

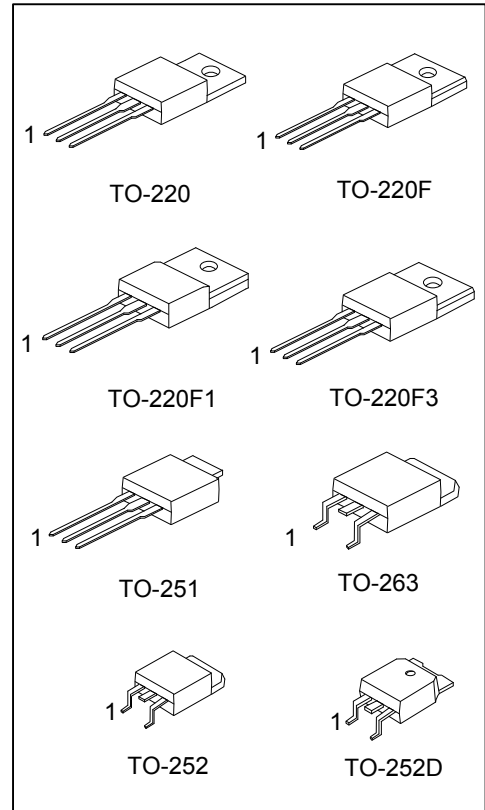
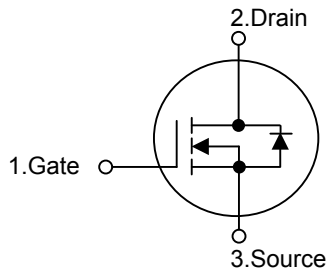
**50N06****Power MOSFET****50 Amps, 60 Volts
N-CHANNEL POWER MOSFET****DESCRIPTION**

The UTC **50N06** is three-terminal silicon device with current conduction capability of about 50A, fast switching speed. Low on-state resistance, breakdown voltage rating of 60V, and max threshold voltages of 4 volt.

It is mainly suitable electronic ballast, and low power switching mode power appliances.

FEATURES

- * $R_{DS(ON)} < 23m\Omega$ @ $V_{GS}=10V$, $I_D=25A$
- * Fast switching capability
- * 100% avalanche energy specified
- * Improved dv/dt capability

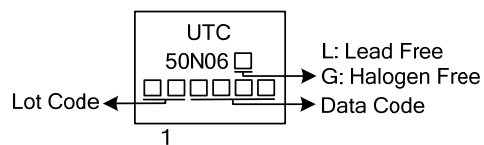
SYMBOL**ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
50N06L-TA3-T	50N06G-TA3-T	TO-220	G	D	S	Tube
50N06L-TF1-T	50N06G-TF1-T	TO-220F1	G	D	S	Tube
50N06L-TF3-T	50N06G-TF3-T	TO-220F	G	D	S	Tube
50N06L-TF3T-T	50N06G-TF3T-T	TO-220F3	G	D	S	Tube
50N06L-TM3-T	50N06G-TM3-T	TO-251	G	D	S	Tube
50N06L-TN3-R	50N06G-TN3-R	TO-252	G	D	S	Tape Reel
50N06L-TND-R	50N06G-TND-R	TO-252D	G	D	S	Tape Reel
50N06L-TQ2-T	50N06G-TQ2-T	TO-263	G	D	S	Tube
50N06L-TQ2-R	50N06G-TQ2-R	TO-263	G	D	S	Tape Reel

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

50N06G-TA3-T (1)Packing Type (2)Package Type (3)Green Package	(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TF1: TO-220F1, TF3: TO-220F, TF3T: TO-220F3, TM3: TO-251, TN3: TO-252, TND: TO-252D, TQ2: TO-263 (3) G: Halogen Free and Lead Free, L: Lead Free
--	---

