



UNISONIC TECHNOLOGIES CO., LTD

60N75

Power MOSFET

60Amps, 75Volts
N-CHANNEL POWER MOSTFET

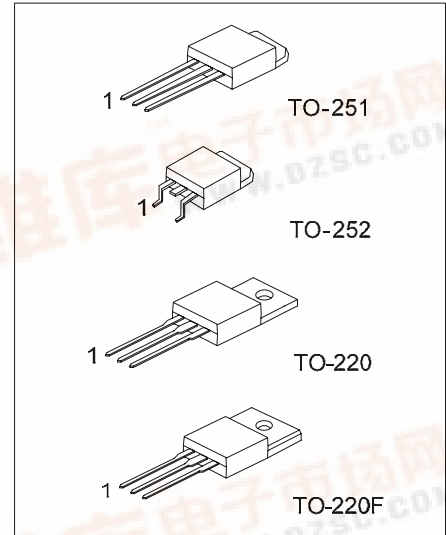
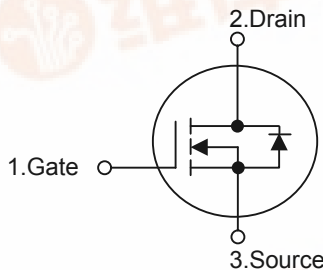
DESCRIPTION

The UTC **60N75** 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

- * $R_{DS(ON)} = 16m\Omega @ V_{GS} = 10 V$
- * Ultra low gate charge (typical 90 nC)
- * Low reverse transfer Capacitance ($C_{RSS} =$ typical 80pF)
- * Fast switching capability
- * Avalanche energy Specified
- * Improved dv/dt capability, high ruggedness

SYMBOL



*Pb-free plating product number: 60N75L

ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Normal	Lead Free Plating		1	2	3	
60N75-TA3-T	60N75L-TA3-T	TO-220	G	D	S	Tube
60N75-TF3-T	60N75L-TF3-T	TO-220F	G	D	S	Tube
60N75-TM3-T	60N75L-TM3-T	TO-251	G	D	S	Tube
60N75-TN3-R	60N75L-TN3-R	TO-252	G	D	S	Tape Reel
60N75-TN3-T	60N75L-TN3-T	TO-252	G	D	S	Tube

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

<p>60N75L-TA3-T</p>	<p>(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TF3: TO-220F, TM3: TO-251, TN3: TO-252 (3) L: Lead Free Plating, Blank: Pb/Sn</p>
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■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Drain to Source Voltage		V_{DSS}	75	V
Continuous Drain Current	$T_C = 25$	I_D	60	A
	$T_C = 100$		56	A
Drain Current Pulsed (Note 1)		I_{DM}	300	A
Gate to Source Voltage		V_{GS}	± 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	
Operating Temperature		T_{OPR}	-55 ~ +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	θ_{JA}			62.5	/W
Thermal Resistance Junction-Case	θ_{JC}			0.8	/W

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	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	μA	
		$V_{DS} = 75\text{ V}, V_{GS} = 0\text{ V}, T_J = 150$			250	μA	
Gate-Source Leakage Current	Forward	I_{GSS}	$V_{GS} = 20\text{ V}, V_{DS} = 0\text{ V}$			100	nA
	Reverse					$V_{GS} = -20\text{ V}, V_{DS} = 0\text{ V}$	-100
ON CHARACTERISTICS							
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-Resistance	$R_{DS(ON)}$	$V_{GS} = 10\text{ V}, I_D = 48\text{ A}$			16	m Ω	
DYNAMIC CHARACTERISTICS							
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	
SWITCHING CHARACTERISTICS							
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	
Turn-On Rise Time	t_R			79		ns	
Turn-Off Delay Time	$t_{D(OFF)}$			80		ns	
Turn-Off Fall Time	t_F			52		ns	
Total Gate Charge	Q_G		$V_{DS} = 60\text{V}, I_D = 48\text{A},$ $V_{GS} = 10\text{ V}$ (Note 4, 5)		90	140	nC
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
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS						
Diode Forward Voltage	V_{SD}	$I_S = 48A, V_{GS} = 0V$			1.4	V
Continuous Source Current	I_S				75	A
Pulsed Source Current	I_{SM}				300	
Reverse Recovery Time	t_{RR}	$I_S = 48A, V_{GS} = 0V$		90		ns
Reverse Recovery Charge	Q_{RR}	$di_F / dt = 100 A/\mu s$		300		μC

