

• General Description

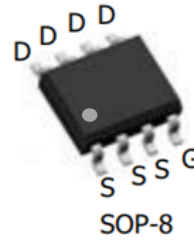
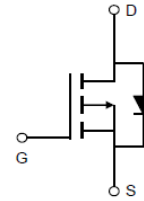
The ZM280P04S combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.

• Features

- Advance high cell density Trench technology
- Low $R_{DS(ON)}$ to minimize conductive loss
- Low Gate Charge for fast switching
- Low Thermal resistance

• Application

- MB/VGA Vcore
- POL application
- BLDC Motor driver

• Product Summary
 $V_{DS} = -40V$
 $R_{DS(ON)} = 28m\Omega$
 $I_D = -7A$

• Ordering Information:

| | |
|---------------------------|-----------|
| Part NO. | ZM280P04S |
| Marking | ZM280P04 |
| Packing Information | REEL TAPE |
| Basic ordering unit (pcs) | 4000 |

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

| Parameter | Symbol | Rating | Unit |
|--------------------------------------|---------------------------|------------|------------|
| Drain-Source Voltage | V_{DS} | -40 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current | $I_D @ T_C = 25^\circ C$ | -7 | A |
| | $I_D @ T_C = 75^\circ C$ | -5.3 | A |
| | $I_D @ T_C = 100^\circ C$ | -4.4 | A |
| Pulsed Drain Current ^① | I_{DM} | -16 | A |
| Total Power Dissipation ^② | $P_D @ T_C = 25^\circ C$ | 3.6 | W |
| Total Power Dissipation | $P_D @ T_A = 25^\circ C$ | 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} | 70 | mJ |

•Thermal resistance

| Parameter | Symbol | Min. | Typ. | Max. | Unit |
|--|-------------------|------|------|------|-------|
| Thermal resistance, junction - case ^② | R _{thJC} | - | - | 34 | ° C/W |
| Thermal resistance, junction - ambient | R _{thJA} | - | - | 180 | ° C/W |
| Soldering temperature, wavesoldering for 10s | T _{sold} | - | - | 265 | ° C |

•Electronic Characteristics

| Parameter | Symbol | Condition | Min. | Typ | Max. | Unit |
|-----------------------------------|---------------------|---|------|-----|------|------|
| Drain-Source Breakdown Voltage | BV _{DSS} | V _{GS} =0V, I _D =-250uA | -40 | | | V |
| Gate Threshold Voltage | V _{GS(TH)} | V _{GS} =V _{DS} , I _D =-250uA | -1.2 | | -2.5 | V |
| Drain-Source Leakage Current | I _{DSS} | V _{DS} =-40V, V _{GS} =0V | | | -1.0 | uA |
| Gate- Source Leakage Current | I _{GSS} | V _{GS} =±20V, V _{DS} =0V | | | ±100 | nA |
| Static Drain-source On Resistance | R _{DS(ON)} | V _{GS} =-10V, I _D =-6A | | 28 | 36 | mΩ |
| | | V _{GS} =-4.5V, I _D =-4A | | 45 | 52 | mΩ |
| Forward Transconductance | g _{FS} | V _{DS} =-10V, I _D =-5A | | 11 | | s |
| Source-drain voltage | V _{SD} | I _S =-6A | | | 1.28 | V |

•Electronic Characteristics

| Parameter | Symbol | Condition | Min. | Typ | Max. | Unit |
|------------------------------|------------------|-----------|------|------|------|------|
| Input capacitance | C _{iss} | f = 1MHz | - | 1350 | - | pF |
| Output capacitance | C _{oss} | | - | 194 | - | |
| Reverse transfer capacitance | C _{rss} | | - | 148 | - | |

•Gate Charge characteristics(T_a = 25°C)

| Parameter | Symbol | Condition | Min. | Typ | Max. | Unit |
|----------------------|-----------------|------------------------|------|-----|------|------|
| Total gate charge | Q _g | V _{DD} =-25V | - | 14 | - | nC |
| Gate - Source charge | Q _{gs} | I _D = -4A | - | 6 | - | |
| Gate - Drain charge | Q _{gd} | V _{GS} = -10V | - | 8 | - | |

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

② Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate;

