

N-Channel Enhancement Mode MOSFET

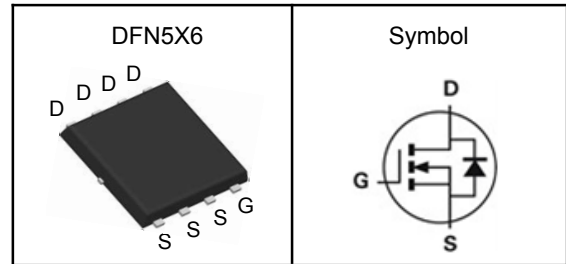
Features

- Low $R_{ds(on)}$ for low conduction loss
- Reliable and Rugged
- ROHS Compliant & Halogen-Free

Applications

- Power Management in Desktop Computer
- DC/DC Converters

Pin Description



| | | |
|------------------|----|------------|
| V_{DSS} | 30 | V |
| $R_{DS(ON)-Typ}$ | 4 | m Ω |
| I_D | 80 | A |

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

| Symbol | Parameter | Rating | Unit |
|----------------|---|------------|------------------|
| V_{DSS} | Drain-Source Voltage | 30 | 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 | 240 | A |
| I_D | Continuous Drain Current | 80 | A |
| P_D | Maximum Power Dissipation | 30 | W |
| $E_{AS}^{(2)}$ | Avalanche Energy, Single pulse $L=0.5\text{mH}$ | 36 | mJ |

Thermal Characteristics

| Symbol | Parameter | Rating | Unit |
|-----------------------|--|--------|--------------------|
| $R_{\theta JA}^{(3)}$ | Thermal Resistance-Junction to Ambient (Max) | 20 | $^\circ\text{C/W}$ |
| $R_{\theta JC}$ | Thermal Resistance-Junction to Case | 4.2 | $^\circ\text{C/W}$ |

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

Note ② : UIS tested and pulse width are limited by maximum junction temperature 150°C .

