

30V N-Channel Mosfet

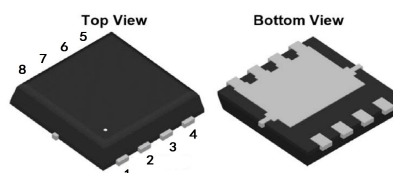
FEATURES

- $R_{SS(ON)}=14m\Omega(Typ.) @V_{GS}=10V$
- $R_{SS(ON)}=25m\Omega(Typ.) @V_{GS}=4.5V$

APPLICATIONS

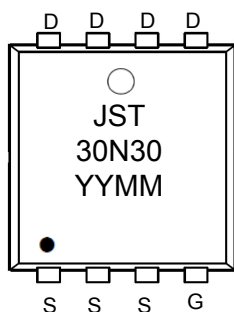
- Portable appliances
- Power management

PDFN3.3*3.3-8L



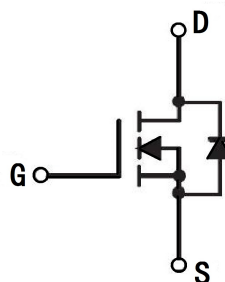
1: S 3: S 5: D 7: D
2: S 4: G 6: D 8: D

MARKING



YYMM:Date Code(year & month)

N-CHANNEL MOSFET



MAXIMUM RATINGS ($T_C=25^{\circ}C$ unless otherwise noted)

| Symbol | Parameter | Limit | Units | |
|-----------------|---|----------------------|---------------|---|
| V_{DS} | Drain-Source Voltage | 30 | V | |
| V_{GS} | Gate-Source Voltage | ± 20 | V | |
| I_D | Continuous Drain Current ^{note1} | $T_C = 25^{\circ}C$ | 30 | A |
| | | $T_C = 100^{\circ}C$ | 20 | A |
| I_{DM} | Pulsed Drain Current ^{note2} | 120 | A | |
| P_D | Power Dissipation | 36 | W | |
| $R_{\theta JC}$ | Thermal Resistance, Junction to Case | 3.5 | $^{\circ}C/W$ | |
| T_J | Junction Temperature | 150 | $^{\circ}C$ | |
| T_{STG} | Storage Temperature Range | -55 to +150 | $^{\circ}C$ | |

MOSFET ELECTRICAL CHARACTERISTICS $T_c=25\text{ }^\circ\text{C}$ unless otherwise specified

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Units |
|---|--|---|------|------|-----------|------------|
| Off Characteristic | | | | | | |
| $V_{(BR)DSS}$ | Drain-Source Breakdown Voltage | $V_{GS} = 0V, I_D = 250\mu A$ | 30 | - | - | V |
| I_{DSS} | Zero Gate Voltage Drain Current | $V_{DS} = 24V, V_{GS} = 0V$ | - | - | 1 | μA |
| I_{GSS} | Gate to Body Leakage Current | $V_{GS} = \pm 20V, V_{DS} = 0V$ | - | - | ± 100 | nA |
| On Characteristics | | | | | | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS} = V_{GS}, I_D = 250\mu A$ | 1.0 | 1.6 | 2.5 | V |
| $R_{DS(ON)}$ | Gate Drain-Source On-State Resistance <small>note3</small> | $V_{GS}=10V, I_D=5A$ | - | 14 | 23 | m Ω |
| | | $V_{GS}=4.5V, I_D=3A$ | - | 25 | 39 | |
| Dynamic Characteristics | | | | | | |
| C_{iss} | Input Capacitance | $V_{DS} = 15V, V_{GS} = 0V,$ $f = 1.0MHz$ | - | 1397 | - | pF |
| C_{oss} | Output Capacitance | | - | 425 | - | pF |
| C_{rss} | Reverse Transfer Capacitance | | - | 164 | - | pF |
| Q_g | Total Gate Charge | $V_{DS}=15V, V_{GS}=10V$ $I_D=10A$ | - | 17 | - | nC |
| Q_{gs} | Gate-Source Charge | | - | 2.8 | - | nC |
| Q_{gd} | Gate-Drain("Miller") Charge | | - | 3.5 | - | nC |
| Switching Characteristics | | | | | | |
| $t_{d(on)}$ | Turn-On Delay Time | $V_{DS}=15V, I_D=10A$ $V_{GS} = 10V, R_G = 4\Omega,$ | - | 15 | - | ns |
| t_r | Turn-On Rise Time | | - | 9 | - | ns |
| $t_{d(off)}$ | Turn-Off Delay Time | | - | 32 | - | ns |
| t_f | Turn-Off Fall Time | | - | 8 | - | ns |
| Drain-Source Diode Characteristics and Maximum Ratings | | | | | | |
| I_S | Maximum Continuous Drain to Source Diode Forward Current | | - | - | 30 | A |
| I_{SM} | Maximum Pulsed Drain to Source Diode Forward Current | | - | - | 120 | A |
| V_{SD} | Drain to Source Diode Forward Voltage | $V_{GS} = 0V, I_{SD}=10A,$ | - | - | 1.2 | V |
| t_{rr} | Reverse Recovery Time | $V_{GS} = 0V, I_F=10A,$ | - | | 40 | ns |
| Q_{rr} | Reverse Recovery Charge | $di/dt = 100A/\mu s$ | - | | 22 | nC |

