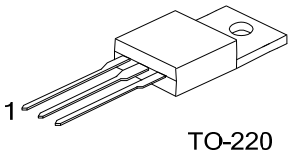
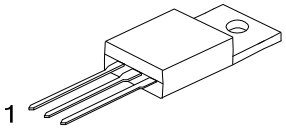
# UTT75N08M

**Preliminary** | ***Power MOSFET***

## 75A, 80V N-CHANNEL POWERTRENCH MOSFET




TO-220




TO-230

### ■ DESCRIPTION

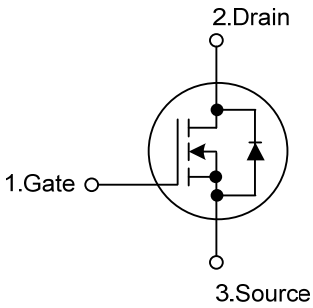
The UTC **UTT75N08M** is an N-channel enhancement MOSFET, it uses UTC's advanced technology to provide the customers with perfect $R_{DS(ON)}$, high switching speed, high current capacity and low gate charge.

The UTC **UTT75N08M** is suitable for DC-DC converters, Off-Line UPS, High Voltage Synchronous Rectifier, Primary Switch for 48V and 24V Systems, etc.

### ■ FEATURES

* $R_{DS(ON}$ < 11 mΩ @ $V_{GS}$=10V, $I_D$=75A
* High Switching Speed
* High Current Capacity

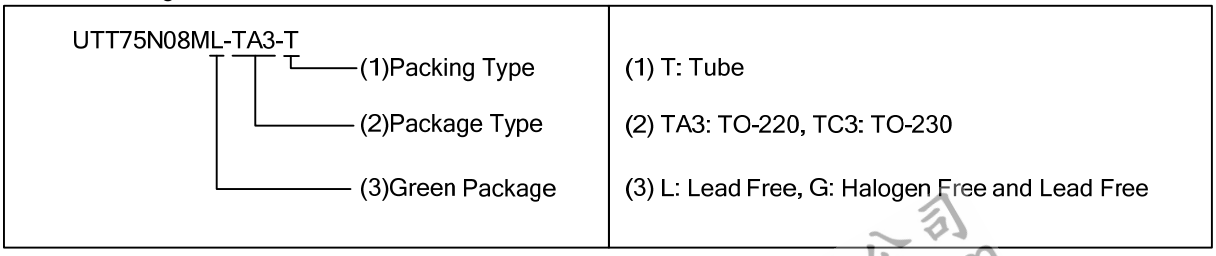
### ■ SYMBOL



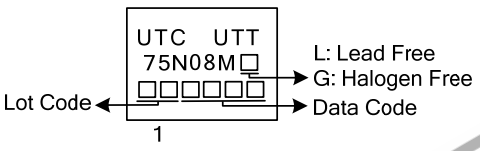

### ■ ORDERING INFORMATION

| Ordering Number | | Package | Pin Assignment | | | Packing |
|---|---|---|---|---|---|---|
| Lead Free | Halogen Free | | 1 | 2 | 3 | |
| UTT75N08ML-TA3-T | UTT75N08MG-TA3-T | TO-220 | G | D | S | Tube |
| UTT75N08ML-TC3-T | UTT75N08MG-TC3-T | TO-230 | G | D | S | Tube |

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




### ■ MARKING



## ■ ABSOLUTE MAXIMUM RATINGS ($T_C$=25°C, unless otherwise noted)

| PARAMETER | | SYMBOL | RATINGS | UNIT |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DSS}$ | 80 | V |
| Gate-Source Voltage | | $V_{GSS}$ | ±20 | V |
| Drain Current | Continuous | $I_D$ | 75 | A |
| | Pulsed (Note 2) | $I_{DM}$ | 300 | A |
| Single Pulsed Avalanche Energy (Note 3) | | $E_{AS}$ | 125 | mJ |
| Peak Diode Recovery dv/dt (Note 4) | | dv/dt | 4.5 | V/ns |
| Power Dissipation | TO-220 | $P_D$ | 125 | W |
| | TO-230 | | 167 | W |
| Junction Temperature | | $T_J$ | 150 | °C |
| Storage Temperature Range | | $T_{STG}$ | -55 ~ +150 | °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 $T_J$.
3. L=0.1mH, $I_{AS}$=50A, $V_{DD}$=50V, $R_G$=25 Ω, Starting $T_J$ = 25°C
4. $I_{SD}$≤30A, di/dt≤200A/μs, $V_{DD}$ ≤ $BV_{DSS}$, Starting $T_J$ = 25°C

