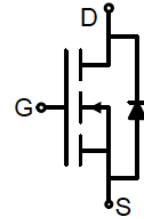


Main Product Characteristics

| | |
|--------------|--------------|
| V_{DS} | 30V |
| $R_{DS(ON)}$ | 65m Ω |
| I_D | 3A |



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 GSF3402 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 ($T_A=25^\circ\text{C}$ unless otherwise specified)

| Parameter | Symbol | Max. | Unit |
|--|-----------------|-------------|--------------------|
| Drain-Source Voltage | V_{DS} | 30 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Drain Current-Continuous | I_D | 3 | A |
| Drain Current-Pulsed ¹ | I_{DM} | 20 | A |
| Maximum Power Dissipation | P_D | 0.9 | W |
| Operating Junction and Storage Temperature Range | T_J, T_{STG} | -55 To +150 | $^\circ\text{C}$ |
| Thermal Resistance, Junction-to-Ambient ² | $R_{\theta JA}$ | 138 | $^\circ\text{C/W}$ |

Electrical Characteristics (T_A=25°C unless otherwise specified)

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|--|---------------------|--|------|------|------|------|
| Off Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | V _{GS} =0V I _D =250μA | 30 | - | - | V |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} =20V, V _{GS} =0V | - | - | 1 | μA |
| Gate-Body Leakage Current | I _{GSS} | V _{GS} =±20V, V _{DS} =0V | - | - | ±100 | nA |
| On Characteristics³ | | | | | | |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} =V _{GS} , I _D =250μA | 1 | 1.5 | 3 | V |
| Drain-Source On-State Resistance | R _{DS(on)} | V _{GS} =10V, I _D =3A | - | 50 | 65 | mΩ |
| | | V _{GS} =4.5V, I _D =3A | - | 65 | 75 | |
| Forward Transconductance | g _{FS} | V _{DS} =5V, I _D =3A | 14 | - | - | S |
| Dynamic Characteristics⁴ | | | | | | |
| Input Capacitance | C _{iss} | V _{DS} =10V, V _{GS} =0V, F=1.0MHz | - | 235 | - | PF |
| Output Capacitance | C _{oss} | | - | 35 | - | PF |
| Reverse Transfer Capacitance | C _{rss} | | - | 18 | - | PF |
| Switching Characteristics⁴ | | | | | | |
| Turn-On Delay Time | t _{d(on)} | V _{DD} =15V, I _D =1A, V _{GS} =10V, R _{GEN} =6Ω | - | 3.5 | - | nS |
| Turn-On Rise Time | t _r | | - | 1.5 | - | nS |
| Turn-Off Delay Time | t _{d(off)} | | - | 17.5 | - | nS |
| Turn-Off Fall Time | t _f | | - | 2.5 | - | nS |
| Total Gate Charge | Q _g | V _{DS} =15V, I _D =3A, V _{GS} =10V | - | 10 | - | nC |
| Gate-Source Charge | Q _{gs} | | - | 0.95 | - | nC |
| Gate-Drain Charge | Q _{gd} | | - | 1.6 | - | nC |
| Drain-Source Diode Characteristics | | | | | | |
| Diode Forward Voltage ³ | V _{SD} | V _{GS} =0V, I _S =3A | - | - | 1.2 | V |
| Diode Forward Current ² | I _S | | - | - | 3 | A |

