



17NM80

Power MOSFET

17A, 800V N-CHANNEL SUPER-JUNCTION MOSFET

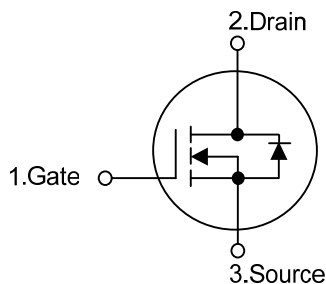
DESCRIPTION

The **UTC 17NM80** 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

- * $R_{DS(ON)} \leq 0.35 \Omega$ @ $V_{GS}=10V$, $I_D=8.5A$
- * Fast switching capability
- * Avalanche energy tested
- * Improved dv/dt capability, high ruggedness

SYMBOL

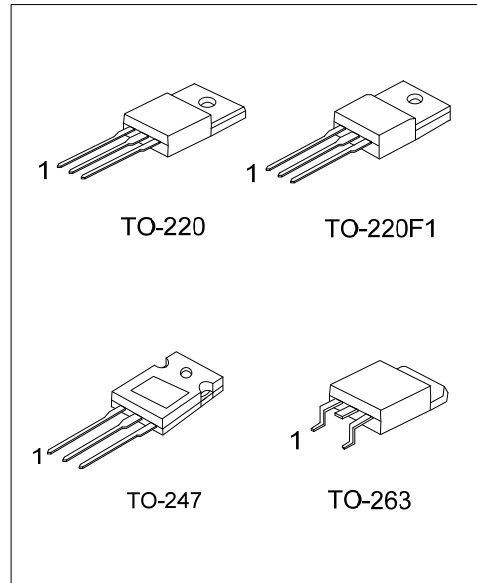


ORDERING INFORMATION

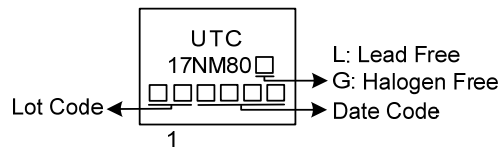
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
17NM80L-TA3-T	17NM80G-TA3-T	TO-220	G	D	S	Tube
17NM80L-TF1-T	17NM80G-TF1-T	TO-220F1	G	D	S	Tube
17NM80L-T47-T	17NM80G-T47-T	TO-247	G	D	S	Tube
17NM80L-TQ2-T	17NM80G-TQ2-T	TO-263	G	D	S	Tube
17NM80L-TQ2-R	17NM80G-TQ2-R	TO-263	G	D	S	Tape Reel

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

17NM80G-TA3-T	(1)Packing Type	(1) T: Tube, R: Tape Reel
	(2)Package Type	(2) TA3: TO-220, TF1: TO-220F1, T47: TO-247, TQ2: TO-263
	(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free



■ 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
Drain Current	Continuous	I_D	17	A
	Pulsed (Note 2)	I_{DM}	39	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	286	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	3	V/ns
Power Dissipation	TO-220/TO-263	P_D	100	W
	TO-220F1		31	W
	TO-247		210	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. $L=17\text{mH}$, $I_{AS}=5.8\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\ \Omega$, Starting $T_J = 25^\circ\text{C}$

4. $I_{SD} \leq 17\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$

■ **THERMAL DATA**

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-220F1	θ_{JA}	62.5	$^\circ\text{C/W}$
	TO-263			
	TO-247		40	$^\circ\text{C/W}$
Junction to Case	TO-220/TO-263	θ_{JC}	1.25	$^\circ\text{C/W}$
	TO-220F1		4.03	$^\circ\text{C/W}$
	TO-247		0.59	$^\circ\text{C/W}$

