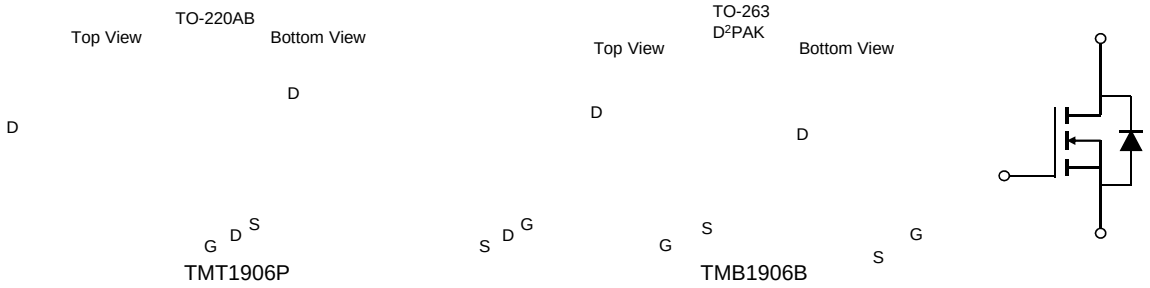
# TMT1906P / TMB1906B
## N-CHANNEL POWER MOSFET

- Power Management for Inverter Systems.

- 60V / 120 A ,
  $R_{DS(ON)}$ = 6.0 mΩ (typ.) @ $V_{GS}$=10V
- Avalanche Rated
- Reliable and Rugged
- Lead Free and Green Devices Available
  (RoHS Compliant)




## Absolute Maximum Ratings

| Symbol | Parameter | | Rating | Unit |
|---|---|---|---|---|
| **Common Ratings** ($T_C$=25°C Unless Otherwise Noted) | | | | |
| $V_{DSS}$ | Drain-Source Voltage | | 60 | V |
| $V_{GSS}$ | Gate-Source Voltage | | ±25 | |
| $T_J$ | Maximum Junction Temperature | | 175 | °C |
| $T_{STG}$ | Storage Temperature Range | | -55 to 175 | °C |
| $I_S$ | Diode Continuous Forward Current | $T_C$=25°C | 120 | A |
| **Mounted on Large Heat Sink** | | | | |
| $I_{DM}$ | Pulsed Drain Current * | $T_C$=25°C | 380** | A |
| $I_D$ | Continuous Drain Current | $T_C$=25°C | 120 | A |
| | | $T_C$=100°C | 80 | |
| $P_D$ | Maximum Power Dissipation | $T_C$=25°C | 188 | W |
| | | $T_C$=100°C | 94 | |
| $R_{\theta JC}$ | Thermal Resistance-Junction to Case | | 0.8 | °C/W |
| $R_{\theta JA}$ | Thermal Resistance-Junction to Ambient | | 62.5 | |
| **Avalanche Ratings** | | | | |
| $E_{AS}$ | Avalanche Energy, Single Pulsed | L=0.5mH | 600*** | mJ |

Note : * Repetitive rating ; pulse width limiited by junction temperature
** Drain current is limited by junction temperature
*** VD=48V

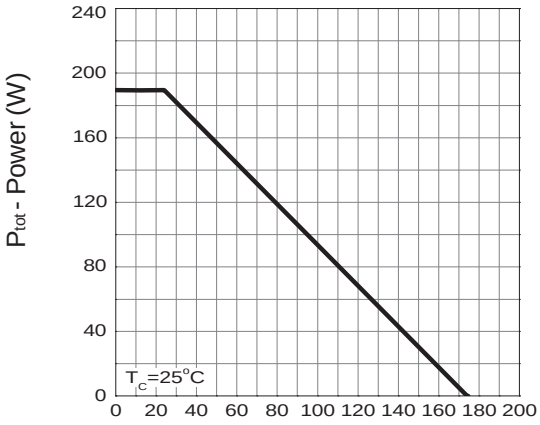
## Electrical Characteristics ($T_C$ = 25°C Unless Otherwise Noted)

