

**G2308E****N-CHANNEL ENHANCEMENT MODE POWER MOSFET**

|         |       |
|---------|-------|
| BVDSS   | 20V   |
| RDS(ON) | 600mΩ |
| ID      | 1.2A  |

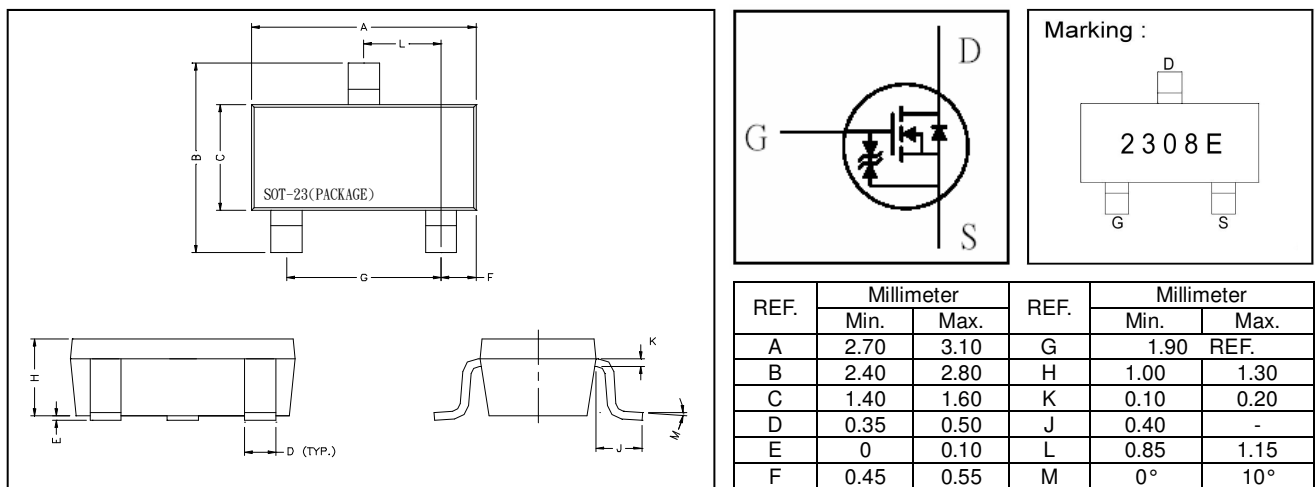
**Description**

The G2308E utilized advanced processing techniques to achieve the lowest possible on-resistance, extremely efficient and cost-effectiveness device.

The SOT-23 package is universally used for all commercial-industrial applications.

**Features**

- \*Capable of 2.5V gate drive
- \*Lower on-resistance
- \*2KV ESD Capability

**Package Dimensions****Absolute Maximum Ratings**

| Parameter                                             | Symbol                | Ratings    | Unit           |
|-------------------------------------------------------|-----------------------|------------|----------------|
| Drain-Source Voltage                                  | $V_{DS}$              | 20         | V              |
| Gate-Source Voltage                                   | $V_{GS}$              | $\pm 6$    | V              |
| Continuous Drain Current <sup>3</sup> , $V_{GS}@4.5V$ | $I_D @TA=25^{\circ}C$ | 1.2        | A              |
| Continuous Drain Current <sup>3</sup> , $V_{GS}@4.5V$ | $I_D @TA=70^{\circ}C$ | 1.0        | A              |
| Pulsed Drain Current <sup>1,2</sup>                   | $I_{DM}$              | 5          | A              |
| Total Power Dissipation                               | $P_D @TA=25^{\circ}C$ | 1.38       | W              |
| Linear Derating Factor                                |                       | 0.01       | W/ $^{\circ}C$ |
| Operating Junction and Storage Temperature Range      | $T_j, T_{stg}$        | -55 ~ +150 | $^{\circ}C$    |

**Thermal Data**

| Parameter                                             | Symbol      | Ratings | Unit          |
|-------------------------------------------------------|-------------|---------|---------------|
| Thermal Resistance Junction-ambient <sup>3</sup> Max. | $R_{thj-a}$ | 90      | $^{\circ}C/W$ |