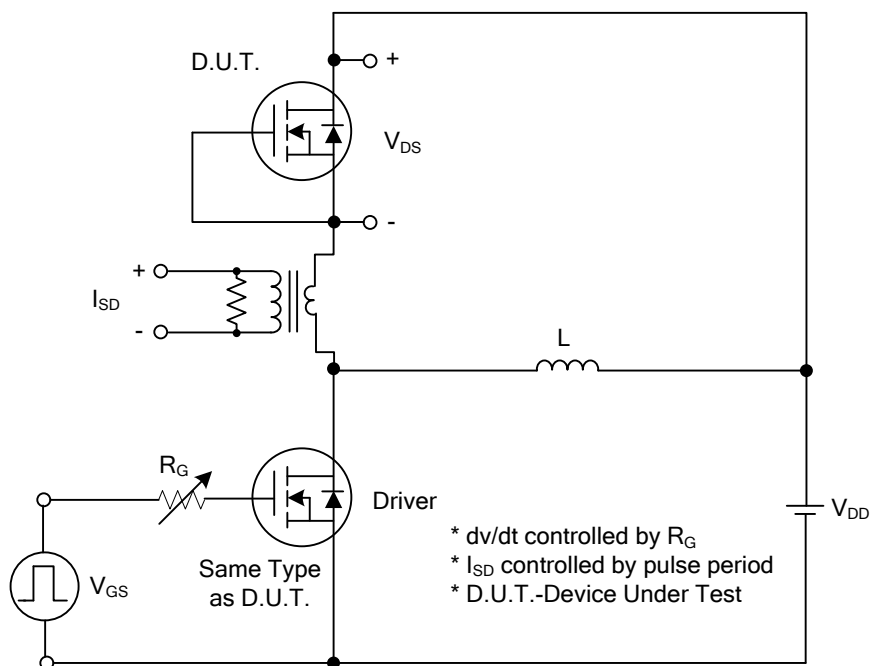
■ **ELECTRICAL CHARACTERISTICS** ($T_J=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	800			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =800V, V _{GS} =0V			10	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =30V, V _{DS} =0V			100	nA
		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 =8.5A			0.35	Ω
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =50V, f=1.0MHz		1600		pF
Output Capacitance	C _{OSS}			121		pF
Reverse Transfer Capacitance	C _{RSS}			6		pF
SWITCHING CHARACTERISTICS						
Total Gate Charge (Note 1)	Q _G	V _{DS} =640V, V _{GS} =10V I _D =17A (Note 1,2)		66		nC
Gate to Source Charge	Q _{GS}			10		nC
Gate to Drain Charge	Q _{GD}			28		nC
Turn-ON Delay Time (Note 1)	t _{D(ON)}	V _{DD} =400V, I _D =17A,R _G =25Ω, V _{GS} =10V (Note 1,2)		28		nS
Rise Time	t _R			30		nS
Turn-OFF Delay Time	t _{D(OFF)}			195		nS
Fall-Time	t _F			56		nS
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I _S				17	A
Maximum Body-Diode Pulsed Current	I _{SM}				39	A
Drain-Source Diode Forward Voltage (Note 1)	V _{SD}	I _S =17A, V _{GS} =0V			1.4	V
Body Diode Reverse Recovery Time (Note 1)	t _{rr}	I _S =17A, V _{GS} =0V		505		nS
Body Diode Reverse Recovery Charge	Q _{rr}	dlf/dt=100A/μs		9.4		μC

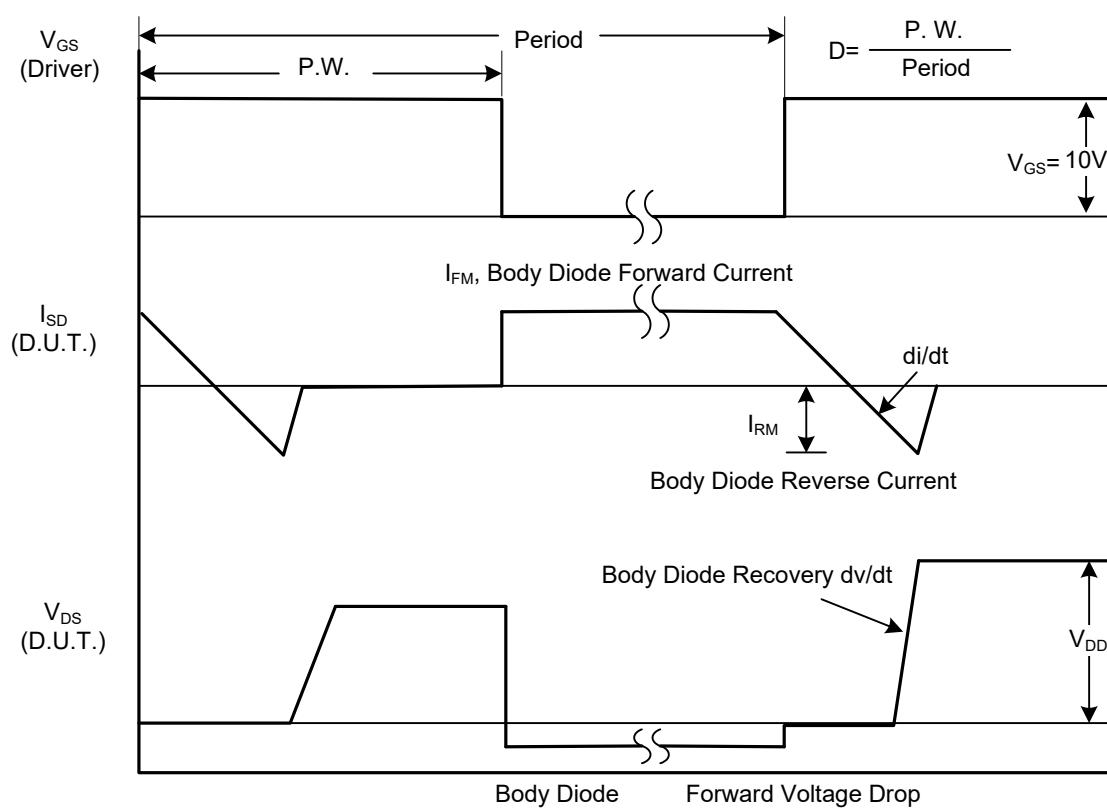
Notes: 1. Pulse Test : Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating ambient temperature.

