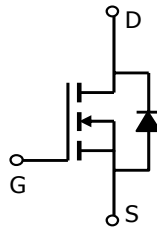
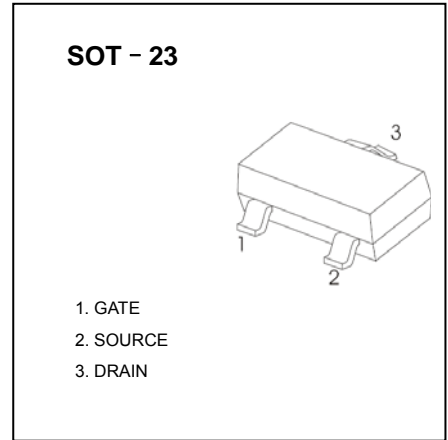


#### ■ Features

- $V_{DS} (V) = 30V$
- $I_D = 5.8 A (V_{GS} = 10V)$
- $R_{DS(ON)} < 25 m\Omega (V_{GS} = 10V)$
- $R_{DS(ON)} < 36 m\Omega (V_{GS} = 4.5V)$



#### ■ Absolute Maximum Ratings $T_a = 25^\circ C$

| Parameter                               | Symbol     | Rating              | Unit         |
|---|------------|---------------------|--------------|
| Drain-Source Voltage                    | $V_{DS}$   | 30                  | V            |
| Gate-Source Voltage                     | $V_{GS}$   | $\pm 20$            |              |
| Continuous Drain Current                | $I_D$      | $T_a = 25^\circ C$  | A            |
|   |            | $T_a = 100^\circ C$ |              |
| Pulsed Drain Current                    | $I_{DM}$   | 20                  | 4.9          |
| Power Dissipation                       | $P_D$      | $T_a = 25^\circ C$  | W            |
|   |            | $T_a = 70^\circ C$  |              |
| Thermal Resistance.Junction- to-Ambient | $R_{thJA}$ | $t \leq 5sec$       | $^\circ C/W$ |
|   |            | Steady State        |              |
| Thermal Resistance.Junction- to-Lead    | $R_{thJL}$ | 60                  | 125          |
| Junction Temperature                    | $T_J$      | 150                 | $^\circ C$   |
| Storage Temperature Range               | $T_{stg}$  | -55 to 150          |              |

## ■ Electrical Characteristics Ta = 25°C

| Parameter                             | Symbol              | Testconditions   | Min  | Typ   | Max | Unit |
|---------------------------------------|---------------------|--|--|-------|-----|------|
| Drain-Source Breakdown Voltage        | V <sub>DSS</sub>    | I <sub>D</sub> =250 μA, V <sub>GS</sub> =0V                      | 30   |       |     | V    |
| Zero Gate Voltage Drain Current       | I <sub>DSS</sub>    | V <sub>DS</sub> =24V, V <sub>GS</sub> =0V                        |  |       | 1   | μA   |
|                                       |                     | V <sub>DS</sub> =24V, V <sub>GS</sub> =0V, T <sub>J</sub> =55°C  |  |       | 5   |      |
| Gate-Body leakage current             | I <sub>GSS</sub>    | V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V                       |  |       | 100 | nA   |
| Gate Threshold Voltage                | V <sub>GS(th)</sub> | V <sub>DS</sub> =V <sub>GS</sub> I <sub>D</sub> =250 μA          | 1  | 1.9   | 3   | V    |
| On state drain current                | I <sub>D(ON)</sub>  | V <sub>GS</sub> =4.5V, V <sub>DS</sub> =5V                       | 20   |       |     | A    |
| Static Drain-Source On-Resistance     | R <sub>DS(ON)</sub> | V <sub>GS</sub> =10V, I <sub>D</sub> =5.8A                       |  |       | 25  | mΩ   |
|                                       |                     | V <sub>GS</sub> =4.5V, I <sub>D</sub> =5.0A                      |  |       | 36  | mΩ   |
| Forward Transconductance              | g <sub>FS</sub>     | V <sub>DS</sub> =5V, I <sub>D</sub> =5.8A                        | 10   |       |     | S    |
| Diode Forward Voltage                 | V <sub>SD</sub>     | I <sub>S</sub> =1A   |  | 0.76  | 1   | V    |
| Maximum Body-Diode Continuous Current | I <sub>S</sub>      |  |  |       | 2.5 | A    |
| Reverse Transfer Capacitance          | C <sub>iss</sub>    | V <sub>GS</sub> =0V, V <sub>DS</sub> =15V, f=1MHz                |  | 680   | 820 | pF   |
| Gate resistance                       | C <sub>oss</sub>    |  |  | 102   |     | pF   |
| Input Capacitance                     | C <sub>rss</sub>    |  |  | 77    |     | pF   |
| Output Capacitance                    | R <sub>g</sub>      | V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz                 |  | 3     | 3.6 | Ω    |
| Total Gate Charge (10V)               | Q <sub>g</sub>      | V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, I <sub>D</sub> =5.8A |  | 13.88 | 17  | nC   |
| Total Gate Charge (4.5V)              | Q <sub>g</sub>      |  |  | 6.78  | 8.1 | nC   |
| Gate Source Charge                    | Q <sub>gs</sub>     |  |  | 1.8   |     | nC   |
| Gate Drain Charge                     | Q <sub>gd</sub>     |  |  | 3.12  |     | nC   |
| Turn-On Rise Time                     | t <sub>D(on)</sub>  |  | V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, R <sub>L</sub> =2.7 Ω, R <sub>GEN</sub> =3 Ω |       | 4.6 | 6.5  |
| Turn-Off DelayTime                    | t <sub>r</sub>      |  |  | 3.8   | 5.7 | ns   |
| Turn-Off Fall Time                    | t <sub>D(off)</sub> |  |  | 20.9  | 30  | ns   |
| Turn-On DelayTime                     | t <sub>f</sub>      |  |  | 5     | 7.5 | ns   |
| Body Diode Reverse Recovery Time      | t <sub>rr</sub>     | I <sub>F</sub> =5.8A, di/dt=100A/μs                              |  | 16.1  | 21  | ns   |
| Body Diode Reverse Recovery Charge    | Q <sub>rr</sub>     | I <sub>F</sub> =5.8A, di/dt=100A/μs                              |  | 7.4   | 10  | nC   |

