

## **N-Ch 100V Fast Switching MOSFETs**

### ❖ GENERAL DESCRIPTION

The AM6008 is the high cell density trench N-ch MOSFETs, which provide excellent  $R_{DS(ON)}$  and gate charge for most of the Synchronous Rectification for AC/DC Quick Charger.

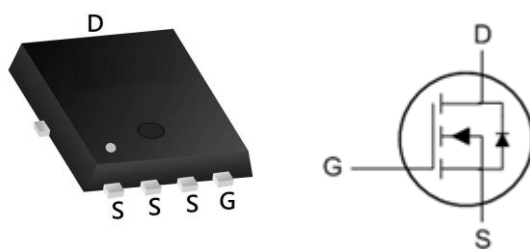
### ❖ FEATURES

- 100% EAS Guaranteed
- Low  $R_{DS(ON)}$
- Low Gate Charge
- RoHS and Halogen free compliant

#### Product Summary

| BVDSS | $R_{DS(ON)}$ | ID  |
|-------|--------------|-----|
| 100V  | 8m $\Omega$  | 48A |

#### PRPAK5X6 Pin configuration





**❖ ELECTRICAL CHARACTERISTICS**

 (T<sub>J</sub>=25 °C, unless otherwise noted)

| Symbol              | Parameter                                      | Conditions   | Min. | Typ. | Max. | Unit |
|---------------------|--|--|------|------|------|------|
| BV <sub>DSS</sub>   | Drain-Source Breakdown Voltage                 | V <sub>GS</sub> =0V, I <sub>D</sub> =250uA   | 100  | ---  | ---  | V    |
| R <sub>DS(ON)</sub> | Static Drain-Source On-Resistance <sup>2</sup> | V <sub>GS</sub> =10V, I <sub>D</sub> =13.5A  | ---  | 6.6  | 8    | mΩ   |
|                     | Static Drain-Source On-Resistance <sup>2</sup> | V <sub>GS</sub> =4.5V, I <sub>D</sub> =11.5A   | ---  | 8.7  | 10.5 |      |
| V <sub>GS(th)</sub> | Gate Threshold Voltage                         | V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA                             | 1.2  | ---  | 2.3  | V    |
| I <sub>DSS</sub>    | Drain-Source Leakage Current                   | V <sub>DS</sub> =80V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C                      | ---  | ---  | 1    | uA   |
|                     |  | V <sub>DS</sub> =80V, V <sub>GS</sub> =0V, T <sub>J</sub> =55°C                      | ---  | ---  | 5    |      |
| I <sub>GSS</sub>    | Gate-Source Leakage Current                    | V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V   | ---  | ---  | ±100 | nA   |
| g <sub>fs</sub>     | Forward Transconductance                       | V <sub>DS</sub> =5V, I <sub>D</sub> =20A   | ---  | 85   | ---  | S    |
| Q <sub>g</sub>      | Total Gate Charge (10V)                        | V <sub>DS</sub> =50V, V <sub>GS</sub> =10V, I <sub>D</sub> =13.5A                    | ---  | 45   | ---  | nC   |
| Q <sub>g</sub>      | Total Gate Charge (4.5V)                       |  | ---  | 19.3 | ---  |      |
| Q <sub>gs</sub>     | Gate-Source Charge                             |  | ---  | 9.5  | ---  |      |
| Q <sub>gd</sub>     | Gate-Drain Charge                              |  | ---  | 4.8  | ---  |      |
| T <sub>d(on)</sub>  | Turn-On Delay Time                             | V <sub>DD</sub> =50V, V <sub>GS</sub> =10V, R <sub>G</sub> =3, I <sub>D</sub> =13.5A | ---  | 10   | ---  | ns   |
| T <sub>r</sub>      | Rise Time                                      |  | ---  | 6.5  | ---  |      |
| T <sub>d(off)</sub> | Turn-Off Delay Time                            |  | ---  | 45   | ---  |      |
| T <sub>f</sub>      | Fall Time                                      |  | ---  | 7.5  | ---  |      |
| C <sub>iss</sub>    | Input Capacitance                              | V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, f=1MHz                                    | ---  | 3320 | ---  | pF   |
| C <sub>oss</sub>    | Output Capacitance                             |  | ---  | 605  | ---  |      |
| C <sub>rss</sub>    | Reverse Transfer Capacitance                   |  | ---  | 20   | ---  |      |

