

Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)MAX}$ | I_D |
|---------------|-----------------|-------|
| 40V | 3.4mΩ@10V | 90A |

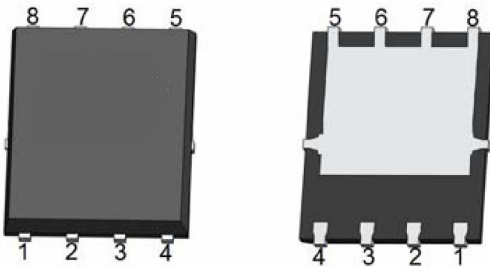
Feature

- Excellent gate charge x $R_{DS(on)}$ product(FOM)
- Very low on-resistance $R_{DS(on)}$
- 150 °C operating temperature

Application

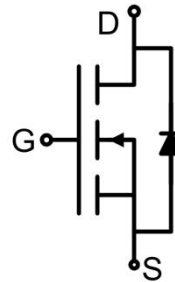
- DC/DC converter
- Ideal for high-frequency switching and synchronous rectification

Package

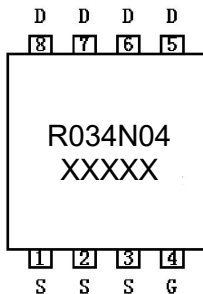


DFN5X6-8L

Circuit diagram



Marking



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

| Parameter | Symbol | Value | Unit |
|---|------------------------|------------|------|
| Drain-Source Voltage | V _{DS} | 40 | V |
| Gate-Source Voltage | V _{GS} | ±20 | V |
| Continuous Drain Current | I _D | 90 | A |
| Continuous Drain Current(T _c =100°C) | I _D (100°C) | 63.6 | A |
| Pulsed Drain Current | I _{DM} | 360 | A |
| Power Dissipation | P _D | 70 | W |
| Thermal Resistance,Junction-to-Case ¹⁾ | R _{θJC} | 1.8 | °C/W |
| Single pulse avalanche energy ⁴⁾ | E _{AS} | 500 | 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 | 40 | | | V |
| Zero gate voltage drain current | I _{DSS} | V _{DS} =40V, V _{GS} = 0V | | | 1 | μA |
| Gate-body leakage current | I _{GSS} | V _{GS} =±20V, V _{DS} = 0V | | | ±100 | nA |
| Gate threshold voltage ²⁾ | V _{GS(th)} | V _{DS} =V _{GS} , I _D =250μA | 2.0 | 3.0 | 4.0 | V |
| Drain-source on-resistance ²⁾ | R _{DS(on)} | V _{GS} =10V, I _D =20A | | 2.9 | 3.4 | mΩ |
| Dynamic characteristics³⁾ | | | | | | |
| Input Capacitance | C _{iss} | V _{DS} =20V, V _{GS} =0V, f =1MHz | | 1695 | | pF |
| Output Capacitance | C _{oss} | | | 840 | | |
| Reverse Transfer Capacitance | C _{rss} | | | 34 | | |
| Total Gate Charge | Q _g | V _{DS} =20V, V _{GS} =10V, I _D =20A | | 28 | | nC |
| Gate-Source Charge | Q _{gs} | | | 9.1 | | |
| Gate-Drain Charge | Q _{gd} | | | 5.8 | | |
| Turn-on delay time | t _{d(on)} | V _{DD} =20V, V _{GS} =10V, I _D =20A, R _G =1.6Ω | | 7.5 | | nS |
| Turn-on rise time | t _r | | | 4.0 | | |
| Turn-off delay time | t _{d(off)} | | | 37 | | |
| Turn-off fall time | t _f | | | 7.5 | | |
| Source-Drain Diode characteristics | | | | | | |
| Diode Forward Current ¹⁾ | I _S | | | | 90 | A |
| Diode Forward voltage ²⁾ | V _{SD} | V _{GS} =0V, I _S =20A | | | 1.2 | V |
| Reverse Recovery Time | t _{rr} | T _J = 25°C, I _F = I _S di/dt = 100A/μs ²⁾ | | 14 | | nS |
| Reverse Recovery Charge | Q _{rr} | | | | 21 | |

Notes:

- 1) Surface Mounted on FR4 Board, t ≤ 10 sec.
- 2) Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
- 3) Guaranteed by design, not subject to production.
- 4) EAS condition : T_J=25 °C, V_{DD}=20V, V_G=10V, L=0.5mH, R_G=25Ω.

