

# MSKSEMI 美森科

SEMICONDUCTOR



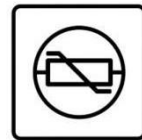
ESD



TVS



TSS



MOV



GDT



PLED

## **BSS84PH6327-MS**

**Product specification**

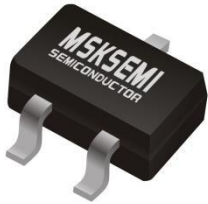
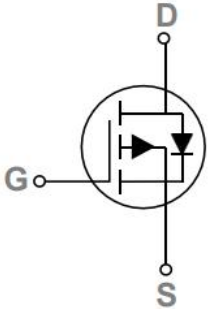

**General Features**

- -55 V,-0.3A,  $R_{DS(ON)} = 4.0\Omega @ V_{GS} = -10V$
- Improved  $dv/dt$  capability
- Fast switching
- Green Device Available
- ESD protected up to 2KV

**Application**

- Notebook
- Load Switch
- Battery Protection

**Reference News**

| PACKAGE OUTLINE  | Pin Configuration  | Marking  |
|--|--|--|
|  |  |  |
| <p>SOT-23</p>  |  |  |

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

| Symbol           | Parameter                             | Rating     | Units |
|------------------|---------------------------------------|------------|-------|
| V <sub>DS</sub>  | Drain-Source Voltage                  | -55        | V     |
| V <sub>GS</sub>  | Gate-Source Voltage                   | ±20        | V     |
| I <sub>D</sub>   | Drain Current – Continuous (TA=25°C)  | -0.3       | A     |
|                  | Drain Current – Continuous (TA=70°C)  | -0.2       | A     |
| I <sub>DM</sub>  | Drain Current – Pulsed <sup>1</sup>   | -1.2       | A     |
| P <sub>D</sub>   | Power Dissipation (TA=25°C)           | 1.0        | W     |
|                  | Power Dissipation – Derate above 25°C | 12.5       | mW/°C |
| T <sub>STG</sub> | Storage Temperature Range             | -55 to 150 | °C    |
| T <sub>J</sub>   | Operating Junction Temperature Range  | -55 to 150 | °C    |

**Thermal Characteristics**

| Symbol           | Parameter                              | Typ. | Max. | Unit |
|------------------|--|------|------|------|
| R <sub>θJA</sub> | Thermal Resistance Junction to ambient | ---  | 80   | °C/W |

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

| Symbol            | Parameter                      | Conditions  | Min. | Typ. | Max. | Unit |
|-------------------|--------------------------------|---|------|------|------|------|
| BV <sub>DSS</sub> | Drain-Source Breakdown Voltage | V <sub>GS</sub> =0V , I <sub>D</sub> =-250uA                        | -55  | ---  | ---  | V    |
| I <sub>DSS</sub>  | Drain-Source Leakage Current   | V <sub>DS</sub> =-55V , V <sub>GS</sub> =0V , T <sub>J</sub> =25°C  | ---  | ---  | -1   | uA   |
|                   |                                | V <sub>DS</sub> =-48V , V <sub>GS</sub> =0V , T <sub>J</sub> =125°C | ---  | ---  | -10  | uA   |
| I <sub>GSS</sub>  | Gate-Source Leakage Current    | V <sub>GS</sub> = ±20V , V <sub>DS</sub> =0V                        | ---  | ---  | ±20  | uA   |

**On Characteristics**

|                     |                                   |   |      |      |      |   |
|---------------------|-----------------------------------|---|------|------|------|---|
| R <sub>DS(ON)</sub> | Static Drain-Source On-Resistance | V <sub>GS</sub> =-10V , I <sub>D</sub> =-0.3A             | ---  | 4.0  | 5    | Ω |
|                     |                                   | V <sub>GS</sub> =-4.5V , I <sub>D</sub> =-0.2A            | ---  | 3.5  | 6.0  |   |
| V <sub>GS(th)</sub> | Gate Threshold Voltage            | V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =-250uA | -1.0 | -1.7 | -2.5 | V |
| g <sub>fs</sub>     | Forward Transconductance          | V <sub>DS</sub> =-10V , I <sub>D</sub> =-0.3A             | ---  | 0.4  | ---  | S |

