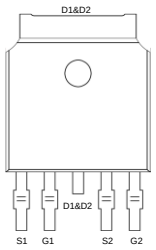
# GPM800NP06LTG

## 60V N- and P-Channel MOSFET

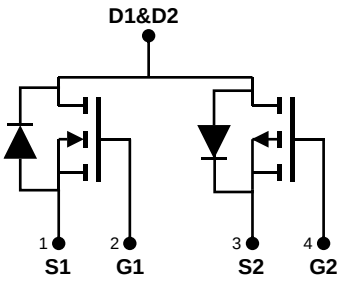
### Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)TYP}$ | $I_D$ |
|---|---|---|
| 60V | 30mΩ@10V | 18A |
| | 37mΩ@4.5V | |
| -60V | 62mΩ@-10V | -12A |
| | 75mΩ@-4.5V | |

**TO-252-4L**




**Schematic diagram**



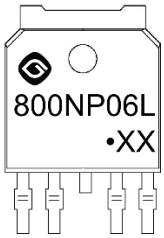

### Feature

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

### Application

- Synchronous Rectifiers
- Wireless Power
- H-bridge Motor Drive

### MARKING:




800NP06L = Device Code
XX = Data Code
Solid Dot = Green Device Indicater

### ABSOLUTE MAXIMUM RATINGS ($T_A$ = 25℃ unless otherwise noted)

| Parameter | | Symbol | NMOS | PMOS | Unit |
|---|---|---|---|---|---|
| Drain - Source Voltage | | $V_{DS}$ | 60 | -60 | V |
| Gate - Source Voltage | | $V_{GS}$ | ±20 | ±20 | V |
| Continuous Drain Current[1] | $T_C$ = 25℃ | $I_D$ | 18 | -12 | A |
| Pulsed Drain Current[2] | | $I_{DM}$ | 72 | -48 | A |
| Single Pulsed Avalanche Current[3,4] | | $I_{AS}$ | 15 | -12 | A |
| Single Pulsed Avalanche Energy[3,4] | | $E_{AS}$ | 56 | 36 | mJ |
| Power Dissipation[6] | | $P_D$ | 16 | 14 | W |
| Thermal Resistance from Junction to Ambient[7] | | $R_{\theta JA}$ | 50 | 50 | ℃/W |
| Thermal Resistance from Junction to Case | | $R_{\theta JC}$ | 8 | 9 | ℃/W |
| Junction Temperature | | $T_J$ | 150 | 150 | ℃ |
| Storage Temperature | | $T_{STG}$ | -55~ +150 | -55~ +150 | ℃ |

**MOSFET ELECTRICAL CHARACTERISTICS ($T_J$ = 25℃ unless otherwise noted)**

**NMOS:**

| Parameter | Symbol | Test Condition | Min | Type | Max | Unit |
|---|---|---|---|---|---|---|
| **Off Characteristics** | | | | | | |
| Drain - Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$ = 0V, $I_D$ = 250μA | 60 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ = 48V, $V_{GS}$ = 0V | | | 1 | μA |
| Gate - Body Leakage Current | $I_{GSS}$ | $V_{GS}$ = ±20V, $V_{DS}$ = 0V | | | ±100 | nA |
| **On Characteristics[5]** | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$ = $V_{GS}$, $I_D$ = 250μA | 1 | 1.7 | 3 | V |
| Drain-source On-resistance | $R_{DS(on)}$ | $V_{GS}$ = 10V, $I_D$ = 10A | | 30 | 40 | mΩ |
| | | $V_{GS}$ = 4.5V, $I_D$ = 8A | | 37 | 55 | |
| Forward tranconductance | $g_{FS}$ | $V_{DS}$ = 6V, $I_D$ = 10A | 5 | | | S |
| **Dynamic Characteristics** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$ = 30V, $V_{GS}$ = 0V, f = 1MHz | | 974 | | pF |
| Output Capacitance | $C_{oss}$ | | | 62 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 53 | | |
| Gate Resistance | $R_g$ | $V_{DS}$ = 0V, $V_{GS}$ = 0V, f = 1MHz | | 1.8 | | Ω |
| **Switching Characteristics** | | | | | | |
| Total Gate Charge | $Q_g$ | $V_{DS}$ = 30V, $V_{GS}$ = 10V, $I_D$ = 10A | | 20 | | nC |
| Gate-source Charge | $Q_{gs}$ | | | 2.7 | | |
| Gate-drain Charge | $Q_{gd}$ | | | 4.7 | | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD}$ = 30V, $V_{GS}$ = 10V, $R_L$ = 2.5Ω $R_G$ = 3Ω | | 5.6 | | ns |
| Turn-on Rise Time | $t_r$ | | | 4.8 | | |
| Turn-off Delay Ttime | $t_{d(off)}$ | | | 26 | | |
| Turn-off Fall Time | $t_f$ | | | 3.5 | | |
| **Source - Drain Diode Characteristics** | | | | | | |
| Diode Forward Voltage[5] | $V_{SD}$ | $V_{GS}$ = 0V, $I_S$ = 10A | | | 1.2 | V |

