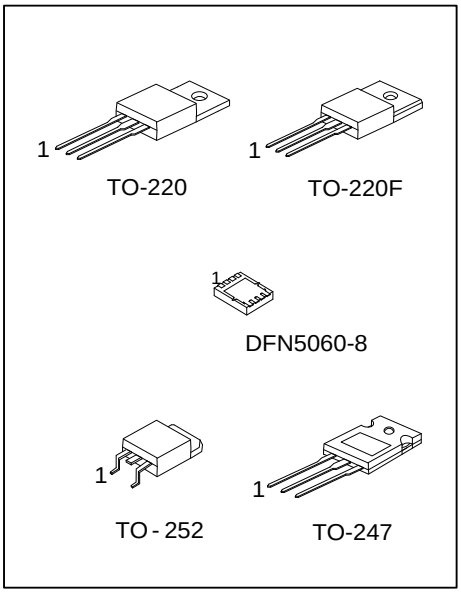
UTT100N75H

POWER MOSFET

100A, 75V N-CHANNEL POWER MOSFET



■ DESCRIPTION

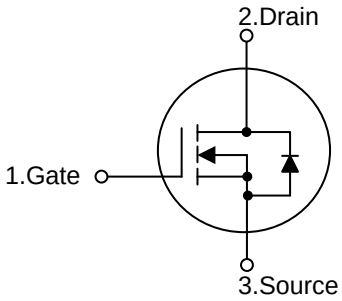
The UTC **UTT100N75H** is a N-channel Power MOSFET, it uses UTC's advanced technology to provide excellent $R_{DS(On)}$ with low gate charge, etc.

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

■ FEATURES

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

■ SYMBOL



■ ORDERING INFORMATION

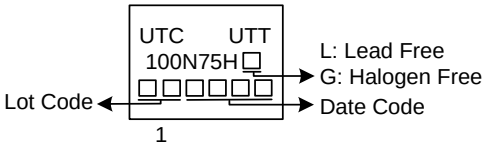
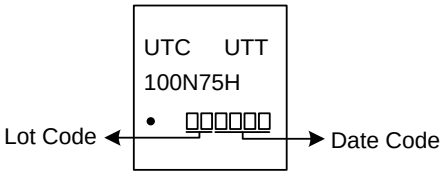
Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UTT100N75HL-TA3-T	UTT100N75HG-TA3-T	TO-220	G	D	S	-	-	-	-	-	Tube
UTT100N75HL-TF3-T	UTT100N75HG-TF3-T	TO-220F	G	D	S	-	-	-	-	-	Tube
UTT100N75HL-TN3-R	UTT100N75HG-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UTT100N75HL-T47-T	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

UTT100N75HG-TA3-T
(1)Packing Type
(2)Package Type
(3)Green Package

(1) T: Tube, R: Tape Reel
(2) TA3: TO-220, TF3: TO-220F, TN3: TO-252
T47: TO-247, K08-5060: DFN5060-8
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

TO-220 / TO-220F / TO-252 / TO-247	DFN5060-8
	

■ ABSOLUTE MAXIMUM RATING (T_A =25°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°C	I_D	100	A
		T_C=100°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°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	°C
Storage Temperature Range			T_{STG}	-55 ~ +150	°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=0.5mH, I_{AS}=25.2A, V_{DD}=50V, R_G=25 Ω, Starting T_J = 25°C
4. I_{SD}≤30A, di/dt≤200A/μs, V_{DD}≤ BV_{DSS}, Starting T_J = 25°C

■ THERMAL RESISTANCES CHARACTERISTICS

PARAMETER			SYMBOL	RATINGS	UNIT
Junction to Ambient	steady state	TO-220 TO-220F	$θ_{JA}$	62.5	°C/W
		TO-252		110	°C/W
		TO-247		30	°C/W
		DFN5060-8		35.7	°C/W
Junction to Case	steady state	TO-220	$θ_{JC}$	0.69	°C/W
		TO-220F		2.77	°C/W
		TO-252		1.5 (Note)	°C/W
		TO-247		0.54	°C/W
		DFN5060-8		2 (Note)	°C/W

