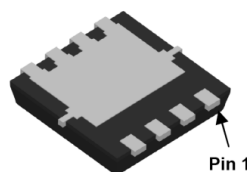
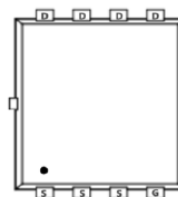


Main Product Characteristics:

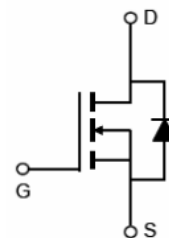
| | |
|--------------|--------------------|
| V_{DSS} | 30V |
| $R_{DS(on)}$ | 7m Ω (typ.) |
| I_D | 60A |



PDFN 3*3-8L



Pin Assignment



Schematic Diagram

Features and Benefits:

- Advanced MOSFET process technology
- Special designed for PWM, load switching and general purpose applications
- Ultra low on-resistance with low gate charge
- Fast switching and reverse body recovery
- 150°C operating temperature


Description:

It utilizes the latest processing techniques to achieve the high cell density and reduces the on-resistance with high repetitive avalanche rating. These features combine to make this design an extremely efficient and reliable device for use in power switching application and a wide variety of other applications.

Absolute Max Rating:

| Symbol | Parameter | Max. | Units |
|----------------------------------|--|-------------|------------------|
| I_D @ $T_C = 25^\circ\text{C}$ | Continuous Drain Current, V_{GS} @ 10V ① | 60 | A |
| I_{DM} | Pulsed Drain Current ② | 92 | |
| P_D @ $T_C = 25^\circ\text{C}$ | Power Dissipation ③ | 29 | W |
| V_{DS} | Drain-Source Voltage | 30 | V |
| V_{GS} | Gate-to-Source Voltage | ± 20 | V |
| E_{AS} | Single Pulse Avalanche Energy | 57.8 | mJ |
| I_{AS} | Avalanche Current | 34 | A |
| T_J T_{STG} | Operating Junction and Storage Temperature Range | -55 to +150 | $^\circ\text{C}$ |

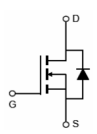
Thermal Resistance

| Symbol | Characterizes | Typ. | Max. | Units |
|-----------------|--|------|------|-------|
| $R_{\theta JC}$ | Junction-to-case ③ | — | 4.3 | °C/W |
| $R_{\theta JA}$ | Junction-to-ambient ($t \leq 10s$) ④ | — | 75 | °C/W |

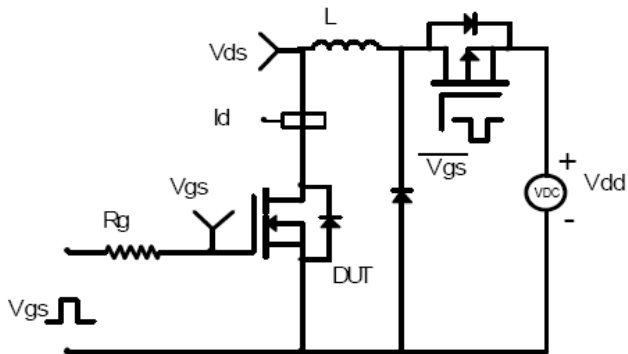
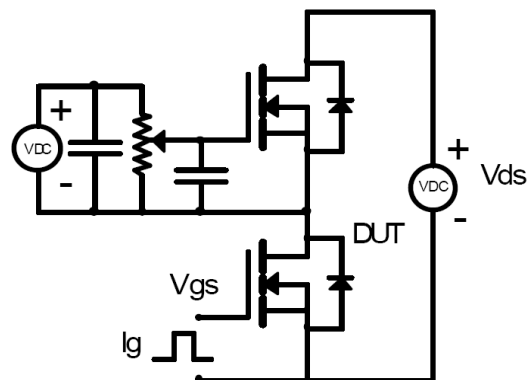
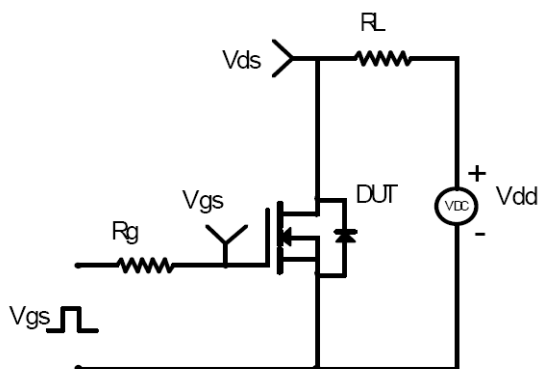
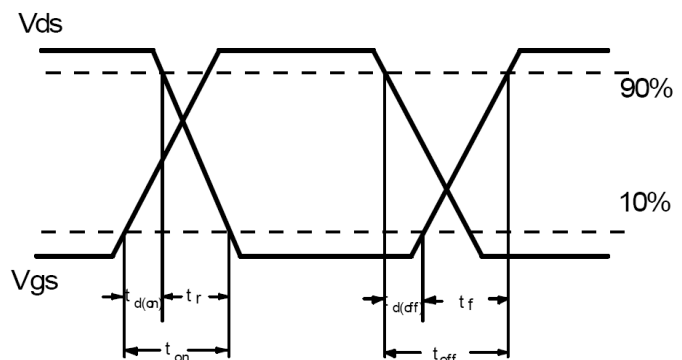
Electrical Characterizes @ $T_A=25^\circ\text{C}$ unless otherwise specified

