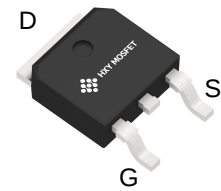




## Description

The IPD90P03P4L04ATMA1 uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

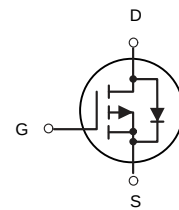


TO-252-2L

## General Features

$V_{DS} = -30V$   $I_D = -100A$

$R_{DS(ON)} < 4.5m\Omega$  @  $V_{GS} = -10V$



P-Channel MOSFET

## Application

Lithium battery protection

Wireless impact

Mobile phone fast charging

## Package Marking and Ordering Information

| Product ID         | Pack      | Brand      | Qty(PCS) |
|--------------------|-----------|------------|----------|
| IPD90P03P4L04ATMA1 | TO-252-2L | HXY MOSFET | 2500     |

## Absolute Maximum Ratings ( $T_c=25^\circ C$ unless otherwise noted)

| Symbol   | Parameter                                       | Max.        | Units        |
|----------|-------------------------------------------------|-------------|--------------|
| VDSS     | Drain-Source Voltage                            | -30         | V            |
| VGSS     | Gate-Source Voltage                             | $\pm 20$    | V            |
| ID       | Continuous Drain Current $T_c = 25^\circ C$     | -100        | A            |
| ID       | Continuous Drain Current $T_c = 100^\circ C$    | -59         | A            |
| IDM      | Pulsed Drain Current <sup>note1</sup>           | -360        | A            |
| EAS      | Single Pulsed Avalanche Energy <sup>note2</sup> | 210         | mJ           |
| PD       | Power Dissipation $T_c = 25^\circ C$            | 109         | W            |
| RθJC     | Thermal Resistance, Junction to Case            | 1.4         | $^\circ C/W$ |
| TJ, TSTG | Operating and Storage Temperature Range         | -55 to +175 | $^\circ C$   |



**Electrical Characteristics@T<sub>j</sub>=25°C(unless otherwise specified)**

| Symbol   | Parameter                                                | Test Condition                               | Min. | Typ. | Max. | Units |
|----------|----------------------------------------------------------|----------------------------------------------|------|------|------|-------|
| V(BR)DSS | Drain-Source Breakdown Voltage                           | VGS=0V, ID= -250μA                           | -30  | -33  | -    | V     |
| IDSS     | Zero Gate Voltage Drain Current                          | VDS= -30V, VGS=0V,                           | -    | -    | -1   | μA    |
| IGSS     | Gate to Body Leakage Current                             | VDS=0V, VGS= ±20V                            | -    | -    | ±100 | nA    |
| VGS(th)  | Gate Threshold Voltage                                   | VDS=VGS, ID= -250μA                          | -1.0 | -1.6 | -2.5 | V     |
| RDS(on)  | Static Drain-Source on-Resistance                        | VGS= -10V, ID= -30A                          | -    | 3.5  | 4.5  | mΩ    |
|          |                                                          | VGS= -4.5V, ID= -20A                         | -    | 4.8  | 6.2  |       |
| Ciss     | Input Capacitance                                        | VDS= -15V, VGS=0V,<br>f=1.0MHz               | -    | 6800 | -    | pF    |
| Coss     | Output Capacitance                                       |                                              | -    | 769  | -    | pF    |
| Crss     | Reverse Transfer Capacitance                             |                                              | -    | 726  | -    | pF    |
| Qg       | Total Gate Charge                                        | VDS= -15V, ID= -30A,<br>VGS= -10V            | -    | 30   | -    | nC    |
| Qgs      | Gate-Source Charge                                       |                                              | -    | 6    | -    | nC    |
| Qgd      | Gate-Drain("Miller") Charge                              |                                              | -    | 8    | -    | nC    |
| td(on)   | Turn-on Delay Time                                       | VDD= -15V, ID= -30A,<br>VGS= -10V, RGEN=2.5Ω | -    | 11   | -    | ns    |
| tr       | Turn-on Rise Time                                        |                                              | -    | 13   | -    | ns    |
| td(off)  | Turn-off Delay Time                                      |                                              | -    | 52   | -    | ns    |
| tf       | Turn-off Fall Time                                       |                                              | -    | 21   | -    | ns    |
| IS       | Maximum Continuous Drain to Source Diode Forward Current |                                              | -    | -    | -100 | A     |
| ISM      | Maximum Pulsed Drain to Source Diode Forward Current     |                                              | -    | -    | -360 | A     |
| VSD      | Drain to Source Diode Forward Voltage                    | VGS=0V, IS= -30 A                            |      | -0.8 | -1.2 | V     |

