

Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)MAX}$ | I_D |
|---------------|-----------------|-------|
| 100V | 110mΩ@10V | 10A |
| | 120mΩ@4.5V | |

| $V_{(BR)DSS}$ | $R_{DS(on)MAX}$ | I_D |
|---------------|-----------------|-------|
| -100V | 110mΩ@-10V | -18A |
| | 120mΩ@-4.5V | |

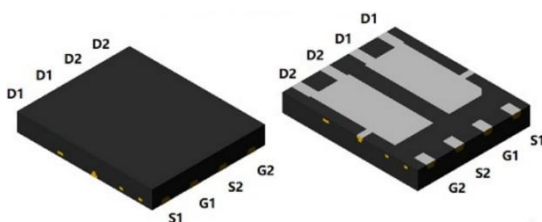
Feature

- Trench Power LV MOSFET technology
- Excellent package for heat dissipation

Application

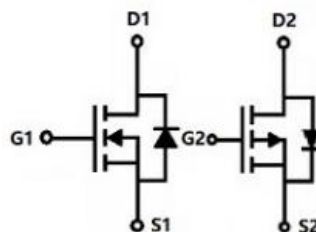
- Load switching
- Hard switched and high frequency circuits
- Uninterruptible power supply

Package

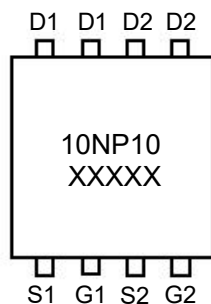


DFN5X6-8L

Circuit diagram



Marking



Absolute maximum ratings (TA=25°C unless otherwise noted)

| Parameter | Symbol | N-Channel | p-Channel | Unit |
|---|------------------|------------|-----------|------|
| Drain-Source Voltage | V _{DS} | 100 | -100 | V |
| Gate-Source Voltage | V _{GS} | ±20 | ±20 | V |
| Continuous Drain Current | I _D | 10 | -18 | A |
| Pulsed Drain Current ¹⁾ | I _{DM} | 40 | -72 | A |
| Power Dissipation ³⁾ | P _D | 30 | 72 | W |
| Single Pulse Avalanche Energy ²⁾ | E _{AS} | 6.25 | 30.25 | mJ |
| Thermal Resistance, Junction-to-Case | R _{θjc} | 4 | 1.7 | °C/W |
| Junction Temperature | T _J | -55 ~ +150 | | °C |
| Storage Temperature | T _{STG} | -55 ~ +150 | | °C |

N-CH Electrical characteristics (T_J=25 °C, unless otherwise noted)

| Parameter | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|---|----------------------|---|------|------|------|------|
| Static Characteristics | | | | | | |
| Drain-source breakdown voltage | V _{(BR)DSS} | V _{GS} = 0V, I _D = 250μA | 100 | | | V |
| Zero gate voltage drain current | I _{DSS} | V _{DS} = 100V, V _{GS} = 0V | | | 1 | μA |
| Gate-body leakage current | I _{GSS} | V _{GS} = ±20V, V _{DS} = 0V | | | ±100 | nA |
| Gate threshold voltage | V _{GS(th)} | V _{DS} = V _{GS} , I _D = 250μA | 1.1 | 1.8 | 3.0 | V |
| Drain-source on-resistance ²⁾ | R _{DS(on)} | V _{GS} = 10V, I _D = 10A | | 90 | 110 | mΩ |
| | | V _{GS} = 4.5V, I _D = 5A | | 95 | 120 | mΩ |
| Dynamic characteristics³⁾ | | | | | | |
| Input Capacitance | C _{iss} | V _{DS} = 50V, V _{GS} = 0V, f = 1MHz | | 900 | | pF |
| Output Capacitance | C _{oss} | | | 35 | | |
| Reverse Transfer Capacitance | C _{rss} | | | 30 | | |
| Total Gate Charge | Q _g | V _{DS} = 50V, V _{GS} = 10V, I _D = 5A | | 16 | | nC |
| Gate-Source Charge | Q _{gs} | | | 2.5 | | |
| Gate-Drain Charge | Q _{gd} | | | 2.6 | | |
| Turn-on delay time | t _{d(on)} | V _{DD} = 50V, V _{GS} = 10V, I _D = 5A, R _{GEN} = 2.2Ω | | 5 | | nS |
| Turn-on rise time | t _r | | | 40 | | |
| Turn-off delay time | t _{d(off)} | | | 20 | | |
| Turn-off fall time | t _f | | | 7 | | |
| Source-Drain Diode characteristics | | | | | | |
| Diode Forward Current | I _S | | | | 10 | A |
| Diode Forward voltage | V _{DS} | V _{GS} = 0V, I _S = 10A | | | 1.2 | V |
| Reverse Recovery Time | t _{rr} | T _J = 25°C, I _F = 5A di/dt = 100A/μs | | 35 | | nS |
| Reverse Recovery Charge | Q _{rr} | | | 90 | | nC |

