

## Description

This bipolar junction transistor (BJT) is designed to meet the stringent requirements of automotive applications.

## Features

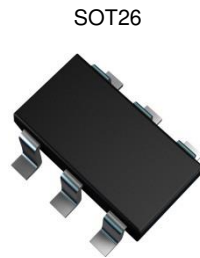
- $BV_{CEO} > -20V$
  - $I_C = -2.5A$  Continuous Collector Current
  - $I_{CM} = -6A$  Peak Pulse Current
  - $R_{CE(sat)} = 96m\Omega$  for a Low Equivalent On-Resistance
  - Low Saturation Voltage (-220mV max @ -1A)
  - $h_{FE}$  Characterized Up to -6A for High Current Gain Hold-Up
  - **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
  - **Halogen and Antimony Free. "Green" Device (Note 3)**
  - **The ZXT10P20DE6Q 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

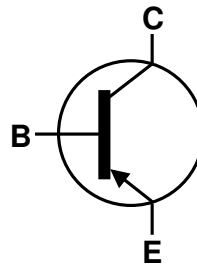
- Package: SOT26
- Package Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.015 grams (Approximate)

## Applications

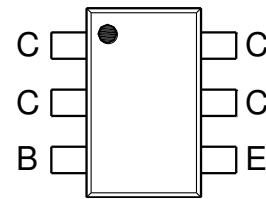
- DC-DC converters
- Power-management functions
- Power switches
- Motor controls



Top View



Device Symbol



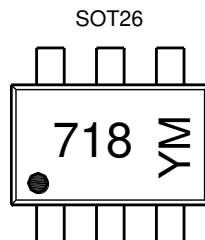
Pin-Out Top View

## Ordering Information (Note 4)

Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
ZXT10P20DE6QTA	SOT26	718	7	8	3000	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



718 = Product Type Marking Code  
 YM = Date Code Marking  
 Y or  $\bar{Y}$  = Year (ex: K = 2023)  
 M or  $\bar{M}$  = Month (ex: 6 = June)

### Date Code Key

Year	2018	-	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Code	F	-	K	L	M	N	P	R	S	T	U	V

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<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	-20	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-20	V
Emitter-Base Voltage	V <sub>EBO</sub>	-7	V
Base Current	I <sub>B</sub>	-500	mA
Continuous Collector Current	I <sub>C</sub>	-2.5	A
Peak Pulse Collector Current	I <sub>CM</sub>	-6	A

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation	P <sub>D</sub>	1.1	W
		8.8	mW/°C
Linear Derating Factor		1.7	W
		13.6	mW/°C
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	113	°C/W
		73	
Thermal Resistance, Junction to Case	R <sub>θJC</sub>	12	°C/W
Thermal Resistance, Junction to Leads	R <sub>θJL</sub>	30	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**ESD Ratings** (Note 8)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge – Human Body Model	ESD HBM	4000	V	3A
Electrostatic Discharge – Machine Model	ESD MM	400	V	C

- Notes:
5. For a device mounted with collector leads on 25mm × 25mm 2oz copper that is on a single-sided 1.6mm FR-4 PCB; device is measured under still air conditions whilst operating in a steady state.
  6. Same as Note 5, except the device is measured at t ≤ 5secs.
  7. Thermal resistance from junction to solder-point (at the end of the collector leads).
  8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

