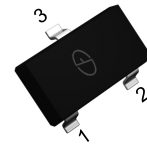


## N-Channel 60V (D-S) Power MOSFET

### Features

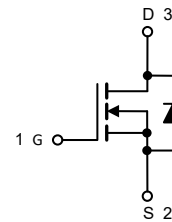
- 100% Avalanche Tested
- Halogen Free, Pb-Free
- RoHS Compliant



SOT-23

### Applications

- Relay driver
- Switching circuits
- High-side load switch
- High-speed line driver



### Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$ unless otherwise noted)

| Parameter  | Symbol          | Value       | Unit             |
|--|-----------------|-------------|------------------|
| Drain Source Voltage                             | $V_{DS}$        | 60          | V                |
| Gate Source Voltage                              | $V_{GS}$        | $\pm 20$    | V                |
| Drain Current, Continuous<br>$V_{GS}=10\text{V}$ | $I_D$           | 2.7         | A                |
| $T_C=25^\circ\text{C}$                           |                 |             |                  |
| Drain Current, Pulsed (Note 1)                   | $I_{DM}$        | 10.8        | A                |
| Power Dissipation                                | $P_D$           | 1.25        | W                |
| $T_C=25^\circ\text{C}$                           |                 |             |                  |
| Operating Junction/ Storage Temperature Range    | $T_J / T_{STG}$ | -55 to +150 | $^\circ\text{C}$ |

Note 1: Single pulse;  $t_p \leq 1\mu\text{s}$ .

### Thermal Characteristics

| Parameter                                       | Symbol     | Max | Unit               |
|---|------------|-----|--------------------|
| Thermal Resistance Junction to Ambient (Note 2) | $R_{thJA}$ | 100 | $^\circ\text{C/W}$ |

Note 2: Device mounted on 1 square inch FR4 PCB board, with 2oz single-sided copper, in a  $25^\circ\text{C}$  still air environment.

