



UF150N06M

Power MOSFET

150A, 60V N-CHANNEL POWER MOSFET

DESCRIPTION

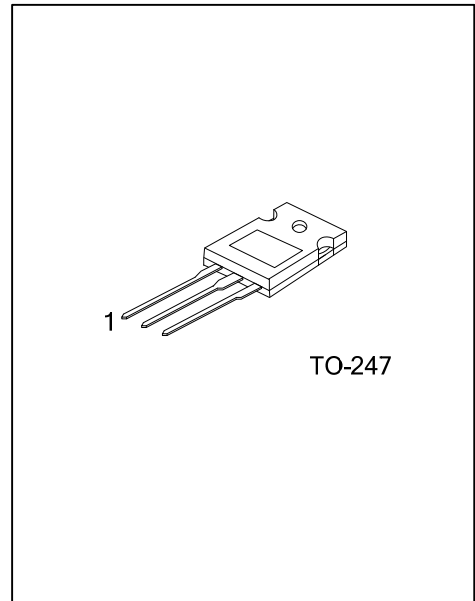
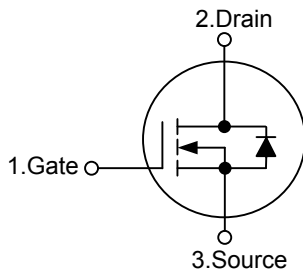
The UTC **UF150N06M** is a N-channel enhancement mode power MOSFET using UTC's advanced technology to provide customers with ideal for low voltage inverter applications.

The UTC **UF150N06M** is suitable for high efficiency synchronous rectification in SMPS, UPS, hard switched and high frequency circuits.

FEATURES

- * $R_{DS(ON)} < \text{m}\Omega @ V_{GS}=10V, I_D=75A$
- * High Cell Density Trench Technology
- * High Power and Current Handling Capability

SYMBOL



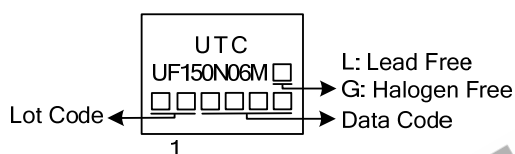
ORDERING INFORMATION

| Ordering Number | | Package | Pin Assignment | | | Packing |
|------------------|------------------|---------|----------------|---|---|---------|
| Lead Free | Halogen Free | | 1 | 2 | 3 | |
| UF150N06ML-T47-T | UF150N06MG-T47-T | TO-247 | G | D | S | Tube |

Note: Pin Assignment: G: Gate D: Drain S: Source

| | |
|---|--|
| <p>UF150N06MG-T47-T</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p> | <p>(1) T: Tube</p> <p>(2) T47: TO-247</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p> |
|---|--|

MARKING



■ ABSOLUTE MAXIMUM RATINGS ($T_J=25^{\circ}\text{C}$, unless otherwise specified)

| PARAMETER | | SYMBOL | RATINGS | UNIT |
|------------------------------------|------------------------|-----------|------------|--------------------|
| Drain-Source Voltage | | V_{DSS} | 60 | V |
| Gate-Source Voltage | | V_{GSS} | ± 20 | V |
| Drain Current | Continuous | I_D | 150 | A |
| | Pulsed | I_{DM} | 450 | A |
| Avalanche Energy | Single Pulsed (Note 3) | E_{AS} | 680 | mJ |
| Peak Diode Recovery dv/dt (Note 4) | | dv/dt | 6.5 | V/ns |
| Power Dissipation | | P_D | 231 | W |
| Junction Temperature | | T_J | +150 | $^{\circ}\text{C}$ |
| Storage Temperature | | T_{STG} | -55 ~ +150 | $^{\circ}\text{C}$ |

- Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
 2. Repetitive Rating: Pulse width limited by maximum junction temperature.
 3. $L = 0.1\text{mH}$, $I_{AS} = 116.7\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^{\circ}\text{C}$
 4. $I_{SD} \leq 30\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^{\circ}\text{C}$