**Dynamic and switching Characteristics**

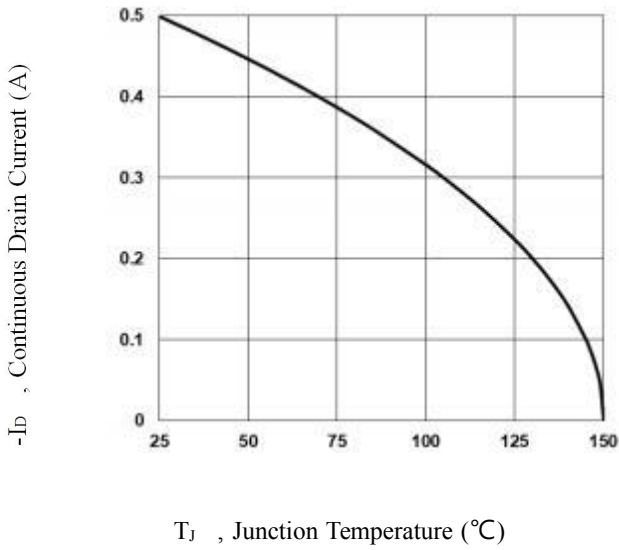
|              |                                     |  |     |      |     |    |
|--------------|-------------------------------------|--|-----|------|-----|----|
| $Q_g$        | Total Gate Charge <sup>2, 3</sup>   | $V_{DS}=-30V, V_{GS}=-10V, I_D=-0.3A$                  | --- | 2.8  | --- | nC |
| $Q_{gs}$     | Gate-Source Charge <sup>2, 3</sup>  |  | --- | 0.96 | --- |    |
| $Q_{gd}$     | Gate-Drain Charge <sup>2, 3</sup>   |  | --- | 0.6  | --- |    |
| $T_{d(on)}$  | Turn-On Delay Time <sup>2, 3</sup>  | $V_{DD}=-30V, V_{GS}=-10V, R_G=6\Omega$<br>$I_D=-0.3A$ | --- | 3    | --- | ns |
| $T_r$        | Rise Time <sup>2, 3</sup>           |  | --- | 5    | --- |    |
| $T_{d(off)}$ | Turn-Off Delay Time <sup>2, 3</sup> |  | --- | 14   | --- |    |
| $T_f$        | Fall Time <sup>2, 3</sup>           |  | --- | 9    | --- |    |
| $C_{iss}$    | Input Capacitance                   | $V_{DS}=-30V, V_{GS}=0V, F=1MHz$                       | --- | 30.5 | --- | pF |
| $C_{oss}$    | Output Capacitance                  |  | --- | 15.1 | --- |    |
| $C_{rss}$    | Reverse Transfer Capacitance        |  | --- | 7    | --- |    |

**Drain-Source Diode Characteristics and Maximum Ratings**

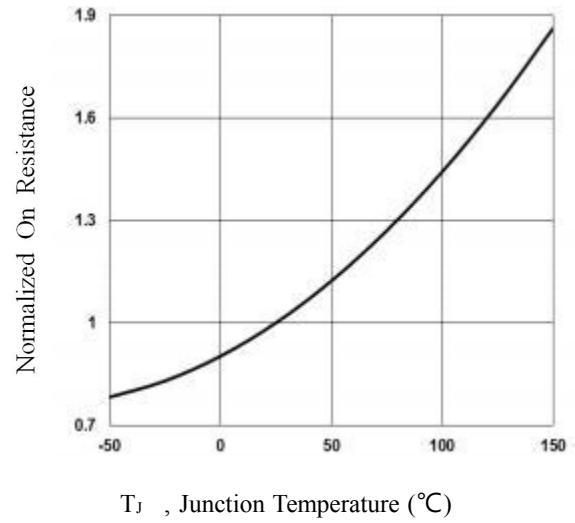
| Symbol   | Parameter                 | Conditions   | Min. | Typ. | Max. | Unit |
|----------|---------------------------|--|------|------|------|------|
| $I_S$    | Continuous Source Current | $V_G=V_D=0V, \text{ Force Current}$                      | ---  | ---  | -0.3 | A    |
| $I_{SM}$ | Pulsed Source Current     |  | ---  | ---  | -0.6 | A    |
| $V_{SD}$ | Diode Forward Voltage     | $V_{GS}=0V, I_S=-0.2A, T_J=25^\circ C$                   | ---  | ---  | -1.2 | V    |
| $T_{rr}$ | Reverse Recovery Time     | $V_R=-50V, I_S=-0.3A$<br>$di/dt=100A/ps, T_J=25^\circ C$ | ---  | 13.5 | ---  | nS   |
| $Q_{rr}$ | Reverse Recovery Charge   |  | ---  | 3    | ---  | nC   |

