

Product Specification

XBLW FDS4435BZ

P-Channel Enhancement Mode MOSFET

WEB | www.xinboleic.com

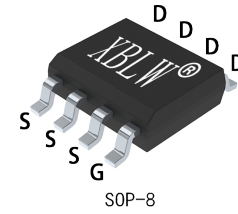


Description

The FDS4435BZ uses advanced trench technology to provide excellent RDS(ON), low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

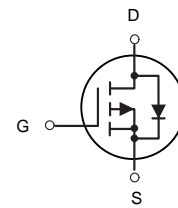
General Features

- VDS = -30V ID = -11A
- RDS(ON) < 16mΩ @ VGS=10V



Application

- Battery protection
- Load switch
- Uninterruptible power supply



P-Channel MOSFET

Package Marking and Ordering Information

| Product Model | Package Type | Marking | Packing | Packing Qty |
|----------------|--------------|---------|---------|--------------|
| XBLW FDS4435BZ | SOP-8 | FDS4435 | Tape | 3000Pcs/Reel |
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Absolute Maximum Ratings (Tc=25°C unless otherwise noted)

| Symbol | Parameter | Rating | Units |
|--------------------------------------|---|------------|-------|
| V _{DS} | Drain-Source Voltage | - 30 | V |
| V _{GS} | Gate-Source Voltage | ±20 | V |
| I _D @T _A =25°C | Drain Current ³ , V _{GS} @ 10V | -11 | A |
| I _{DM} | Pulsed Drain Current ¹ | -40 | A |
| P _D @T _A =25°C | Total Power Dissipation | 3.7 | W |
| T _{STG} | Storage Temperature Range | -55 to 150 | °C |
| T _J | Operating Junction Temperature Range | -55 to 150 | °C |
| R _{thj-a} | Maximum Thermal Resistance, Junction-ambient ³ | 33.8 | °C/W |

Electrical Characteristics (T_J = 25°C, unless otherwise noted)

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Units |
|---|--|---|------|------|------|-------|
| Off Characteristic | | | | | | |
| V _{(BR)DSS} | Drain-Source Breakdown Voltage | V _{GS} =0V, I _D = -250μA | -30 | - | - | V |
| I _{DSS} | Zero Gate Voltage Drain Current | V _{DS} = -30V, V _{GS} =0V, | - | - | -1 | μA |
| I _{GSS} | Gate to Body Leakage Current | V _{DS} =0V, V _{GS} = ±20V | - | - | ±100 | nA |
| On Characteristics | | | | | | |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} =V _{GS} , I _D = -250μA | -1.0 | -1.6 | -2.5 | V |
| R _{DS(on)} | Static Drain-Source on-Resistance Note3 | V _{GS} = -10V, I _D = -10A | - | 13 | 16 | mΩ |
| | | V _{GS} = -4.5V, I _D = -5A | - | 18 | 27 | |
| Dynamic Characteristics | | | | | | |
| C _{iss} | Input Capacitance | V _{DS} = -15V, V _{GS} =0V, f=1.0MHz | - | 1330 | - | pF |
| C _{oss} | Output Capacitance | | - | 183 | - | pF |
| C _{rss} | Reverse Transfer Capacitance | | - | 156 | - | pF |
| Q _g | Total Gate Charge | V _{DS} = -15V, I _D = -5A, V _{GS} = -10V | - | 22 | - | nC |
| Q _{gs} | Gate-Source Charge | | - | 1.0 | - | nC |
| Q _{gd} | Gate-Drain("Miller") Charge | | - | 1.8 | - | nC |
| Switching Characteristics | | | | | | |
| t _{d(on)} | Turn-on Delay Time | V _{DD} = -15V, I _D = -10A, V _{GS} =-10V, R _{GEN} =2.5Ω | - | 9 | - | ns |
| t _r | Turn-on Rise Time | | - | 13 | - | ns |
| t _{d(off)} | Turn-off Delay Time | | - | 48 | - | ns |
| t _f | Turn-off Fall Time | | - | 20 | - | ns |
| Drain-Source Diode Characteristics and Maximum Ratings | | | | | | |
| I _S | Maximum Continuous Drain to Source Diode Forward Current | | - | - | -11 | A |
| I _{SM} | Maximum Pulsed Drain to Source Diode Forward Current | | - | - | -40 | A |
| V _{SD} | Drain to Source Diode Forward Voltage | V _{GS} =0V, I _S = -15A | - | -0.8 | -1.2 | V |
| trr | Reverse Recovery Time | T _J =25°C, | - | 64 | - | ns |
| Qrr | Reverse Recovery Charge | V _{DD} = -24V, I _F =-2.8A, dI/dt=-100A/μs | - | 25 | - | nC |

