
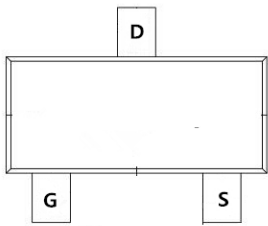




TMN3007MI

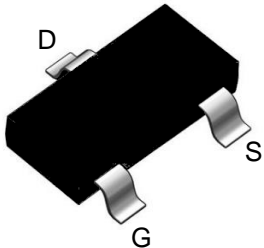
N-Channel Enhancement Mosfet

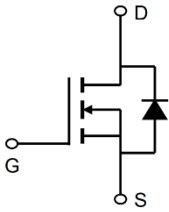
| | |
|--|---|
| <p>General Description</p> <ul style="list-style-type: none"> • Low $R_{DS(ON)}$ • RoHS and Halogen-Free Compliant <p>Applications</p> <ul style="list-style-type: none"> • Load switch • PWM | <p>General Features</p> <p>$V_{DS} = 30V$ $I_D = 6.6A$</p> <p>$R_{DS(ON)} = 23 m\Omega$ (Typ.) @ $V_{GS} = 10V$</p> <p>100% UIS Tested 100% R_g Tested</p>  |
|--|---|



Marking: X0

MI:SOT-23-3L





Absolute Maximum Ratings ($T_C = 25^\circ C$ unless otherwise noted)

| Symbol | Parameter | Rating | Units |
|--------------------------|---|------------|--------------|
| V_{DS} | Drain-Source Voltage | 30 | V |
| V_{GS} | Gate-Source Voltage | ± 12 | V |
| $I_D @ T_A = 25^\circ C$ | Continuous Drain Current | 6.6 | A |
| $I_D @ T_A = 70^\circ C$ | Continuous Drain Current | 4.9 | A |
| I_{DM} | Pulsed Drain Current ² | 20 | A |
| $P_D @ T_A = 25^\circ C$ | Total Power Dissipation ³ | 1 | W |
| T_{STG} | Storage Temperature Range | -55 to 150 | $^\circ C$ |
| T_J | Operating Junction Temperature Range | -55 to 150 | $^\circ C$ |
| $R_{\theta JA}$ | Thermal Resistance Junction-ambient ¹ | 125 | $^\circ C/W$ |
| $R_{\theta JA}$ | Thermal Resistance Junction-Ambient ¹ ($t \leq 10s$) | 85 | $^\circ C/W$ |

TMN3007MI
N-Channel Enhancement Mosfet
Electrical Characteristics ($T_J=25\text{ }^\circ\text{C}$, unless otherwise noted)

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|------------------------------|--|--|------|-------|-----------|----------------------|
| BV_{DSS} | Drain-Source Breakdown Voltage | $V_{GS}=0V, I_D=250\mu A$ | 30 | --- | --- | V |
| $\Delta BV_{DSS}/\Delta T_J$ | BVDSS Temperature Coefficient | Reference to 25°C , $I_D=1\text{mA}$ | --- | 0.029 | --- | V/ $^\circ\text{C}$ |
| $R_{DS(on)}$ | Static Drain-Source On-Resistance ² | $V_{GS}=10V, I_D=5A$ | --- | 23 | 25 | m Ω |
| | | $V_{GS}=4.5V, I_D=3A$ | --- | 26 | 31 | |
| | | $V_{GS}=2.5V, I_D=1A$ | --- | 30 | 49 | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{GS}=V_{DS}, I_D=250\mu A$ | 0.5 | 0.9 | 1.2 | V |
| $\Delta V_{GS(th)}$ | $V_{GS(th)}$ Temperature Coefficient | | --- | -2.82 | --- | mV/ $^\circ\text{C}$ |
| I_{DSS} | Drain-Source Leakage Current | $V_{DS}=24V, V_{GS}=0V, T_J=25^\circ\text{C}$ | --- | --- | 1 | μA |
| | | $V_{DS}=24V, V_{GS}=0V, T_J=55^\circ\text{C}$ | --- | --- | 5 | |
| I_{GSS} | Gate-Source Leakage Current | $V_{GS}=\pm 12V, V_{DS}=0V$ | --- | --- | ± 100 | nA |
| g_{fs} | Forward Transconductance | $V_{DS}=5V, I_D=5A$ | --- | 25 | --- | S |
| R_g | Gate Resistance | $V_{DS}=0V, V_{GS}=0V, f=1\text{MHz}$ | --- | 1.5 | --- | Ω |
| Q_g | Total Gate Charge (4.5V) | $V_{DS}=15V, V_{GS}=4.5V, I_D=5.8A$ | --- | 11.5 | --- | nC |
| Q_{gs} | Gate-Source Charge | | --- | 1.6 | --- | |
| Q_{gd} | Gate-Drain Charge | | --- | 2.9 | --- | |
| $T_{d(on)}$ | Turn-On Delay Time | $V_{DD}=15V, V_{GS}=10V, R_G=3\Omega, I_D=5A$ | --- | 5 | --- | ns |
| T_r | Rise Time | | --- | 47 | --- | |
| $T_{d(off)}$ | Turn-Off Delay Time | | --- | 26 | --- | |
| T_f | Fall Time | | --- | 8 | --- | |
| C_{iss} | Input Capacitance | $V_{DS}=15V, V_{GS}=0V, f=1\text{MHz}$ | --- | 530 | --- | pF |
| C_{oss} | Output Capacitance | | --- | 130 | --- | |
| C_{rss} | Reverse Transfer Capacitance | | --- | 36 | --- | |
| I_S | Continuous Source Current ^{1,4} | $V_G=V_D=0V, \text{Force Current}$ | --- | --- | 6.6 | A |
| V_{SD} | Diode Forward Voltage ² | $V_{GS}=0V, I_S=1A, T_J=25^\circ\text{C}$ | --- | --- | 1.2 | V |

