

A2N7002

N-Channel Enhancement Mode MOSFET



Features

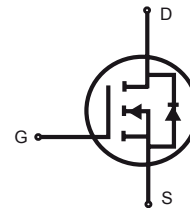
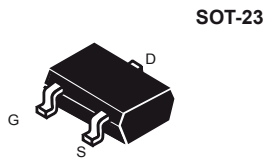
- Super high dense cell design for low $R_{DS(ON)}$
- Very fast switching
- Rugged and reliable
- SOT-23 surface mount package
- Lead (Pb) free product

Product Summary

| V _{DS} (V) | I _D (A) | R _{DS(ON)} (Ω) Max |
|---------------------|--------------------|-----------------------------|
| 60V | 0.25A | 5.0 @V _{GS} = 10V |
| | | 7.5 @V _{GS} = 5V |

Applications

- Load switch
- Battery operated systems
- Logic level translator
- High speed line driver
- Solid state relays



Absolute Maximum Ratings (T_A = 25°C unless otherwise noted)

| Parameter | Symbol | Rating | Unit |
|---|-----------------------------------|------------|------|
| Drain-Source Voltage | V _{DS} | 60 | V |
| Gate-Source Voltage | V _{GS} | ± 30 | V |
| Drain Current-Continuous @ T _C = 125°C | I _D | 250 | mA |
| -Pulsed ^b | I _{DM} | 0.8 | A |
| Drain-Source Diode Forward Current ^a | I _S | 250 | mA |
| Maximum Power Dissipation ^a | P _D | 200 | mW |
| Operating Junction and Storage Temperature Range | T _J , T _{STG} | -55 to 150 | °C |

Thermal Characteristics

| | | | |
|--|------------------|-----|------|
| Thermal Resistance, Junction-to-Ambient ^a | R _{θJA} | 625 | °C/W |
|--|------------------|-----|------|

Electrical Characteristics (TA = 25°C unless otherwise noted)

| Parameter | Symbol | Condition | Min | Typ ^c | Max | Unit |
|----------------------------------|---------------------|---|-----|------------------|------|------|
| Static | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | V _{GS} =0V, I _D = 10 μA | 60 | | | V |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} = 60V, V _{GS} =0V | | | 1 | μA |
| Gate-Body Leakage | I _{GSS} | V _{GS} =±20V, V _{DS} =0V | | | ±100 | nA |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} =V _{GS} I _D =250 μA | 1 | 1.8 | 2.5 | V |
| Drain-Source On-State Resistance | R _{DS(ON)} | V _{GS} =10V, I _D = 250mA | | | 5 | Ω |
| | | V _{GS} = 5V, I _D = 50mA | | | 7.5 | |
| On-State Drain Current | I _{D(ON)} | V _{DS} = 7V, V _{GS} = 10V | 500 | | | mA |
| Forward Transconductance | g _{FS} | V _{DS} = 7V, I _D = 200mA | 70 | | | mS |
| Diode Forward Voltage | V _{SD} | V _{GS} =0V, I _D = 250mA | | 0.75 | 1.5 | V |

Dynamic

| | | | | | | |
|------------------------------|---------------------|--|--|-----|----|----|
| Input Capacitance | C _{ISS} | V _{DS} =25V V _{GS} =0V f=1.0MHz | | 15 | 40 | pF |
| Output Capacitance | C _{OSS} | | | 7 | 25 | |
| Reverse Transfer Capacitance | C _{RSS} | | | 2 | 5 | |
| Turn-On Delay Time | t _{D(ON)} | V _D = 30V, I _D = 100mA, V _{GS} = 10V, R _{GEN} =10Ω, | | 8 | 20 | ns |
| Rise Time | t _r | | | 5.5 | | |
| Turn-Off Delay Time | t _{D(OFF)} | | | 9 | 20 | |
| Fall Time | t _f | | | 2.8 | | |

Notes:

- Surface Mounted on FR4 Board, t ≤ 10 sec.
- Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%.
- Guaranteed by design, not subject to production testing.