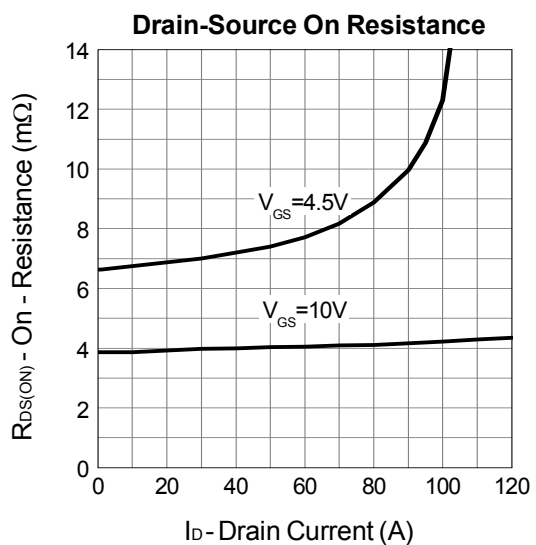
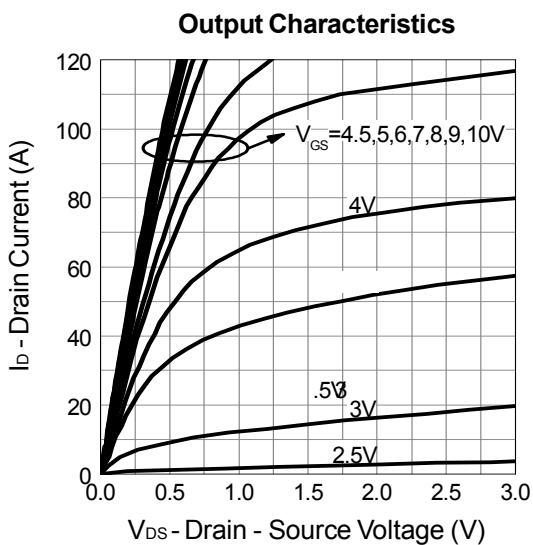
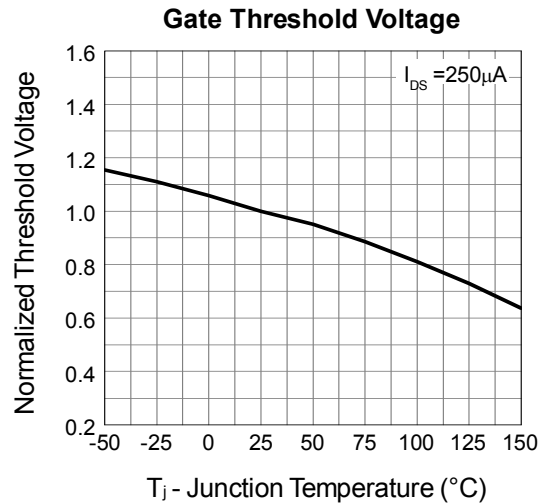
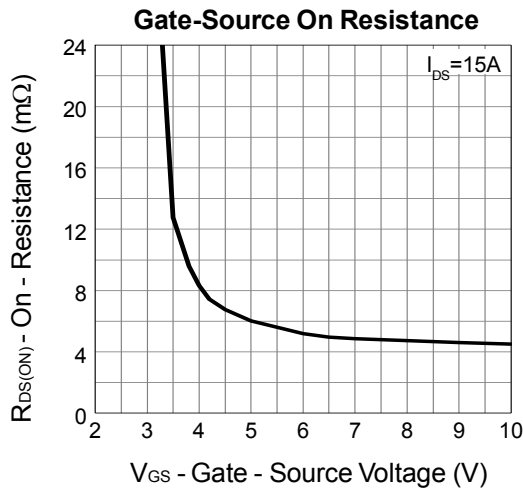
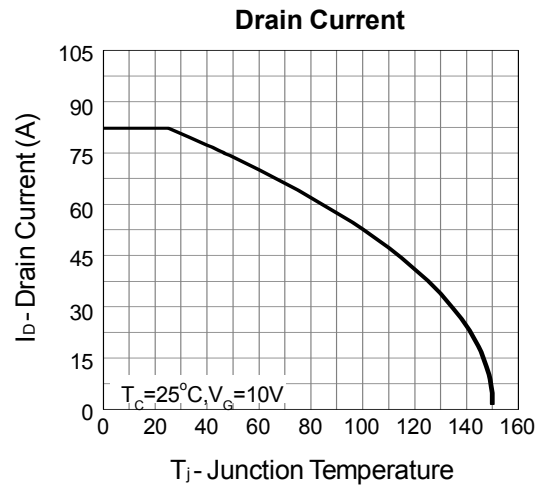
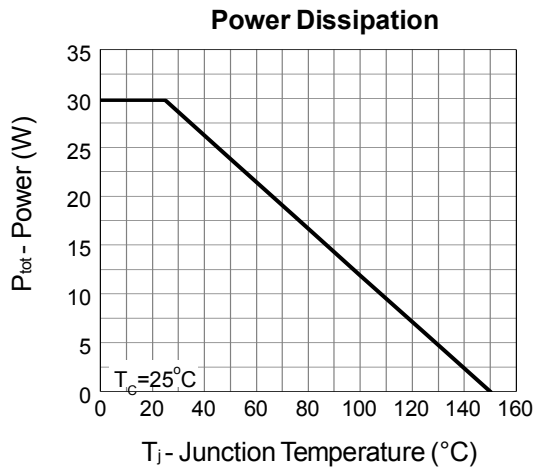
Note ③ : Surface Mounted on 1in^2 FR-4 board with 1oz.

