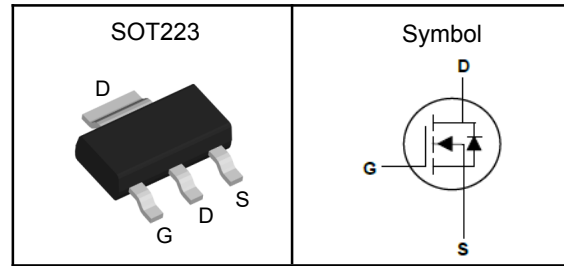


N-Channel Enhancement Mode MOSFET
Features

- Fast switching speed
- Reliable and Rugged
- ROHS Compliant
- 100% UIS and Rg Tested

Applications

- Power Management in Desktop Computer
- DC/DC Converters

Pin Description


| | | |
|------------------|----|------------|
| V_{DSS} | 60 | V |
| $R_{DS(ON)-Typ}$ | 40 | m Ω |
| I_D | 5 | A |

Absolute Maximum Ratings($T_A=25^\circ\text{C}$, Unless Otherwise Noted)

| Symbol | Parameter | N-Channel | Unit |
|--------------|------------------------------|-------------------------------|------------------|
| V_{DSS} | Drain-Source Voltage | 60 | V |
| V_{GSS} | Gate-Source Voltage | ± 20 | V |
| T_J | Maximum Junction Temperature | -55 to 150 | $^\circ\text{C}$ |
| T_{STG} | Storage Temperature Range | -55 to 150 | $^\circ\text{C}$ |
| $I_{DM}^{①}$ | Pulse Drain Current Tested | 48 | A |
| I_D | Continuous Drain Current | $T_A=25^\circ\text{C}$ 5 | A |
| P_D | Maximum Power Dissipation | $T_A=25^\circ\text{C}$ 2.6 | W |

Thermal Characteristics

| Symbol | Parameter | Rating | Unit |
|-----------------|--|--------|---------------------------|
| $R_{\theta JA}$ | Thermal Resistance Junction-Ambient ₁ (Max) | 48 | $^\circ\text{C}/\text{W}$ |
| $R_{\theta JC}$ | Thermal Resistance Junction-Case ₁ | 8.2 | $^\circ\text{C}/\text{W}$ |

Note ① : Max. current is limited by bonding wire.

Note ② : UIS tested and pulse width are limited by maximum junction temperature 150 $^\circ\text{C}$.

Note ③ : Surface Mounted on 1in² FR-4 board with 1oz.



N-Channel Enhancement Mode MOSFET

Electrical Characteristics ($T_J=25^{\circ}\text{C}$, Unless Otherwise Noted)

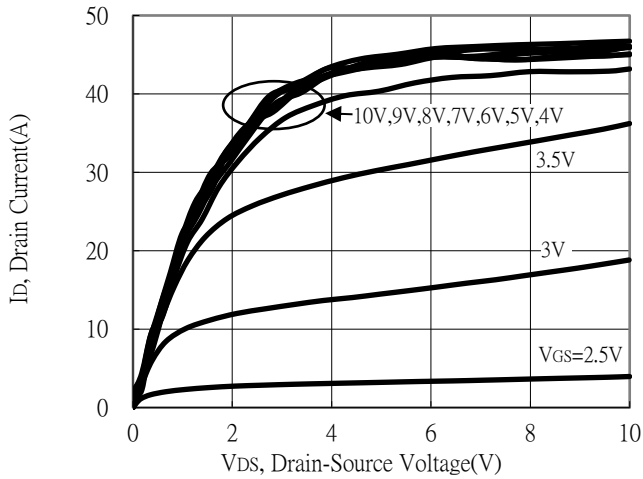
| Symbol | Parameter | Test Conditions | Min | Typ | Max | Unit |
|--|------------------------------------|--|-----|-----|-----------|------------|
| Static Electrical Characteristics | | | | | | |
| BV_{DSS} | Drain-Source Breakdown Voltage | $V_{GS}=0V, I_D=250\mu A$ | 60 | --- | --- | V |
| I_{DSS} | Zero Gate Voltage Drain Current | $V_{DS}=48V, V_{GS}=0V$ | --- | --- | 1 | μA |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}=V_{GS}, I_D=250\mu A$ | 1.0 | --- | 2.5 | V |
| I_{GSS} | Gate Leakage Current | $V_{GS}=\pm 20V, V_{DS}=0V$ | --- | --- | ± 100 | nA |
| $R_{DS(on)}$ | Drain-Source On-state Resistance | $V_{GS}=10V, I_D=5A$ | --- | 40 | 52 | m Ω |
| | | $V_{GS}=4.5V, I_D=3A$ | --- | 45 | 60 | |
| Dynamic Characteristics^⑤ | | | | | | |
| C_{iss} | Input Capacitance | $V_{GS}=0V, V_{DS}=30V, \text{Freq.}=1\text{MHz}$ | --- | 725 | --- | pF |
| C_{oss} | Output Capacitance | | --- | 45 | --- | |
| C_{riss} | Reverse Transfer Capacitance | | --- | 35 | --- | |
| $T_{d(on)}$ | Turn-on Delay Time | $V_{DS}=30V, V_{GS}=10V, R_G=6\Omega, I_D=5A$ | --- | 7 | --- | nS |
| T_r | Turn-on Rise Time | | --- | 8 | --- | |
| $T_{d(off)}$ | Turn-off Delay Time | | --- | 40 | --- | |
| T_f | Turn-off Fall Time | | --- | 7 | --- | |
| Q_g | Total Gate Charge | $V_{DS}=30V, V_{GS}=10V, I_D=5A$ | --- | 18 | --- | nC |
| Q_{gs} | Gate-Source Charge | | --- | 2.2 | --- | |
| Q_{gd} | Gate-Drain Charge | | --- | 3.6 | --- | |
| Source-Drain Characteristics ($T_J=25^{\circ}\text{C}$) | | | | | | |
| V_{SD} | Diode Forward Voltage _z | $V_{GS}=0V, I_S=5A, T_J=25^{\circ}\text{C}$ | --- | 0.8 | 1.2 | V |
| t_{rr} | Reverse Recovery Time | $I_F=5A, di/dt=100A/\mu s, T_J=25^{\circ}\text{C}$ | --- | 12 | --- | nS |
| Q_{rr} | Reverse Recovery Charge | | --- | 7.5 | --- | nC |

