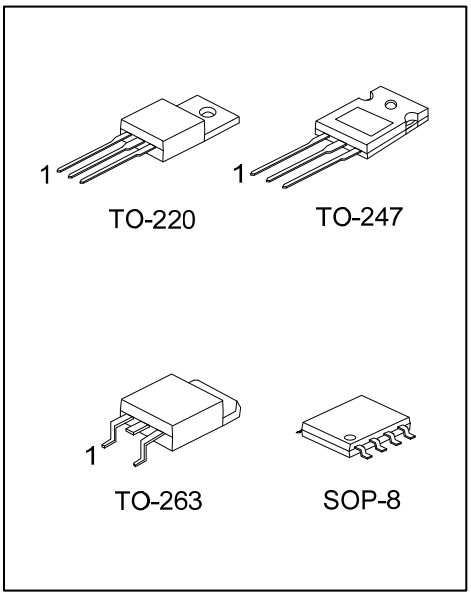
UTT75N06

Power MOSFET

75A, 60V N-CHANNEL POWER MOSFET



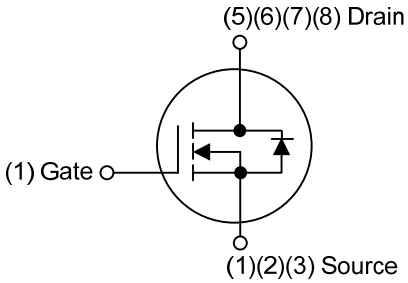
■ DESCRIPTION

The UTC **UTT75N06** 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

* $R_{DS(ON)} \leq 10m\Omega$ @ V_{GS}=10V, I_D=35A
  $R_{DS(ON)} \leq 37m\Omega$ @ V_{GS}=4.5V, I_D=35A
* Fast switching capability
* Avalanche energy specified
* Improved dv/dt capability

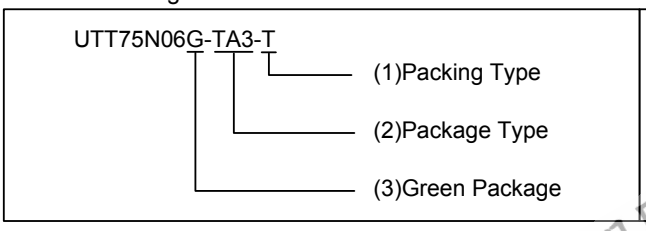
■ SYMBOL



■ ORDERING INFORMATION

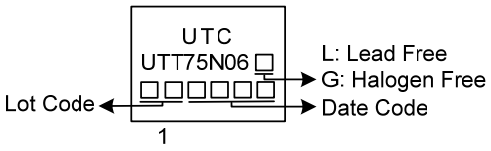
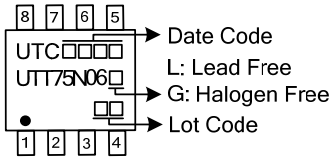
Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UTT75N06L-TA3-T	UTT75N06G-TA3-T	TO-220	G	D	S	-	-	-	-	-	Tube
UTT75N06L-T47-T	UTT75N06G-T47-T	TO-247	G	D	S	-	-	-	-	-	Tube
UTT75N06L-TQ2-T	UTT75N06G-TQ2-T	TO-263	G	D	S	-	-	-	-	-	Tube
UTT75N06L-TQ2-R	UTT75N06G-TQ2-R	TO-263	G	D	S	-	-	-	-	-	Tape Reel
UTT75N06L-S08-R	UTT75N06G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

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



(1) T: Tube, R: Tape Reel
(2) TA3: TO-220, T47: TO-247, TQ2: TO-263, S08: SOP-8
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

TO-220 / TO-247 / TO-263	SOP-8
	

■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	60	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Drain Current	T_C=25°C	I_D	75	A
	T_C=100°C		50	A
Drain Current Pulsed (Note 2)		I_{DM}	150	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	80	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	1.2	V/ns
Power Dissipation	TO-220/TO-263	P_D	220	W
	TO-247		150	W
	SOP-8		2	W
Junction Temperature		T_J	+150	°C
Storage Temperature		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 junction temperature.
3. L=0.1mH, I_{AS}=58.3A, V_{DD}=25V, R_G=20Ω, Starting T_J=25°C
4. I_{SD}≤75A, di/dt≤200A/μs, V_{DD}≤BV_{DSS}, Starting T_J=25°C

