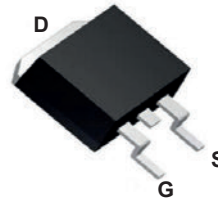
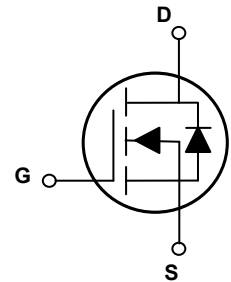


## Main Product Characteristics

|               |                      |
|---------------|----------------------|
| $V_{(BR)DSS}$ | 500V                 |
| $R_{DS(ON)}$  | 900m $\Omega$ (Max.) |
| $I_D$         | 8A                   |



TO-263



Schematic Diagram

## Features and Benefits

- Advanced MOSFET process technology
- Ideal for high efficiency switched mode power supplies
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery



## Description

The GSGT5008 utilizes the latest techniques to achieve high cell density and low on-resistance. These features make this device extremely efficient and reliable for use in high efficiency switch mode power supplies and a wide variety of other applications.

## Absolute Maximum Ratings (T<sub>C</sub>=25°C unless otherwise specified)

| Parameter  | Symbol                           | Max.        | Unit |
|--|----------------------------------|-------------|------|
| Drain-Source Voltage   | $V_{DS}$                         | 500         | V    |
| Gate-to-Source Voltage   | $V_{GS}$                         | ±30         | V    |
| Continuous Drain Current, @ Steady-State (T <sub>C</sub> =25°C) <sup>1</sup> | $I_D$                            | 8           | A    |
| Continuous Drain Current, @ Steady-State (T <sub>C</sub> =100°C)             |                                  | 5           | A    |
| Pulsed Drain Current <sup>2</sup>  | $I_{DM}$                         | 32          | A    |
| Power Dissipation (T <sub>C</sub> =25°C)                                     | $P_D$                            | 131         | W    |
| Linear Derating Factor (T <sub>C</sub> =25°C)                                |                                  | 1.05        | W/°C |
| Single Pulse Avalanche Energy <sup>3</sup>                                   | $E_{AS}$                         | 512         | mJ   |
| Junction-to-Case   | $R_{\theta JC}$                  | 1.15        | °C/W |
| Junction-to-Ambient (PCB Mounted, Steady-State) <sup>4</sup>                 | $R_{\theta JA}$                  | 62.0        | °C/W |
| Operating Junction and Storage Temperature Range                             | T <sub>J</sub> /T <sub>STG</sub> | -55 to +150 | °C   |

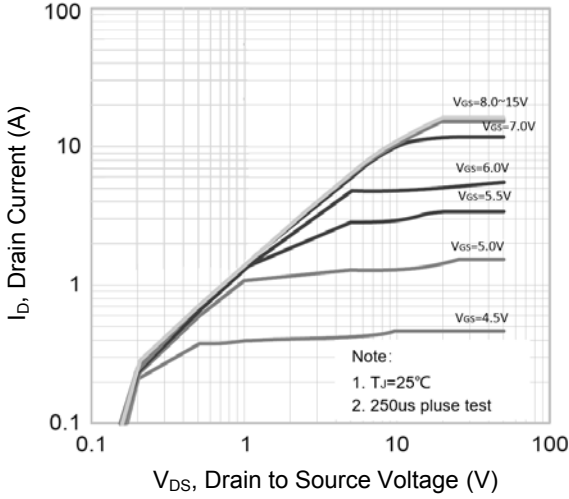
**Electrical Characteristics** ( $T_A=25^\circ\text{C}$  unless otherwise specified)