**Electrical Characteristics (T<sub>j</sub> = 25°C unless otherwise specified)**

| Parameter                                          | Symbol                         | Min. | Typ. | Max. | Unit | Test Conditions                                                                                                    |
|----------------------------------------------------|--------------------------------|------|------|------|------|--------------------------------------------------------------------------------------------------------------------|
| Drain-Source Breakdown Voltage                     | BV <sub>DSS</sub>              | 20   | -    | -    | V    | V <sub>GS</sub> =0, I <sub>D</sub> =250uA                                                                          |
| Breakdown Voltage Temperature Coefficient          | $\Delta BV_{DSS} / \Delta T_j$ | -    | 0.1  | -    | V/°C | Reference to 25°C, I <sub>D</sub> =1mA                                                                             |
| Gate Threshold Voltage                             | V <sub>GS(th)</sub>            | 0.5  | -    | 1.2  | V    | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA                                                           |
| Forward Transconductance                           | g <sub>fs</sub>                | -    | 1    | -    | S    | V <sub>DS</sub> =5V, I <sub>D</sub> =1.2A                                                                          |
| Gate-Source Leakage Current                        | I <sub>GSS</sub>               | -    | -    | ±10  | uA   | V <sub>GS</sub> = ±6V                                                                                              |
| Drain-Source Leakage Current(T <sub>j</sub> =25°C) | I <sub>DSS</sub>               | -    | -    | 1    | uA   | V <sub>DS</sub> =20V, V <sub>GS</sub> =0                                                                           |
| Drain-Source Leakage Current(T <sub>j</sub> =70°C) |                                | -    | -    | 10   | uA   | V <sub>DS</sub> =16V, V <sub>GS</sub> =0                                                                           |
| Static Drain-Source On-Resistance                  | R <sub>DS(ON)</sub>            | -    | -    | 600  | mΩ   | V <sub>GS</sub> =4.5V, I <sub>D</sub> =1.2A                                                                        |
|                                                    |                                | -    | -    | 850  |      | V <sub>GS</sub> =2.5V, I <sub>D</sub> =0.5A                                                                        |
| Total Gate Charge <sup>2</sup>                     | Q <sub>g</sub>                 | -    | 1.2  | 2    | nC   | I <sub>D</sub> =1.2A<br>V <sub>DS</sub> =16V<br>V <sub>GS</sub> =4.5V                                              |
| Gate-Source Charge                                 | Q <sub>gs</sub>                | -    | 0.4  | -    |      |                                                                                                                    |
| Gate-Drain ("Miller") Charge                       | Q <sub>gd</sub>                | -    | 0.3  | -    |      |                                                                                                                    |
| Turn-on Delay Time <sup>2</sup>                    | T <sub>d(on)</sub>             | -    | 17   | -    | ns   | V <sub>DS</sub> =10V<br>I <sub>D</sub> =1.2A<br>V <sub>GS</sub> =5V<br>R <sub>G</sub> =3.3Ω<br>R <sub>D</sub> =10Ω |
| Rise Time                                          | T <sub>r</sub>                 | -    | 36   | -    |      |                                                                                                                    |
| Turn-off Delay Time                                | T <sub>d(off)</sub>            | -    | 76   | -    |      |                                                                                                                    |
| Fall Time                                          | T <sub>f</sub>                 | -    | 73   | -    |      |                                                                                                                    |
| Input Capacitance                                  | C <sub>iss</sub>               | -    | 37   | 60   | pF   | V <sub>GS</sub> =0V<br>V <sub>DS</sub> =10V<br>f=1.0MHz                                                            |
| Output Capacitance                                 | C <sub>oss</sub>               | -    | 17   | -    |      |                                                                                                                    |
| Reverse Transfer Capacitance                       | C <sub>rss</sub>               | -    | 13   | -    |      |                                                                                                                    |

**Source-Drain Diode**

| Parameter                       | Symbol          | Min. | Typ. | Max. | Unit | Test Conditions                           |
|---------------------------------|-----------------|------|------|------|------|-------------------------------------------|
| Forward On Voltage <sup>2</sup> | V <sub>SD</sub> | -    | -    | 1.2  | V    | I <sub>S</sub> =1.2A, V <sub>GS</sub> =0V |

Notes: 1. Pulse width limited by Max. junction temperature.