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-263	θ_{JA}	40	°C/W
	TO-247		62.5	°C/W
	SOP-8		90	°C/W
Junction to Case	TO-220/TO-263	θ_{JC}	0.57	°C/W
	TO-247		0.83	°C/W
	SOP-8		62.5 (Note)	°C/W

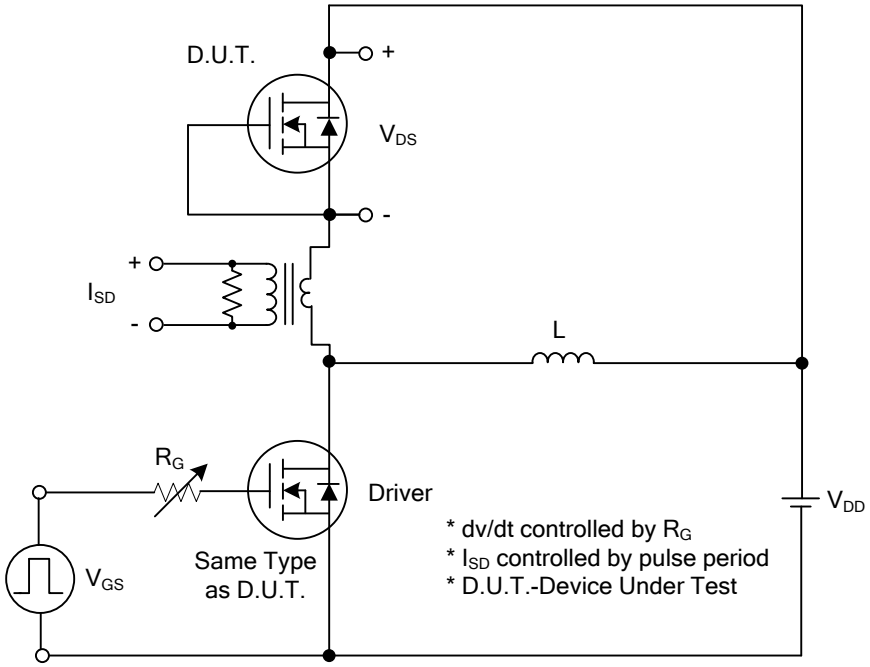
Note: The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.

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

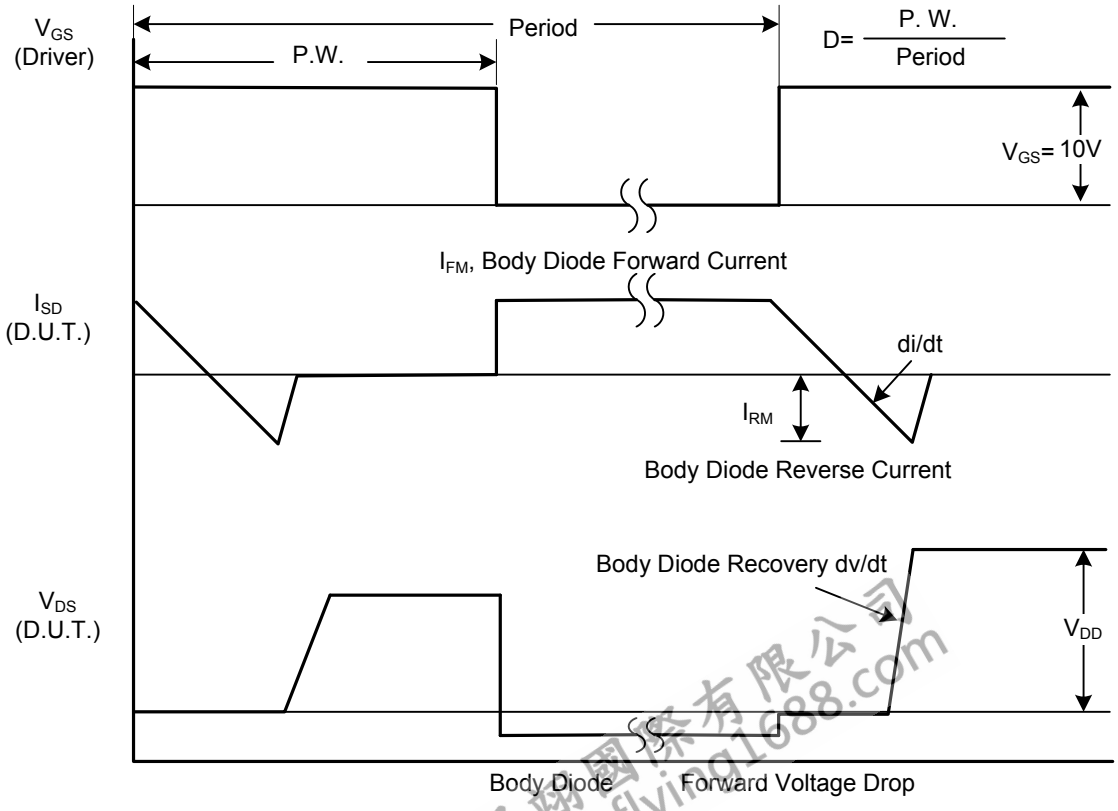
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	V_{GS}=0V, I_D=250μA	60			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=60V, V_{GS}=0V			1	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=20V, V_{DS}=0V			100	nA
	Reverse		V_{GS}=-20V, 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			10	mΩ
			V_{GS}=4.5V, I_D=35A			37	mΩ
DYNAMIC CHARACTERISTICS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=25V, f=1MHz		3800		pF
Output Capacitance		C_{OSS}			330		pF
Reverse Transfer Capacitance		C_{RSS}			250		pF
SWITCHING CHARACTERISTICS							
Total Gate Charge		Q_G	V_{DS}=48V, V_{GS}=10V, I_D=75A R_G=1mA (Note 1, 2)		82		nC
Gate-Source Charge		Q_{GS}			12		nC
Gate-Drain Charge (Miller Charge)		Q_{GD}			20		nC
Turn-On Delay Time		$t_{D(ON)}$	V_{DD}=30V, I_D=75A, R_G=25Ω (Note 1, 2)		17		ns
Turn-On Rise Time		t_R			19		ns
Turn-Off Delay Time		$t_{D(OFF)}$			58		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				75	A
Maximum Pulsed Drain-Source Diode Forward Current		I_{SM}				150	A
Drain-Source Diode Forward Voltage		V_{SD}	V_{GS}=0V, I_S=75A			1.4	V
Reverse Recovery Time		t_{rr}	V_{GS}=0V, I_S=75A dI_F/dt=100A/μs		41		ns
Reverse Recovery Charge		Q_{rr}			54		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

