

Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)TYP}$ | I_D |
|---------------|---------------------|-------|
| 40V | 2.0m Ω @10V | 120A |
| | 2.7m Ω @4.5V | |

Feature

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

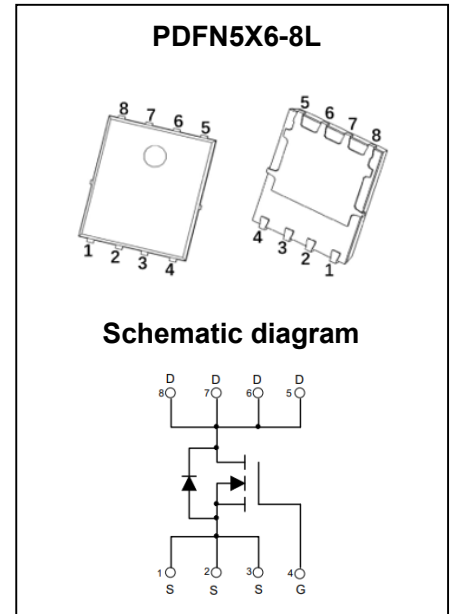
Application

- Power Switching Application

MARKING:



T023N04L = 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} | 40 | V | |
| Gate - Source Voltage | V_{GS} | ± 20 | V | |
| Continuous Drain Current ¹ | $T_C = 25^\circ\text{C}$ | I_D | 120 | A |
| | $T_C = 100^\circ\text{C}$ | I_D | 84 | A |
| Pulsed Drain Current ² | I_{DM} | 480 | A | |
| Single Pulsed Avalanche Current ³ | I_{AS} | 38 | A | |
| Single Pulsed Avalanche Energy ³ | E_{AS} | 361 | mJ | |
| Power Dissipation ⁵ | $T_C = 25^\circ\text{C}$ | P_D | 132 | W |
| Thermal Resistance from Junction to Ambient ⁶ | $R_{\theta JA}$ | 50 | $^\circ\text{C}/\text{W}$ | |
| Thermal Resistance from Junction to Case | $R_{\theta JC}$ | 0.95 | $^\circ\text{C}/\text{W}$ | |
| Junction Temperature | T_J | 150 | $^\circ\text{C}$ | |
| Storage Temperature | T_{STG} | -55~ +150 | $^\circ\text{C}$ | |

