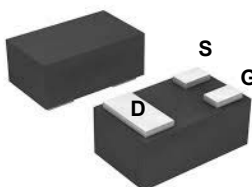
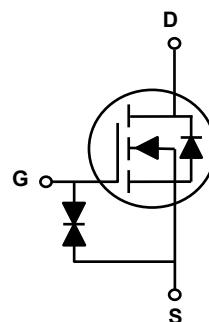


### Main Product Characteristics

|              |       |
|--------------|-------|
| $BV_{DSS}$   | 50V   |
| $R_{DS(ON)}$ | 1.6Ω  |
| $I_D$        | 360mA |



SOT-883



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 GSFW0500 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 supply and a wide variety of other applications.

### Absolute Maximum Ratings ( $T_A=25^{\circ}C$ unless otherwise specified)

| Parameter  | Symbol          | Max.        | Unit |
|--|-----------------|-------------|------|
| Drain-Source Voltage                                 | $V_{DS}$        | 50          | V    |
| Gate-Source Voltage                                  | $V_{GS}$        | ±20         | V    |
| Drain Current-Continuous <sup>1</sup>                | $I_D$           | 360         | mA   |
| Drain Current-Pulsed <sup>4</sup>                    | $I_{DM}$        | 1440        | mA   |
| Power Dissipation <sup>1</sup>                       | $P_D$           | 0.15        | W    |
| Power Dissipation-Derate above 25°C                  |                 | 0.0012      | W/°C |
| Thermal Resistance, Junction-to-Ambient <sup>1</sup> | $R_{\theta JA}$ | 834         | °C/W |
| Thermal Resistance, Junction-to-Case <sup>1</sup>    | $R_{\theta JC}$ | 421         | °C/W |
| Thermal Resistance, Junction-to-Lead <sup>1</sup>    | $R_{\theta JL}$ | 500         | °C/W |
| Operating Junction Temperature Range                 | $T_J$           | -55 To +150 | °C   |
| Storage Temperature Range                            | $T_{STG}$       | -55 To +150 | °C   |

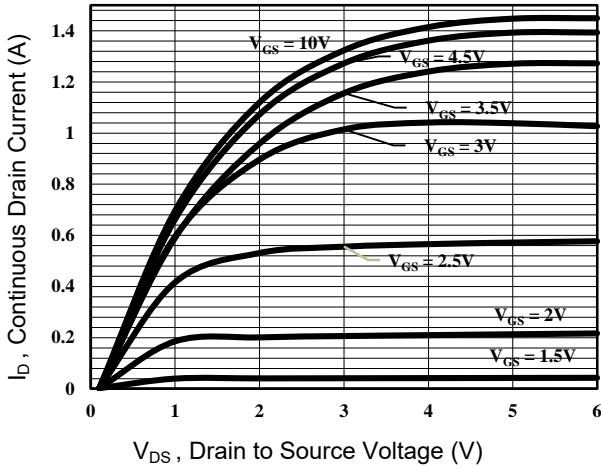
**Electrical Characteristics** ( $T_A=25^{\circ}\text{C}$  unless otherwise specified)