■ TEST CIRCUITS AND WAVEFORMS

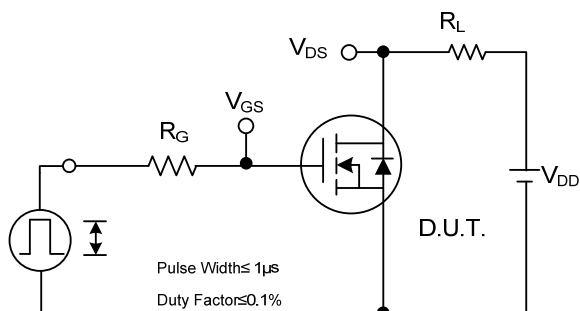


Peak Diode Recovery dv/dt Test Circuit

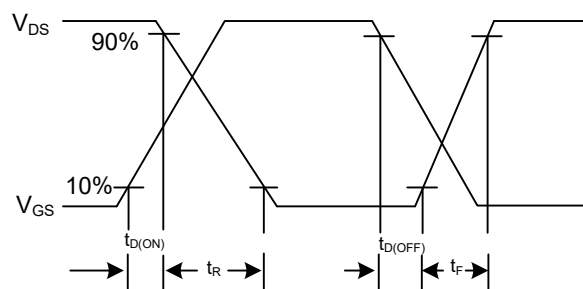


Peak Diode Recovery dv/dt Waveforms

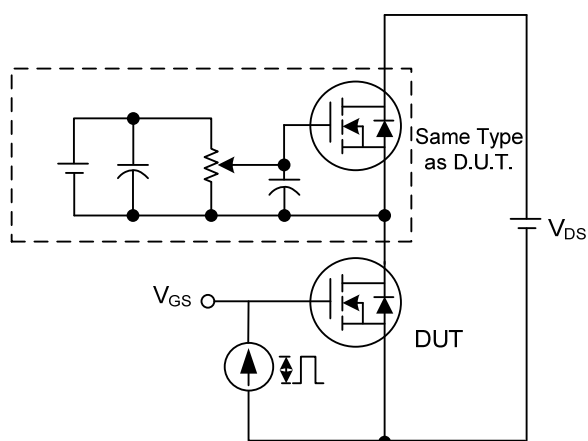
■ TEST CIRCUITS AND WAVEFORMS



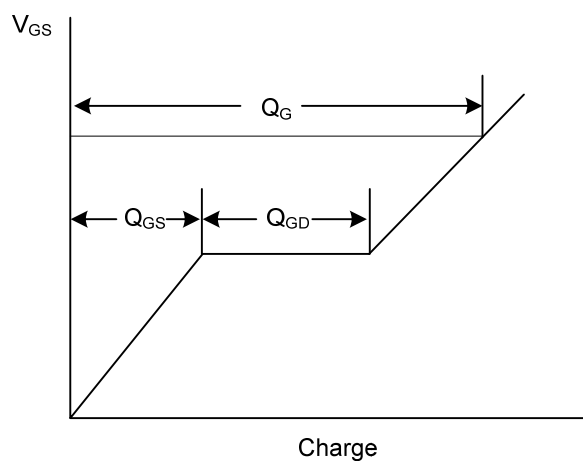
Switching Test Circuit



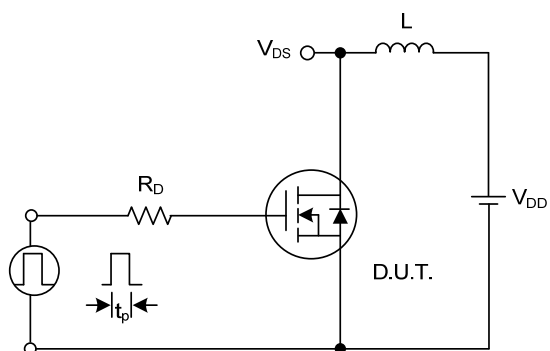
