



80V 2.35mΩ 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

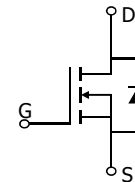
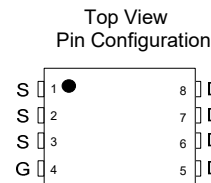
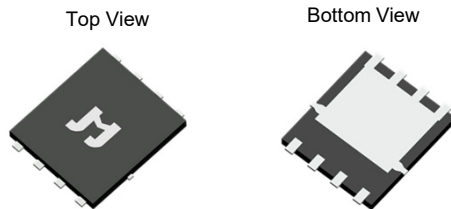
Product Summary

| Items | Typ. | Units |
|---|------|-------|
| V_{DS} | 80 | V |
| $V_{GS(th)}$ | 2.8 | V |
| I_D (at $V_{GS}=10V$) ⁽¹⁾ | 143 | A |
| $R_{DS(ON)}$ (at $V_{GS}=10V$) | 2.35 | mΩ |

Applications

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

PDFN5x6-8L

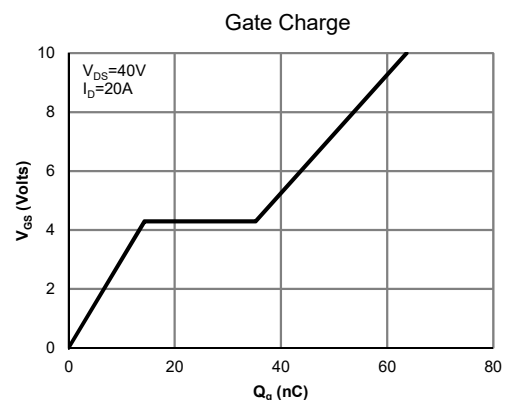
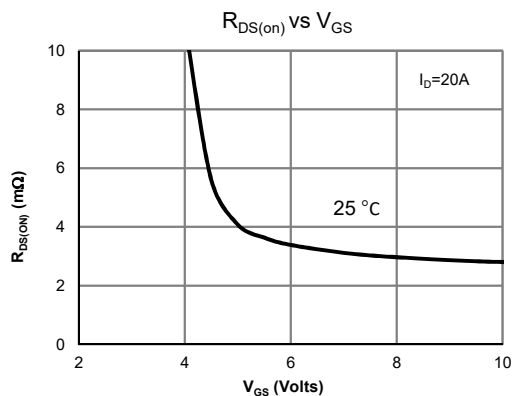


Ordering information

| Device | Package | Pins | Marking | MSL | T_J (°C) | Reel Size | Quantity |
|---------------|------------|------|---------|-----|------------|--------------|----------|
| JMSH0803AG-13 | PDFN5x6-8L | 8 | H0803A | 1 | -55 to 150 | 13-inch Reel | 3000 |

Absolute Maximum Ratings $T_A=25^\circ\text{C}$ (unless otherwise specified)

| Parameter | Symbol | Value | Units |
|--|----------------|------------------------|-------|
| Drain to source voltage | V_{DS} | 80 | V |
| Gate to source voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current | I_D | $T_C=25^\circ\text{C}$ | 143 |
| | | $T_C=70^\circ\text{C}$ | 115 |
| Pulsed Drain Current ⁽²⁾ | I_{DM} | 600 | A |
| Avalanche Current ⁽³⁾ | I_{AS} | 60 | A |
| Avalanche energy $L=0.1\text{mH}$ ⁽³⁾ | E_{AS} | 180 | mJ |
| Power Dissipation ⁽⁴⁾ | P_D | $T_C=25^\circ\text{C}$ | 104 |
| | | $T_C=70^\circ\text{C}$ | 67 |
| Junction and Storage Temp. Range | T_J, T_{STG} | -55 to 150 | °C |



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

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Units |
|-----------------------------------|----------------------|---|------|------|------|-------|
| STATIC PARAMETERS | | | | | | |
| Drain-Source Breakdown Voltage | V _{(BR)DSS} | I _D =250μA, V _{GS} =0V | 80 | | | V |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} =80V, V _{GS} =0V T _J =55°C | | | 1 | μA |
| | | | | | 5 | |
| 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 | 2.8 | 4 | V |
| Static Drain-Source On-Resistance | R _{DS(ON)} | V _{GS} =10V, I _D =20A | | 2.35 | 2.8 | mΩ |
| Forward Transconductance | g _{FS} | V _{DS} =5V, I _D =20A | | 78 | | S |
| Diode Forward Voltage | V _{SD} | I _S =1A, V _{GS} =0V | | 0.7 | 1 | V |
| Maximum Diode Continuous Current | I _S | T _C =25° C | | | 104 | A |