| Parameter                                       | Symbol        | Conditions   | Min. | Typ. | Max. | Unit     |
|---|---------------|--|------|------|------|----------|
| <b>On / Off Characteristics</b>                 |               |  |      |      |      |          |
| Drain-to-Source Breakdown Voltage               | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=250\mu A$                                      | 500  | -    | -    | V        |
| Drain-to-Source Leakage Current                 | $I_{DSS}$     | $V_{DS}=500V, V_{GS}=0V$                                       | -    | -    | 1    | $\mu A$  |
|   |               | $T_J=125^\circ\text{C}$  | -    | -    | 50   |          |
| Gate-to-Source Forward Leakage                  | $I_{GSS}$     | $V_{GS}=30V$   | -    | -    | 100  | nA       |
|   |               | $V_{GS}=-30V$  | -    | -    | -100 |          |
| Static Drain-to-Source On-Resistance            | $R_{DS(ON)}$  | $V_{GS}=10V, I_D=4A$   | -    | 0.68 | 0.90 | $\Omega$ |
| Gate Threshold Voltage                          | $V_{GS(th)}$  | $V_{DS}=V_{GS}, I_D=250\mu A$                                  | 2.1  | 3    | 3.9  | V        |
| <b>Dynamic and Switching Characteristics</b>    |               |  |      |      |      |          |
| Input Capacitance                               | $C_{iss}$     | $V_{GS}=0V, V_{DS}=25V$<br>$f=1\text{MHz}$                     | -    | 904  | -    | pF       |
| Output Capacitance                              | $C_{oss}$     |  | -    | 120  | -    |          |
| Reverse Transfer Capacitance                    | $C_{rss}$     |  | -    | 2.7  | -    |          |
| Total Gate Charge                               | $Q_g$         | $I_D=8A, V_{DS}=400V,$<br>$V_{GS}=10V$                         | -    | 14.7 | -    | nC       |
| Gate-to-Source Charge                           | $Q_{gs}$      |  | -    | 5.6  | -    |          |
| Gate-to-Drain ("Miller") Charge                 | $Q_{gd}$      |  | -    | 4.4  | -    |          |
| Turn-on Delay Time                              | $t_{d(on)}$   | $V_{GS}=10V, V_{DS}=250V,$<br>$R_{GEN}=25\Omega, I_D=8A$       | -    | 29.2 | -    | nS       |
| Rise Time                                       | $t_r$         |  | -    | 59.3 | -    |          |
| Turn-Off Delay Time                             | $t_{d(off)}$  |  | -    | 41   | -    |          |
| Fall Time                                       | $t_f$         |  | -    | 29.4 | -    |          |
| Gate Resistance                                 | $R_g$         | $f=1\text{MHz}$  | -    | 2.7  | -    | $\Omega$ |
| <b>Source-Drain Ratings and Characteristics</b> |               |  |      |      |      |          |
| Continuous Source Current (Body Diode)          | $I_S$         | MOSFET symbol showing the integral reverse p-n junction diode. | -    | -    | 8    | A        |
| Pulsed Source Current (Body Diode)              | $I_{SM}$      |  | -    | -    | 28   | A        |
| Diode Forward Voltage                           | $V_{SD}$      | $I_S=8A, V_{GS}=0V$  | -    | -    | 1.4  | V        |
| Reverse Recovery Time                           | $T_{rr}$      | $T_J=25^\circ\text{C}, I_F=8A,$<br>$di/dt=100A/\mu s$          | -    | 470  | -    | nS       |
| Reverse Recovery Charge                         | $Q_{rr}$      |  | -    | 3.28 | -    | $\mu C$  |

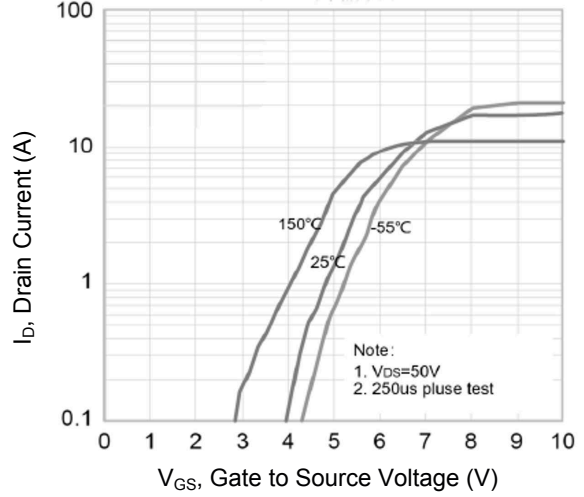
Note:

1. Pulse test: pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
2. Repetitive rating; pulse width limited by max. junction temperature.
3.  $L=30\text{mH}, V_{DD}=130V, T_J=25^\circ\text{C}$ .
4. Device mounted on FR-4 PCB, 1inch x 0.85inch x 0.062inch.

