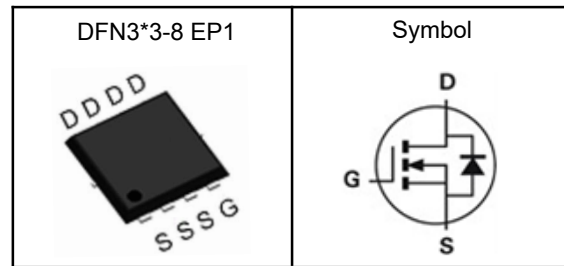


N-Channel Enhancement Mode MOSFET
Features

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

Applications

- Power Management in Desktop Computer
- DC/DC Converters

Pin Description


| | | |
|------------------|-----|------------|
| V_{DSS} | 30 | V |
| $R_{DS(ON)-Typ}$ | 7.2 | m Ω |
| I_D | 50 | A |

Absolute Maximum Ratings ($T_C=25^{\circ}C$, 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 | $^{\circ}C$ |
| T_{STG} | Storage Temperature Range | -55 to 150 | $^{\circ}C$ |
| $I_{DM}^{①}$ | Pulse Drain Current Tested | 71 | A |
| I_D | Continuous Drain Current | 50 | A |
| P_D | Maximum Power Dissipation | 30 | W |
| E_{AS} | Avalanche Energy, Single pulse | 22 | mJ |

Thermal Characteristics

| Symbol | Parameter | Rating | Unit |
|-----------------|--|--------|---------------|
| $R_{\theta JA}$ | Thermal Resistance-Junction to Ambient | 95 | $^{\circ}C/W$ |
| $R_{\theta JC}$ | Thermal Resistance-Junction to Case | 4.2 | $^{\circ}C/W$ |

