ZXTP2041F
SOT23 40 volt PNP silicon planar medium power transistor

Summary

$V_{(BR)CEO}$ > -40V
$I_{c(cont)}$ = -1A
$V_{ce(sat)}$ < -500mV @ -1A

Complementary type

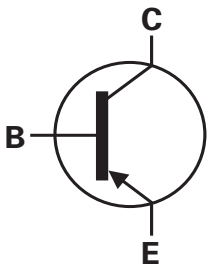
ZXTN2040F

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

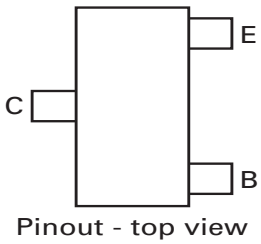


Applications

- Power MOSFET gate driving
- Low loss power switching

Ordering information

Device	Reel size	Tape width	Quantity per reel
ZXTP2041FTA	7″	8mm	3,000
ZXTP2041FTC	13″	8mm	10,000



Pinout - top view

Device marking

P41

Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-Base voltage	V_{CBO}	-40	V
Collector-Emitter voltage	V_{CEO}	-40	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

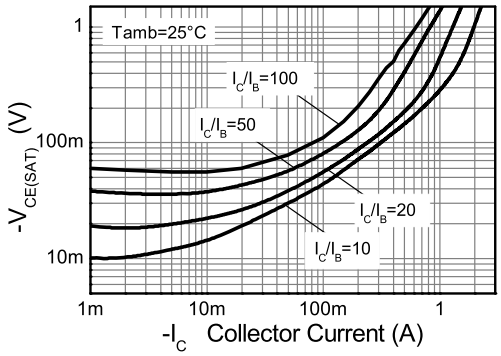
NOTES:
(*) For a device surface mounted on a 15mm x 15mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

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

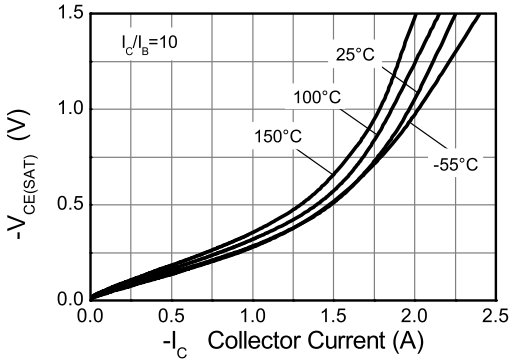
Parameter	Symbol	Min.	Max.	Unit	Conditions
Collector-Base breakdown voltage	$V_{(BR)CBO}$	-40		V	I_C=-100μA
Collector-Emitter breakdown voltage	$V_{(BR)CEO}$	-40		V	I_C=-10mA (*)
Emitter-Base breakdown voltage	$V_{(BR)EBO}$	-5		V	I_E=-100μA
Collector-Emitter cut-off current	I_{CES}		-100	nA	V_{CE}=-30V
Collector-Base cut-off current	I_{CBO}		-100	nA	V_{CB}=-30V
Emitter-Base cut-off current	I_{EBO}		-100	nA	V_{EB}=-4V
Static forward current transfer ratio	h_{FE}	300 300 250 160 30	800		I_C=-1mA, V_{CE}=-5V I_C=-100mA, 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 -0.3 -0.5	V V V	I_C=-100mA, I_B=-1mA(*) I_C=-500mA, I_B=-20mA(*) I_C=-1A, I_B=-100mA(*)
Base-Emitter saturation voltage	$V_{BE(sat)}$		-1.1	V	I_C=-1A, I_B=-50mA(*)
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=300 μS. Duty cycle ≤2%
Spice parameter data is available upon request for this device

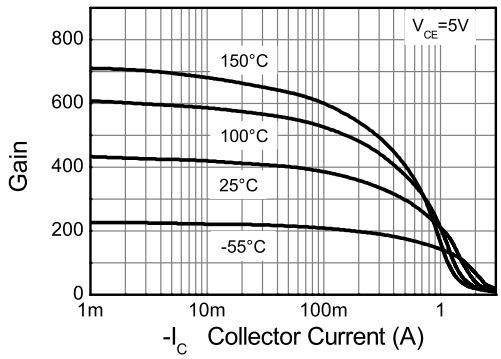
PNP electrical characteristics



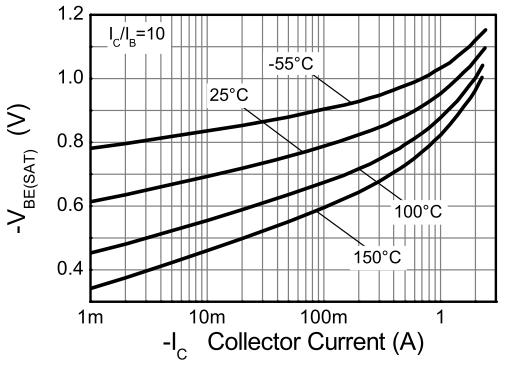
$V_{CE(SAT)}$ v I_C



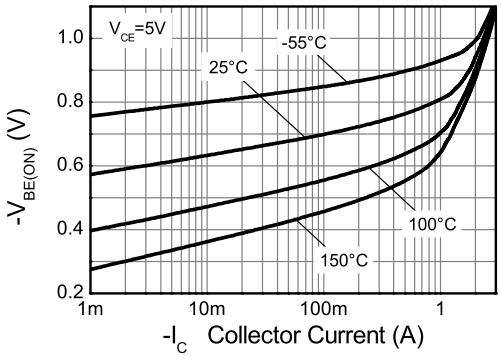
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C