Notes: 1. Calculated continuous current based on maximum allowable junction temperature.

2. Repetitive rating; pulse width limited by max. junction temperature.

3. Pulse Test: Pulse Width $\leq 380\mu s$, Duty Cycle $\leq 2\%$

Typical Performance Characteristics

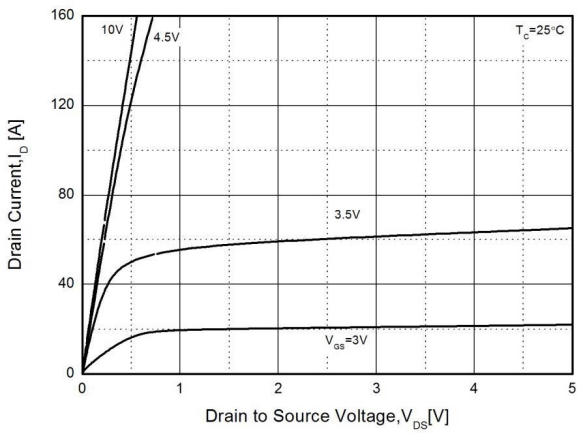


Figure1. Output Characteristics

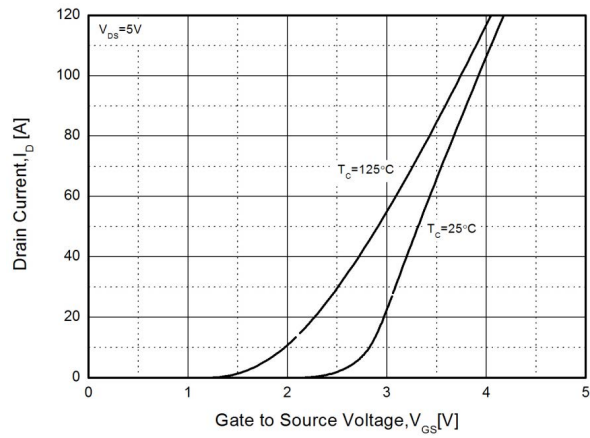


