

# Product Specification

XBLW AO3415A

P-Channel Enhancement Mode MOSFET

WEB | [www.xinboleic.com](http://www.xinboleic.com)

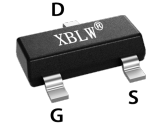


## Description

The AO3415A uses advanced trench technology to provide excellent RDS(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

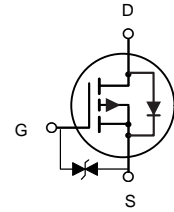
- VDS = -20V ID =-4.1A
- RDS(ON) < 45mΩ@ VGS= -4.5V
- ESD Rating: 1500V HBM



SOT-23-3L

## 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 AO3415A  | SOT-23-3L    | AFHV    | Tape    | 3000Pcs/Reel |
|               |              |         |         |              |
|               |              |         |         |              |
|               |              |         |         |              |
|               |              |         |         |              |

## Absolute Maximum Ratings (TA=25°C unless otherwise noted)

| Symbol                            | Parameter   | Limit      | Unit |
|-----------------------------------|---|------------|------|
| V <sub>DS</sub>                   | Drain-Source Voltage  | -20        | V    |
| V <sub>GS</sub>                   | Gate-Source Voltage   | ±10        | V    |
| I <sub>D</sub>                    | Drain Current-Continuous                                    | -4.1       | A    |
| I <sub>DM</sub>                   | Drain Current-Pulsed <sup>(Note 1)</sup>                    | -30        | A    |
| P <sub>D</sub>                    | Maximum Power Dissipation                                   | 1.4        | W    |
| T <sub>J</sub> , T <sub>STG</sub> | Operating Junction and Storage Temperature Range            | -55 To 150 | °C   |
| R <sub>θJA</sub>                  | Thermal Resistance, Junction-to-Ambient <sup>(Note 2)</sup> | 89.3       | °C/W |

### Electrical Characteristics (TA=25°C unless otherwise noted)

|   |              |   |       |       |          |           |
|---|--------------|---|-------|-------|----------|-----------|
| Zero Gate Voltage Drain Current           | $I_{DSS}$    | $V_{DS}=-20V, V_{GS}=0V$  | -     | -     | 1        | $\mu A$   |
| Gate-Body Leakage Current                 | $I_{GSS}$    | $V_{GS}=\pm 10V, V_{DS}=0V$                                     | -     | -     | $\pm 10$ | $\mu A$   |
| <b>On Characteristics (Note 3)</b>        |              |   |       |       |          |           |
| Gate Threshold Voltage                    | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=-250\mu A$                                  | -0.35 | -0.55 | -0.9     | V         |
| Drain-Source On-State Resistance          | $R_{DS(on)}$ | $V_{GS}=-4.5V, I_D=-4A$   | -     | 34    | 45       | $m\Omega$ |
|   |              | $V_{GS}=-2.5V, I_D=-4A$   | -     | 44    | 60       | $m\Omega$ |
| Forward Transconductance                  | $g_{FS}$     | $V_{DS}=-5V, I_D=-4A$   | 8     | -     | -        | S         |
| <b>Dynamic Characteristics (Note4)</b>    |              |   |       |       |          |           |
| Input Capacitance                         | $C_{iss}$    | $V_{DS}=-10V, V_{GS}=0V,$<br>$F=1.0MHz$                         | -     | 950   | -        | PF        |
| Output Capacitance                        | $C_{oss}$    |   | -     | 165   | -        | PF        |
| Reverse Transfer Capacitance              | $C_{rss}$    |   | -     | 120   | -        | PF        |
| <b>Switching Characteristics (Note 4)</b> |              |   |       |       |          |           |
| Turn-on Delay Time                        | $t_{d(on)}$  | $V_{DD}=-10V, R_L=2.5\Omega$<br>$V_{GS}=-4.5V, R_{GEN}=3\Omega$ | -     | 12    |          | nS        |
| Turn-on Rise Time                         | $t_r$        |   | -     | 10    |          | nS        |
| Turn-Off Delay Time                       | $t_{d(off)}$ |   | -     | 19    |          | nS        |
| Turn-Off Fall Time                        | $t_f$        |   | -     | 25    |          | nS        |
| Total Gate Charge                         | $Q_g$        | $V_{DS}=-10V, I_D=-4A,$<br>$V_{GS}=-4.5V$                       | -     | 12    |          | nC        |
| Gate-Source Charge                        | $Q_{gs}$     |   | -     | 1.4   | -        | nC        |
| Gate-Drain Charge                         | $Q_{gd}$     |   | -     | 3.6   | -        | nC        |
| <b>Drain-Source Diode Characteristics</b> |              |   |       |       |          |           |
| Diode Forward Voltage (Note 3)            | $V_{SD}$     | $V_{GS}=0V, I_S=-4A$  | -     | -     | -1.2     | V         |
| Diode Forward Current (Note 2)            | $I_S$        |   | -     | -     | -4       | A         |