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

 2. EAS condition: T_J=25°C, V_{GS}=10V, R_G=25Ω, L=0.5mH, I_{AS}=-12.7A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Typical Characteristics

Figure 1: Output Characteristics

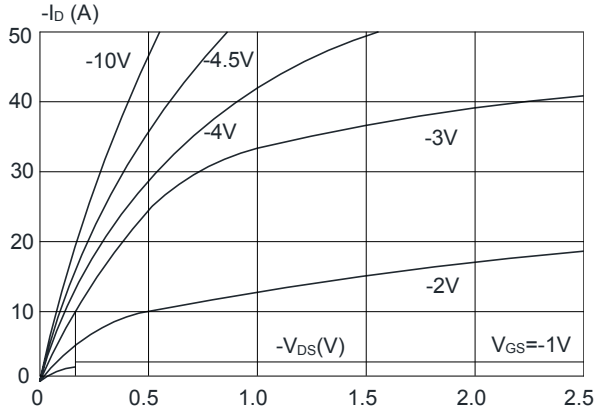


Figure 2: Typical Transfer Characteristics

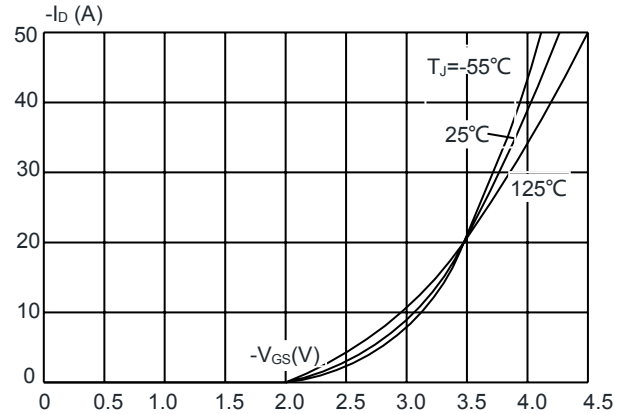


Figure 3: On-resistance vs. Drain Current