## ■ THERMAL CHARACTERISTICS

| PARAMETER | | SYMBOL | RATINGS | UNIT |
|---|---|---|---|---|
| Junction to Ambient | TO-220 | $\theta_{JA}$ | 62.5 | °C/W |
| | TO-230 | | 55 | °C/W |
| Junction to Case | TO-220 | $\theta_{JC}$ | 1 | °C/W |
| | TO-230 | | 0.7 | °C/W |

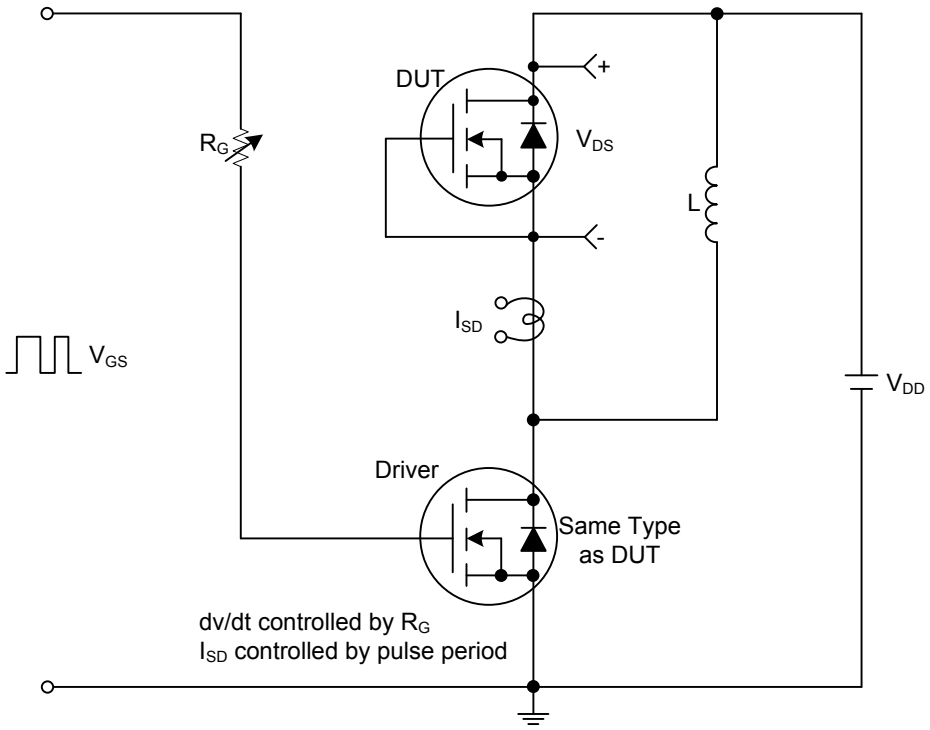
## ■ ELECTRICAL CHARACTERISTICS ($T_J$=25°C, unless otherwise noted)

