## Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)TYP}$ | $I_D$ |
|---|---|---|
| 30V | 11mΩ@10V | 18A |
| | 17mΩ@4.5V | |
| -30V | 20mΩ@-10V | -16A |
| | 29mΩ@-4.5V | |

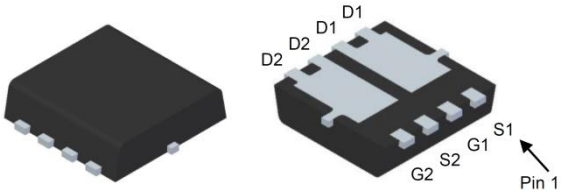
## Feature

- TrenchFET Power MOSFET
- Excellent RDS(on) and Low Gate Charge
- Fast Switching Speed

## Application

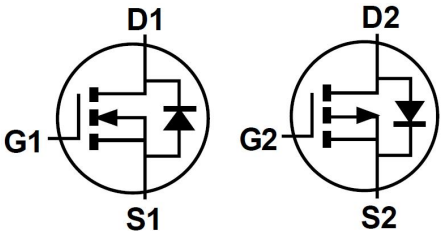
- Motor Control
- Inverters

## Package

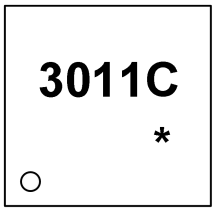



**PDFNWB3.3×3.3-8L-B**

## Circuit diagram




## Marking




**3011C = Device code**

*** = Month Code**

## Absolute maximum ratings (Ta=25℃ unless otherwise noted)

| Parameter | Symbol | Value | | Unit |
|---|---|---|---|---|
| | | N-Channel | P-Channel | |
| Drain-Source Voltage | $V_{DS}$ | 30 | -30 | V |
| Gate-Source Voltage | $V_{GS}$ | ±20 | ±20 | V |
| Continuous Drain Current(t≤10s) | $I_D$ | 18 | -16 | A |
| Power Dissipation(t≤10s) | $P_D$ | 22 | 18 | W |
| Thermal Resistance from Junction to Ambient(t≤10s) | $R_{\theta JA}$ | 5.68 | 6.94 | ℃/W |
| Junction Temperature | $T_J$ | 150 | | ℃ |
| Storage Temperature | $T_{STG}$ | -55~ +150 | | ℃ |

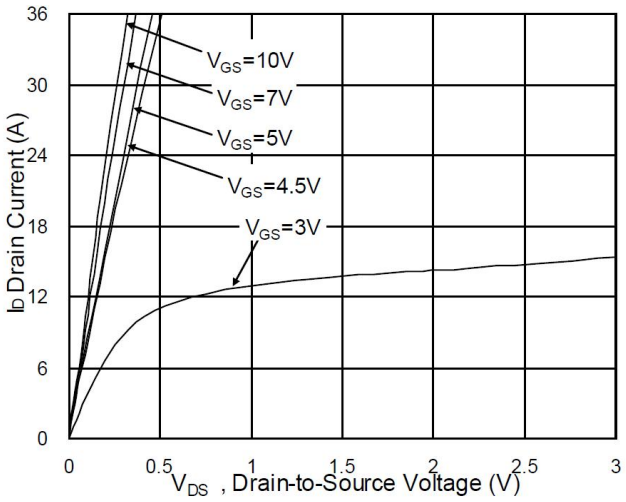
## N-Channel Electrical characteristics ($T_A$=25 °C, unless otherwise noted)