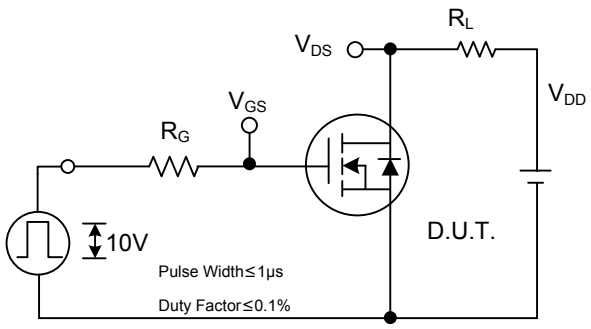


Fig. 2A Switching Test Circuit

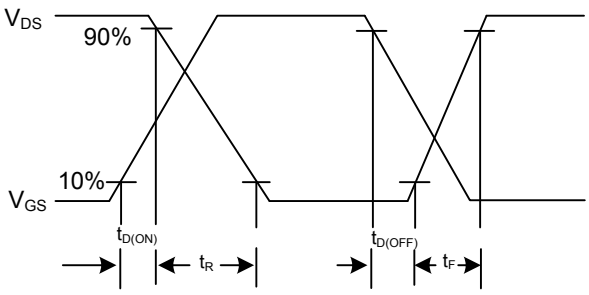


Fig. 2B Switching Waveforms

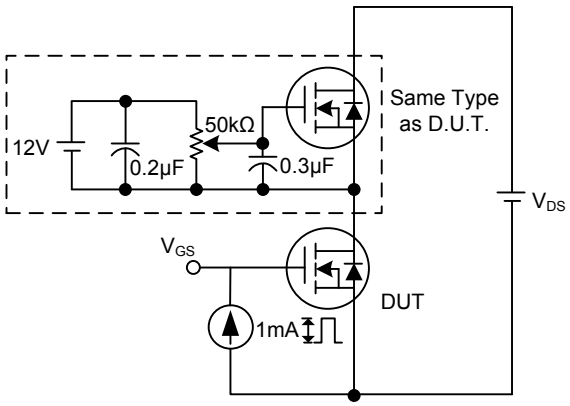


Fig. 3A Gate Charge Test Circuit

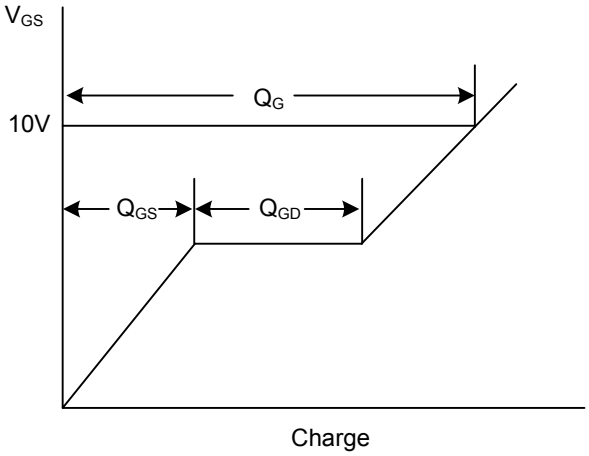


