

Description

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

Features

- $BV_{CEO} > 60V$
- Maximum Continuous Collector Current $I_C = 5A$
- $V_{CE(sat)} < 45mV @ 1A$
- $R_{CE(sat)} = 25m\Omega$
- High Power Dissipation SOT23 (Type DN) Package
- High Peak Current
- Low Saturation Voltage
- 140V Forward Blocking Voltage
- Complementary Part Number: [ZXP2027FQ](#)
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The ZXTN2018FQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**
<https://www.diodes.com/quality/product-definitions/>

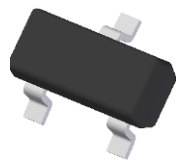
Mechanical Data

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

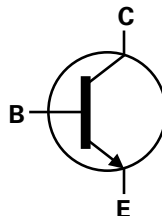
Applications

- MOSFET and IGBT gate driving
- Motor drives
- Relays, lamps, and solenoid drives

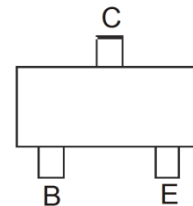
SOT23 (Type DN)



Top View



Device Symbol



Top View
Pinout

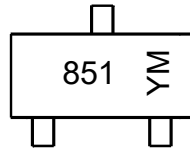
Ordering Information (Note 4)

Orderable Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
ZXTN2018FQTA	SOT23 (Type DN)	851	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 (Type DN)



851 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: M = 2025)
 M = Month (ex: 9 = September)

Date Code Key

Year	2019	-	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Code	G	-	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}	140	V
Collector-Emitter Voltage	V _{CEV}	140	V
Collector-Emitter Voltage	V _{CEO}	60	V
Emitter-Base Voltage	V _{EBO}	7	V
Continuous Collector Current	I _C	5	A
Base Current	I _B	1	A
Peak Pulse Current	I _{CM}	12	A

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

Characteristic	Symbol	Value	Unit
Power Dissipation Linear Derating Factor	P _D	1.0	W mW/°C
		8.0	
		1.2	
		9.6	
Thermal Resistance, Junction to Ambient	R _{θJA}	1.56	°C/W
		12.5	
		125	
Thermal Resistance, Junction to Case	R _{θJC}	104	°C/W
		80	
		32	
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 9)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

Notes:

- For a device mounted with the collector lead on 15mm x 15mm 2oz copper that is on a single-sided 1.6mm FR-4 PCB; device is measured under still air conditions whilst operating in steady state.
- Same as Note 5, except the device is mounted on 25mm x 25mm 2oz copper.
- Same as Note 6, except measured at t < 5 seconds.
- Thermal resistance from junction to the top of the case.
- Refer to JEDEC specifications JESD22-A114 and JESD22-A115.

Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

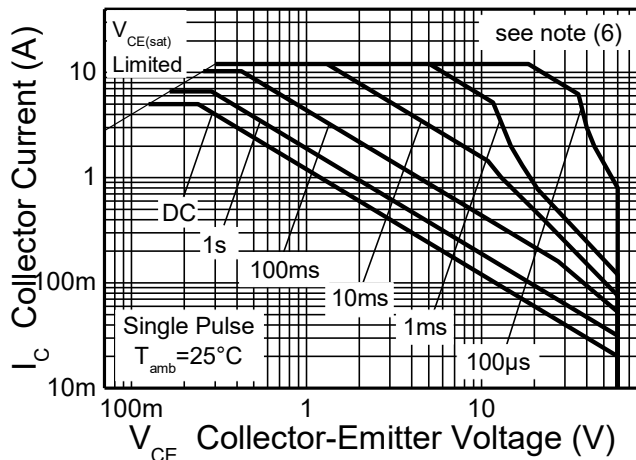


Fig. 1 Safe Operating Area

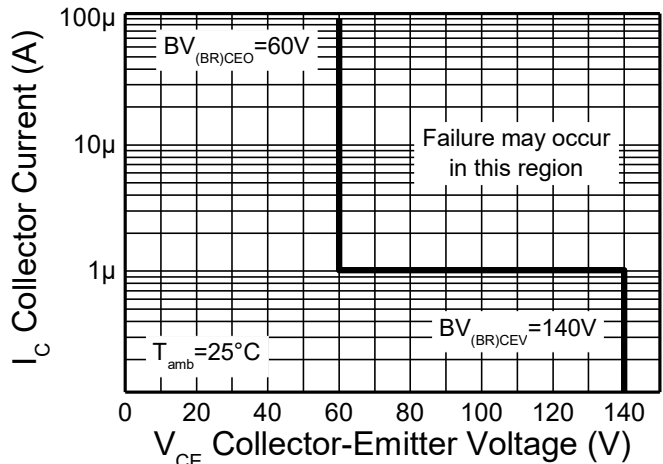


Fig. 2 Safe Operating Area

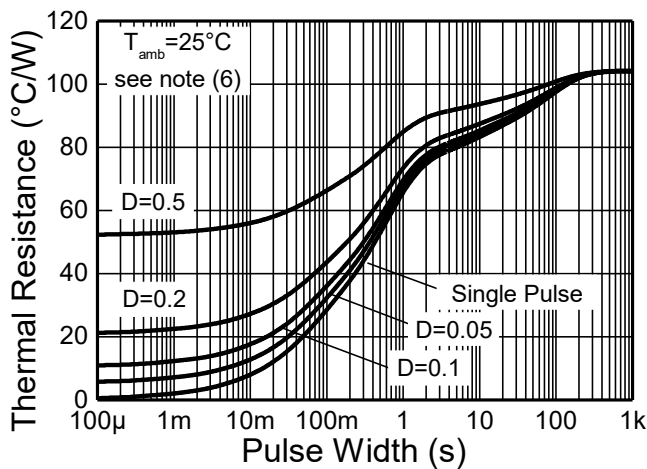


Fig. 3 Transient Thermal Impedance

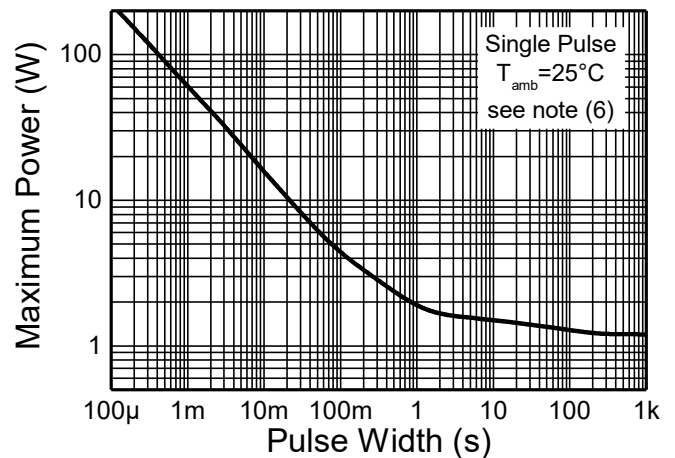


Fig. 4 Pulse Power Dissipation

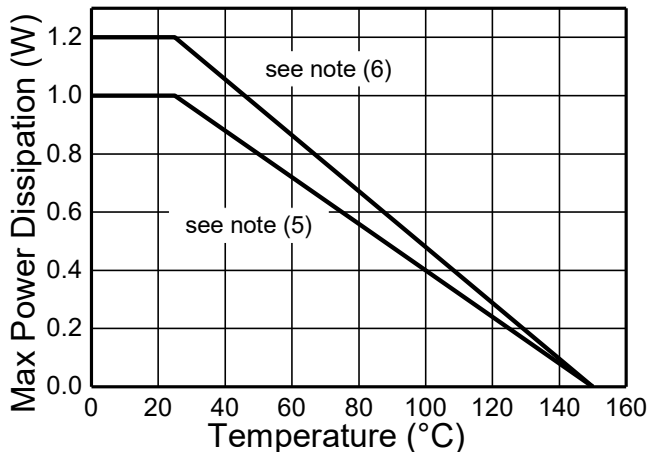


Fig. 5 Derating Curve

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	140	180	—	V	I _C = 100μA
Collector-Emitter Breakdown Voltage	BV _{CEV}	140	180	—	V	I _C = 1μA, -1V < V _{BE} < +0.3V
Collector-Emitter Breakdown Voltage (Note 10)	BV _{CEO}	60	80	—	V	I _C = 10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	7	8	—	V	I _E = 100μA
Collector-Base Cutoff Current	I _{CBO}	—	1	50	nA	V _{CB} = 110V
Collector-Emitter Cutoff Current	I _{CEV}	—	1	100	nA	V _{CE} = 110V, V _{BE} = -1V
Emitter-Base Cutoff Current	I _{EBO}	—	1	10	nA	V _{EB} = 6V
Static Forward Current Transfer Ratio (Note 10)	h _{FE}	100	220	—	—	I _C = 10mA, V _{CE} = 1V
		100	200	300		I _C = 2A, V _{CE} = 1V
		40	65	—		I _C = 5A, V _{CE} = 1V
		15	25	—		I _C = 10A, V _{CE} = 1V
Collector-Emitter Saturation Voltage (Note 10)	V _{CE(sat)}	—	15	30	mV	I _C = 0.1A, I _B = 5mA
		—	35	45		I _C = 1A, I _B = 100mA
		—	40	55		I _C = 1A, I _B = 50mA
		—	85	110		I _C = 2A, I _B = 50mA
		—	145	170		I _C = 5A, I _B = 250mA
		—	170	210		I _C = 6A, I _B = 300mA
Base-Emitter Saturation Voltage (Note 10)	V _{BE(sat)}	—	0.92	1.00	V	I _C = 5A, I _B = 250mA
Base-Emitter Turn-On Voltage (Note 10)	V _{BE(on)}	—	0.85	0.95	V	I _C = 5A, V _{CE} = 1V
Output Capacitance	C _{obo}	—	28	—	pF	V _{CB} = 10V, f = 1MHz
Transition Frequency	f _r	—	130	—	MHz	V _{CE} = 10V, I _C = 100mA, f = 50MHz
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	

