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Green

ZVN4306A

60V N-CHANNEL ENHANCEMENT MODE VERTICAL DMOS FET IN E-LINE

Product Summary

BV_{DSS}	Max $R_{DS(ON)}$	Max I_D @ T_A = +25°C
60V	330mΩ @ V_{GS} = 10V	1.4A
	450mΩ @ V_{GS} = 5V	1.2A

Application

- DC - DC convertors
- Solenoids/relay drivers for automotive

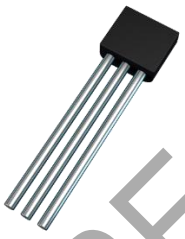
Features and Benefits

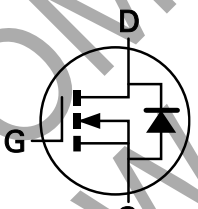
- Breakdown Voltage BV_{DSS} > 60V
- $R_{DS(ON)}$ ≤ 0.33Ω @ V_{GS} = 10V
- Maximum Continuous Drain Current I_D = 1.1A
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e.: parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please refer to the related automotive grade (Q-suffix) part. A listing can be found at https://www.diodes.com/products/automotive/automotive-products/.**
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability. https://www.diodes.com/quality/product-definitions/**

Mechanical Data

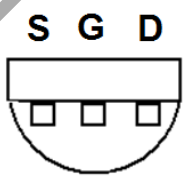
- Package: E-Line (TO-92 Compatible)
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Terminals: Matte Tin Finish ⓔ3
- Weight: 0.159 grams (Approximate)

E-Line





Equivalent Circuit



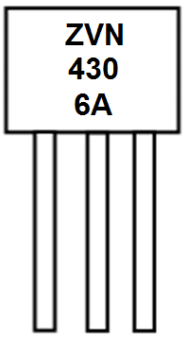
Pin Out - Bottom View

Ordering Information (Note 4)

Orderable Part Number	Package	Marking	Packing	
			Qty.	Carrier
ZVN4306ASTZ	E-Line	ZVN4306A	2,000	Ammo Pack
ZVN4306A	E-Line	ZVN4306A	4,000	Loose per Box

Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
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



ZVN4306A = Product Type Marking Code on Rounded Face

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Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

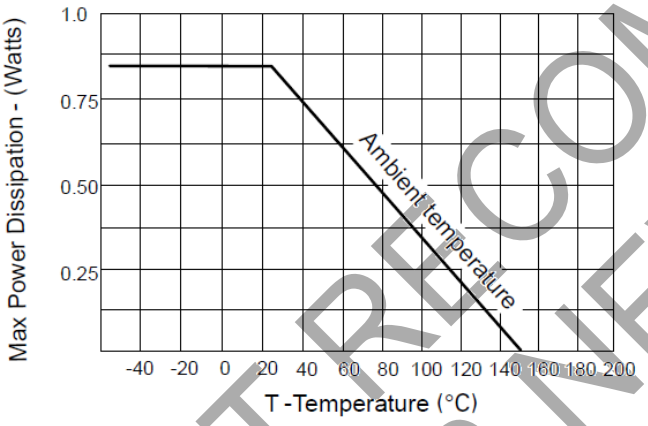
Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	60	V
Gate-Source Voltage	V_{GSS}	±20	V
Continuous Drain Current	I_D	1.1	A
Practical Continuous Drain Current	I_{DP}	1.3	A
Pulsed Drain Current	I_{DM}	15	A

