



Description

The FDD8447L-F085 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.



General Features

$V_{DS} = 40V$ $I_D = 50A$

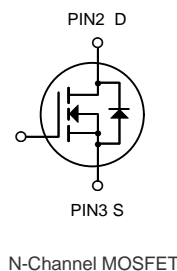
$R_{DS(ON)} < 16m\Omega$ @ $V_{GS}=10V$

Application

Battery protection

Load switch

Uninterruptible power supply



Package Marking and Ordering Information

| Product ID | Pack | Brand | Qty(PCS) |
|---------------|-----------|------------|----------|
| FDD8447L-F085 | TO-252-2L | HXY MOSFET | 2500 |

Absolute Maximum Ratings ($T_C=25^{\circ}C$ unless otherwise noted)

| Symbol | Parameter | Rating | Units |
|------------------------|---|------------|---------------|
| V_{DS} | Drain-Source Voltage | 40 | V |
| V_{GS} | Gate-Source Voltage | ± 20 | V |
| $I_D@T_C=25^{\circ}C$ | Continuous Drain Current, V_{GS} @ 10V ¹ | 50 | A |
| $I_D@T_C=100^{\circ}C$ | Continuous Drain Current, V_{GS} @ 10V ¹ | 25 | A |
| I_{DM} | Pulsed Drain Current ² | 80 | A |
| EAS | Single Pulse Avalanche Energy ³ | 19 | mJ |
| I_{AS} | Avalanche Current | 30 | A |
| $P_D@T_C=25^{\circ}C$ | Total Power Dissipation ⁴ | 20 | W |
| T_{STG} | Storage Temperature Range | -55 to 150 | $^{\circ}C$ |
| T_J | Operating Junction Temperature Range | -55 to 150 | $^{\circ}C$ |
| $R_{\theta JA}$ | Thermal Resistance Junction-ambient (Steady State) ¹ | 55 | $^{\circ}C/W$ |
| $R_{\theta JC}$ | Thermal Resistance Junction-Case ¹ | 4.32 | $^{\circ}C/W$ |



Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|------------------------------------|--------------|--|-----|------|-----------|------------|
| Off Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | $V_{GS}=0V, I_D=250\mu A$ | 40 | - | - | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=40V, V_{GS}=0V$ | - | - | 1 | μA |
| Gate-Body Leakage Current | I_{GSS} | $V_{GS}=\pm 20V, V_{DS}=0V$ | - | - | ± 100 | nA |
| On Characteristics | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 1 | 1.5 | 2.0 | V |
| Drain-Source On-State Resistance | $R_{DS(ON)}$ | $V_{GS}=10V, I_D=8A$ | - | 11.0 | 16 | m Ω |
| | | $V_{GS}=4.5V, I_D=4A$ | - | 18.9 | 24 | m Ω |
| Forward Transconductance | g_{FS} | $V_{DS}=5V, I_D=8A$ | 33 | - | - | S |
| Dynamic Characteristics | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS}=20V, V_{GS}=0V,$ $F=1.0MHz$ | - | 964 | - | PF |
| Output Capacitance | C_{oss} | | - | 109 | - | PF |
| Reverse Transfer Capacitance | C_{rss} | | - | 96 | - | PF |
| Switching Characteristics | | | | | | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD}=20V, R_L=2.5\Omega$ $V_{GS}=10V, R_{GEN}=3\Omega$ | - | 5.5 | - | nS |
| Turn-on Rise Time | t_r | | - | 14 | - | nS |
| Turn-Off Delay Time | $t_{d(off)}$ | | - | 24 | - | nS |
| Turn-Off Fall Time | t_f | | - | 12 | - | nS |
| Total Gate Charge | Q_g | $V_{DS}=20V, I_D=8A,$ $V_{GS}=10V$ | - | 22.9 | - | nC |
| Gate-Source Charge | Q_{gs} | | - | 3.5 | - | nC |
| Gate-Drain Charge | Q_{gd} | | - | 5.3 | - | nC |
| Drain-Source Diode Characteristics | | | | | | |
| Diode Forward Voltage | V_{SD} | $V_{GS}=0V, I_S=9A$ | - | 0.8 | 1.2 | V |



Typical Electrical and Thermal Characteristics (Curves)

