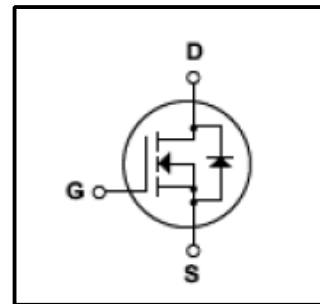


Silicon N-Channel MOSFET

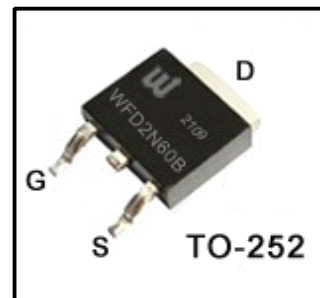
Features

- 2A,600V, $R_{DS(on)}$ (Max 5.0 Ω)@ $V_{GS}=10V$
- Ultra-low Gate Charge(Typical 9nC)
- 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 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 | ± 30 | V |
| E_{AS} | Single Pulsed Avalanche Energy (Note2) | 140 | mJ |
| E_{AR} | Repetitive Avalanche Energy (Note1) | 6.4 | mJ |
| dv/dt | Peak Diode Recovery dv /dt (Note3) | 5.5 | V/ ns |
| P_D | Total Power Dissipation(@ $T_c=25^{\circ}C$) | 46 | W |
| | Derating Factor above 25 $^{\circ}C$ | 0.35 | W/ $^{\circ}C$ |
| 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 | - | - | 2.7 | $^{\circ}C/W$ |
| R_{QCS} | Thermal Resistance , Case-to-Sink | 0.5 | - | - | $^{\circ}C/W$ |
| 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} =±30V,V _{DS} =0V | - | - | ±100 | 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} =600V,V _{GS} =0V | - | - | 10 | μA |
| | | | V _{DS} =480V,Tc=125°C | - | - | 100 | μA |
| Drain -source breakdown voltage | | V _{(BR)DSS} | I _D =250 μA,V _{GS} =0V | 600 | - | - | V |
| Gate threshold voltage | | V _{GS(th)} | V _{DS} =10V,I _D =250 μA | 2 | - | 4 | V |
| Drain -source ON resistance | | R _{DS(ON)} | V _{GS} =10V,I _D =1A | - | 4.5 | 5.0 | Ω |
| Forward Transconductance | | g _{fs} | V _{DS} =50V,I _D =1A | - | 2.25 | - | S |
| Input capacitance | | C _{iss} | V _{DS} =25V, | - | 280 | 330 | pF |
| Reverse transfer capacitance | | C _{rss} | V _{GS} =0V, | - | 6 | 8 | |
| Output capacitance | | C _{oss} | f=1MHz | - | 45 | 55 | |
| Switching time | Rise time | t _r | V _{DD} =300V, | - | 10 | 28 | ns |
| | Turn-on time | t _{on} | I _D =2A, | - | 25 | 55 | |
| | Fall time | t _f | R _G =25Ω, | - | 20 | 60 | |
| | Turn-off time | t _{off} | (Note4,5) | - | 25 | 60 | |
| Total gate charge(gate-source plus gate-drain) | | Q _g | V _{DD} =320V, V _{GS} =10V, | - | 9.0 | 12 | nC |
| Gate-source charge | | Q _{gs} | I _D =2A | - | 1.7 | - | |
| Gate-drain("miller") Charge | | Q _{gd} | (Note4,5) | - | 4.5 | - | |