| Symbol | Parameter | Min. | Typ. | Max. | Units | Conditions |
|---------------|--------------------------------------|------|------|------|-------|--|
| $V_{(BR)DSS}$ | Drain-to-Source breakdown voltage | 30 | — | — | V | $V_{GS} = 0V, I_D = 250\mu A$ |
| $R_{DS(on)}$ | Static Drain-to-Source on-resistance | — | 7 | 8.5 | mΩ | $V_{GS}=10V, I_D=12A$ |
| | | — | 10 | 13 | | $V_{GS}=4.5V, I_D=10A$ |
| $V_{GS(th)}$ | Gate threshold voltage | 1.0 | — | 2.5 | V | $V_{DS} = V_{GS}, I_D = 250\mu A$ |
| I_{DSS} | Drain-to-Source leakage current | — | — | 1 | μA | $V_{DS} = 24V, V_{GS} = 0V$ |
| I_{GSS} | Gate-to-Source forward leakage | — | — | 100 | nA | $V_{GS} = 20V$ |
| | | — | — | -100 | | $V_{GS} = -20V$ |
| Q_g | Total gate charge | — | 11 | — | nC | $I_D = 12A,$ $V_{DS}=20V,$ $V_{GS} = 4.5V$ |
| Q_{gs} | Gate-to-Source charge | — | 3 | — | | |
| Q_{gd} | Gate-to-Drain("Miller") charge | — | 5 | — | | |
| $t_{d(on)}$ | Turn-on delay time | — | 4 | — | ns | $V_{GS}=10V, V_{DS}=12V,$ $R_{GEN}=3.3\Omega$ $I_D = 5A$ |
| t_r | Rise time | — | 10 | — | | |
| $t_{d(off)}$ | Turn-Off delay time | — | 22 | — | | |
| t_f | Fall time | — | 8 | — | | |
| C_{iss} | Input capacitance | — | 1203 | — | pF | $V_{GS} = 0V$ $V_{DS} = 15V$ $f = 1MHz$ |
| C_{oss} | Output capacitance | — | 154 | — | | |
| C_{riss} | Reverse transfer capacitance | — | 118 | — | | |

