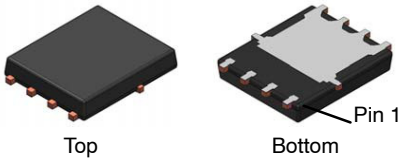
# MOSFET – N-Channel, POWERTRENCH®

## 30 V, 28 A, 7.5 mΩ

# FDMS7692, FDMS7692-NC

| $V_{DS}$ | $R_{DS(on)}$ MAX | $I_D$ MAX |
|---|---|---|
| 30 V | 7.5 mΩ @ 10 V | 28 A |
| | 13 mΩ @ 4.5 V | |




**PQFN8 5x6, 1.27P**
**(Power 56)**
**CASE 483AE**

### General Description

This N-Channel MOSFET has been designed specifically to improve the overall efficiency and to minimize switch node ringing of DC/DC converters using either synchronous or conventional switching PWM controllers. It has been optimized for low gate charge, low $R_{DS(on)}$, fast switching speed and body diode reverse recovery performance.

### Features

- Max $R_{DS(ON)}$ = 7.5 mΩ @ $V_{GS}$ = 10 V, $I_D$ = 13 A
- Max $R_{DS(ON)}$ = 13 mΩ @ $V_{GS}$ = 4.5 V, $I_D$ = 10 A
- Advanced Package and Silicon Combination for Low $R_{DS(on)}$ and High Efficiency
- Next Generation Enhanced Body Diode Technology, Engineered for Soft Recovery
- MSL1 Robust Package Design
- 100% UIL Tested
- RoHS Compliant

### Applications

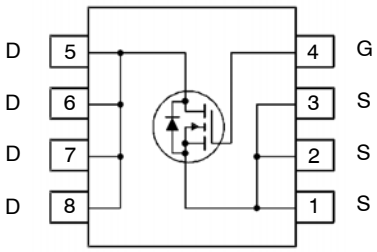
- IMVP Vcore Switching for Notebook
- VRM Vcore Switching for Desktop and Server
- OringFET / Load Switch
- DC-DC Conversion

### MARKING DIAGRAM




| | |
|---|---|
| &Z | = Assembly Plant Code |
| &3 | = Data Code (Year & Week) |
| &K | = Lot Code |
| FDMS7692 | = Specific Device Code |

### PIN CONNECTIONS




### ABSOLUTE MAXIMUM RATINGS ($T_A$ = 25 °C unless otherwise noted)

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_{DS}$ | Drain to Source Voltage | 30 | V |
| $V_{DSt}$ | Drain to Source Transient Voltage ($t_{Transient}$ < 100 ns) | 33 | V |
| $V_{GS}$ | Gate to Source Voltage | ±20 | V |
| $I_D$ | Drain Current<br>Continuous (Package Limited) $T_C$ = 25 °C<br>Continuous (Silicon Limited) $T_C$ = 25 °C<br>Continuous (Note 1a) $T_A$ = 25 °C<br>Pulsed | <br>28<br>47<br>14<br>50 | A |
| $E_{AS}$ | Single Pulse Avalanche Energy (Note 3) | 21 | mJ |
| $P_D$ | Power Dissipation<br>$T_C$ = 25 °C<br>(Note 1a) $T_A$ = 25 °C | <br>27<br>2.5 | W |
| $T_J$, $T_{STG}$ | Operating and Storage Junction Temperature Range | −55 to +150 | °C |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

### ORDERING INFORMATION

| Device | Package | Shipping† |
|---|---|---|
| FDMS7692 | PQFN8 | 3000 / Tape & Reel |
| FDMS7692-NC | PQFN8 | 3000 / Tape & Reel |

† For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

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## THERMAL CHARACTERISTICS

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $R_{\theta JC}$ | Thermal Resistance, Junction to Case | 4.6 | °C/W |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient (Note 1a) | 50 | |

