



8N100-FCQ

Power MOSFET

8.0A, 1000V N-CHANNEL POWER MOSFET

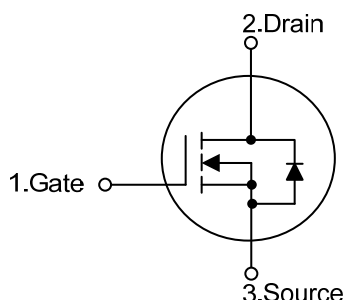
DESCRIPTION

The UTC **8N100-FCQ** provide excellent $R_{DS(ON)}$, low gate charge and operation with low gate voltages. This device is suitable for use as a load switch or in PWM applications.

FEATURES

- * $R_{DS(ON)} \leq 2.9 \Omega$ @ $V_{GS}=10V$, $I_D=4.0A$
- * Fast switching capability
- * Avalanche energy specified
- * Improved dv/dt capability, high ruggedness

SYMBOL



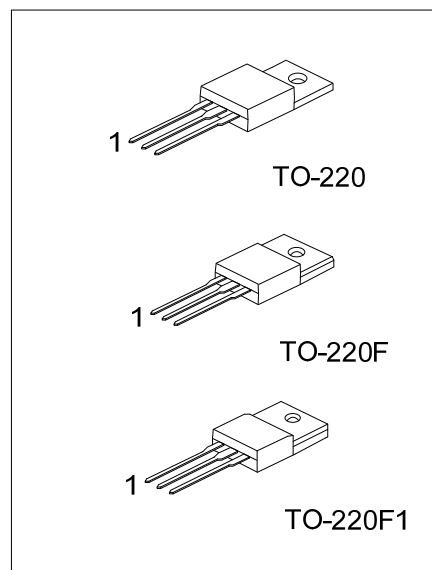
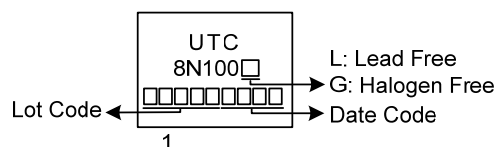
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
8N100L-TA3-T	8N100G-TA3-T	TO-220	G	D	S	Tube
8N100L-TF1-T	8N100G-TF1-T	TO-220F1	G	D	S	Tube
8N100L-TF3-T	8N100G-TF3-T	TO-220F	G	D	S	Tube

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

8N100G-TA3-T (1) Packing Type (2) Package Type (3) Green Package	(1) T: Tube (2) TA3: TO-220, TF1: TO220F1, TF3: TO-220F (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING



■ ABSOLUTE MAXIMUM RATINGS ($T_C=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	1000	V
Gate-Source Voltage		V_{GSS}	± 30	V
Continuous Drain Current		I_D	8	A
Pulsed Drain Current (Note 2)		I_{DM}	16	A
Avalanche Energy (Note 3)	Single Pulsed	E_{AS}	360	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	1.6	V/ns
Power Dissipation	TO-220	P_D	148	W
	TO-220F/TO-220F1		35	W
Junction Temperature		T_J	+150	$^{\circ}\text{C}$
Storage Temperature		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. $L=30\text{mH}$, $I_{AS}=4.9\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\ \Omega$, Starting $T_J = 25^{\circ}\text{C}$

4. $I_{SD}\leq 8.0\text{A}$, $di/dt\leq 200\text{A}/\mu\text{s}$, $V_{DD}\leq BV_{DSS}$, Starting $T_J = 25^{\circ}\text{C}$

■ THERMAL DATA

PARAMETER		SYMBOL	RATING	UNIT
Junction to Ambient		θ_{JA}	62.5	$^{\circ}\text{C}/\text{W}$
Junction to Case	TO-220	θ_{JC}	0.84	$^{\circ}\text{C}/\text{W}$
	TO-220F/TO-220F1		3.57	$^{\circ}\text{C}/\text{W}$