DYNAMIC PARAMETERS ⁽⁵⁾

| | | | | | | |
|------------------------------|------------------|---|--|------|--|----|
| Input Capacitance | C _{iss} | V _{GS} =0V, V _{DS} =40V, f=1MHz | | 4250 | | pF |
| Output Capacitance | C _{oss} | | | 1340 | | pF |
| Reverse Transfer Capacitance | C _{rss} | | | 8 | | pF |
| Gate resistance | R _g | V _{GS} =0V, V _{DS} =0V, f=1MHz | | 1.2 | | Ω |

SWITCHING PARAMETERS ⁽⁵⁾

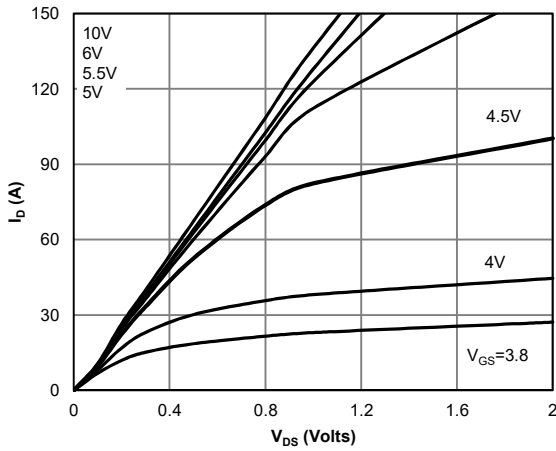
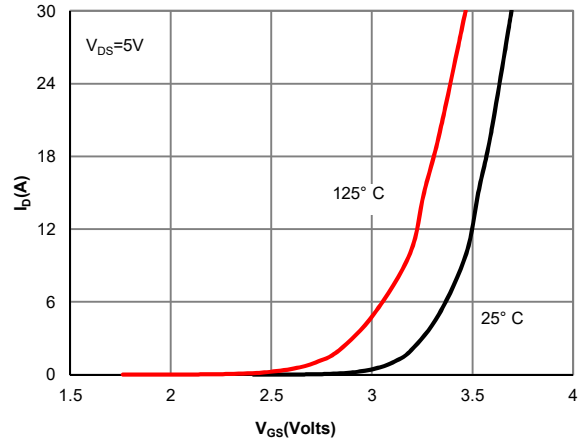
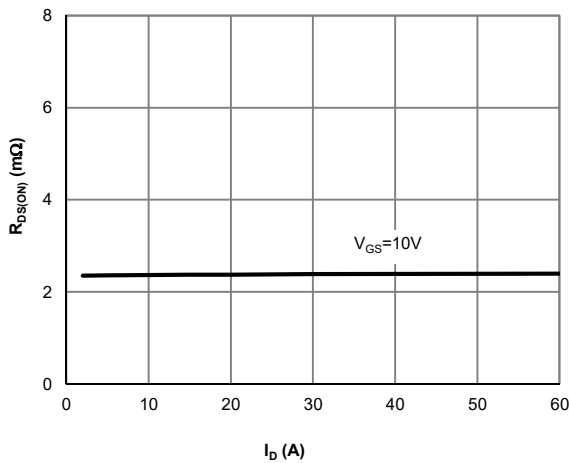
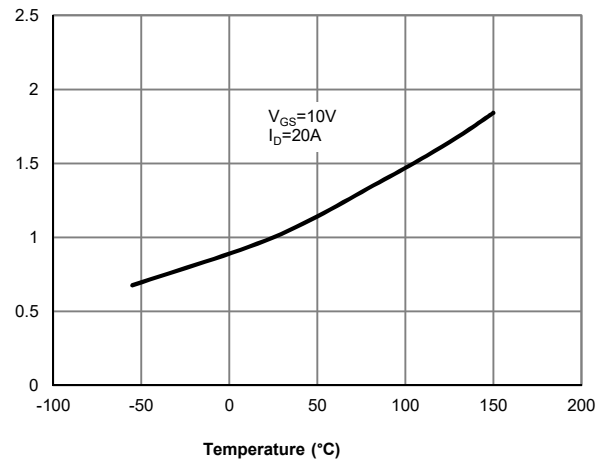
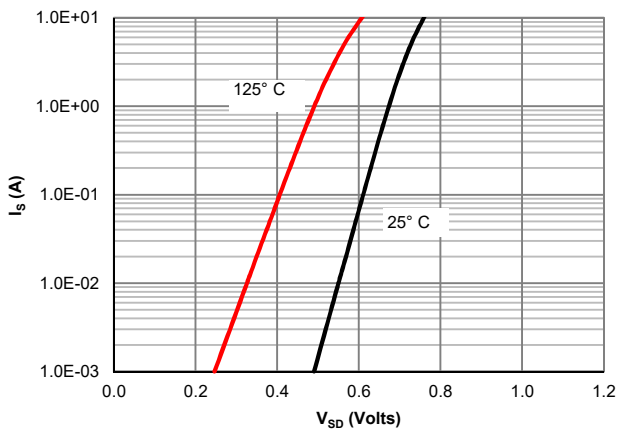
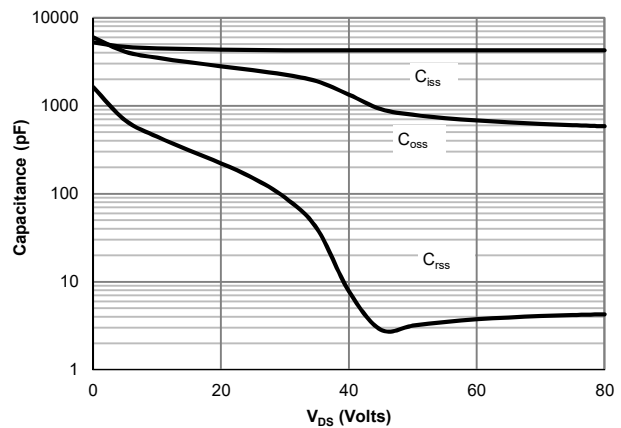
| | | | | | | |
|------------------------------------|---------------------|---|--|-----|--|----|
| Total Gate Charge | Q _{g(10V)} | V _{GS} =10V, V _{DS} =40V, I _D =20A | | 63 | | nC |
| Total Gate Charge | Q _{g(6V)} | | | 43 | | nC |
| Gate Source Charge | Q _{gs} | | | 14 | | nC |
| Gate Drain Charge | Q _{gd} | | | 20 | | nC |
| Turn-On DelayTime | t _{D(on)} | V _{GS} =10V, V _{DS} =40V, R _L =2Ω, R _{GEN} =6Ω | | 14 | | ns |
| Turn-On Rise Time | t _r | | | 22 | | ns |
| Turn-Off DelayTime | t _{D(off)} | | | 65 | | ns |
| Turn-Off Fall Time | t _f | | | 37 | | ns |
| Body Diode Reverse Recovery Time | t _{rr} | I _F =20A, dI/dt=100A/μs | | 65 | | ns |
| Body Diode Reverse Recovery Charge | Q _{rr} | I _F =20A, dI/dt=100A/μs | | 147 | | nC |

