

**Product Summary**

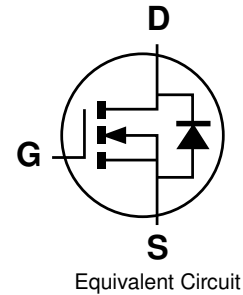
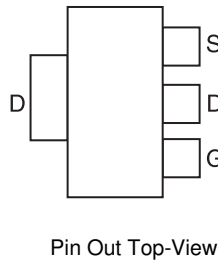
$V_{(BR)DSS}$	Max $R_{DS(on)}$	Max $I_D$ $T_A = +25^{\circ}C$
250V	8.5Ω @ $V_{GS} = 10V$	310mA

**Description and Applications**

This 250V enhancement mode N-Channel MOSFET provides users with a competitive specification offering efficient power handling capability, high impedance and is free from thermal runaway and thermally induced secondary breakdown. Applications benefiting from this device include a variety of telecommunication and general high voltage circuits.

SOT89 and SOT23-6 versions are also available.

- Earth Recall and Dialing Switches
- Electronic Hook Switches
- High Voltage Power MOSFET Drivers
- Telecom Call Routers
- Solid State Relays



**Features and Benefits**

- High Voltage
- Low On-Resistance
- Fast Switching Speed
- Low Gate Drive
- Low Threshold
- Complementary P-Channel Type ZVP4525G
- SOT223 Package
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

**Mechanical Data**

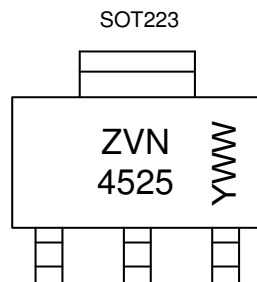
- Case: SOT223
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram Below
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe; Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.112 grams (Approximate)

**Ordering Information** (Note 4)

Part Number	REEL SIZE (inches)	TAPE WIDTH (mm)	Packaging
ZVN4525GTA	7	8mm Embossed	1,000
ZVN4525GTC	13	8mm Embossed	4,000

- 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](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**



ZVN 4525 = Product Type Marking Code  
 YWW = Date Code Marking  
 Y or  $\bar{Y}$  = Last Digit of Year (ex: 5= 2015)  
 WW or  $\bar{W}W$  = Week Code (01~53)

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DSS</sub>	250	V
Gate-Source Voltage	V <sub>GS</sub>	±40	V
Continuous Drain Current, V <sub>GS</sub> = 10V (Note 5)	I <sub>D</sub>	T <sub>A</sub> = +25°C	310
		T <sub>A</sub> = +70°C	248
Pulsed Drain Current (Note 7)	I <sub>DM</sub>	1.44	A
Continuous Source Current (Body Diode)	I <sub>S</sub>	1.1	A
Pulsed Source Current (Body Diode)	I <sub>SM</sub>	1.44	A