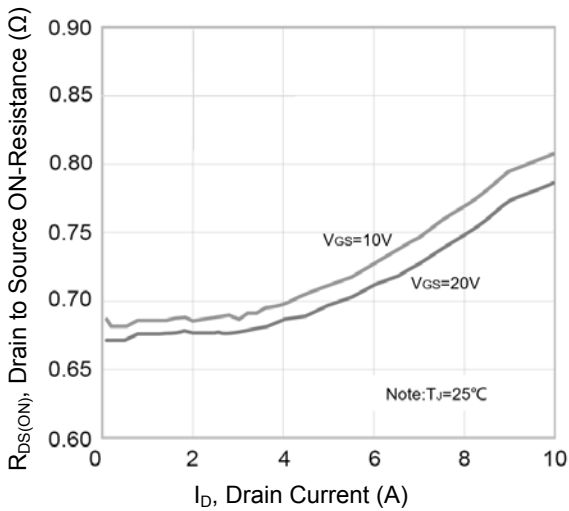
## Typical Electrical and Thermal Characteristic Curves



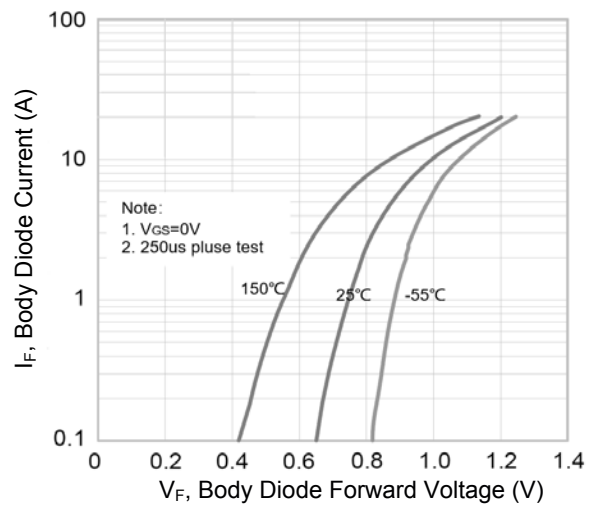
**Figure 1. Typical Output Characteristics**



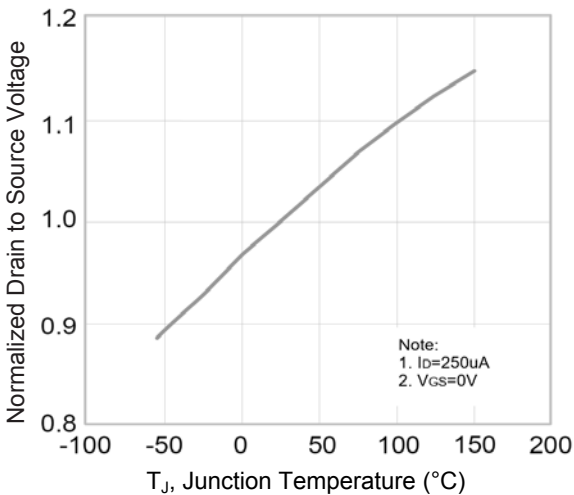
**Figure 2. Transfer Characteristics**



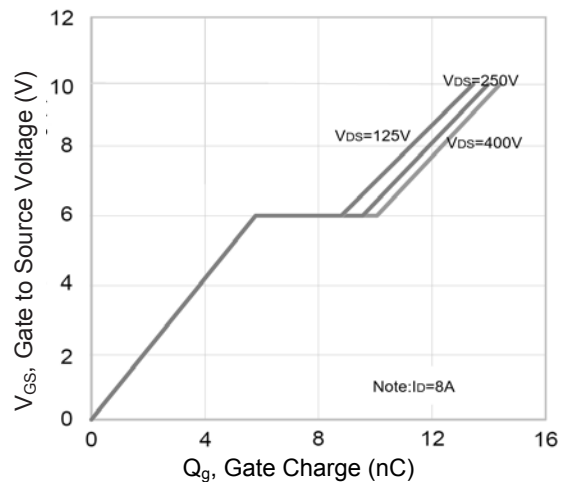
**Figure 3. Drain-Source On-Resistance**



