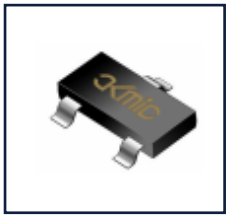
## General Features

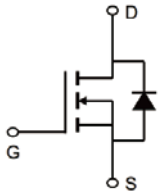
- $V_{DS}$ = -20V $I_D$ =-3A
- $R_{DS(ON)}$ < 55mΩ @ $V_{GS}$=-4.5V



SOT23

## Applications

- Battery protection
- Load switch
- Uninterruptible power supply




Equivalent Circuit

## Description

The PMV65XP,215-AK uses advanced trench technology to provide excellent RDS(ON), low gat e charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Batter y protection or in other Switching application.

## Ordering information

| Product ID | Pack | Marking | Qty(PCS) |
|---|---|---|---|
| PMV65XP,215-AK | SOT23 | A1SHB<br>S1 | 3000 |

## Absolute Maximum Ratings ($T_A$=25℃ unless otherwise noted)

| Symbol | Parameter | Rating | Units |
|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | -20 | V |
| $V_{GS}$ | Gate-Source Voltage | ±12 | V |
| $I_D$@$T_A$=25℃ | Continuous Drain Current, VGS @ 4.5V1 | -3 | A |
| $I_D$@$T_A$=70℃ | Continuous Drain Current, VGS @ 4.5V1 | -2.6 | A |
| $I_{DM}$ | Pulsed Drain Current2 | -13 | A |
| $P_D$@$T_A$=25℃ | Total Power Dissipation3 | 1.4 | W |
| $T_{STG}$ | Storage Temperature Range | -55 to 150 | ℃ |
| $T_J$ | Operating Junction Temperature Range | -55 to 150 | ℃ |
| $R_{\theta JA}$ | Thermal Resistance Junction-ambient 1 | 125 | ℃/W |
| $R_{\theta JC}$ | Thermal Resistance Junction-Case1 | 90 | ℃/W |

## Electrical Characteristics ($T_A$=25℃, unless otherwise noted)

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| On/Off States | | | | | | |
| $B_{VDSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V , $I_D$=-250uA | -20 | -22 | --- | V |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance2 | $V_{GS}$=-4.5V , $I_D$=-3A | --- | 55 | 80 | mΩ |
| | | $V_{GS}$=-2.5V , $I_D$=-2A | --- | 75 | 100 | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{GS}$=$V_{DS}$ , $I_D$ =-250uA | -0.45 | -0.6 | -1.0 | V |
| $I_{DSS}$ | Drain-Source Leakage Current | $V_{DS}$=-20V , $V_{GS}$=0V , $T_J$=25℃ | --- | --- | -1 | uA |
| | | $V_{DS}$=-20V , $V_{GS}$=0V , $T_J$=55℃ | --- | --- | -5 | |
| $I_{GSS}$ | Gate-Source Leakage Current | $V_{GS}$=±12V , $V_{DS}$=0V | --- | --- | ±100 | nA |
| gfs | Forward Transconductance | $V_{DS}$=-5V , $I_D$=-3A | --- | 12.2 | --- | S |
| Dynamic Characteristics | | | | | | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=-15V , $V_{GS}$=0V , f=1MHz | --- | 677 | --- | pF |
| $C_{oss}$ | Output Capacitance | | --- | 82 | --- | |
| $C_{rss}$ | Reverse Transfer Capacitance | | --- | 73 | --- | |
| $Q_g$ | Total Gate Charge (4.5V) | $V_{DS}$=15V , $V_{GS}$=-4.5V , $I_D$=-3A | --- | 10.1 | --- | nC |
| $Q_{gs}$ | Gate-Source Charge | | --- | 1.21 | --- | |
| $Q_{gd}$ | Gate-Drain Charge | | --- | 2.46 | --- | |
| Switching Characteristics | | | | | | |
| $T_{d(on)}$ | Turn-On Delay Time | $V_{DD}$=-10V , $V_{GS}$=-4.5V , $R_G$=3.3Ω $I_D$=3A | --- | 5.6 | --- | ns |
| $T_r$ | Rise Time | | --- | 32.2 | --- | |
| $T_{d(off)}$ | Turn-Off Delay Time | | --- | 45.6 | --- | |
| $T_f$ | Fall Time | | --- | 29.2 | --- | |
| Drain-Source Diode Characteristics and Maximum Ratings | | | | | | |
| IS | Continuous Source Current1,4 | $V_G$=$V_D$=0V , Force Current | --- | --- | -3 | A |
| VSD | Diode Forward Voltage[2] | $V_{GS}$=0V , $I_S$=-1A , $T_J$=25℃ | --- | --- | -1 | V |

Note :

1、The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.