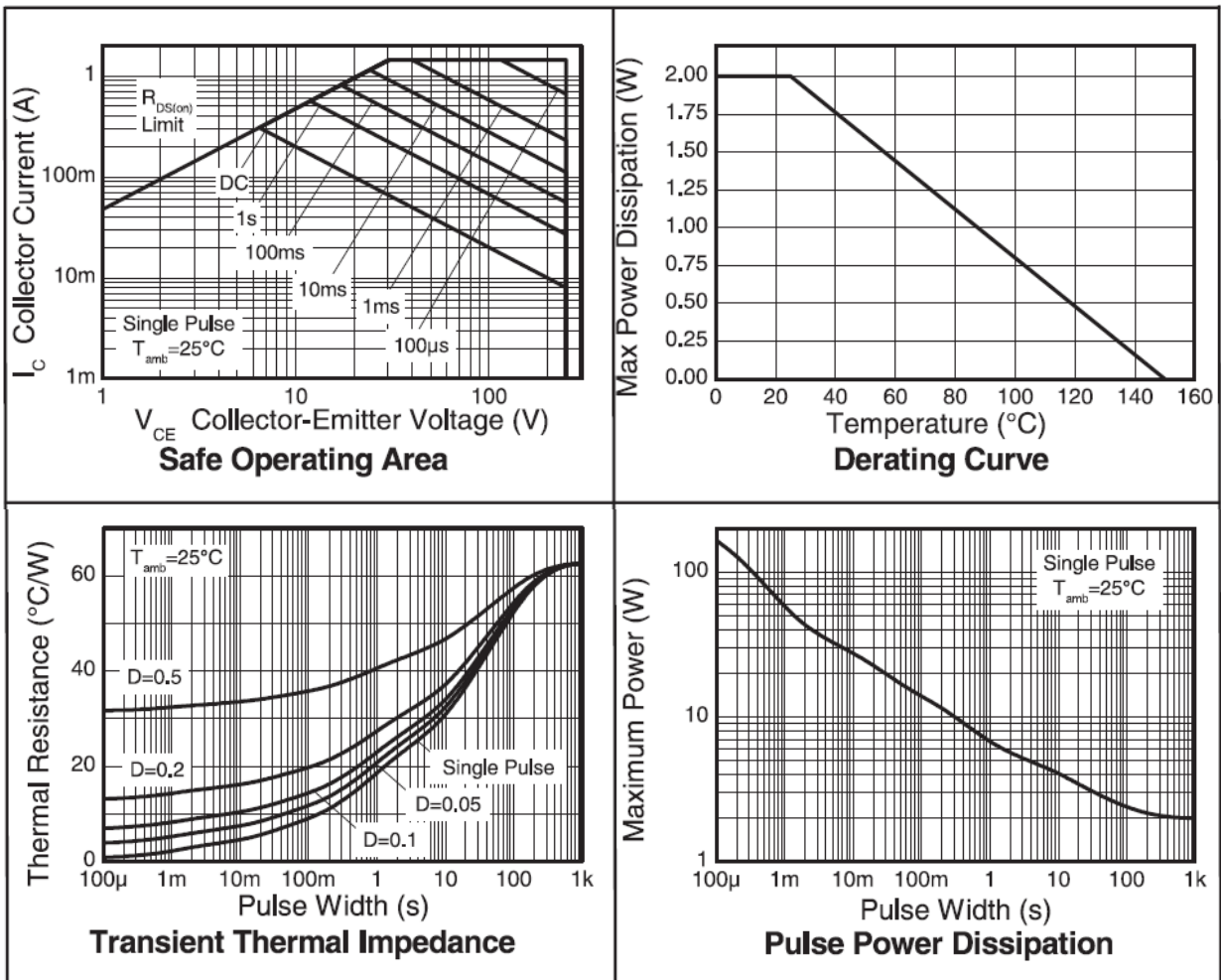
**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation at T <sub>A</sub> = +25°C (Note 5)	P <sub>D</sub>	2	W
Linear Derating Factor		16	mW/°C
Junction to Ambient (Note 5)	R <sub>θJA</sub>	63	°C/W
Junction to Ambient (Note 6)	R <sub>θJA</sub>	26	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

- Notes:
- 5. For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
  - 6. For a device surface mounted on FR4 PCB measured at t ≤ 5 seconds.
  - 7. Repetitive rating - pulse width limited by maximum junction temperature. Refer to Transient Thermal.

**NB High Voltage Applications**

For high voltage applications, the appropriate industry sector guidelines should be considered with regard to voltage spacing between conductors.

