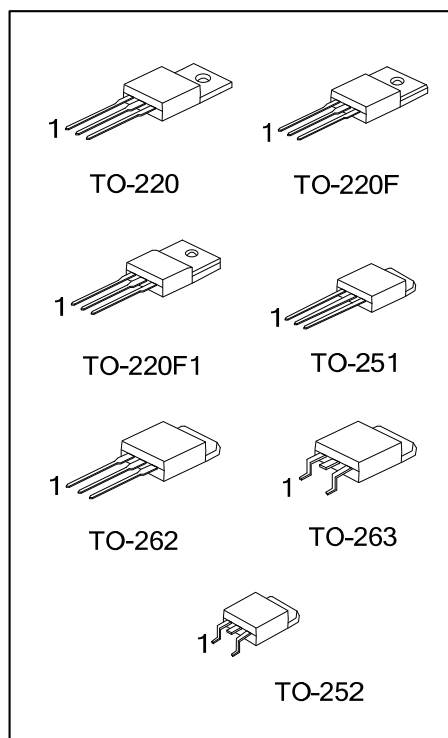
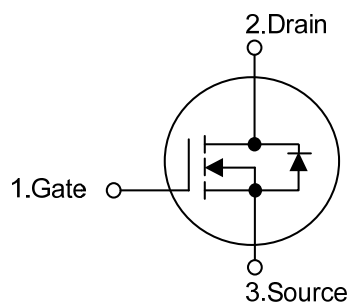


**8NM80-Q****Power MOSFET****8.0A, 800V N-CHANNEL
SUPER-JUNCTION MOSFET****DESCRIPTION**

The **UTC 8NM80-Q** is a Super Junction MOSFET Structure and is designed to have better characteristics, such as fast switching time, low gate charge, low on-state resistance and a high rugged avalanche characteristics. This power MOSFET is usually used at AC-DC converters for power applications.

FEATURES

- * $R_{DS(ON)} \leq 0.75 \Omega$ @ $V_{GS}=10V$, $I_D=4.0A$
- * Fast switching capability
- * Avalanche energy tested
- * Improved dv/dt capability, high ruggedness

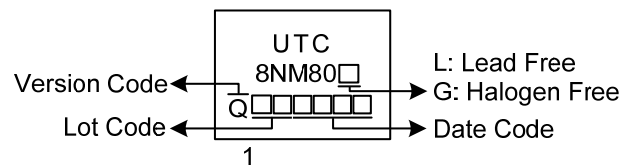
SYMBOL**ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
8NM80L-TA3-T	8NM80G-TA3-T	TO-220	G	D	S	Tube
8NM80L-TF1-T	8NM80G-TF1-T	TO-220F1	G	D	S	Tube
8NM80L-TF3-T	8NM80G-TF3-T	TO-220F	G	D	S	Tube
8NM80L-TM3-T	8NM80G-TM3-T	TO-251	G	D	S	Tube
8NM80L-TN3-R	8NM80G-TN3-R	TO-252	G	D	S	Tape Reel
8NM80L-T2Q-T	8NM80G-T2Q-T	TO-262	G	D	S	Tube
8NM80L-TQ2-T	8NM80G-TQ2-T	TO-263	G	D	S	Tube
8NM80L-TQ2-R	8NM80G-TQ2-R	TO-263	G	D	S	Tape Reel

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

8NM80G-TA3-T (1) Packing Type (2) Package Type (3) Green Package	(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TF1: TO-220F1, TF3: TO-220F, TM3: TO-251, TN3: TO-252, T2Q: TO-262, TQ2: TO-263 (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}	800	V
Gate-Source Voltage			V _{GSS}	±30	V
Continuous Drain Current	Continuous	T _C = 25°C	I _D	8	A
		T _C =100°C		5.2	A
Pulsed Drain Current	Pulsed (Note 2)		I _{DM}	24	A
Single Pulsed Avalanche Energy	Single Pulsed (Note 3)		E _{AS}	313	mJ
Peak Diode Recovery dv/dt (Note 4)			dv/dt	2.7	V/ns
Power Dissipation	TO-220/TO-262/TO-263		P _D	62	W
	TO-220F/TO-220F1			27	W
	TO-251/TO-252			32	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. $L = 100\text{mH}$, $I_{AS} = 2.5\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\Omega$, 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	RATINGS	UNIT
Junction to Ambient	TO-220/TO-220F	θ_{JA}	62.5	$^{\circ}\text{C}/\text{W}$
	TO-220F1/TO-262			
	TO-263		110	$^{\circ}\text{C}/\text{W}$
	TO-251/TO-252			
Junction to Case	TO-220/TO-262/TO-263	θ_{JC}	2.01	$^{\circ}\text{C}/\text{W}$
	TO-220F/TO-220F1		4.63	$^{\circ}\text{C}/\text{W}$
	TO-251/TO-252		3.9 (Note)	$^{\circ}\text{C}/\text{W}$