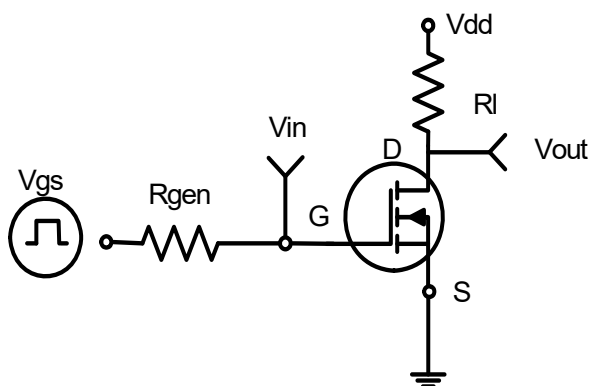


Figure 1: Switching Test Circuit

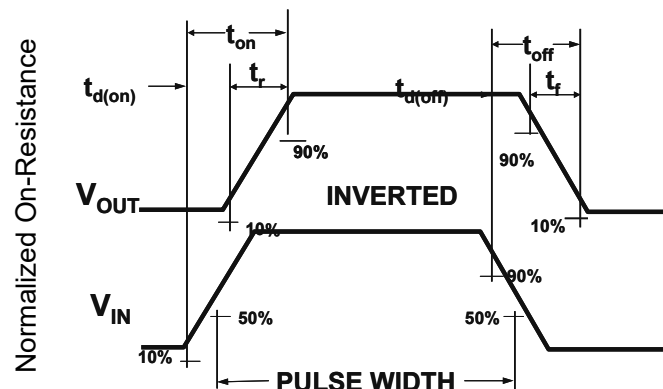


Figure 2: Switching Waveforms

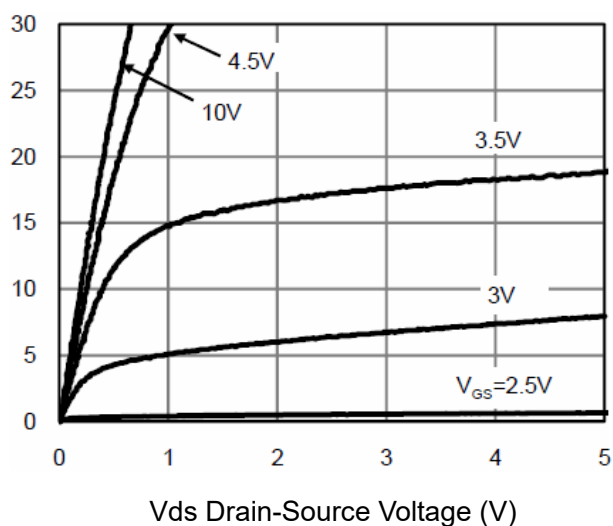


Figure 3 Output Characteristics

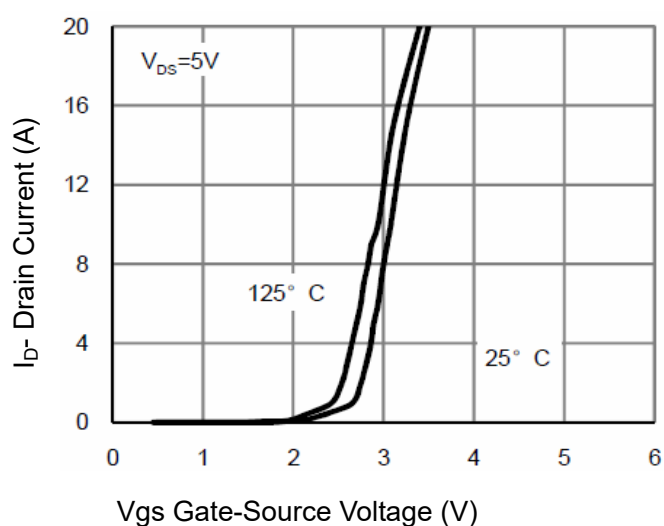


