

### Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)MAX}$ | $I_D$ |
|---------------|-----------------|-------|
| -60V          | 65mΩ@-10V       | -16A  |
|               | 85mΩ@-4.5V      |       |

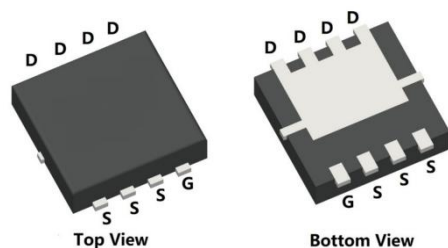
### Feature

- High power and current handing capability
- Surface mount package
- Suffix “-Q1” for AEC-Q101

### Application

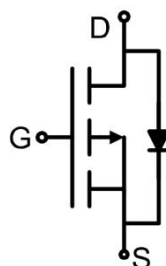
- Power management
- Load switch

### Package

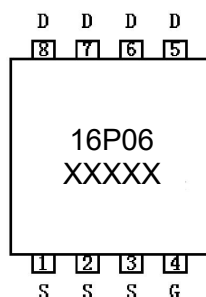


PDFN3.3\*3.3-8L

### Circuit diagram



### Marking



### Absolute maximum ratings (T<sub>c</sub>=25°C unless otherwise noted)

| Parameter                                         | Symbol           | Value      | Unit |
|---------------------------------------------------|------------------|------------|------|
| Drain-Source Voltage                              | V <sub>DS</sub>  | -60        | V    |
| Gate-Source Voltage                               | V <sub>GS</sub>  | ±20        | V    |
| Continuous Drain Current                          | I <sub>D</sub>   | -16        | A    |
| Pulsed Drain Current                              | I <sub>DM</sub>  | -64        | A    |
| Power Dissipation                                 | P <sub>D</sub>   | 30         | W    |
| Thermal Resistance Junction-to-Case <sup>1)</sup> | R <sub>θJA</sub> | 4.2        | °C/W |
| Operating Junction Temperature                    | T <sub>J</sub>   | -55 ~ +150 | °C   |
| Storage Temperature                               | T <sub>STG</sub> | -55 ~ +150 | °C   |

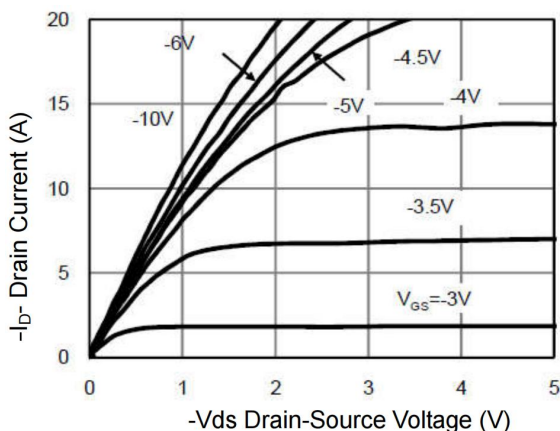
### Electrical characteristics (T<sub>c</sub>=25 °C, unless otherwise noted)

