

**• General Description**

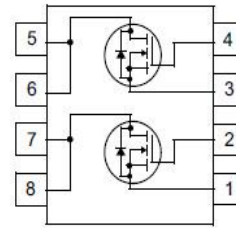
The ZMD68603S combines advanced trench MOSFET technology with a low resistance package to provide extremely low  $R_{DS(ON)}$ .

**• Features**

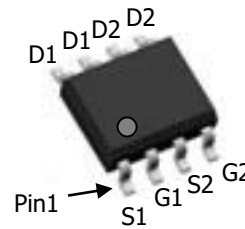
- Advance high cell density Trench technology
- Low  $R_{DS(ON)}$  to minimize conductive loss
- Low Gate Charge for fast switching
- Dual DIE in one package

**• Application**

- Power Management in Notebook Computer,
- Portable Equipment and Battery Powered Systems

**• Product Summary**


$V_{DS1} = 60V$   
 $V_{DS2} = 60V$   
 $R_{DS(ON)1} = 55m\Omega$   
 $R_{DS(ON)2} = 55m\Omega$   
 $I_{D1} = 4.5A$   
 $I_{D2} = 4.5A$



SOP8

**• Ordering Information:**

|                           |           |
|---------------------------|-----------|
| Part NO.                  | ZMD68603S |
| Marking                   | ZMD68603  |
| Packing Information       | REEL TAPE |
| Basic ordering unit (pcs) | 3000      |

**• Absolute Maximum Ratings ( $T_C = 25^\circ C$ )**

| Parameter                         | Symbol                 | Rating     | Unit       |
|-----------------------------------|------------------------|------------|------------|
| Drain-Source Voltage              | $V_{DS}$               | 60         | V          |
| Gate-Source Voltage               | $V_{GS}$               | $\pm 20$   | V          |
| Continuous Drain Current          | $I_{D@TC=25^\circ C}$  | 4.5        | A          |
|                                   | $I_{D@TC=75^\circ C}$  | 3.4        | A          |
|                                   | $I_{D@TC=100^\circ C}$ | 2.8        | A          |
| Pulsed Drain Current <sup>①</sup> | $I_{DM}$               | 12         | A          |
| Total Power Dissipation           | $P_D@TC=25^\circ C$    | 3.6        | W          |
| Total Power Dissipation           | $P_D@TA=25^\circ C$    | 0.69       | W          |
| Operating Junction Temperature    | $T_J$                  | -55 to 150 | $^\circ C$ |
| Storage Temperature               | $T_{STG}$              | -55 to 150 | $^\circ C$ |
| Single Pulse Avalanche Energy     | $E_{AS}$               | 25         | mJ         |

**•Thermal resistance**

| Parameter                                    | Symbol            | Min. | Typ. | Max. | Unit  |
|--|-------------------|------|------|------|-------|
| Thermal resistance, junction - case          | R <sub>thJC</sub> | -    | -    | 34   | ° C/W |
| Thermal resistance, junction - ambient       | R <sub>thJA</sub> | -    | -    | 180  | ° C/W |
| Soldering temperature, wavesoldering for 10s | T <sub>sold</sub> | -    | -    | 265  | ° C   |

**•Electronic Characteristics**

| Parameter                         | Symbol              | Condition  | Min. | Typ | Max. | Unit |
|-----------------------------------|---------------------|--|------|-----|------|------|
| Drain-Source Breakdown Voltage    | BV <sub>DSS</sub>   | V <sub>GS</sub> =0V, I <sub>D</sub> =250uA               | 60   |     |      | V    |
| Gate Threshold Voltage            | V <sub>GS(TH)</sub> | V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA | 1.2  |     | 2.5  | V    |
| Drain-Source Leakage Current      | I <sub>DSS</sub>    | V <sub>DS</sub> =60V, V <sub>GS</sub> =0V                |      |     | 1.0  | uA   |
| Gate- Source Leakage Current      | I <sub>GSS</sub>    | V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V               |      |     | ±100 | nA   |
| Static Drain-source On Resistance | R <sub>DS(ON)</sub> | V <sub>GS</sub> =10V, I <sub>D</sub> =8A                 |      | 55  | 65   | mΩ   |
|                                   |                     | V <sub>GS</sub> =4.5V, I <sub>D</sub> =4.5A              |      | 85  | 95   | mΩ   |
| Forward Transconductance          | g <sub>FS</sub>     | V <sub>DS</sub> =25V, I <sub>D</sub> =4A                 |      | 8   |      | s    |
| Source-drain voltage              | V <sub>SD</sub>     | I <sub>S</sub> =4.5A                                     |      |     | 1.28 | V    |

