# 100V 6.2mΩ N-Ch Power MOSFET

## Features

- Ultra-low $R_{DS(ON)}$
- Low Gate Charge
- 100% UIS Tested, 100% $R_g$ Tested
- Pb-free Lead Plating
- Halogen-free and RoHS-compliant

## Product Summary

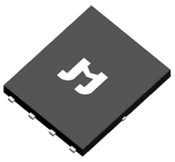
| Parameter | Value | Unit |
|---|---|---|
| $V_{DS}$ | 100 | V |
| $V_{GS(th)}$ | 2.8 | V |
| $I_D$ (@ $V_{GS}$ = 10V) (1) | 92 | A |
| $R_{DS(ON)}$ (@ $V_{GS}$ = 10V) | 6.2 | mΩ |

## Applications

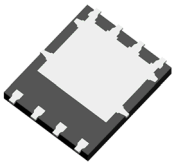
- Power Managerment in Telecom., Industrial Automation, CE
- Current Switching in DC/DC & AC/DC Sub-systems
- Motor Driving in Power Tool, E-vehicle, Robotics

PDFN5x6-8L

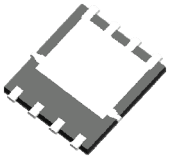
Top View



Bottom View Type-A

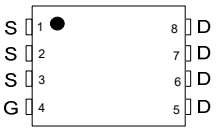


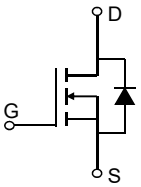
Bottom View Type-B



Pin Configuration

Top View



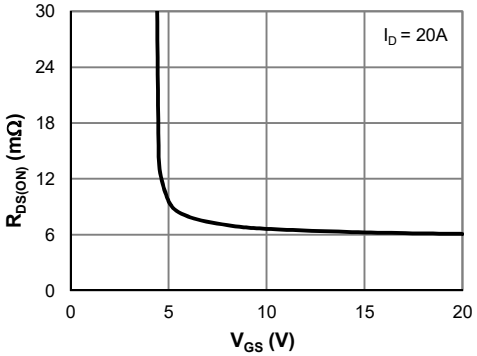

## Ordering Information

| Device | Package | # of Pins | Marking | MSL | $T_J$ (°C) | Media | Quantity (pcs) |
|---|---|---|---|---|---|---|---|
| JMSH1008AG-13 | PDFN5x6-8L | 8 | 1008H | 1 | -55 to 150 | 13-inch Reel | 5000 |

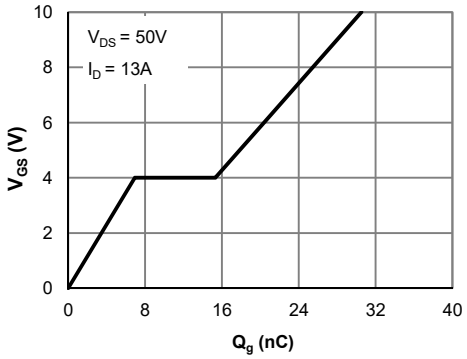
## Absolute Maximum Ratings (@ $T_A$ = 25°C unless otherwise specified)

| Parameter | | Symbol | Value | Unit |
|---|---|---|---|---|
| Drain-to-Source Voltage | | $V_{DS}$ | 100 | V |
| Gate-to-Source Voltage | | $V_{GS}$ | ±20 | V |
| Continuous Drain Current (1) | $T_C$ = 25°C | $I_D$ | 92 | A |
| | $T_C$ = 100°C | | 58 | |
| Pulsed Drain Current (2) | | $I_{DM}$ | 251 | A |
| Avalanche Current (3) | | $I_{AS}$ | 45 | A |
| Avalanche Energy (3) | | $E_{AS}$ | 101 | mJ |
| Power Dissipation (4) | $T_C$ = 25°C | $P_D$ | 125 | W |
| | $T_C$ = 100°C | | 50 | |
| Junction & Storage Temperature Range | | $T_J$, $T_{STG}$ | -55 to 150 | °C |

