

## Product Summary

|                           |     |
|---------------------------|-----|
| $V_{DS}$ (V)              | 100 |
| $R_{DS(ON)}$ ( $\Omega$ ) | 10  |

## Description and Applications

This MOSFET utilizes a structure that combines low input capacitance with relatively low on-resistance and has an intrinsically higher pulse current handling capability in linear mode than a comparable trench technology structure. This MOSFET is suitable for general purpose applications.

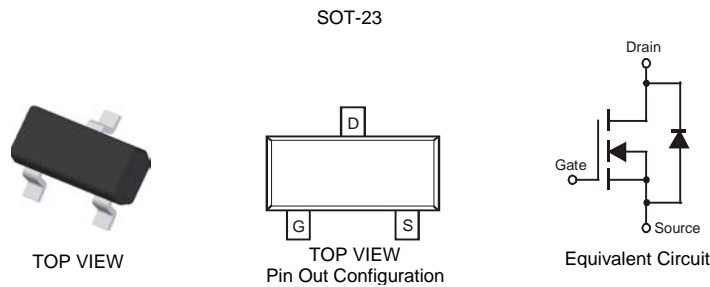
- General purpose 100V FET
- Power management
- Disconnect switches
- Telecoms
- Complementary Type – ZVP3310F

## Features and Benefits

- High pulse current handling in linear mode
- Low input capacitance
- Fast switching speed
- **Lead Free By Design/RoHS Compliant (Note 1)**

## Mechanical Data

- Case: SOT-23
- Case Material: UL Flammability Classification Rating 94V-0
- Moisture sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish annealed over Alloy 42 leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Weight: 0.008 grams (approximate)

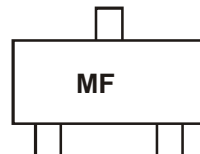


## Ordering Information (Note 2)

| Product    | Marking | Reel size (inches) | Tape width (mm) | Quantity per reel |
|------------|---------|--------------------|-----------------|-------------------|
| ZVN3310FTA | MF      | 7                  | 8               | 3000              |

- Notes:
1. No purposefully added lead.
  2. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

## Marking Information



MF = Product Type Marking Code

### Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

| Characteristic           | Symbol    | Value    | Units |
|--------------------------|-----------|----------|-------|
| Drain-Source Voltage     | $V_{DSS}$ | 100      | V     |
| Gate-Source Voltage      | $V_{GSS}$ | $\pm 20$ | V     |
| Continuous Drain Current | $I_D$     | 100      | mA    |
| Pulsed Drain Current     | $I_{DM}$  | 2        | A     |

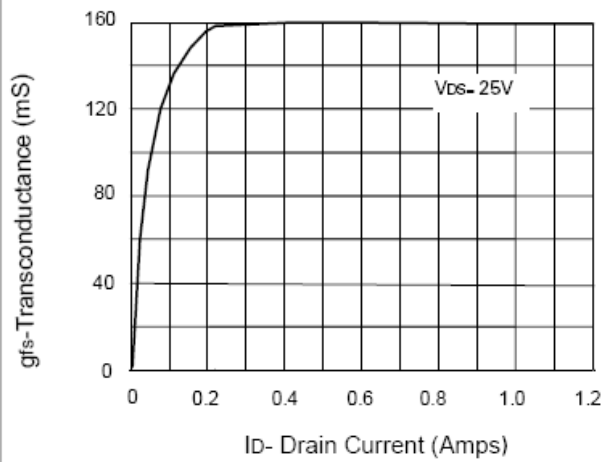
### Thermal Characteristics

| Characteristic                               | Symbol         | Value       | Unit             |
|--|----------------|-------------|------------------|
| Power Dissipation @ $T_A = 25^\circ\text{C}$ | $P_D$          | 330         | mW               |
| Operating and Storage Temperature Range      | $T_J, T_{STG}$ | -55 to +150 | $^\circ\text{C}$ |

