

Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)MAX}$ | I_D |
|---------------|-----------------|-------|
| -19V | 7mΩ@-4.5V | -45A |
| | 9mΩ@-2.5V | |
| | 12mΩ@-1.8V | |

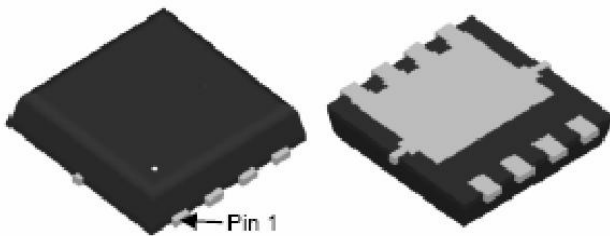
Feature

- High density cell design for ultra low Rdson
- High Speed switching
- Suffix “-Q1” for AEC-Q101

Application

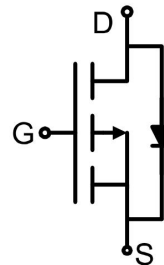
- Battery protection
- Load switching
- Power management

Package

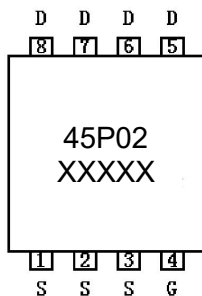


DFN3.3X3.3-8L

Circuit diagram



Marking



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

| Parameter | Symbol | Value | Unit |
|---|-------------------------|------------|------|
| Drain-Source Voltage | V _{DS} | -19 | V |
| Gate-Source Voltage | V _{GS} | ±12 | V |
| Continuous Drain Current | I _D | -45 | A |
| Continuous Drain Current(T _C =100 °C) | I _D (100 °C) | -35 | A |
| Pulsed Drain Current | I _{DM} | -200 | A |
| Power Dissipation | P _D | 80 | W |
| Thermal Resistance,Junction-to-Case | R _{θJC} | 1.6 | °C/W |
| Junction Temperature | T _J | 150 | °C |
| Storage Temperature | T _{STG} | -55 ~ +150 | °C |

Electrical characteristics (T_A=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 | -19 | | | V |
| Zero gate voltage drain current | I _{DSS} | V _{DS} = -16V, V _{GS} = 0V | | | -1 | μA |
| Gate-body leakage current | I _{GSS} | V _{GS} = ±12V, V _{DS} = 0V | | | ±100 | nA |
| Gate threshold voltage | V _{GS(th)} | V _{DS} = V _{GS} , I _D = -250μA | -0.4 | | -1.0 | V |
| Drain-source on-resistance ¹⁾ | R _{DS(on)} | V _{GS} = -4.5V, I _D = -20A | | 5.8 | 7 | mΩ |
| | | V _{GS} = -2.5V, I _D = -20A | | 7.2 | 9 | |
| | | V _{GS} = -1.8V, I _D = -20A | | 9 | 12 | |
| Forward transconductance ¹⁾ | g _{FS} | V _{DS} = -5V, I _D = -20A | 80 | | | S |
| Dynamic characteristics²⁾ | | | | | | |
| Input Capacitance | C _{iss} | V _{DS} = -10V, V _{GS} = 0V, f = 1MHz | | 3500 | | pF |
| Output Capacitance | C _{oss} | | | 577 | | |
| Reverse Transfer Capacitance | C _{rss} | | | 445 | | |
| Total Gate Charge | Q _g | V _{DS} = -10V, V _{GS} = -4.5V, I _D = -20A | | 55 | | nC |
| Gate-Source Charge | Q _{gs} | | | 10 | | |
| Gate-Drain Charge | Q _{gd} | | | 15 | | |
| Turn-on delay time | t _{d(on)} | V _{DD} = -10V, V _{GS} = -4.5V, R _L = 0.5Ω, R _{GEN} = 3Ω | | 18 | | nS |
| Turn-on rise time | t _r | | | 42 | | |
| Turn-off delay time | t _{d(off)} | | | 85 | | |
| Turn-off fall time | t _f | | | 23 | | |
| Source-Drain Diode characteristics | | | | | | |
| Diode Forward Current ¹⁾ | I _S | | | | -45 | A |
| Diode Forward voltage | V _{DS} | V _{GS} = 0V, I _S = -20A | | | -1.2 | V |
| Reverse Recovery Time | t _{rr} | T _J = 25 °C, I _F = -10A di/dt = 100A/μs ¹⁾ | | 47 | | nS |
| Reverse Recovery Charge | Q _{rr} | | | 53 | | nC |

Notes:

- 1) Pulse Test: Pulse Width < 300μs, Duty Cycle ≤2%.
- 2) Guaranteed by design, not subject to production testing.