■ THERMAL DATA

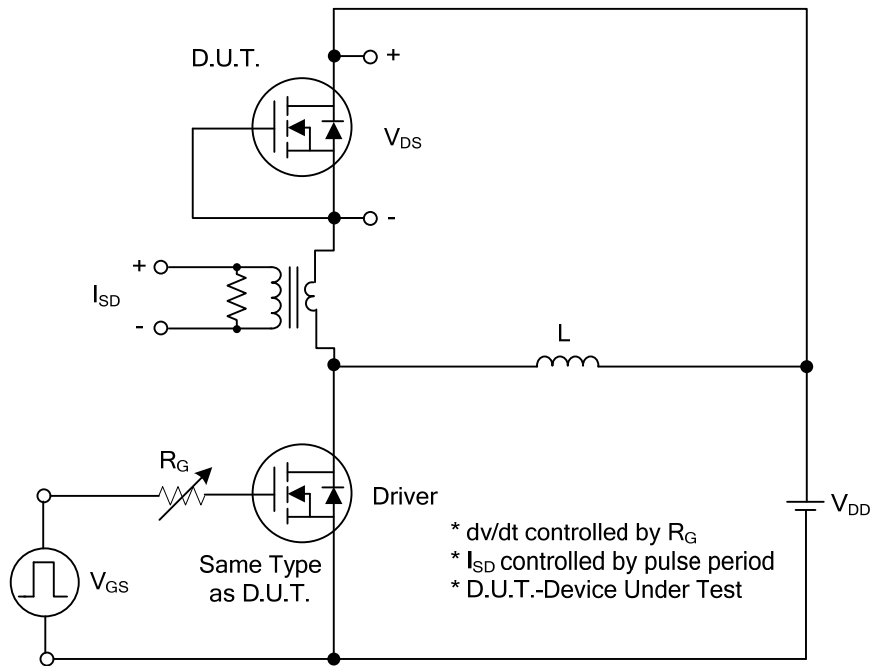
| PARAMETER | SYMBOL | RATINGS | UNIT |
|---------------------|---------------|---------|-----------------------------|
| Junction to Ambient | θ_{JA} | 40 | $^{\circ}\text{C}/\text{W}$ |
| Junction to Case | θ_{JC} | 0.35 | $^{\circ}\text{C}/\text{W}$ |

■ ELECTRICAL CHARACTERISTICS ($T_J = 25^{\circ}\text{C}$, unless otherwise noted)