## ELECTRICAL CHARACTERISTICS ($T_J$ = 25 °C unless otherwise noted)

| Symbol | Parameter | Test Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | | |
| $BV_{DSS}$ | Drain to Source Breakdown Voltage | $I_D$ = 250 μA, $V_{GS}$ = 0 V | 30 | | | V |
| $\frac{\Delta BV_{DSS}}{\Delta T_J}$ | Breakdown Voltage Temperature Coefficient | $I_D$ = 250 μA, Referenced to 25 °C | | 13 | | mV/°C |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{GS}$ = 0 V, $V_{DS}$ = 24 V | | | 1 | μA |
| $I_{GSS}$ | Gate to Source Leakage Current | $V_{GS}$ = 20 V, $V_{DS}$ = 0 V | | | 100 | nA |
| **ON CHARACTERISTICS** | | | | | | |
| $V_{GS(th)}$ | Gate to Source Threshold Voltage | $V_{GS}$ = $V_{DS}$, $I_D$ = 250 μA | 1.2 | 2.0 | 3.0 | V |
| $\frac{\Delta V_{GS(th)}}{\Delta T_J}$ | Gate to Source Threshold Voltage Temperature Coefficient | $I_D$ = 250 μA, Referenced to 25 °C | | –6 | | mV/°C |
| $R_{DS(on)}$ | Static Drain to Source On Resistance | $V_{GS}$ = 10 V, $I_D$ = 13 A | | 6.5 | 7.5 | mΩ |
| | | $V_{GS}$ = 4.5 V, $I_D$ = 10 A | | 9.5 | 13 | |
| | | $V_{GS}$ = 10 V, $I_D$ = 13 A, $T_J$ = 125 °C | | 9.0 | 11 | |
| $g_{FS}$ | Forward Transconductance | $V_{DD}$ = 5 V, $I_D$ = 13 A | | 68 | | S |
| **DYNAMIC CHARACTERISTICS** | | | | | | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$ = 15 V, $V_{GS}$ = 0 V, f = 1 MHz | | 1015 | 1350 | pF |
| $C_{oss}$ | Output Capacitance | | | 325 | 435 | pF |
| $C_{rss}$ | Reverse Transfer Capacitance | | | 45 | 65 | pF |
| $R_g$ | Gate Resistance | | | 1.0 | 2.0 | Ω |
| **SWITCHING CHARACTERISTICS** | | | | | | |
| $t_{d(on)}$ | Turn-On Delay Time | $V_{DD}$ = 15 V, $I_D$ = 13 A, $V_{GS}$ = 10 V, $R_{GEN}$ = 6 Ω | | 8 | 16 | ns |
| $t_r$ | Rise Time | | | 2.7 | 10 | ns |
| $t_{d(off)}$ | Turn-Off Delay Time | | | 17 | 31 | ns |
| $t_f$ | Fall Time | | | 2.3 | 10 | ns |
| $Q_g$ | Total Gate Charge | $V_{GS}$ = 0 V to 10 V, $V_{DD}$ = 15 V, $I_D$ = 13 A | | 15 | 22 | nC |
| | | $V_{GS}$ = 0 V to 4.5 V, $V_{DD}$ = 15 V, $I_D$ = 13 A | | 7 | 10 | nC |
| $Q_{gs}$ | Gate to Source Charge | $V_{DD}$ = 15 V, $I_D$ = 13 A | | 3.4 | | nC |
| $Q_{gd}$ | Gate to Drain “Miller” Charge | | | 1.9 | | nC |
| **DRAIN-SOURCE DIODE CHARACTERISTICS** | | | | | | |
| $V_{SD}$ | Source to Drain Diode Forward Voltage | $V_{GS}$ = 0 V, $I_S$ = 2.1 A (Note 2) | | 0.75 | 1.1 | V |
| | | $V_{GS}$ = 0 V, $I_S$ = 13 A (Note 2) | | 0.84 | 1.2 | |
| $t_{rr}$ | Reverse Recovery Time | $I_F$ = 13 A, di/dt = 100 A/μs | | 21 | 34 | ns |
| $Q_{rr}$ | Reverse Recovery Charge | | | 6 | 12 | nC |
| $t_{rr}$ | Reverse Recovery Time | $I_F$ = 13 A, di/dt = 300 A/μs | | 17 | 31 | ns |
| $Q_{rr}$ | Reverse Recovery Charge | | | 12 | 21 | nC |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

