

Features

- Fast switching
- Low Gate Charge
- Improved dv/dt capability
- 100% avalanche tested
- Green Device Available

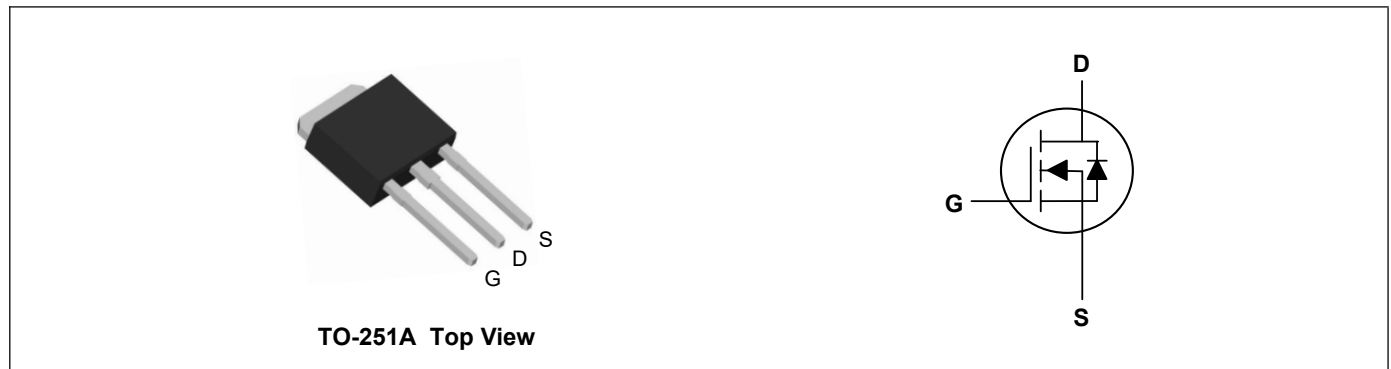
Applications

- Switch Mode Power Supply (SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)
- AC to DC Converters

Product Summary



| | | |
|---------------------------------|-----|----------|
| V_{DS} | 650 | V |
| I_D | 2 | A |
| $R_{DS(ON)}$ (at $V_{GS}=10V$) | 5.2 | Ω |



Absolute Maximum Ratings ($T_C=25^\circ\text{C}$, unless otherwise noted)

| Parameter | Symbol | Rating | Units |
|--|-----------|------------|------------------|
| Drain-Source Voltage | V_{DS} | 650 | V |
| Gate-Source Voltage | V_{GS} | ± 30 | V |
| Continuous Drain Current ¹ | I_D | 2 | A |
| Pulsed Drain Current ² | I_{DM} | 6 | A |
| Single Pulse Avalanche Energy ³ | E_{AS} | 95 | mJ |
| Avalanche Current | I_{AS} | 2.3 | A |
| Repetitive Avalanche Energy | E_{AR} | 6.4 | mJ |
| Total Power Dissipation ⁴ | P_D | 25 | W |
| Storage Temperature Range | T_{STG} | -55 to 150 | $^\circ\text{C}$ |
| Operating Junction Temperature Range | T_J | -55 to 150 | $^\circ\text{C}$ |

Thermal Characteristics

| Parameter | Symbol | Typ | Max | Unit |
|--|-----------------|-----|-----|---------------------------|
| Thermal Resistance Junction-Ambient ¹ | $R_{\theta JA}$ | --- | 60 | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance Junction-Case ¹ | $R_{\theta JC}$ | --- | 5 | $^\circ\text{C}/\text{W}$ |

