240V N-CHANNEL ENHANCEMENT MODE VERTICAL DMOSFET

Features

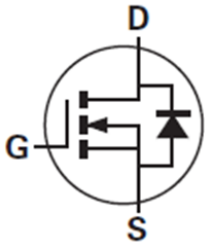
- BV_{DSS} > 240V
- $R_{DS(ON)}$ ≤ 6Ω @ V_{GS} = 2.5V
- I_D = 260mA Maximum Continuous Drain Current
- Fast Switching Speed
- Low Threshold
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

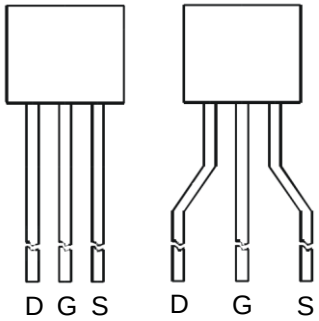
- Case: E-Line (TO92 Compatible)
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Rating 94V-0
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.159 grams (Approximate)

E-Line
(TO92 Compatible)

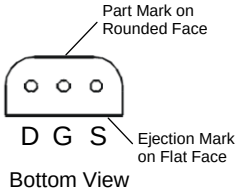
Flat Face View



Device Symbol



Rounded Face View



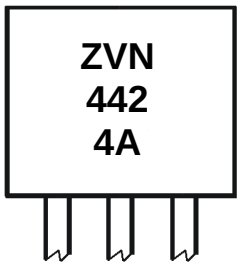
Bottom View

Ordering Information (Note 4)

Part Number	Compliance	Package	Leads	Quantity
ZVN4424A	AEC-Q101	E-Line	Straight	4,000 Loose in a Box
ZVN4424ASTZ	AEC-Q101	E-Line	Joggled	2,000 Taped per Ammo Box

Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
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.
4. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information



Rounded Face View

ZVN
442
4A = Product Type Marking Code

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

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	240	V
Gate-Source Voltage	V_{GSS}	±40	V
Continuous Drain Current	I_D	260	mA
Pulsed Drain Current	I_{DM}	1.5	A

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

Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	750	mW
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	167	°C/W
Thermal Resistance, Junction to Lead	(Note 6)	$R_{\theta JL}$	71	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

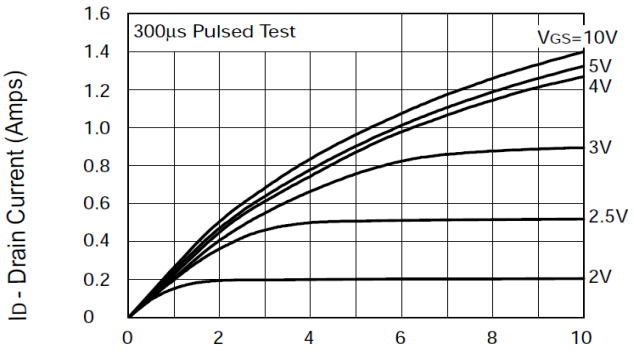
Notes: 5. For a through-hole device mounted on the minimum recommended pad layout with 12mm lead length from the bottom of package to the single-sided FR-4 PCB; device is measured under still air conditions whilst operating in a steady-state.
6. Thermal resistance from junction to solder-point at the seating plane (2.5mm from the bottom of package along the collector lead).