| Parameter | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **Static Characteristics** | | | | | | |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $V_{GS}$ = 0V, $I_D$ =250μA | 30 | | | V |
| Zero gate voltage drain current | $I_{DSS}$ | $V_{DS}$ = 24V,$V_{GS}$ = 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 | 1.5 | 2.5 | V |
| Drain-source on-resistance | $R_{DS(on)}$ | $V_{GS}$ =10V, $I_D$ =8A | | 11 | 15 | mΩ |
| | | $V_{GS}$ =4.5V, $I_D$ =6A | | 17 | 23 | |
| **Dynamic characteristics** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$ =15V, $V_{GS}$ =0V,f=1MHz | | 940 | | pF |
| Output Capacitance | $C_{oss}$ | | | 131 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 109 | | |
| **Switching Characteristics** | | | | | | |
| Total gate charge | $Q_g$ | $V_{DS}$ =15V,$V_{GS}$ =4.5V, $I_D$ =8A | | 9.63 | | nC |
| Gate-source charge | $Q_{gs}$ | | | 3.88 | | |
| Gate-drain charge | $Q_{gd}$ | | | 3.44 | | |
| Turn-on delay time | $t_{d(on)}$ | VDD=15V , VGS=10V , RG=1.5, ID=8A | | 4.2 | | ns |
| Turn-on rise time | $t_r$ | | | 8.2 | | |
| Turn-off delay time | $t_{d(off)}$ | | | 31 | | |
| Turn-off fall time | $t_f$ | | | 4 | | |
| **Source-Drain Diode Characteristics** | | | | | | |
| Body Diode Voltage | $V_{SD}$ | $I_S$=1A, $V_{GS}$ = 0V | | | 1.2 | V |

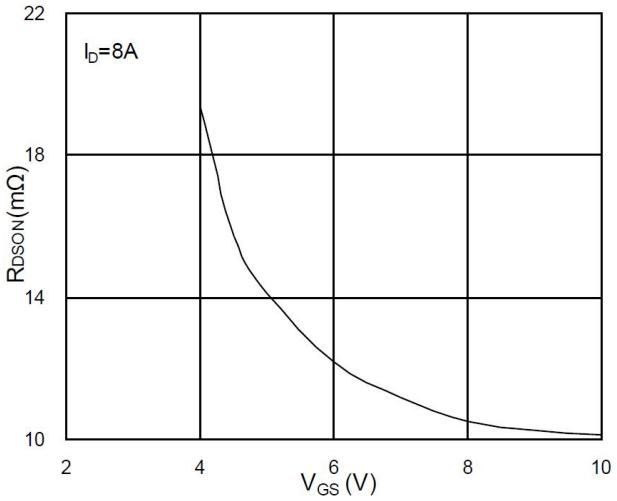
## P-Channel Electrical characteristics ($T_A$=25 °C, unless otherwise noted)

| Parameter | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **Static Characteristics** | | | | | | |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $V_{GS}$ = 0V, $I_D$ =-250μA | -30 | | | V |
| Zero gate voltage drain current | $I_{DSS}$ | $V_{DS}$ =- 24V,$V_{GS}$ = 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 | -1.5 | -2.5 | V |
| Drain-source on-resistance | $R_{DS(on)}$ | $V_{GS}$ =-10V, $I_D$ =-8A | | 20 | 24 | mΩ |
| | | $V_{GS}$ =-4.5V, $I_D$ =-6A | | 29 | 38 | |
| **Dynamic characteristics** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$ =-15V, $V_{GS}$ =0V,f=1MHz | | 1600 | | pF |
| Output Capacitance | $C_{oss}$ | | | 350 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 300 | | |
| **Switching Characteristics** | | | | | | |
| Total gate charge | $Q_g$ | $V_{DS}$ =-15V,$V_{GS}$ =-4.5V, $I_D$ =-8A | | 30 | | nC |
| Gate-source charge | $Q_{gs}$ | | | 5.5 | | |
| Gate-drain charge | $Q_{gd}$ | | | 8 | | |
| Turn-on delay time | $t_{d(on)}$ | $V_{DD}$=-15V,ID=-1A, VGS=-10V,$R_{GEN}$=6Ω | | 10 | | ns |
| Turn-on rise time | $t_r$ | | | 15 | | |
| Turn-off delay time | $t_{d(off)}$ | | | 110 | | |
| Turn-off fall time | $t_f$ | | | 70 | | |
| **Source-Drain Diode Characteristics** | | | | | | |
| Body Diode Voltage | $V_{SD}$ | $I_S$=-1A, $V_{GS}$ = 0V | | | -1.2 | V |