Electrical Characteristics (T_J=25°C, unless otherwise noted)

| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|--|---------------------|--|-----|-----|------|------|
| Drain-Source Breakdown Voltage | BV _{DSS} | V _{GS} =0V, I _D =250uA | 650 | --- | --- | V |
| Static Drain-Source On-Resistance ² | R _{DS(ON)} | V _{GS} =10V, I _D =1A | --- | 4.2 | 5.2 | Ω |
| Gate Threshold Voltage | V _{GS(th)} | V _{GS} =V _{DS} , I _D =250uA | 2.0 | --- | 4.0 | V |
| Drain-Source Leakage Current | I _{DSS} | V _{DS} =650V, V _{GS} =0V, T _J =25°C | --- | --- | 1 | uA |
| Gate-Source Leakage Current | I _{GSS} | V _{GS} =±30V, V _{DS} =0V | --- | --- | ±100 | nA |
| Total Gate Charge | Q _g | V _{DD} =400V, V _{GS} =10V, I _D =2A | --- | 6.3 | --- | nC |
| Gate-Source Charge | Q _{gs} | | --- | 1.2 | --- | |
| Gate-Drain Charge | Q _{gd} | | --- | 2.9 | --- | |
| Turn-On Delay Time | T _{d(on)} | V _{DD} =300V, R _G =25Ω, I _D =2A | --- | 8 | --- | ns |
| Rise Time | T _r | | --- | 33 | --- | |
| Turn-Off Delay Time | T _{d(off)} | | --- | 23 | --- | |
| Fall Time | T _f | | --- | 59 | --- | |
| Input Capacitance | C _{iss} | V _{DS} =25V, V _{GS} =0V, f=1MHz | --- | 359 | --- | pF |
| Output Capacitance | C _{oss} | | --- | 46 | --- | |
| Reverse Transfer Capacitance | C _{rss} | | --- | 10 | --- | |

Drain-Source Diode Characteristics

| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|--|-----------------|--|-----|-----|-----|------|
| Continuous Source Current ¹ | I _S | T _C =25°C | --- | --- | 2 | A |
| Pulsed Source Current | I _{SM} | | --- | --- | 8 | A |
| Diode Forward Voltage ² | V _{SD} | V _{GS} =0V, I _S =2A, T _J =25°C | --- | --- | 1.4 | V |
| Reverse Recovery Time | t _{rr} | I _F =2A, V _{GS} =400V di/dt=100A/μs, T _J =25°C | --- | 80 | --- | nS |
| Reverse Recovery Charge | Q _{rr} | | --- | 1.8 | --- | nC |

Note:

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%
- 3.The EAS data shows Max. rating. The test condition is V_{DD}=50V, V_{GS}=10V, L=10mH
- 4.The power dissipation is limited by 150°C junction temperature

