



250V N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

V _{(BR)DSS}	Max R _{DS(on)}	Max I _D T _A = +25°C	
250V	8.5Ω @ V _{GS} = 10V	230mA	

Description and Applications

This 250V enhancement mode N-channel MOSFET provides users with a competitive specification. It offers efficient power handling capability, high impedance and is free from thermal runaway and thermally induced secondary breakdowns. Applications benefiting from this device include a variety of Telecom and general highvoltage circuits.

SOT89 and SOT223 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 threshold
- Low gate drive
- Complementary P-channel Type ZVP4525E6
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)

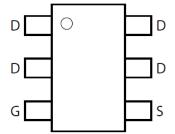
Mechanical Data

- 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 Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 @3
- Weight: 0.015 grams (Approximate)

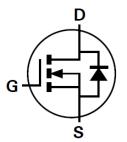








Pinout Top-view



Device symbol

Ordering Information (Note 4)

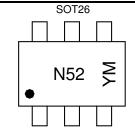
Part Number	Reel Size (inch)	Tape Width (mm)	Quantity Per Reel
ZVN4525E6TA	7	8	3,000
ZVN4525E6TC	13	8	10,000

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"
- 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.

Marking Information



N52 = 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	2	016	2017	2018	2019	2020	202	1 20	22 2	2023	2024	2025
Code	С		D	Е	F	G	Н		,	J	K	L	М
Month	1	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



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

	Characteristic		Symbol	Value	Unit
Drain-Source Voltage			V _{DSS}	250	V
Gate-Source Voltage			V _{GS}	±40	V
Continuous Drain Current	101/	T _A =+25 °C (Note 4)	1	230	m A
Continuous Drain Current	$V_{GS} = 10V$	T _A =+70 °C (Note 4)	ID	183	mA
Pulsed Drain Current (Note 6	i)		I _{DM}	1.44	Α
Continuous Source Current (Body Diode)		Is	1.1	Α
Pulsed Source Current (Body	/ Diode)		I _{SM}	1.44	A

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

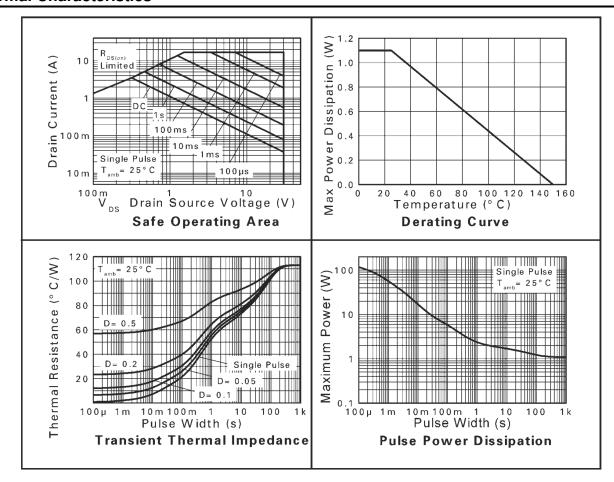
Characteristic	Symbol	Value	Unit
Power Dissipation at T _A =+25 °C (Note 4)	P _D	1.1	W
Linear Derating Factor		8.8	mW/℃
Junction to Ambient (Note 4)	$R_{ heta JA}$	113	°C/W
Junction to Ambient (Note 5)	$R_{ heta JA}$	65	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	℃

 For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
 For a device surface mounted on FR4 PCB measured at t ≤ 5 secs. Notes:

NB High Voltage Applications

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

Thermal Characteristics



^{6.} Repetitive rating - pulse width limited by maximum junction temperature. Refer to Transient Thermal.