**Notes:**

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board,  $t \leq 10$  sec.
3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to production

## TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

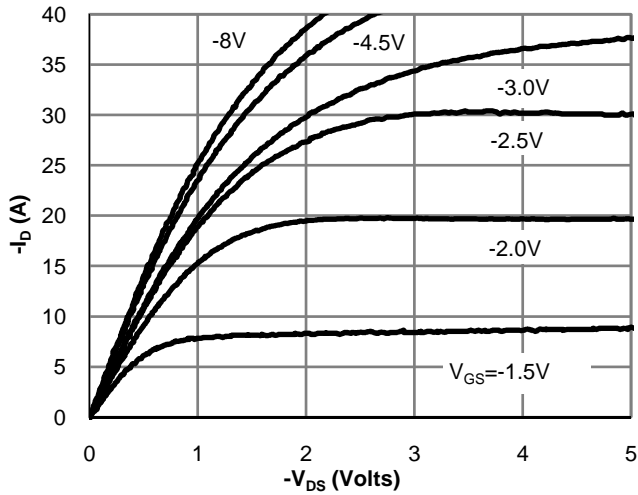


Fig 1: On-Region Characteristics (Note E)

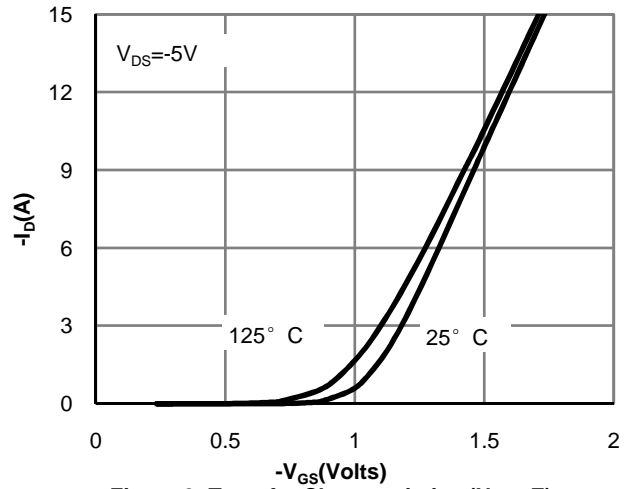


Figure 2: Transfer Characteristics (Note E)