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

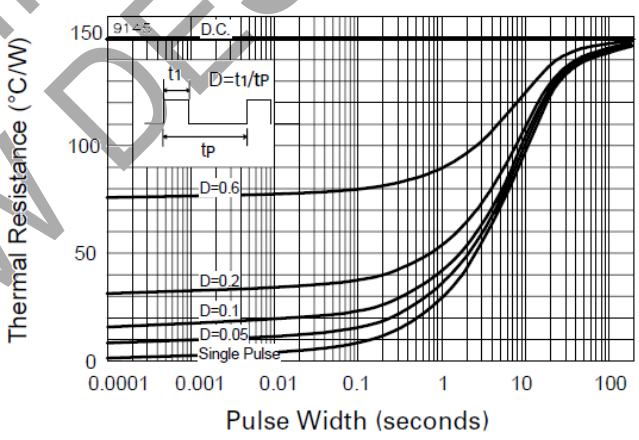
Characteristic		Symbol	Value	Unit
Power Dissipation		P_D	850	mW
Practical Power Dissipation	(Note 5)	P_{DP}	1.13	W
Thermal Resistance, Junction to Ambient		$R_{\theta JA}$	150	°C/W
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	111	°C/W
Thermal Resistance, Junction to Leads	(Note 6)	$R_{\theta JL}$	50	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Notes: 5. For a device mounted on 25mm x 25mm x 1.6mm FR-4 PCB with high coverage of single sided 1oz copper, in still air condition.
6. Thermal resistance from junction to solder-point.

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Derating curve



Maximum transient thermal impedance

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

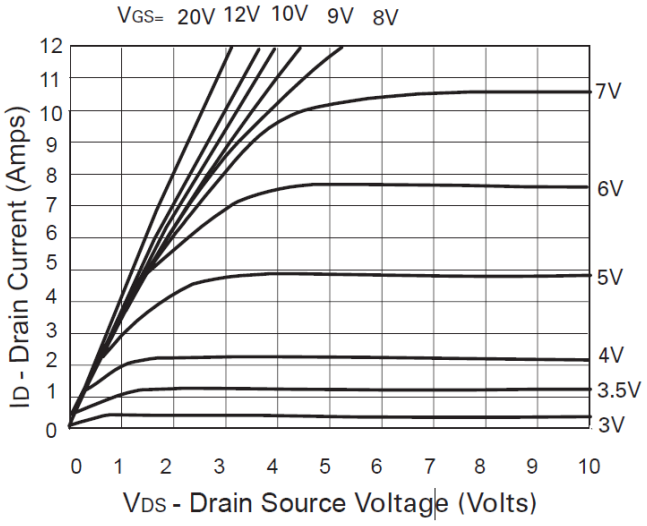
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	60	—	—	V	V_{GS} = 0, I_D = 1mA
Zero Gate Voltage Drain Current T_J = +25°C	I_{DSS}	—	—	1 20	μA	V_{DS} = 60V, V_{GS} = 0 V_{DS} = 48V, V_{GS} = 0, T_A = +125°C
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±20V, V_{DS} = 0
On-State Drain Current	$I_{D(ON)}$	12	—	—	A	V_{GS} = 10V, V_{DS} = 10
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	1.3	—	3	V	V_{DS} = V_{GS}, I_D = 1mA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	0.22 0.32	0.33 0.45	Ω	V_{GS} = 10V, I_D = 3A V_{GS} = 5V, I_D = 1.5A
Forward Transconductance	g_{fs}	700	—	—	mS	V_{DS} = 10V, I_D = 3A
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C_{iss}	—	—	350	pF	V_{DS} = 25V, V_{GS} = 0, f = 1.0MHz
Output Capacitance	C_{oss}	—	—	140	pF	
Reverse Transfer Capacitance	C_{rss}	—	—	30	pF	
Turn-On Delay Time (Note 8)	$t_{D(ON)}$	—	—	8	ns	V_{DD} = 25V, I_D = 3A, V_{GEM} = 10V
Turn-On Rise Time (Note 8)	t_R	—	—	25	ns	
Turn-Off Delay Time (Note 8)	$t_{D(OFF)}$	—	—	30	ns	
Turn-Off Fall Time (Note 8)	t_F	—	—	16	ns	

Notes: 7. Measured under pulsed conditions. Width = 300μs. Duty cycle ≤ 2%.
8. Switching times measured with 50Ω source impedance and < 5ns rise time on a pulse generator.