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

2. $L=0.24mH, I_{AS}=48A, V_{DD} = 50V, R_G=20\Omega$, 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

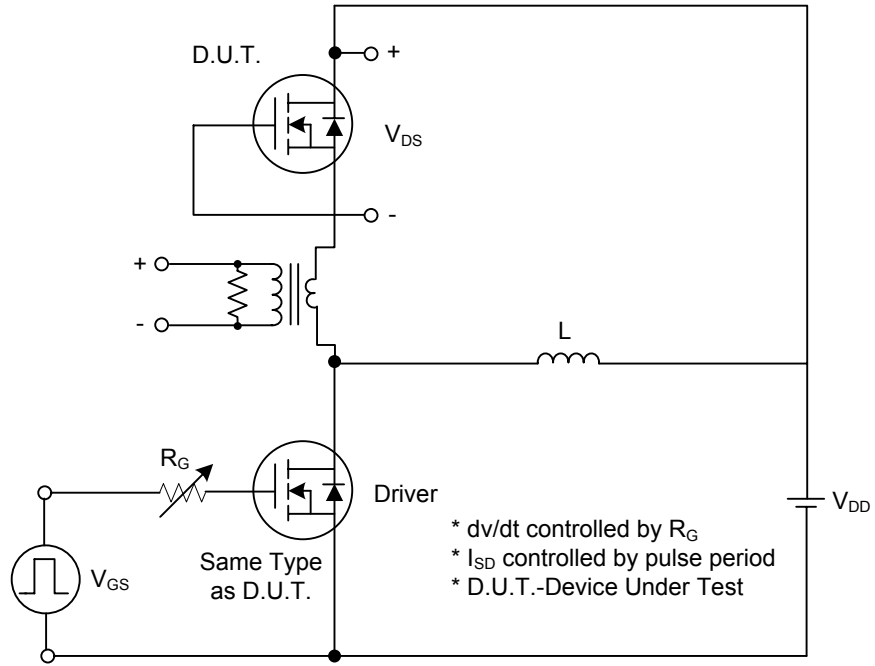


Fig. 1A Peak Diode Recovery dv/dt Test Circuit

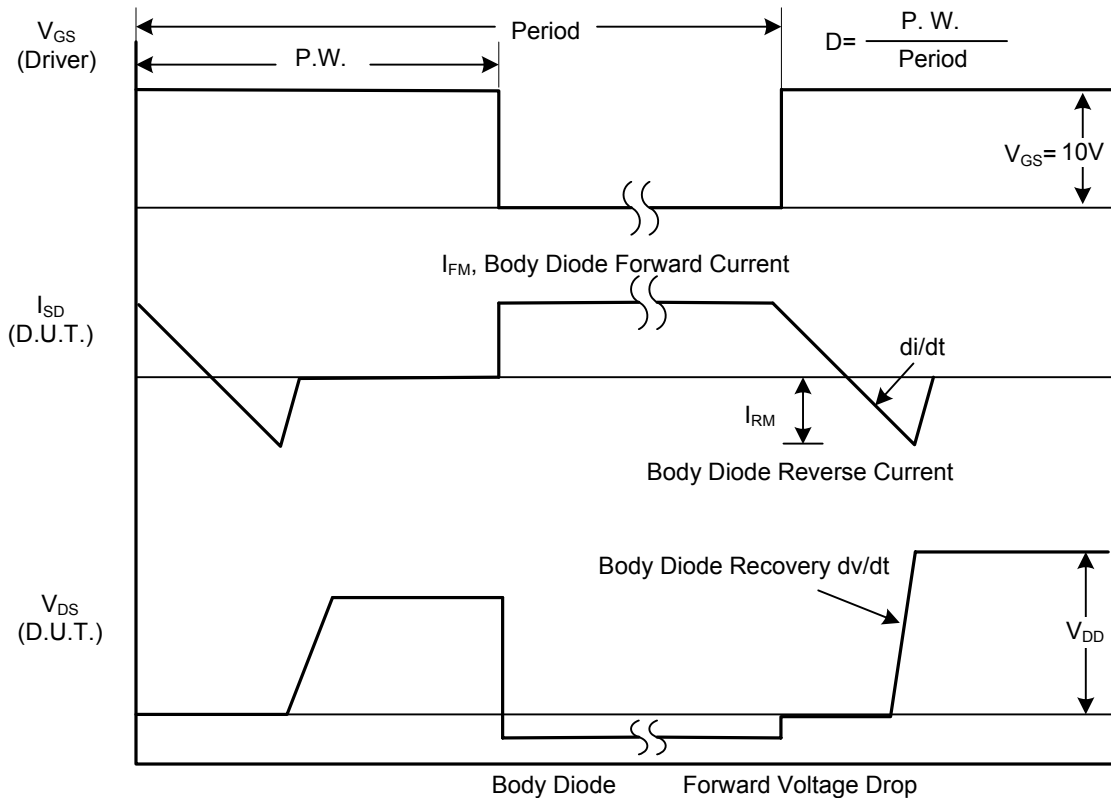


Fig. 1B Peak Diode Recovery dv/dt Waveforms

■ TEST CIRCUITS AND WAVEFORMS (Cont.)