Typical Characteristics

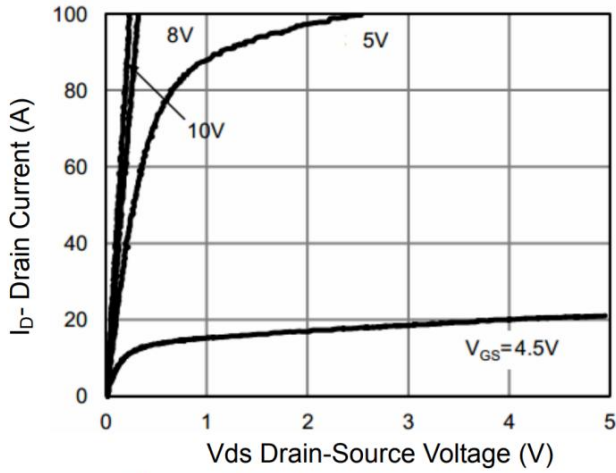


Figure 1 Output Characteristics

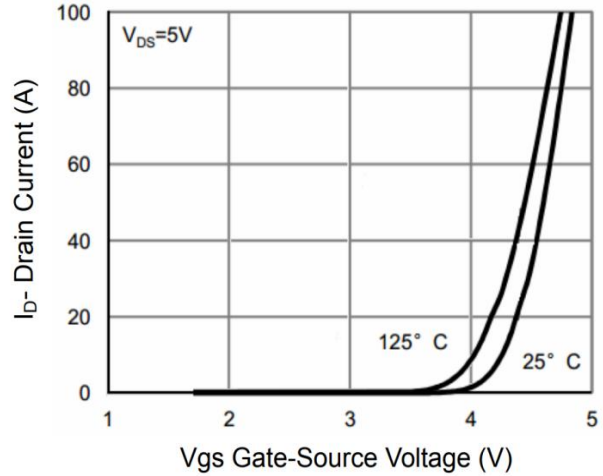


Figure 2 Transfer Characteristics

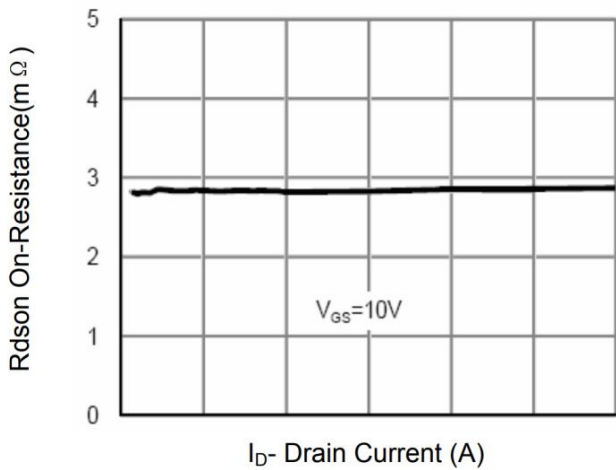


Figure 3 Rdson- Drain Current

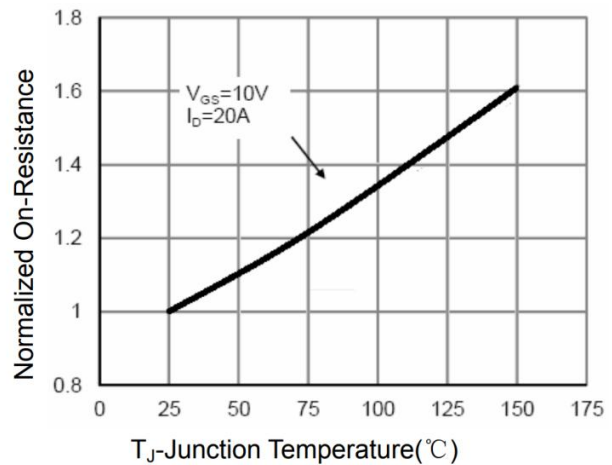


Figure 4 Rdson-Junction Temperature

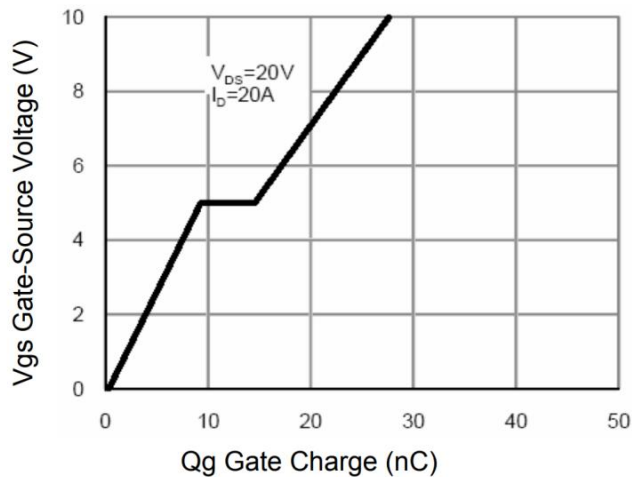


Figure 5 Gate Charge

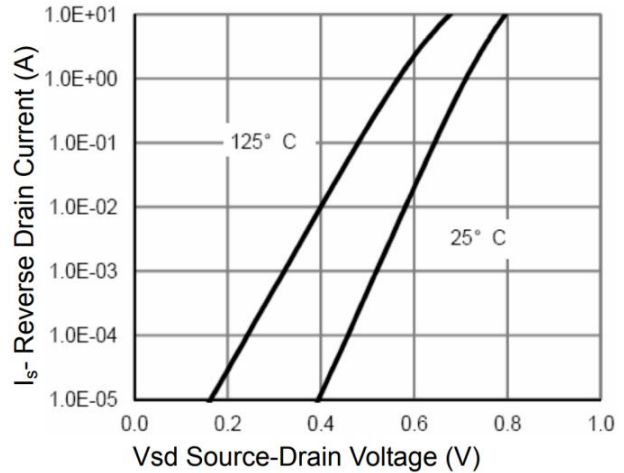


Figure 6 Source- Drain Diode Forward

