ZXTN2018F
60V, SOT23, NPN medium power transistor

Summary

$V_{(BR)CEV}$ > 140V, $V_{(BR)CEO}$ > 60V

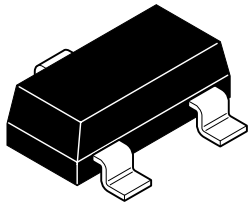
$I_{C(cont)}$ = 5A

$R_{CE(sat)}$ = 25 mΩ typical

$V_{CE(sat)}$ < 45 mV @ 1A

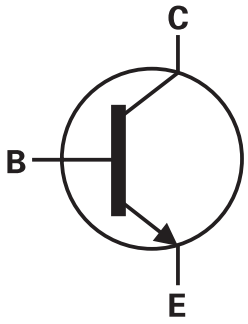
P_D = 1.2W

Complementary part number : ZXTP2027F



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.

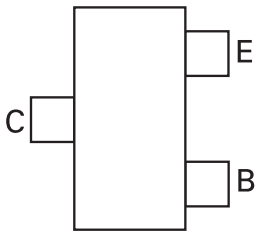


Features

- Higher power dissipation SOT23 package
- High peak current
- Low saturation voltage
- 140V forward blocking voltage

Applications

- MOSFET and IGBT gate driving
- Motor drive
- Relay, lamp and solenoid drive



Pinout - top view

Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTN2018FTA	7	8	3,000

Device marking

851

Absolute maximum ratings

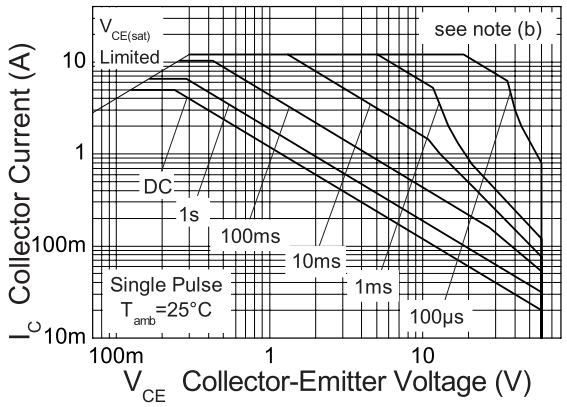
Parameter	Symbol	Limit	Unit
Collector-base voltage	V_{CBO}	140	V
Collector-emitter voltage	$V_{(BR)CEV}$	140	V
Collector-emitter voltage	V_{CEO}	60	V
Emitter-base voltage	V_{EBO}	7	V
Peak pulse current	I_{CM}	12	A
Continuous collector current (a)	I_C	5	A
Base current	I_B	1	A
Power dissipation @ T_A=25°C (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

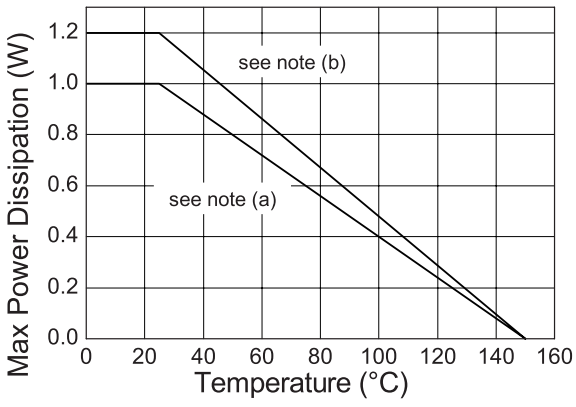
Parameter	Symbol	Value	Unit
Junction to ambient (a)	$R\Theta_{JA}$	125	°C/W
Junction to ambient (b)	$R\Theta_{JA}$	104	°C/W
Junction to ambient (c)	$R\Theta_{JA}$	80	°C/W

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.