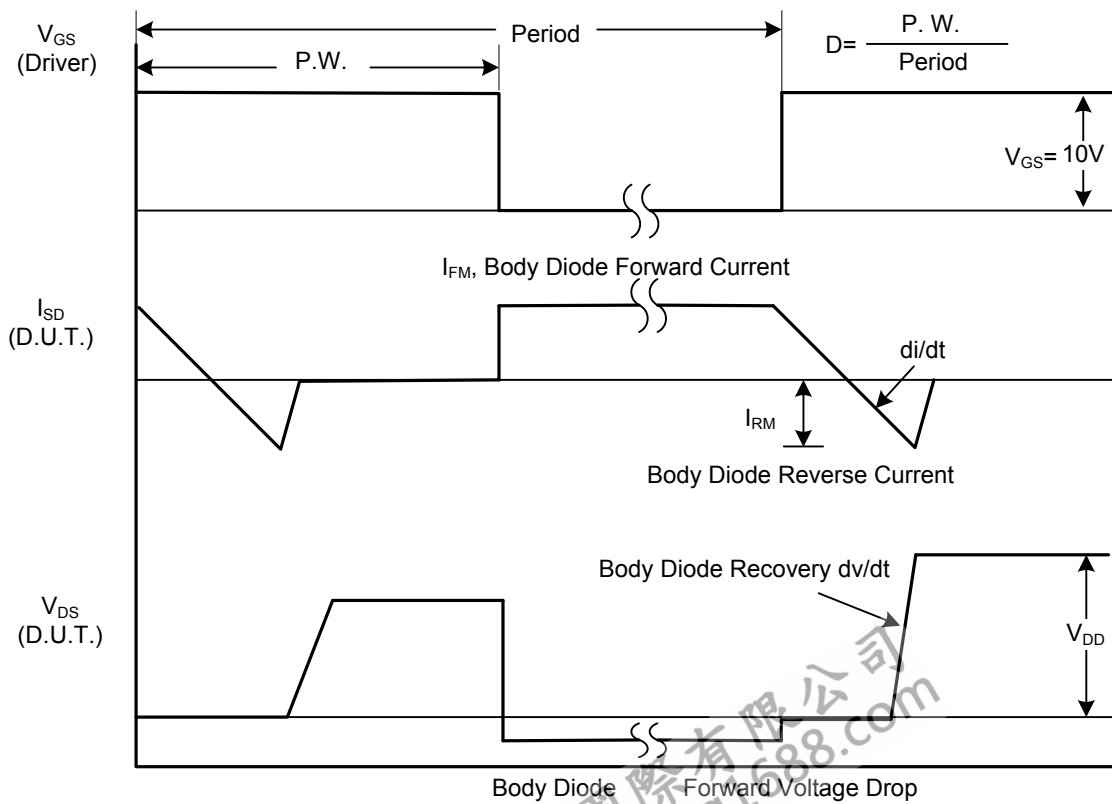
| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|--|--------------|--|-----|------|------|---------------|
| OFF CHARACTERISTICS | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | $V_{GS}=0\text{V}$, $I_D=250\mu\text{A}$ | 60 | | | V |
| Drain-Source Leakage Current | I_{DSS} | $V_{DS}=60\text{V}$, $V_{GS}=0\text{V}$ | | | 1 | μA |
| Gate-Source Leakage Current | Forward | I_{GSS} | | | +100 | nA |
| | Reverse | | | | -100 | nA |
| ON CHARACTERISTICS (Note 1) | | | | | | |
| Gate Threshold Voltage | $V_{GS(TH)}$ | $V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$ | 1.0 | | 3.0 | V |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | $V_{GS}=10\text{V}$, $I_D=75\text{A}$ | | | 6.0 | m Ω |
| | | $V_{GS}=4.5\text{V}$, $I_D=75\text{A}$ | | | 9.0 | m Ω |
| DYNAMIC PARAMETERS (Note 2) | | | | | | |
| Input Capacitance | C_{ISS} | $V_{DS}=25\text{V}$, $V_{GS}=0\text{V}$, $f=1.0\text{MHz}$ | | 7200 | | pF |
| Output Capacitance | C_{OSS} | | | 2100 | | pF |
| Reverse Transfer Capacitance | C_{RSS} | | | 540 | | pF |
| SWITCHING PARAMETERS (Note 2) | | | | | | |
| Total Gate Charge | Q_G | $V_{DS}=48\text{V}$, $V_{GS}=10\text{V}$, $I_D=60\text{A}$, $I_G=1\text{mA}$ (Note 1, 2) | | 174 | | nC |
| Gate Source Charge | Q_{GS} | | | 34 | | nC |
| Gate Drain Charge | Q_{GD} | | | 54 | | nC |
| Turn-ON Delay Time | $t_{D(ON)}$ | $V_{DS}=30\text{V}$, $V_{GS}=10\text{V}$, $I_D=60\text{A}$, $R_G = 25\Omega$ (Note 1, 2) | | 54 | | ns |
| Turn-ON Rise Time | t_R | | | 130 | | ns |
| Turn-OFF Delay Time | $t_{D(OFF)}$ | | | 504 | | ns |
| Turn-OFF Fall-Time | t_F | | | 212 | | ns |
| SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS | | | | | | |
| Drain-Source Diode Forward Current | I_S | | | | 150 | A |
| Maximum Body-Diode Pulsed Current | I_{SM} | | | | 450 | A |
| Drain-Source Diode Forward Voltage | V_{SD} | $V_{GS}=0\text{V}$, $I_S=150\text{A}$ | | | 1.5 | V |
| Body Diode Reverse Recovery Time | t_{rr} | $V_{GS}=0\text{V}$, $I_S=30\text{A}$ | | 92 | | ns |
| Body Diode Reverse Recovery Charge | Q_{rr} | $di/dt=100\text{A}/\mu\text{s}$ (Note 1) | | 300 | | nC |

- Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.
 2. Essentially independent of operating temperature.

TEST CIRCUITS AND WAVEFORMS

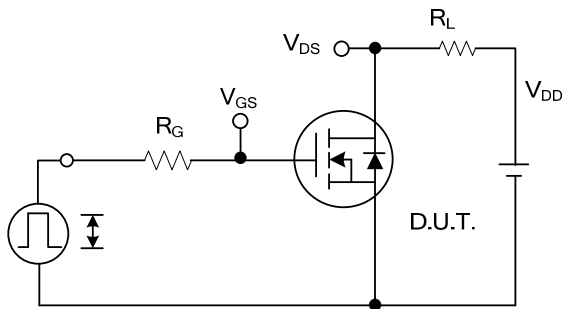


Peak Diode Recovery dv/dt Test Circuit

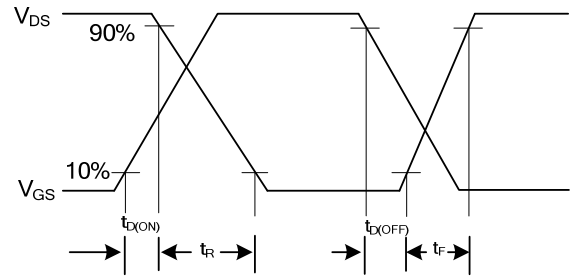


Peak Diode Recovery dv/dt Waveforms

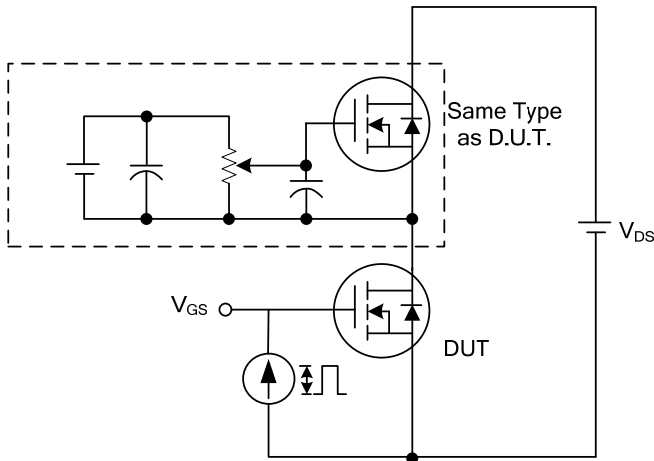
TEST CIRCUITS AND WAVEFORMS (Cont.)