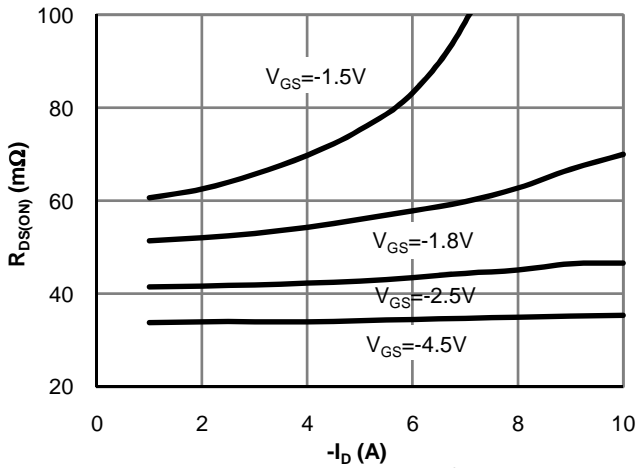


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

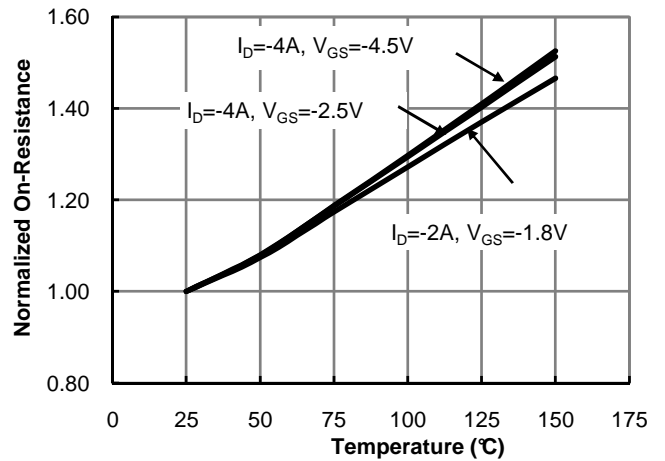


Figure 4: On-Resistance vs. Junction Temperature (Note E)

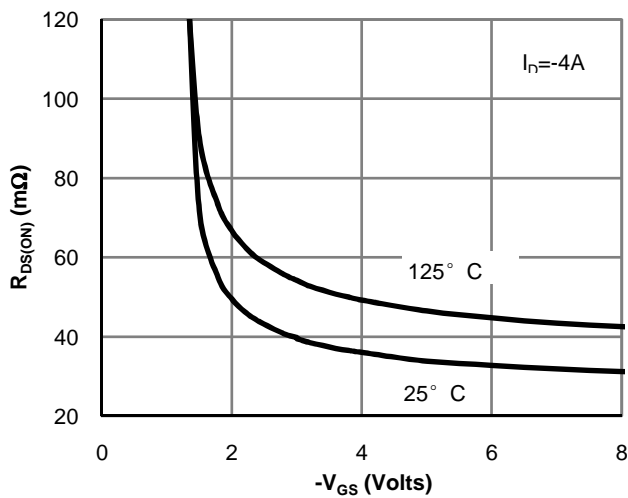


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

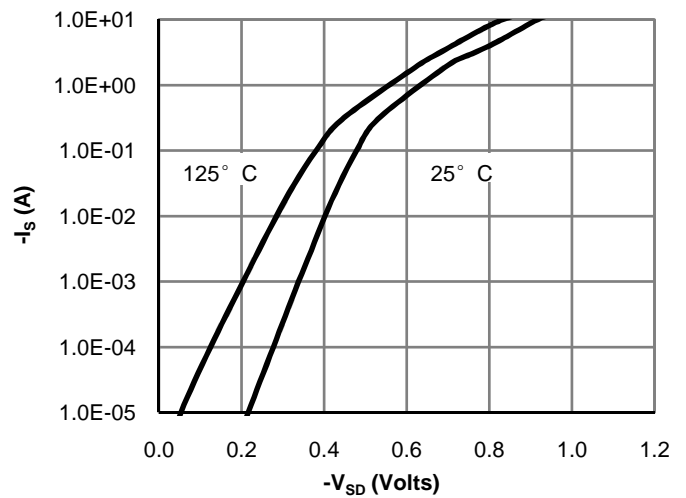


Figure 6: Body-Diode Characteristics (Note E)

