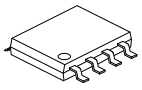
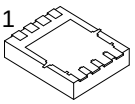
UTT45N03

Power MOSFET

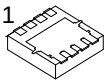
45A, 30V N-CHANNEL POWER MOSFET



SOP-8



DFN5060-8



DFN3030-8

■ DESCRIPTION

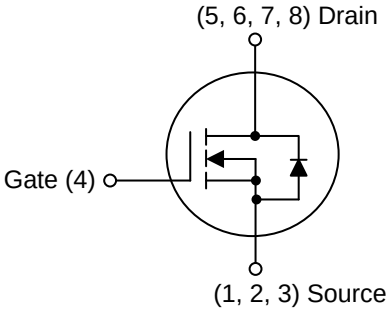
The UTC **UTT45N03** is an N-channel power MOSFET using UTC's advanced technology to provide customers with a minimum on-state resistance and superior switching performance.

The UTC **UTT45N03** is generally applied in low power switching mode power appliances and electronic ballast.

■ FEATURES

* $R_{DS(ON)} \leq 10m\Omega$ @ V_{GS}=10V, I_D=25A
  $R_{DS(ON)} \leq 18m\Omega$ @ V_{GS}=4.5V, I_D=15A
* High Switching Speed
* Improved dv/dt capability

■ SYMBOL



■ ORDERING INFORMATION

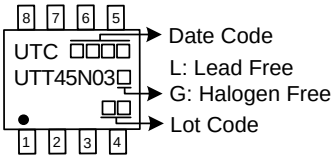
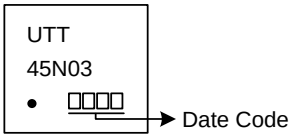
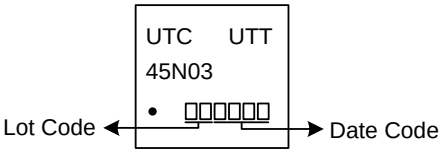
Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UTT45N03L-S08-R	UTT45N03G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel
UTT45N03L-K08-3030-R	UTT45N03G-K08-3030-R	DFN3030-8	S	S	S	G	D	D	D	D	Tape Reel
UTT45N03L-K08-5060-R	UTT45N03G-K08-5060-R	DFN5060-8	S	S	S	G	D	D	D	D	Tape Reel

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

UTT45N03G-S08-R
(1)Packing Type
(2)Package Type
(3)Green Package

(1) R: Tape Reel
(2) S08: SOP-8, DFN3030-8: DFN3030-8
K08-5060: DFN5060-8
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

PACKAGE	MARKING
SOP-8	
DFN3030-8	
DFN5060-8	

■ ABSOLUTE MAXIMUM RATINGS (T_C=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	30	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Drain Current		I_D	45	A
Pulsed Drain Current (Note 2)		I_{DM}	90	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	38	mJ
Peak Diode Recovery dv/dt		dv/dt	4.4	V/ns
Power Dissipation	SOP-8	P_D	1.8	W
	DFN3030-8		15	W
	DFN5060-8		30	W
Junction Temperature		T_J	+150	°C
Operation and 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 maximum junction temperature.
3. L=0.1mH, I_{AS}=27.6A, V_{DD}=20V, R_G=20Ω, Starting T_J=25°C
4. I_{SD} ≤ 30A, V_{DS}=0V, di/dt ≤ 200A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOP-8	θ_{JA}	90	°C/W
	DFN3030-8		75	°C/W
	DFN5060-8		70	°C/W
Junction to Case	SOP-8	θ_{JC}	69	°C/W
	DFN3030-8		8.3	°C/W
	DFN5060-8		4.2	°C/W