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

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

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

2.L=18.5mH I_{AS}=2A,V_{DD}=50V,R_G=0Ω ,Starting T_J=25°C

3.I_{SD}≤2A,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

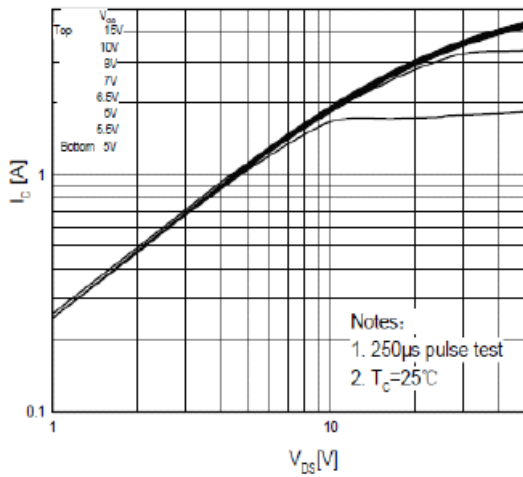


Fig.1 On-State Characteristics

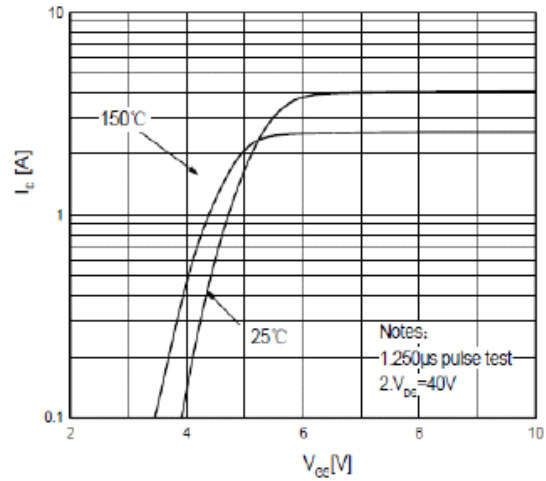


Fig.2 Transfer Current characteristics

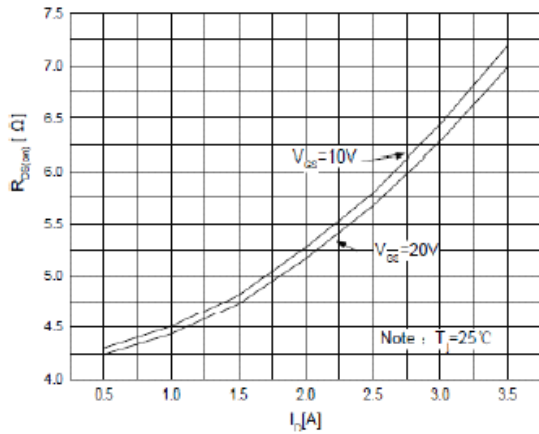


Fig.3 On Resistance variation vs Drain Current

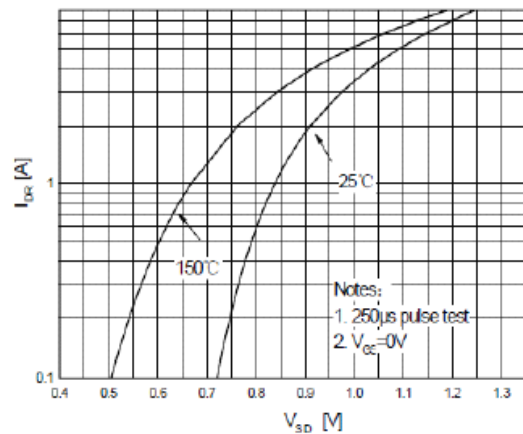


Fig.4 Body Diode Forward Voltage Variation With Source Current And temperature

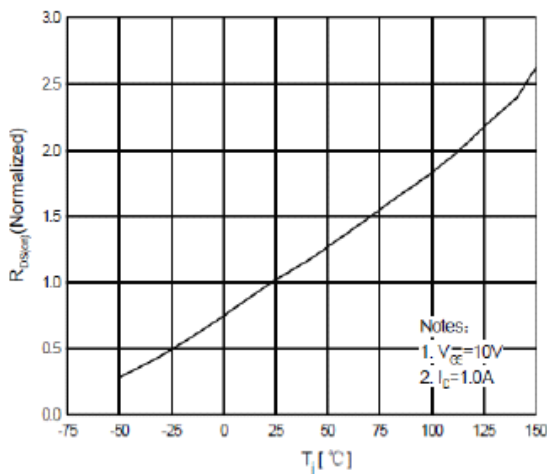


Fig.5 On-Resistance Variation vs Junction Temperature