■ MARKING



■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	60	V
Gate-Source Voltage		V_{GSS}	± 20	V
Continuous Drain Current		I_D	50	A
Pulsed Drain Current (Note 2)		I_{DM}	150	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	205	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	3.6	V/ns
Power Dissipation ($T_C=25^\circ\text{C}$)	TO-220/TO-263	P_D	120	W
	TO-220F/TO-220F1 TO-220F3		70	W
	TO-251/TO-252 TO-252D		46	W
Junction Temperature		T_J	+150	$^\circ\text{C}$
Operation and 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. $L=0.1\text{mH}$, $I_{AS}=64\text{A}$, $V_{DD}=25\text{V}$, $R_G=20\Omega$, 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	RATING	UNIT
Junction to Ambient	TO-220/TO-220F TO-220F1/TO-220F3 TO-263	θ_{JA}	62	$^\circ\text{C}/\text{W}$
	TO-251/TO-252 TO-252D		100	$^\circ\text{C}/\text{W}$
Junction to Case	TO-220	θ_{JC}	1.24	$^\circ\text{C}/\text{W}$
	TO-220F/TO-220F1 TO-220F3		1.78	$^\circ\text{C}/\text{W}$
	TO-251/TO-252 TO-252D		2.7	$^\circ\text{C}/\text{W}$
	TO-263		1.24	$^\circ\text{C}/\text{W}$

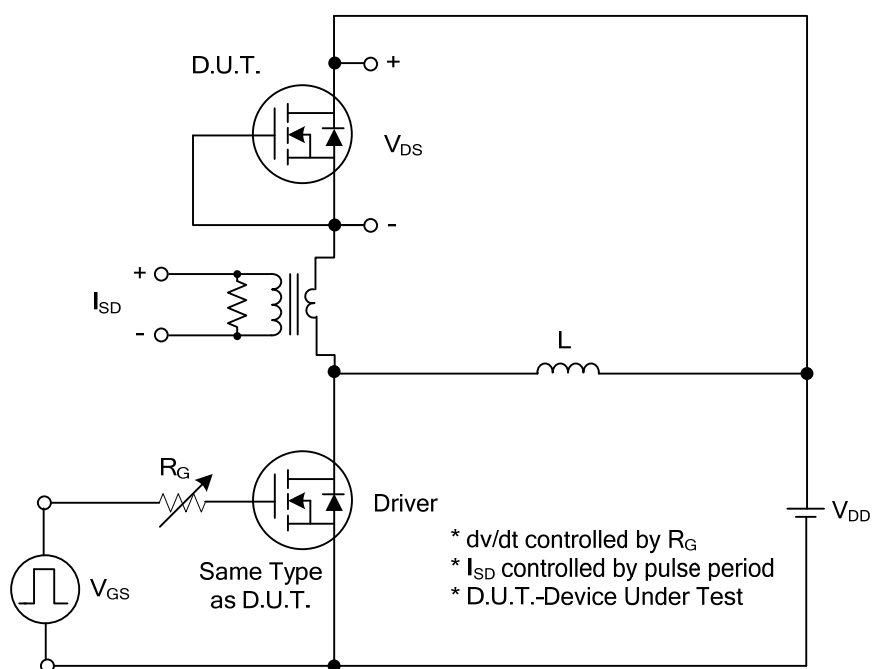
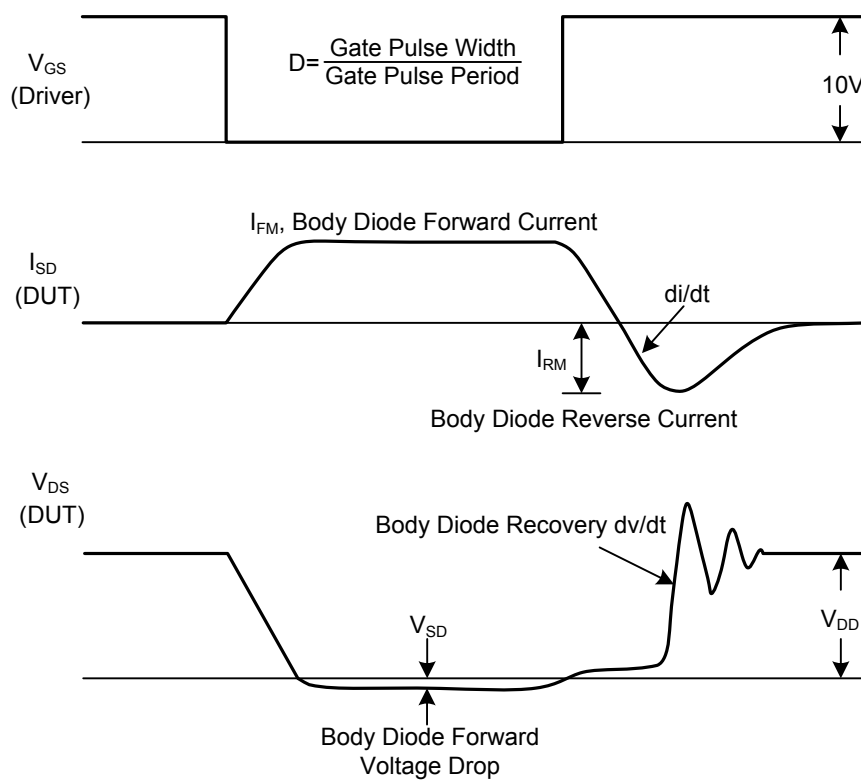
