



UTT100N75H

POWER MOSFET

100A, 75V N-CHANNEL POWER MOSFET

DESCRIPTION

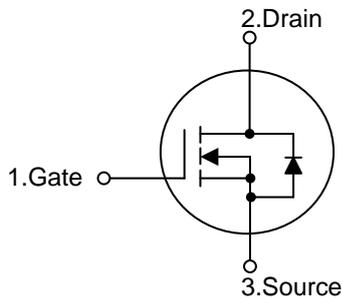
The UTC **UTT100N75H** is a N-channel Power MOSFET, it uses UTC's advanced technology to provide excellent $R_{DS(ON)}$ with low gate charge, etc.

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

FEATURES

- * $R_{DS(ON)} \leq 8.0 \text{ m}\Omega @ V_{GS}=10V, I_D=50A$
- * High power and current handling capability
- * High speed switching
- * Low gate charge

SYMBOL

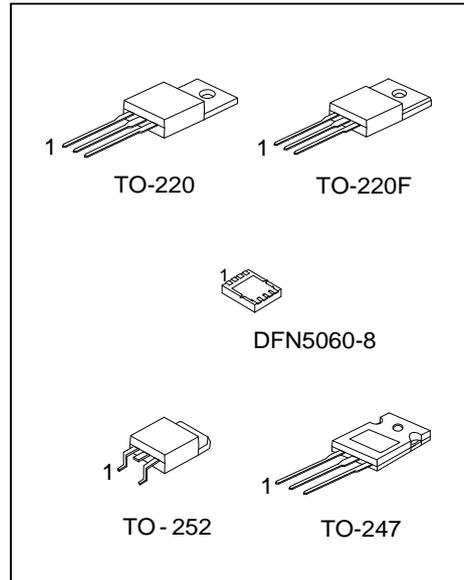


ORDERING INFORMATION

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-K08-5060-R	UTT100N75HG-K08-5060-R	DFN5060-8	S	S	S	G	D	D	D	D	Tape Reel

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

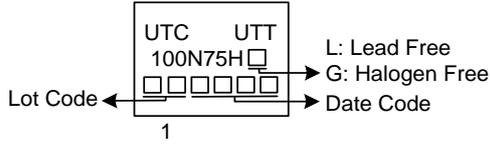
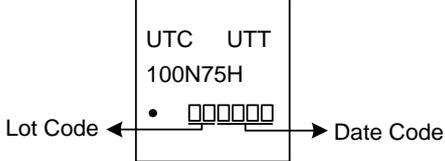
<p>UTT100N75HG-TA3-T</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) TA3: TO-220, TF3: TO-220F, TN3: TO-252 T47: TO-247, K08-5060: DFN5060-8</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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UTT100N75H

Power MOSFET

MARKING

TO-220 / TO-220F / TO-252 / TO-247	DFN5060-8
 <p>UTC UTT 100N75H □ □ □ □ □ □ 1</p> <p>Lot Code ← → Date Code</p> <p>L: Lead Free G: Halogen Free</p>	 <p>UTC UTT 100N75H • □ □ □ □ □</p> <p>Lot Code ← → 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}	400	A
Peak diode recovery voltage			dv/dt	3.86	V/ns
Avalanche Energy (Note 3)			E_{AS}	162	mJ
Power Dissipation	$T_C = 25^\circ\text{C}$	TO-220	P_D	180	W
		TO-220F		45	W
		TO-252		83	W
		TO-247		230	W
		DFN5060-8		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. $L=0.5\text{mH}$, $I_{AS}=25.2\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\ \Omega$, 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	$^\circ\text{C/W}$		
		TO-220F					
		TO-252				110	$^\circ\text{C/W}$
		TO-247				30	$^\circ\text{C/W}$
		DFN5060-8				35.7	$^\circ\text{C/W}$
Junction to Case	steady state	TO-220	θ_{JC}	0.69	$^\circ\text{C/W}$		
		TO-220F		2.77	$^\circ\text{C/W}$		
		TO-252		1.5 (Note)	$^\circ\text{C/W}$		
		TO-247		0.54	$^\circ\text{C/W}$		
		DFN5060-8		2 (Note)	$^\circ\text{C/W}$		