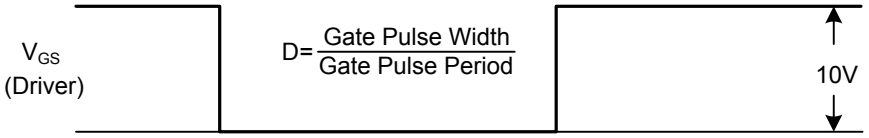
| PARAMETER | | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | | | |
| Drain-Source Breakdown Voltage | | $BV_{DSS}$ | $I_D$=250μA, $V_{GS}$=0V | 80 | | | V |
| Drain-Source Leakage Current | | $I_{DSS}$ | $V_{DS}$=80V, $V_{GS}$=0V | | | 1 | μA |
| Gate-Source Leakage Current | Forward | $I_{GSS}$ | $V_{GS}$=+20V, $V_{DS}$=0V | | | +100 | nA |
| | Reverse | | $V_{GS}$=-20V, $V_{DS}$=0V | | | -100 | nA |
| **ON CHARACTERISTICS** | | | | | | | |
| Gate Threshold Voltage | | $V_{GS(TH)}$ | $V_{DS}$=$V_{GS}$, $I_D$=250μA | 1.0 | | 3.0 | V |
| Static Drain-Source On-State Resistance | | $R_{DS(ON)}$ | $V_{GS}$=10V, $I_D$=75A | | | 11 | mΩ |
| **DYNAMIC PARAMETERS** | | | | | | | |
| Input Capacitance | | $C_{ISS}$ | $V_{GS}$=0V, $V_{DS}$=25V, f=1.0MHz | | 4000 | | pF |
| Output Capacitance | | $C_{OSS}$ | | | 320 | | pF |
| Reverse Transfer Capacitance | | $C_{RSS}$ | | | 120 | | pF |
| **SWITCHING PARAMETERS** | | | | | | | |
| Total Gate Charge | | $Q_G$ | $V_{GS}$=10V, $V_{DD}$=50V, $I_D$=1.3A, $I_G$=100μA | | 300 | | nC |
| Gate to Source Charge | | $Q_{GS}$ | | | 14 | | nC |
| Gate to Drain Charge | | $Q_{GD}$ | | | 16 | | nC |
| Turn-ON Delay Time | | $t_{D(ON)}$ | $V_{DD}$=30V, $I_D$=0.5A, $V_{GS}$=10V, $R_G$=25Ω | | 56 | | ns |
| Rise Time | | $t_R$ | | | 65 | | ns |
| Turn-OFF Delay Time | | $t_{D(OFF)}$ | | | 780 | | ns |
| Fall-Time | | $t_F$ | | | 200 | | ns |
| **SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS** | | | | | | | |
| Maximum Continuous Drain-Source Diode Forward Current | | $I_S$ | | | | 75 | A |
| Maximum Pulsed Drain-Source Diode Forward Current | | $I_{SM}$ | | | | 300 | A |
| Drain-Source Diode Forward Voltage | | $V_{SD}$ | $I_{SD}$=75A | | | 1.4 | V |

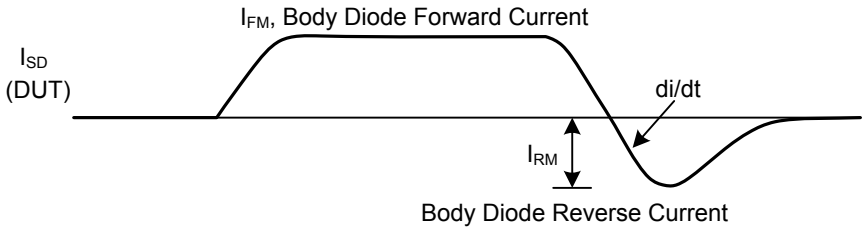
| | | | | | | |
|---|---|---|---|---|---|---|
| Reverse Recovery Time | $t_{rr}$ | $V_{GS}$ = 0 V, $I_{SD}$ = 30A, | | 48 | | ns |
| Reverse Recovery Charge | $Q_{RR}$ | di/dt = 100 A/μs (Note 1) | | 62 | | nC |

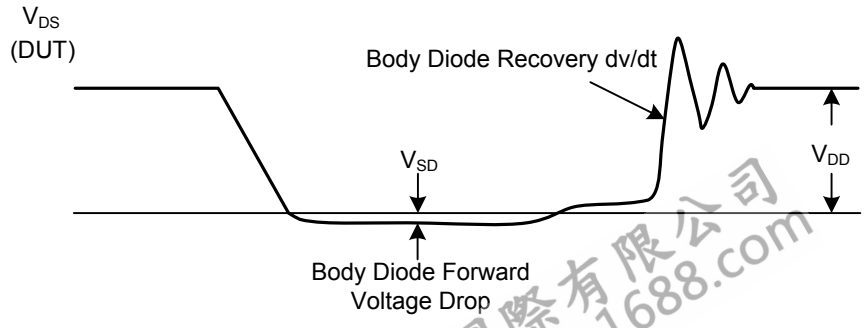
Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle≤2%.
2. Essentially independent of operating temperature.

