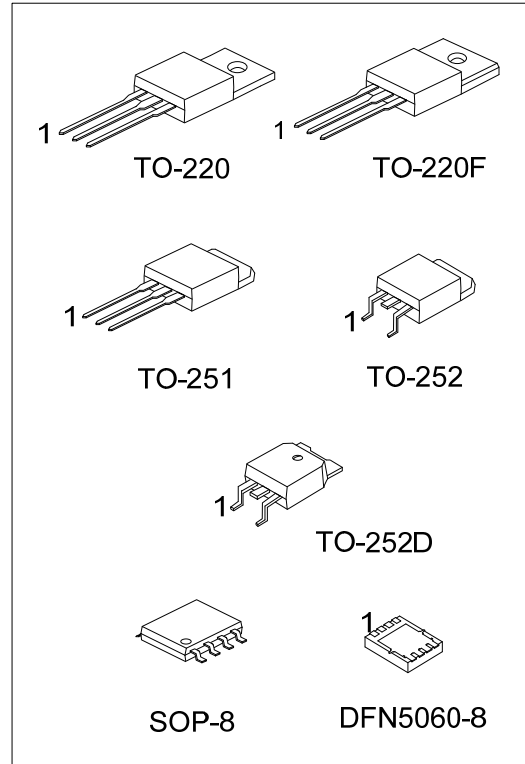
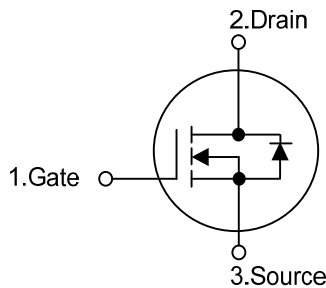


**UTT70N06****Power MOSFET****70 Amps, 60 Volts
N-CHANNEL POWER MOSFET****DESCRIPTION**

The UTC **UTT70N06** 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

- * $R_{DS(ON)} \leq 12 \text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=35\text{A}$
- * Fast switching capability
- * Avalanche energy specified
- * Improved dv/dt capability

SYMBOL**ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UTT70N06L-TA3-T	UTT70N06G-TA3-T	TO-220	G	D	S	-	-	-	-	-	Tube
UTT70N06L-TF3-T	UTT70N06G-TF3-T	TO-220F	G	D	S	-	-	-	-	-	Tube
UTT70N06L-TM3-T	UTT70N06G-TM3-T	TO-251	G	D	S	-	-	-	-	-	Tube
UTT70N06L-TN3-R	UTT70N06G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UTT70N06L-TND-R	UTT70N06G-TND-R	TO-252D	G	D	S	-	-	-	-	-	Tape Reel
UTT70N06L-S08-R	UTT70N06G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel
UTT70N06L-K08-5060-R	UTT70N06G-K08-5060-R	DFN5060-8	S	S	S	G	D	D	D	D	Tape Reel

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

UTT70N06G-TA3-T (1)Packing Type (2)Package Type (3)Green Package		(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TF3: TO-220F, TM3: TO-251 TN3: TO-252, TND: TO-252D, TQ2: TO-263, S08: SOP-8, K08-5060: DFN5060-8 (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING

PACKAGE	MARKING
TO-220 / TO-220F TO-251 / TO-252 TO-252D	UTC UTT70N06 Lot Code → 1 → Date Code L: Lead Free G: Halogen Free
SOP-8	UTC UTT70N06 Lot Code → 1 → Date Code L: Lead Free G: Halogen Free
DFN5060-8	UTC UTT 70N06 Lot Code → 1 → Date Code L: Lead Free G: Halogen Free

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	60	V
Gate-Source Voltage		V_{GSS}	± 20	V
Continuous Drain Current		I_D	70	A
Drain Current Pulsed (Note 2)		I_{DM}	140	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	142	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	2.1	V/ns
Power Dissipation	TO-220	P_D	145	W
	TO-220F		36	W
	TO-251/TO-252 TO-252D		55	W
	SOP-8		7.5	W
	DFN5060-8		50	W
Junction Temperature		T_J	+150	$^\circ\text{C}$
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. Repeatability rating: pulse width limited by junction temperature.