P-CH Electrical characteristics (T_J=25 °C, unless otherwise noted)

| Parameter | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|---|----------------------|---|------|------|------|------|
| Static Characteristics | | | | | | |
| Drain-source breakdown voltage | V _{(BR)DSS} | V _{GS} = 0V, I _D = -250μA | -100 | | | V |
| Zero gate voltage drain current | I _{DSS} | V _{DS} = -100V, V _{GS} = 0V | | | -1 | μA |
| Gate-body leakage current | I _{GSS} | V _{GS} = ±20V, V _{DS} = 0V | | | ±100 | nA |
| Gate threshold voltage | V _{GS(th)} | V _{DS} = V _{GS} , I _D = -250μA | -1.0 | -1.8 | -2.5 | V |
| Drain-source on-resistance ²⁾ | R _{DS(on)} | V _{GS} = -10V, I _D = -10A | | 88 | 110 | mΩ |
| | | V _{GS} = -4.5V, I _D = -5A | | 95 | 120 | mΩ |
| Dynamic characteristics³⁾ | | | | | | |
| Input Capacitance | C _{iss} | V _{DS} = -50V, V _{GS} = 0V, f = 1MHz | | 1050 | | pF |
| Output Capacitance | C _{oss} | | | 120 | | |
| Reverse Transfer Capacitance | C _{rss} | | | 25 | | |
| Total Gate Charge | Q _g | V _{DS} = -50V, V _{GS} = -10V, I _D = -5A | | 20 | | nC |
| Gate-Source Charge | Q _{gs} | | | 4 | | |
| Gate-Drain Charge | Q _{gd} | | | 4.5 | | |
| Turn-on delay time | t _{d(on)} | V _{DD} = -50V, V _{GS} = -10V, R _L = 2.5Ω, R _{GEN} = 6Ω | | 10 | | nS |
| Turn-on rise time | t _r | | | 30 | | |
| Turn-off delay time | t _{d(off)} | | | 77 | | |
| Turn-off fall time | t _f | | | 81 | | |
| Source-Drain Diode characteristics | | | | | | |
| Diode Forward Current | I _S | | | | -18 | A |
| Diode Forward voltage | V _{DS} | V _{GS} = 0V, I _S = -10A | | | -1.3 | V |
| Reverse Recovery Time | t _{rr} | T _J = 25°C, I _F = -5A di/dt = 100A/μs | | 70 | | nS |
| Reverse Recovery Charge | Q _{rr} | | | 140 | | nC |

Notes:

- 1) Repetitive rating; pulse width limited by max. junction temperature.
- 2) NMOS: T_J=25°C, V_{DD}=50V, V_G=10V, R_G=25Ω, L=0.5mH, I_{AS}=5A.
PMOS: T_J=25°C, V_{DD}=-50V, V_G=-10V, R_G=25Ω, L=0.5mH, I_{AS}=-11A.
- 3) P_d is based on max. junction temperature, using junction-case thermal resistance.

