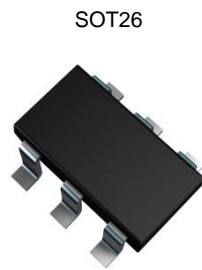


**50V NPN LOW SATURATION SWITCHING TRANSISTOR**
**Features**

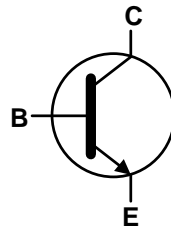
- $BV_{CEO} > 50V$
- $I_C = 3A$  Continuous Collector Current
- $I_{CM} = 6A$  Peak Pulse Current
- $R_{CE(SAT)} = 75m\Omega$  for a Low Equivalent On-Resistance
- Low Saturation Voltage (200mV Max @ 1A)
- $h_{FE}$  Characterized up to 6A
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

**Mechanical Data**

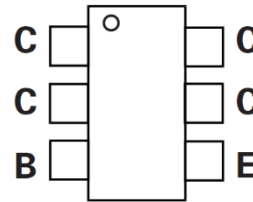
- Case: SOT26
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.015 grams (Approximate)



Top View



Device Symbol

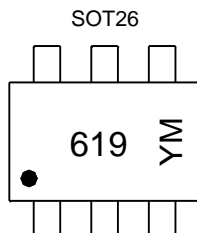


Top View Pin-Out

**Ordering Information** (Note 4)

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
ZXT10N50DE6TA	AEC-Q101	619	7	8	3,000

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  2. See [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) 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 <http://www.diodes.com/products/packages.html>.

**Marking Information**


619 = Product Type Marking Code  
 YM = Date Code Marking  
 Y or  $\bar{Y}$  = Year (ex: C = 2015)  
 M or  $\bar{M}$  = Month (ex: 9 = September)

## Date Code Key

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
Code	C	D	E	F	G	H	I	J	K	L	M	
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>	50	V
Collector-Emitter Voltage	V <sub>CEO</sub>	50	V
Emitter-Base Voltage	V <sub>EBO</sub>	5	V
Base Current	I <sub>B</sub>	500	mA
Continuous Collector Current	I <sub>C</sub>	3	A
Peak Pulse Collector Current	I <sub>CM</sub>	6	A

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

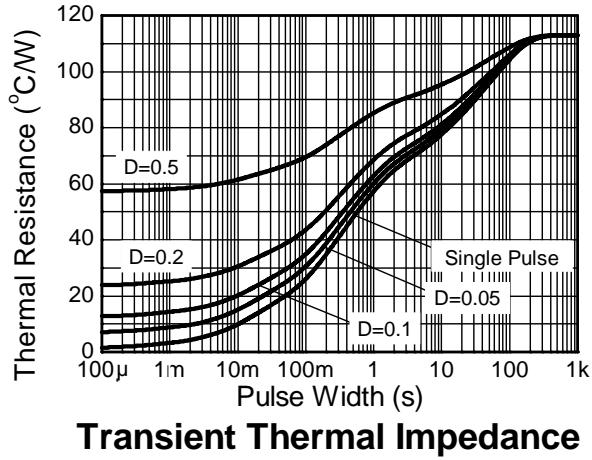
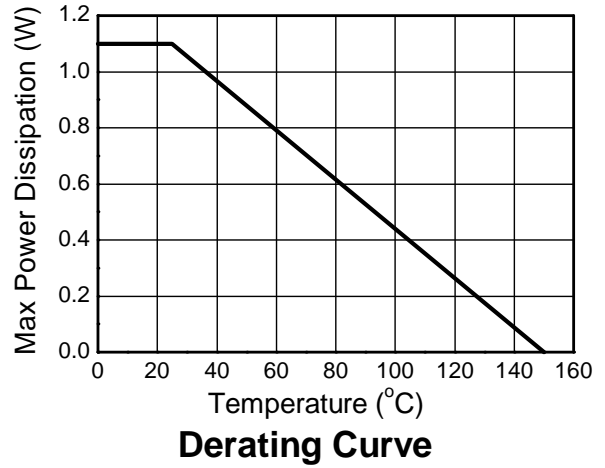
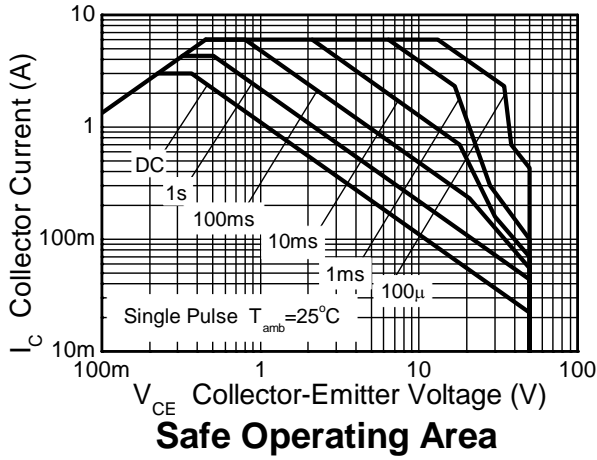
Characteristic	Symbol	Value	Unit
Power Dissipation Linear Derating Factor	P <sub>D</sub>	1.1	W
		8.8	
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	1.7	mW/°C
		13.6	
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	113	°C/W
		73	
Thermal Resistance, Junction to Lead	R <sub>θJL</sub>	18.6	
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	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
5. For a device mounted with the collector lead on 25mm x 25mm 1oz copper that is on 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 ≤ 5 sec.
  7. Thermal resistance from junction to solder-point (at the end of the collector lead).
  8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

