

## PMV213SN,215

Rev-1.2

SuperMOS – SOT-23 100V  $BV_{DSS}$ ,  $2.70\Omega$   $R_{DS(ON)}$ , N-channel MOSFET

## 1. Description

The PMV213SN,215 is N-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent  $R_{DS(ON)}$  with low gate charge. Device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product PMV213SN,215 is Pb-free.

## 2. Features

- 100V,  $R_{DS(ON)}=2.70\Omega$ (Typ.) @  $V_{GS}=10V$   
 $R_{DS(ON)}=2.95\Omega$ (Typ.) @  $V_{GS}=4.5V$
- High density cell design for low  $R_{DS(on)}$
- Material: Halogen free
- Reliable and rugged
- Avalanche Rated
- Low leakage current

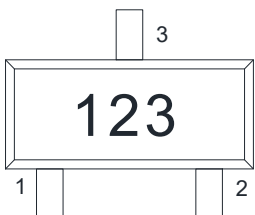
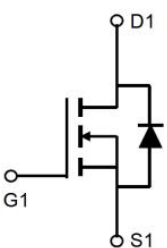
## 3. Applications

- PWM applications
- Load switch
- Power management in portable/desktop PCs
- DC/DC conversion

## 4. Ordering Information

| Part Number  | Package | Marking | Material     | Packing     | Quantity per reel | Flammability Rating | Reel Size |
|--------------|---------|---------|--------------|-------------|-------------------|---------------------|-----------|
| PMV213SN,215 | SOT-23  | 123     | Halogen free | Tape & Reel | 3,000 PCS         | UL 94V-0            | 7 inches  |

## 5. Pin Configuration and Functions

| Pin | Function | Outline                                                                             | Circuit Diagram                                                                       |
|-----|----------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 1   | Gate     |  |  |
| 2   | Source   |                                                                                     |                                                                                       |
| 3   | Drain    |                                                                                     |                                                                                       |

## 6. Specification

### Absolute Maximum Rating & Thermal Characteristics

Ratings at 25 °C ambient temperature unless otherwise specified.

| Parameter                      |                          | Symbol     | Limit      | Unit |
|--------------------------------|--------------------------|------------|------------|------|
| Drain-Source Voltage           |                          | $BV_{DSS}$ | 100        | V    |
| Gate-Source Voltage            |                          | $V_{GS}$   | ±20        | V    |
| Continuous Drain Current       | $T_A=25^{\circ}\text{C}$ | $I_D$      | 0.29       | A    |
|                                | $T_A=70^{\circ}\text{C}$ |            | 0.20       |      |
| Maximum Power Dissipation      |                          | $P_D$      | 0.35       | W    |
| Operating Junction Temperature |                          | $T_J$      | 150        | °C   |
| Lead Temperature               |                          | $T_L$      | 260        | °C   |
| Storage Temperature Range      |                          | $T_{stg}$  | -55 to 150 | °C   |

### Thermal resistance ratings

| Single Operation                       |                     |                 |         |         |      |
|----------------------------------------|---------------------|-----------------|---------|---------|------|
| Parameter                              |                     | Symbol          | Typical | Maximum | Unit |
| Junction-to-Ambient Thermal Resistance | $t \leq 10\text{s}$ | $R_{\theta JA}$ |         | 357     | °C/W |

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## Electrical Characteristics