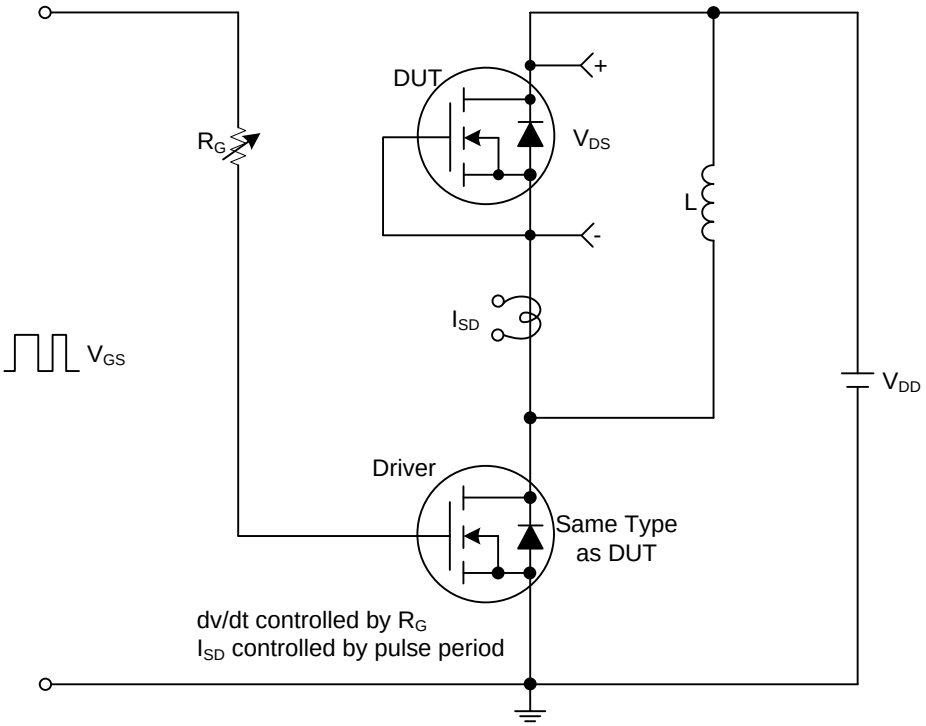
Note: The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.

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

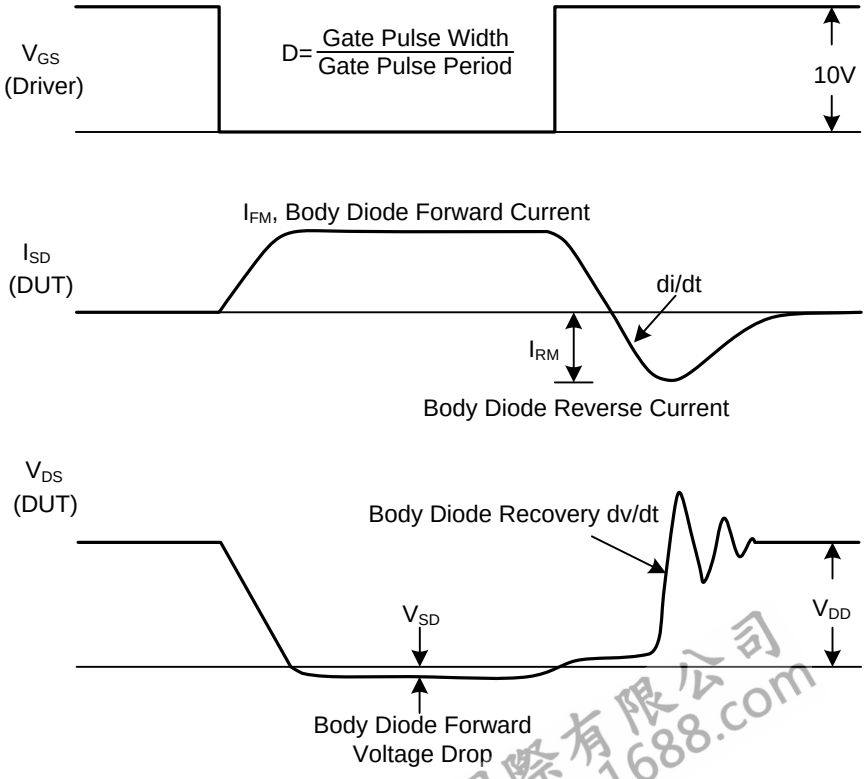
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{GS}=0V	75			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=75V, V_{GS}=0V,T_C=25°C			1	μA
			V_{DS}=75V, V_{GS}=0V,T_C=125°C			10	μA
Gate-Source Leakage Current	Forward	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=50A			8.0	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=25V, f=1.0MHz		3929		pF
Output Capacitance		C_{OSS}			364		pF
Reverse Transfer Capacitance		C_{RSS}			225		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	V_{DS}=60V, V_{GS}=10V, I_D=100A I_D=1mA		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}=37.5V, V_{GS}=10V, I_D=100A R_G=3Ω		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=100A, V_{GS}=0V			1.2	V
Body Diode Reverse Recovery Time (Note 1)		t_{rr}	I_S=30A, dI_S/dt=100A/μs		35		ns
Body Diode Reverse Recovery Charge (Note 1)		Q_{rr}			58		nC

Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.
2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS



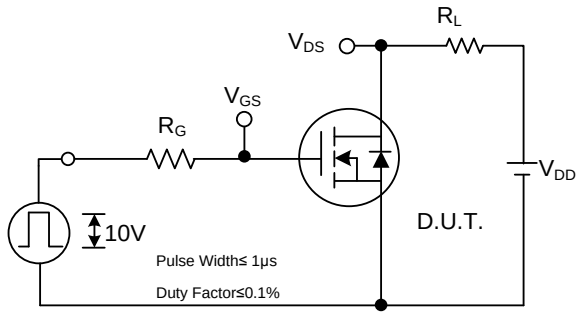
Peak Diode Recovery dv/dt Test Circuit



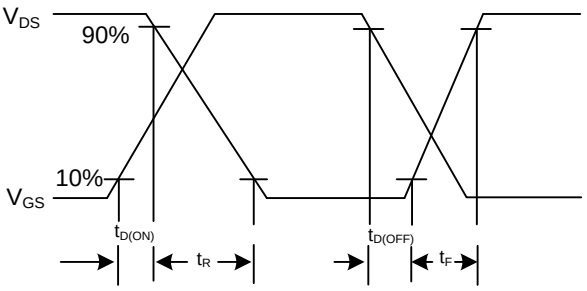
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

