150V PNP HIGH-VOLTAGE TRANSISTOR IN SOT23

Description

This Bipolar Junction Transistor (BJT) is designed to meet the stringent requirements of automotive applications.

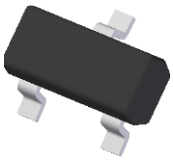
Features and Benefits

- BV_{CEO} > -150V
- Maximum Continuous Collector Current I_C = -600mA
- Excellent h_{FE} Characteristics up to I_C = -50mA
- Low Saturation Voltages
- Complementary Part Number: ZXTN5551FLQ
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The ZXTP5401FLQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF16949 certified facilities.**
  https://www.diodes.com/quality/product-definitions/

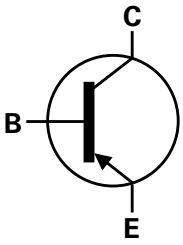
Mechanical Data

- Package: SOT23
- Package Material: Molded Plastic. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish; Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.008 grams (Approximate)

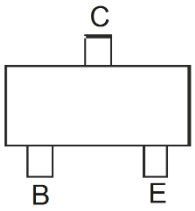
SOT23



Top View



Device Symbol



Top View
Pinout

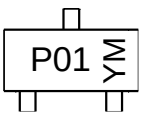
Ordering Information (Note 4)

Orderable Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
ZXTP5401FLQTA	SOT23	P01	7	8	3,000	Reel

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information

SOT23



P01 = Product Type Marking Code
YM = Date Code Marking
Y or $\overline{Y}$ = Year (ex: M = 2025)
M = Month (ex: 9 = September)

Date Code Key

Year	2021	-	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Code	I	-	M	N	P	R	S	T	U	V	W	X

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

Absolute Maximum Ratings (@ T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-160	V
Collector-Emitter Voltage	V_{CEO}	-150	V
Emitter-Base Voltage	V_{EBO}	-5	V
Continuous Collector Current	I_C	-600	mA
Peak Pulse Current	I_{CM}	-1	A

Thermal Characteristics (@ T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Collector Power Dissipation	(Note 5)	P_D	310	mW
	(Note 6)		350	
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	403	°C/W
	(Note 6)		357	
Thermal Resistance, Junction to Leads	(Note 7)	$R_{\theta JL}$	350	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Notes: 5. For the device mounted on minimum recommended pad layout FR4 PCB with high coverage of single-sided 1oz copper in still air condition.
6. Same as Note 5, expect the device is mounted on 15mm x 15mm x 1.6mm FR4 PCB.
7. Thermal resistance from junction to solder-point (at the end of the collector lead).