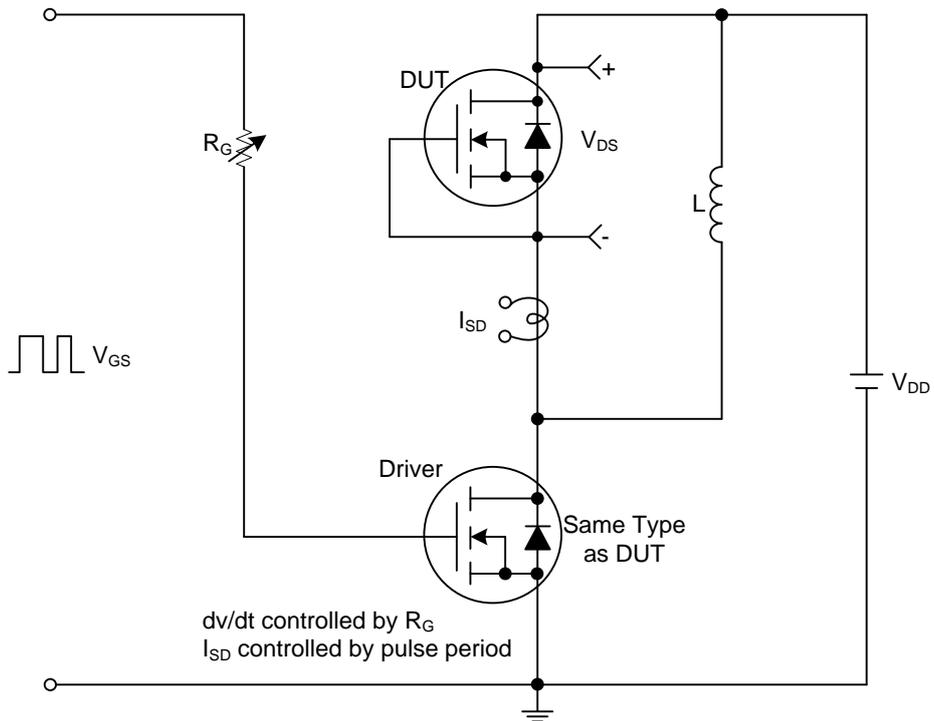
Note: The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.