Note :

- 1、The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2、The data tested by pulsed , pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$
- 3、The power dissipation is limited by 150°C junction temperature
- 4、The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.



TMN3007MI

N-Channel Enhancement Mosfet

Typical Characteristics

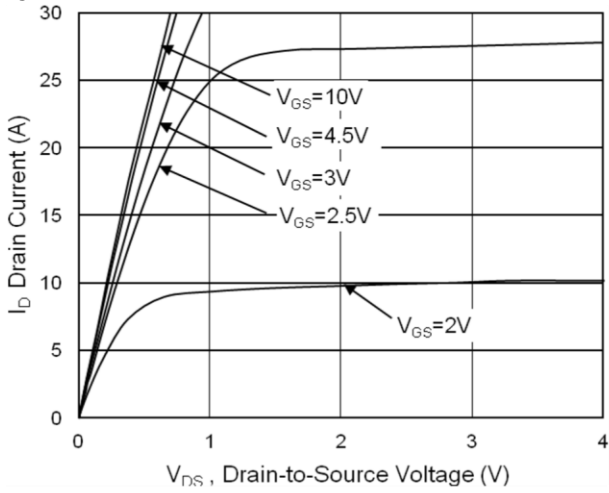


Fig.1 Typical Output Characteristics

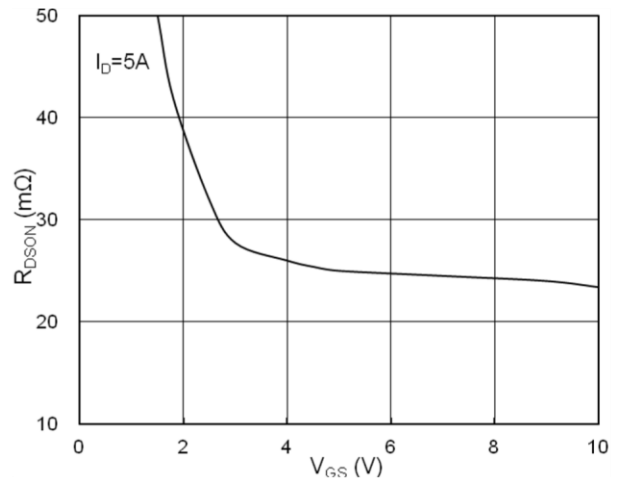


