



UTT100N75H

POWER MOSFET

100A, 75V N-CHANNEL POWER MOSFET

DESCRIPTION

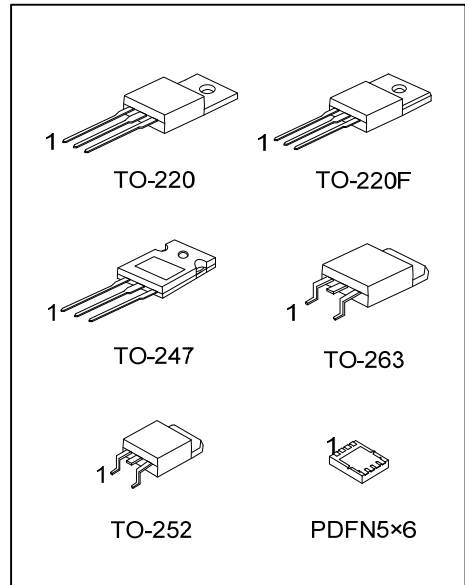
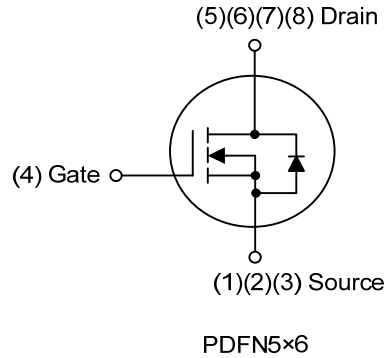
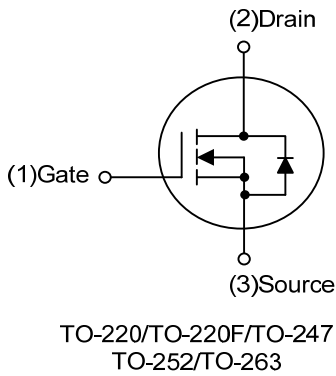
The UTC **UTT100N75H** is a N-channel Power MOSFET, it uses UTC's advanced technology to provide excellent $R_{DS(ON)}$ with low gate charge, etc.

The UTC **UTT100N75H** is suitable for DC motor control, UPS and load switching, etc.

FEATURES

- * $R_{DS(ON)} \leq 9.0 \text{ m}\Omega @ V_{GS}=10V, I_D=50A$
- * High power and current handling capability
- * High speed switching
- * Low gate charge

SYMBOL



ORDERING INFORMATION

| Ordering Number | | Package | Pin Assignment | | | | | | | | Packing |
|---------------------|---------------------|---------|----------------|---|---|---|---|---|---|---|-----------|
| Lead Free | Halogen Free | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| UTT100N75HL-TA3-T | UTT100N75HG-TA3-T | TO-220 | G | D | S | - | - | - | - | - | Tube |
| UTT100N75HL-TF3-T | UTT100N75HG-TF3-T | TO-220F | G | D | S | - | - | - | - | - | Tube |
| UTT100N75HL-TN3-R | UTT100N75HG-TN3-R | TO-252 | G | D | S | - | - | - | - | - | Tape Reel |
| UTT100N75HL-T47-T | UTT100N75HG-T47-T | TO-247 | G | D | S | - | - | - | - | - | Tube |
| UTT100N75HL-TQ2-T | UTT100N75HG-TQ2-T | TO-263 | G | D | S | - | - | - | - | - | Tube |
| UTT100N75HL-TQ2-R | UTT100N75HG-TQ2-R | TO-263 | G | D | S | - | - | - | - | - | Tape Reel |
| UTT100N75HL-P5060-R | UTT100N75HG-P5060-R | PDFN5x6 | S | S | S | G | D | D | D | D | Tape Reel |

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

| | |
|---|--|
| <p>UTT100N75HG-TA3-T</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p> | <p>(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TF3: TO-220F, TN3: TO-252 T47: TO-247, TQ2: TO-263, P5060: PDFN5x6 (3) G: Halogen Free and Lead Free, L: Lead Free</p> |
|---|--|

MARKING

| TO-220 / TO-220F / TO-247 / TO-252 / TO-263 | PDFN5x6 |
|---|---|
| <p>Lot Code ← UTC UTT 100N75H [] → L: Lead Free → G: Halogen Free → Date Code</p> <p>1</p> | <p>Lot Code ← UTC UTT 100N75H [] → Date Code</p> |

