.

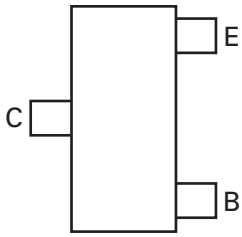


Features

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

Applications

- LED driving
- DC-DC converters
- MOSFET and IGBT gate driving
- Motor drive



Pinout - top view

Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTN25015DFHTA	7	8	3,000

Device marking

1A8

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Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-base voltage	V_{CBO}	40	V
Collector-emitter voltage (forward blocking)	V_{CEX}	30	V
Collector-emitter voltage	V_{CEO}	15	V
Emitter-collector voltage (reverse blocking)	V_{ECO}	4.5	V
Emitter-base voltage	V_{EBO}	7	V
Continuous collector current[c]	I_C	5	A
Peak pulse current	I_{CM}	15	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.

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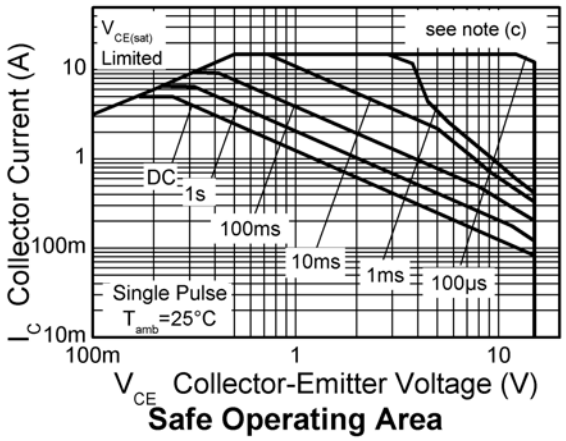
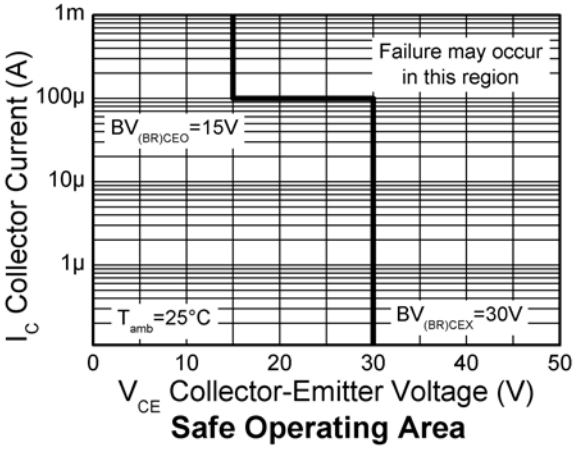
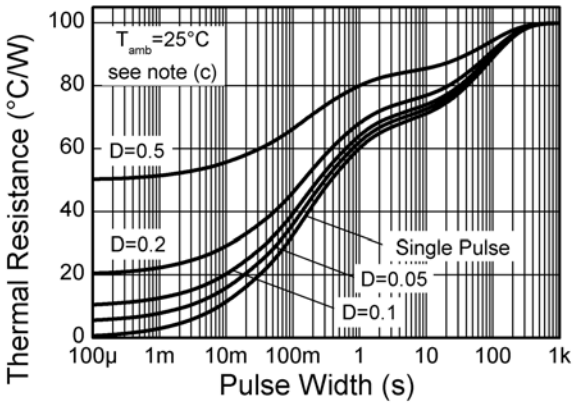
Characteristics