N- Channel Typical Characteristics

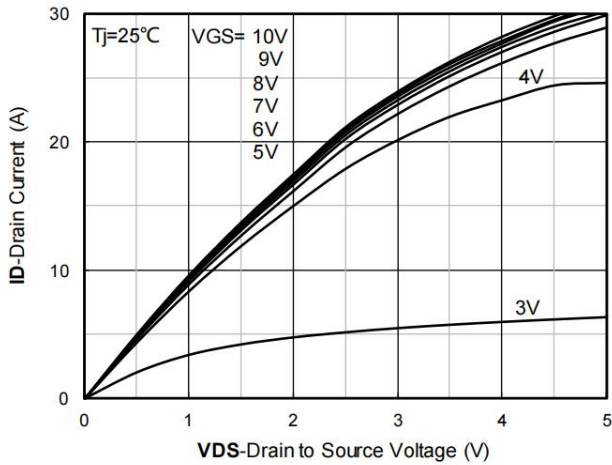


Figure1. Output Characteristics

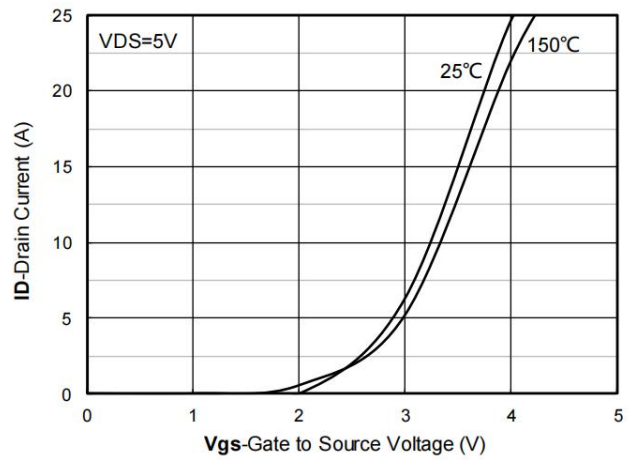


Figure2. Transfer Characteristics

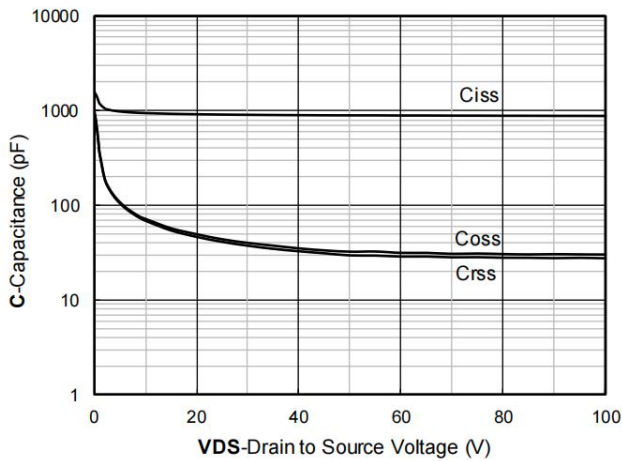


Figure3. Capacitance Characteristics

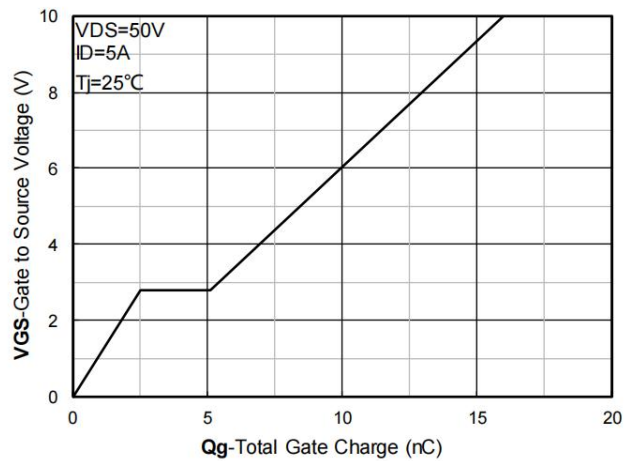


Figure4. Gate Charge

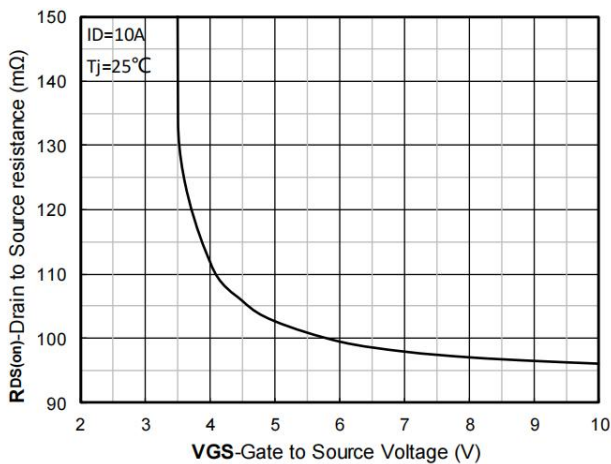


Figure5. On-Resistance vs Gate to Source Voltage

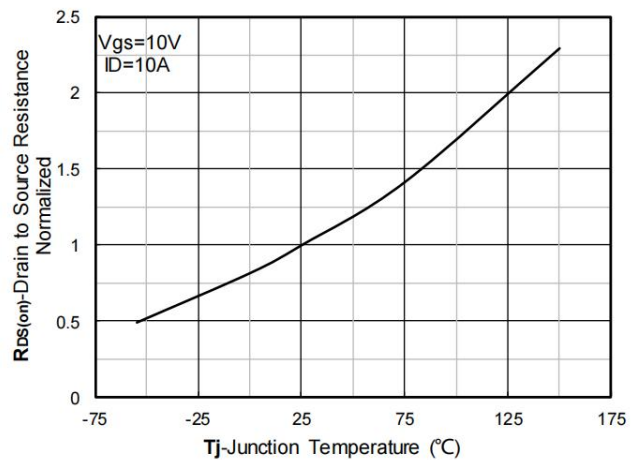


Figure6. Normalized On-Resistan