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

Typical Electrical and Thermal Characteristic Curves

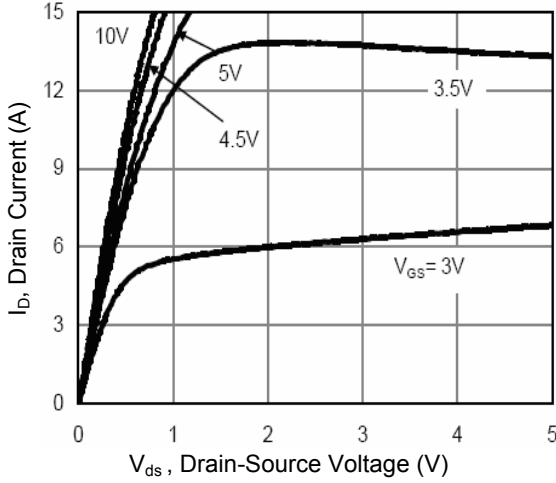


Figure 1. Output Characteristics

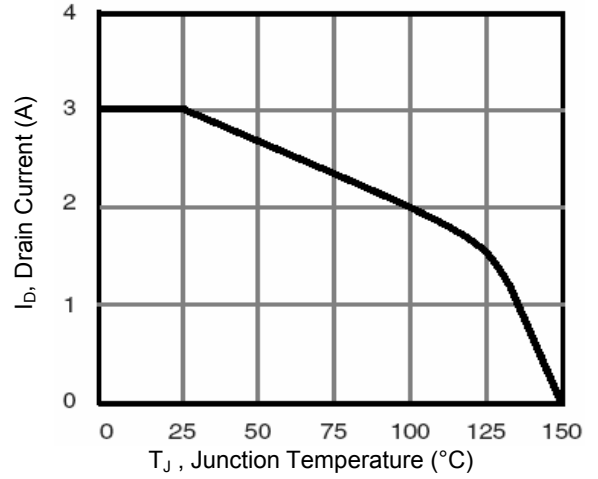


Figure 2. Drain Current

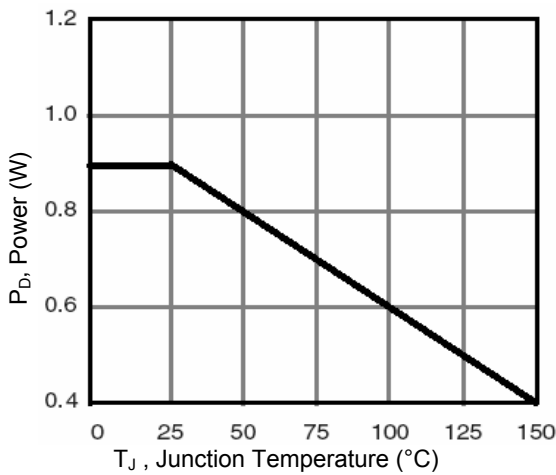


Figure 3. Power Dissipation

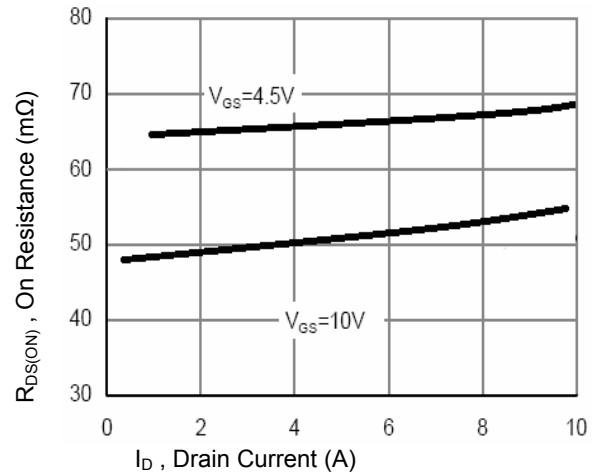


Figure 4. Drain-Source On-Resistance

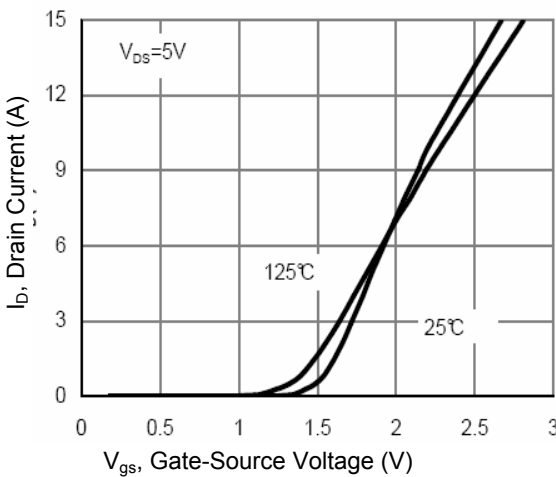


Figure 5. Transfer Characteristics

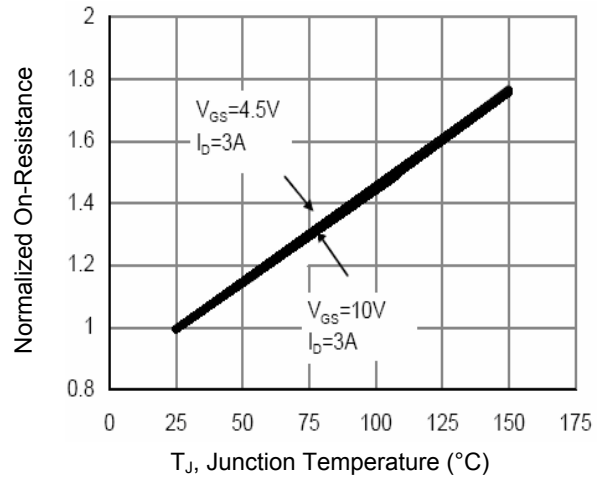