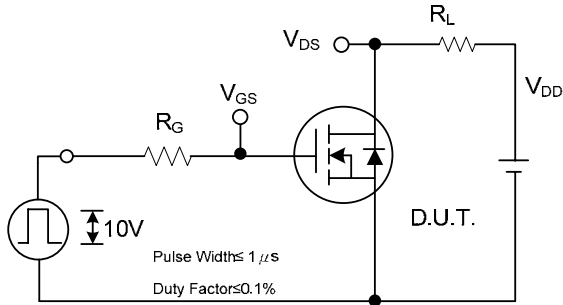


Fig. 2A Switching Test Circuit

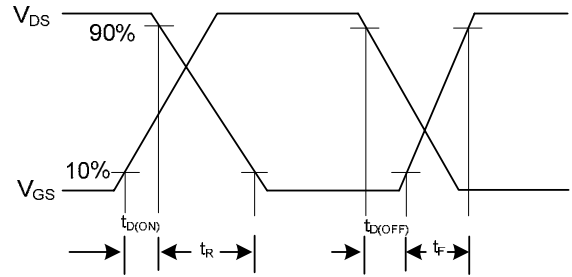


Fig. 2B Switching Waveforms

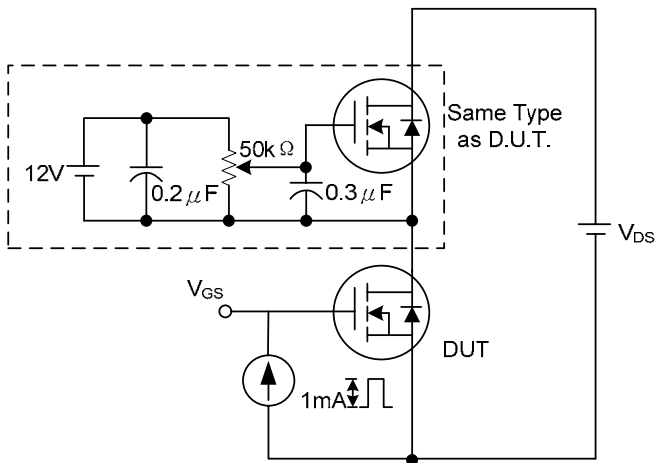


Fig. 3A Gate Charge Test Circuit

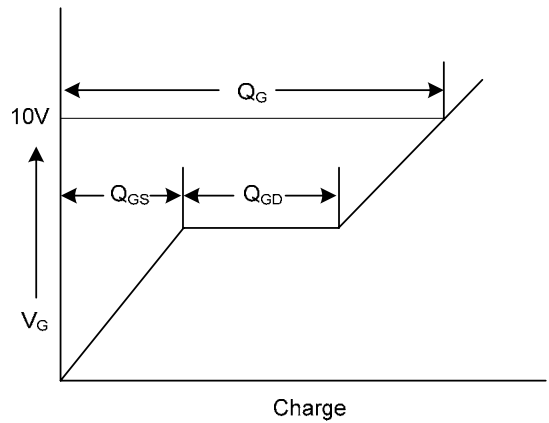