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

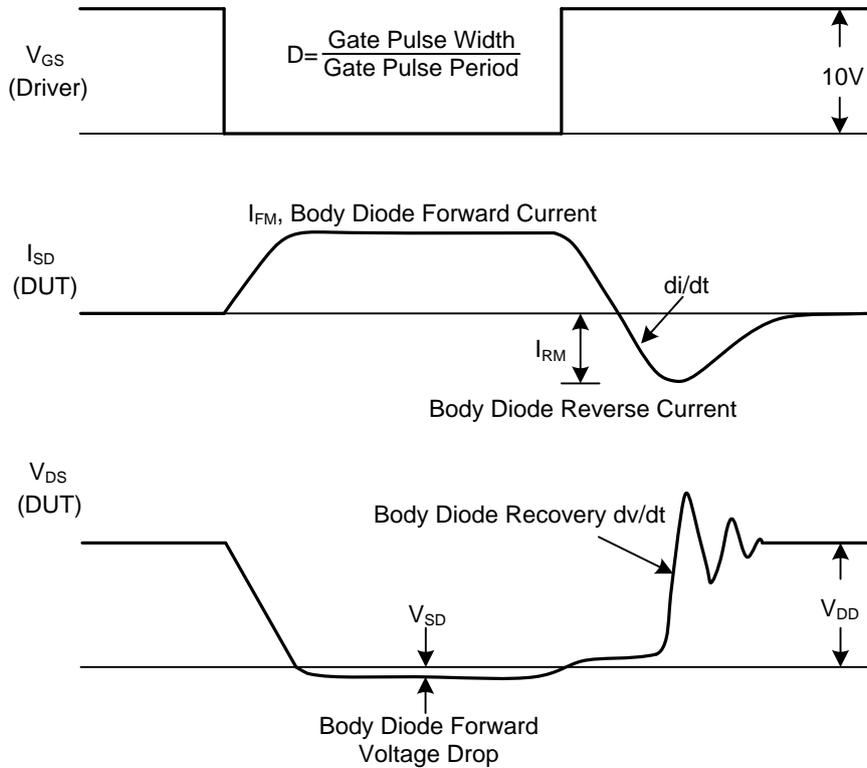
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=250\mu\text{A}, V_{GS}=0\text{V}$	75			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=75\text{V}, V_{GS}=0\text{V}, T_C=25^\circ\text{C}$			1	μA
		$V_{DS}=75\text{V}, V_{GS}=0\text{V}, T_C=125^\circ\text{C}$			10	μA
Gate-Source Leakage Current	Forward	I_{GSS}				
	Reverse					
		$V_{GS}=+20\text{V}, V_{DS}=0\text{V}$			+100	nA
		$V_{GS}=-20\text{V}, V_{DS}=0\text{V}$			-100	nA
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-State Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}, I_D=50\text{A}$			8.0	m Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{GS}=0\text{V}, V_{DS}=25\text{V}, f=1.0\text{MHz}$		3929		pF
Output Capacitance	C_{OSS}			364		pF
Reverse Transfer Capacitance	C_{RSS}			225		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	$V_{DS}=60\text{V}, V_{GS}=10\text{V}, I_D=100\text{A}$ $I_D=1\text{mA}$		73		nC
Gate to Source Charge	Q_{GS}			16		nC
Gate to Drain Charge	Q_{GD}			24		nC
Turn-on Delay Time	$t_{D(ON)}$	$V_{DD}=37.5\text{V}, V_{GS}=10\text{V}, I_D=100\text{A}$ $R_G=3\Omega$		26		ns
Rise Time	t_R			20		ns
Turn-off Delay Time	$t_{D(OFF)}$			31		ns
Fall-Time	t_F			22		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Continuous Drain-Source Diode Forward Current	I_S				100	A
Pulsed Drain-Source Diode Forward Current	I_{SD}				400	A
Drain-Source Diode Forward Voltage (Note 1)	V_{SD}	$I_S=100\text{A}, V_{GS}=0\text{V}$			1.2	V
Body Diode Reverse Recovery Time (Note 1)	t_{rr}	$I_S=30\text{A}, di_S/dt=100\text{A}/\mu\text{s}$		35		ns
Body Diode Reverse Recovery Charge (Note 1)	Q_{rr}			58		nC

Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.
2. Essentially independent of operating temperature.

TEST CIRCUITS AND WAVEFORMS



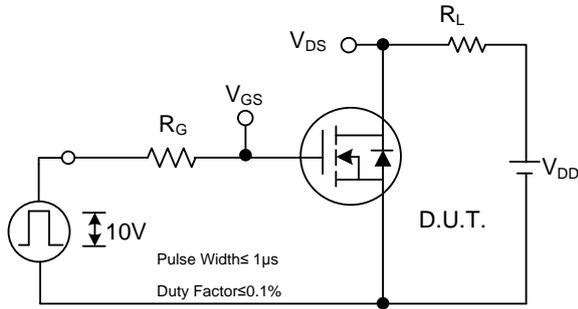
Peak Diode Recovery dv/dt Test Circuit



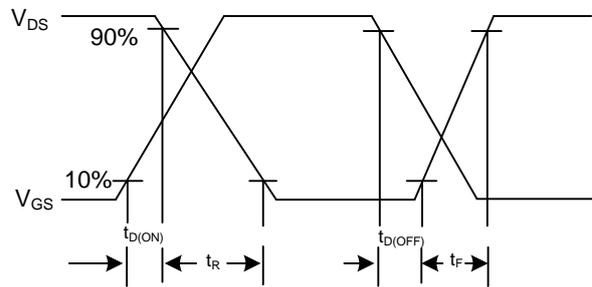
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