Note :

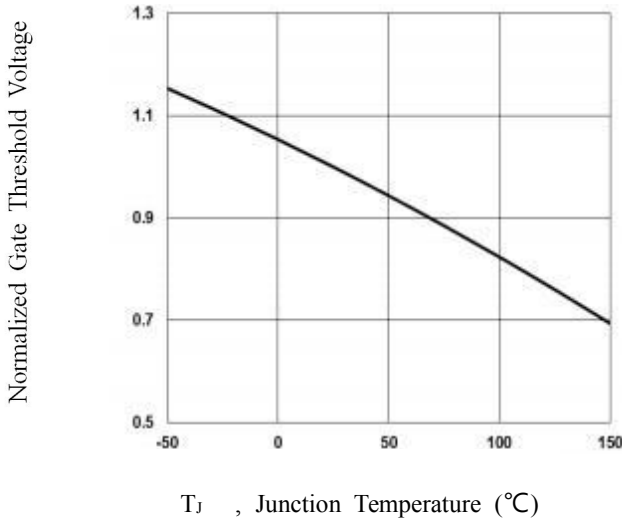
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width  $\leq 300\mu s$  , duty cycle  $\leq 2\%$
3. Essentially independent of operating temperature.



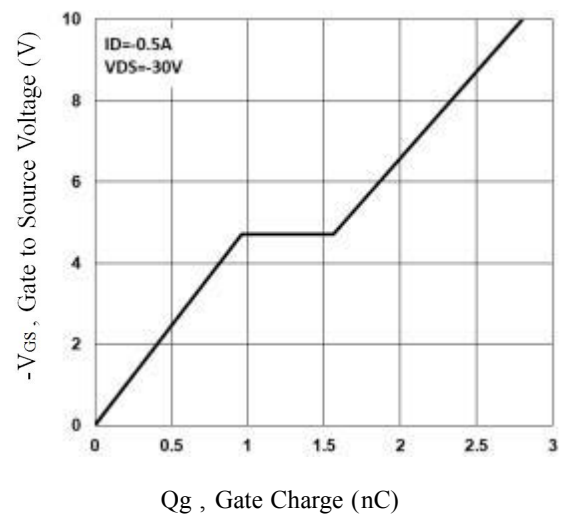
**Fig.1 Continuous Drain Current vs. T<sub>j</sub>**



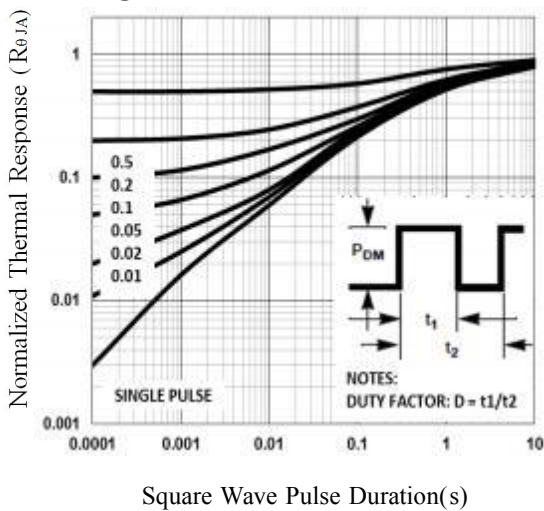
**Fig.2 Normalized R<sub>DS(on)</sub> vs. T<sub>j</sub>**