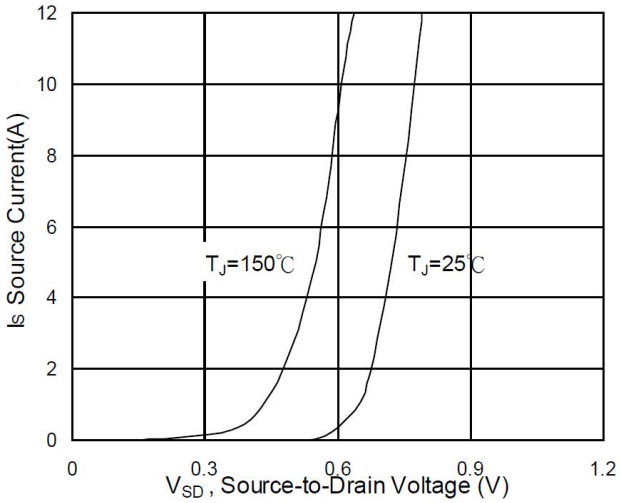
## N-Channel Typical Characteristics



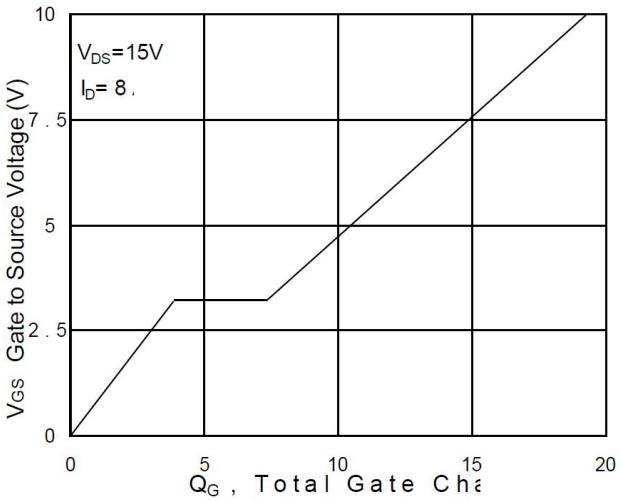

**Typical Output Characteristics**



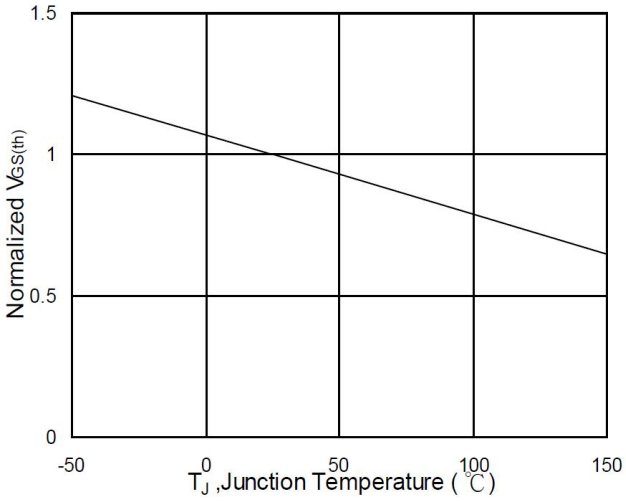

**On-Resistance vs.Gate-Source**



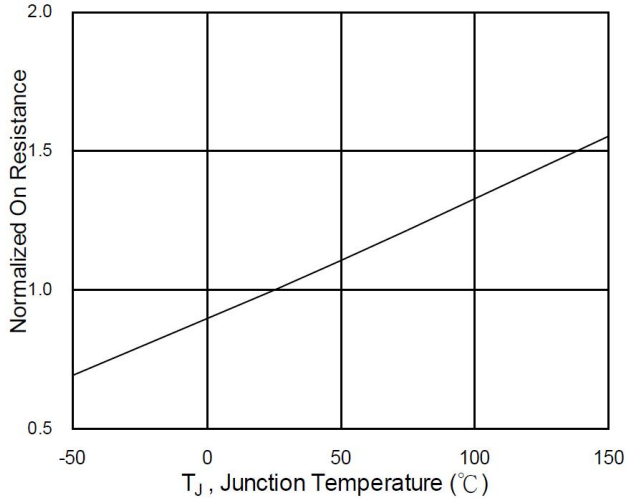

**Forward Characteristics Of Reverse**



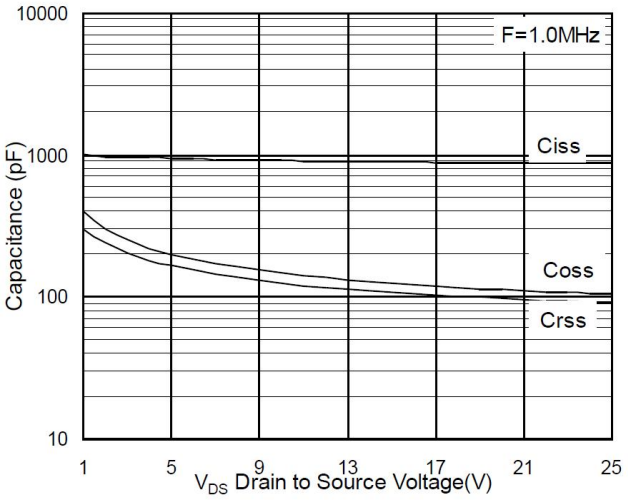

**Gate-Charge Characteristics**



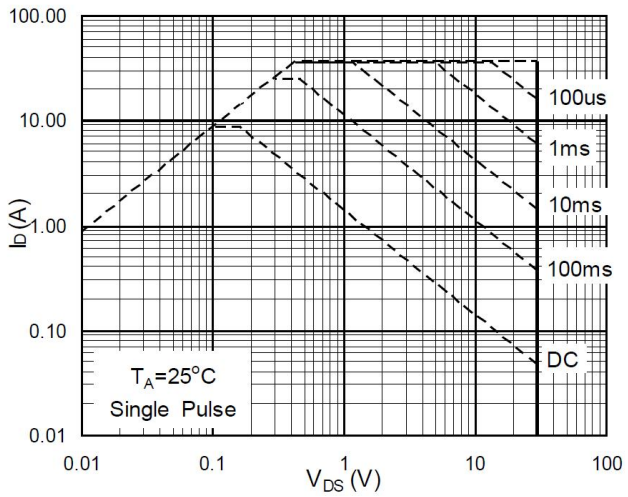

