



6N65-TC

Power MOSFET

6A, 650V N-CHANNEL POWER MOSFET

DESCRIPTION

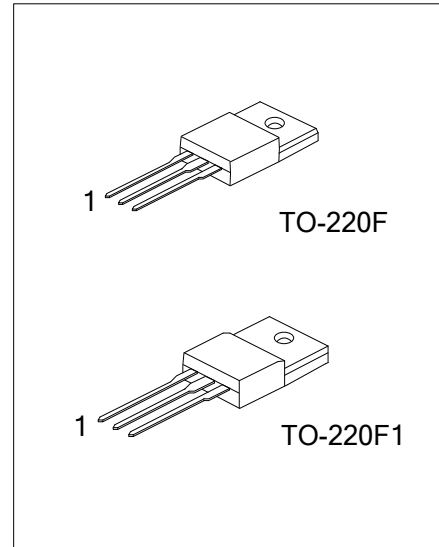
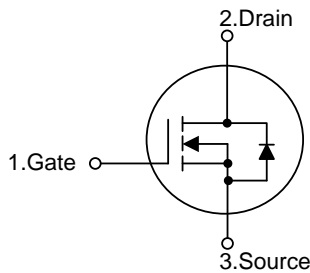
The UTC 6N65-TC is a N-channel mode power MOSFET using UTC's advanced technology to provide customers with planar stripe and DMOS technology. This technology allows a minimum on-state resistance and superior switching performance. It also can withstand high energy pulse in the avalanche and commutation mode.

The UTC 6N65-TC is generally applied in high efficiency switch mode power supplies.

FEATURES

- * $R_{DS(ON)} \leq 1.9\Omega$ @ $V_{GS}=10V, I_D=3.0A$
- * High Switching Speed

SYMBOL



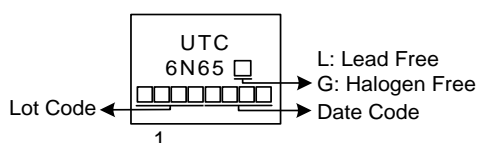
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen-Free		1	2	3	
6N65L-TF1-T	6N65G-TF1-T	TO-220F1	G	D	S	Tube
6N65L-TF3-T	6N65G-TF3-T	TO-220F	G	D	S	Tube

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

	<p>(1) T: Tube</p> <p>(2) TF1: TO-220F1, TF3: TO-220F</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V _{DSS}	650	V
Gate-Source Voltage		V _{GSS}	±30	V
Drain Current	Continuous	I _D	6	A
	Pulsed (Note 2)	I _{DM}	12	A
Avalanche Energy	Single Pulsed (Note 3)	E _{AS}	245	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	2	V/ns
Power Dissipation		P _D	35	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 maximum junction temperature.
 3. L = 10mH, I_{AS} = 7.0A, V_{DD} = 50V, R_G = 25 Ω Starting T_J = 25°C
 4. I_{SD} ≤ 6.0A, di/dt ≤ 200A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C

■ THERMAL DATA

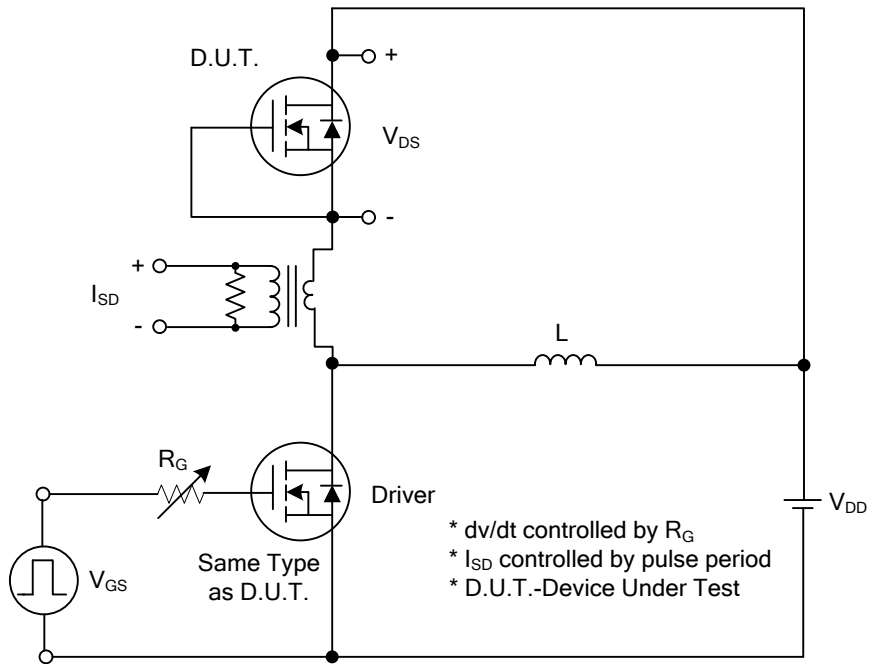
PARAMETER	SYMBOL	RATING	UNIT
Junction to Ambient	θ _{JA}	62.5	°C/W
Junction to Case	θ _{JC}	3.57	°C/W

