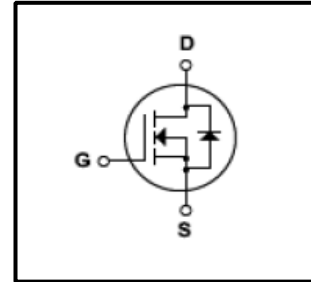


Silicon N-Channel MOSFET

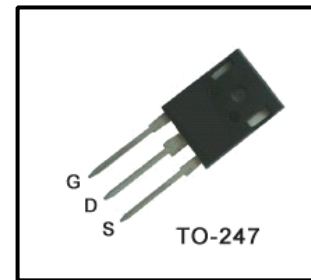
Features

- 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℃)



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 devices is specially wellsuited 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(@ $T_c=25^{\circ}C$) | 208 | 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 | - | - | 0.60 | $^{\circ}C/W$ |
| R_{QJA} | Thermal Resistance , Junction-to -Ambient | - | - | 40 | $^{\circ}C/W$ |

Electrical Characteristics(Tc=25℃)

| Characteristics | | Symbol | Test Condition | Min | Type | Max | Unit |
|--|---------------|--------------------------------|------------------------------------|----------|------|----------|----------|
| Gate leakage current | | I_{GSS} | $V_{GS}=\pm 25V, V_{DS}=0V$ | - | - | ± 10 | nA |
| Gate-source breakdown voltage | | $V_{(BR)GSS}$ | $I_G=\pm 10 \mu A, V_{DS}=0V$ | ± 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 | | $\Delta BV_{DSS} / \Delta T_J$ | $I_D=250\mu A$, Referenced to 25℃ | - | 0.5 | - | V/℃ |
| Gate threshold voltage | | $V_{GS(th)}$ | $V_{DS}=10V, I_D=1mA$ | 3 | - | 5 | V |
| Drain -source ON resistance | | $R_{DS(ON)}$ | $V_{GS}=10V, I_D=9A$ | - | 0.23 | 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 | $R_G=25\Omega$ | - | 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℃)

| 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} | $di_{DR} / dt \leq 100 A / \mu s$ | - | 5.4 | - | μC |

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

2.L=5.2mH $I_{AS}=18A, V_{DD}=50V, R_G=25\Omega$, Starting $T_J=25^\circ C$

3. $I_{SD} \leq 18A, di/dt \leq 200A/\mu s, V_{DD} < BV_{DSS}$, STARTING $T_J=25^\circ C$