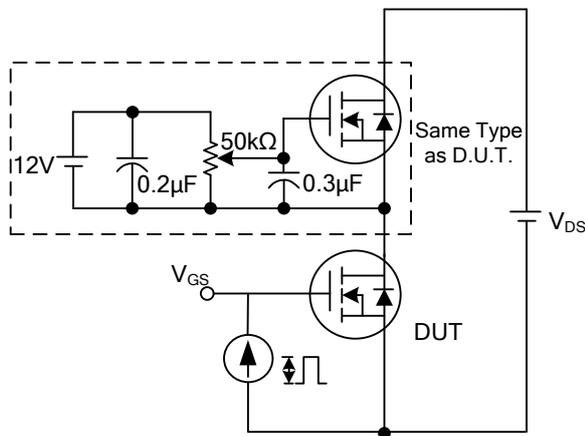
TEST CIRCUITS AND WAVEFORMS



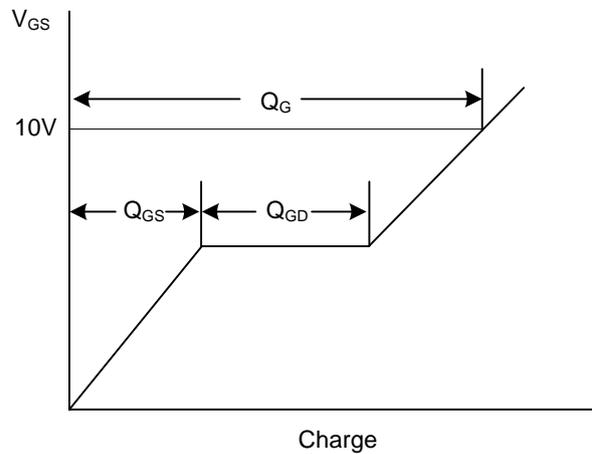
Switching Test Circuit



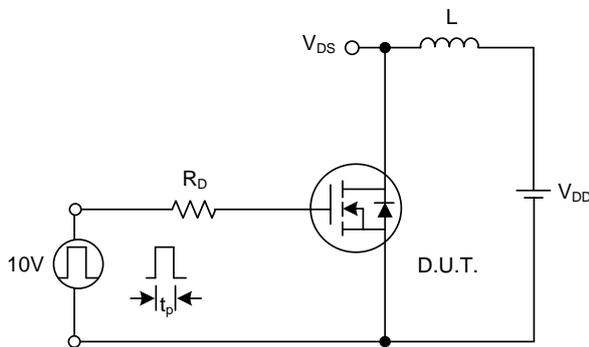
Switching Waveforms



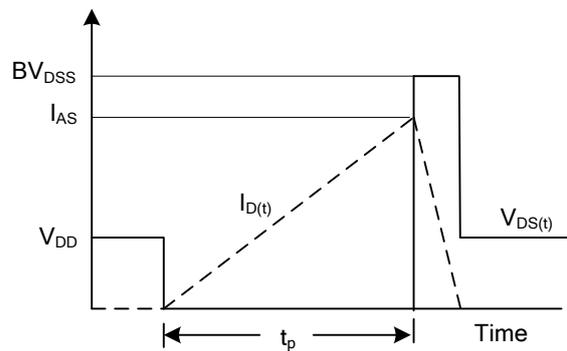
Gate Charge Test Circuit



