

General Description

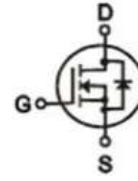
The ZM019N03B combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.

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

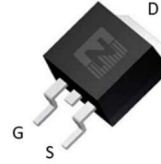
- MB/VGA Vcore
- SMPS 2nd Synchronous Rectifier
- POL application
- BLDC Motor driver

Product Summary


$V_{DS} = 30V$

$R_{DS(ON)} = 2m\Omega$

$I_D = 176A$


TO-263
Ordering Information:

| | |
|---------------------------|-----------|
| Part NO. | ZM019N03B |
| Marking | ZM019N03 |
| Packing Information | REEL TAPE |
| Basic ordering unit (pcs) | 800 |

Absolute Maximum Ratings (T_C=25°C)

| Parameter | Symbol | Rating | Unit |
|---------------------------------------|-------------------------|------------|------|
| Drain-Source Voltage | V_{DS} | 30 | V |
| Gate-Source Voltage | V_{GS} | ±20 | V |
| Continuous Drain Current | $I_{D@TC=25^{\circ}C}$ | 176 | A |
| | $I_{D@TC=75^{\circ}C}$ | 133.8 | A |
| | $I_{D@TC=100^{\circ}C}$ | 110.9 | A |
| Pulsed Drain Current ^① | I_{DM} | 350 | A |
| Total Power Dissipation(TC=25°C) | $P_D@TC=25^{\circ}C$ | 100 | W |
| Total Power Dissipation(TA=25°C) | $P_D@TA=25^{\circ}C$ | 3.2 | W |
| Operating Junction Temperature | T_J | -55 to 150 | °C |
| Storage Temperature | T_{STG} | -55 to 150 | °C |
| Single Pulse Avalanche Energy@L=0.1mH | E_{AS} | 240 | mJ |
| Avalanche Current@L=0.1mH | I_{AS} | 70 | A |

•Thermal resistance

| Parameter | Symbol | Min. | Typ. | Max. | Unit |
|---|------------|------|------|------|---------------|
| Thermal resistance, junction - case | R_{thJC} | - | - | 1.5 | $^{\circ}C/W$ |
| Thermal resistance, junction - ambient | R_{thJA} | - | - | 40 | $^{\circ}C/W$ |
| Soldering temperature, wave soldering for 10s | T_{sold} | - | - | 265 | $^{\circ}C$ |

•Electronic Characteristics

| Parameter | Symbol | Condition | Min. | Typ | Max. | Unit |
|-----------------------------------|--------------|-----------------------------------|------|-----|-----------|-----------|
| Drain-Source Breakdown Voltage | BV_{DSS} | $V_{GS} = 0V, I_D = 250\mu A$ | 30 | | | V |
| Gate Threshold Voltage | $V_{GS(TH)}$ | $V_{GS} = V_{DS}, I_D = 250\mu A$ | 1.2 | | 2.5 | V |
| Drain-Source Leakage Current | I_{DSS} | $V_{DS} = 30V, V_{GS} = 0V$ | | | 1.0 | μA |
| Gate- Source Leakage Current | I_{GSS} | $V_{GS} = \pm 20V, V_{DS} = 0V$ | | | ± 100 | nA |
| Static Drain-source On Resistance | $R_{DS(ON)}$ | $V_{GS} = 10V, I_D = 24A$ | | 2 | 2.5 | $m\Omega$ |
| | | $V_{GS} = 4.5V, I_D = 12A$ | | 2.5 | 3.3 | $m\Omega$ |
| Forward Transconductance | g_{FS} | $V_{DS} = 25V, I_D = 10A$ | | 35 | | s |
| Source-drain voltage | V_{SD} | $I_S = 24A$ | | | 1.28 | V |

•Electronic Characteristics

| Parameter | Symbol | Condition | Min. | Typ | Max. | Unit |
|------------------------------|-----------|------------------------------|------|------|------|------|
| Input capacitance | C_{iss} | $V_{DS} = 25V$ $f = 1MHz$ | - | 5200 | - | pF |
| Output capacitance | C_{oss} | | - | 650 | - | |
| Reverse transfer capacitance | C_{rss} | | - | 500 | - | |