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

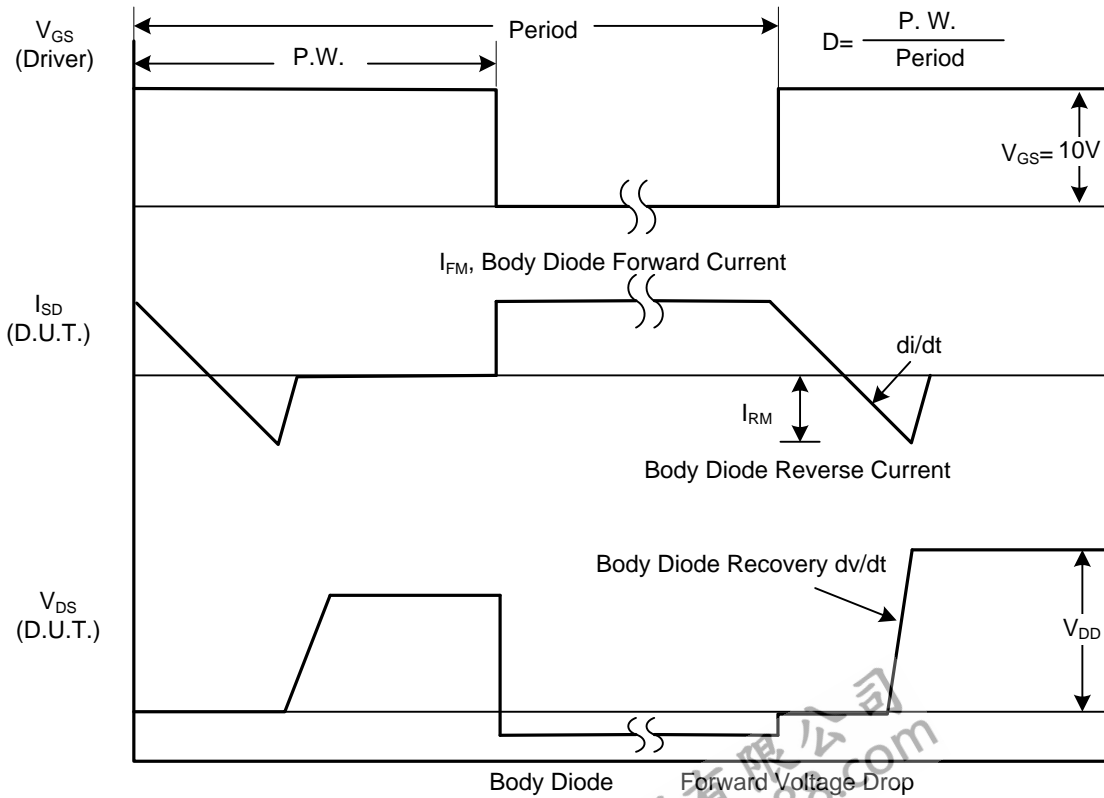
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
OFF CHARACTERISTICS								
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} =0V, I _D = 250μA	650			V	
Drain-Source Leakage Current		I _{DSS}	V _{DS} =650V, V _{GS} =0V			10	μA	
Gate-Source Leakage Current	Forward	I _{GSS}	V _{GS} =30V, V _{DS} =0V			100	nA	
	Reverse		V _{GS} =-30V, 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 =3.0A			1.9	Ω	
DYNAMIC CHARACTERISTICS								
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0 MHz		650		pF	
Output Capacitance		C _{OSS}				72		pF
Reverse Transfer Capacitance		C _{RSS}				5		pF
SWITCHING CHARACTERISTICS								
Total Gate Charge (Note 1)		Q _G	V _{DS} =520V, V _{GS} =10V, I _D =6.0A I _G =1mA (Note 1, 2)		15.5		nC	
Gate-source Charge		Q _{GS}				7		nC
Gate-Drain Charge		Q _{GD}				2.5		nC
Turn-on Delay Time (Note 1)		t _{D(ON)}	V _{DS} =200V, V _{GS} =10V, I _D =6.0A, R _G =25Ω (Note 1, 2)		8		ns	
Rise Time		t _R				19		ns
Turn-off Delay Time		t _{D(OFF)}				35		ns
Fall-Time		t _F				24		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS								
Maximum Body-Diode Continuous Current		I _S				6	A	
Maximum Body-Diode Pulsed Current		I _{SM}				12	A	
Drain-Source Diode Forward Voltage (Note 1)		V _{SD}	V _{GS} =0V, I _S =6.0A			1.4	V	
Reverse Recovery Time (Note 1)		t _{rr}	V _{GS} =0V, I _S =6.0A			420	ns	
Reverse Recovery Charge		Q _{rr}	di/dt=100A/μs (Note1)			2.8	μC	

