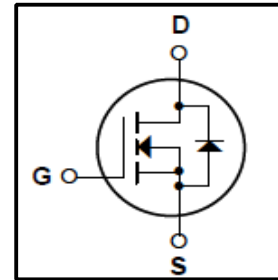


Silicon N-Channel MOSFET

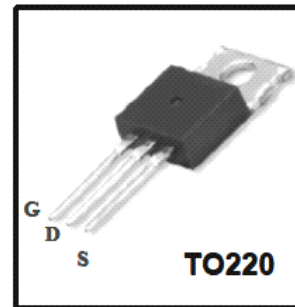
Features

- 5A,500V,RDS(on)(Max1.6Ω)@VGS=10V
- Ultra-low Gate Charge(Typical 32nC)
- Fast Switching Capability
- 100%Avalanche Tested
- Maximum Junction Temperature Range(150°C)



General Description

This Power MOSFET is produced using Winsemi's advanced planar stripe, DMOS 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 model power supplies, power factor correction and half bridge and full bridge resonant topology line a electronic lamp ballast.



Absolute Maximum Ratings

| Symbol | Parameter | Value | Units |
|-----------------------------------|---|---------|-------|
| V _{DSS} | Drain Source Voltage | 500 | V |
| I _D | Continuous Drain Current(@Tc=25°C) | 5 | A |
| | Continuous Drain Current(@Tc=100°C) | 2.9 | A |
| I _{DM} | Drain Current Pulsed (Note1) | 18 | A |
| V _{GS} | Gate to Source Voltage | ±30 | V |
| E _{AS} | Single Pulsed Avalanche Energy (Note 2) | 300 | mJ |
| E _{AR} | Repetitive Avalanche Energy (Note 1) | 7.5 | mJ |
| dv/dt | Peak Diode Recovery dv/dt (Note 3) | 4.5 | V/ns |
| P _D | Total Power Dissipation(@Tc=25°C) | 73 | W |
| | Derating Factor above 25°C | 0.55 | W/°C |
| T _J , T _{stg} | Junction and Storage Temperature | -55~150 | °C |
| T _L | Channel Temperature | 300 | °C |

Thermal Characteristics

| Symbol | Parameter | Value | | | Units |
|------------------|---|-------|-----|------|-------|
| | | Min | Typ | Max | |
| R _{θJC} | Thermal Resistance, Junction-to-Case | - | - | 1.7 | °C/W |
| R _{θCS} | Thermal Resistance, Case-to-Sink | - | 0.5 | - | °C/W |
| R _{θJA} | Thermal Resistance, Junction-to-Ambient | - | - | 62.5 | °C/W |

Electrical Characteristics (Tc = 25°C)

| Characteristics | Symbol | Test Condition | Min | Type | Max | Unit | |
|---|-------------------------------------|--|---|------|------|------|----|
| Gate leakage current | I _{GSS} | V _{GS} = ±30 V, V _{DS} = 0 V | - | - | ±100 | nA | |
| Gate-source breakdown voltage | V _{(BR)GSS} | I _G = ±10 μA, V _{DS} = 0 V | ±30 | - | - | V | |
| Drain cut-off current | I _{DSS} | V _{DS} = 500 V, V _{GS} = 0 V | - | - | 1 | μA | |
| Drain-source breakdown voltage | V _{(BR)DSS} | I _D = 250 μA, V _{GS} = 0 V | 500 | - | - | V | |
| Break Voltage Temperature Coefficient | ΔBV _{DSS} /ΔT _J | I _D =250μA, Referenced to 25°C | - | 0.55 | - | V/°C | |
| Gate threshold voltage | V _{GS(th)} | V _{DS} = 10 V, I _D =250 μA | 3 | - | 4.5 | V | |
| Drain-source ON resistance | R _{DS(ON)} | V _{GS} = 10 V, I _D = 2.25A | - | 1.16 | 1.6 | Ω | |
| Forward Transconductance | g _{fs} | V _{DS} = 40 V, I _D = 2.25A | - | 4.2 | - | S | |
| Input capacitance | C _{iss} | V _{DS} = 25 V, | - | 800 | 1050 | pF | |
| Reverse transfer capacitance | C _{rss} | V _{GS} = 0 V, | - | 17 | 22 | | |
| Output capacitance | C _{oss} | f = 1 MHz | - | 76 | 100 | | |
| Switching time | Rise time | t _r | V _{DD} =250 V, I _D =4.5A R _G =25Ω (Note4,5) | - | 15 | 40 | ns |
| | Turn-on time | t _{on} | | - | 40 | 90 | |
| | Fall time | t _f | | - | 85 | 180 | |
| | Turn-off time | t _{off} | | - | 45 | 100 | |
| Total gate charge (gate-source plus gate-drain) | Q _g | V _{DD} = 400 V, V _{GS} = 10 V, I _D =5 A | - | 32 | 44 | nC | |
| Gate-source charge | Q _{gs} | (Note4,5) | - | 3.7 | - | | |
| Gate-drain ("miller") Charge | Q _{gd} | (Note4,5) | - | 15 | - | | |