**Thermal Characteristics and Derating Information**

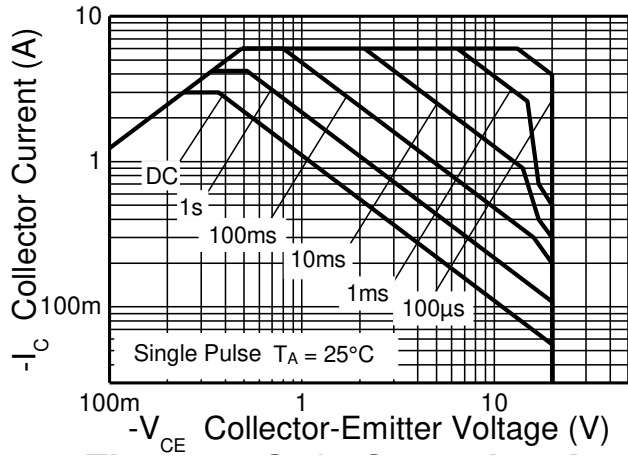


Figure 1. Safe Operating Area

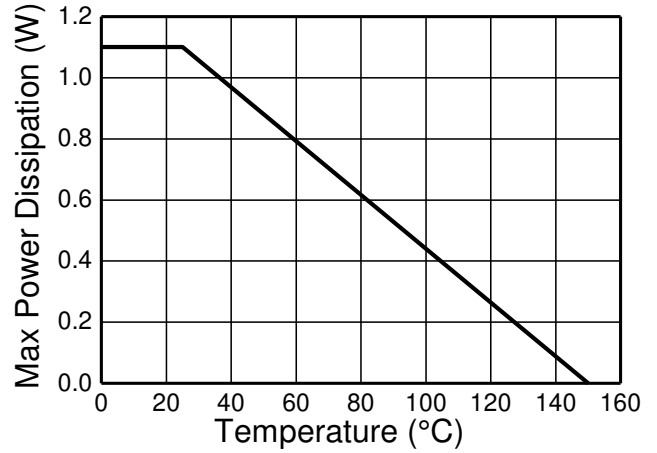


Figure 2. Derating Curve

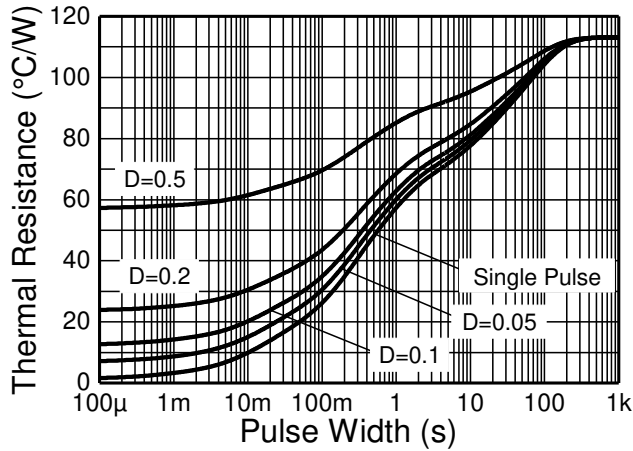


Figure 3. Transient Thermal Impedance

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b>						
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	-20	-65	—	V	I <sub>C</sub> = -100μA
Collector-Emitter Breakdown Voltage (Note 9)	BV <sub>CEO</sub>	-20	-53	—	V	I <sub>C</sub> = -10mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	-7	-8.8	—	V	I <sub>E</sub> = -100μA
Collector-Base Cutoff Current	I <sub>CBO</sub>	—	-1	-100	nA	V <sub>CB</sub> = -15V
Emitter Cutoff Current	I <sub>EBO</sub>	—	-1	-100	nA	V <sub>EB</sub> = -5V
Collector-Emitter Cutoff Current	I <sub>CES</sub>	—	-1	-100	nA	V <sub>CES</sub> = -15V
<b>ON CHARACTERISTICS</b> (Note 9)						
DC Current Gain	h <sub>FE</sub>	300	475	—	—	I <sub>C</sub> = -10mA, V <sub>CE</sub> = -2V
		300	450	—	—	I <sub>C</sub> = -0.1A, V <sub>CE</sub> = -2V
		150	230	—	—	I <sub>C</sub> = -2A, V <sub>CE</sub> = -2V
		15	30	—	—	I <sub>C</sub> = -6A, V <sub>CE</sub> = -2V
Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	—	-19	-30	mV	I <sub>C</sub> = -0.1A, I <sub>B</sub> = -10mA
		—	-170	-220		I <sub>C</sub> = -1A, I <sub>B</sub> = -20mA
		—	-190	-250		I <sub>C</sub> = -1.5A, I <sub>B</sub> = -50mA
		—	-240	-350		I <sub>C</sub> = -2.5A, I <sub>B</sub> = -150mA
Base-Emitter Saturation Voltage	V <sub>BE(sat)</sub>	—	-0.97	-1.05	V	I <sub>C</sub> = -2.5A, I <sub>B</sub> = -150mA
Base-Emitter Turn-On Voltage	V <sub>BE(on)</sub>	—	-0.85	-0.95	V	I <sub>C</sub> = -2.5A, V <sub>CE</sub> = -2V
<b>SMALL SIGNAL CHARACTERISTICS</b>						
Current Gain-Bandwidth Product	f <sub>T</sub>	150	180	—	MHz	V <sub>CE</sub> = -10V, I <sub>C</sub> = -50mA, f = 100MHz
Output Capacitance	C <sub>obo</sub>	—	21	30	pF	V <sub>CB</sub> = -10V, f = 1MHz
Turn-On Time	t <sub>(on)</sub>	—	40	—	ns	V <sub>CC</sub> = -10V, I <sub>C</sub> = -1A, I <sub>B1</sub> = -I <sub>B2</sub> = -20mA
Turn-Off Time	t <sub>(off)</sub>	—	670	—	ns	

