

N-Channel Enhancement Mode MOSFET

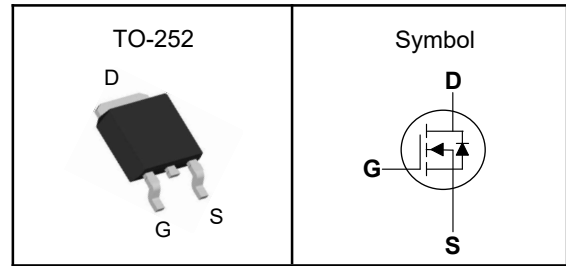
Features

- 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} | 70 | V |
| $R_{DS(ON)-Typ}$ | 7.2 | m Ω |
| I_D | 83 | A |

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

| Symbol | Parameter | Rating | Unit |
|--------------|----------------------------------------------|------------|------------------|
| V_{DSS} | Drain-Source Voltage | 70 | V |
| V_{GSS} | Gate-Source Voltage | ± 25 | V |
| T_J | Maximum Junction Temperature | -55 to 150 | $^\circ\text{C}$ |
| T_{STG} | Storage Temperature Range | -55 to 150 | $^\circ\text{C}$ |
| E_{AS} | Single Pulse Avalanche Energy ^③ | 100 | mJ |
| $I_{DM}^{①}$ | 300 μs Pulse Drain Current Tested | 332 | A |
| I_D | Continuous Drain Current | 83 | A |
| P_D | Maximum Power Dissipation | 111 | W |

Thermal Characteristics

| Symbol | Parameter | Rating | Unit |
|-----------------|-----------------------------------------------------------------|--------|---------------------------|
| $R_{\theta JA}$ | Thermal Resistance Junction-Ambient ^① (Steady State) | 91 | $^\circ\text{C}/\text{W}$ |
| $R_{\theta JC}$ | Thermal Resistance Junction-Case ^① (Steady State) | 1.13 | $^\circ\text{C}/\text{W}$ |