Fig. 3B Gate Charge Waveform

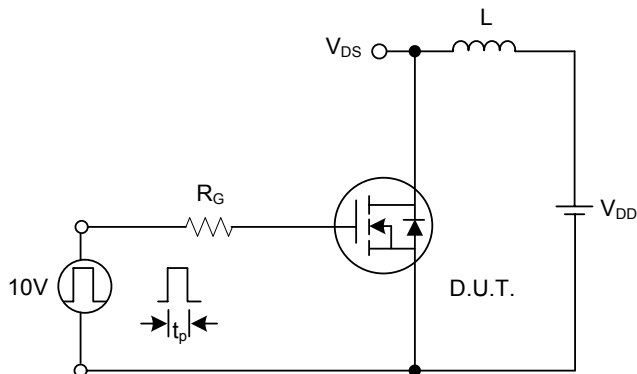


Fig. 4A Unclamped Inductive Switching Test Circuit

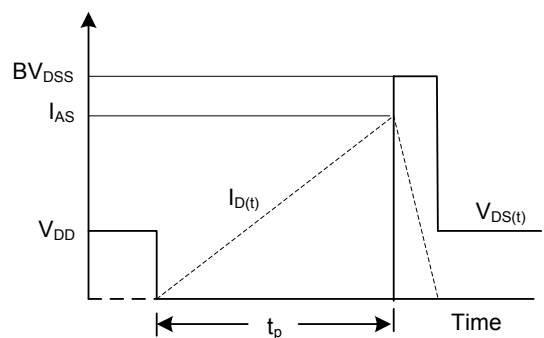
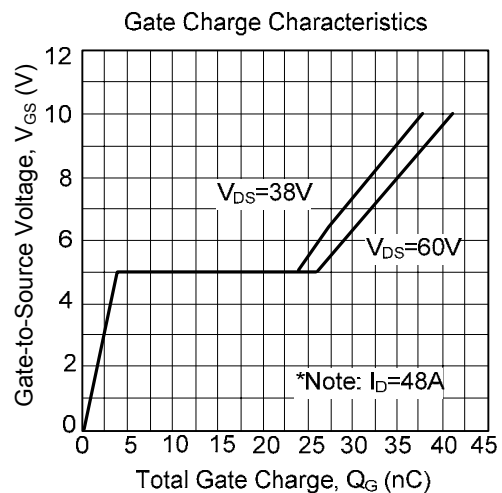
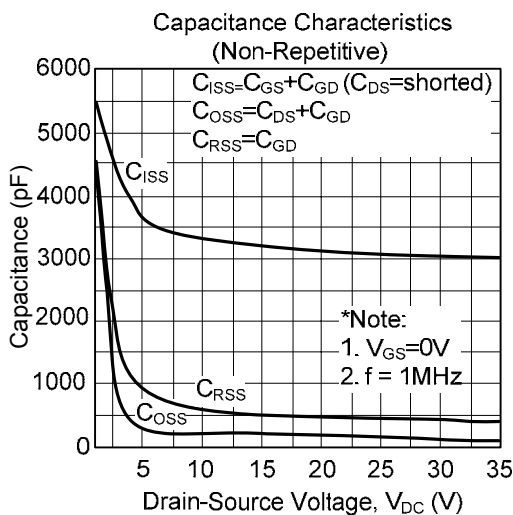