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

| Characteristics | Symbol | Test Condition | Min | Type | Max | Unit |
|----------------------------------|------------------|---|-----|------|-----|------|
| Continuous drain reverse current | I _{DR} | - | - | - | 5 | A |
| Pulse drain reverse current | I _{DRP} | - | - | - | 18 | A |
| Forward voltage (diode) | V _{DSF} | I _{DR} =5A, V _{GS} = 0 V | - | - | 1.4 | V |
| Reverse recovery time | t _{rr} | I _{DR} =5A, V _{GS} = 0 V, dI _{DR} / dt = 100 A / μs | - | 305 | - | ns |
| Reverse recovery charge | Q _{rr} | | - | 2.6 | - | μC |

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

2.L=24mH,I_{AS}=5A,V_{DD}=50V,R_G=25Ω,Starting T_J=25°C

3.I_{SD}≤5A,di/dt≤300A/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

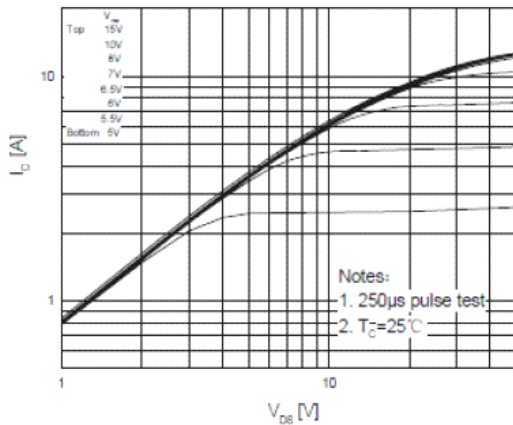


Fig. 1 On-State Characteristics

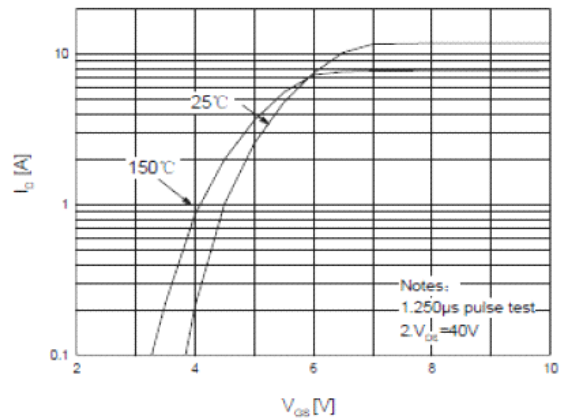


Fig.2 Transfer Characteristics

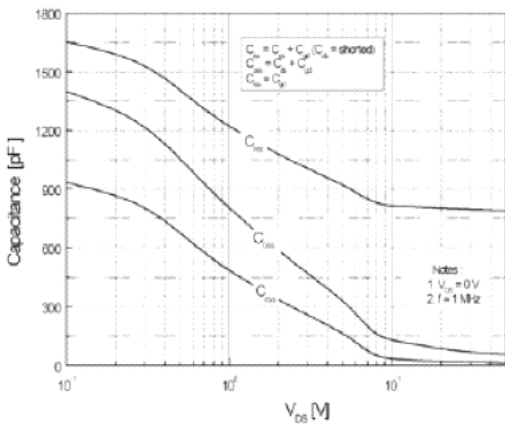


Fig.3 Capacitance Variation vs Drain Voltage

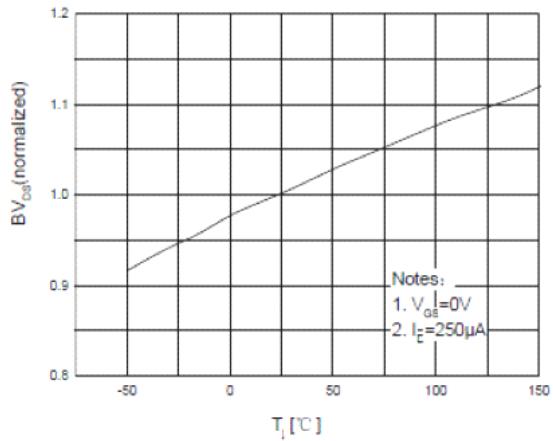


Fig.4 Breakdown Voltage Variation vs Temperature

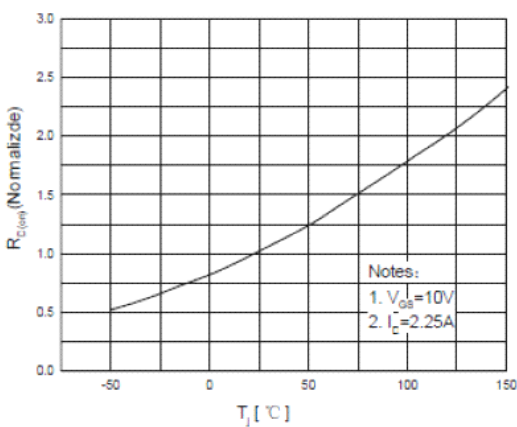