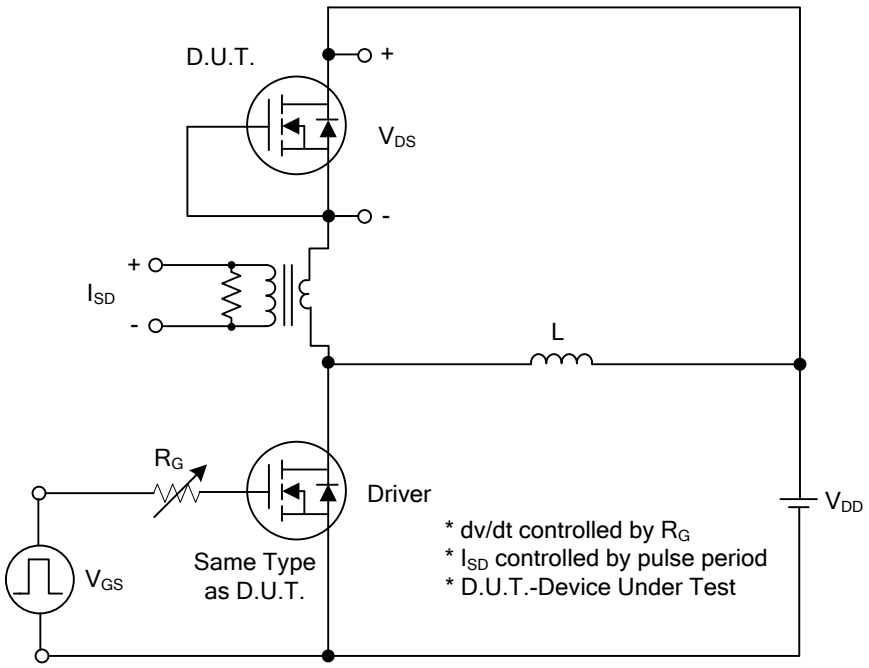
Note: The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.

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

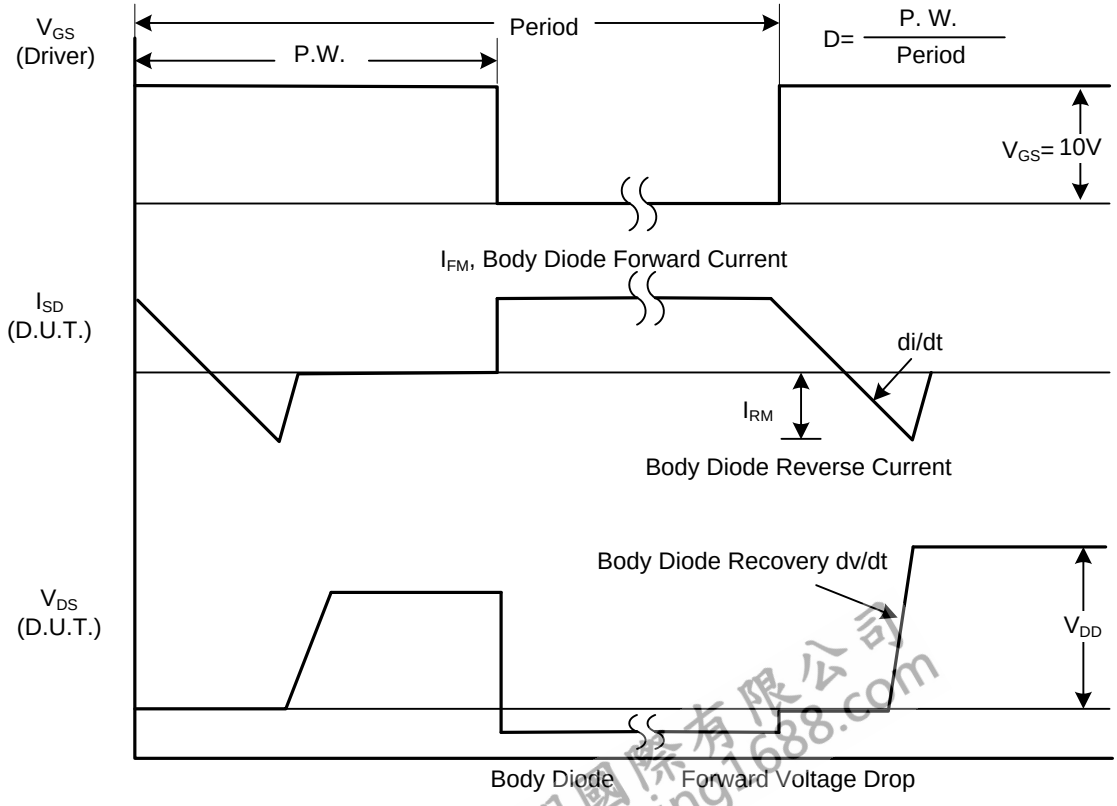
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	V_{GS}=0V, I_D=250μA	30			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=30V, V_{GS}=0V			1	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=20V, V_{DS}=0V			100	nA
	Reverse		V_{GS}=-20V, V_{DS}=0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	0.9		2.0	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=10V, I_D=25A			10	mΩ
			V_{GS}=4.5V, I_D=15A			18	mΩ
DYNAMIC CHARACTERISTICS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=15V, f=1MHz		920		pF
Output Capacitance		C_{OSS}			238		pF
Reverse Transfer Capacitance		C_{RSS}			210		pF
SWITCHING CHARACTERISTICS							
Total Gate Charge		Q_G	V_{DS}=15V, V_{GS}=10V, I_D=45A I_G=1mA (Note1,2)		25.7		nC
Gate-Source Charge		Q_{GS}			2.6		nC
Gate-Drain Charge		Q_{GD}			6		nC
Turn-On Delay Time		$t_{D(ON)}$	V_{DS}=15V, V_{GS}=10V, I_D=45A, R_G=3.3Ω (Note1,2)		6		ns
Turn-On Rise Time		t_R			16.5		ns
Turn-Off Delay Time		$t_{D(OFF)}$			25		ns
Turn-Off Fall Time		t_F			22		ns
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS							
Maximum Body-Diode Continuous Current		I_S				45	A
Maximum Body-Diode Pulsed Current		I_{SM}				90	A
Drain-Source Diode Forward Voltage		V_{SD}	I_S=45A, V_{GS}=0V			1.4	V
Body Diode Reverse Recovery Time		t_{rr}	I_S=30A, V_{GS}=0V, dI_S/dt=100A/μs		182		ns
Body Diode Reverse Recovery Charge		Q_{rr}			294		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 Waveforms