Fig.2 On-Resistance vs. Gate-Source

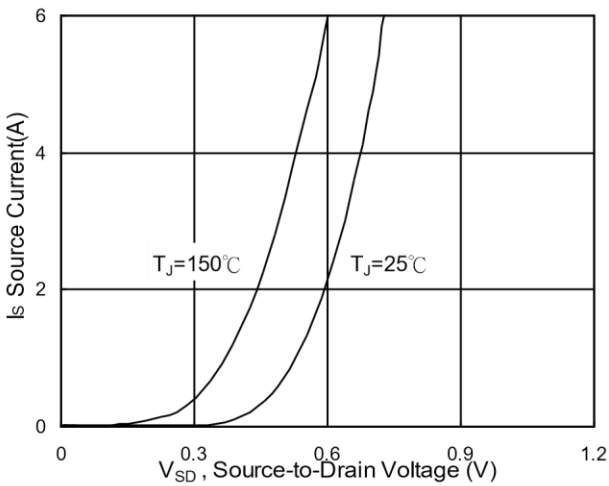


Fig.3 Forward Characteristics Of Reverse

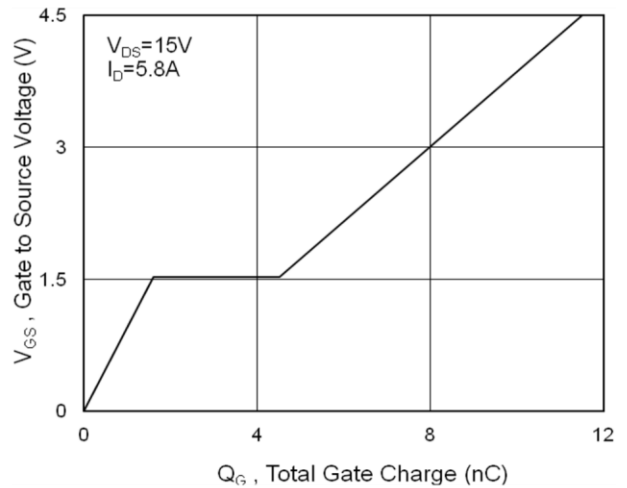


Fig.4 Gate-Charge Characteristics

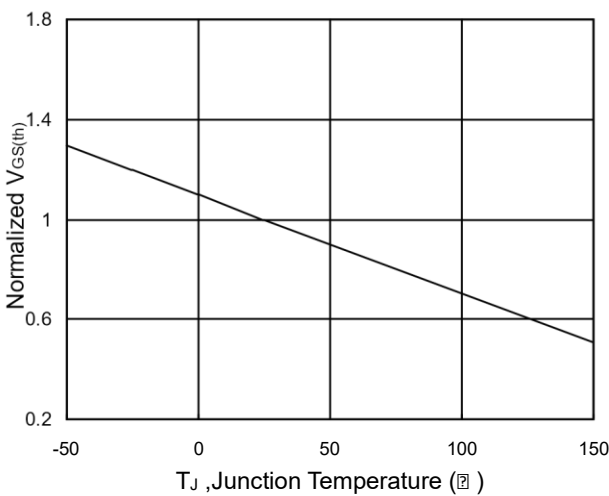


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

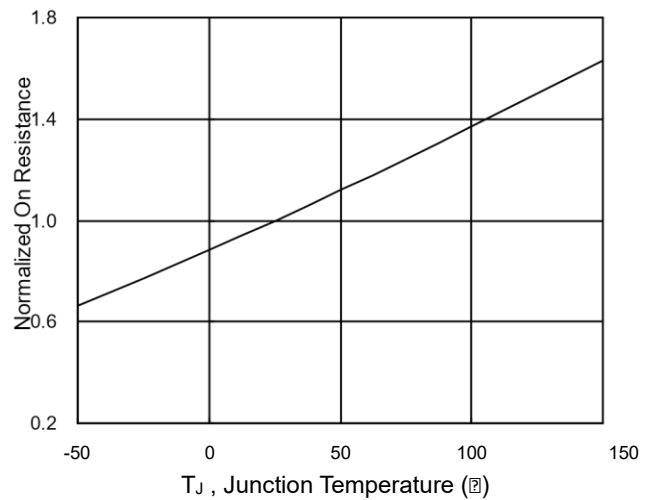


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

TMN3007MI

N-Channel Enhancement Mosfet

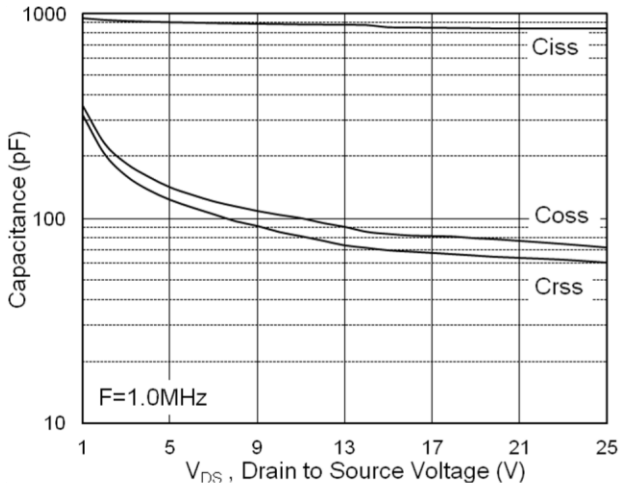