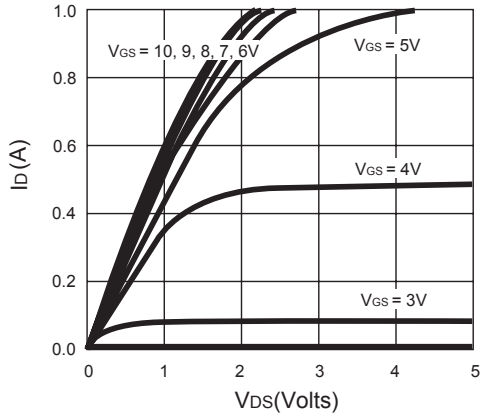


Figure 1. On-Regions Characteristics

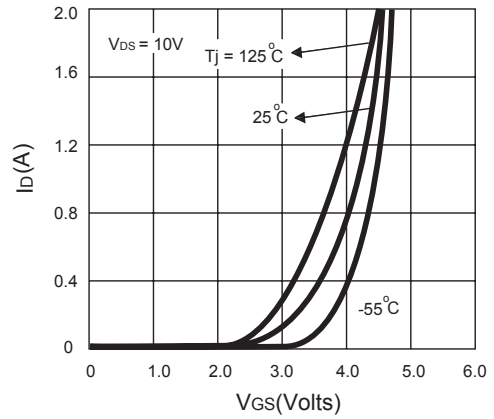


Figure 2. Transfer Characteristics

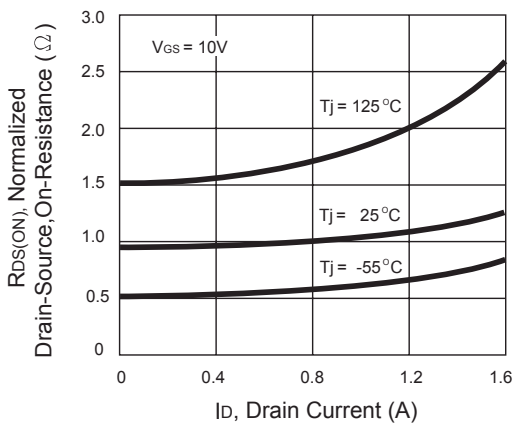


Figure 3. On-Resistance Variation with Temperature

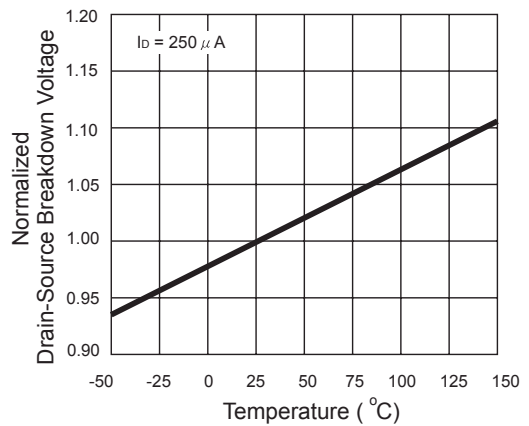


Figure 4. Drain-Source Breakdown Voltage vs. Temperature

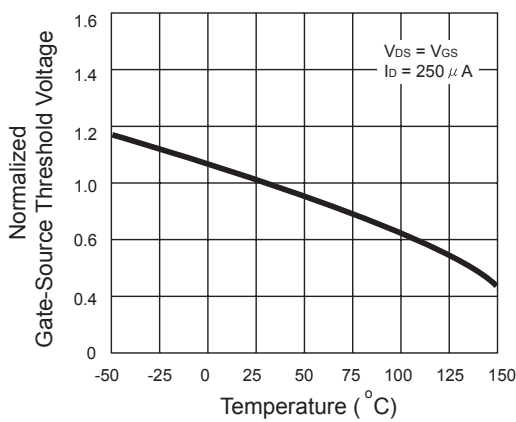


Figure 5. Gate Threshold vs. Junction Temperature

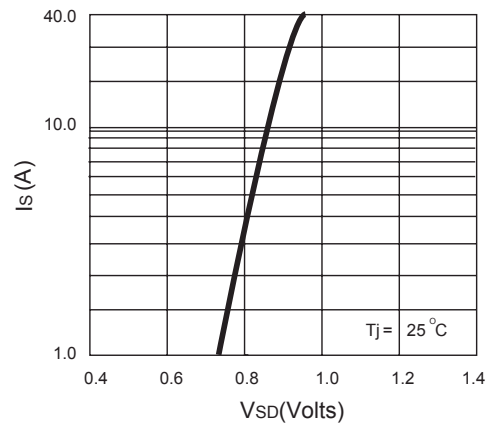


Figure 6. Body Diode Characteristics

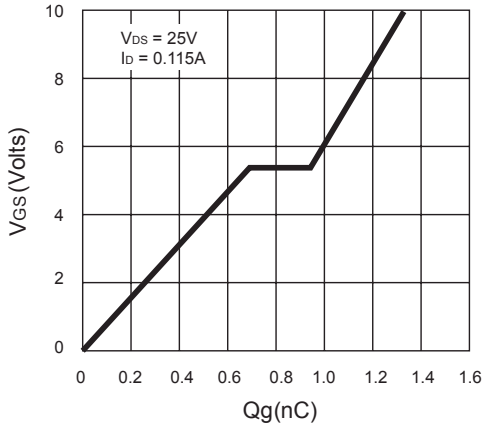