Gate Charge Waveform

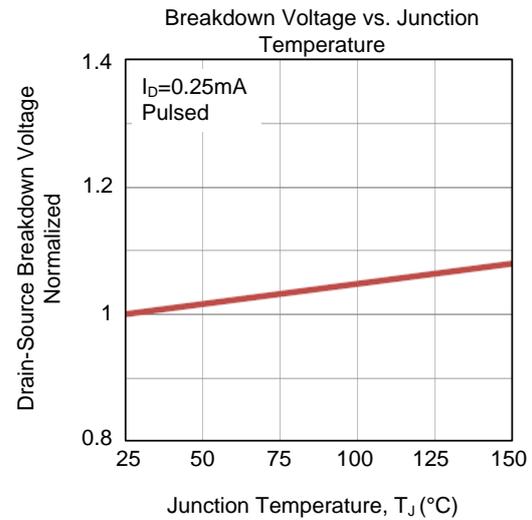
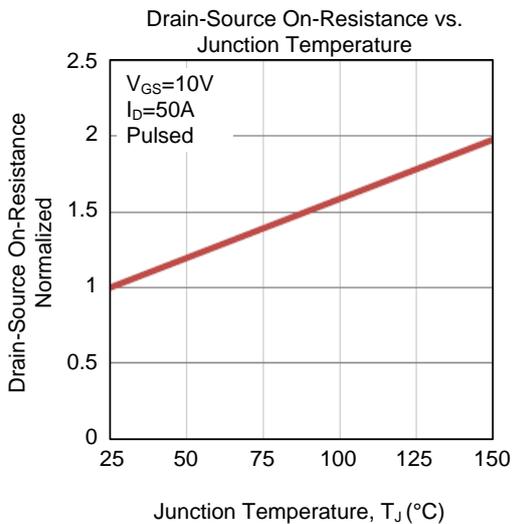
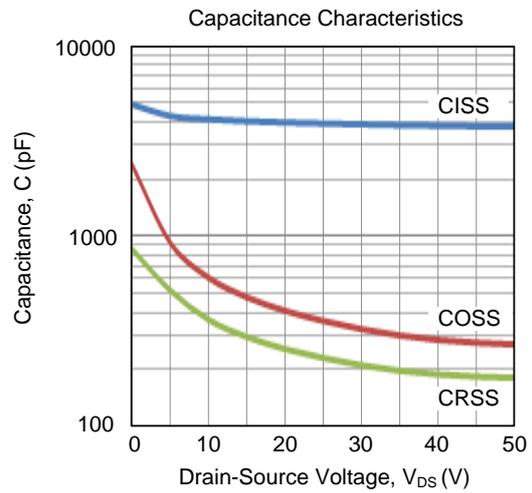
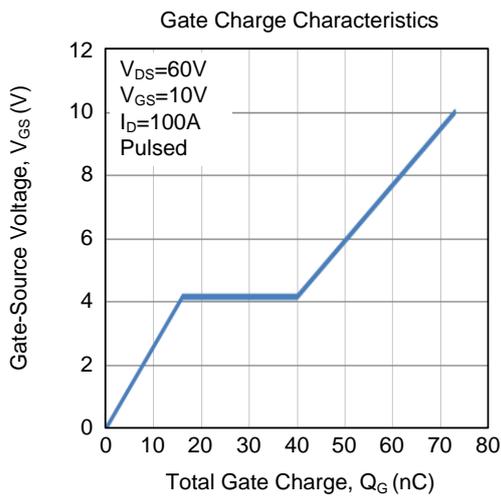
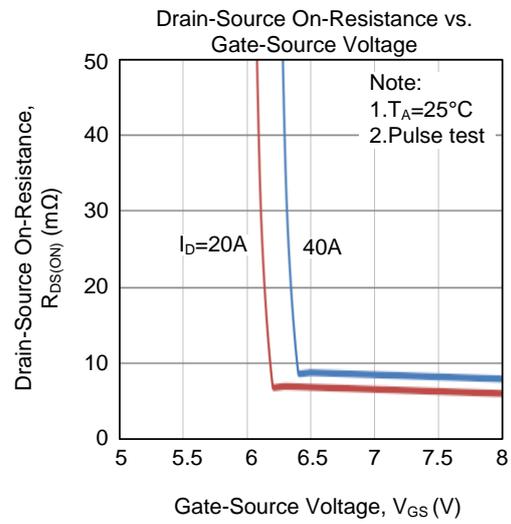
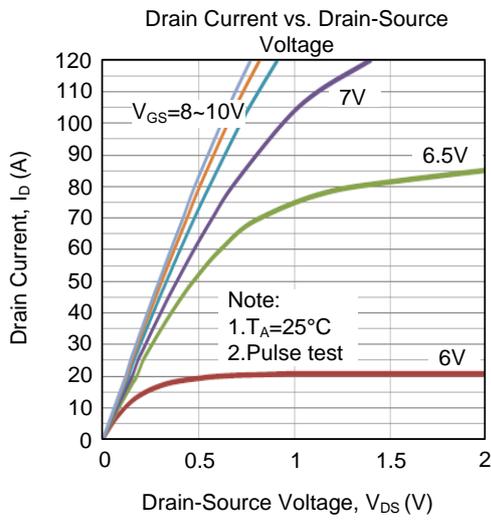