2、The data tested by pulsed , pulse width △ 300us , duty cycle △ 2%

3、The power dissipation is limited by 150℃ junction temperature

4、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

## Typical Characteristics

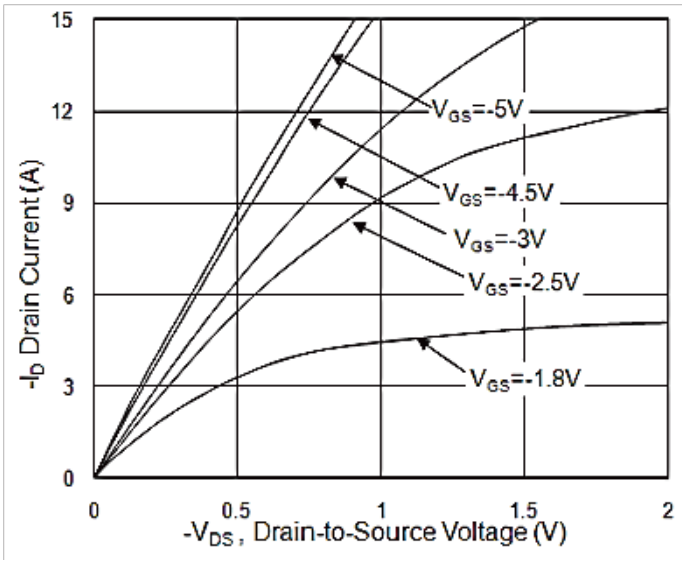



Fig.1 Typical Output Characteristics

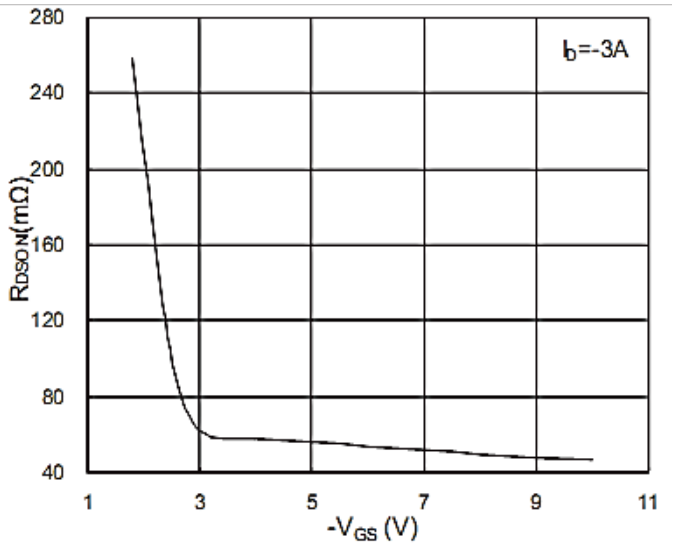



Fig.2 On.Resistance vs. G.S Voltage

