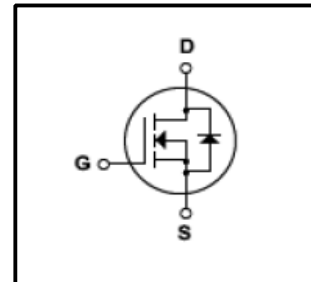


Silicon N-Channel MOSFET

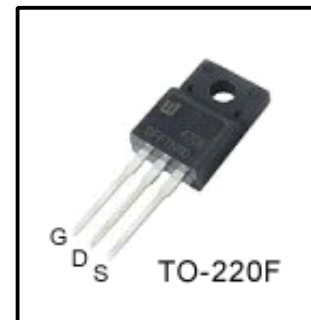
Features

- 18A,500V, $R_{DS(on)}$ (Max0.27 Ω)@ $V_{GS}=10V$
- Ultra-low Gate charge(Typical 42nC)
- Fast Switching Capability
- 100%Avalanche Tested
- Maximum Junction Temperature Range(150 $^{\circ}C$)



General Description

This Power MOSFET is produced using Winsemi's advanced planar stripe, VDMOS technology. This latest technology has been especially designed to minimize on-state resistance, have a high rugged avalanche characteristics. This device is specially well suited for AC-DC switching power supplies, DC-DC power converters, high voltage H-bridge motor drive PWM.



Absolute Maximum Ratings

| Symbol | Parameter | Value | Units |
|----------------|--|----------|-------------|
| V_{DSS} | Drain Source Voltage | 500 | V |
| I_D | Continuous Drain Current (@ $T_c=25^{\circ}C$) | 18 | A |
| | Continuous Drain Current (@ $T_c=100^{\circ}C$) | 12.7 | A |
| I_{DM} | Drain Current Pulsed (Note1) | 80 | A |
| V_{GS} | Gate to Source Voltage | ± 30 | V |
| E_{AS} | Single Pulsed Avalanche Energy (Note2) | 330 | mJ |
| E_{AR} | Repetitive Avalanche Energy (Note1) | 27.7 | mJ |
| dv/dt | Peak Diode Recovery dv /dt (Note3) | 4.5 | V/ ns |
| P_D | Total Power Dissipation (@ $T_c=25^{\circ}C$) | 69 | W |
| T_J, T_{stg} | Junction and Storage Temperature | -55~150 | $^{\circ}C$ |
| T_L | Channel Temperature | 300 | $^{\circ}C$ |

Thermal Characteristics

| Symbol | Parameter | Value | | | Units |
|-----------|---|-------|-----|------|---------------|
| | | Min | Typ | Max | |
| R_{QJC} | Thermal Resistance , Junction -to -Case | - | - | 1.8 | $^{\circ}C/W$ |
| R_{QJA} | Thermal Resistance , Junction-to -Ambient | - | - | 62.5 | $^{\circ}C/W$ |

Electrical Characteristics(Tc=25°C)