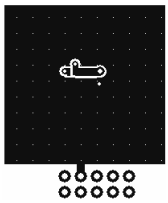


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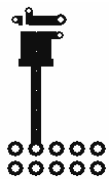
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NOTES:

1. $R_{\theta JA}$ is determined with the device mounted on a 1 $in^2$ pad 2 oz copper pad on a 1.5 × 1.5 in. board of FR-4 material. $R_{\theta JC}$ is guaranteed by design while $R_{\theta CA}$ is determined by the user's board design.



a.) 50 °C/W when mounted on a 1 $in^2$ pad of 2 oz copper.



b) 125 °C/W when mounted on a minimum pad of 2 oz copper.

2. Pulse Test: Pulse Width < 300 μs, Duty cycle < 2.0 %.
3. Starting $T_J$ = 25 °C, L = 0.3 mH, $I_{AS}$ = 12 A, $V_{DD}$ = 27 V, $V_{GS}$ = 10 V.



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## TYPICAL CHARACTERISTICS ($T_J$ = 25 °C unless otherwise noted)

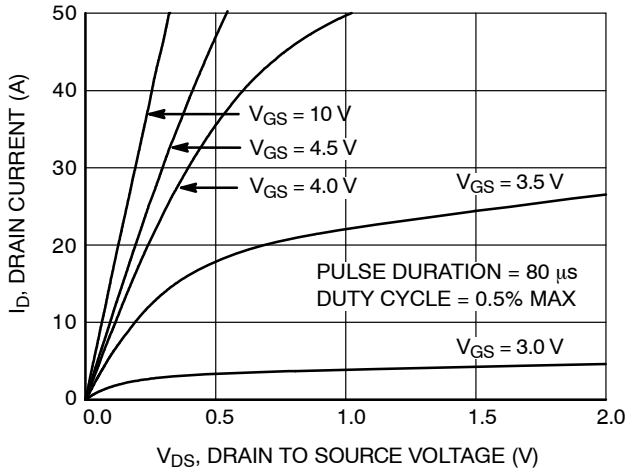



**Figure 1. On-Region Characteristics**

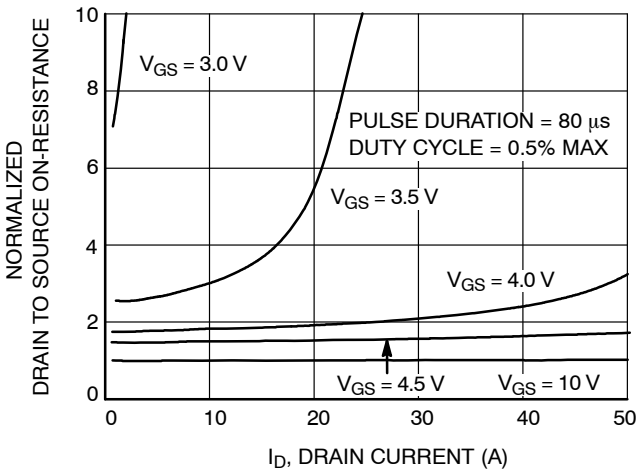



**Figure 2. Normalized On-Resistance vs. Drain Current and Gate Voltage**

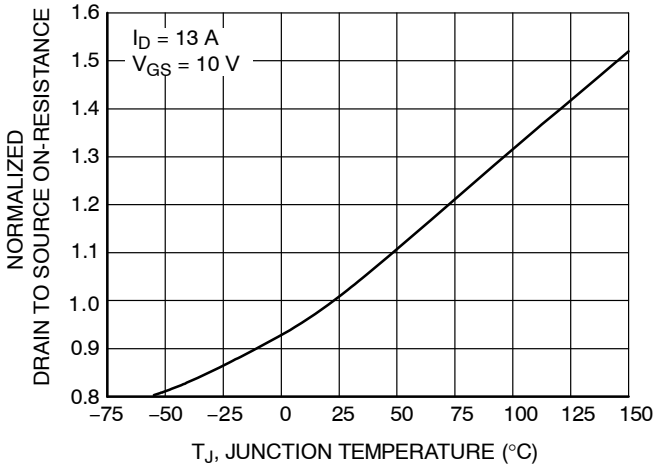



**Figure 3. Normalized On-Resistance vs. Junction Temperature**

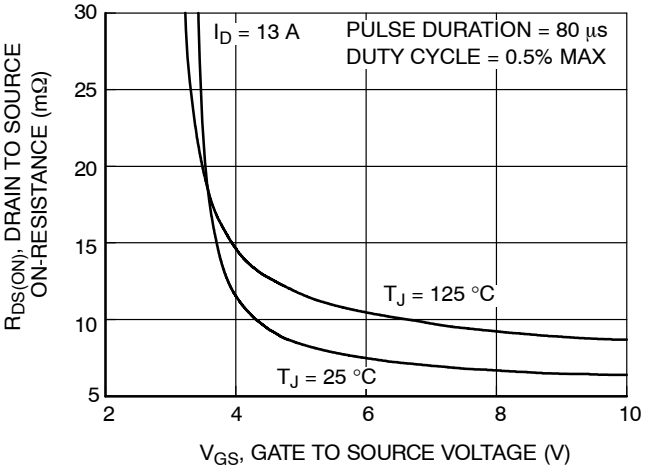



**Figure 4. On-Resistance vs. Gate to Source Voltage**

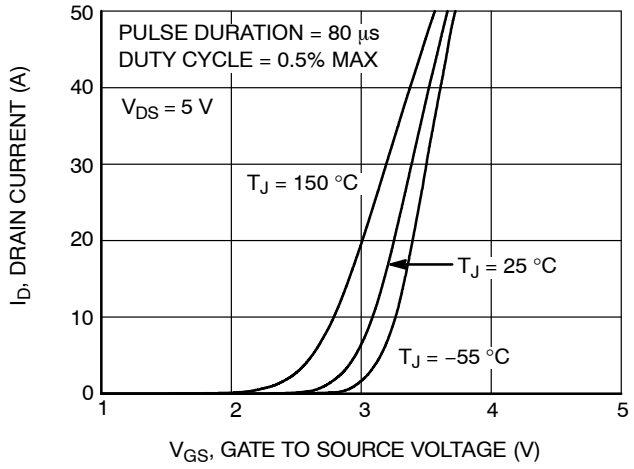



**Figure 5. Transfer Characteristics**

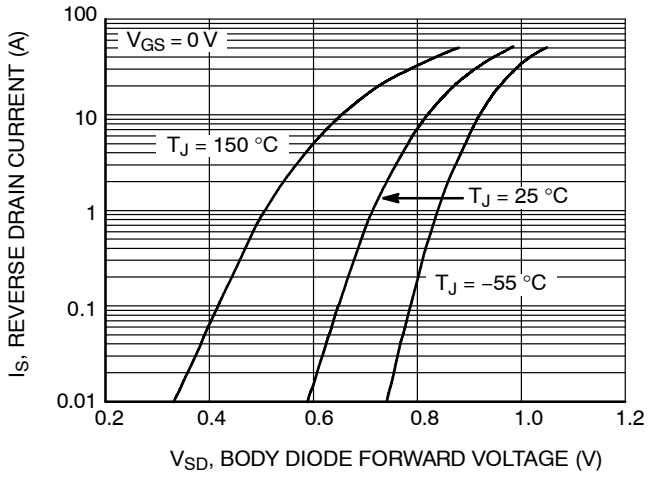



**Figure 6. Source to Drain Diode Forward Voltage vs. Source Current**



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## TYPICAL CHARACTERISTICS ($T_J$ = 25 °C unless otherwise noted) (continued)