N- Channel Typical Characteristics

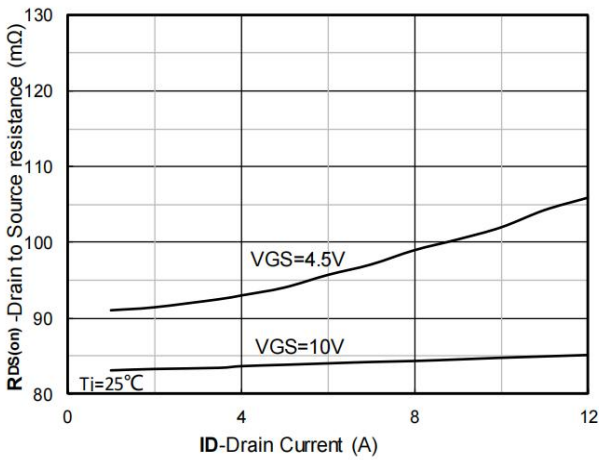


Figure7. RDS(on) VS Drain Current

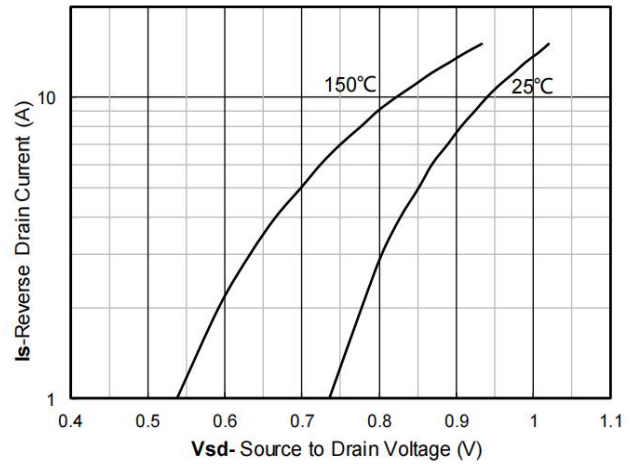


Figure8. Forward characteristics of reverse diode

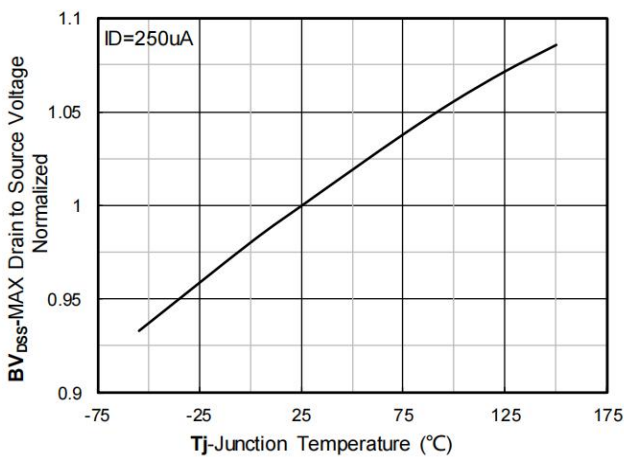


Figure9. Normalized breakdown voltage

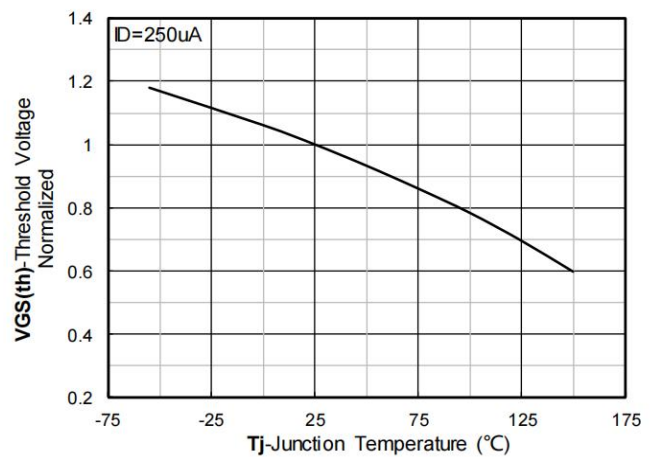


Figure10. Normalized Threshold voltage

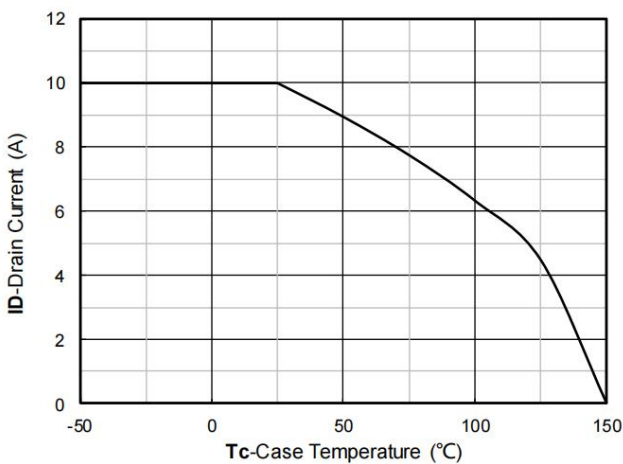


Figure11. Current dissipation

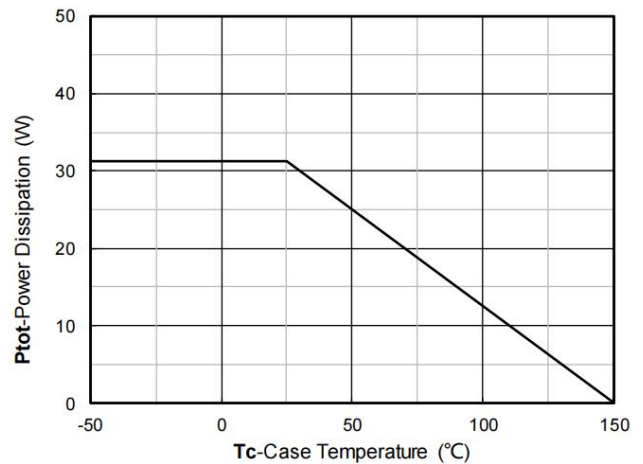


