

N-Channel Enhancement Mode MOSFET

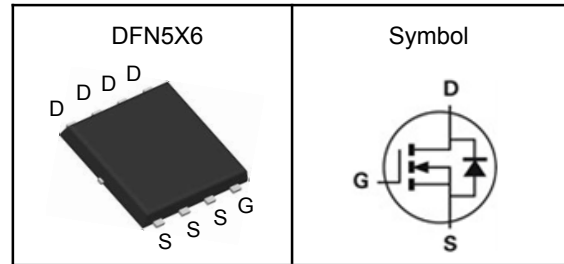
Features

- 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} | 30 | V |
| $R_{DS(ON)-Typ}$ | 0.75 | m Ω |
| I_D | 200 | A |

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

| Symbol | Parameter | N-Channel | 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 | $^\circ\text{C}$ |
| EAS | Single Pulse Avalanche Energy ^③ | 1058 | mJ |
| $I_{DM}^{①}$ | Pulse Drain Current Tested | 644 | A |
| I_D | Continuous Drain Current | $T_C=25^\circ\text{C}$ 200 | A |
| P_D | Maximum Power Dissipation | $T_C=25^\circ\text{C}$ 35 | W |

Thermal Characteristics

| Symbol | Parameter | Rating | Unit |
|-----------------|---|--------|---------------------------|
| $R_{\theta JA}$ | Thermal Resistance-Junction to Ambient | 62.5 | $^\circ\text{C}/\text{W}$ |
| $R_{\theta JC}$ | Thermal Resistance Junction-Case ^① | 3.5 | $^\circ\text{C}/\text{W}$ |