**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTIC**

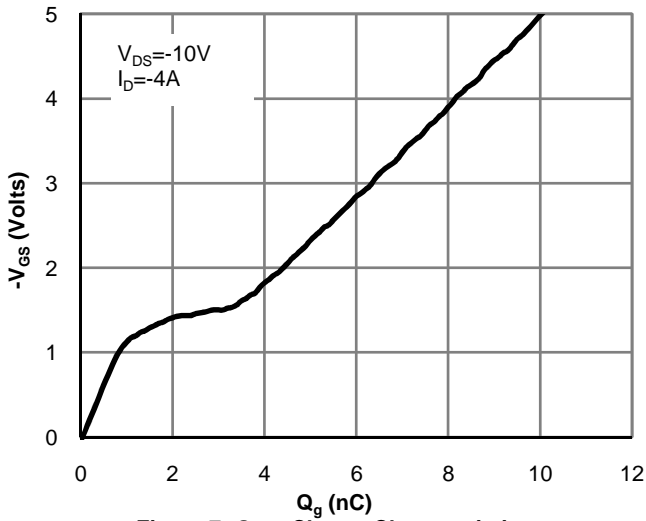


Figure 7: Gate-Charge Characteristics

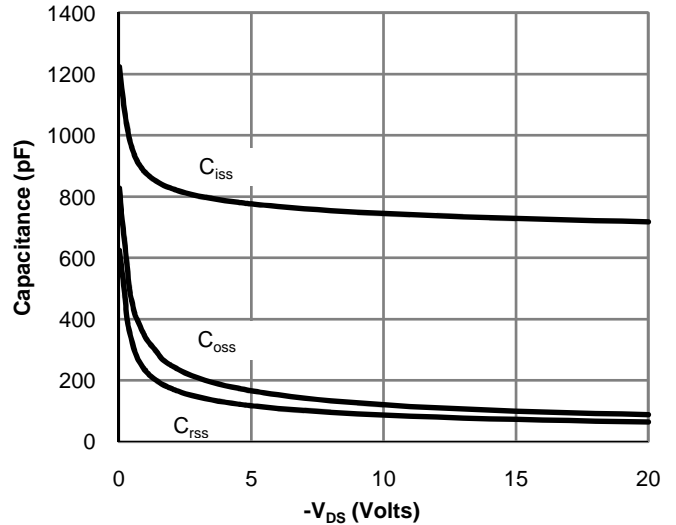


Figure 8: Capacitance Characteristics

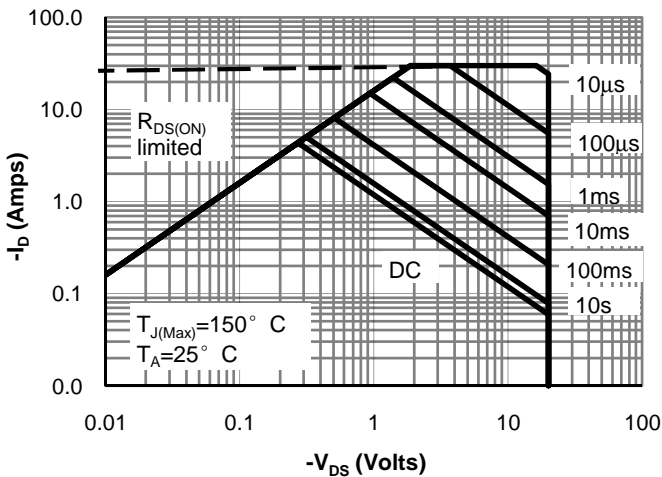


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