| Symbol | Parameter | Test Conditions | 1906 | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| **Static Characteristics** | | | | | | |
| $BV_{DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V, $I_{DS}$=250μA | 60 | - | - | V |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$=60V, $V_{GS}$=0V | - | - | 1 | μA |
| | | $T_J$=85°C | - | - | 10 | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$=$V_{GS}$, $I_{DS}$=250μA | 2 | 3 | 4 | V |
| $I_{GSS}$ | Gate Leakage Current | $V_{GS}$=±25V, $V_{DS}$=0V | - | - | ±100 | nA |
| $R_{DS(ON)}$* | Drain-Source On-state Resistance | $V_{GS}$=10V, $I_{DS}$=60A | - | 6.0 | 7.5 | mΩ |
| **Diode Characteristics** | | | | | | |
| $V_{SD}$* | Diode Forward Voltage | $I_{SD}$=60A, $V_{GS}$=0V | - | 0.8 | 1.2 | V |
| $t_{rr}$ | Reverse Recovery Time | $I_{SD}$=60A, $dI_{SD}/dt$=100A/μs | - | 50 | - | ns |
| $Q_{rr}$ | Reverse Recovery Charge | | - | 95 | - | nC |
| **Dynamic Characteristics** | | | | | | |
| $R_G$ | Gate Resistance | $V_{GS}$=0V,$V_{DS}$=0V,F=1MHz | - | 1.0 | - | Ω |
| $C_{iss}$ | Input Capacitance | $V_{GS}$=0V, $V_{DS}$=25V, Frequency=1.0MHz | - | 4577 | - | pF |
| $C_{oss}$ | Output Capacitance | | - | 876 | - | |
| $C_{rss}$ | Reverse Transfer Capacitance | | - | 276 | - | |
| $t_{d(ON)}$ | Turn-on Delay Time | $V_{DD}$=30V, $R_G$ = 6 Ω, $I_{DS}$=60A, $V_{GS}$=10V, | - | 13 | 26 | ns |
| $T_r$ | Turn-on Rise Time | | - | 11 | 20 | |
| $t_{d(OFF)}$ | Turn-off Delay Time | | - | 40 | 66 | |
| $T_f$ | Turn-off Fall Time | | - | 60 | 95 | |
| **Gate Charge Characteristics** [b] | | | | | | |
| $Q_g$ | Total Gate Charge | $V_{DS}$=30V, $V_{GS}$=10V, $I_{DS}$=60A | - | 96 | - | nC |
| $Q_{gs}$ | Gate-Source Charge | | - | 21 | - | |
| $Q_{gd}$ | Gate-Drain Charge | | - | 23 | - | |

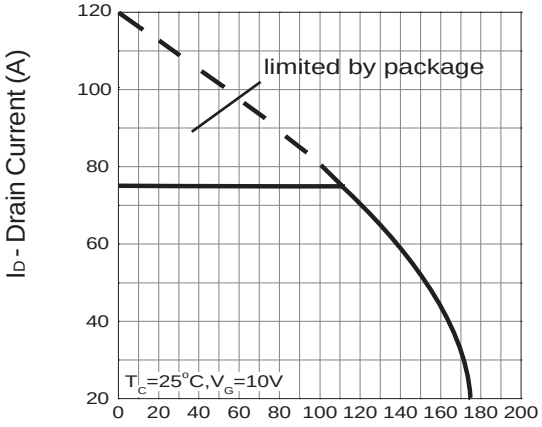
Note * : Pulse test ; pulse width ≤300μs, duty cycle≤2%.