Typical Characteristics

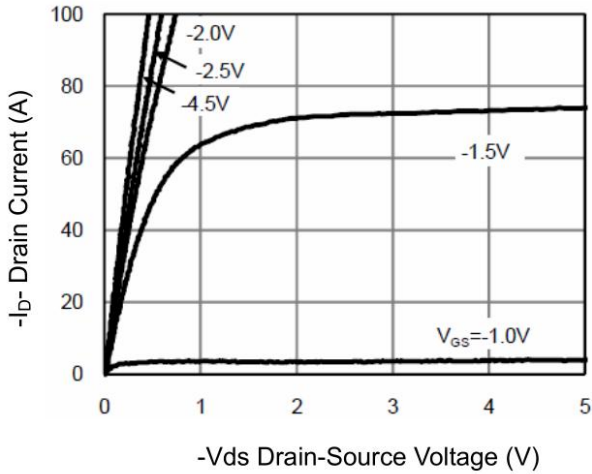


Figure 1 Output Characteristics

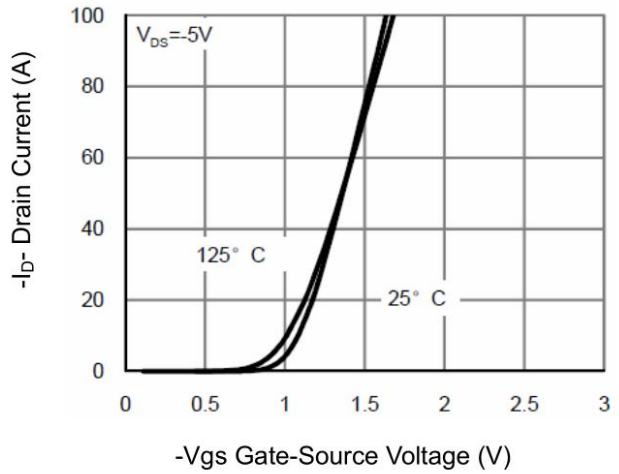


Figure 2 Transfer Characteristics

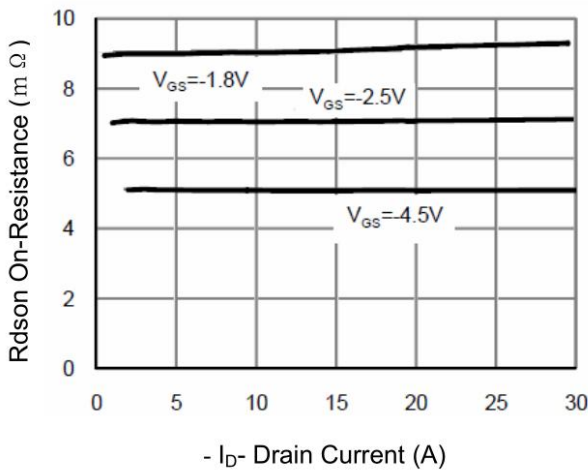


Figure 3 Rdson- Drain Current

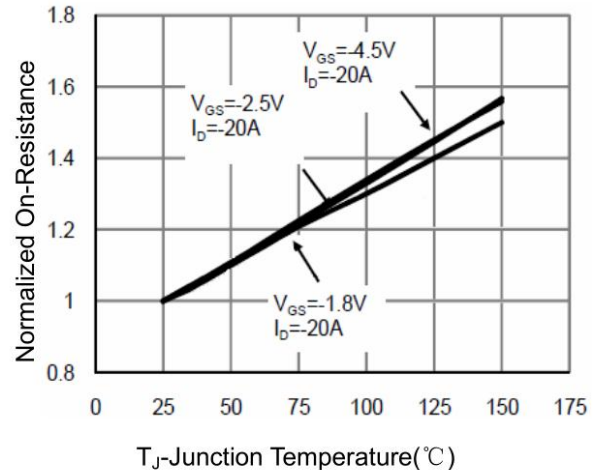


Figure 4 Rdson-Junction Temperature

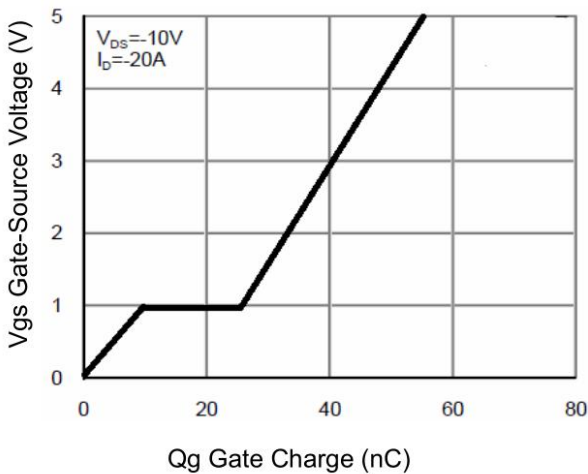


Figure 5 Gate Charge

