



## 75N75

### Power MOSFET

## 75Amps, 75Volts N-CHANNEL POWER MOSTFET

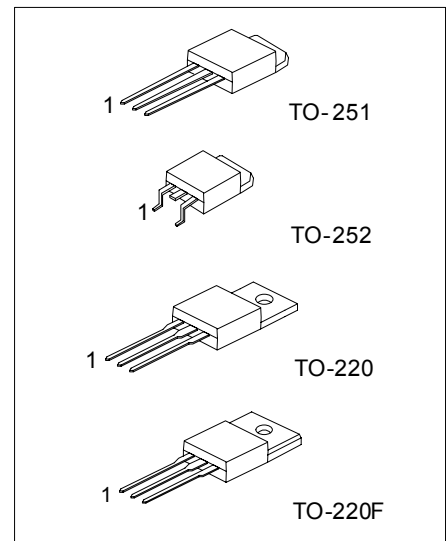
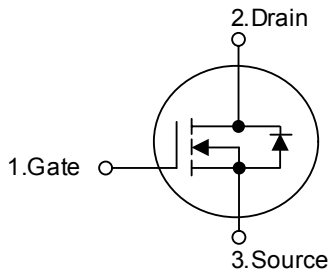
### DESCRIPTION

The UTC **75N75** is n-channel enhancement mode power field effect transistors with stable off-state characteristics, fast switching speed, low thermal resistance, usually used at telecom and computer application.

### FEATURES

- \*  $R_{DS(ON)} = 12.5m\Omega @ V_{GS} = 10V$
- \* Ultra low gate charge ( typical 90 nC )
- \* Fast switching capability
- \* Avalanche energy Specified
- \* Improved dv/dt capability, high ruggedness

### SYMBOL



\*Pb-free plating product number: 75N75L

### ORDERING INFORMATION

Order Number		Package	Pin Assignment			Packing
Normal	Lead Free Plating		1	2	3	
75N75-TA3-T	75N75L-TA3-T	TO-220	G	D	S	Tube
75N75-TF3-T	75N75L-TF3-T	TO-220F	G	D	S	Tube
75N75-TM3-T	75N75L-TM3-T	TO-251	G	D	S	Tube
75N75-TN3-R	75N75L-TN3-R	TO-252	G	D	S	Tape Reel
75N75-TN3-T	75N75L-TN3-T	TO-252	G	D	S	Tube

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

<p>75N75L-TA3-T</p> <p>(1)Packing Type (2)Package Type (3)Lead Plating</p>	<p>(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TF3: TO-220F, TM3: TO-251, TN 3: TO-252 (3) L: Lead Free Plating Blank: Pb/Sn</p>
--	---

### ■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Drain to Source Voltage		$V_{DSS}$	75	V
Continuous Drain Current	$T_C = 25$	$I_D$	75	A
	$T_C = 100$		56	A
Drain Current Pulsed (Note 1)		$I_{DM}$	300	A
Gate to Source Voltage		$V_{GS}$	$\pm 20$	V
Avalanche Energy	Single Pulsed (Note 2)	$E_{AS}$	900	mJ
	Repetitive (Note 1)	$E_{AR}$	300	mJ
Peak Diode Recovery dv/dt (Note 3)		dv/dt	15	V/ns
Total Power Dissipation	$T_C = 25$	$P_D$	220	W
	Derating above 25		1.4	W/
Junction Temperature		$T_J$	+150	
Storage Temperature		$T_{STG}$	-55 ~ +150	

Note: 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.

### ■ THERMAL DATA

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Thermal Resistance Junction-Ambient	$\theta_{JA}$			62.5	/W
Thermal Resistance Junction-Case	$\theta_{JC}$			0.8	/W
Thermal Resistance Case-Sink	$\theta_{CS}$		0.5		/W