**❖ Diode Characteristics**

| Symbol          | Parameter                                  | Conditions  | Min. | Typ. | Max. | Unit |
|-----------------|--|---|------|------|------|------|
| I <sub>S</sub>  | Continuous Source Current <sup>1,5,6</sup> | V <sub>G</sub> =V <sub>D</sub> =0V, Force Current             | ---  | ---  | 48   | A    |
| V <sub>SD</sub> | Diode Forward Voltage <sup>2</sup>         | V <sub>GS</sub> =0V, I <sub>S</sub> =1A, T <sub>J</sub> =25°C | ---  | ---  | 1.1  | V    |
| t <sub>rr</sub> | Reverse Recovery Time                      | I <sub>F</sub> =13.5A, di/dt=100A/μs,                         | ---  | 33   | ---  | nS   |
| Q <sub>rr</sub> | Reverse Recovery Charge                    | T <sub>J</sub> =25°C  | ---  | 150  | ---  | nC   |

Note :

- The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 20Z copper.
- The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%
- The EAS data shows Max. rating. The test condition is V<sub>DD</sub>=25V, V<sub>GS</sub>=10V, L=0.3mH, I<sub>AS</sub>=35A
- The power dissipation is limited by 150°C junction temperature
- The data is theoretically the same as I<sub>D</sub> and I<sub>DM</sub>, in real applications, should be limited by total power dissipation.
- The maximum current rating is package limited.

