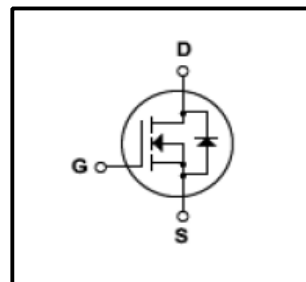
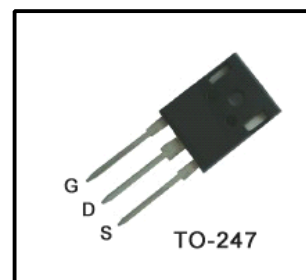


**Silicon N-Channel MOSFET**
**Features**

- 18A,500V, $R_{DS(on)}$ (Max0.27 $\Omega$ )@ $V_{GS}=10V$
- 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                          | $\pm 30$ | 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(@ $T_c=25^{\circ}C$ )   | 280      | 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   | -     | -    | 0.45 | $^{\circ}C/W$ |
| $R_{QCS}$ | Thermal Resistance , Case-to-Sink         | -     | 0.24 | -    | $^{\circ}C/W$ |
| $R_{QJA}$ | Thermal Resistance , Junction-to -Ambient | -     | -    | 40   | $^{\circ}C/W$ |

## Electrical Characteristics(Tc=25℃)

| Characteristics                                |               | Symbol                         | Test Condition                      | Min      | Type | Max      | Unit     |
|------------------------------------------------|---------------|--------------------------------|-------------------------------------|----------|------|----------|----------|
| Gate leakage current                           |               | $I_{GSS}$                      | $V_{GS}=\pm 25V, V_{DS}=0V$         | -        | -    | $\pm 10$ | nA       |
| Gate-source breakdown voltage                  |               | $V_{(BR)GSS}$                  | $I_G=\pm 10 \mu A, V_{DS}=0V$       | $\pm 30$ | -    | -        | V        |
| Drain cut -off current                         |               | $I_{DSS}$                      | $V_{DS}=500V, V_{GS}=0V$            | -        | -    | 100      | $\mu A$  |
| 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     | $\Omega$ |
| 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) |               | $Q_g$                          | $V_{DD}=400V,$<br>$V_{GS}=10V,$     | -        | 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          | $Q_{rr}$  | $dI_{DR} / dt = 100 A / \mu s$ | -   | 5.4  | -   | $\mu C$ |

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  $T_J=25^\circ C$

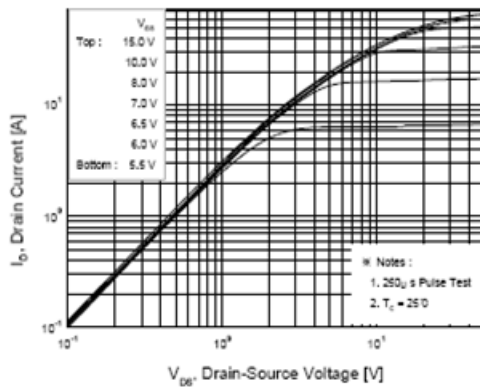
3. $I_{SD} \leq 18A, di/dt \leq 200A/\mu s, V_{DD} < BV_{DSS}$ , STARTING  $T_J=25^\circ C$

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

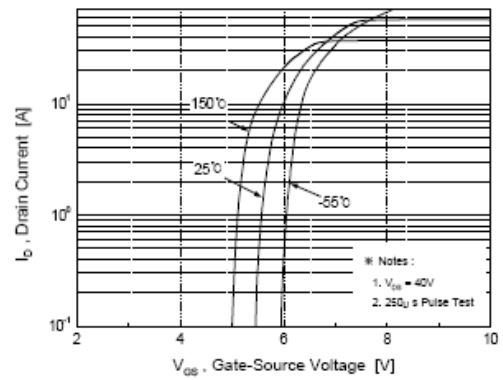
5. Essentially independent of operating temperature.