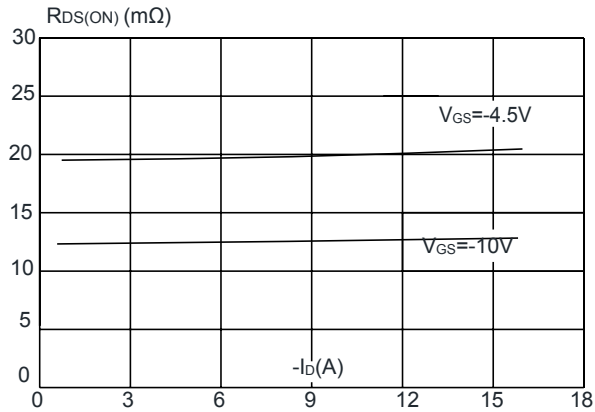


Figure 4: Body Diode Characteristics

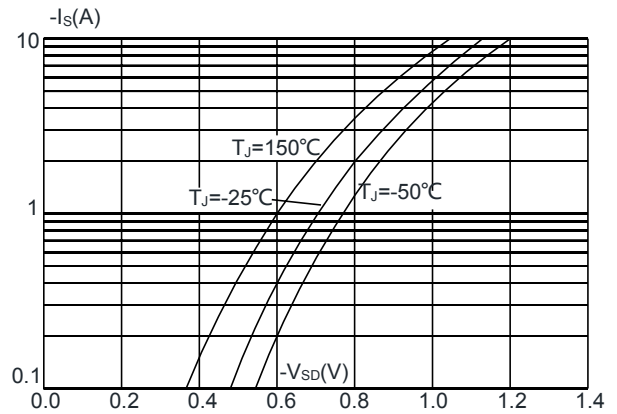


Figure 5: Gate Charge Characteristics

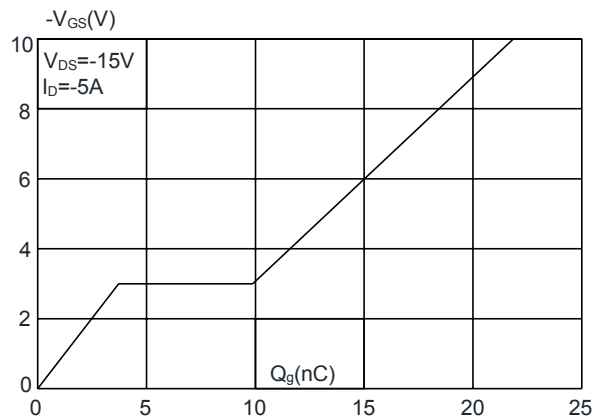


Figure 6: Capacitance Characteristics

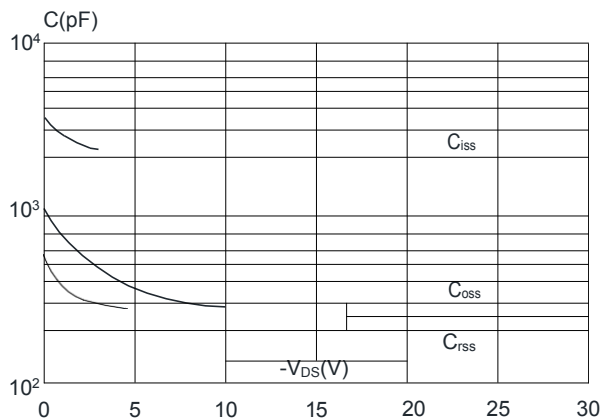


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

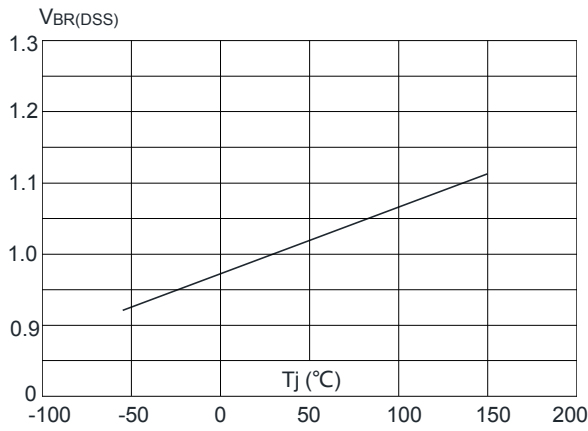