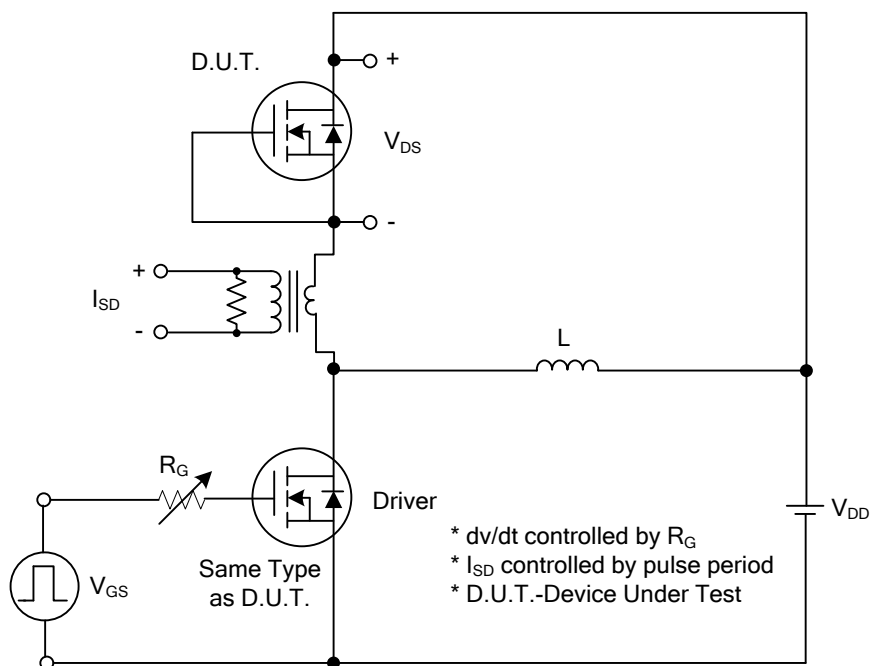
■ ELECTRICAL CHARACTERISTICS ($T_J=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	1000			V
Drain-Source Leakage Current		I_{DSS}	$V_{DS}=1000V, V_{GS}=0V$			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		$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	3.0		5.0	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	$V_{GS}=10V, I_D=4.0A$			2.9	Ω
DYNAMIC CHARACTERISTICS							
Input Capacitance		C_{ISS}	$V_{DS}=25V, V_{GS}=0V, f=1MHz$		1250		pF
Output Capacitance		C_{OSS}			102		pF
Reverse Transfer Capacitance		C_{RSS}			2.6		pF
SWITCHING CHARACTERISTICS							
Total Gate Charge		Q_G	$V_{DS}=800V, V_{GS}=10V, I_D=8.0A$ $I_G=1mA$ (Note1, 2)		28		nC
Gate-Source Charge		Q_{GS}			12		nC
Gate-Drain Charge		Q_{GD}			4		nC
Turn-On Delay Time		$t_{D(ON)}$	$V_{DD}=100V, V_{GS}=10V, I_D=8.0A$ $R_G=25\Omega$ (Note1, 2)		14		ns
Turn-On Rise Time		t_R			16		ns
Turn-Off Delay Time		$t_{D(OFF)}$			45		ns
Turn-Off Fall Time		t_F			35		ns
DRAIN-SOURCE DIODE CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S				8	A
Continuous Drain-Source Current		I_{SD}				16	A
Drain-Source Diode Forward Voltage		V_{SD}	$I_S=8.0A, V_{GS}=0V$			1.4	V
Reverse Recovery Time		t_{rr}	$I_F=8.0A, di/dt=100A/\mu s$		620		ns
Reverse Recovery Charge		Q_{rr}			7.5		μC