4.Pulse Test:Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

5. Essentially independent of operating temperature.

This transistor is an electrostatic sensitive device

Please handle with caution

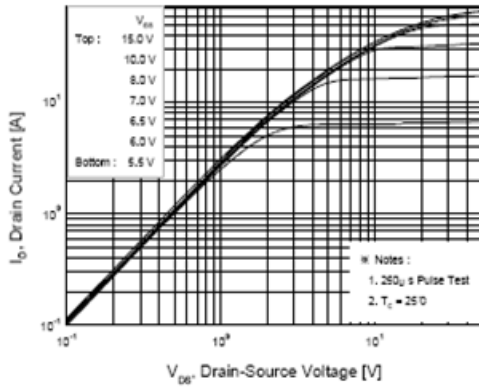


Fig.1 On State Characteristics

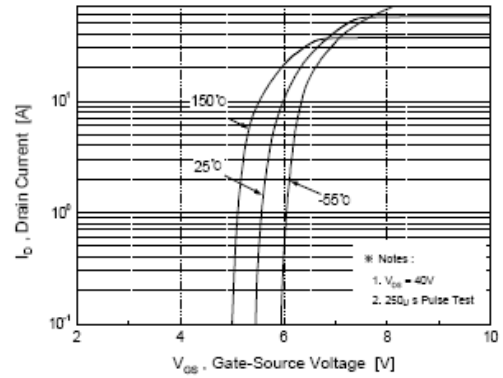


Fig.2 Transfer Current Characteristics

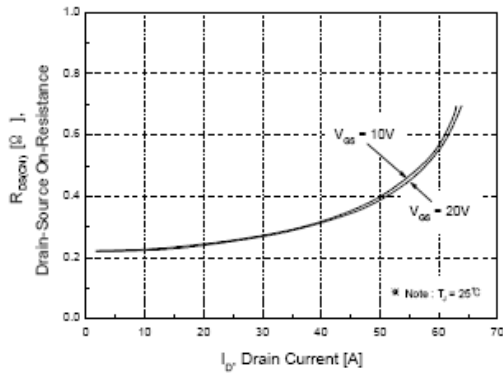


Fig.3 On-Resistance Variation vs Drain Current

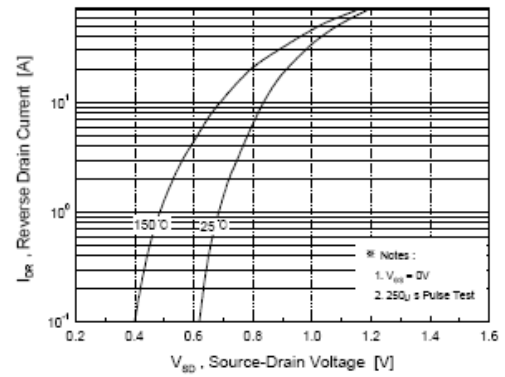