Figure 8: Normalized on Resistance vs. Junction Temperature

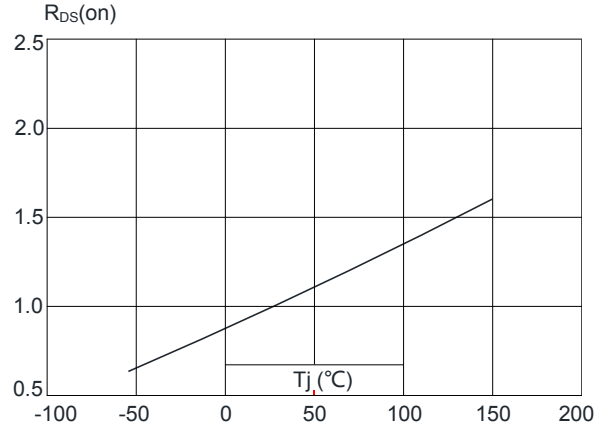


Figure 9: Maximum Safe Operating Area

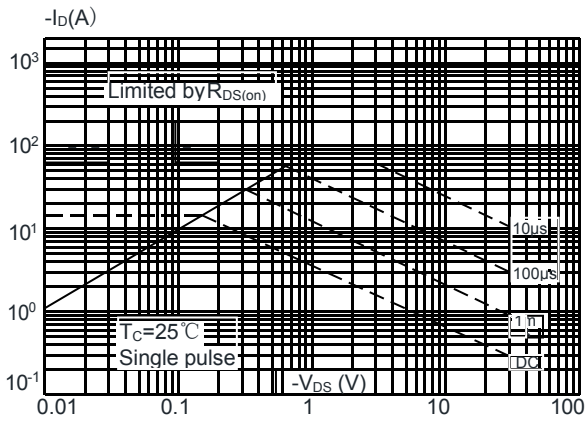


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

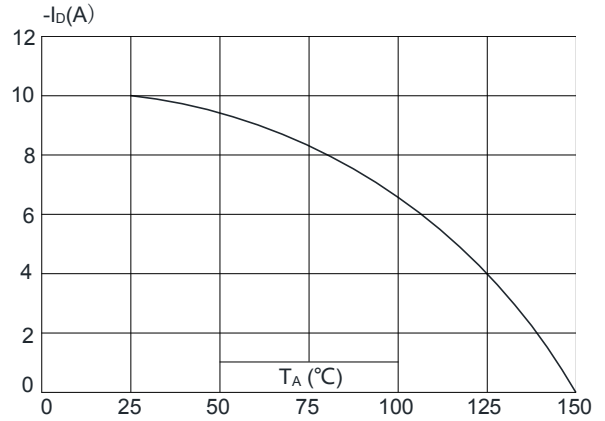
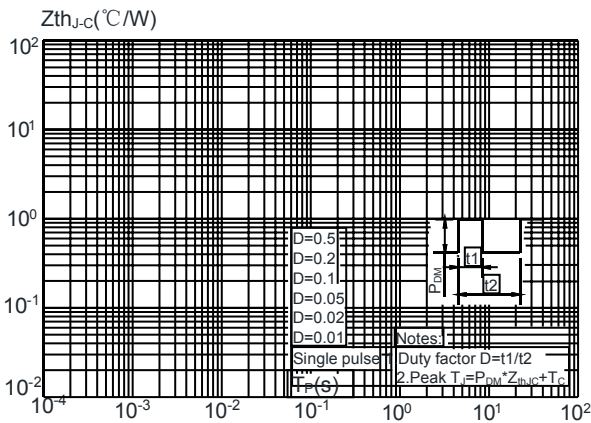
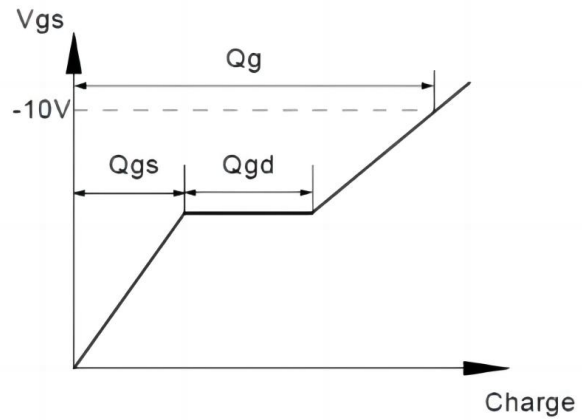
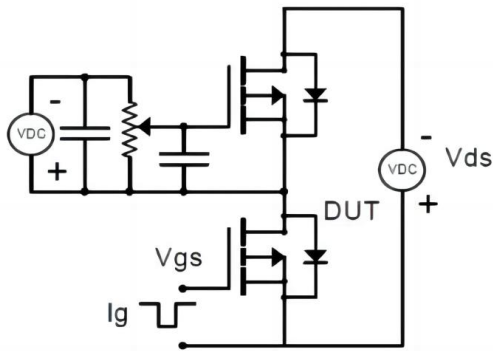