2. Pulse width ≤ 300us, duty cycle ≤ 2%.

3. Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board; 270°C/W when mounted on min. copper pad.

## Characteristics Curve

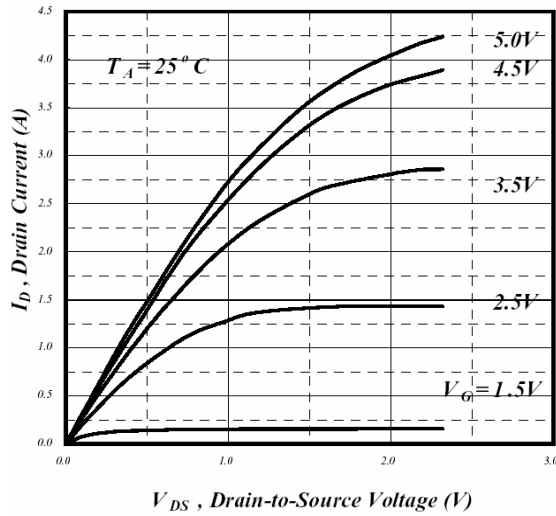


Fig 1. Typical Output Characteristics

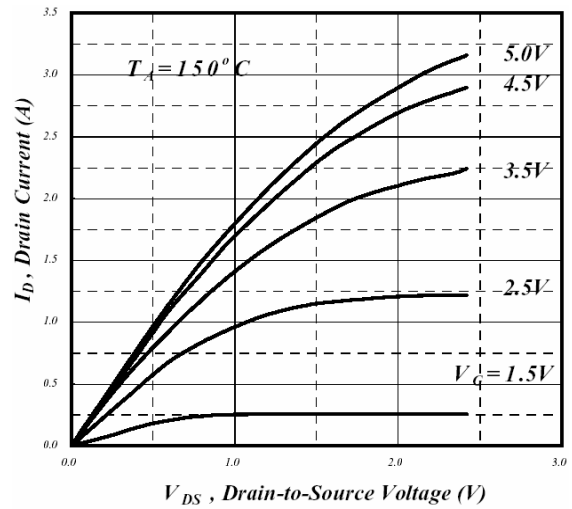


Fig 2. Typical Output Characteristics

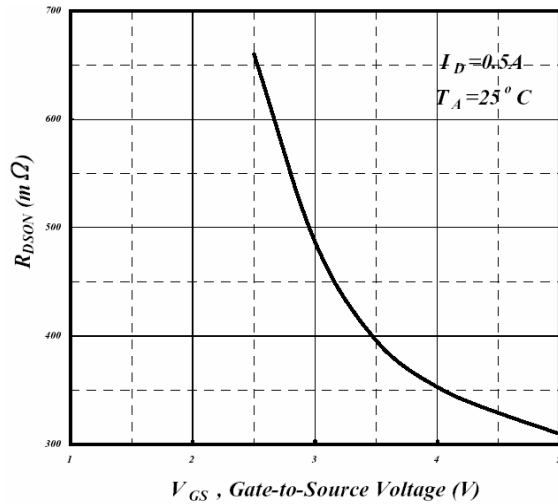


Fig 3. On-Resistance v.s. Gate Voltage

