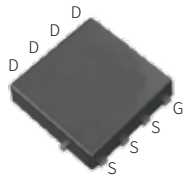
# FEATURES

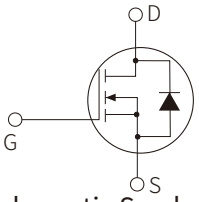
- Advanced trench cell design
- Low Thermal Resistance




PDFN5×6-8L

# APPLICATION

- Motor drivers
- DC - DC Converter




Schematic Symbol

# APPROVALS

| | |
|---|---|
| **RoHS** | Compliance with 2011/65/EU |
| **HF** | Compliance with IEC61249-2-21:2003 |

# ABSOLUTE MAXIMUM RATINGS

| Parameter | | Symbol | Value | Unit |
|---|---|---|---|---|
| Drain-Source Voltage $T_C$=25°C | | $V_{DS}$ | 40 | V |
| Drain Current ( Pulsed ) $T_C$=25°C $V_{GS}$=10V | | $I_{DM}$*,**,*** | 800 | A |
| Drain Current ( DC ) | $T_C$=25°C $V_{GS}$=10V | $I_D$*,*** | 200 | A |
| | $T_C$=100°C $V_{GS}$=10V | | 200 | A |
| Gate-Source Voltage $T_C$=25°C | | $V_{GS}$ | ±20 | V |
| Total Power Dissipation $T_C$=25°C | | $P_{tot}$* | 150 | W |
| Diode Forward Current $T_C$=25°C | | $I_S$ | 200 | A |
| Junction Temperature | | $T_J$ | 175 | °C |
| Storage Temperature | | $T_{STG}$ | -55 to 175 | °C |
| Single Pulsed Avalanche Energy $V_{DD}$= 40 V , L=1.0mH | | $E_{AS}$* | 1012 | mJ |
| Thermal Resistance –Junction to Ambient | | $R_{\theta JA}$* | 56 | °C/W |
| Thermal Resistance- Junction to Case | | $R_{\theta JC}$* | 1 | °C/W |

Notes:
* Surface Mounted on 1 $in^2$ pad area, t ⩽10 sec
** Pulse width⩽10us, duty cycle⩽ 1 %
*** Limited by bonding wire

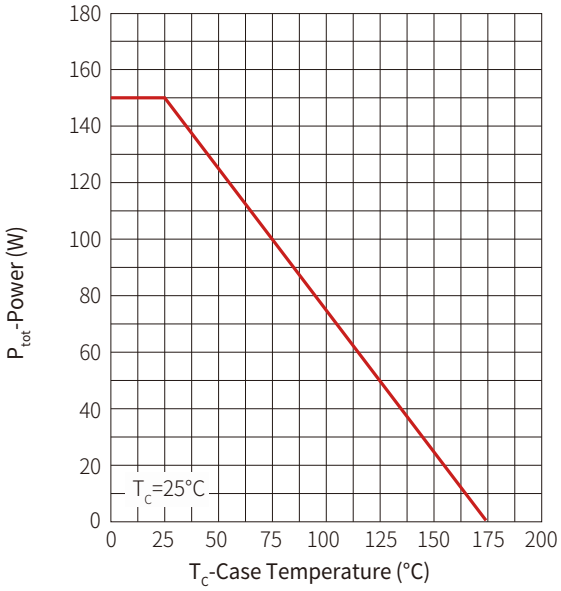
# ELECTRICAL CHARACTERISTICS ($T_A$=25°C)