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

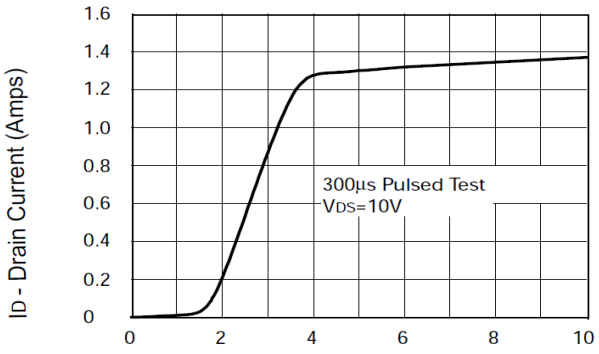
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	240	—	—	V	I_D = 1mA, V_{GS} = 0V
Zero Gate Voltage Drain Current	I_{DSS}	—	—	10 100	μA	V_{DS} = 240V, V_{GS} = 0V V_{DS} = 190V, V_{GS} = 0V, T = +125°C
Gate-Source Leakage	I_{GSS}	—	—	100	nA	V_{GS} = ±40V, V_{DS} = 0V
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	0.8	1.3	1.8	V	I_D = 1mA, V_{DS} = V_{GS}
Static Drain-Source On-Resistance (Note 7)	$R_{DS(ON)}$	—	4	5.5	Ω	V_{GS} = 10V, I_D = 500mA
			4.3	6		V_{GS} = 2.5V, I_D = 500mA
Forward Transconductance (Notes 7 & 9)	g_{FS}	0.4	0.75	—	S	V_{DS} = 10V, I_D = 0.5A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	—	110	200	pF	V_{DS} = 25V, V_{GS} = 0V f = 1.0MHz
Output Capacitance	C_{oss}	—	15	25		
Reverse Transfer Capacitance	C_{rss}	—	3.5	15		
Turn-On Delay Time (Note 8)	$t_{D(ON)}$	—	2.5	5	ns	V_{DD} = 50V, V_{GEN} = 10V I_D = 0.25A
Turn-On Rise Time (Note 8)	t_R	—	5	8		
Turn-Off Delay Time (Note 8)	$t_{D(OFF)}$	—	40	60		
Turn-Off Fall Time (Note 8)	t_F	—	16	25		

Notes: 7. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.
8. Switching characteristics are independent of operating junction temperature. Switching times are measured with 50Ω source impedance and <5ns rise time on a pulse generator.
9. For design aid only, not subject to production testing.

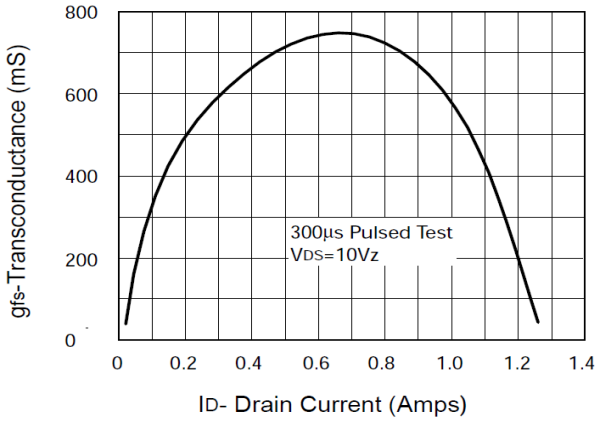
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



