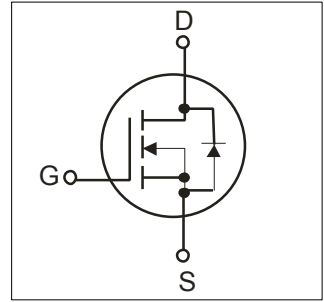


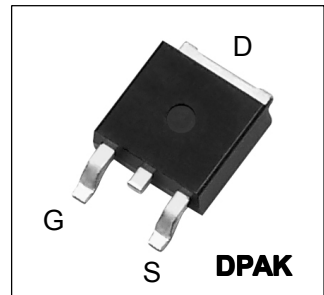
## Features

- 2A,600V, $R_{DS(on)}$ (Max 5.0 $\Omega$ )@ $V_{GS}=10V$
- Ultra-low Gate Charge(Typical 5.3nC)
- 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 well suited for high efficiency switch mode power supply .



## Absolute Maximum Ratings

| Symbol         | Parameter                                      | Value    | Units |
|----------------|------------------------------------------------|----------|-------|
| $V_{DSS}$      | Drain Source Voltage                           | 600      | V     |
| $I_D$          | Continuous Drain Current(@ $T_c=25^\circ C$ )  | 2.0      | A     |
|                | Continuous Drain Current(@ $T_c=100^\circ C$ ) | 1.3      | A     |
| $I_{DM}$       | Drain Current Pulsed (Note1)                   | 8        | A     |
| $V_{GS}$       | Gate to Source Voltage                         | $\pm 30$ | V     |
| $E_{AS}$       | Single Pulsed Avalanche Energy (Note2)         | 121      | mJ    |
| $E_{AR}$       | Repetitive Avalanche Energy (Note1)            | 4.5      | mJ    |
| $dv/dt$        | Peak Diode Recovery $dv/dt$ (Note3)            | 4.4      | V/ ns |
| $P_D$          | Total Power Dissipation(@ $T_c=25^\circ C$ )   | 46       | W     |
|                | Derating Factor above 25℃                      | 0.35     | W/℃   |
| $T_J, T_{stg}$ | Junction and Storage Temperature               | -55~150  | ℃     |
| $T_L$          | Channel Temperature                            | 300      | ℃     |

## Thermal Characteristics

| Symbol    | Parameter                                 | Value |     |     | Units |
|-----------|-------------------------------------------|-------|-----|-----|-------|
|           |                                           | Min   | Typ | Max |       |
| $R_{QJC}$ | Thermal Resistance , Junction -to -Case   | -     | -   | 2.7 | ℃/W   |
| $R_{QJA}$ | Thermal Resistance , Junction-to -Ambient | -     | -   | 110 | ℃/W   |