Fig. 3B Gate Charge Waveform

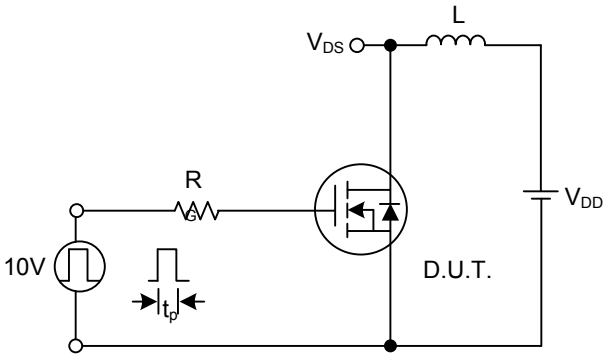


Fig. 4A Unclamped Inductive Switching Test Circuit

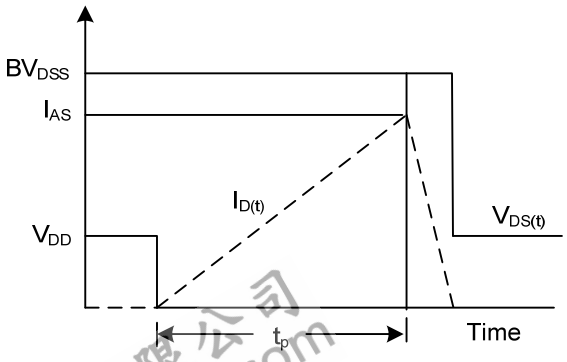
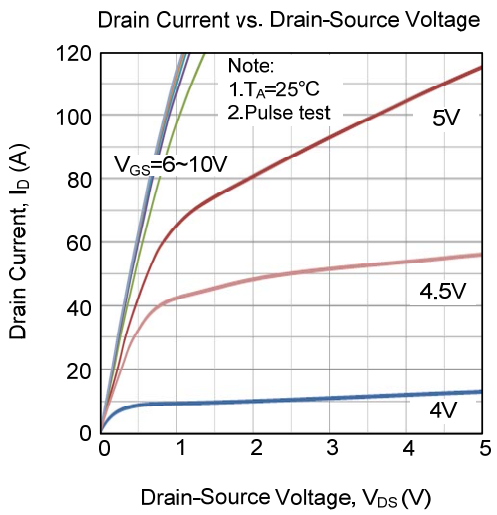
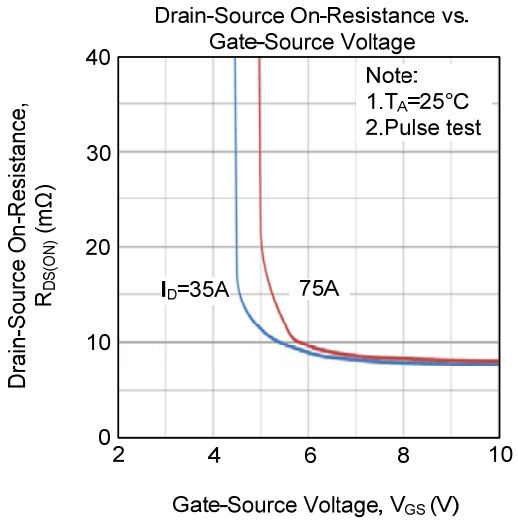
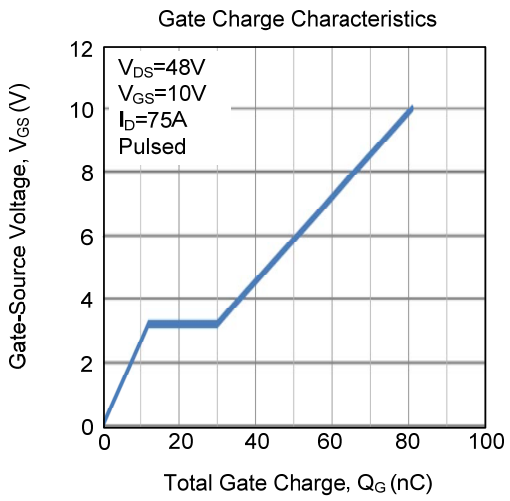


