# SuperMOS –PDFN3*3-8L 30V $BV_{DSS}$, 11.5mΩ $R_{DS(on)}$, N-channel MOSFET

## 1. Description

The ESN4832 is N-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. Device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product ESN4832 is Pb-free.

## 2. Features

- 30V, $R_{DS(ON)}$=11.5mΩ(TYP.) @$V_{GS}$=10V
  $R_{DS(ON)}$=14.5mΩ(TYP.) @$V_{GS}$=4.5V
- Use trench MOSFET technology
- High density cell design for low $R_{DS(on)}$
- Material: Halogen free
- Reliable and rugged
- Avalanche Rated
- Low leakage current

## 3. Applications

- PWM applications
- Load switch
- Power management in portable/desktop PCs
- DC/DC conversion

100% UIS TESTED

## 4. Ordering Information

| Part Number | Package | Marking | Material | Packing | Quantity per reel | Flammability Rating | Reel Size |
|---|---|---|---|---|---|---|---|
| ESN4832 | PDFN3*3-8L | ESN4832/lot | Halogen free | Tape & Reel | 5,000 PCS | UL 94V-0 | 13 inches |

Table-1 Ordering information

## 5. Pin Configuration and Functions

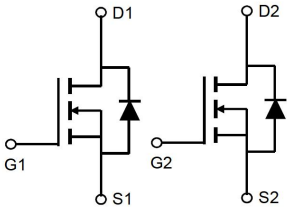
| Pin | Function | Outline | Circuit Diagram |
|---|---|---|---|
| 1 | Source1 |  |  |
| 2 | Gate1 | | |
| 7/8 | Drain1 | | |
| 3 | Source2 | | |
| 4 | Gate2 | | |
| 5/6 | Drain2 | | |





Table-2 Pin configuration

# 6. Specification

## Absolute Maximum Rating & Thermal Characteristics

Ratings at 25 ℃ ambient temperature unless otherwise specified.

| Parameter | | Symbol | Limit | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $BV_{DSS}$ | 30 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±20 | V |
| Continuous Drain Current | $T_C$=25°C | $I_D$ | 27 | A |
| | $T_C$=75°C | | 20 | |
| Maximum Power Dissipation | $T_C$=25°C | $P_D$ | 20.8 | W |
| | $T_C$=75°C | | 12.5 | |
| Pulsed Drain Current | | $I_{DM}$ | 100 | A |
| Avalanche Current, Single Pulsed [a] | | $I_{AS}$ | 15 | A |
| Avalanche Energy, Single Pulsed [a] | | $E_{AS}$ | 33 | mJ |
| Operating Junction Temperature | | $T_J$ | 150 | °C |
| Lead Temperature | | $T_L$ | 260 | °C |
| Storage Temperature Range | | $T_{stg}$ | -55 to 150 | °C |

Thermal resistance ratings

| Single Operation | | | | | |
|---|---|---|---|---|---|
| Parameter | | Symbol | Typical | Maximum | Unit |
| Junction-to-Case Thermal Resistance | t ≤ 10 s | $R_{\theta JC}$ | | 6 | °C/W |

Note:

a:Tj=25℃,$V_{DD}$=30V,$V_G$=10V,L=0.3mH,Rg=25Ω

## Electrical Characteristics

At TA = 25℃ unless otherwise specified

| Parameter | Symbol | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | | |
| Drain-to-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$=0V, $I_D$=250uA | 30 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=30V, $V_{GS}$=0V | | | 1.0 | uA |
| Gate-to-source Leakage Current | $I_{GSS}$ | $V_{DS}$=0V, $V_{GS}$=±20V | | | ±100 | nA |
| **ON CHARACTERISTICS** | | | | | | |
| Gate Threshold Voltage | $V_{GS(TH)}$ | $V_{GS}$=$V_{DS}$, $I_D$=250uA | 1.0 | 1.5 | 2.4 | V |
| Drain-to-source On-resistance | $R_{DS(on)}$ | $V_{GS}$=10V, $I_D$=8A | | 11.5 | 19 | mΩ |
| | | $V_{GS}$=4.5V, $I_D$=6A | | 14.5 | 26 | |
| Forward Trans conductance | $g_{FS}$ | $V_{DS}$=5.0V, $I_D$=8A | | | 80 | S |
| **CHARGES, CAPACITANCES AND GATE RESISTANCE** | | | | | | |
| Input Capacitance | $C_{ISS}$ | $V_{GS}$=0V, f=1MHz, $V_{DS}$=15V | | 750 | | pF |
| Output Capacitance | $C_{OSS}$ | | | 125 | | |
| Reverse Transfer Capacitance | $C_{RSS}$ | | | 70 | | |
| Total Gate Charge | $Q_{G(TOT)}$ | $V_{GS}$=4.5V, $V_{DS}$=15V, $I_D$=8A | | 15 | | nC |
| Gate-to-Source Charge | $Q_{GS}$ | | | 2.5 | | |
| Gate-to-Drain Charge | $Q_{GD}$ | | | 3 | | |
| **SWITCHING CHARACTERISTICS** | | | | | | |
| Turn-On Delay Time | $t_{d(ON)}$ | $V_{GS}$=10V, $V_{DS}$=15V, $R_L$=1.5Ω, $R_{GEN}$=3Ω | | 4.5 | | ns |
| Rise Time | $t_r$ | | | 10 | | |
| Turn-Off Delay Time | $t_{d(OFF)}$ | | | 18 | | |
| Fall Time | $t_f$ | | | 6 | | |
| **BODY DIODE CHARACTERISTICS** | | | | | | |
| Forward Voltage | $V_{SD}$ | $V_{GS}$=0V, $I_S$=1.0A | 0.45 | | 1.5 | V |