■ **ELECTRICAL CHARACTERISTICS** ($T_C = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} =0V, I _D =250μA	60			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =60V, V _{GS} =0V			10	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	2.0		4.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =25A			23	mΩ
DYNAMIC CHARACTERISTICS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1MHz		1200		pF
Output Capacitance		C _{OSS}			580		pF
Reverse Transfer Capacitance		C _{RSS}			180		pF
SWITCHING CHARACTERISTICS							
Total Gate Charge		Q _G	V _{DS} =50V, V _{GS} =10V, I _D =1.3A I _G =100μA (Note1,2)		145		nC
Gate-Source Charge		Q _{GS}			10		nC
Gate-Drain Charge		Q _{GD}			36		nC
Turn-On Delay Time		t _{D(ON)}	V _{DD} =30V, V _{GS} =10V, I _D =50A, R _G =25Ω (Note1,2)		18		ns
Turn-On Rise Time		t _R			84		ns
Turn-Off Delay Time		t _{D(OFF)}			62		ns
Turn-Off Fall Time		t _F			48		ns
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS							
Maximum Continuous Drain-Source Diode Forward Current		I _S				50	A
Maximum Pulsed Drain-Source Diode Forward Current		I _{SM}				150	A
Drain-Source Diode Forward Voltage		V _{SD}	I _S =50A, V _{GS} =0V			1.5	V
Reverse Recovery Time		t _{rr}	I _S =30A, V _{GS} =0V		90		ns
Reverse Recovery Charge		Q _{rr}	dI _F /dt=100A/μs		260		nC

