

Description

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

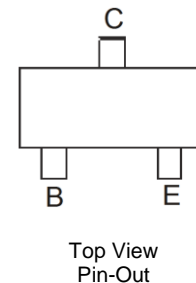
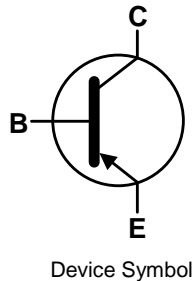
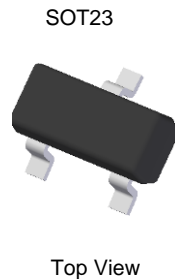
Features and Benefits

- $BV_{CEO} > -150V$
- 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
- UL Flammability Rating 94V-0
- Case material: molded Plastic.
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish; Solderable per MIL-STD-202, Method 208
- Weight: 0.008 grams (Approximate)

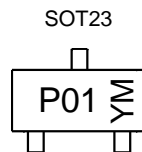


Ordering Information (Note 4)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTP5401FLQTA	Automotive	P01	7	8	3,000

- 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



P01 = Product Type Marking Code
 YM = Date Code Marking
 Y or \bar{Y} = Year (ex: 1 = 2021)
 M = Month (ex: 9 = September)

Date Code Key

Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Code	I	J	K	L	M	N	O	P	R	S	T	U

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

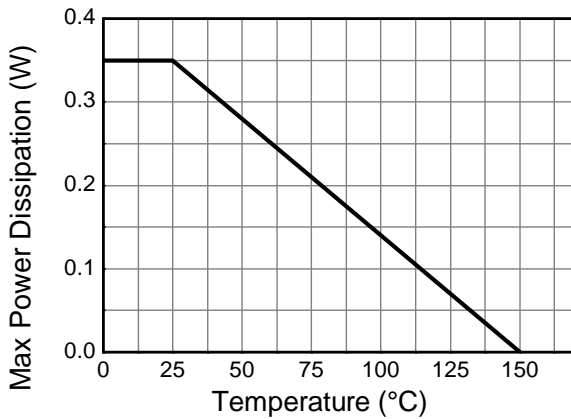
Absolute Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CB0}	-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

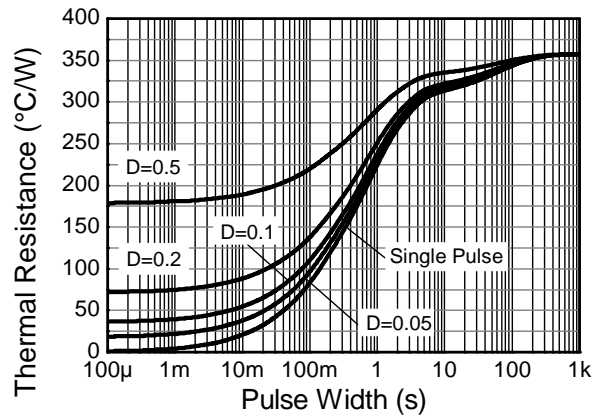
Thermal Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

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

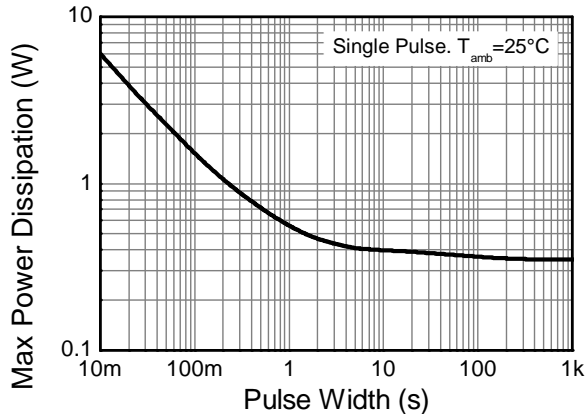
- Notes:
- For the device mounted on minimum recommended pad layout FR4 PCB with high coverage of single sided 1oz copper in still air condition.
 - Same as Note 5, expect the device is mounted on 15mm x 15mm x 1.6mm FR4 PCB.
 - Thermal resistance from junction to solder-point (at the end of the collector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