| Parameter | Symbol | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **Static Characteristics** | | | | | | |
| Drain-source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$=0V,$I_{DS}$=250μA | 40 | | | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$,$I_{DS}$=250μA | 1 | | 2.5 | V |
| Drain Leakage Current | $I_{DSS}$ | $V_{DS}$=32V,$V_{GS}$=0V | | | 1 | μA |
| Gate Leakage Current | $I_{GSS}$ | $V_{GS}$=±20V ,$V_{DS}$=0V | | | ±100 | nA |
| On-State Resistance | $R_{DS(on)}$ [a] | $V_{GS}$=10V,$I_{DS}$=30A | | 0.65 | 0.8 | mΩ |
| | | $V_{GS}$=4.5V,$I_{DS}$=20A | | 1.1 | 1.3 | mΩ |
| **Diode Characteristics** | | | | | | |
| Diode Forward Voltage | $V_{SD}$ [a] | $I_{SD}$=30A,$V_{GS}$=0V | | | 1.3 | V |
| Reverse Recovery Time | $t_{rr}$ | $I_{DS}$=30A, $V_{GS}$=0V<br>$dI_{SD}$/dt=100A/μs | | 40 | | nS |
| Reverse Recovery Charge | $Q_{rr}$ | | | 28 | | nC |
| **Diode Characteristics**[b] | | | | | | |
| Input capacitance | $C_{iss}$ | $V_{GS}$=0V,$V_{DS}$=20V,<br>Frequency = 1 MHz | | 5702 | | pF |
| Output capacitance | $C_{oss}$ | | | 1876 | | pF |
| Reverse transfer capacitance | $C_{rss}$ | | | 204 | | pF |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DS}$=20V,$V_{GEN}$=10V<br>$R_G$= 3.9Ω, $R_L$=0.66Ω,<br>$I_{DS}$=30A | | 54 | | nS |
| Turn-on Rise Time | $t_r$ | | | 65 | | nS |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 101 | | nS |
| Turn-Off Fall Time | $t_f$ | | | 73 | | nS |
| **Gate Charge Characteristics**[b] | | | | | | |
| Total Gate Charge | $Q_g$ | $V_{DS}$=20V,$V_{GS}$=10V,$I_{DS}$=30A | | 114 | | nC |
| Gate-Source Charge | $Q_{gs}$ | | | 23 | | nC |
| Gate-Drain Charge | $Q_{gd}$ | | | 25 | | nC |

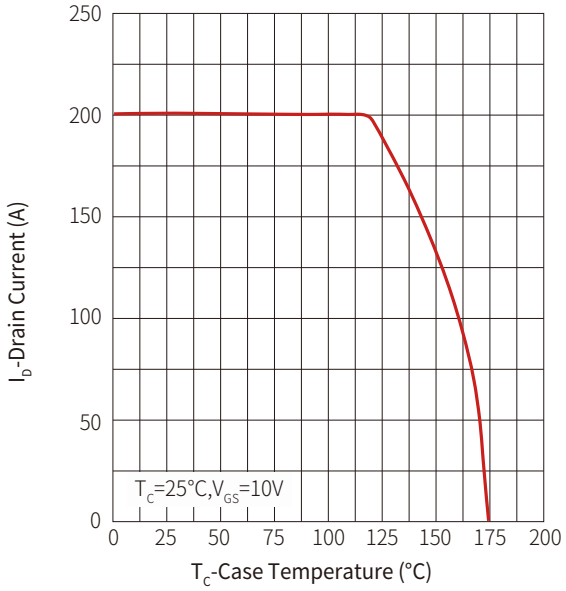
Notes:
a : Pulse test ; pulse width≤300us, duty cycle≤2 %
b : Guaranteed by design, not subject to production testing