Typical Characteristics

Figure 1. Output Characteristics

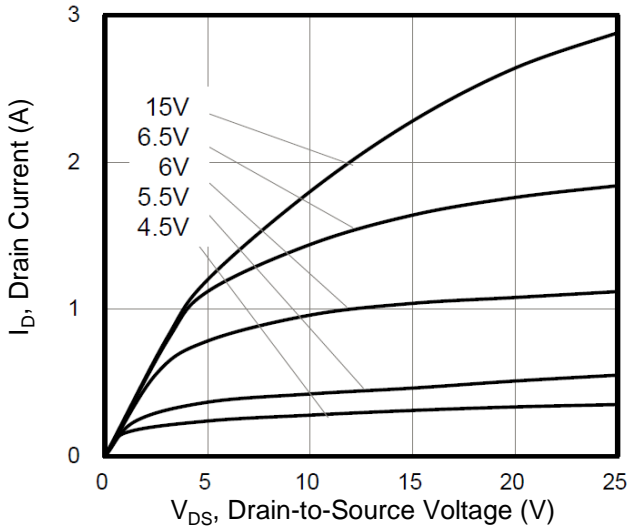


Figure 2. Transfer Characteristics

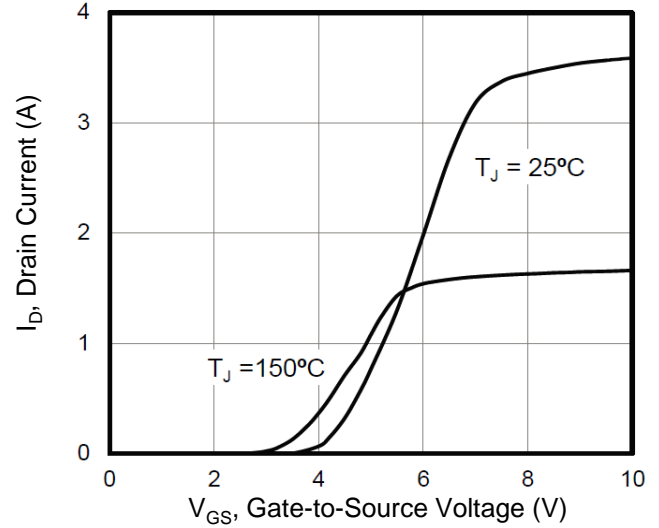


Figure 3. Drain Current vs. Temperature

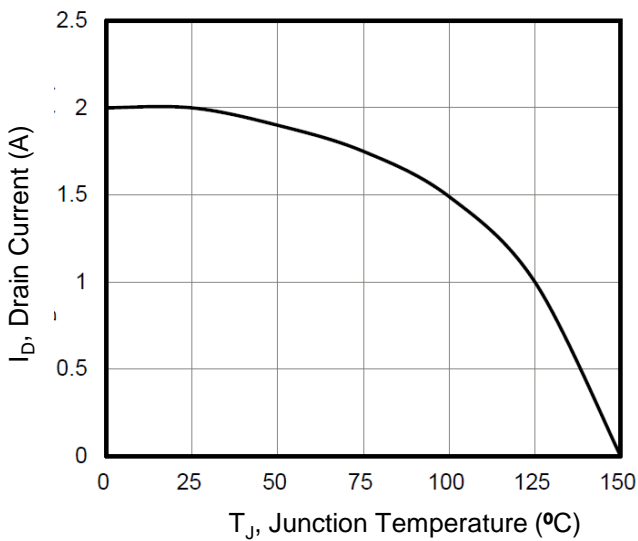


Figure 4. Capacitance

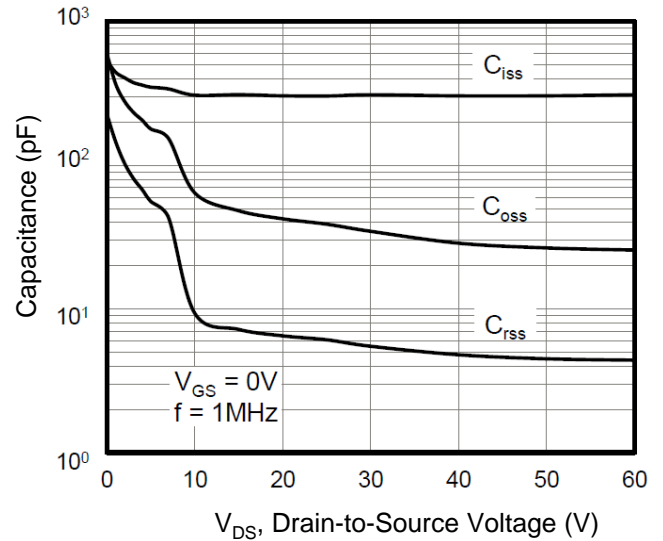


Figure 5. Gate Charge

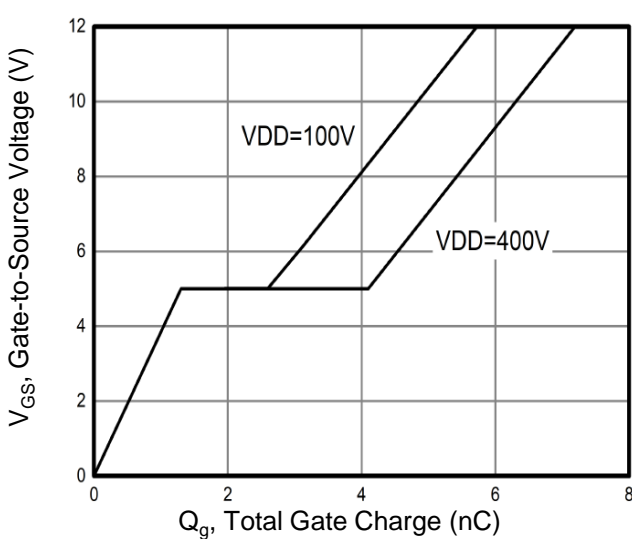


Figure 6. Body Diode Forward Voltage