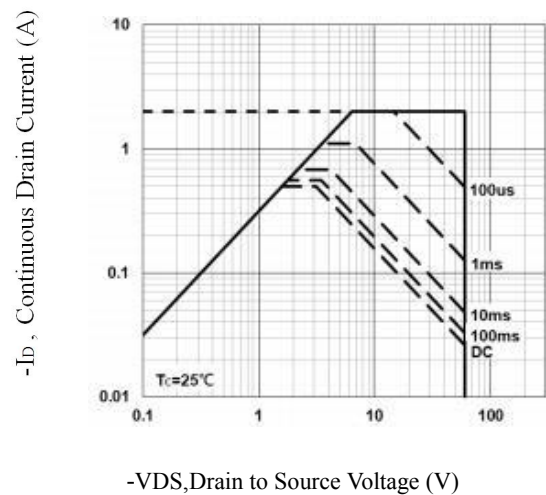
**Fig.3 Normalized V<sub>th</sub> vs. T<sub>j</sub>**



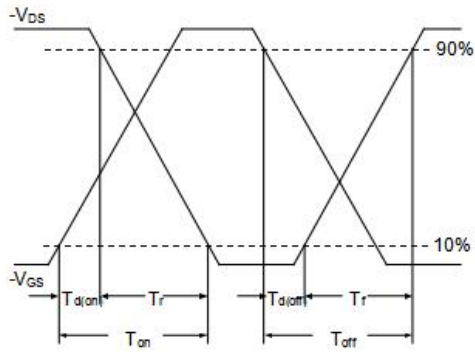
**Fig.4 Gate Charge Waveform**



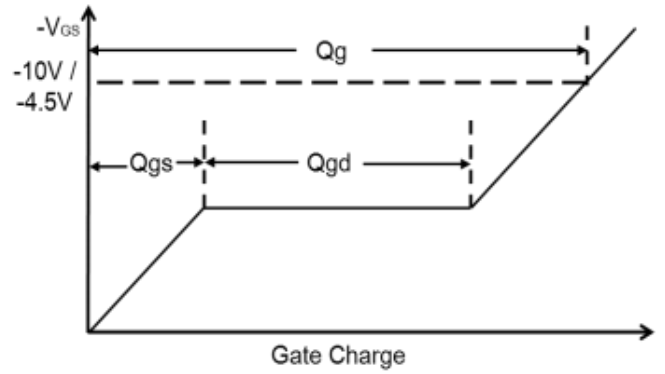
**Fig.5 Normalized Transient Impedance**



**Fig.6 Maximum Safe Operation Area**



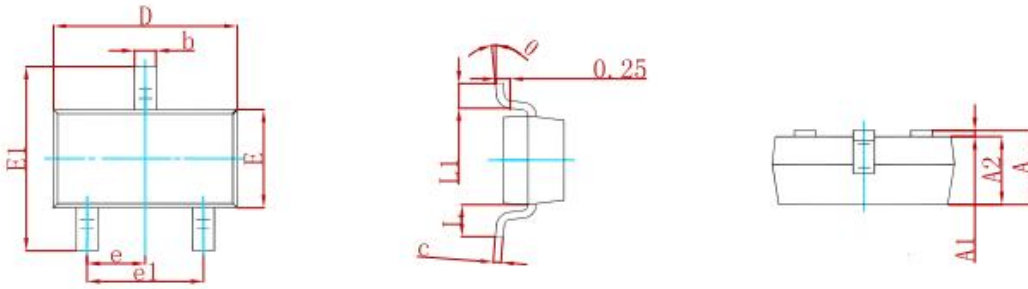
**Fig. 7 Switching Time Waveform**



**Fig. 8 Gate Charge Waveform**

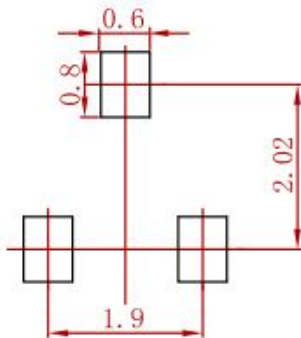


**PACKAGE MECHANICAL DATA**



| 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°    |

**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.

**REEL SPECIFICATION**

| P/N            | PKG    | QTY  |
|----------------|--------|------|
| BSS84PH6327-MS | SOT-23 | 3000 |



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