**Thermal Characteristics and Derating Information**

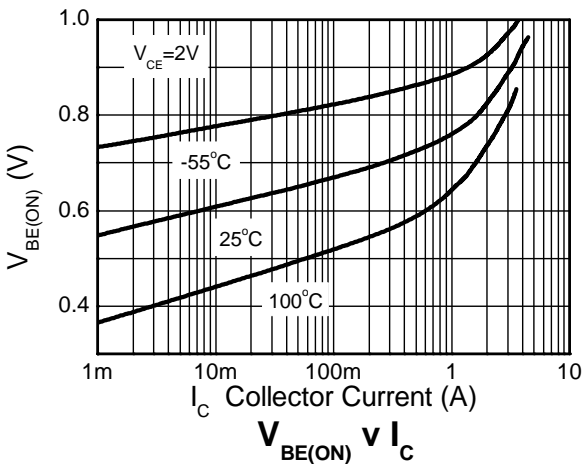
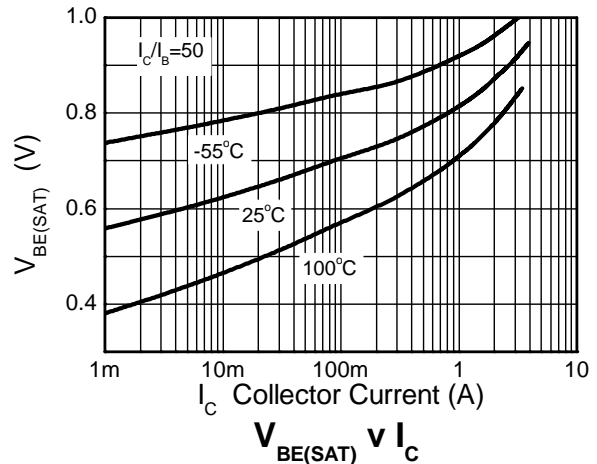
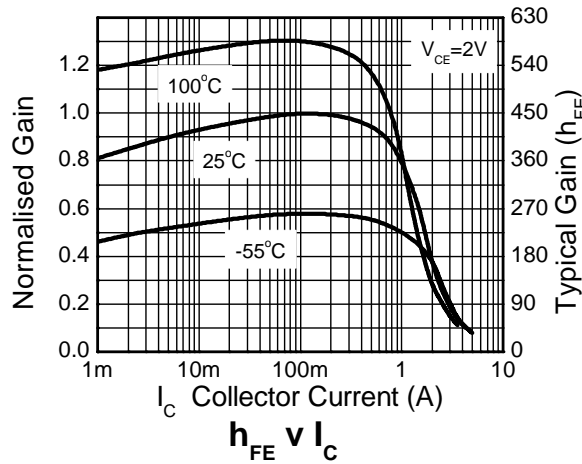
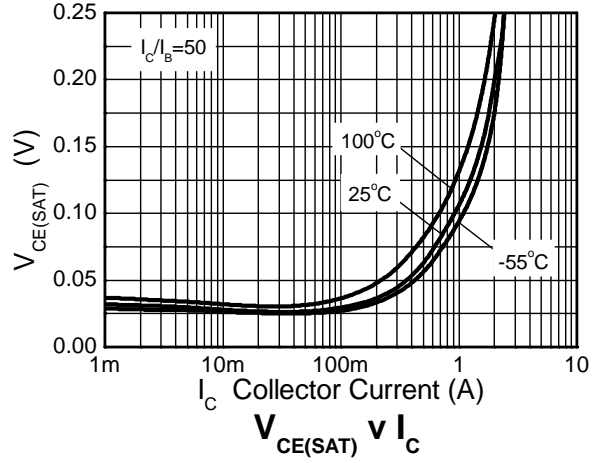
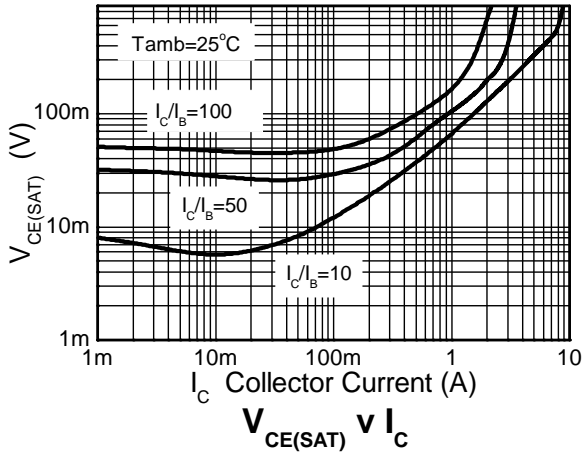