Switching Waveforms



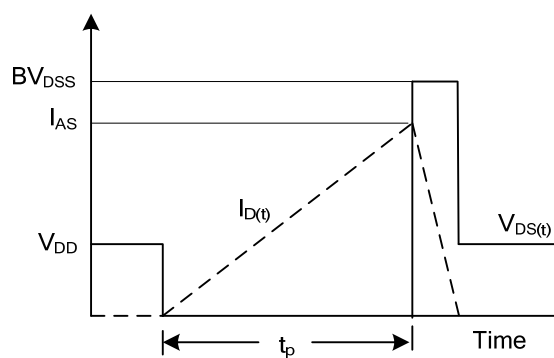
Gate Charge Test Circuit



Gate Charge Waveform

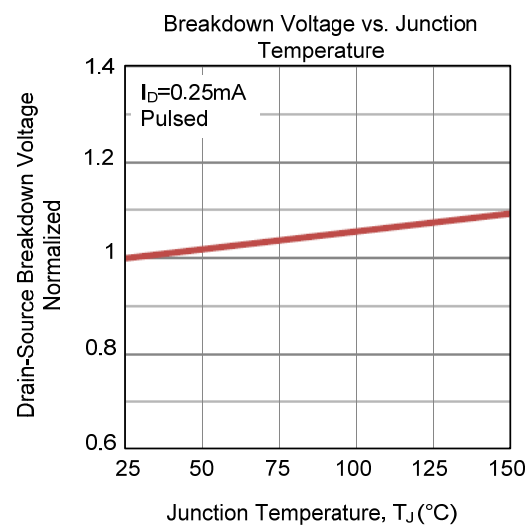
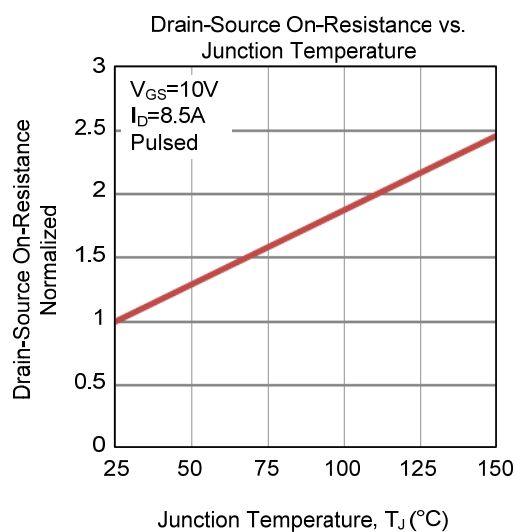
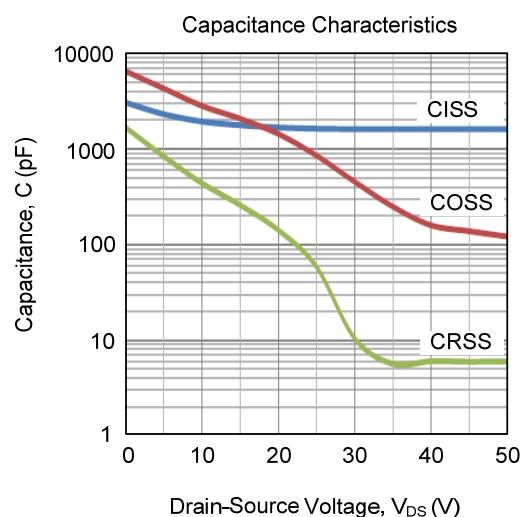
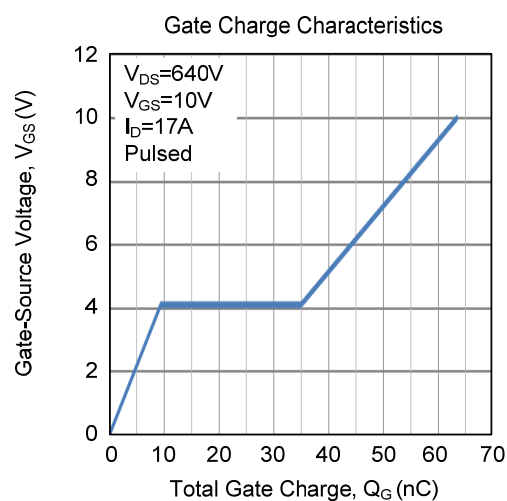
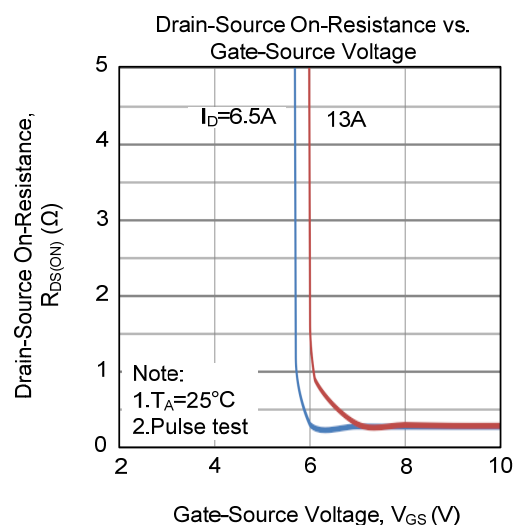
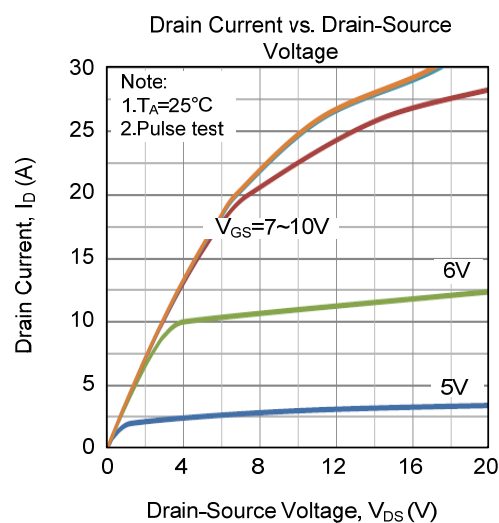


