



## Description

The PMV27UPER uses advanced trench technology to provide excellent  $R_{DS(ON)}$ . This device is suitable for use as a load switch or in PWM applications.

## General Features

$V_{DS} = -20V, I_D = -7.0A$

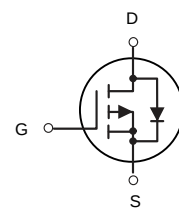
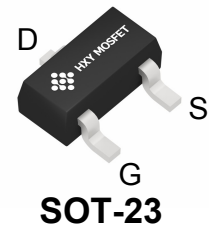
$R_{DS(ON)} < 28m\Omega @ V_{GS} = -4.5V$

## Application

Battery protection

Load switch

Uninterruptible power supply



P-Channel MOSFET

## Ordering Information

| Product ID | Pack   | Brand      | Qty(PCS) |
|------------|--------|------------|----------|
| PMV27UPER  | SOT-23 | HXY MOSFET | 3000     |

## Absolute Maximum Ratings (TA=25°C unless otherwise noted)

| Symbol          | Parameter                                        | Limit      | Unit |
|-----------------|--------------------------------------------------|------------|------|
| $V_{DS}$        | Drain-Source Voltage                             | -20        | V    |
| $V_{GS}$        | Gate-Source Voltage                              | $\pm 12$   | V    |
| $I_D$           | Drain Current-Continuous                         | -7.0       | A    |
| $I_{DM}$        | Drain Current-Pulsed (Note 1)                    | -15        | A    |
| $P_D$           | Maximum Power Dissipation                        | 2          | W    |
| $T_J, T_{STG}$  | Operating Junction and Storage Temperature Range | -55 To 150 | °C   |
| $R_{\theta JA}$ | Thermal Resistance, Junction-to-Ambient (Note 2) | 74         | °C/W |



**Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)**

|                                                      |                     |                                                                                                                     |       |      |      |    |
|------------------------------------------------------|---------------------|---------------------------------------------------------------------------------------------------------------------|-------|------|------|----|
| Drain-Source Breakdown Voltage                       | BV <sub>DSS</sub>   | V <sub>GS</sub> =0V I <sub>D</sub> =-250μA                                                                          | -     | -20  | -    | V  |
| Zero Gate Voltage Drain Current                      | I <sub>DSS</sub>    | V <sub>DS</sub> =-20V, V <sub>GS</sub> =0V                                                                          | -     | -    | -1   | μA |
| Gate-Body Leakage Current                            | I <sub>GSS</sub>    | V <sub>GS</sub> =±8V, V <sub>DS</sub> =0V                                                                           | -     | -    | ±100 | nA |
| <b>On Characteristics</b> <sup>(Note 3)</sup>        |                     |                                                                                                                     |       |      |      |    |
| Gate Threshold Voltage                               | V <sub>GS(th)</sub> | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA                                                           | -0.45 | -0.7 | -1.0 | V  |
| Drain-Source On-State Resistance                     | R <sub>DS(ON)</sub> | V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-4.1A                                                                       | -     | 20   | 28   | mΩ |
|                                                      |                     | V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-3A                                                                         | -     | 27   | 36   |    |
| Forward Transconductance                             | g <sub>FS</sub>     | V <sub>DS</sub> =-5V, I <sub>D</sub> =-3.5A                                                                         | -     | 8.5  | -    | S  |
| <b>Dynamic Characteristics</b> <sup>(Note4)</sup>    |                     |                                                                                                                     |       |      |      |    |
| Input Capacitance                                    | C <sub>iss</sub>    | V <sub>DS</sub> =-4V, V <sub>GS</sub> =0V,<br>F=1.0MHz                                                              | -     | 980  | -    | PF |
| Output Capacitance                                   | C <sub>oss</sub>    |                                                                                                                     | -     | 450  | -    | PF |
| Reverse Transfer Capacitance                         | C <sub>rss</sub>    |                                                                                                                     | -     | 250  | -    | PF |
| <b>Switching Characteristics</b> <sup>(Note 4)</sup> |                     |                                                                                                                     |       |      |      |    |
| Turn-on Delay Time                                   | t <sub>d(on)</sub>  | V <sub>DD</sub> =-4V, I <sub>D</sub> =-3.3A ,<br>R <sub>L</sub> =-1.2Ω, V <sub>GEN</sub> =-4.5V, R <sub>g</sub> =1Ω | -     | 12   | -    | nS |
| Turn-on Rise Time                                    | t <sub>r</sub>      |                                                                                                                     | -     | 35   | -    | nS |
| Turn-Off Delay Time                                  | t <sub>d(off)</sub> |                                                                                                                     | -     | 30   | -    | nS |
| Turn-Off Fall Time                                   | t <sub>f</sub>      |                                                                                                                     | -     | 10   | -    | nS |
| Total Gate Charge                                    | Q <sub>g</sub>      | V <sub>DS</sub> =-4V, I <sub>D</sub> =-4.1A, V <sub>GS</sub> =-4.5V                                                 | -     | 7.8  | -    | nC |
| Gate-Source Charge                                   | Q <sub>gs</sub>     |                                                                                                                     | -     | 1.2  | -    | nC |
| Gate-Drain Charge                                    | Q <sub>gd</sub>     |                                                                                                                     | -     | 1.6  | -    | nC |
| <b>Drain-Source Diode Characteristics</b>            |                     |                                                                                                                     |       |      |      |    |
| Diode Forward Voltage <sup>(Note 3)</sup>            | V <sub>SD</sub>     | V <sub>GS</sub> =0V, I <sub>S</sub> =-1.6A                                                                          | -     | -    | -1.2 | V  |
| Diode Forward Current <sup>(Note 2)</sup>            | I <sub>S</sub>      |                                                                                                                     | -     | -    | 7.0  | A  |