### ■ ELECTRICAL CHARACTERISTICS ( $T_C = 25$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	75			V
Breakdown Voltage Temperature Coefficient	$BV_{DSS}/T_J$	$I_D = 1\text{ mA}$ , Referenced to 25		0.08		V/
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS} = 75\text{ V}, V_{GS} = 0\text{ V}$			20	$\mu\text{A}$
		$V_{DS} = 75\text{ V}, V_{GS} = 0\text{ V}$ , $T_J = 150$			250	$\mu\text{A}$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS} = 20\text{ V}, V_{DS} = 0\text{ V}$			100	nA
Gate-Source Leakage Reverse		$V_{GS} = -20\text{ V}, V_{DS} = 0\text{ V}$			-100	nA
<b>On Characteristics</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	2.0		4.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS} = 10\text{ V}, I_D = 48\text{ A}$		12.5	15	m $\Omega$
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{ISS}$	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}$ $f = 1\text{ MHz}$		3300		pF
Output Capacitance	$C_{OSS}$			530		pF
Reverse Transfer Capacitance	$C_{RSS}$			80		pF
<b>Switching Characteristics</b>						
Turn-On Delay Time	$t_{D(ON)}$	$V_{DD} = 38\text{ V}, I_D = 48\text{ A}$ , $V_{GS} = 10\text{ V}$ , (Note 4, 5)		12		ns
Rise Time	$t_R$			79		ns
Turn-Off Delay Time	$t_{D(OFF)}$			80		ns
Fall Time	$t_F$			52		ns
Total Gate Charge	$Q_G$		$V_{DS} = 60\text{ V}, V_{GS} = 10\text{ V}$ $I_D = 48\text{ A}$ , (Note 4, 5)		90	140
Gate-Source Charge	$Q_{GS}$			20	35	nC
Gate-Drain Charge (Miller Charge)	$Q_{GD}$			30	45	nC

■ ELECTRICAL CHARACTERISTICS(Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>Source-Drain Diode Ratings and Characteristics</b>						
Continuous Source Current	$I_S$				75	A
Pulsed Source Current	$I_{SM}$				300	
Diode Forward Voltage	$V_{SD}$	$I_S = 48A, V_{GS} = 0 V$			1.4	V
Reverse Recovery Time	$t_{rr}$	$I_S = 48A, V_{GS} = 0 V$		90		ns
Reverse Recovery Charge	$Q_{rr}$	$di_F / dt = 100 A/\mu s$		300		$\mu C$

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

2.  $L=0.24mH, I_{AS}=48A, R_G=20\Omega$ , Starting  $T_J=25$

3.  $I_{SD}\leq 48A, di/dt\leq 300A/\mu s, V_{DD}\leq BV_{DSS}$ , Starting  $T_J=25$