## Electrical Characteristics(Tc=25℃)

| Characteristics                                |                     | Symbol               | Test Condition                                                                     | Min | Type | Max  | Unit |
|------------------------------------------------|---------------------|----------------------|------------------------------------------------------------------------------------|-----|------|------|------|
| Gate leakage current                           |                     | I <sub>GSS</sub>     | V <sub>GS</sub> =±30V,V <sub>DS</sub> =0V                                          | -   | -    | ±100 | nA   |
| Gate-source breakdown voltage                  |                     | V <sub>(BR)GSS</sub> | I <sub>G</sub> =±10 μA,V <sub>DS</sub> =0V                                         | ±30 | -    | -    | V    |
| Drain cut -off current                         |                     | I <sub>DSS</sub>     | V <sub>DS</sub> =600V,V <sub>GS</sub> =0V                                          | -   | -    | 10   | μA   |
|                                                |                     |                      | V <sub>DS</sub> =480V,Tc=125℃                                                      | -   |      | 100  | μA   |
| Drain -source breakdown voltage                |                     | V <sub>(BR)DSS</sub> | I <sub>D</sub> =250 μA,V <sub>GS</sub> =0V                                         | 600 | -    | -    | V    |
| Gate threshold voltage                         |                     | V <sub>GS(th)</sub>  | V <sub>DS</sub> = V <sub>GS</sub> ,I <sub>D</sub> =250 μA                          | 2   | -    | 4    | V    |
| Drain -source ON resistance                    |                     | R <sub>DS(ON)</sub>  | V <sub>GS</sub> =10V,I <sub>D</sub> =1A                                            | -   | 4.5  | 5.0  | Ω    |
| Forward Transconductance                       |                     | g <sub>fs</sub>      | V <sub>DS</sub> =50V,I <sub>D</sub> =1A                                            | -   | 2.25 | -    | S    |
| Input capacitance                              |                     | C <sub>iSS</sub>     | V <sub>DS</sub> =25V,<br>V <sub>GS</sub> =0V,<br>f=1MHz                            | -   | 190  | 230  | pF   |
| Reverse transfer capacitance                   |                     | C <sub>rSS</sub>     |                                                                                    | -   | 1.8  | 2.1  |      |
| Output capacitance                             |                     | C <sub>oSS</sub>     |                                                                                    | -   | 15   | 20   |      |
| Switching time                                 | Turn-on Rise time   | t <sub>r</sub>       | V <sub>DD</sub> =300V,<br>I <sub>D</sub> =2A,<br>R <sub>G</sub> =25Ω,<br>(Note4,5) | -   | 23   | 45   | ns   |
|                                                | Turn-on delay time  | Td(on)               |                                                                                    | -   | 7    | 23   |      |
|                                                | Turn-off Fall time  | t <sub>f</sub>       |                                                                                    | -   | 24   | 46   |      |
|                                                | Turn-off delay time | Td(off)              |                                                                                    | -   | 22   | 43   |      |
| Total gate charge(gate-source plus gate-drain) |                     | Q <sub>g</sub>       | V <sub>DD</sub> =480V,<br>V <sub>GS</sub> =10V,<br>I <sub>D</sub> =2A<br>(Note4,5) | -   | 5.3  | 6    | nC   |
| Gate-source charge                             |                     | Q <sub>gs</sub>      |                                                                                    | -   | 1.7  | -    |      |
| Gate-drain("miller") Charge                    |                     | Q <sub>gd</sub>      |                                                                                    | -   | 1.8  | -    |      |

## Source-Drain Ratings and Characteristics(Ta=25℃)

| Characteristics                  | Symbol           | Test Condition                             | Min | Type | Max | Unit |
|----------------------------------|------------------|--------------------------------------------|-----|------|-----|------|
| Continuous drain reverse current | I <sub>DR</sub>  | -                                          | -   | -    | 2.0 | A    |
| Pulse drain reverse current      | I <sub>DRP</sub> | -                                          | -   | -    | 8.0 | A    |
| Forward voltage(diode)           | V <sub>DSF</sub> | I <sub>DR</sub> =2.0A, V <sub>GS</sub> =0V | -   | -    | 1.4 | V    |
| Reverse recovery time            | t <sub>rr</sub>  | I <sub>DR</sub> =2.A, V <sub>GS</sub> =0V, | -   | 180  | -   | ns   |
| Reverse recovery charge          | Q <sub>rr</sub>  | dI <sub>DR</sub> / dt =100 A / μs          | -   | 0.72 | -   | μC   |

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

2.L=56mH I<sub>AS</sub>=2A, V<sub>DD</sub>=50V, R<sub>G</sub>=25Ω ,Starting T<sub>J</sub>=25℃

3.I<sub>SD</sub>≤2A, di/dt≤200A/us, V<sub>DD</sub><BV<sub>DSS</sub>, STARTING T<sub>J</sub>=25℃