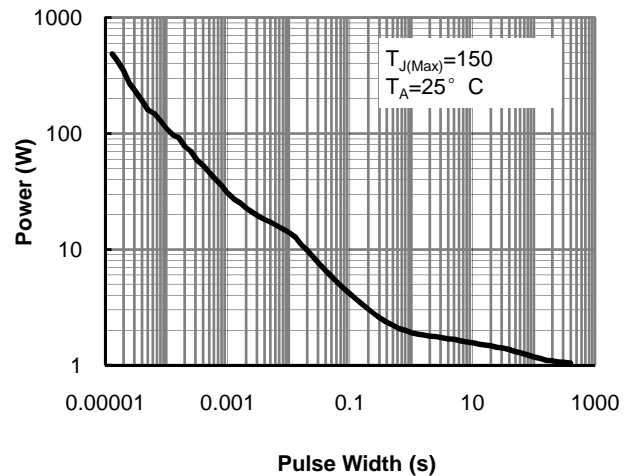


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

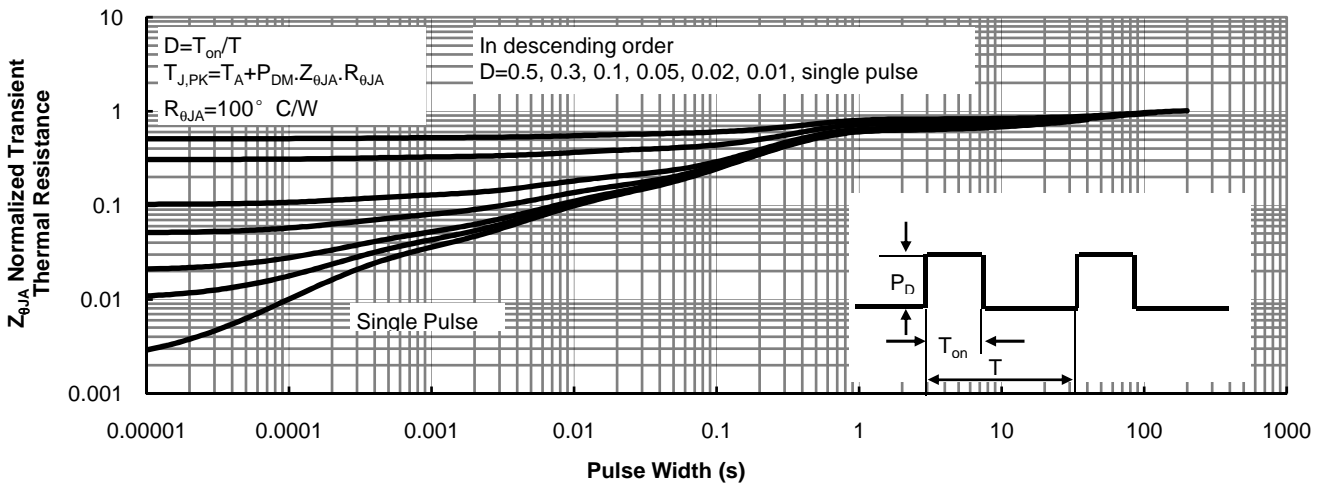
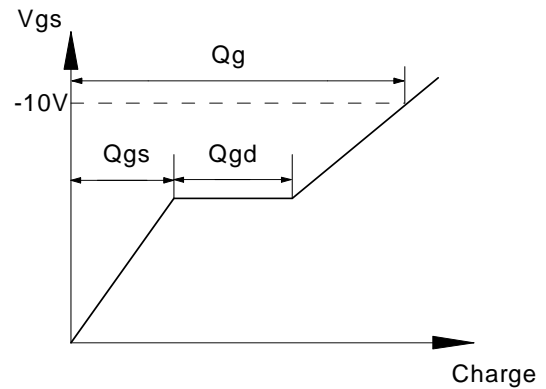
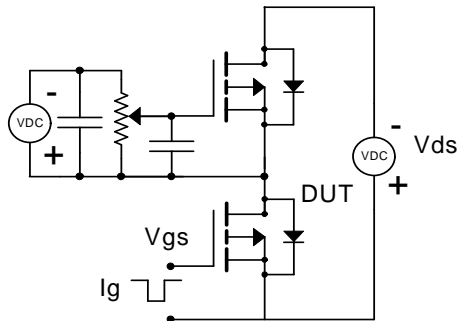
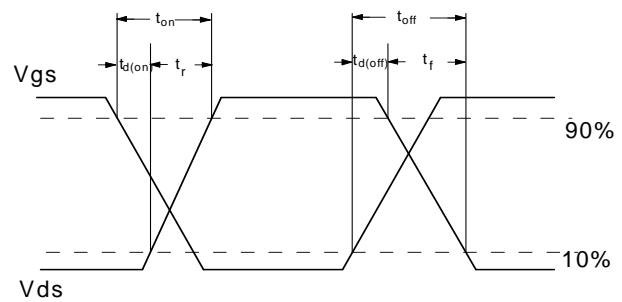
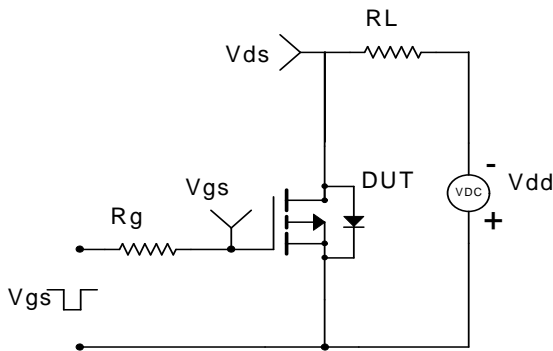