# PARAMETER CHARACTERISTIC CURVE

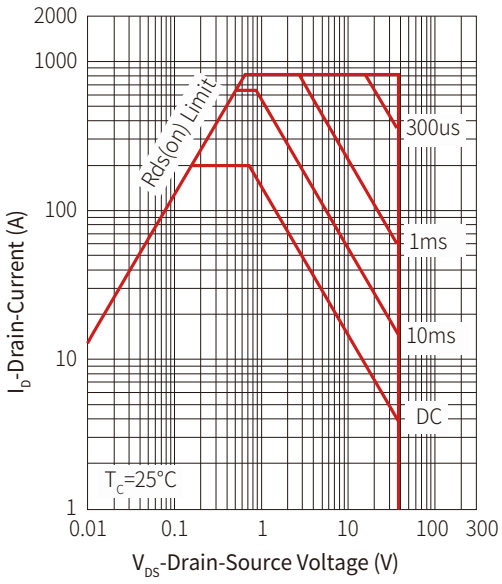
## Figure1: Power Capability



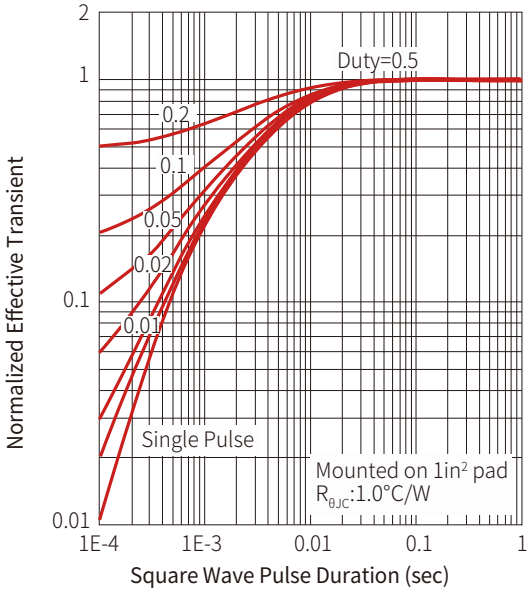

## Figure2: Current Capability



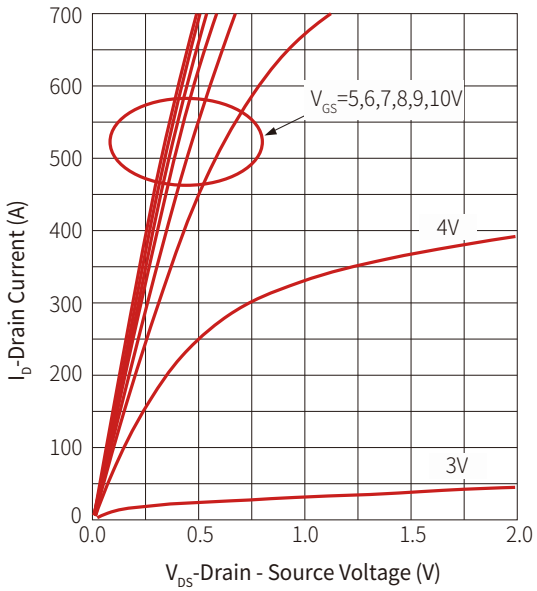

## Figure3: Safe Operation Area



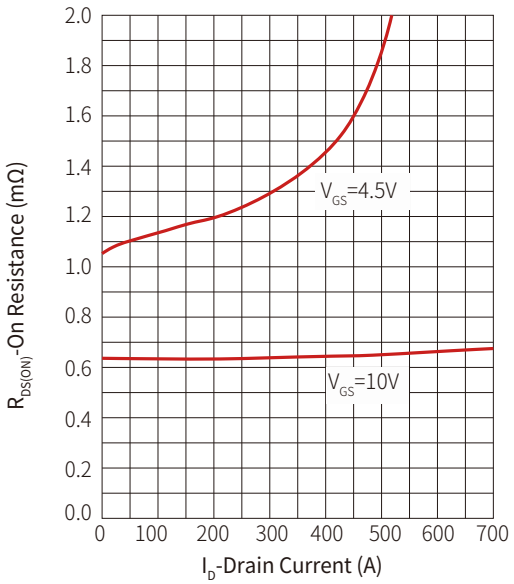

## Figure 4: Transient Thermal Impedance



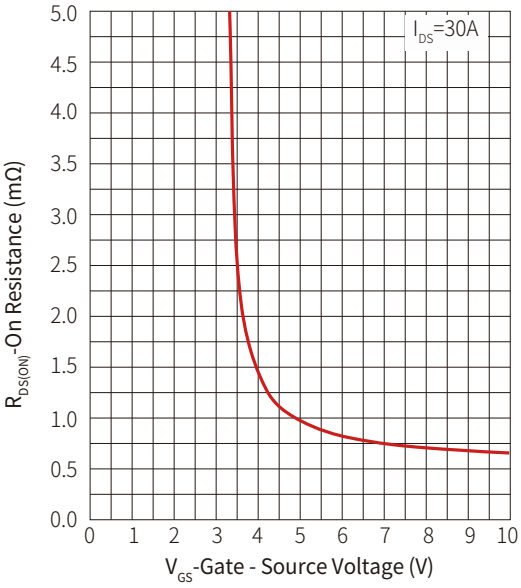
## Figure 5:Output Characteristics



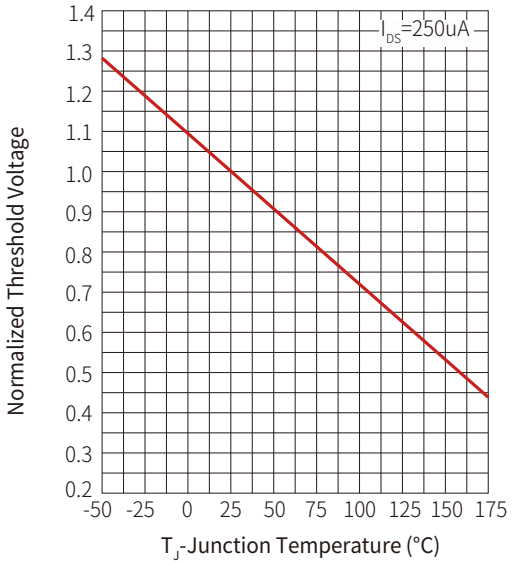

## Figure 6: On Resistance



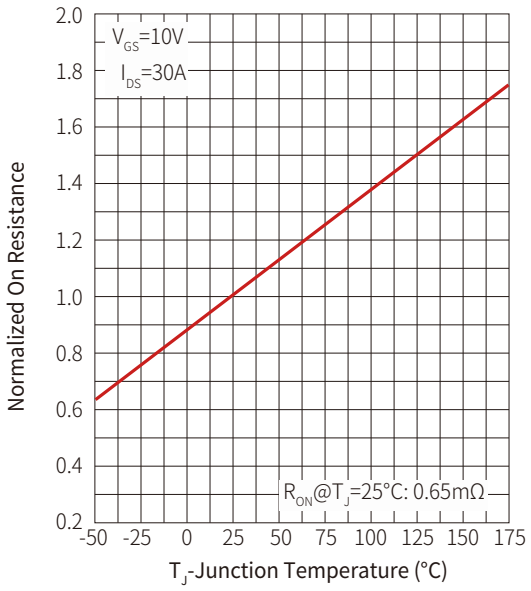

## Figure 7:Transfer Characteristics



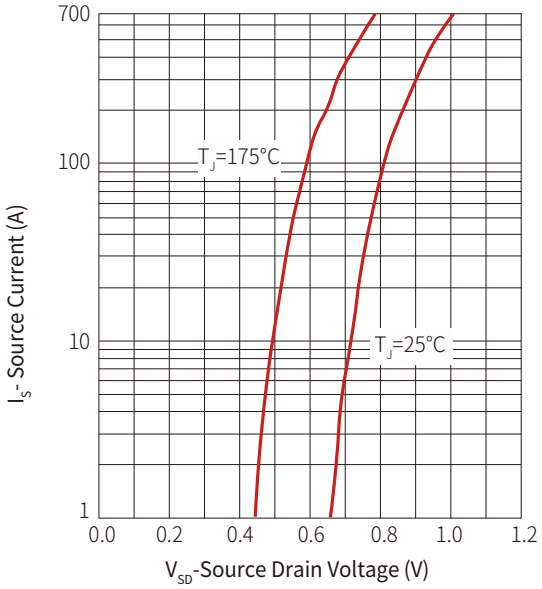