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

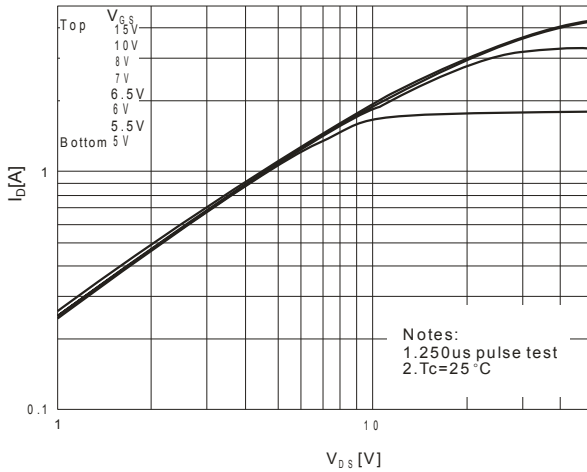


Fig.1 On-Region Characteristics

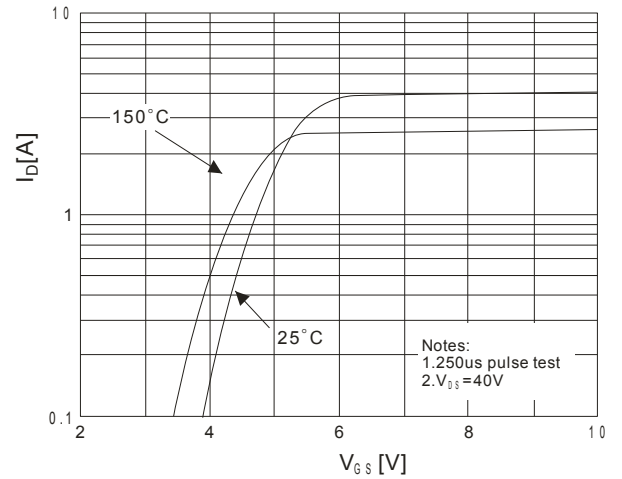


Fig.2 Transfer characteristics

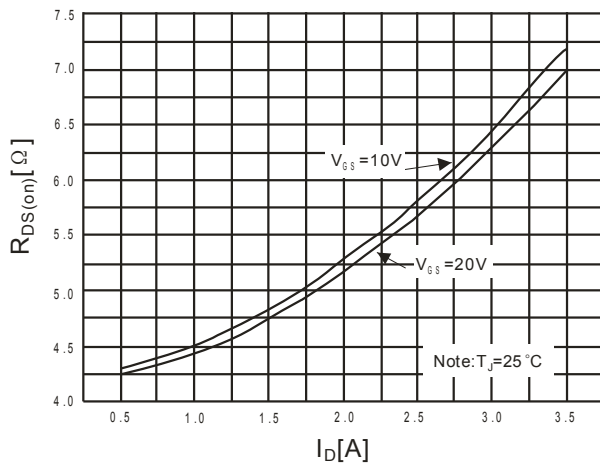


Fig.3 On Resistance variation vs Drain Current and Gate Voltage

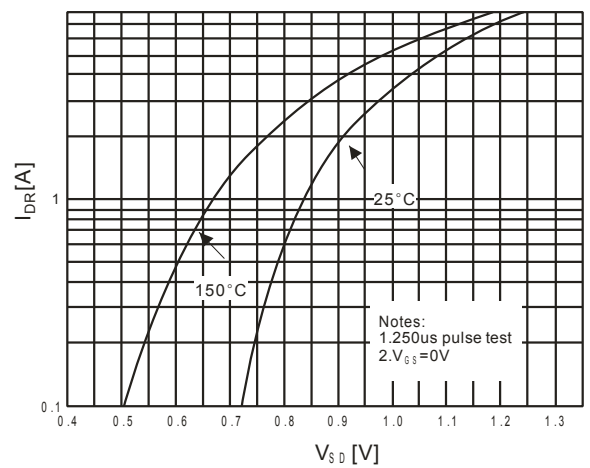


Fig.4 Body Diode Forward Voltage Variation With Source Current And temperature