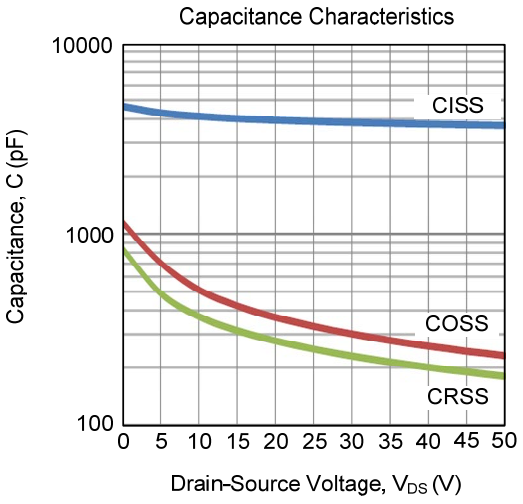
Fig. 4B Unclamped Inductive Switching Waveforms

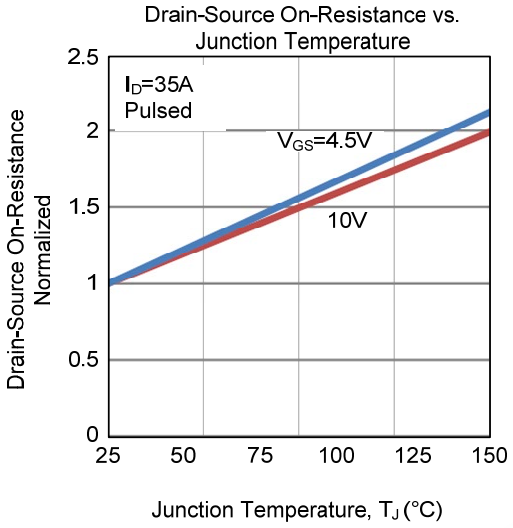
■ TYPICAL CHARACTERISTICS

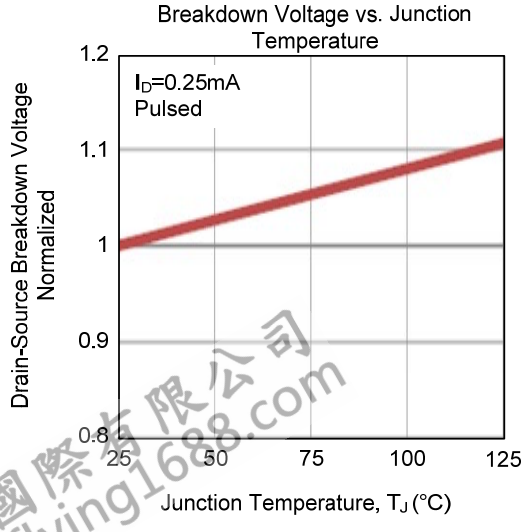






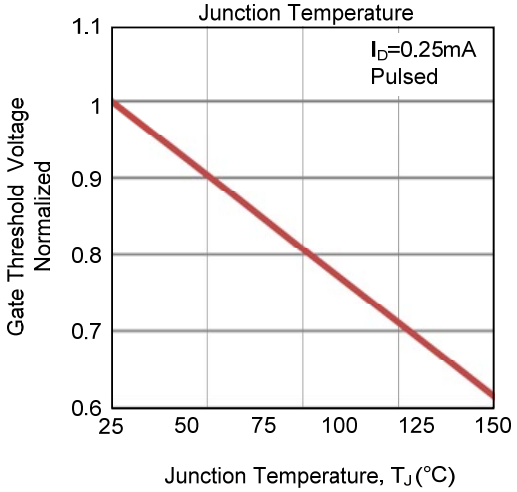




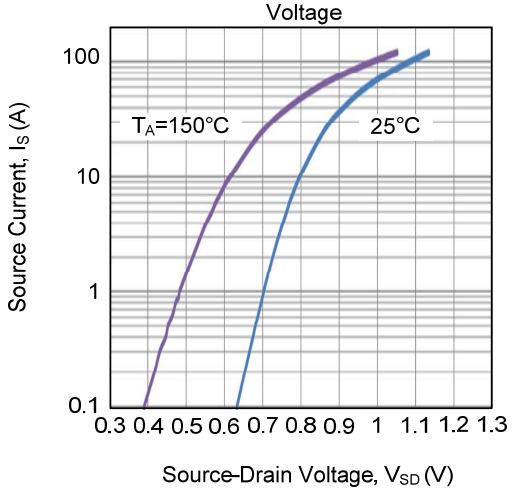


■ TYPICAL CHARACTERISTICS (Cont.)

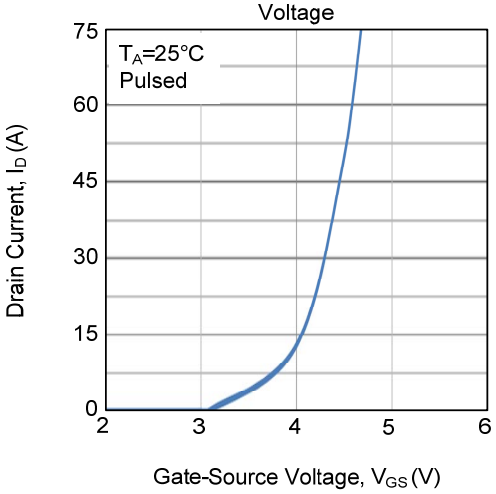
Gate Threshold Voltage vs. Junction Temperature