Note: Device mounted on FR-4 substrate P_c board, 2oz copper, with 1inch square copper plate.

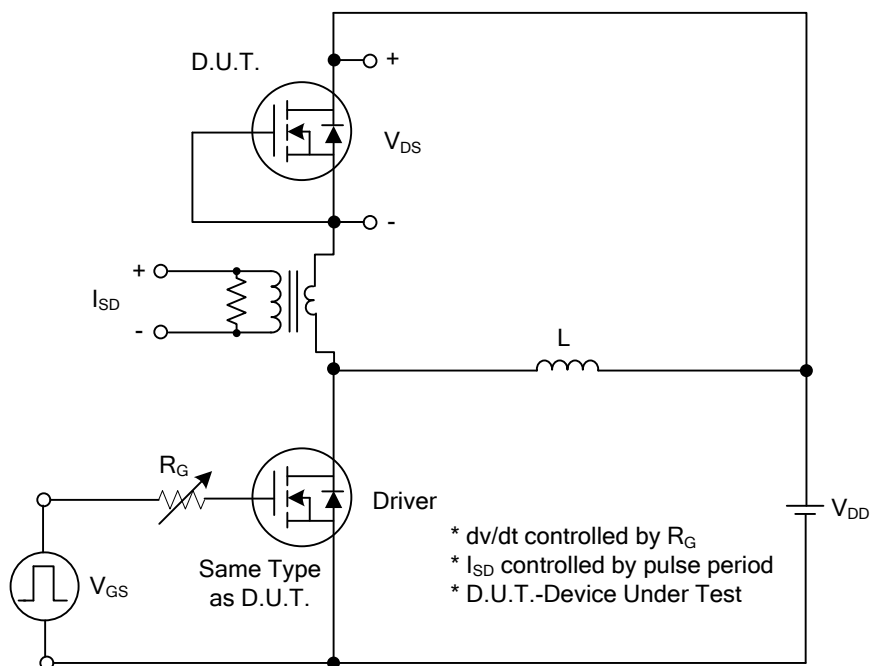
■ **ELECTRICAL CHARACTERISTICS** ($T_J=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} =0V, I _D =250μA	800			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =800V, 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	2.5		4.5	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =4.0A			0.75	Ω
DYNAMIC CHARACTERISTICS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =50V, f=1.0MHz		751		pF
Output Capacitance		C _{OSS}			106		pF
Reverse Transfer Capacitance		C _{RSS}			3.3		pF
SWITCHING CHARACTERISTICS							
Total Gate Charge (Note 1)		Q _G	V _{DS} =640V, V _{GS} =10V, I _D =8.0A (Note 1, 2)		31.5		nC
Gate to Source Charge		Q _{GS}			9		nC
Gate to Drain Charge		Q _{GD}			9		nC
Turn-ON Delay Time (Note 1)		t _{D(ON)}	V _{DS} =100V, V _{GS} =10V, I _D =8.0A, R _G =25Ω (Note 1, 2)		12		nS
Rise Time		t _R			23		nS
Turn-OFF Delay Time		t _{D(OFF)}			90		nS
Fall-Time		t _F			46		nS
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Continuous Drain-Source Diode Forward Current		I _S				8	A
Maximum Pulsed Drain-Source Diode Forward Current		I _{SM}				24	A
Drain-Source Diode Forward Voltage (Note 1)		V _{SD}	I _S =8.0A, V _{GS} =0V			1.4	V
Body Diode Reverse Recovery Time (Note 1)		t _{rr}	I _S =8.0A, V _{GS} =0V,		370		nS
Body Diode Reverse Recovery Charge		Q _{rr}	dI _F /dt=100A/μs		10.5		μC