Note: 9. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

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

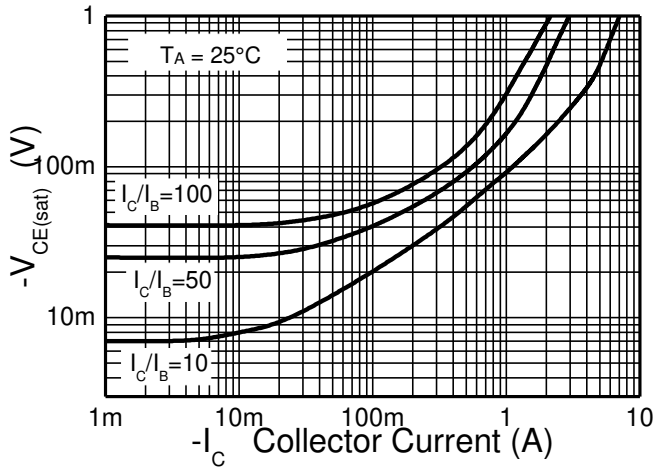


Figure 4.  $V_{CE(sat)}$  vs.  $I_C$

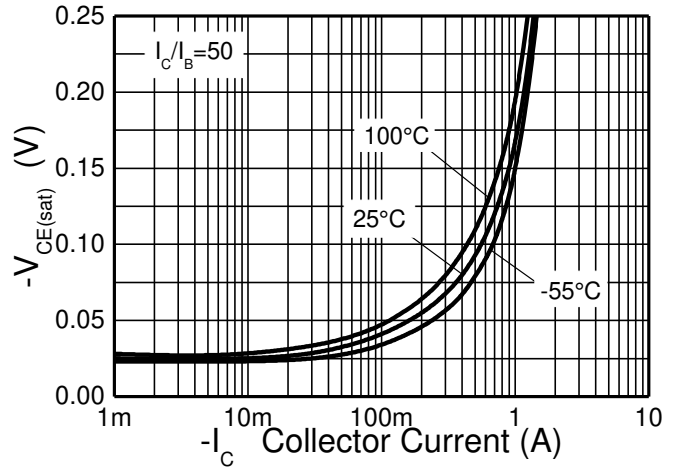


Figure 5.  $V_{CE(sat)}$  vs.  $I_C$

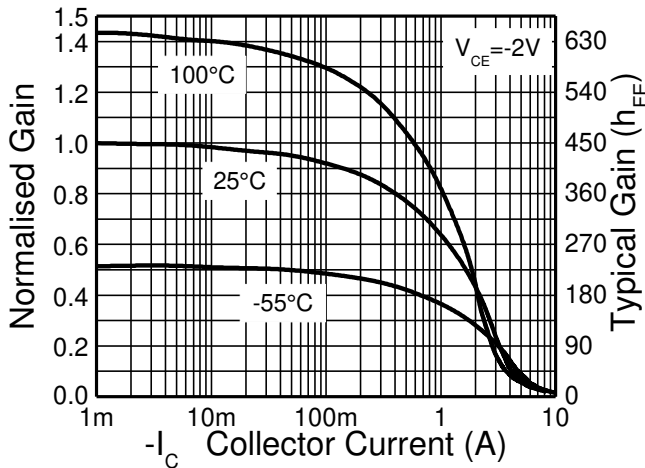


Figure 6.  $h_{FE}$  vs.  $I_C$

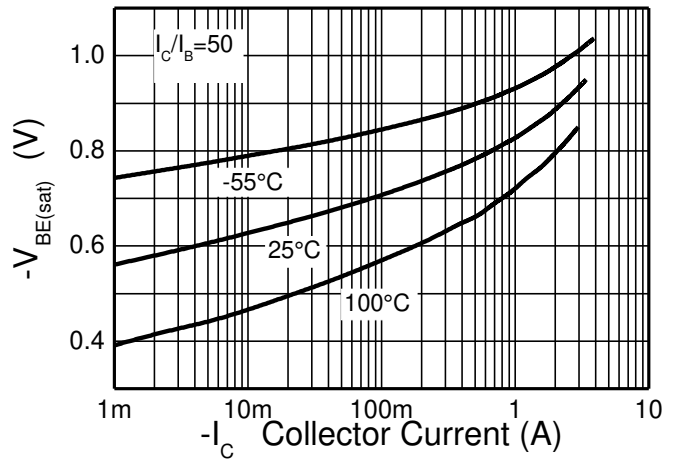


Figure 7.  $V_{BE(sat)}$  vs.  $I_C$

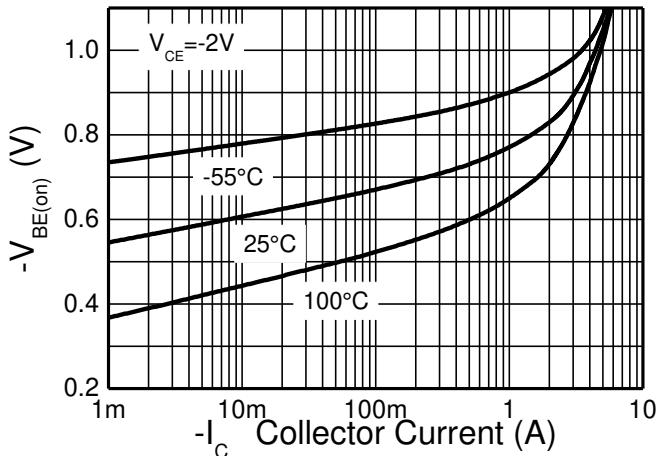
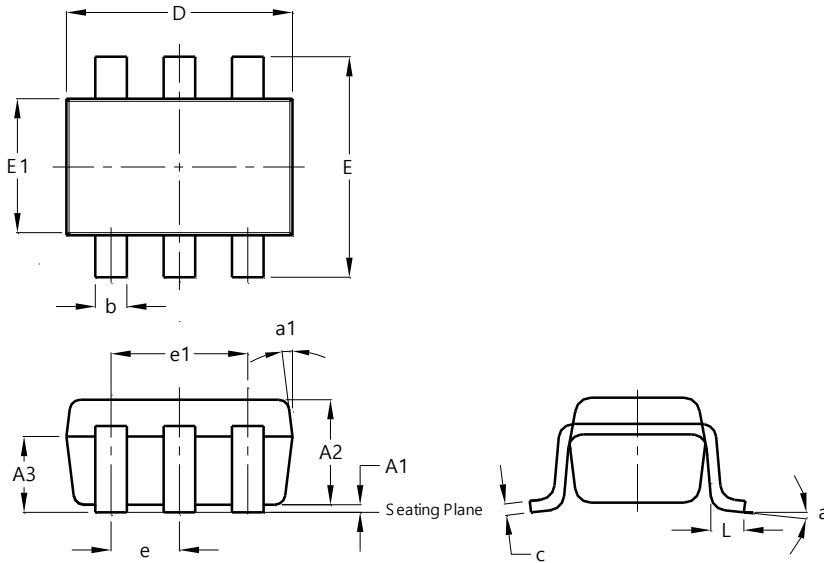


Figure 8.  $V_{BE(on)}$  vs.  $I_C$

**Package Outline Dimensions**

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

**SOT26**

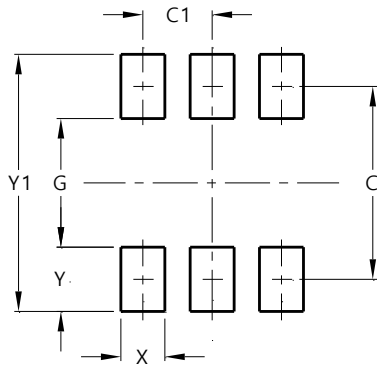


SOT26			
Dim	Min	Max	Typ
A1	0.013	0.10	0.05
A2	1.00	1.30	1.10
A3	0.70	0.80	0.75
b	0.35	0.50	0.38
c	0.10	0.20	0.15
D	2.90	3.10	3.00
e	-	-	0.95
e1	-	-	1.90
E	2.70	3.00	2.80
E1	1.50	1.70	1.60
L	0.35	0.55	0.40
a	-	-	8°
a1	-	-	7°
All Dimensions in mm			

**Suggested Pad Layout**

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

**SOT26**



Dimensions	Value (in mm)
C	2.40
C1	0.95
G	1.60
X	0.55
Y	0.80
Y1	3.20

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