## 7. Typical Characteristic

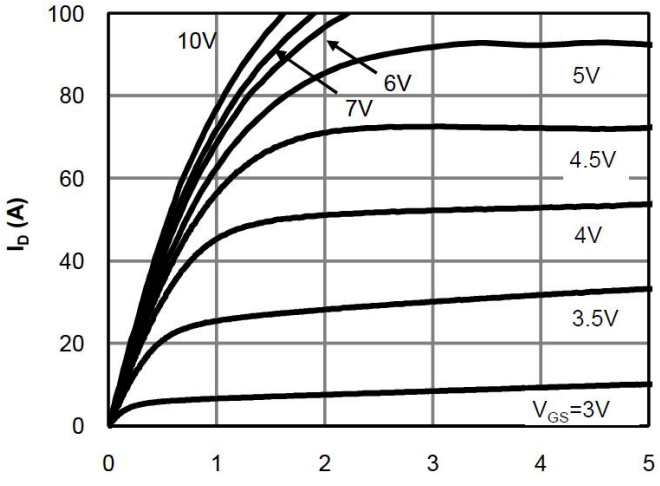



**Fig 1: On-Region Characteristics**

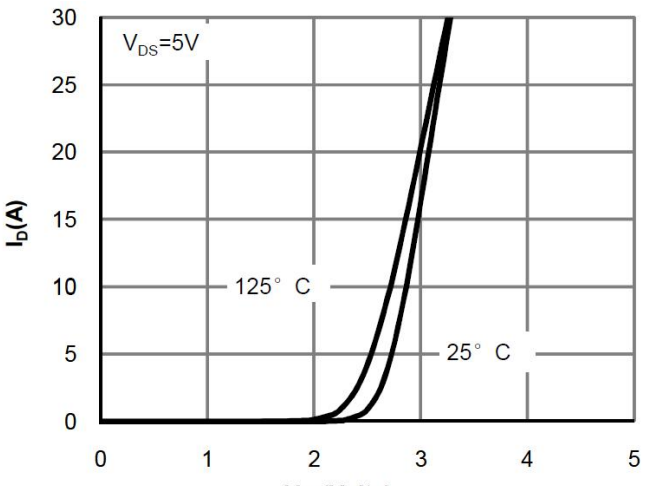



**Figure 2: Transfer Characteristics**

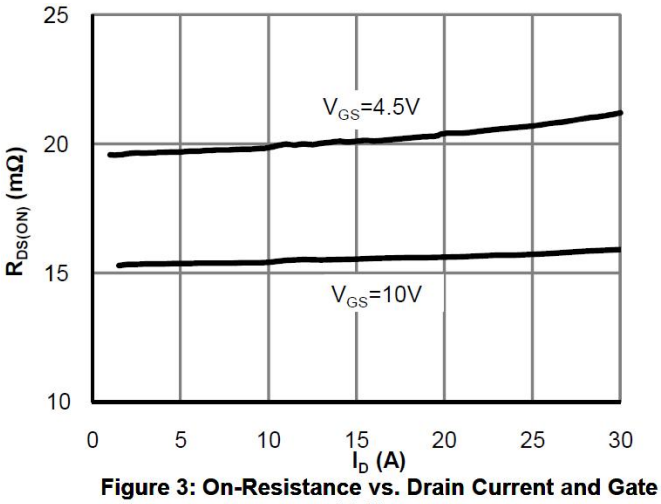



**Figure 3: On-Resistance vs. Drain Current and Gate Voltage**

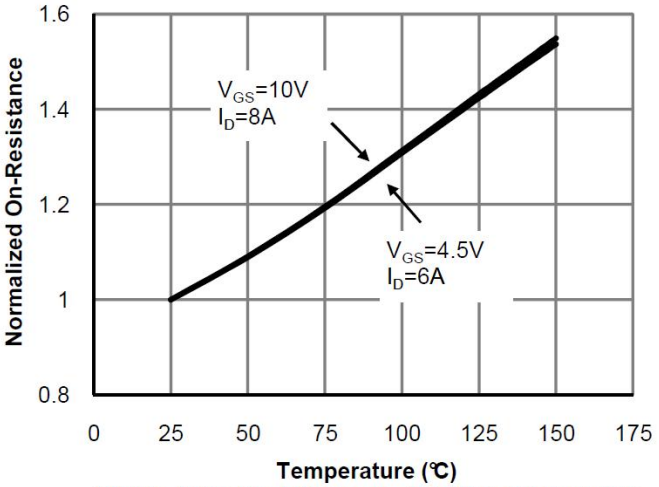



**Figure 4: On-Resistance vs. Junction Temperature**

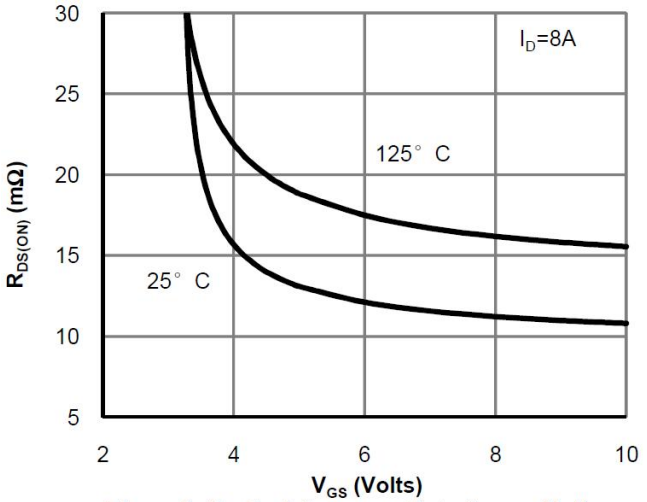