Source-Drain Ratings and Characteristics

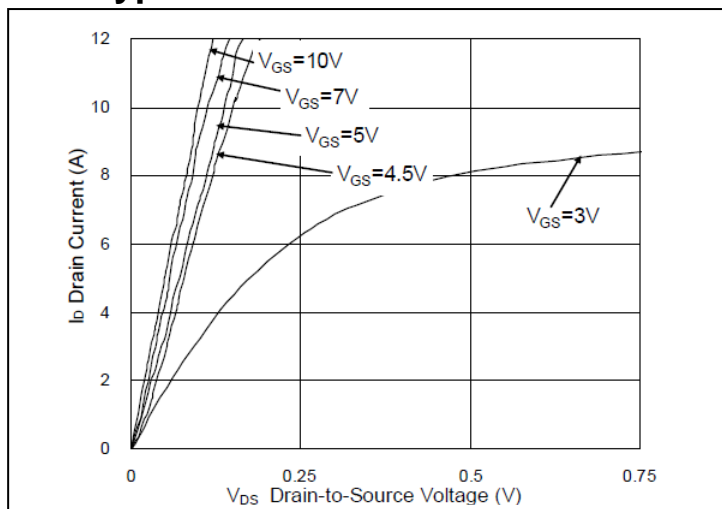
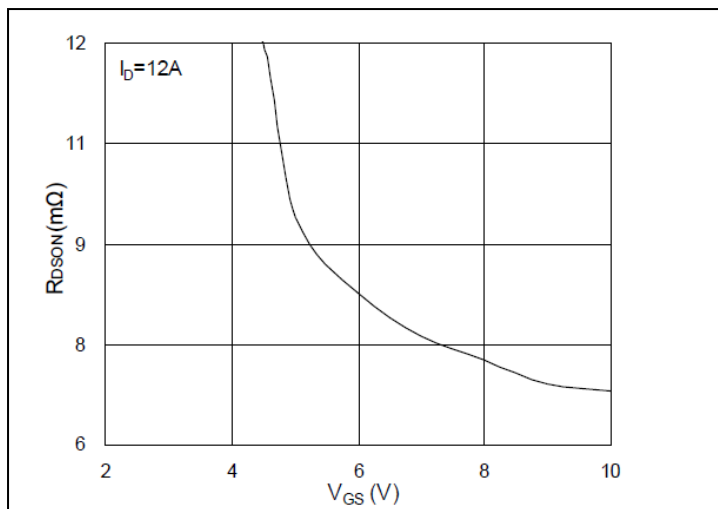
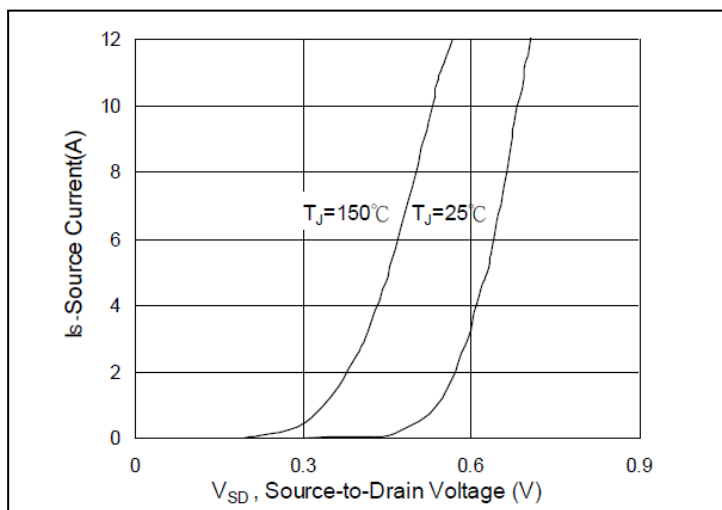
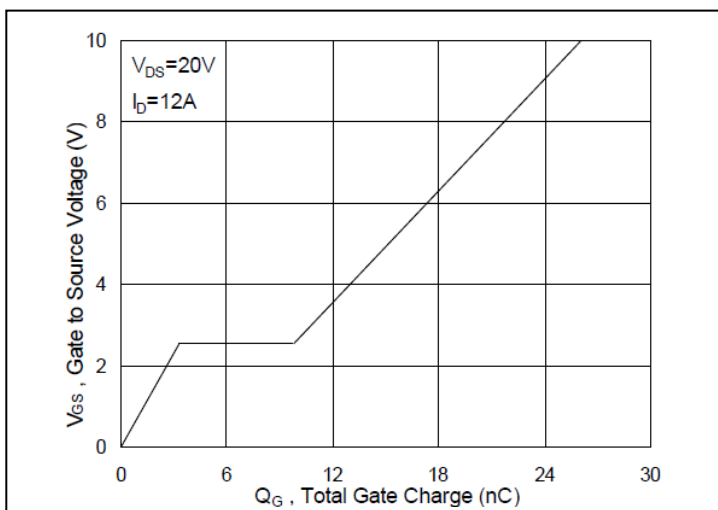
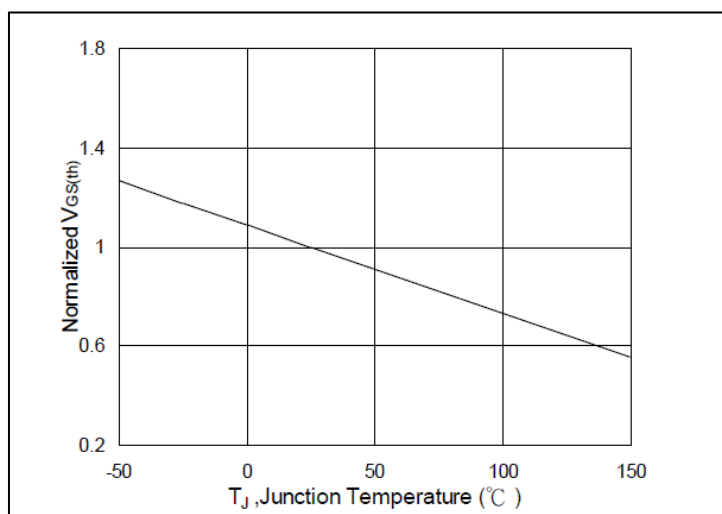
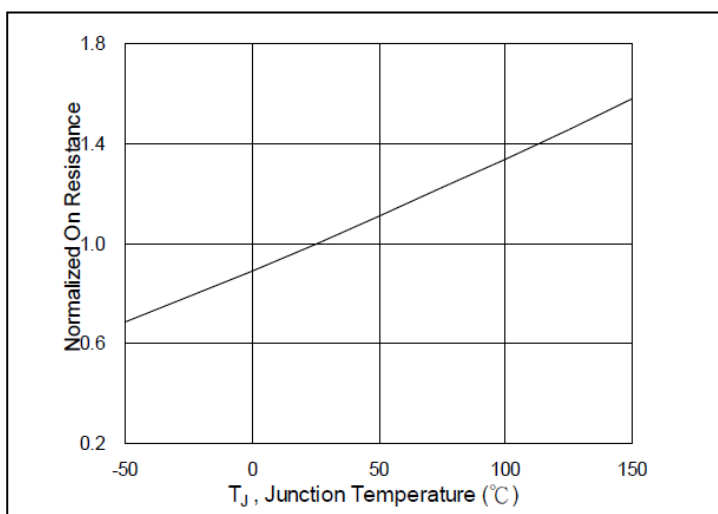
| Symbol | Parameter | Min. | Typ. | Max. | Units | Conditions |
|----------|---|------|------|------|-------|--|
| I_S | Continuous Source Current (Body Diode) | — | — | 46 | A | MOSFET symbol showing the integral reverse p-n junction diode.  |
| V_{SD} | Diode Forward Voltage | — | — | 1 | V | $I_S=1A, V_{GS}=0V$ |