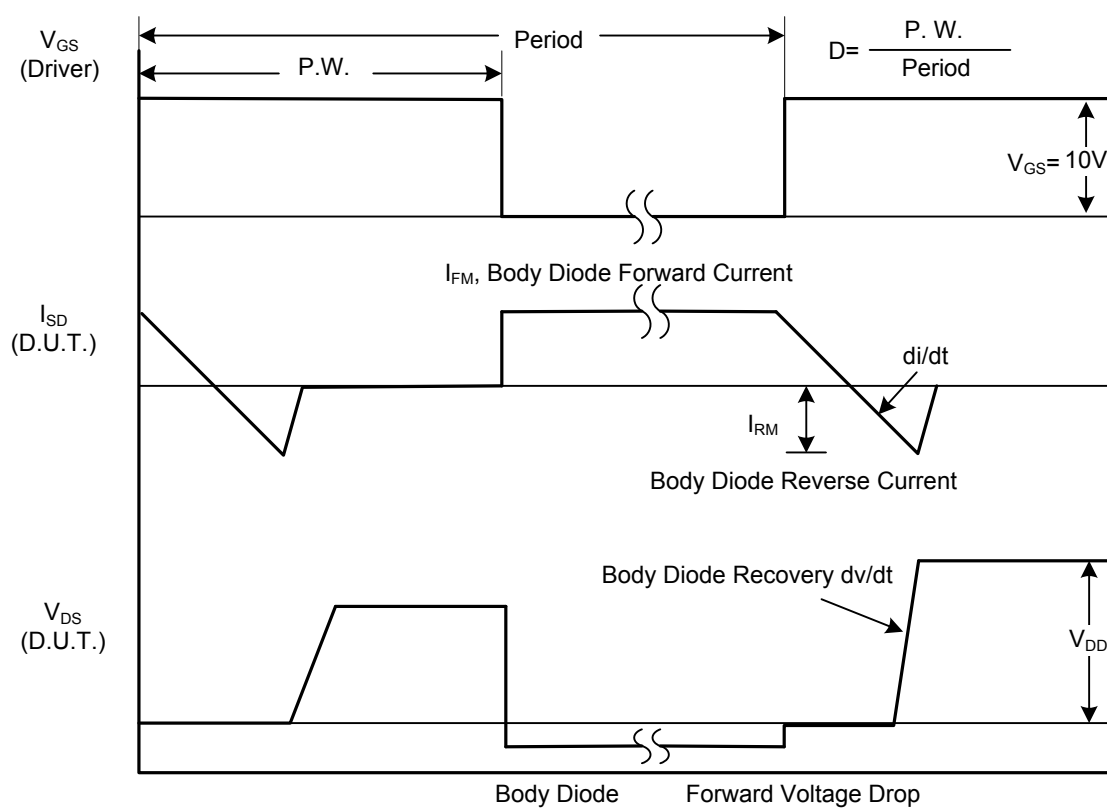
Notes: 1. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