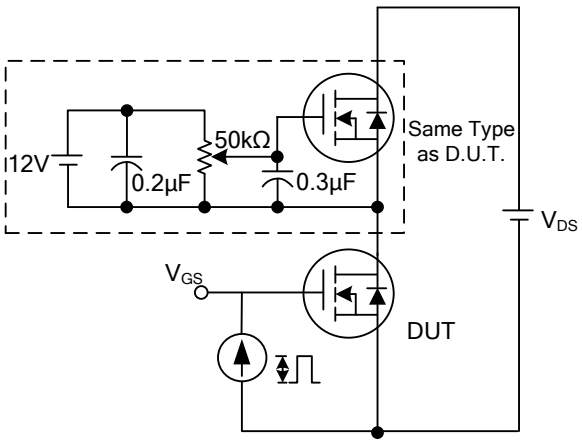
■ TEST CIRCUITS AND WAVEFORMS



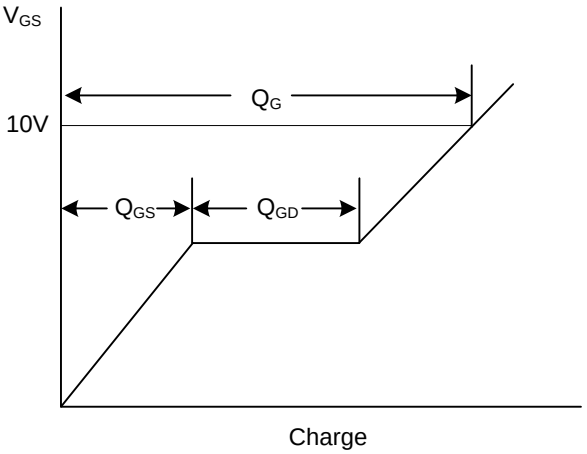
Switching Test Circuit



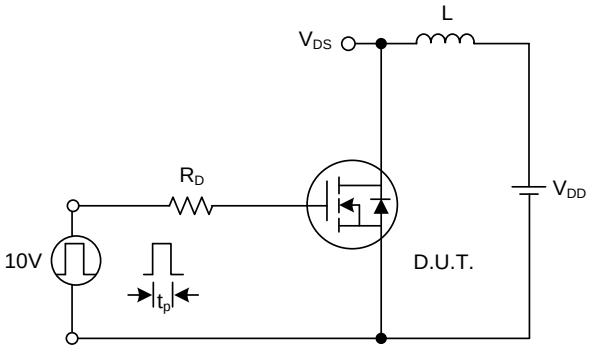
Switching Waveforms



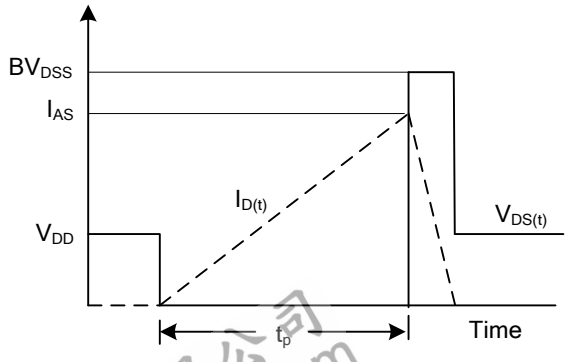
Gate Charge Test Circuit



Gate Charge Waveform



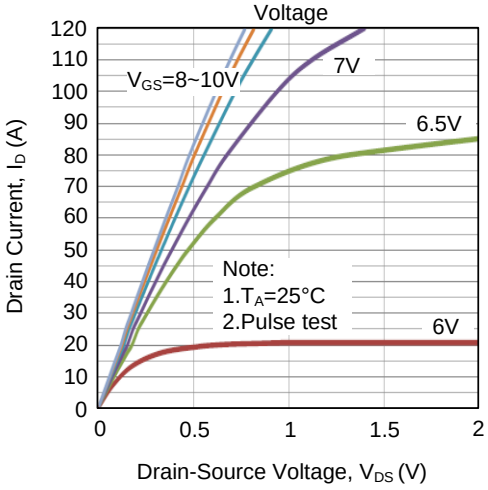
Unclamped Inductive Switching Test Circuit



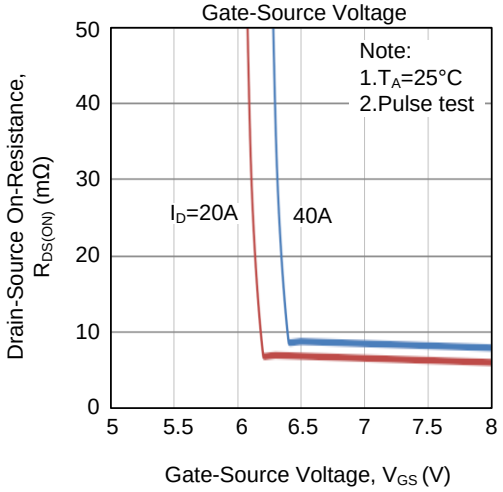
Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS

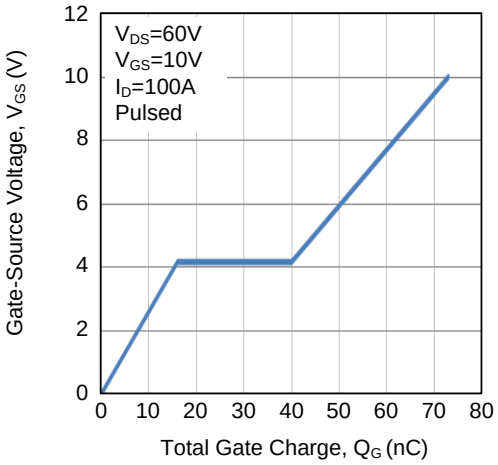
Drain Current vs. Drain-Source Voltage



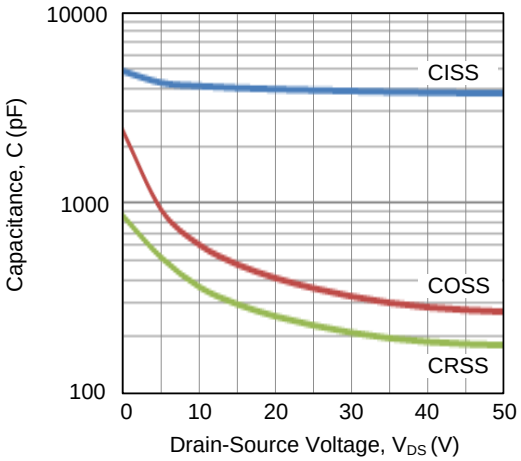
Drain-Source On-Resistance vs. Gate-Source Voltage



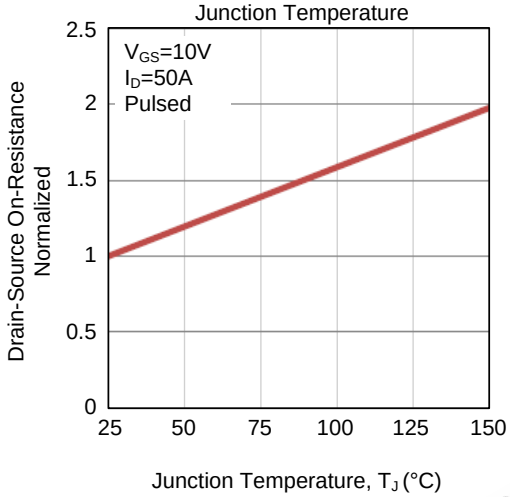
Gate Charge Characteristics



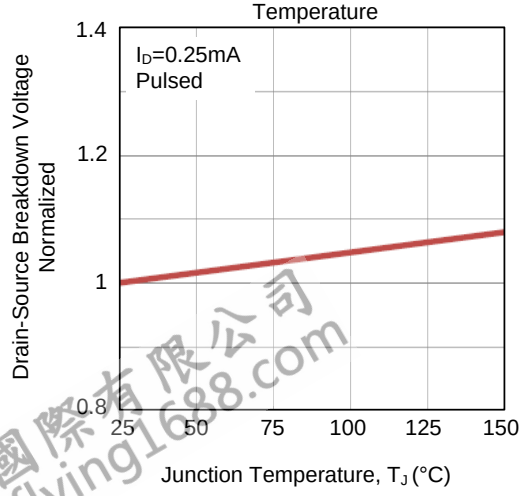
Capacitance Characteristics



Drain-Source On-Resistance vs. Junction Temperature

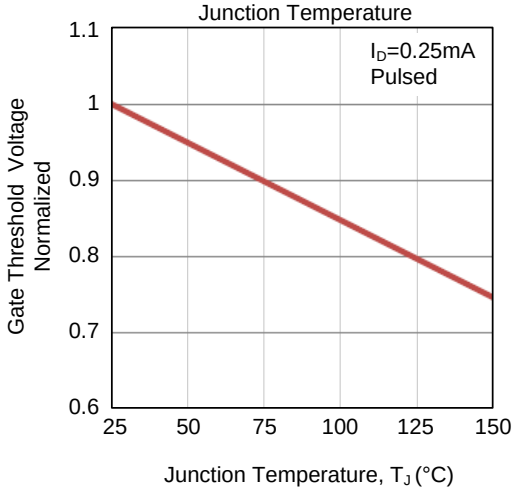


Breakdown Voltage vs. Junction Temperature

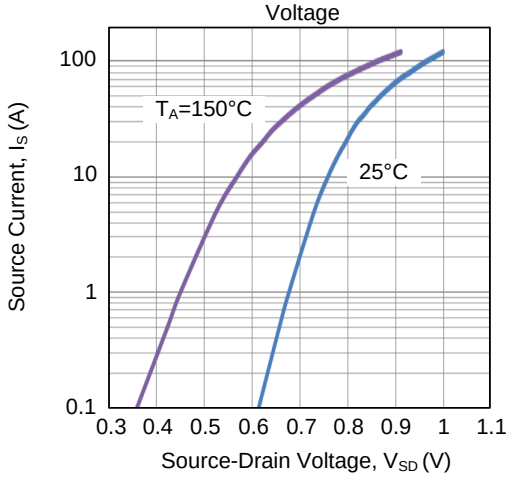


■ TYPICAL CHARACTERISTICS (Cont.)