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

■ TEST CIRCUITS AND WAVEFORMS

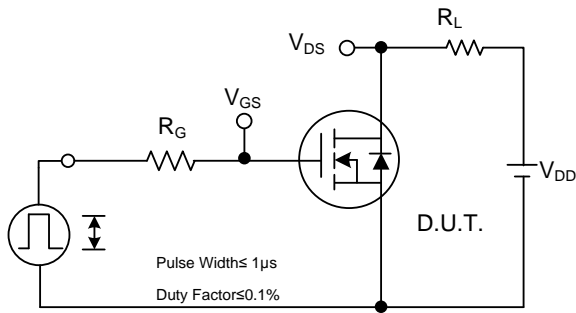


Peak Diode Recovery dv/dt Test Circuit

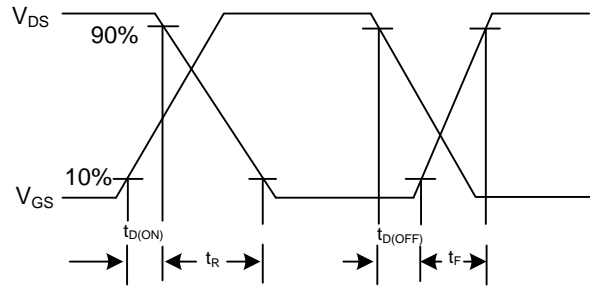


Peak Diode Recovery dv/dt Waveforms

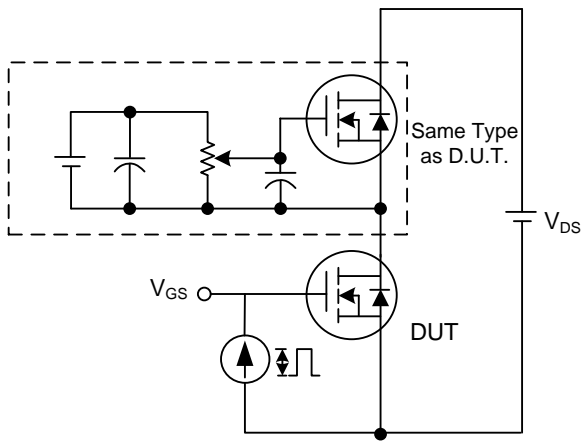
■ TEST CIRCUITS AND WAVEFORMS



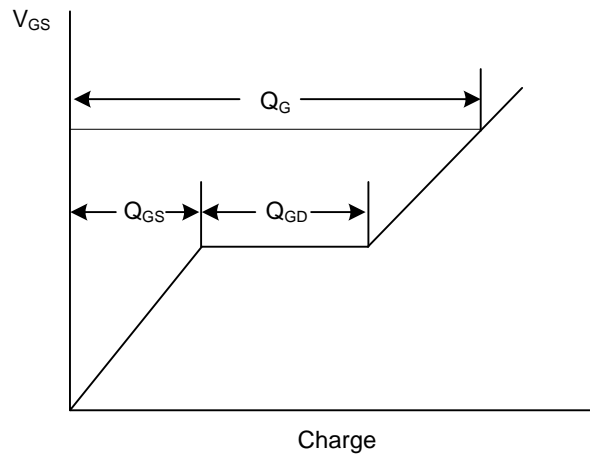
Switching Test Circuit