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

| PARAMETER | | | SYMBOL | RATINGS | UNIT |
|--|-----------------|---------------------------|-----------|------------|--------------------|
| Drain-Source Voltage | | | V_{DSS} | 75 | V |
| Gate-Source Voltage | | | V_{GSS} | ± 20 | V |
| Drain Current | Continuous | $T_C=25^{\circ}\text{C}$ | I_D | 100 | A |
| | | $T_C=100^{\circ}\text{C}$ | | 48 | A |
| | Pulsed (Note 2) | | I_{DM} | 200 | A |
| Peak diode recovery voltage | | | dv/dt | 3.77 | V/ns |
| Avalanche Energy (Note 3) | | | E_{AS} | 180 | mJ |
| Power Dissipation ($T_C=25^{\circ}\text{C}$) | TO-220 | | P_D | 180 | W |
| | TO-263 | | | | |
| | TO-220F | | | 45 | W |
| | TO-252 | | | 64 | W |
| | TO-247 | | | 230 | W |
| | PDFN5x6 | | | 60 | W |
| Junction Temperature | | | T_J | +150 | $^{\circ}\text{C}$ |
| Storage Temperature Range | | | 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. $L=0.1\text{mH}$, $I_{AS}=60\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\ \Omega$, 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 RESISTANCES CHARACTERISTICS

| PARAMETER | | | SYMBOL | RATINGS | UNIT | | |
|---------------------|--------------|---------|---------------|-------------|-----------------------------|-------------|-----------------------------|
| Junction to Ambient | steady state | TO-220 | θ_{JA} | 62.5 | $^{\circ}\text{C}/\text{W}$ | | |
| | | TO-220F | | | | | |
| | | TO-263 | | 110 | $^{\circ}\text{C}/\text{W}$ | | |
| | | TO-252 | | | | | |
| | | TO-247 | | | | 40 | $^{\circ}\text{C}/\text{W}$ |
| | | PDFN5x6 | | | | 35.7 (Note) | $^{\circ}\text{C}/\text{W}$ |
| Junction to Case | steady state | TO-220 | θ_{JC} | 0.69 | $^{\circ}\text{C}/\text{W}$ | | |
| | | TO-263 | | 2.77 | $^{\circ}\text{C}/\text{W}$ | | |
| | | TO-220F | | | | | |
| | | TO-252 | | 1.95 (Note) | $^{\circ}\text{C}/\text{W}$ | | |
| | | TO-247 | | 0.54 | $^{\circ}\text{C}/\text{W}$ | | |
| | | PDFN5x6 | | 2 (Note) | $^{\circ}\text{C}/\text{W}$ | | |

Note: The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.