**$R_{DS(ON)}$ vs. $V_{GS}$**




**Gate Charge**



## Electrical Characteristics (@ $T_J$ = 25°C unless otherwise specified)

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **STATIC PARAMETERS** | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $I_D$ = 250μA, $V_{GS}$ = 0V | 100 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ = 80V, $V_{GS}$ = 0V | | | 1.0 | μA |
| | | $T_J$ = 55°C | | | 5.0 | |
| Gate-Body Leakage Current | $I_{GSS}$ | $V_{DS}$ = 0V, $V_{GS}$ = ±20V | | | ±100 | nA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$ = $V_{GS}$, $I_D$ = 250μA | 2.0 | 2.8 | 4.0 | V |
| Static Drain-Source ON-Resistance | $R_{DS(ON)}$ | $V_{GS}$ = 10V, $I_D$ = 20A | | 6.2 | 7.8 | mΩ |
| Forward Transconductance | $g_{FS}$ | $V_{DS}$ = 5V, $I_D$ = 20A | | 51 | | S |
| Diode Forward Voltage | $V_{SD}$ | $I_S$ = 1A, $V_{GS}$ = 0V | | 0.70 | 1.0 | V |
| Diode Continuous Current | $I_S$ | $T_C$ = 25°C | | | 125 | A |
| **DYNAMIC PARAMETERS** (5) | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{GS}$ = 0V, $V_{DS}$ = 50V, f = 1MHz | | 1920 | | pF |
| Output Capacitance | $C_{oss}$ | | | 445 | | pF |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 7.0 | | pF |
| Gate Resistance | $R_g$ | $V_{GS}$ = 0V, $V_{DS}$= 0V, f = 1MHz | | 1.5 | | Ω |
| **SWITCHING PARAMETERS** (5) | | | | | | |
| Total Gate Charge (@$V_{GS}$ = 10V) | $Q_g$ | $V_{GS}$ = 0 to 10V<br>$V_{DS}$ = 50V, $I_D$ = 13A | | 30 | | nC |
| Total Gate Charge (@$V_{GS}$ = 6.0V) | $Q_g$ | | | 20 | | nC |
| Gate Source Charge | $Q_{gs}$ | | | 6.9 | | nC |
| Gate Drain Charge | $Q_{gd}$ | | | 8.4 | | nC |
| Turn-On DelayTime | $t_{D(on)}$ | $V_{GS}$ = 10V, $V_{DS}$ = 50V<br>$R_L$ = 3.8Ω, $R_{GEN}$ = 6Ω | | 8.5 | | ns |
| Turn-On Rise Time | $t_r$ | | | 9.7 | | ns |
| Turn-Off DelayTime | $t_{D(off)}$ | | | 29 | | ns |
| Turn-Off Fall Time | $t_f$ | | | 19.1 | | ns |
| Body Diode Reverse Recovery Time | $t_{rr}$ | $I_F$ = 13A, $dI_F/dt$ = 100A/μs | | 52 | | ns |
| Body Diode Reverse Recovery Charge | $Q_{rr}$ | $I_F$ = 13A, $dI_F/dt$ = 100A/μs | | 55 | | nC |

## Thermal Performance

| Parameter | Symbol | Typ. | Max. | Unit |
|---|---|---|---|---|
| Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | 50 | 65 | °C/W |
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 0.85 | 1.0 | °C/W |

**Notes:**

1. Computed continuous current assumes the condition of $T_{J\_Max}$ while the actual continuous current depends on the thermal & electro-mechanical application board design.
2. This single-pulse measurement was taken under $T_{J\_Max}$ = 150°C.
3. This single-pulse measurement was taken under the following condition [L = 100uH, $V_{GS}$ = 10V, $V_{DS}$ = 50V] while its value is limited by $T_{J\_Max}$ = 150°C.
4. The power dissipation $P_D$ is based on $T_{J\_Max}$ = 150°C.
5. This value is guaranteed by design hence it is not included in the production test.
6. Continuous current rating is limited by the package used.