Figure12. Power dissipation

N- Channel Typical Characteristics

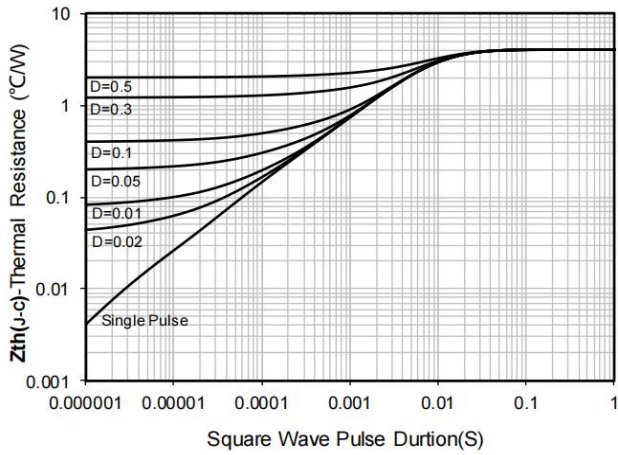


Figure 13. Maximum Transient Thermal Impedance

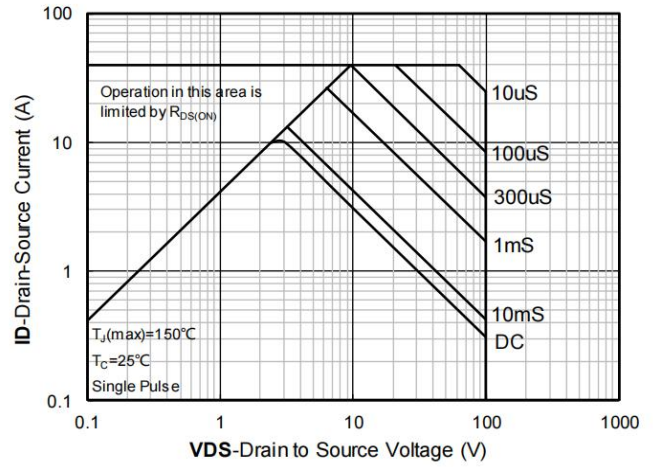


Figure 14. Safe Operation Area

P- Channel Typical Characteristics

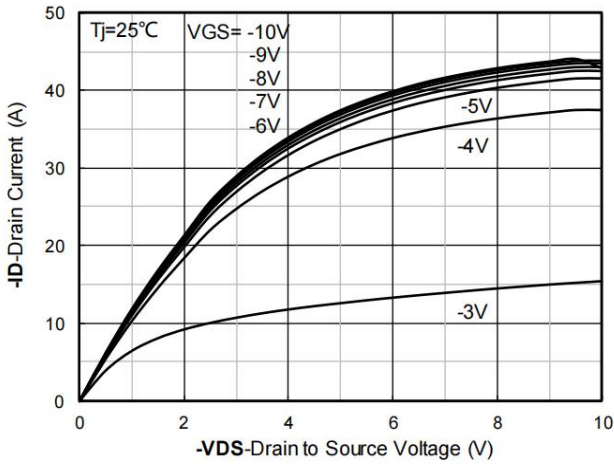


Figure1. Output Characteristics

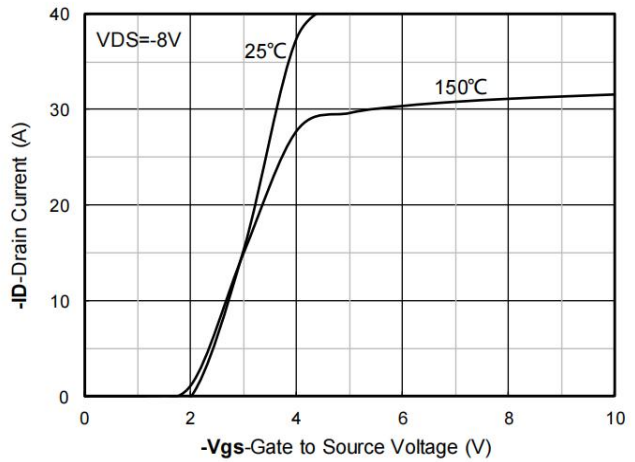


Figure2. Transfer Characteristics

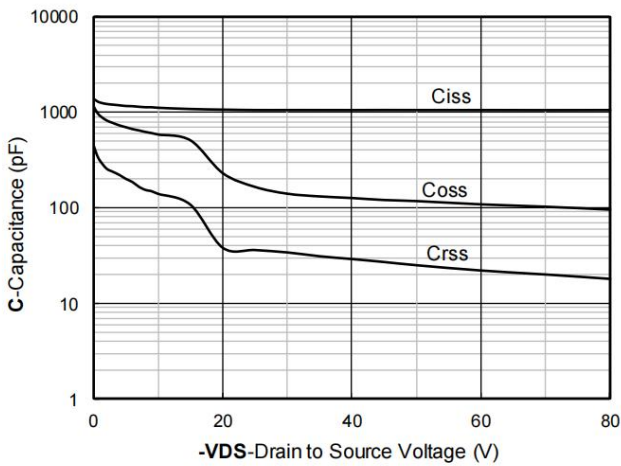


Figure3. Capacitance Characteristics