Note: 10. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

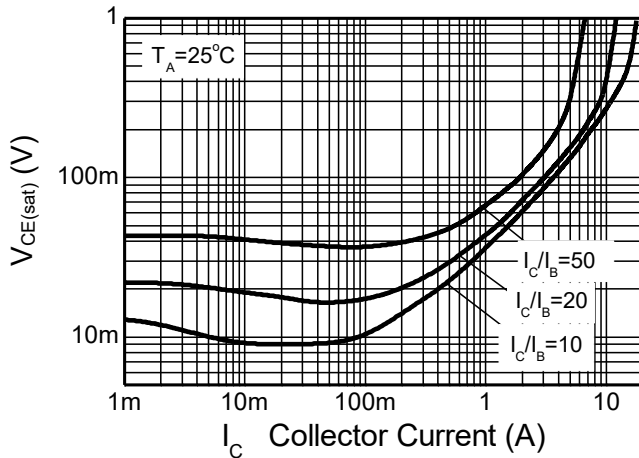


Fig. 6 $V_{CE(sat)}$ vs. I_C

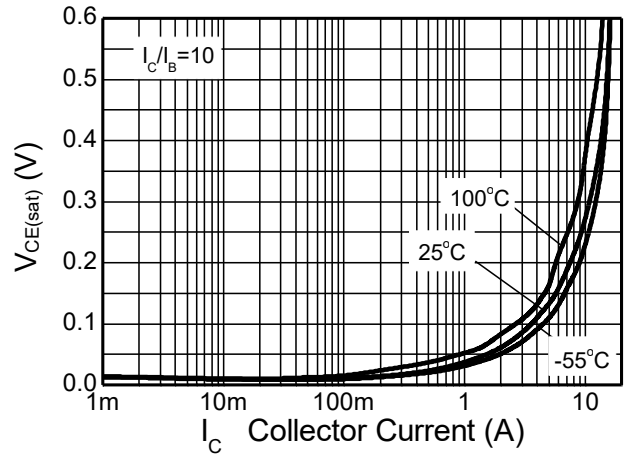


Fig. 7 $V_{CE(sat)}$ vs. I_C

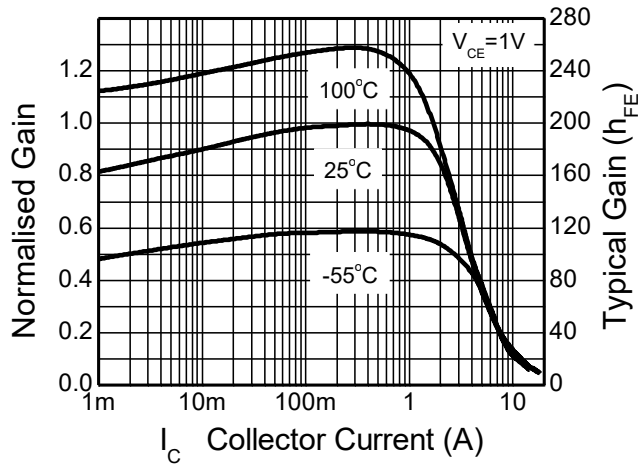


Fig. 8 h_{FE} vs. I_C

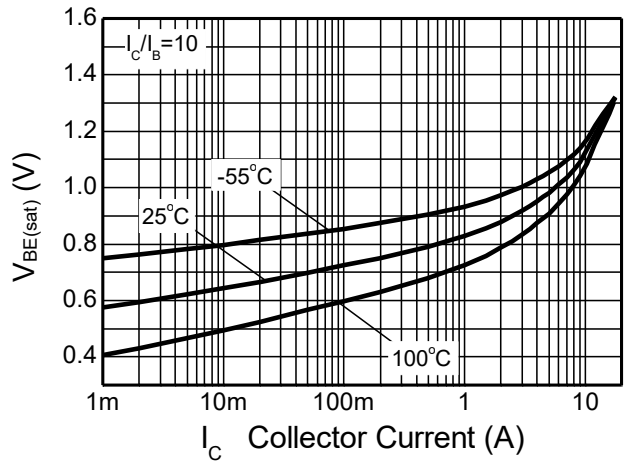


Fig. 9 $V_{BE(sat)}$ vs. I_C

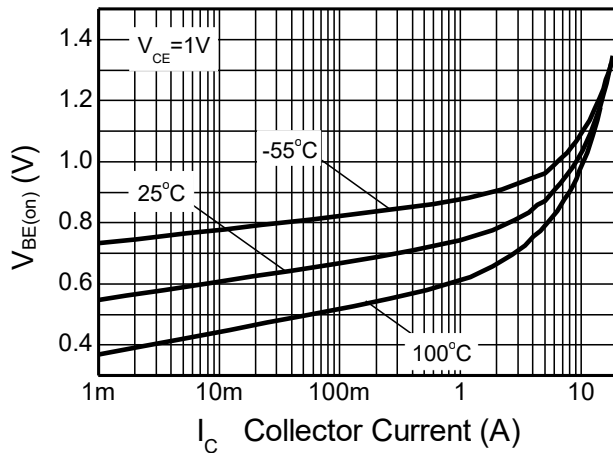
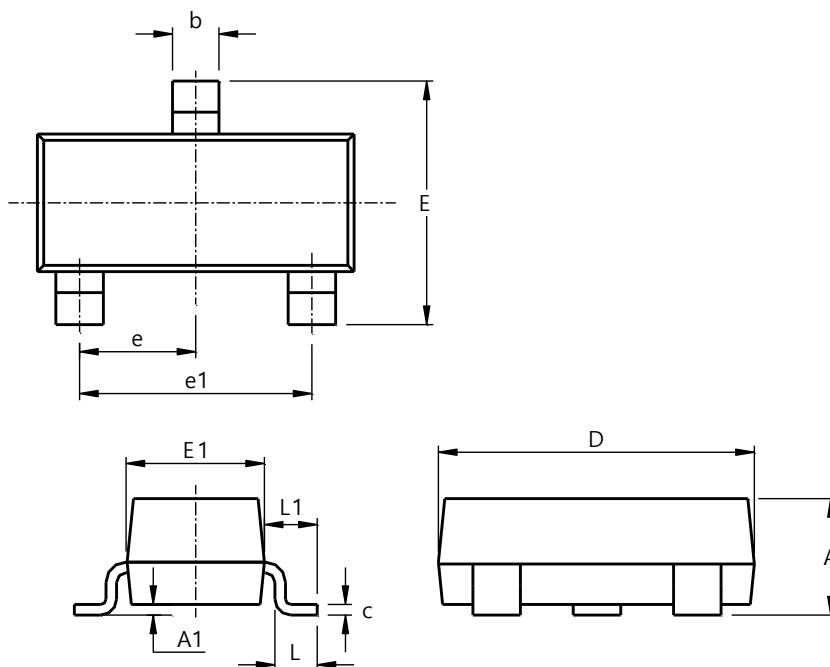


Fig. 10 $V_{BE(on)}$ vs. I_C

Package Outline Dimensions

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

SOT23 (Type DN)

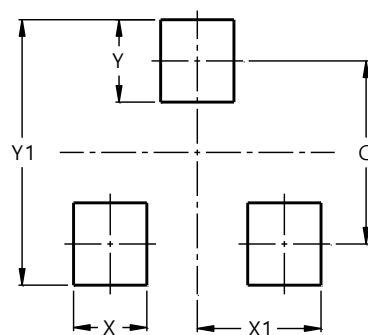


SOT23 Type DN			
Dim	Min	Max	Typ
A	0.89	1.12	1.00
A1	0.01	0.10	0.05
b	0.30	0.51	0.45
c	0.08	0.20	0.10
D	2.80	3.04	3.00
E	2.10	2.64	2.42
E1	1.20	1.40	1.37
e	0.95 REF		
e1	1.90 REF		
L	0.25	0.60	0.30
L1	0.45	0.62	0.54
All Dimensions in mm			

Suggested Pad Layout

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

SOT23 (Type DN)



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

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