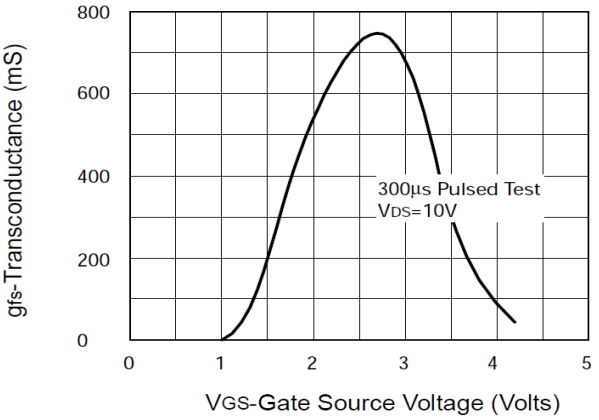
Saturation Characteristics



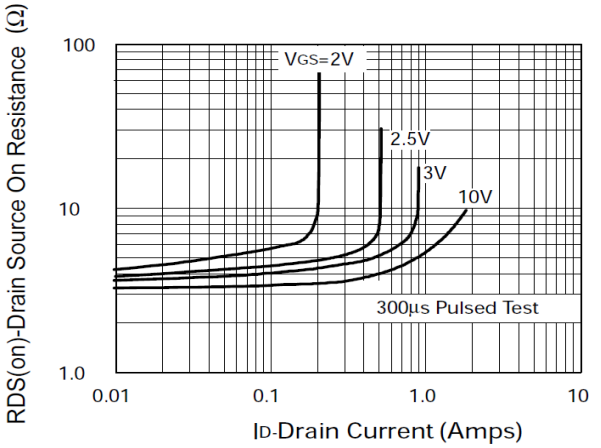
Transfer Characteristics



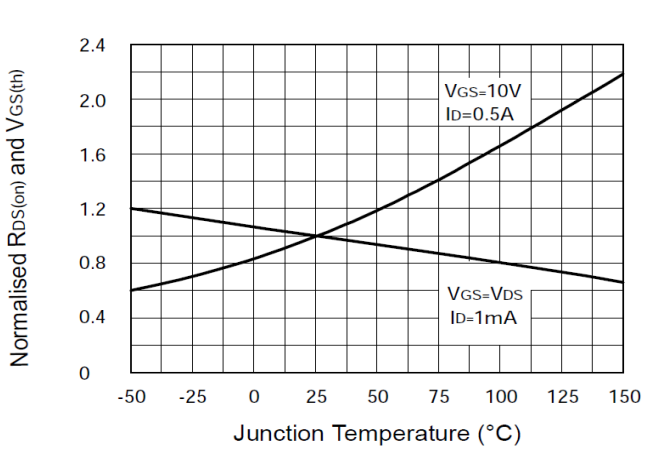
Transconductance v drain current



Transconductance v gate-source voltage

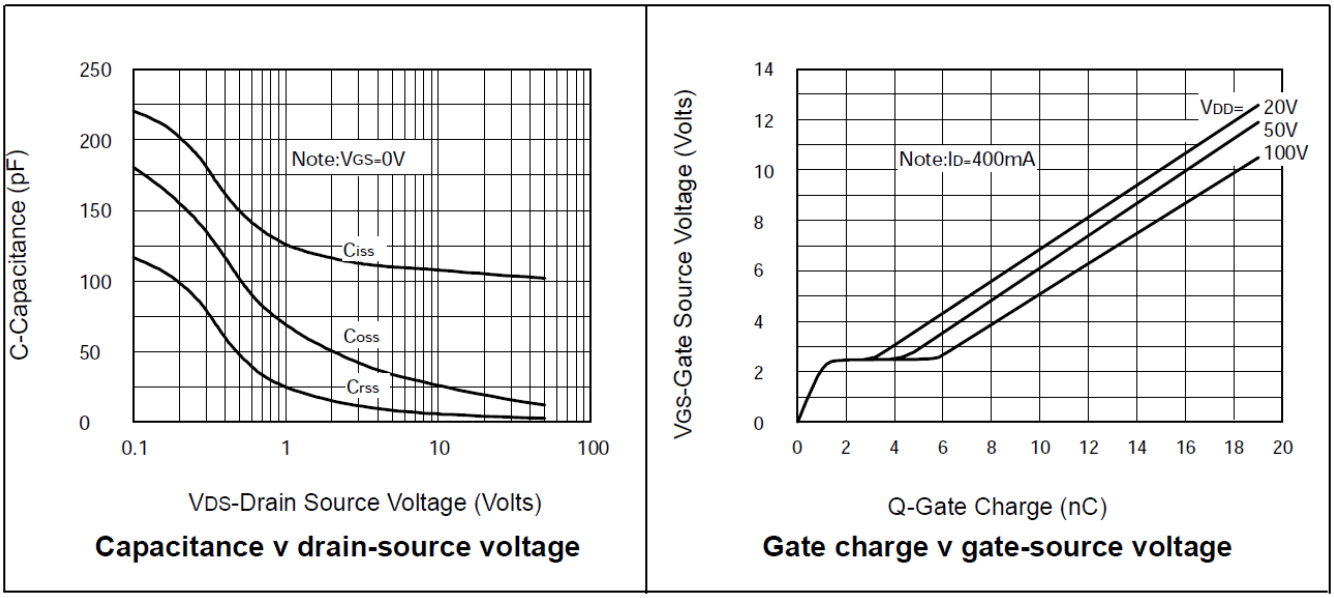


On-resistance vs Drain Current



Normalised $R_{DS(on)}$ and $V_{GS(th)}$ vs Temperature

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



Capacitance v drain-source voltage