| Parameter                                | Symbol               | Test Condition                                                                         | Min. | Typ. | Max. | Unit |
|------------------------------------------|----------------------|----------------------------------------------------------------------------------------|------|------|------|------|
| Static Characteristics                   |                      |                                                                                        |      |      |      |      |
| Drain-source breakdown voltage           | V <sub>(BR)DSS</sub> | V <sub>GS</sub> =0V, I <sub>D</sub> =-250μA                                            | -60  |      |      | V    |
| Zero gate voltage drain current          | I <sub>DSS</sub>     | V <sub>DS</sub> =-60V, V <sub>GS</sub> =0V                                             |      |      | -1   | μA   |
| Gate-body leakage current                | I <sub>GSS</sub>     | V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V                                             |      |      | ±100 | nA   |
| Gate threshold voltage                   | V <sub>GS(th)</sub>  | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA                              | -1   | -1.5 | -2   | V    |
| Drain-source on-resistance <sup>3)</sup> | R <sub>DS(on)</sub>  | V <sub>GS</sub> =-10V, I <sub>D</sub> =-8A                                             |      | 55   | 65   | mΩ   |
|                                          |                      | V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-8A                                            |      | 70   | 85   |      |
| Dynamic characteristics <sup>4)</sup>    |                      |                                                                                        |      |      |      |      |
| Input Capacitance                        | C <sub>iss</sub>     | V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V, f =1MHz                                    |      | 1153 |      | pF   |
| Output Capacitance                       | C <sub>oss</sub>     |                                                                                        |      | 93.7 |      |      |
| Reverse Transfer Capacitance             | C <sub>rss</sub>     |                                                                                        |      | 77.7 |      |      |
| Total Gate Charge                        | Q <sub>g</sub>       | V <sub>DS</sub> =-30V, V <sub>GS</sub> =-10V<br>I <sub>D</sub> =-8A                    |      | 15.8 |      | nC   |
| Gate-Source Charge                       | Q <sub>gs</sub>      |                                                                                        |      | 2.7  |      |      |
| Gate-Drain Charge                        | Q <sub>gd</sub>      |                                                                                        |      | 3.5  |      |      |
| Turn-on delay time                       | t <sub>d(on)</sub>   | V <sub>DS</sub> =-30V, V <sub>GS</sub> =-10V<br>R <sub>L</sub> =6Ω, R <sub>G</sub> =3Ω |      | 8    |      | nS   |
| Turn-on rise time                        | t <sub>r</sub>       |                                                                                        |      | 5    |      |      |
| Turn-off delay time                      | t <sub>d(off)</sub>  |                                                                                        |      | 32   |      |      |
| Turn-off fall time                       | t <sub>f</sub>       |                                                                                        |      | 8    |      |      |
| Source-Drain Diode characteristics       |                      |                                                                                        |      |      |      |      |
| Diode Forward Current <sup>2)</sup>      | I <sub>S</sub>       |                                                                                        |      |      | -16  | A    |
| Diode Forward voltage <sup>3)</sup>      | V <sub>SD</sub>      | V <sub>GS</sub> =0V, I <sub>S</sub> =-8A                                               |      |      | -1.2 | V    |
| Reverse Recovery Time                    | T <sub>rr</sub>      | I <sub>F</sub> =-8A, di/dt =-100A/μs <sup>3)</sup><br>T <sub>J</sub> =25°C             |      | 27   |      | nS   |
| Reverse Recovery Charge                  | Q <sub>rr</sub>      |                                                                                        |      | 32   |      | nC   |

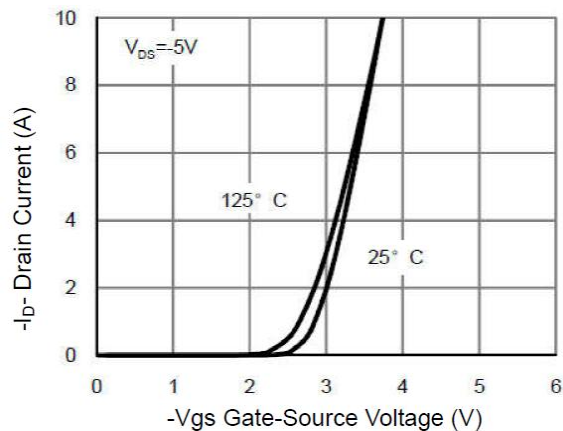
Notes:

- 1) Repetitive Rating: Pulse width limited by maximum junction temperature.
- 2) Surface Mounted on FR4 Board, t ≤ 10 sec.
- 3) Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
- 4) Guaranteed by design, not subject to production testing.