•Gate Charge characteristics($T_a = 25^{\circ}C$)

| Parameter | Symbol | Condition | Min. | Typ | Max. | Unit |
|----------------------|----------|---|------|-----|------|------|
| Total gate charge | Q_g | $V_{DD} = 15V$ $I_D = 24A$ $V_{GS} = 10V$ | - | 92 | - | nC |
| Gate - Source charge | Q_{gs} | | - | 21 | - | |
| Gate - Drain charge | Q_{gd} | | - | 19 | - | |

Note: ① Pulse Test : Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$;

Fig.1 Gate-Charge Characteristics

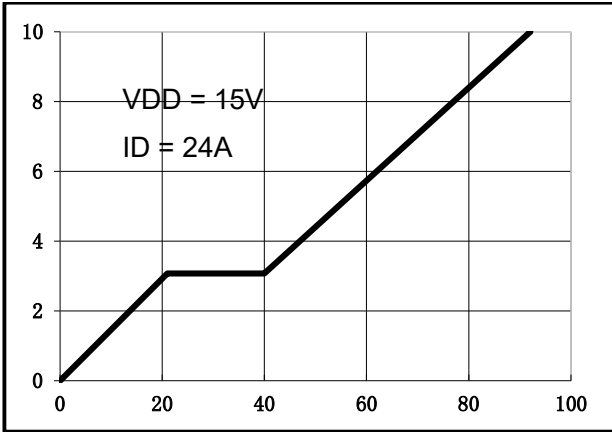


Fig.2 Capacitance Characteristics

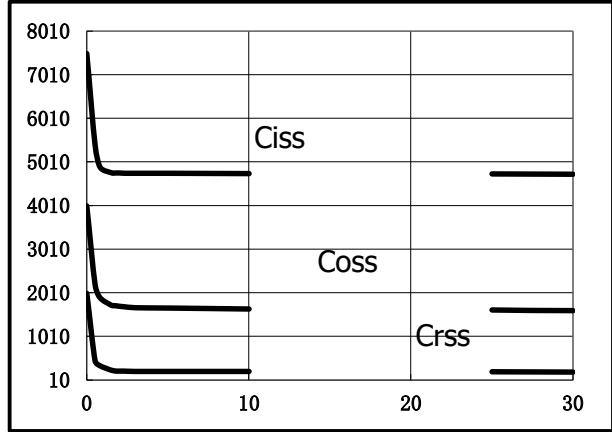


Fig.3 Power Dissipation