3. $L=0.1\text{mH}$, $I_{AS}=53.3\text{A}$, $V_{DD}=25\text{V}$, $R_G=20\Omega$, Starting $T_J=25^\circ\text{C}$

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

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-220F	θ_{JA}	62.5	$^\circ\text{C}/\text{W}$
	TO-251/TO-252 TO-252D		110	$^\circ\text{C}/\text{W}$
	SOP-8		125	$^\circ\text{C}/\text{W}$
	DFN5060-8		60	$^\circ\text{C}/\text{W}$
Junction to Case	TO-220	θ_{JC}	0.86	$^\circ\text{C}/\text{W}$
	TO-220F		3.47	$^\circ\text{C}/\text{W}$
	TO-251/TO-252 TO-252D		2.2 (Note)	$^\circ\text{C}/\text{W}$
	SOP-8		16.67 (Note)	$^\circ\text{C}/\text{W}$
	DFN5060-8		2.5 (Note)	$^\circ\text{C}/\text{W}$

Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

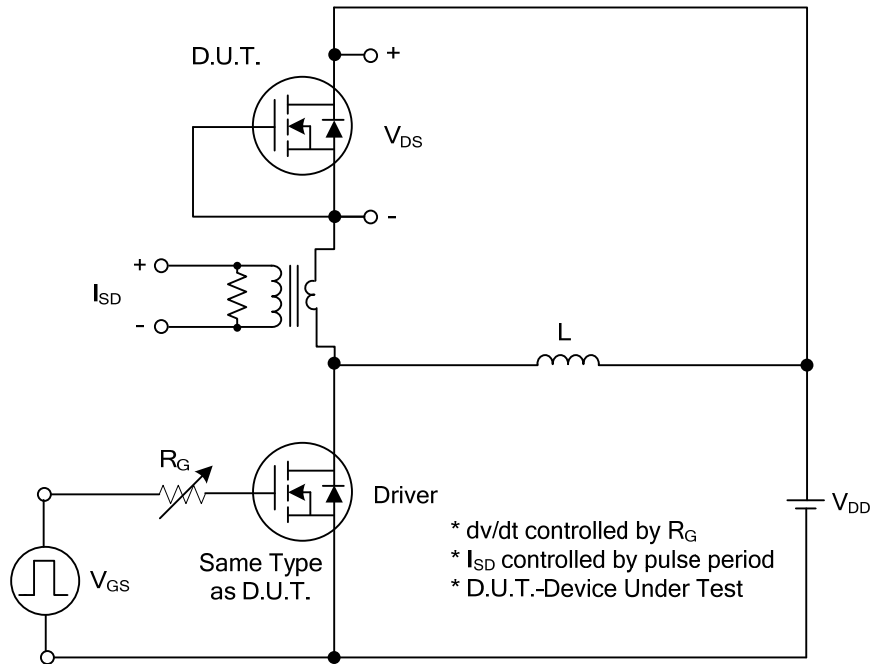
■ ELECTRICAL CHARACTERISTICS (T_J = 25°C, unless otherwise specified)

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			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	2.0		4.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =35A			12	mΩ
DYNAMIC CHARACTERISTICS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1MHz		3000		pF
Output Capacitance		C _{OSS}			300		pF
Reverse Transfer Capacitance		C _{RSS}			260		pF
SWITCHING CHARACTERISTICS							
Total Gate Charge		Q _G	V _{DS} =48V, V _{GS} =10V, I _D =70A, I _G =1mA (Note 1, 2)		78		nC
Gate-Source Charge		Q _{GS}			15		nC
Gate-Drain Charge (Miller Charge)		Q _{GD}			25		nC
Turn-On Delay Time		t _{D(ON)}	V _{DD} =30V, V _{GS} =10V, I _D =70A (Note 1, 2)		14		ns
Turn-On Rise Time		t _R			18		ns
Turn-Off Delay Time		t _{D(OFF)}			40		ns
Turn-Off Fall Time		t _F			22		ns
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS							
Maximum Continuous Drain-Source Diode Forward Current		I _S				70	A
Maximum Pulsed Drain-Source Diode Forward Current		I _{SM}				140	
Drain-Source Diode Forward Voltage		V _{SD}	V _{GS} =0V, I _S =70A			1.4	V
Reverse Recovery Time		t _{rr}	V _{GS} =0V, I _S =70A		43		ns
Reverse Recovery Charge		Q _{rr}	dI _F /dt=100A/μs		90		nC