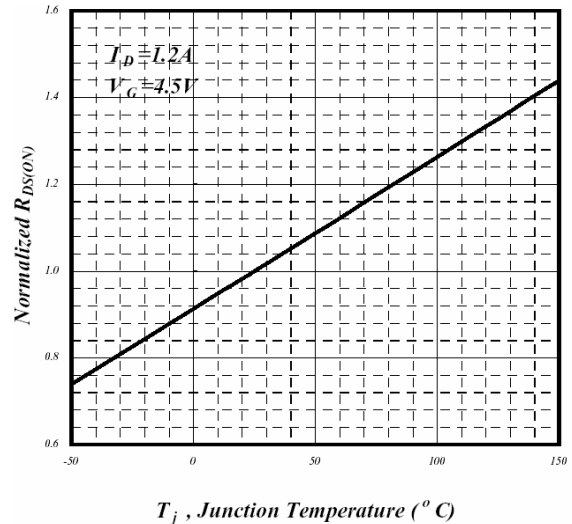


Fig 4. Normalized On-Resistance v.s. Junction Temperature

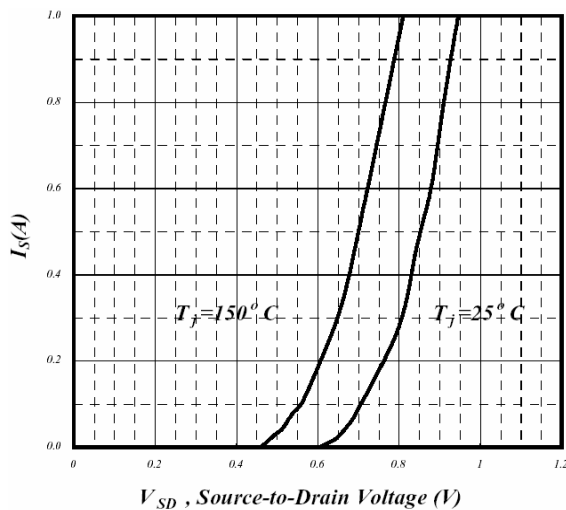


Fig 5. Forward Characteristics of Reverse Diode

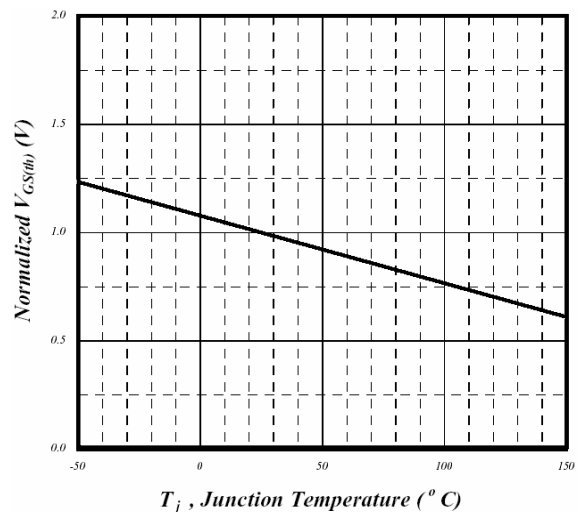


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

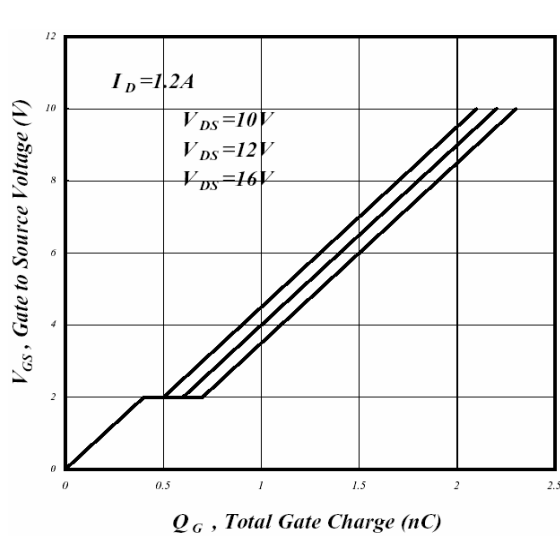


**Fig 7. Gate Charge Characteristics**

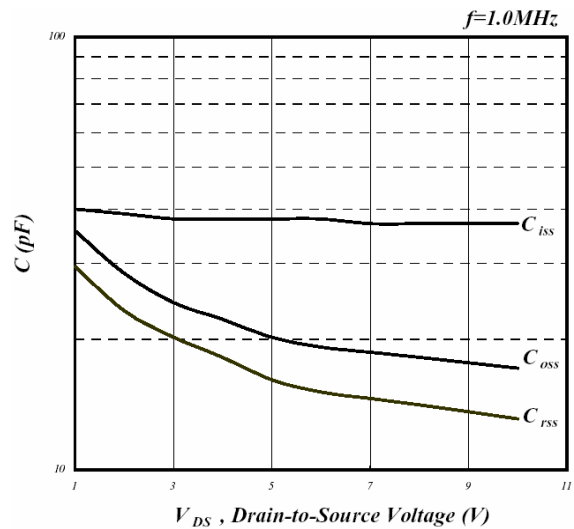