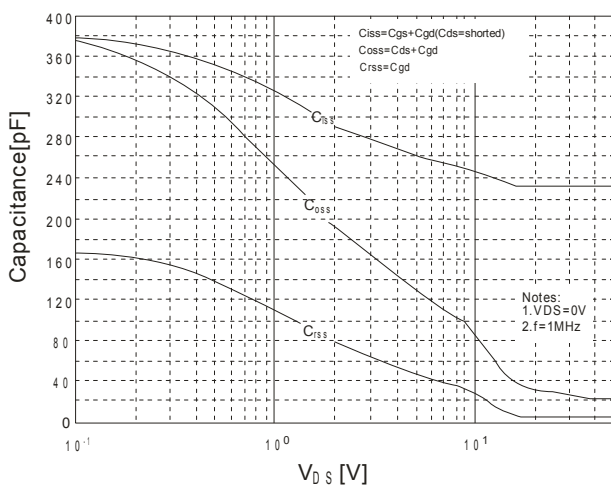


Fig.5 Capacitance Characteristics

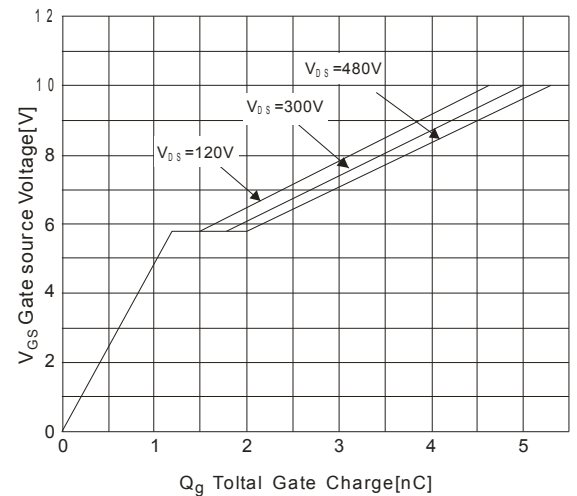


Fig.6 Gate Charge Characteristics

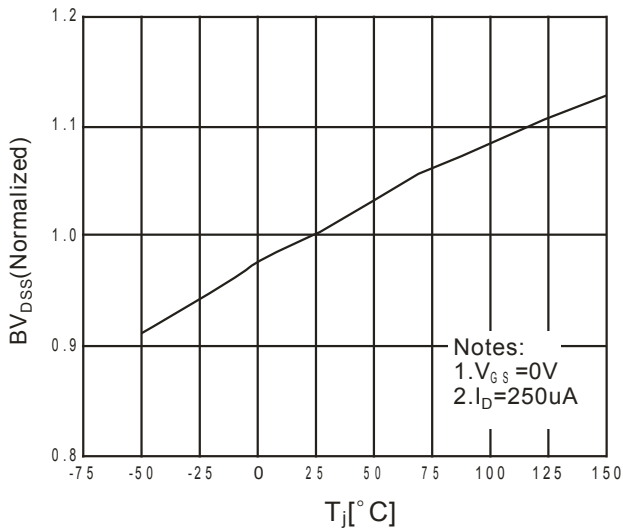


Fig.7 Breakdown Voltage Variation Vs, Temperature

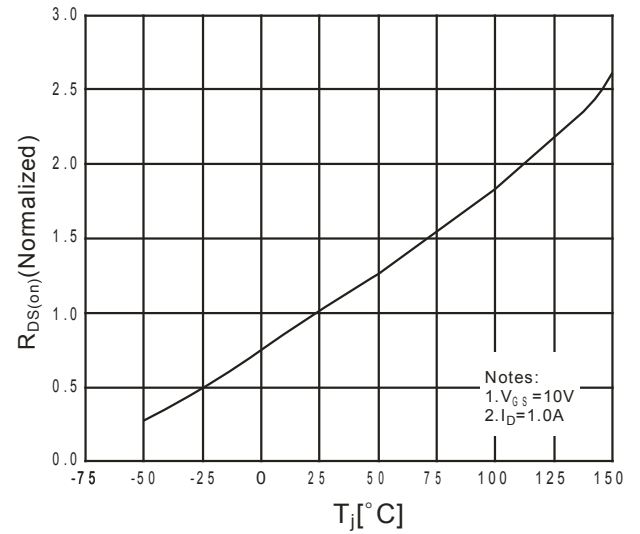


Fig.8 On-Resistance Variation vs. temperature

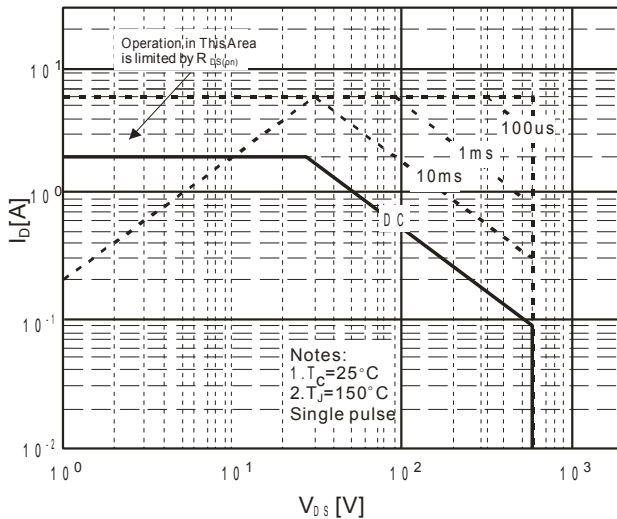


Fig.9 Maximum Safe Operation Area