Figure 4 Transfer Characteristics

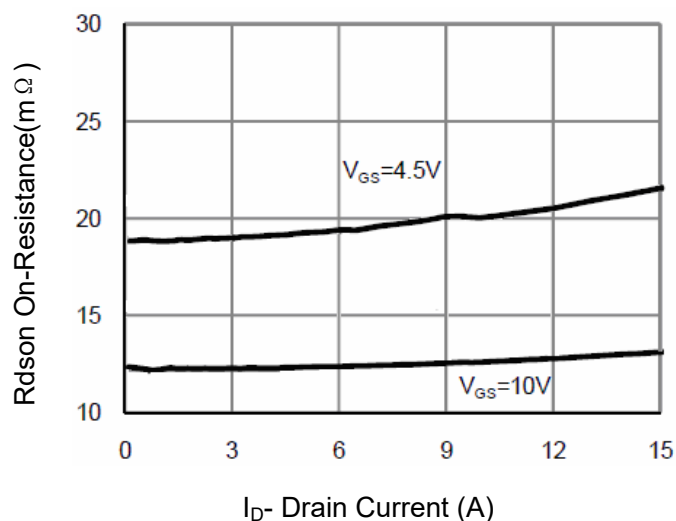


Figure 5 Drain-Source On-Resistance

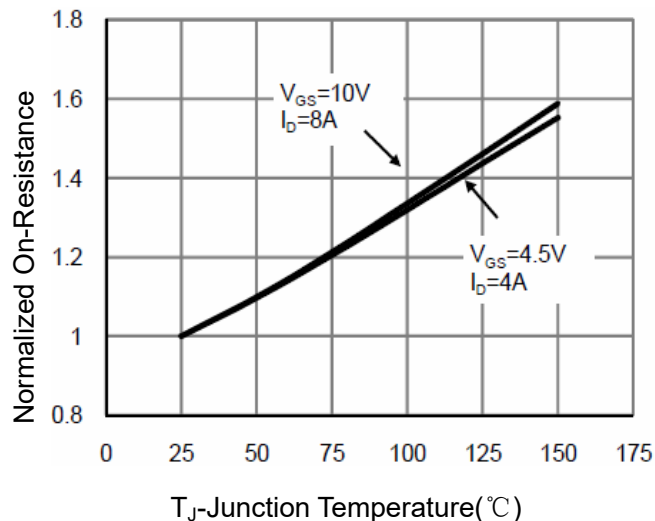
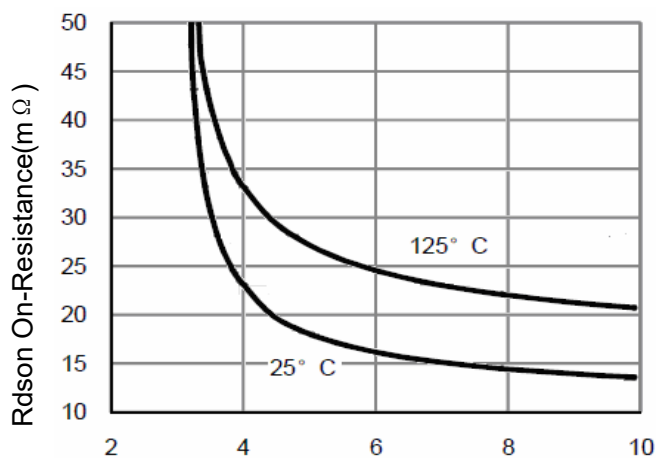
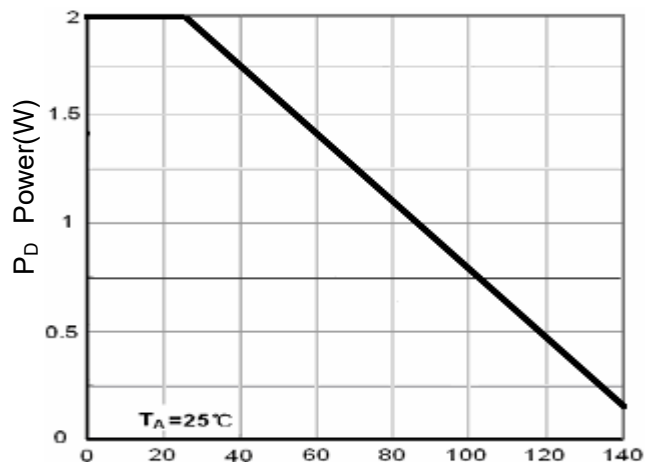