Notes: 1. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$

2. Essentially independent of operating temperature

■ TEST CIRCUITS AND WAVEFORMS

Peak Diode Recovery dv/dt Test CircuitPeak Diode Recovery dv/dt Waveforms

■ TEST CIRCUITS AND WAVEFORMS

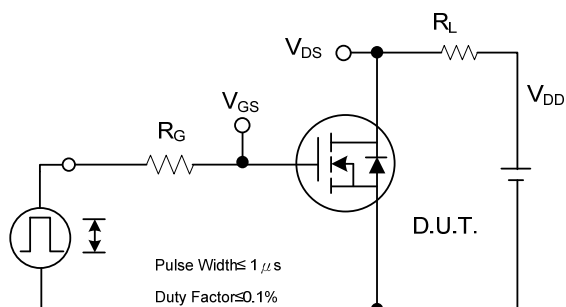


Fig. 2A Switching Test Circuit

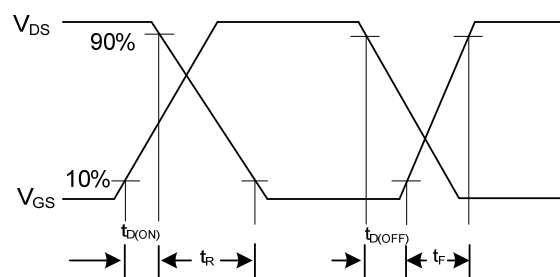


Fig. 2B Switching Waveforms

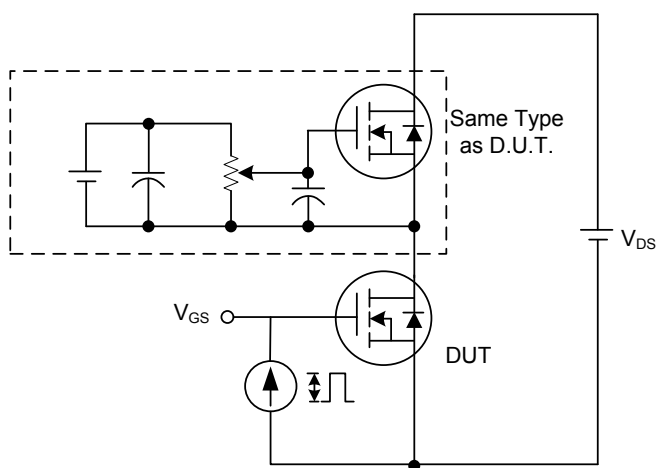