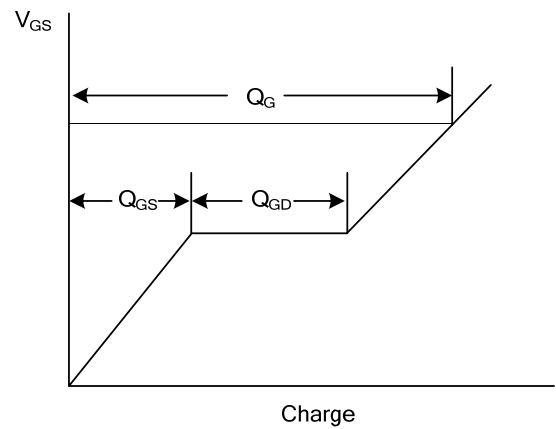
Switching Test Circuit



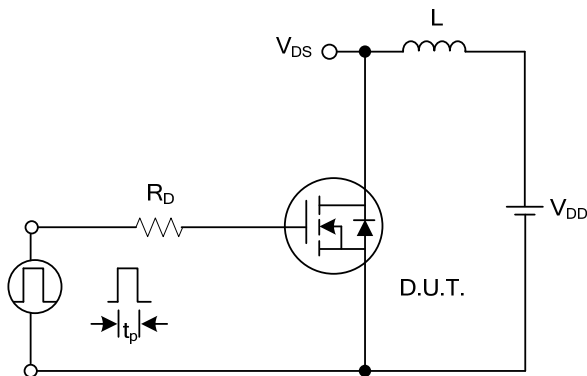
Switching Waveforms



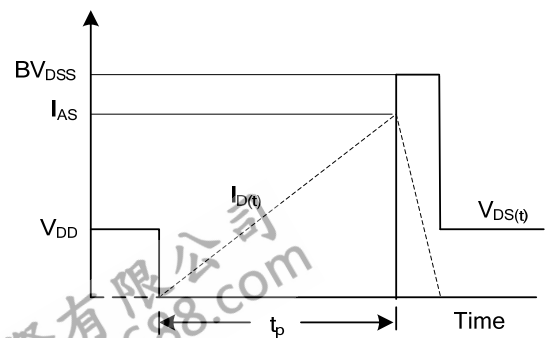
Gate Charge Test Circuit



Gate Charge Waveform

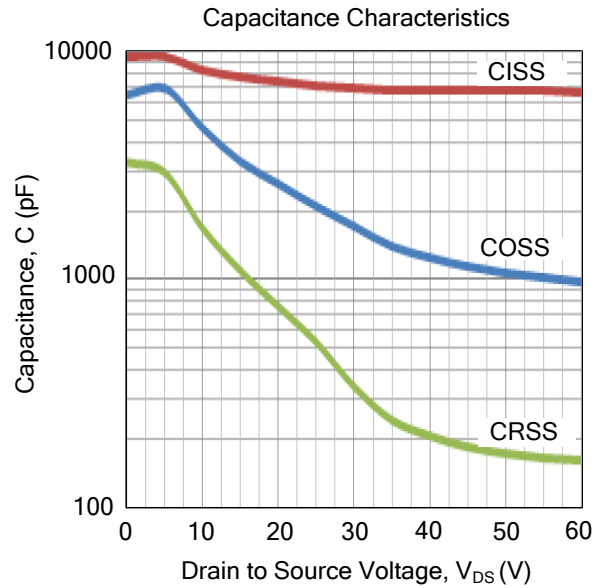
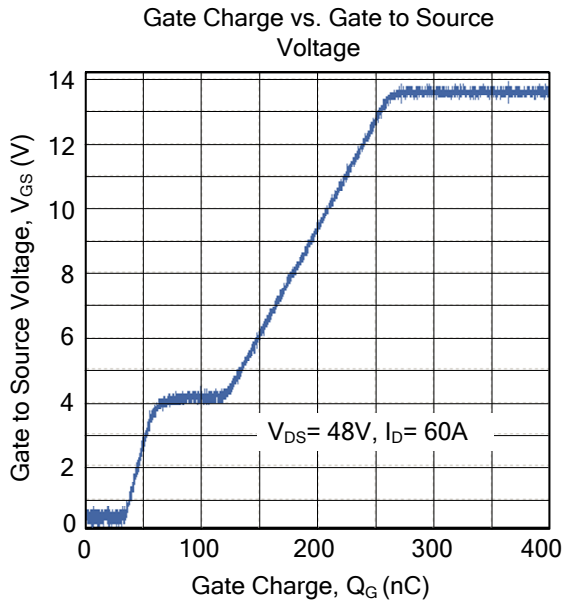


Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

TYPICAL CHARACTERISTICS



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