Gate charge v gate-source voltage

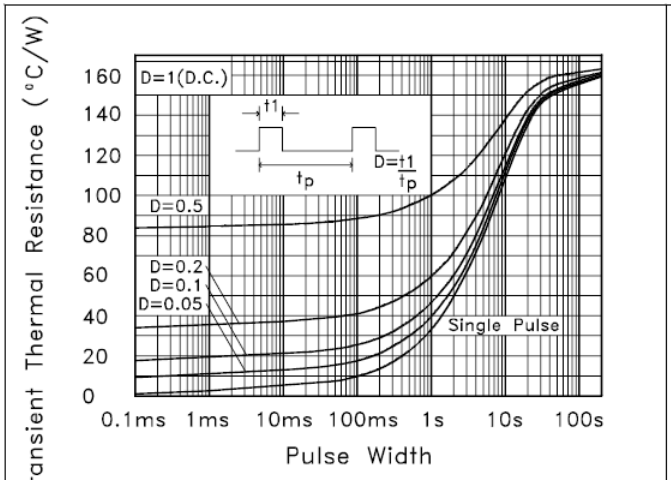


FIG. 9 Transient Thermal Resistance

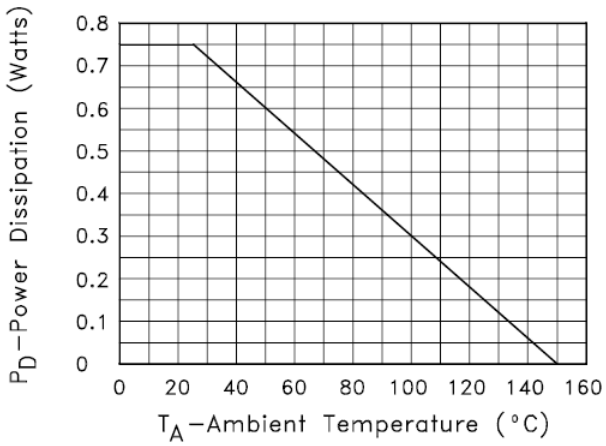
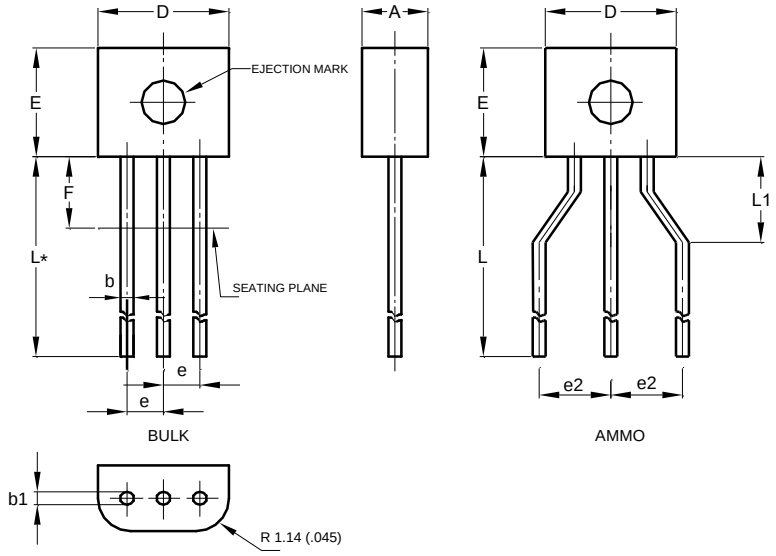


FIG. 10 Power vs. Temperature Derating Curve (Ambient)

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	–
b	0.41	0.495	–
b1	0.41	0.495	–
D	4.37	4.77	–
E	3.61	4.01	–
e	–	–	1.27
e2	–	–	2.54
F	–	2.50	–
L	13.00	13.97	–
L1	2.50	3.50	–
All Dimensions in mm			

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