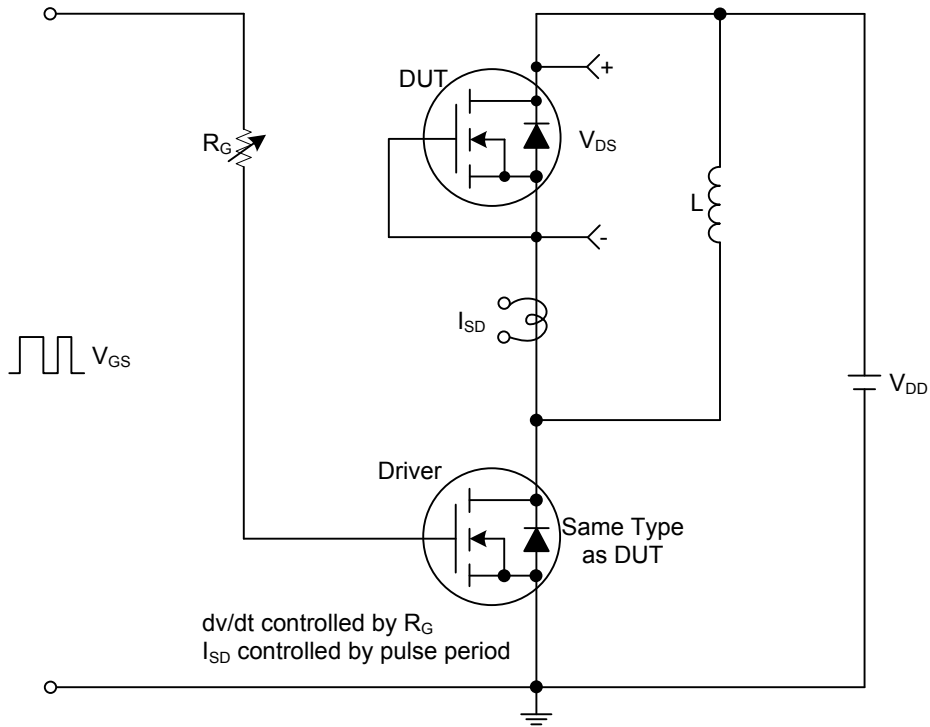
■ ELECTRICAL CHARACTERISTICS (T_A =25°C, unless otherwise specified)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|--|---------------------|--|-----|------|------|------|
| OFF CHARACTERISTICS | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | I _D =250μA, V _{GS} =0V | 75 | | | V |
| Drain-Source Leakage Current | I _{DSS} | V _{DS} =75V, V _{GS} =0V, T _C =25°C | | | 1 | μA |
| | | V _{DS} =75V, V _{GS} =0V, T _C =125°C | | | 10 | μA |
| Gate-Source Leakage Current | Forward | I _{GSS} | | | | |
| | Reverse | | | | | |
| | | V _{GS} =-20V, V _{DS} =0V | | | -100 | nA |
| ON CHARACTERISTICS | | | | | | |
| Gate Threshold Voltage | V _{GS(TH)} | V _{DS} =V _{GS} , I _D =250μA | 2.0 | | 4.0 | V |
| Static Drain-Source On-State Resistance | R _{DS(ON)} | V _{GS} =10V, I _D =50A | | | 9.0 | mΩ |
| DYNAMIC PARAMETERS | | | | | | |
| Input Capacitance | C _{ISS} | V _{GS} =0V, V _{DS} =25V, f=1.0MHz | | 4200 | | pF |
| Output Capacitance | C _{OSS} | | | 365 | | pF |
| Reverse Transfer Capacitance | C _{RSS} | | | 305 | | pF |
| SWITCHING PARAMETERS | | | | | | |
| Total Gate Charge | Q _G | V _{DS} =60V, V _{GS} =10V, I _D =100A I _D =1mA | | 115 | | nC |
| Gate to Source Charge | Q _{GS} | | | 19 | | nC |
| Gate to Drain Charge | Q _{GD} | | | 49 | | nC |
| Turn-on Delay Time | t _{D(ON)} | V _{DD} =37.5V, V _{GS} =10V, I _D =100A R _G =3Ω | | 18 | | ns |
| Rise Time | t _R | | | 22 | | ns |
| Turn-off Delay Time | t _{D(OFF)} | | | 54 | | ns |
| Fall-Time | t _F | | | 23 | | ns |
| SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS | | | | | | |
| Continuous Drain-Source Diode Forward Current | I _S | | | | 100 | A |
| Drain-Source Diode Forward Voltage (Note 1) | V _{SD} | I _S =100A, V _{GS} =0V | | | 1.2 | V |
| Body Diode Reverse Recovery Time (Note 1) | t _{rr} | I _S =30A, dI _S /dt=100A/μs | | 50 | | ns |
| Body Diode Reverse Recovery Charge (Note 1) | Q _{rr} | | | | 70 | |

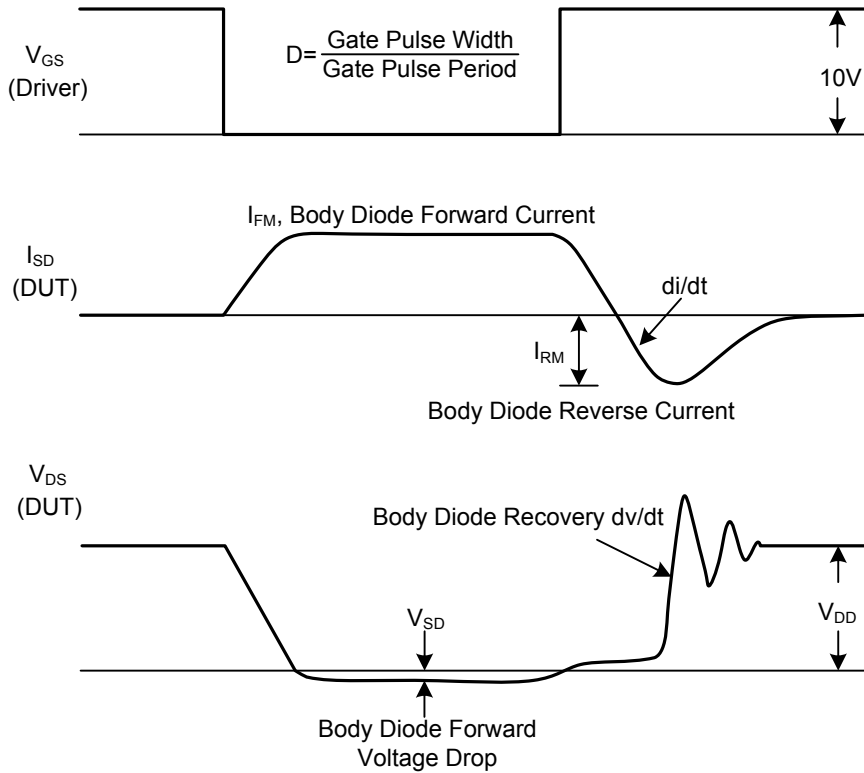
Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating temperature.

