



Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)TYP}$ | I_D |
|---------------|---------------------|-------|
| 30V | 3.1m Ω @10V | 80A |
| | 4.6m Ω @4.5V | |

Feature

- Trench Technology Power MOSFET
- Low $R_{DS(ON)}$
- Low Gate Charge
- Low Gate Resistance
- 100% UIS Tested

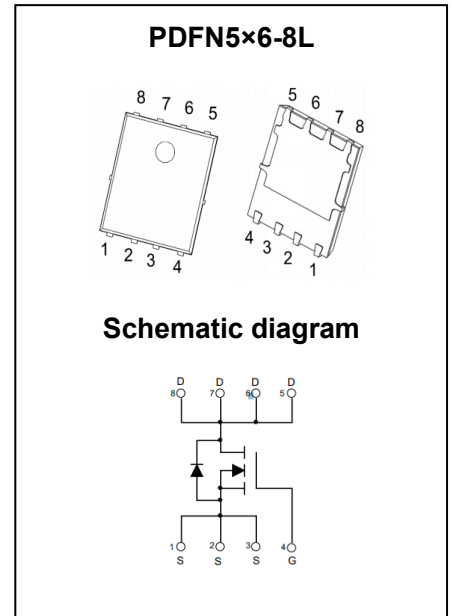
Application

- Power Switching Application

MARKING:



M041N03L = Device Code
XX = Date Code
Solid Dot = Green Indicator



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

| Parameter | Symbol | Value | Unit |
|--|---------------------------|-----------|--------------------|
| Drain - Source Voltage | V_{DS} | 30 | V |
| Gate - Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current ¹ | $T_C = 25^\circ\text{C}$ | I_D | 80 A |
| | $T_C = 100^\circ\text{C}$ | I_D | 55 A |
| Continuous Drain Current ⁶ | $T_A = 25^\circ\text{C}$ | I_D | 22 A |
| Pulsed Drain Current ² | I_{DM} | 240 | A |
| Single Pulsed Avalanche Current ³ | I_{AS} | 28 | A |
| Single Pulsed Avalanche Energy ³ | E_{AS} | 196 | mJ |
| Power Dissipation ⁵ | $T_C = 25^\circ\text{C}$ | P_D | 84 W |
| Power Dissipation ⁶ | $T_A = 25^\circ\text{C}$ | P_D | 2.5 W |
| Thermal Resistance from Junction to Ambient ⁶ | $R_{\theta JA}$ | 50 | $^\circ\text{C/W}$ |
| Thermal Resistance from Junction to Case | $R_{\theta JC}$ | 1.5 | $^\circ\text{C/W}$ |
| Junction Temperature | T_J | 150 | $^\circ\text{C}$ |
| Storage Temperature | T_{STG} | -55~ +150 | $^\circ\text{C}$ |