■ Typical Characteristics

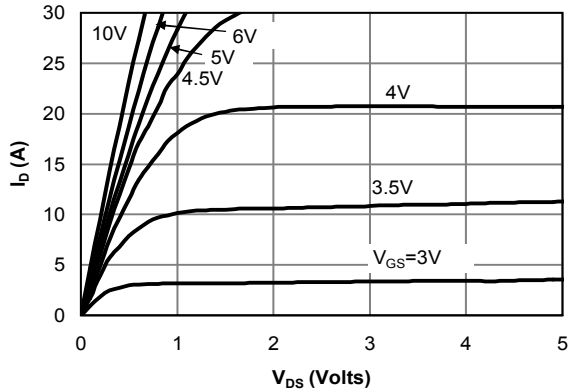


Fig 1: On-Region Characteristics

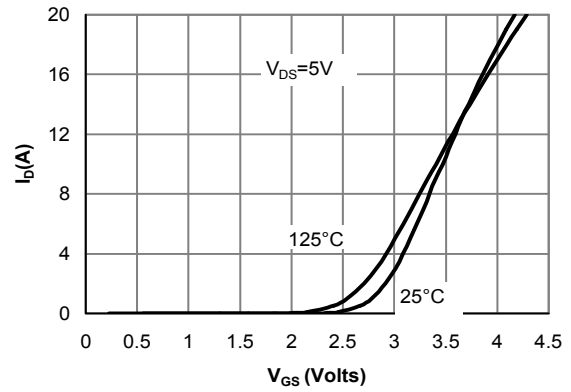


Figure 2: Transfer Characteristics

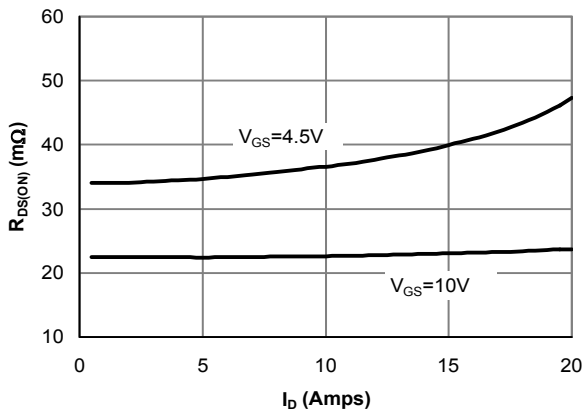


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

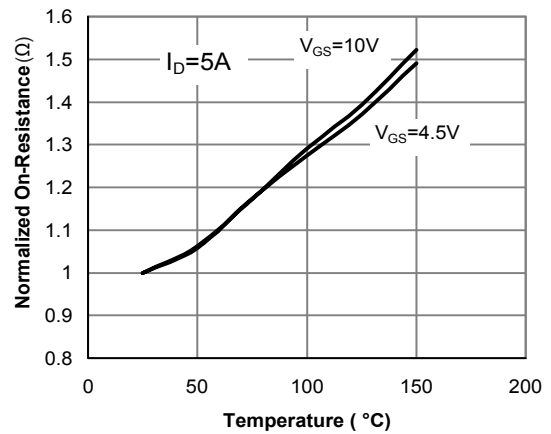


Figure 4: On-Resistance vs. Junction Temperature

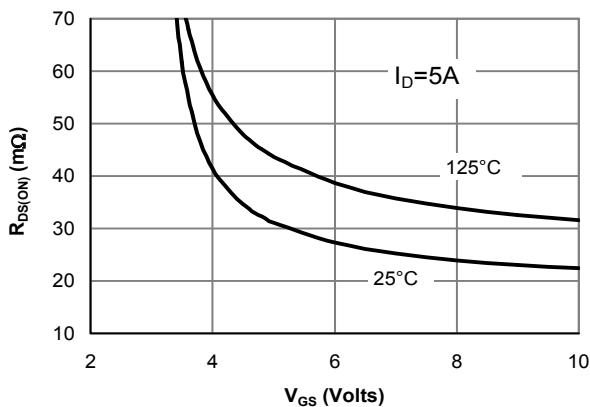


Figure 5: On-Resistance vs. Gate-Source Voltage

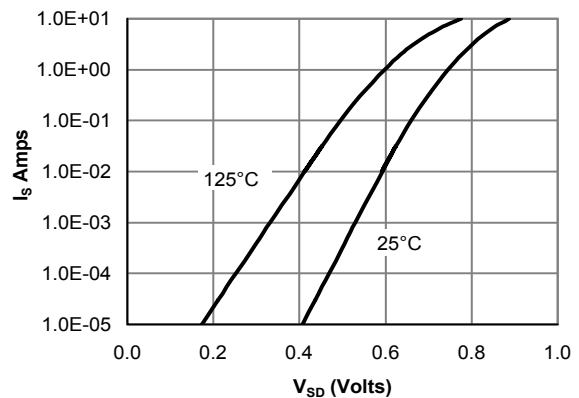


Figure 6: Body diode characteristics

■ Typical Characteristics

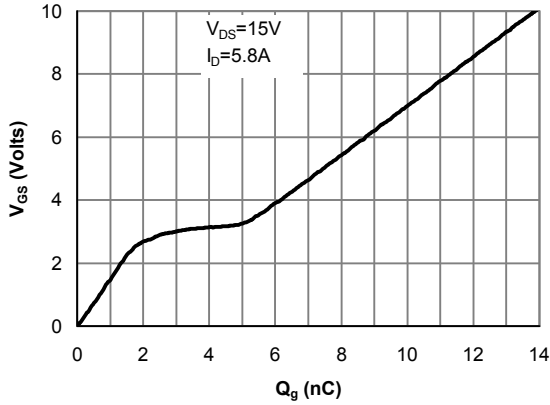


Figure 7: Gate-Charge characteristics

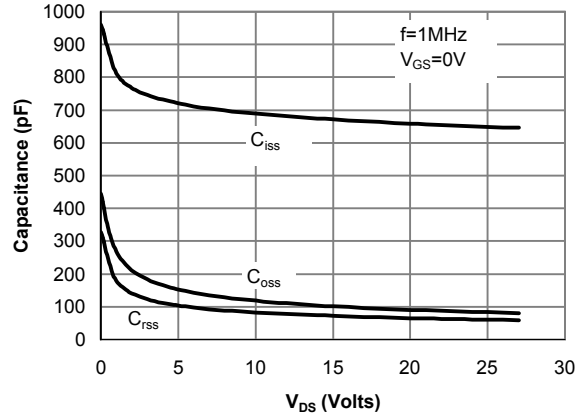


Figure 8: Capacitance Characteristics

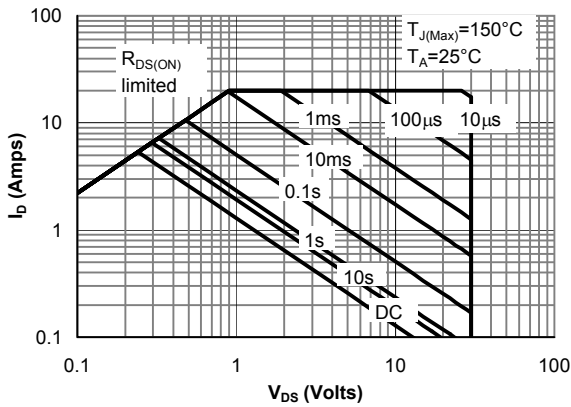


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