At TA = 25°C unless otherwise specified

| Parameter                                 | Symbol              | Test Conditions                                          | Min. | Typ. | Max. | Unit |
|-------------------------------------------|---------------------|----------------------------------------------------------|------|------|------|------|
| OFF CHARACTERISTICS                       |                     |                                                          |      |      |      |      |
| Drain-to-Source Breakdown Voltage         | BV <sub>DSS</sub>   | V <sub>GS</sub> =0V, I <sub>D</sub> =250uA               | 100  |      |      | V    |
| Zero Gate Voltage Drain Current           | I <sub>DSS</sub>    | V <sub>DS</sub> =100V, V <sub>GS</sub> =0V               |      |      | 100  | nA   |
| Gate-to-source Leakage Current            | I <sub>GSS</sub>    | V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V               |      |      | ±100 | nA   |
| ON CHARACTERISTICS                        |                     |                                                          |      |      |      |      |
| Gate Threshold Voltage                    | V <sub>GS(TH)</sub> | V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA | 1.0  | 1.8  | 2.5  | V    |
| Drain-to-source On-resistance             | R <sub>DS(on)</sub> | V <sub>GS</sub> =10V, I <sub>D</sub> =0.2A               |      | 2.7  | 3.5  | Ω    |
|                                           |                     | V <sub>GS</sub> =4.5V, I <sub>D</sub> =0.18A             |      | 2.95 | 4.2  |      |
| CHARGES, CAPACITANCES AND GATE RESISTANCE |                     |                                                          |      |      |      |      |
| Input Capacitance                         | C <sub>ISS</sub>    | V <sub>GS</sub> =0V, f=1MHz,<br>V <sub>DS</sub> =25V     |      | 29   |      | pF   |
| Output Capacitance                        | C <sub>OSS</sub>    |                                                          |      | 2.8  |      |      |
| Reverse Transfer Capacitance              | C <sub>RSS</sub>    |                                                          |      | 2.0  |      |      |
| Gate Resistance                           | R <sub>g</sub>      | f=1MHz                                                   |      | 1.3  |      | Ω    |
| BODY DIODE CHARACTERISTICS                |                     |                                                          |      |      |      |      |
| Forward Voltage                           | V <sub>SD</sub>     | V <sub>GS</sub> =0V, I <sub>S</sub> =0.2A                | 0.45 |      | 1.5  | V    |

