

Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)MAX}$ | I_D |
|---------------|-----------------|-------|
| -100V | 26mΩ@-10V | -55A |
| | 30mΩ@-4.5V | |

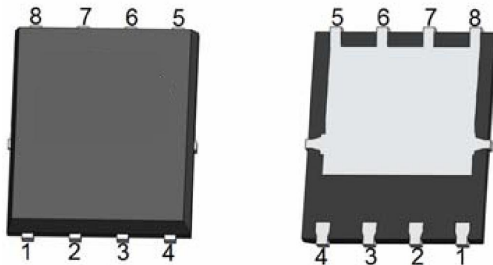
Feature

- Excellent gate charge x $R_{DS(on)}$ product(FOM)
- Very low on-resistance $R_{DS(on)}$

Application

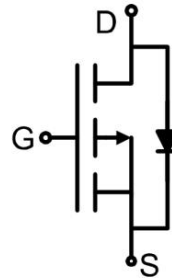
- DC/DC converters
- Ideal for high-frequency switching and synchronous rectification

Package

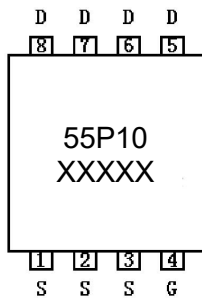


DFN5X6-8L

Circuit diagram



Marking



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

| Parameter | Symbol | Value | Unit |
|--|------------------------|------------|------|
| Drain-Source Voltage | V _{DS} | -100 | V |
| Gate-Source Voltage | V _{GS} | ±20 | V |
| Continuous Drain Current | I _D | -55 | A |
| Continuous Drain Current (T _c =100°C) | I _D (100°C) | -39 | A |
| Pulsed Drain Current | I _{DM} | -220 | A |
| Power Dissipation | P _D | 140 | W |
| Thermal Resistance, Junction-to-Case | R _{θJC} | 0.89 | °C/W |
| Single pulse avalanche energy ¹⁾ | E _{AS} | 670 | mJ |
| Junction Temperature | T _J | 150 | °C |
| Storage Temperature | T _{STG} | -55 ~ +150 | °C |

Electrical characteristics (T_c=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 | -1.2 | -1.7 | -2.5 | V |
| Drain-source on-resistance | R _{DS(on)} | V _{GS} = -10V, I _D = -20A | | 19.5 | 26 | mΩ |
| | | V _{GS} = -4.5V, I _D = -20A | | 22.5 | 30 | |
| Dynamic characteristics²⁾ | | | | | | |
| Input Capacitance | C _{iss} | V _{DS} = -50V, V _{GS} = 0V, f = 1MHz | | 6900 | | pF |
| Output Capacitance | C _{oss} | | | 430 | | |
| Reverse Transfer Capacitance | C _{rss} | | | 10.5 | | |
| Total Gate Charge | Q _g | V _{DS} = -50V, V _{GS} = -10V, I _D = -20A | | 86.5 | | nC |
| Gate-Source Charge | Q _{gs} | | | 16.6 | | |
| Gate-Drain Charge | Q _{gd} | | | 9 | | |
| Turn-on delay time | t _{d(on)} | V _{DD} = -50V, V _{GS} = -10V, R _G = 1.6Ω, I _D = -20A | | 15 | | nS |
| Turn-on rise time | t _r | | | 18 | | |
| Turn-off delay time | t _{d(off)} | | | 50 | | |
| Turn-off fall time | t _f | | | 18 | | |
| Source-Drain Diode characteristics | | | | | | |
| Diode Forward Current | I _S | | | | -55 | A |
| Diode Forward voltage | V _{SD} | V _{GS} = 0V, I _S = -20A | | | -1.2 | V |
| Reverse Recovery Time | t _{rr} | T _J = 25°C, I _F = -20A | | 55 | | nS |
| Reverse Recovery Charge | Q _{rr} | di/dt = 100A/μs | | 101 | | nC |

Notes:

- 1) EAS condition : T_J = 25°C, V_{DD} = -50V, V_G = -10V, L = 0.5mH, R_G = 25Ω.
- 2) Guaranteed by design, not subject to production.
- 3) These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of T_J(MAX) = 150°C. The SOA curve provides a single pulse rating.