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

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

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



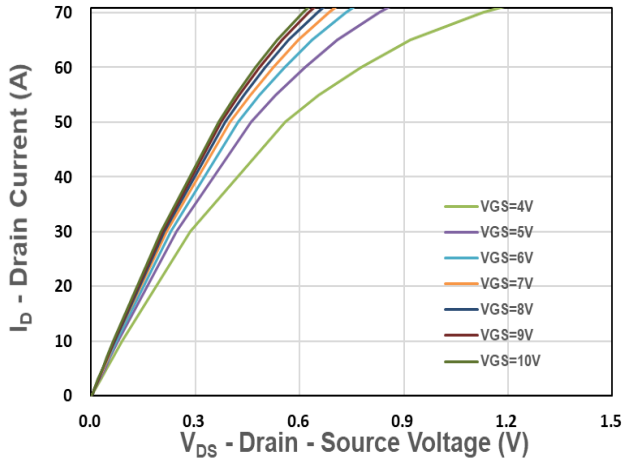
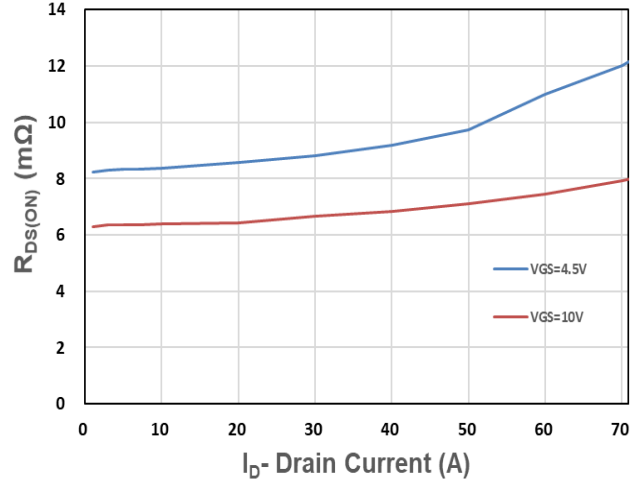
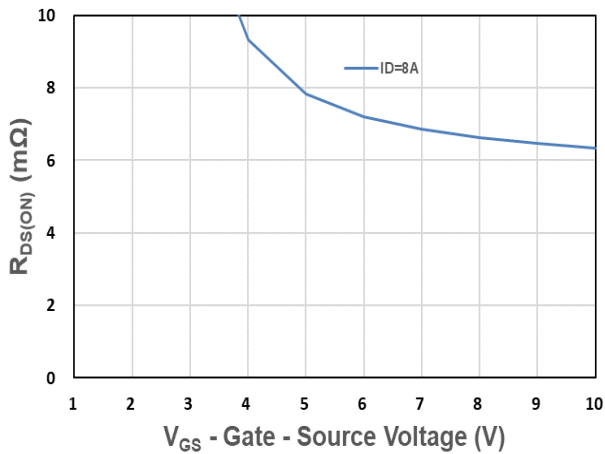
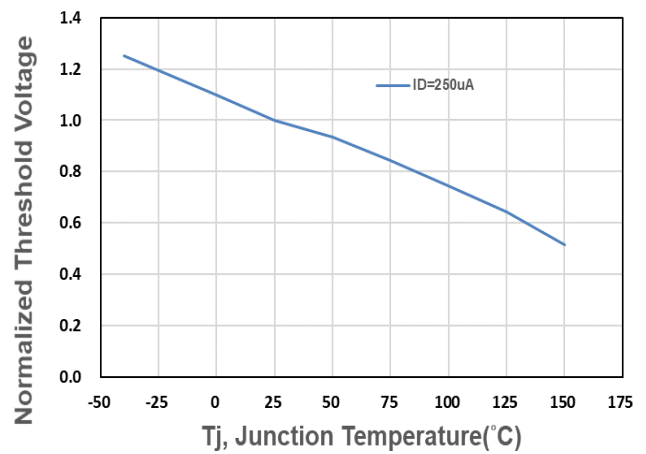
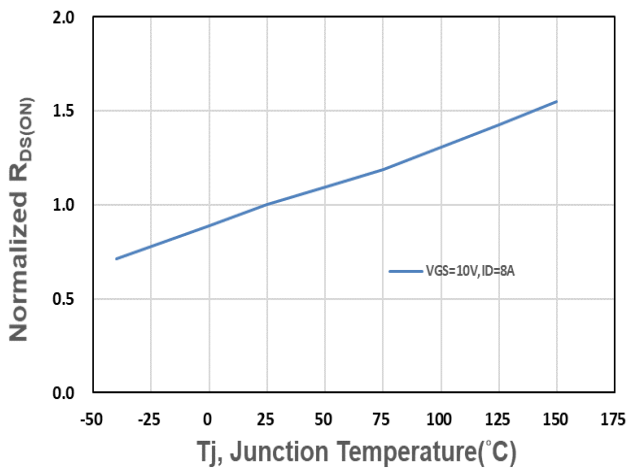
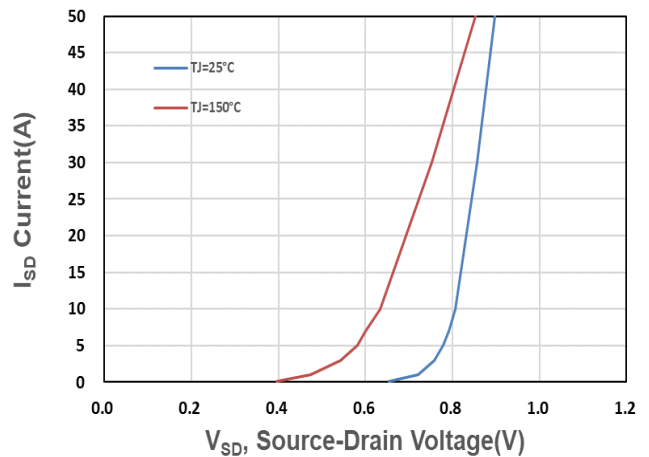
N-Channel Enhancement Mode MOSFET