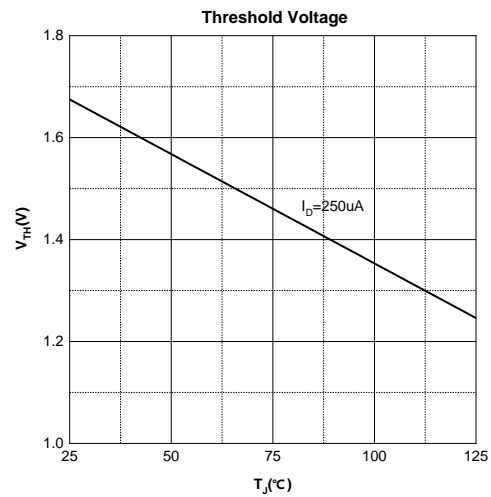
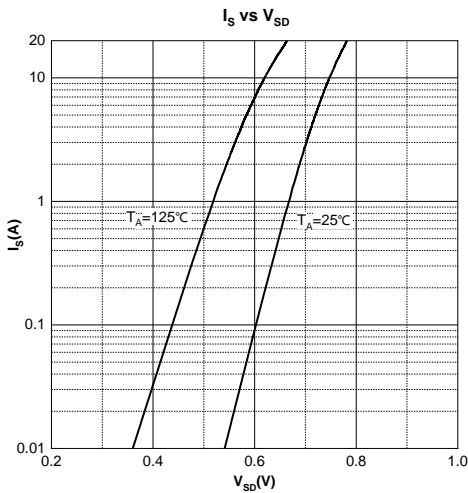
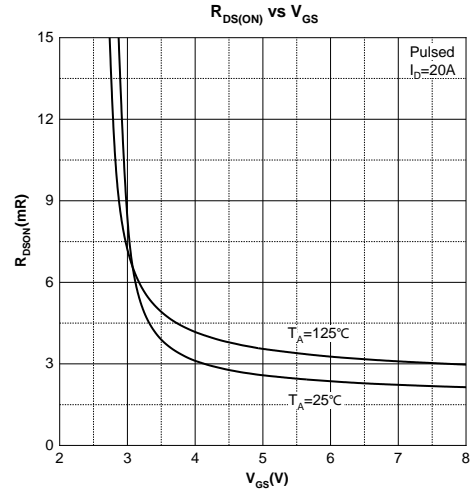
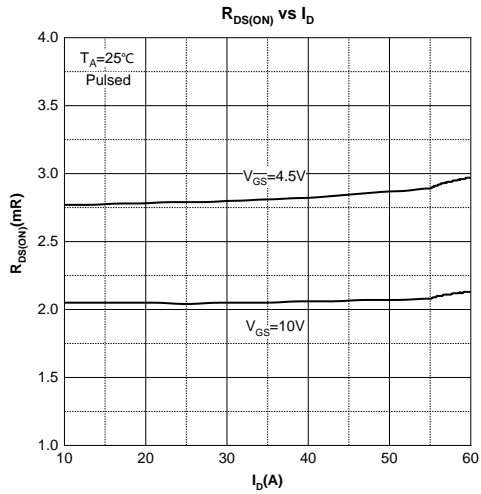
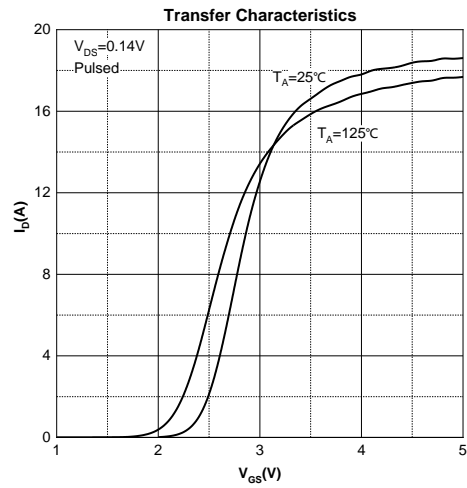
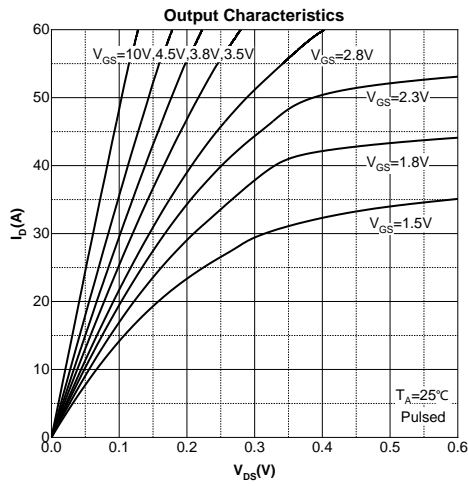
MOSFET ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