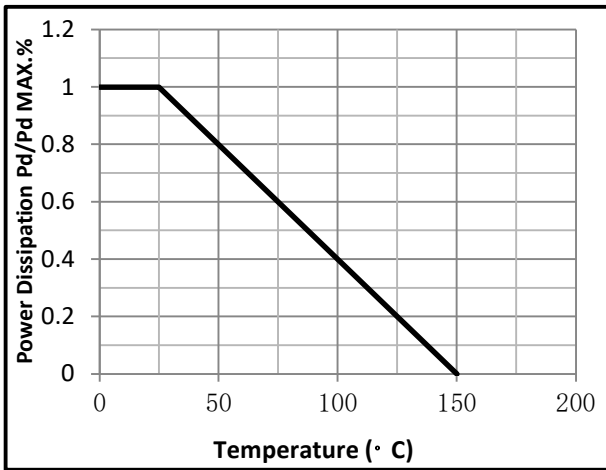


Fig.4 Typical output Characteristics

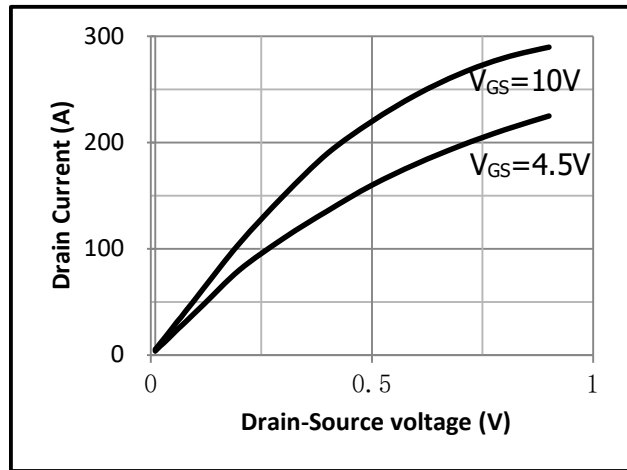


Fig.5 Threshold Voltage V.S Junction Temperature

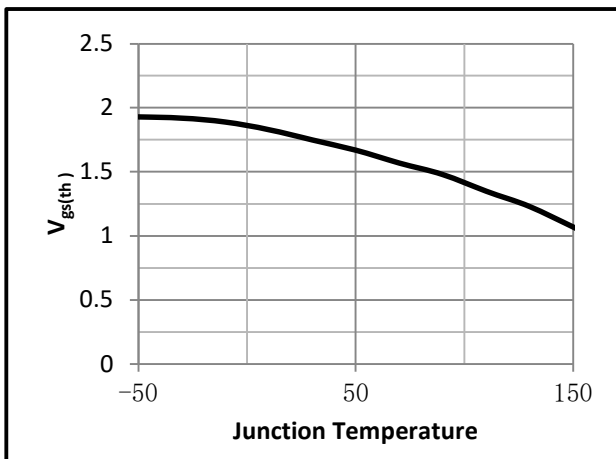


Fig.6 Resistance V.S Drain Current

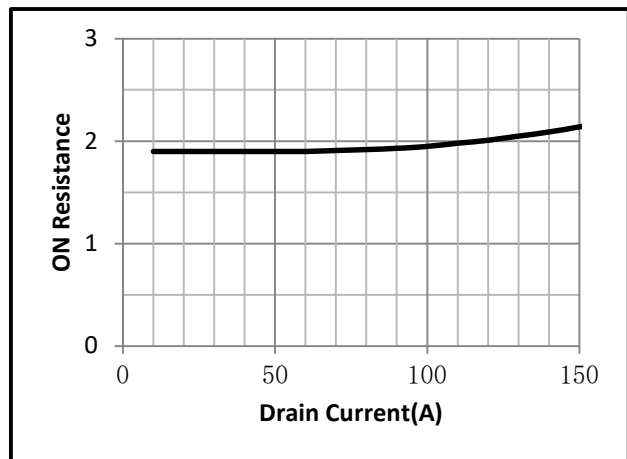


Fig.7 On-Resistance VS Gate Source Voltage

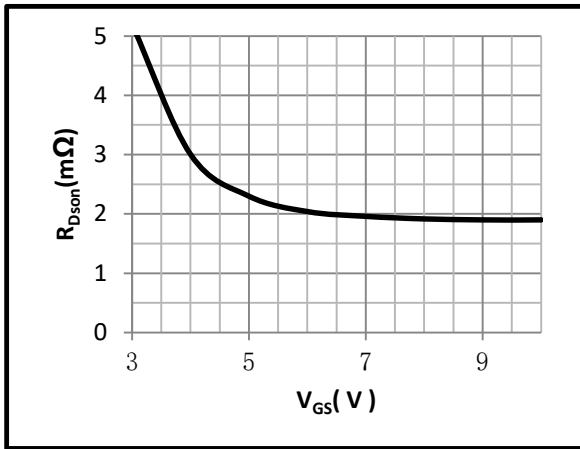


Fig.8 On-Resistance V.S Junction Temperature

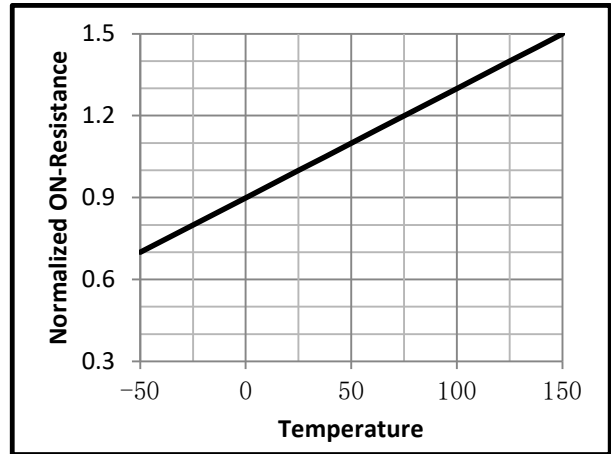


Fig.9 Gate Charge Measurement Circuit

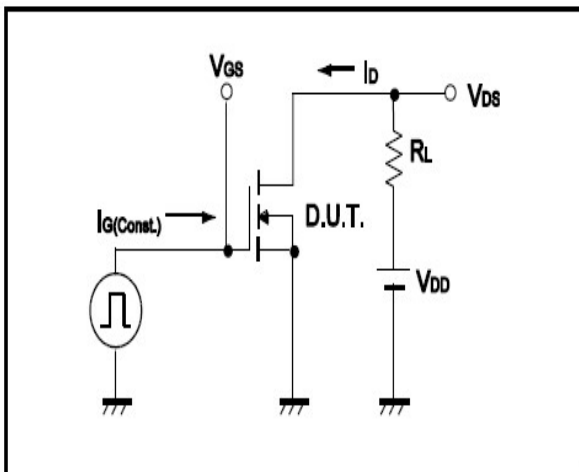


Fig.10 Gate Charge Waveform

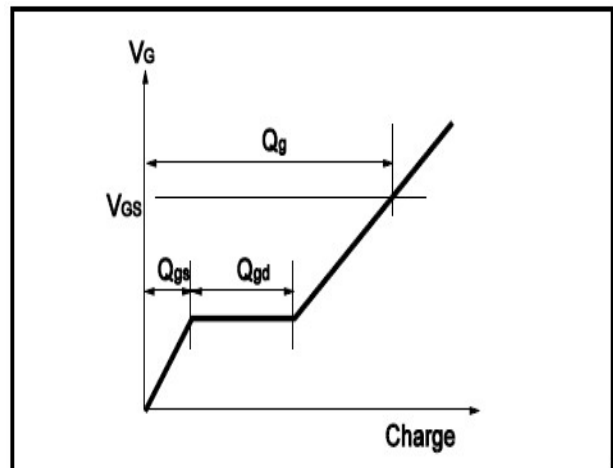


