

**ZXTD09N50DE6**

**50V DUAL NPN SILICON LOW SATURATION SWITCHING TRANSISTOR**

**Features**

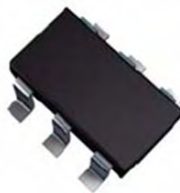
- $BV_{CEO} > 50V$
- $R_{SAT} = 160m\Omega$
- Max continuous Current  $I_C = 1A$
- Low Equivalent On Resistance
- Low Saturation Voltage
- **Lead Free, RoHS Compliant (Note 1)**
- **Halogen and Antimony Free "Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

**Mechanical Data**

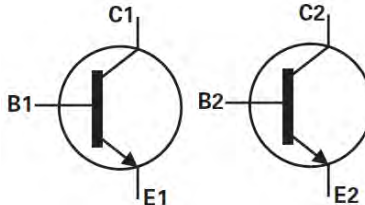
- Case: SOT26
- Case material: Molded Plastic. "Green" Molding Compound.
- UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish
- Weight: 0.018 grams (Approximate)

**Applications**

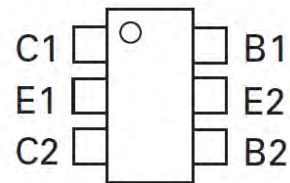
- LCD Backlighting inverter circuits
- Boost functions in DC-DC converters



SOT26



Device symbol



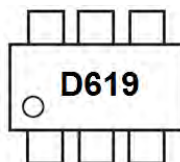
Pin out –top view

**Ordering Information** (Note 3 & 4)

Product	Grade	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTD09N50DE6TA	Commercial	D619	7	8	3,000
ZTD09N50DE6QTA	Automotive	D619	7	8	3,000

- Notes:
1. No purposefully added lead.
  2. Diodes Inc.'s "Green" Policy can be found on our website at <http://www.diodes.com>
  3. For more packaging details, go to our website at <http://www.diodes.com>.
  4. Products with Q-suffix are automotive grade.

**Marking Information**



D619 = Product type Marking Code

**Absolute Maximum Ratings** @T<sub>A</sub> = 25°C unless otherwise specified

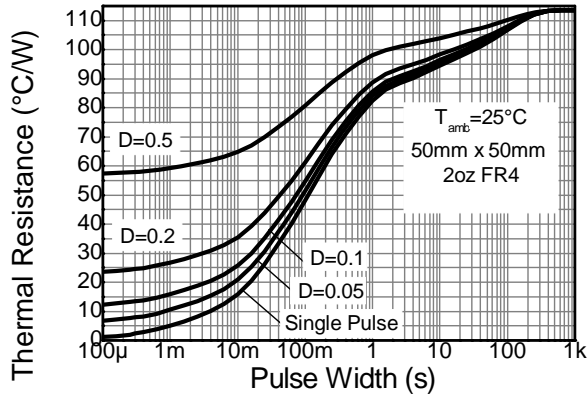
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	50	V
Collector-Emitter Voltage	V <sub>CEO</sub>	50	V
Emitter-Base Voltage	V <sub>EBO</sub>	5	V
Continuous Collector Current	I <sub>C</sub>	1	A
Base current	I <sub>B</sub>	200	mA
Peak Pulse Current	I <sub>CM</sub>	2	A

**Thermal Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

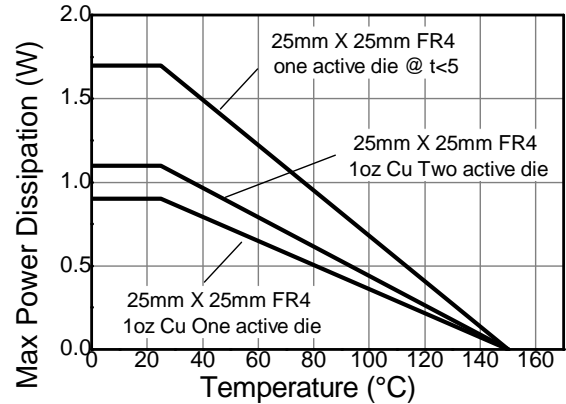
Characteristic	Symbol	Value	Unit
Power Dissipation Linear derating factor	P <sub>D</sub>	(Note 5 & 8)	0.90
		(Note 5 & 9)	7.2
		(Note 6 & 8)	1.1
		(Note 6 & 8)	8.8
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	(Note 5 & 8)	1.7
		(Note 5 & 9)	13.6
		(Note 6 & 8)	139
Thermal Resistance, Junction to Lead	R <sub>θJL</sub>	73	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	75.52	°C/W
		-55 to +150	°C

