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Diodes Incorporated
ZXTN2038FTA

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A Product Line of
Diodes Incorporated

ZXTN2038F
SOT23 80 volt NPN silicon planar medium power transistor

Summary

$V_{(BR)CEV}$ > 80V
$V_{(BR)CEO}$ > 60V
$I_{c(cont)}$ = 1A
$V_{ce(sat)}$ < 500mV @ 1A

Complementary type

ZXTP2039F

Description

This transistor combines high gain, high current operation and low saturation voltage making it ideal for power MOSFET gate driving and low loss power switching.

Features

- Low saturation voltage for reduced power dissipation
- 1 to 2 amp high current capability
- Pb-free
- SOT23 package

Applications

- Power MOSFET gate driving
- Low loss power switching

Ordering information

Device	Reel size	Tape width	Quantity per reel
ZXTN2038FTA	7″	8mm	3,000
ZXTN2038FTC	13″	8mm	10,000

Device marking

N38

Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-base voltage	V_{CBO}	80	V
Collector-emitter voltage	V_{CEV}	80	V
Collector-emitter voltage	V_{CEO}	60	V
Emitter-base voltage	V_{EBO}	5.0	V
Peak pulse current	I_{CM}	2	A
Continuous collector current (*)	I_C	1	A
Peak base current	I_{BM}	1	A
Power dissipation @ T_A=25°C(*)	P_D	350	mW
Operating and storage temperature	T_j:T_{stg}	55 to +150	°C

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

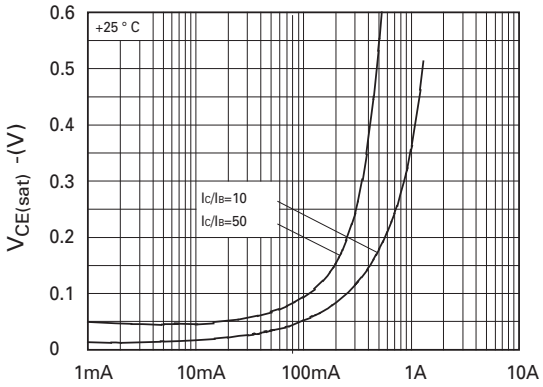
Electrical characteristics (@T_{AMB} = 25°C)

Parameter	Symbol	Min.	Max.	Unit	Conditions
Collector-base breakdown voltage	$V_{(BR)CBO}$	80		V	I_C=100μA
Collector-emitter breakdown voltage	$V_{(BR)CEV}$	80		V	I_C=100μA, 0.3V > V_{BE} > -1V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	60		V	I_C=10mA (*)
Emitter-base breakdown voltage	$V_{(BR)EBO}$	5		V	I_E=100μA
Collector-emitter cut-off current	I_{CES}		100	nA	V_{CE}=60V
Collector-base cut-off current	I_{CBO}		100	nA	V_{CB}=60V
Emitter-base cut-off current	I_{EBO}		100	nA	V_{EB}=4V
Static forward current transfer ratio	h_{FE}	100 100 80 30	300		I_C=1mA, V_{CE}=5V I_C=500mA, V_{CE}=5V(*) I_C=1A, V_{CE}=5V(*) I_C=2A, V_{CE}=5V(*)
Collector-emitter saturation voltage	$V_{CE(sat)}$		0.2 0.25 0.5	V V V	I_C=100mA, I_B=2mA(*) I_C=500mA, I_B=50mA(*) I_C=1A, I_B=100mA(*)
Base-emitter saturation voltage	$V_{BE(sat)}$		1.1	V	I_C=1A, I_B=100mA(*)
Base-emitter turn-on voltage	$V_{BE(on)}$		1.0	V	I_C=1A, V_{CE}=5V(*)
Transition frequency	f_T	150			I_C=50mA, V_{CE}=10V f=100MHz
Output capacitance	C_{obo}		10	pF	V_{CB}=10V, f=1MHz

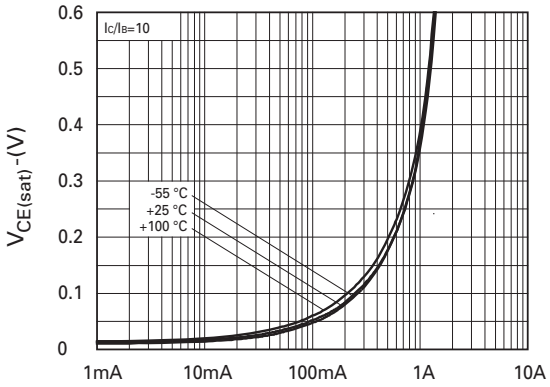
NOTES:
(*) Measured under pulsed conditions. Pulse width=300μS. Duty cycle ≤2%
Spice parameter data is available upon request for this device