## Typical Electrical & Thermal Characteristics

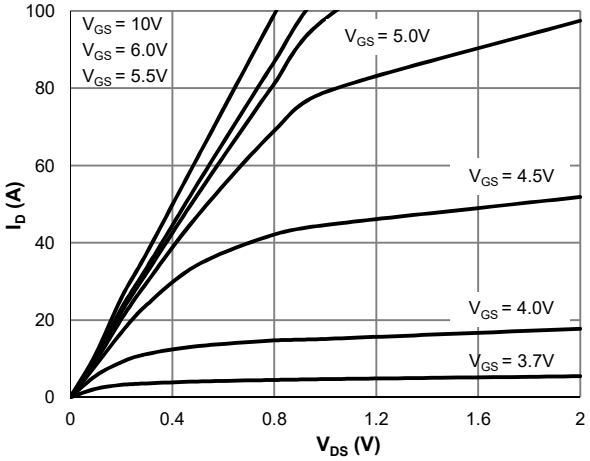



**Figure 1: Saturation Characteristics**

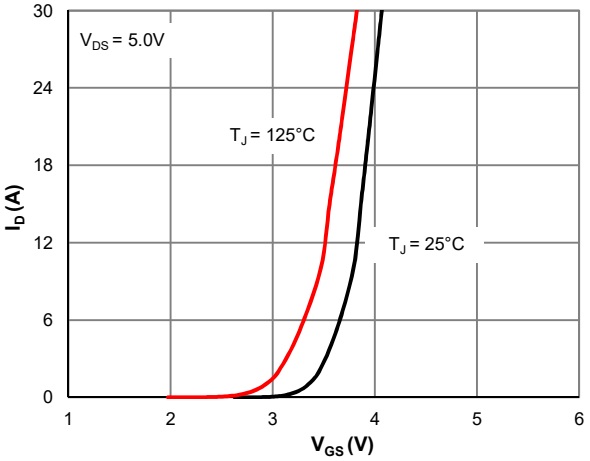



**Figure 2: Transfer Characteristics**

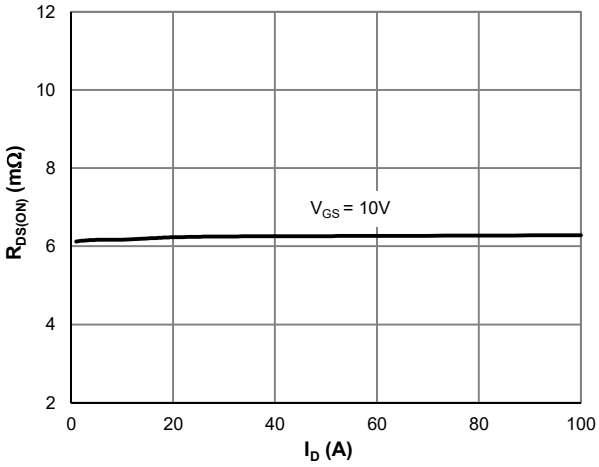



**Figure 3: $R_{DS(ON)}$ vs. Drain Current**

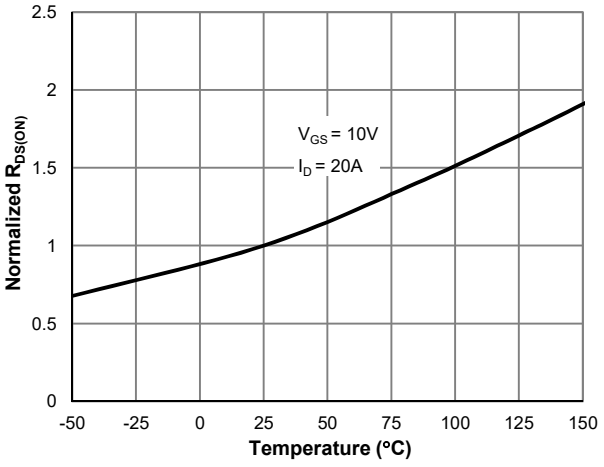