Unclamped Inductive Switching Test Circuit

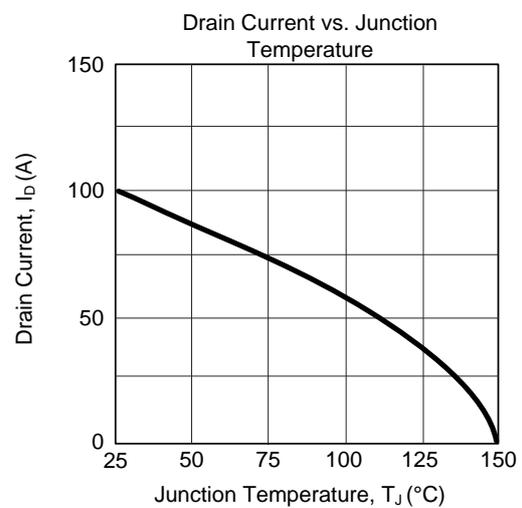
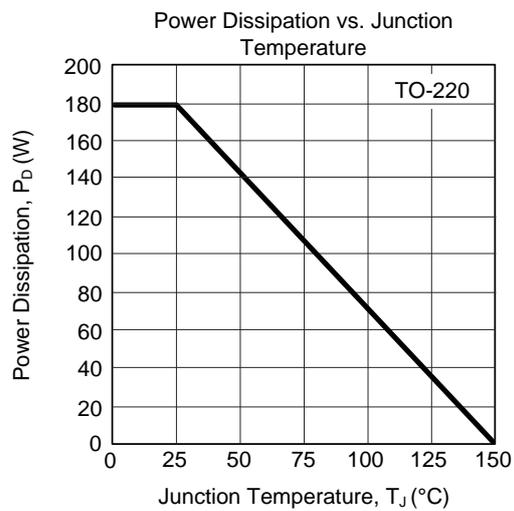
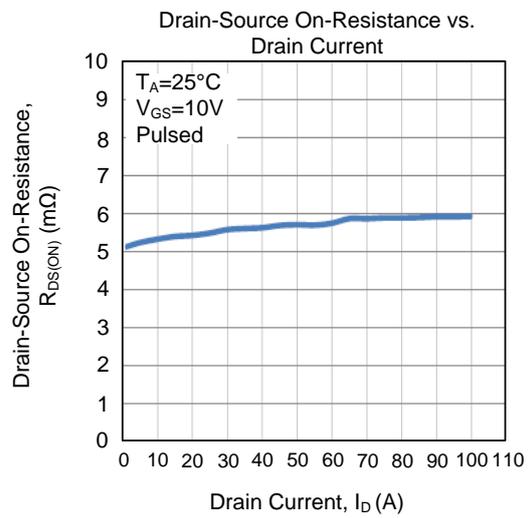
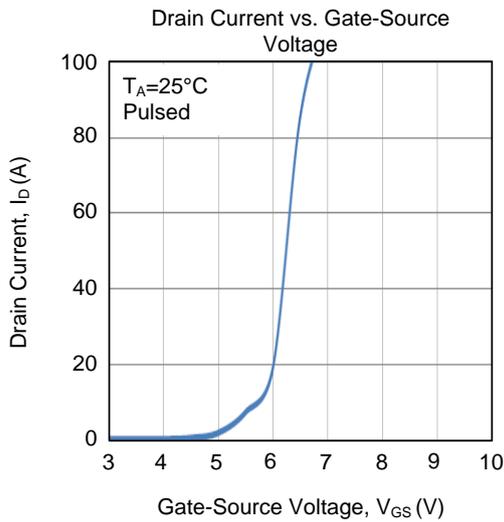
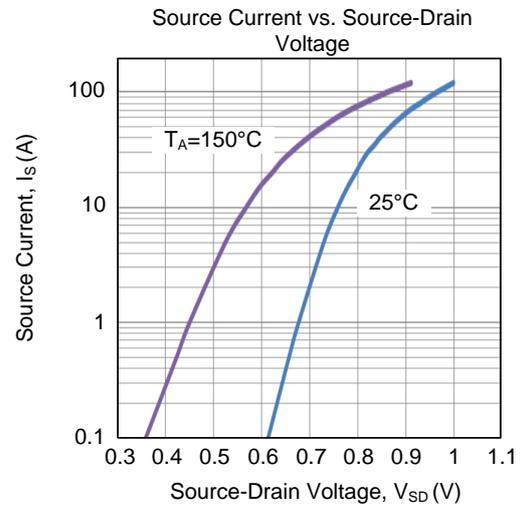