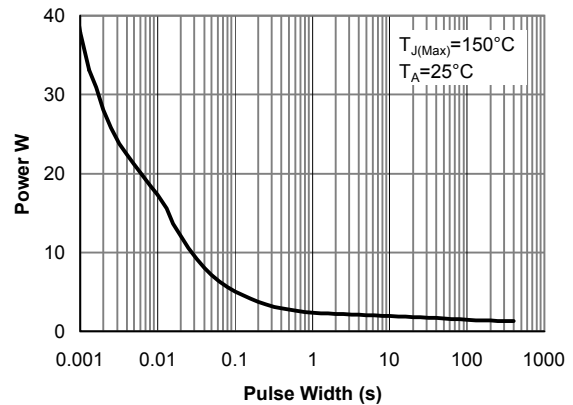


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

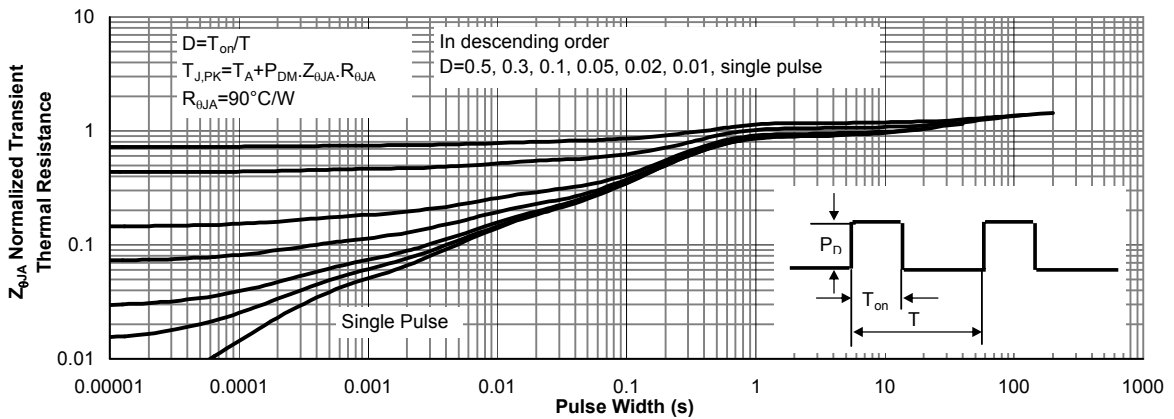
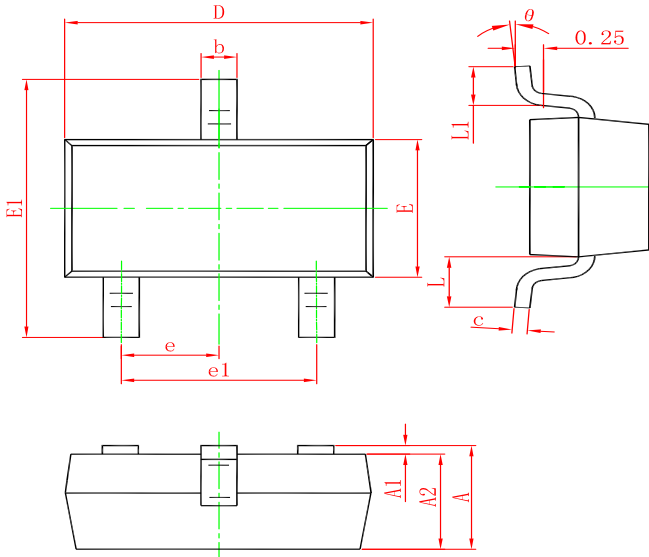


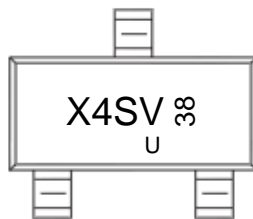
Figure 11: Normalized Maximum Transient Thermal Impedance

SOT-23 PACKAGE OUTLINE DIMENSIONS



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min.                      | Max.  | Min.                 | Max.  |
| A      | 0.900                     | 1.150 | 0.035                | 0.045 |
| A1     | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2     | 0.900                     | 1.050 | 0.035                | 0.041 |
| b      | 0.300                     | 0.500 | 0.012                | 0.020 |
| c      | 0.080                     | 0.150 | 0.003                | 0.006 |
| D      | 2.800                     | 3.000 | 0.110                | 0.118 |
| E      | 1.200                     | 1.400 | 0.047                | 0.055 |
| E1     | 2.250                     | 2.550 | 0.089                | 0.100 |
| e      | 0.950 TYP.                |       | 0.037 TYP.           |       |
| e1     | 1.800                     | 2.000 | 0.071                | 0.079 |
| L      | 0.550 REF.                |       | 0.022 REF.           |       |
| L1     | 0.300                     | 0.500 | 0.012                | 0.020 |
| theta  | 0°                        | 8°    | 0°                   | 8°    |

Marking



Ordering information

| Order code | Package | Baseqty | Deliverymode  |
|------------|---------|---------|---------------|
| AO3404A    | SOT-23  | 3000    | Tape and reel |