**Normalized $V_{GS(th)}$ vs.$T_J$**



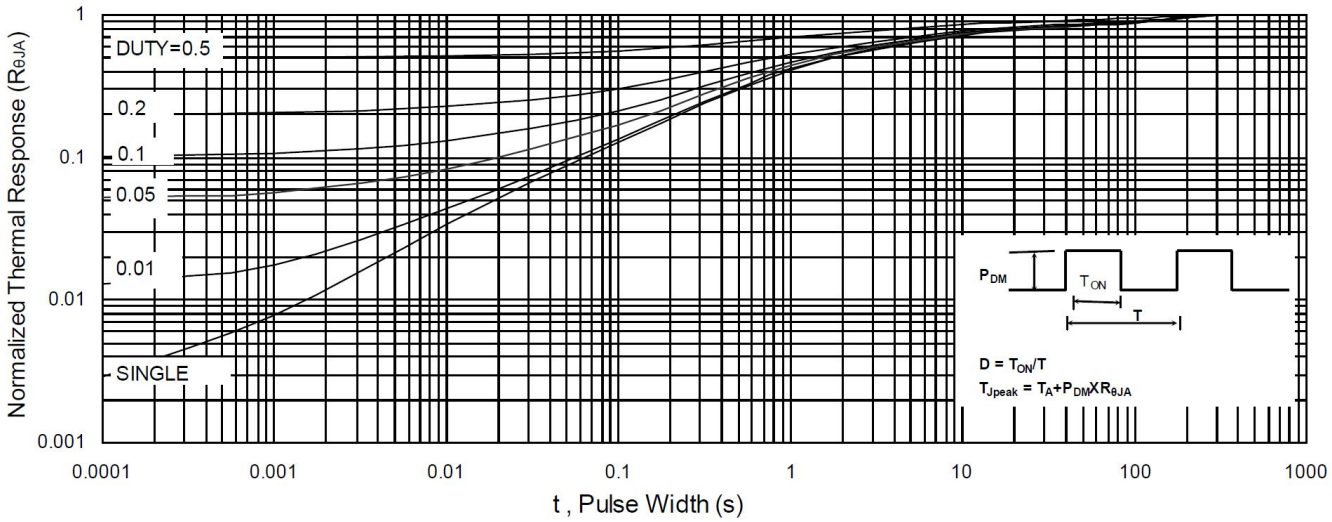

**Normalized $R_{DSON}$ vs.$T_J$**



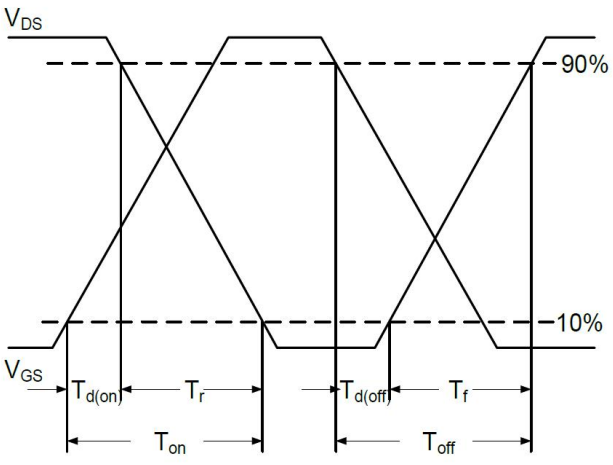

**Capacitance**



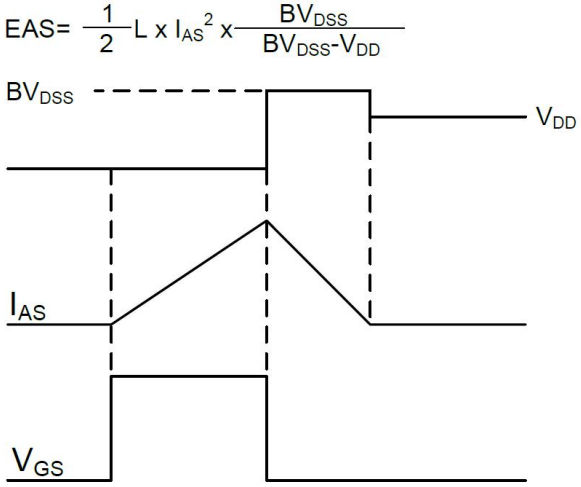

**Safe Operating Area**




**Normalized Maximum Transient Thermal Impedance**

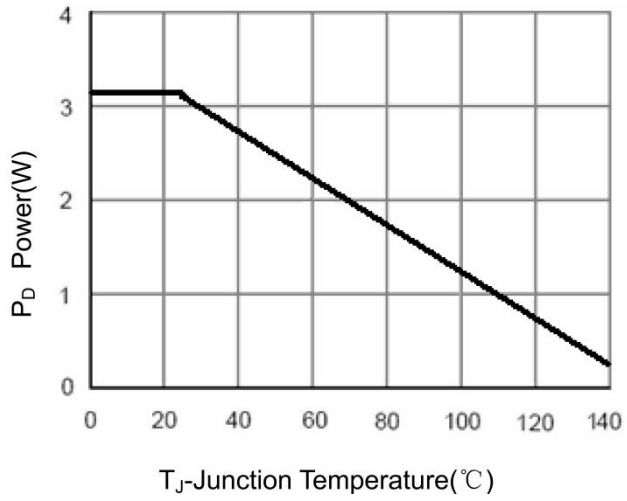



**Switching Time Waveform**

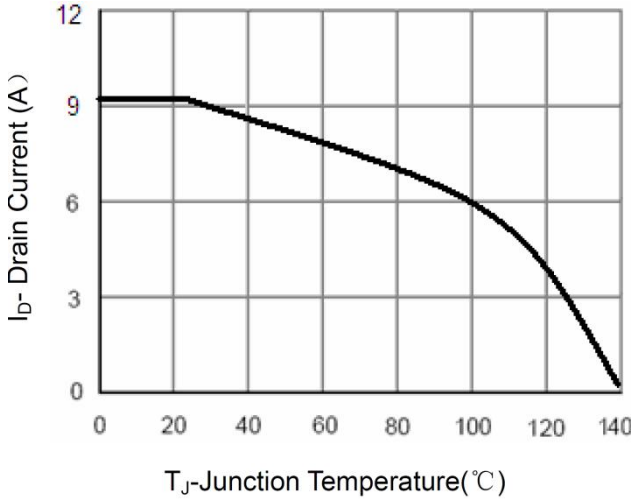