Figure 11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

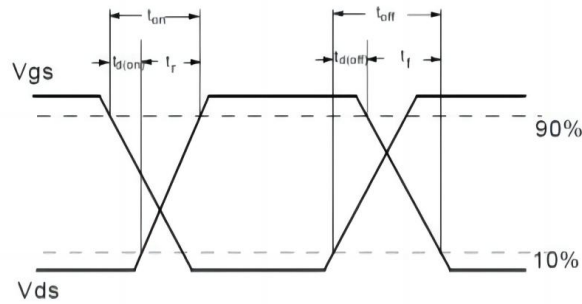
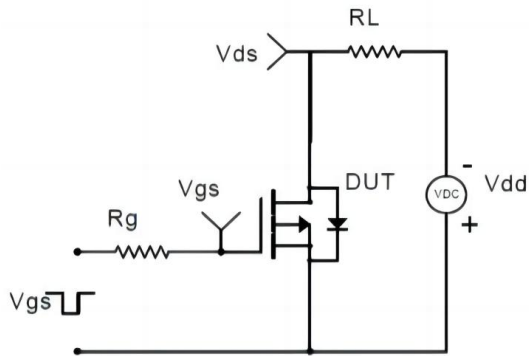


Test Circuit

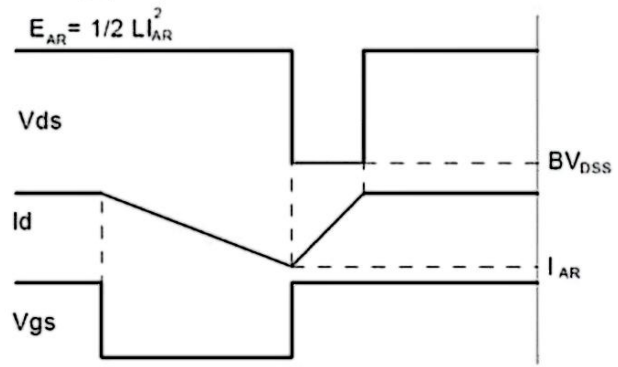
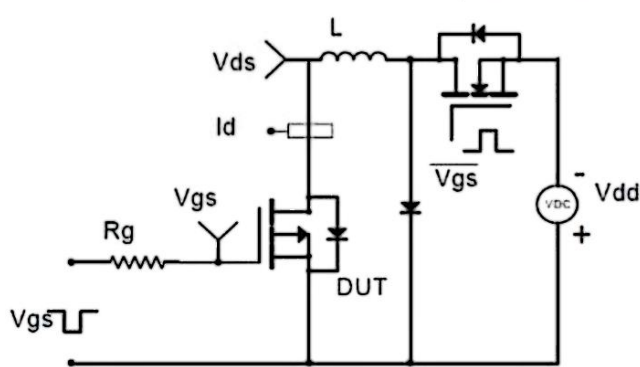
Gate Charge Test Circuit & Waveform



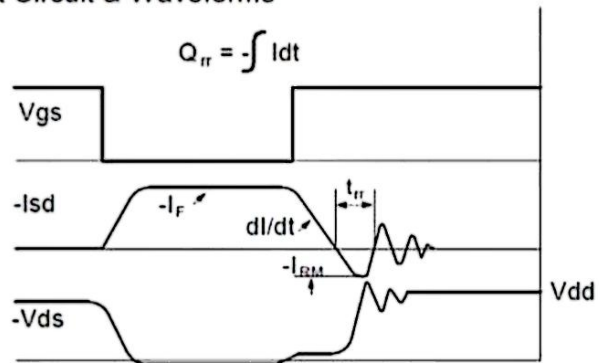
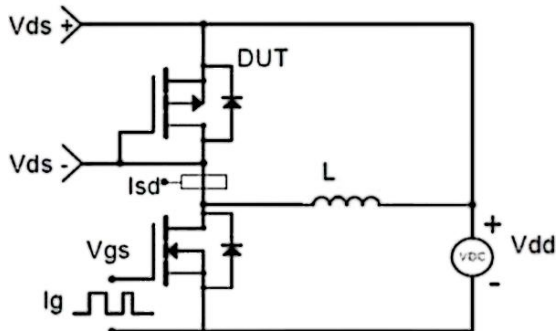
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