Typical Characteristics

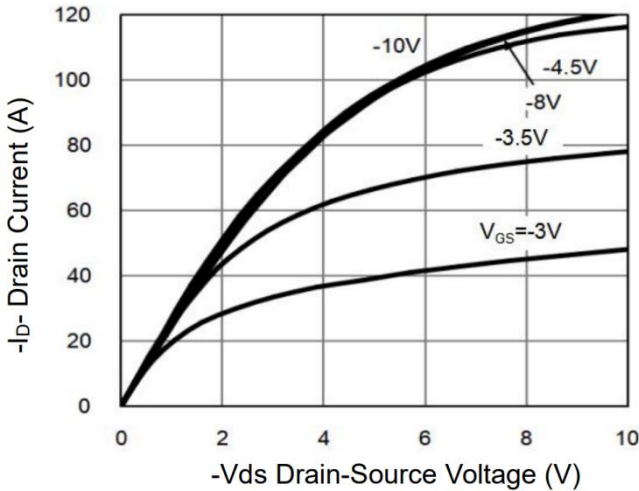


Figure 1 Output Characteristics

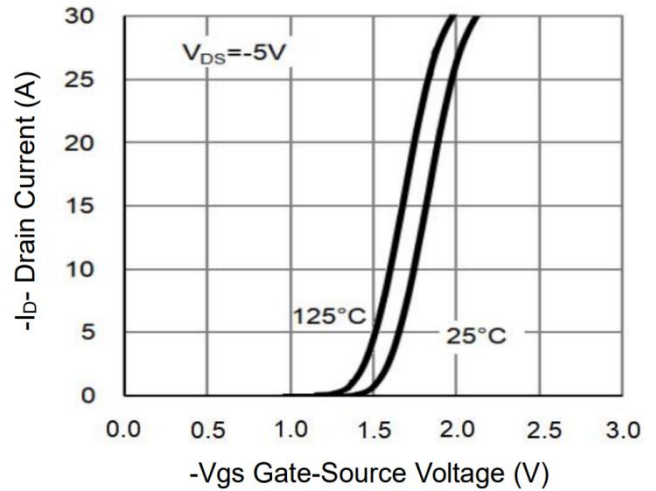


Figure 2 Transfer Characteristics

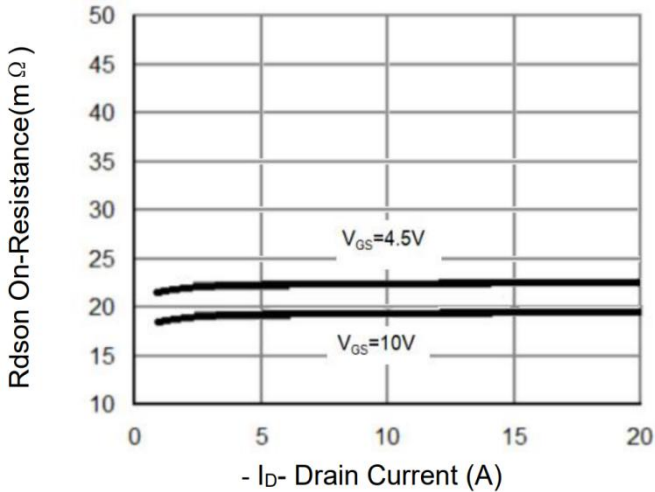


Figure 3 Rdson- Drain Current

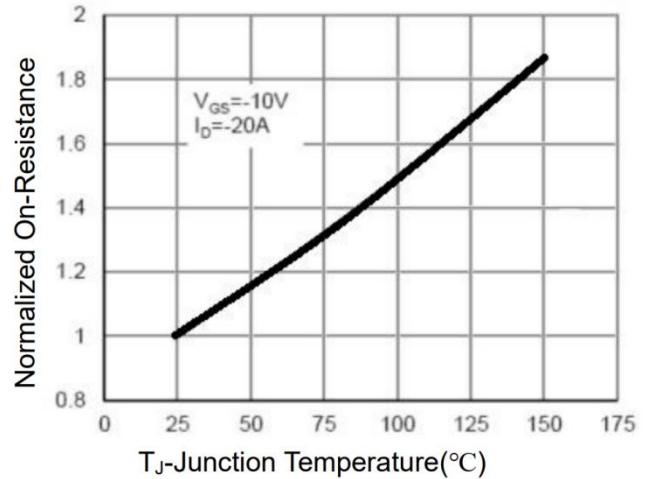


Figure 4 Rdson-Junction Temperature