| Characteristics | Symbol | Test Condition | Min | Type | Max | Unit | |
|--|--------------------------------------|---|------------------------|-------|------|------|----|
| Gate leakage current | I _{GSS} | V _{GS} =±25V,V _{DS} =0V | - | - | ±10 | nA | |
| Gate-source breakdown voltage | V _{(BR)GSS} | I _G =±10 μA,V _{DS} =0V | ±30 | - | - | V | |
| Drain cut -off current | I _{DSS} | V _{DS} =500V,V _{GS} =0V | - | - | 100 | μA | |
| Drain -source breakdown voltage | V _{(BR)DSS} | I _D =10 mA,V _{GS} =0V | 500 | - | - | V | |
| Breakdown voltage Temperature coefficient | $\frac{\Delta BV_{DSS}}{\Delta T_J}$ | I _D =250μA,Referenced to 25°C | - | 0.5 | - | V/°C | |
| Gate threshold voltage | V _{GS(th)} | V _{DS} =10V,I _D =1mA | 3 | - | 5 | V | |
| Drain -source ON resistance | R _{DS(ON)} | V _{GS} =10V,I _D =9A | - | 0.235 | 0.27 | Ω | |
| Forward Transconductance | g _{fs} | V _{DS} =40V,I _D =9A | - | 16 | - | S | |
| Input capacitance | C _{iss} | V _{DS} =25V, | - | 2530 | 3290 | pF | |
| Reverse transfer capacitance | C _{rss} | V _{GS} =0V, | - | 11 | 14.3 | | |
| Output capacitance | C _{oss} | f=1MHz | - | 300 | 390 | | |
| Switching time | Rise time | t _r | V _{DD} =250V, | - | 40 | 90 | ns |
| | Turn-on time | t _{on} | I _D =18A | - | 150 | 310 | |
| | Fall time | t _f | R _G =25Ω | - | 95 | 200 | |
| | Turn-off time | t _{off} | (Note4,5) | - | 110 | 230 | |
| Total gate charge(gate-source plus gate-drain) | Q _g | V _{DD} =400V, V _{GS} =10V, | - | 42 | 55 | nC | |
| Gate-source charge | Q _{gs} | I _D =18A | - | 12 | - | | |
| Gate-drain("miller") Charge | Q _{gd} | (Note4,5) | - | 14 | - | | |

Source-Drain Ratings and Characteristics(Ta=25°C)

| Characteristics | Symbol | Test Condition | Min | Type | Max | Unit |
|----------------------------------|------------------|---|-----|------|-----|------|
| Continuous drain reverse current | I _{DR} | - | - | - | 18 | A |
| Pulse drain reverse current | I _{DRP} | - | - | - | 72 | A |
| Forward voltage(diode) | V _{DSF} | I _{DR} =18A,V _{GS} =0V | - | - | 1.4 | V |
| Reverse recovery time | t _{rr} | I _{DR} =18A,V _{GS} =0V, | - | 500 | - | ns |
| Reverse recovery charge | Q _{rr} | dI _{DR} / dt =100 A / μs | - | 5.4 | - | μC |