TEST CIRCUITS AND WAVEFORMS



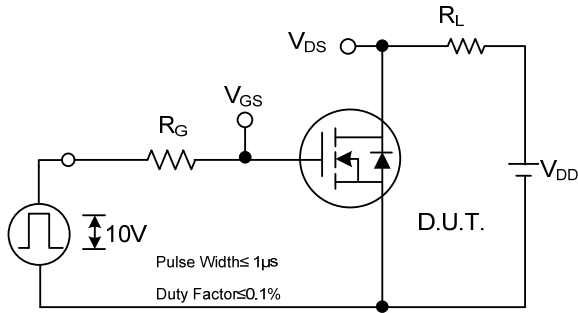
Peak Diode Recovery dv/dt Test Circuit



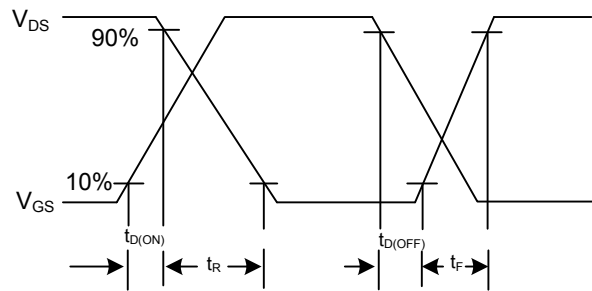
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