**Notes:**

- 1、Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
- 2、E AS condition: T<sub>J</sub> =25°C, V<sub>DD</sub> = -15V, V<sub>G</sub> = -10V, R<sub>G</sub> =25Ω, L=0.5mH, I<sub>AS</sub> = -29A
- 3、Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%



## Typical Characteristics

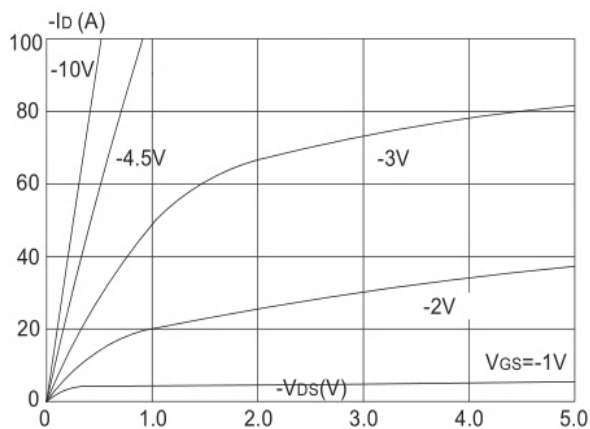


Figure1: Output Characteristics

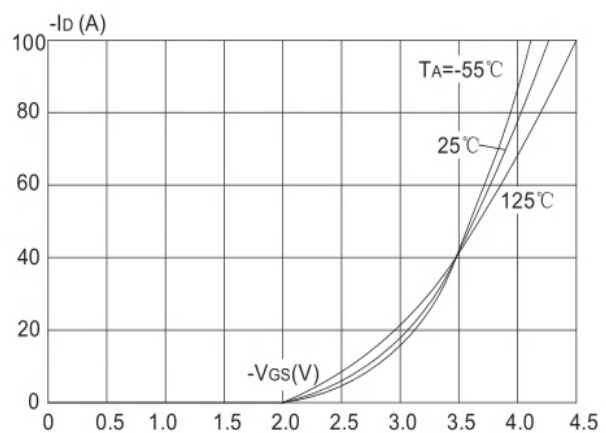


Figure 2: Typical Transfer Characteristics

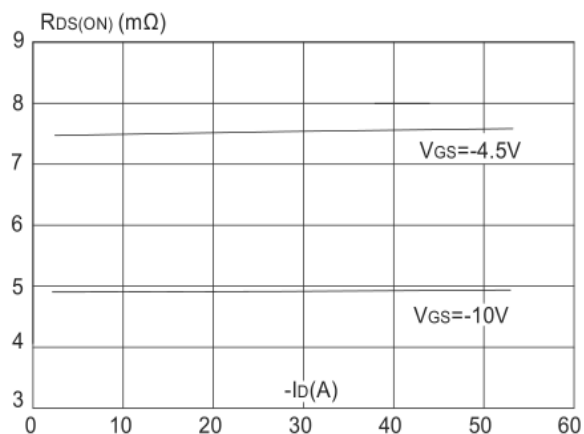


Figure 3: On-resistance vs. Drain Current

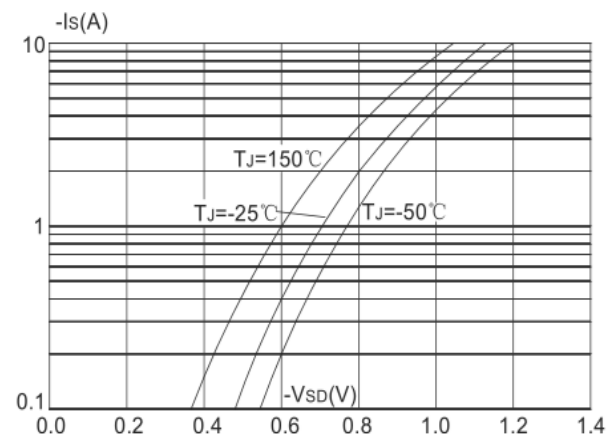


Figure 4: Body Diode Characteristics

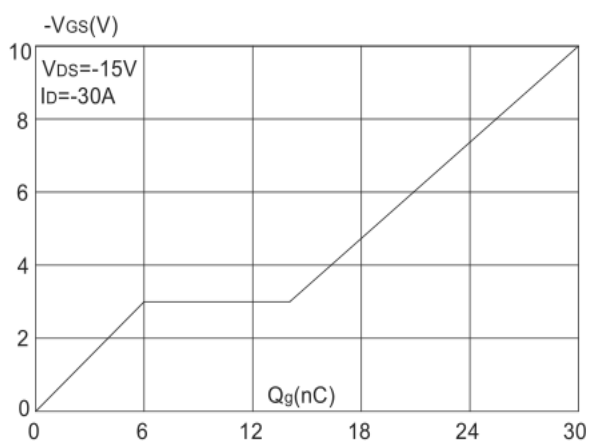


Figure 5: Gate Charge Characteristics

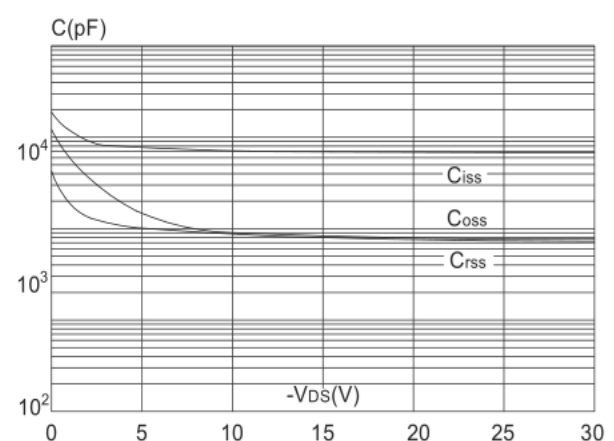


Figure 6: Capacitance Characteristics

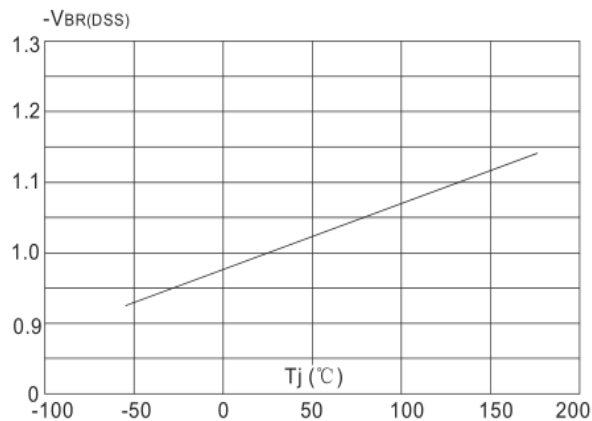


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

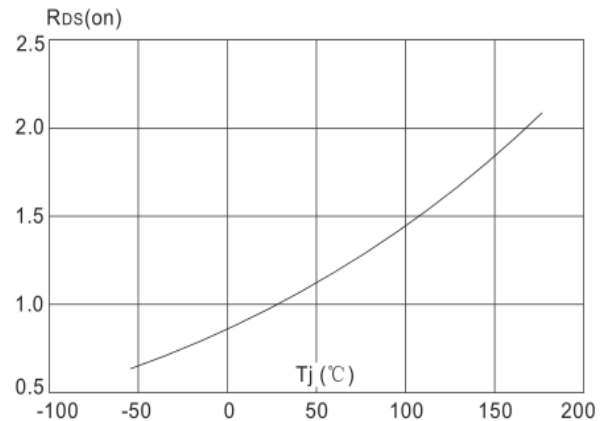


Figure 8: Normalized on Resistance vs. Junction Temperature

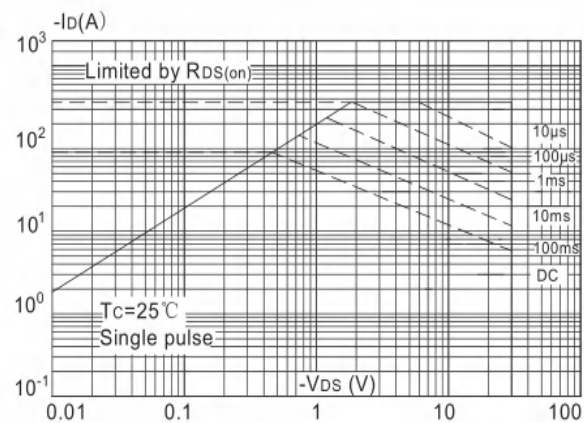