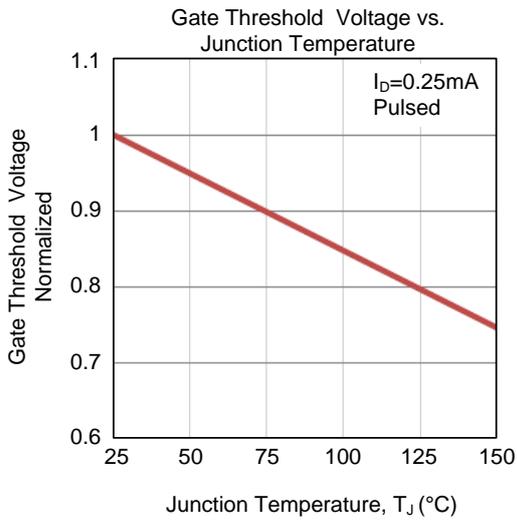


Unclamped Inductive Switching Waveforms

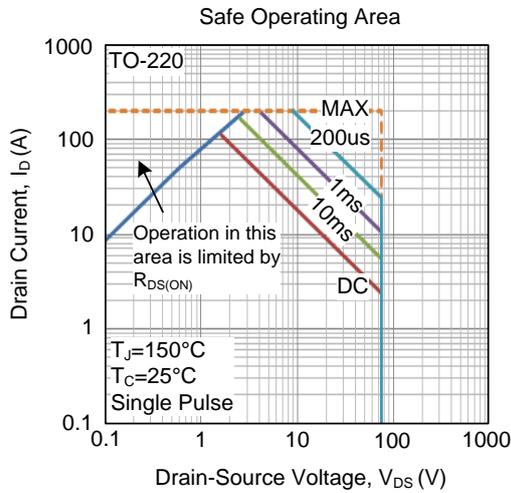
TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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