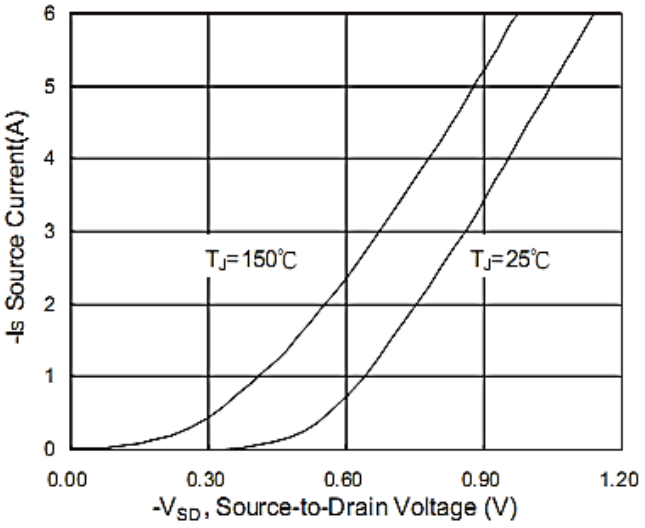



Fig.3 Forward Characteristics Of Reverse

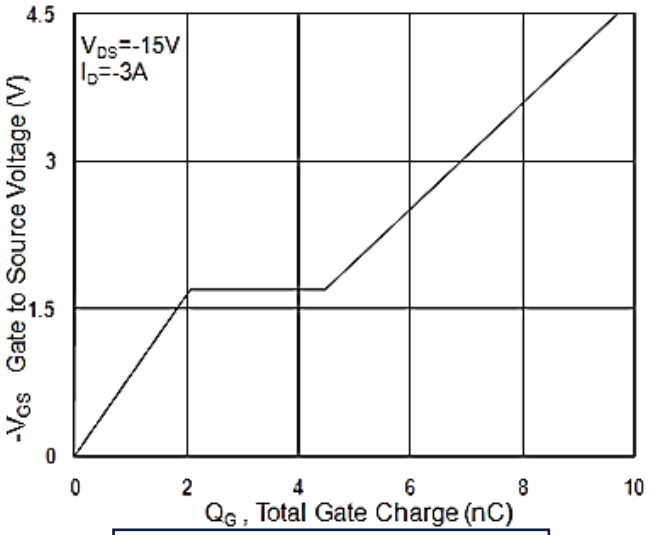



Fig.4 Gate-Charge Characteristics

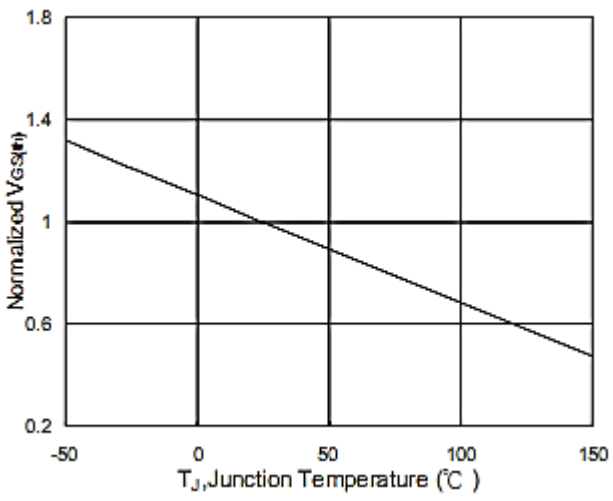



Fig.5 Normalized $V_{GS(th)}$ vs. $T_J$

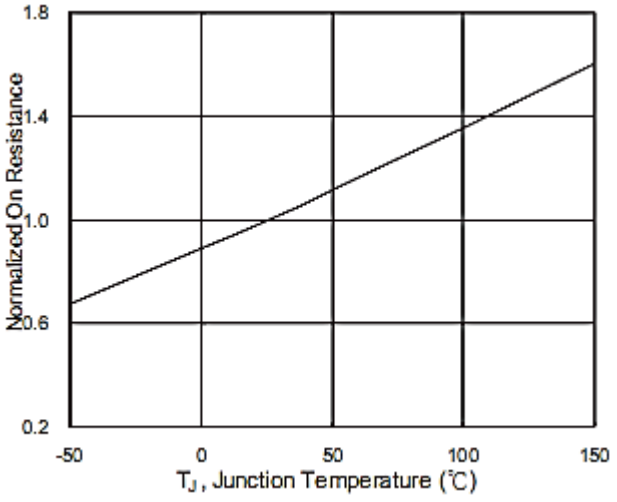



Fig.6 Normalized $R_{DSON}$ vs. $T_J$

## Typical Characteristics

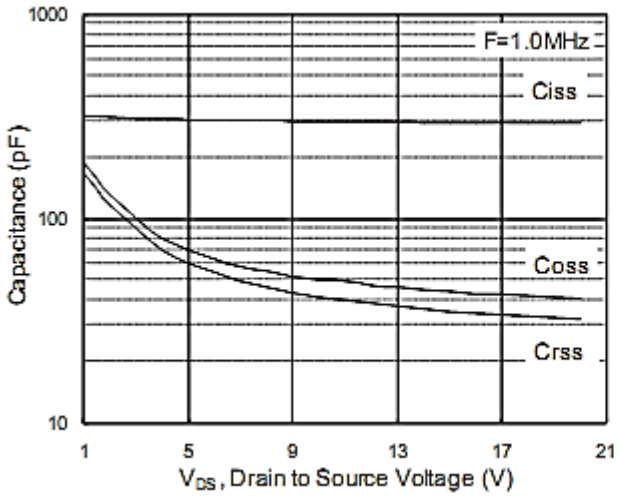