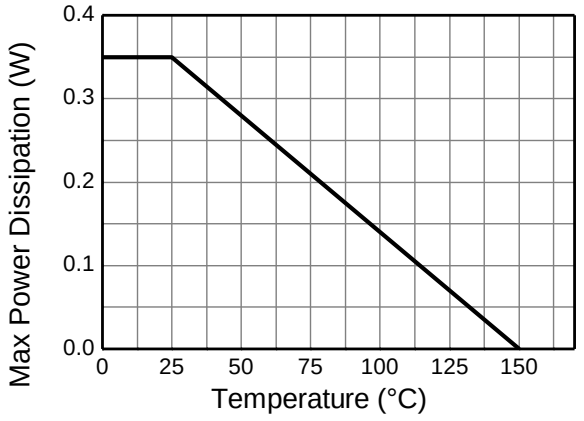


Fig. 1 Derating Curve

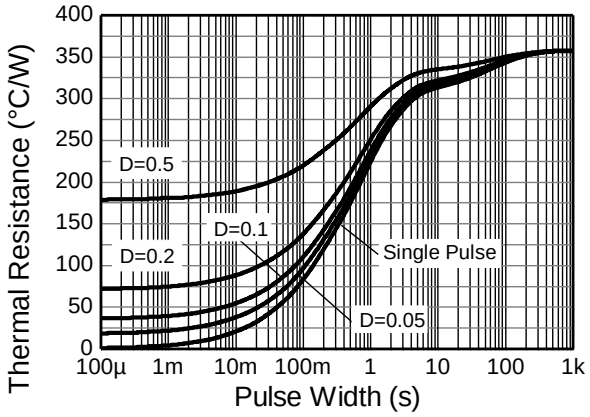


Fig. 2 Transient Thermal Impedance

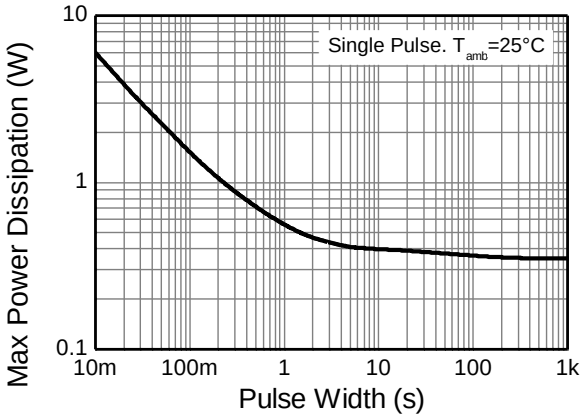


Fig. 3 Pulse Power Dissipation

Electrical Characteristics (@ T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-160	-270	—	V	I_C = -100µA
Collector-Emitter Breakdown Voltage (Note 8)	BV_{CEO}	-150	-240	—	V	I_C = -1mA
Emitter-Base Breakdown Voltage	BV_{EBO}	-5	-8.1	—	V	I_E = -100µA
Collector Cutoff Current	I_{CBO}	— —	-1 —	-50 -50	nA µA	V_{CB} = -120V V_{CB} = -120V, T_{amb} = +100°C
Static Forward Current Transfer Ratio (Note 8)	h_{FE}	50 60 50	135 135 130	— 240 —	—	I_C = -1mA, V_{CE} = -5V I_C = -10mA, V_{CE} = -5V I_C = -50mA, V_{CE} = -5V
Collector-Emitter Saturation Voltage (Note 8)	$V_{CE(sat)}$	— —	-50 -70	-200 -500	mV	I_C = -10mA, I_B = -1mA I_C = -50mA, I_B = -5mA
Base-Emitter Saturation Voltage (Note 8)	$V_{BE(sat)}$	— —	-700 -750	-1000 -1000	mV	I_C = -10mA, I_B = -1mA I_C = -50mA, I_B = -5mA
Output Capacitance	C_{obo}	—	—	10	pF	V_{CB} = -10V, f = 1MHz
Transition Frequency	f_T	—	100	—	MHz	V_{CE} = -10V, I_C = -10mA f = 100MHz
Delay Time	t_d	—	386	—	ns	V_{CC} = -50V, I_C = -100mA I_{B1} = -I_{B2} = -10mA
Rise Time	t_r	—	202	—	ns	
Storage Time	t_s	—	1720	—	ns	
Fall Time	t_f	—	275	—	ns	

Note: 8. Measured under pulsed conditions. Pulse width ≤ 300 µs. Duty cycle ≤ 2%.

Typical Electrical Characteristics (@ T_A = +25°C, unless otherwise specified.)