Typical Characteristics

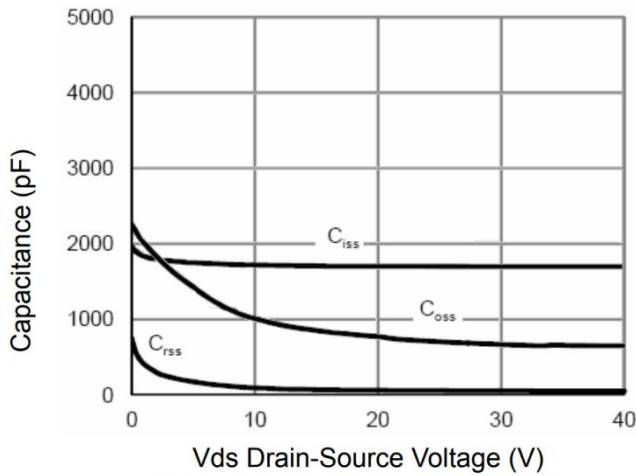


Figure 7 Capacitance vs Vds

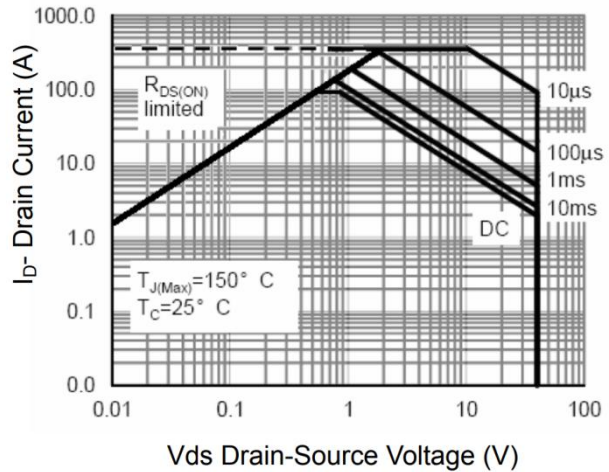


Figure 8 Safe Operation Area

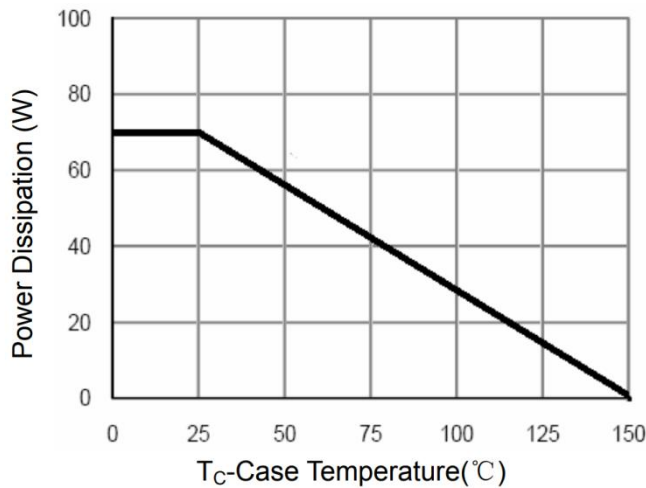


Figure 9 Power De-rating

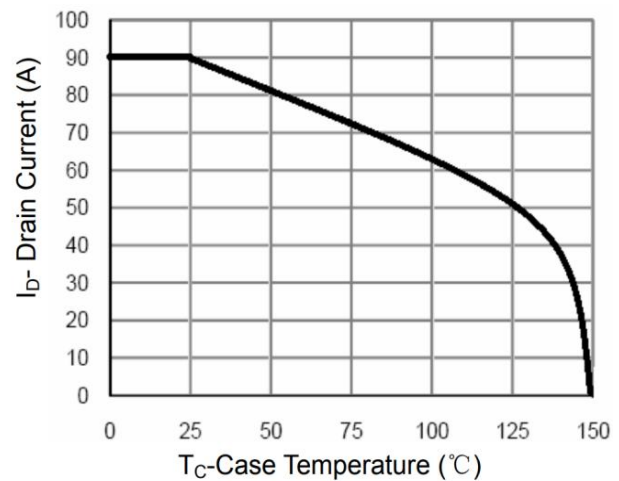


Figure 10 Current De-rating

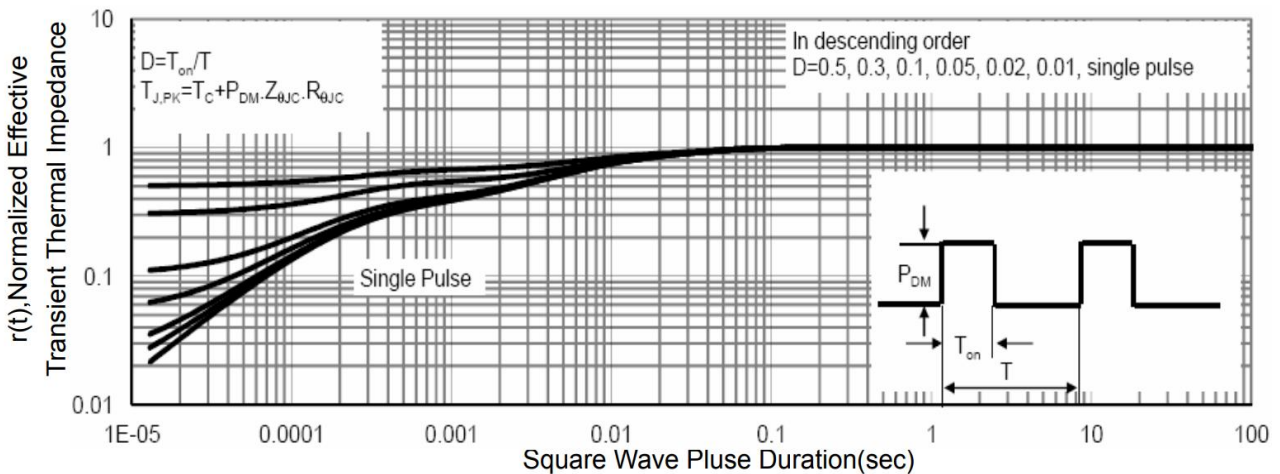
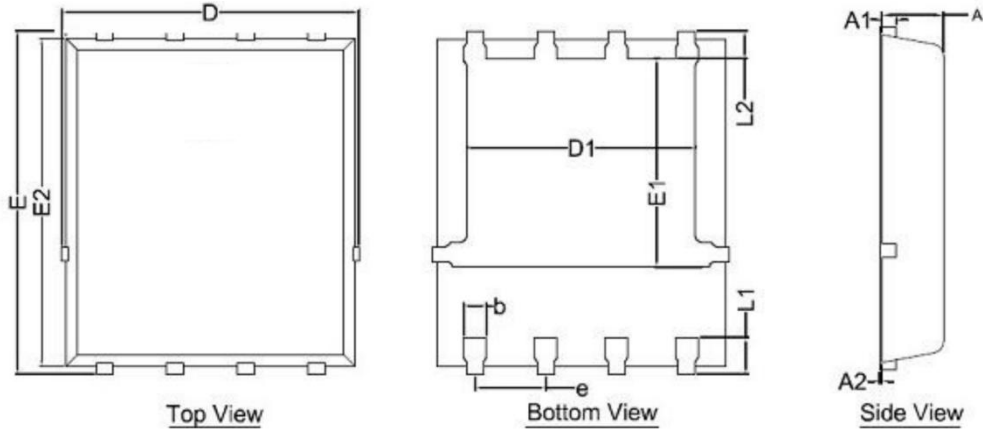


Figure 11 Normalized Maximum Transient Thermal Impedance

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 | 0.200 | 0.300 | 0.008 | 0.012 |
| A2 | 0.000 | 0.050 | 0.000 | 0.002 |
| D | 4.800 | 5.000 | 0.189 | 0.197 |
| E | 5.900 | 6.100 | 0.232 | 0.240 |
| D1 | 3.610 | 3.960 | 0.142 | 0.156 |
| E1 | 3.380 | 3.780 | 0.133 | 0.149 |
| E2 | 5.700 | 5.800 | 0.224 | 0.228 |
| b | 0.330 | 0.510 | 0.013 | 0.020 |
| e | 1.270BSC. | | 0.050BSC | |
| L1 | 0.510 | 0.710 | 0.020 | 0.028 |
| L2 | 0.410 | 0.610 | 0.016 | 0.024 |