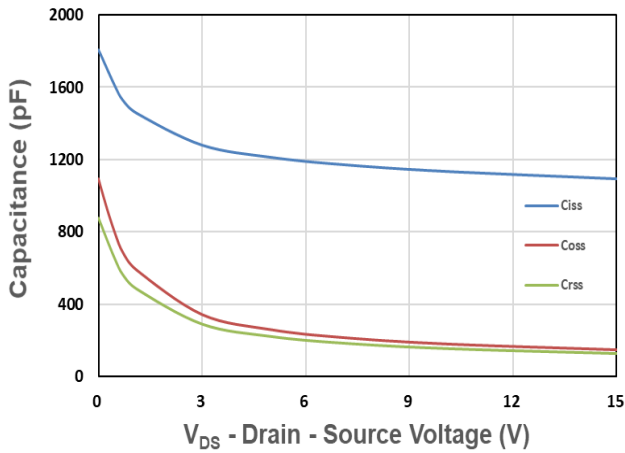
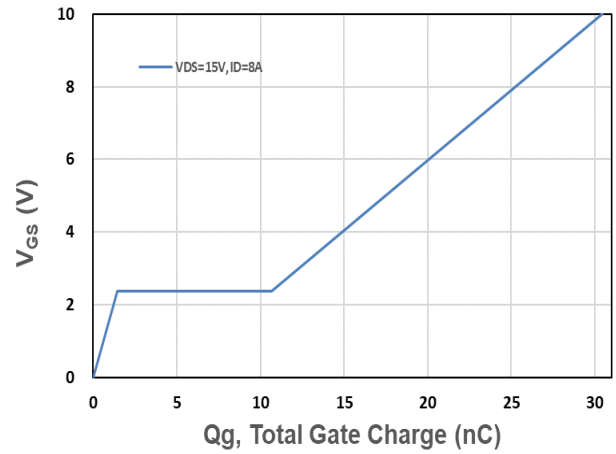
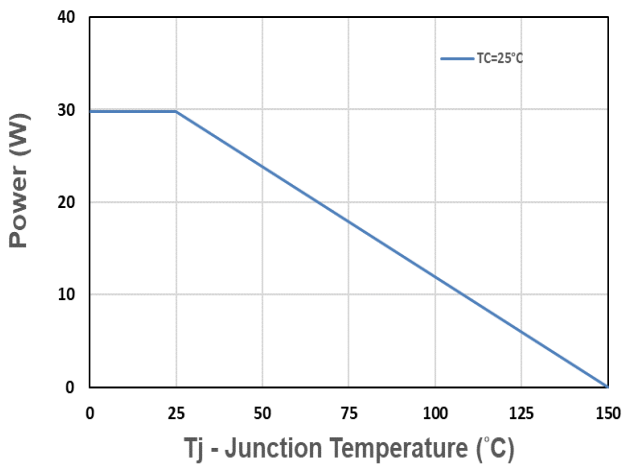
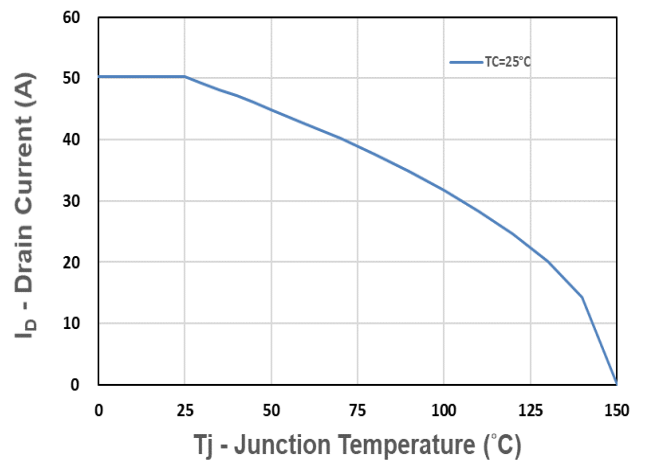
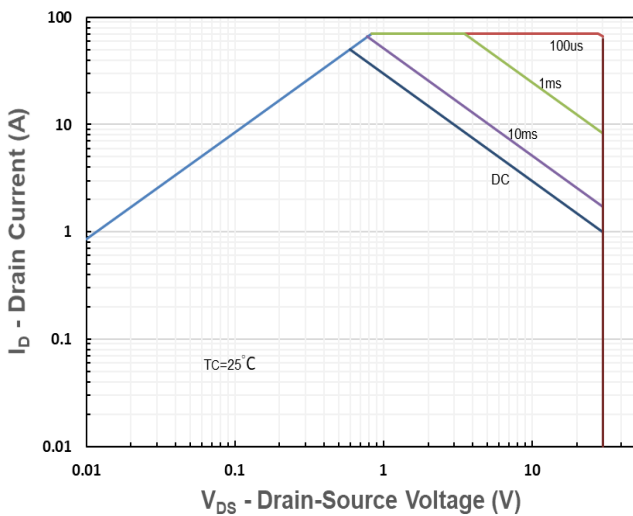
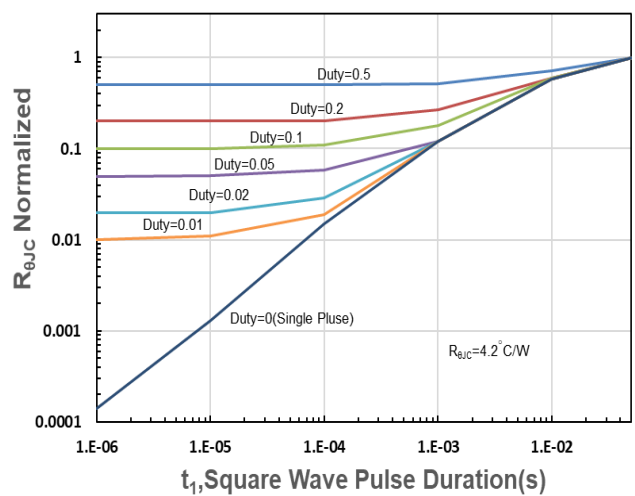
Electrical Characteristics ($T_J=25^{\circ}\text{C}$, Unless Otherwise Noted)