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

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

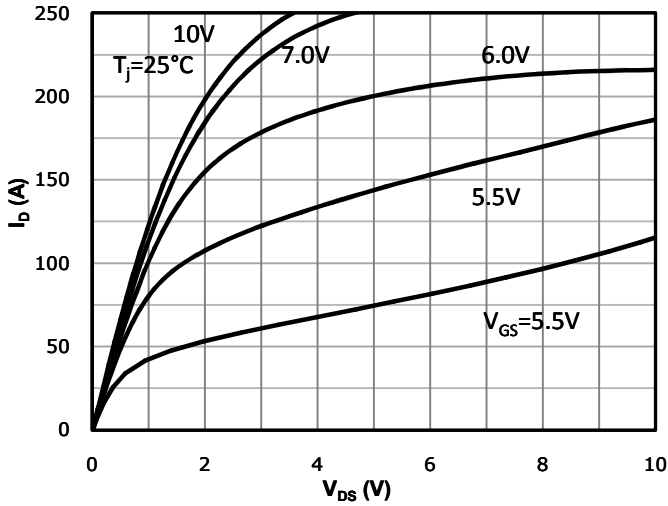
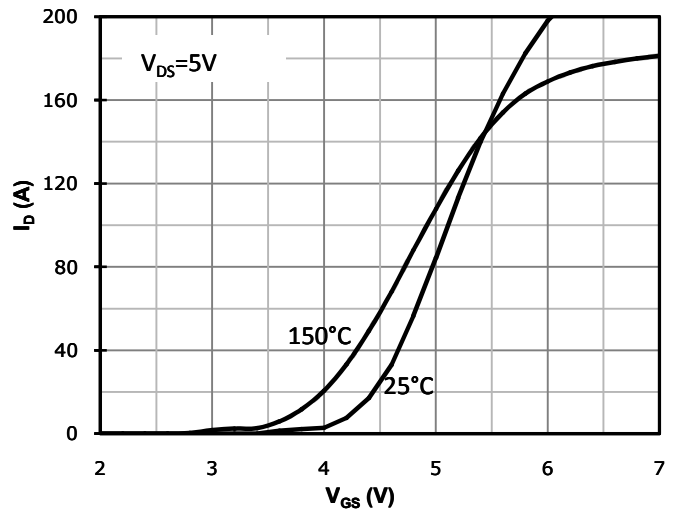
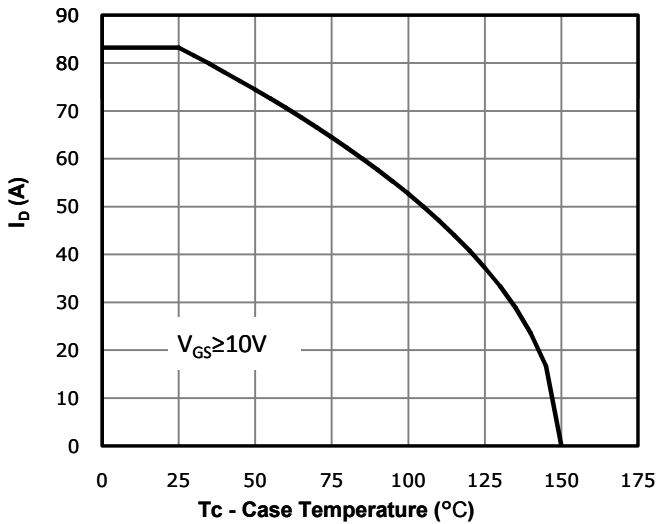
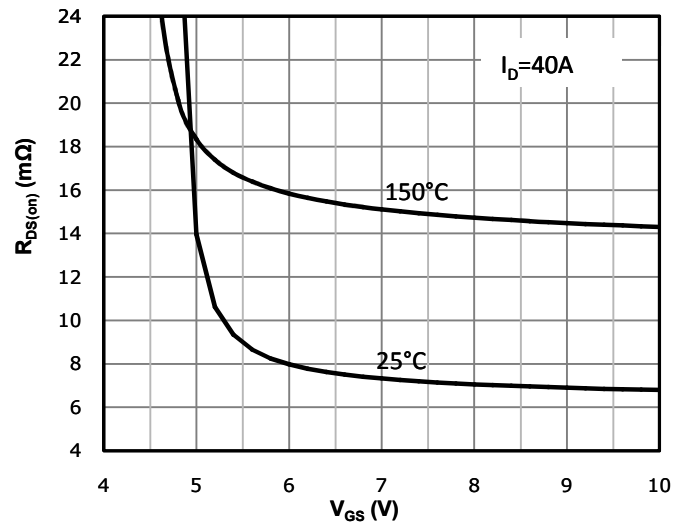
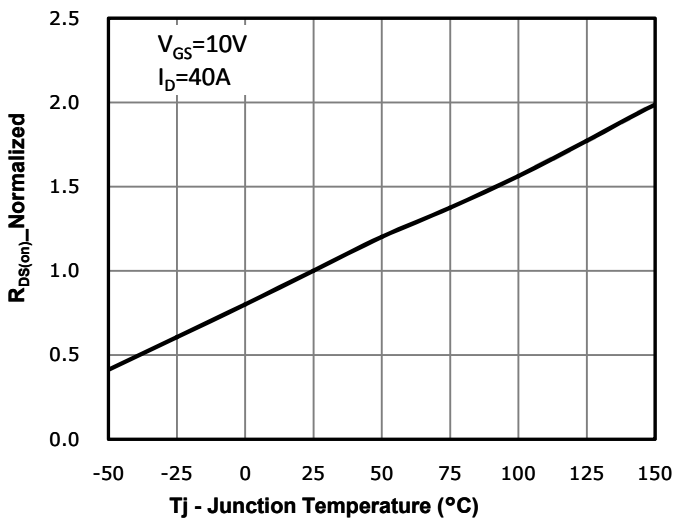
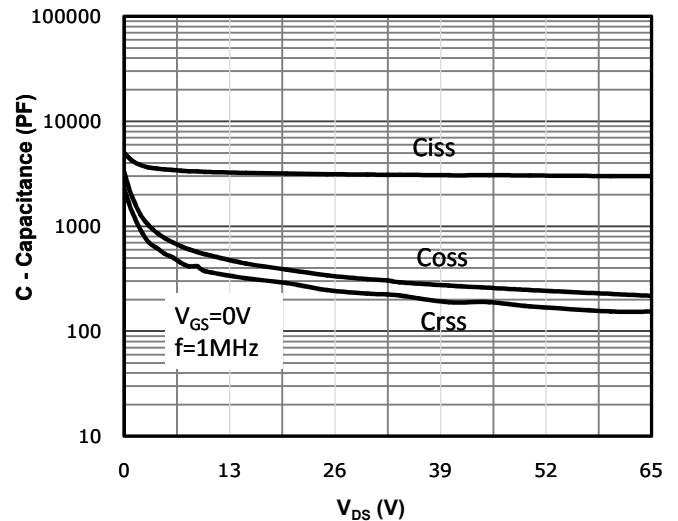
Note ③ : Surface Mounted on 1in² FR-4 board with 1oz.