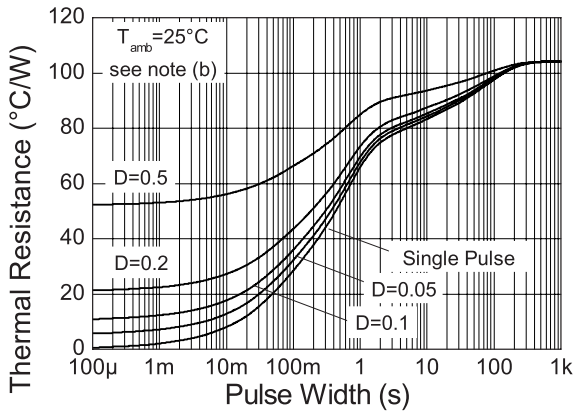
Characteristics



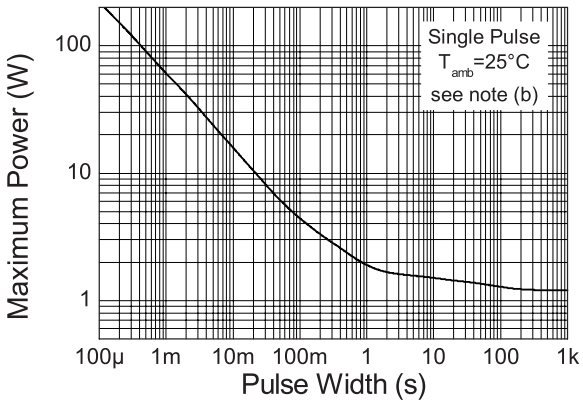
Safe Operating Area



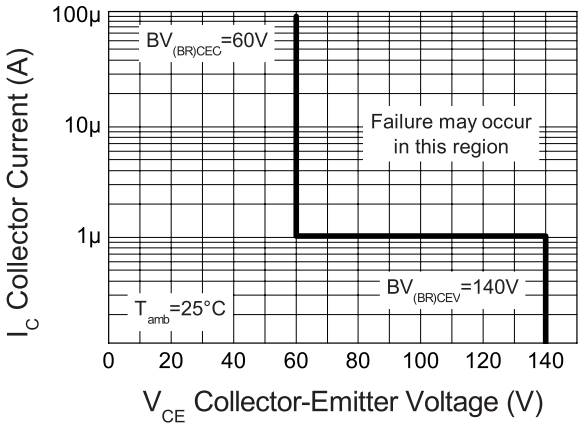
Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation



