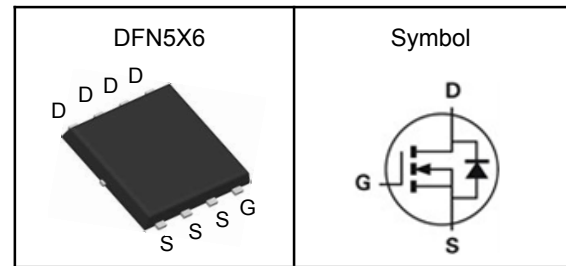


N-Channel Enhancement Mode MOSFET
Features

- Low Rdson for low conduction loss
- Reliable and Rugged
- ROHS Compliant & Halogen-Free

Pin Description

Applications

- Power Management in Desktop Computer
- DC/DC Converters

| | | |
|-------------------------|-----|----|
| V _{DSS} | 30 | V |
| R _{DS(ON)-Typ} | 6.2 | mΩ |
| I _D | 53 | A |

Absolute Maximum Ratings (T_A=25°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 | °C |
| T _{STG} | Storage Temperature Range | -55 to 150 | °C |
| I _{DM} ^① | Pulse Drain Current Tested | T _c =25°C | 71 |
| I _D | Continuous Drain Current | T _c =25°C | 53 |
| | | T _c =100°C | 33 |
| P _D | Maximum Power Dissipation | T _c =25°C | 32 |
| | | T _c =100°C | 13 |
| E _{AS} ^② | Avalanche Energy, Single pulse L=0.1mH | 22 | mJ |

Thermal Characteristics

| Symbol | Parameter | Rating | Unit |
|-------------------------------|--|--------|------|
| R _{θJA} ^③ | Thermal Resistance-Junction to Ambient (Max) | 98 | °C/W |
| R _{θJC} | Thermal Resistance-Junction to Case | 3.9 | °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.