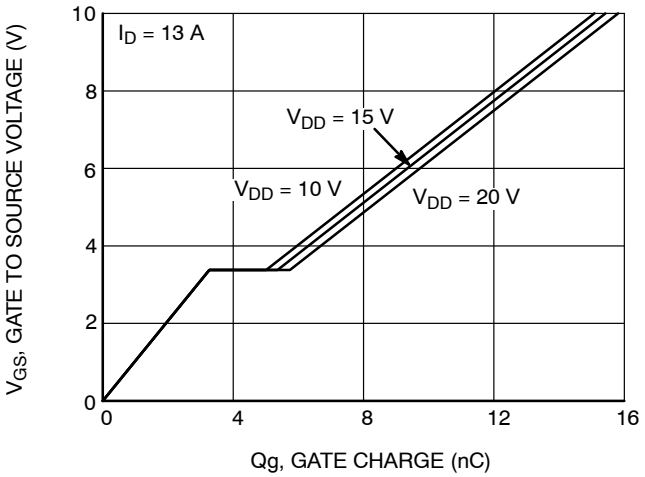



**Figure 7. Gate Charge Characteristics**

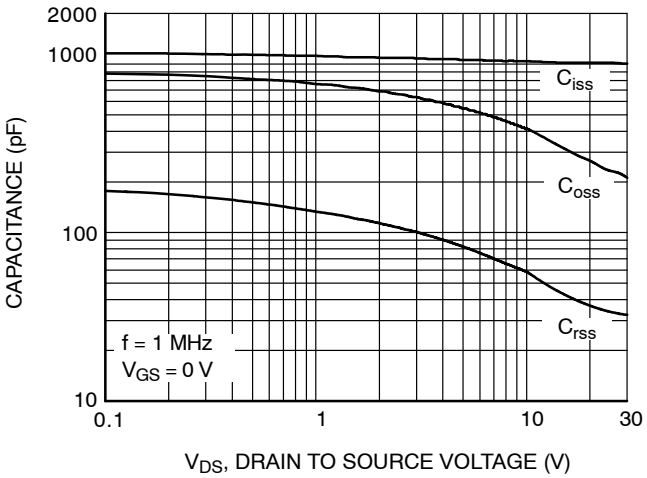



**Figure 8. Capacitance vs. Drain to Source Voltage**

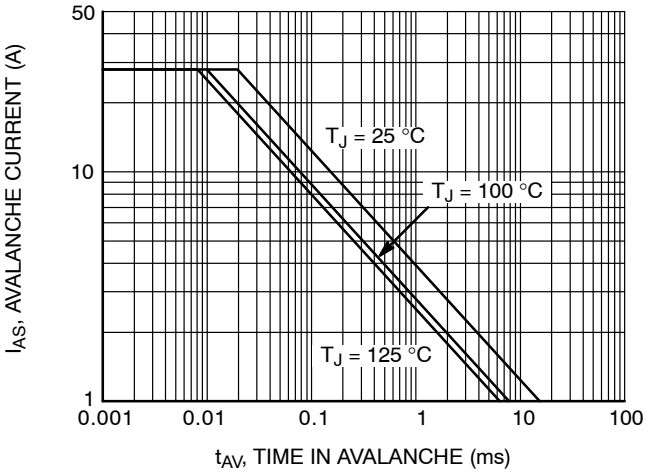



**Figure 9. Unclamped Inductive Switching Capability**

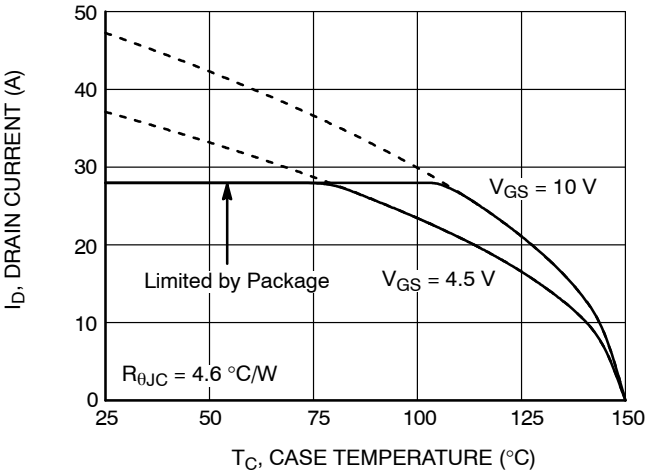