**PMOS:**

| Parameter | Symbol | Test Condition | Min | Type | Max | Unit |
|---|---|---|---|---|---|---|
| **Off Characteristics** | | | | | | |
| Drain - Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$ = 0V, $I_D$ = -250μA | -60 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ = -48V, $V_{GS}$ = 0V | | | -1 | μA |
| Gate - Body Leakage Current | $I_{GSS}$ | $V_{GS}$ = ±20V, $V_{DS}$ = 0V | | | ±100 | nA |
| **On Characteristics[5]** | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$ = $V_{GS}$, $I_D$ = -250μA | -1 | -2 | -3 | V |
| Drain-source On-resistance | $R_{DS(on)}$ | $V_{GS}$ = -10V, $I_D$ = -6A | | 62 | 80 | mΩ |
| | | $V_{GS}$ = -4.5V, $I_D$ = -5A | | 75 | 110 | |
| Forward tranconductance | $g_{FS}$ | $V_{DS}$ = -6V, $I_D$ = -6A | 5 | | | S |
| **Dynamic Characteristics** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$ = -30V, $V_{GS}$ = 0V, f = 1MHz | | 892 | | pF |
| Output Capacitance | $C_{oss}$ | | | 72 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 61 | | |
| Gate Resistance | $R_g$ | $V_{DS}$ = 0V, $V_{GS}$ = 0V, f = 1MHz | | 2.5 | | Ω |
| **Switching Characteristics** | | | | | | |
| Total Gate Charge | $Q_g$ | $V_{DS}$ = -30V, $V_{GS}$ = -10V, $I_D$ = -10A | | 22 | | nC |
| Gate-source Charge | $Q_{gs}$ | | | 2.7 | | |
| Gate-drain Charge | $Q_{gd}$ | | | 5 | | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD}$ = -30V, $V_{GS}$ = -10V, $R_L$ = 2.5Ω $R_G$ = 3Ω | | 10 | | ns |
| Turn-on Rise Time | $t_r$ | | | 12 | | |
| Turn-off Delay Ttime | $t_{d(off)}$ | | | 24 | | |
| Turn-off Fall Time | $t_f$ | | | 10 | | |
| **Source - Drain Diode Characteristics** | | | | | | |
| Diode Forward Voltage[5] | $V_{SD}$ | $V_{GS}$ = 0V, $I_S$ = -6A | | | -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 ≤ 10μs, duty cycle ≤ 1%.

3.$E_{AS}$ condition: $V_{DD}$ = 30V,$V_{GS}$ = 10V, L = 0.5mH, $R_G$ = 25Ω Starting $T_J$ = 25°℃.

4.$E_{AS}$ condition: $V_{DD}$ = -30V,$V_{GS}$ = -10V, L = 0.5mH, $R_G$ = 25Ω Starting $T_J$ = 25°℃.

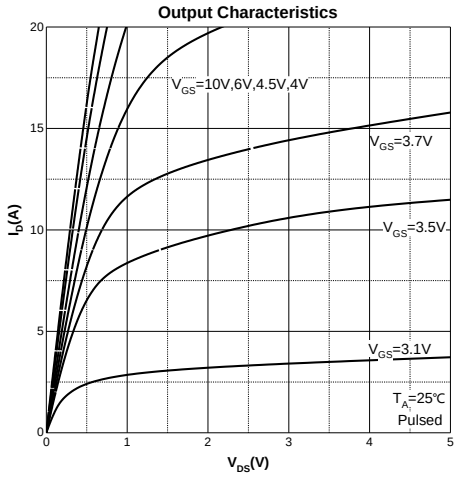
5.Pulse Test : Pulse Width ≤ 300μs, duty cycle ≤ 2%.