**Figure 4. Body Diode Characteristic**

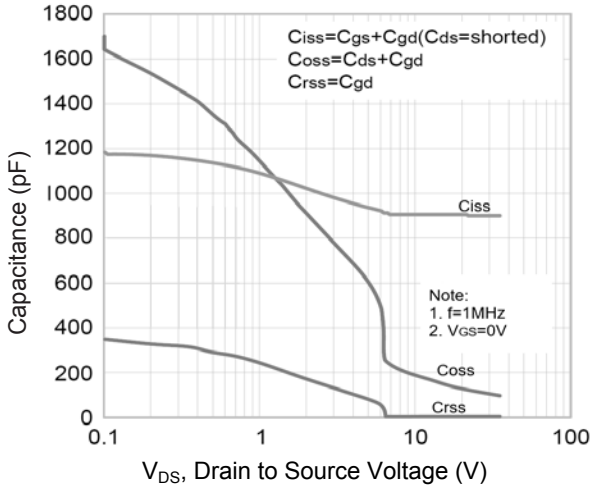


**Figure 5. Normalized BVds Vs. Tj**

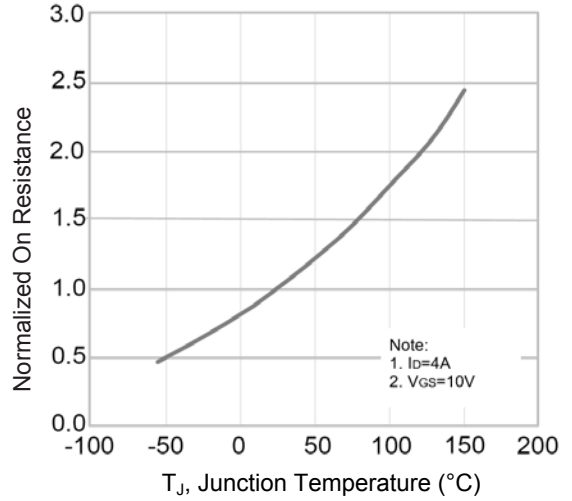


**Figure 6. Gate Charge**

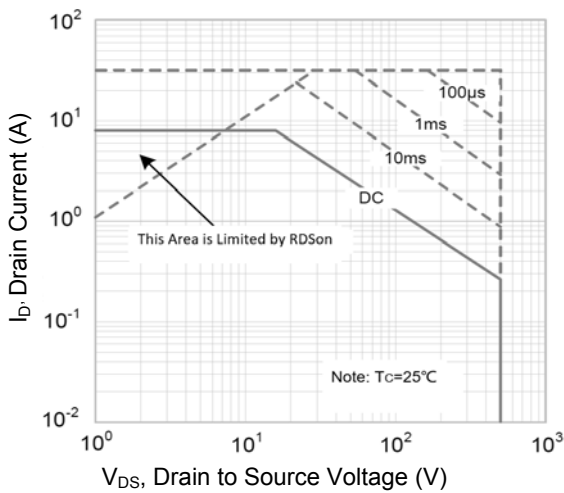
**Typical Electrical and Thermal Characteristic Curves**



**Figure 7. Capacitance Characteristic**

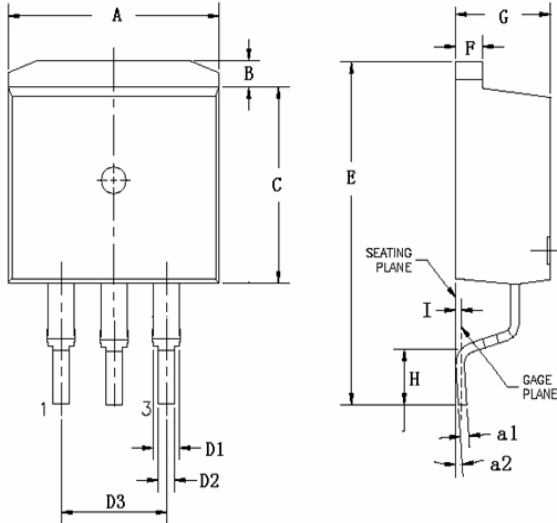


**Figure 8. Normalized  $R_{DS(ON)}$  Vs.  $T_J$**



**Figure 9. Safe Operation Area**

**Package Outline Dimensions (TO-263)**



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 9.66                      | 10.28 | 0.380                | 0.405 |
| B      | 1.02                      | 1.32  | 0.040                | 0.052 |
| C      | 8.59                      | 9.40  | 0.339                | 0.370 |
| D1     | 1.14                      | 1.40  | 0.045                | 0.055 |
| D2     | 0.70                      | 0.90  | 0.028                | 0.037 |
| D3     | 5.08 TYP.                 |       | 0.200 TYP.           |       |
| E      | 15.09                     | 15.39 | 0.594                | 0.606 |
| F      | 1.15                      | 1.40  | 0.045                | 0.055 |
| I      | 0.25 TYP.                 |       | 0.010 TYP.           |       |
| G      | 4.30                      | 4.70  | 0.169                | 0.185 |
| H      | 2.29                      | 2.79  | 0.090                | 0.110 |
| K      | 1.30                      | 1.60  | 0.051                | 0.063 |
| a1     | 0.45                      | 0.65  | 0.018                | 0.026 |
| a2     | 0°                        | 8°    | 0°                   | 8°    |

**Order Information**

| Device   | Package | Marking | Carrier     | Quantity       |
|----------|---------|---------|-------------|----------------|
| GSGT5008 | TO-263  | T5008   | Tape & Reel | 800 Pcs / Reel |

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