Fig.4 Body Diode Forward Voltage Variation with Source Current and Temperature

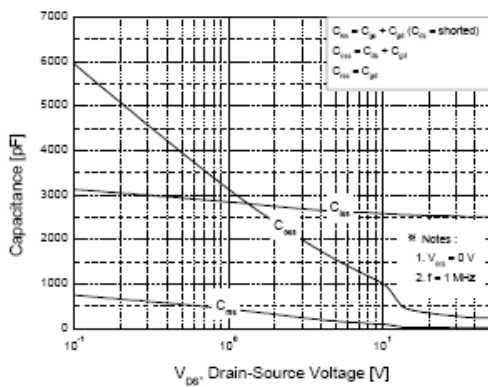


Fig.5 Capacitance Characteristics

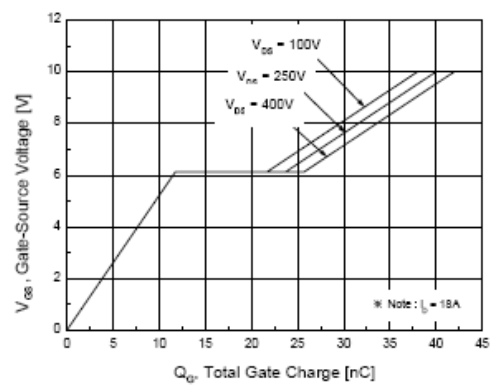


Fig.6 Gate Charge Characteristics

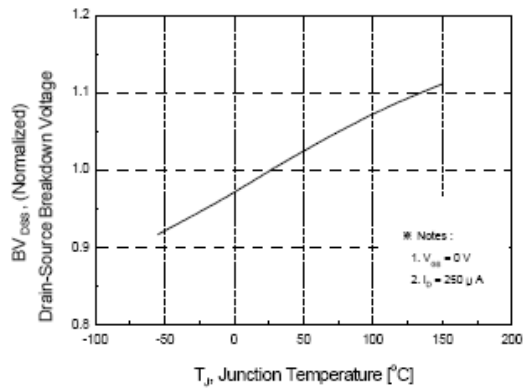


Fig.7 Breakdown Voltage Variation

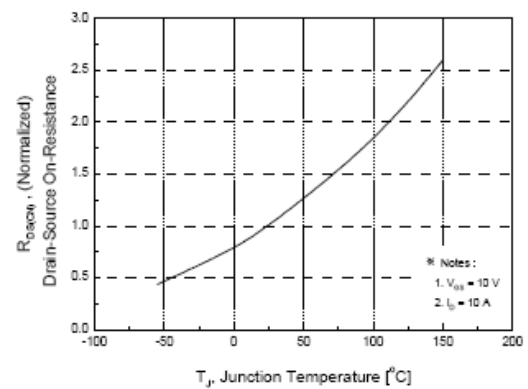


Fig.8 On-Resistance Variation vs. Temperature

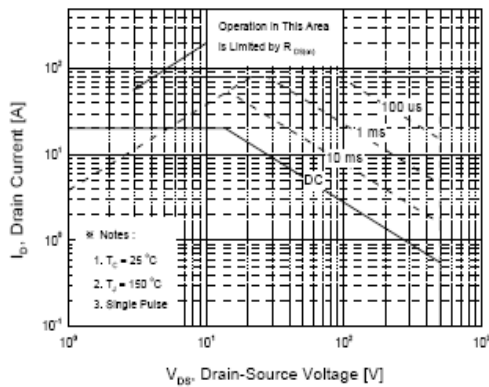


Fig.9 Maximum Safe Operation Area

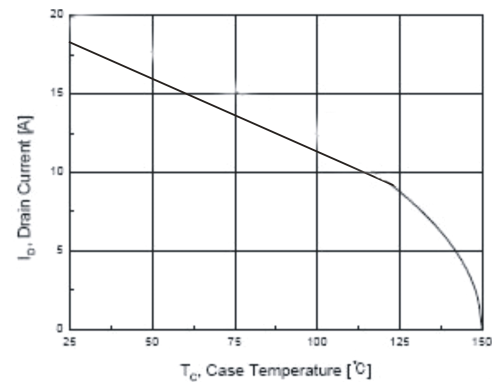


Fig.10 Maximum Drain Current vs. Case Temperature