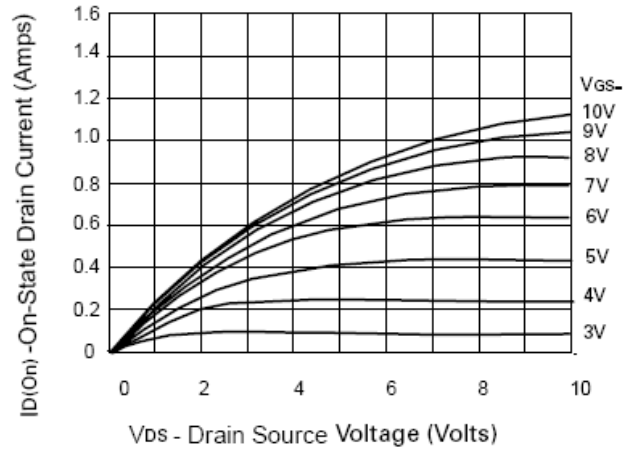
### Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

| Characteristic  | Symbol       | Min | Typ | Max     | Unit          | Test Condition  |
|---|--------------|-----|-----|---------|---------------|---|
| <b>OFF CHARACTERISTICS</b>  |              |     |     |         |               |   |
| Drain-Source Breakdown Voltage  | $BV_{DSS}$   | 100 | —   | —       | V             | $I_D = 1\text{mA}, V_{GS} = 0\text{V}$  |
| Zero Gate Voltage Drain Current<br>$T_J = 25^\circ\text{C}$<br>$T_J = 125^\circ\text{C}$ (Note 4) | $I_{DSS}$    | —   | —   | 1<br>50 | $\mu\text{A}$ | $V_{DS} = 100\text{V}, V_{GS} = 0\text{V}$<br>$V_{DS} = 80\text{V}, V_{GS} = 0\text{V}$ |
| Gate-Source Leakage   | $I_{GSS}$    | —   | —   | 20      | nA            | $V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$   |
| Gate Threshold Voltage  | $V_{GS(th)}$ | 0.8 | —   | 2.4     | V             | $V_{DS} = V_{GS}, I_D = 1\text{mA}$   |
| <b>ON CHARACTERISTICS (Note 3)</b>  |              |     |     |         |               |   |
| On-State Drain Current  | $I_{D(ON)}$  | 500 | —   | —       | mA            | $V_{DS} = 25\text{V}, V_{GS} = 10\text{V}$  |
| Static Drain-Source On-Resistance   | $R_{DS(ON)}$ | —   | —   | 10      | $\Omega$      | $V_{GS} = 10\text{V}, I_D = 500\text{mA}$   |
| <b>DYNAMIC CHARACTERISTICS (Note 4)</b>   |              |     |     |         |               |   |
| Forward Transconductance (Note 3)   | $g_{fs}$     | 100 | —   | —       | mS            | $V_{DS} = 25\text{V}, I_D = 500\text{mA}$   |
| Input Capacitance   | $C_{iss}$    | —   | —   | 40      | pF            | $V_{DS} = 25\text{V}, V_{GS} = 0\text{V}$<br>$f = 1.0\text{MHz}$                        |
| Output Capacitance  | $C_{oss}$    | —   | —   | 15      |               |   |
| Reverse Transfer Capacitance  | $C_{rss}$    | —   | —   | 5       |               |   |
| Turn-On Delay Time (Note 5)   | $t_{D(on)}$  | —   | 3   | 5       | ns            | $V_{DD} \approx 25\text{V}, I_D = 500\text{mA}$   |
| Turn-On Rise Time (Note 5)  | $t_r$        | —   | 5   | 7       |               |   |
| Turn-Off Delay Time (Note 5)  | $t_{D(off)}$ | —   | 4   | 6       |               |   |
| Turn-Off Fall Time (Note 5)   | $t_f$        | —   | 5   | 7       |               |   |

