Lead-free Green

ZXTD09N50DE6

50V DUAL NPN SILICON LOW SATURATION SWITCHING TRANSISTOR

Features

- BV_{CEO} > 50V
- R_{SAT} = 160mV
- 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**

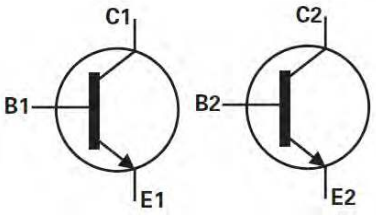
Mechanical Data

- 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)

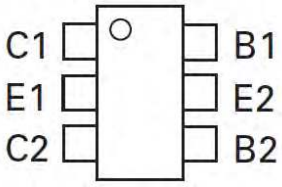
Applications

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

SOT26



Device symbol



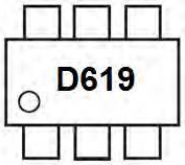
Pin out –top view

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_A = 25°C unless otherwise specified

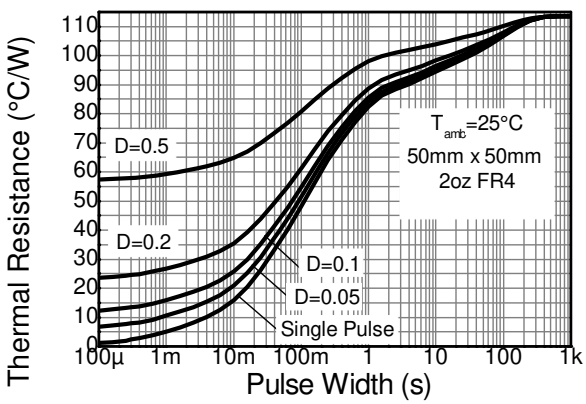
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	50	V
Collector-Emitter Voltage	V_{CEO}	50	V
Emitter-Base Voltage	V_{EBO}	5	V
Continuous Collector Current	I_C	1	A
Base current	I_B	200	mA
Peak Pulse Current	I_{CM}	2	A

Thermal Characteristics @T_A = 25°C unless otherwise specified

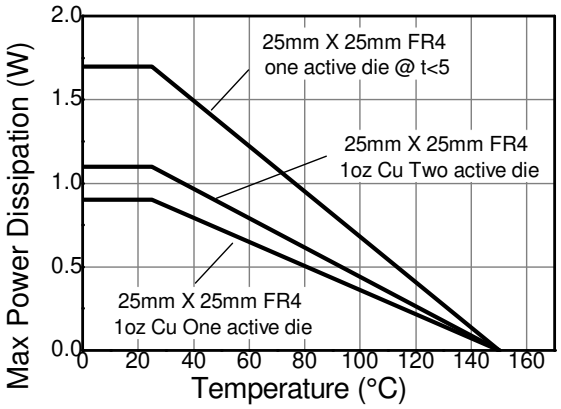
Characteristic		Symbol	Value	Unit
Power Dissipation Linear derating factor	(Note 5 & 8)	P_D	0.90 7.2	W mW /°C
	(Note 5 & 9)		1.1 8.8	
	(Note 6 & 8)		1.7 13.6	
Thermal Resistance, Junction to Ambient	(Note 5 & 8)	$R_{\theta JA}$	139	°C/W
	(Note 5 & 9)		73	
	(Note 6 & 8)		113	
Thermal Resistance, Junction to Lead	(Note 10)	$R_{\theta JL}$	75.52	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-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).