Fig.7 Capacitance

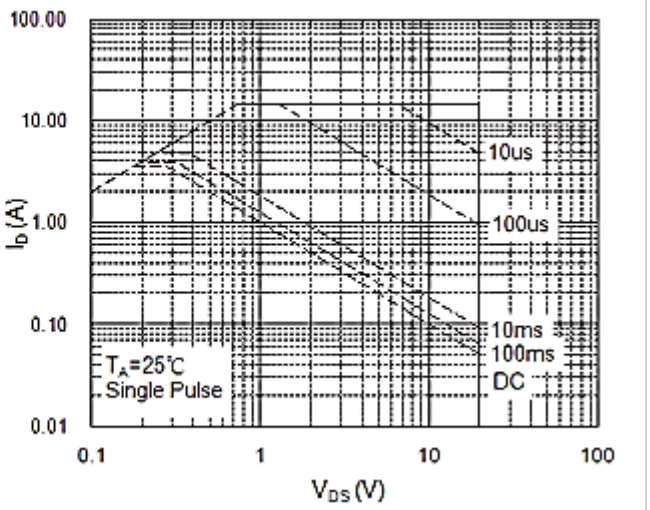



Fig.8 Safe Operating Area

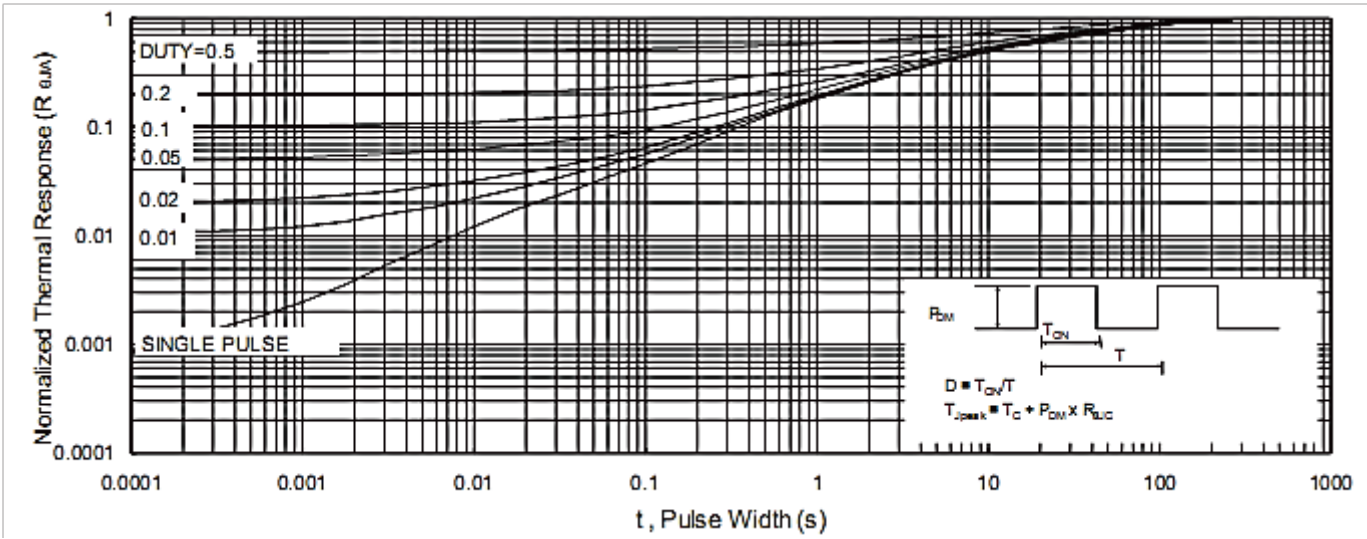



Fig.9 Normalized Maximum Transient Thermal Impedance

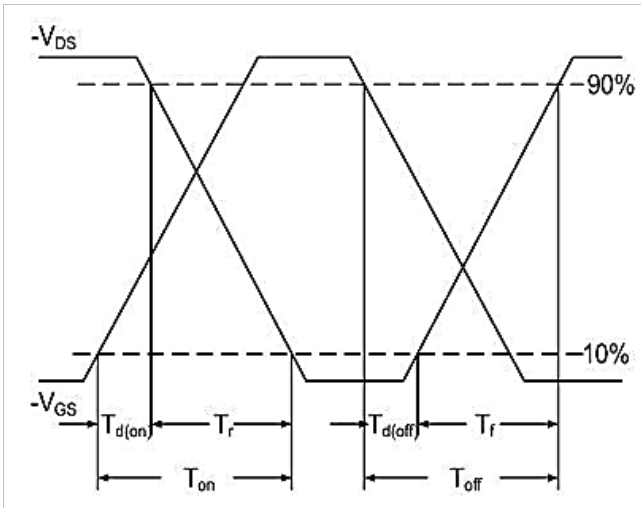



Fig.10 Switching Time Waveform

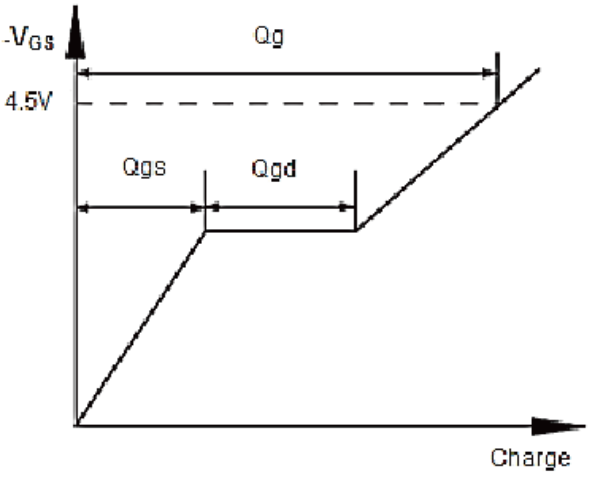
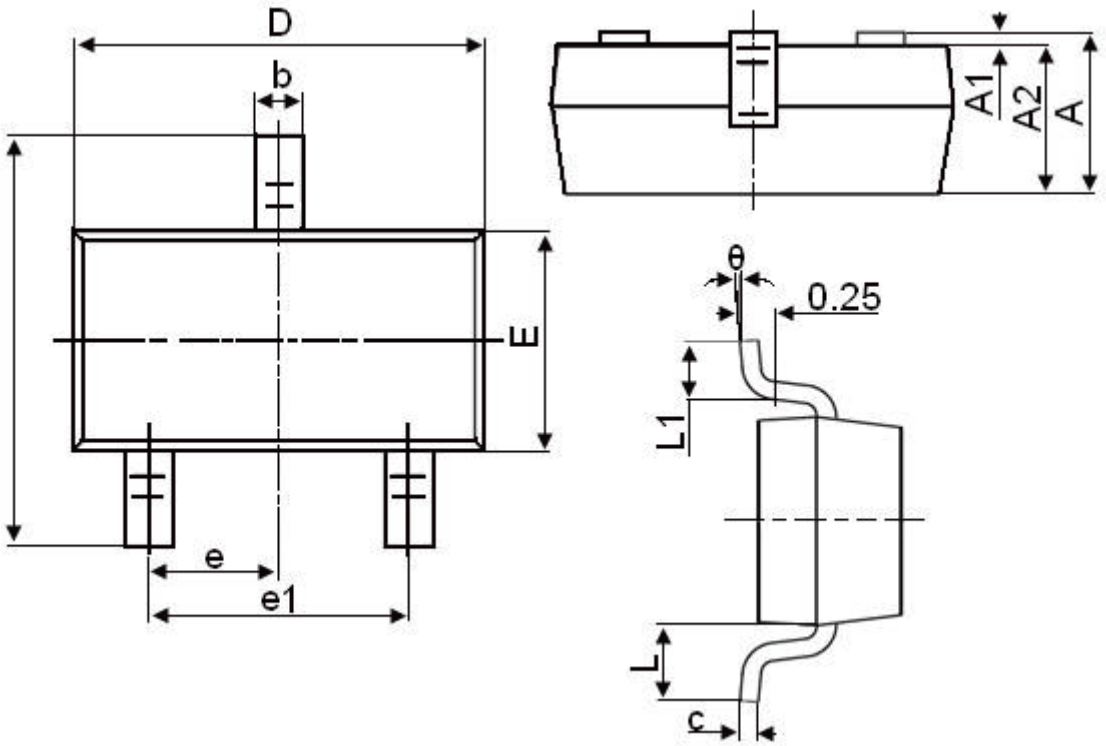



Fig.11 Gate Charge Waveform

## SOT23 Package Outline Dimensions




| Symbol | Dimensions in Millimeters | |
|---|---|---|
| | mm | |
| | Min | Max |
| A | 0.900 | 1.150 |
| A1 | 0.000 | 0.100 |
| A2 | 0.900 | 1.050 |
| b | 0.300 | 0.500 |
| c | 0.080 | 0.150 |
| D | 2.800 | 3.000 |
| E | 1.200 | 1.400 |
| E1 | 2.250 | 2.550 |
| e | 0.950TYP | |
| e1 | 1.800 | 2.000 |
| L | 0.550REF | |
| L1 | 0.300 | 0.500 |
| θ | 0° | 8° |