| Parameter   | Symbol       | Conditions                                       | Min. | Typ. | Max.     | Unit     |
|---|--------------|--|------|------|----------|----------|
| <b>On/Off Characteristics<sup>2</sup></b>                     |              |  |      |      |          |          |
| Drain-Source Breakdown Voltage                                | $BV_{DSS}$   | $V_{GS}=0V, I_D=250\mu A$                        | 50   | -    | -        | V        |
| Drain-Source Leakage Current                                  | $I_{DSS}$    | $V_{DS}=50V, V_{GS}=0V$                          | -    | -    | 1        | $\mu A$  |
| Gate-Source Leakage Current                                   | $I_{GSS}$    | $V_{GS}=\pm 20V, V_{DS}=0V$                      | -    | -    | $\pm 10$ | $\mu A$  |
|   |              | $V_{GS}=\pm 16V, V_{DS}=0V$                      | -    | -    | $\pm 1$  | $\mu A$  |
| Static Drain-Source On-Resistance <sup>2</sup>                | $R_{DS(ON)}$ | $V_{GS}=10V, I_D=0.5A$                           | -    | -    | 1.6      | $\Omega$ |
|   |              | $V_{GS}=4.5V, I_D=0.2A$                          | -    | -    | 2.5      |          |
|   |              | $V_{GS}=2.5V, I_D=0.1A$                          | -    | -    | 4.5      |          |
| Gate Threshold Voltage <sup>2</sup>                           | $V_{GS(TH)}$ | $V_{GS}=V_{DS}, I_D=250\mu A$                    | 0.8  | -    | 1.5      | V        |
| <b>Dynamic and Switching Characteristics<sup>3</sup></b>      |              |  |      |      |          |          |
| Input Capacitance   | $C_{iss}$    | $V_{DS}=25V, V_{GS}=0V, F=1\text{mHz}$           | -    | 27   | -        | pF       |
| Output Capacitance  | $C_{oss}$    |  | -    | 13   | -        |          |
| Reverse Transfer Capacitance                                  | $C_{rss}$    |  | -    | 6    | -        |          |
| Turn-On Delay Time  | $T_{d(on)}$  | $V_{DD}=30V, V_{GS}=10V, I_D=0.29A, R_G=6\Omega$ | -    | -    | 5        | ns       |
| Rise Time   | $T_r$        |  | -    | -    | 18       |          |
| Turn-Off Delay Time   | $T_{d(off)}$ |  | -    | -    | 36       |          |
| Fall Time   | $T_f$        |  | -    | -    | 14       |          |
| <b>Drain-Source Diode Characteristics and Maximum Ratings</b> |              |  |      |      |          |          |
| Continuous Source Current <sup>1</sup>                        | $I_s$        | $T_C=25^{\circ}\text{C}$                         | -    | -    | 0.36     | A        |
| Diode Forward Voltage <sup>1</sup>                            | $V_{SD}$     | $V_{GS}=0V, I_s=0.5A$                            | -    | 0.8  | 1.4      | V        |

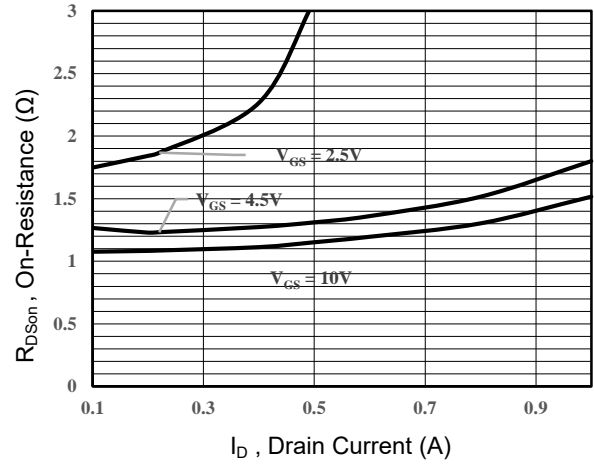
Note:

1. Surface Mounted on FR4 Board,  $t \leq 10$  sec .
2. The datasheet test by pulsed, pulse width $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
3. Guaranteed by design, not subject to production.

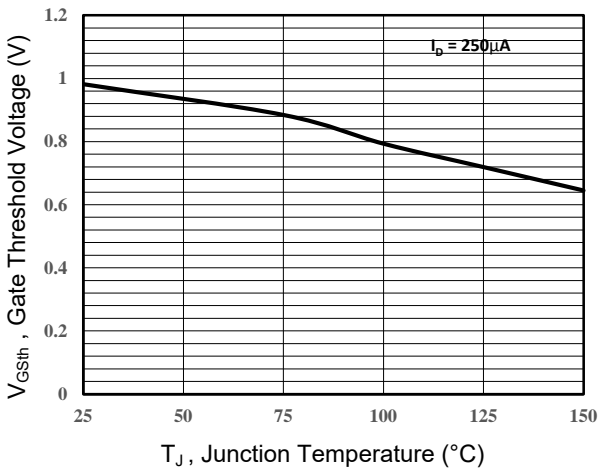
**Typical Electrical and Thermal Characteristic Curves**