7. Typical Characteristic

Figure 1: Output Characteristics

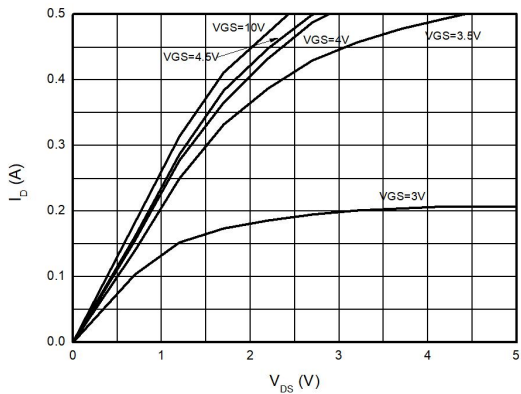


Figure 2: Transfer Characteristics

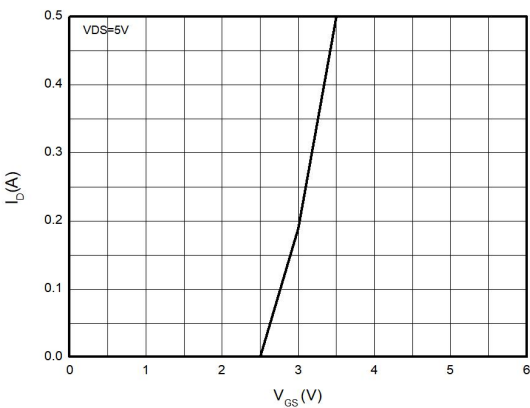


Figure 3: On-resistance vs Drain Current

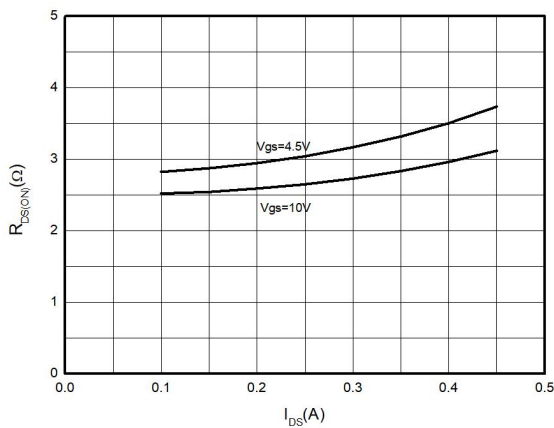


Figure 4: Body Diode Characteristics

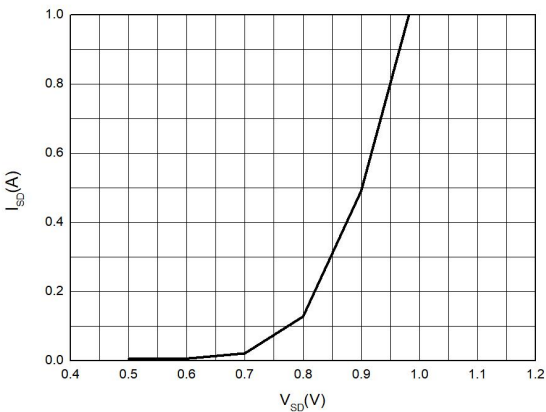


Figure 5: Capacitance Characteristics

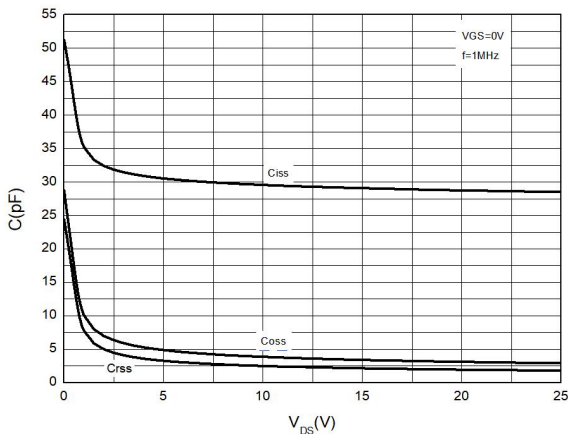
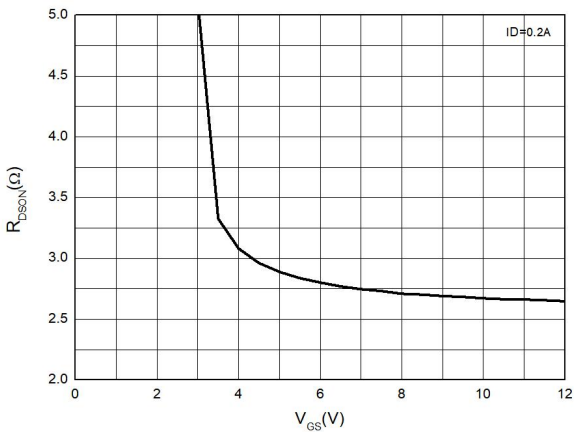