Note 1.Repeativity rating :pulse width limited by junction temperature

2.L=5.2mH I_{AS}=18A,V_{DD}=50V,R_G=25Ω,Starting T_J=25°C

3.I_{SD}≤18A,di/dt≤200A/us,V_{DD}<BV_{DSS},STARTING T_J=25°C

4.Pulse Test:Pulse Width≤300us,Duty Cycle≤2%

5. Essentially independent of operating temperature.

This transistor is an electrostatic sensitive device

Please handle with caution

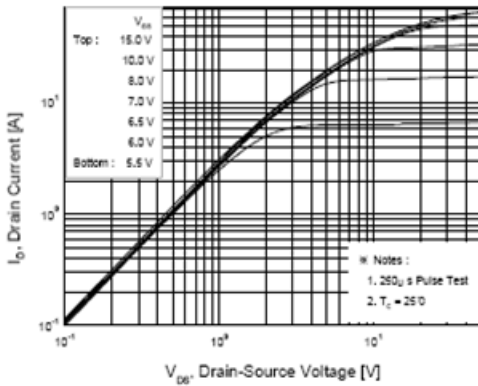


Fig.1 On State Characteristics

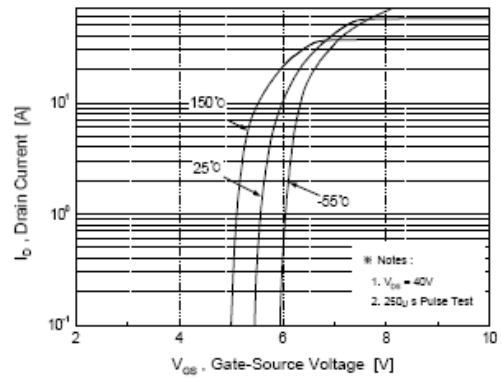


Fig.2 Transfer Current Characteristics

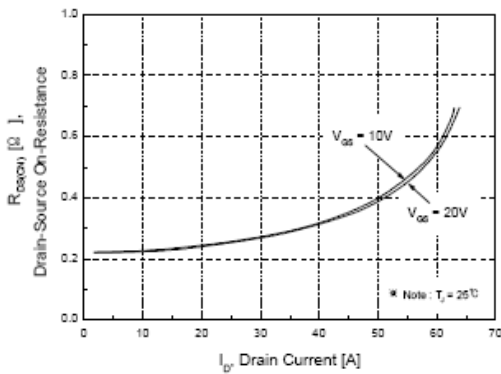


Fig.3 On-Resistance Variation vs Drain Current

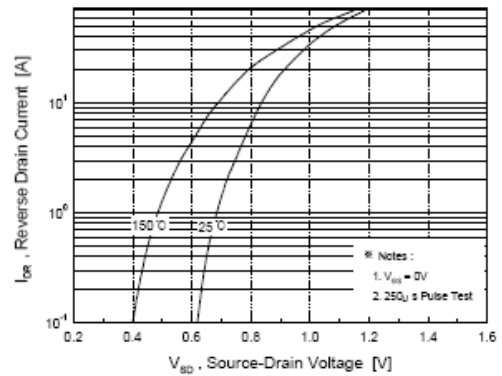


Fig.4 Body Diode Forward Voltage Variation with Source Current and Temperature

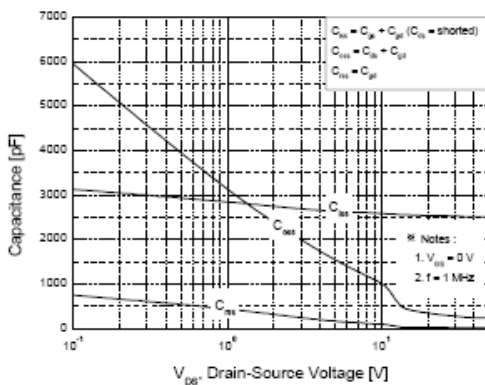


Fig.5 Capacitance Characteristics

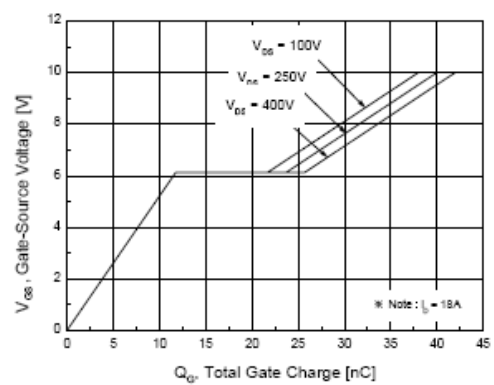