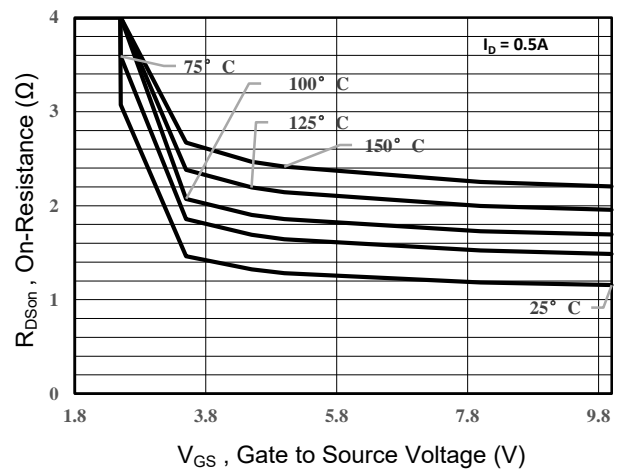
**Figure 1. Output Characteristics**



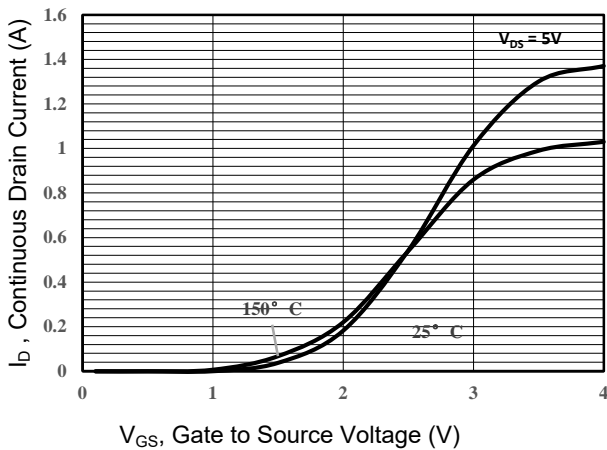
**Figure 2. On Resistance vs.  $I_D$**



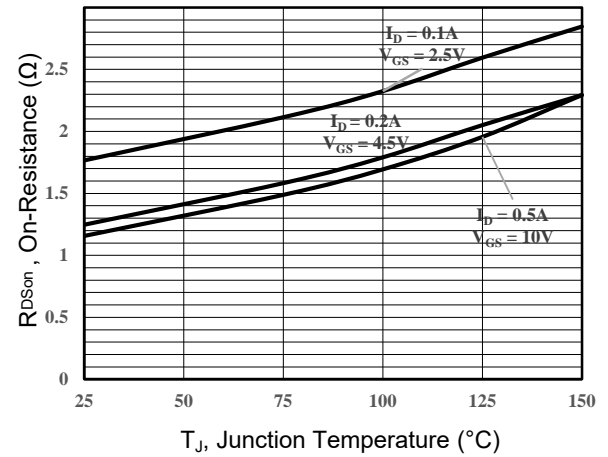
**Figure 3. Gate Threshold Voltage  $V_{GS(th)}$  vs.  $T_J$**