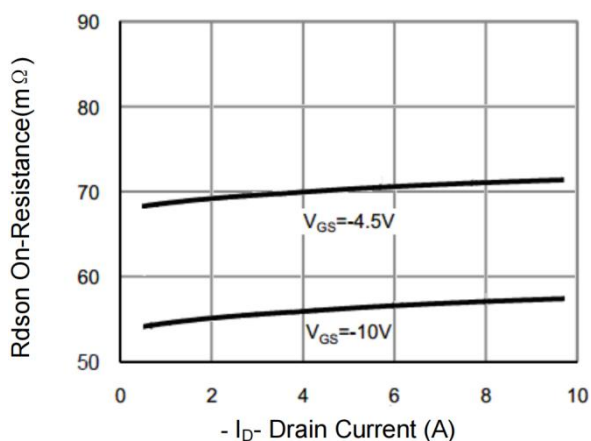
## Typical Characteristics



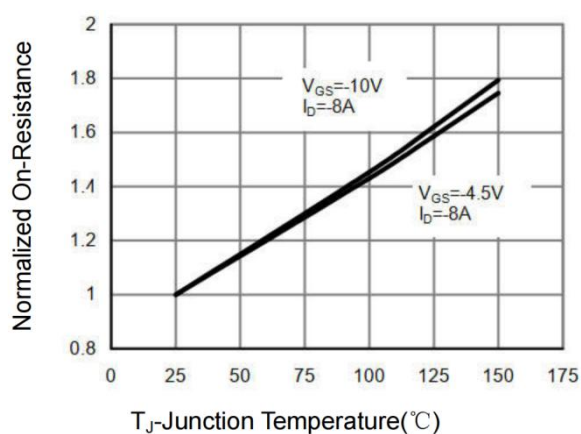
**Figure 1 Output Characteristics**



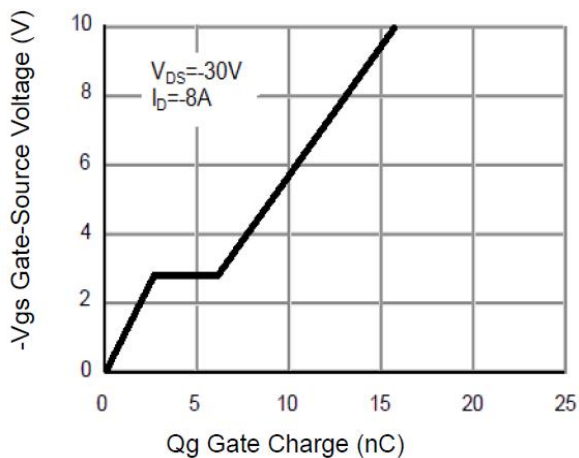
**Figure 2 Transfer Characteristics**



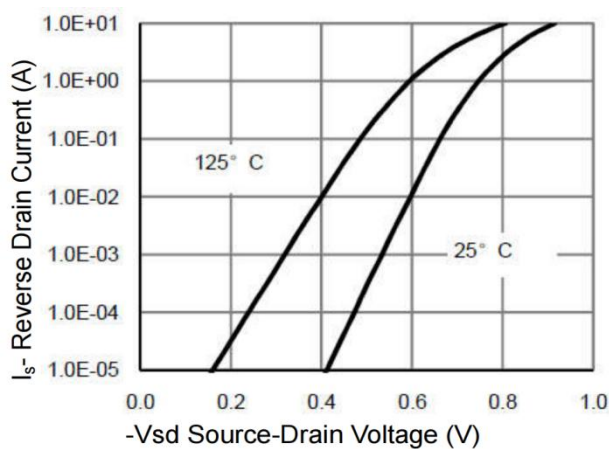
**Figure 3 Rdson- Drain Current**



**Figure 4 Rdson-Junction Temperature**



**Figure 5 Gate Charge**



**Figure 6 Source- Drain Diode Forward**

## Typical Characteristics

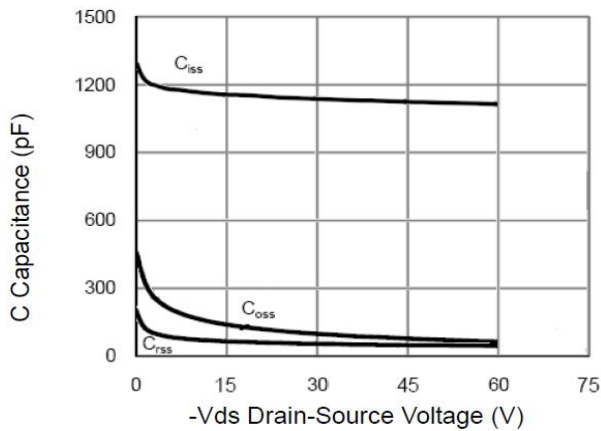


Figure 7 Capacitance vs Vds

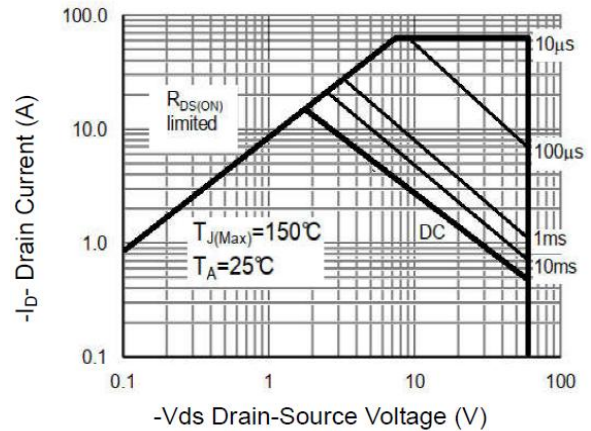


Figure 8 Safe Operation Area

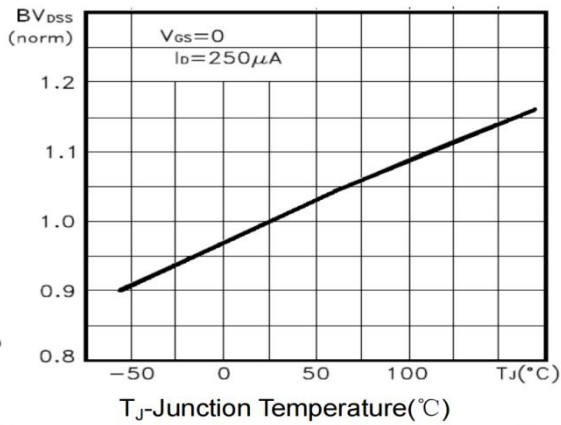


Figure 9 BV<sub>DSS</sub> vs Junction Temperature

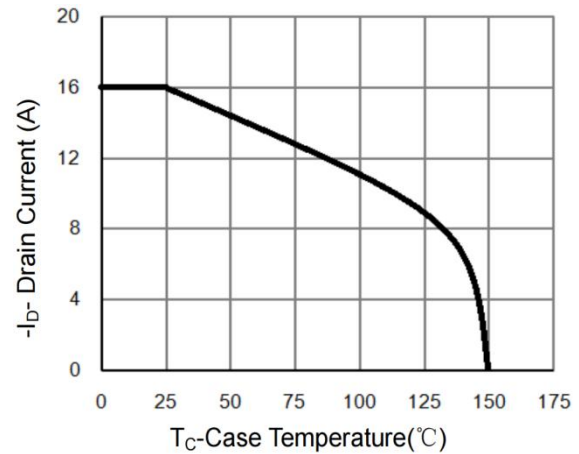