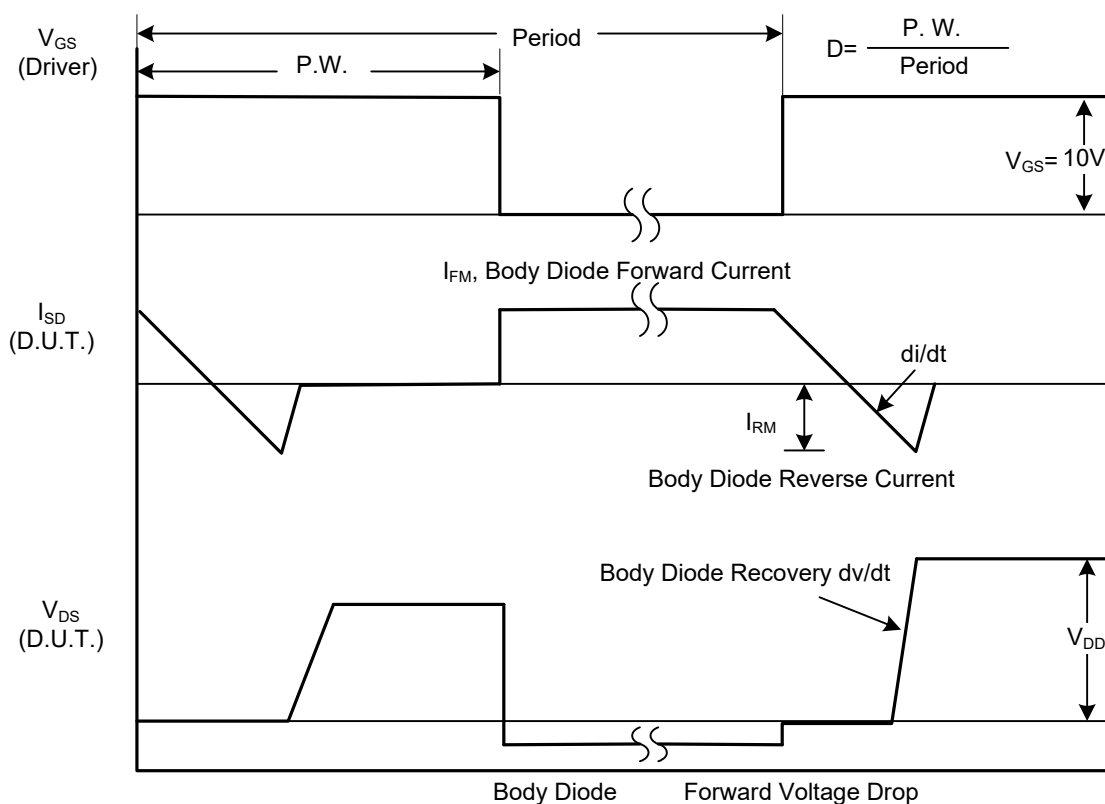
Notes: 1. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating ambient temperature.