Fig. 3A Gate Charge Test Circuit

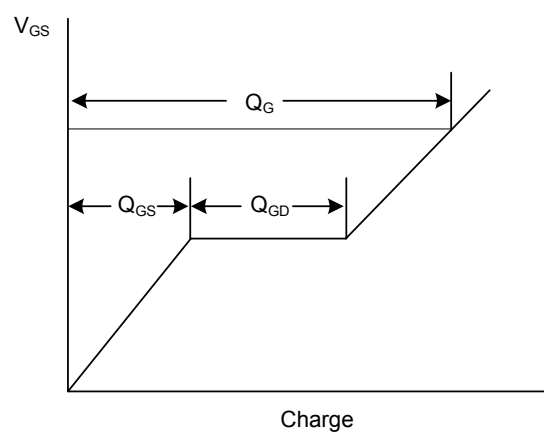


Fig. 3B Gate Charge Waveform

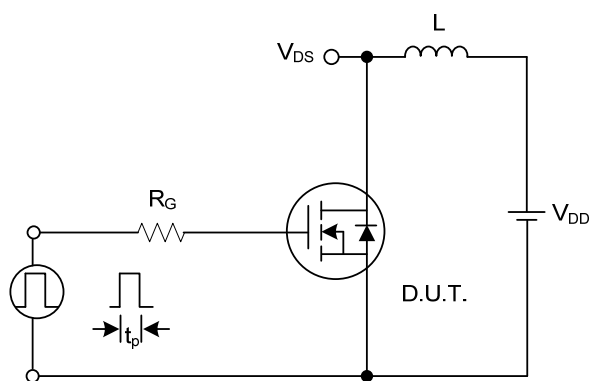


Fig. 4A Unclamped Inductive Switching Test Circuit

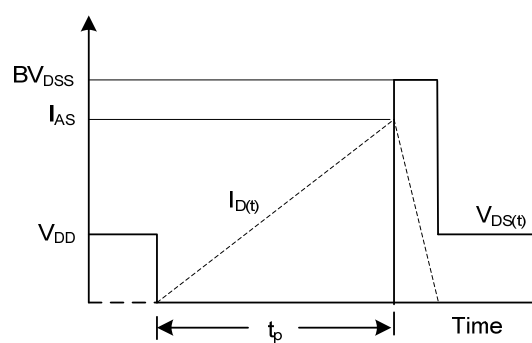
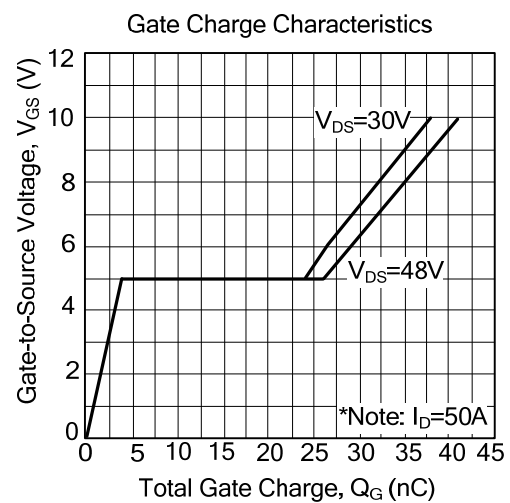
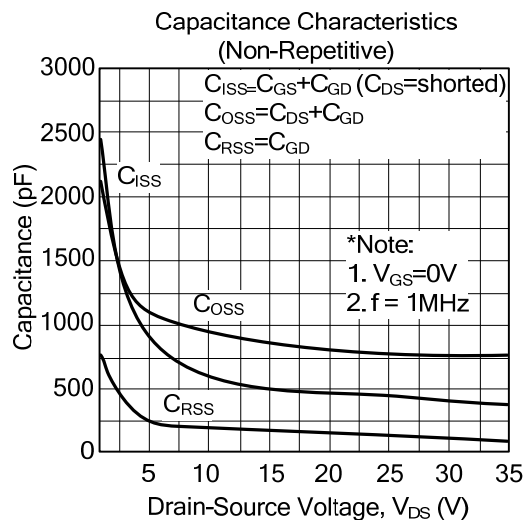
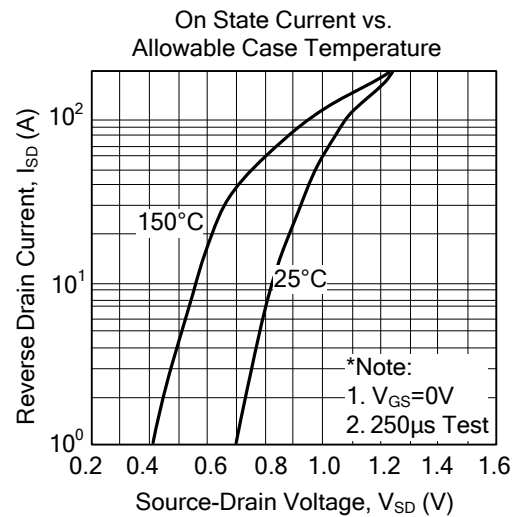
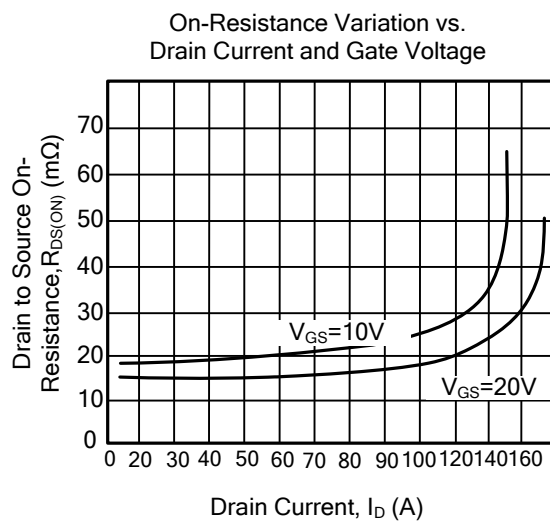
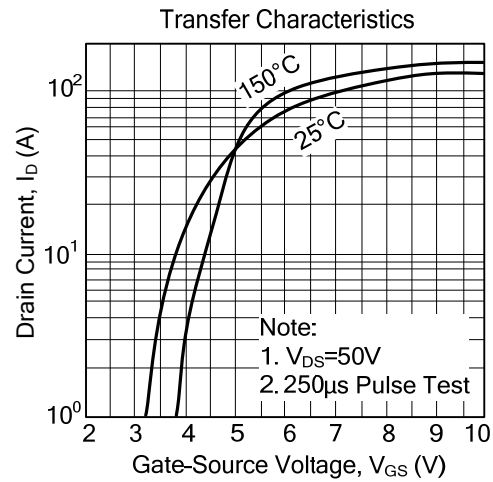