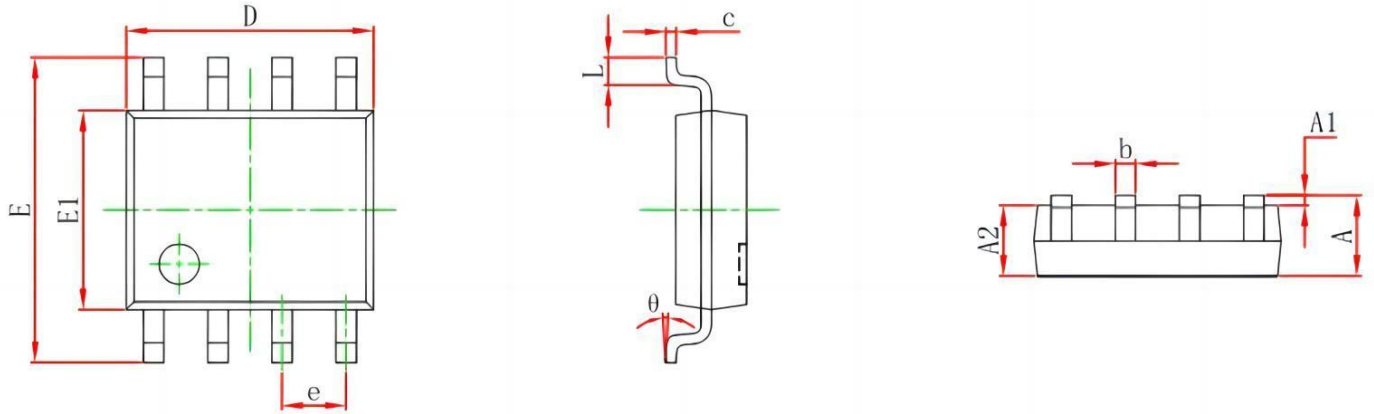


Diode Recovery Test Circuit & Waveforms

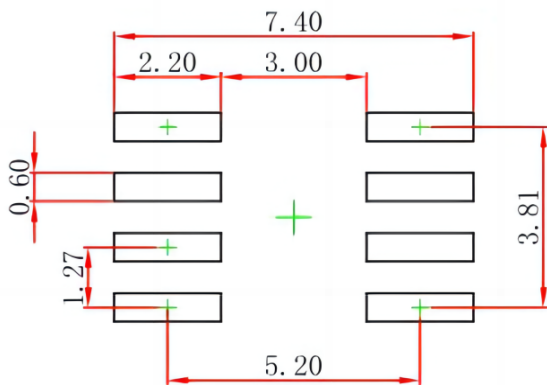


Package Outline Dimensions

SOP-8



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 1.350 | 1.750 | 0.053 | 0.069 |
| A1 | 0.100 | 0.250 | 0.004 | 0.010 |
| A2 | 1.350 | 1.550 | 0.053 | 0.061 |
| b | 0.330 | 0.510 | 0.013 | 0.020 |
| c | 0.170 | 0.250 | 0.007 | 0.010 |
| D | 4.800 | 5.000 | 0.189 | 0.197 |
| e | 1.270 (BSC) | | 0.050 (BSC) | |
| E | 5.800 | 6.200 | 0.228 | 0.244 |
| E1 | 3.800 | 4.000 | 0.150 | 0.157 |
| L | 0.400 | 1.270 | 0.016 | 0.050 |
| θ | 0° | 8° | 0° | 8° |



Note:

1. Controlling dimension: In millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.

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