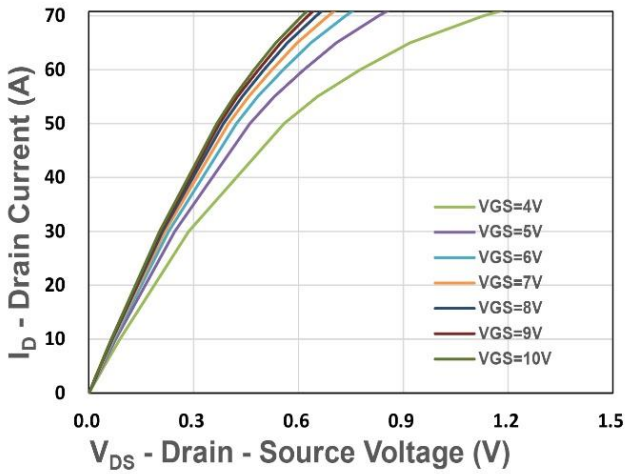
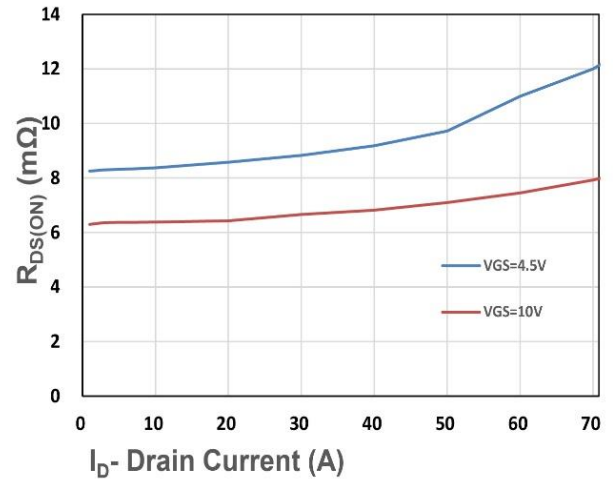
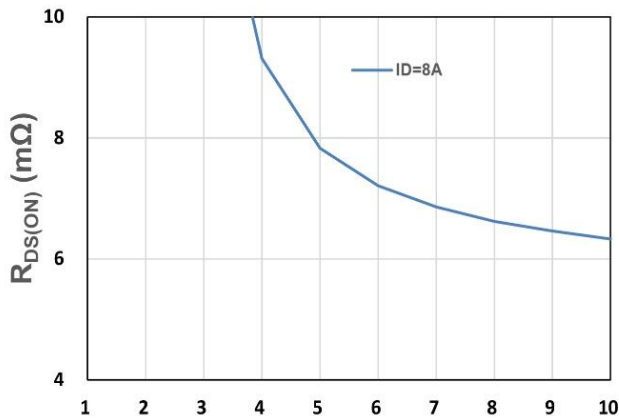
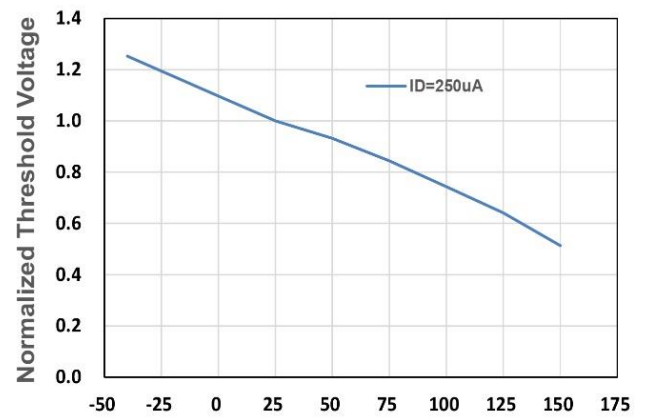
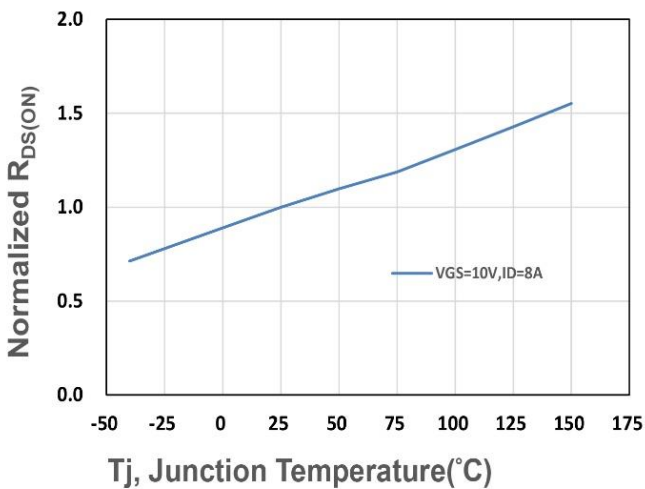
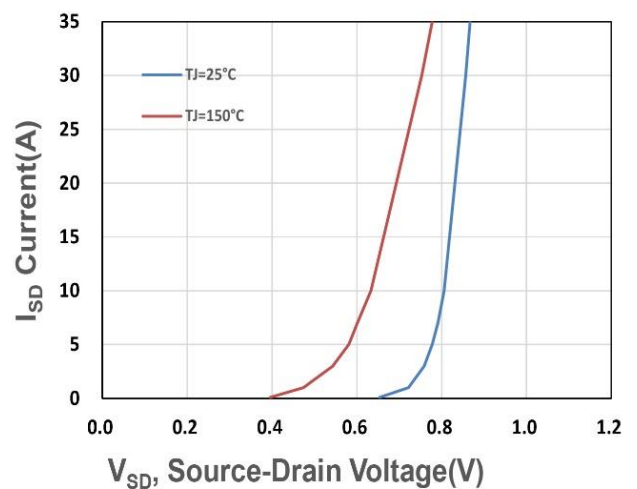
Note ③ : Surface Mounted on 1in² FR-4 board with 1oz.