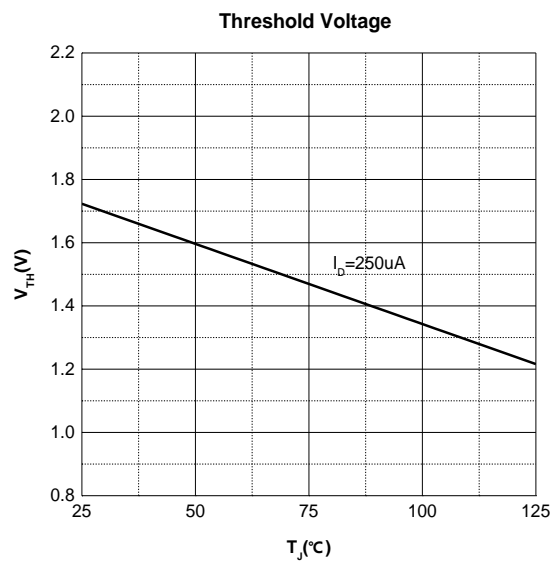
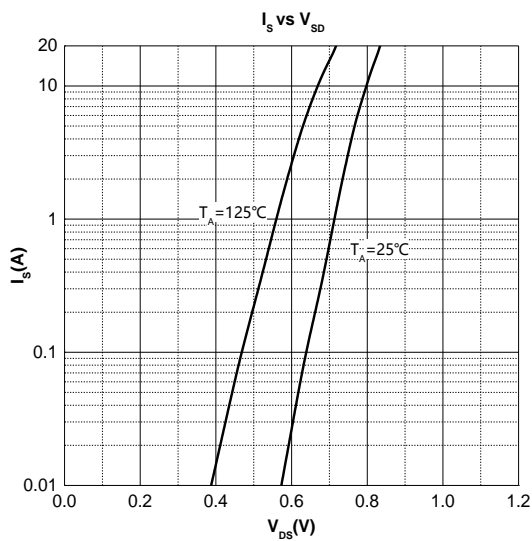
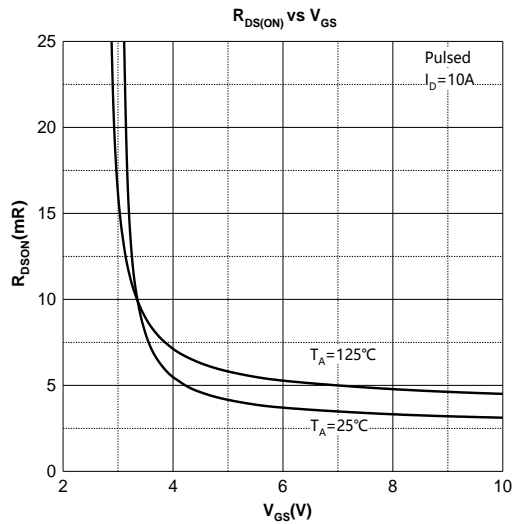
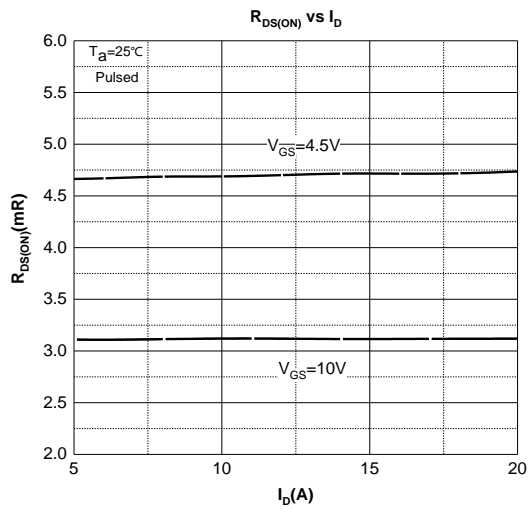
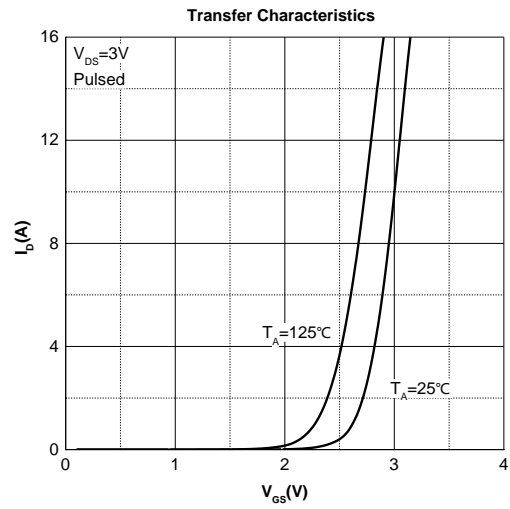
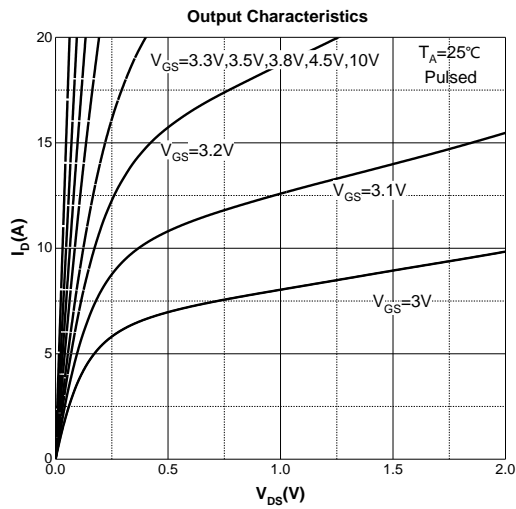
MOSFET ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$ unless otherwise noted)