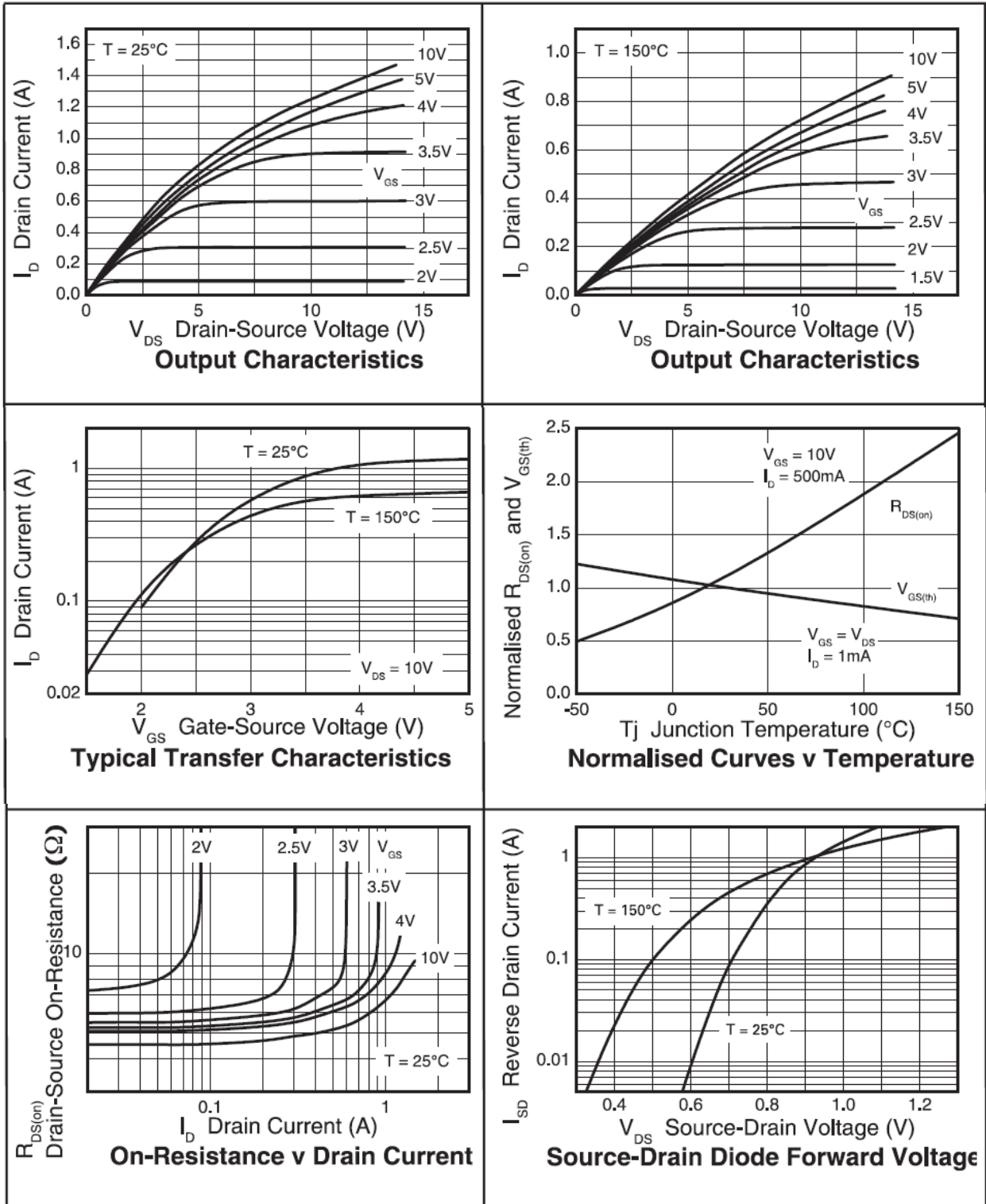


**Electrical Characteristics** (@T<sub>A</sub> = +25 °C, unless otherwise specified.)

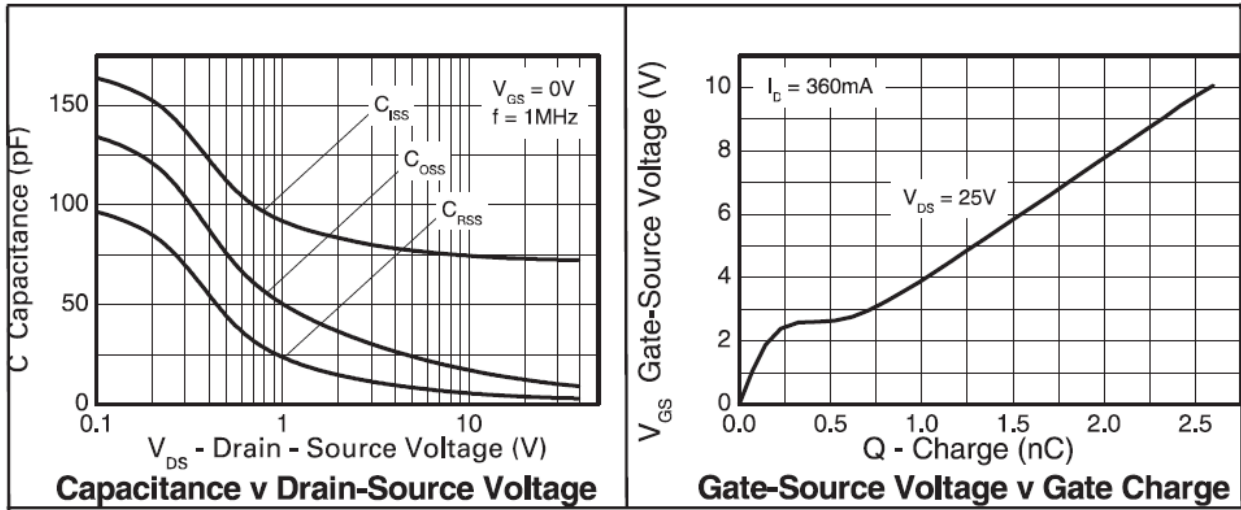
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	250	285	—	V	I <sub>D</sub> = 1mA, V <sub>GS</sub> = 0V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	35	500	nA	V <sub>DS</sub> = 250V, V <sub>GS</sub> = 0V
Gate-Body Leakage	I <sub>GSS</sub>	—	±1	±100	nA	V <sub>GS</sub> = ±40V, V <sub>DS</sub> = 0V
Gate-Source Threshold Voltage	V <sub>GS(th)</sub>	0.8	1.4	1.8	V	I <sub>D</sub> = 1mA, V <sub>DS</sub> = V <sub>GS</sub>
On-State Drain Current (Note 8)	I <sub>D(on)</sub>	3	—	—	A	V <sub>DS</sub> = 25V, V <sub>GS</sub> = 10V
Static Drain-Source On-State Resistance (Note 8)	R <sub>DS(ON)</sub>	—	5.6	8.5	Ω	V <sub>GS</sub> = 10V, I <sub>D</sub> = 500mA
		—	5.9	9		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 360mA
		—	6.4	9.5		V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 20mA
Forward Transconductance (Note 10)	g <sub>fs</sub>	0.3	0.475	—	S	V <sub>DS</sub> = 10V, I <sub>D</sub> = 0.3A
Diode Forward Voltage (Note 8)	V <sub>SD</sub>	—	—	0.97	V	I <sub>S</sub> = 360mA, V <sub>GS</sub> = 0V, T <sub>J</sub> = +25 °C
<b>DYNAMIC CHARACTERISTICS (Note 10)</b>						
Input Capacitance	C <sub>iSS</sub>	—	72	—	pF	V <sub>DS</sub> = 25 V, V <sub>GS</sub> = 0V f = 1MHz
Output Capacitance	C <sub>oss</sub>	—	11	—	pF	
Reverse Transfer Capacitance	C <sub>rSS</sub>	—	3.6	—	pF	
Total Gate Charge	Q <sub>g</sub>	—	2.6	3.65	nC	V <sub>DS</sub> = 25V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 360mA (refer to test circuit)
Gate-Source Charge	Q <sub>gs</sub>	—	0.2	0.28		
Gate-Drain Charge	Q <sub>gd</sub>	—	0.5	0.70		
Turn-On Delay Time (Note 9)	t <sub>d(on)</sub>	—	1.25	—	ns	V <sub>DD</sub> = 30V, I <sub>D</sub> = 360mA, R <sub>G</sub> = 50Ω, V <sub>GS</sub> = 10V (refer to test circuit)
Rise Time (Note 9)	t <sub>r</sub>	—	1.7	—		
Turn-Off Delay Time (Note 9)	t <sub>d(off)</sub>	—	11.4	—		
Fall Time (Note 9)	t <sub>f</sub>	—	3.5	—		
Reverse Recovery Time	t <sub>rr</sub>	—	186	260	ns	I <sub>F</sub> = 360mA, di/dt = 100A/μs,
Reverse Recovery Charge	Q <sub>rr</sub>	—	34	48	nC	T <sub>J</sub> = +25 °C