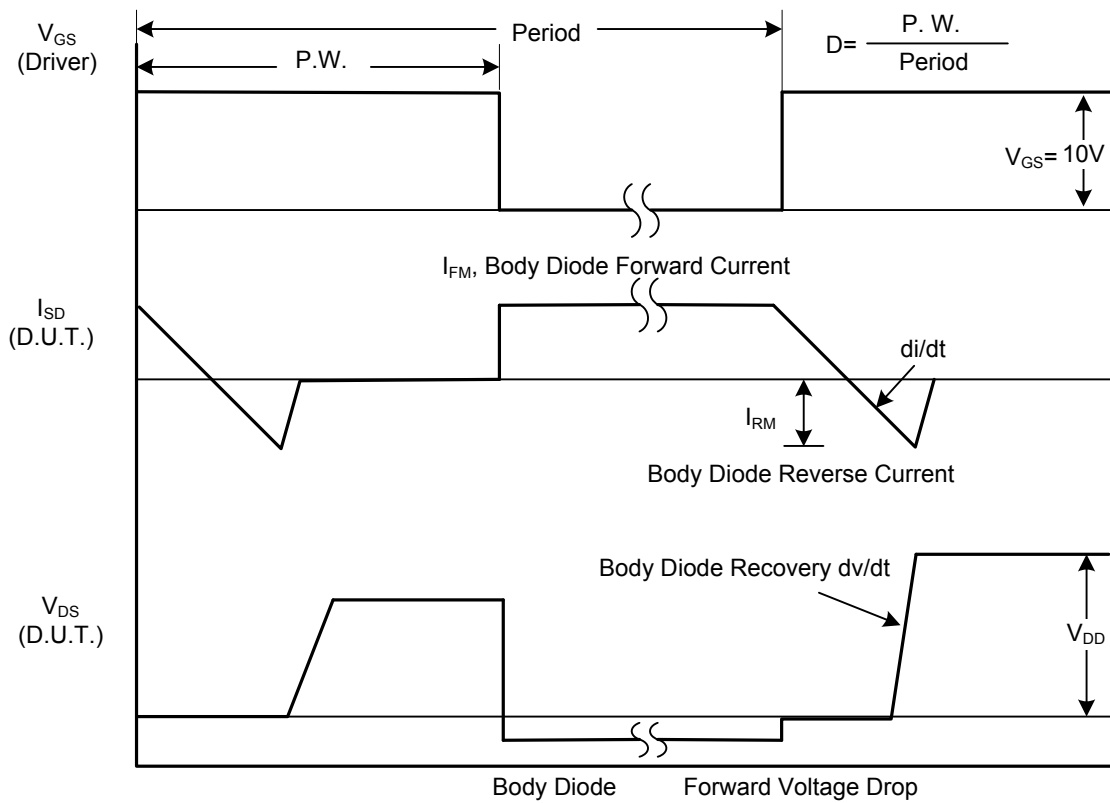
Notes: 1. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS



