

• General Description

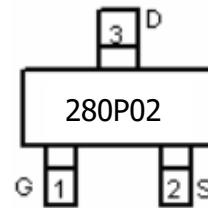
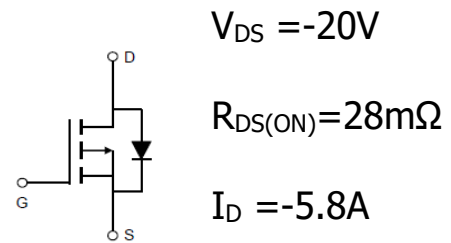
The ZM280P02T combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.

• 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

- Load Switches
- DC/DC
- BLDC Motor driver

• Product Summary

SOT23-3
• Ordering Information:

| | |
|---------------------------|-----------|
| Part NO. | ZM280P02T |
| Marking | 280P02 |
| 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} | -20 | V |
| Gate-Source Voltage | V_{GS} | ± 8 | V |
| Continuous Drain Current | $I_{D@TC=25^\circ C}$ | -5.8 | A |
| | $I_{D@TC=75^\circ C}$ | -4.4 | A |
| | $I_{D@TC=100^\circ C}$ | -3.7 | A |
| Pulsed Drain Current ^① | I_{DM} | -12 | A |
| Total Power Dissipation ^② | P_D | 1.5 | W |
| Total Power Dissipation($T_A=25^\circ C$) | $P_D@T_A=25^\circ C$ | 0.7 | 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} | 30 | mJ |

•Thermal resistance

| Parameter | Symbol | Min. | Typ. | Max. | Unit |
|--|-------------------|------|------|------|-------|
| Thermal resistance, junction - case ^② | R _{thJC} | - | - | 80 | ° 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 | -20 | | | V |
| Gate Threshold Voltage | V _{GS(TH)} | V _{GS} = V _{DS} , I _D = -250uA | -0.3 | | -1.2 | V |
| Drain-Source Leakage Current | I _{DSS} | V _{DS} = -20V, V _{GS} = 0V | | | 1.0 | uA |
| Gate- Source Leakage Current | I _{GSS} | V _{GS} = ±8V, V _{DS} = 0V | | | ±100 | nA |
| Static Drain-source On Resistance | R _{DS(ON)} | V _{GS} = -4.5V, I _D = -5.8A | | 28 | 33 | mΩ |
| | | V _{GS} = -2.5V, I _D = -4A | | 37 | 45 | mΩ |
| Forward Transconductance | g _{FS} | V _{DS} = -10V, I _D = -2A | | 10 | | s |
| Source-drain voltage | V _{SD} | I _S = -5.8A | | | 1.28 | V |

•Electronic Characteristics

| Parameter | Symbol | Condition | Min. | Typ | Max. | Unit |
|------------------------------|------------------|-----------|------|------|------|------|
| Input capacitance | C _{iss} | f = 1MHz | - | 1050 | - | pF |
| Output capacitance | C _{oss} | | - | 155 | - | |
| Reverse transfer capacitance | C _{rss} | | - | 125 | - | |

•Gate Charge characteristics(T_a = 25°C)

| Parameter | Symbol | Condition | Min. | Typ | Max. | Unit |
|----------------------|-----------------|-------------------------|------|-----|------|------|
| Total gate charge | Q _g | V _{DD} = -15V | - | 11 | - | nC |
| Gate - Source charge | Q _{gs} | I _D = -3A | - | 5 | - | |
| Gate - Drain charge | Q _{gd} | V _{GS} = -4.5V | - | 7 | - | |