Note ④ : Pulse test (pulse width \leq 300 μs , duty cycle \leq 2%).

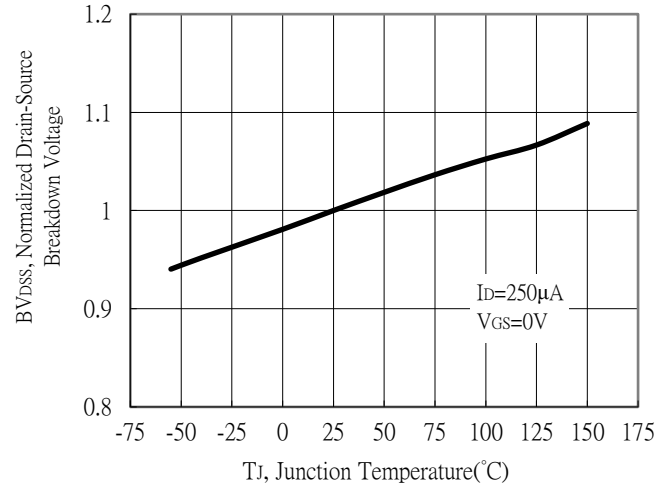
Note ⑤ : Guaranteed by design, not subject to production testing.

N-Channel Enhancement Mode MOSFET
Typical Characteristics

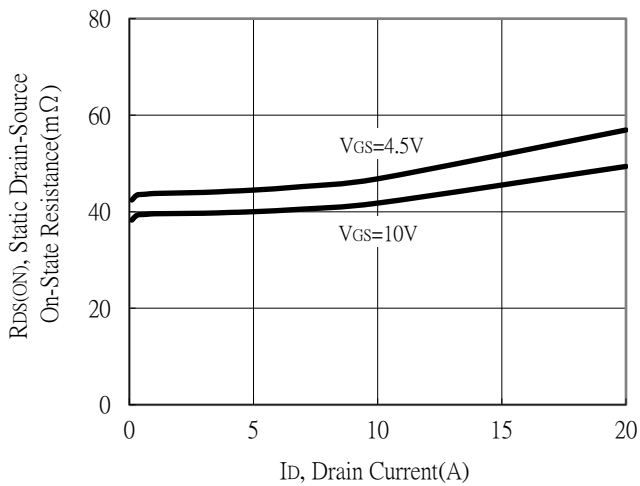
Typical Output Characteristics



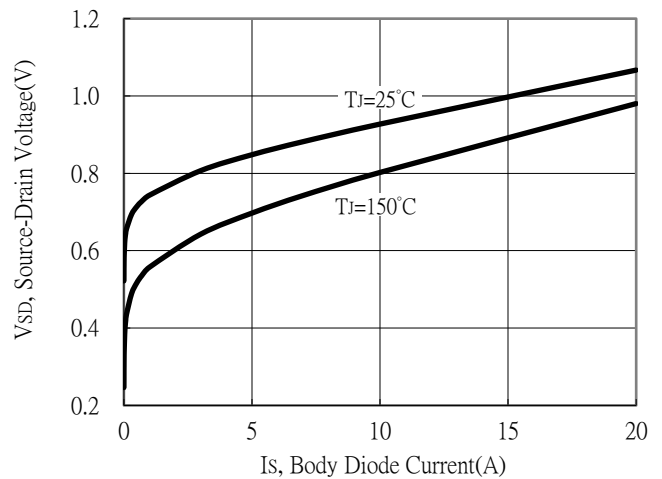
Breakdown Voltage vs Ambient Temperature



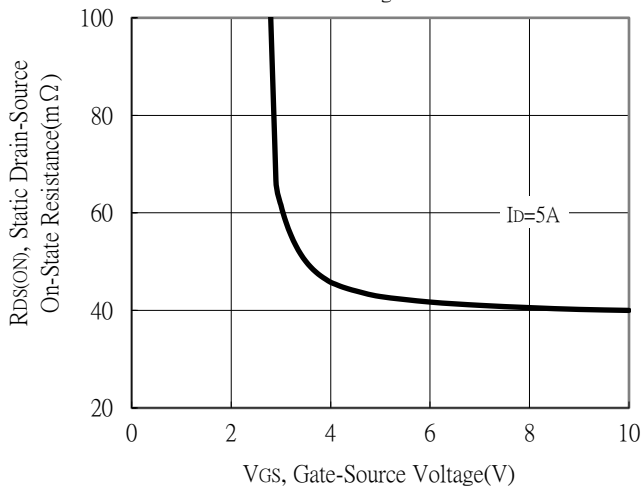
Static Drain-Source On-State resistance vs Drain Current



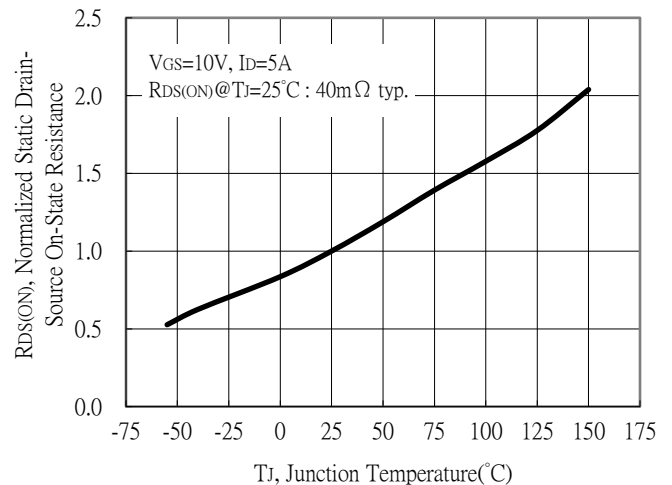
Body Diode Current vs Source-Drain Voltage