**Figure 4: $R_{DS(ON)}$ vs. Junction Temperature**

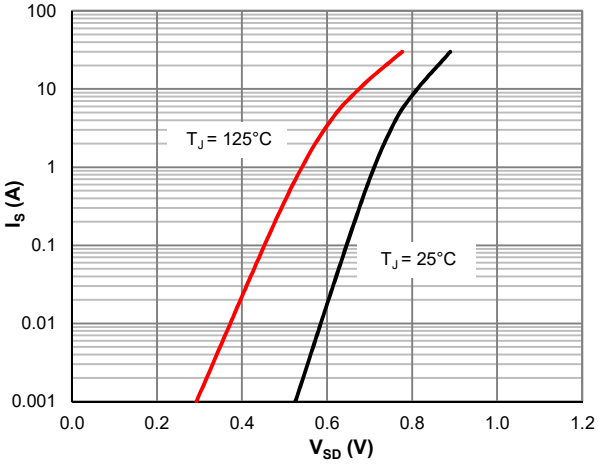



**Figure 5: Body-Diode Characteristics**

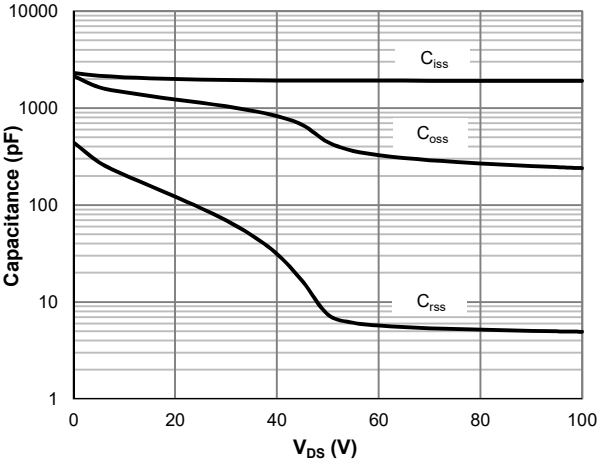



**Figure 6: Capacitance Characteristics**

## Typical Electrical & Thermal Characteristics

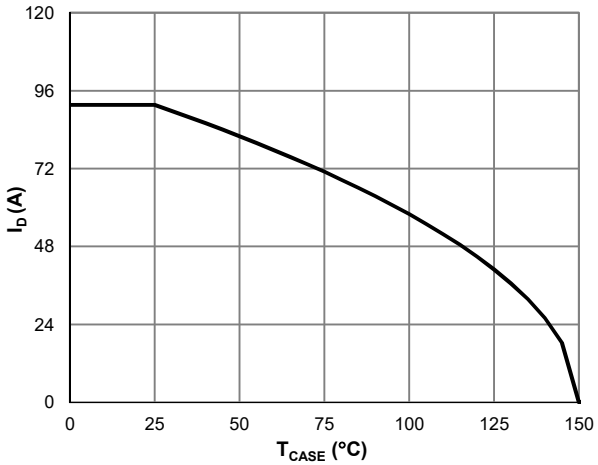



Figure 7: Current De-rating

