

50V DUAL NPN LOW SATURATION SWITCHING TRANSISTOR IN SOT26

Features

- $BV_{CEO} > 50V$
- I_C = 1A High Continuous Current
- High Gain
- $R_{SAT} = 160 m\Omega$ for Low Equivalent On Resistance
- Low Saturation Voltage V_{CE(sat)} < -270mV @ 1A
- 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
- PPAP Capable (Note 4)

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 @3
- Weight: 0.015 grams (Approximate)

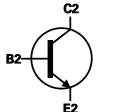
Applications

C1

- LCD Backlighting Inverter Circuits
- Boost Functions in DC-DC Converters

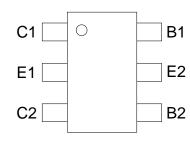






Device Symbol

B1



Top View Pin-Out

Ordering Information (Notes 4 & 5)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTD09N50DE6TA	AEC-Q101	D619	7	8	3,000
ZTD09N50DE6QTA	Automotive	D619	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 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.</p>
 4. Automotive products are AEC-Q101 qualified and PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified.
- 5. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information

D619

SOT26

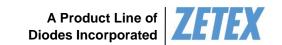
D619 = Product Type Marking Code YM = Date Code Marking Y or \overline{Y} = Year (ex: C = 2015)

M or \overline{M} = Month (ex: 9 = September)

Date Code Key

Year	2015	1 2	2016	2017	2018	2019	2020	202	1 20	22	2023	2024	2025
Code	С		D	E	F	G	Н	1	,	J	K	L	М
Montl	h	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code)	1	2	3	4	5	6	7	8	9	0	N	D





Absolute Maximum Ratings – Q1 & Q2 Common (@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}	7	V
Continuous Collector Current	Ic	1	Α
Peak Pulse Current	Ісм	2	Α
Base Current	lΒ	200	mA

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

Characteristic		Symbol	Value	Unit	
	(Notes 6 & 10) (Notes 7 & 10)		0.7 5.6		
			0.9 7.2		
Power Dissipation Linear Derating Factor	(Notes 7 & 11)	P_{D}	1.1 8.8	W mW/°C	
	(Notes 8 & 10)		1.1 8.8		
	(Notes 9 & 10)		1.7 13.6		
	(Notes 6 & 10)		179		
	(Notes 7 & 10)	$R_{ hetaJA}$	139		
Thermal Resistance, Junction to Ambient	(Notes 7 & 11)		113	0000	
	(Notes 8 & 10)		113	°C/W	
	(Notes 9 & 10)		73		
Thermal Resistance, Junction to Lead	(Note 12)	$R_{ heta JL}$	95.50		
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C	

ESD Ratings (Note 13)

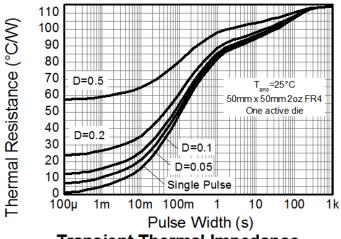
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	С

Notes:

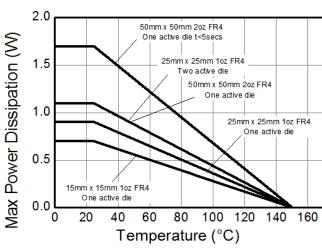
- 6. For a device surface mounted on 15mm x 15mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
- 7. Same as Note 6, except the device is surface mounted on 25mm x 25mm 1oz copper.
- 8. Same as Note 6, except the device is surface mounted on 50mm x 50mm 2oz copper.
- 9. Same as Note 8, except the device is measured at t < 5 seconds.
- 10. For device with one active die, both collectors attached to a common heatsink.
- 11. For device with two active dice running at equal power, split heatsink 50% to each collector.
- 12. Thermal resistance from junction to solder-point (at the end of the collector lead).
- 13. Refer to JEDEC specification JESD22-A114 and JESD22-A115.



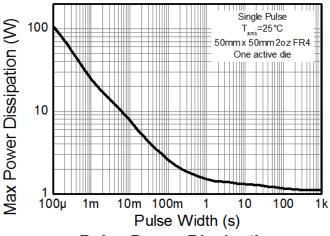
Thermal Characteristics and Derating Information