**Unclamped Inductive Switching Waveform**

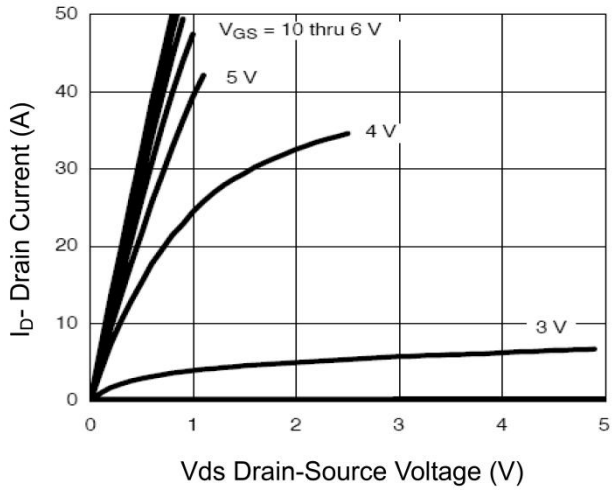
## P-Channel Typical Characteristics



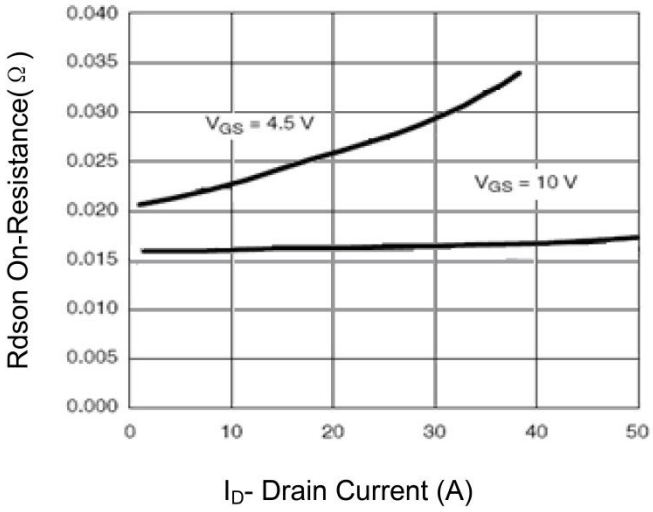

**Power Dissipation**



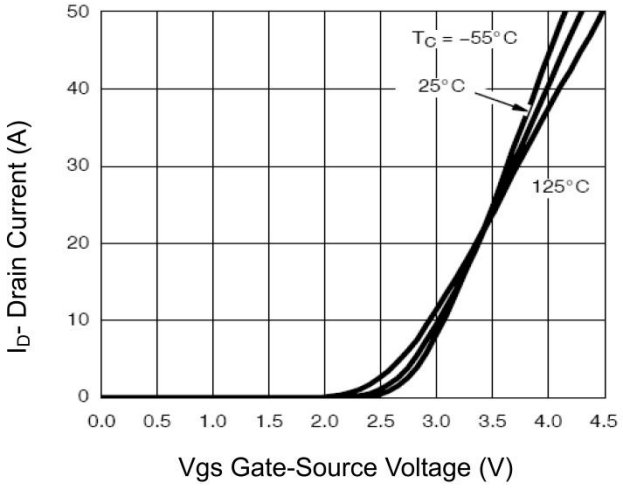

**Drain Current**



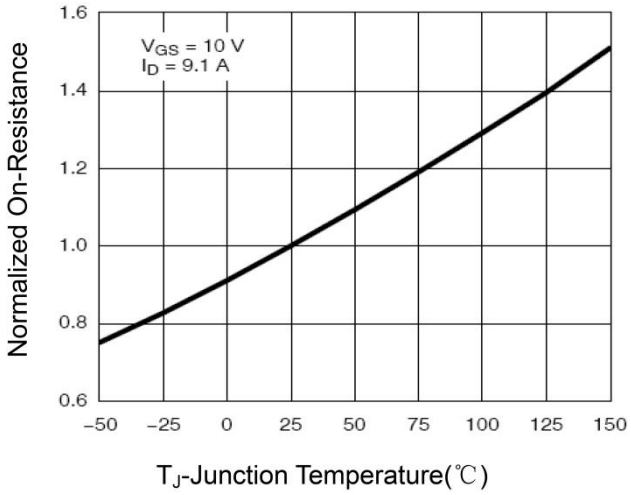

**Output Characteristics**



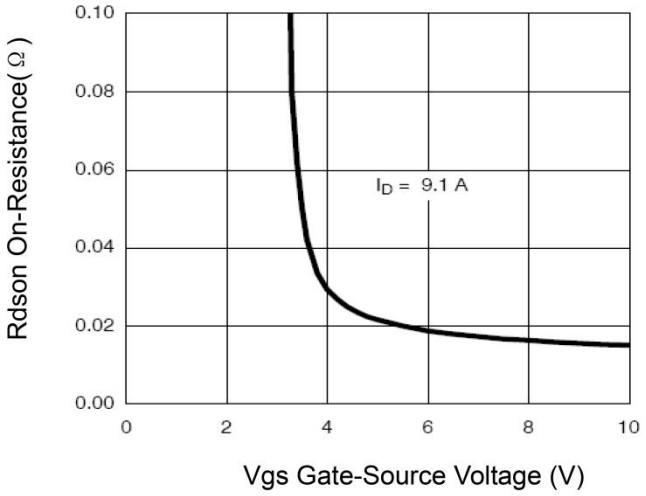

**Drain-Source On-Resistance**



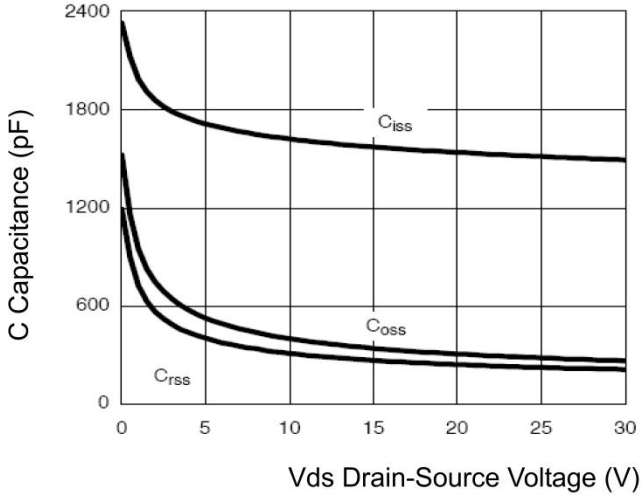

