

Description

Features

- 800V, 10A
- $R_{DS(ON)} = 0.8\Omega$ (Typ.) @ $V_{GS} = 10V$, $I_D = 5A$
- Fast Switching
- 100% Avalanche Tested
- Improved dv/dt Capability

Application

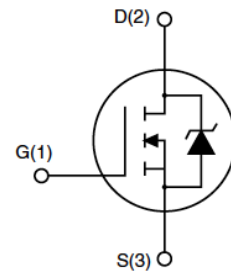
- Switch Mode Power Supply (SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)



TO-247



TO-220F



Schematic Diagram

Absolute Maximum Ratings (T_C=25°C unless otherwise specified)

| Symbol | Parameter | | Max. | | Units |
|-----------------------------------|---|------------------------|-------------|--------|-------|
| | | | TO-220F | TO-247 | |
| V _{DSS} | Drain-Source Voltage | | 800 | | V |
| V _{GSS} | Gate-Source Voltage | | ±30 | | V |
| I _D | Continuous Drain Current | T _C = 25°C | 10 | | A |
| | | T _C = 100°C | 6 | | A |
| I _{DM} | Pulsed Drain Current ^{note1} | | 40 | | A |
| E _{AS} | Single Pulsed Avalanche Energy ^{note2} | | 562 | | mJ |
| P _D | Power Dissipation | T _C = 25°C | 65 | 260 | W |
| R _{θJC} | Thermal Resistance, Junction to Case | | 1.92 | 0.48 | °C/W |
| R _{θJA} | Thermal Resistance, Junction to Ambient | | 62.5 | 41 | °C/W |
| T _J , T _{STG} | Operating and Storage Temperature Range | | -55 to +150 | | °C |

Electrical Characteristics ($T_C=25^{\circ}\text{C}$ unless otherwise specified)

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Units |
|--|---|--|------|------|------|-------|
| Off Characteristic | | | | | | |
| V _{(BR)DSS} | Drain-Source Breakdown Voltage | V _{GS} = 0V, I _D = 250μA | 800 | - | - | V |
| I _{DSS} | Zero Gate Voltage Drain Current | V _{DS} = 800V, V _{GS} = 0V, T _J = 25℃ | - | - | 1 | μA |
| | | V _{DS} = 640V, V _{GS} = 0V, T _J = 125℃ | | | 100 | |
| I _{GSS} | Gate to Body Leakage Current | V _{GS} = ±30V | - | - | ±100 | nA |
| On Characteristics | | | | | | |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} =V _{GS} , I _D = 250μA | 2.0 | 3.0 | 4.0 | V |
| R _{DS(on)} | Static Drain-Source On-Resistance <small>note3</small> | V _{GS} =10V, I _D = 5A | - | 0.8 | 1 | Ω |
| Dynamic Characteristics | | | | | | |
| C _{iss} | Input Capacitance | V _{DS} = 25V, V _{GS} = 0V, f = 1.0MHz | - | 1979 | - | pF |
| C _{oss} | Output Capacitance | | - | 233 | - | pF |
| C _{rss} | Reverse Transfer Capacitance | | - | 53 | - | pF |
| Q _g | Total Gate Charge | V _{DD} = 640V, I _D =10A, V _{GS} = 10V | - | 83 | - | nC |
| Q _{gs} | Gate-Source Charge | | - | 9 | - | nC |
| Q _{gd} | Gate-Drain(“Miller”) Charge | | - | 49 | - | nC |
| Switching Characteristics | | | | | | |
| t _{d(on)} | Turn-On Delay Time | V _{DD} = 400V, I _D =10A, R _G = 25Ω | - | 23 | - | ns |
| t _r | Turn-On Rise Time | | - | 15 | - | ns |
| t _{d(off)} | Turn-Off Delay Time | | - | 90 | - | ns |
| t _f | Turn-Off Fall Time | | - | 30 | - | ns |
| Drain-Source Diode Characteristics and Maximum Ratings | | | | | | |
| I _S | Maximum Continuous Drain to Source Diode Forward Current | | - | - | 10 | A |
| I _{SM} | Maximum Pulsed Drain to Source Diode Forward Current | | - | - | 40 | A |
| V _{SD} | Drain to Source Diode Forward Voltage | V _{GS} = 0V, I _{SD} = 10A, T _J = 25℃ | - | - | 1.4 | V |
| t _{rr} | Reverse Recovery Time | V _{GS} = 0V, I _S = 10A, | - | 320 | - | ns |
| Q _{rr} | Reverse Recovery Charge | di/dt =100A/μs | - | 4.2 | - | uC |

Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature

2. $I_{AS} = 7.5A, V_{DD} = 50V$, Starting $T_J = 25^{\circ}\text{C}$

3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 1\%$

Typical Performance Characteristics

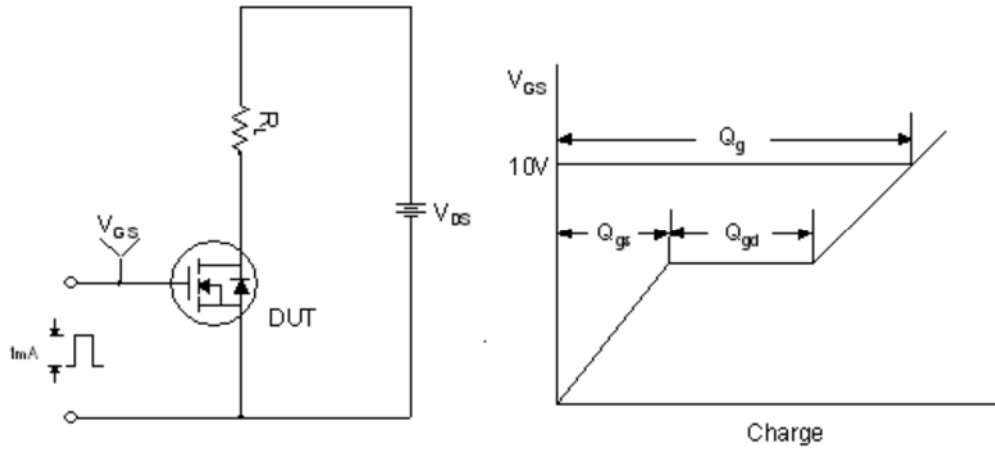


Figure 1. Gate Charge Test Circuit & Waveform

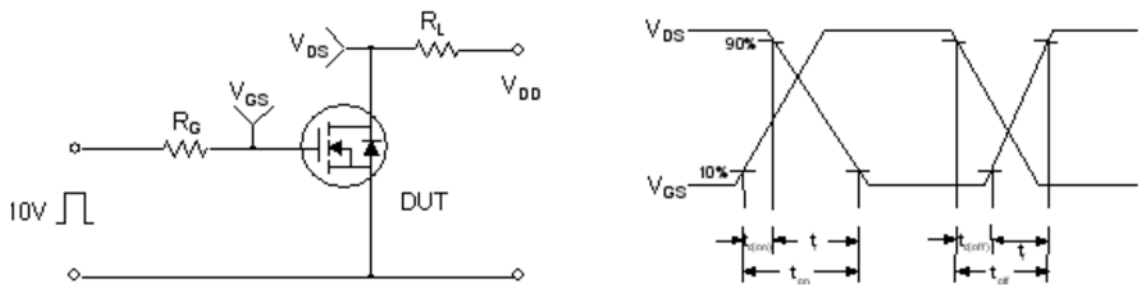