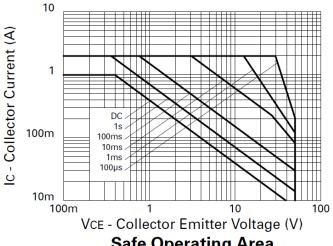
Transient Thermal Impedance



Derating Curve



Pulse Power Dissipation



Safe Operating Area





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

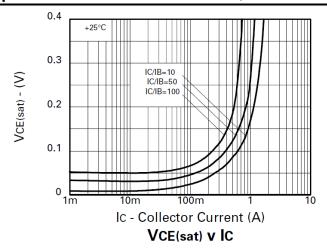
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	50	_	_	V	$I_C = 100\mu A$
Collector-Emitter Breakdown Voltage (Note 13)	BV _{CEO}	50	_	_	V	I _C = 10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	7	_	_	V	I _E = 100μA
Collector-Base Cut-Off Current	I _{CBO}	_	_	10	nA	V _{CB} = 40V
Collector-Emitter Cut-Off Current	I _{CES}	_	_	10	nA	V _{CES} = 40V
Emitter Cutoff Current	I _{EBO}	_	_	10	nA	$V_{EB} = 5.6V$
DC Current Gain (Note 13)	h _{FE}	200 300 200 75 20	420 450 350 130 60		l	$\begin{split} &I_{C} = 10\text{mA}, \ V_{CE} = 2\text{V} \\ &I_{C} = 100\text{mA}, \ V_{CE} = 2\text{V} \\ &I_{C} = 500\text{mA}, \ V_{CE} = 2\text{V} \\ &I_{C} = 1\text{A}, \ V_{CE} = 2\text{V} \\ &I_{C} = 1.5\text{A}, \ V_{CE} = 2\text{V} \end{split}$
Collector-Emitter Saturation Voltage (Note 13)	VCE(sat)	-	24 60 120 160	35 80 200 270	mV	$I_C = 100$ mA, $I_B = 10$ mA $I_C = 250$ mA, $I_B = 10$ mA $I_C = 500$ mA, $I_B = 10$ mA $I_C = 1$ A, $I_B = 50$ mA
Base-Emitter Saturation Voltage (Note 13)	V _{BE(sat)}	_	940	1100	mV	$I_C = 1A$, $I_B = 50mA$
Base-Emitter Turn-On Voltage (Note 13)	$V_{BE(on)}$	_	850	1100	mV	$I_C = 1A$, $V_{CE} = 2V$
Output Capacitance	C_{obo}	_	10	_	рF	$V_{CB} = 10V. f = 1MHz$
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	$I_{B1} = I_{B2} = 100 \text{mA}$

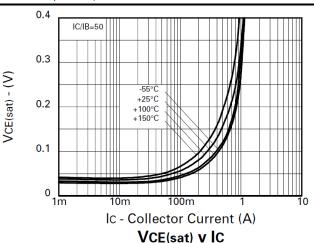
Note:

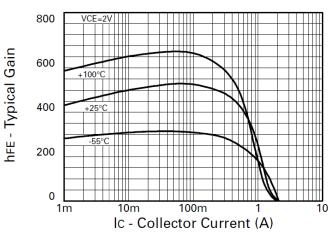
13. Measured under pulsed conditions. Pulse width ≤ 300 µs. Duty cycle ≤ 2%.



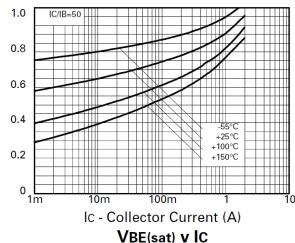
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



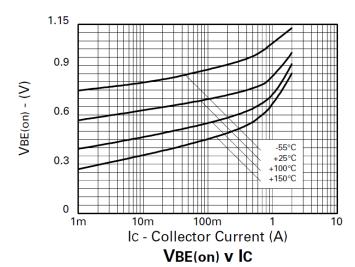




1.0



hFE v IC

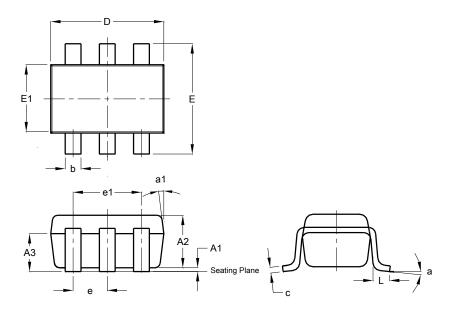


VBE(sat) - (V)



Package Outline Dimensions

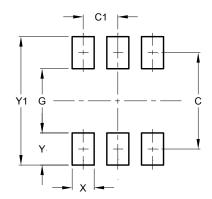
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



SOT26								
Dim	Min	Max	Тур					
A 1	0.013	0.10	0.05					
A2	1.00	1.30	1.10					
А3	0.70	0.80	0.75					
b	0.35	0.50	0.38					
С	0.10	0.20	0.15					
D	2.90	3.10	3.00					
е	-	-	0.95					
e1	-	-	1.90					
Е	2.70	3.00	2.80					
E1	1.50	1.70	1.60					
L	0.35	0.55	0.40					
а	-	-	8°					
a1	-	-	7°					
All	All Dimensions in mm							

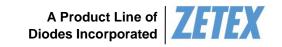
Suggested Pad Layout

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



Dimensions	Value (in mm)
С	2.40
C1	0.95
G	1.60
Х	0.55
Υ	0.80
Y1	3.20





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