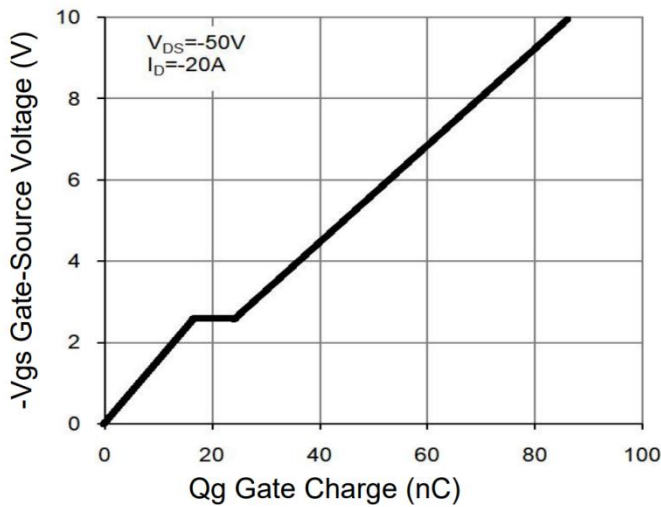


Figure 5 Gate Charge

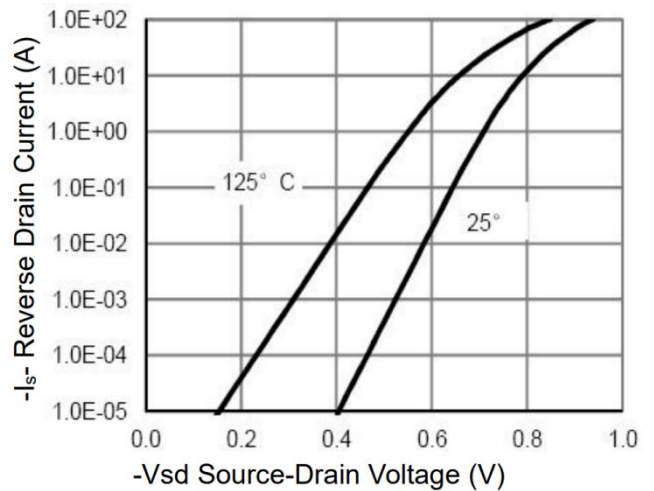


Figure 6 Source- Drain Diode Forward

Typical Characteristics

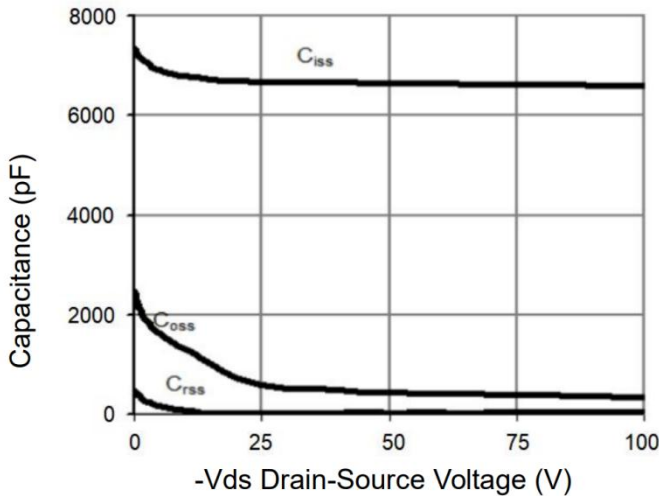


Figure 7 Capacitance vs Vds

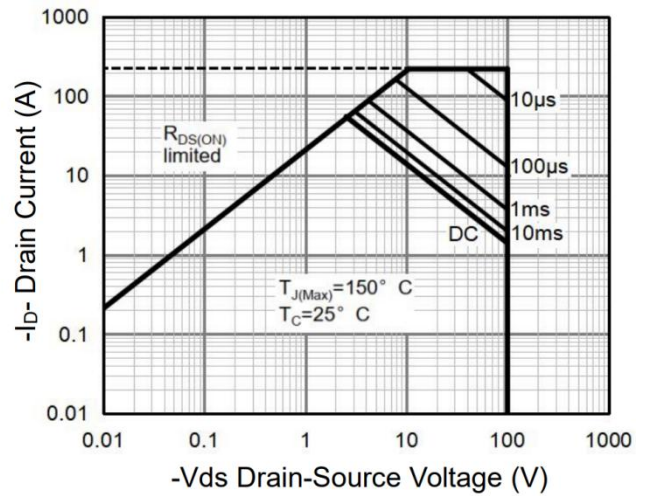


Figure 8 Safe Operation Area (Note 3)