Fig.1 Gate-Charge Characteristics

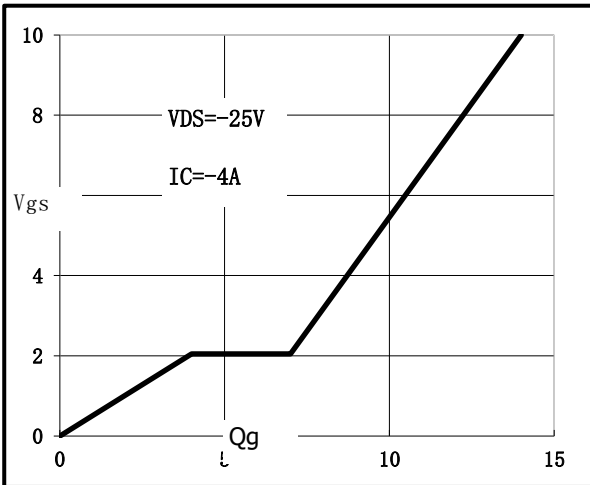


Fig.2 Capacitance Characteristics

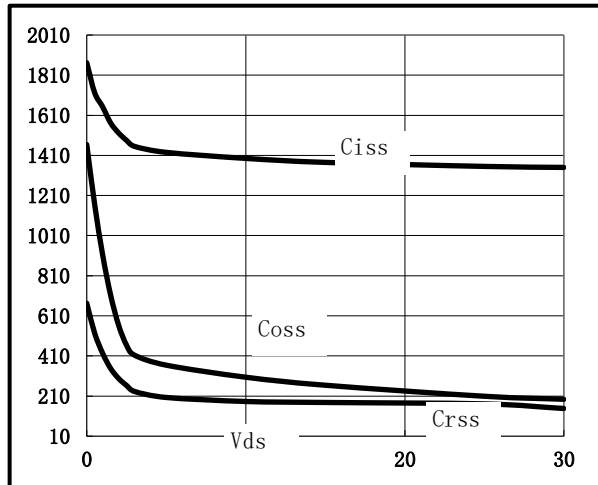


Fig.3 Power Dissipation Derating Curve

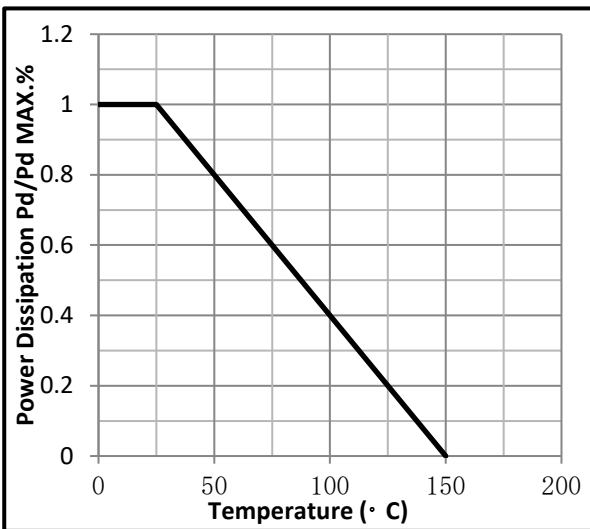


Fig.4 Typical output Characteristics

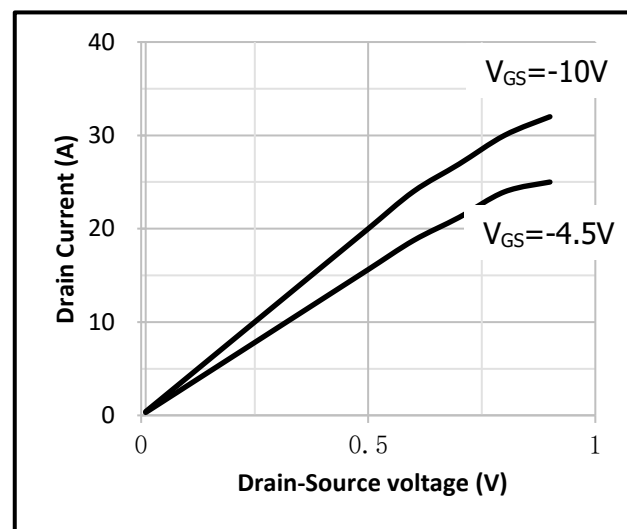


Fig.5 Threshold Voltage V.S Junction Temperature