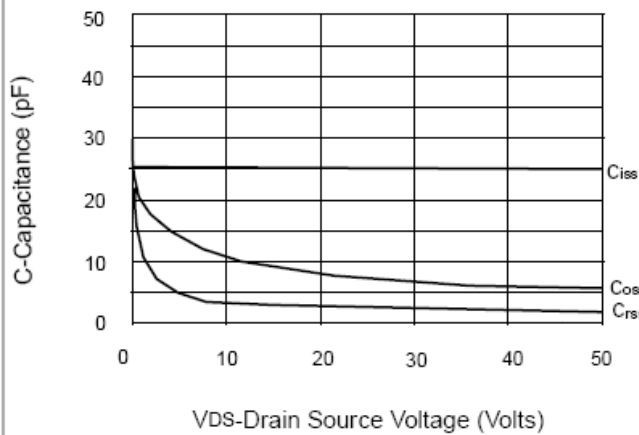
- Notes:
3. Measured under pulsed conditions. Width = 300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$
  4. Sample test.
  5. Switching times measured with 50 $\Omega$  source impedance and <5ns rise time on a pulse generator.



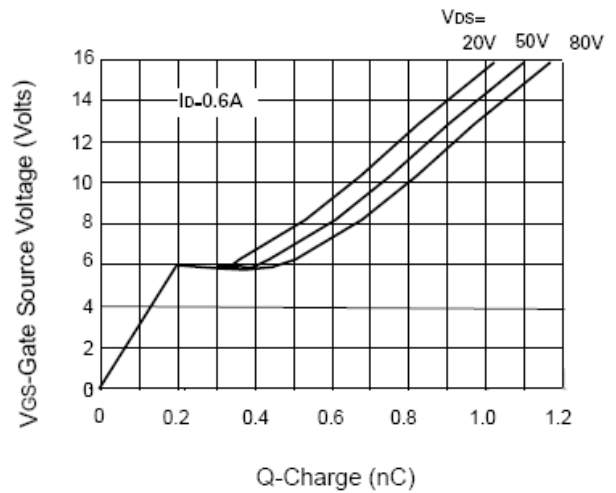
**Transconductance v drain current**



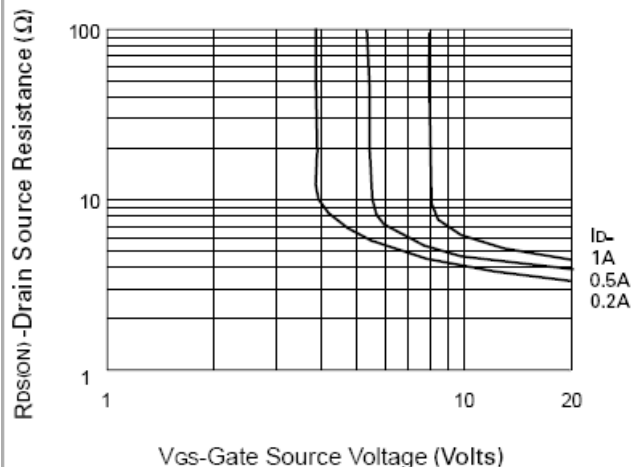
**Saturation Characteristics**



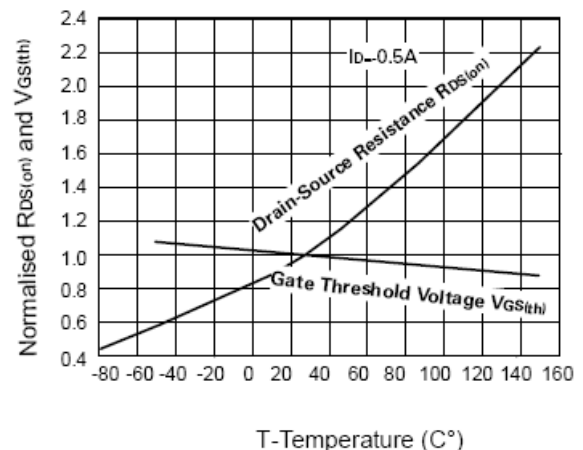
**Capacitance v drain-source voltage**



**Gate charge v gate-source voltage**

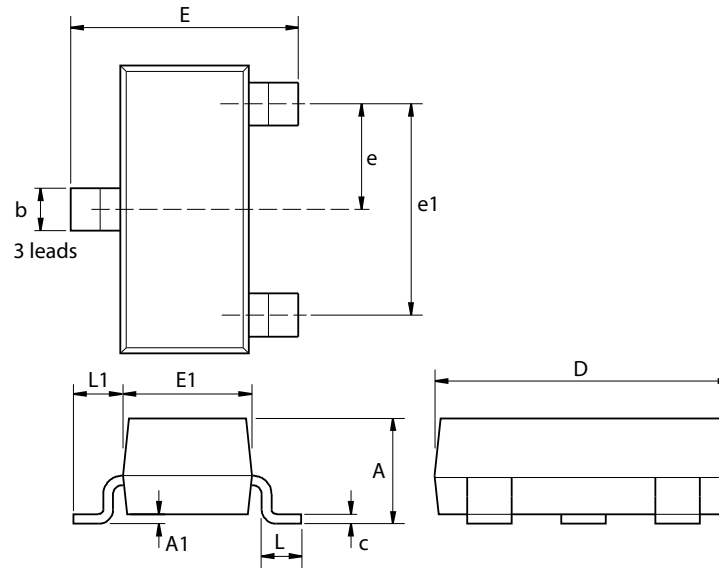


**On-resistance vs gate-source voltage**



**Normalised RDS(on) and VGS(th) vs Temperature**

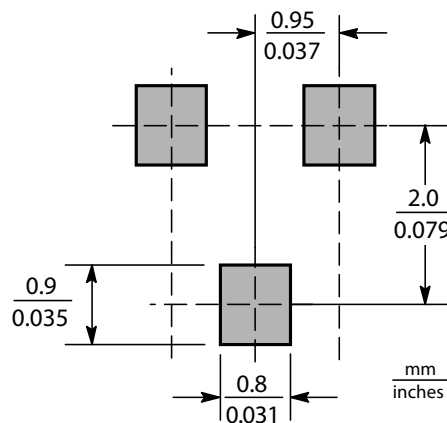
**Package Outline Dimensions**



| Dim. | Millimeters |      | Inches    |       | Dim. | Millimeters |      | Inches    |        |
|------|-------------|------|-----------|-------|------|-------------|------|-----------|--------|
|      | Min.        | Max. | Min.      | Max.  |      | Min.        | Max. | Min.      | Max.   |
| A    | -           | 1.12 | -         | 0.044 | e1   | 1.90 NOM    |      | 0.075 NOM |        |
| A1   | 0.01        | 0.10 | 0.0004    | 0.004 | E    | 2.10        | 2.64 | 0.083     | 0.104  |
| b    | 0.30        | 0.50 | 0.012     | 0.020 | E1   | 1.20        | 1.40 | 0.047     | 0.055  |
| c    | 0.085       | 0.20 | 0.003     | 0.008 | L    | 0.25        | 0.60 | 0.0098    | 0.0236 |
| D    | 2.80        | 3.04 | 0.110     | 0.120 | L1   | 0.45        | 0.62 | 0.018     | 0.024  |
| e    | 0.95 NOM    |      | 0.037 NOM |       | -    | -           | -    | -         | -      |

Note: Controlling dimensions are in millimeters. Approximate dimensions are provided in inches

**Suggested Pad Layout**



#### IMPORTANT NOTICE

DIODES INCORPORATED MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDING 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.

#### 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 © 2009, Diodes Incorporated

[www.diodes.com](http://www.diodes.com)