

### Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)TYP}$ | $I_D$ |
|---------------|-----------------|-------|
| 40V           | 1.5mΩ@10V       | 120A  |
|               | 2.0mΩ@4.5V      |       |

### Feature

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

### Application

- Current Switching in DC/DC & AC/DC (SR) Sub-systems

### MARKING:

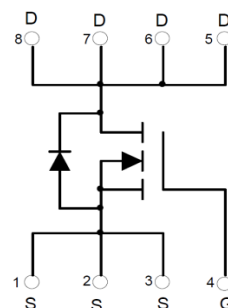


T015N04L = Device Code  
 XX = Date Code  
 Solid Dot = Green Indicator

### PLP3.3X3.3-8L



### Schematic diagram



### 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 <sup>1</sup>                    | $T_C = 25^\circ\text{C}$  | $I_D$           | 120       | A                  |
|                                                          | $T_C = 100^\circ\text{C}$ | $I_D$           | 78        | A                  |
| Pulsed Drain Current <sup>2</sup>                        |                           | $I_{DM}$        | 480       | A                  |
| Single Pulsed Avalanche Current <sup>3</sup>             |                           | $I_{AS}$        | 36        | A                  |
| Single Pulsed Avalanche Energy <sup>3</sup>              |                           | $E_{AS}$        | 324       | mJ                 |
| Power Dissipation <sup>5</sup>                           |                           | $P_D$           | 66        | W                  |
| $T_C = 25^\circ\text{C}$                                 |                           |                 |           |                    |
| Thermal Resistance from Junction to Ambient <sup>6</sup> |                           | $R_{\theta JA}$ | 39        | $^\circ\text{C/W}$ |
| Thermal Resistance from Junction to Case                 |                           | $R_{\theta JC}$ | 1.9       | $^\circ\text{C/W}$ |
| Junction Temperature                                     |                           | $T_J$           | 150       | $^\circ\text{C}$   |
| Storage Temperature                                      |                           | $T_{STG}$       | -55~ +150 | $^\circ\text{C}$   |

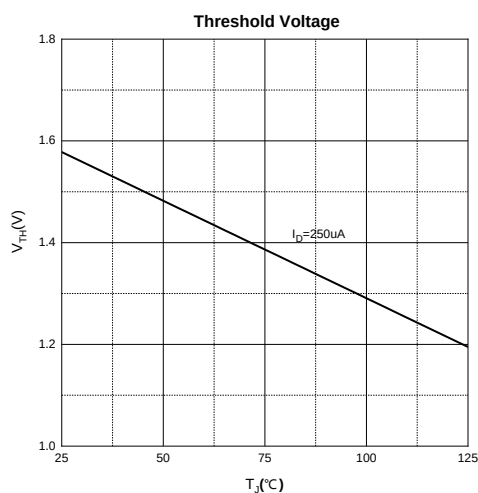
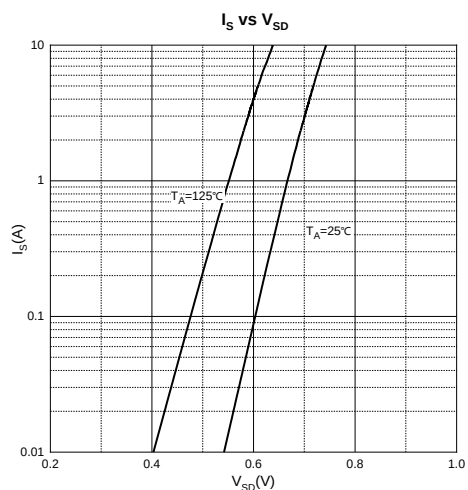
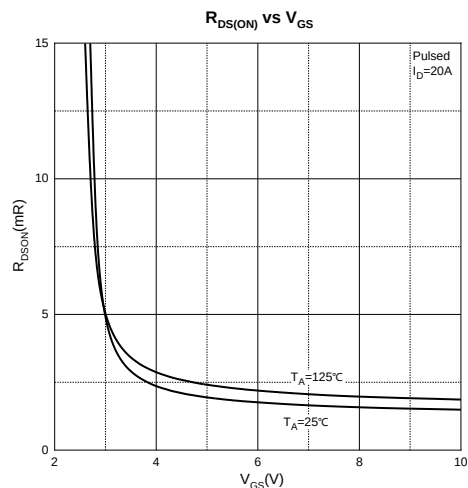
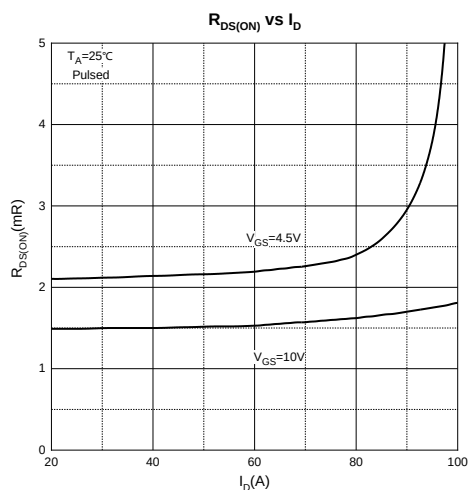
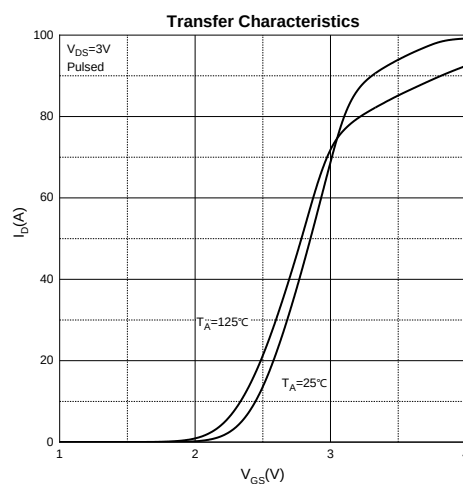
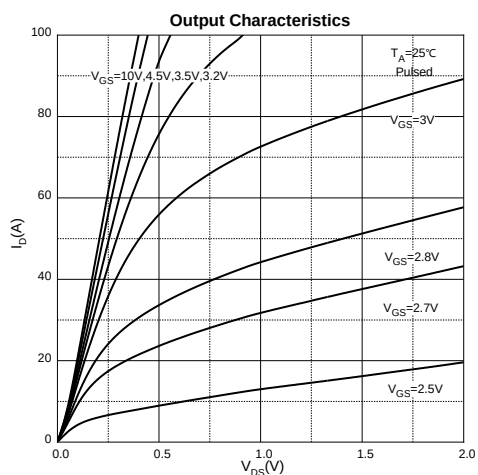
**MOSFET ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$  unless otherwise noted)**