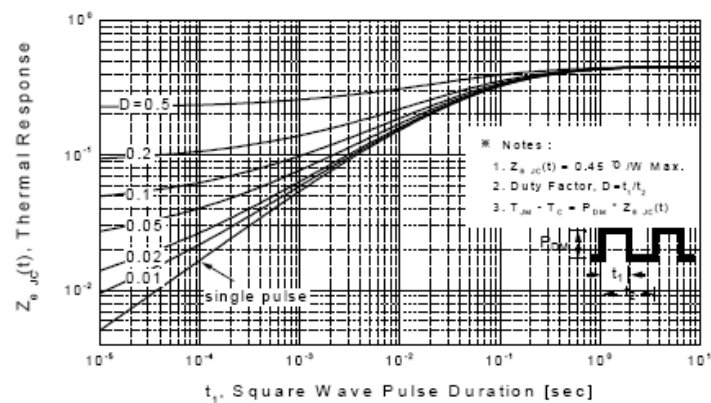


Fig.11 Transient Thermal Response Curve

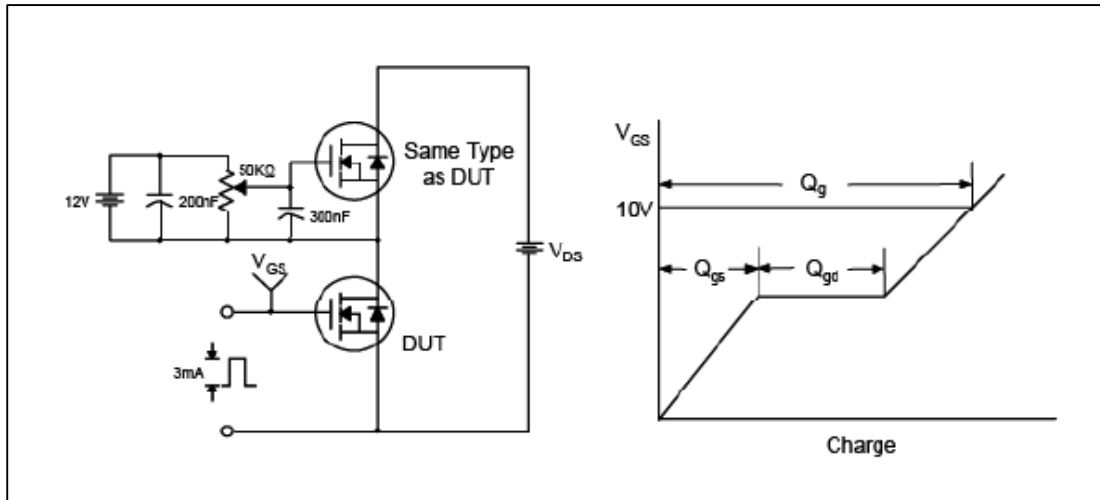


Fig.12 Gate Test Circuit & Waveform

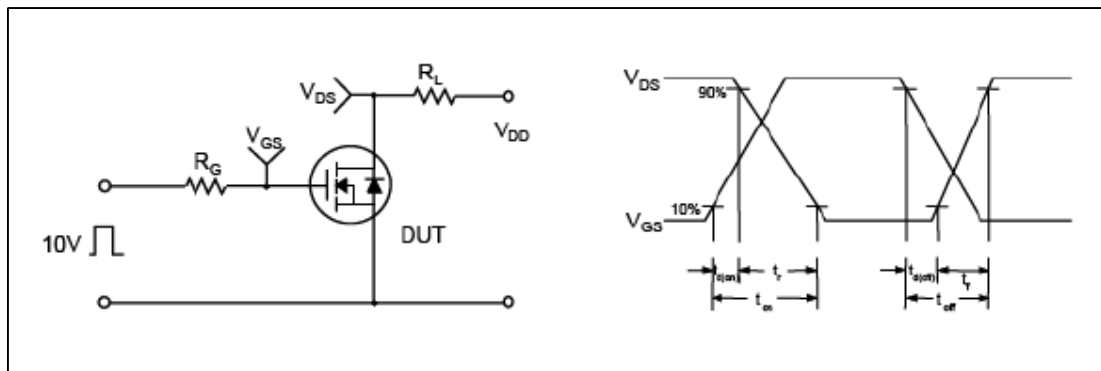


Fig.13 Resistive Switching Test Circuit & Waveform

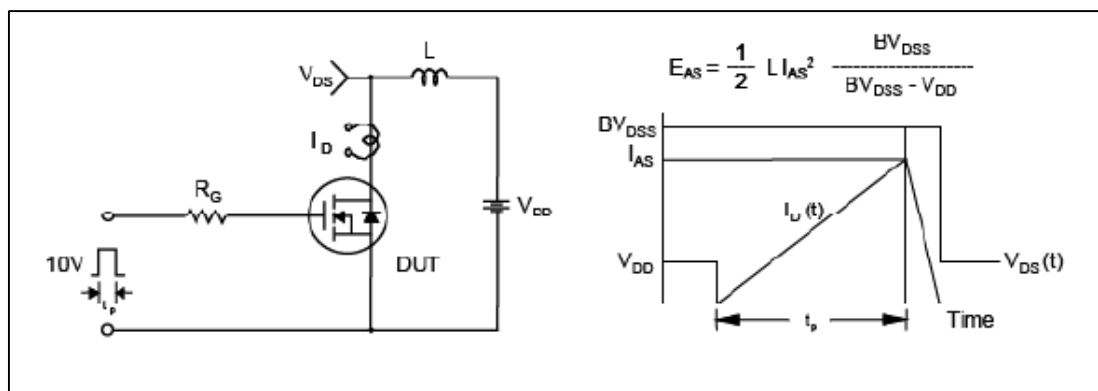


Fig.14 Unclamped Inductive Switching Test Circuit & Waveform

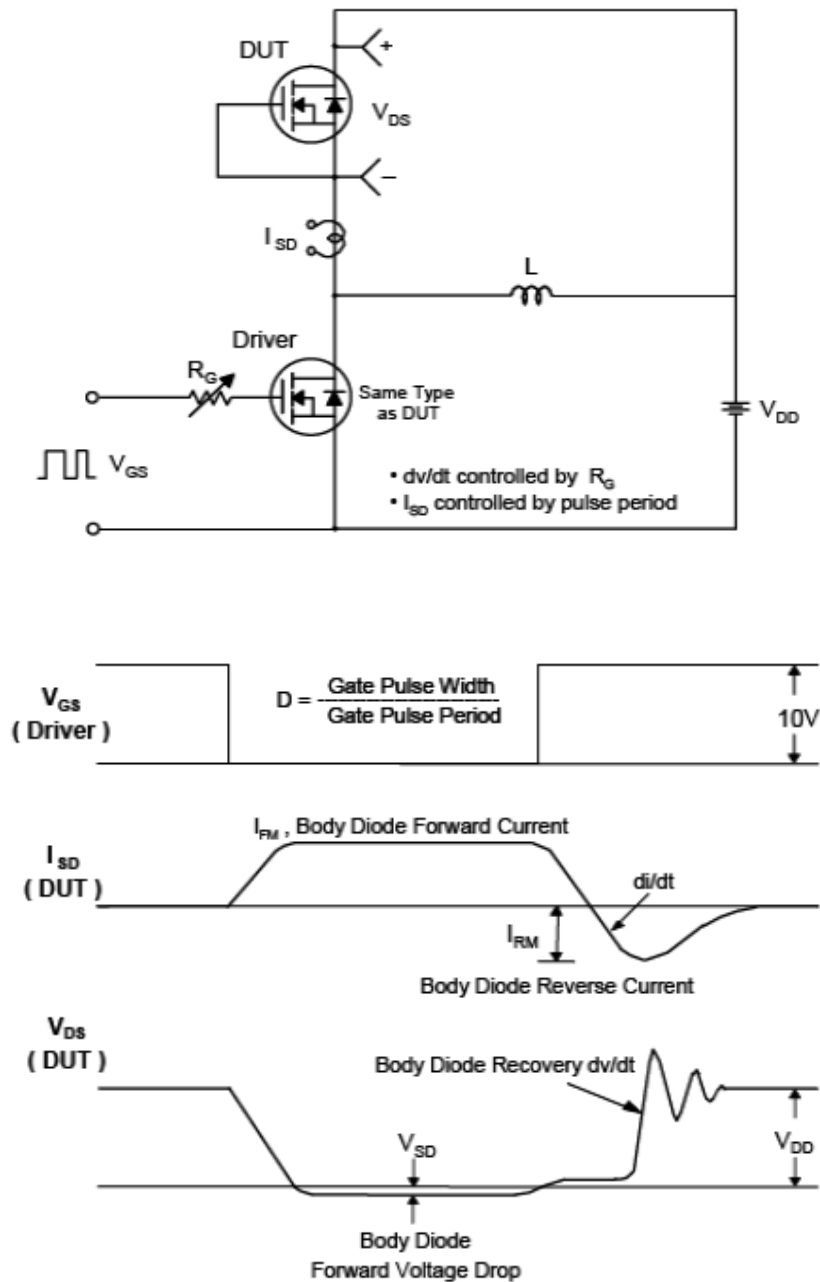


Fig.15 Peak Diode Recovery dv/dt Test Circuit & Waveform

TO-247 Package Dimension

Unit:mm