4. Pulse Test: Pulse Width $\leq 300\mu s$ , Duty Cycle $\leq 2\%$

5. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

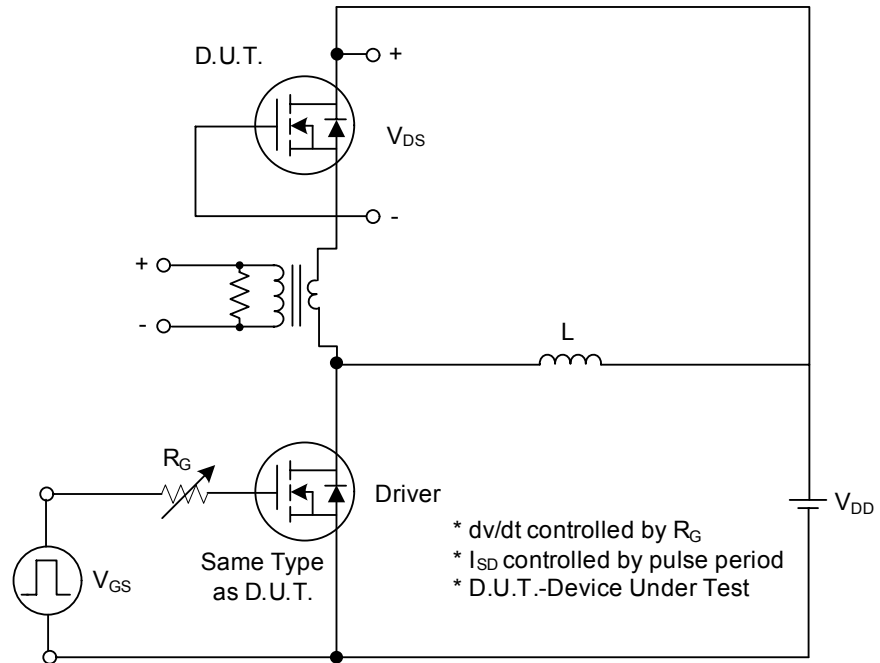


Fig. 1A Peak Diode Recovery dv/dt Test Circuit

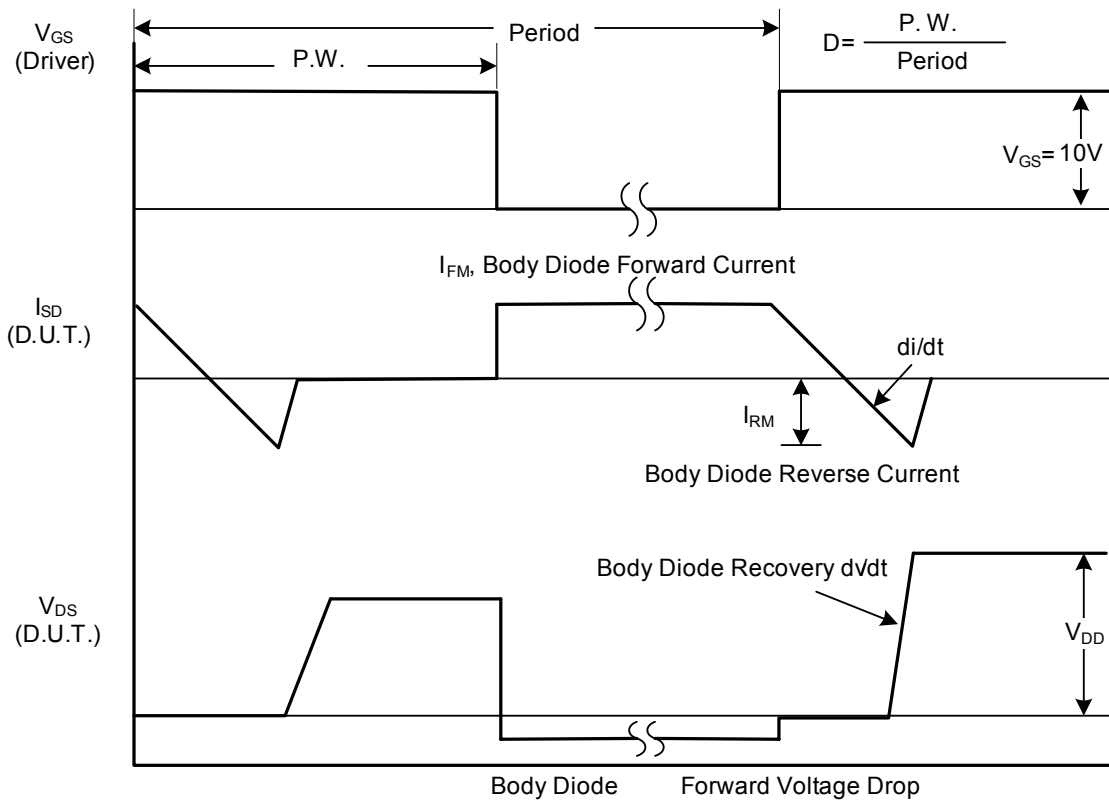


Fig. 1B Peak Diode Recovery dv/dt Waveforms

■ TEST CIRCUITS AND WAVEFORMS (Cont.)