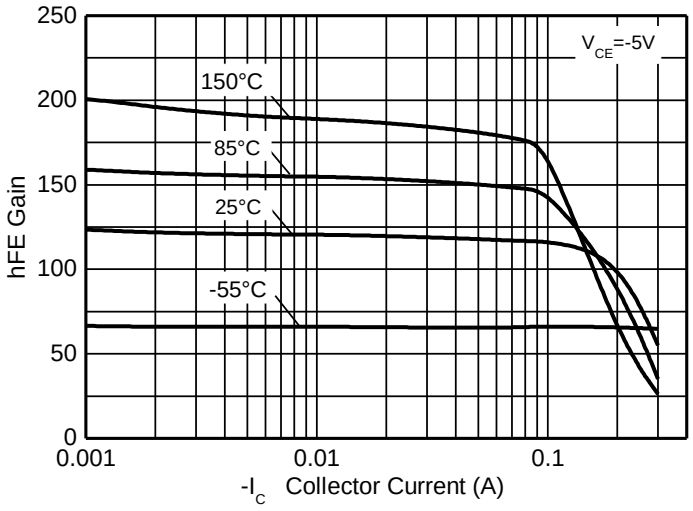


Fig. 4 hFE v I_C

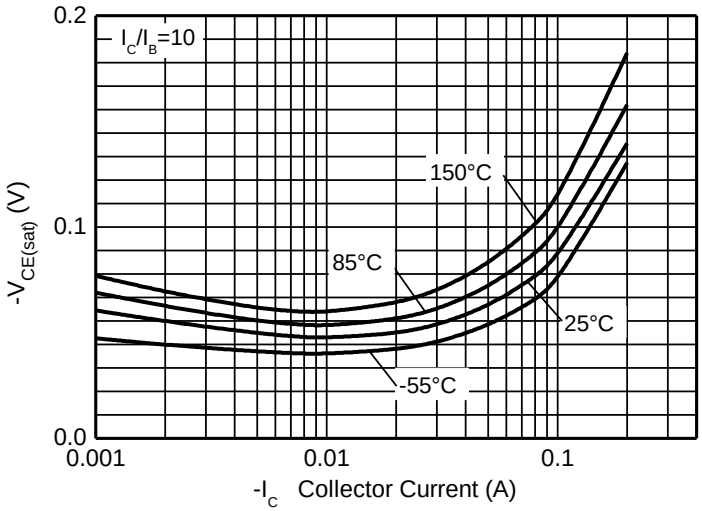


Fig. 5 $V_{CE(sat)}$ v I_C

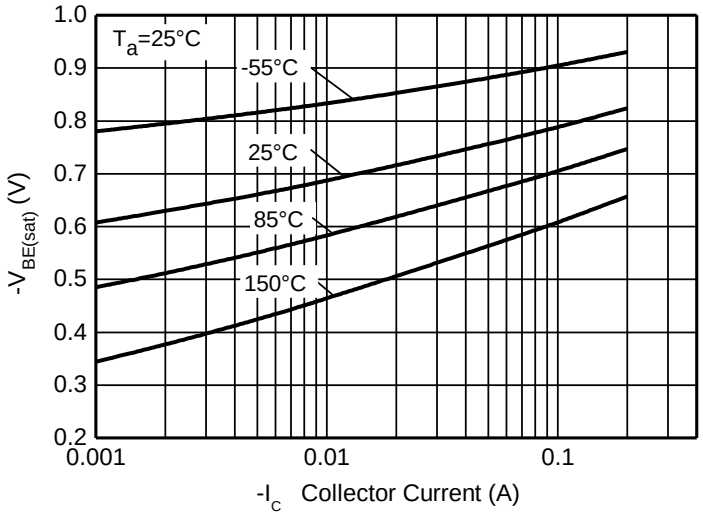


Fig. 6 $V_{BE(sat)}$ v I_C

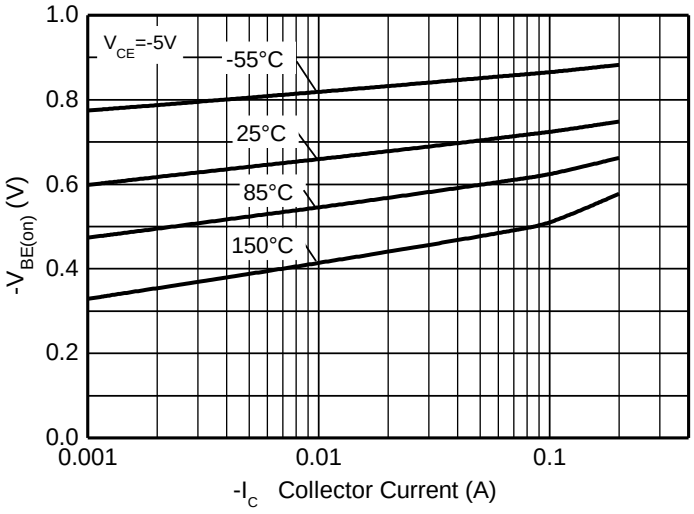
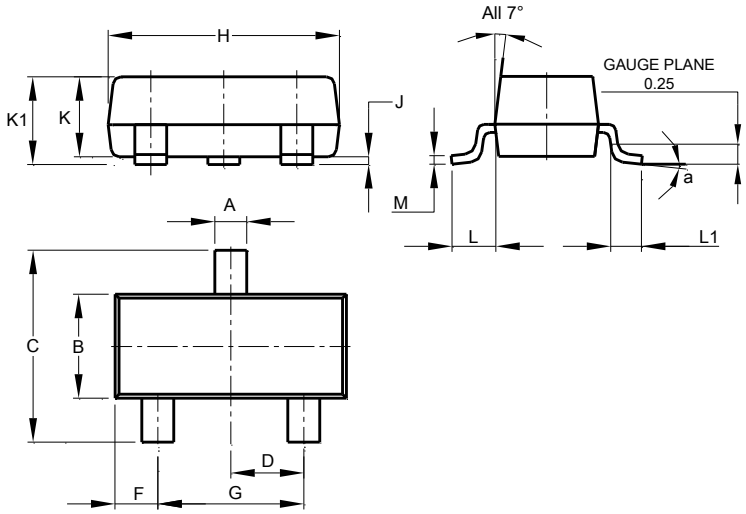


Fig. 7 $V_{BE(on)}$ v I_C

Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

SOT23

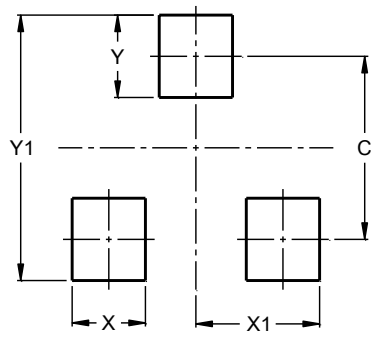


SOT23			
Dim	**Min**	**Max**	**Typ**
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

SOT23



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

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