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

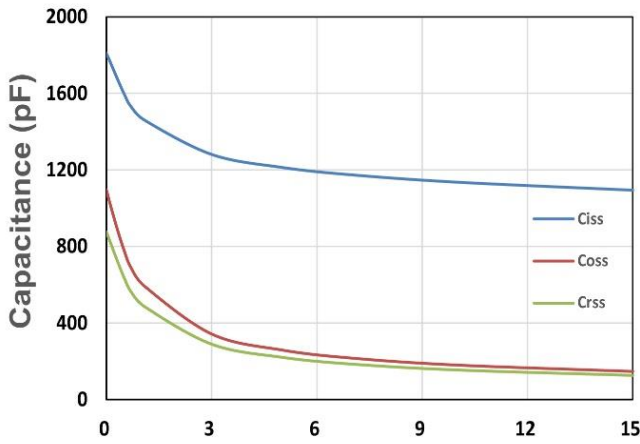
| Symbol | Parameter | Test Conditions | Min | Typ | Max | Unit |
|--|----------------------------------|---|-----|------|-----------|------------|
| Static Electrical Characteristics | | | | | | |
| BV_{DSS} | Drain-Source Breakdown Voltage | $V_{GS}=0V, I_D=250\mu A$ | 30 | --- | --- | V |
| I_{DSS} | Zero Gate Voltage Drain Current | $V_{DS}=24V, V_{GS}=0V$ | --- | --- | 1 | μA |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}=V_{GS}, I_D=250\mu A$ | 1.1 | --- | 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 | $V_{GS}=10V, I_D=8A$ | --- | 6.2 | 7.4 | m Ω |
| | | $V_{GS}=4.5V, I_D=6A$ | --- | 8.2 | 10.7 | |
| gfs | Forward Transconductance | $V_{DS}=5V, I_D=8A$ | --- | 12 | --- | S |
| Dynamic Characteristics^⑤ | | | | | | |
| C_{iss} | Input Capacitance | $V_{GS}=0V,$ $V_{DS}=15V,$ Freq.=1MHz | --- | 1094 | --- | pF |
| C_{oss} | Output Capacitance | | --- | 147 | --- | |
| C_{riss} | Reverse Transfer Capacitance | | --- | 127 | --- | |
| $T_{d(on)}$ | Turn-on Delay Time | $V_{DD}=15V, V_{GS}=10V,$ $R_G=6\Omega, I_D=1A$ | --- | 6 | --- | nS |
| T_r | Turn-on Rise Time | | --- | 22 | --- | |
| $T_{d(off)}$ | Turn-off Delay Time | | --- | 48 | --- | |
| T_f | Turn-off Fall Time | | --- | 20 | --- | |
| Q_g | Total Gate Charge | $V_{DS}=15V, V_{GS}=10V,$ $I_D=8A$ | --- | 31 | --- | nC |
| Q_{gs} | Gate-Source Charge | | --- | 1.4 | --- | |
| Q_{gd} | Gate-Drain Charge | | --- | 9.3 | --- | |
| Source-Drain Characteristics | | | | | | |
| $V_{SD}^{④}$ | Diode Forward Voltage | $V_{GS}=0V, I_S=1A, T_J=25^{\circ}\text{C}$ | --- | 0.7 | 1.1 | V |
| t_{rr} | Reverse Recovery Time | $I_F=1A,$ $di/dt=100A/\mu s, T_J=25^{\circ}\text{C}$ | --- | 14 | --- | nS |
| Q_{rr} | Reverse Recovery Charge | | --- | 5.6 | --- | nC |

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

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

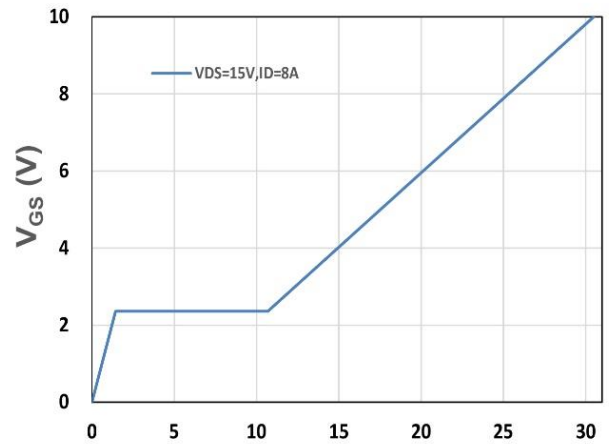
N-Channel Enhancement Mode MOSFET
Typical Characteristics