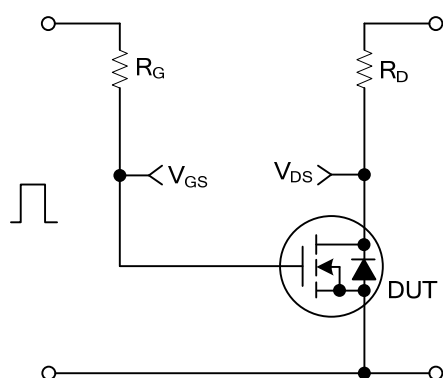


Peak Diode Recovery dv/dt Test Circuit

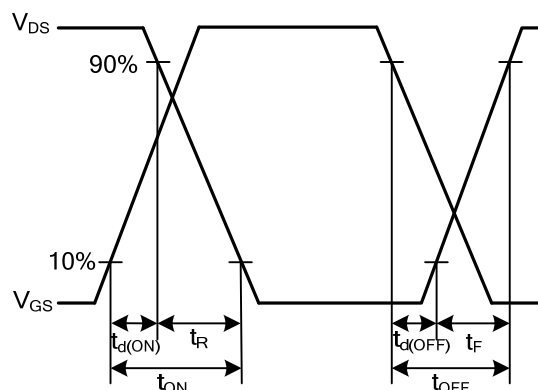


Peak Diode Recovery dv/dt Waveforms

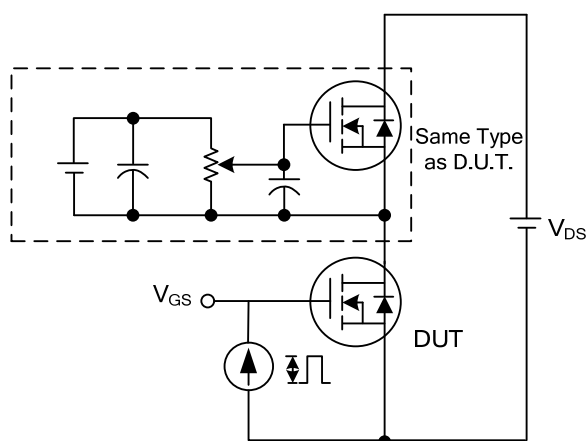
■ TEST CIRCUITS AND WAVEFORMS



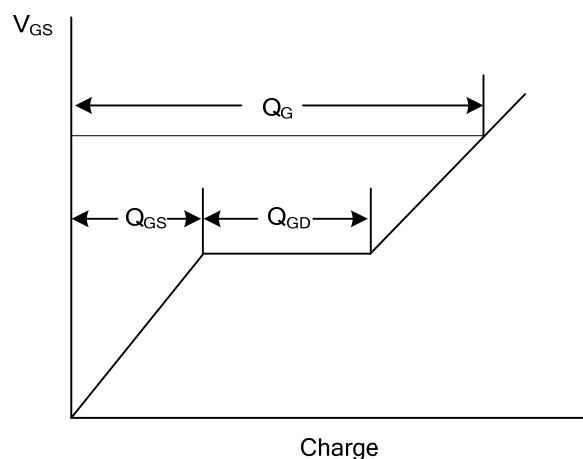
Switching Test Circuit



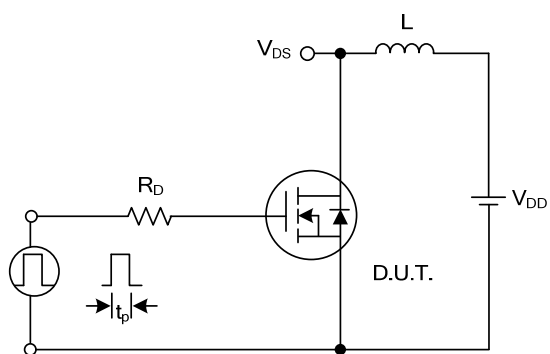
