

## Features

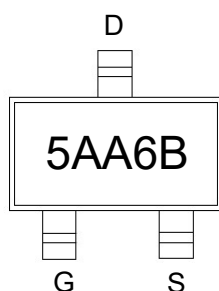
- Fast switching capability
- 100% avalanche tested
- Improved dv/dt capability

## Application

- Switch Mode Power Supply (SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)

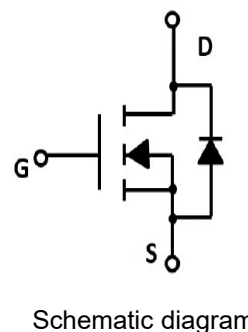
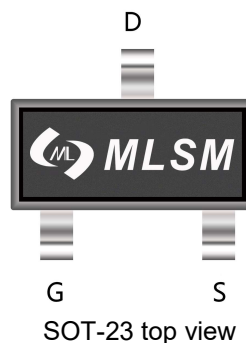
## Product Summary

| $V_{DS}$ | $R_{DS(ON)}$ MAX | $I_D$ MAX |
|----------|------------------|-----------|
| 500V     | 25Ω@10V          | 0.6A      |



5AA6B: Device code

Marking and pin assignment



Halogen-Free

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

| Symbol                                                 | Parameter                        | Rating                        | Unit |
|--------------------------------------------------------|----------------------------------|-------------------------------|------|
| <b>Common Ratings (TC=25°C Unless Otherwise Noted)</b> |                                  |                               |      |
| $V_{DS}$                                               | Drain-Source Breakdown Voltage   | 500                           | V    |
| $V_{GS}$                                               | Gate-Source Voltage              | ±30                           | V    |
| $T_J$                                                  | Maximum Junction Temperature     | 150                           | °C   |
| $T_{STG}$                                              | Storage Temperature Range        | -50 to 155                    | °C   |
| $I_S$                                                  | Diode Continuous Forward Current | $T_c=25^\circ\text{C}$<br>0.6 | A    |

## Mounted on Large Heat Sink

|                 |                                     |                               |      |
|-----------------|-------------------------------------|-------------------------------|------|
| $I_{DM}$        | Pulse Drain Current Tested          | $T_c=25^\circ\text{C}$<br>2.4 | A    |
| $I_D$           | Continuous Drain Current            | $T_c=25^\circ\text{C}$<br>0.6 | A    |
| $P_D$           | Maximum Power Dissipation           | $T_c=25^\circ\text{C}$<br>0.5 | W    |
| $R_{\theta JA}$ | Thermal Resistance Junction-Ambient | 150                           | °C/W |