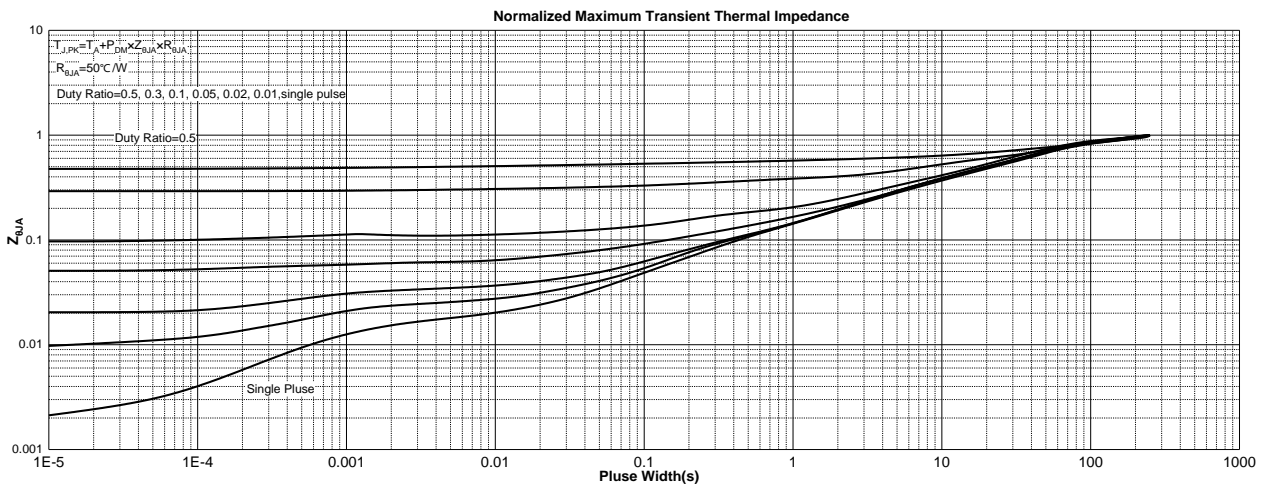
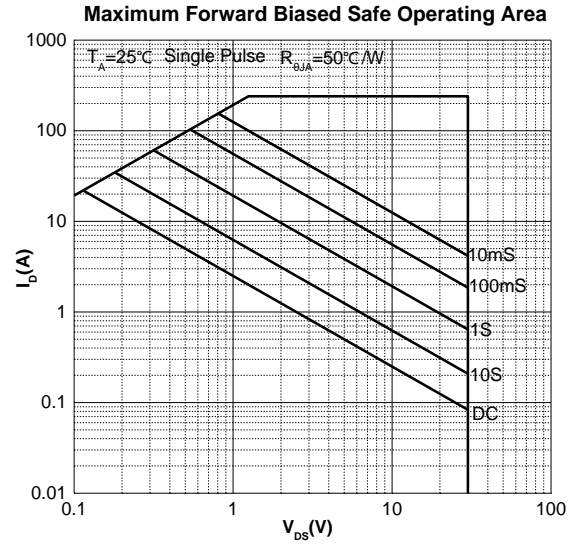
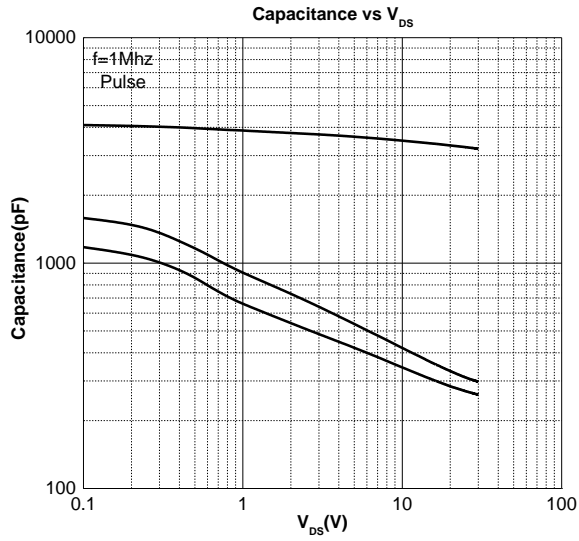
| Parameter | Symbol | Test Condition | Min | Type | Max | Unit |
|---|---------------|---|-----|------|-----------|------------|
| Off Characteristics | | | | | | |
| Drain - Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = 250\mu A$ | 30 | | | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS} = 24V, V_{GS} = 0V$ | | | 1 | μA |
| Gate - Body Leakage Current | I_{GSS} | $V_{GS} = \pm 20V, V_{DS} = 0V$ | | | ± 100 | nA |
| On Characteristics⁴ | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250\mu A$ | 1.0 | 1.7 | 3.0 | V |
| Drain-source On-resistance | $R_{DS(on)}$ | $V_{GS} = 10V, I_D = 10A$ | | 3.1 | 4.1 | m Ω |
| | | $V_{GS} = 4.5V, I_D = 10A$ | | 4.6 | 6.5 | |
| Forward Transconductance | g_{FS} | $V_{DS} = 10V, I_D = 10A$ | 10 | 20 | | S |