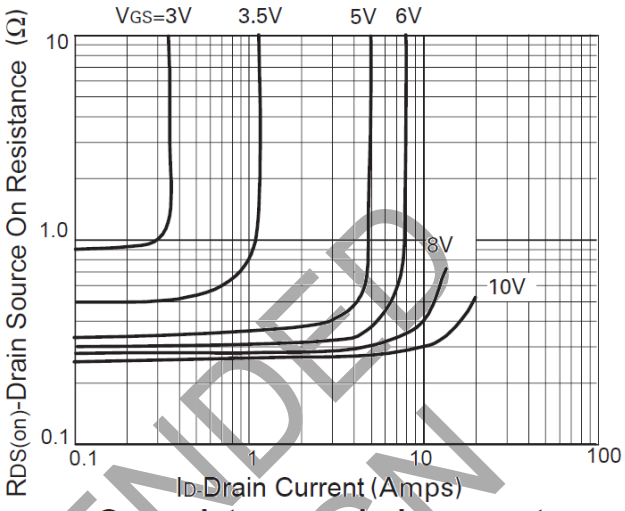
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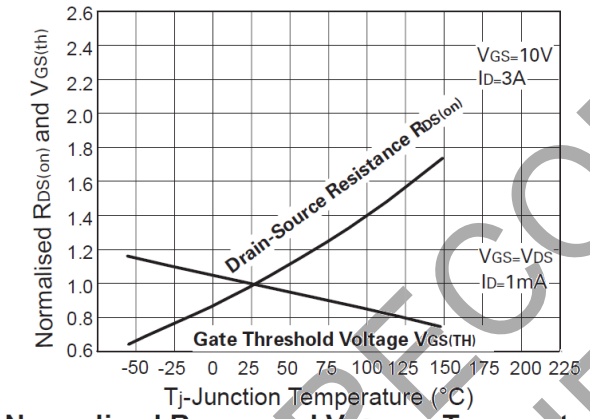
Electrical Characteristics