Fig.7 Capacitance

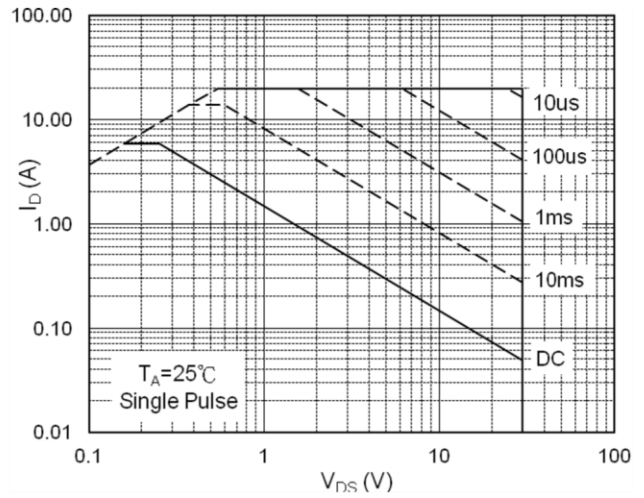


Fig.8 Safe Operating Area

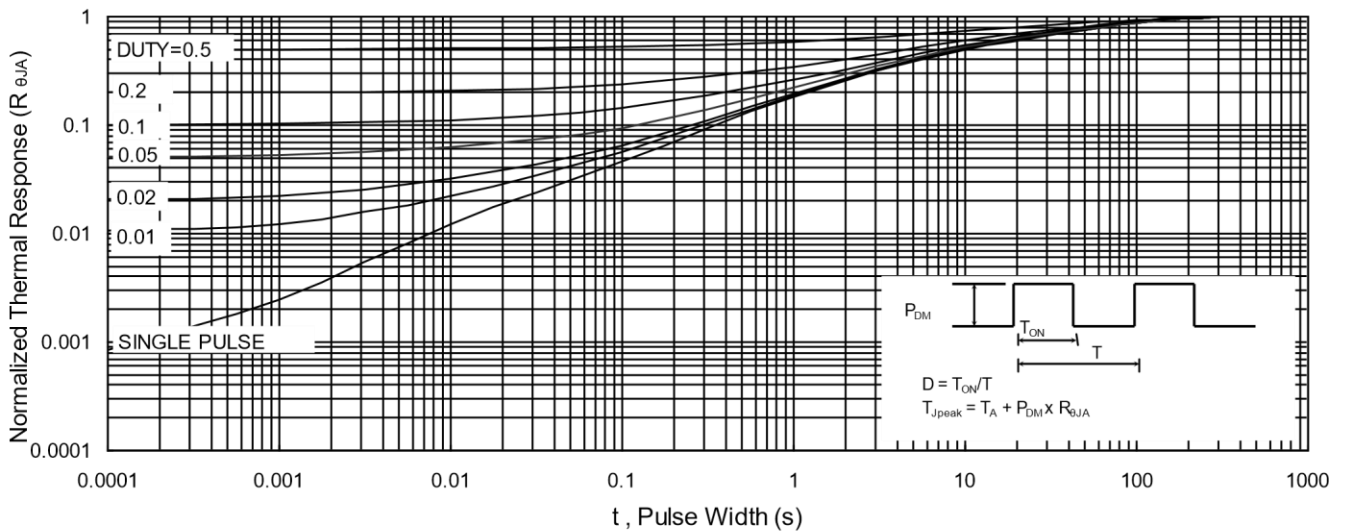


Fig.9 Normalized Maximum Transient Thermal Impedance

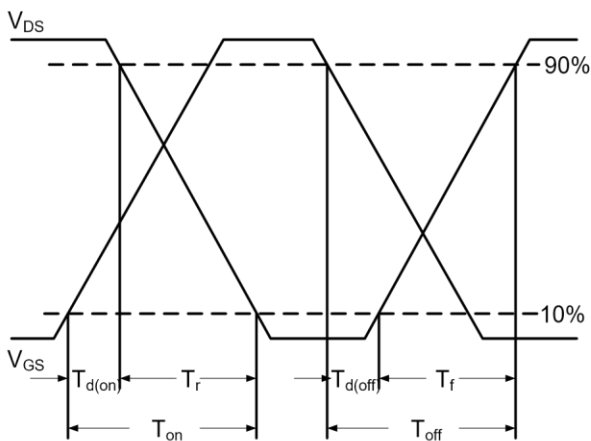


Fig.10 Switching Time Waveform

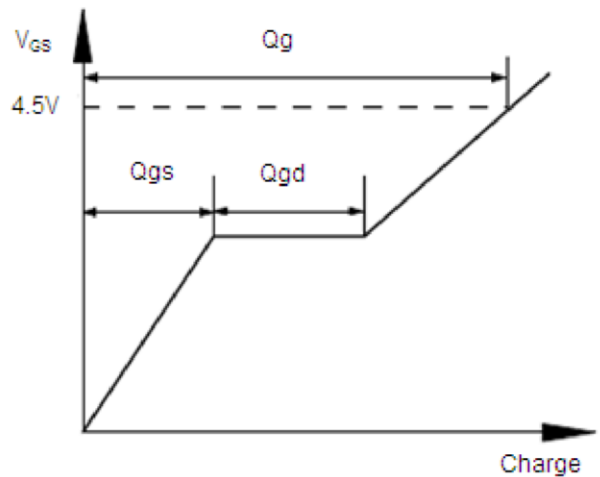
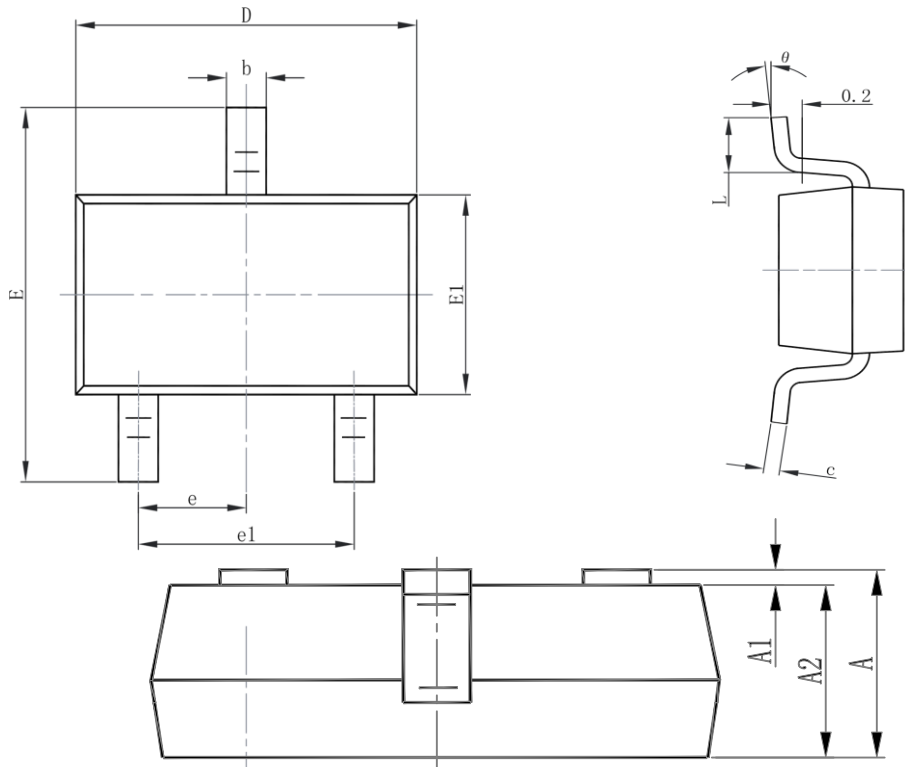


Fig.11 Gate Charge Waveform

Package Mechanical Data:SOT-23-3L



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 1.050 | 1.250 | 0.041 | 0.049 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 1.050 | 1.150 | 0.041 | 0.045 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.100 | 0.200 | 0.004 | 0.008 |
| D | 2.820 | 3.020 | 0.111 | 0.119 |
| E1 | 1.500 | 1.700 | 0.059 | 0.067 |
| E | 2.650 | 2.950 | 0.104 | 0.116 |
| e | 0.950(BSC) | | 0.037(BSC) | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.300 | 0.600 | 0.012 | 0.024 |
| θ | 0° | 8° | 0° | 8° |

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