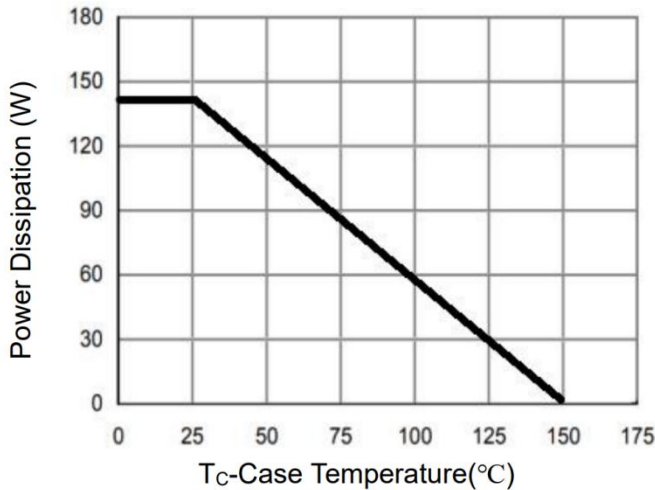


Figure 9 Power De-rating

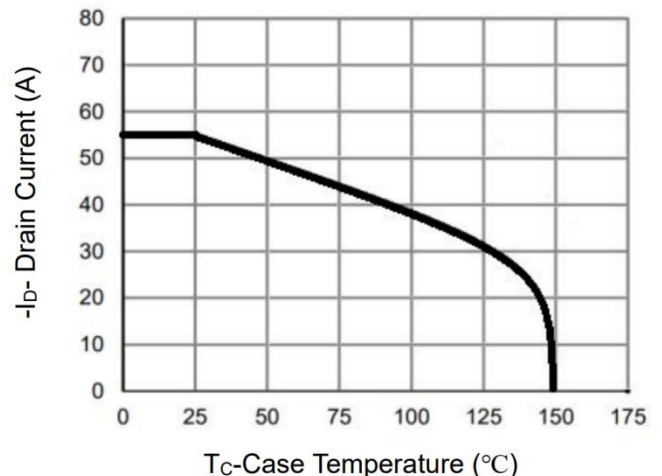


Figure 10 Current De-rating

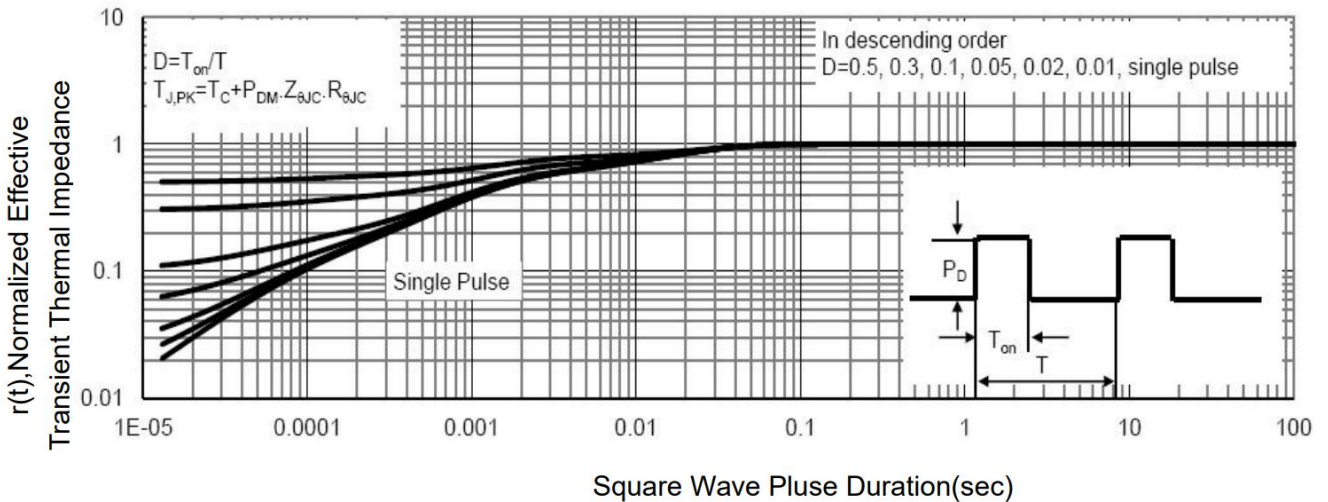
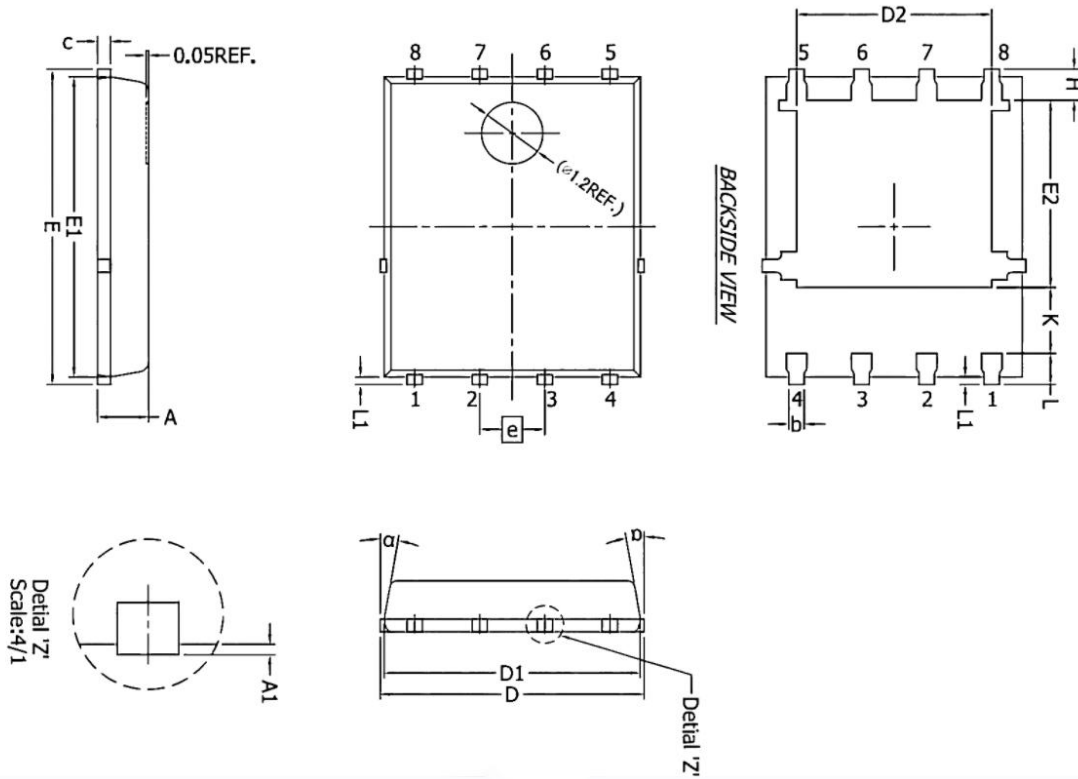


Figure 11 Normalized Maximum Transient Thermal Impedance

DFN5X6-8L Package Information



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 0.900 | 1.100 | 0.035 | 0.043 |
| A1 | - | 0.050 | - | 0.002 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.200 | 0.300 | 0.008 | 0.012 |
| D | 5.15 BSC | | 0.203 BSC | |
| D1 | 5.00 BSC | | 0.197 BSC | |
| D2 | 3.760 | 3.860 | 0.148 | 0.152 |
| E | 6.150 BSC | | 0.242 BSC | |
| E1 | 5.800 | 5.900 | 0.228 | 0.232 |
| E2 | 3.450 | 3.850 | 0.136 | 0.152 |
| e | 1.270 BSC | | 0.050 BSC | |
| H | 0.510 | 0.710 | 0.020 | 0.028 |
| K | 1.100 | - | 0.043 | - |
| L | 0.510 | 0.710 | 0.020 | 0.028 |
| L1 | 0.080 | 0.230 | 0.003 | 0.009 |
| α | 10° | 12° | 10° | 12° |