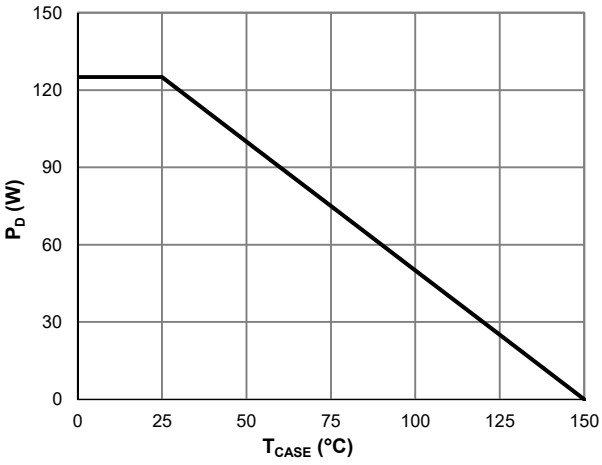



Figure 8: Power De-rating

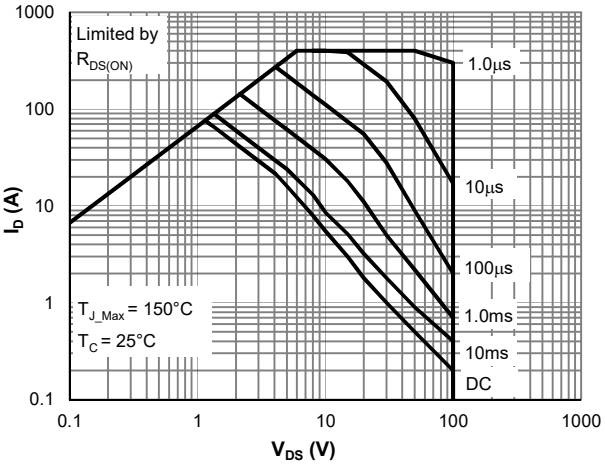



Figure 9: Maximum Safe Operating

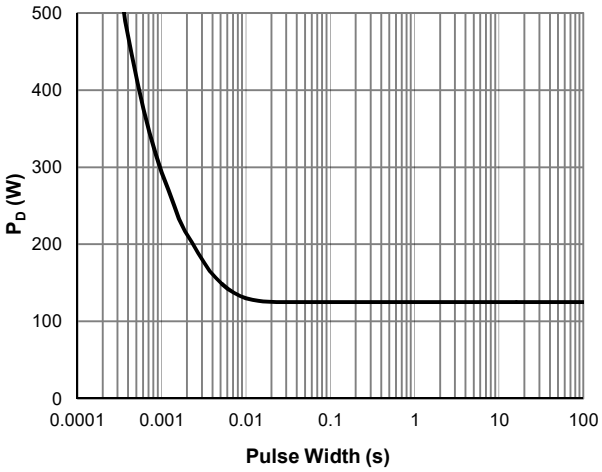



Figure 10: Single Pulse Power Rating, Junction-to-Case

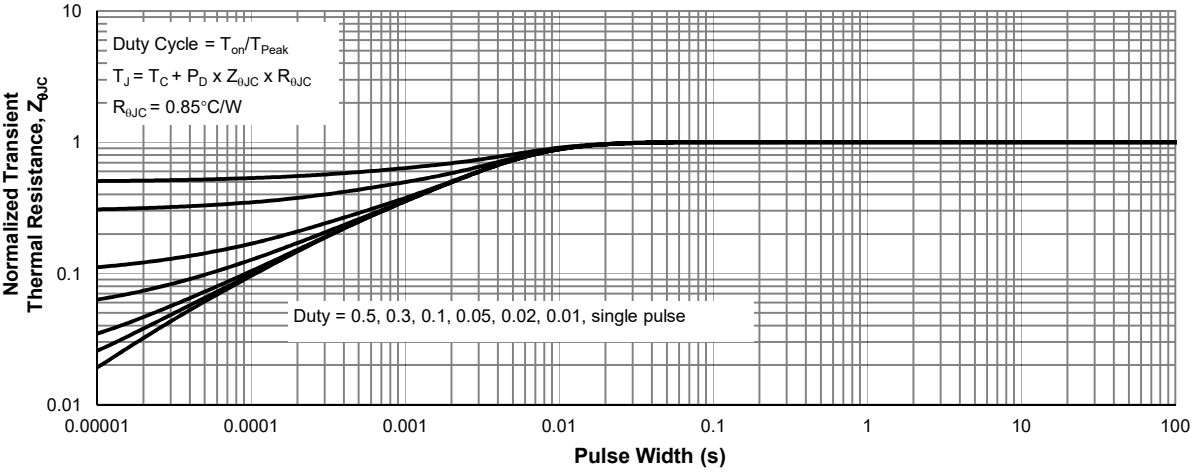
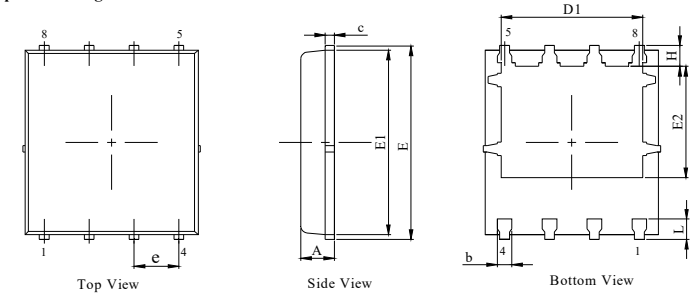