■ TEST CIRCUITS AND WAVEFORMS

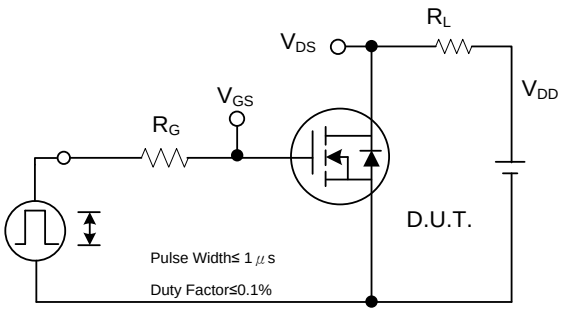


Fig. 2A Switching Test Circuit

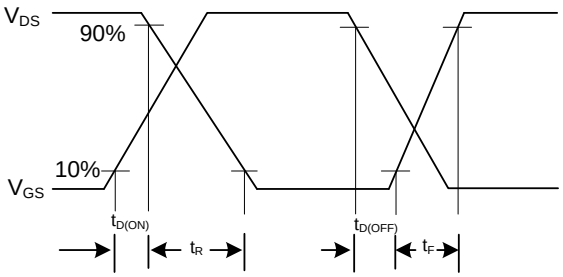


Fig. 2B Switching Waveforms

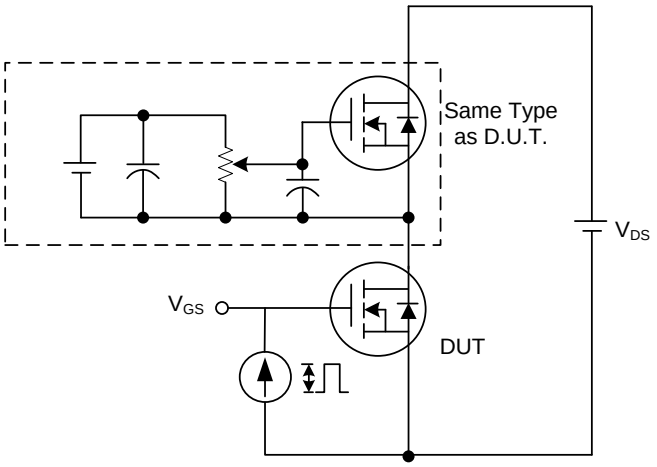


Fig. 3A Gate Charge Test Circuit

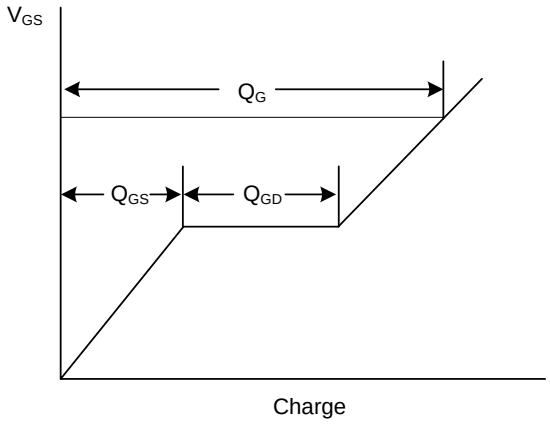


Fig. 3B Gate Charge Waveform

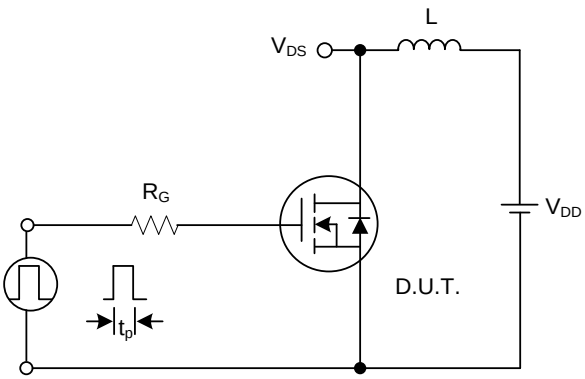


Fig. 4A Unclamped Inductive Switching Test Circuit

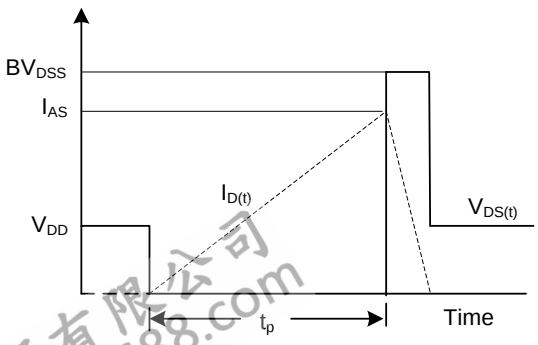
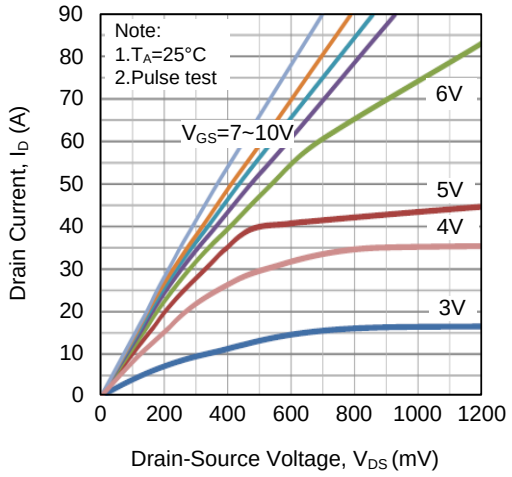


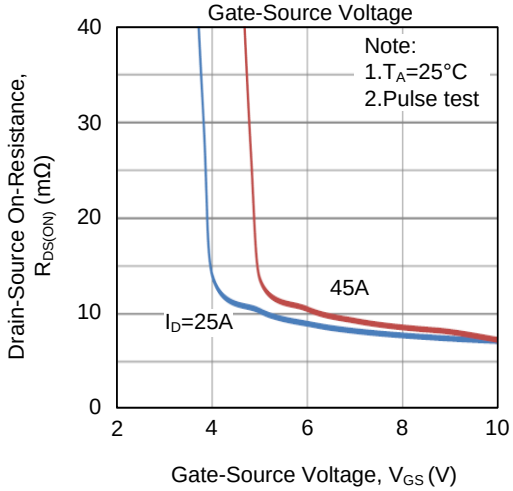
Fig. 4B Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS

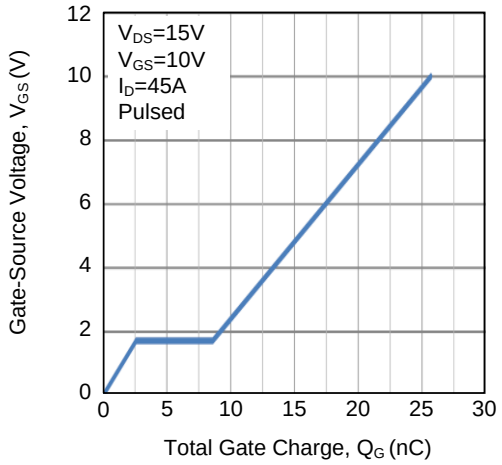
Drain Current vs. Drain-Source Voltage



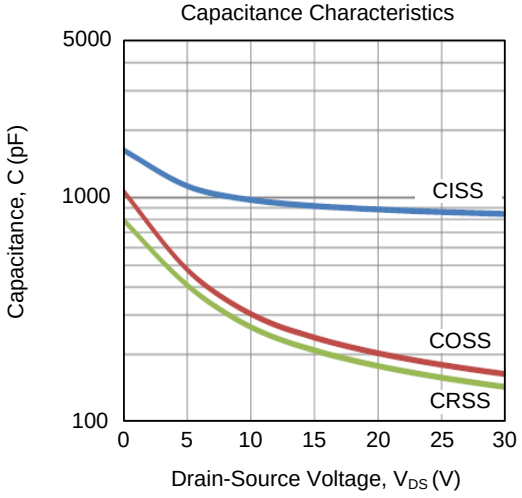
Drain-Source On-Resistance vs. Gate-Source Voltage



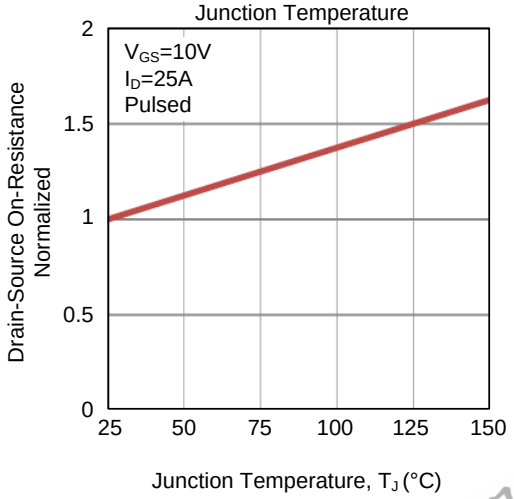
Gate Charge Characteristics



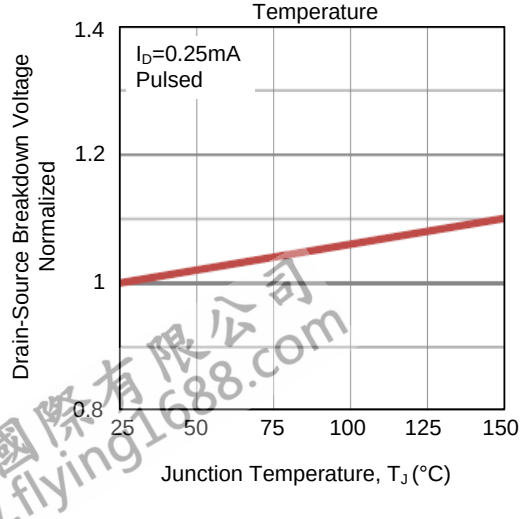
Capacitance Characteristics



Drain-Source On-Resistance vs. Junction Temperature

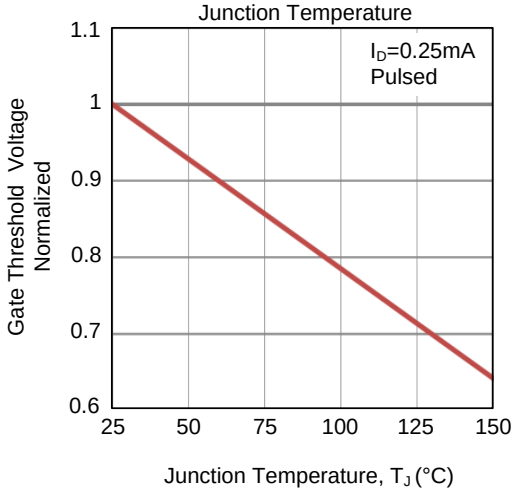


Breakdown Voltage vs. Junction Temperature

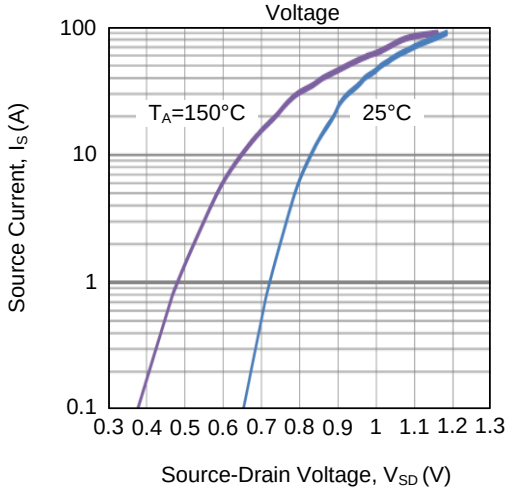


■ TYPICAL CHARACTERISTICS (Cont.)