Switching Waveforms



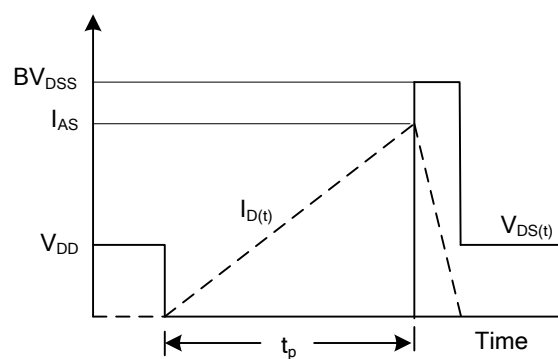
Gate Charge Test Circuit



Gate Charge Waveform

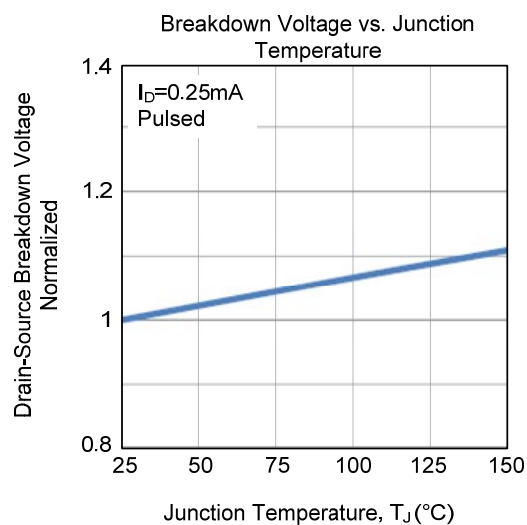
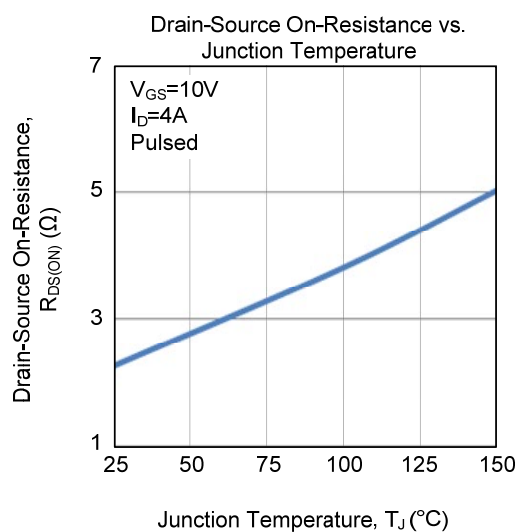
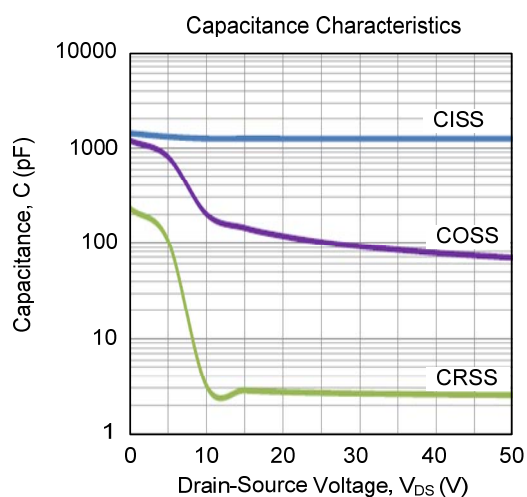
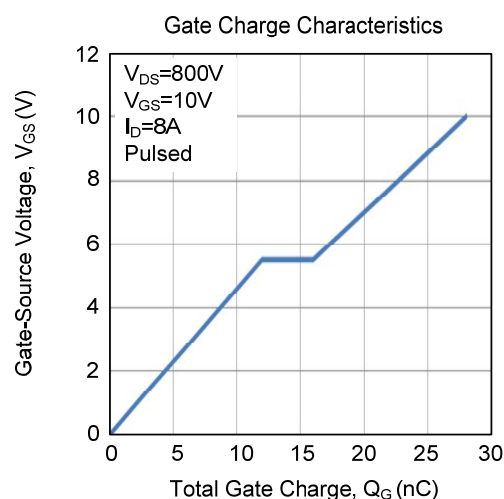
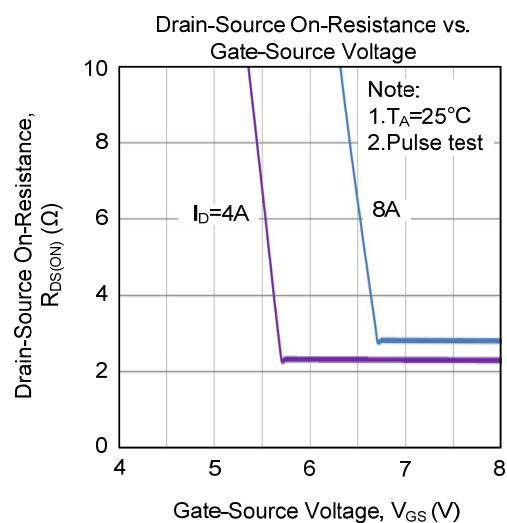
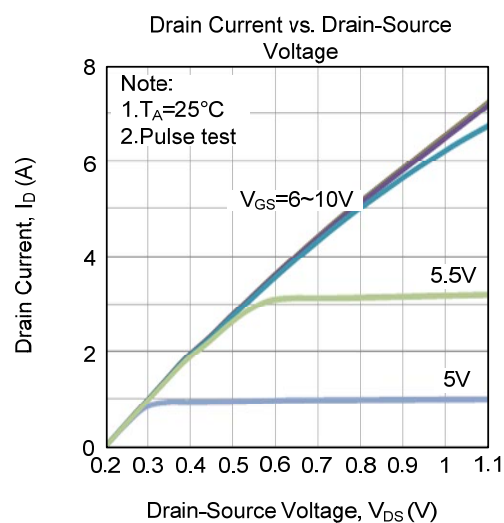