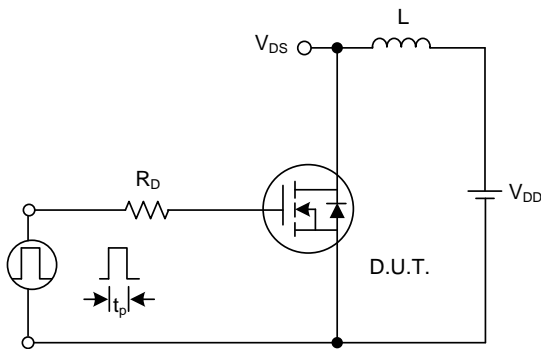
Switching Waveforms



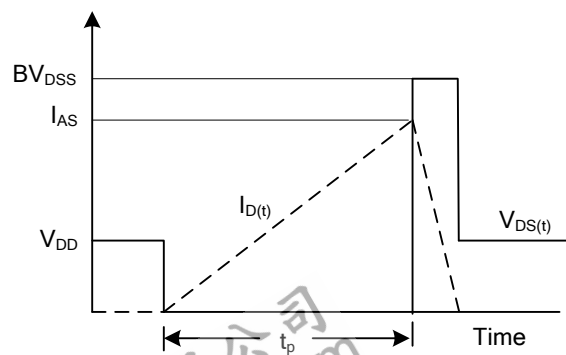
Gate Charge Test Circuit



Gate Charge Waveform

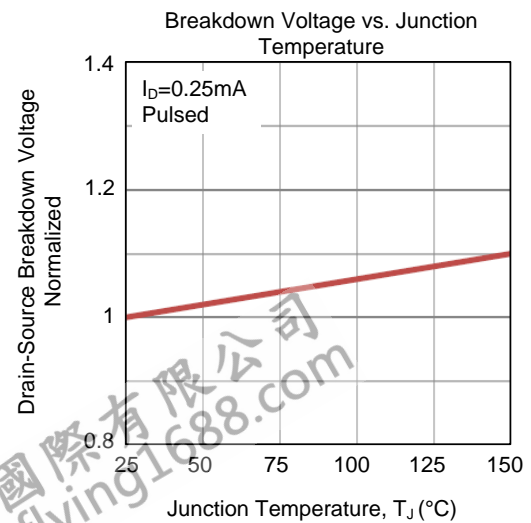
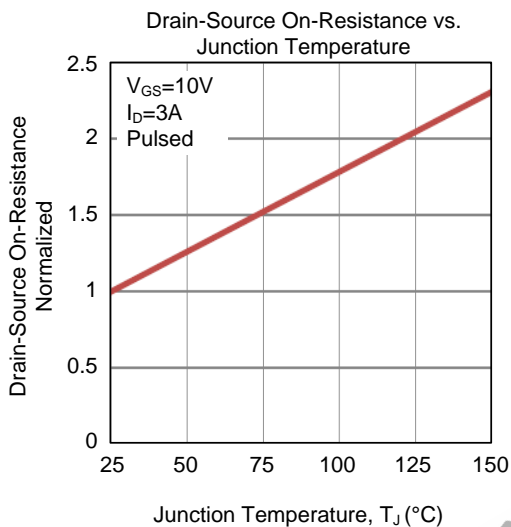
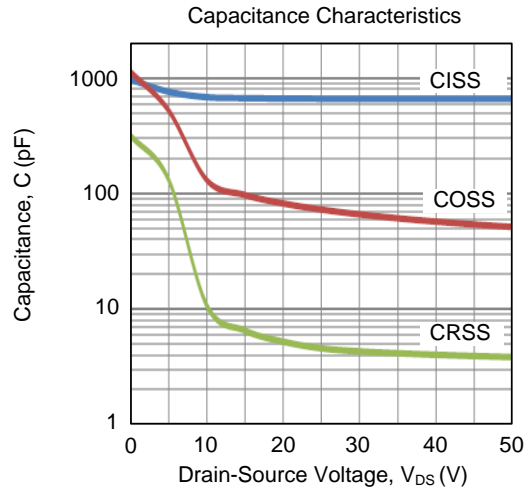
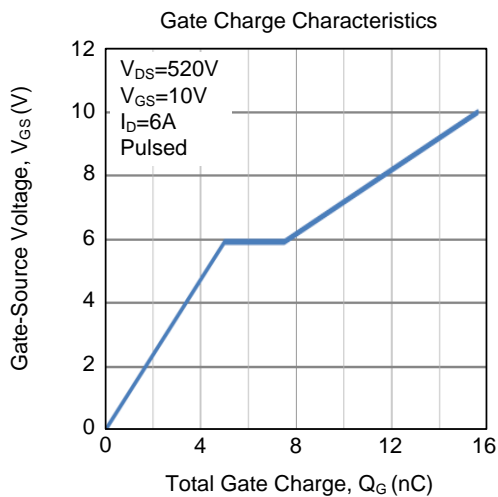
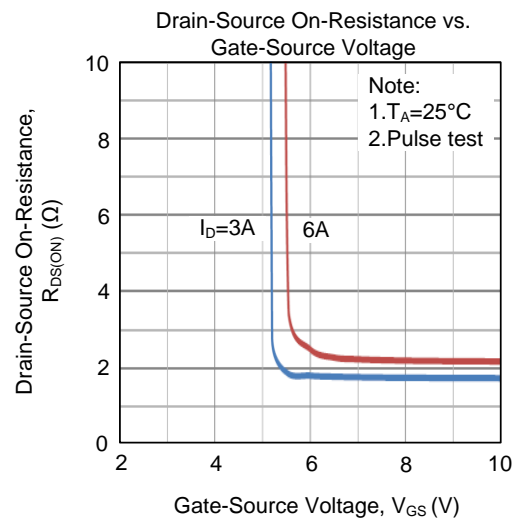
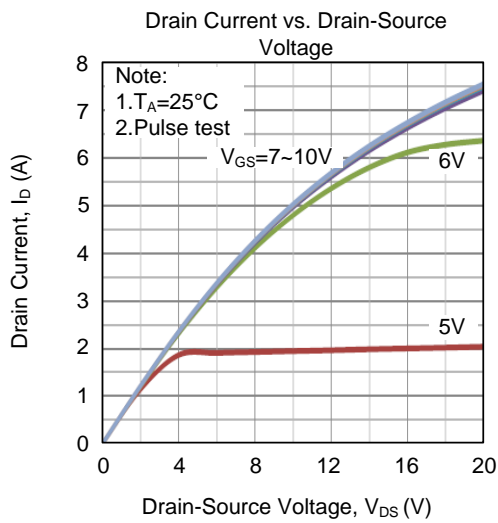