Figure 6: On-resistance vs Gate to Source

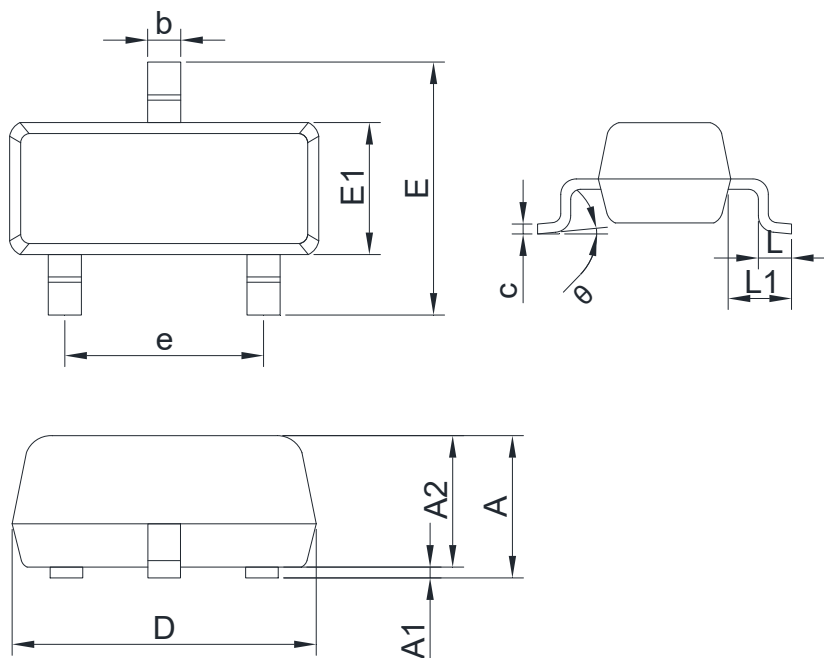


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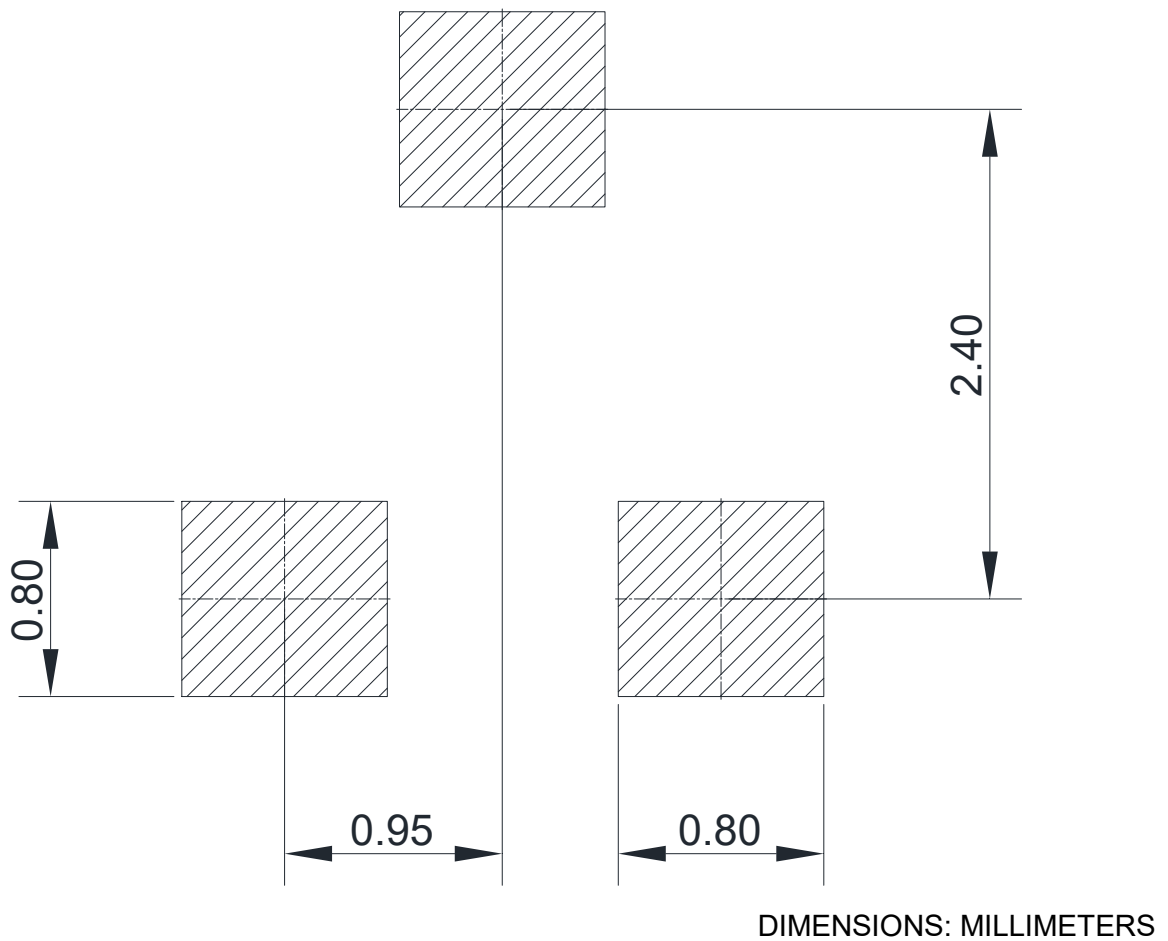
## 8. Dimension (SOT-23)

POD(Z)



| COMMON DIMENSIONS CUNITS MEASURE=MILLIMETER |      |      |          |       |       |
|---------------------------------------------|------|------|----------|-------|-------|
| SYMBOL                                      | MIN  | MAX  | SYMBOL   | MIN   | MAX   |
| A                                           | 0.90 | 1.20 | E        | 2.25  | 2.55  |
| A1                                          | 0.00 | 0.10 | E1       | 1.20  | 1.40  |
| A2                                          | 0.90 | 1.10 | e        | 1.80  | 2.00  |
| b                                           | 0.30 | 0.50 | L        | 0.30  | 0.50  |
| c                                           | 0.07 | 0.18 | L1       | 0.475 | 0.625 |
| D                                           | 2.80 | 3.04 | $\theta$ | 0°    | 8°    |

## 9. Recommended Soldering Footprint



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