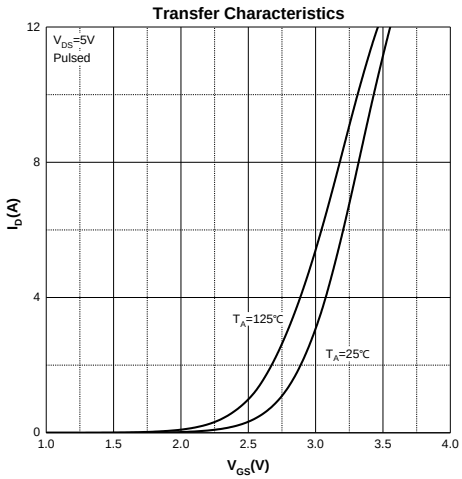
6.The power dissipation $P_D$ is limited by $T_{J(MAX)}$ = 150°C.And device mounted on a large heatsink

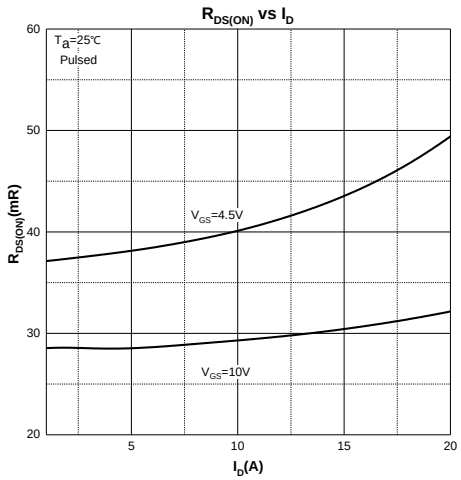
7.Device mounted on 1in$^2$ FR-4 board with 2oz. Copper, in a still air environment with $T_A$ =25°C.

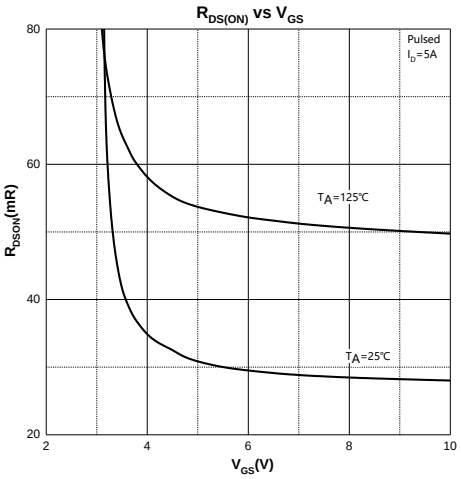
## Typical Characteristics

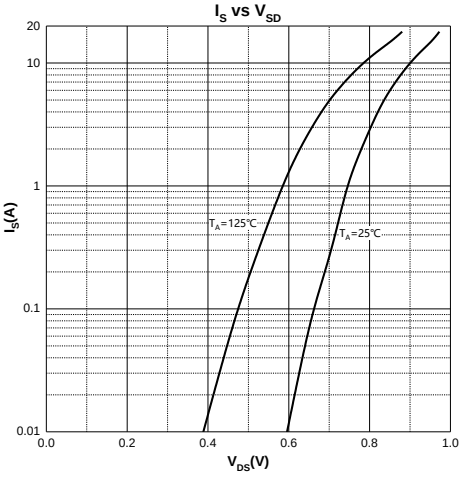
### NMOS:

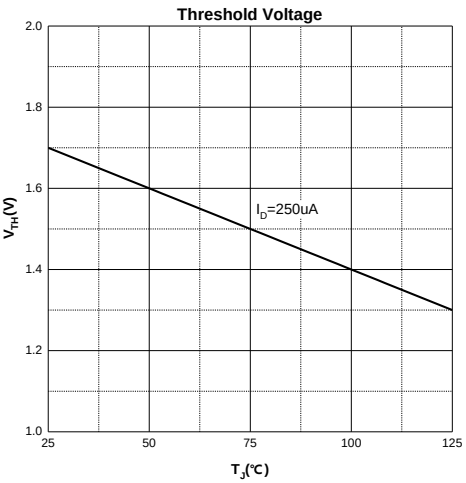


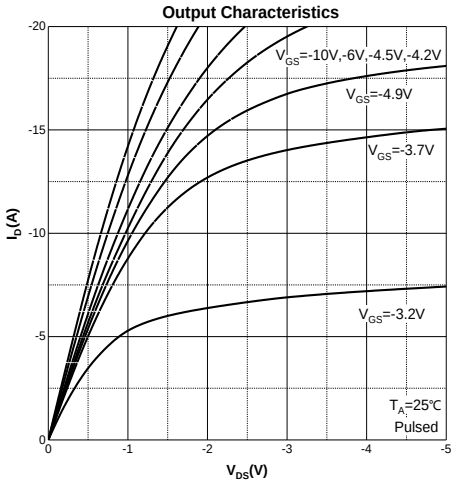



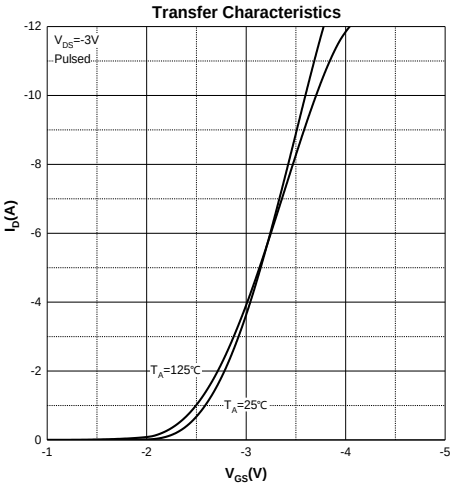



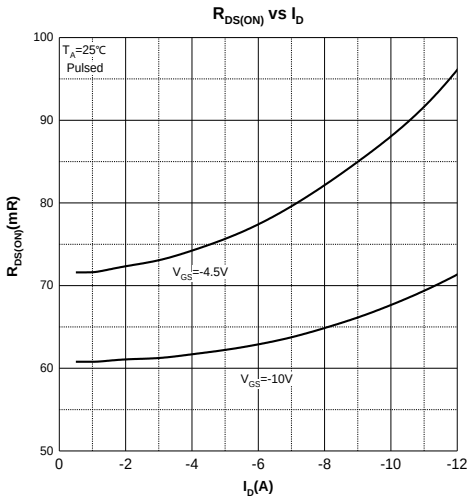



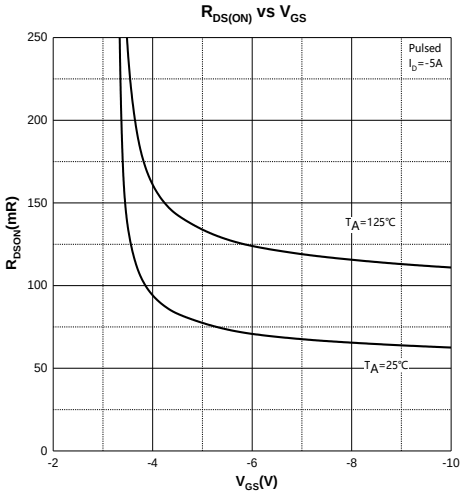



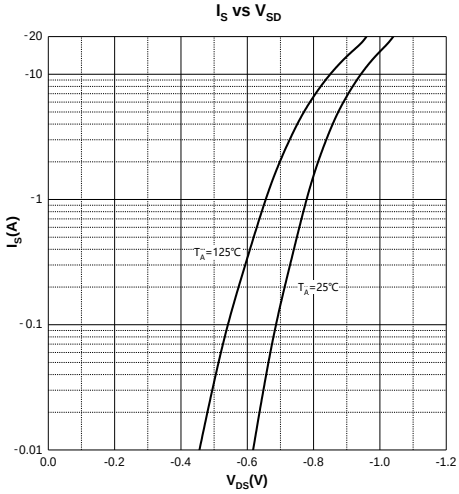
**PMOS:**

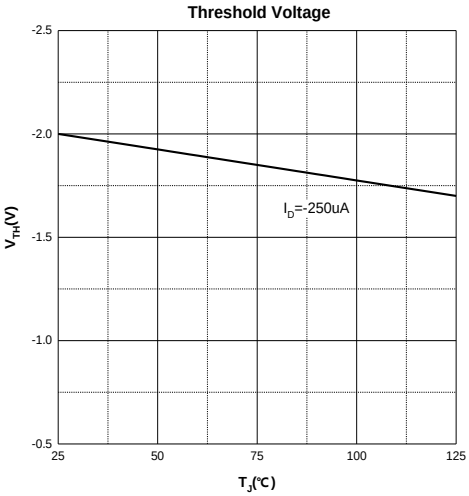

Output Characteristics
$V_{GS}$=-10V,-6V,-4.5V,-4.2V
$V_{GS}$=-4.9V
$V_{GS}$=-3.7V
$V_{GS}$=-3.2V
$T_A$=25℃
Pulsed
$I_D$(A)
$V_{DS}$(V)