Figure 1. Output Characteristics

Figure 2. On-Resistance vs. ID

Figure 3. On-Resistance vs. VGS

Figure 4. Gate Threshold Voltage

Figure 5. Drain-Source On Resistance

Figure 6. Source-Drain Diode Forward

N-Channel Enhancement Mode MOSFET



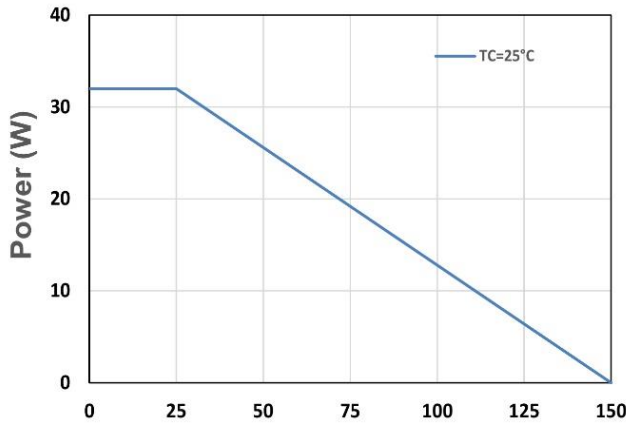
V_{DS} - Drain - Source Voltage (V)

Figure 7. Capacitance



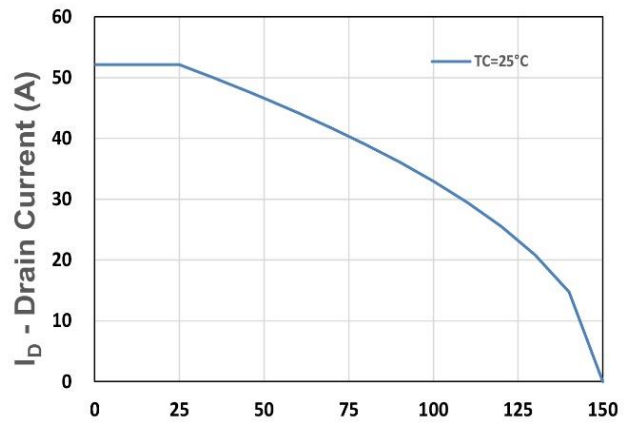
Q_g, Total Gate Charge (nC)

Figure 8. Gate Charge Characteristics



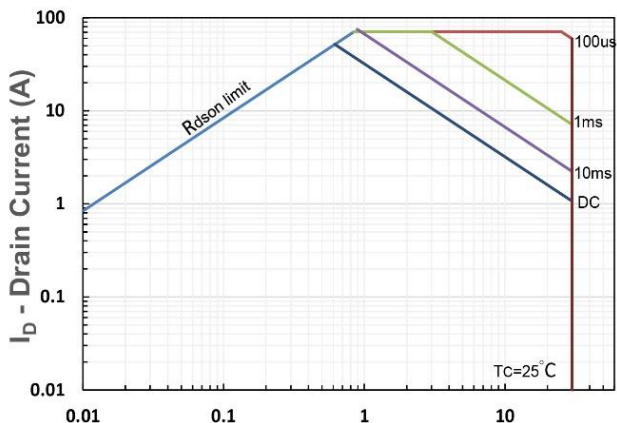
T_j - Junction Temperature (°C)

Figure 9. Power Dissipation



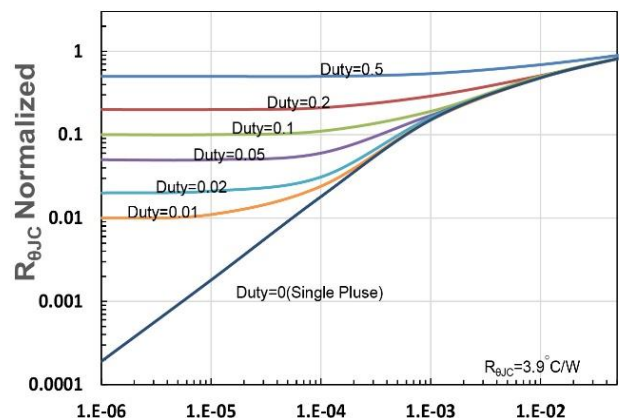
T_j - Junction Temperature (°C)