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

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

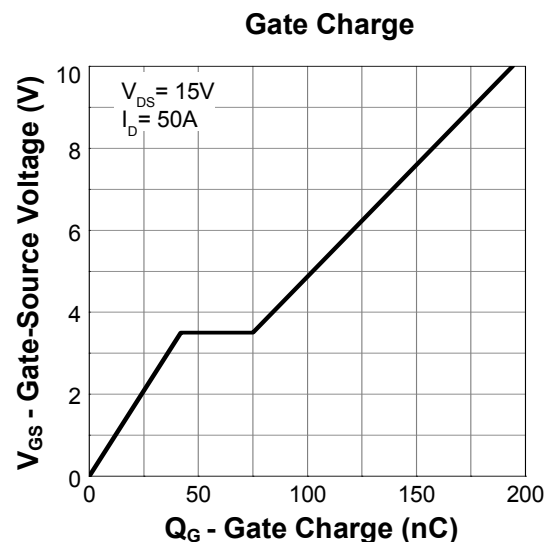
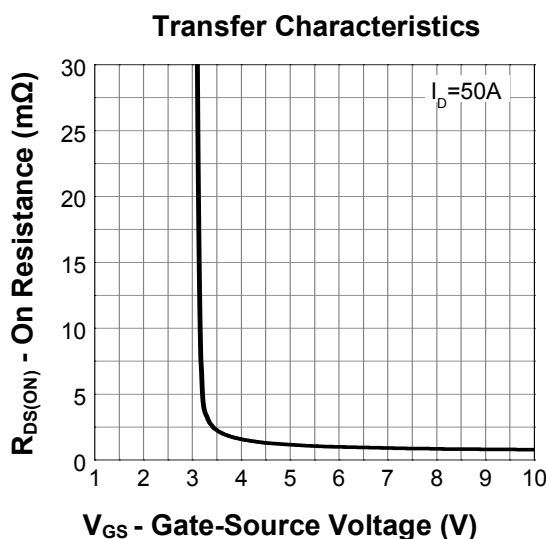
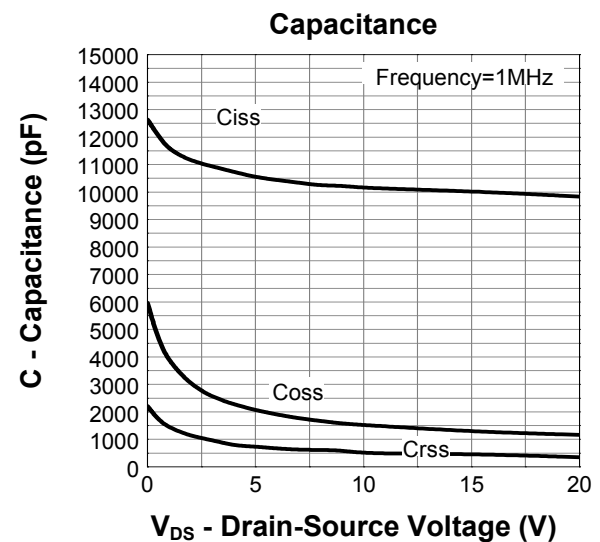
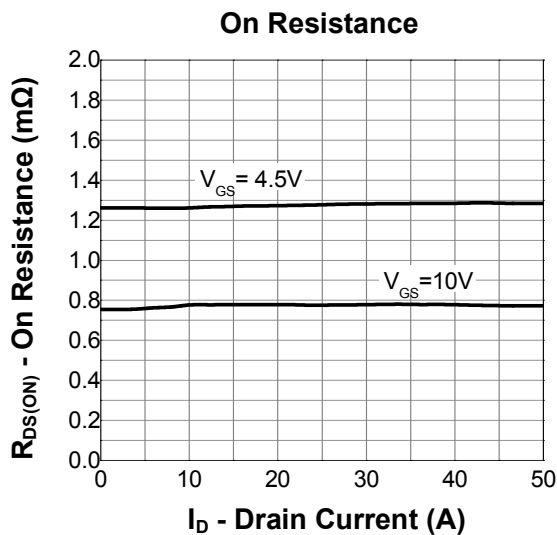
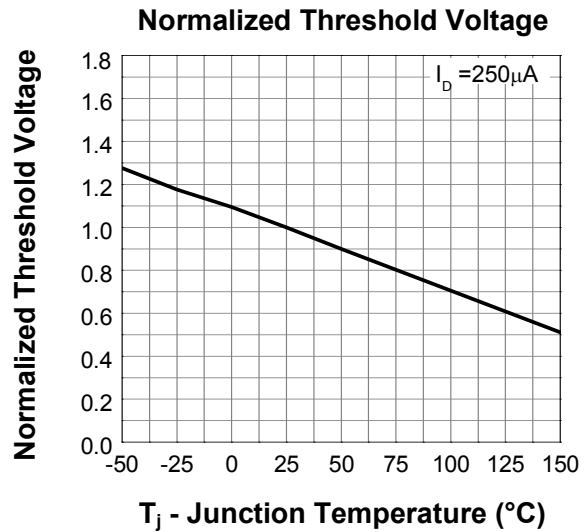
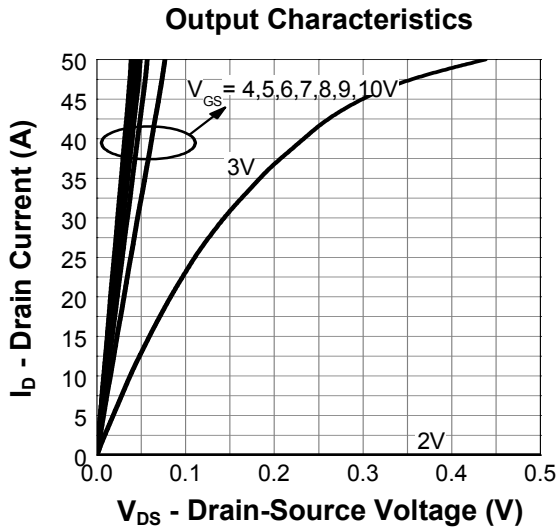
Note ③ : Surface Mounted on 1in² FR-4 board with 1oz.

**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 | $V_{GS}=0V, I_D=250\mu A$ | 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 | --- | 2.0 | V |
| I_{GSS} | Gate Leakage Current | $V_{GS}=\pm 20V, V_{DS}=0V$ | --- | --- | ± 100 | nA |
| $R_{DS(on)}$ | Drain-Source On-state Resistance | $V_{GS}=10V, I_D=50A$ | --- | 0.75 | 0.85 | $m\Omega$ |
| | | $V_{GS}=4.5V, I_D=30A$ | --- | 1.25 | 1.45 | $m\Omega$ |
| Dynamic Characteristics ^⑤ | | | | | | |
| C_{iss} | Input Capacitance | $V_{GS}=0V, V_{DS}=15V, \text{Freq.}=1\text{MHz}$ | --- | 9950 | --- | pF |
| C_{oss} | Output Capacitance | | --- | 1260 | --- | |
| C_{rss} | Reverse Transfer Capacitance | | --- | 475 | --- | |
| $T_{d(on)}$ | Turn-on Delay Time | $V_{DS}=15V, V_{GS}=10V, R_G=4.5\Omega, R_L=0.3\Omega, I_D=50A$ | --- | 25 | --- | nS |
| T_r | Turn-on Rise Time | | --- | 94 | --- | |
| $T_{d(off)}$ | Turn-off Delay Time | | --- | 148 | --- | |
| T_f | Turn-off Fall Time | | --- | 98 | --- | |
| Q_g | Total Gate Charge | $V_{DS}=15V, V_{GS}=10V, I_D=50A$ | --- | 190 | --- | nC |
| Q_{gs} | Gate-Source Charge | | --- | 40 | --- | |
| Q_{gd} | Gate-Drain Charge | | --- | 33 | --- | |
| Source-Drain Characteristics | | | | | | |
| V_{SD} ^④ | Diode Forward Voltage | $I_S=50A, V_{GS}=0V$ | --- | --- | 1.3 | V |
| t_{rr} | Reverse Recovery Time | $I_F=40A, V_R=30V$ | --- | 35 | --- | nS |
| Q_{rr} | Reverse Recovery Charge | $di/dt=100A/\mu s, T_J=25^{\circ}\text{C}$ | --- | 23 | --- | nC |