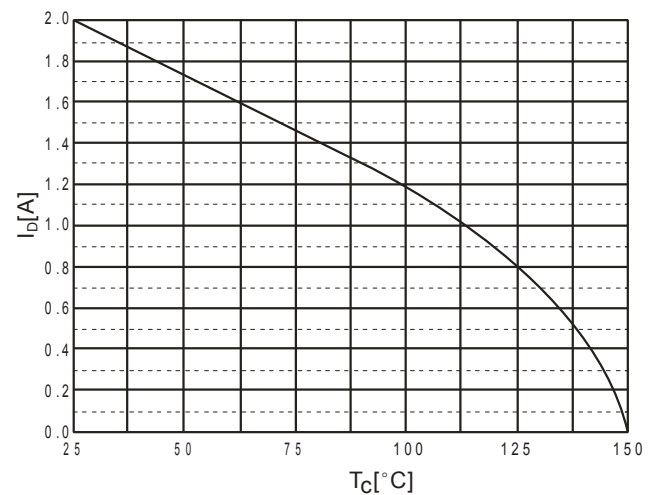


Fig.10 Maximum Drain Current vs Case Temperature

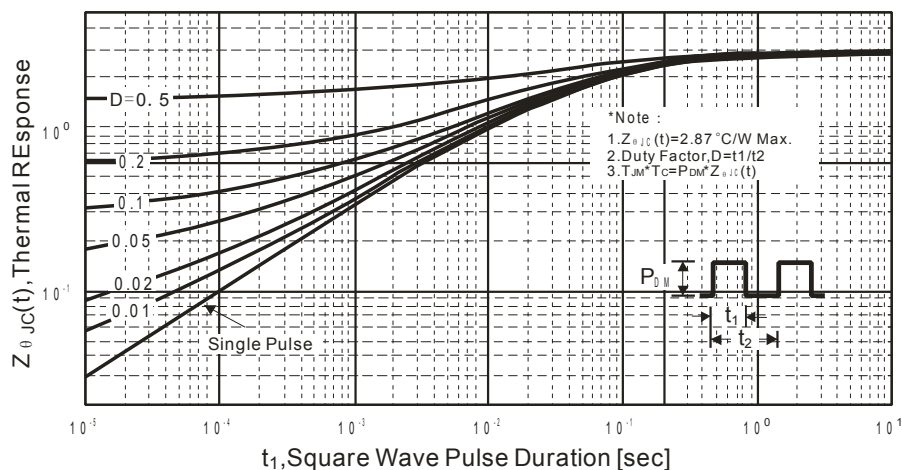


Fig.11 Transient Thermal Response curve

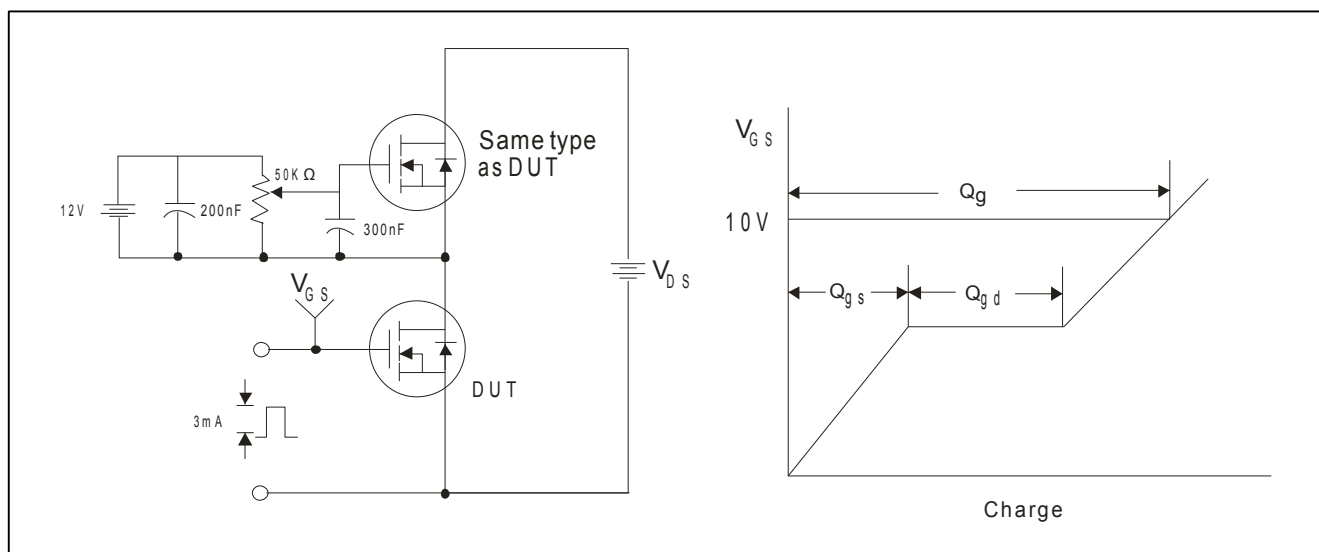


Fig.12 Gate Test Circuit &amp; Waveform

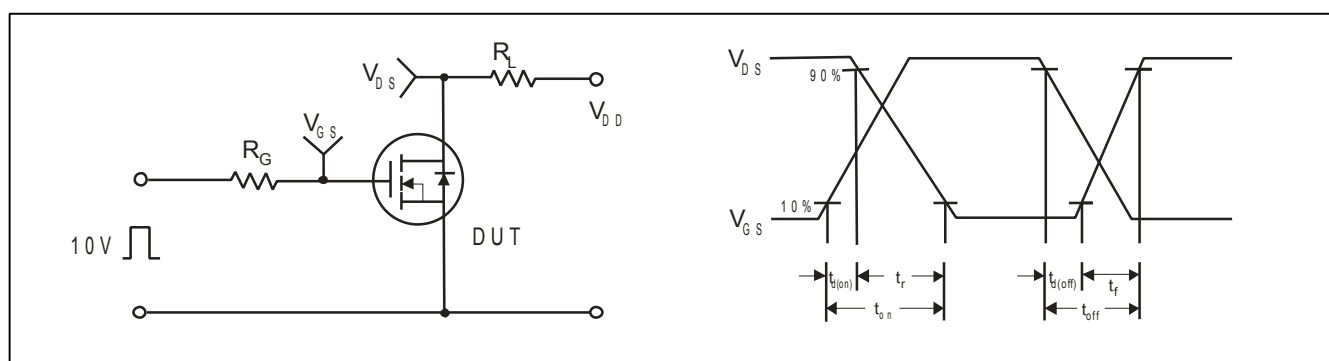


Fig.13 Resistive Switching Test Circuit &amp; Waveform

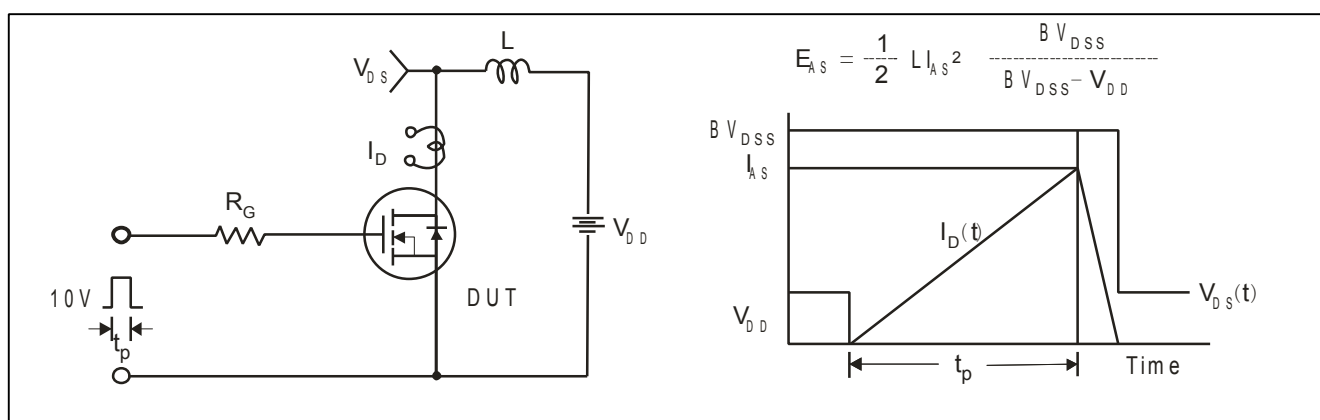
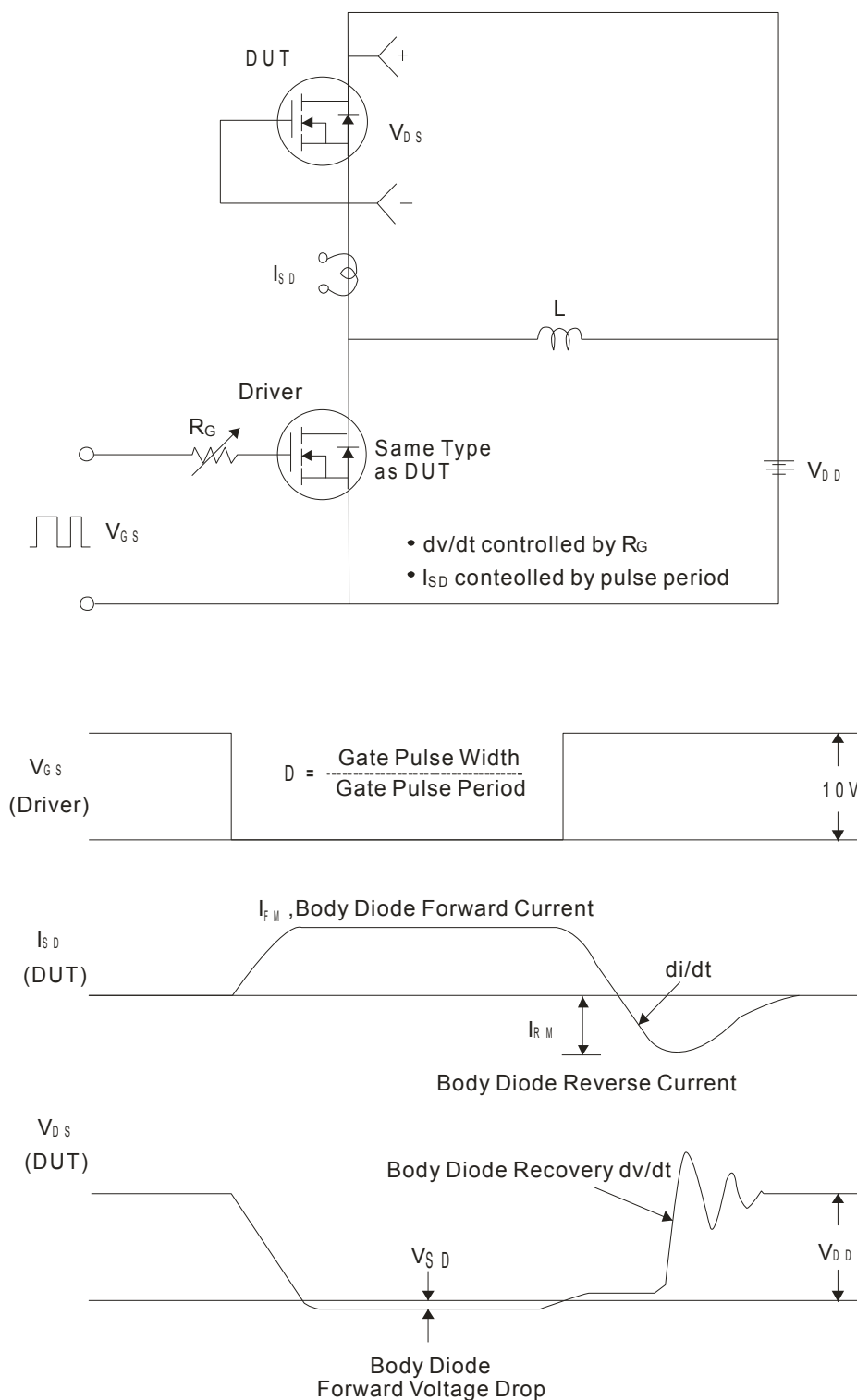