**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b>						
Collector-Base Breakdown Voltage	$BV_{CBO}$	50	190	—	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 9)	$BV_{CEO}$	50	65	—	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	$BV_{EBO}$	5	8.3	—	V	$I_E = 100\mu\text{A}$
Collector-Base Cutoff Current	$I_{CBO}$	—	—	100	nA	$V_{CB} = 40\text{V}$
Emitter Cutoff Current	$I_{EBO}$	—	—	100	nA	$V_{EB} = 4\text{V}$
Collector-Emitter Cutoff Current	$I_{CES}$	—	—	100	nA	$V_{CES} = 40\text{V}$
<b>ON CHARACTERISTICS (Note 9)</b>						
DC Current Gain	$h_{FE}$	200	400	—	—	$I_C = 10\text{mA}, V_{CE} = 2\text{V}$
		300	450	—		$I_C = 0.2\text{A}, V_{CE} = 2\text{V}$
		200	400	—		$I_C = 1\text{A}, V_{CE} = 2\text{V}$
		100	225	—		$I_C = 2\text{A}, V_{CE} = 2\text{V}$
		—	40	—		$I_C = 6\text{A}, V_{CE} = 2\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	—	14	20	mV	$I_C = 0.1\text{A}, I_B = 10\text{mA}$
		—	145	200		$I_C = 1\text{A}, I_B = 10\text{mA}$
		—	115	200		$I_C = 2\text{A}, I_B = 50\text{mA}$
		—	225	300		$I_C = 3\text{A}, I_B = 100\text{mA}$
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	—	0.93	1.0	V	$I_C = 3\text{A}, I_B = 100\text{mA}$
Base-Emitter Turn-On Voltage	$V_{BE(ON)}$	—	0.88	0.95	V	$I_C = 3\text{A}, V_{CE} = 2\text{V}$
<b>SMALL SIGNAL CHARACTERISTICS</b>						
Current Gain-Bandwidth Product	$f_T$	100	165	—	MHz	$V_{CE} = 10\text{V}, I_C = 50\text{mA}, f = 100\text{MHz}$
Output Capacitance	$C_{obo}$	—	12	20	pF	$V_{CB} = 10\text{V}, f = 1\text{MHz}$
Turn-On Time	$t_{(on)}$	—	170	—	ns	$V_{CC} = 10\text{V}, I_C = 1\text{A}$
Turn-Off Time	$t_{(off)}$	—	750	—	ns	$I_{B1} = I_{B2} = 10\text{mA}$

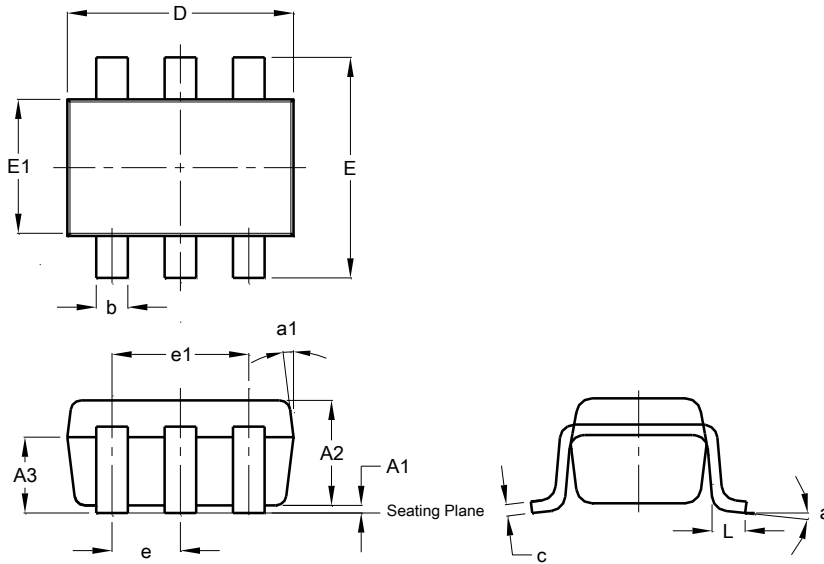
Note: 9. Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

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



**Package Outline Dimensions**

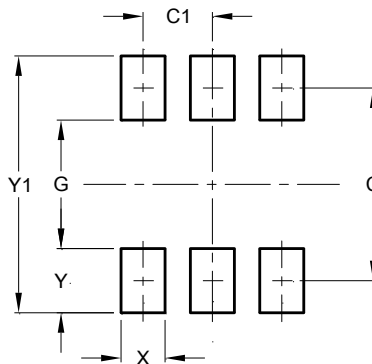
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



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 AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



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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