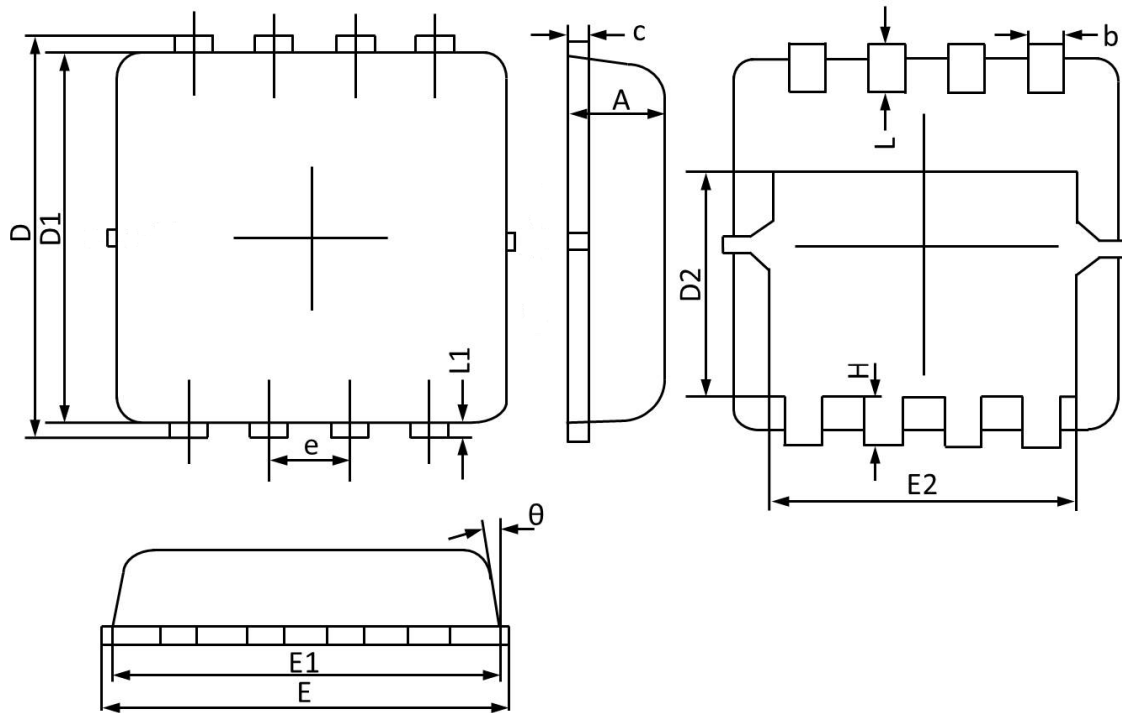
| Symbol | Parameter | Test Conditions | Min | Typ | Max | Unit |
|---|----------------------------------|--|-----|------|-----------|------------|
| Static Electrical Characteristics | | | | | | |
| BV_{DSS} | Drain-Source Breakdown Voltage | $V_{GS}=0V, I_D=250\mu A$ | 30 | --- | --- | V |
| I_{DSS} | 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 | --- | 2.2 | V |
| I_{GSS} | Gate Leakage Current | $V_{GS}=\pm 20V, V_{DS}=0V$ | --- | --- | ± 100 | nA |
| $R_{DS(on)}$ | Drain-Source On-state Resistance | $V_{GS}=10V, I_D=8A$ | --- | 7.2 | 8.8 | m Ω |
| | | $V_{GS}=4.5V, I_D=6A$ | --- | 9.5 | 11.5 | m Ω |
| Dynamic Characteristics ^⑤ | | | | | | |
| C_{iss} | Input Capacitance | $V_{GS}=0V, V_{DS}=15V, \text{Freq.}=1\text{MHz}$ | --- | 1094 | --- | pF |
| C_{oss} | Output Capacitance | | --- | 147 | --- | |
| C_{rss} | 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 | | --- | 22.5 | --- | |
| $T_{d(off)}$ | Turn-off Delay Time | | --- | 48.6 | --- | |
| T_f | Turn-off Fall Time | | --- | 19.8 | --- | |
| Q_g | Total Gate Charge | $V_{DS}=25V, V_{GS}=10V, I_D=8A$ | --- | 31 | --- | nC |
| Q_{gs} | Gate-Source Charge | | --- | 1.4 | --- | |
| Q_{gd} | Gate-Drain Charge | | --- | 9.3 | --- | |
| Source-Drain Characteristics | | | | | | |
| V_{SD} | Diode Forward Voltage | $I_S=1A, V_{GS}=0V$ | --- | 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 $\leq 300\mu s$, duty cycle $\leq 2\%$).