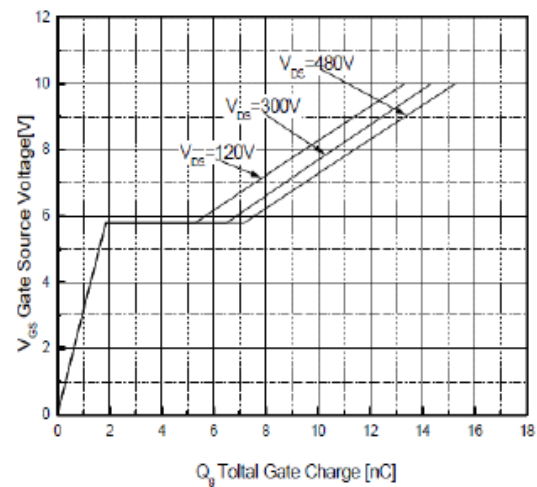


Fig.6 Gate Charge Characteristics

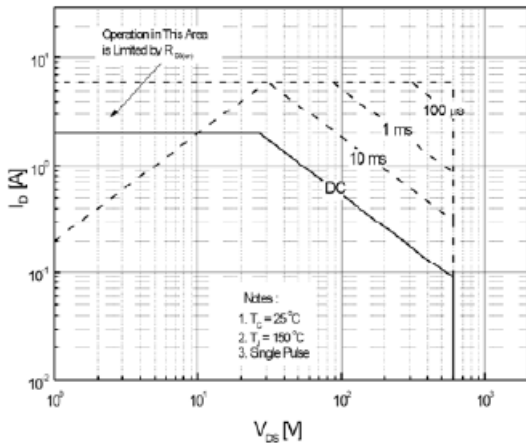


Fig.7 Maximum Safe Operation Area

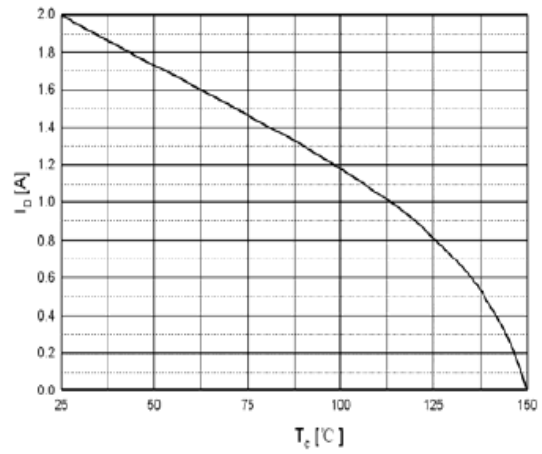


Fig.8 Maximum Drain Current vs Case Temperature

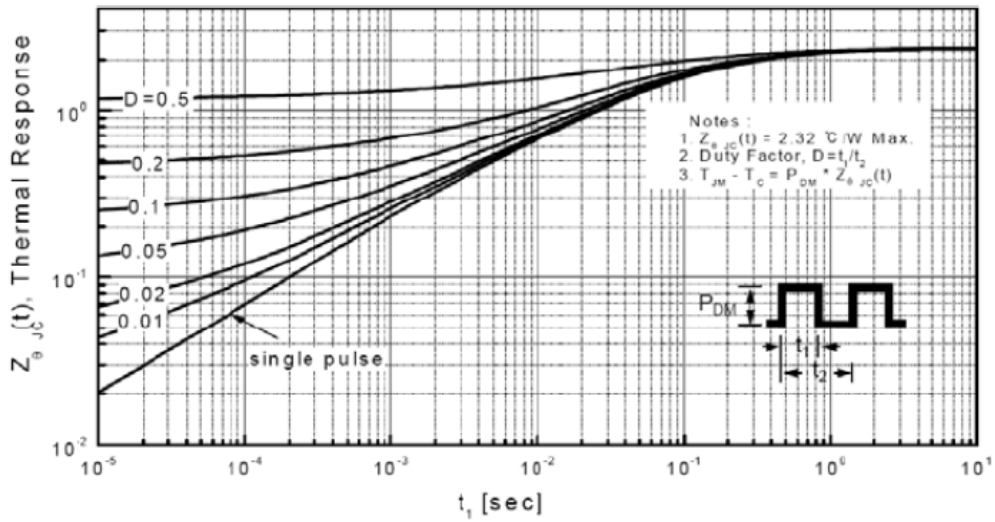


Fig.9 Transient Thermal Response curve

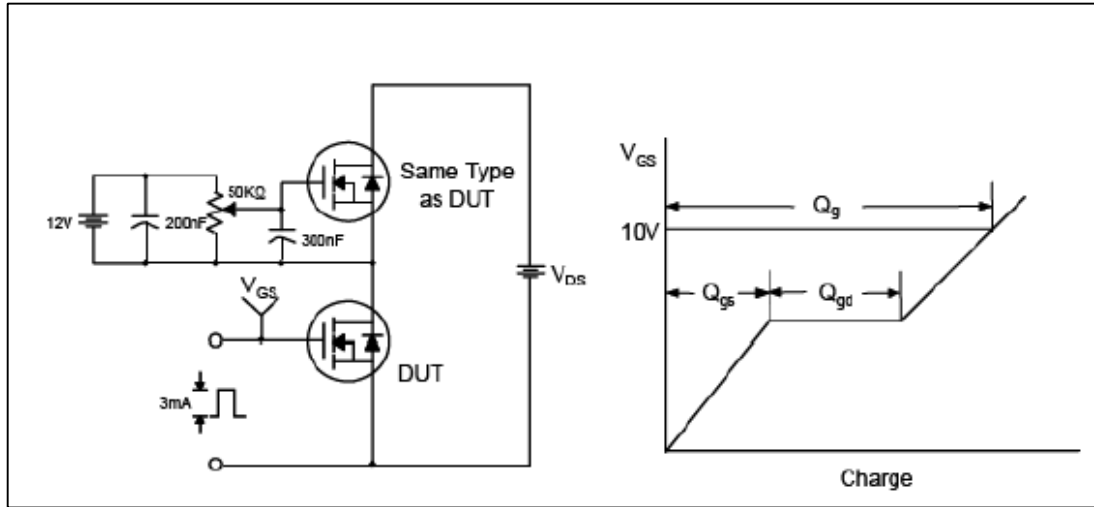