Figure 7. Gate-Charge Characteristics

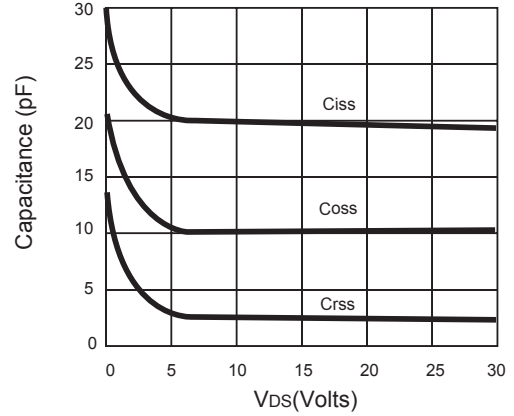


Figure 8. Capacitance Characteristics

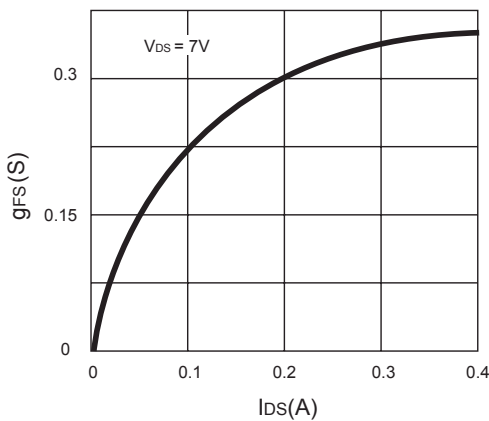


Figure 9. Transconductance vs. Drain Current

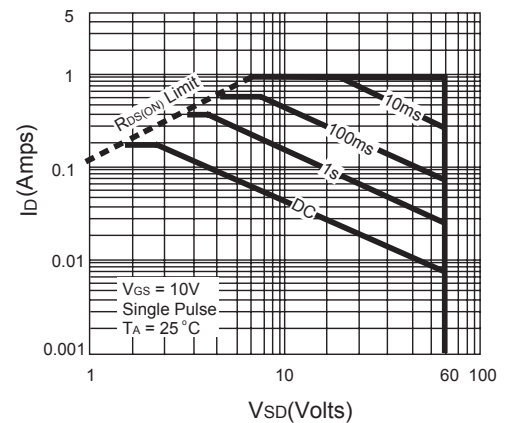


Figure 10. Maximum Forward Biased Safe Operating Area

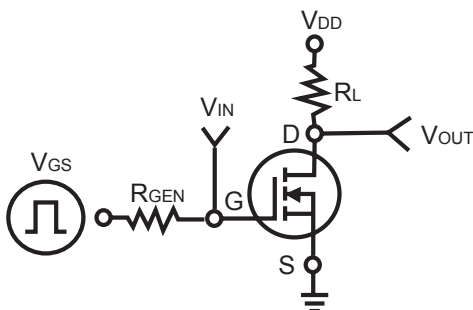


Figure 11. Switching Test Circuit

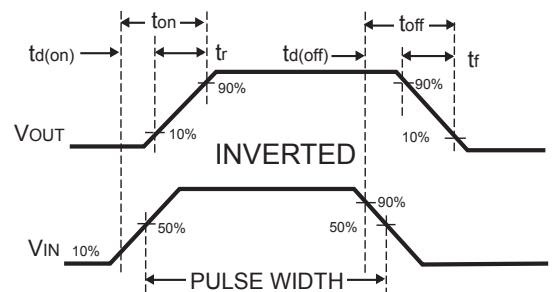


Figure 12. Switching Waveforms

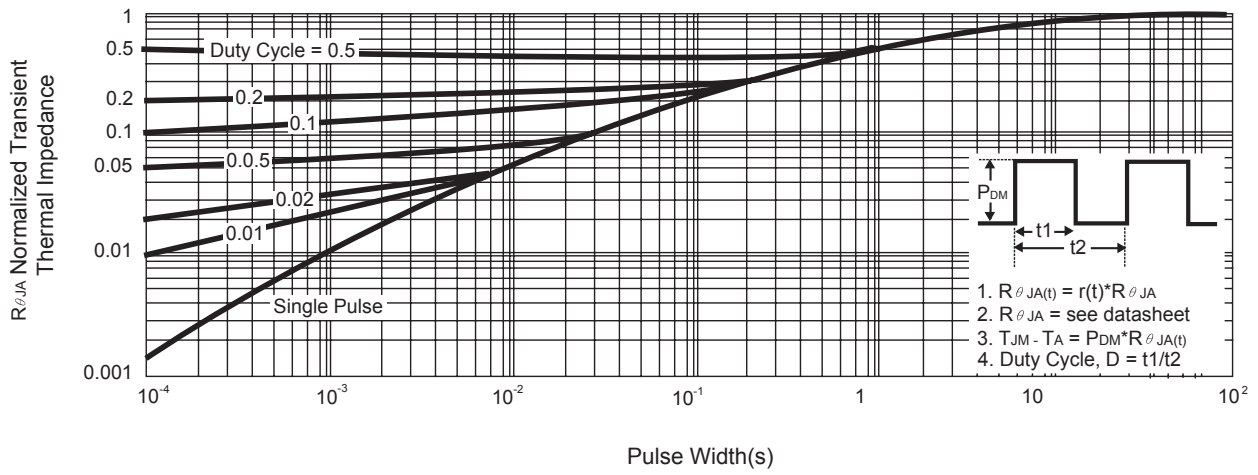


Figure 13. Normalized Maximum Transient Thermal Impedance