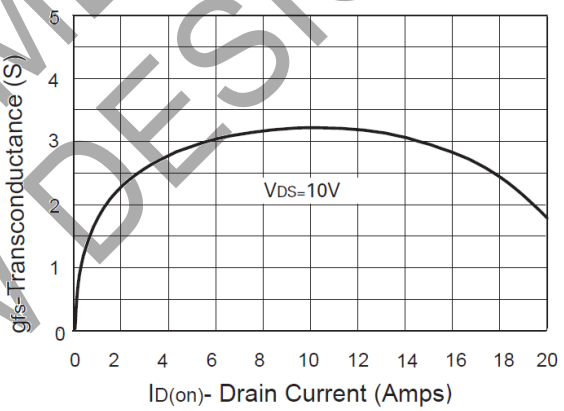
Saturation Characteristics



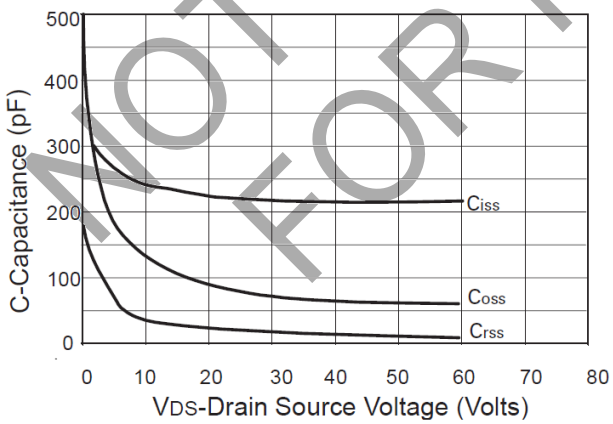
On-resistance v drain current



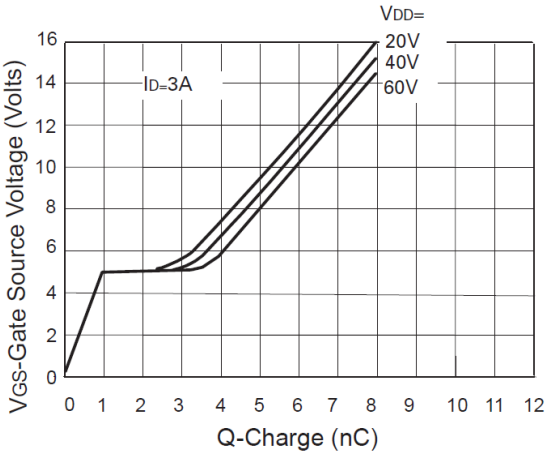
Normalised RDS(on) and VGS(th) v Temperature



Transconductance v drain current



Capacitance v drain-source voltage



Gate charge v gate-source voltage

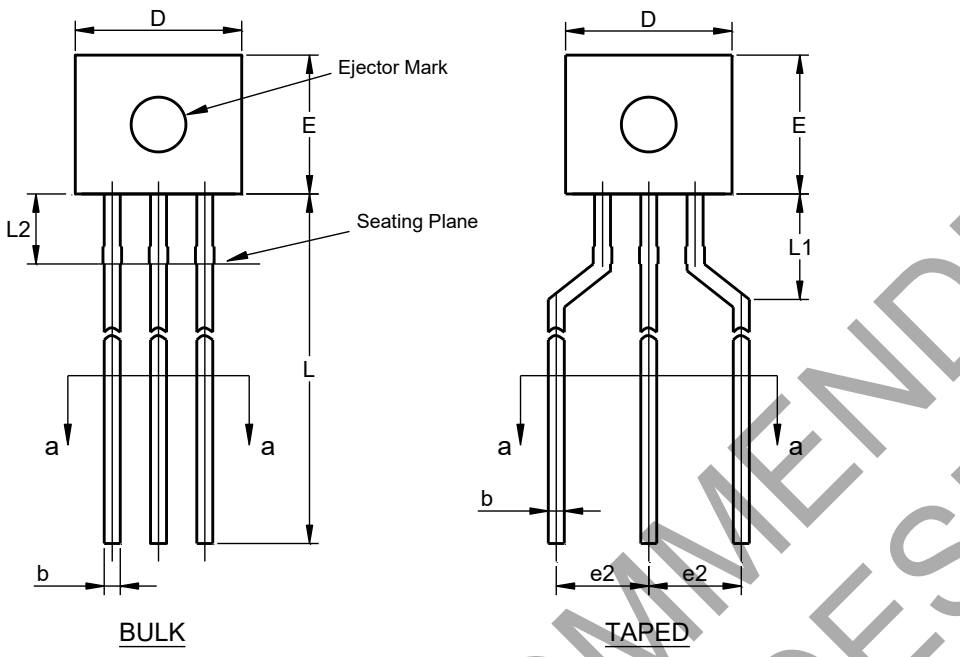
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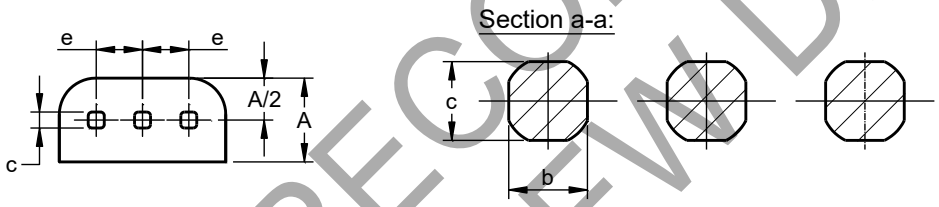
Package Outline Dimensions

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

E-Line



E-Line			
Dim	**Min**	**Max**	**Typ**
A	2.16	2.41	2.28
b	0.41	0.49	0.44
c	0.41	0.49	0.44
D	4.37	4.77	4.57
E	3.61	4.01	3.90
e	1.27 REF		
e2	2.54 REF		
L	13.00	13.97	13.50
L1	2.50	3.50	--
L2	--	--	2.50
All Dimensions in mm			



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