Unclamped Inductive Switching Test Circuit

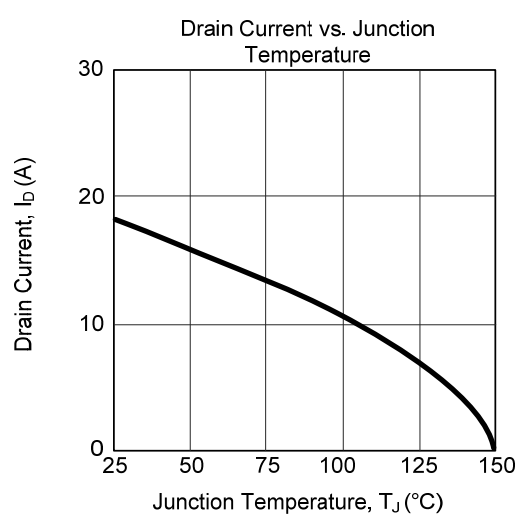
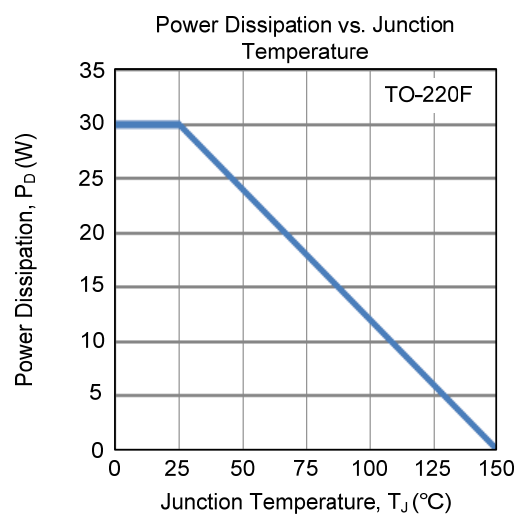
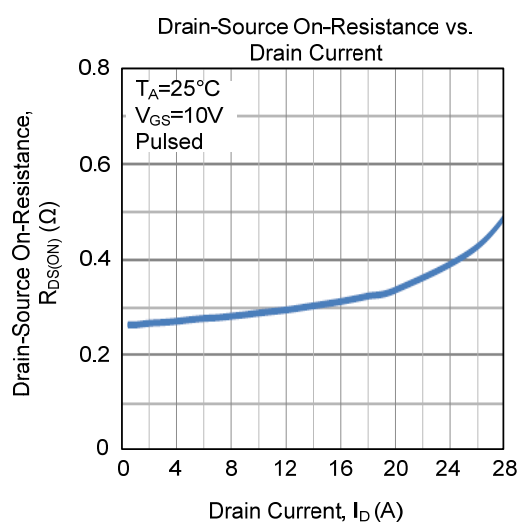
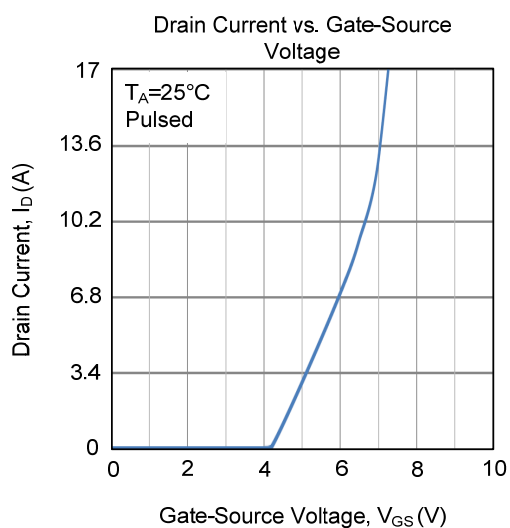
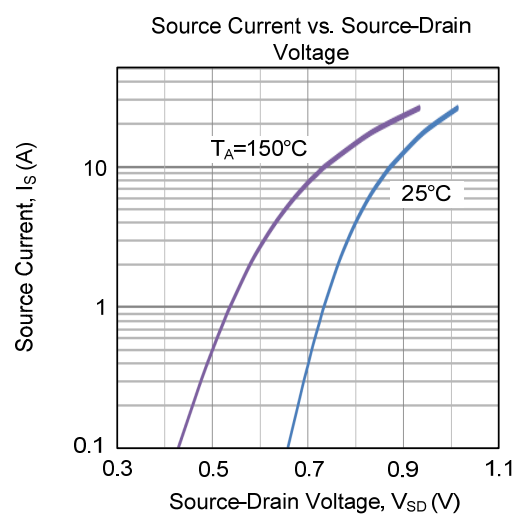