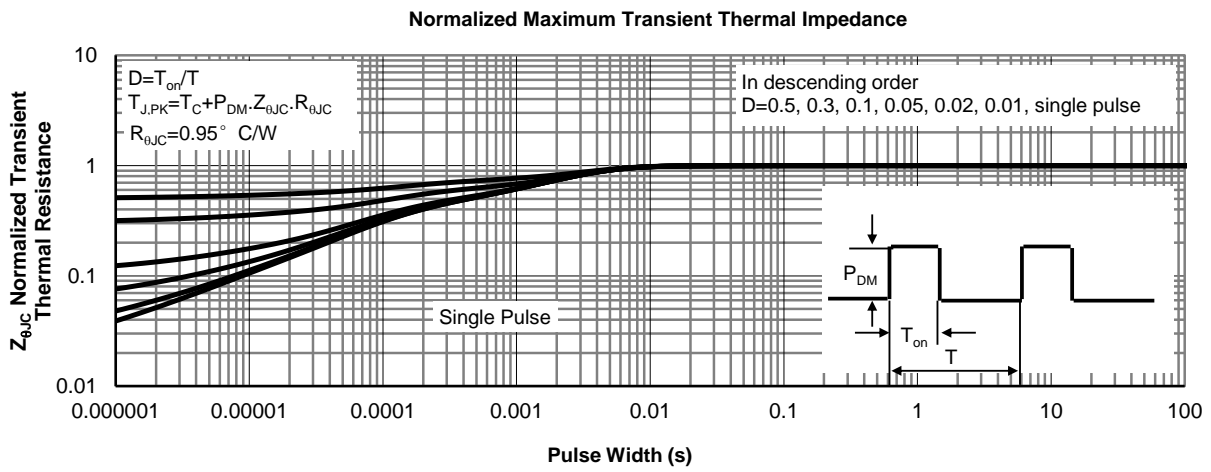
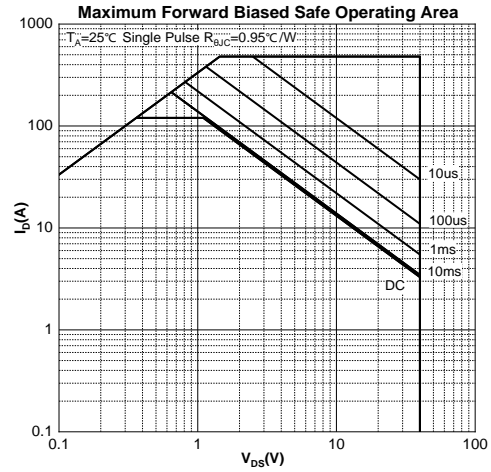
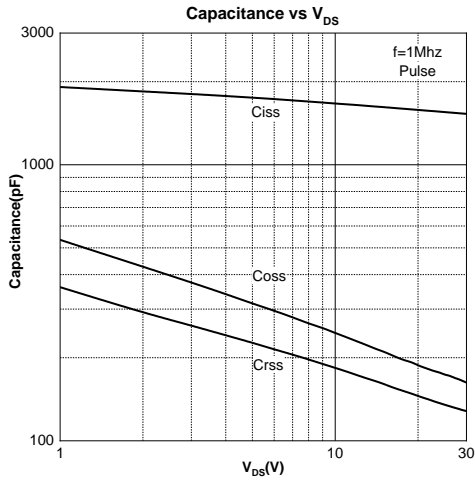
| Parameter | Symbol | Test Condition | Min | Type | Max | Unit |
|---|---------------|---|-----|------|-----------|------------|
| Off Characteristics | | | | | | |
| Drain - Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = 250\mu A$ | 40 | | | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS} = 40V, V_{GS} = 0V$ | | | 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 | $R_{DS(on)}$ | $V_{GS} = 10V, I_D = 20A$ | | 2.0 | 3.0 | m Ω |
| | | $V_{GS} = 4.5V, I_D = 10A$ | | 2.7 | 3.7 | |
| Forward Transconductance | g_{FS} | $V_{DS} = 5V, I_D = 20A$ | | 77 | | S |
| Dynamic Characteristics | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS} = 15V, V_{GS} = 0V, f = 1MHz$ | | 3131 | | pF |
| Output Capacitance | C_{oss} | | | 114 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 72 | | |
| Gate Resistance | R_g | $V_{DS} = 0V, V_{GS} = 0V, f = 1MHz$ | | 3.7 | | Ω |
| Switching Characteristics | | | | | | |
| Total Gate Charge | Q_g | $V_{DS} = 20V, V_{GS} = 10V, I_D = 20A$ | | 48.5 | | nC |
| Gate-source Charge | Q_{gs} | | | 8.3 | | |
| Gate-drain Charge | Q_{gd} | | | 7.4 | | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD} = 20V, V_{GS} = 10V, R_L = 1\Omega,$ $R_G = 3\Omega$ | | 12 | | ns |
| Turn-on Rise Time | t_r | | | 3 | | |
| Turn-off Delay Time | $t_{d(off)}$ | | | 30 | | |
| Turn-off Fall Time | t_f | | | 4 | | |
| Source - Drain Diode Characteristics | | | | | | |
| Diode Forward Voltage ⁴ | V_{SD} | $V_{GS} = 0V, I_S = 10A$ | | | 1.2 | V |

Notes :