- Notes:
5. For a device surface mounted on 25mm X 25mm FR4 PCB with high coverage of single sided 1 oz copper, in still air conditions
  6. For a device surface mounted on FR4 PCB measured at < 5sec
  7. Repetitive rating – pulse width limited by maximum junction temperature. Refer to transient thermal impedance graph
  8. For a device with one active die
  9. For a device with two die running at equal power
  10. Thermal resistance from junction to solder-point (at the end of the collector lead).

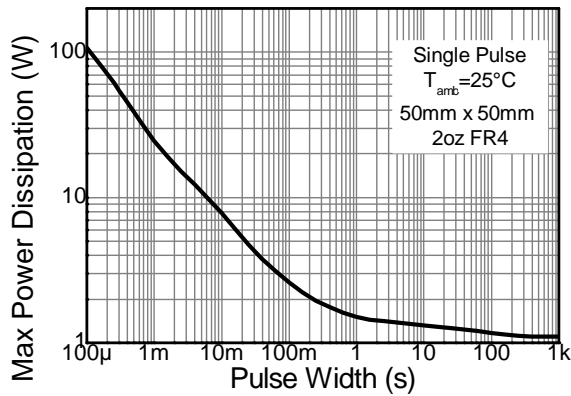
**Thermal Characteristics**



**Transient Thermal Impedance**



**Derating Curve**



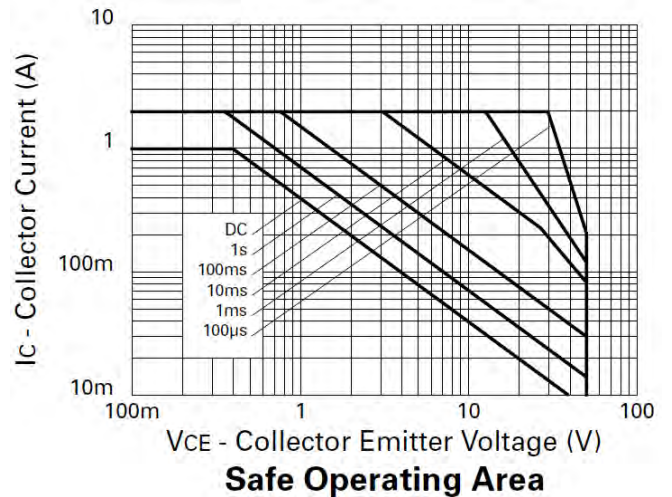
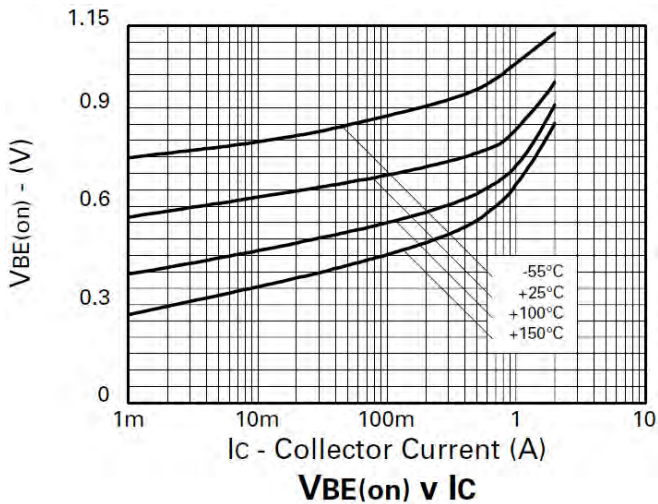
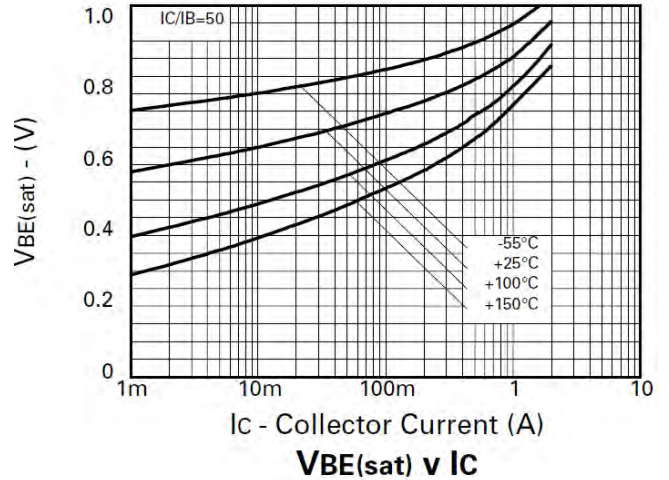
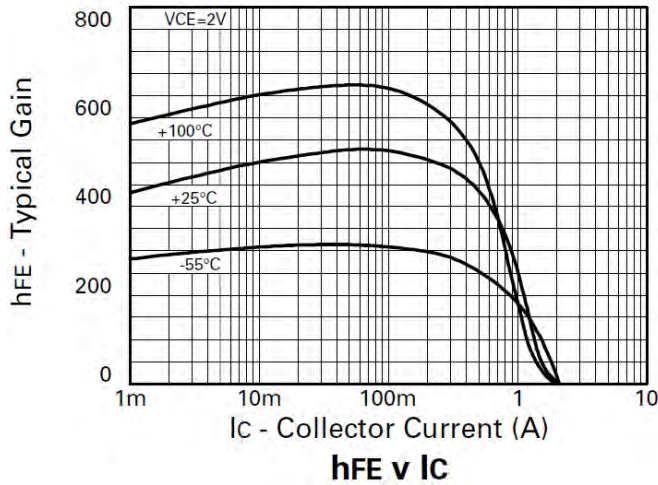
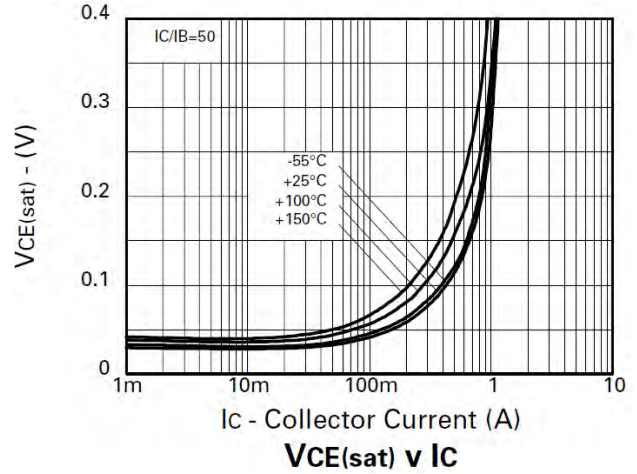
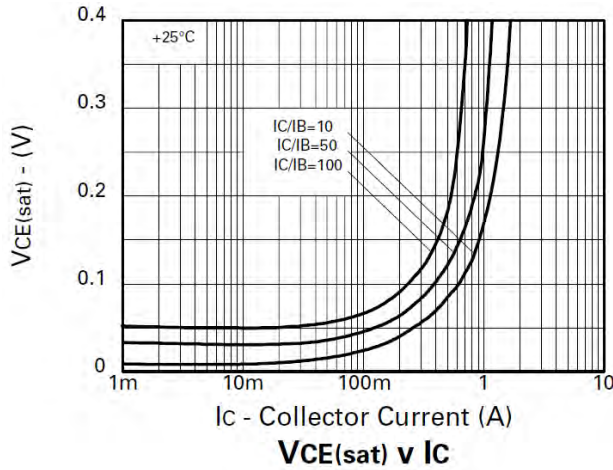
**Pulse Power Dissipation**