Unclamped Inductive Switching Test Circuit

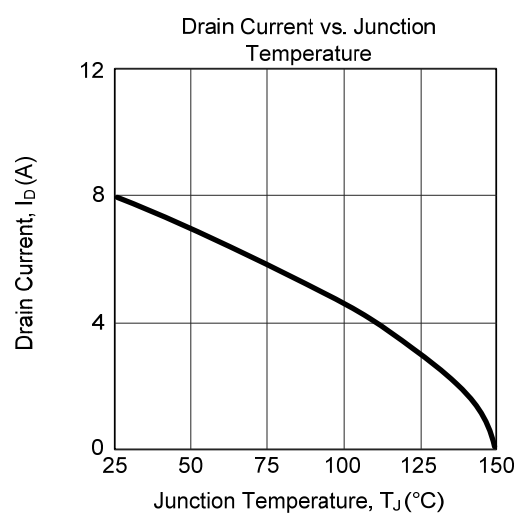
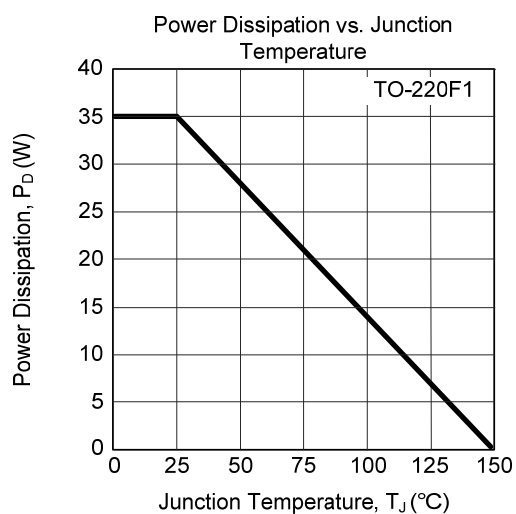
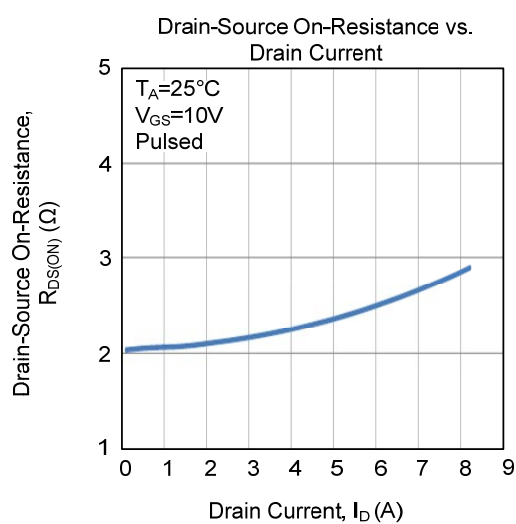
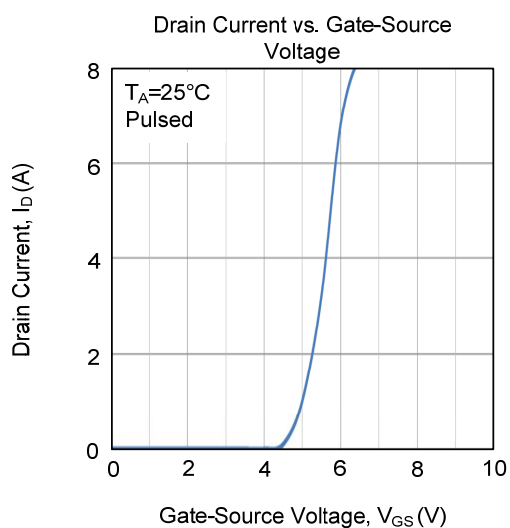
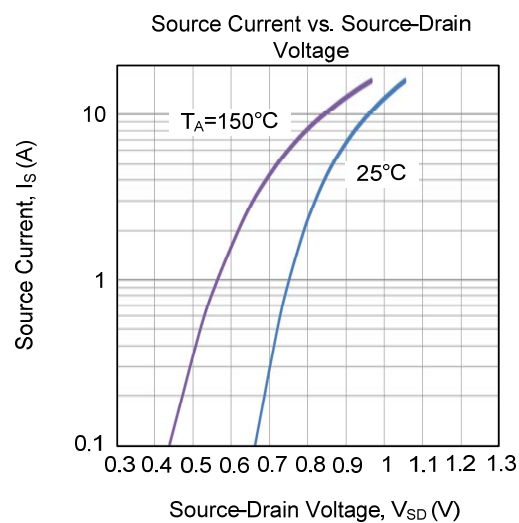
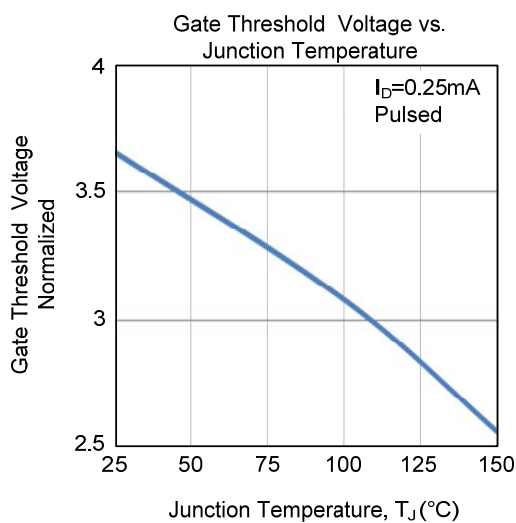


Unclamped Inductive Switching Waveforms

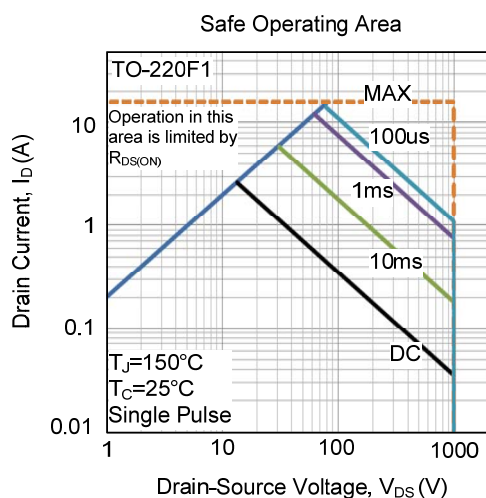
TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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