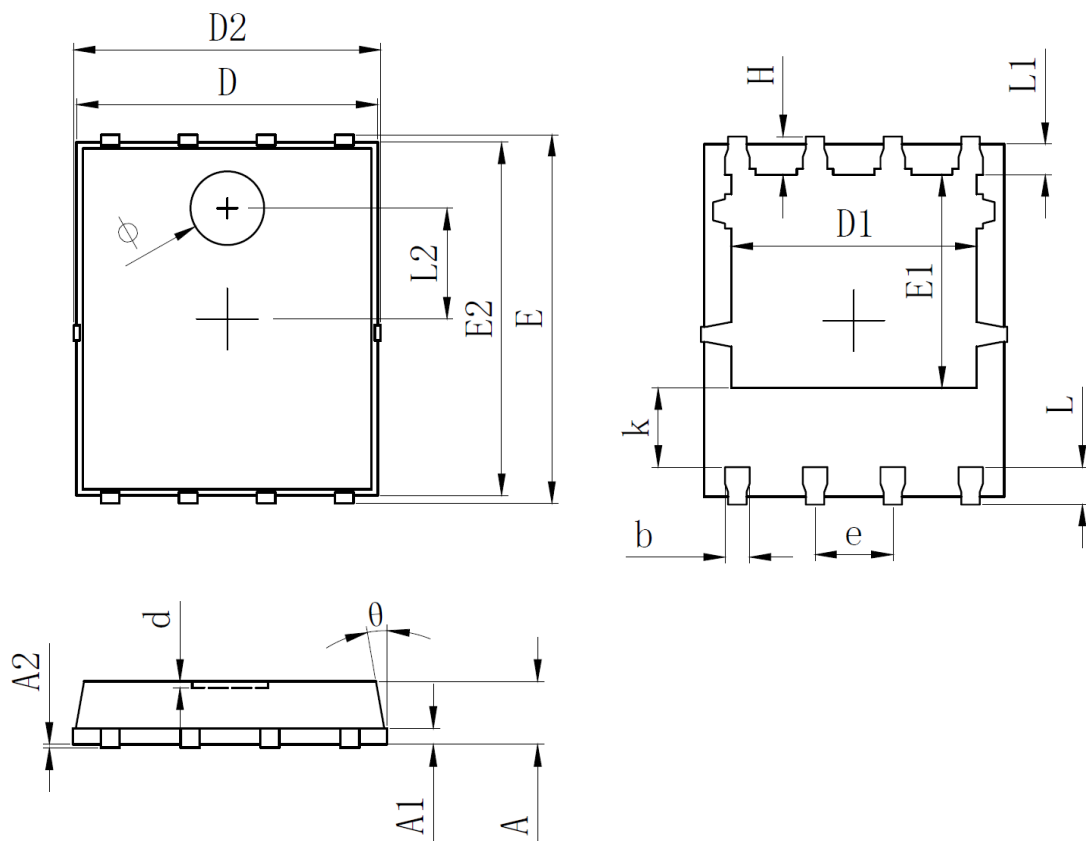
- 1.The maximum current rating is limited by package.And device mounted on a large heatsink
- 2.Pulse Test : Pulse Width $\leq 10\mu s$, duty cycle $\leq 1\%$.
- 3.EAS condition: $V_{DD} = 25V, V_{GS} = 10V, L = 0.5mH, R_G = 25\Omega$ Starting $T_J = 25^\circ\text{C}$.
- 4.Pulse Test : Pulse Width $\leq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

Typical Characteristics





PDFN5X6-8L Package Information



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|----------|---------------------------|-------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 0.900 | 1.100 | 0.035 | 0.043 |
| A1 | 0.254REF | | 0.010REF | |
| A2 | 0.000 | 0.050 | 0.000 | 0.002 |
| D | 4.824 | 4.976 | 0.190 | 0.196 |
| D1 | 3.910 | 4.110 | 0.154 | 0.162 |
| D2 | 4.924 | 5.076 | 0.194 | 0.200 |
| E | 5.924 | 6.076 | 0.233 | 0.239 |
| E1 | 3.375 | 3.575 | 0.133 | 0.141 |
| E2 | 5.674 | 5.826 | 0.223 | 0.229 |
| b | 0.350 | 0.450 | 0.014 | 0.018 |
| e | 1.270TYP | | 0.050TYP | |
| L | 0.534 | 0.686 | 0.021 | 0.027 |
| L1 | 0.424 | 0.576 | 0.017 | 0.023 |
| k | 1.190 | 1.390 | 0.047 | 0.055 |
| H | 0.549 | 0.701 | 0.022 | 0.028 |
| θ | 8° | 12° | 8° | 12° |
| Φ | 1.100 | 1.300 | 0.043 | 0.051 |
| d | - | 0.100 | - | 0.004 |