## ■ TEST CIRCUITS AND WAVEFORMS



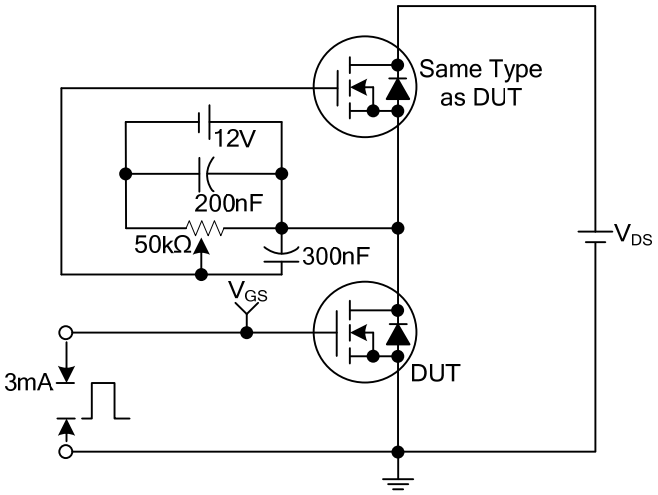



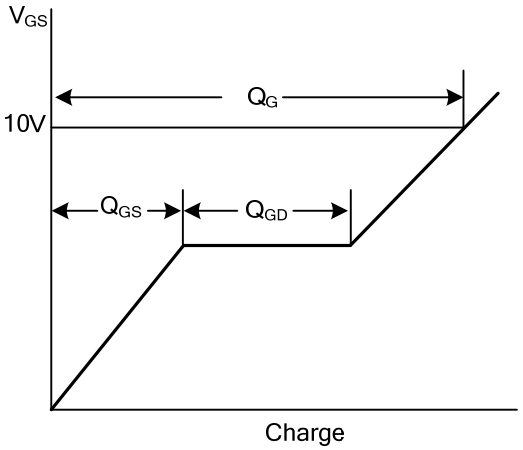




Peak Diode Recovery dv/dt Test Circuit and Waveforms

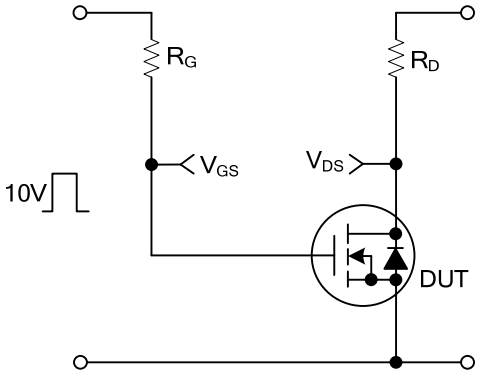
## ■ TEST CIRCUITS AND WAVEFORMS (Cont.)



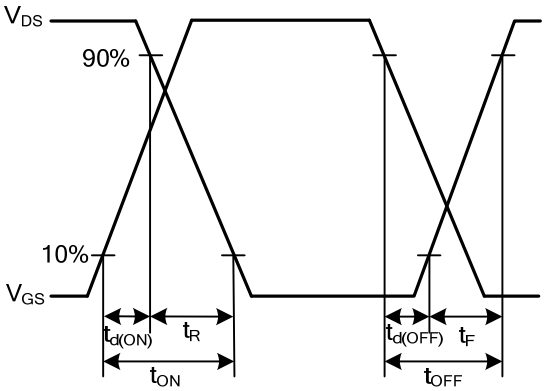

Gate Charge Test Circuit



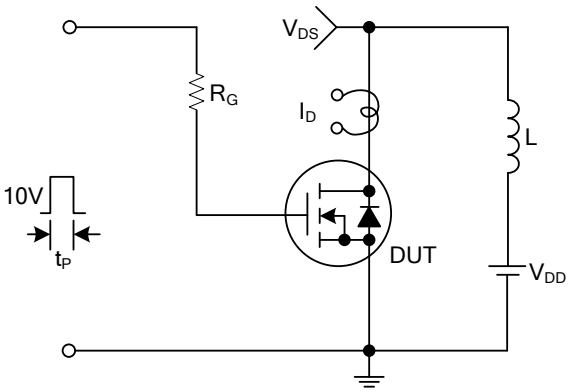

Gate Charge Waveforms



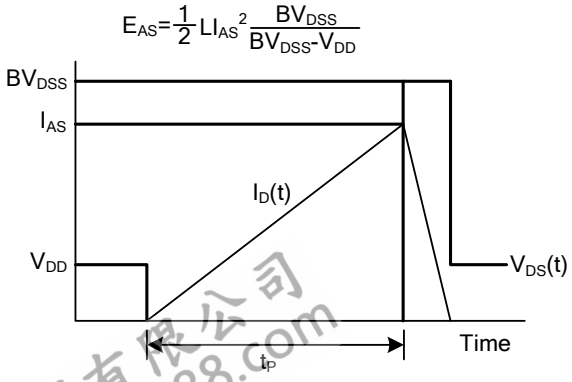

Resistive Switching Test Circuit




Resistive Switching Waveforms




Unclamped Inductive Switching Test Circuit




Unclamped Inductive Switching Waveforms