**Fig 8. Typical Capacitance Characteristics**

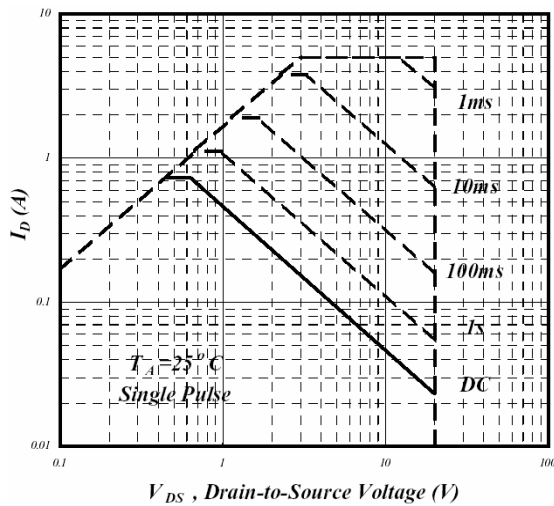


**Fig 9. Maximum Safe Operating Area**

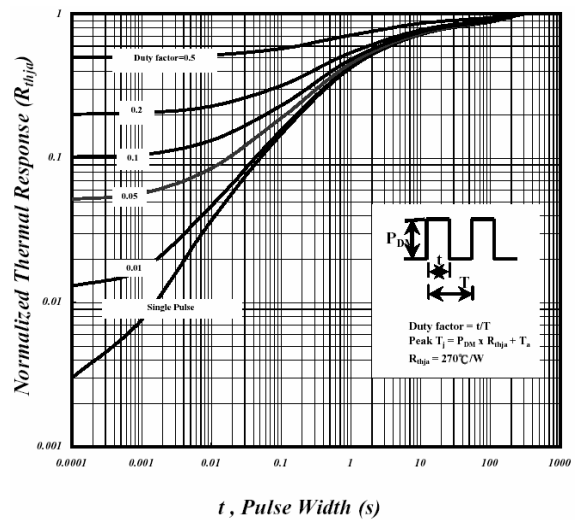


**Fig 10. Effective Transient Thermal Impedance**

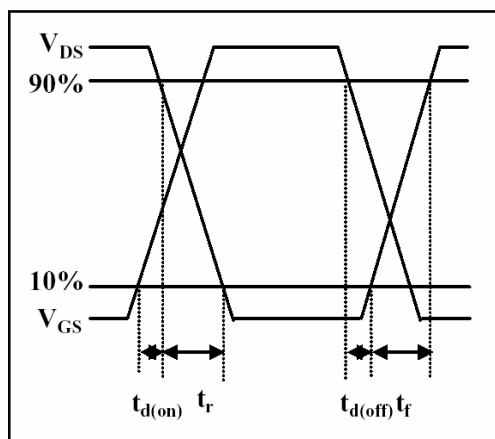


**Fig 11. Switching Time Waveform**

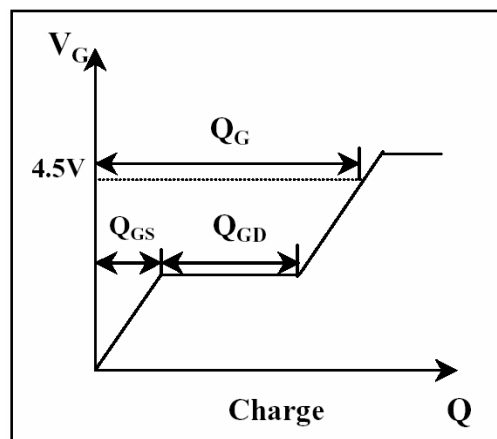


**Fig 12. Gate Charge Waveform**

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