Figure 10. Drain Current



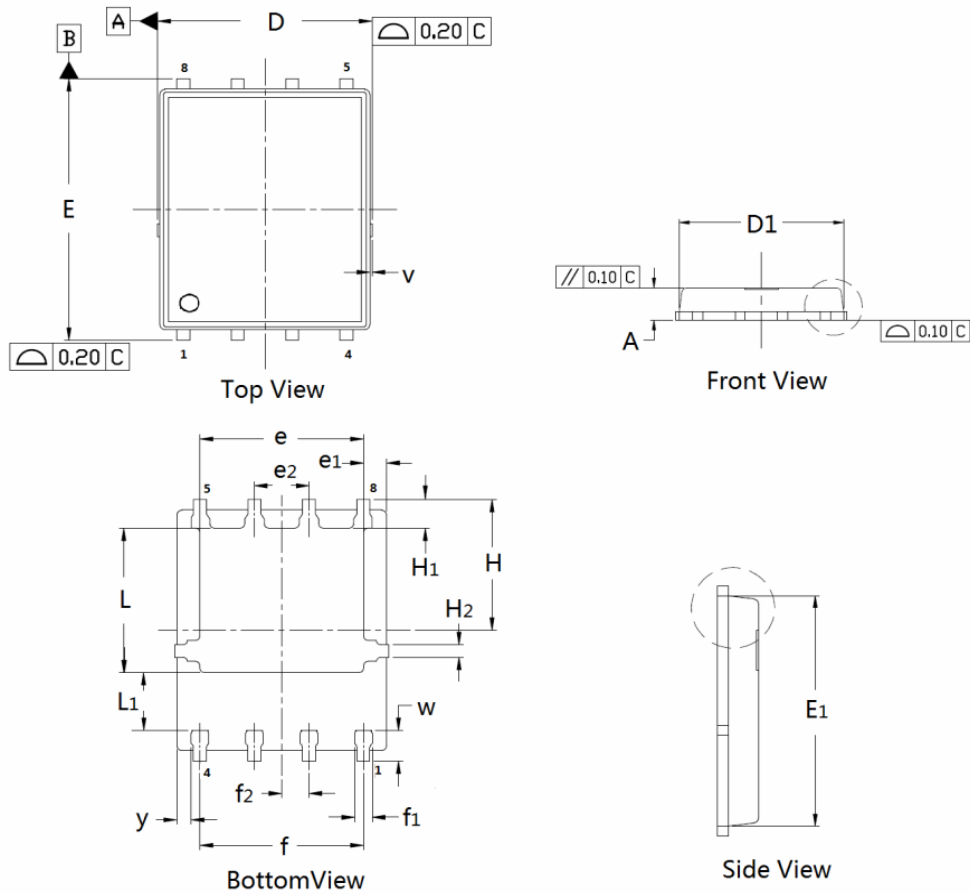
V_{DS} - Drain-Source Voltage (V)

Figure 11. Safe Operating Area



t₁, Square Wave Pulse Duration(s)

Figure 12. R_{θJC} 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 | 1.10 | D | 4.90 | 4.98 | 5.10 |
| D₁ | 4.80 | 4.89 | 5.10 | E | 5.90 | 6.11 | 6.25 |
| E₁ | 5.65 | 5.74 | 5.95 | 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 | 0.79 | H₂ | 0.26 | 0.28 | 0.32 |
| L | 3.35 | 3.45 | 3.65 | L₁ | -- | 1. | -- |
| v | -- | 0.1 | -- | w | 0.64 | 0.68 | 0.84 |
| y | -- | 0.3 | -- | | -- | | -- |