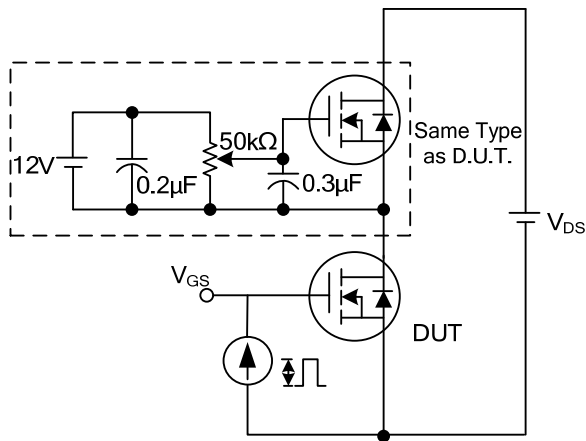
TEST CIRCUITS AND WAVEFORMS



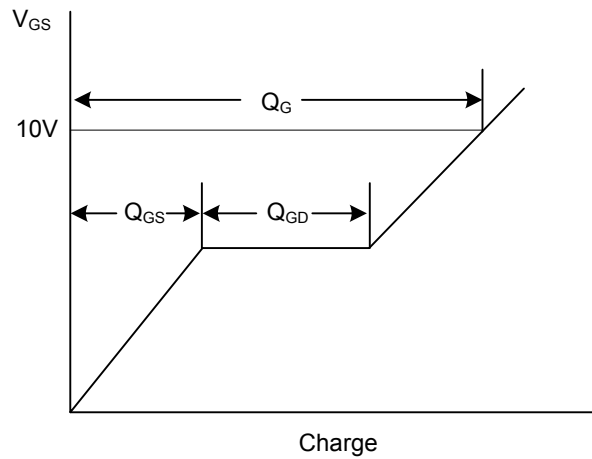
Switching Test Circuit



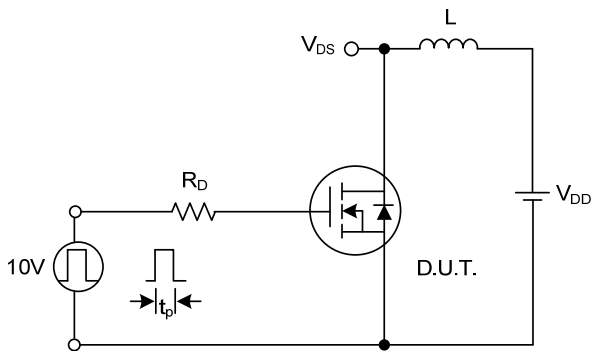
Switching Waveforms



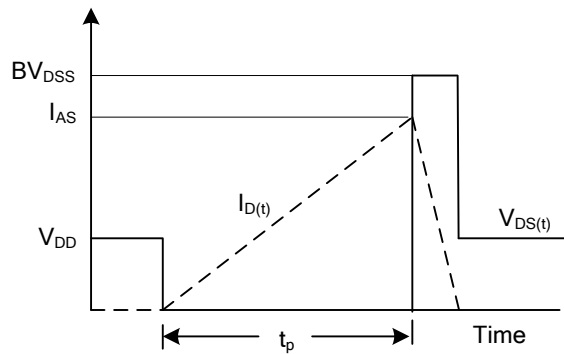
Gate Charge Test Circuit