Fig.6 Gate Charge Characteristics

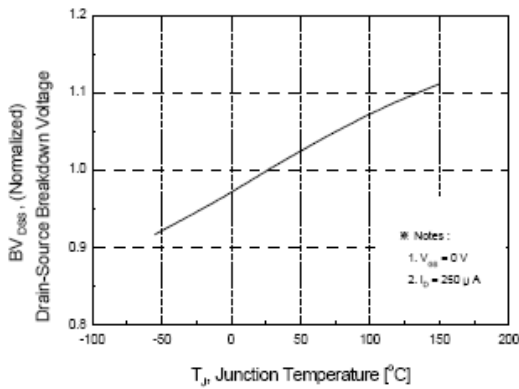


Fig.7 Breakdown Voltage Variation

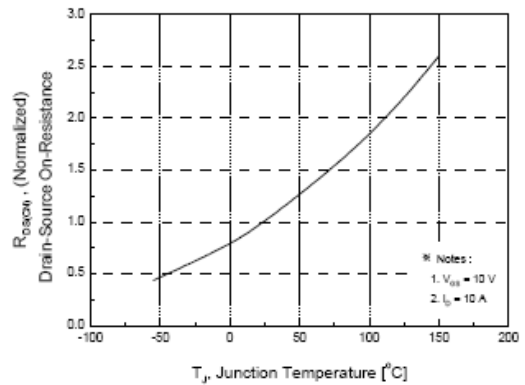


Fig.8 On-Resistance Variation vs. Temperature

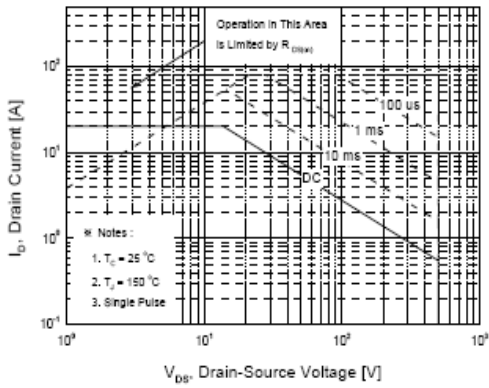


Fig.9 Maximum Safe Operation Area

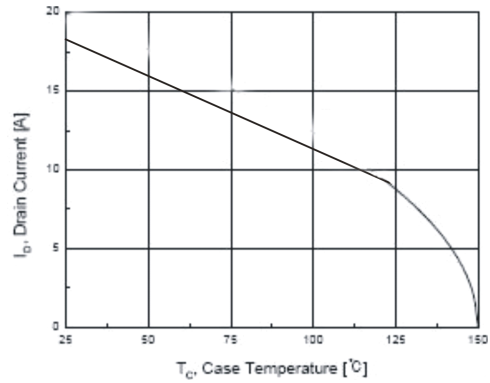


Fig.10 Maximum Drain Current vs Case Temperature

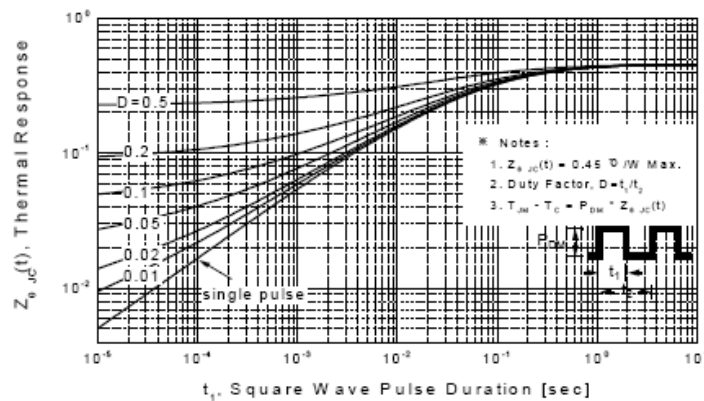