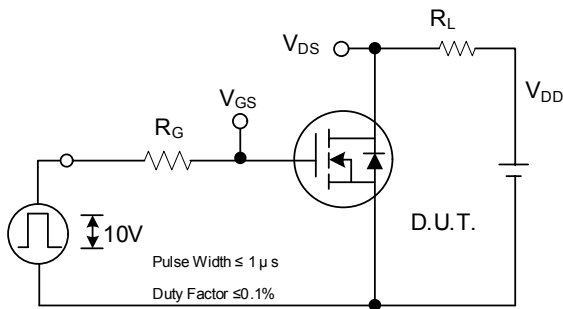


Fig. 2A Switching Test Circuit

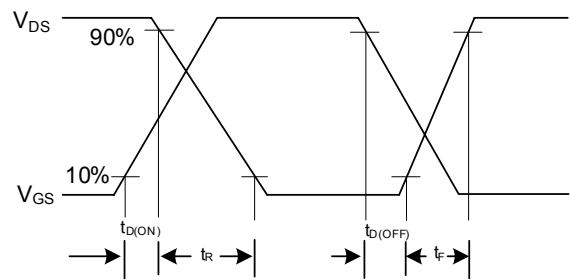


Fig. 2B Switching Waveforms

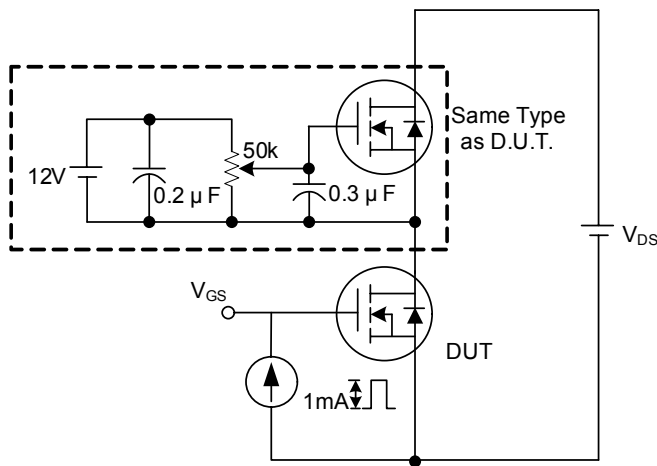


Fig. 3A Gate Charge Test Circuit

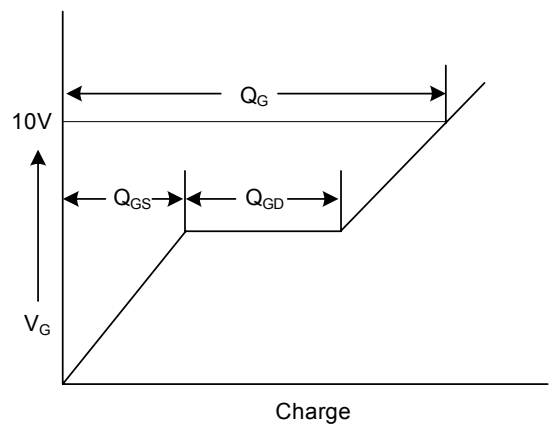


Fig. 3B Gate Charge Waveform

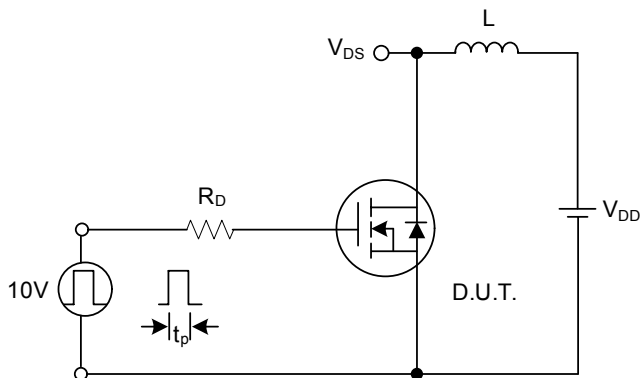