1A Peak Diode Recovery dv/dt Test Circuit



1B Peak Diode Recovery dv/dt Waveforms

■ TEST CIRCUITS AND WAVEFORMS

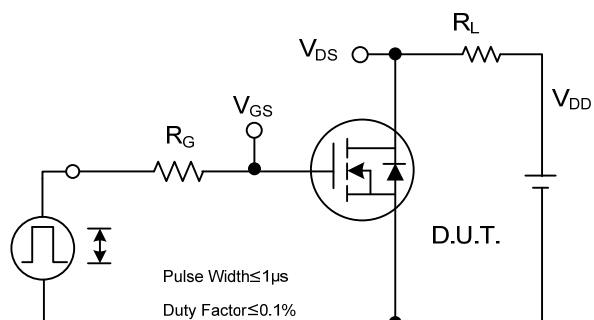


Fig. 2A Switching Test Circuit

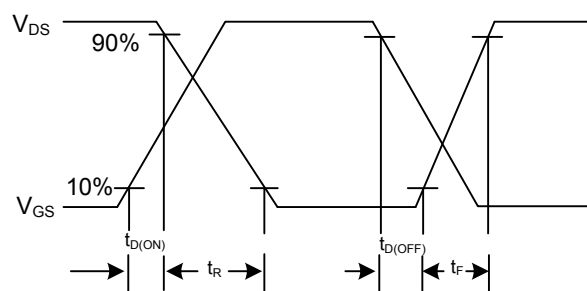


Fig. 2B Switching Waveforms

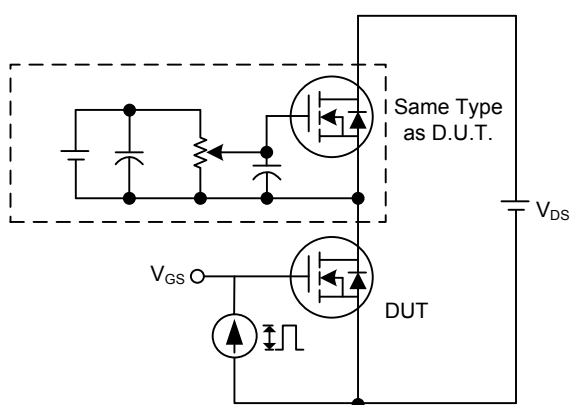