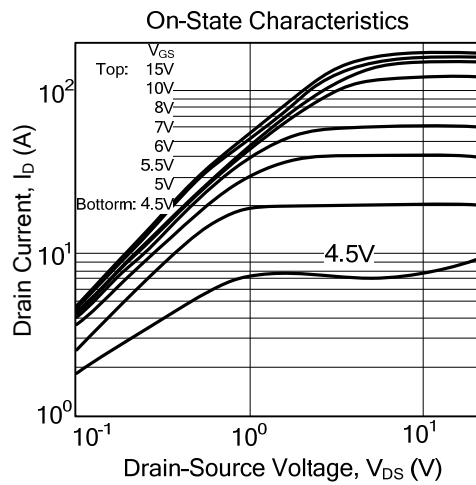
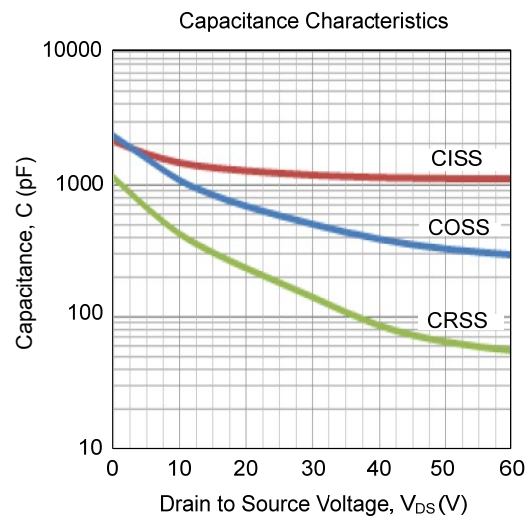
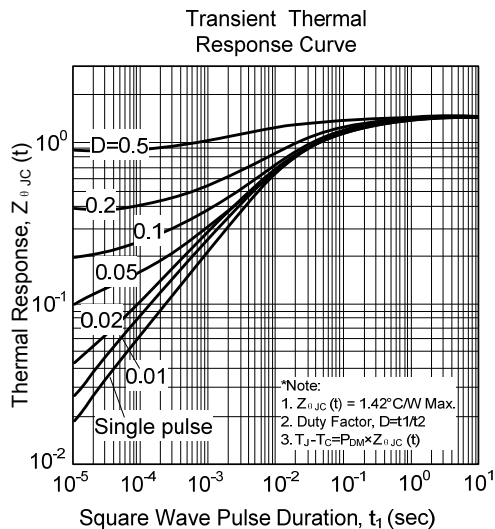
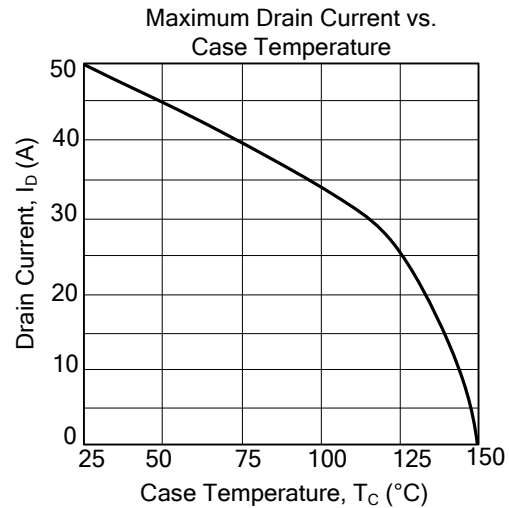
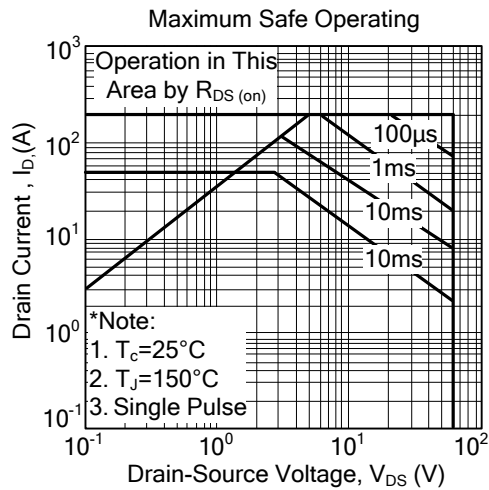
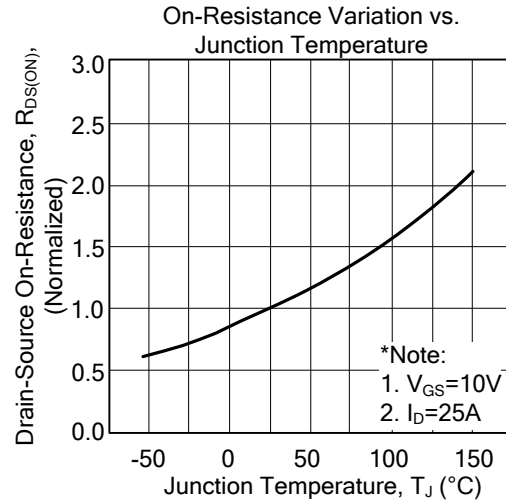
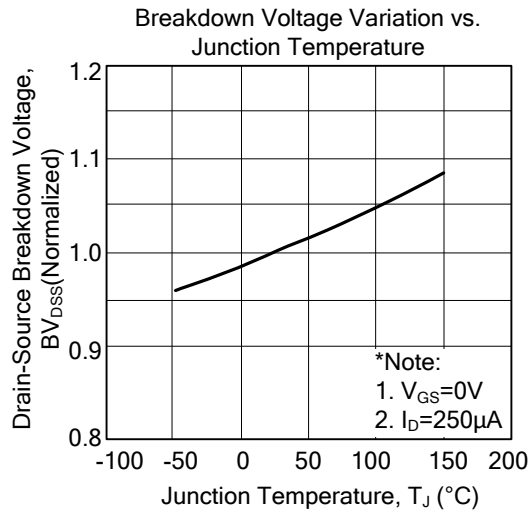


Fig. 4B Unclamped Inductive Switching Waveforms

■ 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. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.