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

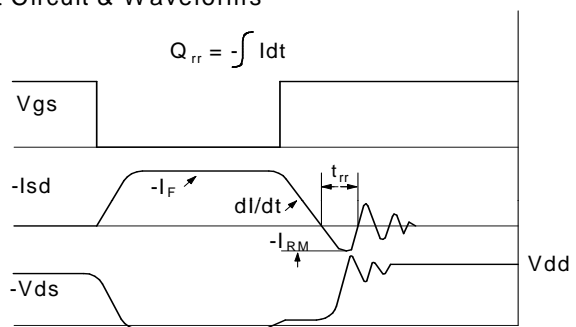
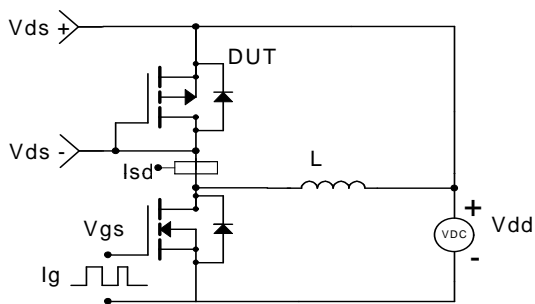
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

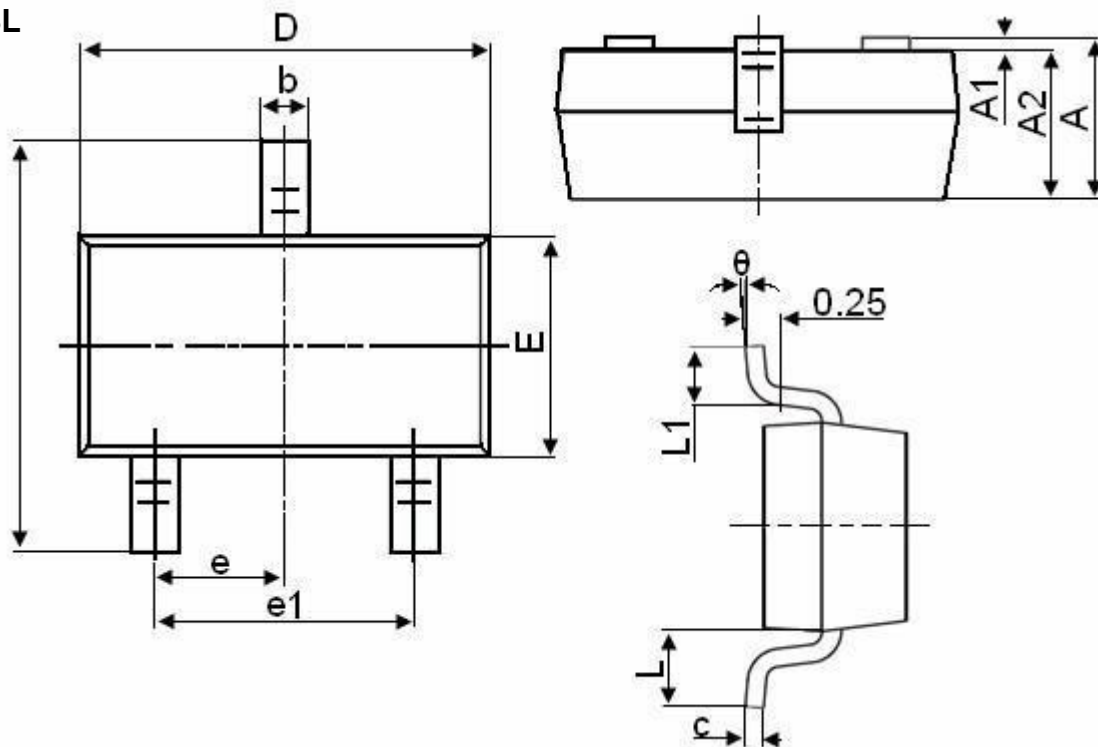


Diode Recovery Test Circuit & Waveforms



**Package Information**

SOT23-3L



| Symbol   | Dimensions in Millimeters |       |
|----------|---------------------------|-------|
|          | MIN.                      | MAX.  |
| A        | 1.050                     | 1.250 |
| A1       | 0.000                     | 0.100 |
| A2       | 1.050                     | 1.150 |
| b        | 0.300                     | 0.500 |
| c        | 0.100                     | 0.200 |
| D        | 2.800                     | 3.000 |
| E        | 1.500                     | 1.700 |
| E1       | 2.650                     | 2.950 |
| e        | 0.950TYP                  |       |
| e1       | 1.800                     | 2.000 |
| L        | 0.550REF                  |       |
| L1       | 0.300                     | 0.600 |
| $\theta$ | 0°                        | 8°    |

## Statement:

- XBLW reserves the right to modify the product manual without prior notice! Before placing an order, customers need to confirm whether the obtained information is the latest version and verify the completeness of the relevant information.
- Any semi-guide product is subject to failure or malfunction under specified conditions. It is the buyer's responsibility to comply with safety standards when using XBLW products for system design and whole machine manufacturing. And take the appropriate safety measures to avoid the potential in the risk of loss of personal injury or loss of property situation!
- XBLW products have not been licensed for life support, military, and aerospace applications, and therefore XBLW is not responsible for any consequences arising from the use of this product in these areas.
- If any or all XBLW products (including technical data, services) described or contained in this document are subject to any applicable local export control laws and regulations, they may not be exported without an export license from the relevant authorities in accordance with such laws.