❖ TYPICAL CHARACTERISTICS

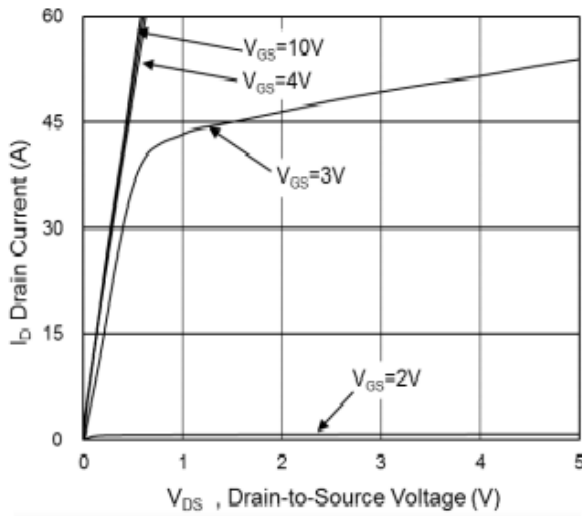


Fig.1 Typical Output Characteristics

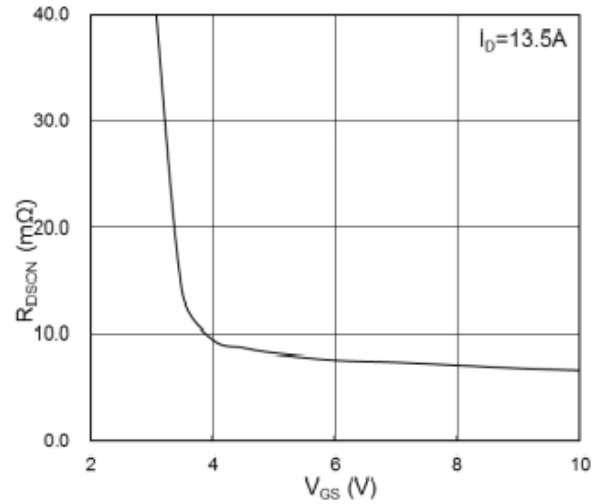


Fig.2 On-Resistance vs G-S Voltage

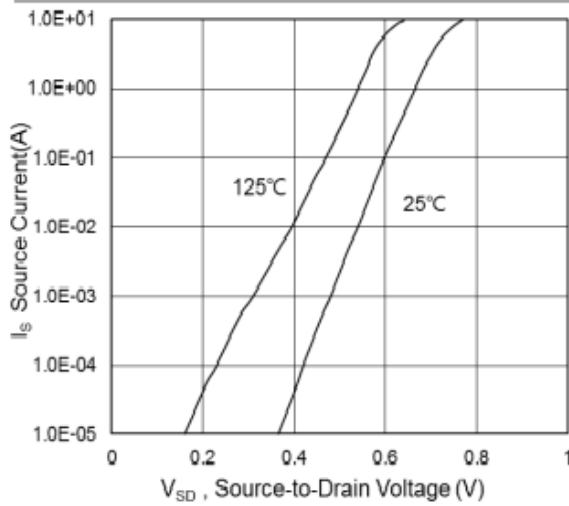


Fig.3 Source-Drain Forward Characteristics

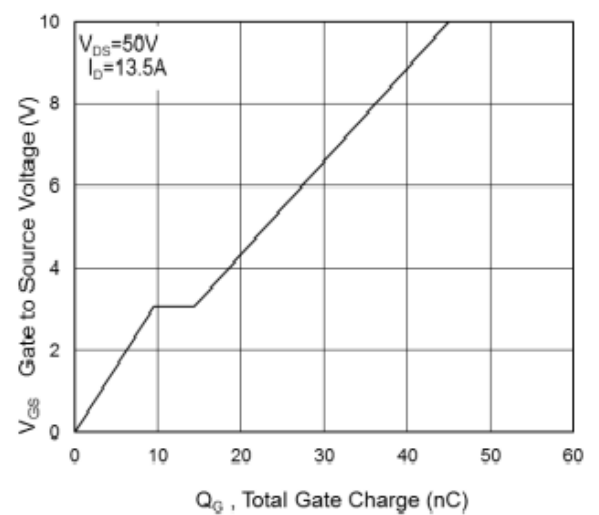
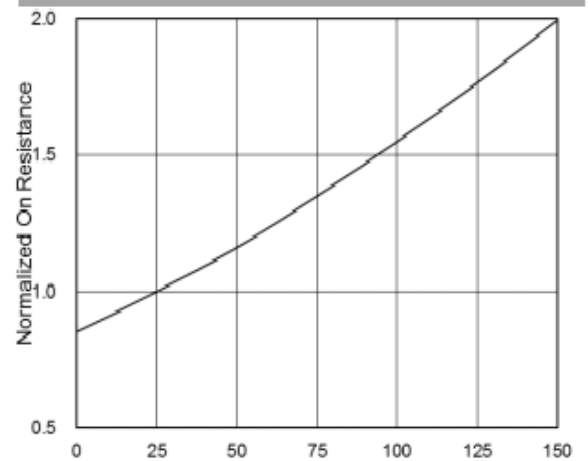
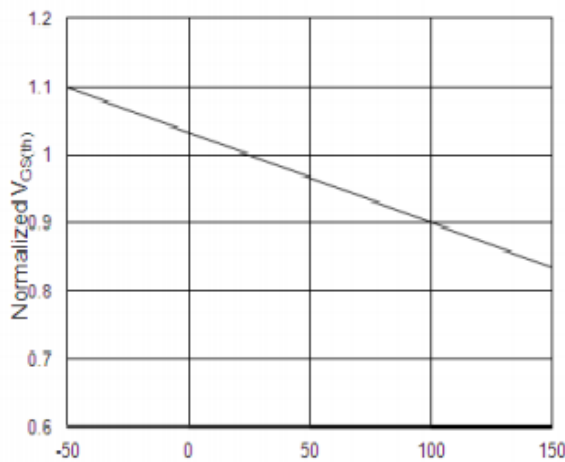