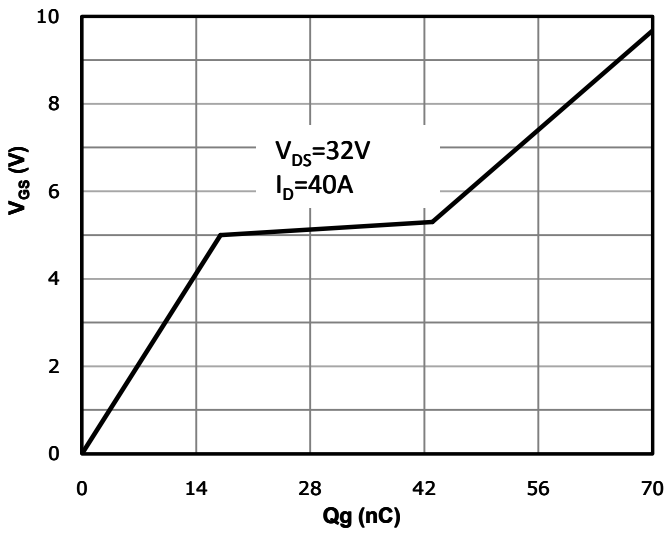
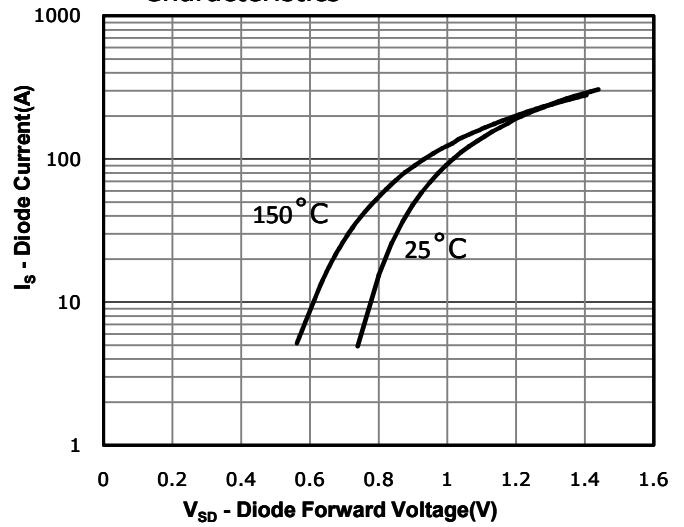
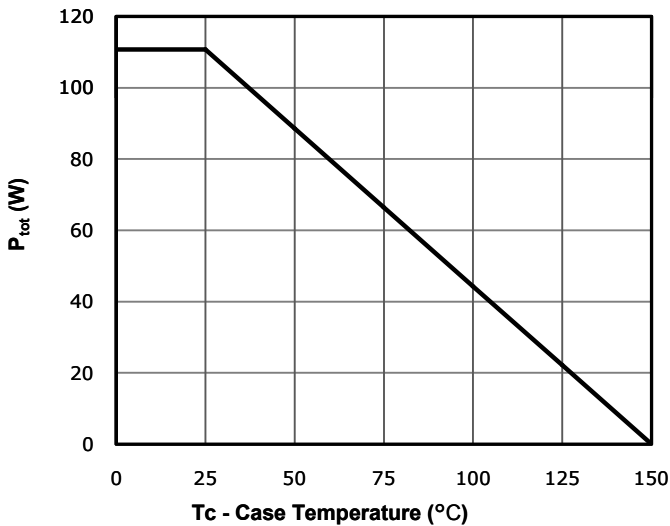
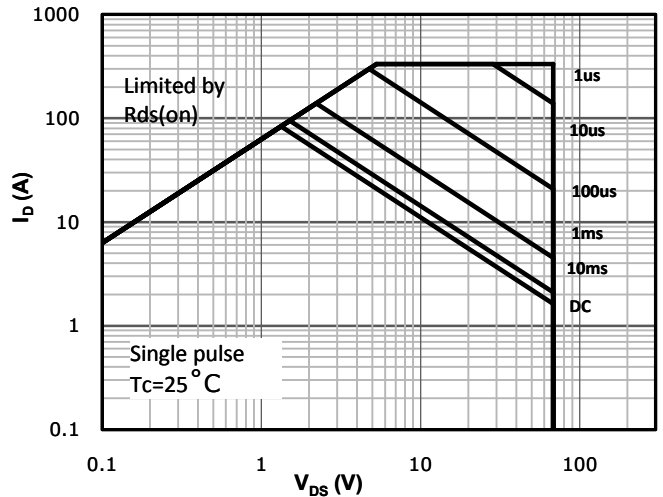
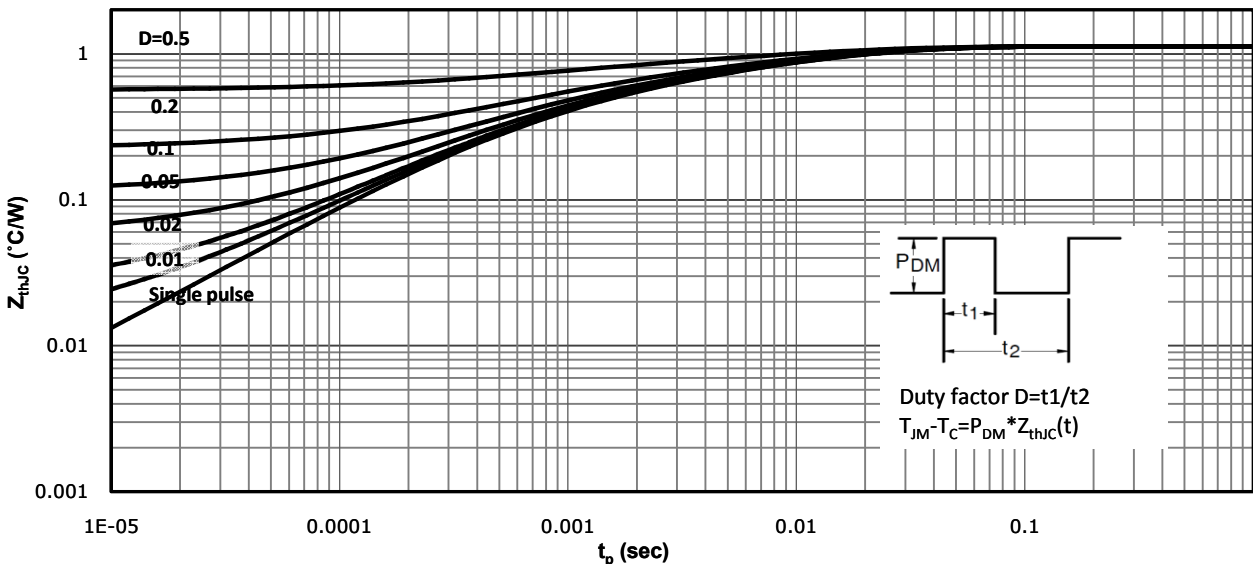
**N-Channel Enhancement Mode MOSFET****Electrical Characteristics** ($T_J=25^\circ\text{C}$, Unless Otherwise Noted)