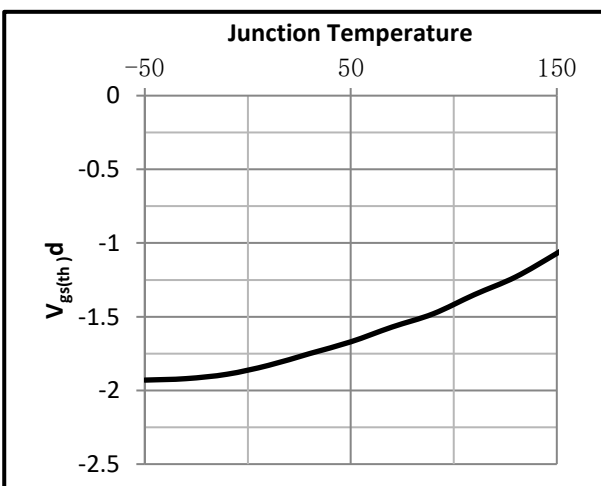


Fig.6 Resistance V.S Drain Current

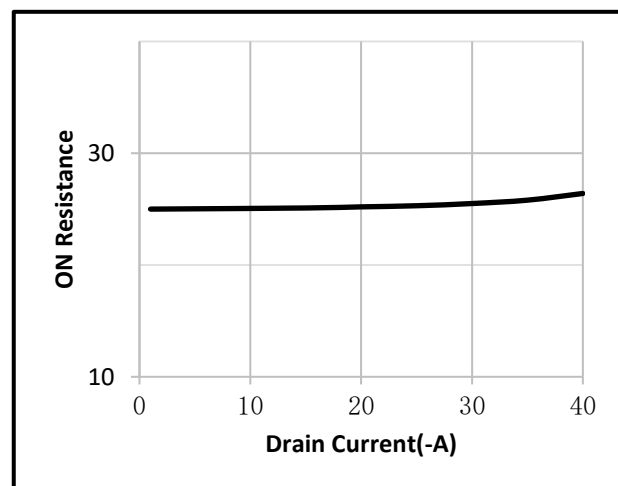


Fig.7 On-Resistance VS Gate Source Voltage

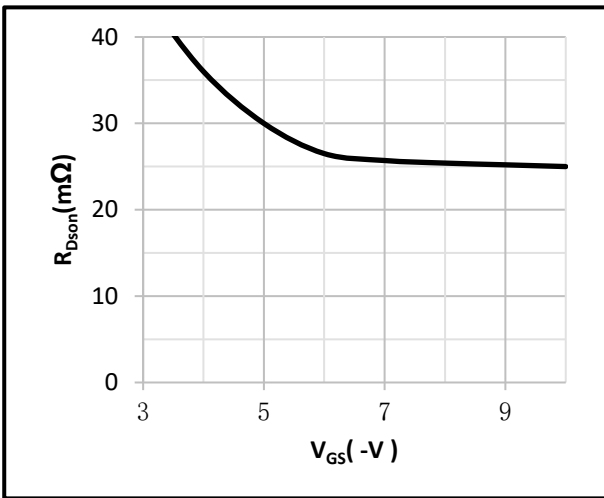


Fig.8 On-Resistance V.S Junction Temperature

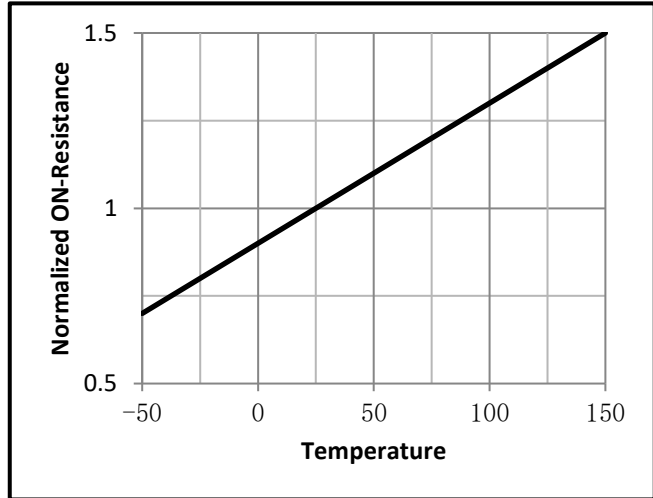


Fig.9 Switching Time Measurement Circuit