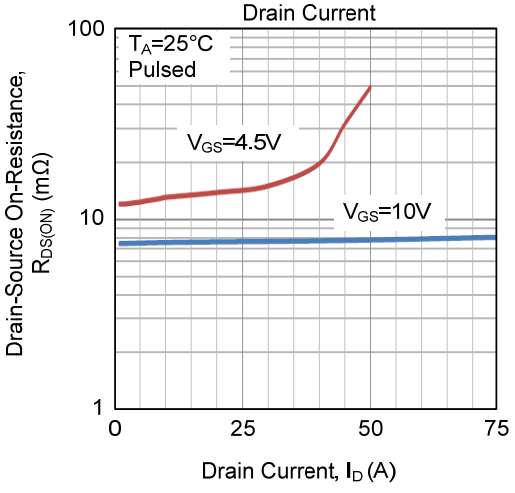
Source Current vs. Source-Drain Voltage



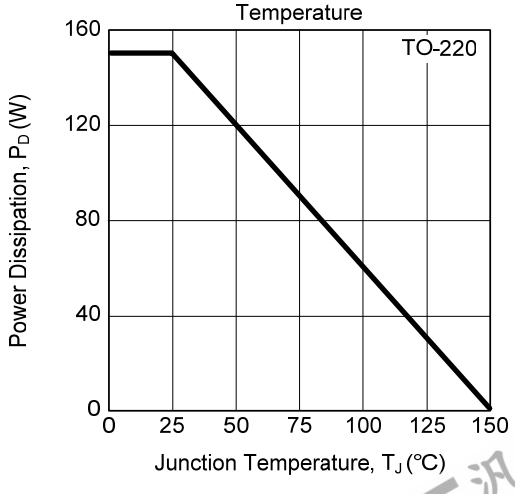
Drain Current vs. Gate-Source Voltage



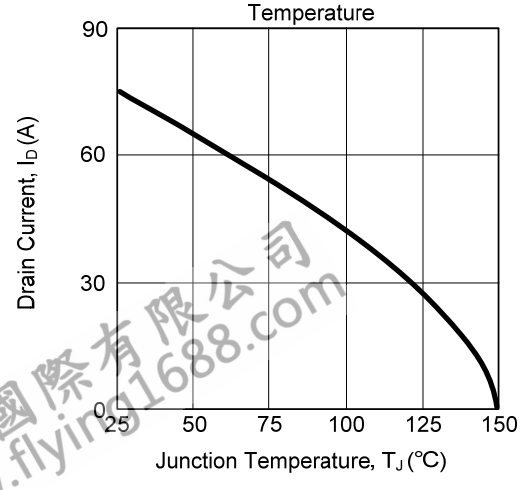
Drain-Source On-Resistance vs. Drain Current



Power Dissipation vs. Junction Temperature



Drain Current vs. Junction Temperature



■ TYPICAL CHARACTERISTICS (Cont.)