■ TEST CIRCUITS AND WAVEFORMS

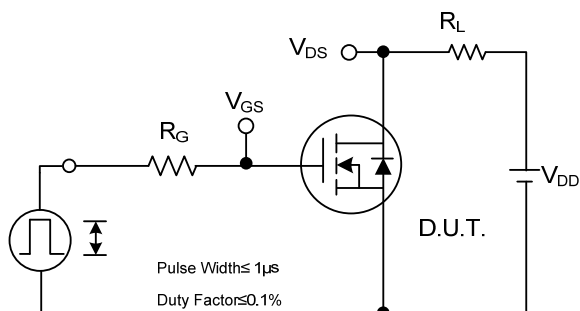


Peak Diode Recovery dv/dt Test Circuit

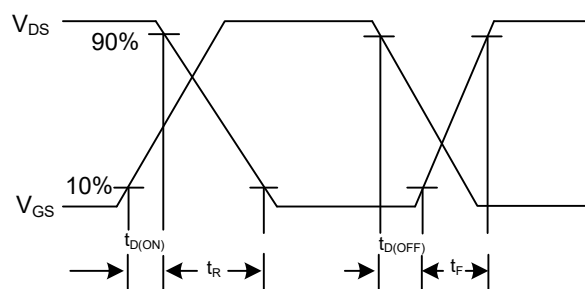


Peak Diode Recovery dv/dt Waveforms

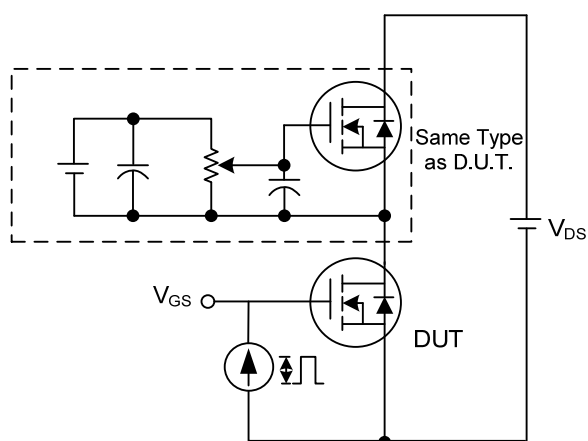
■ TEST CIRCUITS AND WAVEFORMS



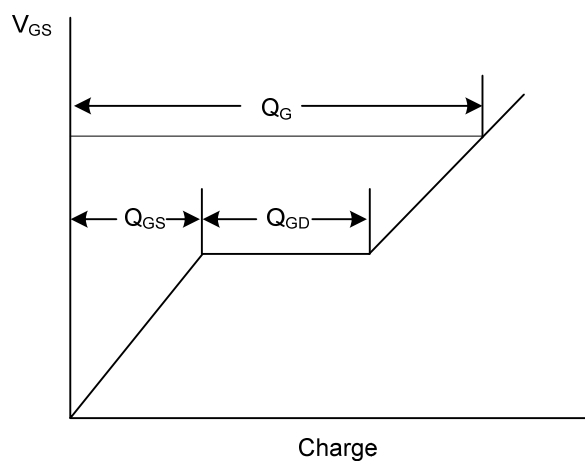
Switching Test Circuit



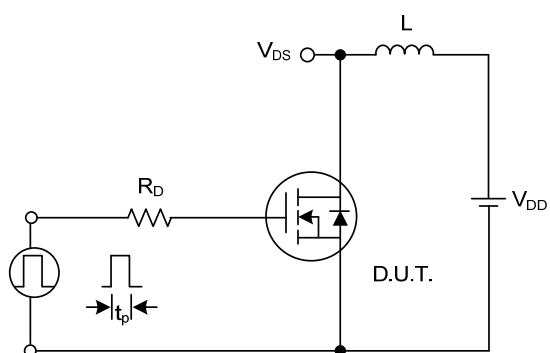
