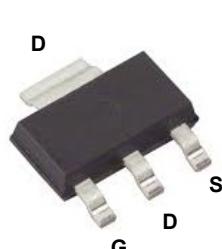
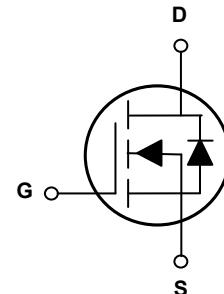


Main Product Characteristics

| | |
|---------------|--------------|
| $V_{(BR)DSS}$ | 650V |
| $R_{DS(ON)}$ | 0.78Ω (Typ.) |
| I_D | 5A |



SOT-223



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 GSFL65R900 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 ($T_A=25^\circ\text{C}$ unless otherwise specified)

| Parameter | Symbol | Parameter. | Unit |
|--|-------------------|--------------|---------------------------|
| Drain-Source Voltage | V_{DS} | 650 | V |
| Gate-to-Source Voltage | V_{GS} | ± 30 | V |
| Continuous Drain Current, @ Steady-State ($T_C=25^\circ\text{C}$) | I_D | 5 | A |
| Continuous Drain Current, @ Steady-State ($T_C=100^\circ\text{C}$) | | 3.2 | A |
| Pulsed Drain Current | I_{DM} | 20 | A |
| Power Dissipation ($T_C=25^\circ\text{C}$) | P_D | 20 | W |
| | | 0.16 | W/ $^\circ\text{C}$ |
| Single Pulse Avalanche Energy ¹ | E_{AS} | 214 | mJ |
| Single Pulse Avalanche Current | I_{AS} | 2.8 | A |
| Body Diode Reverse Voltage Slope ² | dv/dt | 15 | V/ns |
| MOS dv/dt Reggedness ³ | dv/dt | 50 | V/ns |
| Junction-to-Ambient (PCB Mounted, Steady-State) | $R_{\theta JA}$ | 62.0 | $^\circ\text{C}/\text{W}$ |
| Junction-to-Case | $R_{\theta JC}$ | 6.25 | $^\circ\text{C}/\text{W}$ |
| Operating Junction and Storage Temperature Range | T_J/T_{STG} | -55 to + 150 | $^\circ\text{C}$ |
| Soldering Temperature | T_{sold} | 260 | $^\circ\text{C}$ |

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

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---|-----------------------------|---|------|------|------|---------------|
| On / Off Characteristics | | | | | | |
| Drain-to-Source Breakdown Voltage | $V_{(\text{BR})\text{DSS}}$ | $V_{\text{GS}}=0\text{V}, I_D=250\mu\text{A}$ | 650 | - | - | V |
| Drain-to-Source Leakage Current | I_{DSS} | $V_{\text{DS}}=650\text{V}, V_{\text{GS}}=0\text{V}, T_J=25^\circ\text{C}$ | - | - | 1.0 | μA |
| | | $V_{\text{DS}}=650\text{V}, V_{\text{GS}}=0\text{V}, T_J=125^\circ\text{C}$ | - | 1.5 | - | μA |