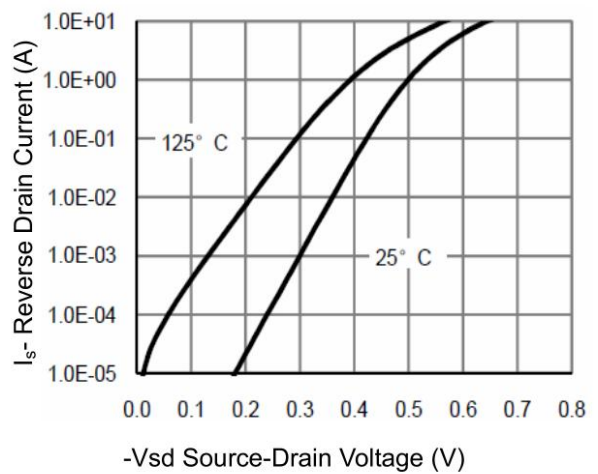


Figure 6 Source- Drain Diode Forward

Typical Characteristics

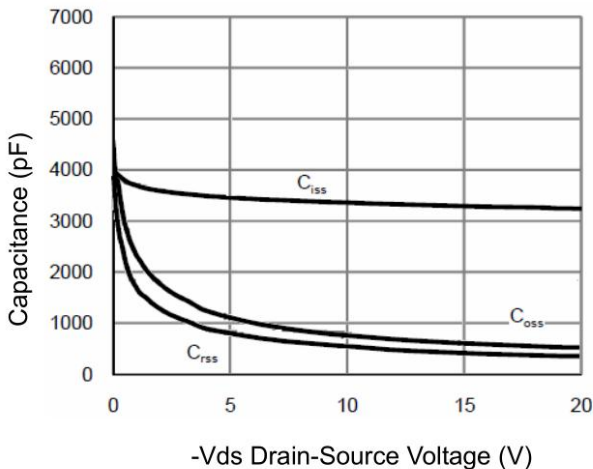


Figure 7 Capacitance vs Vds

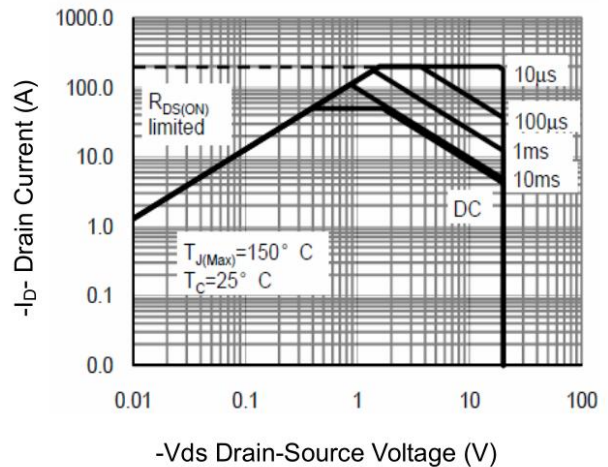


Figure 8 Safe Operation Area

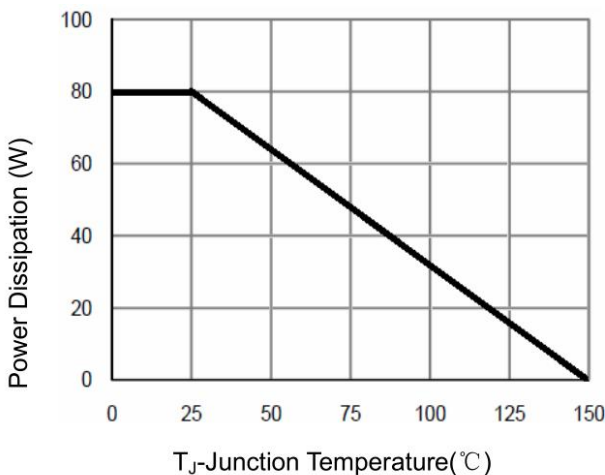


Figure 9 Power De-rating

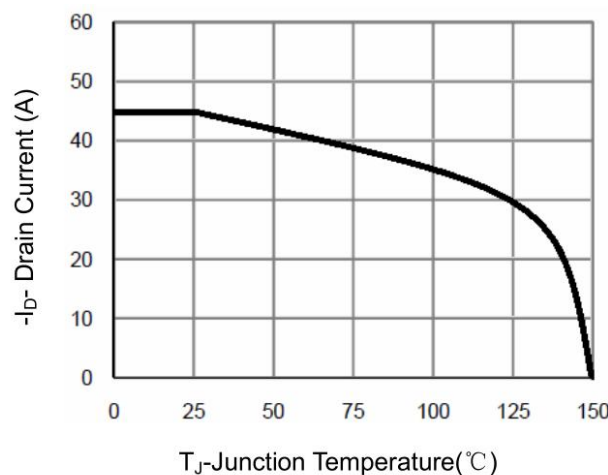


Figure 10 -Current De-rating