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

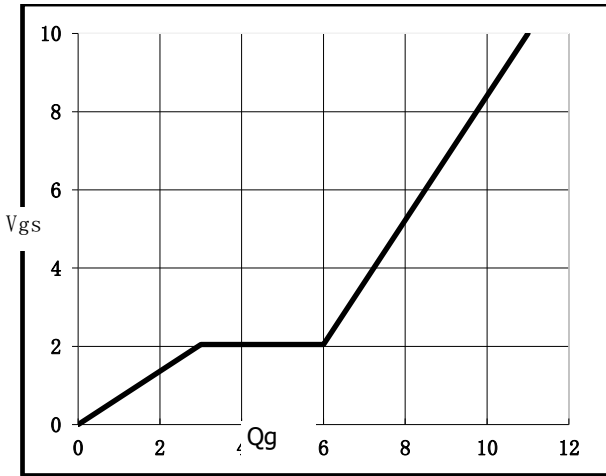


Fig.2 Capacitance Characteristics

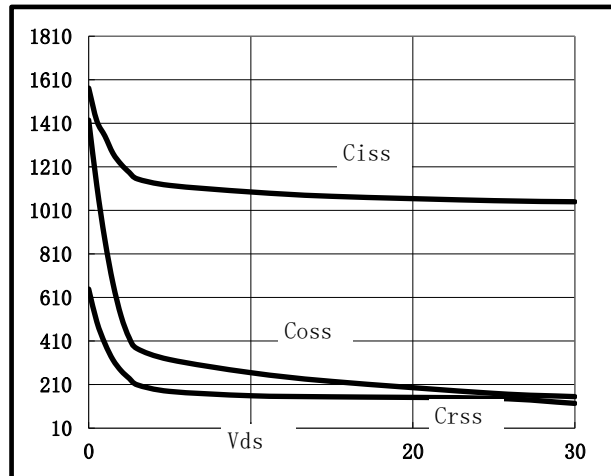


Fig.3 Power Dissipation Derating Curve

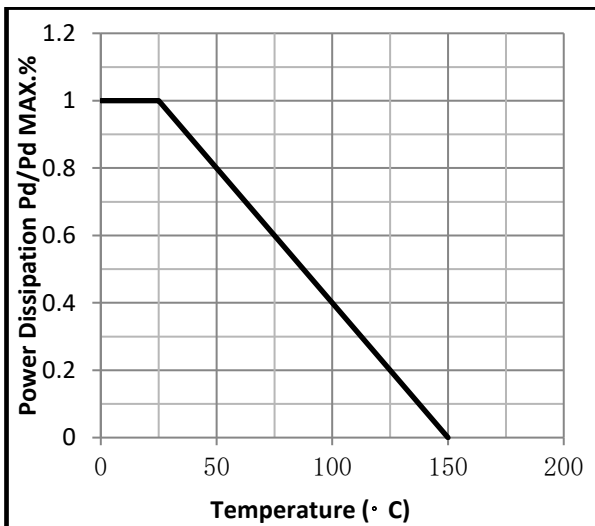


Fig.4 Typical output Characteristics

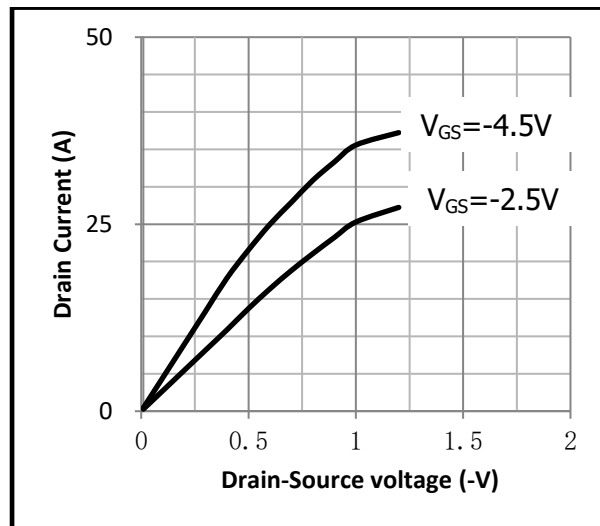


Fig.5 Threshold Voltage V.S Junction Temperature

Fig.6 Resistance V.S Drain Current

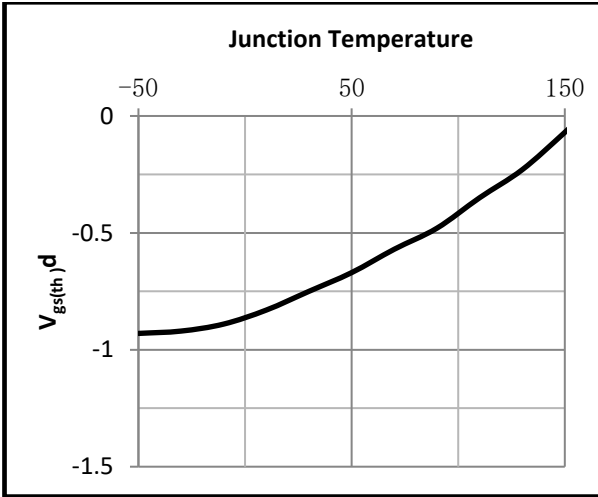


Fig.7 On-Resistance VS Gate Source Voltage