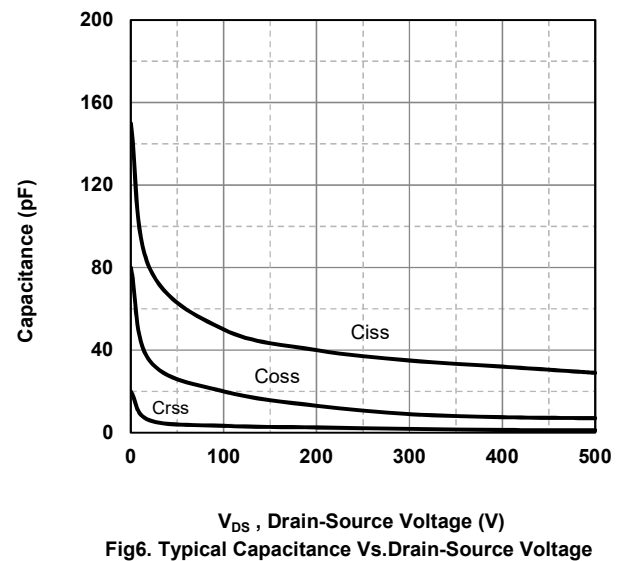
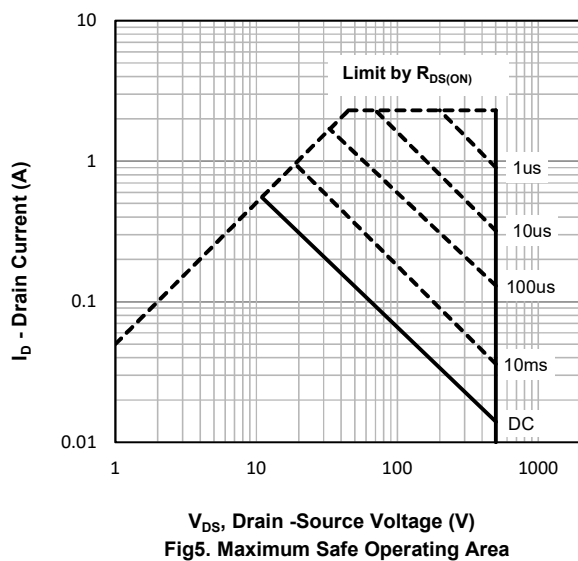
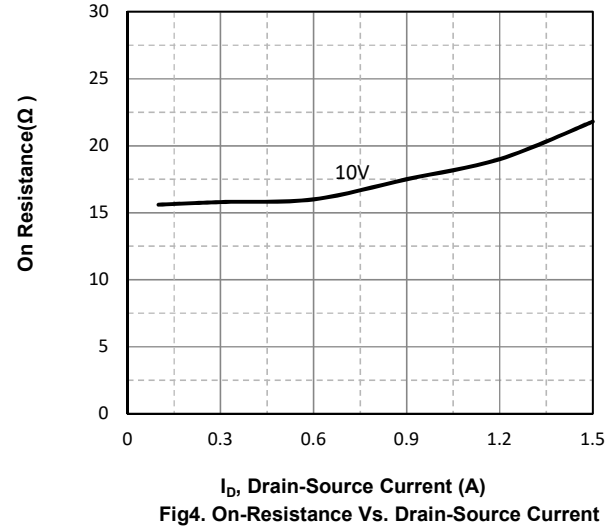
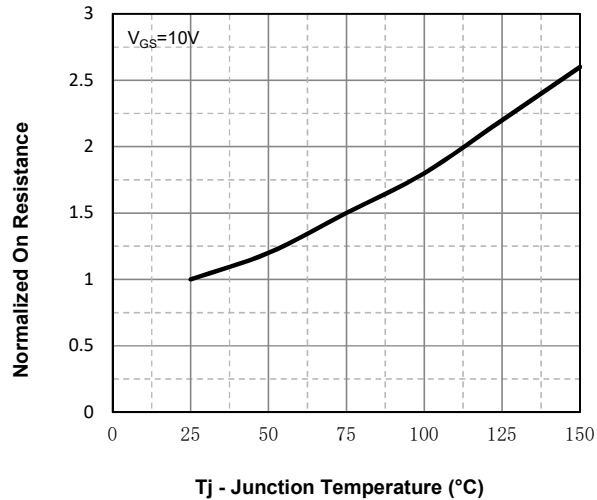
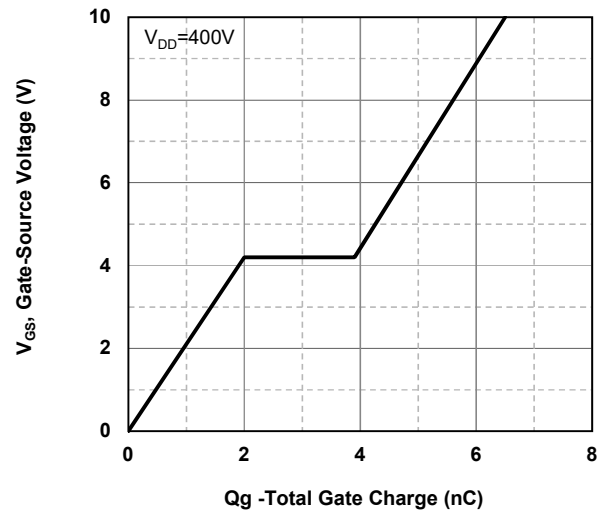
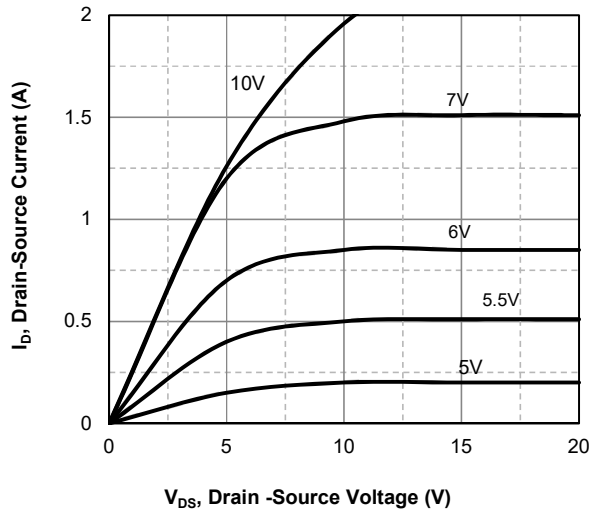
## Ordering Information (Example)