Figure 10 ID Current De-rating

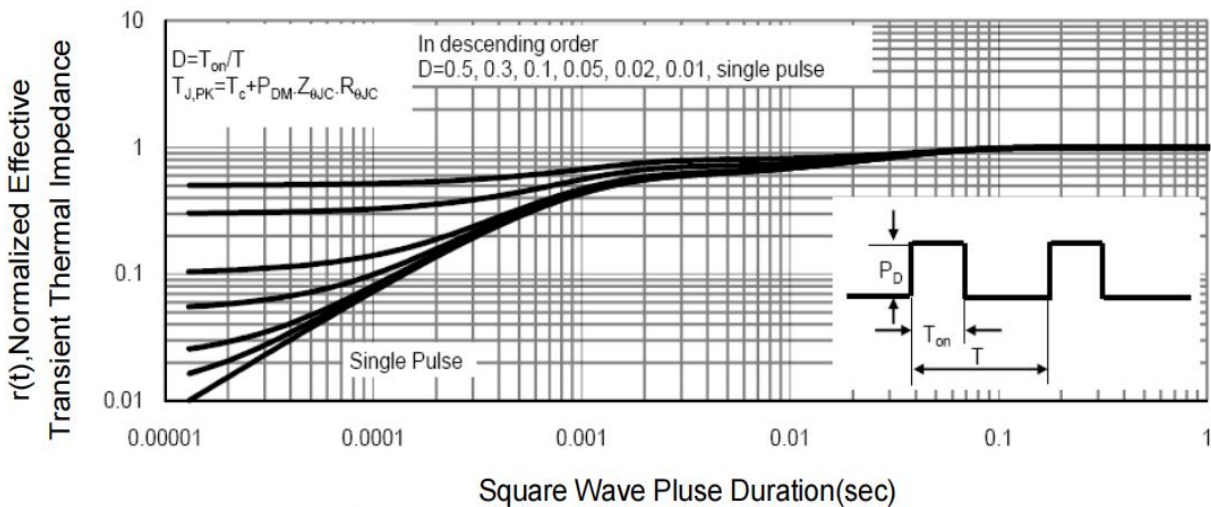
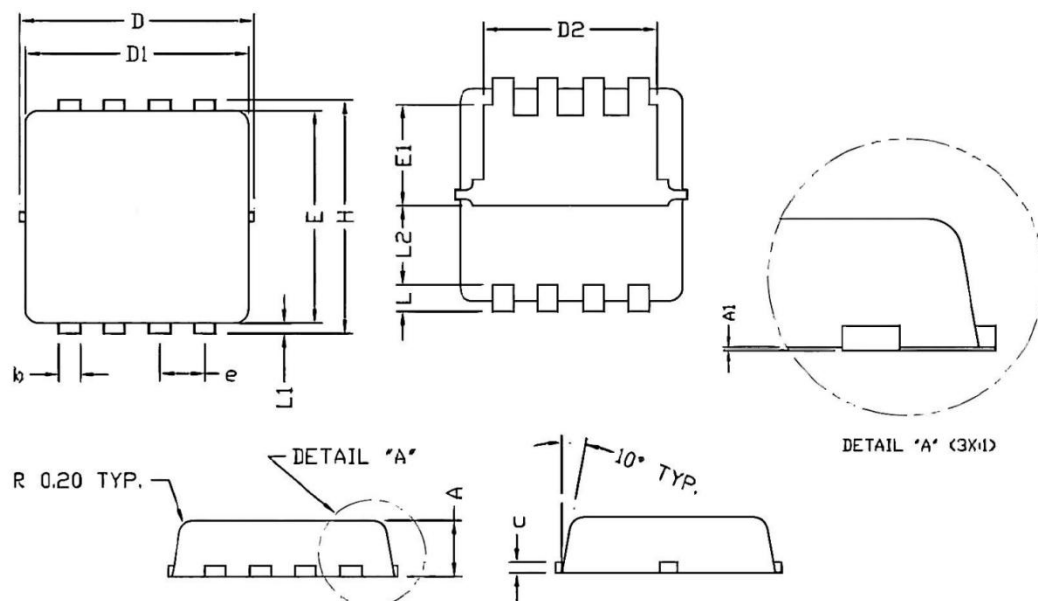


Figure 11 Normalized Maximum Transient Thermal Impedance

### PDFN3.3\*3.3-8L Package Information



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min.                      | Max.  | Min.                 | Max.  |
| A      | 0.700                     | 0.900 | 0.028                | 0.035 |
| A1     | 0.000                     | 0.050 | 0.000                | 0.002 |
| b      | 0.240                     | 0.350 | 0.009                | 0.014 |
| c      | 0.100                     | 0.200 | 0.004                | 0.008 |
| D      | 3.250                     | 3.400 | 0.128                | 0.134 |
| D1     | 3.050                     | 3.250 | 0.120                | 0.128 |
| D2     | 2.400                     | 2.600 | 0.094                | 0.102 |
| E      | 3.000                     | 3.200 | 0.118                | 0.126 |
| E1     | 1.350                     | 1.550 | 0.053                | 0.061 |
| e      | 0.650 BSC.                |       | 0.026 BSC.           |       |
| H      | 3.200                     | 3.400 | 0.126                | 0.134 |
| L      | 0.300                     | 0.500 | 0.012                | 0.020 |
| L1     | 0.100                     | 0.200 | 0.004                | 0.008 |
| L2     | 1.130 REF.                |       | 0.044 REF.           |       |