Fig. 3A Gate Charge Test Circuit

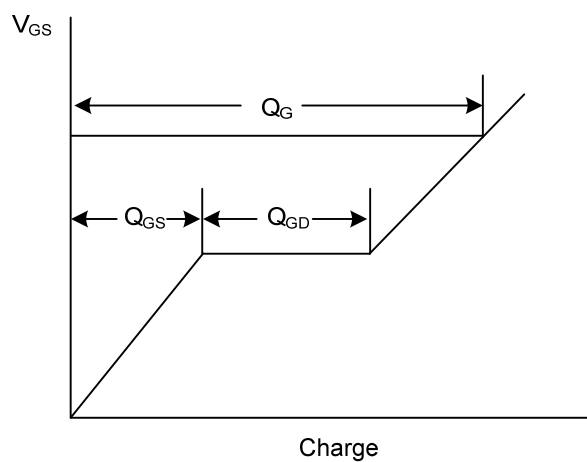


Fig. 3B Gate Charge Waveform

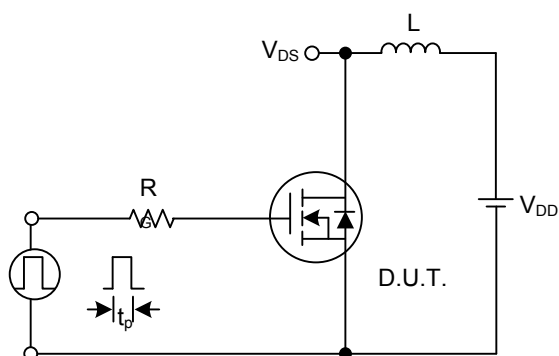


Fig. 4A Unclamped Inductive Switching Test Circuit

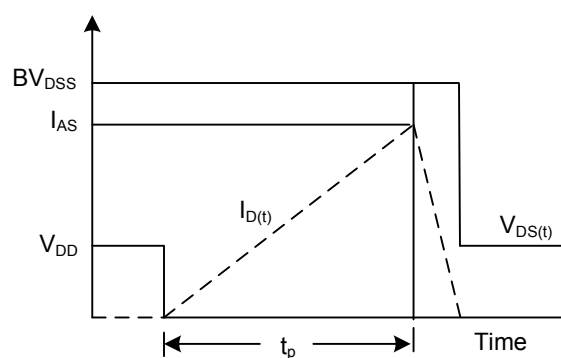
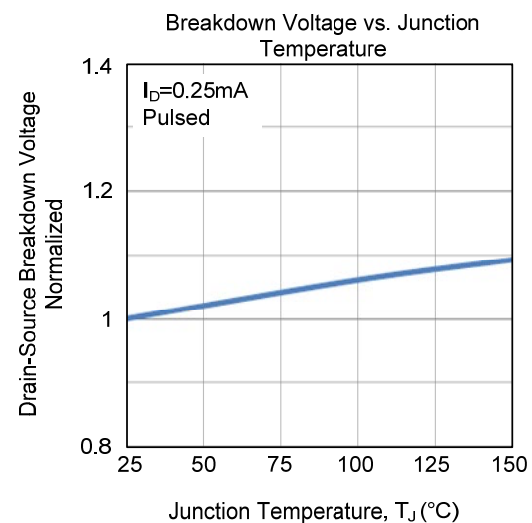
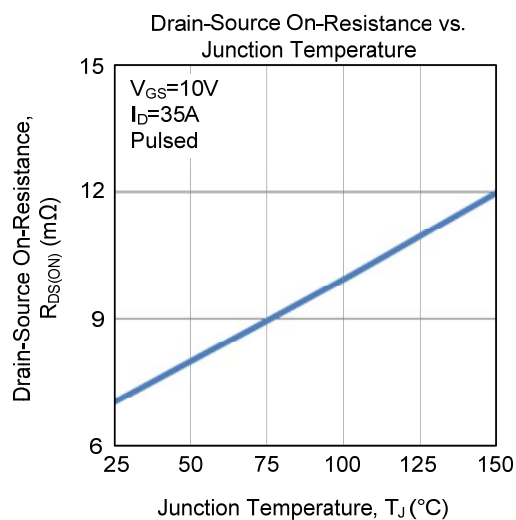