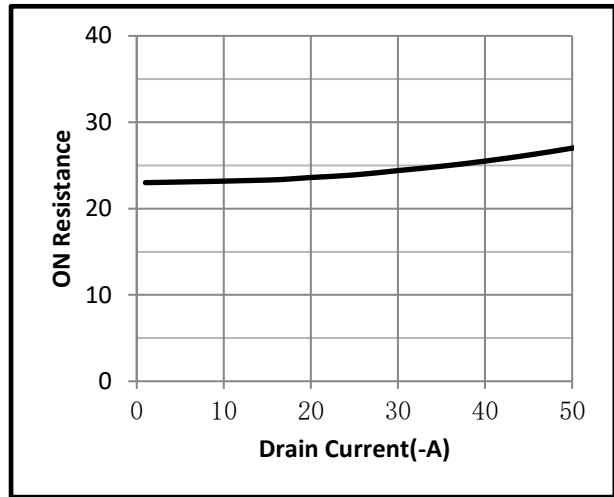


Fig.8 On-Resistance V.S Junction Temperature

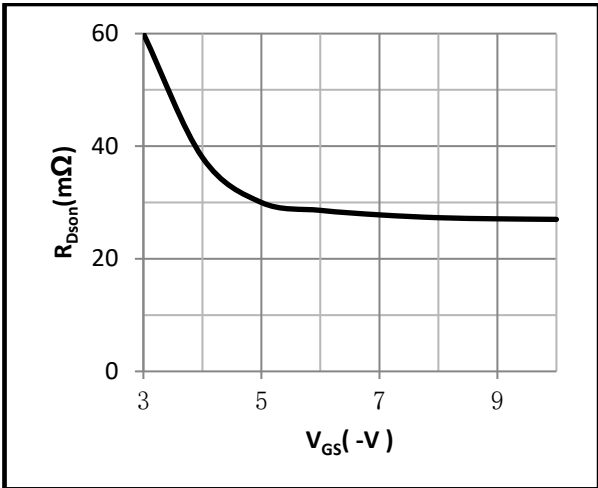


Fig.9 Switching Time Measurement Circuit

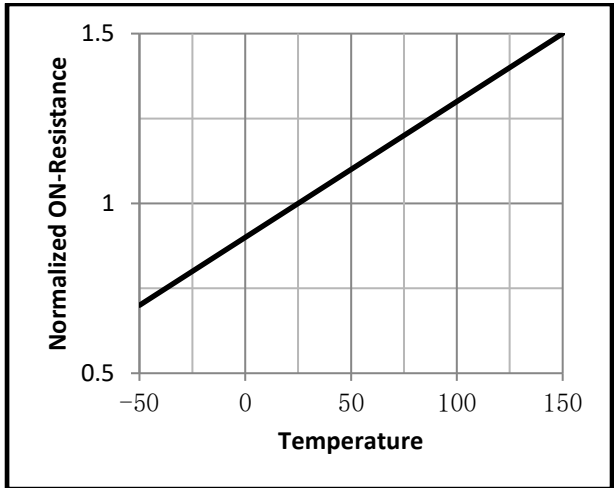


Fig.10 Gate Charge Waveform

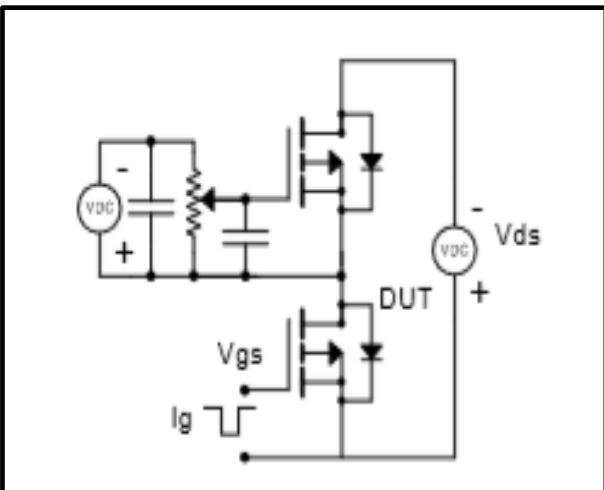


Fig.11 Switching Time Measurement Circuit

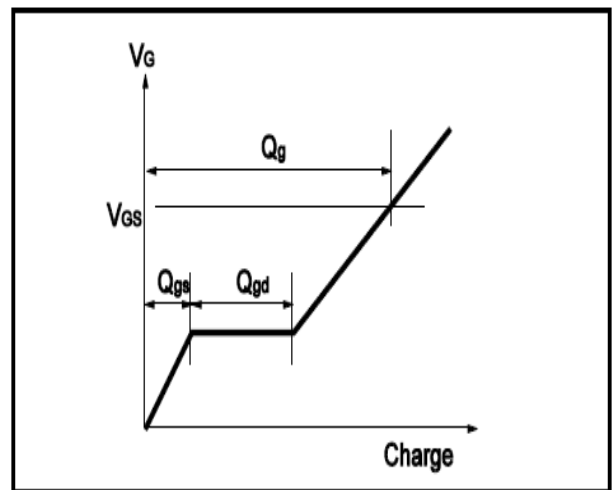
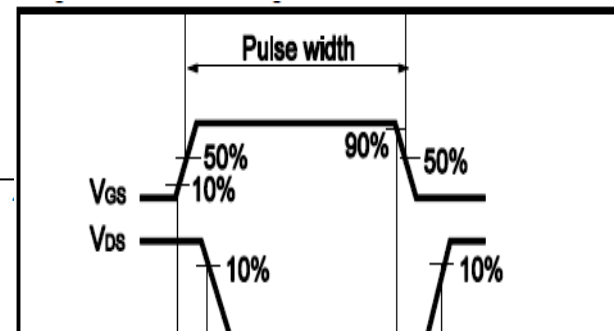
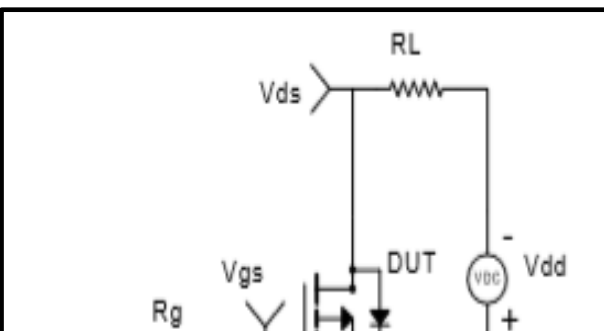