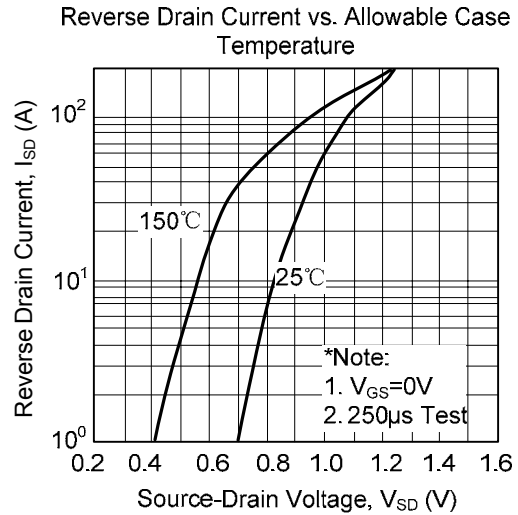
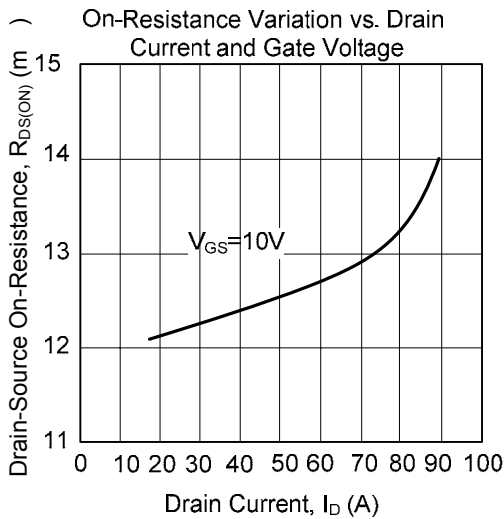
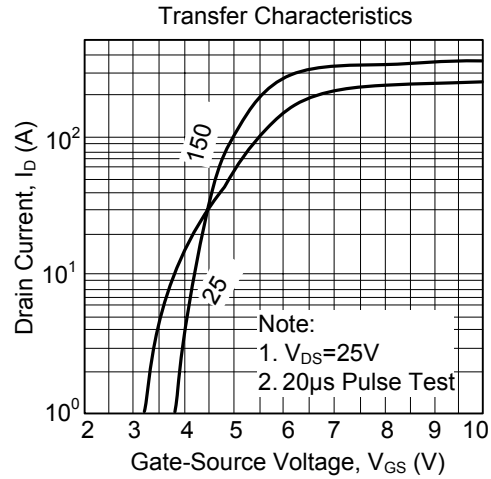
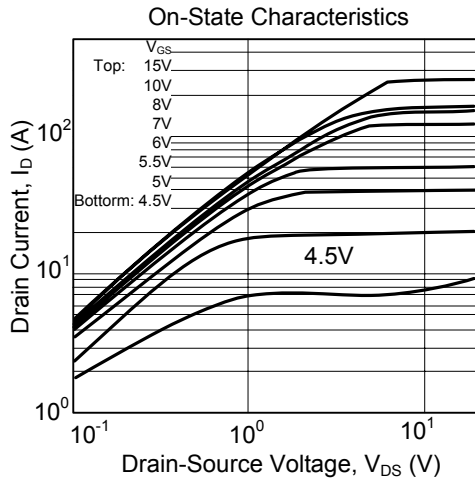
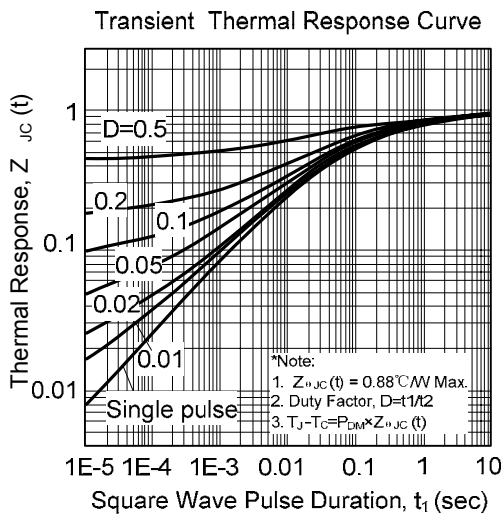
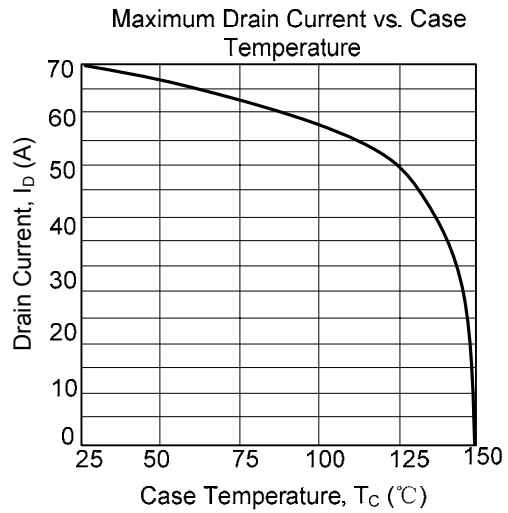
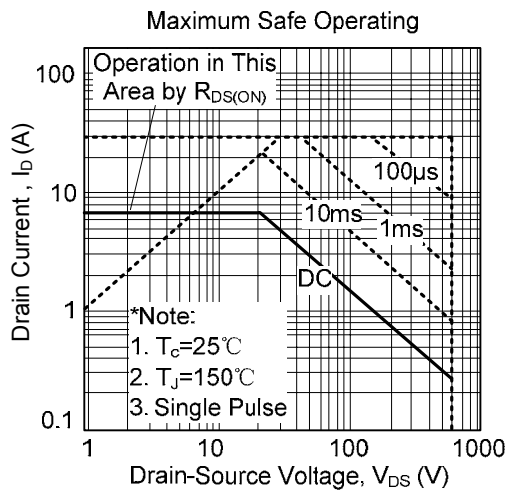