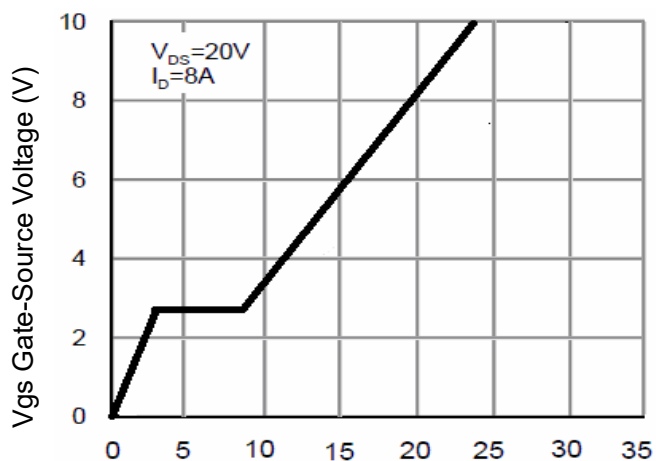
Figure 6 Drain-Source On-Resistance



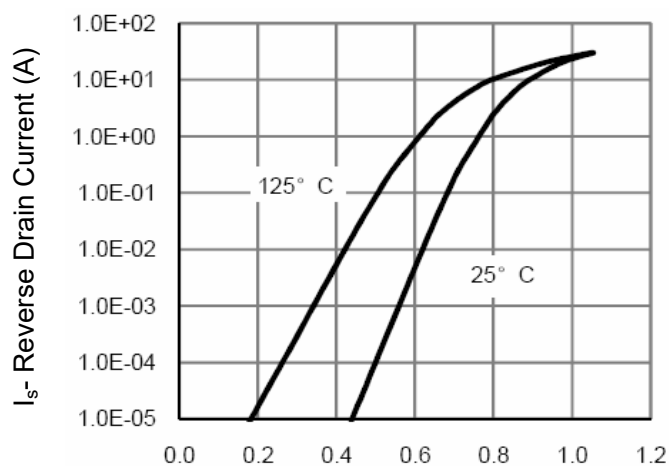
Vgs Gate-Source Voltage (V)
Figure 7 Rdson vs Vgs



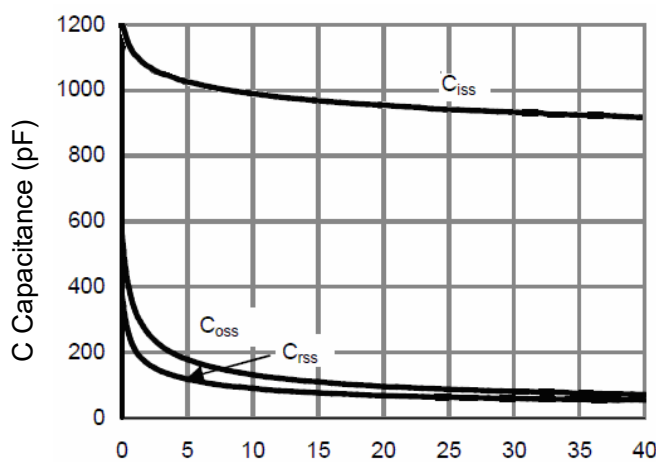
Tj-Junction Temperature(°C)
Figure 8 Power Dissipation



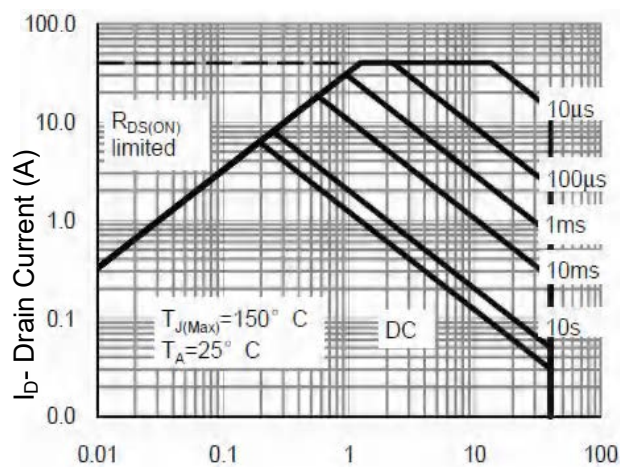
Qg Gate Charge (nC)
Figure 9 Gate Charge