Fig.5 On-Resistance Variation vs Junction Temperature

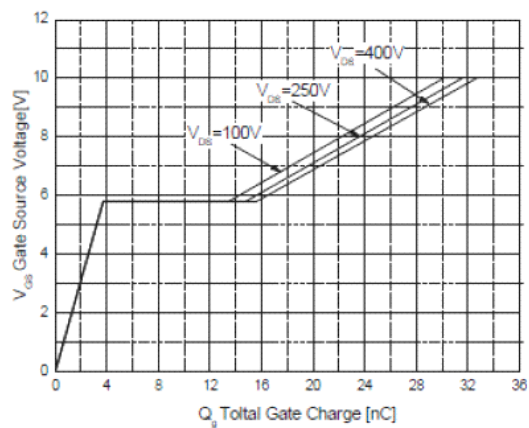


Fig.6 Gate Charge Characteristics

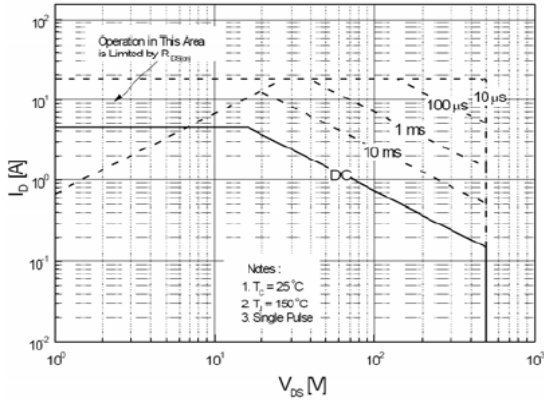


Fig.7 Maximum Safe Operation Area

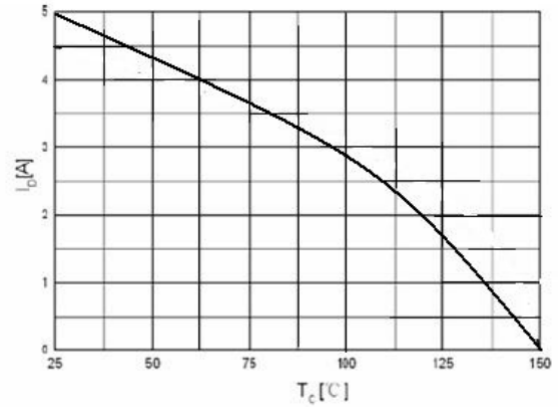


Fig.8 Maximum Drain Current vs Case Temperature

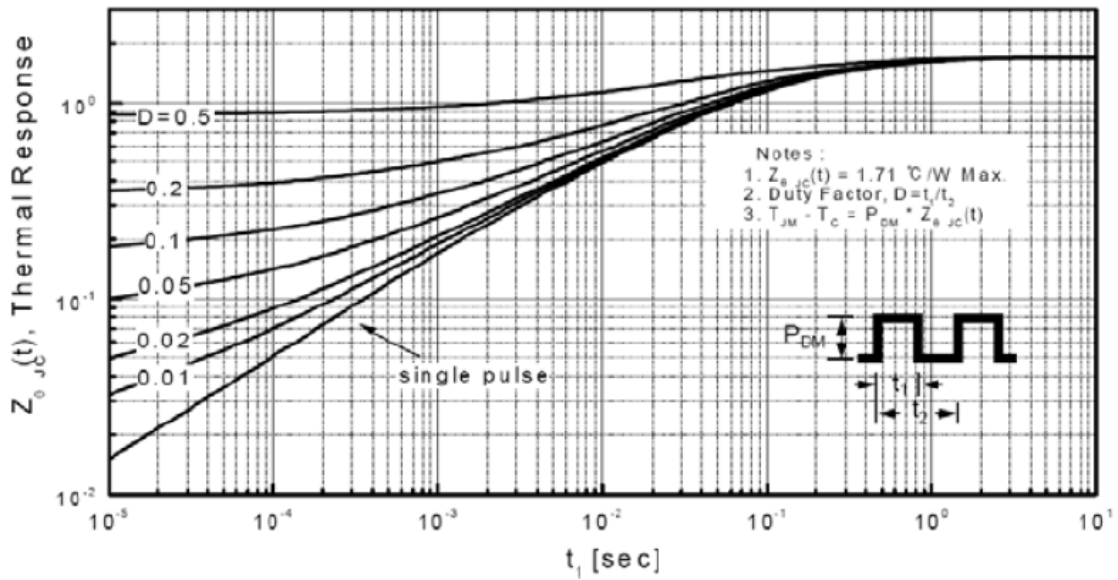


Fig.9 Transient Thermal Response Curve