**Figure 5: On-Resistance vs. Gate-Source Voltage**

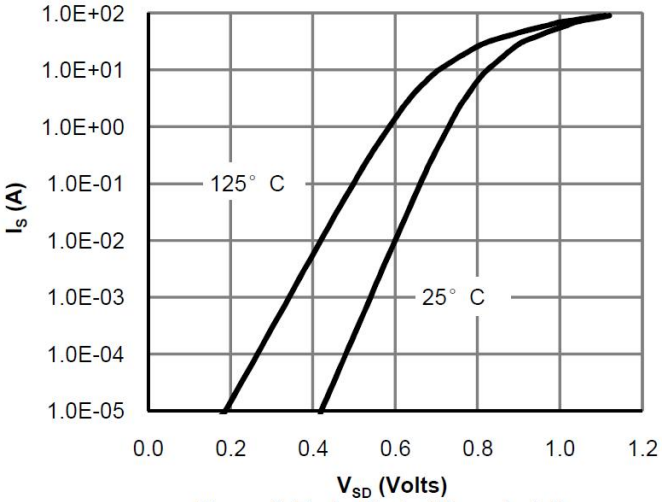



**Figure 6: Body-Diode Characteristics**

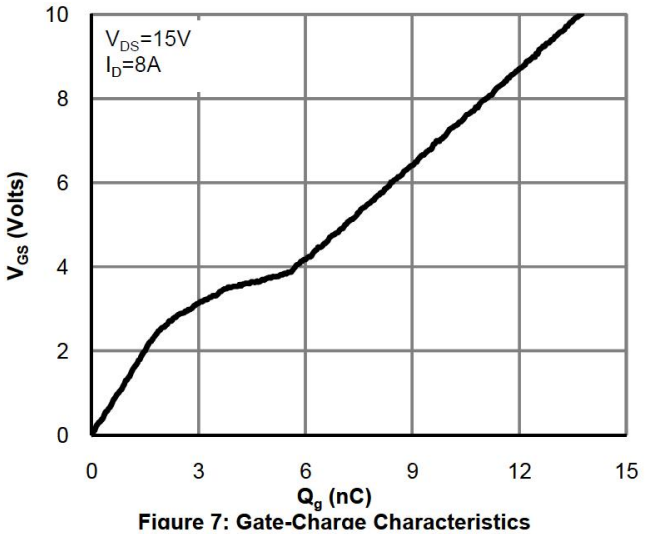



Figure 7: Gate-Charge Characteristics

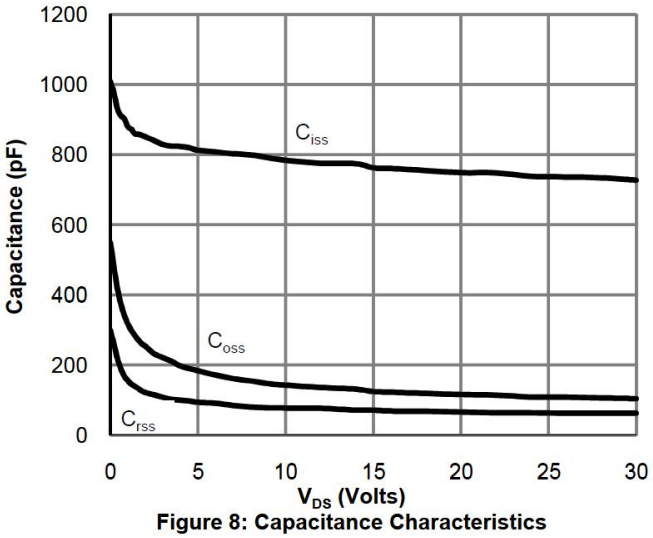



Figure 8: Capacitance Characteristics

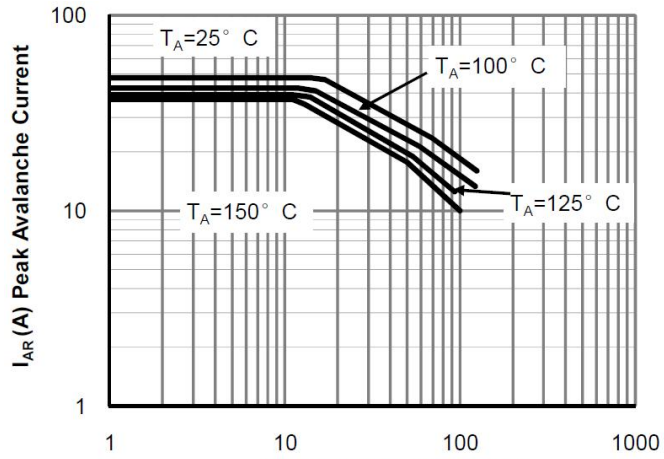



Figure 9: Single Pulse Avalanche capability

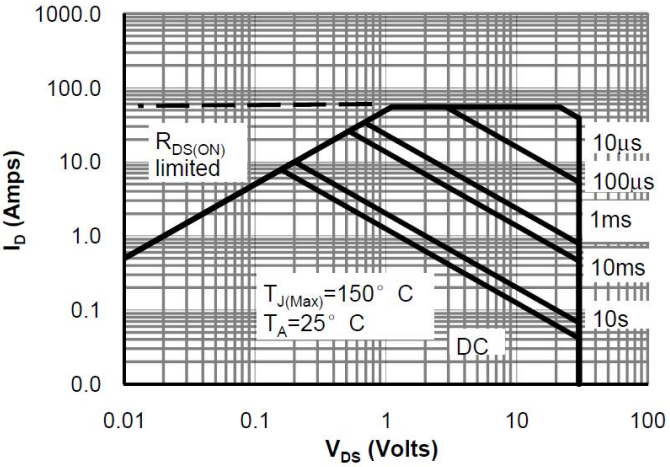