Fig. 4A Unclamped Inductive Switching Test Circuit

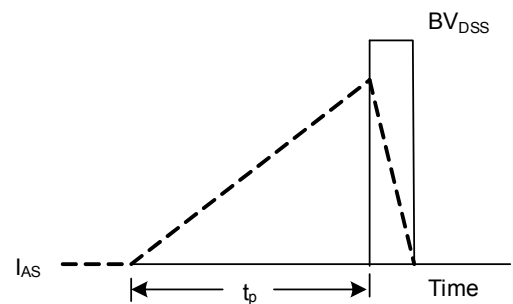
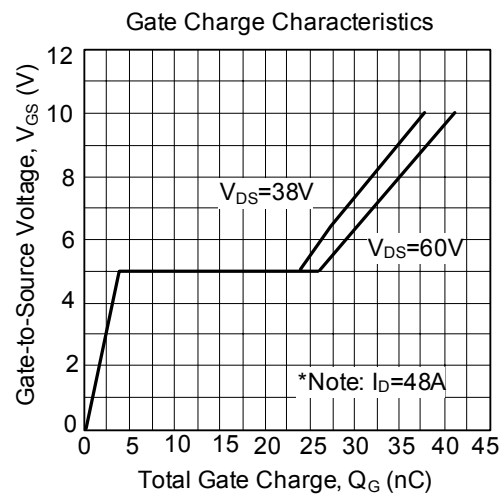
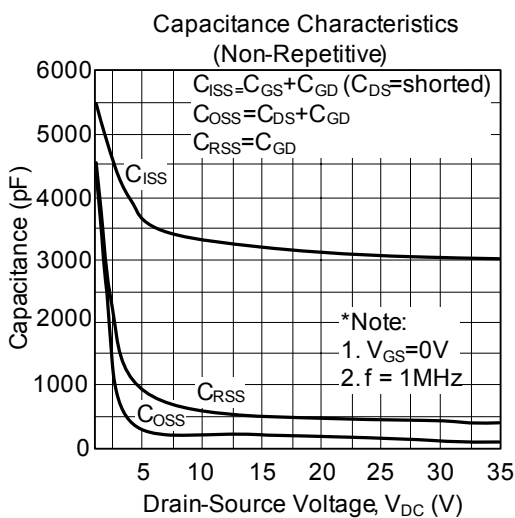
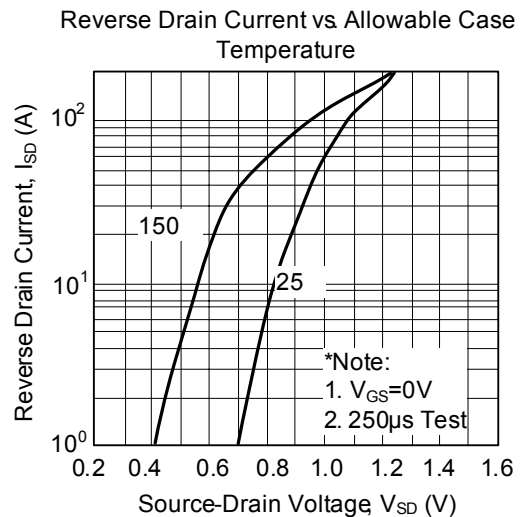
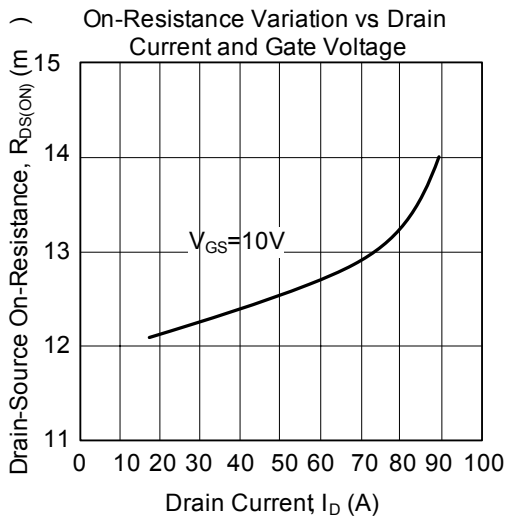
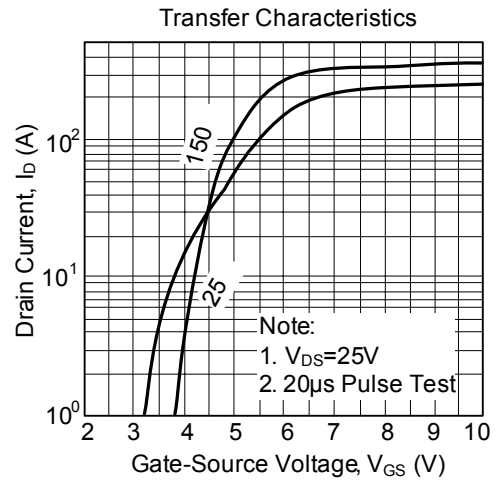
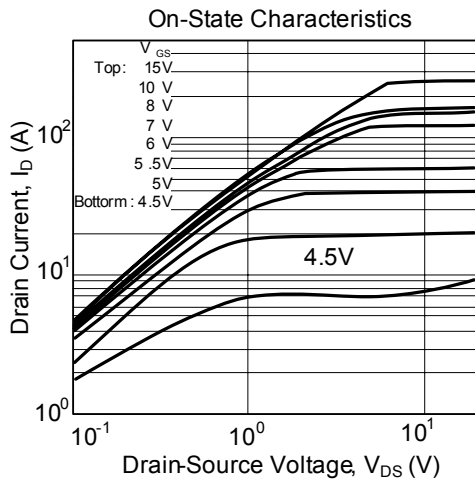
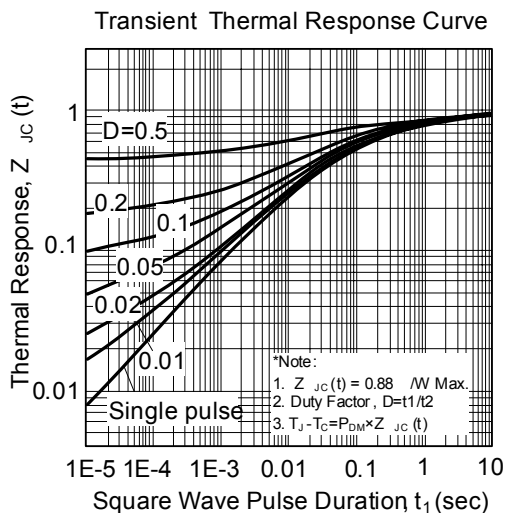