Thermal performance

| Parameter | Symbol | Typ | Max | Units |
|-----------------------------|------------------|-----|-----|-------|
| Maximum Junction-to-Ambient | R _{θJA} | 50 | 65 | ° C/W |
| Maximum Junction-to-Case | R _{θJC} | 0.9 | 1.2 | ° 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 = 100μH, V_{GS} = 10V, V_{DD} = 40V] 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.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Fig 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 AND THERMAL CHARACTERISTICS

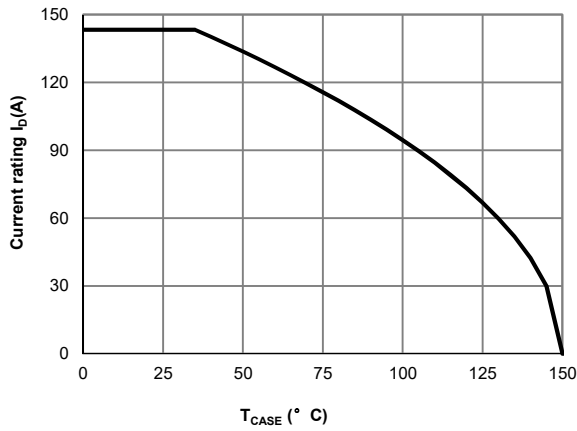


Figure 7: Current De-rating

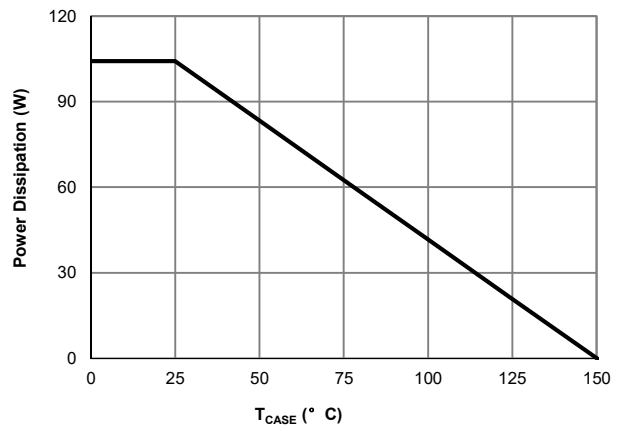


Figure 8: Power De-rating

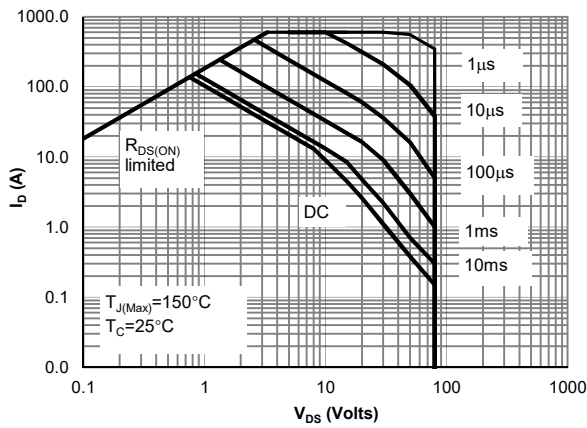