Test circuits and Waveforms

EAS Test Circuit:

Gate charge test circuit:

Switching Time Test Circuit:

Switching Waveforms:


Notes:

- ① Calculated continuous current based on maximum allowable junction temperature.
- ② Repetitive rating; pulse width limited by max. junction temperature.
- ③ The power dissipation PD is based on max. junction temperature, using junction-to-case thermal
- ④ The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$

Typical electrical and thermal characteristics

Figure 1: Typical Output Characteristics

Figure 2: On-Resistance Vs. G-S Voltage

Figure 3: Source Drain Forward Characteristics

Figure 4: Gate Charge

Figure 5: V_{th} Vs. Case Temperature

Figure 6: Normalized On-Resistance Vs. Case Temperature

Typical electrical and thermal characteristics

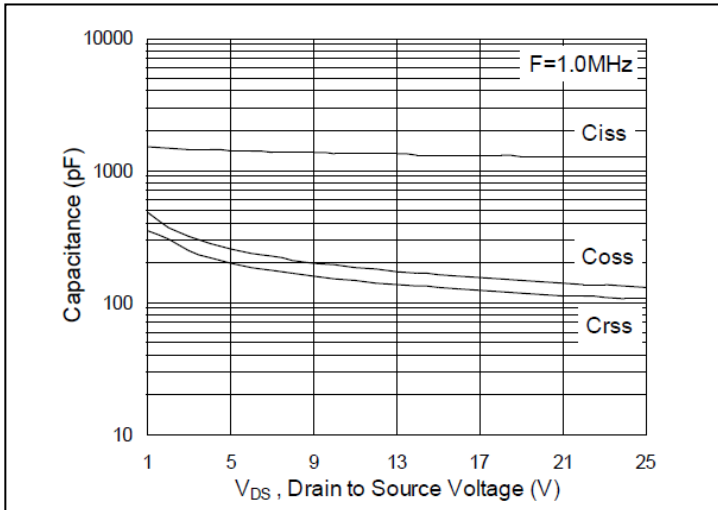


Figure 7: Capacitance