# Typical Operating Characteristics

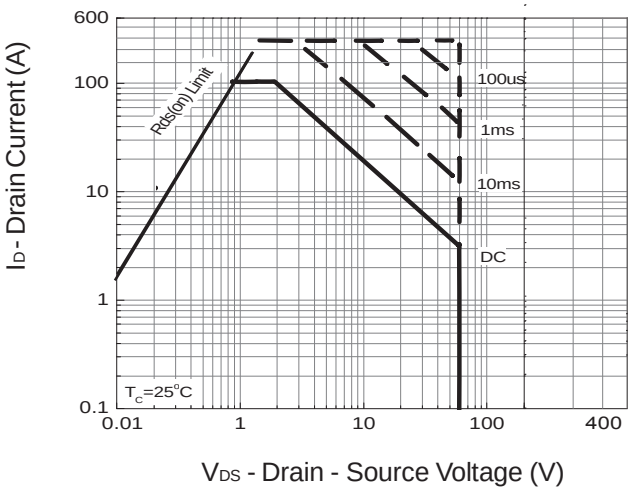
**Power Dissipation**



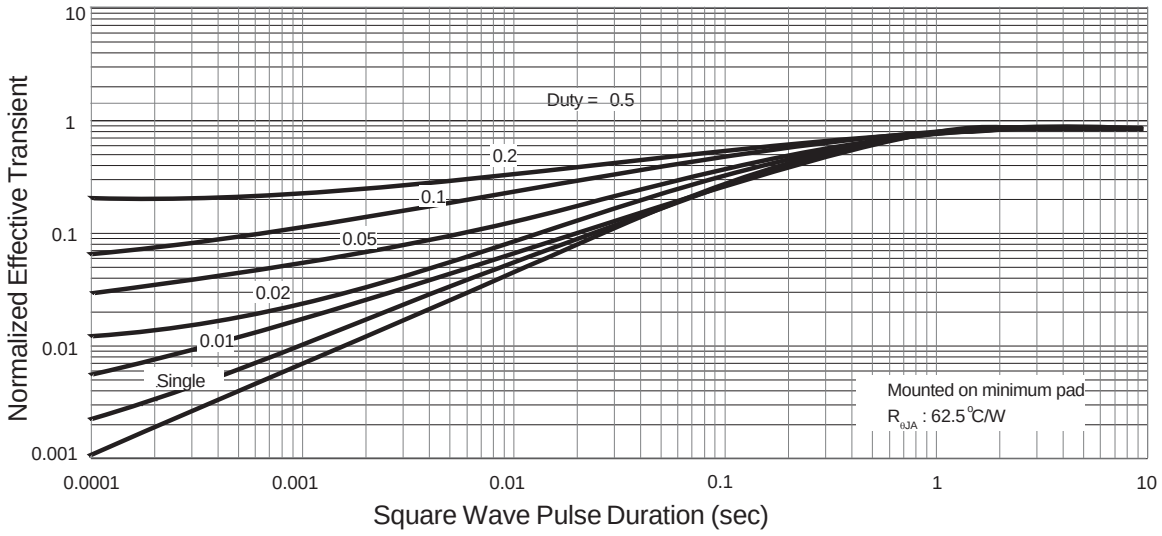

**Drain Current**




**Safe Operation Area**

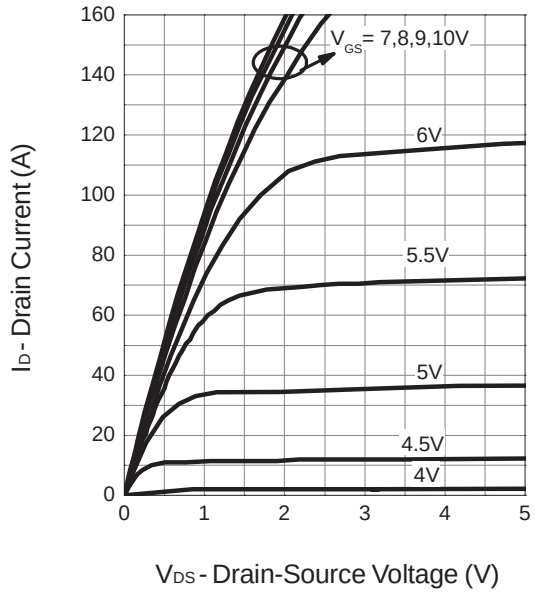



**Thermal Transient Impedance**

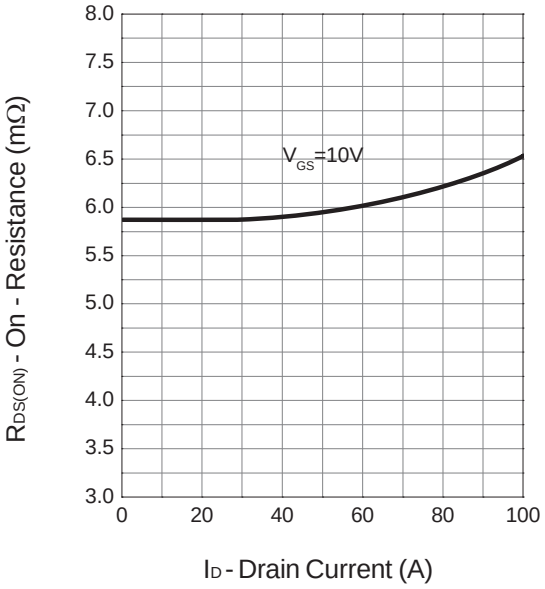


# Typical Operating Characteristics (Cont.)

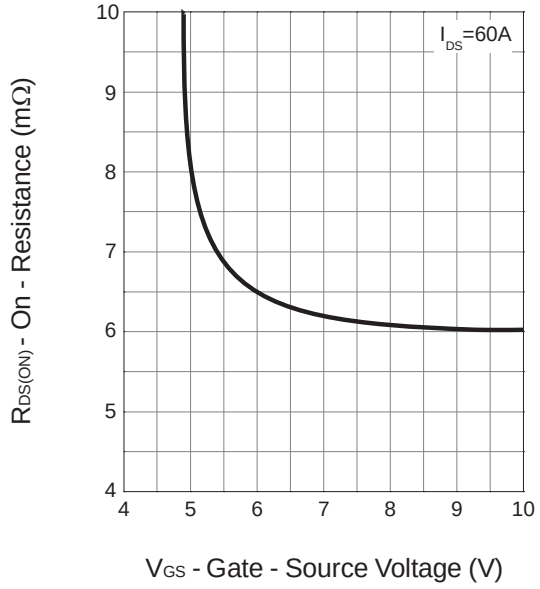
**Output Characteristics**



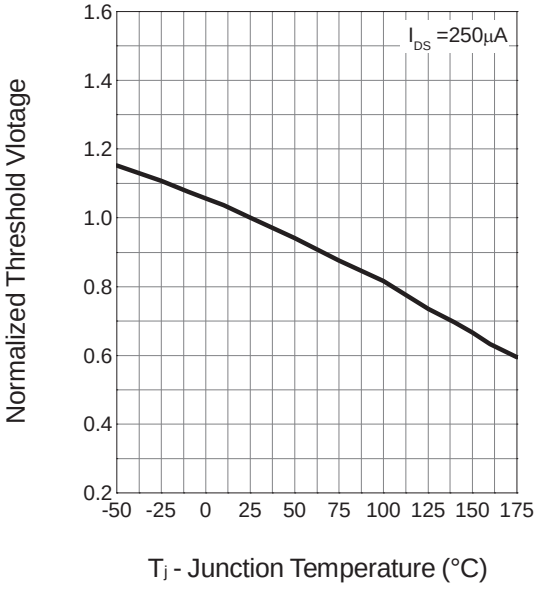