Fig.11 Switching Time Measurement Circuit

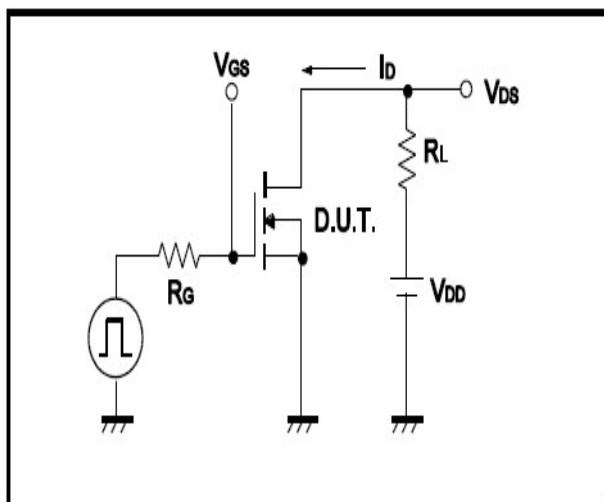
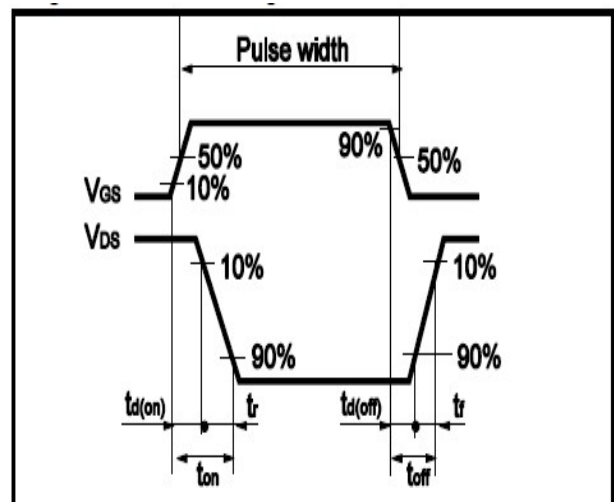


Fig.12 Switching Time Waveform





• Dimensions (TO-263)

Unit: mm

| SYMBOL | MIN | TYP | MAX | SYMBOL | MIN | TYP | MAX |
|--------|------|-----|-------|--------|-------|-----|-------|
| A | 4.42 | | 4.72 | E | 8.99 | | 9.29 |
| B | 1.22 | | 1.32 | e1 | 2.44 | | 2.64 |
| b | 0.76 | | 0.86 | e2 | 4.98 | | 5.18 |
| b1 | 1.22 | | 1.32 | L1 | 15.19 | | 15.79 |
| b2 | 0.33 | | 0.43 | L2 | 2.29 | | 2.79 |
| C | 1.22 | | 1.32 | L3 | 1.3 | | 1.75 |
| D | 9.95 | | 10.25 | | | | |