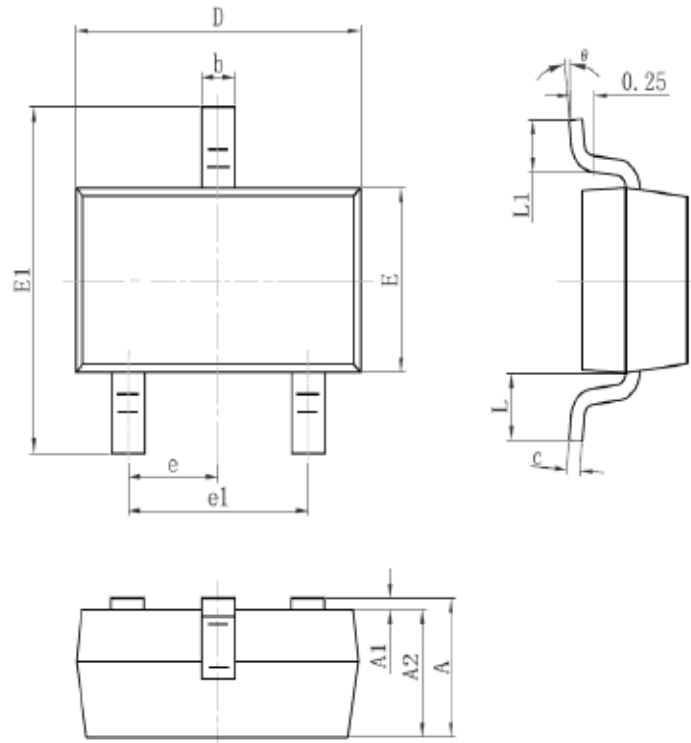
| Electrical Characteristics (T <sub>A</sub> =25°C unless otherwise noted) |                      |   |     |      |      |      |
|--|----------------------|---|-----|------|------|------|
| Parameter  | Symbol               | Test Conditions   | Min | Typ  | Max  | Unit |
| Drain Source Breakdown Voltage   | V <sub>(BR)DSS</sub> | V <sub>GS</sub> =0V, I <sub>D</sub> =250μA  | 60  | --   | --   | V    |
| Zero Gate Voltage Drain Current  | I <sub>DSS</sub>     | V <sub>DS</sub> =60V, V <sub>GS</sub> =0V   | --  | --   | 1    | uA   |
| Gate Threshold Voltage   | V <sub>GS(TH)</sub>  | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =250uA                                       | 1   | --   | 2.5  | V    |
| Gate Leakage Current   | I <sub>GSS</sub>     | V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V  | --  | --   | ±100 | nA   |
| Drain-Source On-state Resistance (Note 3)                                | R <sub>DS(on)</sub>  | V <sub>GS</sub> =10V, I <sub>D</sub> =2.7A  | --  | 70   | 92   | mΩ   |
| Total Gate Charge  | Q <sub>g</sub>       | V <sub>GS(off)</sub> =0V, V <sub>GS(on)</sub> =10V,<br>V <sub>DD</sub> =40V, I <sub>D</sub> =4A | --  | 12   | --   | nC   |
| Gate-Source Charge   | Q <sub>gs</sub>      |   | --  | 3.5  | --   |      |
| Gate-Drain Charge  | Q <sub>gd</sub>      |   | --  | 3.7  | --   |      |
| Turn-on Delay Time   | t <sub>d(on)</sub>   | V <sub>GS</sub> =10V, V <sub>DD</sub> =25V,<br>I <sub>D</sub> =1.2A, R <sub>G</sub> =50Ω        | --  | 9.2  | --   | ns   |
| Turn-on Rise Time  | t <sub>r</sub>       |   | --  | 16.7 | --   |      |
| Turn-off Delay Time  | t <sub>d(off)</sub>  |   | --  | 35.4 | --   |      |
| Turn-off Fall Time   | t <sub>f</sub>       |   | --  | 8.6  | --   |      |
| Input Capacitance  | C <sub>iss</sub>     | V <sub>GS</sub> =0V, V <sub>DS</sub> =25V, f=1MHz   | --  | 641  | --   | pF   |
| Output Capacitance   | C <sub>oss</sub>     |   | --  | 48   | --   |      |
| Reverse Transfer Capacitance   | C <sub>rss</sub>     |   | --  | 38   | --   |      |

| Reverse Diode Characteristics (T <sub>A</sub> =25°C unless otherwise noted) |                 |   |      |      |      |      |
|---|-----------------|---|------|------|------|------|
| Parameter   | Symbol          | Test Conditions                           | Min. | Typ. | Max. | Unit |
| Forward Current, Continuous   | I <sub>SD</sub> | T <sub>C</sub> =25°C                      | --   | --   | 2.7  | A    |
| Diode Forward Voltage (Note 3)  | V <sub>SD</sub> | I <sub>F</sub> =2.7A, V <sub>GS</sub> =0V | --   | 0.85 | 1.3  | V    |

Note 3: Pulse test; pulse width ≤ 380μs, duty cycle ≤ 1%.

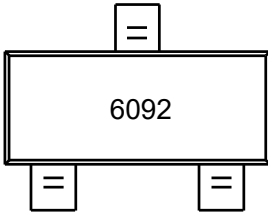
## Package Outline Dimensions (Unit: millimeters)

### SOT-23



| Symbol | Dimension In Millimeters |       | Dimension 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      | 0.95TYP                  |       | 0.037TYP            |       |
| e1     | 1.800                    | 2.000 | 0.071               | 0.079 |
| L      | 0.55REF                  |       | 0.022REF            |       |
| L1     | 0.300                    | 0.500 | 0.012               | 0.020 |
| θ      | 0°                       | 8°    | 0°                  | 8°    |

## Marking Outline



Part Name: GMN6092G1

1. P/N Mark: 6092

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