| Dynamic Characteristics | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS} = 15V, V_{GS} = 0V, f = 1MHz$ | | 3380 | | pF |
| Output Capacitance | C_{oss} | | | 620 | | |
| Reverse Transfer Capacitance | C_{riss} | | | 300 | | |
| Gate Resistance | R_g | $V_{DS} = 0V, V_{GS} = 0V, f = 1MHz$ | | 1.9 | | Ω |
| Switching Characteristics | | | | | | |
| Total Gate Charge | Q_g | $V_{DS} = 15V, V_{GS} = 4.5V, I_D = 20A$ | | 33 | | nC |
| Gate-source Charge | Q_{gs} | | | 10.6 | | |
| Gate-drain Charge | Q_{gd} | | | 20 | | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD} = 15V, V_{GS} = 10V, R_L = 0.75\Omega, R_G = 3\Omega$ | | 13 | | ns |
| Turn-on Rise Time | t_r | | | 17 | | |
| Turn-off Delay Time | $t_{d(off)}$ | | | 42 | | |
| Turn-off Fall Time | t_f | | | 16 | | |
| Source - Drain Diode Characteristics | | | | | | |
| Diode Forward Voltage ⁴ | V_{SD} | $V_{GS} = 0V, I_S = 10A$ | | | 1.2 | V |

