

## DMG3407SSN

## P-CHANNEL ENHANCEMENT MODE MOSFET

## Product Summary

| $V_{(BR)DSS}$ | $R_{DS(ON)}$                   | $I_D$<br>$T_A = 25^\circ\text{C}$ |
|---------------|--------------------------------|-----------------------------------|
| -30V          | 50mΩ @ $V_{GS} = -10\text{V}$  | -4.0A                             |
|               | 72mΩ @ $V_{GS} = -4.5\text{V}$ | -3.3A                             |

## Description and Applications

This new generation MOSFET has been designed to minimize the on-state resistance ( $R_{DS(on)}$ ) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

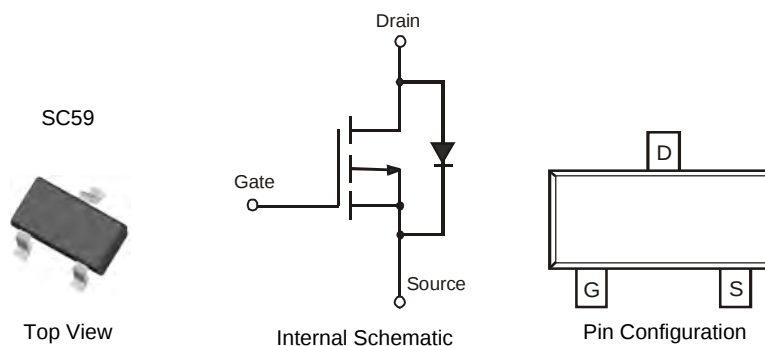
- Load Switch
- DC-DC Converters
- Power management functions

## Features and Benefits

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Lead-Free Finish; RoHS compliant (Note 1)
- Halogen and Antimony Free. "Green" Device (Note 2)
- Qualified to AEC-Q101 Standards for High Reliability

## Mechanical Data

- Case: SC59
- Case Material – Molded Plastic. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Weight: 0.014 grams (approximate)

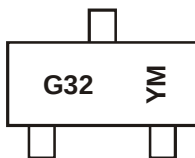


## Ordering Information (Note 3)

| Part Number  | Case | Packaging          |
|--------------|------|--------------------|
| DMG3407SSN-7 | SC59 | 3000 / Tape & Reel |

Notes: 1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. No purposely added lead. Halogen and Antimony free

## Marking Information



G32 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: X = 2010)  
 M = Month (ex: 9 = September)

## Date Code Key

| Year | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|------|------|------|------|------|------|------|------|
| Code | X    | Y    | Z    | A    | B    | C    | D    |

| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code  | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | O   | N   | D   |

**Maximum Ratings** @T<sub>A</sub> = 25°C unless otherwise specified

| Characteristic                                            |              |                                                | Symbol           | Value        | Units |
|-----------------------------------------------------------|--------------|------------------------------------------------|------------------|--------------|-------|
| Drain-Source Voltage                                      |              |                                                | V <sub>DSS</sub> | -30          | V     |
| Gate-Source Voltage                                       |              |                                                | V <sub>GSS</sub> | ±20          | V     |
| Continuous Drain Current (Note 5) V <sub>GS</sub> = -10V  | Steady State | T <sub>A</sub> = 25°C<br>T <sub>A</sub> = 70°C | I <sub>D</sub>   | -4.0<br>-3.2 | A     |
|                                                           | t<10s        | T <sub>A</sub> = 25°C<br>T <sub>A</sub> = 70°C | I <sub>D</sub>   | -4.6<br>-3.6 | A     |
| Continuous Drain Current (Note 5) V <sub>GS</sub> = -4.5V | Steady State | T <sub>A</sub> = 25°C<br>T <sub>A</sub> = 70°C | I <sub>D</sub>   | -3.3<br>-2.6 | A     |
|                                                           | t<10s        | T <sub>A</sub> = 25°C<br>T <sub>A</sub> = 70°C | I <sub>D</sub>   | -3.9<br>-3.1 | A     |
| Pulsed Drain Current (10μs pulse, duty cycle = 1%)        |              |                                                | I <sub>DM</sub>  | -30          | A     |
| Maximum Body Diode Forward Current (Note 5)               |              |                                                | I <sub>S</sub>   | -2.0         | A     |

**Thermal Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

| Characteristic                                   |                       | Symbol                            | Value       | Units |
|--------------------------------------------------|-----------------------|-----------------------------------|-------------|-------|
| Total Power Dissipation (Note 4)                 | T <sub>A</sub> = 25°C | P <sub>D</sub>                    | 1.1         | W     |
|                                                  | T <sub>A</sub> = 70°C |                                   | 0.7         |       |
| Thermal Resistance, Junction to Ambient (Note 4) | Steady state          | R <sub>θJA</sub>                  | 166         | °C/W  |
|                                                  | t<10s                 |                                   | 118         |       |
| Total Power Dissipation (Note 5)                 | T <sub>A</sub> = 25°C | P <sub>D</sub>                    | 1.8         | W     |
|                                                  | T <sub>A</sub> = 70°C |                                   | 1.1         |       |
| Thermal Resistance, Junction to Ambient (Note 5) | Steady state          | R <sub>θJA</sub>                  | 98          | °C/W  |
|                                                  | t<10s                 |                                   | 71          |       |
| Thermal Resistance, Junction to Case (Note 5)    |                       | R <sub>θJC</sub>                  | 18          |       |
| Operating and Storage Temperature Range          |                       | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C    |