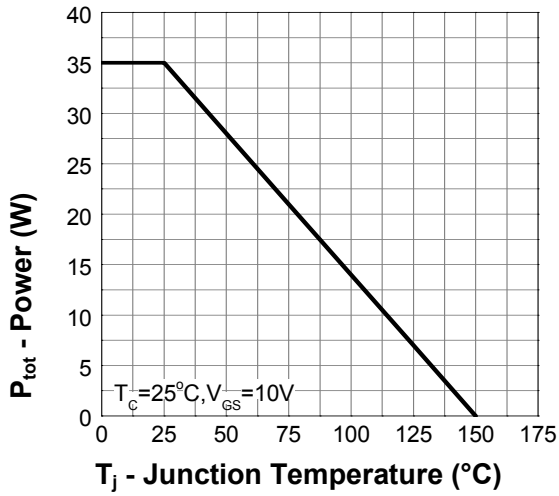
Note ④ : Pulse test (pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$).

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

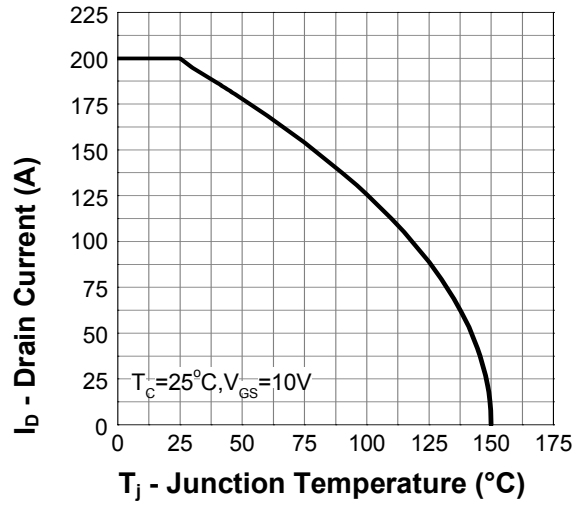
N-Channel Enhancement Mode MOSFET
Typical Characteristics