Figure 6. Drain-Source On-Resistance

Typical Electrical and Thermal Characteristic Curves

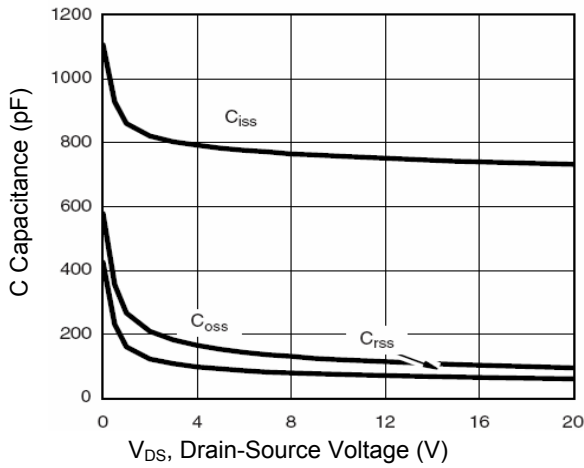


Figure 7. Capacitance vs. V_{DS}

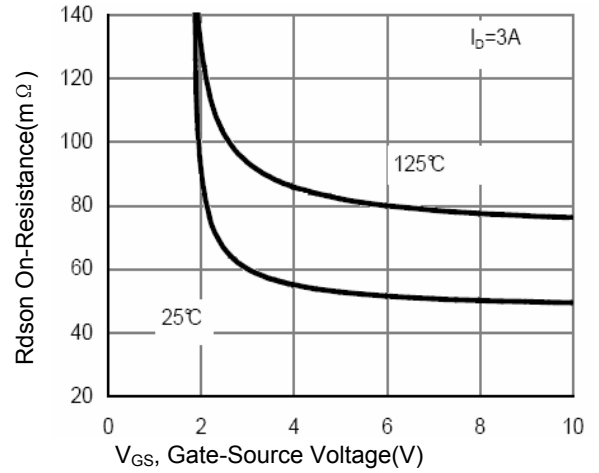


Figure 8. R_{dson} vs. V_{GS}

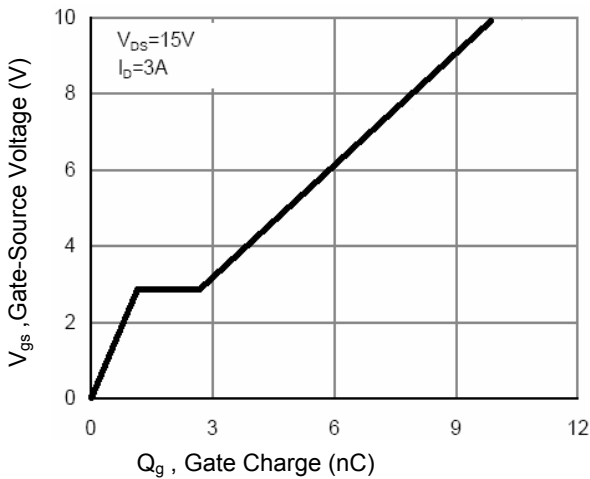


Figure 9. Gate Charge

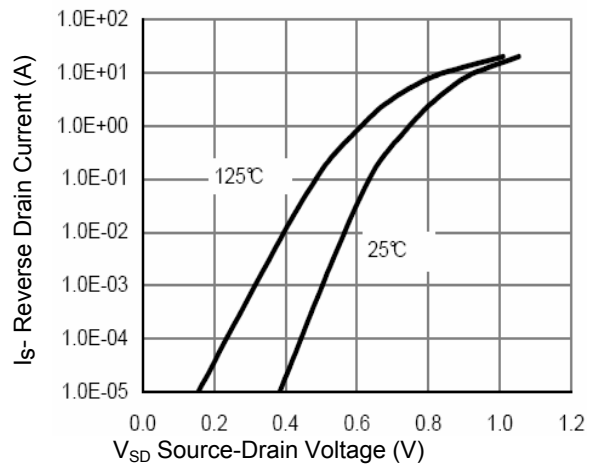


Figure 10. Source-Drain Diode Forward

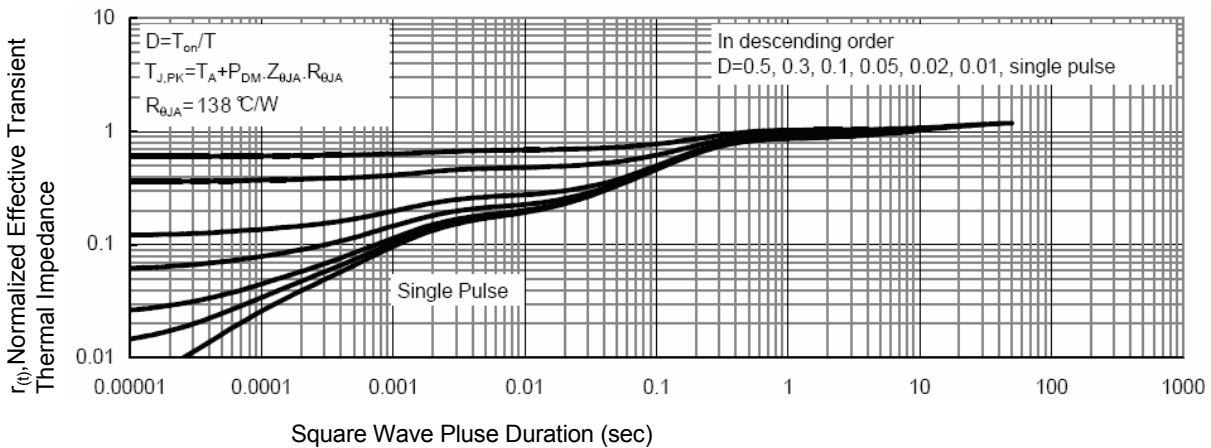


Figure 11. Normalized Maximum Transient Thermal Impedance