Figure 9: Maximum Safe Operating Area

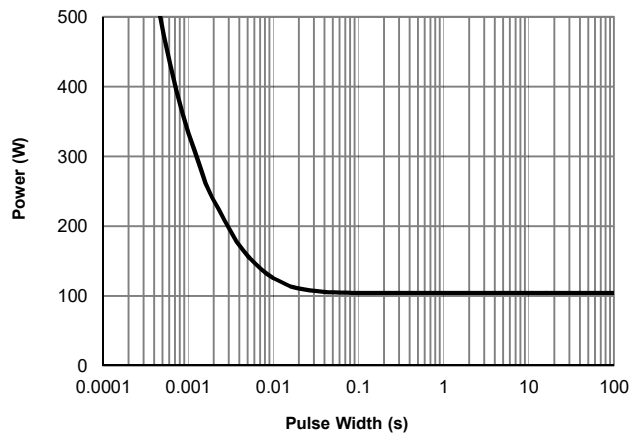


Figure 10: Single Pulse Power Rating Junction-to-Case

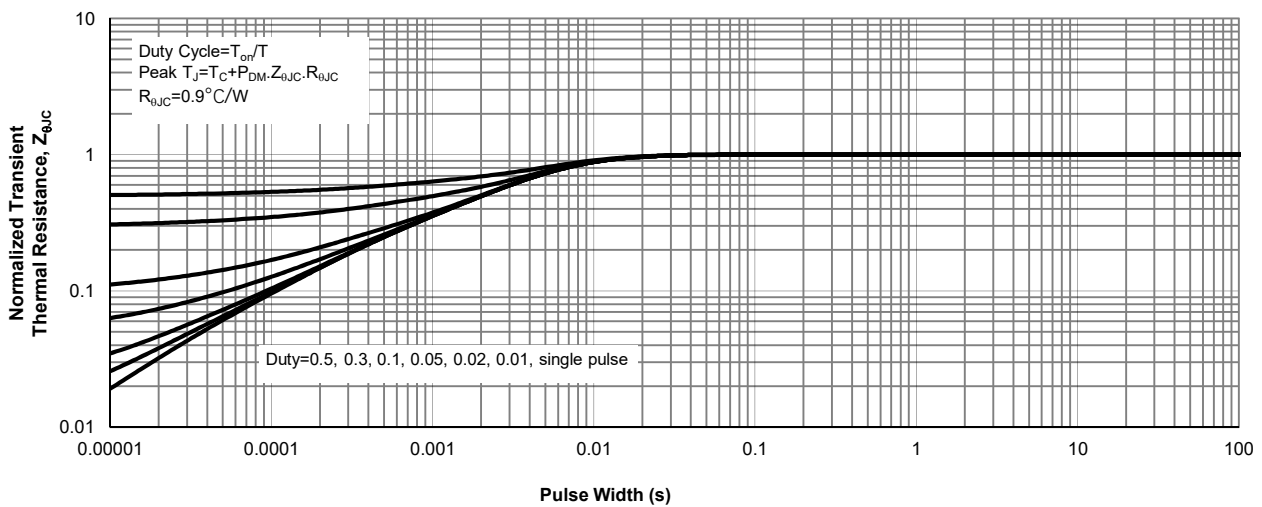
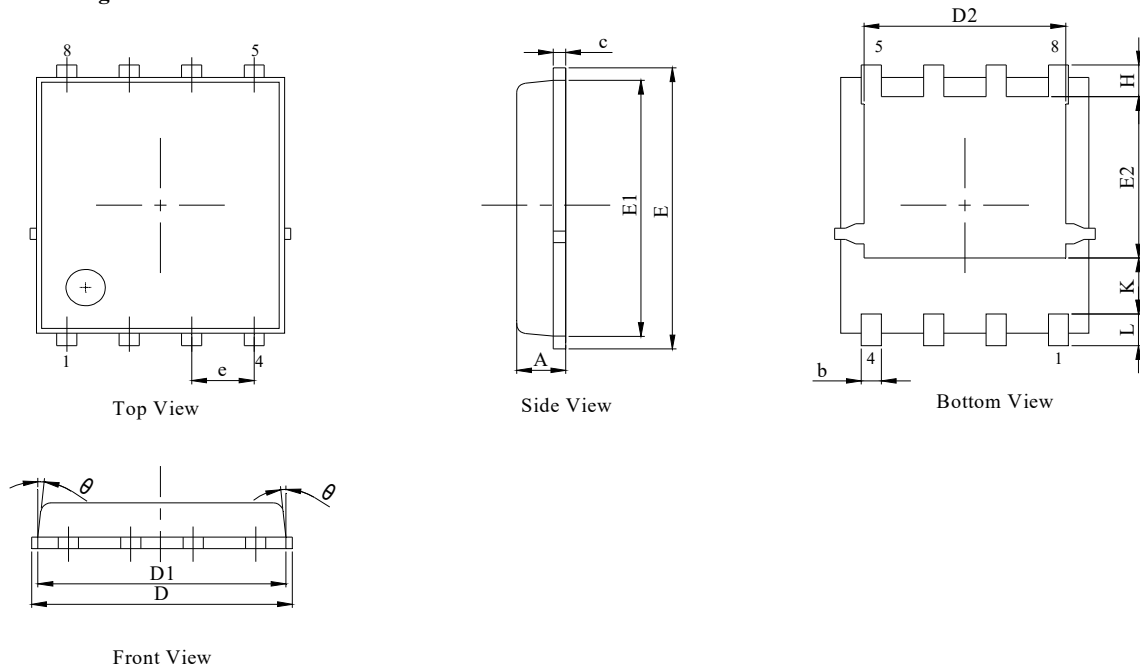
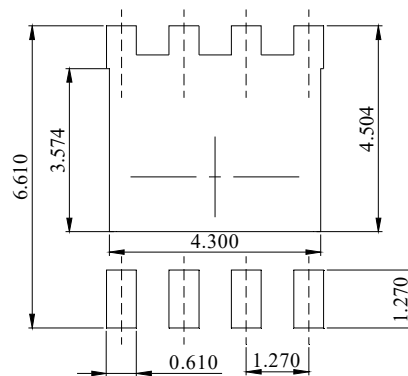


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

PDFN5x6-8L Package Information
Package Outline

NOTES:

1. Dimension and tolerance per ASME Y14.5M, 1994.
2. All dimensions in millimeter (angle 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 | 0.31 | 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 |
| K | 1.23 REF | | |
| θ | - | - | 10° |

Recommended Soldering Footprint


DIMENSIONS: MILLIMETERS