N-Channel Enhancement Mode MOSFET

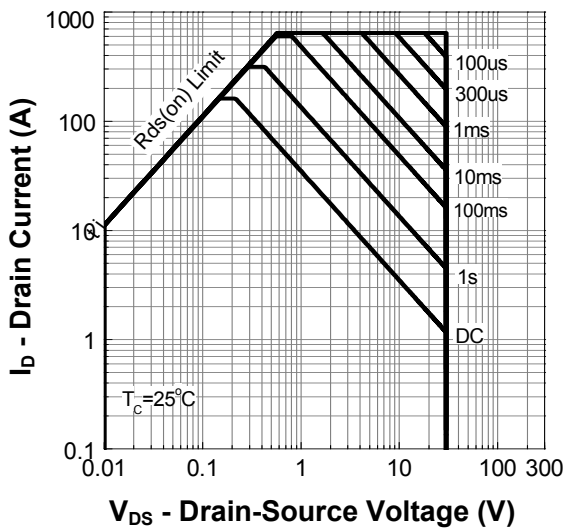
Power Capability



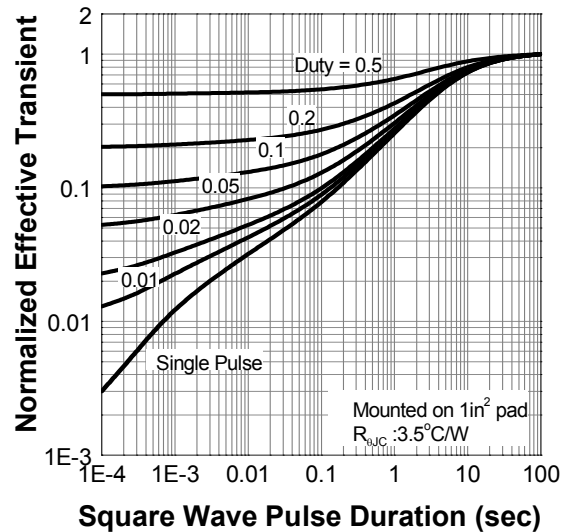
Current Capability

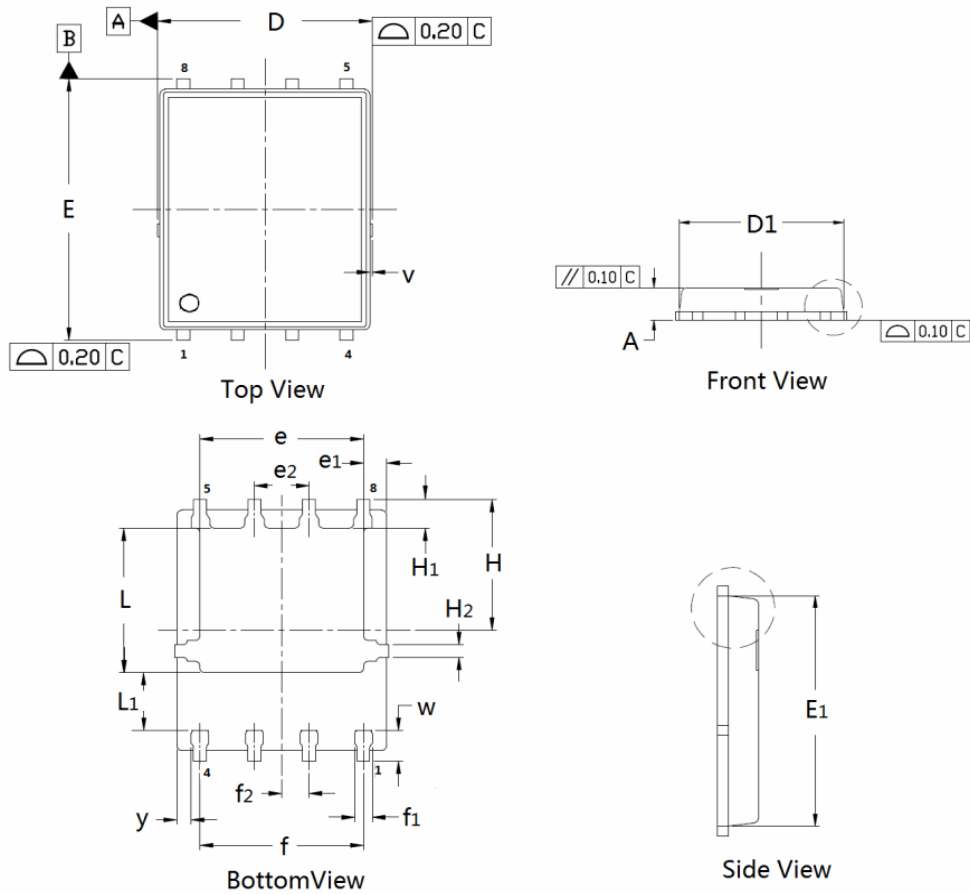


Safe Operation Area



Transient Thermal Impedance



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

DIMENSIONS (unit : mm)

| Symbol | Typ | Max | Symbol | Min | Typ | Max |
|----------------------|------|------|----------------------|------|------|------|
| A | 0.90 | 1.02 | D | 4.90 | 4.98 | 5.10 |
| D₁ | 4.80 | 4.89 | E | 5.90 | 6.11 | 6.25 |
| E₁ | 5.65 | 5.74 | e | 3.72 | 3.80 | 3.92 |
| e₁ | -- | 0.5 | e₂ | -- | 1. | -- |
| f | -- | 3.8 | f₁ | 0.31 | 0.37 | 0.51 |
| f₂ | -- | 0.6 | H | -- | 3. | -- |
| H₁ | 0.59 | 0.63 | H₂ | 0.26 | 0.28 | 0.32 |
| L | 3.35 | 3.45 | L₁ | -- | 1. | -- |
| v | -- | 0.1 | w | 0.64 | 0.68 | 0.84 |
| y | -- | 0.3 | | -- | | -- |