Switching Waveforms



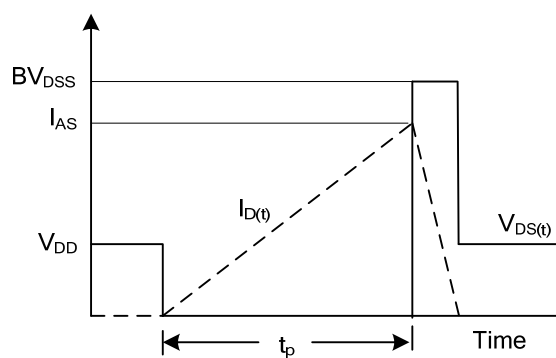
Gate Charge Test Circuit



Gate Charge Waveform

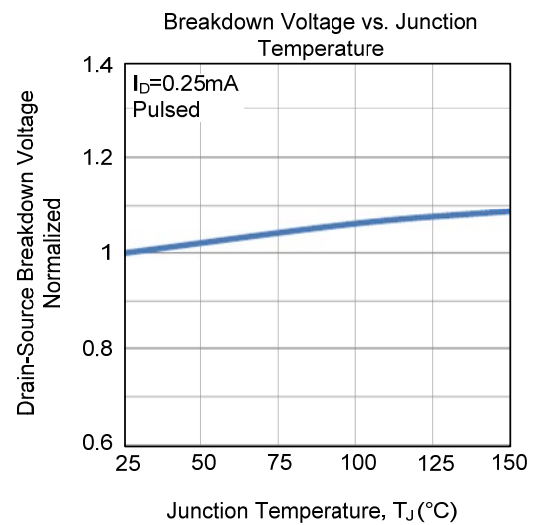
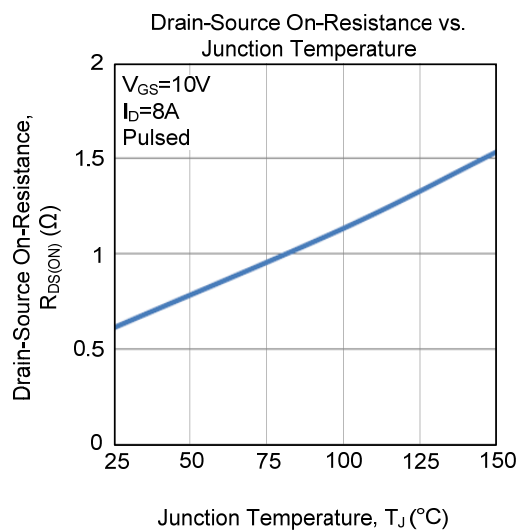
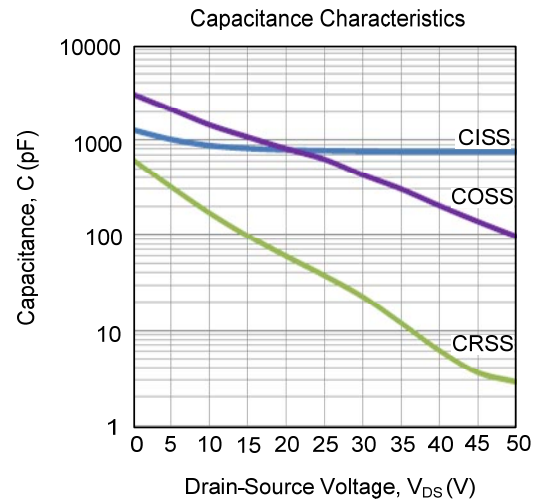
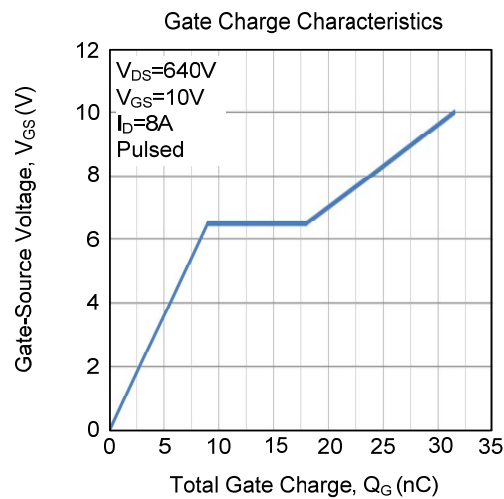
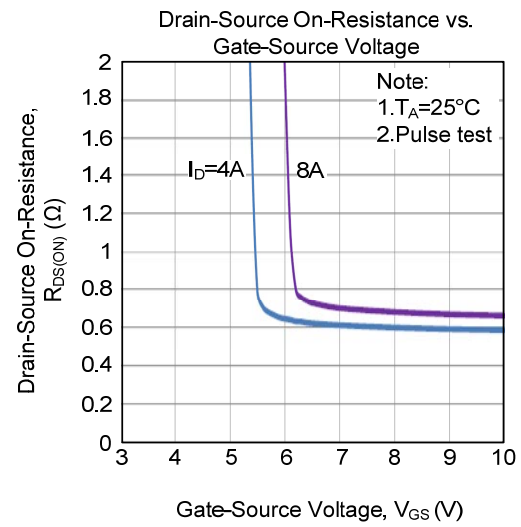
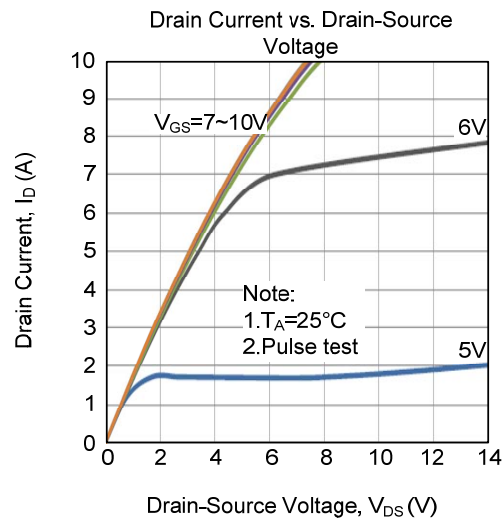