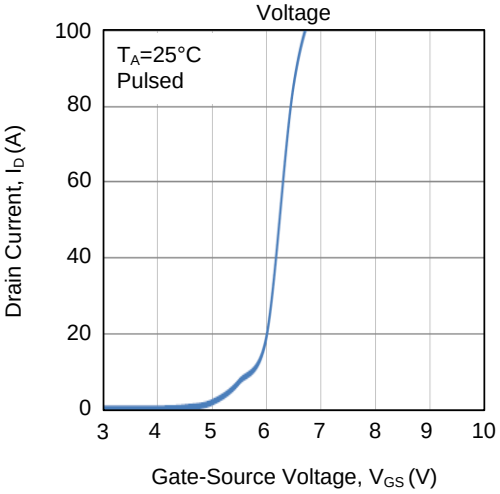
Gate Threshold Voltage vs. Junction Temperature



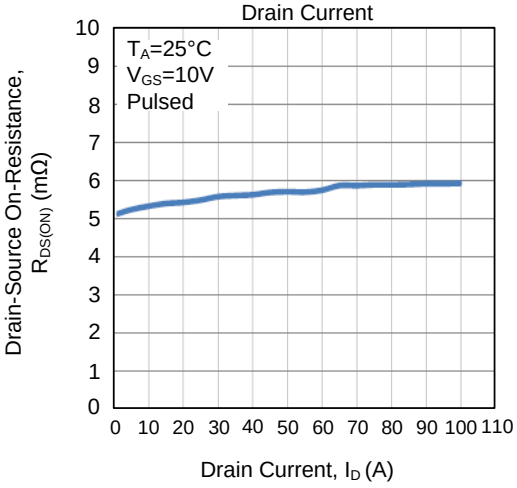
Source Current vs. Source-Drain Voltage



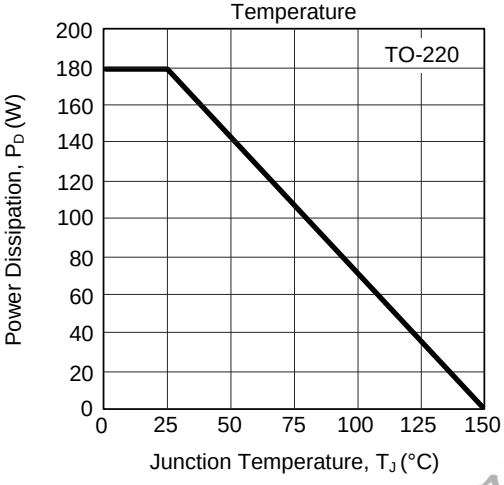
Drain Current vs. Gate-Source Voltage



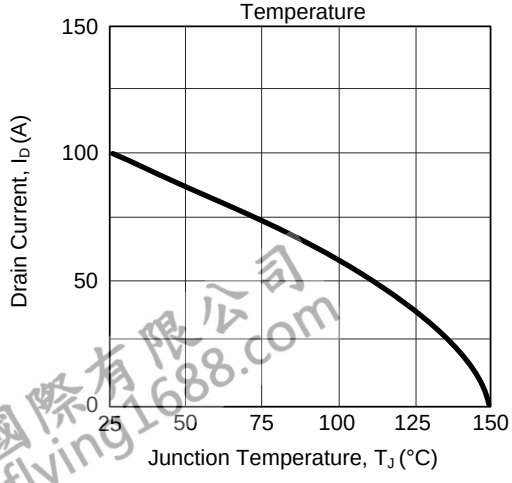
Drain-Source On-Resistance vs. Drain Current



Power Dissipation vs. Junction Temperature



Drain Current vs. Junction Temperature



■ TYPICAL CHARACTERISTICS (Cont.)