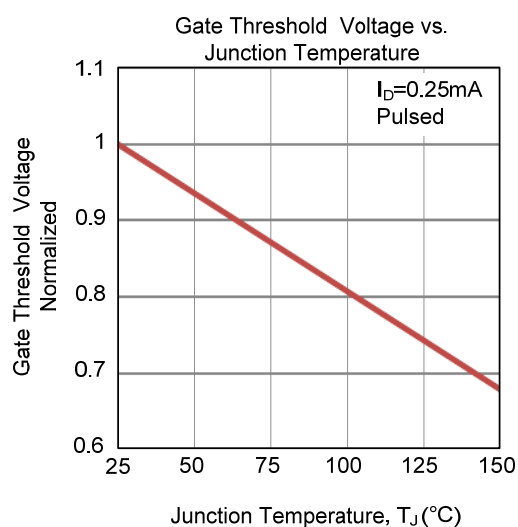


Unclamped Inductive Switching Waveforms

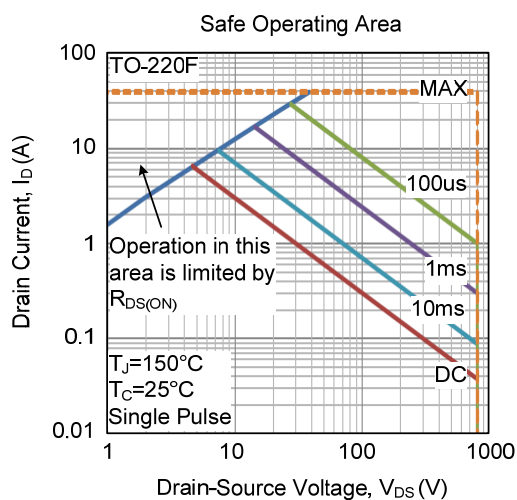
■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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