Gate Charge Waveform

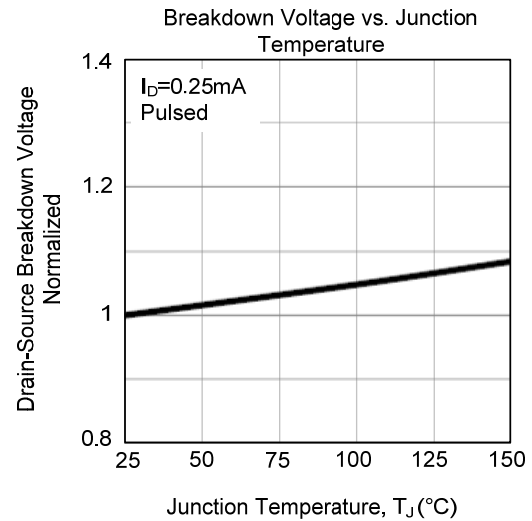
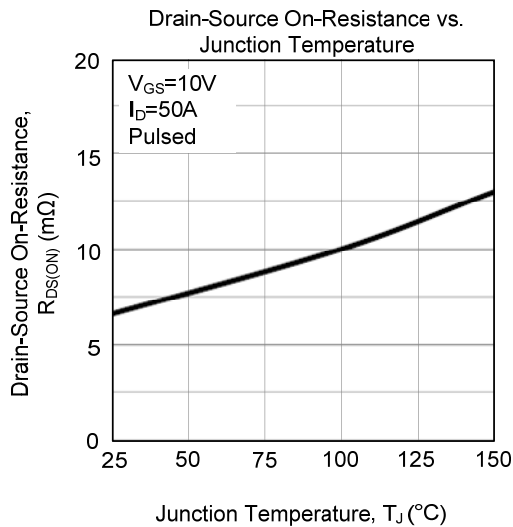
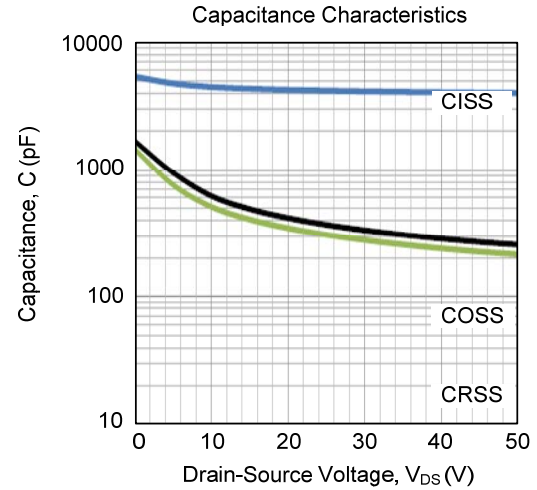
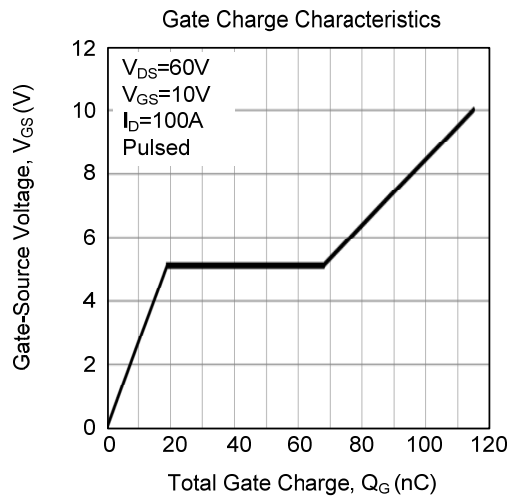
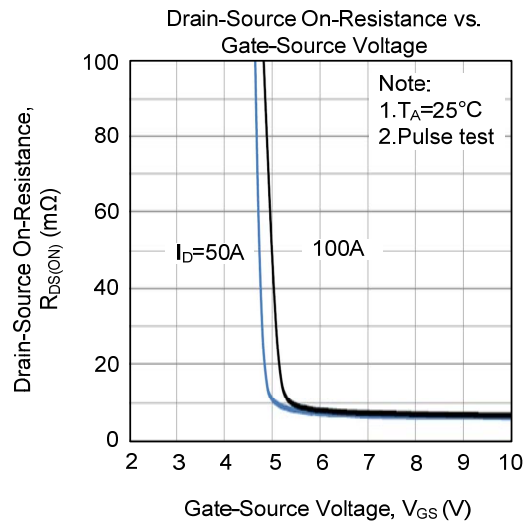
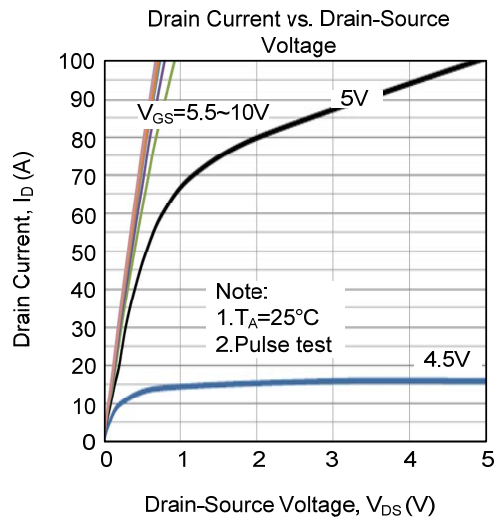