**•Electronic Characteristics**

| Parameter                    | Symbol           | Condition | Min. | Typ | Max. | Unit |
|------------------------------|------------------|-----------|------|-----|------|------|
| Input capacitance            | C <sub>iss</sub> | f = 1MHz  | -    | 950 | -    | pF   |
| Output capacitance           | C <sub>oss</sub> |           | -    | 230 | -    |      |
| Reverse transfer capacitance | C <sub>rss</sub> |           | -    | 113 | -    |      |

**•Gate Charge characteristics(T<sub>a</sub> = 25°C)**

| Parameter            | Symbol          | Condition             | Min. | Typ | Max. | Unit |
|----------------------|-----------------|-----------------------|------|-----|------|------|
| Total gate charge    | Q <sub>g</sub>  | V <sub>DD</sub> = 25V | -    | 12  | -    | nC   |
| Gate - Source charge | Q <sub>gs</sub> | I <sub>D</sub> = 5A   | -    | 4   | -    |      |
| Gate - Drain charge  | Q <sub>gd</sub> | V <sub>GS</sub> = 10V | -    | 6   | -    |      |

Note: ① Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2% ;

Fig.1 Power Dissipation

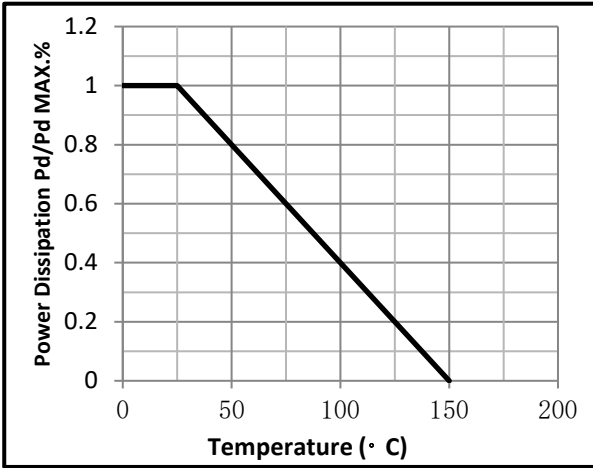


Fig.2 Typical output Characteristics

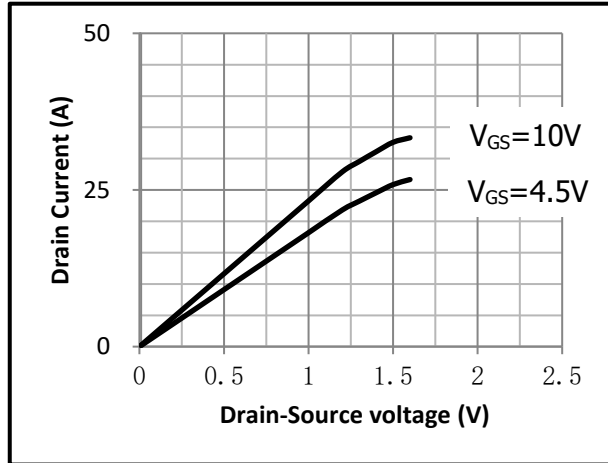


Fig.3 Threshold Voltage V.S Junction Temperature

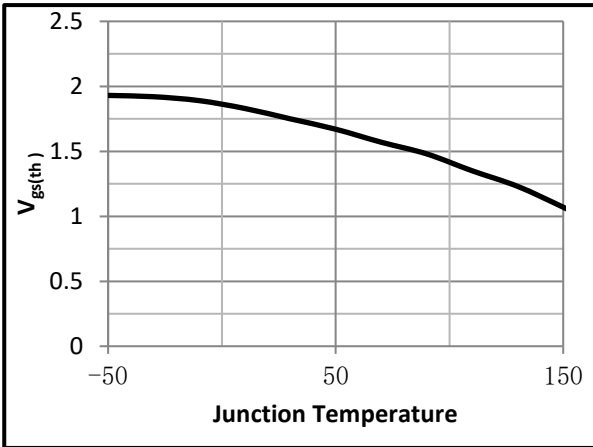


Fig.4 Resistance V.S Drain Current

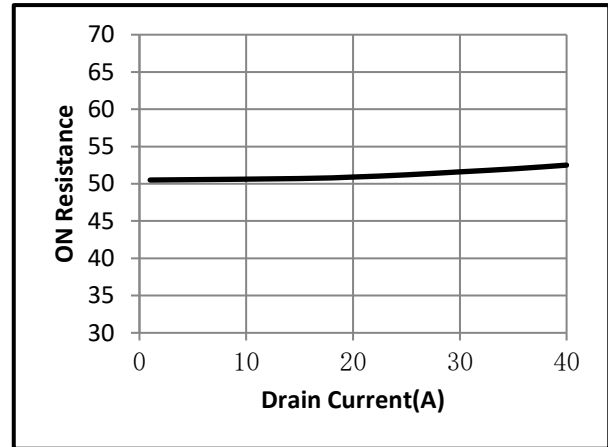


Fig.5 On-Resistance VS Gate Source Voltage

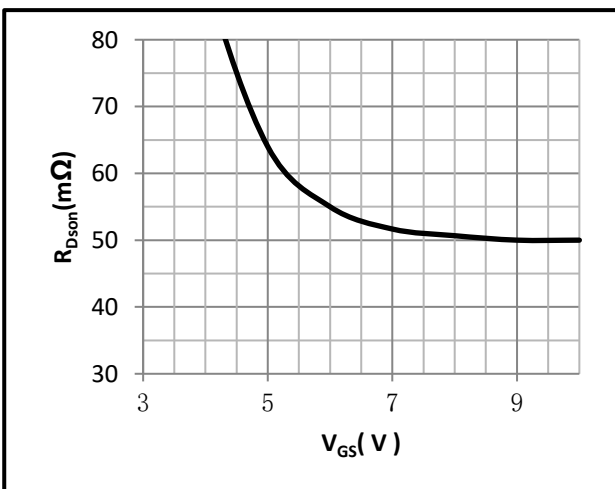


Fig.6 On-Resistance V.S Junction Temperature

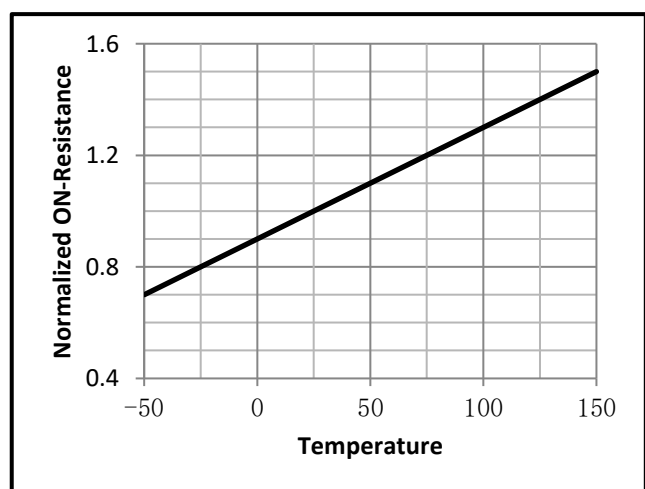


Fig.7 Switching Time Measurement Circuit

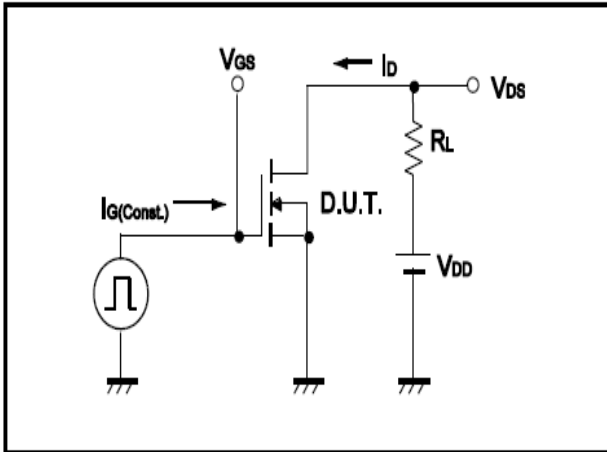


Fig.8 Gate Charge Waveform

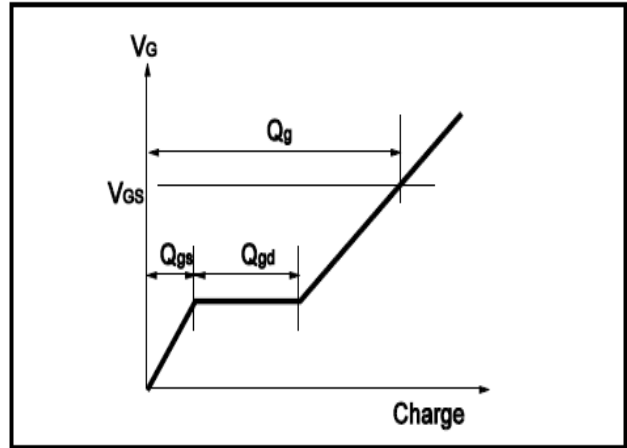


