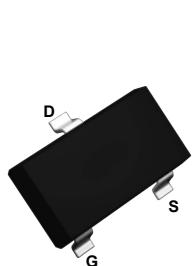
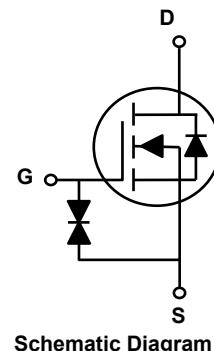


Main Product Characteristics

| | |
|--------------|-------------|
| V_{DS} | 60V |
| $R_{DS(ON)}$ | 1.6Ω (Max.) |
| I_D | 0.34A |



SOT-23



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 GS2N7002KL 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 | Max. | Unit |
|----------------------------------------------------------------------------------|-----------------|-------------|-------|
| Drain-Source Voltage | V_{DS} | 60 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current, @ Steady-State ¹ ($T_A=25^\circ\text{C}$) | I_D | 0.34 | A |
| Continuous Drain Current, @ Steady-State ($T_A=70^\circ\text{C}$) | | 0.272 | |
| Drain Current-Pulsed ² | I_{DM} | 1.5 | A |
| Power Dissipation ($T_A=25^\circ\text{C}$) | P_D | 350 | mW |
| Linear Derating Factor ($T_A=25^\circ\text{C}$) | | 2.8 | mW/°C |
| Junction-to-Ambient (PCB Mounted, Steady-State) ³ | $R_{\theta JA}$ | 357 | °C/W |
| Operating Junction Temperature | 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 |
|---------------------------------------------------------------|-----------------------------|---------------------------------------------------------------------------------------------|------|------|-----------|---------------|
| On / Off Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(\text{BR})\text{DSS}}$ | $V_{\text{GS}}=0\text{V}, I_D=250\mu\text{A}$ | 60 | - | - | V |
| Drain-Source Leakage Current | $I_{\text{DS}S}$ | $V_{\text{DS}}=60\text{V}, V_{\text{GS}}=0\text{V}$ | - | - | 1 | μA |
| | | $T_J=125^\circ\text{C}$ | - | - | 50 | μA |
| Gate-Source Leakage Current | $I_{\text{GS}S}$ | $V_{\text{GS}}=\pm 20\text{V}$ | - | - | ± 100 | nA |
| | | $V_{\text{GS}}=\pm 10\text{V}$ | - | - | ± 50 | nA |
| Static Drain-Source On-Resistance | $R_{\text{DS}(\text{ON})}$ | $V_{\text{GS}}=10\text{V}, I_D=0.3\text{A}$ | - | 0.9 | 1.6 | Ω |
| | | $V_{\text{GS}}=4.5\text{V}, I_D=0.2\text{A}$ | - | 1 | 2 | Ω |
| Gate Threshold Voltage | $V_{\text{GS}(\text{th})}$ | $V_{\text{GS}}=V_{\text{DS}}, I_D=250\mu\text{A}$ | 1 | 1.35 | 2.4 | V |
| Dynamic and Switching Characteristics | | | | | | |
| Total Gate Charge | Q_g | $V_{\text{DS}}=30\text{V}, I_D=0.3\text{A}$ $V_{\text{GS}}=10\text{V}$ | - | 1.7 | 2.4 | nC |
| Turn-On Delay Time | $t_{\text{d}(\text{on})}$ | $V_{\text{DS}}=30\text{V}, R_G=6\Omega$ $V_{\text{GS}}=10\text{V}, I_D=0.3\text{A}$ | - | 5.5 | - | nS |
| Turn-Off Delay Time | $t_{\text{d}(\text{off})}$ | | - | 17.2 | - | |
| Input Capacitance | C_{iss} | $V_{\text{DS}}=30\text{V}, V_{\text{GS}}=0\text{V},$ $F=1\text{MHz}$ | - | 16.4 | - | pF |
| Output Capacitance | C_{oss} | | - | 10.5 | - | |
| Reverse Transfer Capacitance | C_{rss} | | - | 5.6 | - | |
| Drain-Source Diode Characteristics and Maximum Ratings | | | | | | |
| Continuous Source Current (Body Diode) | I_s | MOSFET symbol showing the integral reverse p-n junction diode. | - | - | 0.34 | A |
| Pulsed Source Current (Body Diode) | I_{SM} | | - | - | 0.68 | A |
| Diode Forward Voltage | V_{SD} | $V_{\text{GS}}=0\text{V}, I_S=0.3\text{A}$ | - | 0.82 | 1.2 | V |
| Reverse Recovery Time | trr | $T_J=25^\circ\text{C}, I_F=0.3\text{A},$ $dI/dt=100\text{A}/\mu\text{s}, V_R=25\text{V}$ | - | 30.2 | - | ns |

Note:

1. Pulse test: pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
2. Repetitive rating; pulse width limited by max. junction temperature.
3. Device mounted on FR-4 PCB, 1inch x 0.85inch x 0.062 inch.