| Gate-to-Source Forward Leakage | I_{GSS} | $V_{\text{DS}}=0\text{V}, V_{\text{GS}}=30\text{V}$ | - | - | 100 | nA |
| | | $V_{\text{DS}}=0\text{V}, V_{\text{GS}}=-30\text{V}$ | - | - | -100 | |
| Static Drain-to-Source On-Resistance | $R_{\text{DS}(\text{ON})}$ | $V_{\text{GS}}=10\text{V}, I_D=2.5\text{A}$ | - | 0.78 | 0.90 | Ω |
| Gate Threshold Voltage | $V_{\text{GS}(\text{th})}$ | $V_{\text{DS}}=V_{\text{GS}}, I_b=250\mu\text{A}$ | 2.0 | - | 4.0 | V |
| Dynamic and Switching Characteristics | | | | | | |
| Input Capacitance | C_{iss} | $V_{\text{GS}}=0\text{V}, V_{\text{DS}}=100\text{V}, f=1\text{MHz}$ | - | 300 | - | pF |
| Output Capacitance | C_{oss} | | - | 20 | - | |
| Reverse Transfer Capacitance | C_{rss} | | - | 2.4 | - | |
| Total Gate Charge ^{4,5} | Q_g | $I_D=5\text{A}, V_{\text{DD}}=520\text{V}, V_{\text{GS}}=10\text{V}$ | - | 13 | - | nC |
| Gate-to-Source Charge ^{4,5} | Q_{gs} | | - | 3.0 | - | |
| Gate-to-Drain ("Miller") Charge ^{4,5} | Q_{gd} | | - | 6.8 | - | |
| Gate Plateau ^{4,5} | V_{plateau} | | - | 6.5 | - | V |
| Turn-on Delay Time ^{4,5} | $t_{\text{d}(\text{on})}$ | $V_{\text{DD}}=325\text{V}, V_{\text{GS}}=10\text{V}, R_G=24\Omega$ $I_D=5\text{A}$ | - | 8.7 | - | nS |
| Rise Time ^{4,5} | t_r | | - | 25 | - | |
| Turn-Off Delay Time ^{4,5} | $t_{\text{d}(\text{off})}$ | | - | 30 | - | |
| Fall Time ^{4,5} | t_f | | - | 23 | - | |
| Gate Resistance | R_g | $f=1\text{MHz}$ | - | 7.2 | - | Ω |
| Source-Drain Ratings and Characteristics | | | | | | |
| Continuous Source Current (Body Diode) | I_S | $T_c=25^\circ\text{C}$, MOSFET symbol showing the integral reverse p-n junction diode. | - | - | 5 | A |
| Diode Pulse Current | $I_{\text{S, pulse}}$ | | - | - | 20 | A |
| Diode Forward Voltage | V_{SD} | $I_S=5\text{A}, V_{\text{GS}}=0\text{V}$ | - | - | 1.4 | V |
| Reverse Recovery Time ⁴ | T_{rr} | $I_S=5\text{A}, V_{\text{GS}}=0\text{V}, \frac{dI_F}{dt}=100\text{A/us}$ | - | 334 | - | nS |
| Reverse Recovery Charge ⁴ | Q_{rr} | | - | 2.2 | - | μC |