Vds Drain-Source Voltage (V)
Figure 10 Source- Drain Diode Forward



Vds Drain-Source Voltage (V)
Figure 11 Capacitance vs Vds



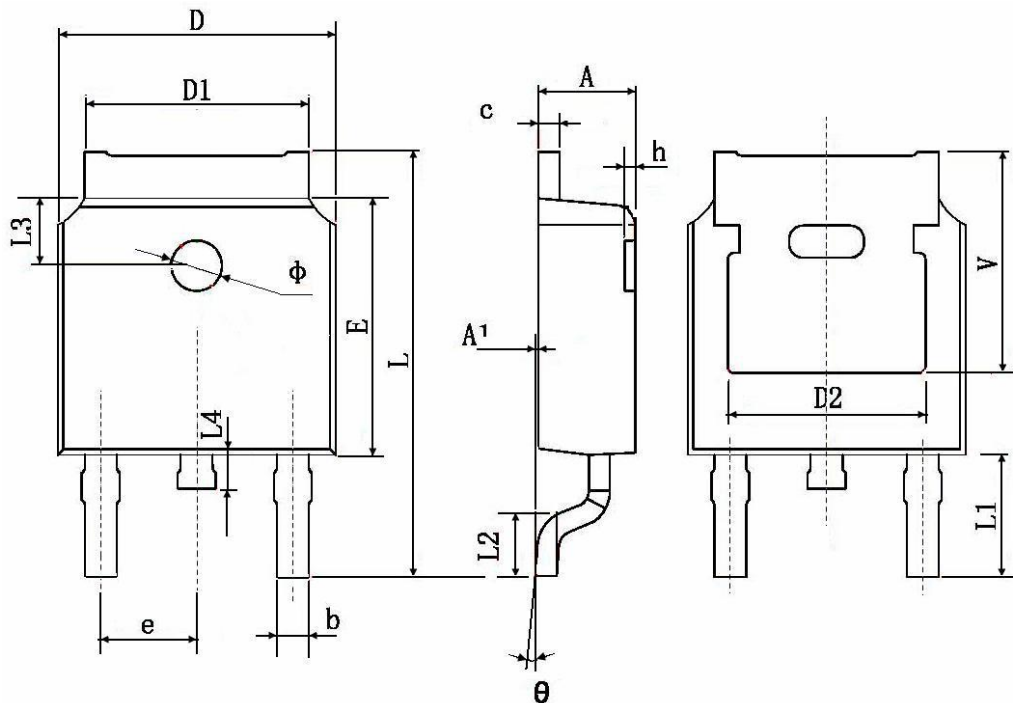
Vds Drain-Source Voltage (V)
Figure 12 Safe Operation Area



FDD8447L-F085

N-Channel Enhancement Mode MOSFET

TO-252-2L(TO-252(DPAK)) Package Information



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|--------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 2.200 | 2.400 | 0.087 | 0.094 |
| A1 | 0.000 | 0.127 | 0.000 | 0.005 |
| b | 0.660 | 0.860 | 0.026 | 0.034 |
| c | 0.460 | 0.580 | 0.018 | 0.023 |
| D | 6.500 | 6.700 | 0.256 | 0.264 |
| D1 | 5.100 | 5.460 | 0.201 | 0.215 |
| D2 | 0.483 TYP. | | 0.190 TYP. | |
| E | 6.000 | 6.200 | 0.236 | 0.244 |
| e | 2.186 | 2.386 | 0.086 | 0.094 |
| L | 9.800 | 10.400 | 0.386 | 0.409 |
| L1 | 2.900 TYP. | | 0.114 TYP. | |
| L2 | 1.400 | 1.700 | 0.055 | 0.067 |
| L3 | 1.600 TYP. | | 0.063 TYP. | |
| L4 | 0.600 | 1.000 | 0.024 | 0.039 |
| Φ | 1.100 | 1.300 | 0.043 | 0.051 |
| θ | 0° | 8° | 0° | 8° |
| h | 0.000 | 0.300 | 0.000 | 0.012 |
| V | 5.350 TYP. | | 0.211 TYP. | |



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