Static Drain-Source On-State Resistance vs Gate-Source Voltage

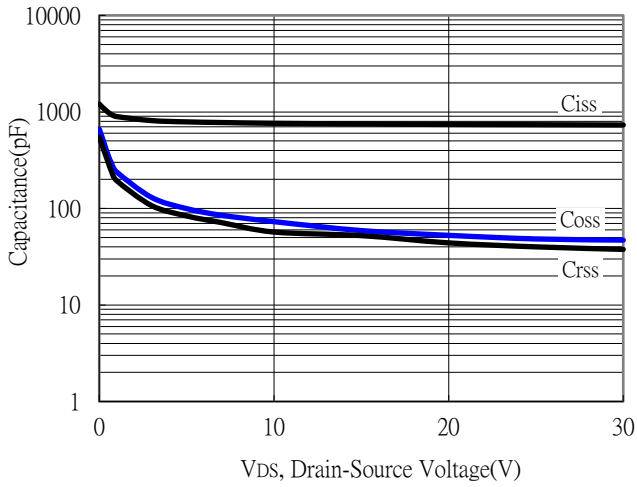


Drain-Source On-State Resistance vs Junction Temperature

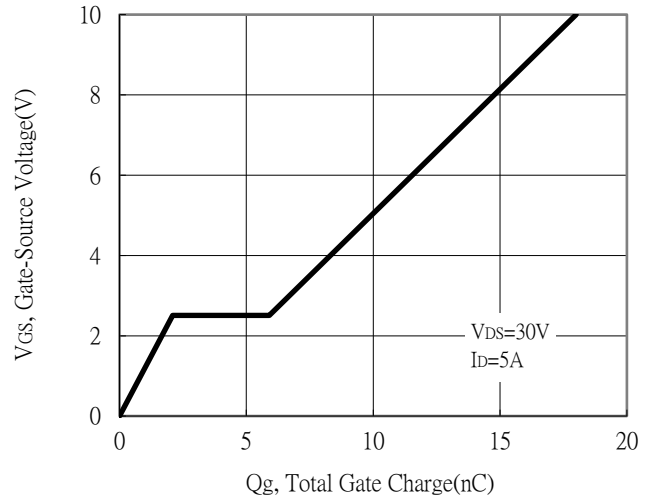


N-Channel Enhancement Mode MOSFET