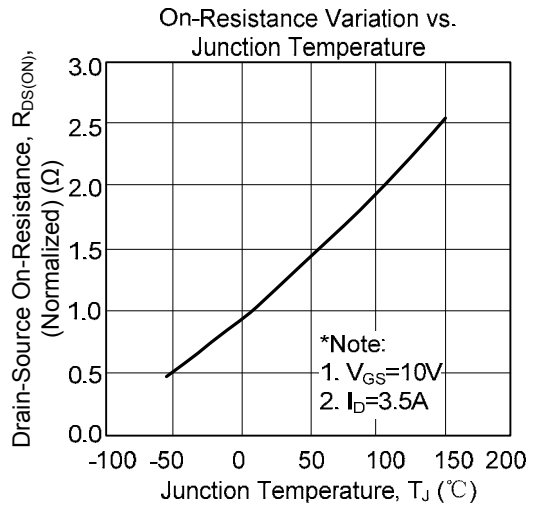
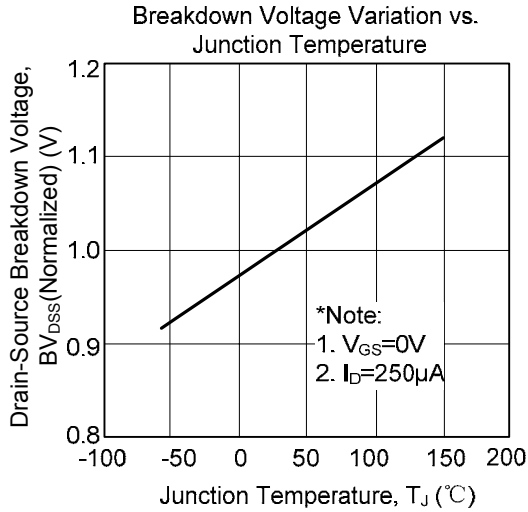


Fig. 4B Unclamped Inductive Switching Waveforms

TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS(Cont.)



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