Notes: 8. Measured under pulsed conditions. Width=300μs. Duty cycle ≤ 2%.  
9. Switching characteristics are independent of operating junction temperature.  
10. For design aid only, not subject to production testing.

**Typical Characteristics**

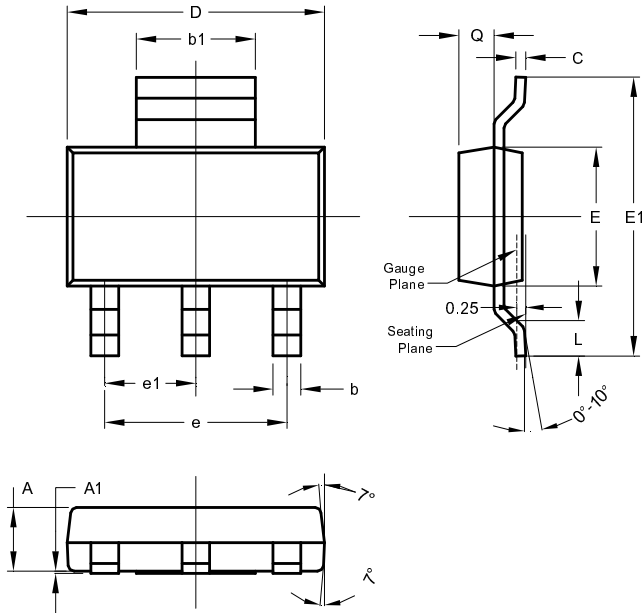


**Typical Characteristics** (cont.)



**Package Outline Dimensions**

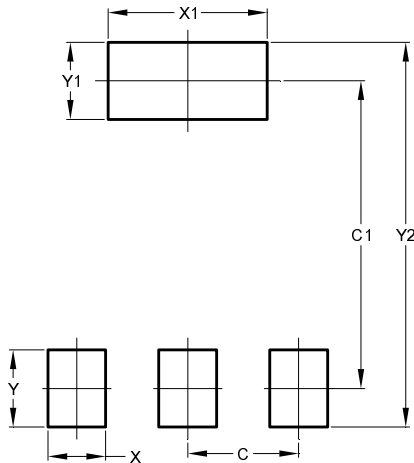
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



SOT223			
Dim	Min	Max	Typ
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b	0.60	0.80	0.70
b1	2.90	3.10	3.00
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	-	-	4.60
e1	-	-	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89
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)
C	2.30
C1	6.40
X	1.20
X1	3.30
Y	1.60
Y1	1.60
C2	8.00

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