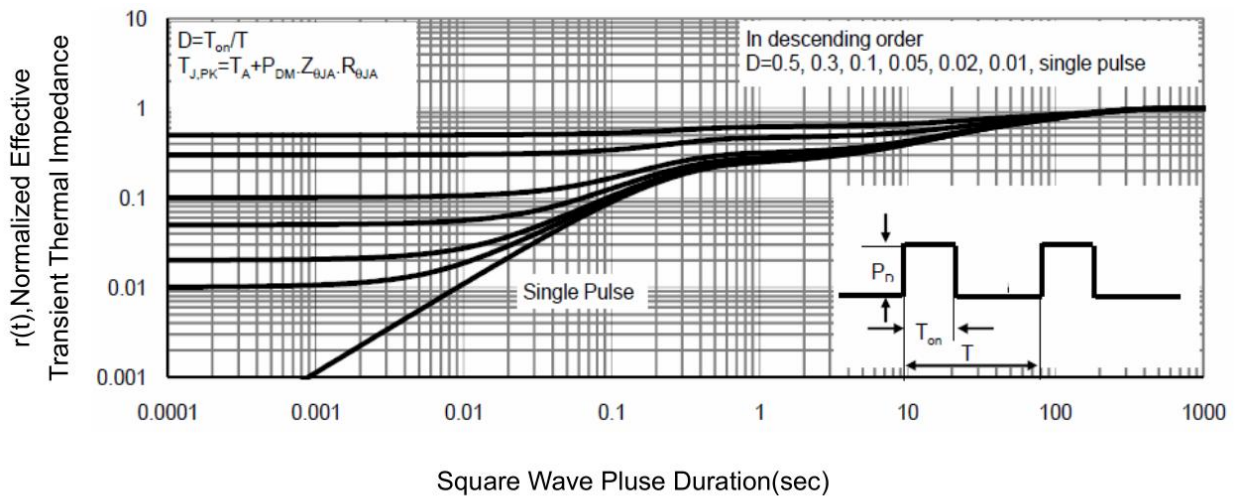
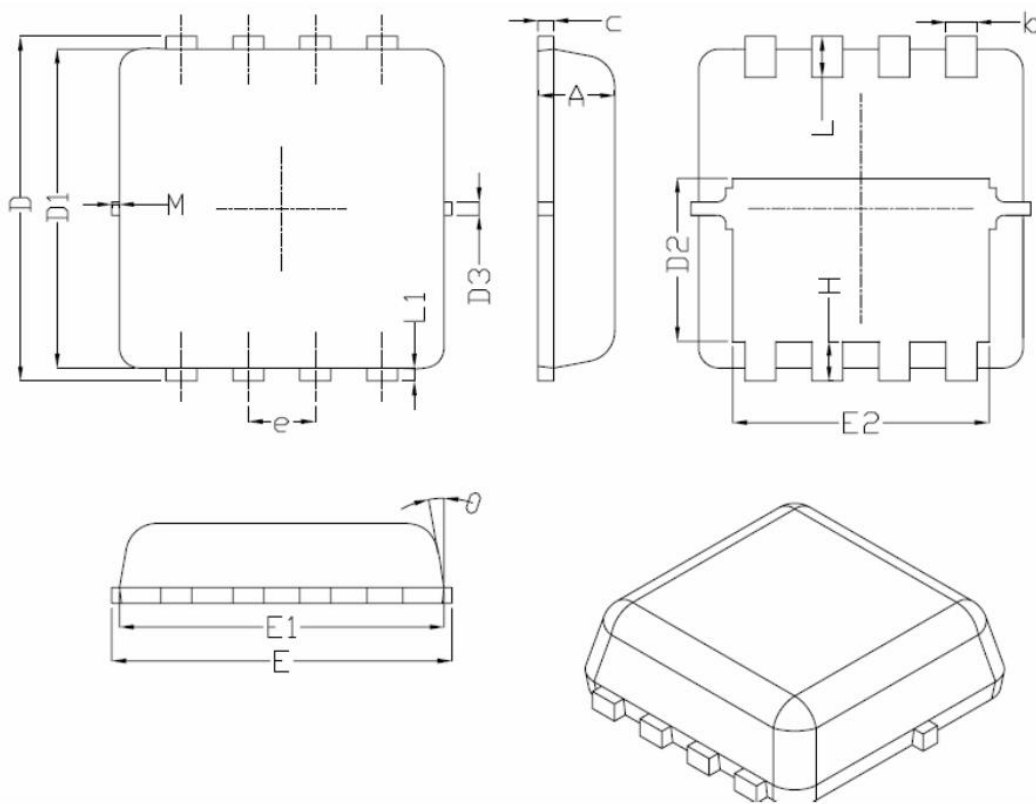


Figure 11 Normalized Maximum Transient Thermal Impedance

DFN3.3X3.3-8L Package Information



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 0.700 | 0.800 | 0.028 | 0.031 |
| b | 0.250 | 0.350 | 0.010 | 0.014 |
| c | 0.100 | 0.250 | 0.004 | 0.010 |
| D | 3.250 | 3.450 | 0.128 | 0.136 |
| D1 | 3.000 | 3.200 | 0.118 | 0.126 |
| D2 | 1.480 | 1.680 | 0.058 | 0.066 |
| D3 | 0.130 TYP. | | 0.005 TYP. | |
| E | 3.200 | 3.400 | 0.126 | 0.134 |
| E1 | 3.000 | 3.200 | 0.118 | 0.126 |
| E2 | 2.390 | 2.590 | 0.094 | 0.102 |
| e | 0.650 BSC | | 0.026 BSC | |
| H | 0.300 | 0.500 | 0.012 | 0.020 |
| L | 0.300 | 0.500 | 0.012 | 0.020 |
| L1 | 0.130 TYP. | | 0.005 TYP. | |
| θ | 0° | 12° | 0° | 12° |
| M | - | 0.150 | - | 0.006 |