Typical Electrical and Thermal Characteristic Curves

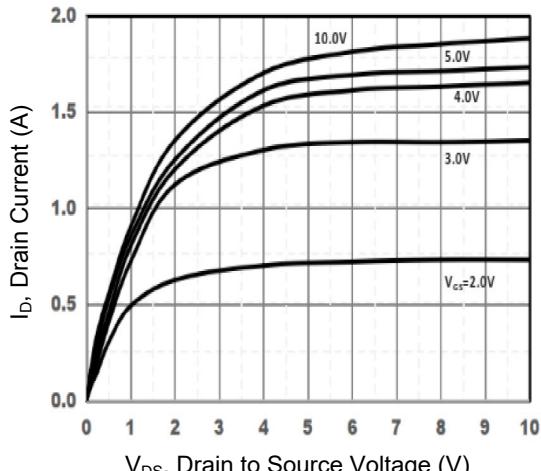


Figure 1. Output Characteristics

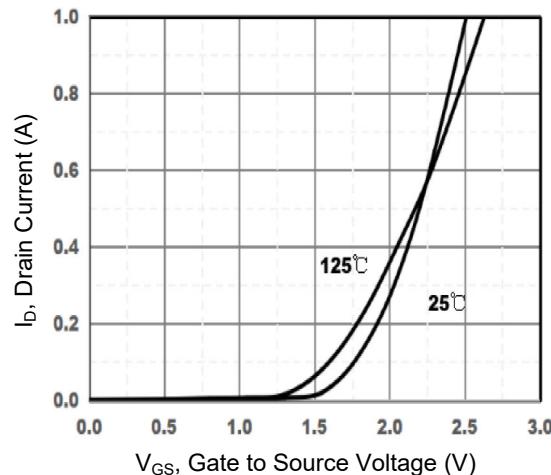


Figure 2. Transfer Characteristics

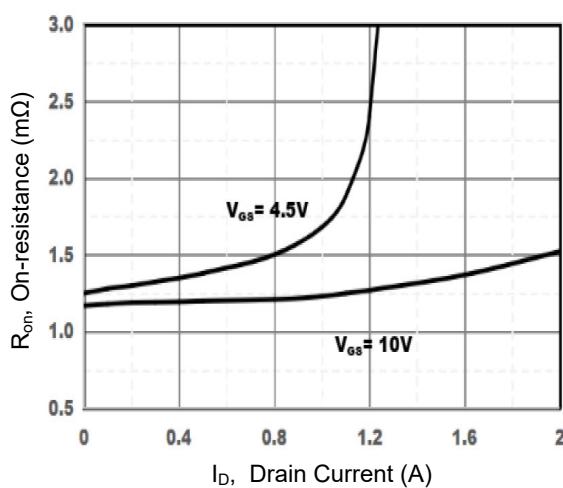


Figure 3. On-Resistance vs. I_D

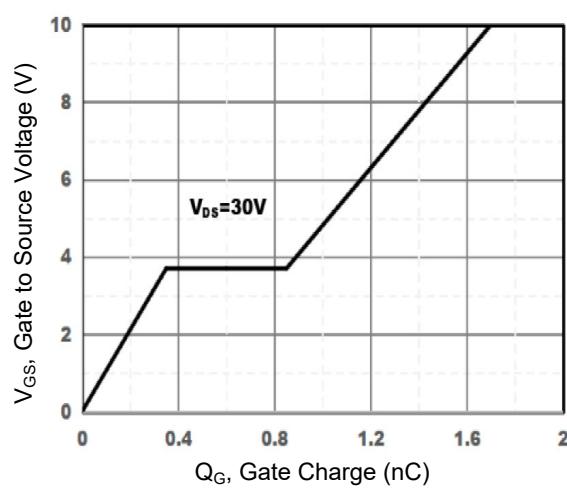


Figure 4. Gate Charge

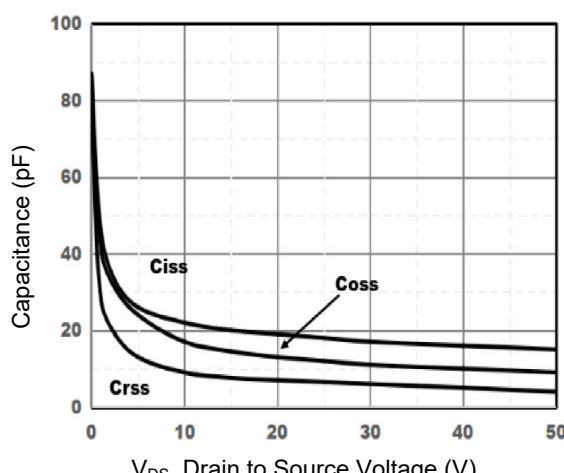


Figure 5. Capacitance Characteristics

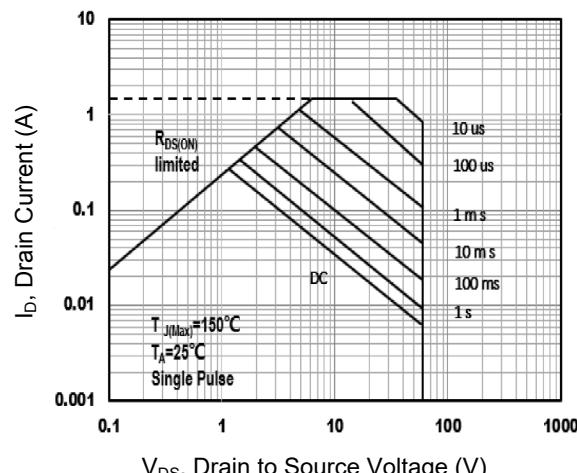
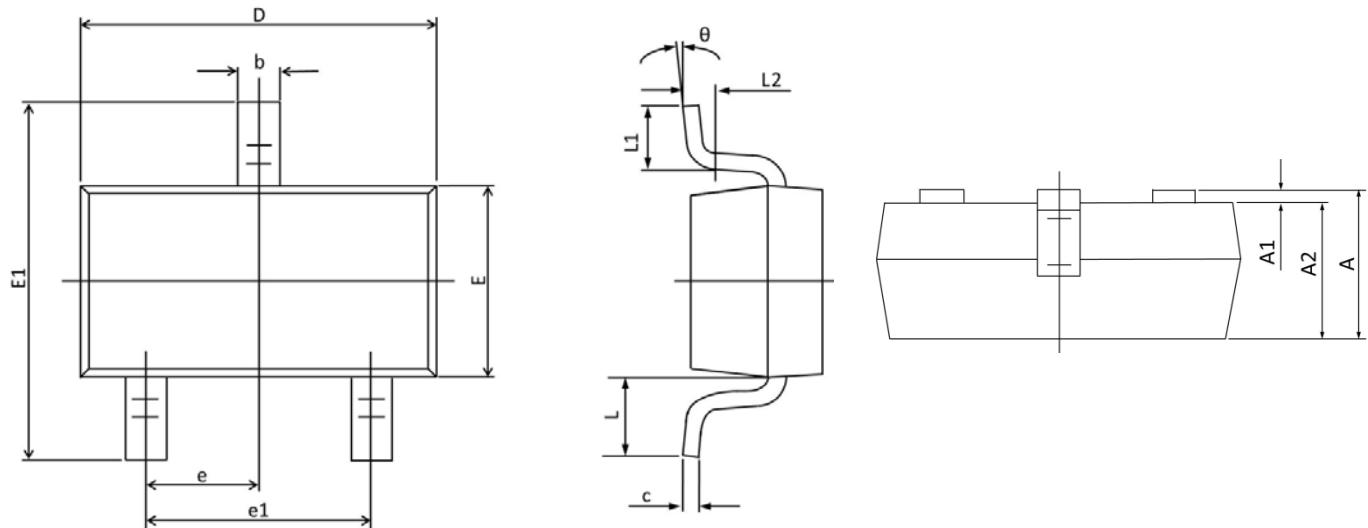


Figure 6. Safe Operation Area

Package Outline Dimensions (SOT-23)



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 0.900 | 1.150 | 0.035 | 0.045 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.050 | 0.035 | 0.041 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.080 | 0.150 | 0.003 | 0.006 |
| D | 2.800 | 3.000 | 0.110 | 0.118 |
| E | 1.200 | 1.400 | 0.047 | 0.055 |
| E1 | 2.250 | 2.550 | 0.089 | 0.100 |
| e | 0.950 TYP. | | 0.037 TYP. | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.550 REF. | | 0.022 REF. | |
| L1 | 0.300 | 0.500 | 0.012 | 0.020 |
| L2 | 0.250 TYP. | | 0.010 TYP. | |
| θ | 0° | 8° | 0° | 8° |