This transistor is an electrostatic sensitive device

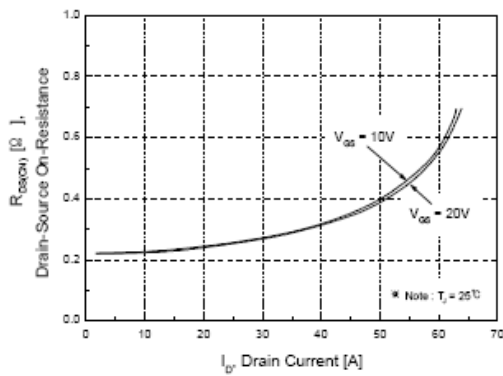
Please handle with caution



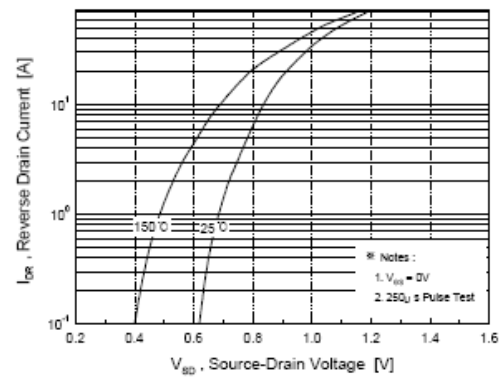
**Fig.1 On State Characteristics**



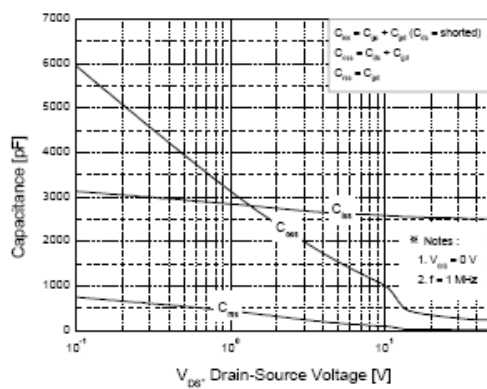
**Fig.2 Transfer Current Characteristics**



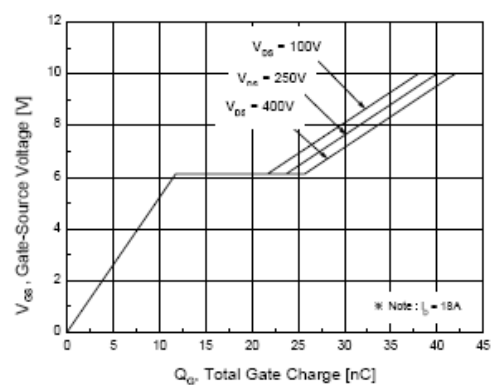
**Fig.3 On-Resistance Variation vs Drain Current**



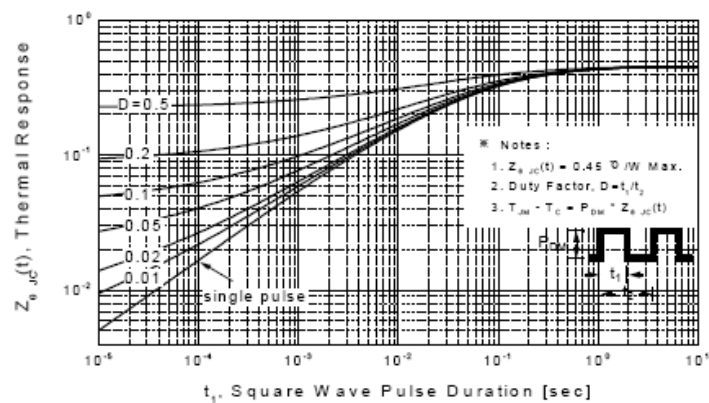
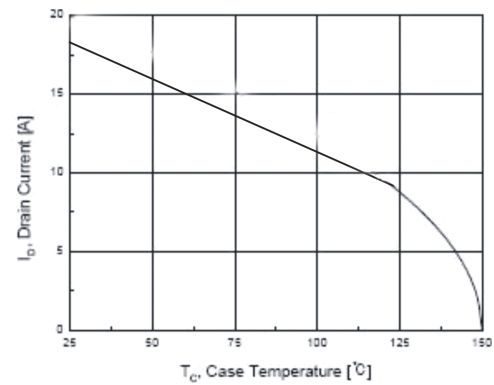
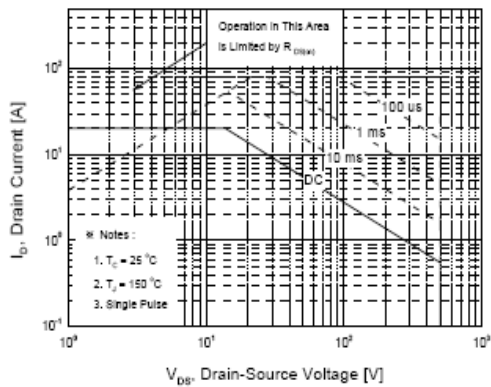
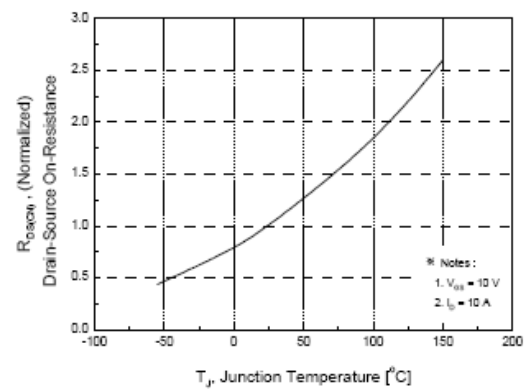
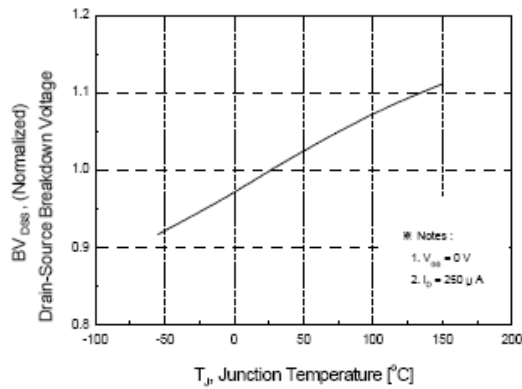
**Fig.4 Body Diode Forward Voltage Variation with Source Current and Temperature**