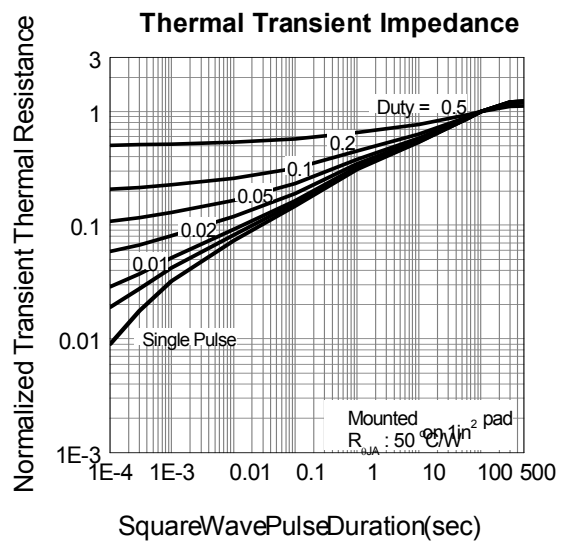
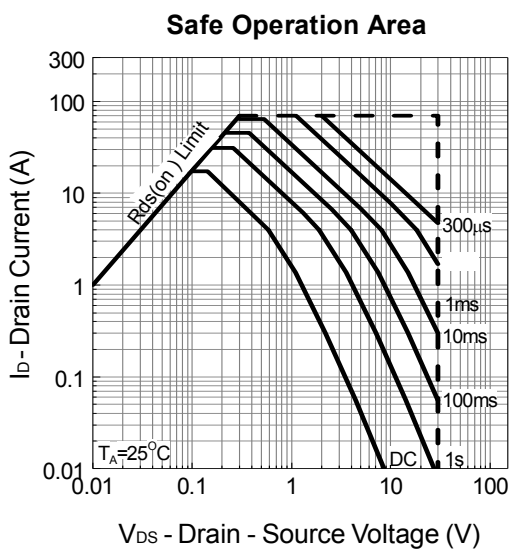
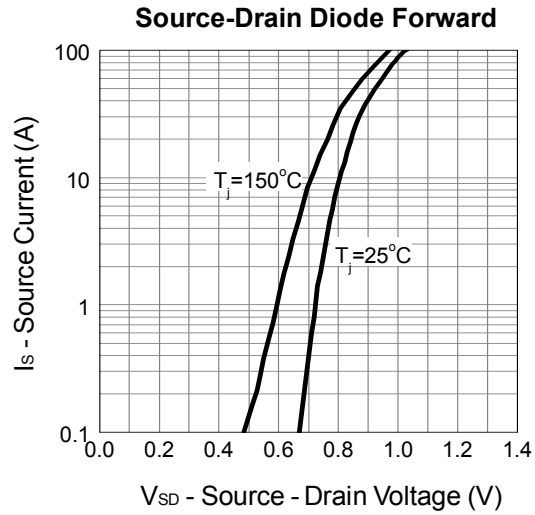
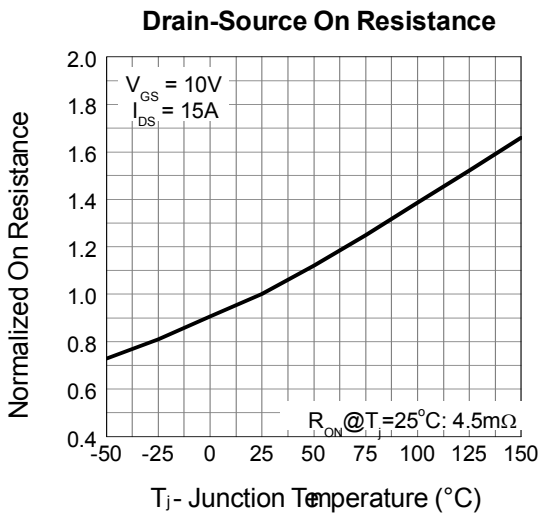
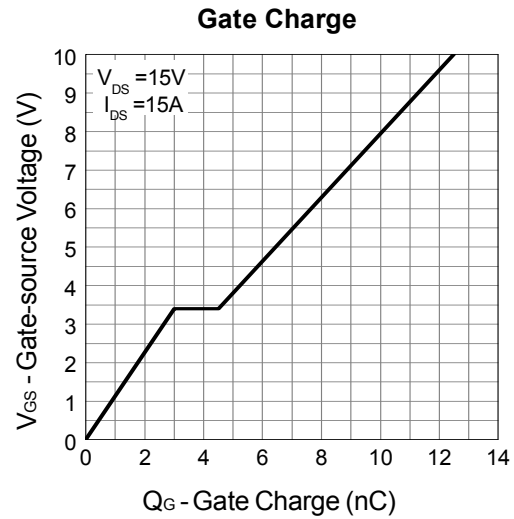
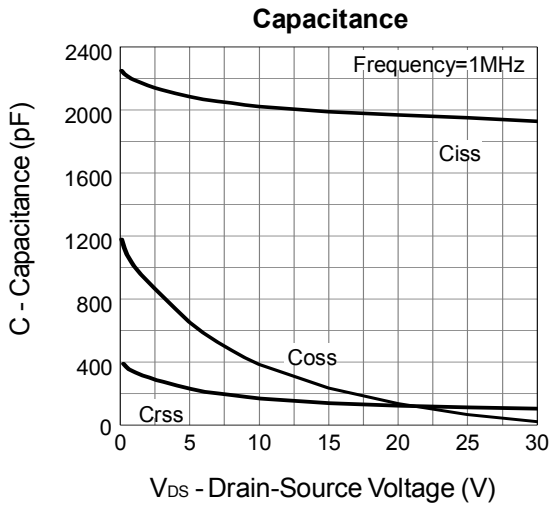
**N-Channel Enhancement Mode MOSFET****Electrical Characteristics** ($T_J=25^{\circ}\text{C}$, Unless Otherwise Noted)