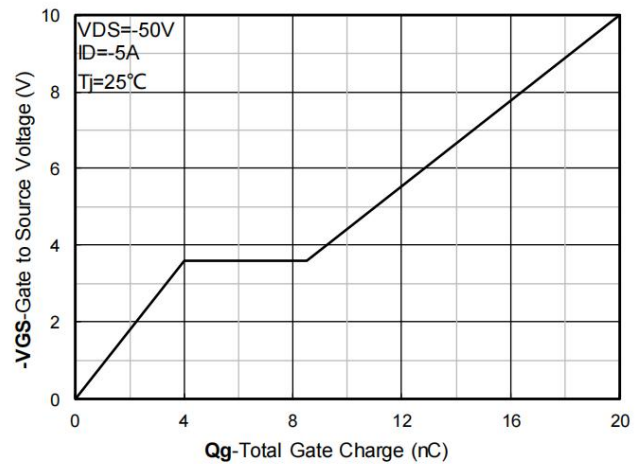


Figure4. Gate Charge

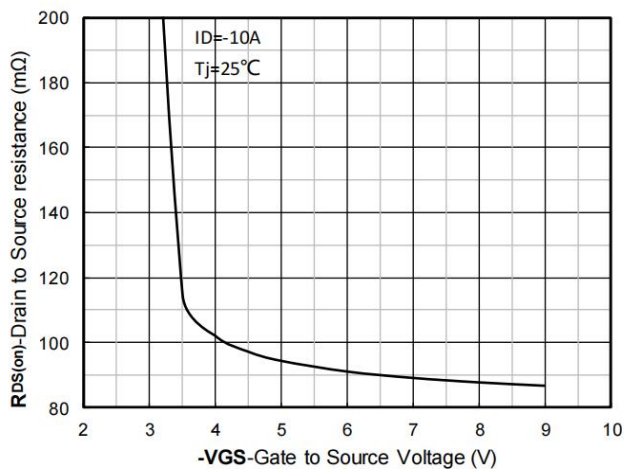


Figure5. On-Resistance vs Gate to Source Voltage

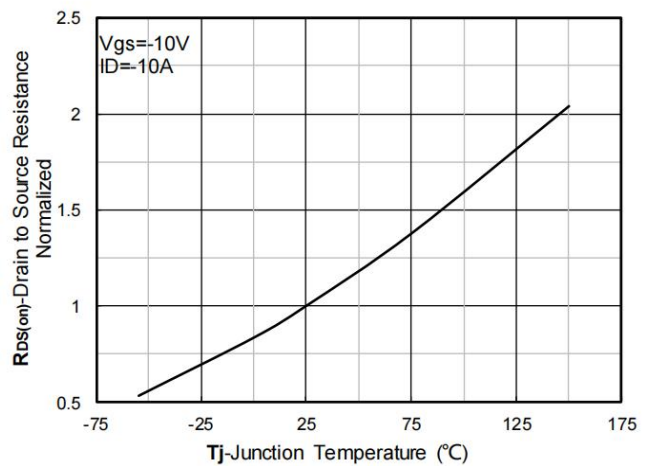


Figure6. Normalized On-Resistance

P- Channel Typical Characteristics

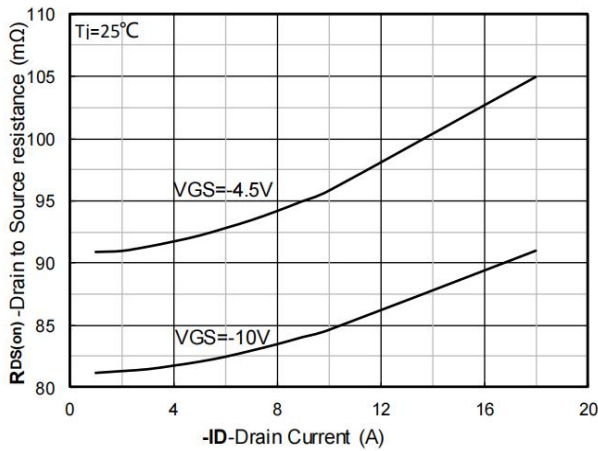


Figure7. RDS(on) VS Drain Current

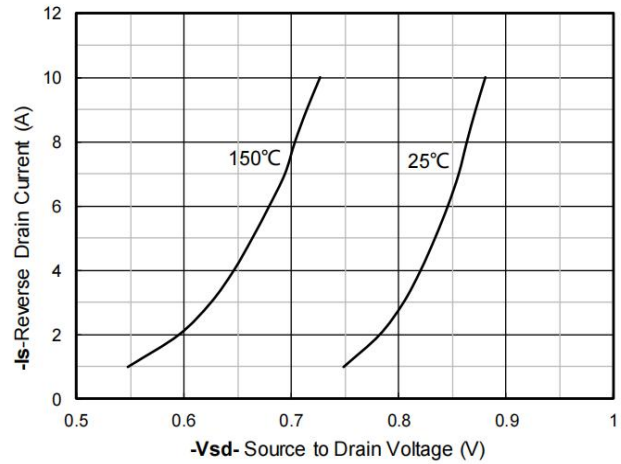


Figure8. Forward characteristics of reverse diode

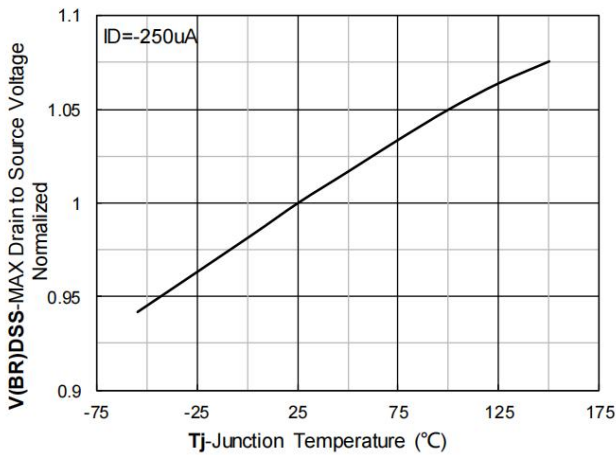