Transfer Characteristics
$V_{DS}$=-3V
Pulsed
$T_A$=125℃
$T_A$=25℃
$I_D$(A)
$V_{GS}$(V)

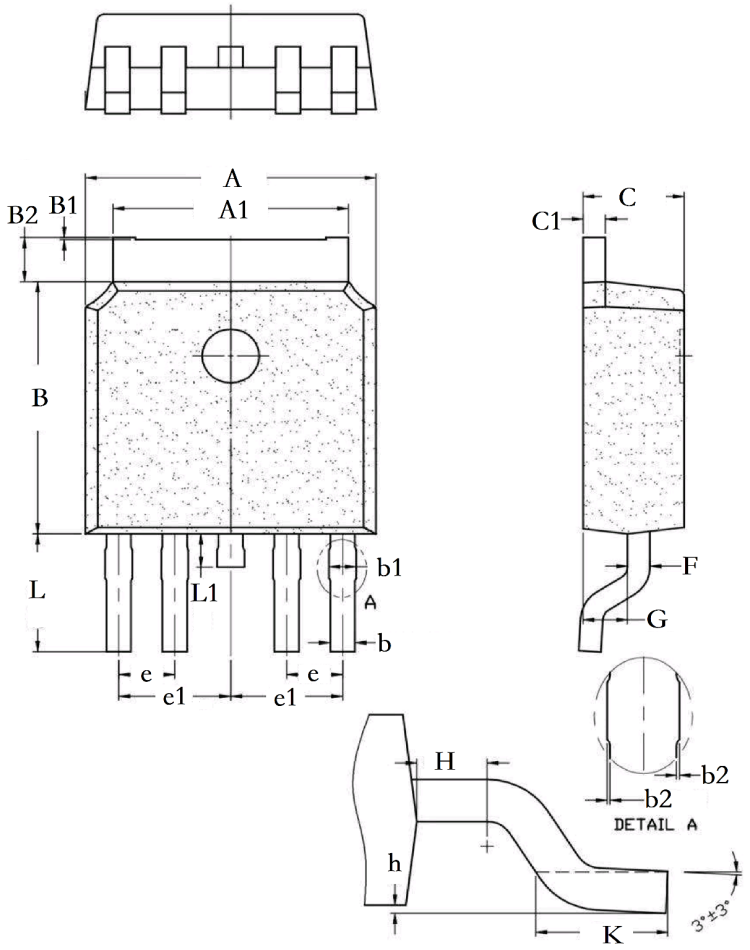

$R_{DS(ON)}$ vs $I_D$
$T_A$=25℃
Pulsed
$V_{GS}$=-4.5V
$V_{GS}$=-10V
$R_{DS(ON)}$(mR)
$I_D$(A)


$R_{DS(ON)}$ vs $V_{GS}$
Pulsed
$I_D$=-5A
$T_A$=125℃
$T_A$=25℃
$R_{DSON}$(mR)
$V_{GS}$(V)


$I_S$ vs $V_{SD}$
$T_A$=125℃
$T_A$=25℃
$I_S$(A)
$V_{DS}$(V)


Threshold Voltage
$I_D$=-250uA
$V_{TH}$(V)
$T_J$(℃)

## TO-252-4L Package Information




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | 6.550 | 6.650 | 0.258 | 0.262 |
| A1 | 5.234 | 5.434 | 0.206 | 0.214 |
| B | 6.050 | 6.150 | 0.238 | 0.242 |
| B1 | 0.000 | 0.050 | 0.000 | 0.002 |
| B2 | 0.962 | 1.162 | 0.038 | 0.046 |
| C | 2.250 | 2.350 | 0.089 | 0.093 |
| C1 | 0.458 | 0.558 | 0.018 | 0.022 |
| L | 2.698 | 2.998 | 0.106 | 0.118 |
| L1 | 0.700 | 0.900 | 0.028 | 0.035 |
| b | 0.510 | 0.610 | 0.020 | 0.024 |
| b1 | 0.570 | 0.670 | 0.022 | 0.026 |
| b2 | 0.000 | 0.050 | 0.000 | 0.002 |
| e | 1.270TYP | | 0.050TYP | |
| e1 | 2.540TYP | | 0.100TYP | |
| F | 0.458 | 0.558 | 0.018 | 0.022 |
| G | 0.960 | 1.06 | 0.038 | 0.042 |
| H | 0.650 | 0.950 | 0.026 | 0.037 |
| h | 0.050 | 0.150 | 0.002 | 0.006 |
| K | 1.300 | 1.700 | 0.051 | 0.067 |