| 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         | $\mu A$    |
| Gate - Body Leakage Current          | $I_{GSS}$     | $V_{GS} = \pm 20V, V_{DS} = 0V$                               |     |      | $\pm 100$ | nA         |
| On Characteristics <sup>4</sup>      |               |                                                               |     |      |           |            |
| Gate Threshold Voltage               | $V_{GS(th)}$  | $V_{DS} = V_{GS}, I_D = 250\mu A$                             | 1   | 1.5  | 3         | V          |
| Drain-source On-resistance           | $R_{DS(on)}$  | $V_{GS} = 10V, I_D = 20A$                                     |     | 1.5  | 2         | m $\Omega$ |
|                                      |               | $V_{GS} = 4.5V, I_D = 10A$                                    |     | 2    | 3         |            |
| Dynamic Characteristics              |               |                                                               |     |      |           |            |
| Input Capacitance                    | $C_{iss}$     | $V_{DS} = 20V, V_{GS} = 0V, f = 1MHz$                         |     | 3280 |           | pF         |
| Output Capacitance                   | $C_{oss}$     |                                                               |     | 1058 |           |            |
| Reverse Transfer Capacitance         | $C_{rss}$     |                                                               |     | 73   |           |            |
| Gate Resistance                      | $R_g$         | $V_{DS} = 0V, V_{GS} = 0V, f = 1MHz$                          |     | 3.5  |           | $\Omega$   |
| Switching Characteristics            |               |                                                               |     |      |           |            |
| Total Gate Charge                    | $Q_g$         | $V_{DS} = 30V, V_{GS} = 10V, I_D = 20A$                       |     | 54.4 |           | nC         |
| Gate-source Charge                   | $Q_{gs}$      |                                                               |     | 8.0  |           |            |
| Gate-drain Charge                    | $Q_{gd}$      |                                                               |     | 9.7  |           |            |
| Turn-on Delay Time                   | $t_{d(on)}$   | $V_{DD} = 20V, V_{GS} = 10V, I_D = 20A,$<br>$R_G = 1.6\Omega$ |     | 10   |           | ns         |
| Turn-on Rise Time                    | $t_r$         |                                                               |     | 5    |           |            |
| Turn-off Delay Time                  | $t_{d(off)}$  |                                                               |     | 45   |           |            |
| Turn-off Fall Time                   | $t_f$         |                                                               |     | 10   |           |            |
| Source - Drain Diode Characteristics |               |                                                               |     |      |           |            |
| Diode Forward Voltage <sup>4</sup>   | $V_{SD}$      | $V_{GS} = 0V, I_S = 10A$                                      |     |      | 1.2       | V          |

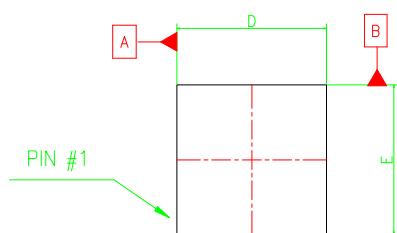
Notes :

- 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:  $V_{DD} = 20V, V_{GS} = 10V, L = 0.5mH, R_G = 25\Omega$  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  $T_A = 25^\circ\text{C}$ .

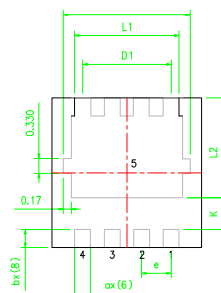
## Typical Characteristics



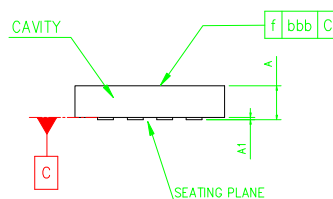
## PLP3.3X3.3-8L Package Information



Top View



Bottom View



Side View

| symbol | Dimension in mm |       |       |
|--------|-----------------|-------|-------|
|        | MIN             | NOM   | MAX   |
| A      | 0.650           | 0.700 | 0.750 |
| A1     | 0.025           | 0.050 | 0.075 |
| D      | 3.200           | 3.300 | 3.400 |
| E      | 3.200           | 3.300 | 3.40  |
| D1     | ---             | 1.950 | ---   |
| e      | ---             | 0.650 | ---   |
| ax(6)  | 0.300           | 0.350 | 0.400 |
| bx(8)  | 0.350           | 0.400 | 0.450 |
| L1     | 2.250           | 2.300 | 2.350 |
| L2     | 2.150           | 2.200 | 2.250 |
| L3     | 2.750           | 2.800 | 2.850 |
| K      | 0.600           | 0.700 | 0.800 |
| bbb    | 0.100           |       |       |
| N      | 5               |       |       |
| MD/ME  | 4/2             |       |       |
|        |                 |       |       |
|        |                 |       |       |