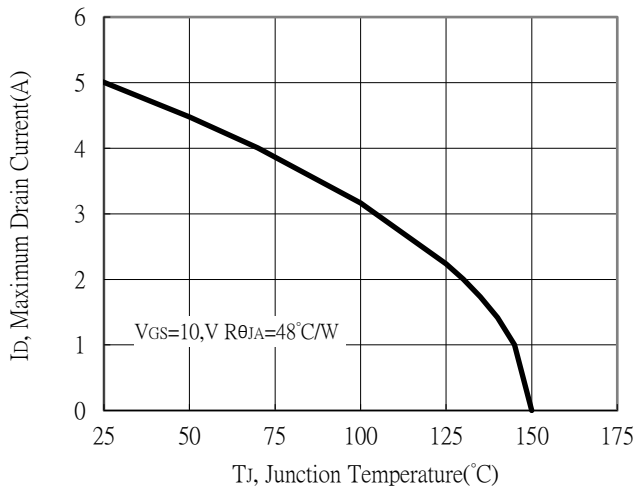
Capacitance vs Drain-to-Source Voltage



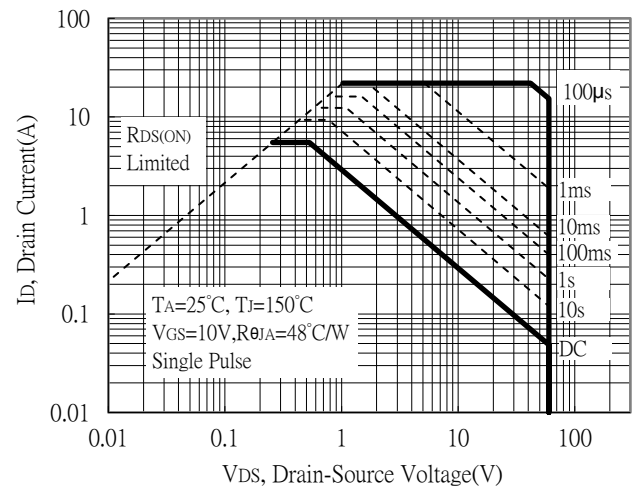
Gate Charge Characteristics



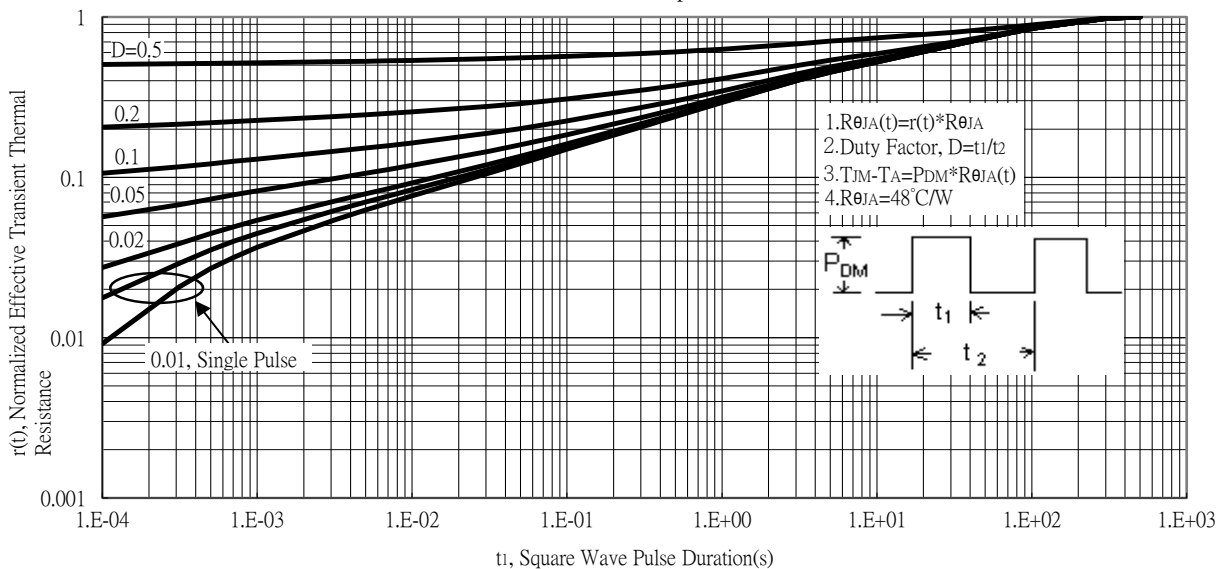
Maximum Drain Current vs Junction Temperature