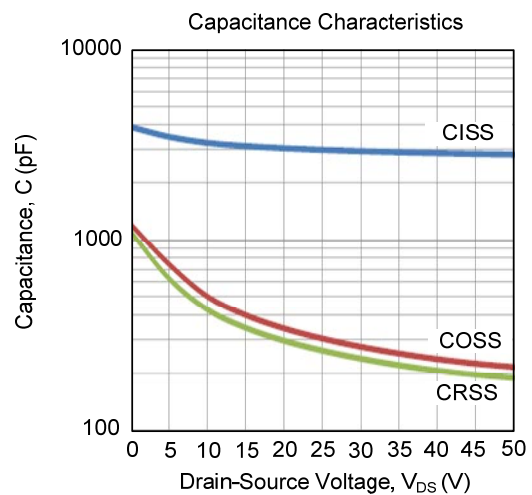
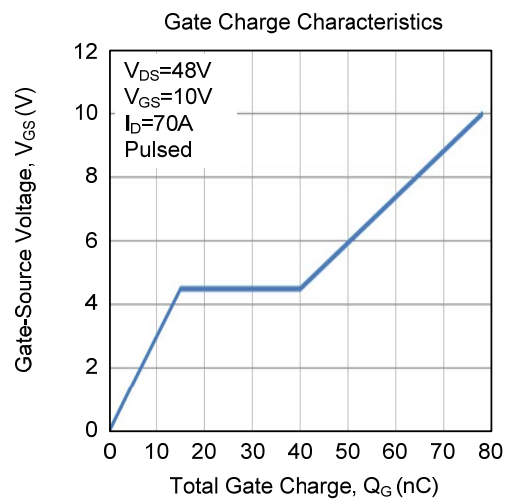
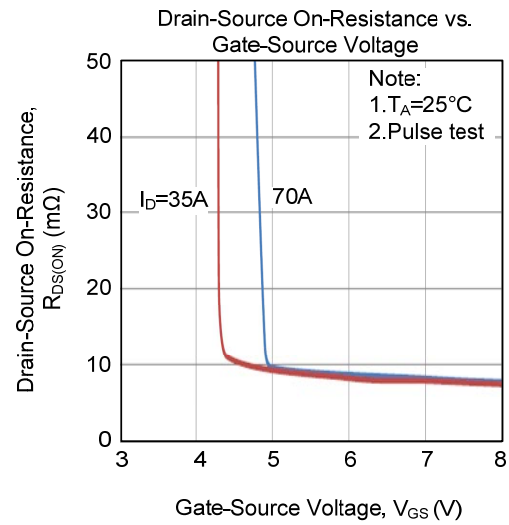
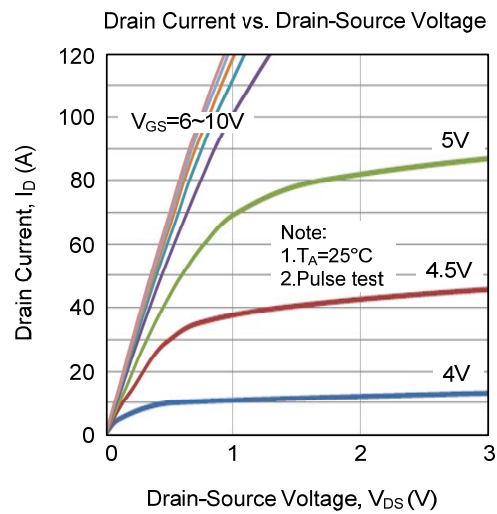
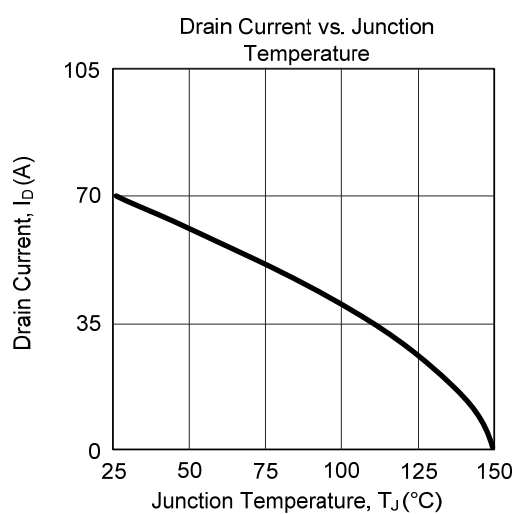
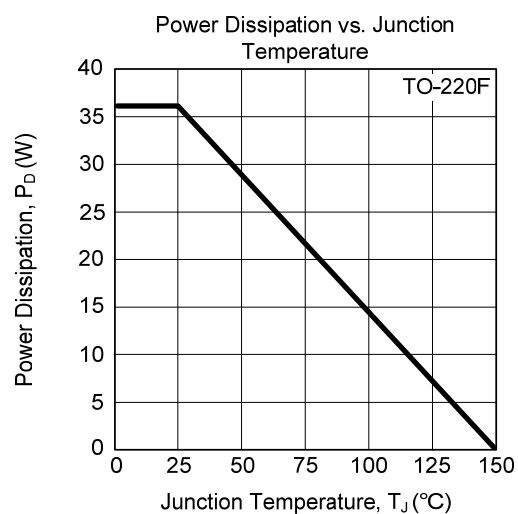
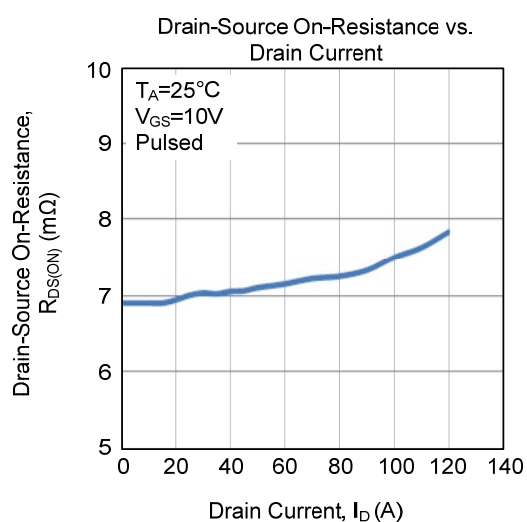