Derating Curve



Transient Thermal Impedance



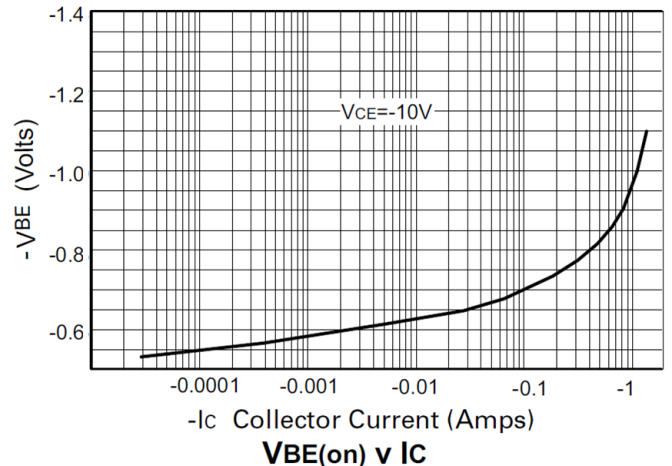
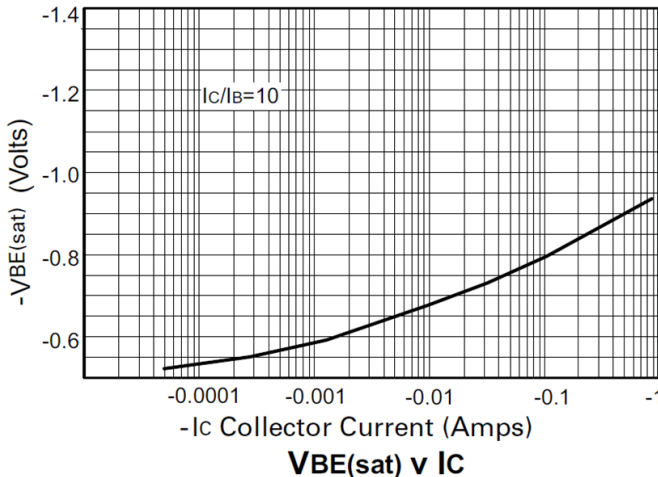
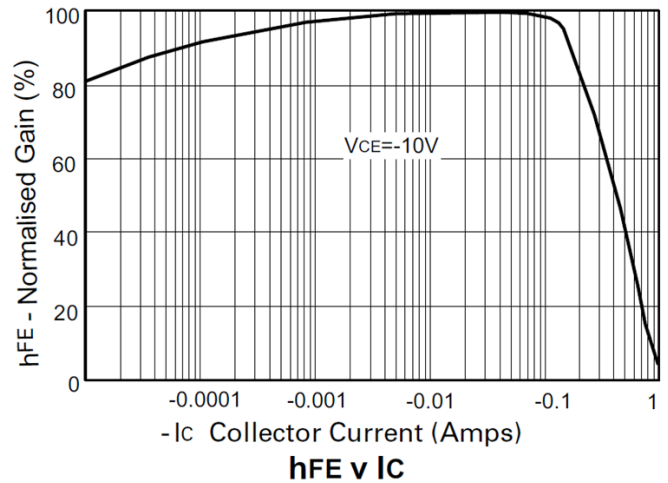
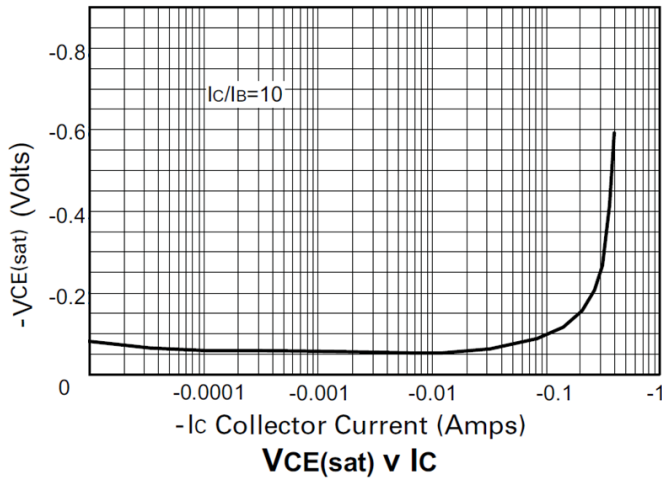
Pulse Power Dissipation

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	nA	V _{CB} = -120V
			-	-50	μA	V _{CB} = -120V, T _{amb} = 100°C
Static Forward Current Transfer Ratio (Note 8)	h _{FE}	50	135	-	-	I _C = -1mA, V _{CE} = -5V
		60	135	240	-	I _C = -10mA, V _{CE} = -5V
		50	130	-	-	I _C = -50mA, V _{CE} = -5V
Collector-Emitter Saturation Voltage (Note 8)	V _{CE(sat)}	-	-50	-200	mV	I _C = -10mA, I _B = -1mA
		-	-70	-500	mV	I _C = -50mA, I _B = -5mA
Base-Emitter Saturation Voltage (Note 8)	V _{BE(sat)}	-	-700	-1000	mV	I _C = -10mA, I _B = -1mA
		-	-750	-1000	mV	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	

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

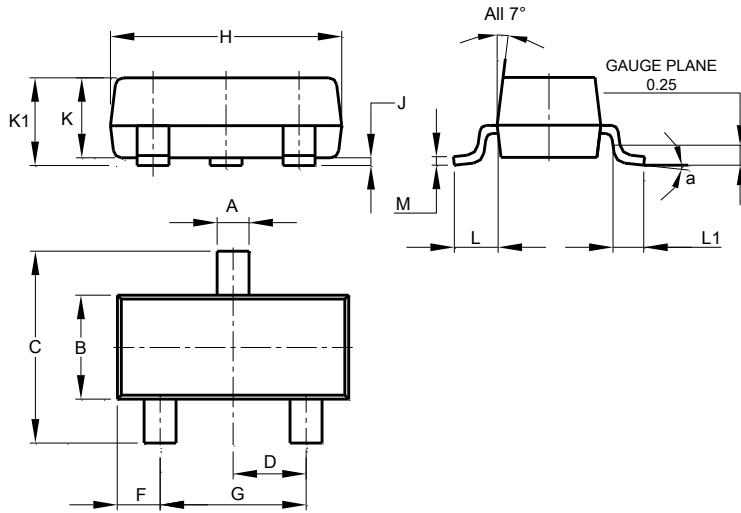
Typical Electrical Characteristics @ T_A = 25°C unless otherwise specified



Package Outline Dimensions

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

SOT23

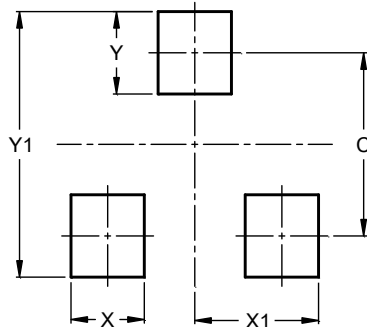


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

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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