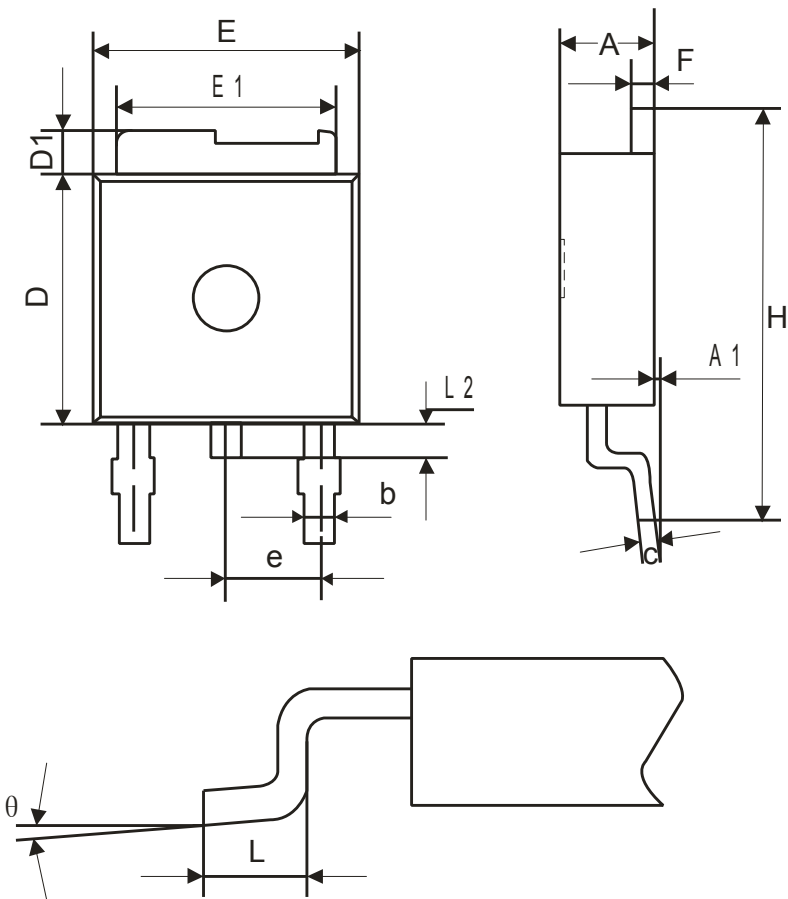


Fig.14 Unclamped Inductive Switching Test Circuit &amp; Waveform

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

DPAK Package Dimension

Unit:mm



| 符号<br>symbol | M I N    | M A X  |
|--------------|----------|--------|
| A            | 2. 19    | 2. 38  |
| A 1          | —        | 0. 13  |
| b            | 0. 64    | 0. 89  |
| c            | 0. 46    | 0. 61  |
| D            | 5. 97    | 6. 22  |
| D 1          | 0. 89    | 1. 27  |
| E            | 6. 35    | 6. 73  |
| E 1          | 5. 21    | 5. 46  |
| e            | 2. 28TYP |        |
| F            | 0. 46    | 0. 61  |
| H            | 9. 65    | 10. 41 |
| L            | 1. 40    | 1. 78  |
| L 2          | 0. 64    | 1. 01  |
| θ            | 0°       | 8°     |

**NOTE:**

- 1.We strongly recommend customers check carefully on the trademark when buying our product, if there is any question, please don't be hesitate to contact us.
- 2.Please do not exceed the absolute maximum ratings of the device when circuit designing.
- 3.Winsemi Microelectronics Co., Ltd reserved the right to make changes in this specification sheet and is subject to change without prior notice.

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