**Drain-Source On Resistance**



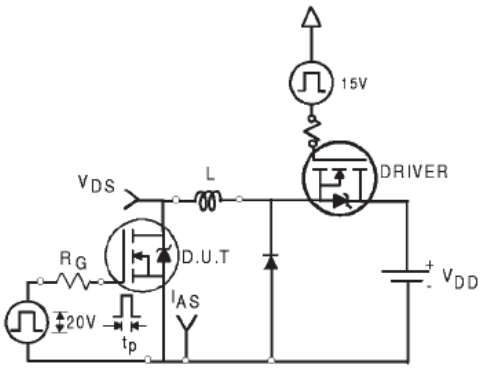

**Drain-Source On Resistance**

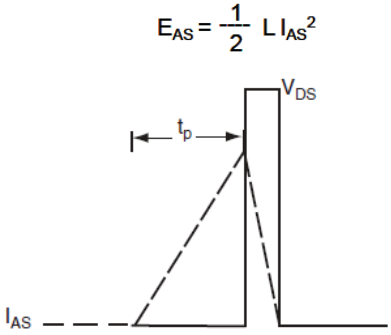



**Gate Threshold Voltage**

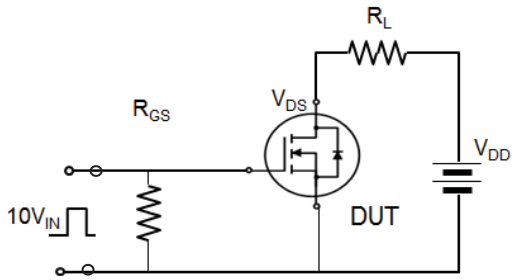


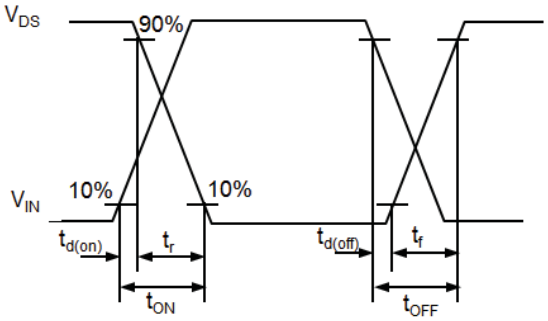
## Avalanche Test Circuit



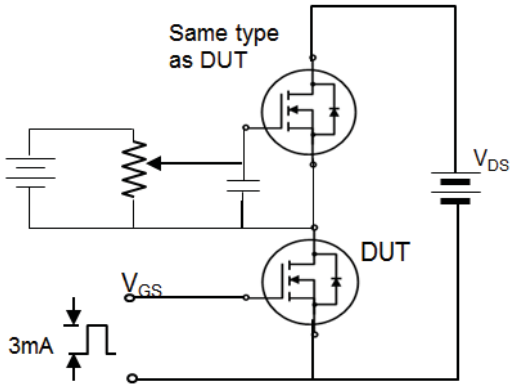



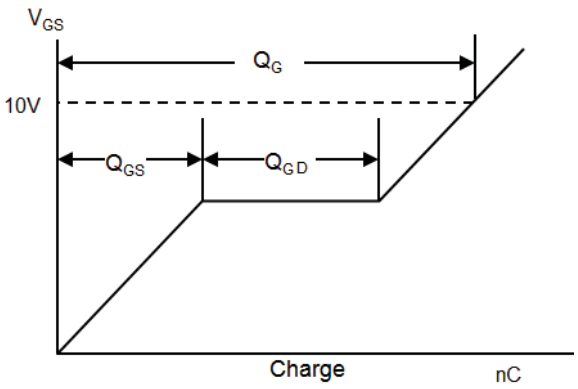

## Switching Time Test Circuit




## Gate Charge Test Circuit



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