**Figure 10. Maximum Continuous Drain Current vs. Case Temperature**

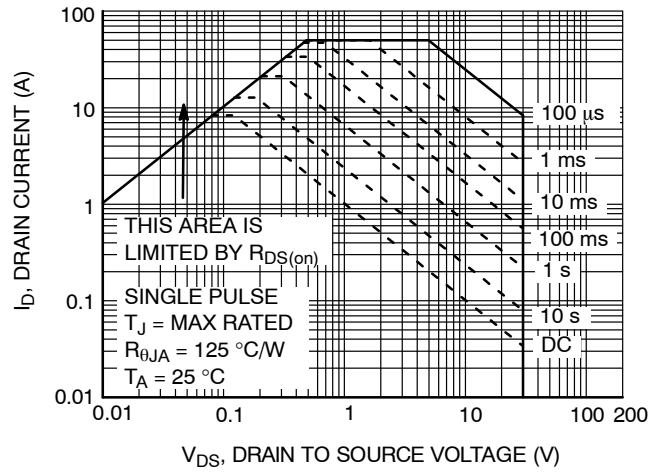



**Figure 11. Forward Bias Safe Operating Area**

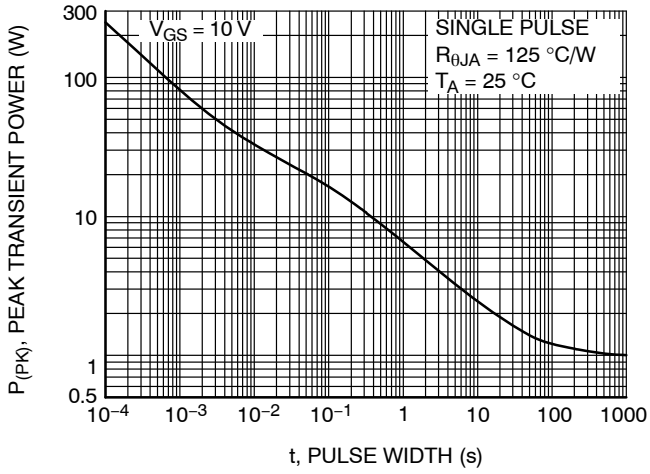



**Figure 12. Single Pulse Maximum Power Dissipation**



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## TYPICAL CHARACTERISTICS ($T_J$ = 25 °C unless otherwise noted) (continued)