Unclamped Inductive Switching Test Circuit

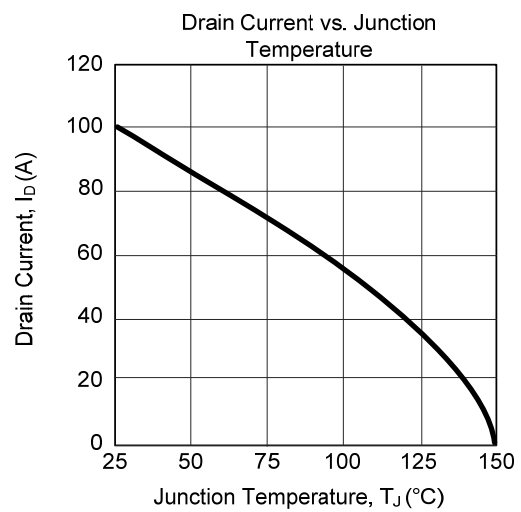
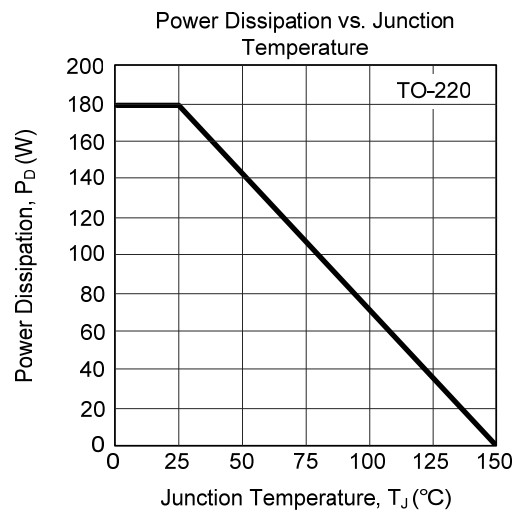
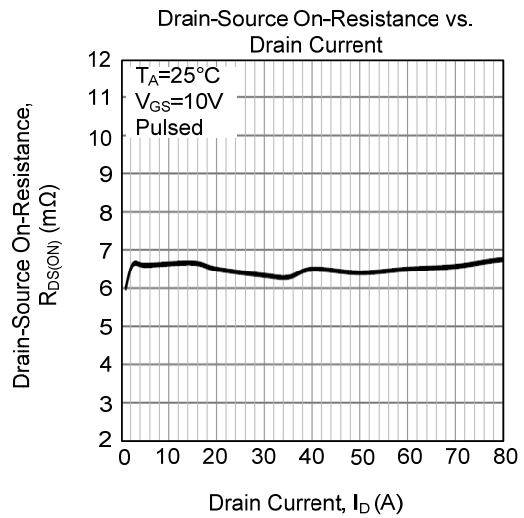
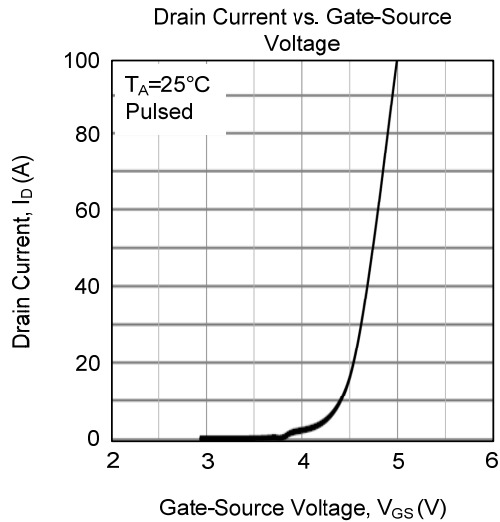
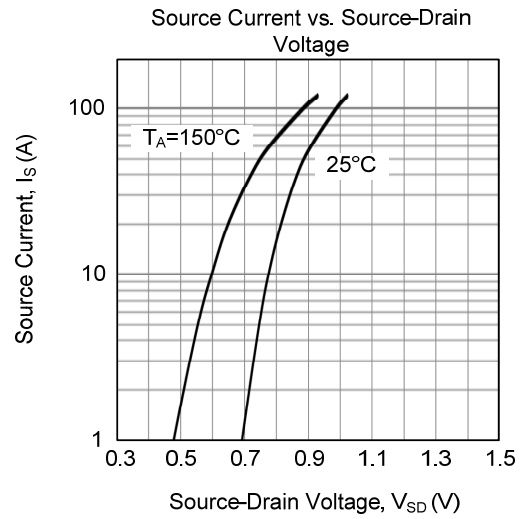
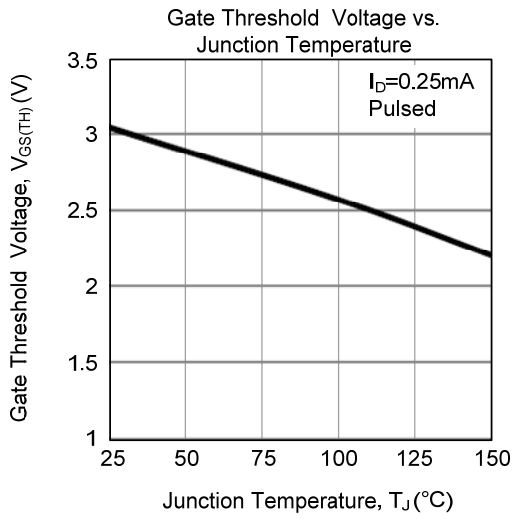


Unclamped Inductive Switching Waveforms

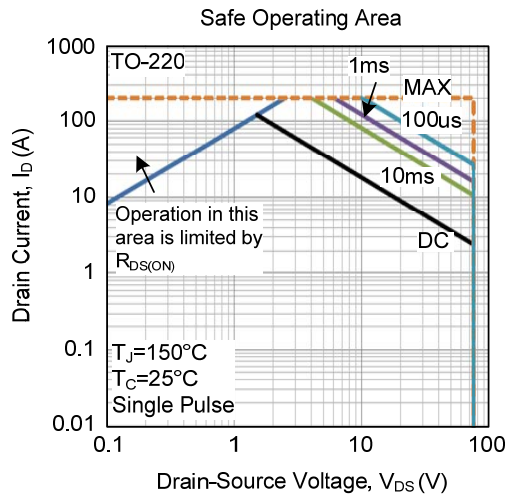
TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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