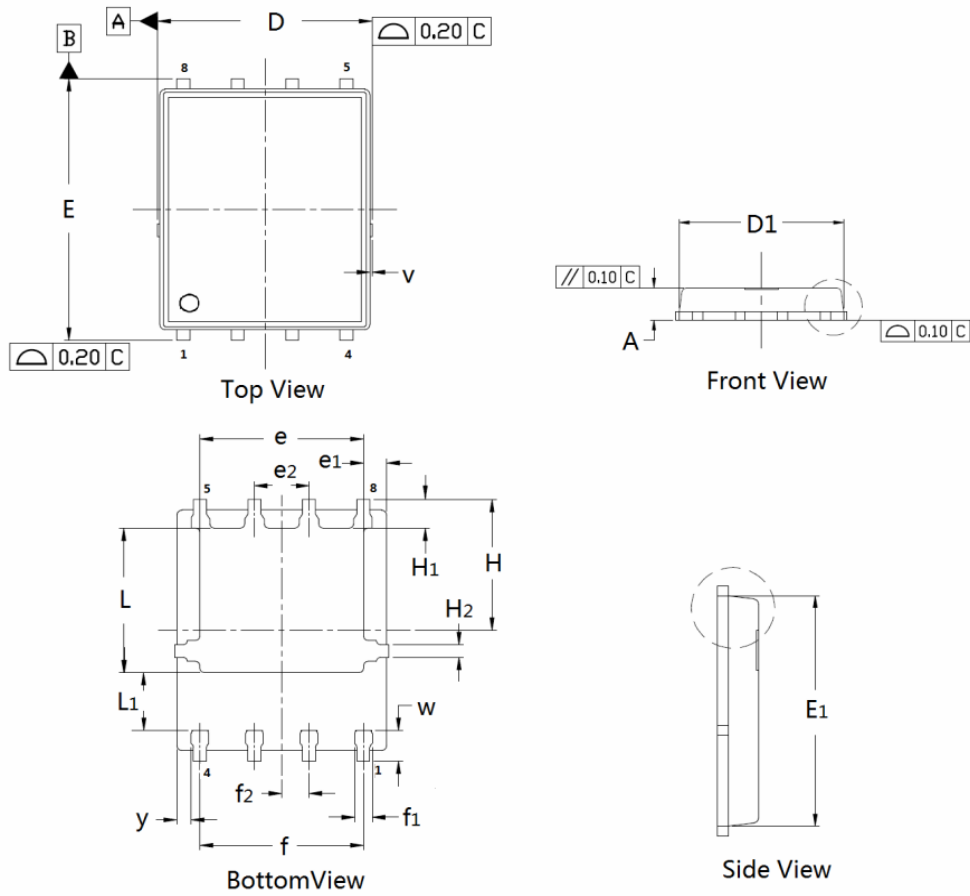
| Symbol | Parameter | Test Conditions | Min | Typ | Max | Unit |
|--|----------------------------------|---|-----|------|-----------|------------|
| Static Electrical Characteristics | | | | | | |
| BV_{DSS} | Drain-Source Breakdown Voltage | $V_{GS}=0V, I_D=250\mu A$ | 30 | --- | --- | V |
| I_{DSS} | Zero Gate Voltage Drain Current | $V_{DS}=24V, V_{GS}=0V$ | --- | --- | 1 | μA |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}=V_{GS}, I_D=250\mu A$ | 1.0 | --- | 2.2 | V |
| I_{GSS} | Gate Leakage Current | $V_{GS}=\pm 20V, V_{DS}=0V$ | --- | --- | ± 100 | nA |
| $R_{DS(on)}$ | Drain-Source On-state Resistance | $V_{GS}=10V, I_D=15A$ | --- | 4.0 | 5.2 | m Ω |
| | | $V_{GS}=4.5V, I_D=10A$ | --- | 6.8 | 9.0 | |
| Dynamic Characteristics^⑤ | | | | | | |
| C_{iss} | Input Capacitance | $V_{GS}=0V,$ $V_{DS}=15V,$ Freq.=1MHz | --- | 1980 | --- | pF |
| C_{oss} | Output Capacitance | | --- | 210 | --- | |
| C_{rss} | Reverse Transfer Capacitance | | --- | 179 | --- | |
| $T_{d(on)}$ | Turn-on Delay Time | $V_{DS}=15V, V_{GS}=10V,$ $R_G=1\Omega, R_L=15\Omega,$ $I_D=1A$ | --- | 11 | --- | nS |
| T_r | Turn-on Rise Time | | --- | 8 | --- | |
| $T_{d(off)}$ | Turn-off Delay Time | | --- | 19.6 | --- | |
| T_f | Turn-off Fall Time | | --- | 17 | --- | |
| Q_g | Total Gate Charge | $V_{DS}=15V, V_{GS}=10V,$ $I_D=15A$ | --- | 12.5 | --- | nC |
| Q_{gs} | Gate-Source Charge | | --- | 3 | --- | |
| Q_{gd} | Gate-Drain Charge | | --- | 1.5 | --- | |
| Source-Drain Characteristics | | | | | | |
| $V_{SD}^{④}$ | Diode Forward Voltage | $V_{GS}=0V, I_S=10A, T_J=25^{\circ}\text{C}$ | --- | --- | 0.8 | V |
| t_{rr} | Reverse Recovery Time | $I_F=5A,$ $di/dt=100A/\mu s, T_J=25^{\circ}\text{C}$ | --- | 25 | --- | nS |
| Q_{rr} | Reverse Recovery Charge | | --- | 11.8 | --- | nC |