Unclamped Inductive Switching Test Circuit

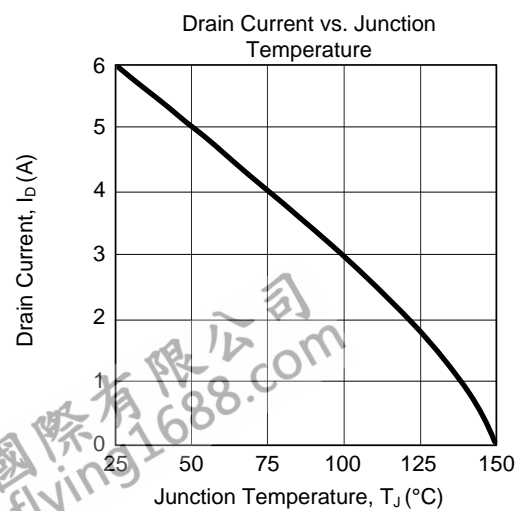
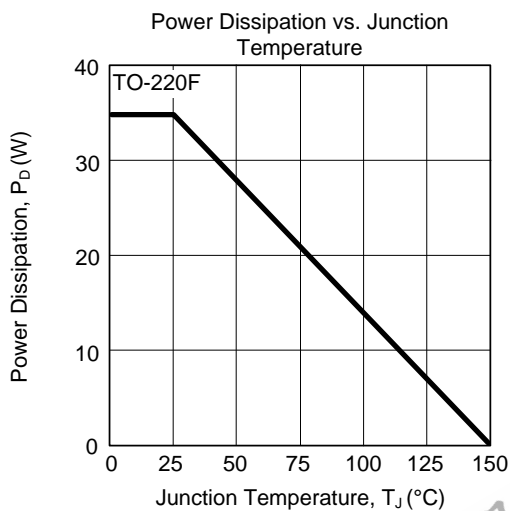
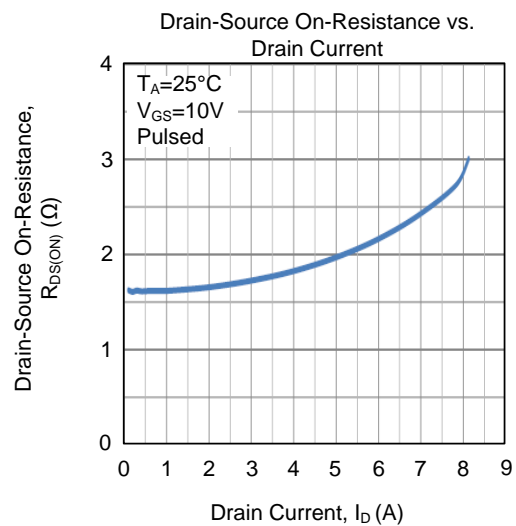
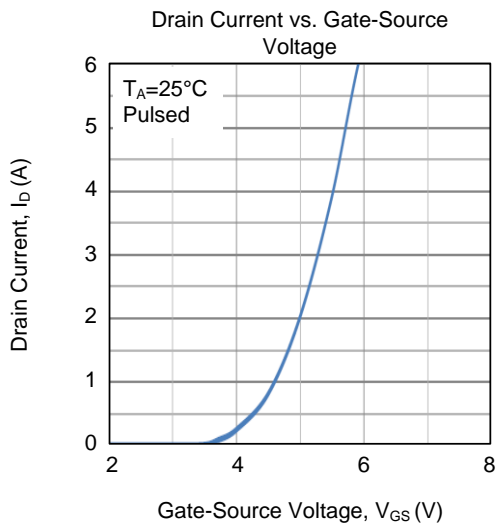
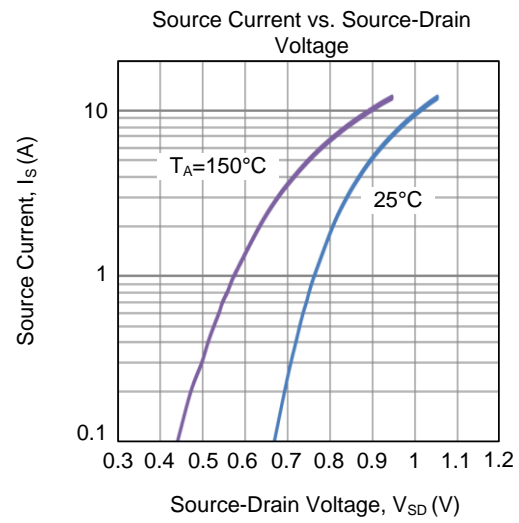