## Figure 8: Normalized Threshold Voltage



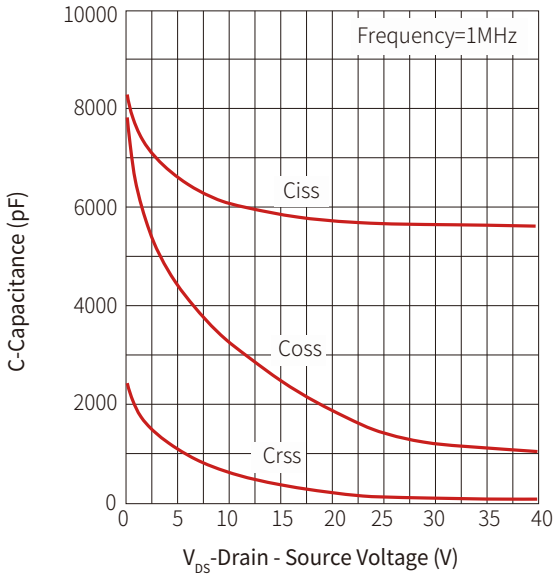
## Figure 9:Normalized On Resistance



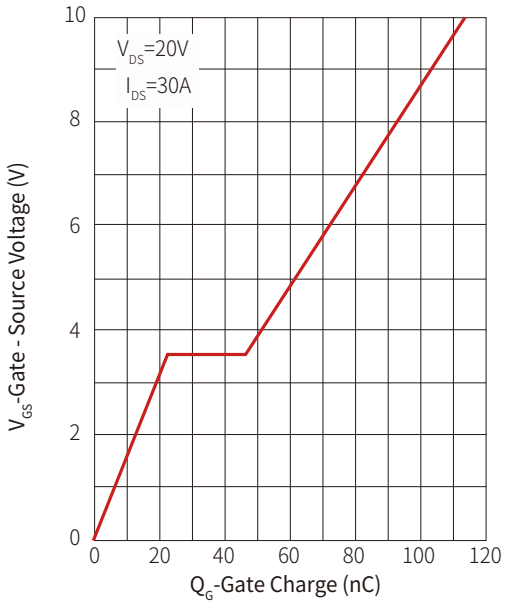

## Figure 10: Diode Forward Current



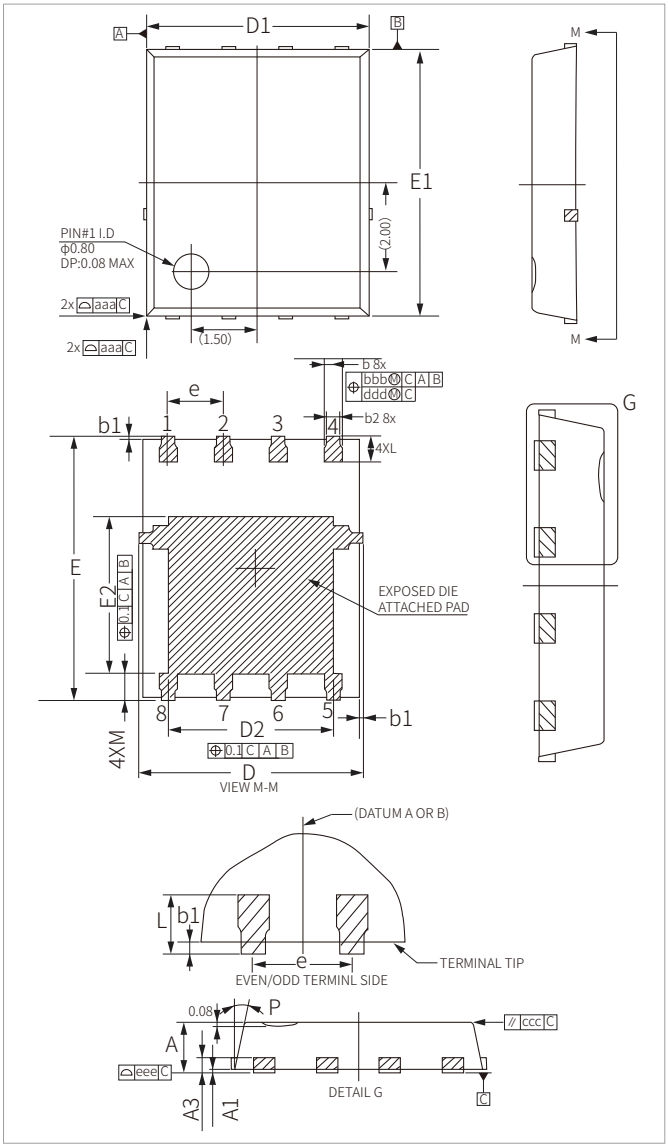

## Figure 11:Capacitance




## Figure 12: Gate Charge



# PDFN5×6-8L PACKAGE INFORMATION




| Ref. | Millimeters | | Inches | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | 0.90 | 1.17 | 0.035 | 0.046 |
| A1 | 0.00 | 0.05 | 0.000 | 0.002 |
| A3 | 0.254REF | | 0.010REF | |
| b | 0.31 | 0.51 | 0.012 | 0.020 |
| b1 | 0.03 | 0.13 | 0.001 | 0.005 |
| b2 | 0.21 | 0.41 | 0.008 | 0.016 |
| D | 5.15BSC | | 0.203BSC | |
| D1 | 5.00BSC | | 0.197BSC | |
| D2 | 3.70 | 3.90 | 0.146 | 0.154 |
| E | 6.15BSC | | 0.242BSC | |
| E1 | 6.00BSC | | 0.236BSC | |
| E2 | 3.56 | 3.76 | 0.140 | 0.148 |
| e | 1.27BSC | | 0.050BSC | |
| L | 0.51 | 0.71 | 0.020 | 0.028 |
| M | 0.51 | 0.71 | 0.020 | 0.028 |
| P | 10° | 12° | 0.394° | 0.472° |
| aaa | 0.10 | | 0.004 | |
| bbb | 0.10 | | 0.004 | |
| ccc | 0.10 | | 0.004 | |
| ddd | 0.05 | | 0.002 | |
| eee | 0.08 | | 0.003 | |

# ORDERING INFORMATION

| Part Number | Component Package | Marking | QTY/Reel | Reel Size |
|---|---|---|---|---|
| SNM009N04GL | PDFN5×6-8L | 9N04 XXXX | 5000PCS | 13” |

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