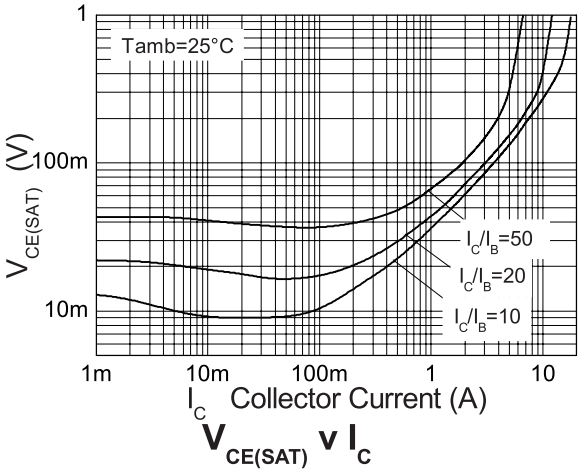
Safe Operating Area

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

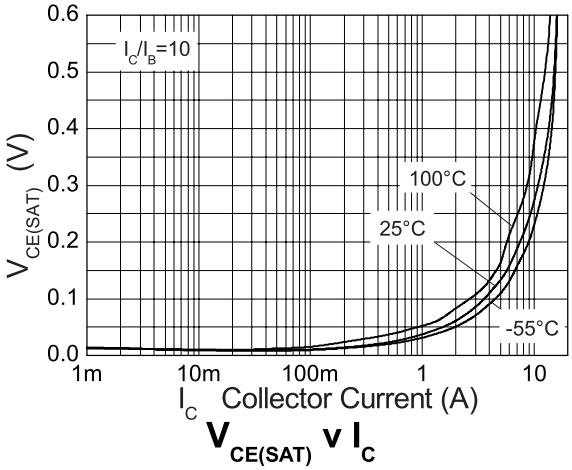
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	$V_{(BR)CBO}$	140	180		V	I_C=100μA
Collector-emitter breakdown voltage	$V_{(BR)CEV}$	140	180		V	I_C =1μA, -1V < V_{BE} < +0.3V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	60	80		V	I_C=10mA [(a)]
Emitter-base breakdown voltage	$V_{(BR)EBO}$	7	8		V	I_E=100μA
Collector-emitter cut-off current	I_{CEV}		<1	20	nA	V_{CE}=110V, V_{BE} = -1V
Collector-base cut-off current	I_{CBO}		<1	20	nA	V_{CB}=110V
Emitter-base cut-off current	I_{EBO}		<1	10	nA	V_{EB}=6V
Static forward current transfer ratio	H_{FE}	100	220			I_C=10mA, V_{CE}=1V[(a)]
		100	200	300		I_C=2A, V_{CE}=1V[(a)]
		40	65			I_C=5A, V_{CE}=1V[(a)]
		15	25			I_C=10A, V_{CE}=1V[(a)]
Collector-emitter saturation voltage	$V_{CE(sat)}$		15	30	mV	I_C=0.1A, I_B=5mA[(a)]
			35	45	mV	I_C=1A, I_B=100mA[(a)]
			40	55	mV	I_C=1A, I_B=50mA[(a)]
			85	110	mV	I_C=2A, I_B=50mA[(a)]
			145	170	mV	I_C=5A, I_B=250mA[(a)]
			170	210	mV	I_C=6A, I_B=300mA[(a)]
Base-emitter saturation voltage	$V_{BE(sat)}$		0.92	1.00	V	I_C=5A, I_B=250mA[(a)]
Base-emitter turn-on voltage	$V_{BE(on)}$		0.85	0.95	V	I_C=5A, V_{CE}=1V[(a)]
Transition frequency	f_T		130		MHz	Ic=100mA, V_{CE}=10V, f=50MHz
Output capacitance	C_{obo}		28		pF	V_{CB}=10V, f=1MHz
Turn-on time	$t_{(on)}$		33		ns	V_{CC}=10V, I_C=1A, I_{B1}=I_{B2}=100mA
Turn-off time	$t_{(off)}$		668		ns	