ZXTN2038F

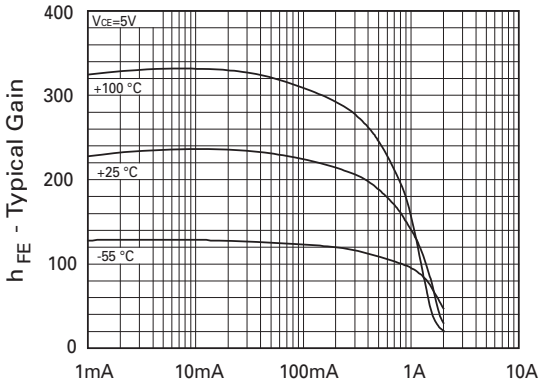
Typical characteristics



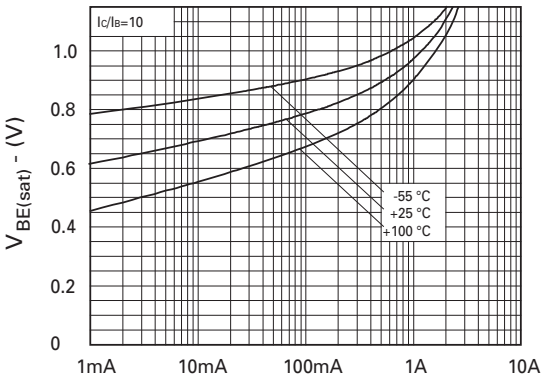
VCE(sat) v IC



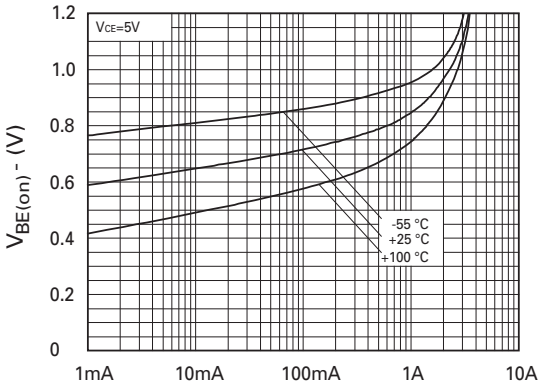
VCE(sat) v IC



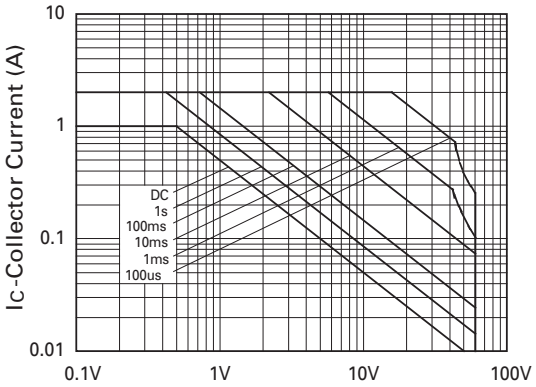
hFE V IC



VBE(sat) v IC

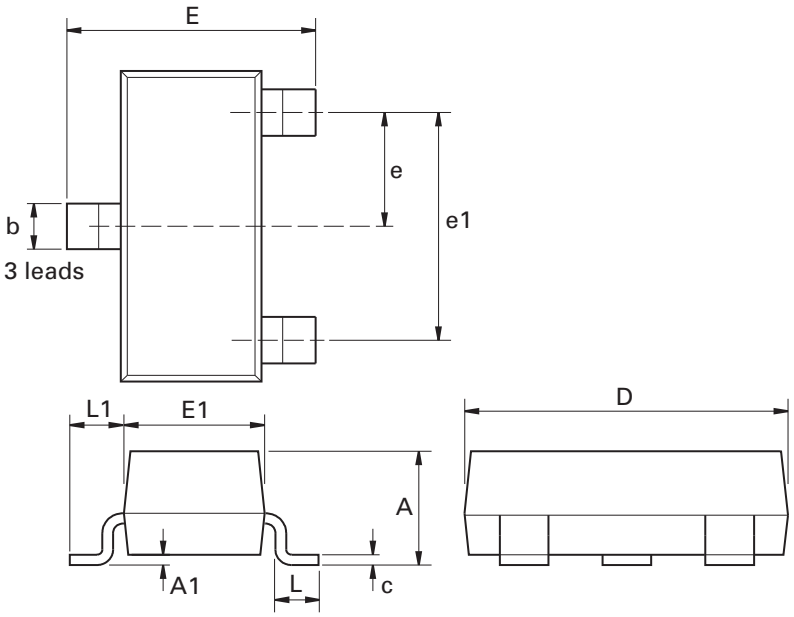


VBE(on) v IC



Safe Operating Area

Packaging details - SOT23



Package dimensions

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

Definitions

Product change

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   1. are intended to implant into the body

or

   2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.

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ESD (Electrostatic discharge)

Semiconductor devices are susceptible to damage by ESD. Suitable precautions should be taken when handling and transporting devices. The possible damage to devices depends on the circumstances of the handling and transporting, and the nature of the device. The extent of damage can vary from immediate functional or parametric malfunction to degradation of function or performance in use over time. Devices suspected of being affected should be replaced.

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Diodes Inc. is committed to environmental excellence in all aspects of its operations which includes meeting or exceeding regulatory requirements with respect to the use of hazardous substances. Numerous successful programs have been implemented to reduce the use of hazardous substances and/or emissions.

All Diodes Zetex components are compliant with the RoHS directive, and through this it is supporting its customers in their compliance with WEEE and ELV directives.

Product status key:

"Preview"	Future device intended for production at some point. Samples may be available
"Active"	Product status recommended for new designs
"Last time buy (LTB)"	Device will be discontinued and last time buy period and delivery is in effect
"Not recommended for new designs"	Device is still in production to support existing designs and production
"Obsolete"	Production has been discontinued

Datasheet status key:

"Draft version"	This term denotes a very early datasheet version and contains highly provisional information, which may change in any manner without notice.
"Provisional version"	This term denotes a pre-release datasheet. It provides a clear indication of anticipated performance. However, changes to the test conditions and specifications may occur, at any time and without notice.
"Issue"	This term denotes an issued datasheet containing finalized specifications. However, changes to specifications may occur, at any time and without notice.

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