**Notes:**

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production



## Typical Characteristics

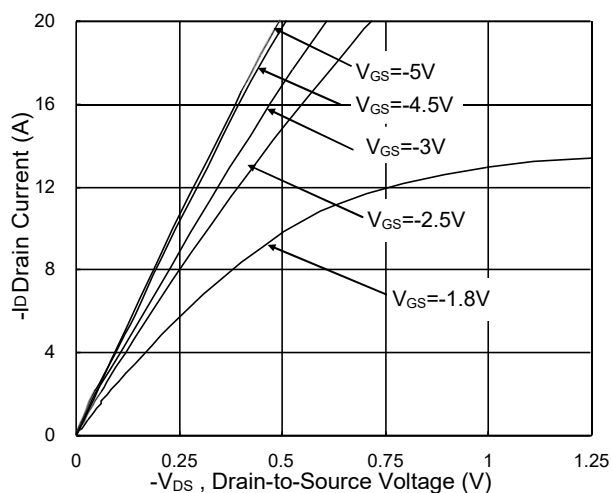


Fig.1 Typical Output Characteristics

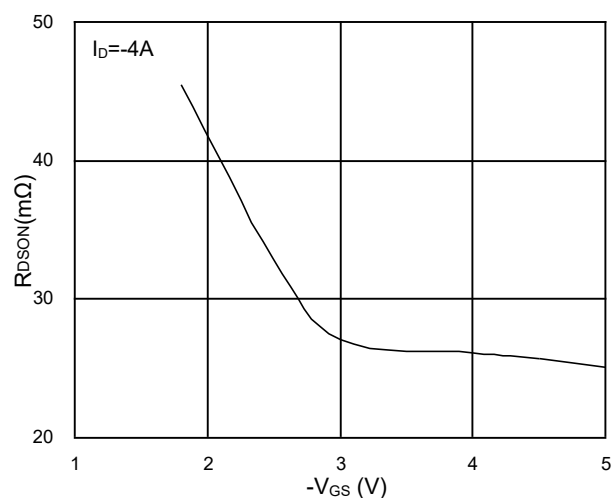


Fig.2 On-Resistance vs. Gate-Source

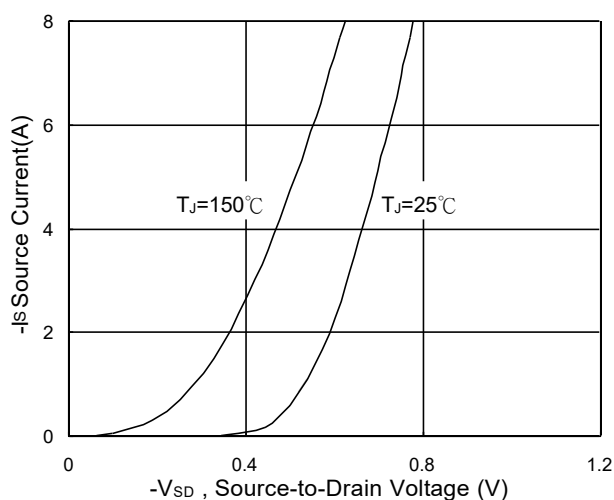


Fig.3 Forward Characteristics Of Reverse

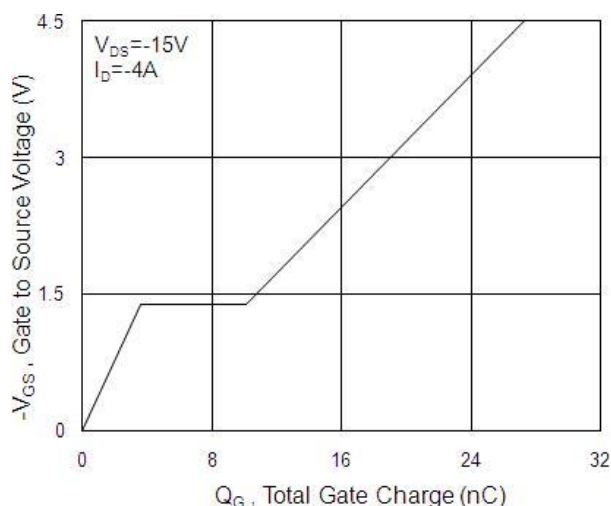


Fig.4 Gate-Charge Characteristics

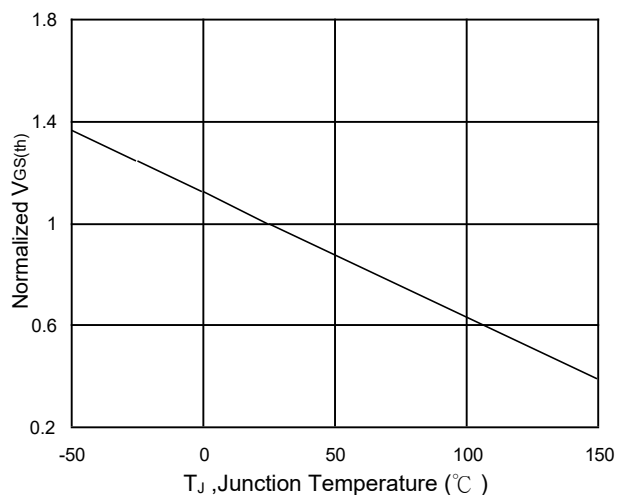


Fig.5 Normalized  $V_{GS(th)}$  vs.  $T_J$

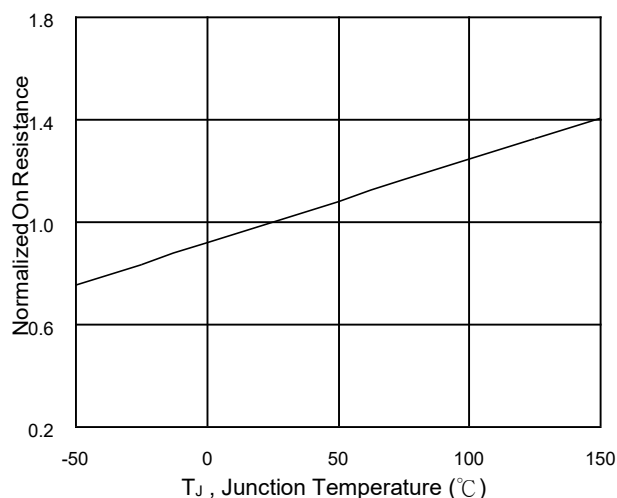


Fig.6 Normalized  $R_{DS(on)}$  vs.  $T_J$