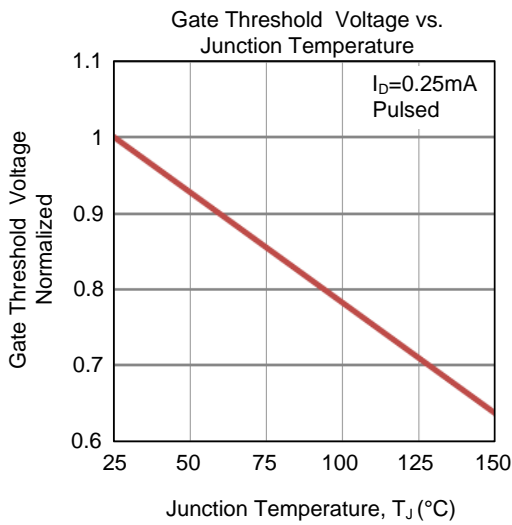


Unclamped Inductive Switching Waveforms

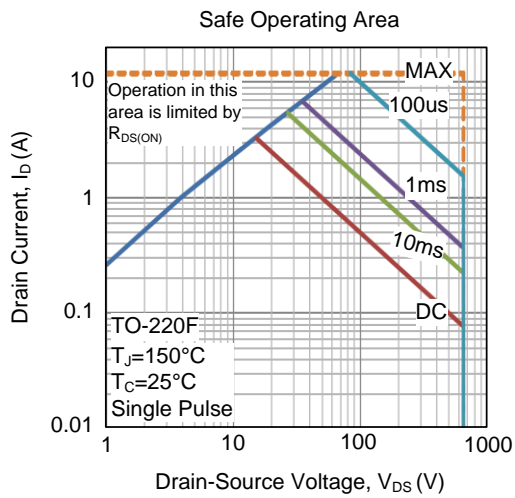
TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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