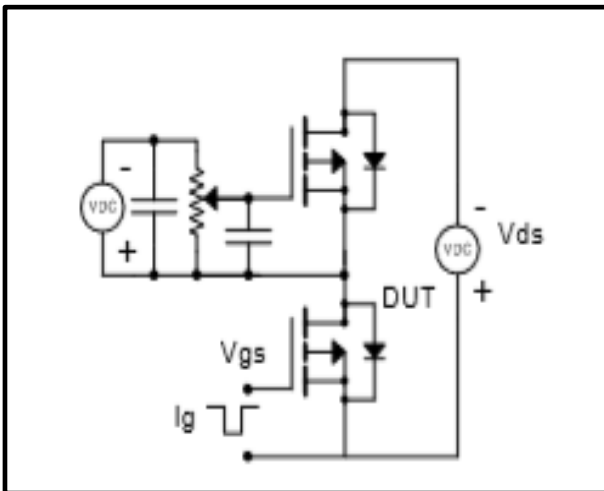


Fig.10 Gate Charge Waveform

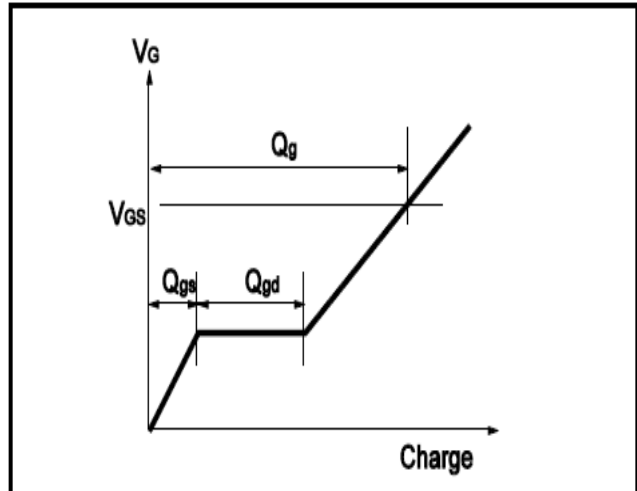


Fig.11 Switching Time Measurement Circuit

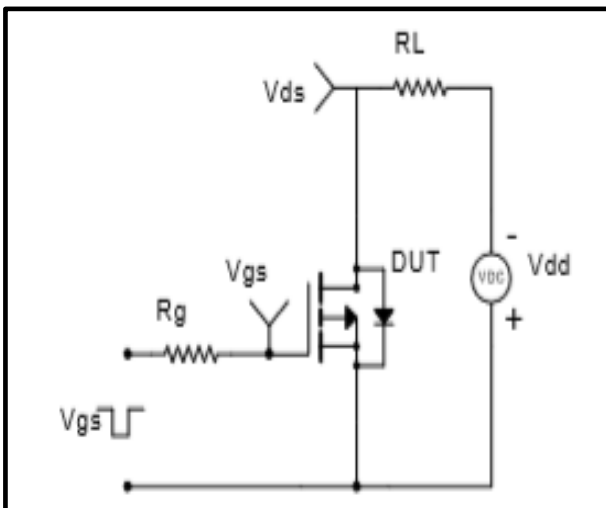
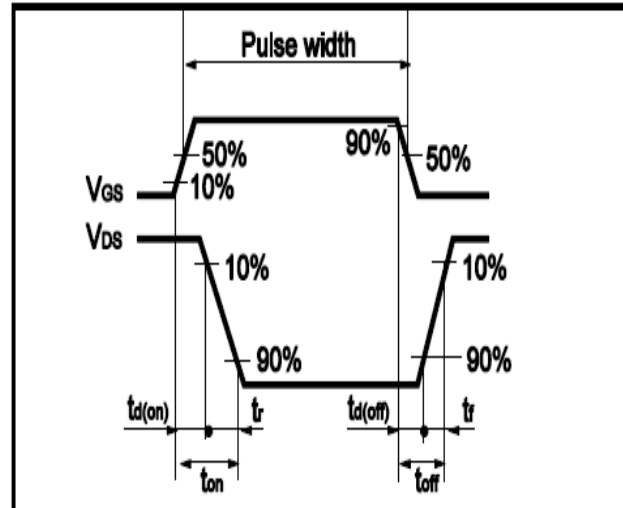


Fig.12 Gate Charge Waveform



●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 |