| Type     | Package | Marking | Minimum Package(pcs) | Inner Box Quantity(pcs) | Outer Carton Quantity(pcs) | Delivery Mode |
|----------|---------|---------|----------------------|-------------------------|----------------------------|---------------|
| MLS5AA6B | SOT-23  | 5AA6B   | 3,000                | 45,000                  | 180,000                    | 7"reel        |

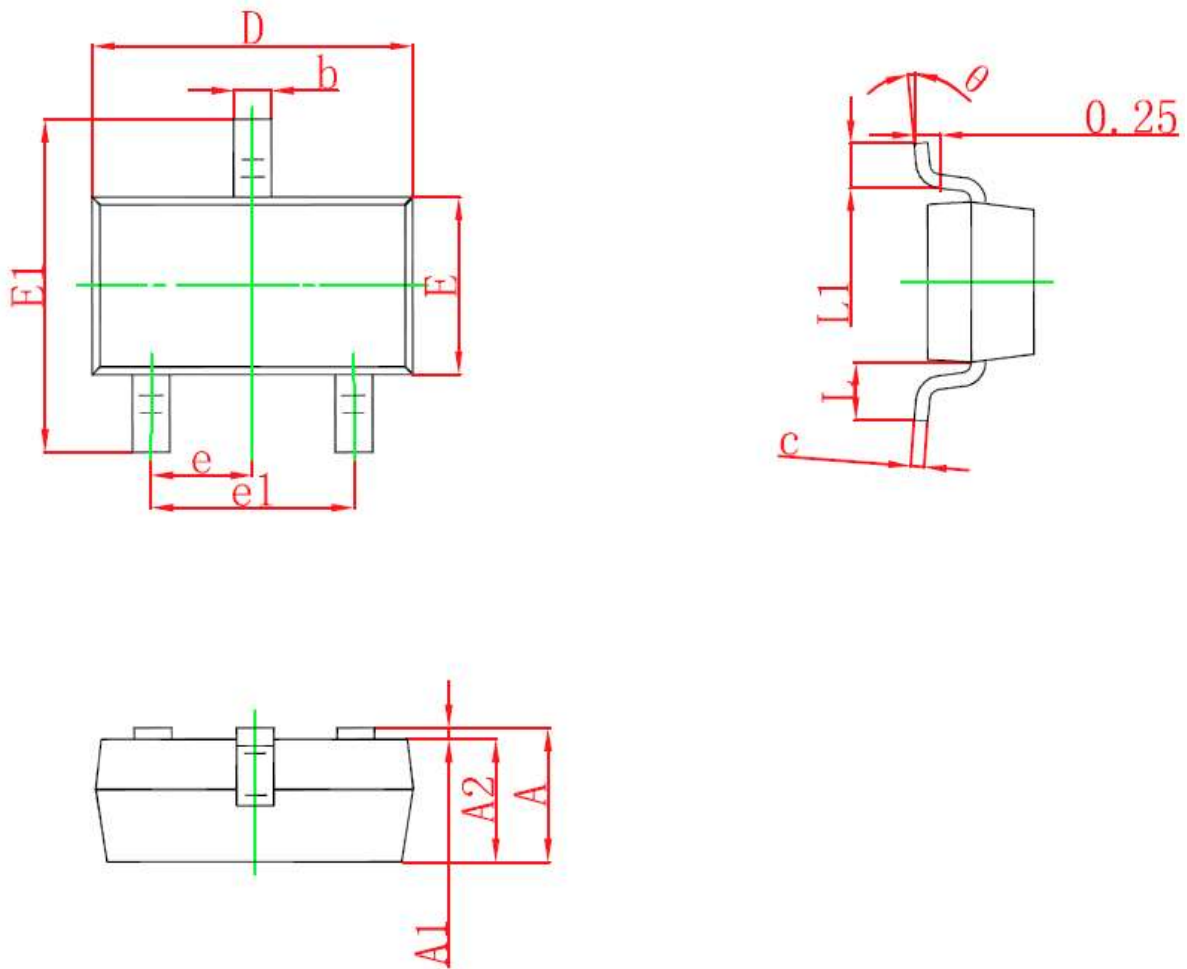


| Electrical Characteristics (TJ=25°C unless otherwise noted)              |                                  |                                                                                        |     |     |      |      |
|--------------------------------------------------------------------------|----------------------------------|----------------------------------------------------------------------------------------|-----|-----|------|------|
| Symbol                                                                   | Parameter                        | Condition                                                                              | Min | Typ | Max  | Unit |
| Static Electrical Characteristics @ TJ = 25°C (unless otherwise stated)  |                                  |                                                                                        |     |     |      |      |
| BV <sub>(BR)DSS</sub>                                                    | Drain-Source Breakdown Voltage   | V <sub>GS</sub> =0V, I <sub>D</sub> =250μA                                             | 500 | --  | --   | V    |
| I <sub>DSS</sub>                                                         | Zero Gate Voltage Drain Current  | V <sub>DS</sub> =500V, V <sub>GS</sub> =0V                                             | --  | --  | 1    | μA   |
| I <sub>GSS</sub>                                                         | Gate-Body Leakage Current        | V <sub>GS</sub> =±30V, V <sub>DS</sub> =0V                                             | --  | --  | ±100 | nA   |
| V <sub>GS(th)</sub>                                                      | Gate Threshold Voltage           | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA                               | 1   | --  | 2.5  | V    |
| R <sub>DS(on)</sub>                                                      | Drain-Source On-State Resistance | V <sub>GS</sub> =10V, I <sub>D</sub> =0.3A                                             | --  | 16  | 25   | Ω    |
| Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated) |                                  |                                                                                        |     |     |      |      |
| C <sub>ISS</sub>                                                         | Input Capacitance                | V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1MHz                                      | --  | 30  | --   | pF   |
| C <sub>OSS</sub>                                                         | Output Capacitance               |                                                                                        | --  | 8.5 | --   | pF   |