Figure 9: Maximum Safe Operating Area

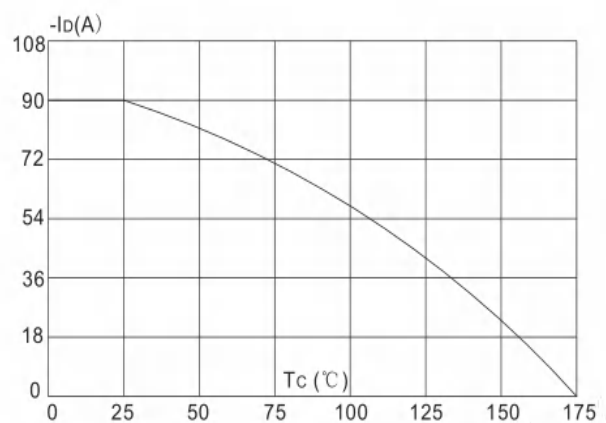


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

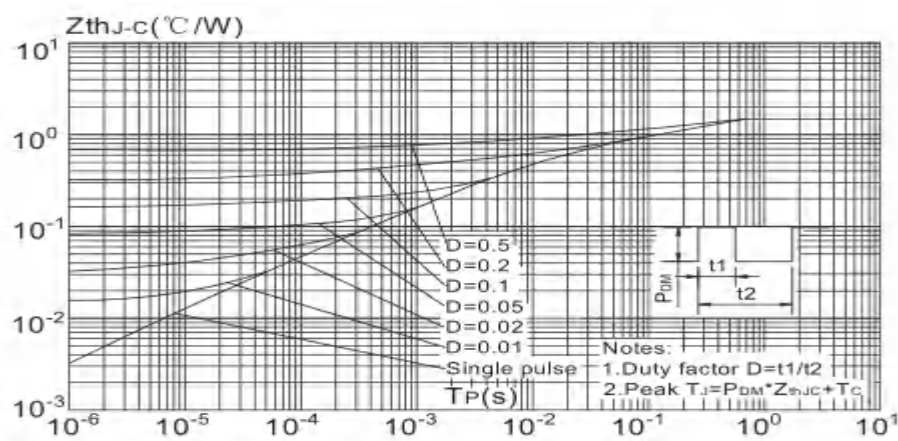
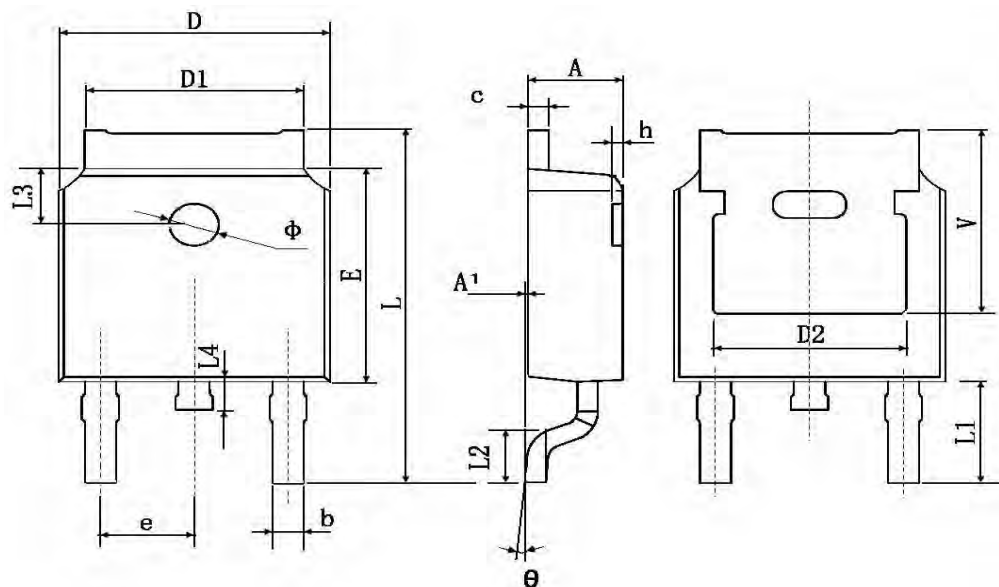


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



## TO-252-2L Package Information



| Symbol | Dimensions In Millimeters |        | Dimensions In Inches |       |
|--------|---------------------------|--------|----------------------|-------|
|        | Min.                      | Max.   | Min.                 | Max.  |
| A      | 2.200                     | 2.400  | 0.087                | 0.094 |
| A1     | 0.000                     | 0.127  | 0.000                | 0.005 |
| b      | 0.660                     | 0.860  | 0.026                | 0.034 |
| c      | 0.460                     | 0.580  | 0.018                | 0.023 |
| D      | 6.500                     | 6.700  | 0.256                | 0.264 |
| D1     | 5.100                     | 5.460  | 0.201                | 0.215 |
| D2     | 4.830 TYP.                |        | 0.190 TYP.           |       |
| E      | 6.000                     | 6.200  | 0.236                | 0.244 |
| e      | 2.186                     | 2.386  | 0.086                | 0.094 |
| L      | 9.800                     | 10.400 | 0.386                | 0.409 |
| L1     | 2.900 TYP.                |        | 0.114 TYP.           |       |
| L2     | 1.400                     | 1.700  | 0.055                | 0.067 |
| L3     | 1.600 TYP.                |        | 0.063 TYP.           |       |
| L4     | 0.600                     | 1.000  | 0.024                | 0.039 |
| Φ      | 1.100                     | 1.300  | 0.043                | 0.051 |
| θ      | 0°                        | 8°     | 0°                   | 8°    |
| h      | 0.000                     | 0.300  | 0.000                | 0.012 |
| V      | 5.350 TYP.                |        | 0.211 TYP.           |       |



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