Fig.4 Gate-Charge Characteristics



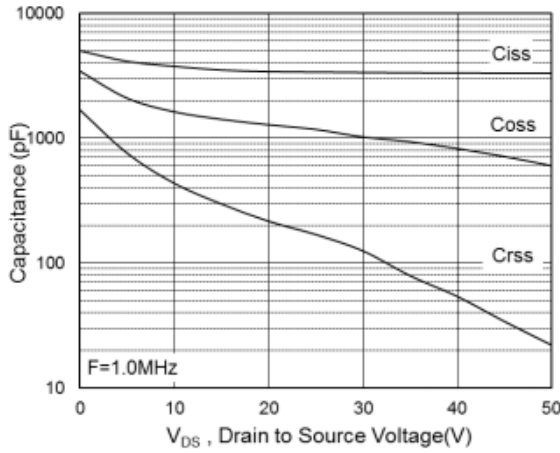


Fig.7 Capacitance

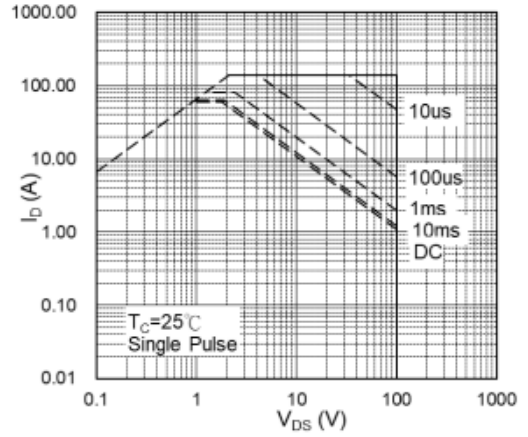


Fig.8 Safe Operating Area

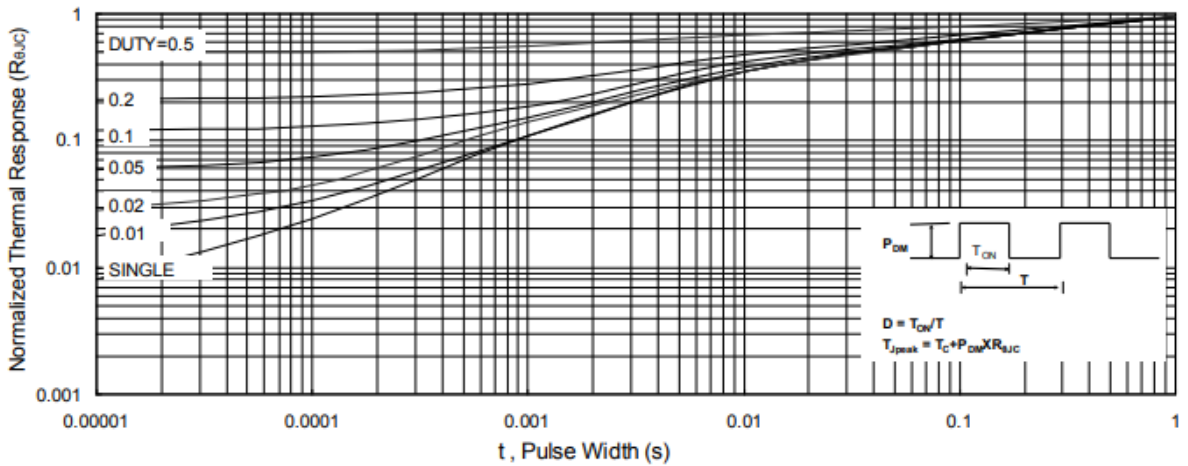


Fig.9 Normalized Maximum Transient Thermal Impedance

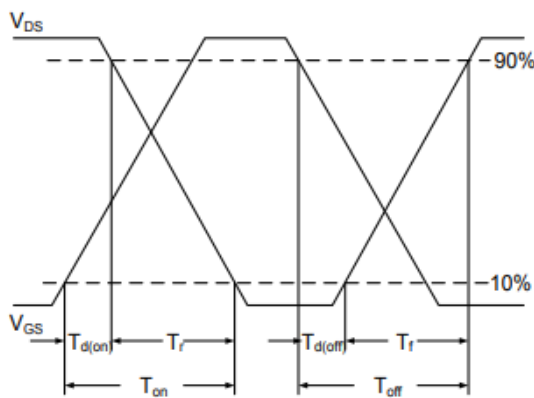


Fig.10 Switching Time Waveform

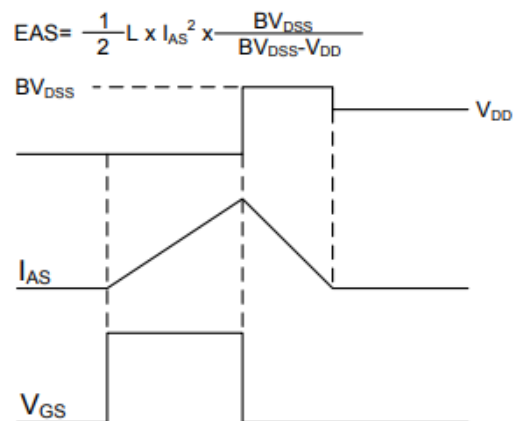
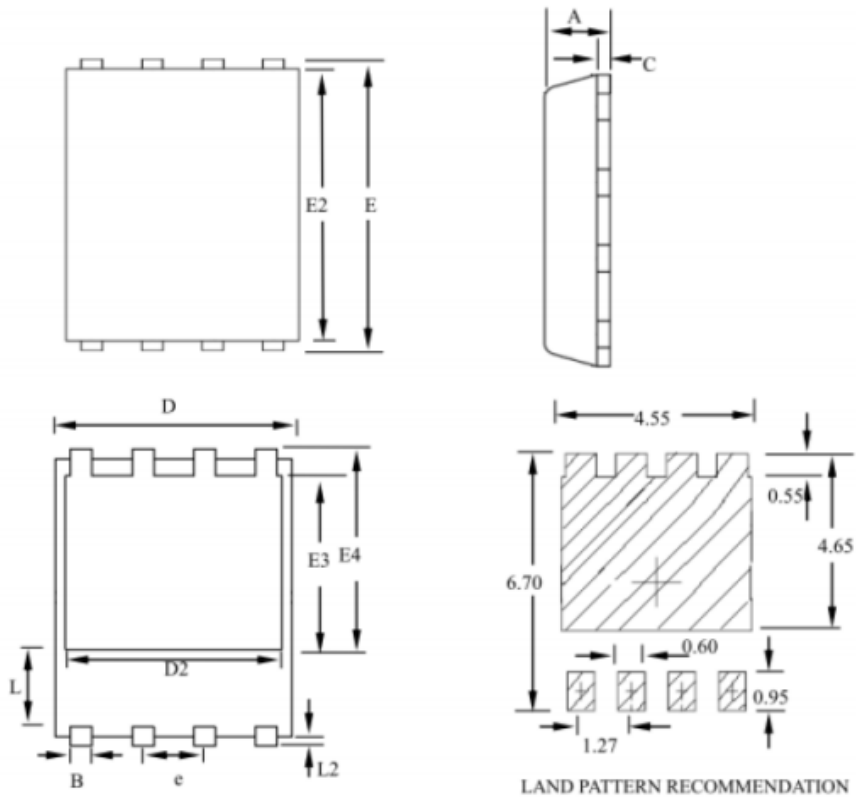


Fig.11 Unclamped Inductive Switching Waveform

$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$

❖ PACKAGE OUTLINES

PRPAK5X6 Package Outline Dimensions



| SYMBOLS | MILLIMETERS |      |      | INCHES |       |       |
|---------|-------------|------|------|--------|-------|-------|
|         | MIN         | NOM  | MAX  | MIN    | NOM   | MAX   |
| A       | 0.80        | --   | 1.20 | 0.031  | --    | 0.047 |
| B       | 0.30        | --   | 0.51 | 0.012  | --    | 0.020 |
| C       | 0.15        | --   | 0.35 | 0.006  | --    | 0.014 |
| D       | 4.80        | --   | 5.30 | 0.189  | --    | 0.209 |
| D2      | 3.61        | --   | 4.35 | 0.142  | --    | 0.171 |
| E       | 5.90        | --   | 6.35 | 0.232  | --    | 0.250 |
| E2      | 5.42        | --   | 5.90 | 0.213  | --    | 0.232 |
| E3      | 3.23        | --   | 3.90 | 0.127  | --    | 0.154 |
| E4      | 3.69        | --   | 4.55 | 0.145  | --    | 0.179 |
| L       | 0.61        | --   | 1.80 | 0.024  | --    | 0.071 |
| L2      | 0.05        | --   | 0.36 | 0.002  | --    | 0.014 |
| e       | --          | 1.27 | --   | --     | 0.050 | --    |