Unclamped Inductive Switching Test Circuit

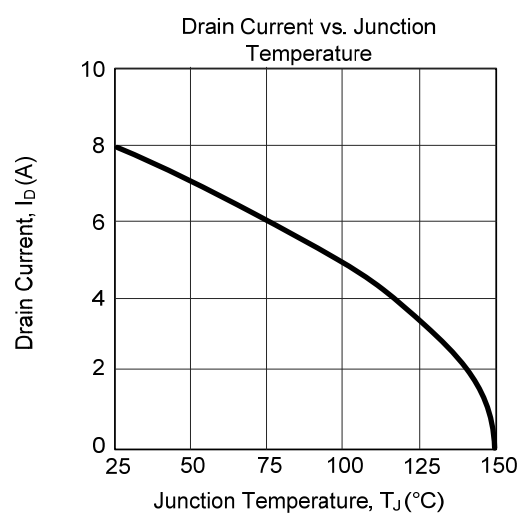
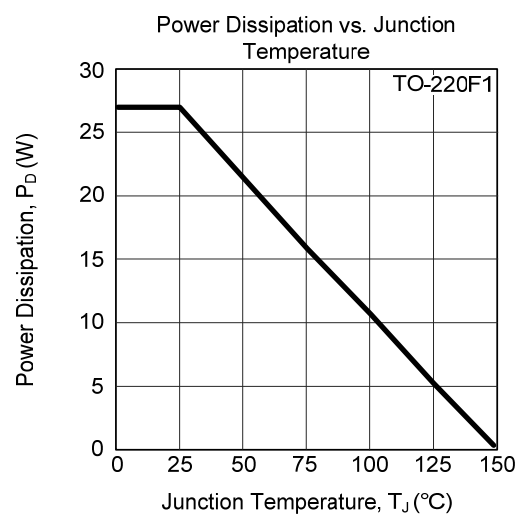
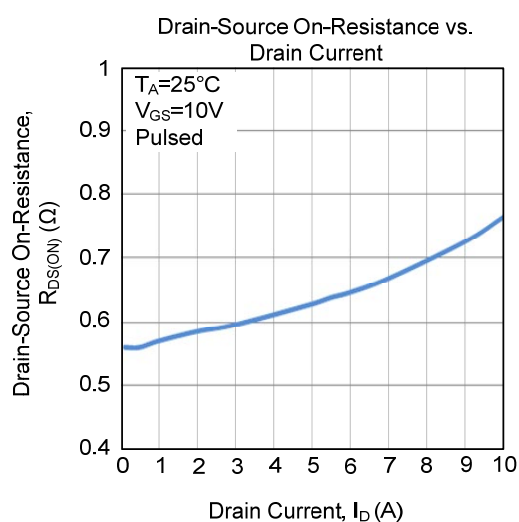
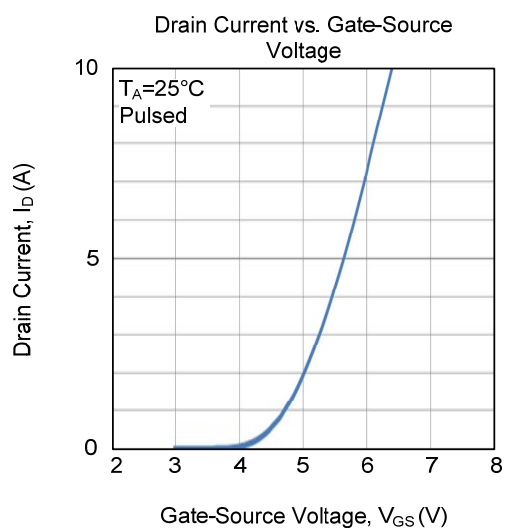
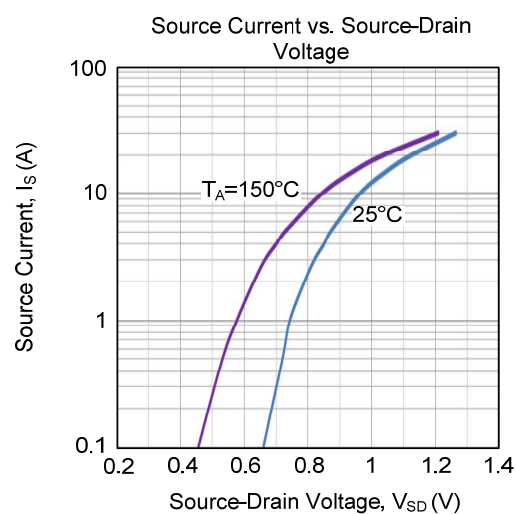
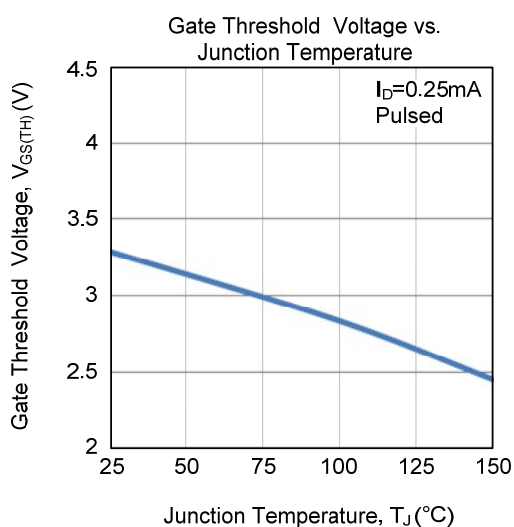