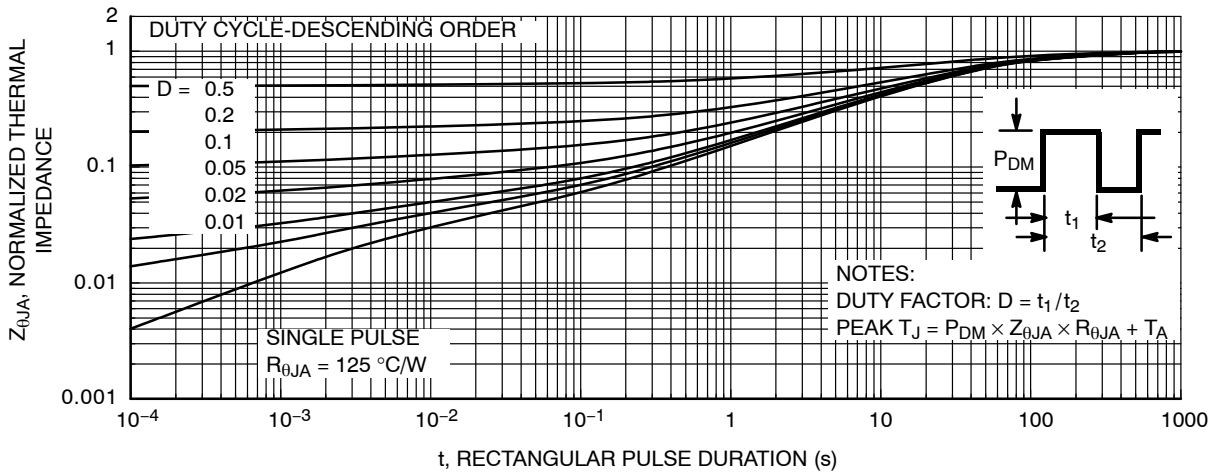



**Figure 13. Junction-to-Ambient Transient Thermal Response Curve**

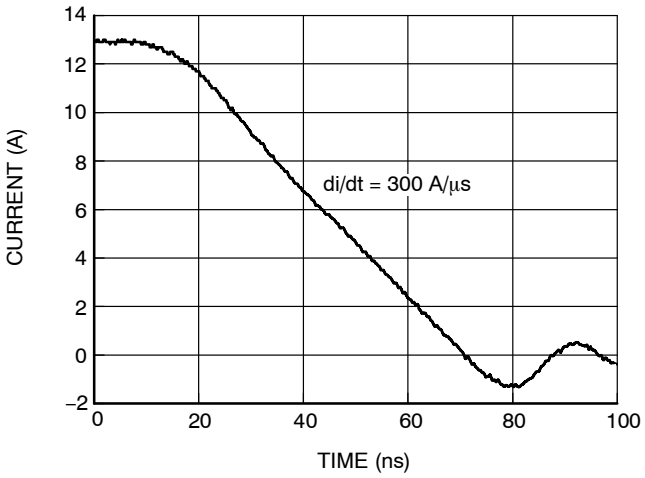



**Figure 14. Body Diode Reverse Recovery Characteristics**

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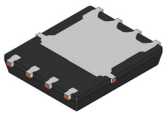
| Revision | Description of Changes | Date |
|---|---|---|
| 4 | Document converted to **onsemi** format; OPN FDMS7692-NC added. | 9/7/2026 |

This document has undergone updates prior to the inclusion of this revision history table. The changes tracked here only reflect updates made on the noted approval dates.



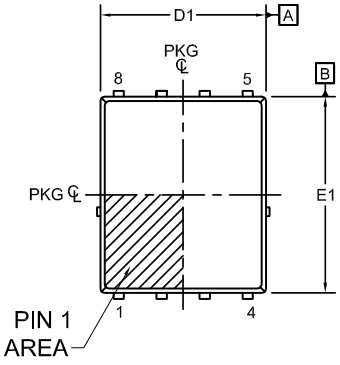
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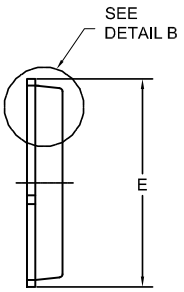