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

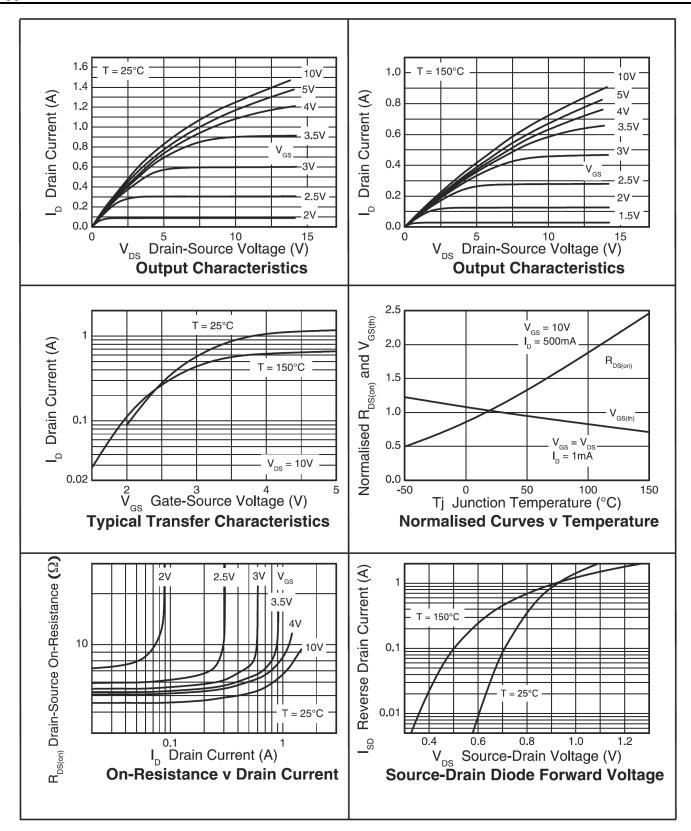
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage	BV_{DSS}	250	285	-	V	$I_D = 1mA$, $V_{GS} = 0V$	
Zero Gate Voltage Drain Current	I _{DSS}	-	35	500	νΑ	$V_{DS} = 250V, V_{GS} = 0V$	
Gate-Body Leakage	I _{GSS}		±1	100	nA	$V_{GS} = \pm 40V, V_{DS} = 0V$	
ON CHARACTERISTICS							
Gate-Source Threshold Voltage	V _{GS(th)}	0.8	1.4	1.8	V	$I_D = 1 \text{mA}, V_{DS} = V_{GS}$	
			5.6	8.5	Ω	$V_{GS} = 10V, I_D = 500mA$	
Static Drain-Source On-State Resistance (Note 7)	R _{DS} (ON)	-	5.9	9.0	Ω	$V_{GS} = 4.5V, I_D = 360mA$	
			6.4	9.5	Ω	$V_{GS} = 2.4V, I_D = 20mA$	
Forward Transconductance (Note 9)	g _{fs}	0.3	0.475	-	S	$V_{DS} = 10V, I_D = 0.3A$	
Diode Forward Voltage (Note 7)	V_{SD}			0.97	V	$T_{J}=+25$ °C , $I_{S}=360$ mA, $V_{GS}=0$ V	
DYNAMIC CHARACTERISTICS (Notes 8 & 9)							
Input Capacitance	Ciss	ı	72	1	рF	V 05 V V 0V	
Output Capacitance	Coss	-	11	-	рF	$V_{DS} = 25 \text{ V}, V_{GS} = 0 \text{V}$ - f = 1MHz	
Reverse Transfer Capacitance	C _{rss}	1	3.6	1	рF	1 = 1101112	
Total Gate Charge	Qg	•	2.6	3.65	nC	V 10V V 05V	
Gate-Source Charge	Q_{gs}	-	0.2	0.28	nC	$V_{GS} = 10V$, $V_{DS} = 25V$	
Gate-Drain Charge	Q_{gd}	-	0.5	0.7	nC	I _D = 360mA(refer to test circuit)	
Reverse Recovery Time (Note 9)	t _{rr}	-	186	260	ns	T _J =+25 ℃, IF=360A,	
Reverse Recovery Charge (Note 9)	Q _{rr}	-	34	48	nC	di/dt= 100A/µs	
Turn-On Delay Time	t _{d(on)}	-	1.25	-	ns		
Turn-On Rise Time	t _r	-	1.7	-	ns	$V_{DD} = 30V, V_{GS} = 10V$	
Turn-Off Delay Time		-	11.40	-	ns	$I_D = 360 \text{mA}, R_G = 50 \Omega$ - (refer to test circuit)	
Turn-Off Fall Time	t _f	-	3.5	=	ns	(leiei to test circuit)	

Notes:

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

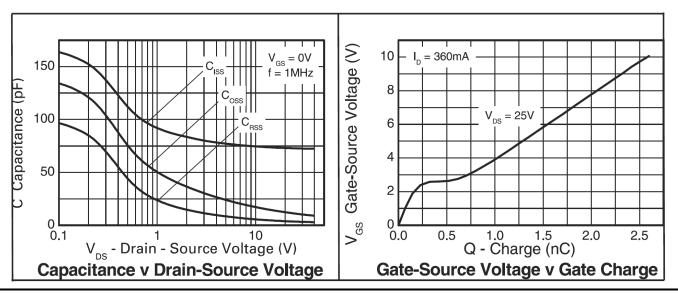


Typical Characteristics

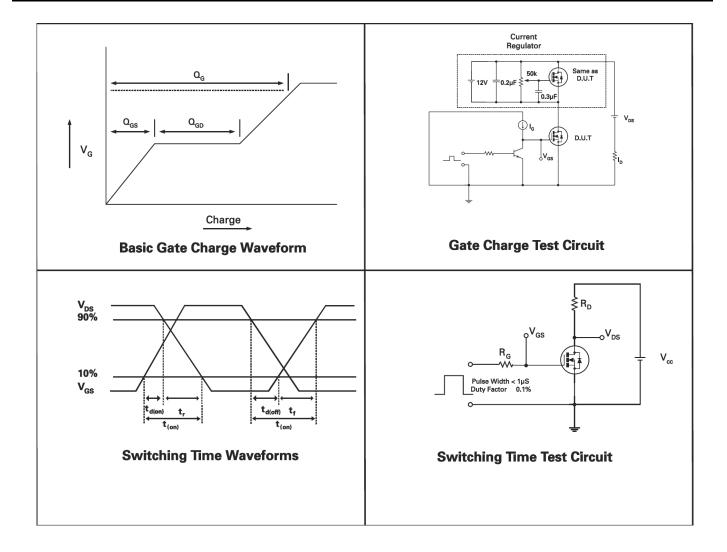




Typical Characteristics (continued)



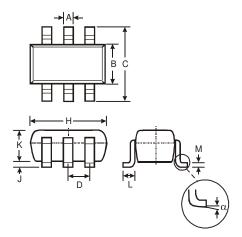
Test Circuits





Package Outline Dimensions

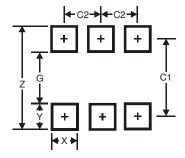
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



SOT26						
Dim	Min	Max	Тур			
Α	0.35	0.50	0.38			
В	1.50	1.70	1.60			
С	2.70	3.00	2.80			
D	_	_	0.95			
Н	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

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



Dimensions	Value (in mm)
Z	3.20
G	1.60
Х	0.55
Υ	0.80
C1	2.40
C2	0.95



IMPORTANT NOTICE

DIODES INCORPORATED MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. Diodes Incorporated does not assume any liability arising out of the application or use of this document or any product described herein; neither does Diodes Incorporated convey any license under its patent or trademark rights, nor the rights of others. Any Customer or user of this document or products described herein in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on Diodes Incorporated website, harmless against all damages.

Diodes Incorporated does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel. Should Customers purchase or use Diodes Incorporated products for any unintended or unauthorized application, Customers shall indemnify and hold Diodes Incorporated and its representatives harmless against all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized application.

Products described herein may be covered by one or more United States, international or foreign patents pending. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks.

This document is written in English but may be translated into multiple languages for reference. Only the English version of this document is the final and determinative format released by Diodes Incorporated.

LIFE SUPPORT

Diodes Incorporated products are specifically not authorized for use as critical components in life support devices or systems without the express written approval of the Chief Executive Officer of Diodes Incorporated. As used herein:

- A. Life support devices or systems are devices or systems which:
 - 1. are intended to implant into the body, or
 - 2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.
- B. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or to affect its safety or effectiveness.

Customers represent that they have all necessary expertise in the safety and regulatory ramifications of their life support devices or systems, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of Diodes Incorporated products in such safety-critical, life support devices or systems, notwithstanding any devices- or systems-related information or support that may be provided by Diodes Incorporated. Further, Customers must fully indemnify Diodes Incorporated and its representatives against any damages arising out of the use of Diodes Incorporated products in such safety-critical, life support devices or systems.

Copyright © 2015, Diodes Incorporated

www.diodes.com