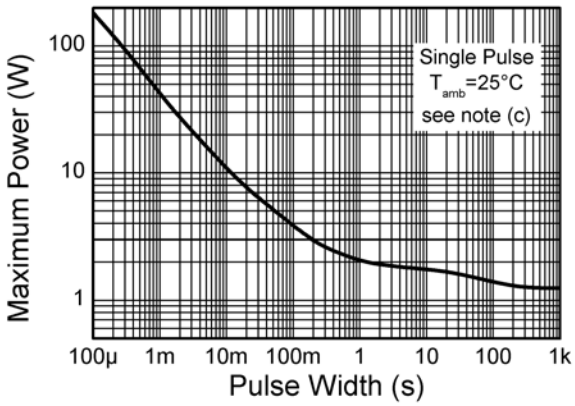
Safe Operating Area



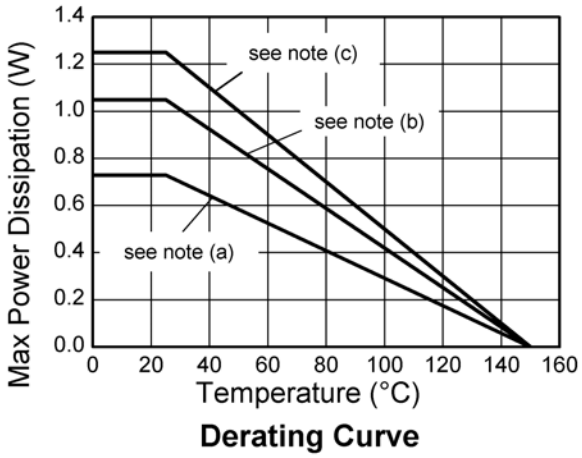
Safe Operating Area



Transient Thermal Impedance



Pulse Power Dissipation



Derating Curve

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-emitter breakdown voltage	BV_{CEO}	15	22		V	I_C = 10mA (*)
Collector-emitter breakdown voltage (reverse blocking)	BV_{ECX}	6	8		V	I_E = 100μA, R_{BC} < 1kΩ or 0.25v > V_{BC} > -0.25V
Collector-emitter breakdown voltage (reverse blocking)	BV_{ECO}	4.5	5.3		V	I_E = 100μA,
Emitter-base breakdown voltage	BV_{EBO}	7	8.2		V	I_E = 100μA
Collector cut-off current	I_{CBO}		<1	50 20	nA μA	V_{CB} = 40V V_{CB} = 40V, T_{amb}= 100°C
Collector-emitter cut-off current	I_{CEX}		-	100	nA	V_{CE} = 30V; R_{BE} < 1kΩ or -1V < V_{BE} < 0.25V
Emitter cut-off current	I_{EBO}		<1	50	nA	V_{EB} = 5.6V
Collector-emitter saturation voltage	$V_{CE(sat)}$		30 60 90 125 160	40 80 125 155 215	mV mV mV mV mV	I_C = 1A, I_B = 100mA(*) I_C = 1A, I_B = 10mA(*) I_C = 2A, I_B = 20mA(*) I_C = 5A, I_B = 500mA(*) I_C = 5A, I_B = 100mA(*)
Base-emitter saturation voltage	$V_{BE(sat)}$		990	1090	mV	I_C = 5A, I_B = 500mA(*)
Base-emitter turn-on voltage	$V_{BE(on)}$		805	900	mV	I_C = 5A, V_{CE} = 2V(*)
Static forward current transfer ratio	h_{FE}	300 300 150 25	450 400 275 40	900		I_C = 10mA, V_{CE} = 2V(*) I_C = 2A, V_{CE} = 2V(*) I_C = 5A, V_{CE} = 2V(*) I_C = 15A, V_{CE} = 2V(*)
Transition frequency	f_T	150	240		MHz	I_C = 50mA, V_{CE} = 10V f = 50MHz
Output capacitance	C_{OBO}		22.7	30	pF	V_{CB} = 10V, f = 1MHz(*)
Delay time	$t_{(d)}$		16		ns	V_{CC} = 10V. I_C = 3A, I_{B1} = I_{B2}= 50mA.
Rise time	$t_{(r)}$		41		ns	
Storage time	$t_{(s)}$		148		ns	
Fall time	$t_{(f)}$		23		ns	

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

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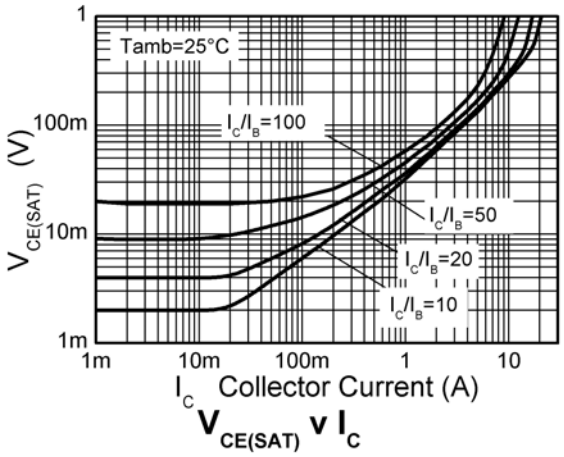
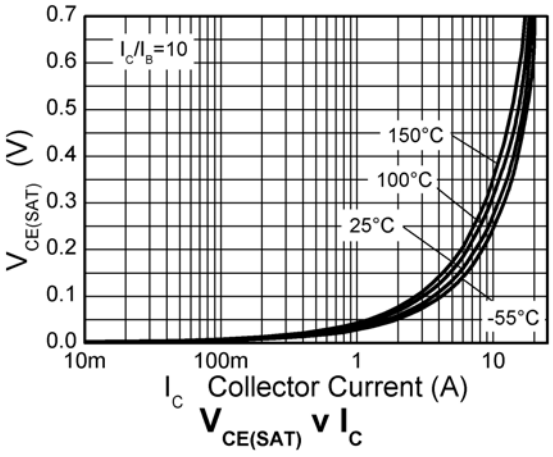
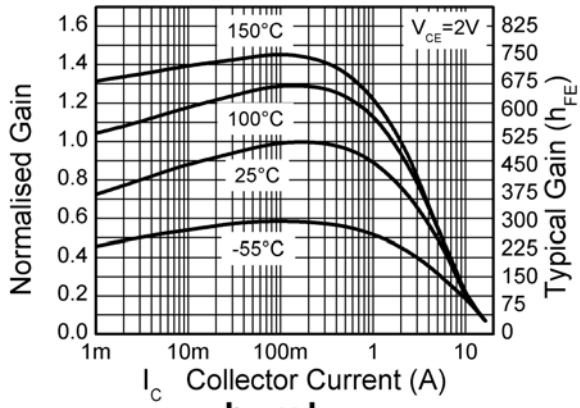
Typical characteristics