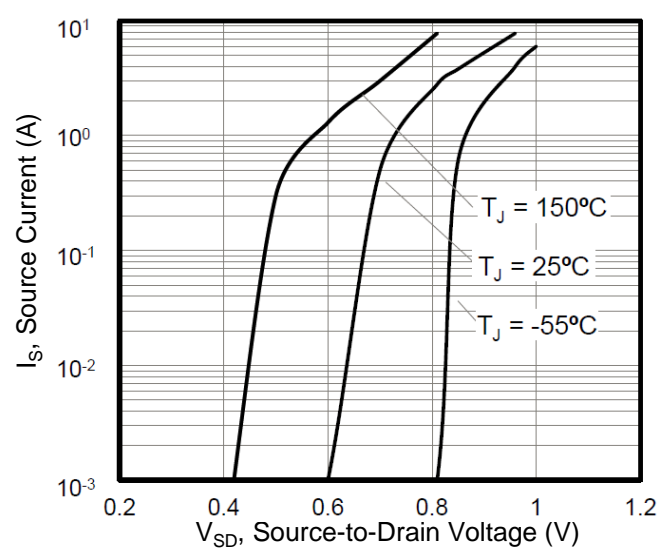


Figure 7. On-Resistance vs. Temperature

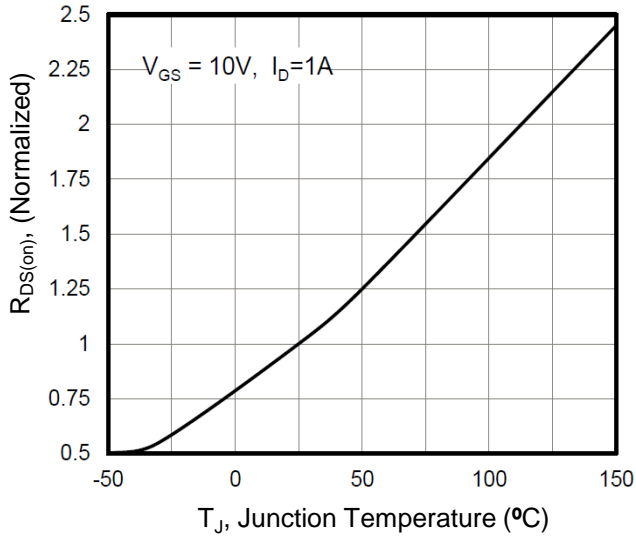


Figure 8. Power Dissipation vs. Temperature

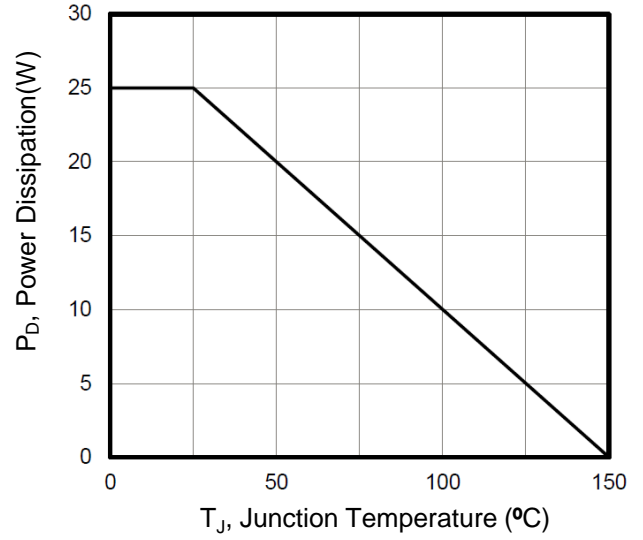
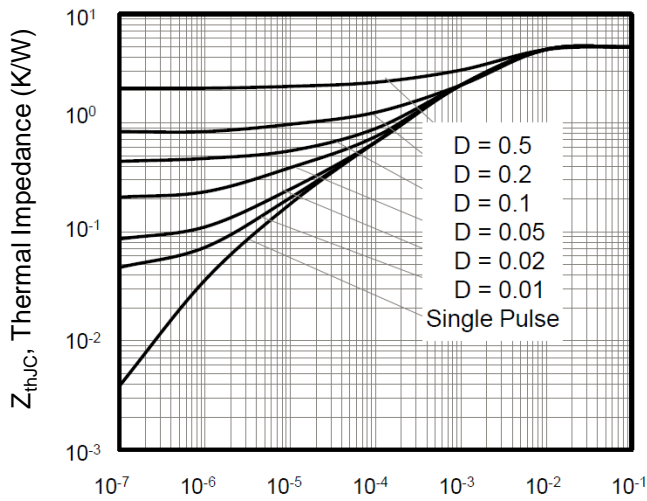
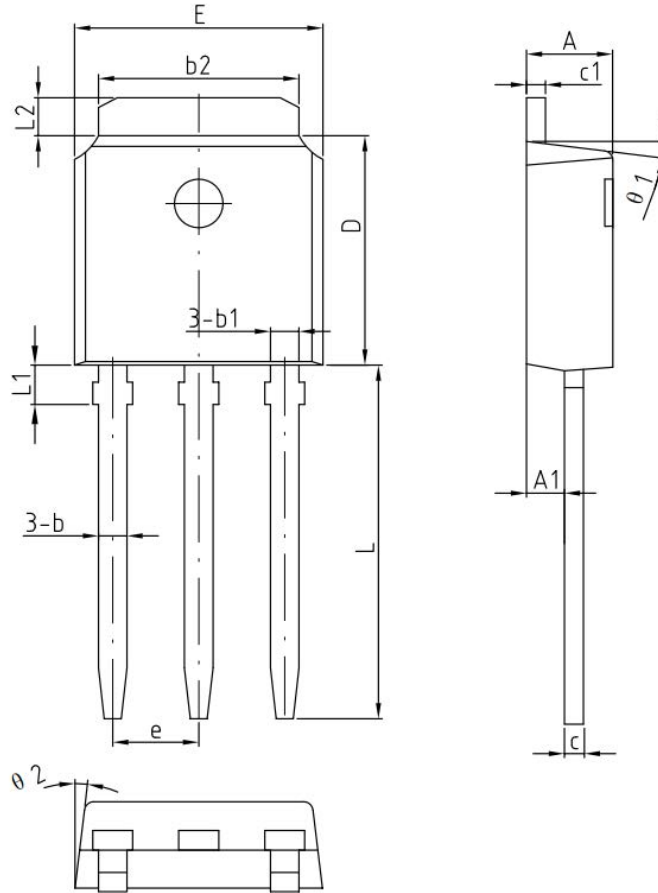


Figure 9. Transient Thermal Impedance



TO-251A Package Outline Dimensions



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

| SYMBOL | MIN | NOM | MAX |
|------------|----------|------|------|
| A | 2.2 | 2.30 | 2.38 |
| A1 | 0.90 | 1.01 | 1.10 |
| b | 0.71 | 0.76 | 0.86 |
| b1 | - | 0.76 | - |
| b2 | 5.13 | 5.33 | 5.46 |
| c | 0.46 | 0.50 | 0.60 |
| c1 | 0.46 | 0.50 | 0.60 |
| D | 6.00 | 6.10 | 6.20 |
| E | 6.50 | 6.60 | 6.70 |
| e | 2.286BSC | | |
| L | 9.10 | 9.40 | 9.70 |
| L1 | 1.05 | | |
| L2 | 0.90 | - | 1.25 |
| $\theta 1$ | 7° | | |
| $\theta 2$ | 7° | | |