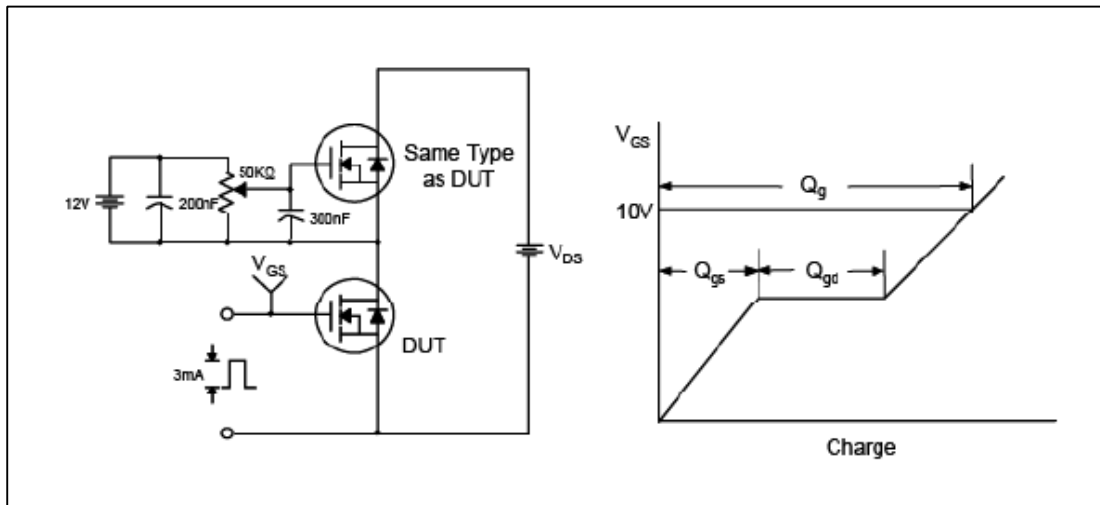


**Fig.5 Capacitance Characteristics**

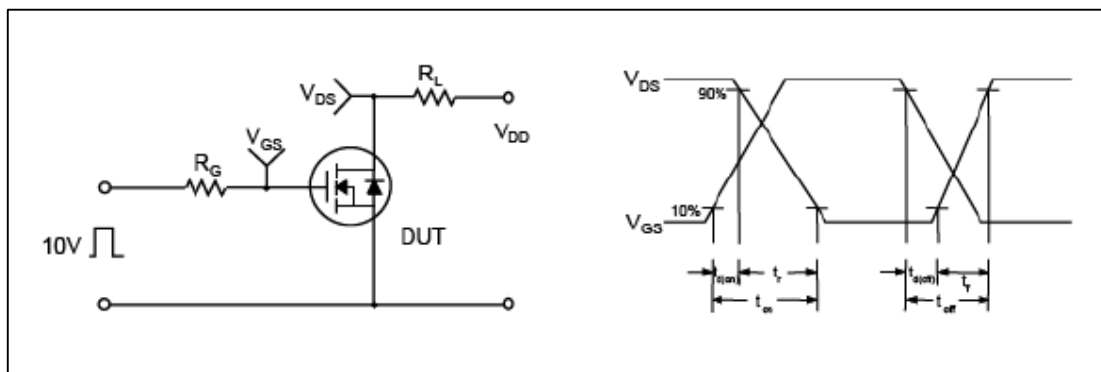


**Fig.6 Gate Charge Characteristics**