Fig.9 Switching Time Measurement Circuit

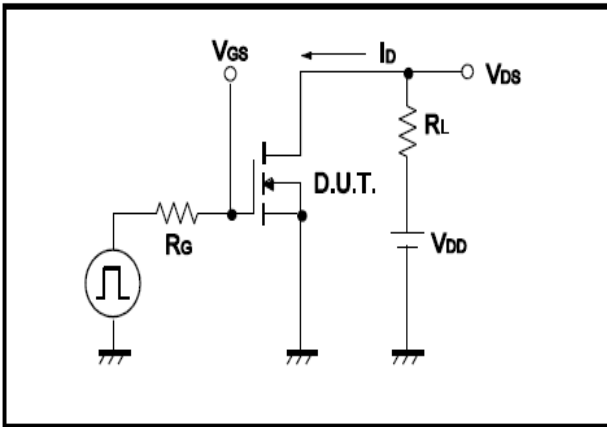


Fig.10 Gate Charge Waveform

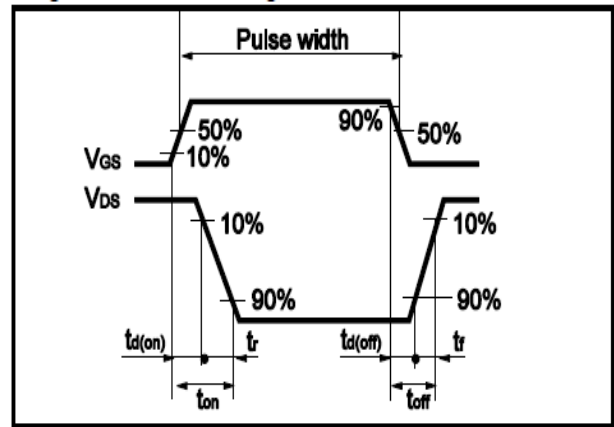


Fig.11 Avalanche Measurement Circuit

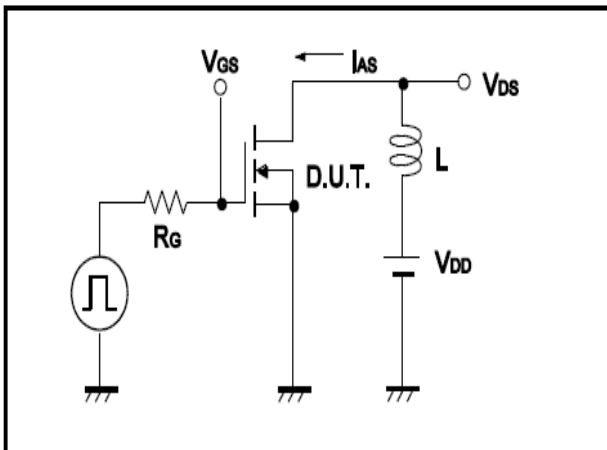
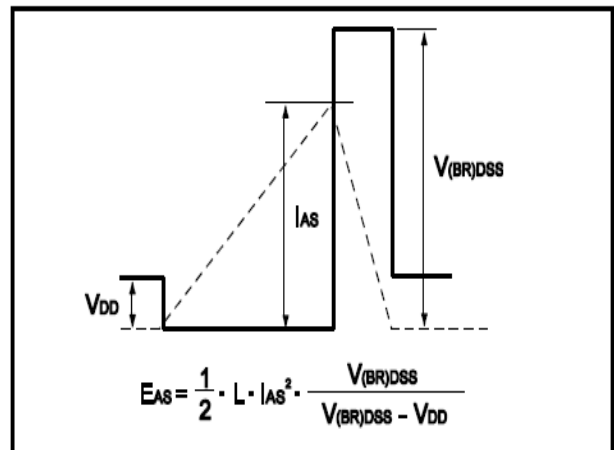


Fig.12 Avalanche Waveform



●Dimensions(SOP8)

Unit: mm

| SYMBOL | min  | TYP  | max  | SYMBOL | min  |      | max  |
|--------|------|------|------|--------|------|------|------|
| A      | 4.80 |      | 5.25 | C      | 1.30 |      | 1.75 |
| A1     | 0.37 |      | 0.49 | C1     | 0.55 |      | 0.75 |
| A2     |      | 1.27 |      | C2     | 0.55 |      | 0.65 |
| A3     |      | 0.41 |      | C3     | 0.05 |      | 0.20 |
| B      | 5.80 |      | 6.20 | C4     | 0.10 | 0.20 | 0.23 |
| B1     | 3.80 |      | 4.10 | D      |      | 1.05 |      |
| B2     |      | 5.00 |      | D1     | 0.40 |      | 0.62 |