Figure9. Normalized breakdown voltage

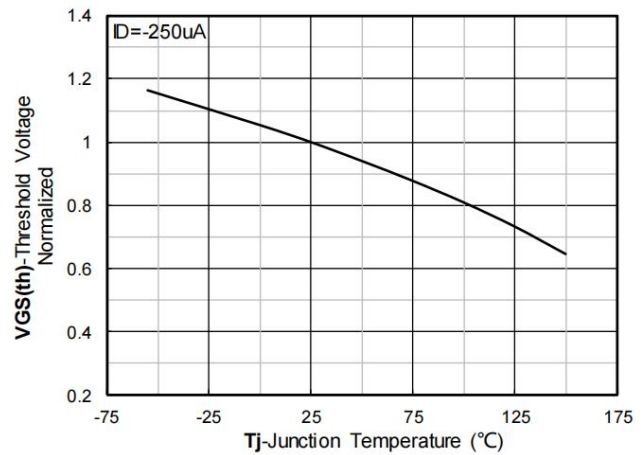


Figure10. Normalized Threshold voltage

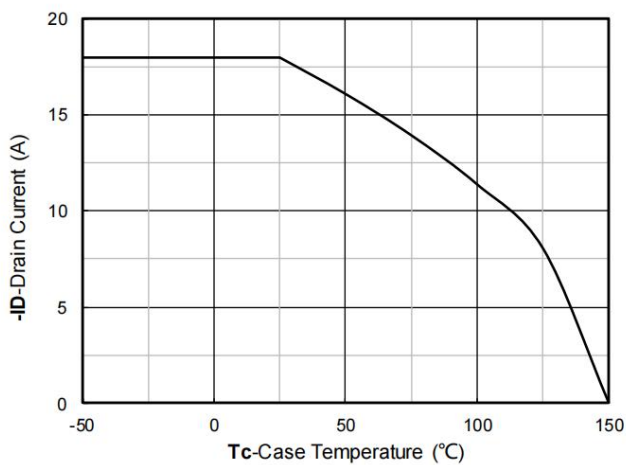


Figure11. Current dissipation

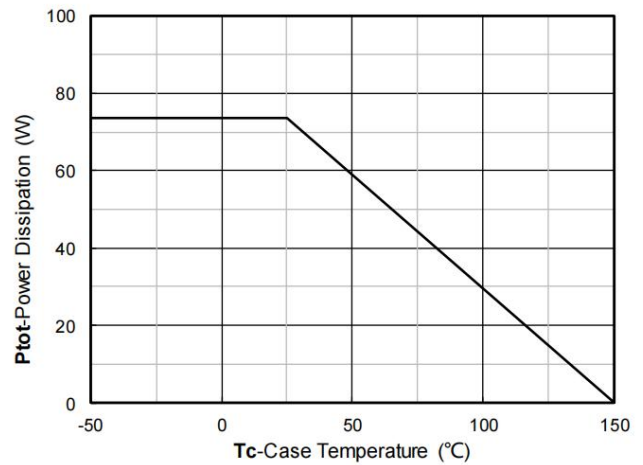


Figure12. Power dissipation

P- Channel Typical Characteristics

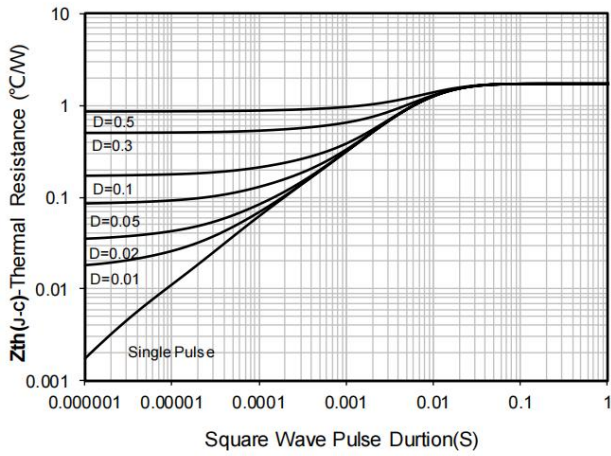


Figure13. Maximum Transient Thermal Impedance

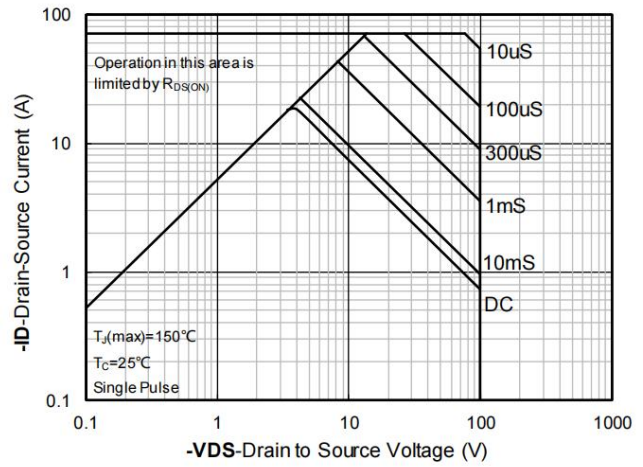
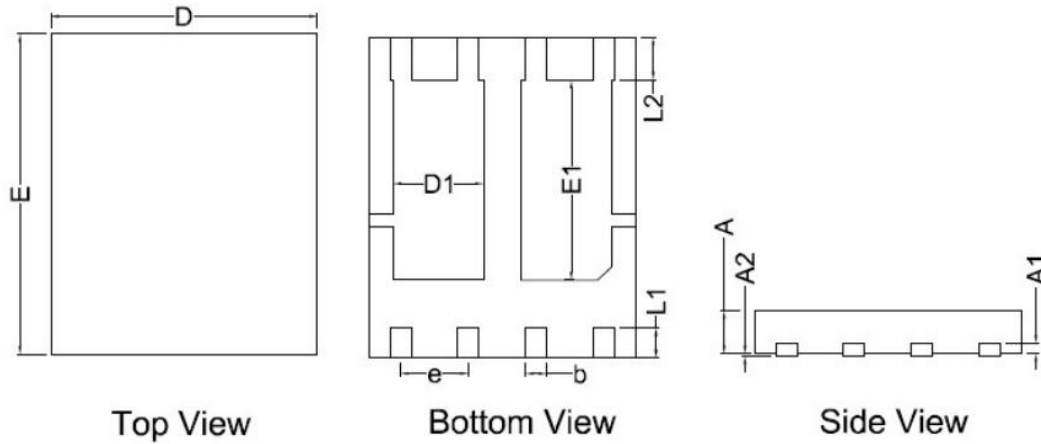


Figure14. Safe Operation Area

DFN5X6-8L Package Information



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 0.700 | 0.900 | 0.027 | 0.035 |
| A1 | 0.200 BSC | | 0.008BSC | |
| A2 | 0.000 | 0.100 | 0.000 | 0.004 |
| b | 0.300 | 0.500 | 0.011 | 0.020 |
| D | 4.900 | 5.100 | 0.193 | 0.201 |
| D1 | 1.600 | 1.800 | 0.063 | 0.071 |
| E | 5.900 | 6.100 | 0.232 | 0.240 |
| E1 | 3.650 | 3.850 | 0.143 | 0.152 |
| e | 1.270 BSC | | 0.050 BSC | |
| L1 | 0.450 | 0.650 | 0.018 | 0.026 |
| L2 | 0.800 BSC | | 0.031 BSC | |