Figure 2. Resistive Switching Test Circuit & Waveforms

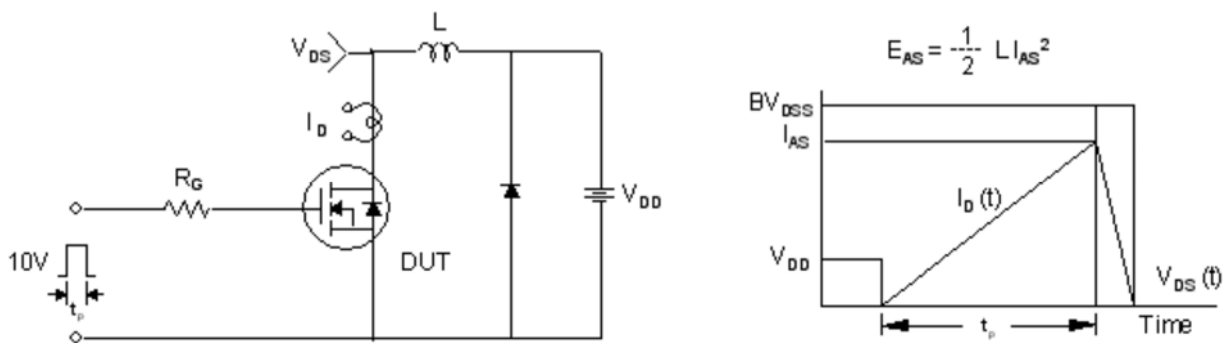


Figure 3. Unclamped Inductive Switching Test Circuit & Waveforms

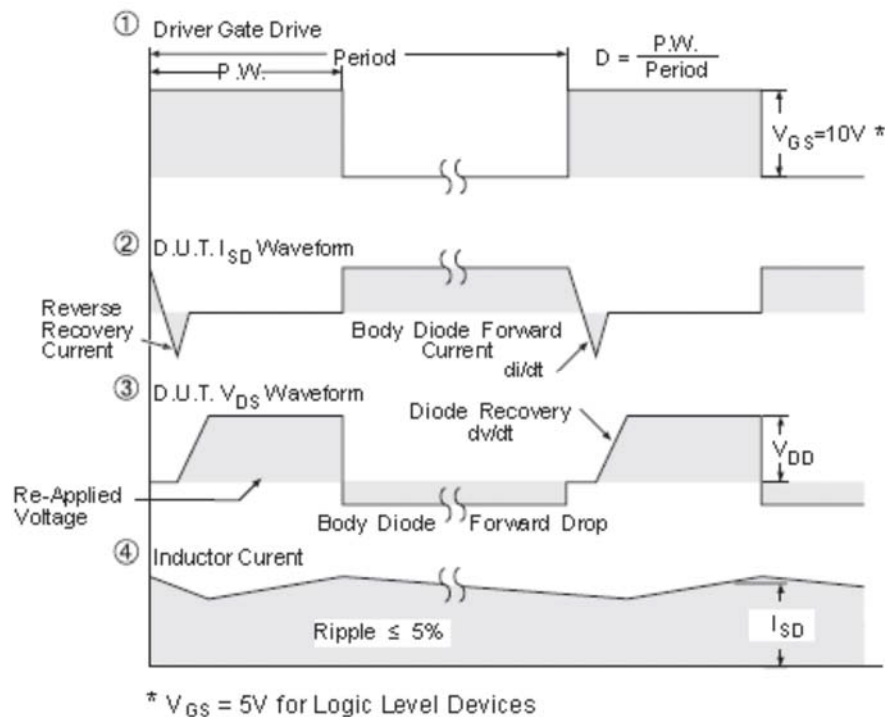
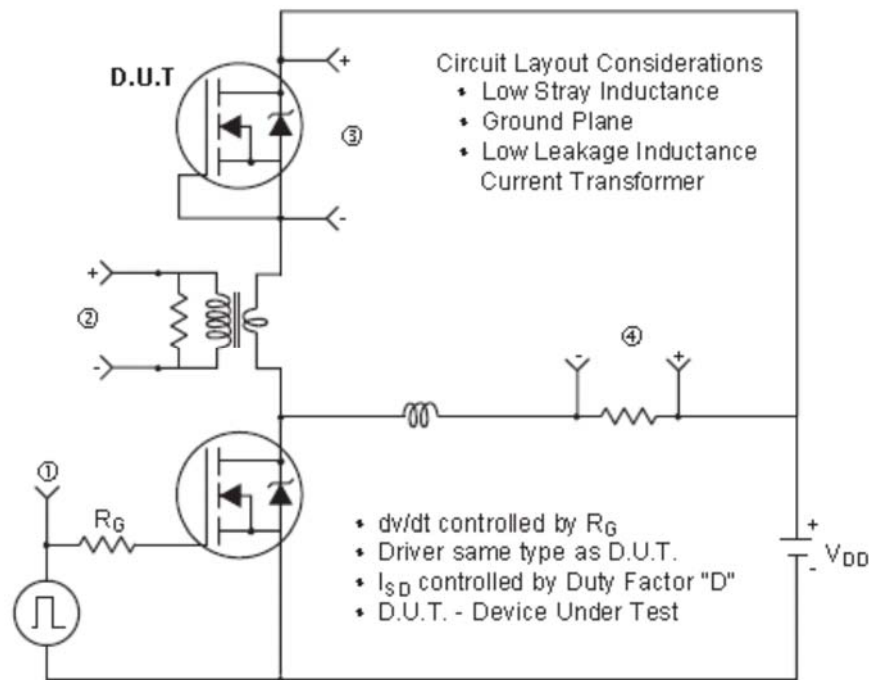


Figure 4. Peak Diode Recovery dv/dt Test Circuit & Waveforms (For N-channel)