Notes:

1. $L=79\text{mH}, V_{\text{DD}}=100\text{V}, R_G=25\Omega$, starting temperature $T_J=25^\circ\text{C}$.
2. $V_{\text{DS}}=0\text{-}400\text{V}, I_{\text{SD}} \leq I_S, T_J=25^\circ\text{C}$.
3. $V_{\text{DS}}=0\text{-}480\text{V}$.
4. Pulse test : pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
5. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

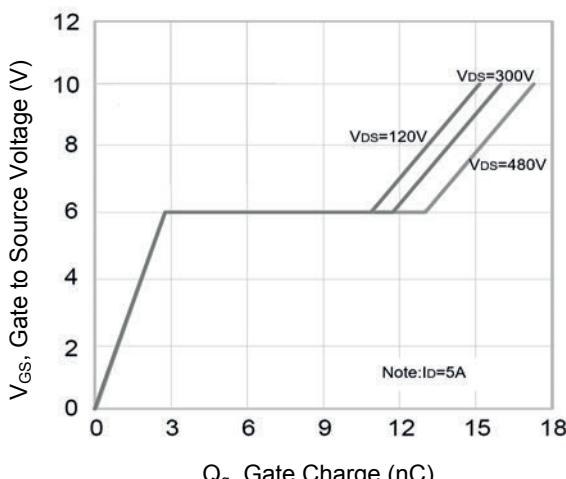
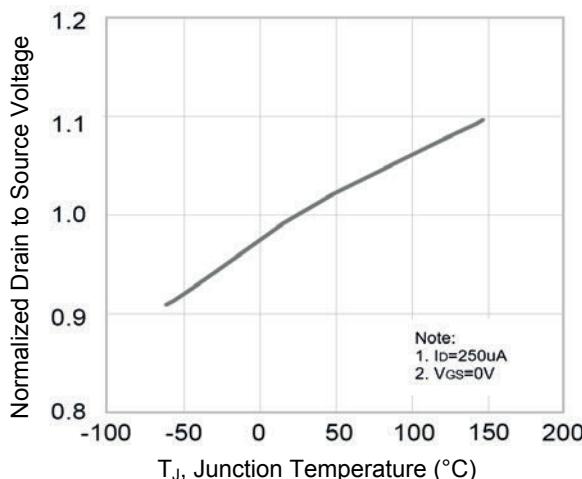
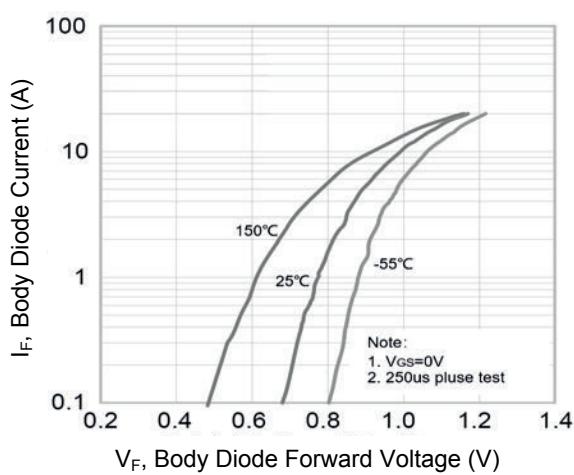
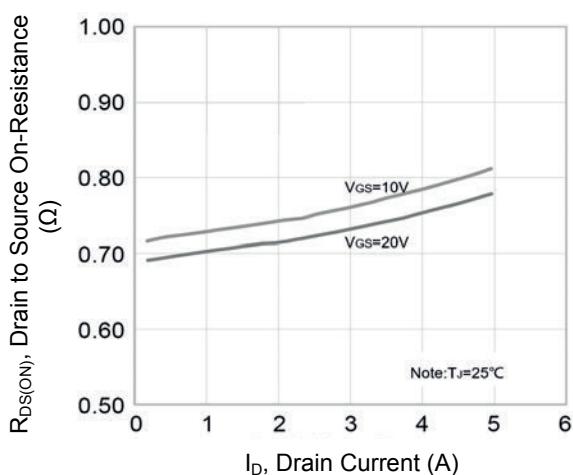
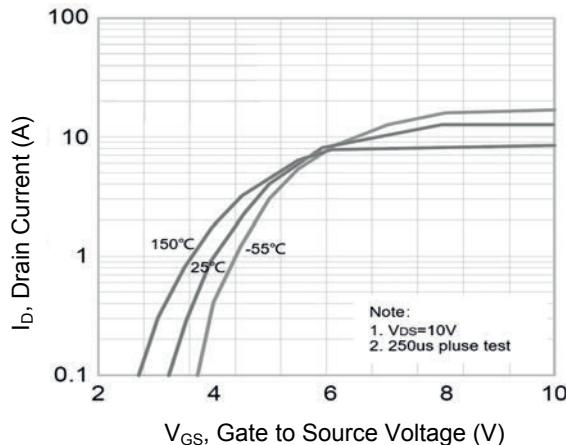
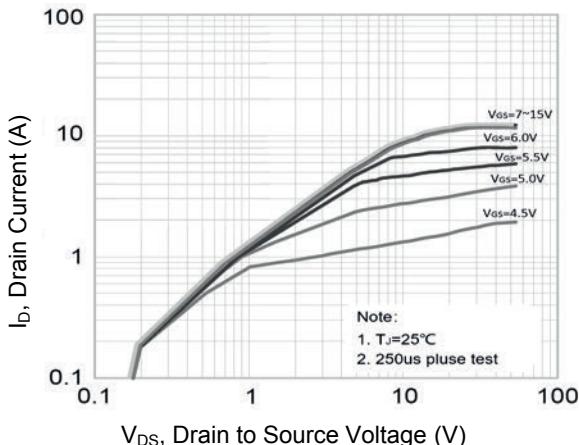