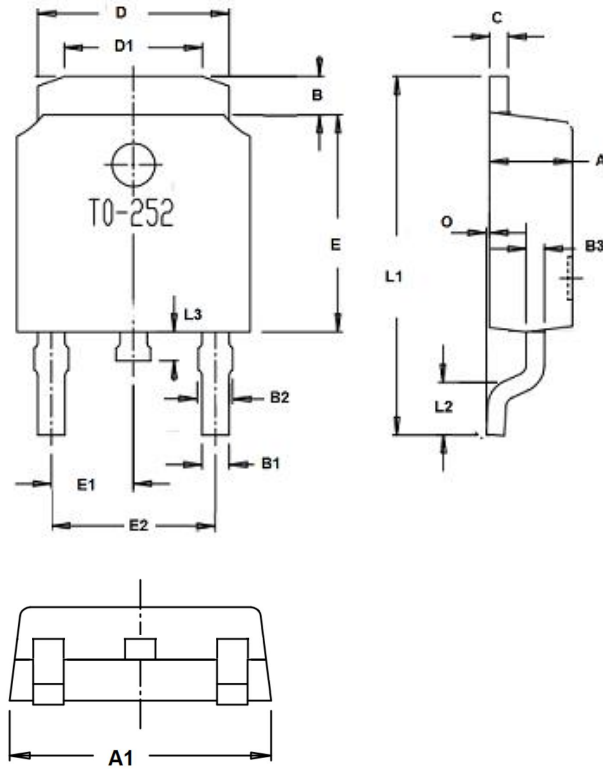
| Symbol | Parameter | Test Conditions | Min | Typ | Max | Unit |
|----------------------------------------------------------------|------------------------------------|-----------------------------------------------------------|-----|------|-----------|------------|
| Static Electrical Characteristics | | | | | | |
| BV_{DSS} | Drain-Source Breakdown Voltage | $V_{GS}=0V, I_D=250mA$ | 70 | --- | --- | V |
| I_{DSS} | Zero Gate Voltage Drain Current | $V_{DS}=65V, V_{GS}=0V$ | --- | --- | 1 | μA |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}=V_{GS}, I_D=250\mu A$ | 2 | --- | 4 | V |
| I_{GSS} | Gate Leakage Current | $V_{GS}=\pm 25V, V_{DS}=0V$ | --- | --- | ± 100 | nA |
| $R_{DS(on)}$ | Drain-Source On-state Resistance | $V_{GS}=10V, I_D=40A$ | --- | 7.2 | 9 | m Ω |
| Gfs | Forward Transconductance | $V_{DS}=5V, I_D=40A$ | --- | 105 | --- | S |
| Dynamic Characteristics ^⑤ | | | | | | |
| C_{iss} | Input Capacitance | $V_{GS}=0V,$ $V_{DS}=35V,$ Freq.=1MHz | --- | 3090 | --- | pF |
| C_{oss} | Output Capacitance | | --- | 292 | --- | |
| C_{rss} | Reverse Transfer Capacitance | | --- | 219 | --- | |
| $T_{d(on)}$ | Turn-on Delay Time | $V_{DD}=32V, I_{DS}=40A,$ $V_{GEN}=10V, R_G=2.7\Omega$ | --- | 13 | --- | nS |
| T_r | Turn-on Rise Time | | --- | 75 | --- | |
| $T_{d(off)}$ | Turn-off Delay Time | | --- | 46 | --- | |
| T_f | Turn-off Fall Time | | --- | 73 | --- | |
| Q_g | Total Gate Charge | $V_{DS}=32V,$ $V_{GS}=10V, I_{DS}=40A$ | --- | 70 | --- | nC |
| Q_{gs} | Gate-Source Charge | | --- | 17 | --- | |
| Q_{gd} | Gate-Drain Charge | | --- | 26 | --- | |
| Source-Drain Characteristics ($T_J=25^\circ\text{C}$) | | | | | | |
| V_{SD} | Diode Forward Voltage _z | $V_{GS}=0V, I_S=40A, T_J=25^\circ\text{C}$ | --- | 0.9 | 1.3 | V |
| t_{rr} | Reverse Recovery Time | $I_F=40A,$ $di/dt=100A/\mu s, T_J=25^\circ\text{C}$ | --- | 36 | --- | nS |
| Q_{rr} | Reverse Recovery Charge | | --- | 43 | --- | nC |