| C <sub>RSS</sub>                                                         | Reverse Transfer Capacitance     |                                                                                        | --  | 1.6 | --   | pF   |
| Switching Characteristics                                                |                                  |                                                                                        |     |     |      |      |
| Q <sub>g</sub>                                                           | Total Gate Charge                | V <sub>DD</sub> =400V, I <sub>D</sub> =0.6A, V <sub>GS</sub> =10V                      | --  | 5   | --   | nC   |
| Q <sub>gs</sub>                                                          | Gate Source Charge               |                                                                                        | --  | 1.5 | --   | nC   |
| Q <sub>gd</sub>                                                          | Gate Drain Charge                |                                                                                        | --  | 1.4 | --   | nC   |
| t <sub>d(on)</sub>                                                       | Turn-on Delay Time               | V <sub>DD</sub> =250V, I <sub>D</sub> =0.3A, V <sub>GS</sub> =10V, R <sub>G</sub> =25Ω | --  | 2.2 | --   | nS   |
| t <sub>r</sub>                                                           | Turn-on Rise Time                |                                                                                        | --  | 36  | --   | nS   |
| t <sub>d(off)</sub>                                                      | Turn-Off Delay Time              |                                                                                        | --  | 18  | --   | nS   |
| t <sub>f</sub>                                                           | Turn-Off Fall Time               |                                                                                        | --  | 65  | --   | nS   |
| Source- Drain Diode Characteristics                                      |                                  |                                                                                        |     |     |      |      |
| V <sub>SD</sub>                                                          | Forward on voltage               | Tj=25°C, Is=0.6A                                                                       | --  | --  | 1.2  | V    |

## Typical Operating Characteristics



**SOT-23 Package information**



| Symbol   | Dimensions in Millimeters(mm) |       | 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 |
| E1       | 2.250                         | 2.550 | 0.088                | 0.100 |
| E        | 1.200                         | 1.400 | 0.047                | 0.055 |
| e        | 0.950TYP                      |       | 0.037TYP             |       |
| 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°    |