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

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

N-Channel Enhancement Mode MOSFET
Typical Characteristics


N-Channel Enhancement Mode MOSFET


N-Channel Enhancement Mode MOSFET
DFN5×6 Package Outline Data

DIMENSIONS (unit : mm)

| Symbol | Min | Typ | Max | Symbol | Min | Typ | Max |
|----------------|------|------|------|----------------|------|------|------|
| A | 0.90 | 1.02 | 1.10 | D | 4.90 | 4.98 | 5.10 |
| D ₁ | 4.80 | 4.89 | 5.10 | E | 5.90 | 6.11 | 6.25 |
| E ₁ | 5.65 | 5.74 | 5.95 | e | 3.72 | 3.80 | 3.92 |
| e ₁ | -- | 0.5 | -- | e ₂ | -- | 1. | -- |
| f | -- | 3.8 | -- | f ₁ | 0.31 | 0.37 | 0.51 |
| f ₂ | -- | 0.6 | -- | H | -- | 3. | -- |
| H ₁ | 0.59 | 0.63 | 0.79 | H ₂ | 0.26 | 0.28 | 0.32 |
| L | 3.35 | 3.45 | 3.65 | L ₁ | -- | 1. | -- |
| v | -- | 0.1 | -- | w | 0.64 | 0.68 | 0.84 |
| y | -- | 0.3 | -- | | -- | | -- |