Figure 5. Normalized BV_{DSS} Vs. T_J

Typical Electrical and Thermal Characteristic Curves

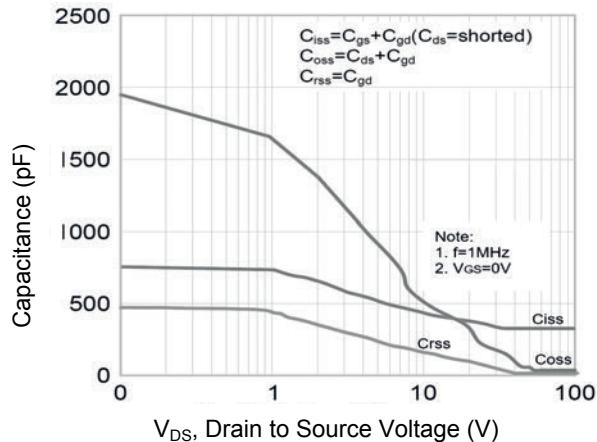


Figure 7. Capacitance Characteristics

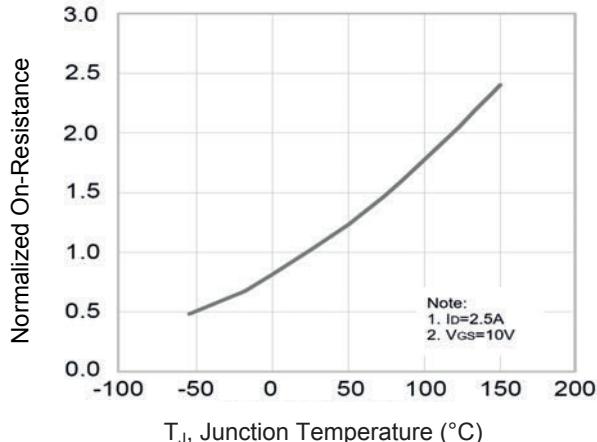


Figure 8. Normalized $R_{DS(ON)}$ Vs. T_J

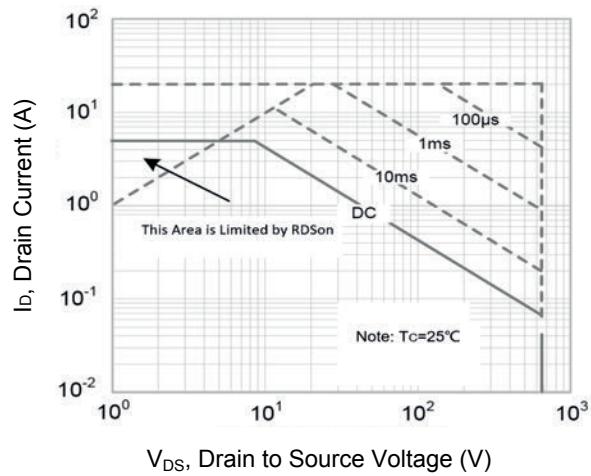
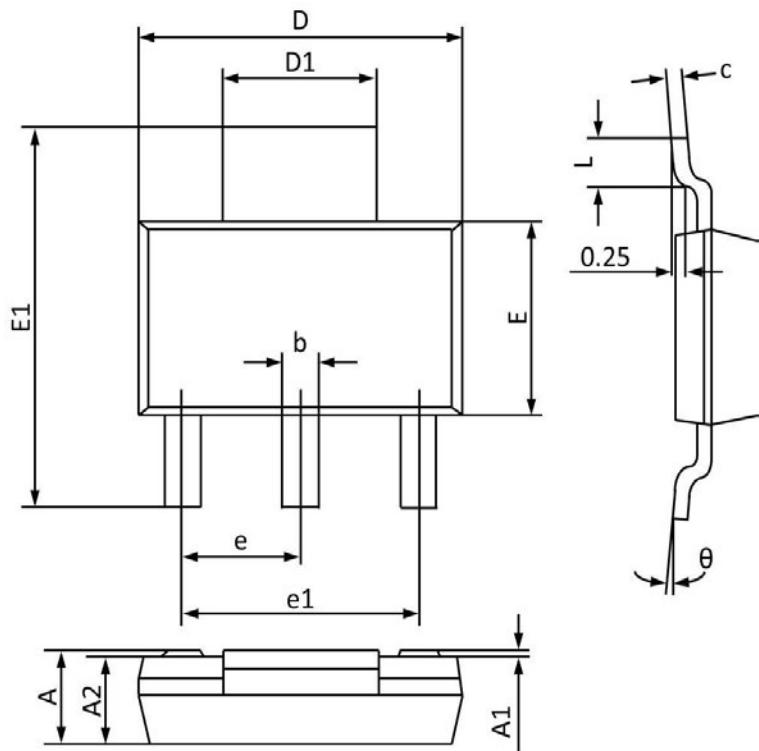


Figure 9. Safe Operation Area

Package Outline Dimensions (SOT-223)



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 1.50 | 1.80 | 0.060 | 0.071 |
| A1 | 0.00 | 0.12 | 0.000 | 0.005 |
| A2 | 1.45 | 1.75 | 0.057 | 0.069 |
| b | 0.60 | 0.82 | 0.024 | 0.032 |
| c | 0.20 | 0.35 | 0.008 | 0.014 |
| D | 6.20 | 6.70 | 0.244 | 0.264 |
| D1 | 2.90 | 3.10 | 0.114 | 0.122 |
| E | 3.30 | 3.70 | 0.130 | 0.146 |
| E1 | 6.70 | 7.30 | 0.264 | 0.287 |
| e | 2.30 BSC | | 0.091 BSC | |
| e1 | 4.40 | 4.70 | 0.173 | 0.185 |
| L | 0.90 | 1.15 | 0.035 | 0.045 |
| θ | 0° | 10° | 0° | 10° |