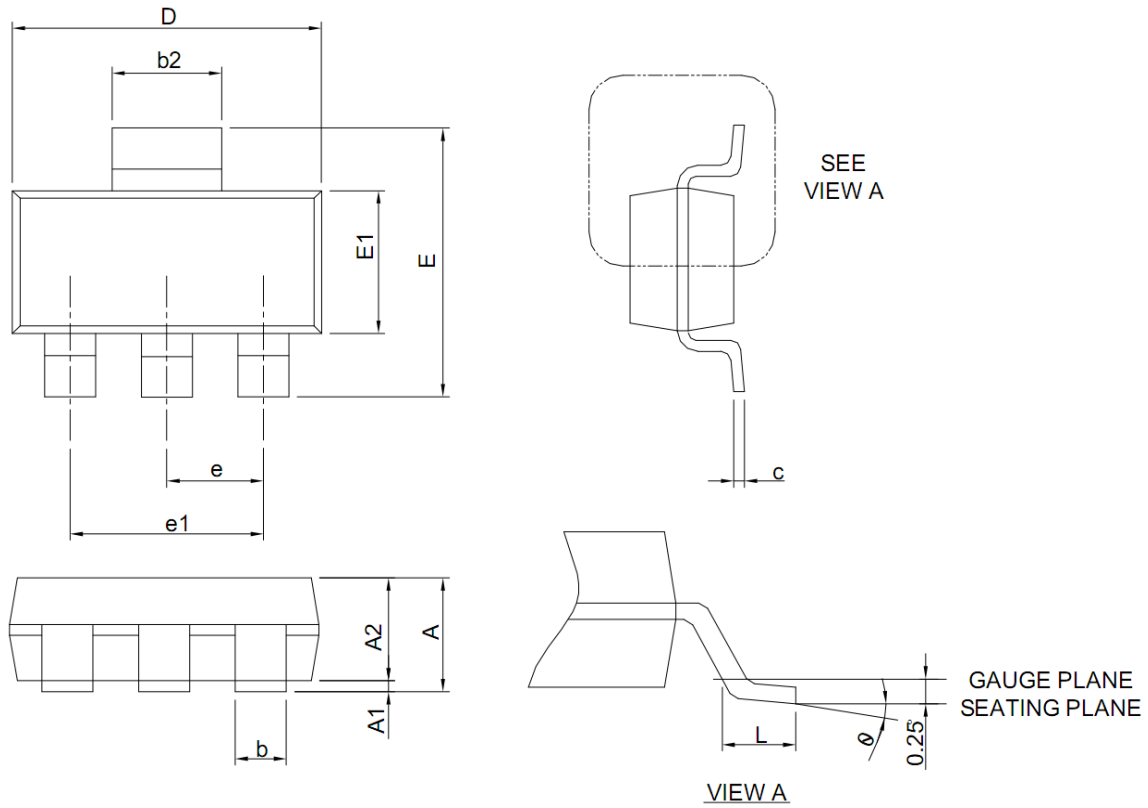


Maximum Safe Operating Area



Transient Thermal Response Curves



N-Channel Enhancement Mode MOSFET
SOT223 Package Outline Data


| Symbol | Dimensions (unit:mm) | | | Symbol | Dimensions (unit:mm) | | |
|-----------|----------------------|------|------|-----------|----------------------|------|------|
| | Min | Typ | Max | | Min | Typ | Max |
| A | 1.50 | 1.65 | 1.80 | A1 | 0.02 | 0.06 | 0.10 |
| A2 | 1.50 | 1.60 | 1.70 | b | 0.66 | 0.72 | 0.80 |
| b2 | 2.90 | 3.00 | 3.10 | c | 0.23 | 0.30 | 0.35 |
| D | 6.30 | 6.50 | 6.70 | E | 6.70 | 7.00 | 7.30 |
| E1 | 3.30 | 3.50 | 3.70 | e | 2.30 REF | | |
| e1 | 4.60 REF | | | L | 0.75 | -- | 1.15 |
| θ | 0° | -- | 10° | | | | |