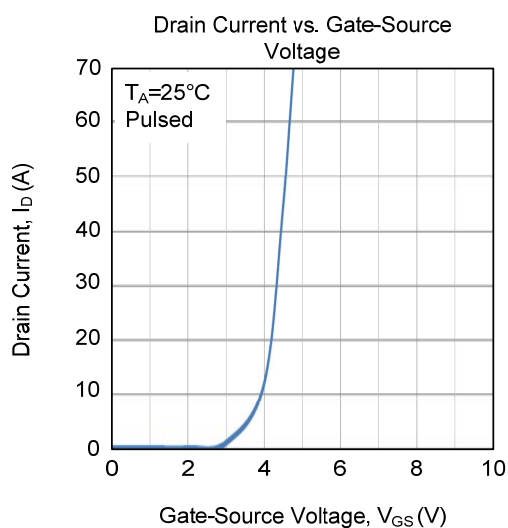
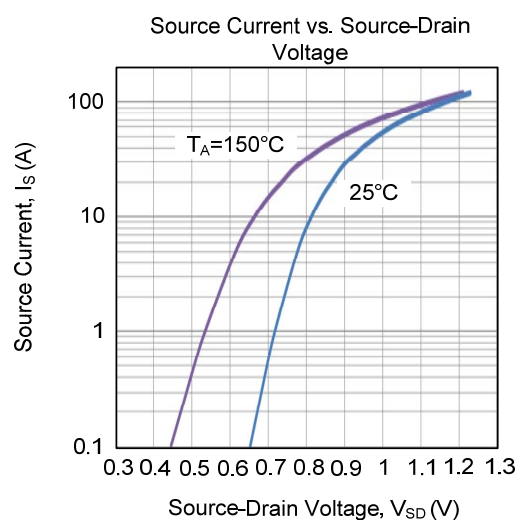
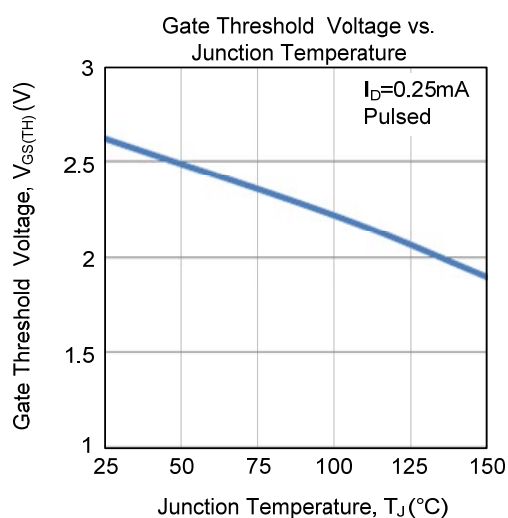


Fig. 4B Unclamped Inductive Switching Waveforms

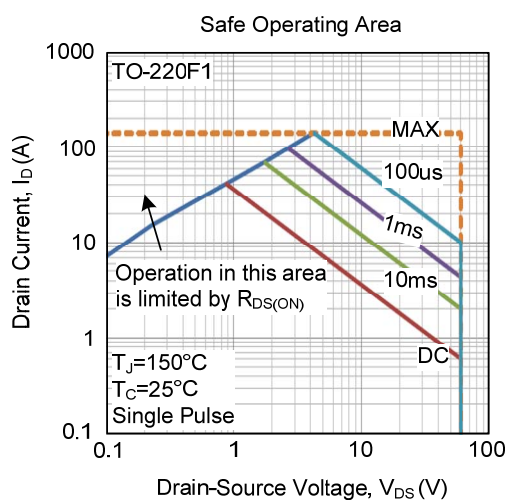
TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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