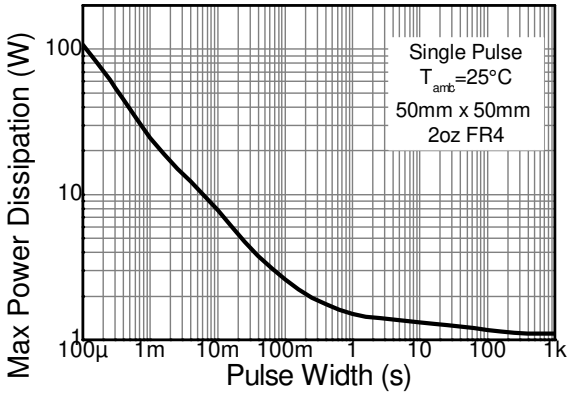
Thermal Characteristics



Transient Thermal Impedance



Derating Curve



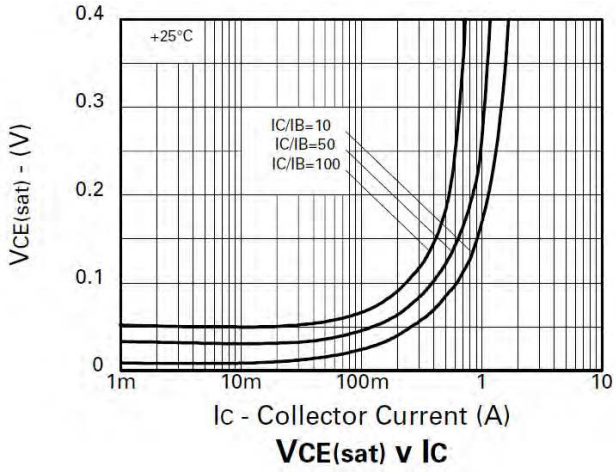
Pulse Power Dissipation

Electrical Characteristics @T_A = 25°C unless otherwise specified (Q1, Q2 common)

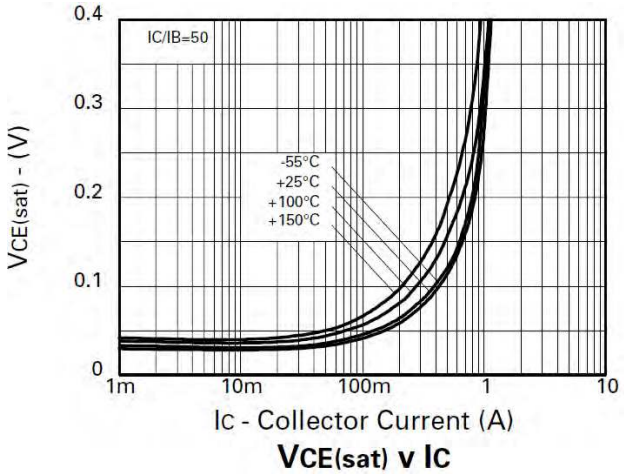
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	50			V	I_C = 100µA
Collector-Emitter Breakdown Voltage (Note 11)	BV_{CEO}	50			V	I_C = 10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	5			V	I_E = 100µA
Collector-Base Cutoff Current	I_{CBO}			10	nA	V_{CB} = 40V
Collector-Emitter Cutoff Current	I_{CES}			10	nA	V_{CES} = 40V
Emitter Cutoff Current	I_{EBO}			10	nA	V_{EB} = 4V
DC Current Gain (Note 11)	h_{FE}	200 300 200 75 20	420 450 350 130 60			I_C = 10mA, V_{CE} = 2V I_C = 100mA, V_{CE} = 2V I_C = 500mA, V_{CE} = 2V I_C = 1A, V_{CE} = 2V I_C = 1.5A, V_{CE} = 2V
Collector-Emitter Saturation Voltage (Note 11)	$V_{CE(sat)}$		24 60 120 160	35 80 200 270	mV	I_C = 100mA, I_B = 10mA I_C = 250mA, I_B = 10mA I_C = 500mA, I_B = 10mA I_C = 1A, I_B = 50mA
Base-Emitter Saturation Voltage (Note 11)	$V_{BE(sat)}$		940	1100	mV	I_C = 1A, I_B = 50mA
Base-Emitter Turn-On Voltage (Note 11)	$V_{BE(on)}$		850	1100	mV	I_C = 1A, V_{CE} = 2V
Output Capacitance	C_{obo}		10		pF	V_{CB} = 10V. f = 1MHz
Current Gain-Bandwidth Product	f_T		215		MHz	V_{CE} = 10V, I_C = 50mA f = 100MHz
Turn-On Time	t_{on}		150		ns	V_{CC} = 10V, I_C = 1A
Turn-Off Time	t_{off}		425		ns	I_{B1} = I_{B2} = 100mA

Notes: 11. Measured under pulsed conditions. Pulse width ≤ 300 µs. Duty cycle ≤ 2%