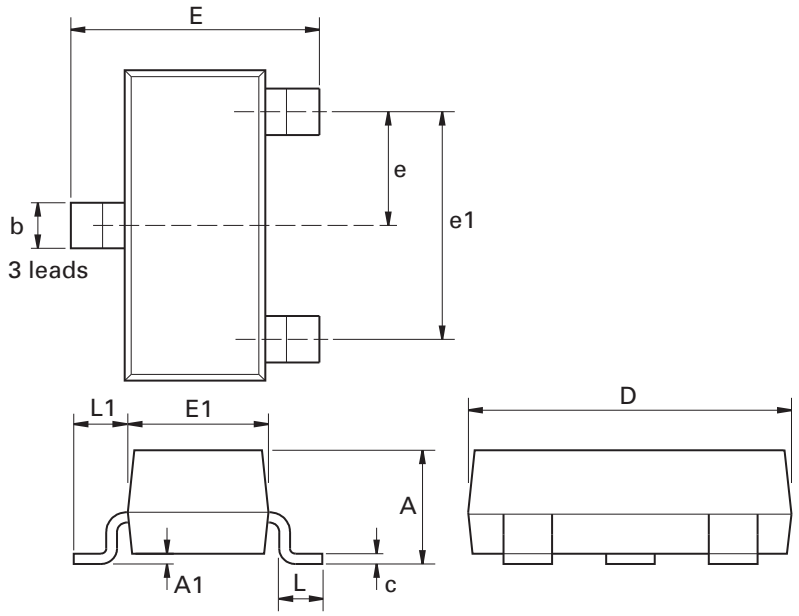


$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

Packaging details - SOT23



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 in millimetres. Approximate dimensions are provided in inches..

Definitions

Product change

Diodes Incorporated reserves the right to alter, without notice, specifications, design, price or conditions of supply of any product or service. Customers are solely responsible for obtaining the latest relevant information before placing orders.

Applications disclaimer

The circuits in this design/application note are offered as design ideas. It is the responsibility of the user to ensure that the circuit is fit for the user's application and meets with the user's requirements. No representation or warranty is given and no liability whatsoever is assumed by Diodes Inc. with respect to the accuracy or use of such information, or infringement of patents or other intellectual property rights arising from such use or otherwise. Diodes Inc. does not assume any legal responsibility or will not be held legally liable (whether in contract, tort (including negligence), breach of statutory duty, restriction or otherwise) for any damages, loss of profit, business, contract, opportunity or consequential loss in the use of these circuit applications, under any circumstances.

Life support

Diodes Zetex products are specifically not authorized for use as critical components in life support devices or systems without the express written approval of the Chief Executive Officer of Diodes Incorporated. As used herein:

A. Life support devices or systems are devices or systems which:
   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.

B. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or to affect its safety or effectiveness.

Reproduction

The product specifications contained in this publication are issued to provide outline information only which (unless agreed by the company in writing) may not be used, applied or reproduced for any purpose or form part of any order or contract or be regarded as a representation relating to the products or services concerned.

Terms and Conditions

All products are sold subjects to Diodes Inc. terms and conditions of sale, and this disclaimer (save in the event of a conflict between the two when the terms of the contract shall prevail) according to region, supplied at the time of order acknowledgement.

For the latest information on technology, delivery terms and conditions and prices, please contact your nearest Diodes or Zetex sales office.

Quality of product

Diodes Zetex Semiconductors Limited is an ISO 9001 and TS16949 certified semiconductor manufacturer.

To ensure quality of service and products we strongly advise the purchase of parts directly from Diodes Inc. or one of our regionally authorized distributors. For a complete listing of authorized distributors please visit: **www.zetex.com or www.diodes.com**

Diodes Inc. does not warrant or accept any liability whatsoever in respect of any parts purchased through unauthorized sales channels.

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.

Green compliance

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.

Sales offices

The Americas

3050 E. Hillcrest Drive
Westlake Village,
CA 91362-3154
Tel: (+1) 805 446 4800
Fax: (+1) 805 446 4850

Europe

Kustermann-Park
Balanstraße 59,
D-81541 München
Germany
Tel: (+49) 894 549 490
Fax: (+49) 894 549 4949

Taiwan

7F, No. 50,
Min Chuan Road
Hsin-Tien
Taipei, Taiwan
Tel: (+886) 289 146 000
Fax: (+886) 289 146 639

Shanghai

Rm. 606, No.1158
Changning Road
Shanghai, China
Tel: (+86) 215 241 4882
Fax (+86) 215 241 4891

Shenzhen

ANLIAN Plaza, #4018
Jintian Road
Futian CBD,
Shenzhen, China
Tel: (+86) 755 882 849 88
Fax: (+86) 755 882 849 99

Korea

6 Floor, Changhwa B/D,
1005-5 Yeongtong-dong,
Yeongtong-gu, Suwon-si,
Gyeonggi-do, Korea 443-813
Tel: (+82) 312 731 884
Fax: (+82) 312 731 885