**Electrical Characteristics** @ T<sub>A</sub> = 25°C unless otherwise stated

| Characteristic                                        | Symbol              | Min  | Typ   | Max  | Unit | Test Condition                                                                                |
|-------------------------------------------------------|---------------------|------|-------|------|------|-----------------------------------------------------------------------------------------------|
| <b>OFF CHARACTERISTICS (Note 6)</b>                   |                     |      |       |      |      |                                                                                               |
| Drain-Source Breakdown Voltage                        | BV <sub>DSS</sub>   | -30  | -     | -    | V    | V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA                                                 |
| Zero Gate Voltage Drain Current T <sub>J</sub> = 25°C | I <sub>DSS</sub>    | -    | -     | -1   | μA   | V <sub>DS</sub> = -30V, V <sub>GS</sub> = 0V                                                  |
| Gate-Source Leakage                                   | I <sub>GSS</sub>    | -    | -     | ±100 | nA   | V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V                                                  |
| <b>ON CHARACTERISTICS (Note 6)</b>                    |                     |      |       |      |      |                                                                                               |
| Gate Threshold Voltage                                | V <sub>GS(th)</sub> | -1.0 | -1.5  | -2.1 | V    | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA                                   |
| Static Drain-Source On-Resistance                     | R <sub>DS(on)</sub> | -    | 39    | 50   | mΩ   | V <sub>GS</sub> = -10V, I <sub>D</sub> = -4.1A                                                |
|                                                       |                     | -    | 56    | 72   |      | V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -3.0A                                               |
| Forward Transfer Admittance                           | Y <sub>fs</sub>     | -    | 8.2   | -    | S    | V <sub>DS</sub> = -5V, I <sub>D</sub> = -4A                                                   |
| Diode Forward Voltage                                 | V <sub>SD</sub>     | -    | -0.75 | -1.1 | V    | V <sub>GS</sub> = 0V, I <sub>S</sub> = -1A                                                    |
| <b>DYNAMIC CHARACTERISTICS (Note 7)</b>               |                     |      |       |      |      |                                                                                               |
| Input Capacitance                                     | C <sub>iss</sub>    | 466  | 582   | 700  | pF   | V <sub>DS</sub> = -15V, V <sub>GS</sub> = 0V,<br>f = 1.0MHz                                   |
| Output Capacitance                                    | C <sub>oss</sub>    | 80   | 114   | 148  |      |                                                                                               |
| Reverse Transfer Capacitance                          | C <sub>rss</sub>    | 47   | 76    | 105  |      |                                                                                               |
| Gate Resistance                                       | R <sub>g</sub>      | 2    | 5     | 8    | Ω    | V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz                                          |
| Total Gate Charge                                     | Q <sub>g</sub>      | 10.6 | 13.3  | 16   | nC   | V <sub>GS</sub> = -10V, V <sub>DS</sub> = -15V, I <sub>D</sub> = -4A                          |
| Total Gate Charge                                     | Q <sub>g</sub>      | 5.2  | 6.5   | 8.5  |      |                                                                                               |
| Gate-Source Charge                                    | Q <sub>gs</sub>     | 1.3  | 1.7   | 2    |      |                                                                                               |
| Gate-Drain Charge                                     | Q <sub>gd</sub>     | 1.1  | 1.9   | 2.7  |      |                                                                                               |
| Turn-On Delay Time                                    | t <sub>D(on)</sub>  | -    | 6.0   | -    | ns   | V <sub>GS</sub> = -10V, V <sub>DS</sub> = -15V,<br>R <sub>L</sub> = 3.6Ω, R <sub>G</sub> = 3Ω |
| Turn-On Rise Time                                     | t <sub>r</sub>      | -    | 12.9  | -    |      |                                                                                               |
| Turn-Off Delay Time                                   | t <sub>D(off)</sub> | -    | 35.4  | -    |      |                                                                                               |
| Turn-Off Fall Time                                    | t <sub>f</sub>      | -    | 30.7  | -    |      |                                                                                               |
| Reverse Recovery Time                                 | t <sub>rr</sub>     | 6.8  | 8.5   | 10.2 | ns   | I <sub>F</sub> = 4A, di/dt = 100A/μs                                                          |
| Reverse Recovery Charge                               | Q <sub>rr</sub>     | 5.5  | 7.0   | 8.5  | nC   |                                                                                               |

- Notes:
2. Device mounted on FR-4 PCB with minimum recommended pad layout, single sided. The power dissipation P<sub>D</sub> is based on t<10s R<sub>θJA</sub>
  3. Device mounted on 1" x 1" FR-4 PCB with high coverage 2 oz. Copper, single sided. The power dissipation P<sub>D</sub> is based on t<10s R<sub>θJA</sub>
  4. Short duration pulse test used to minimize self-heating effect.
  5. Guaranteed by design. Not subject to production testing.



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