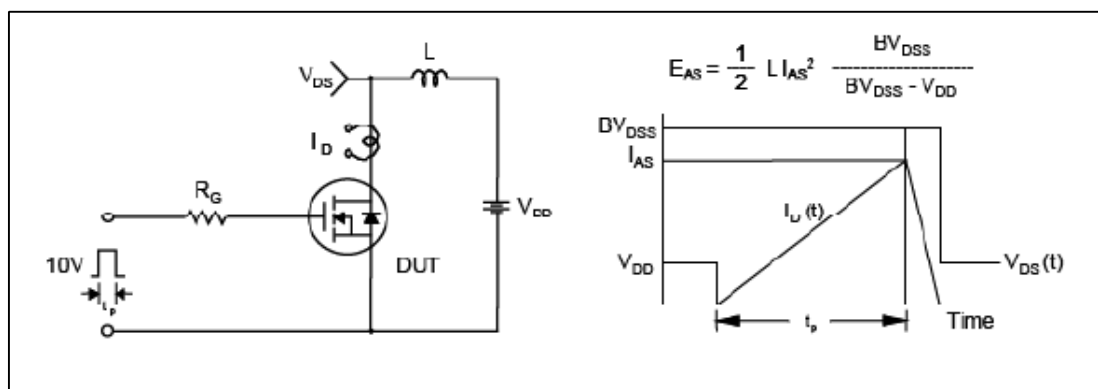




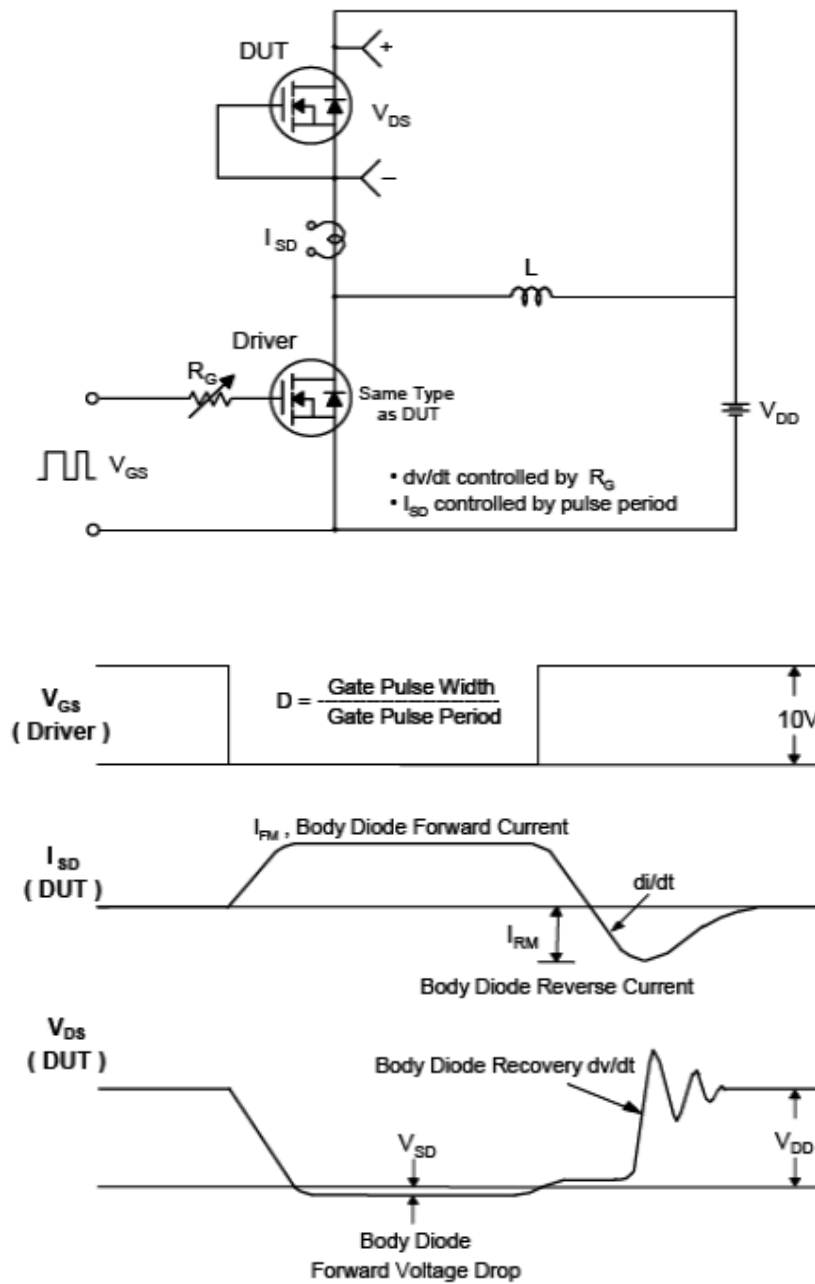
**Fig.12 Gate Test Circuit & Waveform**



**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