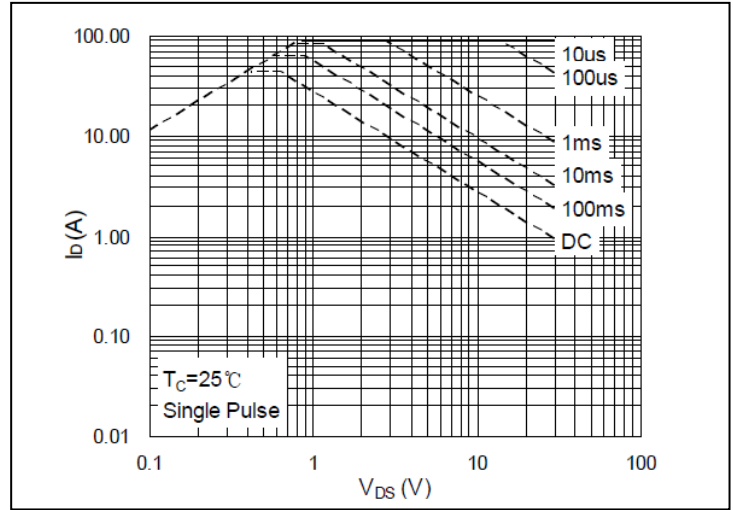


Figure 8: Safe Operation Area

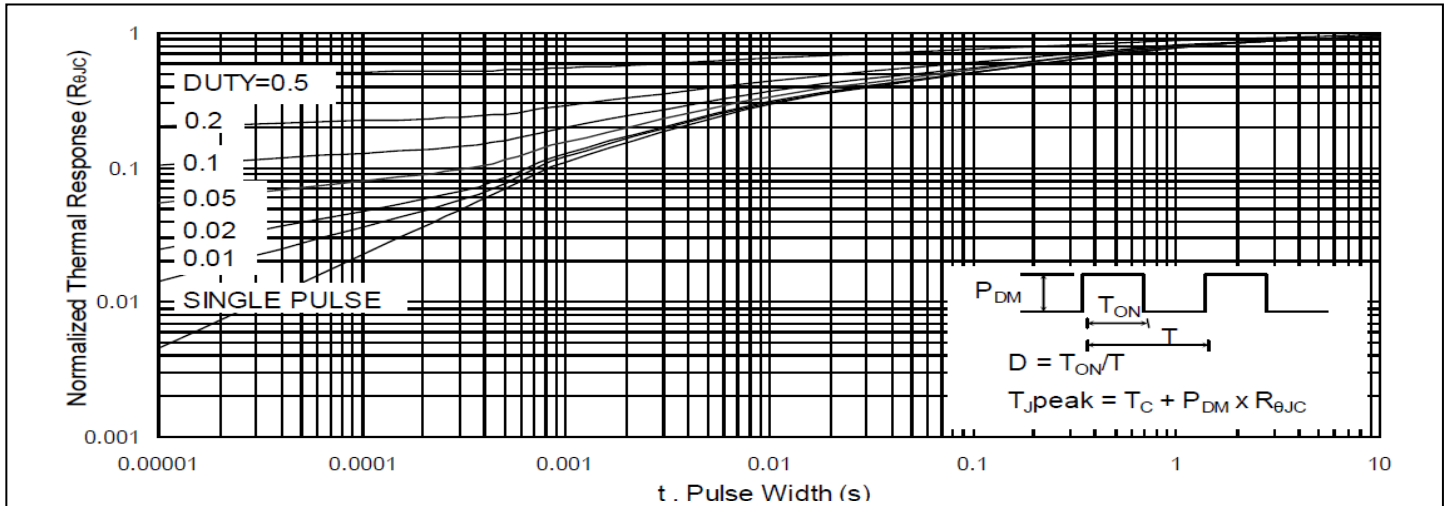
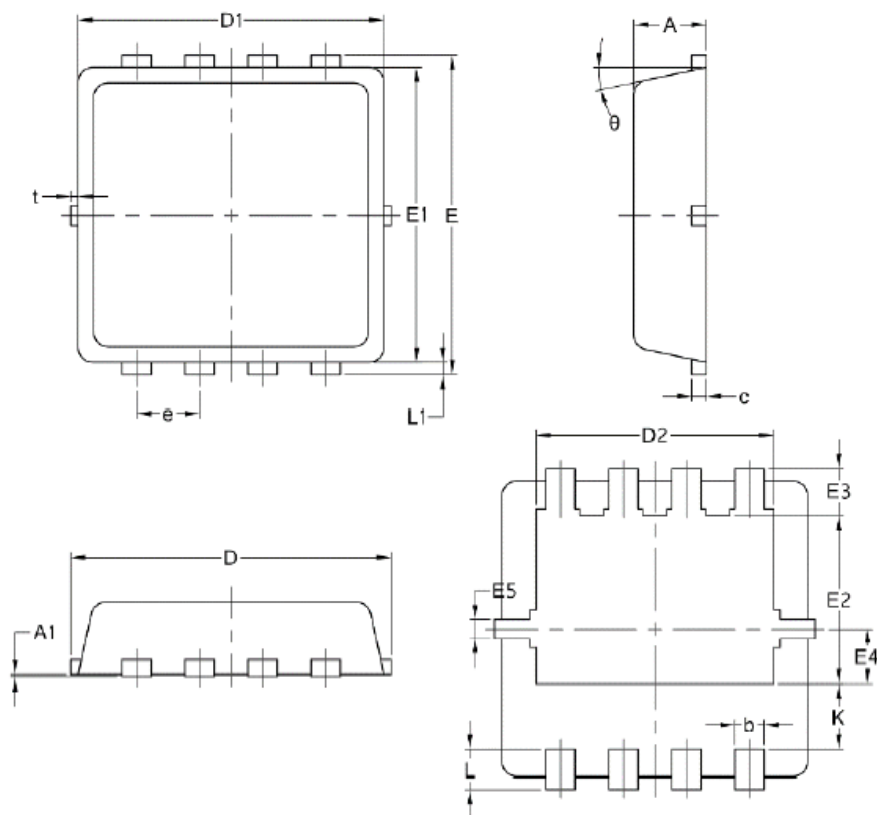


Figure 9: Transient Thermal Impedance

Mechanical Data:


| Symbol | Common | | |
|--------|--------|-------|------|
| | mm | | |
| | Mim | Nom | Max |
| A | 0.70 | 0.75 | 0.85 |
| A1 | / | / | 0.05 |
| b | 0.20 | 0.30 | 0.40 |
| c | 0.10 | 0.152 | 0.25 |
| D | 3.15 | 3.30 | 3.45 |
| D1 | 3.00 | 3.15 | 3.25 |
| D2 | 2.29 | 2.45 | 2.65 |
| E | 3.15 | 3.30 | 3.45 |
| E1 | 2.90 | 3.05 | 3.20 |
| E2 | 1.54 | 1.74 | 1.94 |
| E3 | 0.28 | 0.48 | 0.65 |
| E4 | 0.37 | 0.57 | 0.77 |
| E5 | 0.10 | 0.20 | 0.30 |
| e | 0.60 | 0.65 | 0.70 |
| K | 0.59 | 0.69 | 0.89 |
| L | 0.30 | 0.40 | 0.50 |
| L1 | 0.06 | 0.125 | 0.20 |
| t | 0 | 0.075 | 0.13 |
| Φ | 10 | 12 | 14 |

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