**Figure 4. On Resistance vs.  $V_{GS}$**

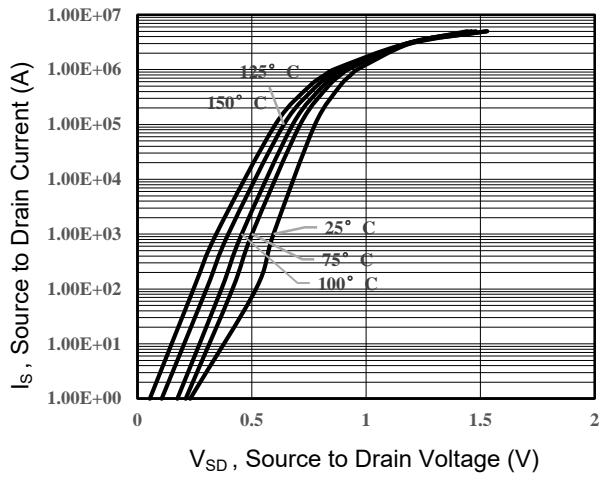


**Figure 5. Transfer Characteristics**

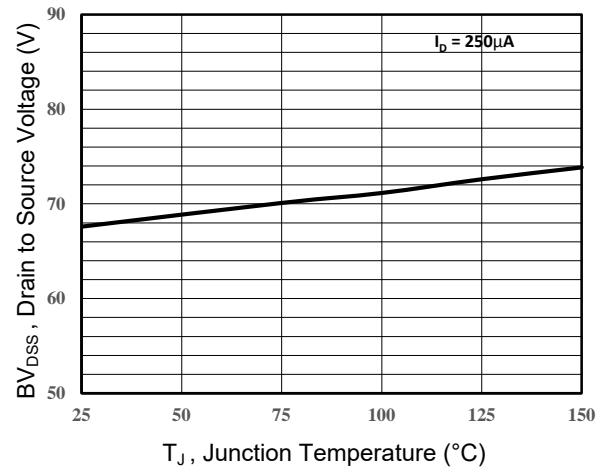


**Figure 6. On Resistance vs.  $T_J$**

**Typical Electrical and Thermal Characteristic Curves**



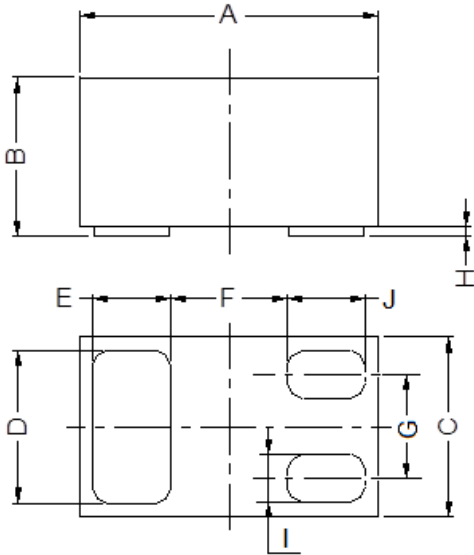
**Figure 7. Body Diode Characteristics**



**Figure 8.  $BV_{DSS}$  vs.  $T_J$**

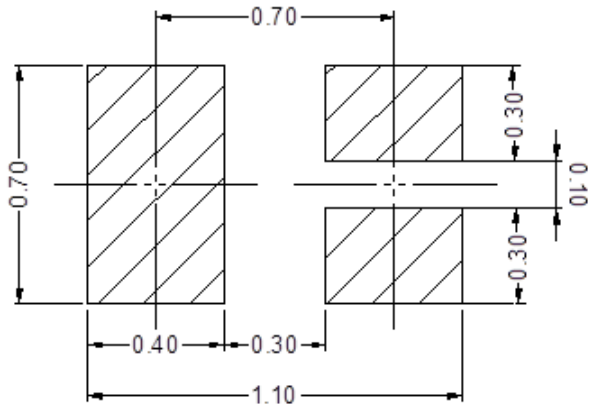
**Package Outline Dimensions**

**SOT-883**



| SOT-883 |      |      |       |
|---------|------|------|-------|
| Dim     | Min  | Typ  | Max   |
| A       | 0.95 | 1.00 | 1.075 |
| B       | 0.47 | 0.50 | 0.53  |
| C       | 0.55 | 0.60 | 0.675 |
| D       | 0.45 | 0.50 | 0.55  |
| E/J     | 0.20 | 0.25 | 0.30  |
| F       | -    | 0.40 | -     |
| G       | -    | 0.35 | -     |
| H       | 0    | 0.03 | 0.05  |
| I       | 0.10 | 0.15 | 0.20  |

**Recommended Pad Layout**



(Unit in mm)

**Order Information**

| MPN      | Package | Marking | Carrier     | Reel Quantity |
|----------|---------|---------|-------------|---------------|
| GSFW0500 | SOT-883 | MM5     | Tape & Reel | 10,000pcs     |