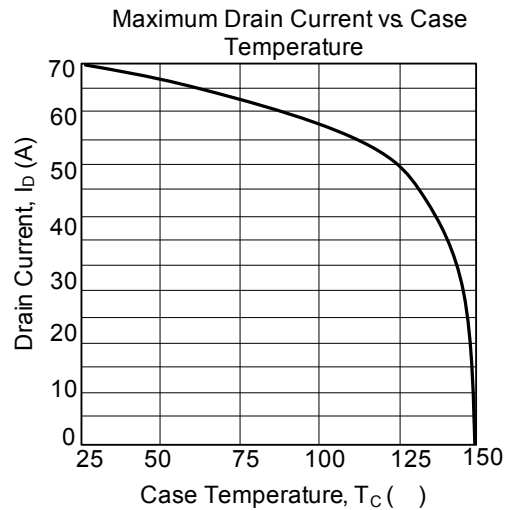
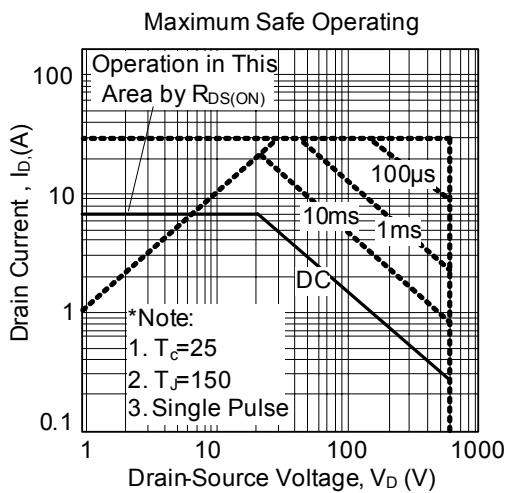
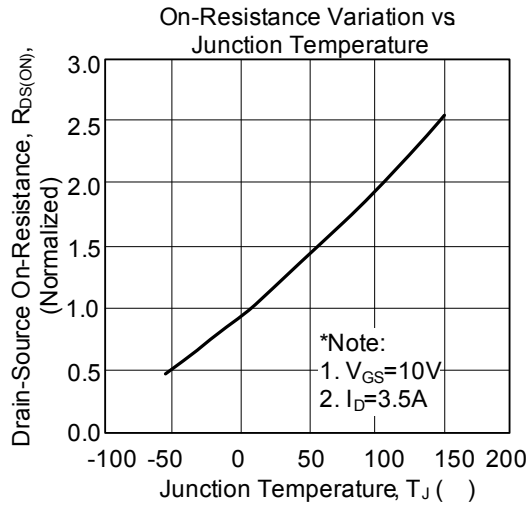
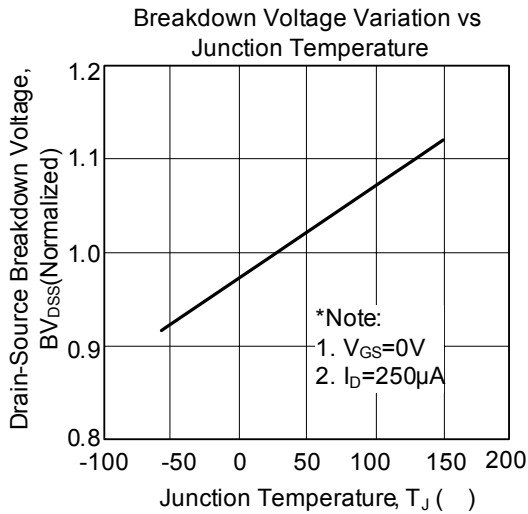


Fig. 4B Unclamped Inductive Switching Waveforms

## TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS(Cont.)



UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.