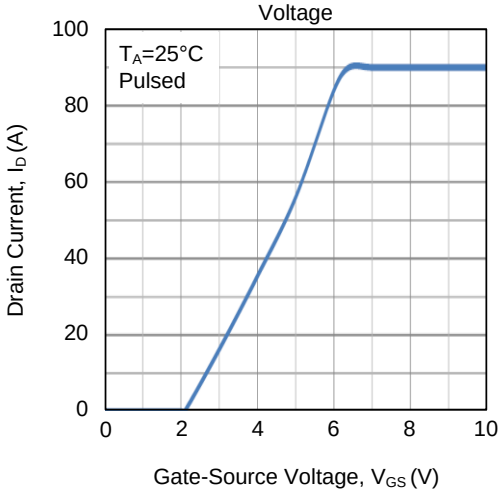
Gate Threshold Voltage vs. Junction Temperature



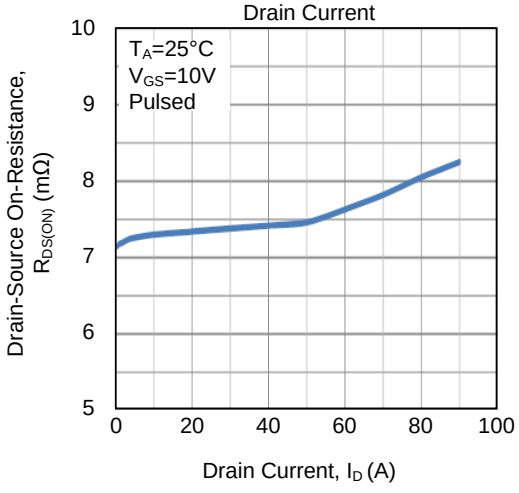
Source Current vs. Source-Drain Voltage



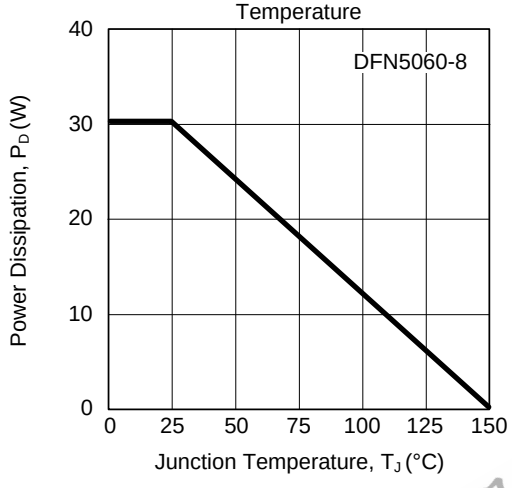
Drain Current vs. Gate-Source Voltage



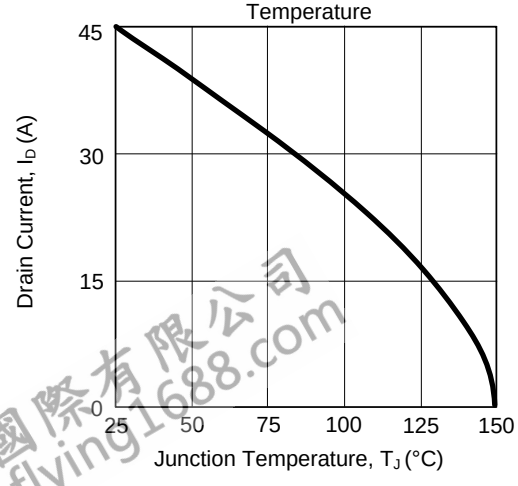
Drain-Source On-Resistance vs. Drain Current



Power Dissipation vs. Junction Temperature



Drain Current vs. Junction Temperature



■ TYPICAL CHARACTERISTICS (Cont.)