**Electrical Characteristics** @ $T_A = 25^\circ\text{C}$  unless otherwise specified (Q1, Q2 common)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$BV_{CBO}$	50			V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 11)	$BV_{CEO}$	50			V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	$BV_{EBO}$	5			V	$I_E = 100\mu\text{A}$
Collector-Base Cutoff Current	$I_{CBO}$			10	nA	$V_{CB} = 40\text{V}$
Collector-Emitter Cutoff Current	$I_{CES}$			10	nA	$V_{CES} = 40\text{V}$
Emitter Cutoff Current	$I_{EBO}$			10	nA	$V_{EB} = 4\text{V}$
DC Current Gain (Note 11)	$h_{FE}$	200	420			$I_C = 10\text{mA}, V_{CE} = 2\text{V}$
		300	450			$I_C = 100\text{mA}, V_{CE} = 2\text{V}$
		200	350			$I_C = 500\text{mA}, V_{CE} = 2\text{V}$
		75	130			$I_C = 1\text{A}, V_{CE} = 2\text{V}$
		20	60			$I_C = 1.5\text{A}, V_{CE} = 2\text{V}$
Collector-Emitter Saturation Voltage (Note 11)	$V_{CE(sat)}$		24	35	mV	$I_C = 100\text{mA}, I_B = 10\text{mA}$
			60	80		$I_C = 250\text{mA}, I_B = 10\text{mA}$
			120	200		$I_C = 500\text{mA}, I_B = 10\text{mA}$
			160	270		$I_C = 1\text{A}, I_B = 50\text{mA}$
Base-Emitter Saturation Voltage (Note 11)	$V_{BE(sat)}$		940	1100	mV	$I_C = 1\text{A}, I_B = 50\text{mA}$
Base-Emitter Turn-On Voltage (Note 11)	$V_{BE(on)}$		850	1100	mV	$I_C = 1\text{A}, V_{CE} = 2\text{V}$
Output Capacitance	$C_{obo}$		10		pF	$V_{CB} = 10\text{V}, f = 1\text{MHz}$
Current Gain-Bandwidth Product	$f_T$		215		MHz	$V_{CE} = 10\text{V}, I_C = 50\text{mA}$ $f = 100\text{MHz}$
Turn-On Time	$t_{on}$		150		ns	$V_{CC} = 10\text{V}, I_C = 1\text{A}$
Turn-Off Time	$t_{off}$		425		ns	

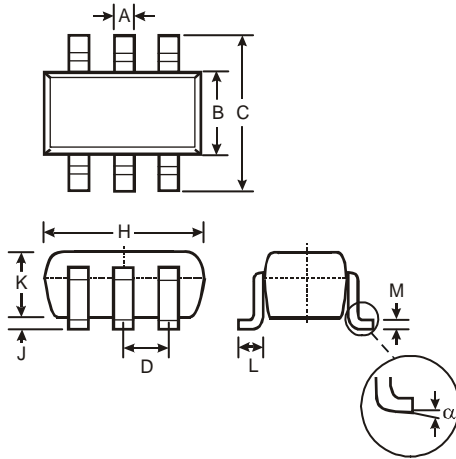
Notes: 11. Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$

**Typical Characteristics**



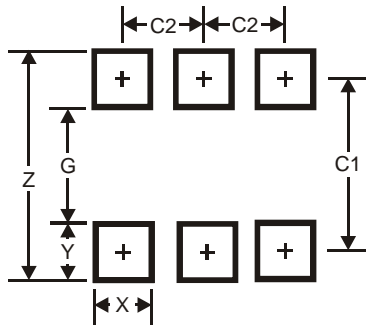
**ZXTD09N50DE6**

**Package Outline Dimensions**



SOT26			
Dim	Min	Max	Typ
A	0.35	0.50	0.38
B	1.50	1.70	1.60
C	2.70	3.00	2.80
D	—	—	0.95
H	2.90	3.10	3.00
J	0.013	0.10	0.05
K	1.00	1.30	1.10
L	0.35	0.55	0.40
M	0.10	0.20	0.15
α	0°	8°	—
<b>All Dimensions in mm</b>			

**Suggested Pad Layout**



Dimensions	Value (in mm)
Z	3.20
G	1.60
X	0.55
Y	0.80
C1	2.40
C2	0.95

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