Unclamped Inductive Switching Waveforms

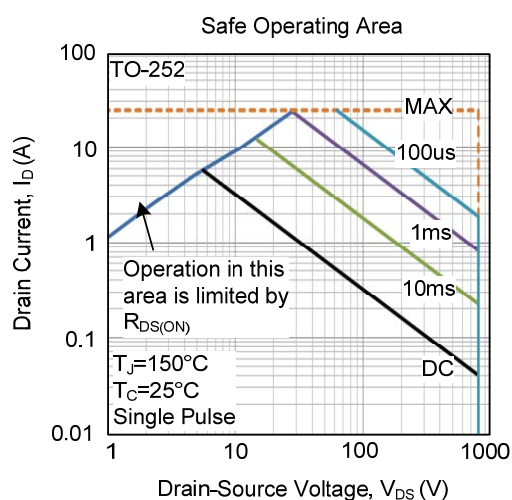
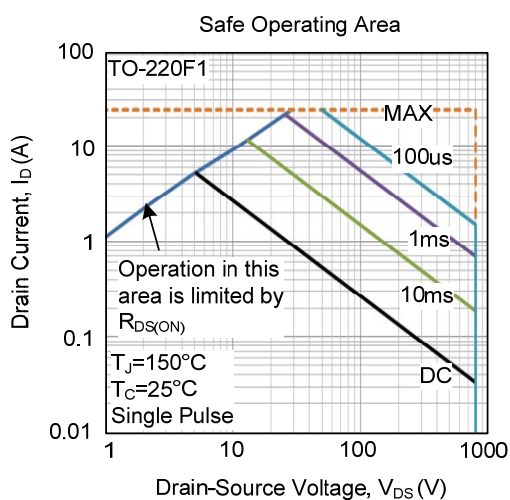
■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



TYPICAL CHARACTERISTICS (Cont.)



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