Notes :

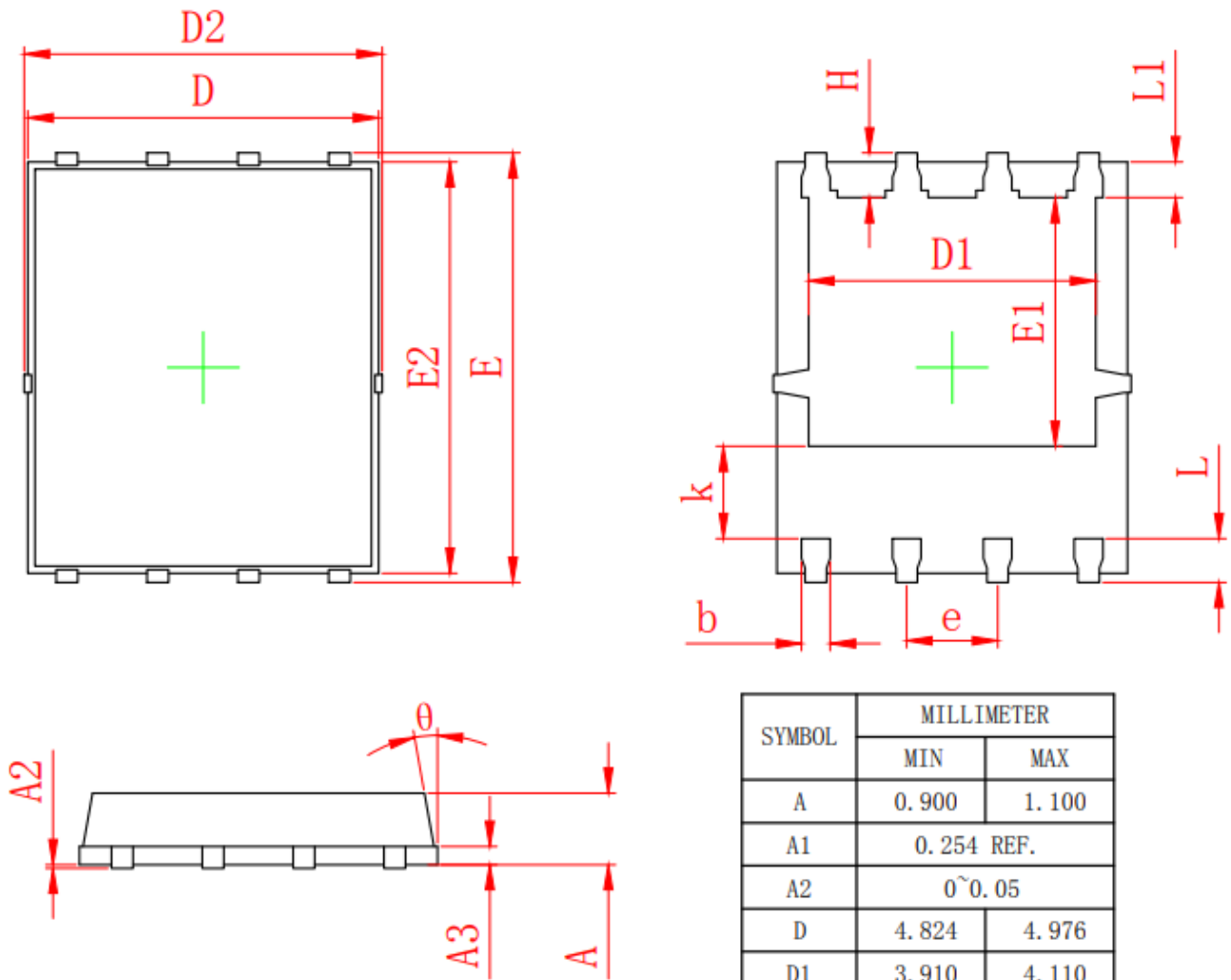
- 1.The maximum current rating is limited by package.And device mounted on a large heatsink
- 2.Pulse Test : Pulse Width $\leq 10\mu s$, duty cycle $\leq 1\%$.
- 3.EAS condition: $V_{DD} = 25V, V_{GS} = 10V, L = 0.5mH, R_G = 25\Omega$ Starting $T_J = 25^\circ\text{C}$.
- 4.Pulse Test : Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- 5.The power dissipation P_D is limited by $T_{J(MAX)} = 150^\circ\text{C}$.And device mounted on a large heatsink
- 6.Device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$.

Typical Characteristics





PDFN5×6-8L Package Information



| SYMBOL | MILLIMETER | |
|----------|------------|-------|
| | MIN | MAX |
| A | 0.900 | 1.100 |
| A1 | 0.254 REF. | |
| A2 | 0~0.05 | |
| D | 4.824 | 4.976 |
| D1 | 3.910 | 4.110 |
| D2 | 4.944 | 5.076 |
| E | 5.924 | 6.076 |
| E1 | 3.375 | 3.575 |
| E2 | 5.674 | 5.826 |
| b | 0.350 | 0.450 |
| e | 1.270 TYP. | |
| L | 0.534 | 0.686 |
| L1 | 0.424 | 0.576 |
| k | 1.190 | 1.390 |
| H | 0.549 | 0.701 |
| θ | 8° | 12° |