Figure 10: Maximum Forward Biased Safe Operating Area

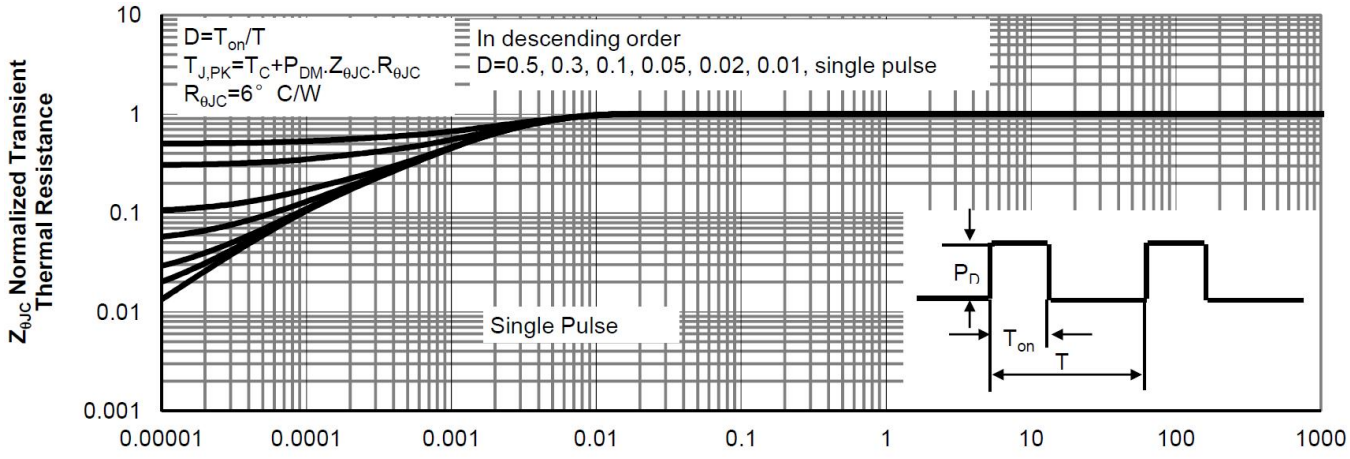
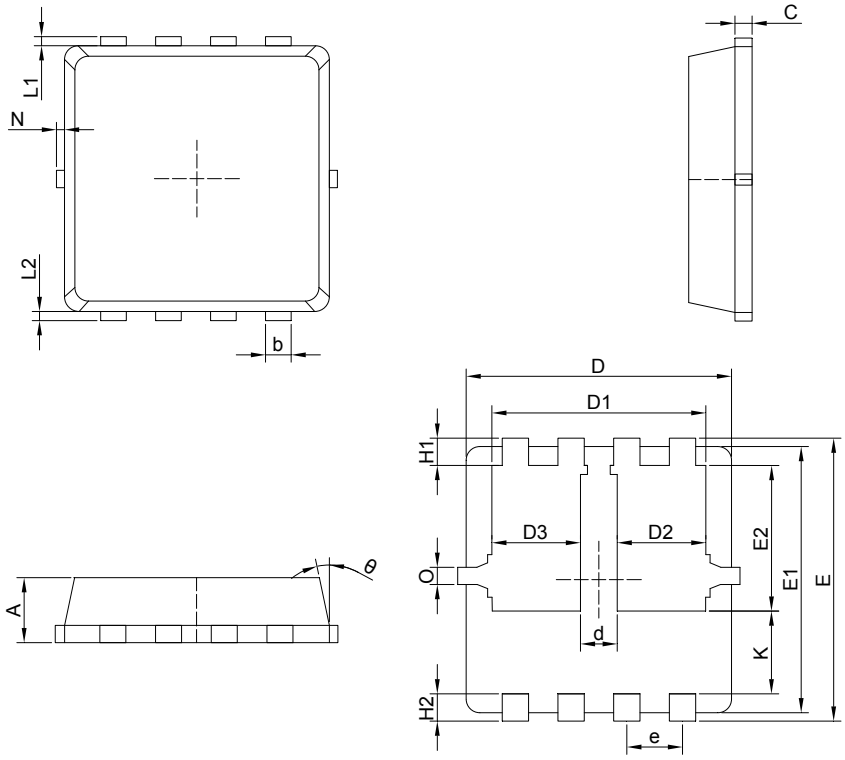



Figure 11: Normalized Maximum Transient Thermal Impedance

## 8. Dimension (PDFN3*3-8L)




| Symbol | Dimensions in Millimeters | | | Symbol | Dimensions in Millimeters | | |
|---|---|---|---|---|---|---|---|
| | MIN | NOM | MAX | | MIN | NOM | MAX |
| A | 0. 65 | 0.75 | 0.85 | E2 | 1.72 | 1.82 | 1.92 |
| b | 0. 25 | 0. 30 | 0. 35 | e | 0. 65 BSC. | | |
| C | 0. 15 | 0. 20 | 0. 25 | H1 | 0. 21 | 0.31 | 0. 41 |
| D | 3. 00 | 3.10 | 3. 20 | H2 | 0. 30 | 0. 40 | 0.50 |
| D1 | 2. 40 | 2. 50 | 2. 60 | K | 0.67 | 0.77 | 0.87 |
| D2/D3 | 1.00 | 1.05 | 1.10 | L1/L2 | 0. 10 REF. | | |
| d | 0.30 | 0.40 | 0.50 | θ | 11° | 12° | 13° |
| E | 3. 20 | 3. 30 | 3. 40 | N | 0 | - | 0.15 |
| E1 | 3. 00 | 3.10 | 3. 20 | O | 0. 2 REF. | | |

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