Fig.10 Gate Test circuit & Waveform

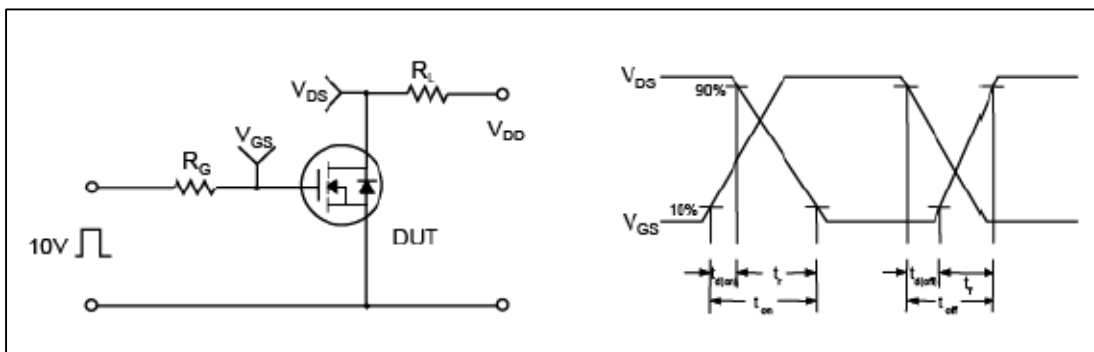


Fig.11 Resistive Switching Test Circuit & Waveform

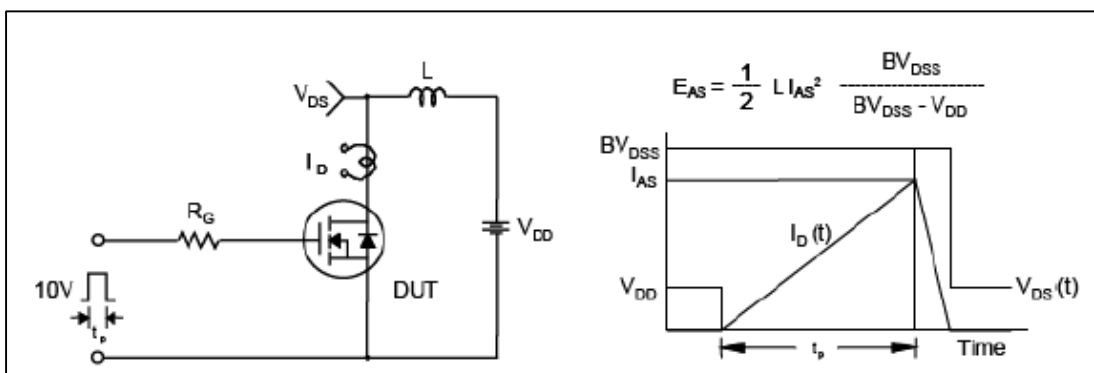


Fig.12 Uncamped Inductive Switching Test Circuit & Waveform

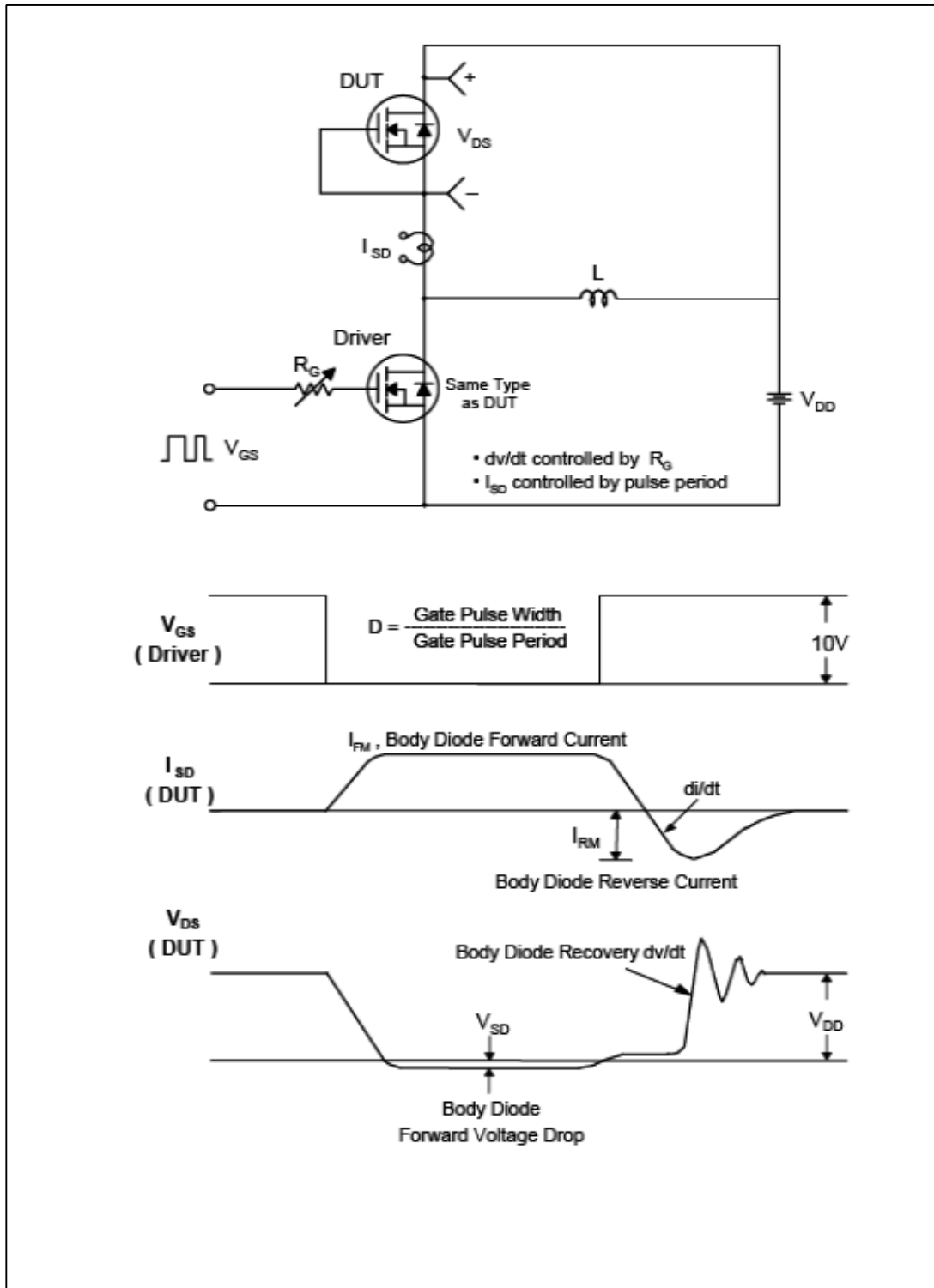


Fig.13 Peak Diode Recovery dv/dt Test Circuit & Waveform

TO252 Package Dimension