Figure 11: Normalized Maximum Transient Thermal Impedance

## PDFN5x6-8L Package Information

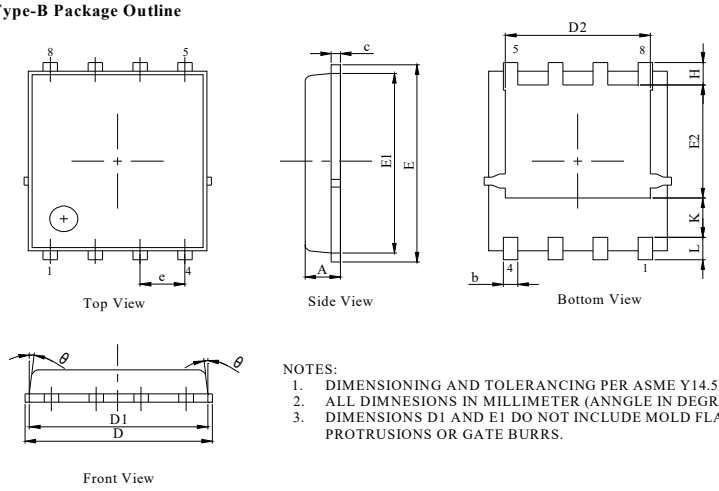
**Type-A Package Outline**




NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M,1994.
2. ALL DIMNESIONS IN MILLIMETER (ANNGLE IN DEGREE).
3. DIMENSIONS D1 AND E1 DO NOT INCLUDE MOLD FLASH PROTRUSIONS OR GATE BURRS.

| DIM. | MILLIMETER | | |
|---|---|---|---|
| | MIN. | NOM. | MAX. |
| A | 0.90 | 1.00 | 1.10 |
| b | 0.20 | 0.30 | 0.40 |
| c | 0.21 | 0.25 | 0.34 |
| D | 4.90 | 5.00 | 5.10 |
| D1 | 3.91 | 4.01 | 4.11 |
| D2 | 4.80 | 4.90 | 5.00 |
| E | 5.90 | 6.00 | 6.10 |
| E1 | 5.65 | 5.75 | 5.85 |
| E2 | 3.37 | 3.48 | 3.58 |
| e | 1.27BSC | | |
| H | 0.55 | 0.65 | 0.75 |
| L | 0.55 | 0.65 | 0.75 |
| θ | 0° | -- | 12° |

**Type-B Package Outline**

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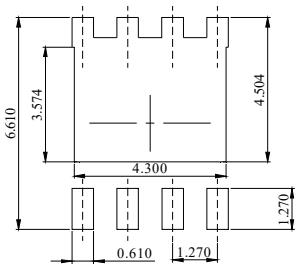
3. DIMENSIONS D1 AND E1 DO NOT INCLUDE MOLD FLASH PROTRUSIONS OR GATE BURRS.

| DIM. | MILLIMETER | | |
|---|---|---|---|
| | MIN. | NOM. | MAX. |
| A | 0.90 | 1.00 | 1.10 |
| b | 0.31 | 0.41 | 0.51 |
| c | 0.20 | 0.25 | 0.30 |
| D | 5.00 | 5.20 | 5.40 |
| D1 | 4.95 | 5.05 | 5.15 |
| D2 | 4.00 | 4.10 | 4.20 |
| E | 6.05 | 6.15 | 6.25 |
| E1 | 5.50 | 5.60 | 5.70 |
| E2 | 3.42 | 3.53 | 3.63 |
| e | 1.27BSC | | |
| H | 0.60 | 0.70 | 0.80 |
| L | 0.50 | 0.70 | 0.80 |
| θ | - | - | 10° |

**Recommended Soldering Footprint**




DIMENSIONS:MILLIMETERS