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

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

N-Channel Enhancement Mode MOSFET
Typical Characteristics
Fig 1: Output Characteristics

Fig 2: Transfer Characteristics

Fig 3: Drain Current Derating

Fig 4: Rds(on) vs Gate Voltage

Fig 5: Rds(on) vs. Temperature

Fig 6: Capacitance Characteristics


N-Channel Enhancement Mode MOSFET
Fig 7: Gate Charge Characteristics

Fig 8: Body-diode Forward Characteristics

Fig 9: Power Dissipation

Fig 10: Safe Operating Area

Fig 12: Max. Transient Thermal Impedance


N-Channel Enhancement Mode MOSFET
TO-252 Package Outline Dimensions


| Dim. | Min. | Max. |
|------------------------------|---------|------|
| A | 2.1 | 2.5 |
| A1 | 6.3 | 6.9 |
| B | 0.96 | 1.42 |
| B1 | 0.74 | 0.86 |
| B2 | 0.74 | 0.94 |
| C | Typ0.5 | |
| D | 5.33 | 5.53 |
| D1 | 3.65 | 4.05 |
| E | 6.0 | 6.2 |
| E1 | Typ2.29 | |
| E2 | Typ4.58 | |
| O | 0 | 0.15 |
| L1 | 9.9 | 10.5 |
| L2 | Typ1.65 | |
| L3 | 0.6 | 1.0 |
| All Dimensions in millimeter | | |