Figure2. Transfer Characteristics

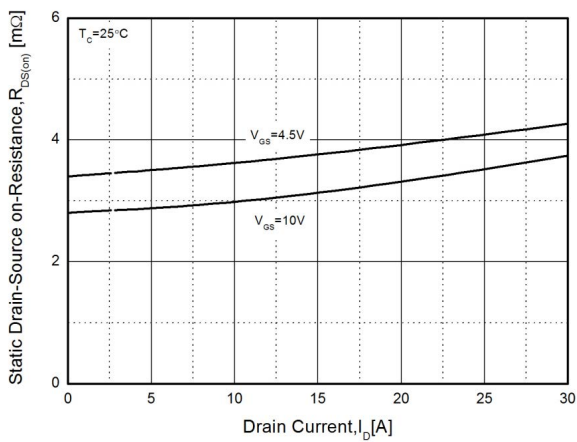


Figure3. Rdson-Drain Current

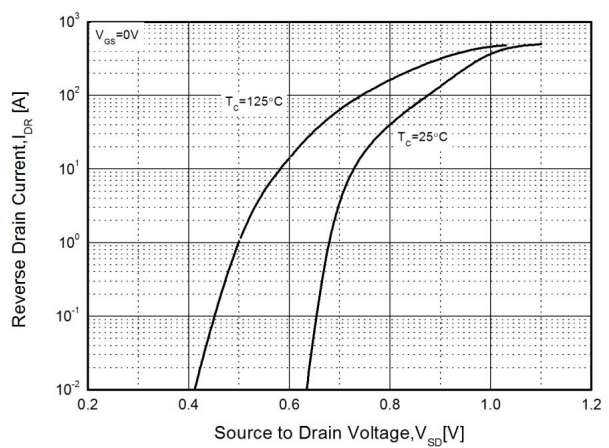


Figure4. Typical Source-Drain Diode Forward Voltage

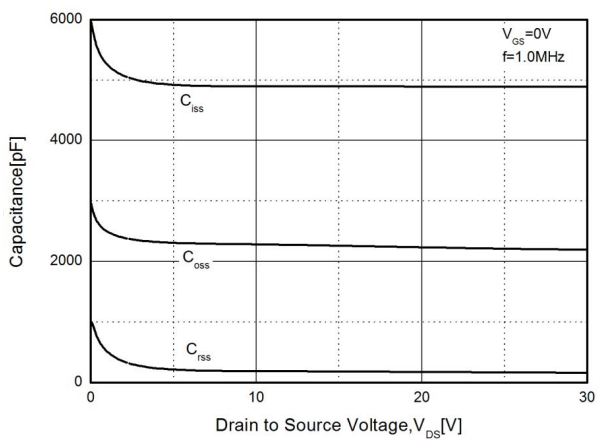


Figure5. Capacitance Characteristics

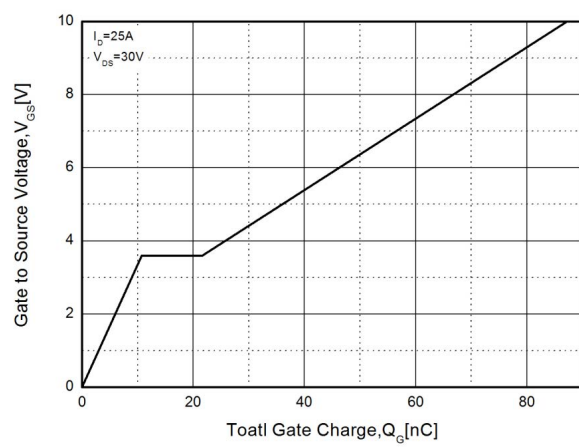


Figure6. Gate Charge

Typical Performance Characteristics (cont.)