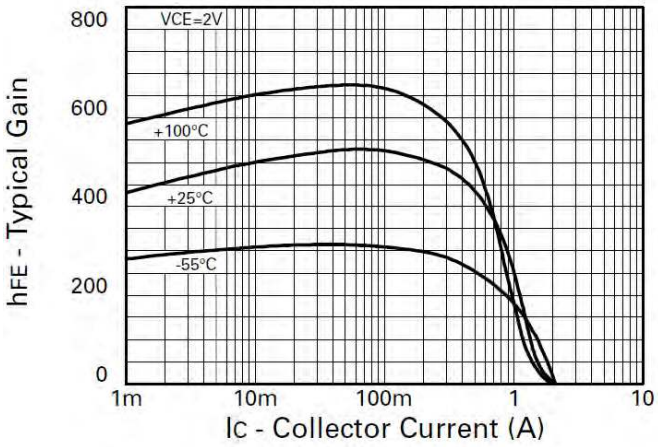
Typical Characteristics



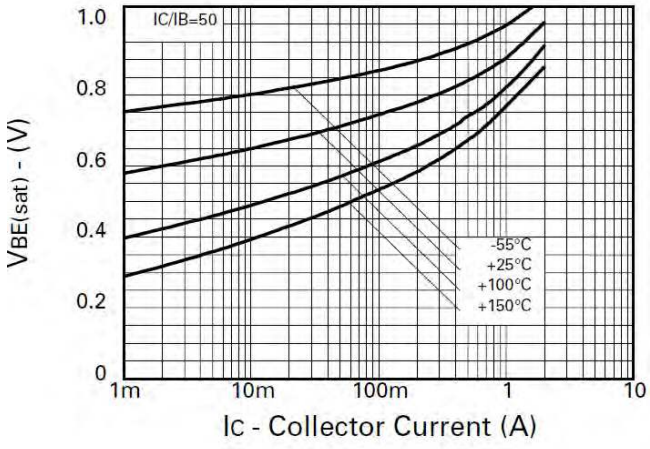
VCE(sat) v IC



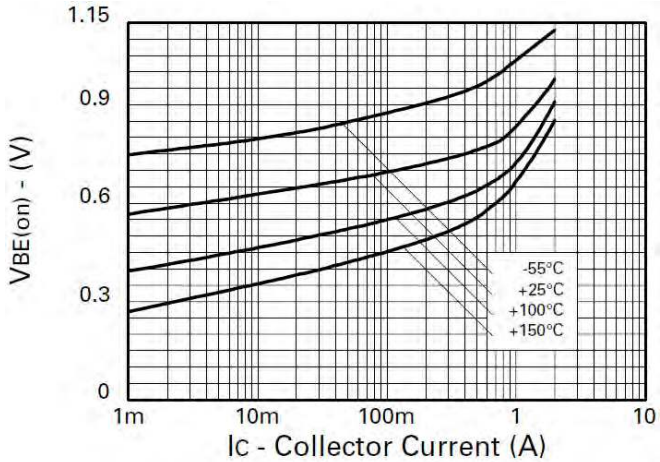
VCE(sat) v IC



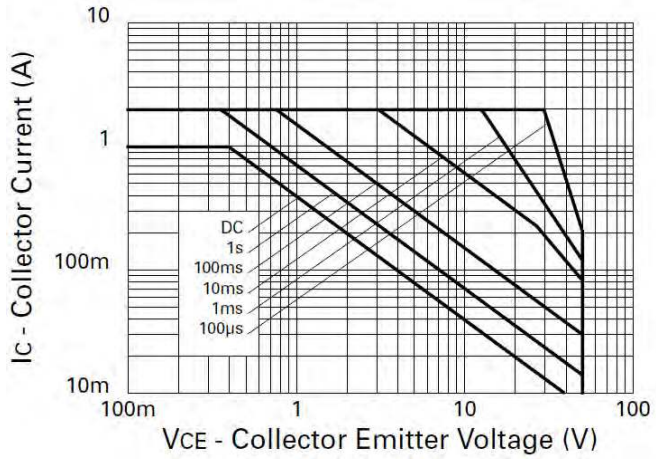
hFE v IC



VBE(sat) v IC

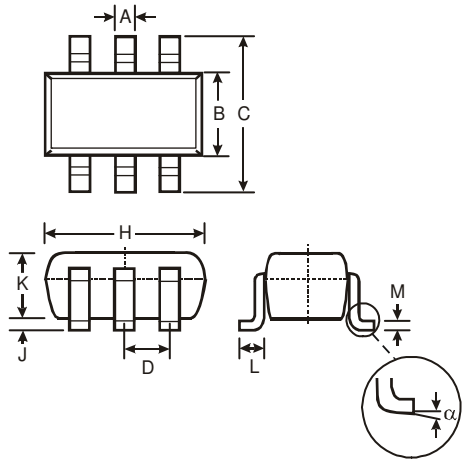


VBE(on) v IC



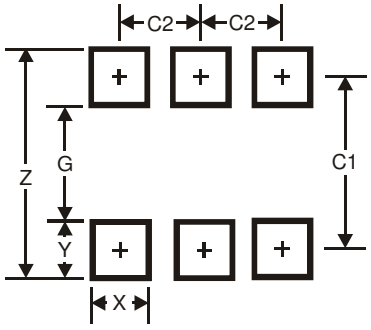
Safe Operating Area

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°	—
All Dimensions in mm			

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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