Fig.11 Transient Thermal Response Curve

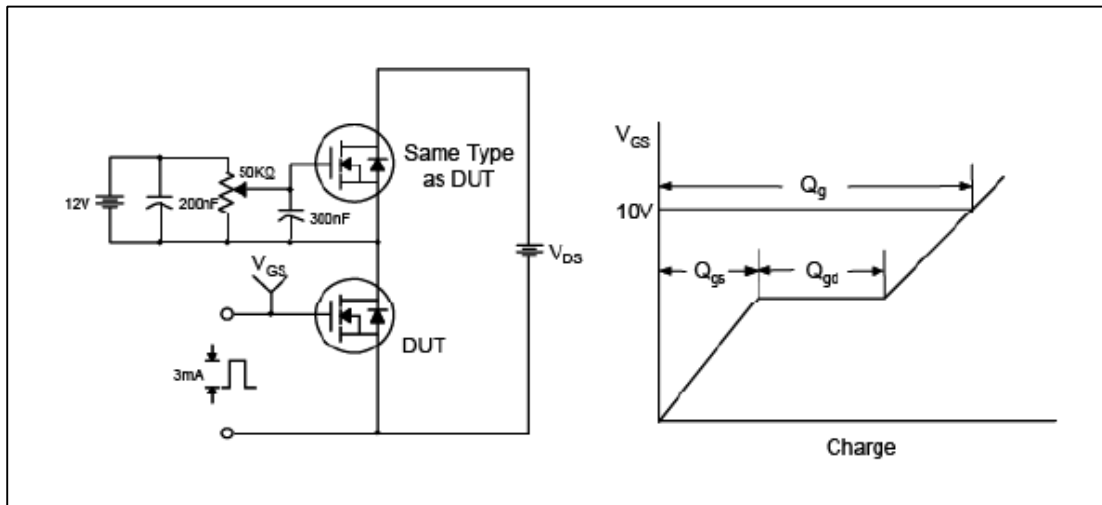


Fig.12 Gate Test Circuit & Waveform

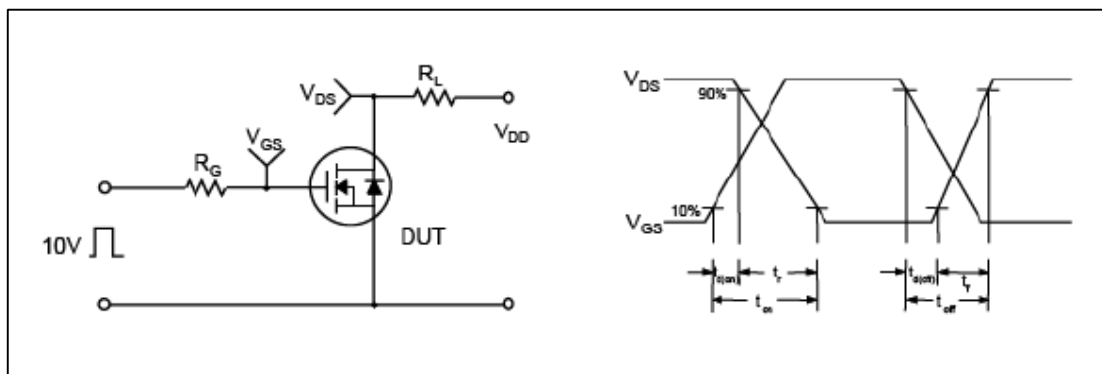


Fig.13 Resistive Switching Test Circuit & Waveform

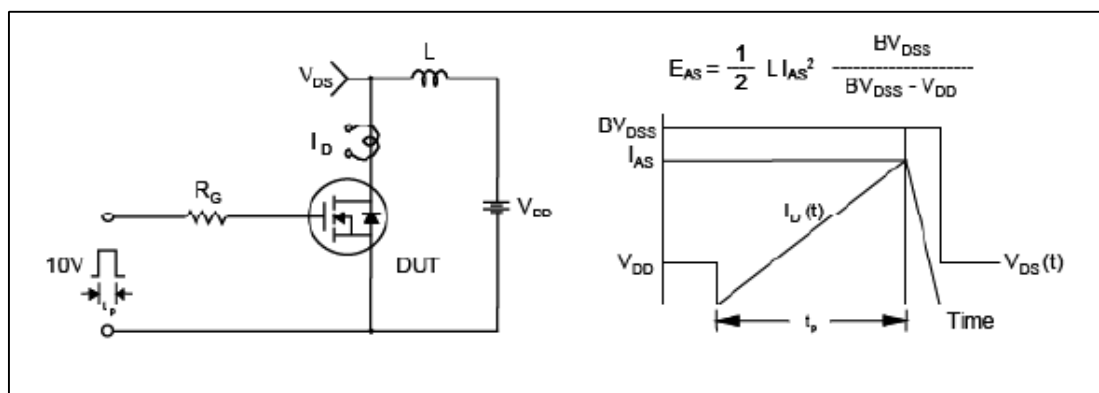


Fig.14 Unclamped Inductive Switching Test Circuit & Waveform

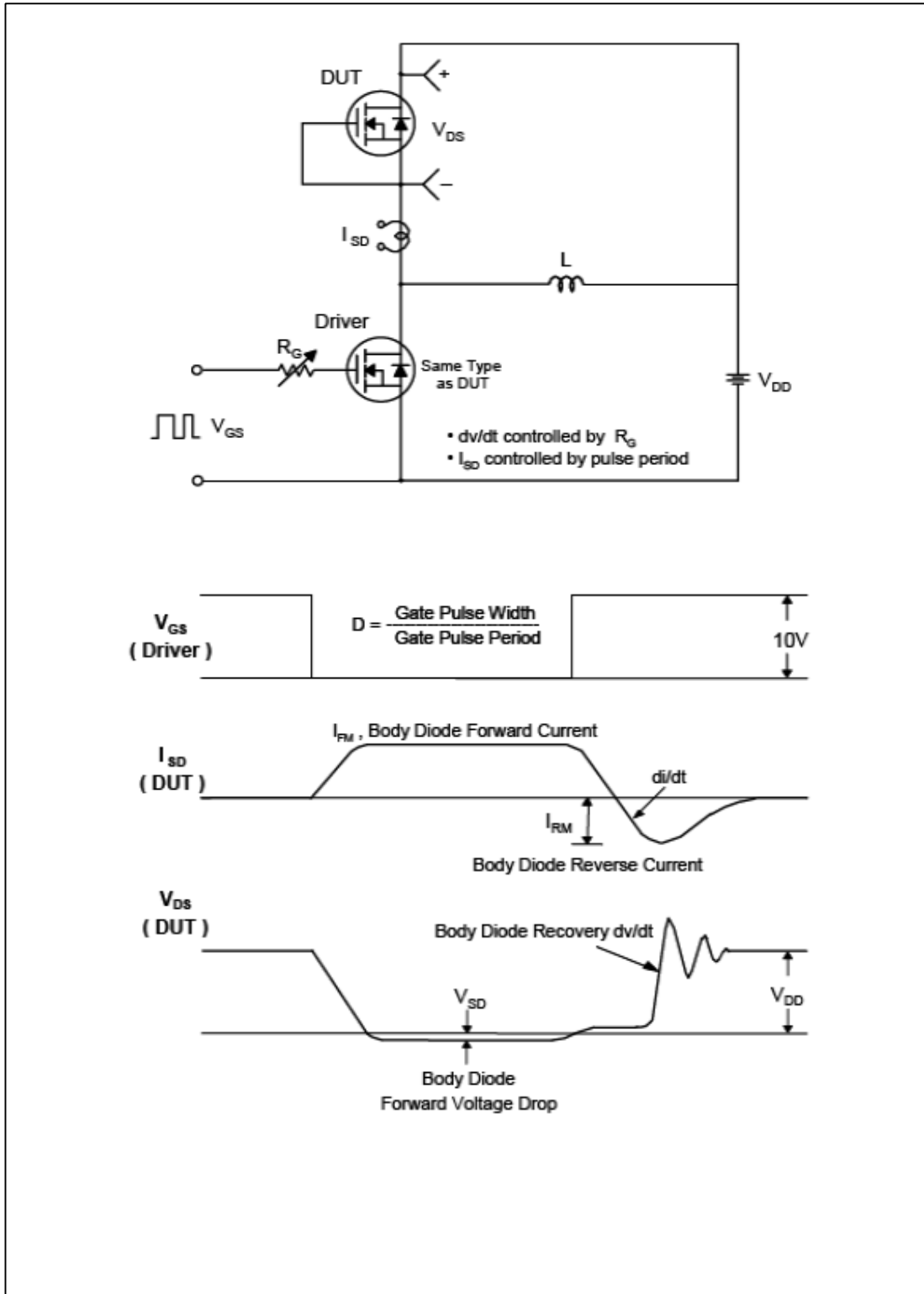


Fig.15 Peak Diode Recovery dv/dt Test Circuit & Waveform

TO-220F Package Dimension