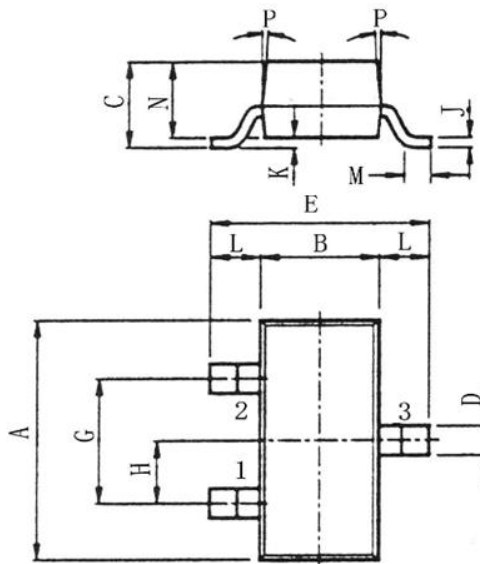


Fig.12 Gate Charge Waveform



•Dimensions(SOT23)

Unit: mm



| SYMBOL | min | nom | max |
|--------|------|------|------|
| A | 2.70 | 2.9 | 3.10 |
| B | 1.15 | 1.3 | 1.50 |
| C | | | 1.30 |
| D | 0.35 | 0.4 | 0.55 |
| E | 2.20 | 2.4 | 2.70 |
| G | 1.70 | 1.9 | 2.10 |
| H | 0.85 | 0.95 | 1.05 |
| J | 0.05 | 0.10 | 0.20 |
| K | 0.00 | | 0.10 |
| L | 0.45 | 0.55 | 0.65 |



| | | | |
|---|------|------|------|
| M | 0.20 | | |
| N | 0.90 | 1.00 | 1.20 |
| P | | 7° | |