**Transfer Characteristics**



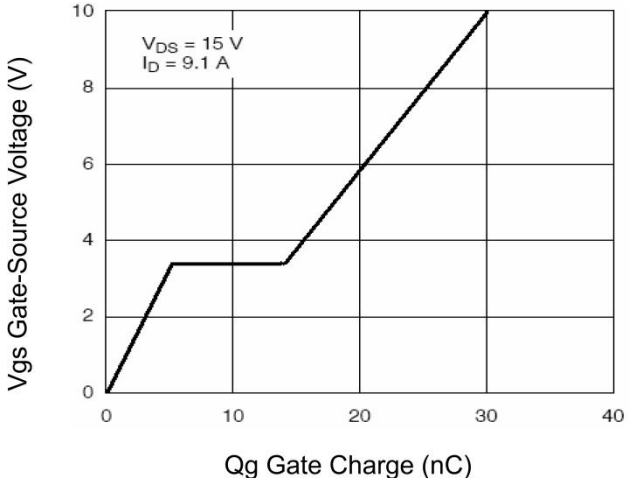

**Drain-Source On-Resistance**



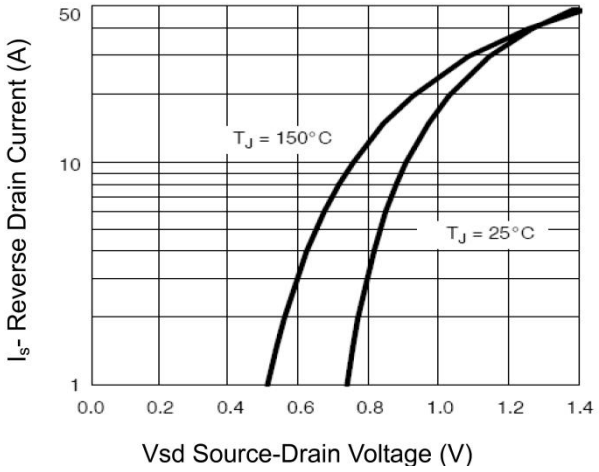

**Rdson vs Vgs**



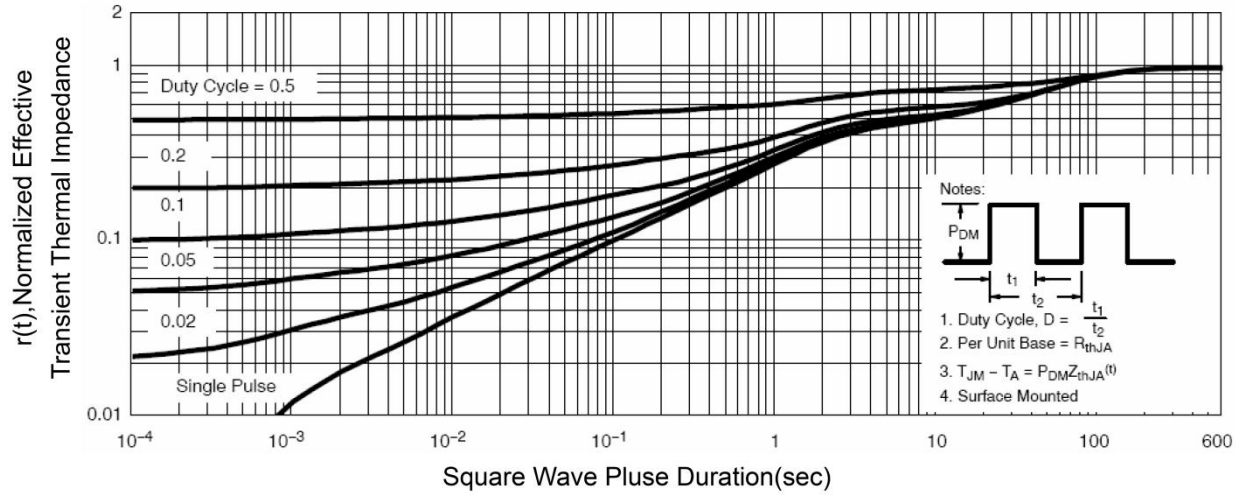

**Capacitance vs Vds**




**Gate Charge**

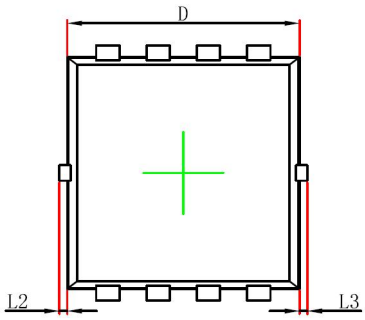



**Source- Drain Diode Forward**

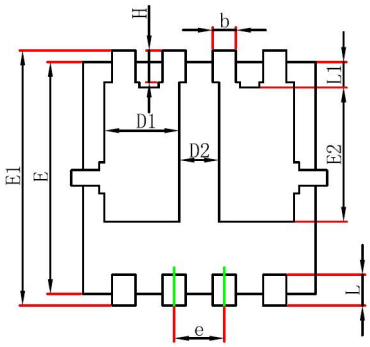



**Normalized Maximum Transient Thermal Impedance**

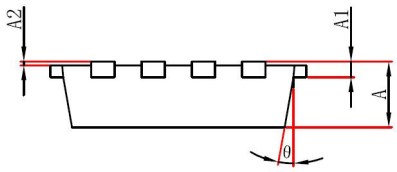