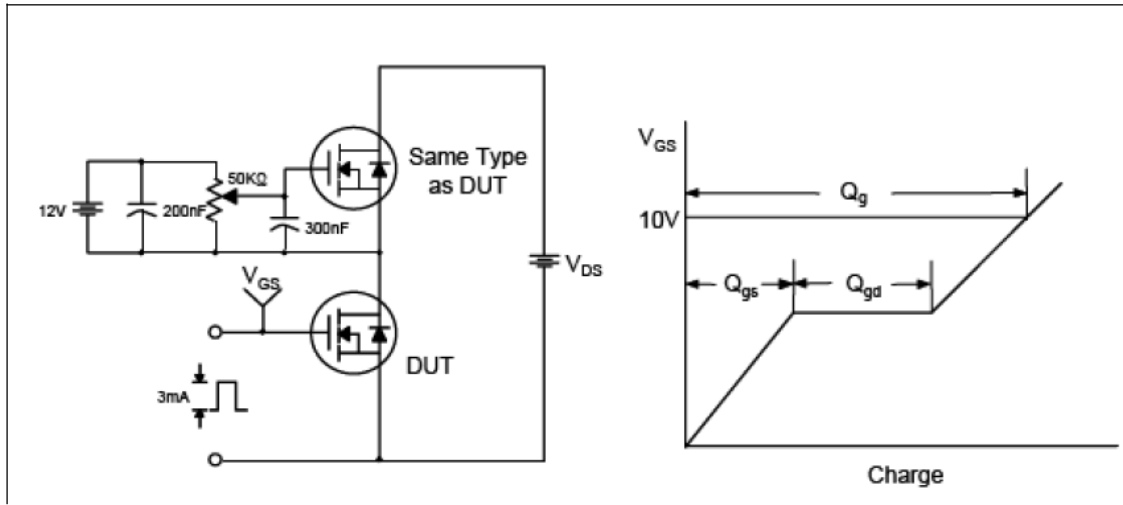


Fig.10 Gate Test Circuit & Waveform

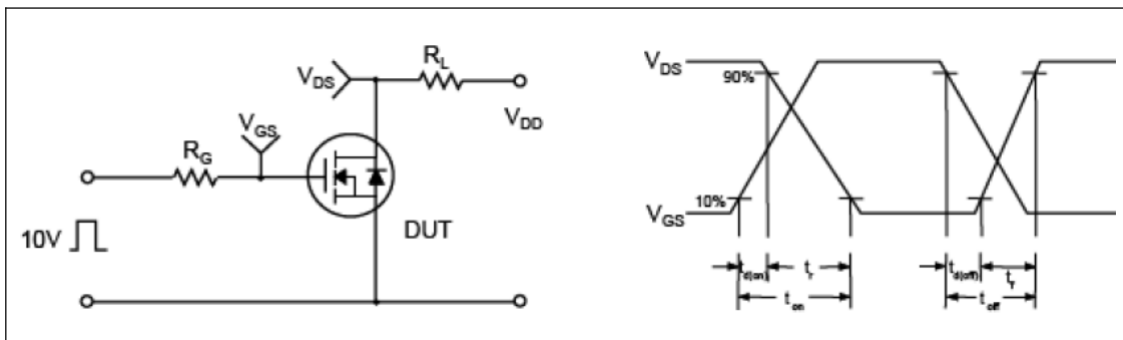


Fig.11 Resistive Switching Test Circuit & Waveform

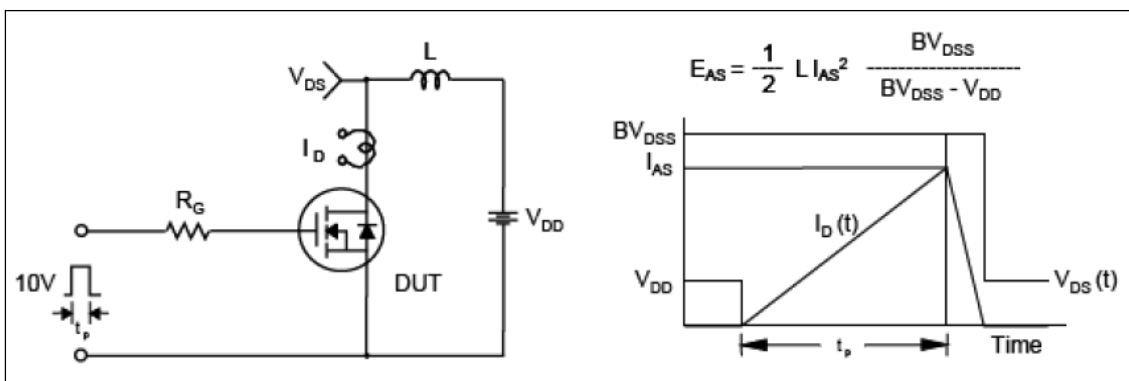


Fig.12 Unclamped Inductive Switching Test Circuit & Waveform

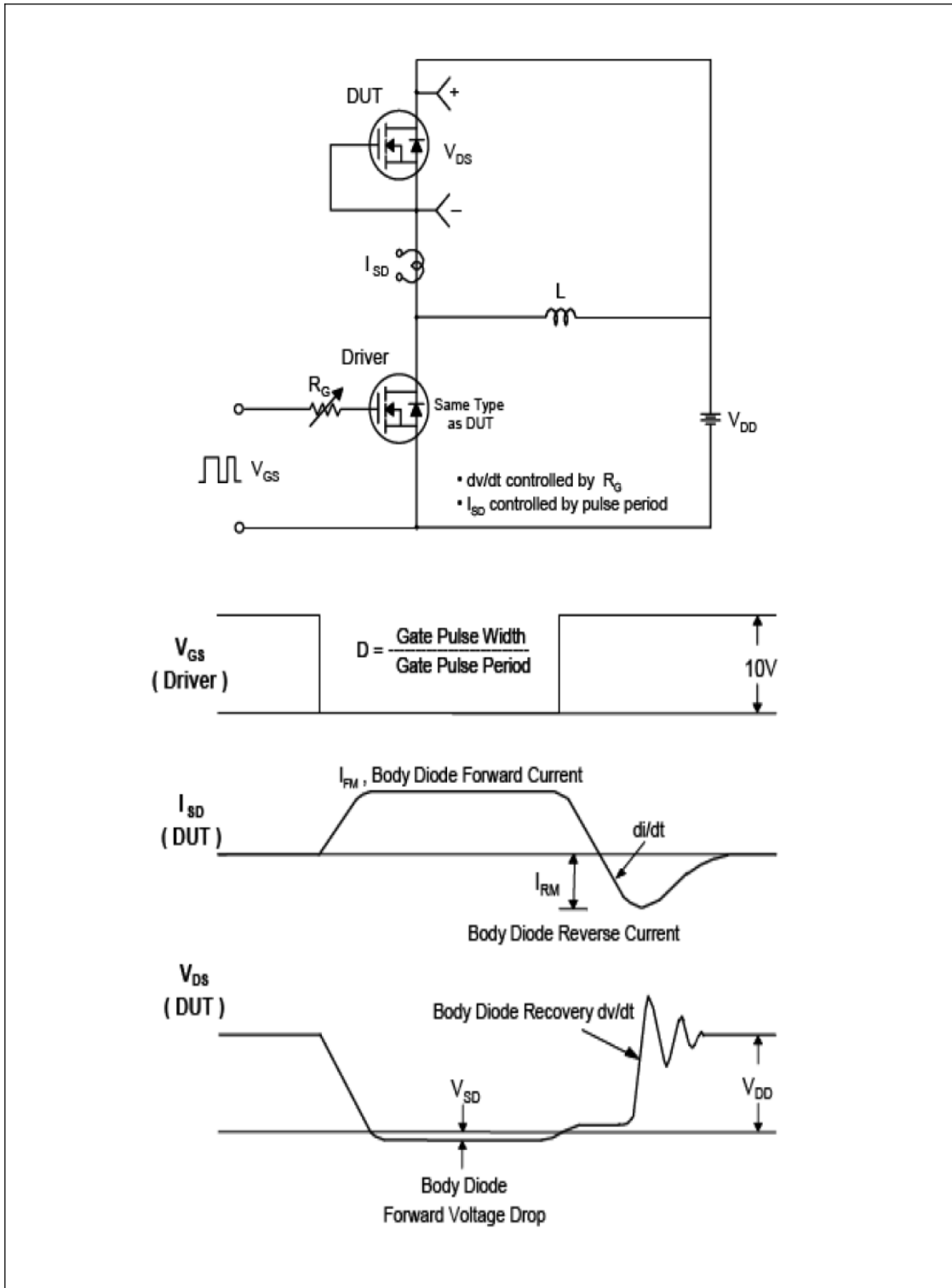


Fig.13 Peak Diode Recovery dv/dt Test Circuit & Waveform

TO-220 Package Dimension