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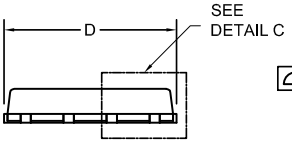
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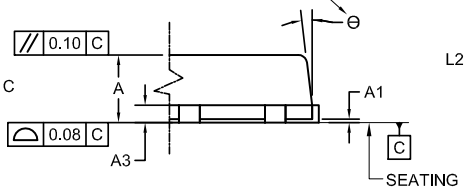

TOP VIEW



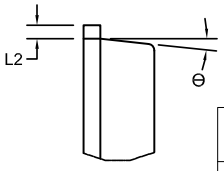

OPTIONAL DRAFT
ANGLE MAY APPEAR
ON FOUR SIDES
OF THE PACKAGE




SIDE VIEW




DETAIL C
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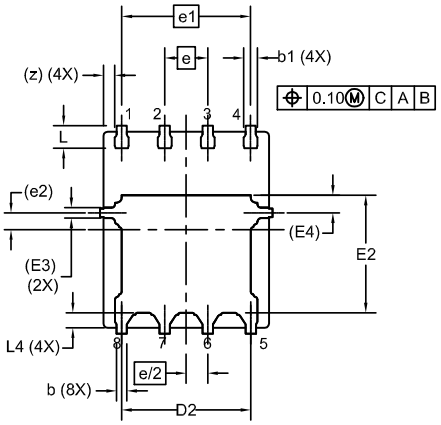



DETAIL B
SCALE: 2:1

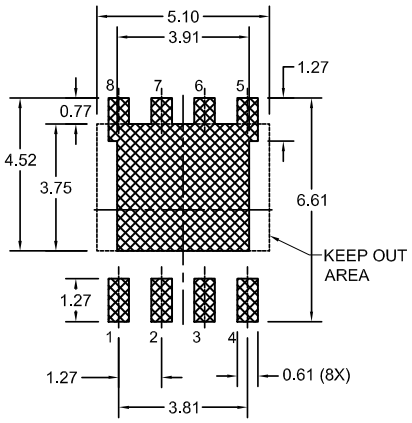
NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2009.
2. CONTROLLING DIMENSION: MILLIMETERS
3. COPLANARITY APPLIES TO THE EXPOSED PADS AS WELL AS THE TERMINALS.
4. DIMENSIONS D1 AND E1 DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.
5. SEATING PLANE IS DEFINED BY THE TERMINALS. "A1" IS DEFINED AS THE DISTANCE FROM THE SEATING PLANE TO THE LOWEST POINT ON THE PACKAGE BODY.
6. IT IS RECOMMENDED TO HAVE NO TRACES OR VIAS WITHIN THE KEEP OUT AREA.

| DIM | MILLIMETERS | | |
|---|---|---|---|
| | MIN. | NOM. | MAX. |
| A | 0.90 | 1.00 | 1.10 |
| A1 | 0.00 | - | 0.05 |
| b | 0.21 | 0.31 | 0.41 |
| b1 | 0.31 | 0.41 | 0.51 |
| A3 | 0.15 | 0.25 | 0.35 |
| D | 4.90 | 5.00 | 5.20 |
| D1 | 4.80 | 4.90 | 5.00 |
| D2 | 3.61 | 3.82 | 3.96 |
| E | 5.90 | 6.15 | 6.25 |
| E1 | 5.70 | 5.80 | 5.90 |
| E2 | 3.38 | 3.48 | 3.78 |
| E3 | 0.30 REF | | |
| E4 | 0.52 REF | | |
| e | 1.27 BSC | | |
| e/2 | 0.635 BSC | | |
| e1 | 3.81 BSC | | |
| e2 | 0.50 REF | | |
| L | 0.51 | 0.66 | 0.76 |
| L2 | 0.05 | 0.18 | 0.30 |
| L4 | 0.34 | 0.44 | 0.54 |
| z | 0.34 REF | | |
| Θ | 0° | - | 12° |




BOTTOM VIEW




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**ONLINE SUPPORT**: www.onsemi.com/support
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