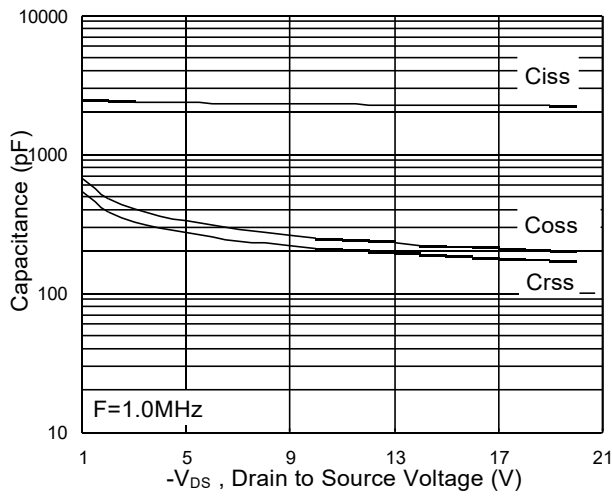


Fig.7 Capacitance

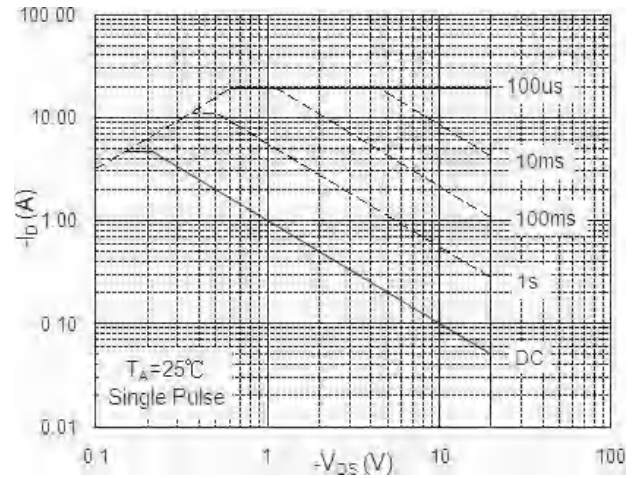


Fig.8 Safe Operating Area

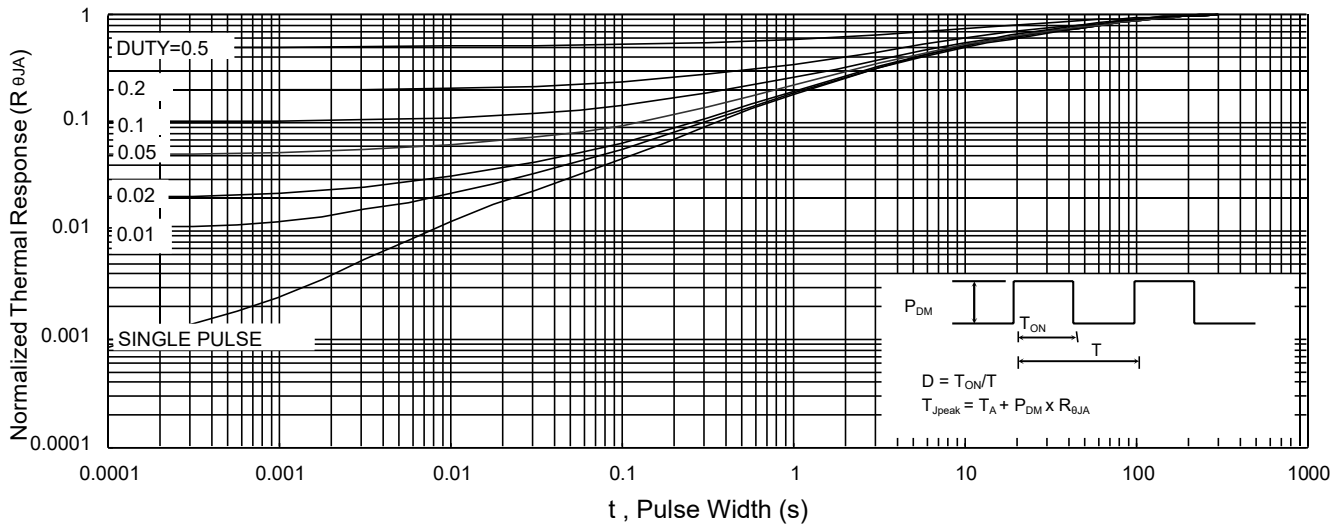


Fig.9 Normalized Maximum Transient Thermal Impedance

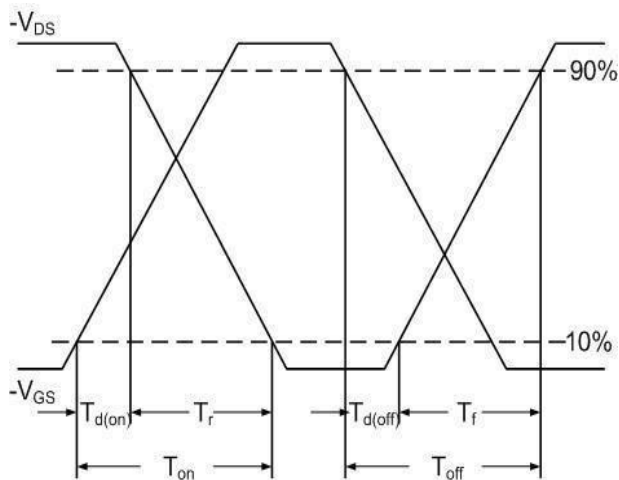


Fig.10 Switching Time Waveform

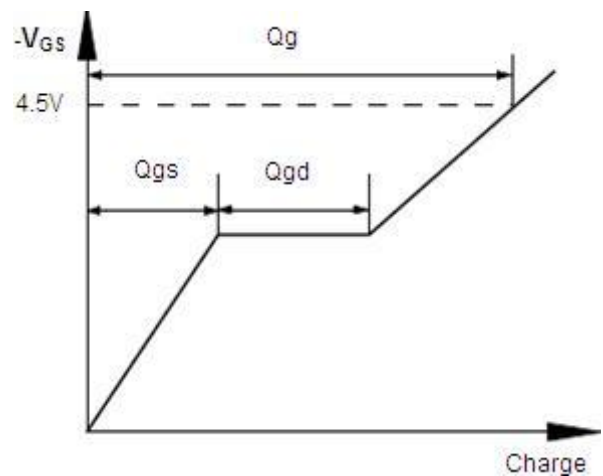
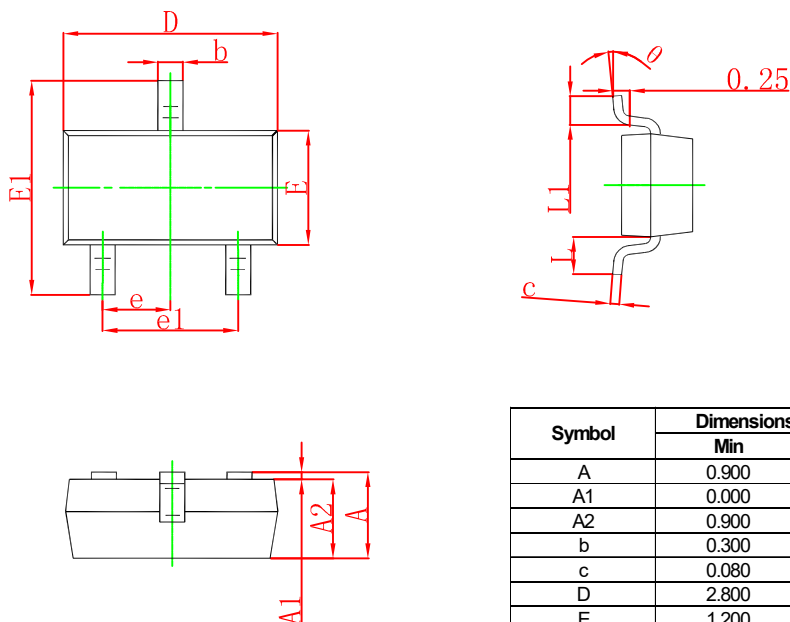


Fig.11 Gate Charge Waveform

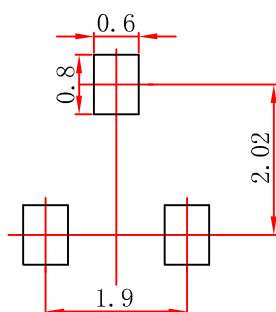


## SOT-23 Package Outline Dimensions



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 0.900                     | 1.150 | 0.035                | 0.045 |
| A1     | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2     | 0.900                     | 1.050 | 0.035                | 0.041 |
| b      | 0.300                     | 0.500 | 0.012                | 0.020 |
| c      | 0.080                     | 0.150 | 0.003                | 0.006 |
| D      | 2.800                     | 3.000 | 0.110                | 0.118 |
| E      | 1.200                     | 1.400 | 0.047                | 0.055 |
| E1     | 2.250                     | 2.550 | 0.089                | 0.100 |
| e      | 0.950 TYP                 |       | 0.037 TYP            |       |
| e1     | 1.800                     | 2.000 | 0.071                | 0.079 |
| L      | 0.550 REF                 |       | 0.022 REF            |       |
| L1     | 0.300                     | 0.500 | 0.012                | 0.020 |
| θ      | 0°                        | 8°    | 0°                   | 8°    |

## SOT-23 Suggested Pad Layout



Note:  
1. Controlling dimension: in millimeters.  
2. General tolerance:  $\pm 0.05\text{mm}$ .  
3. The pad layout is for reference purposes only.



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