Typical Electrical and Thermal Characteristic Curves

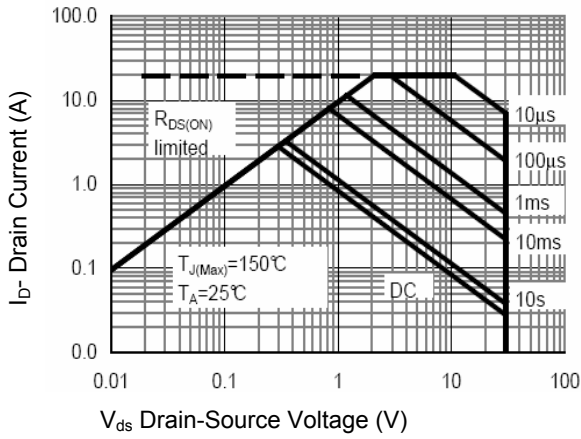


Figure 12. Safe Operation Area

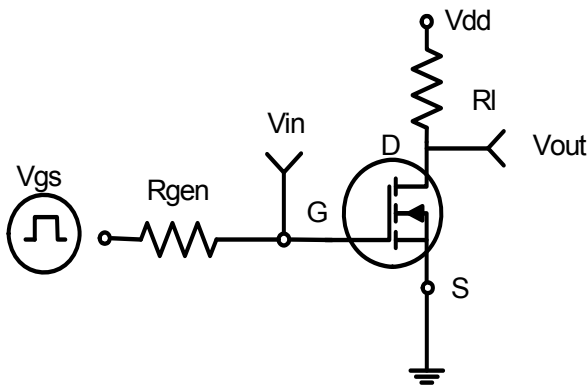


Figure 13. Switch Time Test Circuit

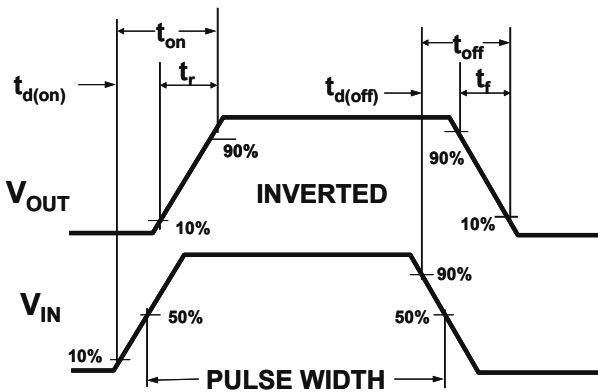
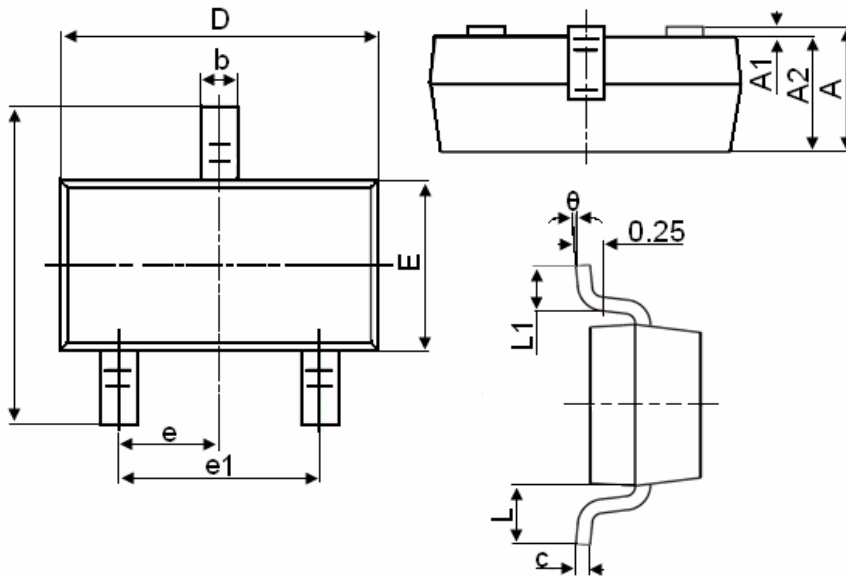


Figure 14. Switching Waveforms

Package Outline Dimensions (SOT-23)



| Symbol | Dimensions in Millimeters | |
|--------|---------------------------|-------|
| | MIN. | MAX. |
| A | 0.900 | 1.150 |
| A1 | 0.000 | 0.100 |
| A2 | 0.900 | 1.050 |
| b | 0.300 | 0.500 |
| c | 0.080 | 0.150 |
| D | 2.800 | 3.000 |
| E | 1.200 | 1.400 |
| E1 | 2.250 | 2.550 |
| e | 0.950TYP | |
| e1 | 1.800 | 2.000 |
| L | 0.550REF | |
| L1 | 0.300 | 0.500 |
| θ | 0° | 8° |

Notes:

1. All dimensions are in millimeters.
2. Tolerance $\pm 0.10\text{mm}$ (4 mil) unless otherwise specified
3. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 5 mils.
4. Dimension L is measured in gauge plane.
5. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.