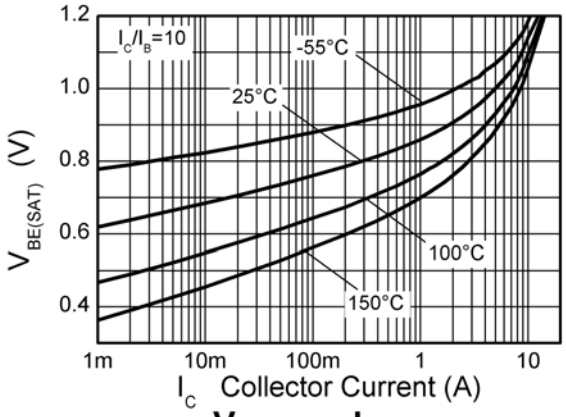
$V_{CE(SAT)}$ v I_C



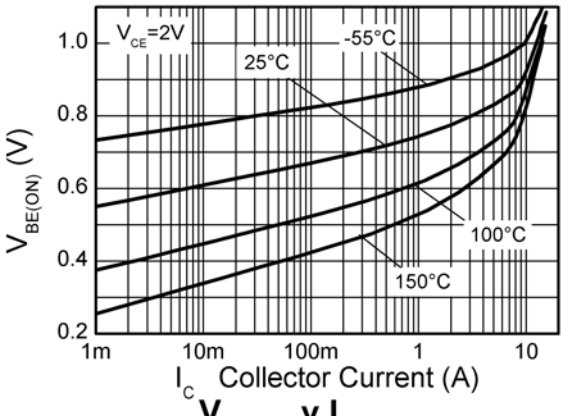
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C



$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

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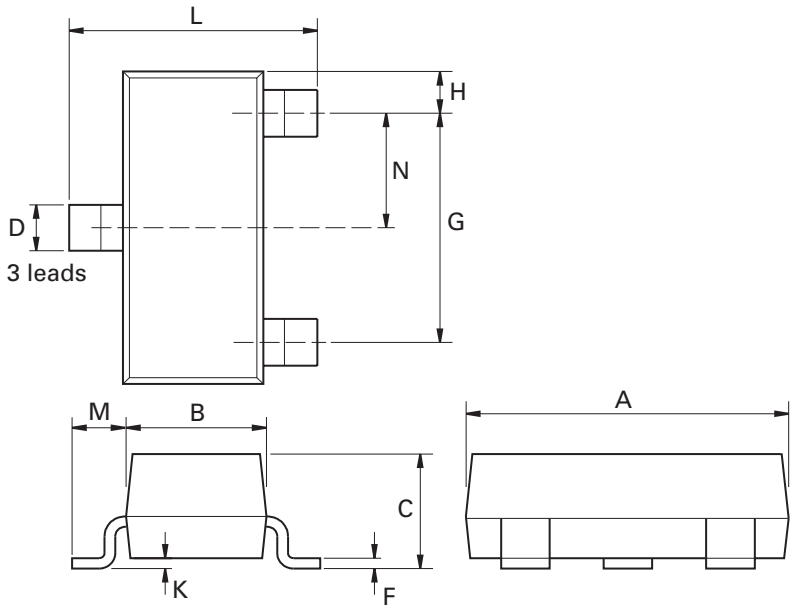
Package outline - SOT23



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

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