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

N-Channel Enhancement Mode MOSFET
Typical Characteristics

Figure 1. Output Characteristics

Figure 2. On-Resistance vs. I_D

Figure 3. On-Resistance vs. V_{GS}

Figure 4. Gate Threshold Voltage

Figure 5. Drain-Source On Resistance

Figure 6. Source-Drain Diode Forward

N-Channel Enhancement Mode MOSFET

Figure 7. Capacitance

Figure 8. Gate Charge Characteristics

Figure 9. Power Dissipation

Figure 10. Drain Current

Figure 11. Safe Operating Area

Figure 12. $R_{\theta JC}$ Transient Thermal Impedance

N-Channel Enhancement Mode MOSFET
DFN3*3-8 EP1 Package Outline Data


| Symbol | Dimensions (unit:mm) | | | Symbol | Dimensions (unit:mm) | | |
|-----------|----------------------|------|------|--------------|----------------------|------|------|
| | Min | Typ | Max | | Min | Typ | Max |
| A | 0.70 | 0.75 | 0.85 | E1 | 2.90 | 3.10 | 3.25 |
| b | 0.24 | 0.30 | 0.35 | E2 | 2.35 | 2.50 | 2.60 |
| c | 0.10 | 0.17 | 0.25 | e | 0.65 BSC | | |
| D | 3.10 | 3.30 | 3.45 | H | 0.30 | 0.40 | 0.50 |
| D1 | 2.90 | 3.05 | 3.20 | L | 0.30 | 0.40 | 0.50 |
| D2 | 1.45 | 1.70 | 1.95 | L1 | -- | 0.13 | -- |
| E | 3.05 | 3.25 | 3.40 | theta | 0° | | 14° |