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

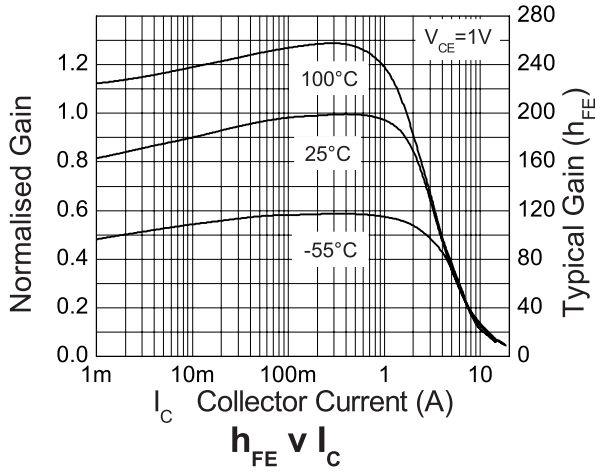
Typical characteristics



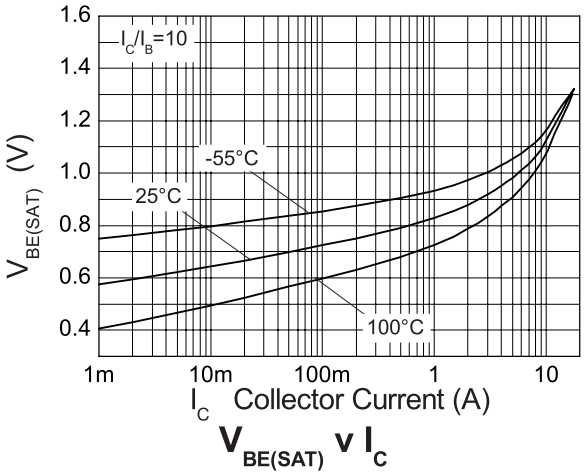
$V_{CE(SAT)}$ v I_C



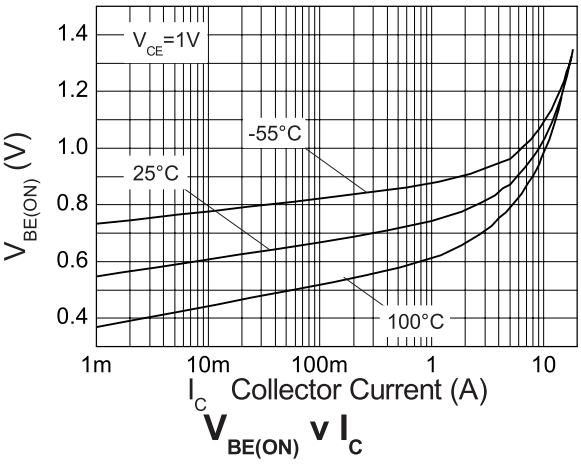
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C

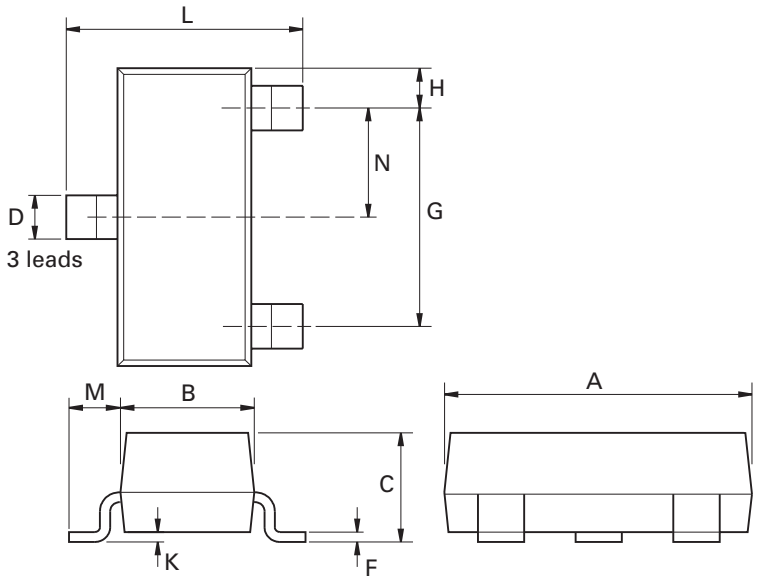


$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

Packaging details - 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

Europe	Americas	Asia Pacific	Corporate Headquarters
Zetex GmbH Streitfeldstraße 19 D-81673 München Germany	Zetex Inc 700 Veterans Memorial Highway Hauppauge, NY 11788 USA	Zetex (Asia Ltd) 3701-04 Metroplaza Tower 1 Hing Fong Road, Kwai Fong Hong Kong	Zetex Semiconductors plc Zetex Technology Park, Chadderton Oldham, OL9 9LL United Kingdom
Telefon: (49) 89 45 49 49 0 Fax: (49) 89 45 49 49 49 europe.sales@zetex.com	Telephone: (1) 631 360 2222 Fax: (1) 631 360 8222 usa.sales@zetex.com	Telephone: (852) 26100 611 Fax: (852) 24250 494 asia.sales@zetex.com	Telephone (44) 161 622 4444 Fax: (44) 161 622 4446 hq@zetex.com