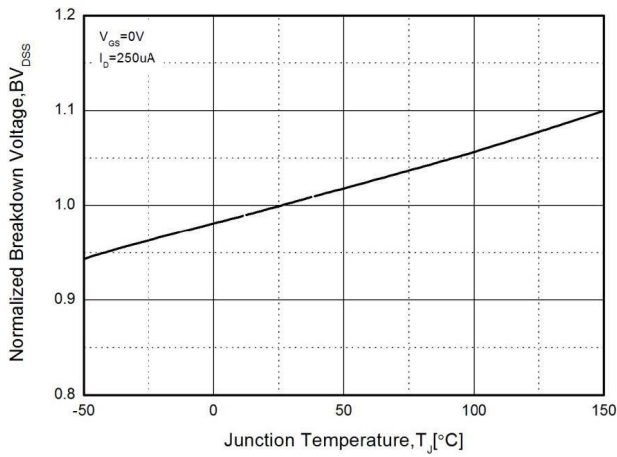


Figure7. Normalized Breakdown Voltage vs. Temperature

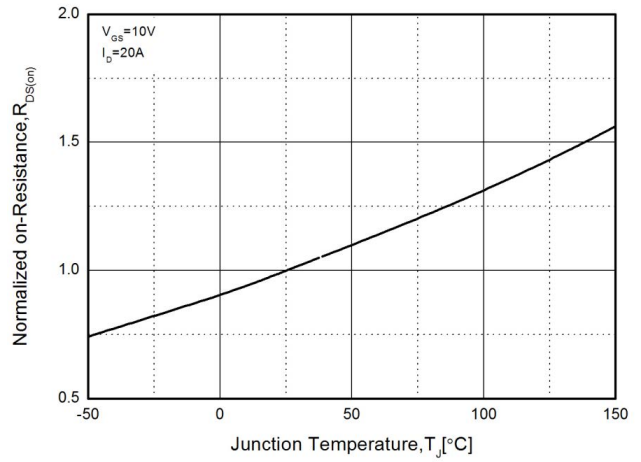


Figure8. Normalized on-Resistance vs. Temperature

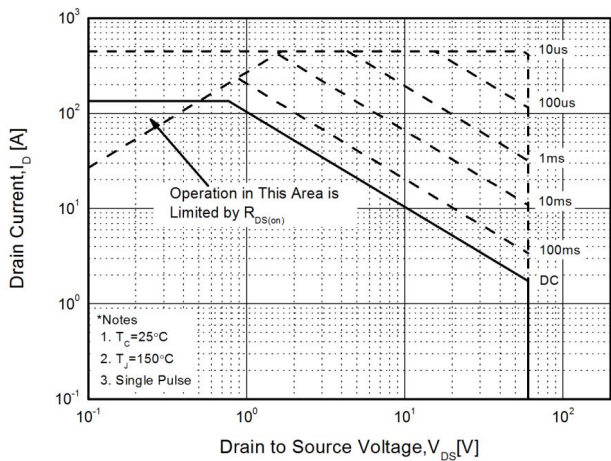


Figure9. Safe Operation Area

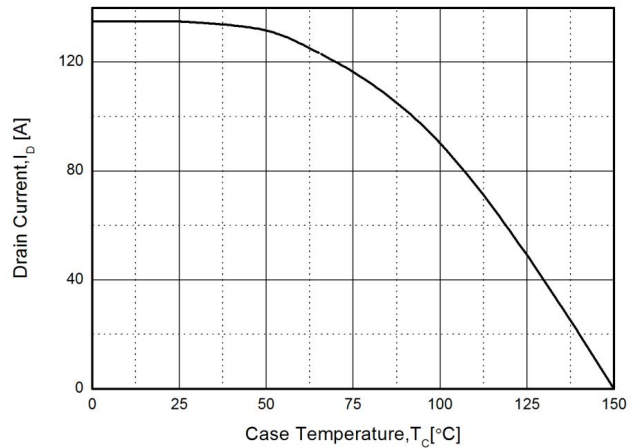


Figure10. Drain Current vs. Case Temperature

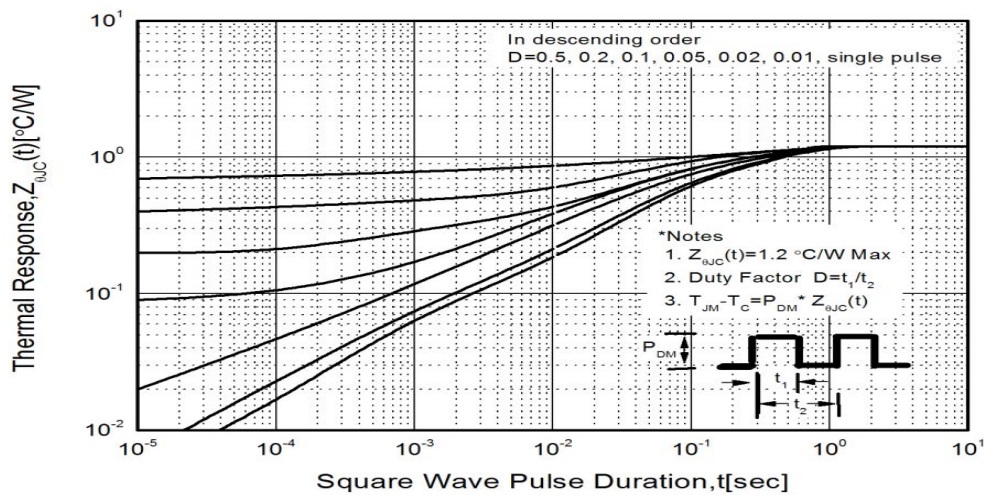
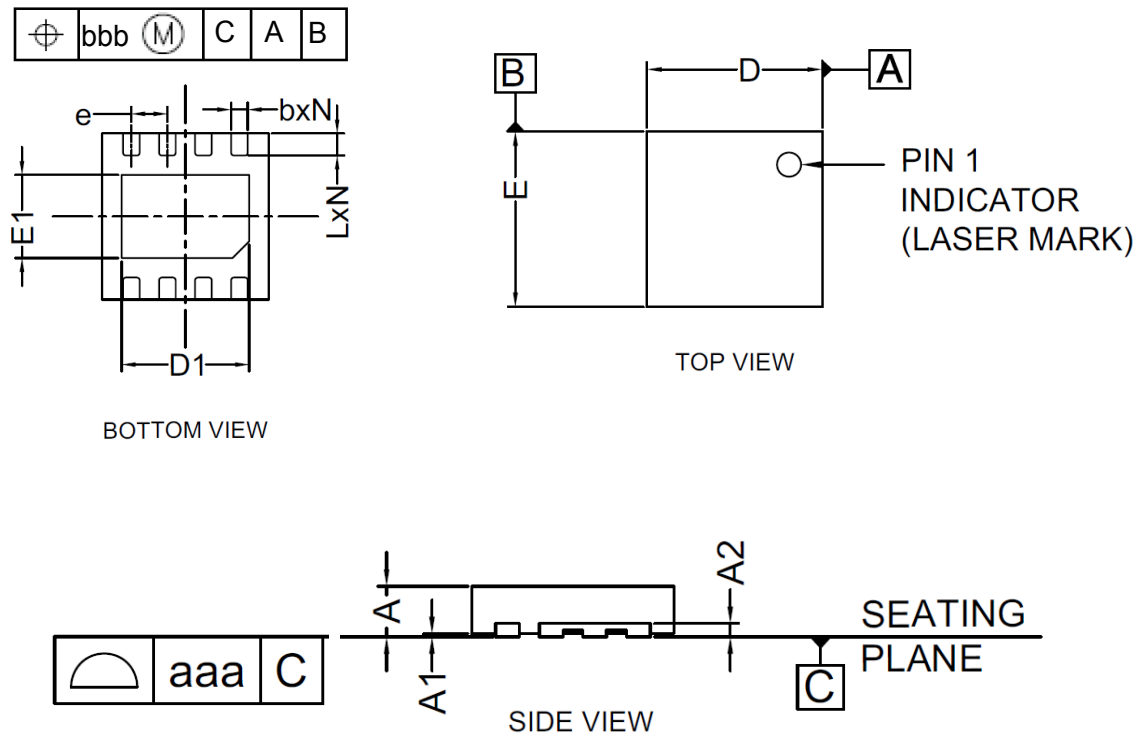


Figure11. Transient Thermal Response Curve

PDFN3.3*3.3-8L PACKAGE OUTLINE DRAWING



UNITS OF MEASURE=MILLIMETER

| Symbol | Min | TYP | MAX |
|--------|---------|------|-------|
| A | 0.70 | 0.75 | 0.80 |
| A1 | 0.00 | 0.02 | 0.05 |
| A2 | 0.203 | | |
| b | 0.25 | 0.30 | 0.35 |
| D | 2.924 | 3.00 | 3.076 |
| D1 | 2.20 | 2.30 | 2.40 |
| E | 2.924 | 3.00 | 3.076 |
| E1 | 1.40 | 1.50 | 1.60 |
| e | 0.65BSC | | |
| L | 0.35 | 0.40 | 0.45 |
| K | 0.20 | - | |
| N | 8 | | |
| aaa | 0.08 | | |
| bbb | 0.10 | | |