- The specifications of any and all XBLW products described or contained in this document specify the performance, characteristics, and functionality of said products in their standalone state, but do not guarantee the performance, characteristics, and functionality of said products installed in Customer's products or equipment. In order to verify symptoms and conditions that cannot be evaluated in a standalone device, the Customer should ultimately evaluate and test the device installed in the Customer's product device.
- XBLW documentation is only allowed to be copied without any alteration of the content and with the relevant authorization. XBLW assumes no responsibility or liability for altered documents.
- XBLW is committed to becoming the preferred semiconductor brand for customers, and XBLW will strive to provide customers with better performance and better quality products.



## X-ON Electronics

Largest Supplier of Electrical and Electronic Components

*Click to view similar products for [MOSFET](#) category:*

*Click to view products by [XBLW](#) manufacturer:*

Other Similar products are found below :

[IRFD120](#) [IRFY240C](#) [JANTX2N5237](#) [2SK2267\(Q\)](#) [BUK455-60A/B](#) [MIC4420CM-TR](#) [VN1206L](#) [NDP4060](#) [SI4482DY](#)  
[IPS70R2K0CEAKMA1](#) [SQD23N06-31L-GE3](#) [TK16J60W,S1VQ\(O](#) [2SK2614\(TE16L1,Q\)](#) [DMN1017UCP3-7](#) [EFC2J004NUZTDG](#)  
[DMN1053UCP4-7](#) [SQJ469EP-T1-GE3](#) [NTE2384](#) [DMC2700UDMQ-7](#) [DMN2080UCB4-7](#) [DMN61D9UWQ-13](#) [US6M2GTR](#)  
[DMN31D5UDJ-7](#) [DMP22D4UFO-7B](#) [DMN1006UCA6-7](#) [DMN16M9UCA6-7](#) [STF5N65M6](#) [IRF40H233XTMA1](#) [STU5N65M6](#)  
[DMN6022SSD-13](#) [DMN13M9UCA6-7](#) [DMTH10H4M6SPS-13](#) [DMN2990UFB-7B](#) [IPB80P04P405ATMA2](#) [2N7002W-G](#) [MCAC30N06Y-](#)  
[TP](#) [MCQ7328-TP](#) [NTMC083NP10M5L](#) [NVMFS2D3P04M8LT1G](#) [BXP7N65D](#) [BXP4N65F](#) [AOL1454G](#) [WMJ80N60C4](#) [BXP2N20L](#)  
[BXP2N65D](#) [BXT1150N10J](#) [BXT1700P06M](#) [TSM60NB380CP](#) [ROG](#) [RQ7L055BGTCR](#) [DMNH15H110SK3-13](#)