## PDFNWB3.3×3.3-8L-B Package Information




Top View
[顶视图]




Bottom View
[背视图]




Side View
[侧视图]

| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | 0.650 | 0.850 | 0.026 | 0.033 |
| A1 | 0.152 REF. | | 0.006 REF. | |
| A2 | 0~0.05 | | 0~0.002 | |
| D | 2.900 | 3.100 | 0.114 | 0.122 |
| D1 | 0.935 | 1.135 | 0.037 | 0.045 |
| D2 | 0.280 | 0.480 | 0.011 | 0.019 |
| E | 2.900 | 3.100 | 0.114 | 0.122 |
| E1 | 3.150 | 3.450 | 0.124 | 0.136 |
| E2 | 1.535 | 1.935 | 0.060 | 0.076 |
| b | 0.200 | 0.400 | 0.008 | 0.016 |
| e | 0.550 | 0.750 | 0.022 | 0.030 |
| L | 0.300 | 0.500 | 0.012 | 0.020 |
| L1 | 0.180 | 0.480 | 0.007 | 0.019 |
| L2 | 0~0.100 | | 0~0.004 | |
| L3 | 0~0.100 | | 0~0.004 | |
| H | 0.315 | 0.515 | 0.012 | 0.020 |
| θ | 9° | 13° | 9° | 13° |

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