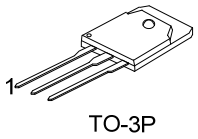
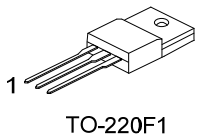
10N80

Power MOSFET

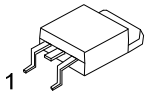
10A, 800V N-CHANNEL POWER MOSFET



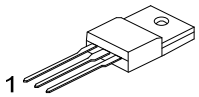
TO-3P



TO-220F1



TO-263



TO-220F2

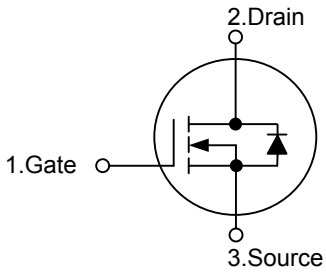
■ DESCRIPTION

The UTC **10N80** uses UTC's advanced proprietary, planar stripe, DMOS technology to 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

* $R_{DS(ON)} \leq 1.1\Omega$ @ V_{GS}=10V, I_D=5.0A
* Fast Switching Capability
* Avalanche Energy Specified
* Improved dv/dt Capability, High Ruggedness

■ SYMBOL



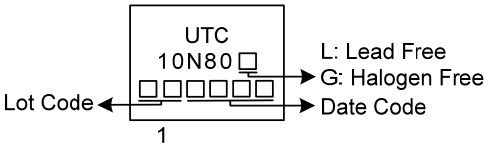
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
10N80L-TF1-T	10N80G-TF1-T	TO-220F1	G	D	S	Tube
10N80L-TF2-T	10N80G-TF2-T	TO-220F2	G	D	S	Tube
10N80L-T3P-T	10N80G-T3P-T	TO-3P	G	D	S	Tube
10N80L-TQ2-T	10N80G-TQ2-T	TO-263	G	D	S	Tube
10N80L-TQ2-R	10N80G-TQ2-R	TO-263	G	D	S	Tape Reel

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

10N80G-TF1-T (1)Packing Type (2)Package Type (3)Green Package	(1) T: Tube, R: Tape Reel (2) TF1: TO-220F1, TF2: TO-220F2, T3P: TO-3P TQ2: TO-263 (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



■ ABSOLUTE MAXIMUM RATINGS (T_C =25°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 (T_C = 25°C)		I_D	10	A
Pulsed Drain Current (Note 2)		I_{DM}	20	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	770	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	2.2	V/ns
Power Dissipation	TO-220F1 TO-220F2	P_D	30	W
	TO-263		145	
	TO-3P		240	
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}=12.4A, V_{DD}=50V, R_G=25Ω, Starting T_J=25°C
4. I_{SD} ≤ 10 A, di/dt ≤ 200A/μs, V_{DD} ≤BV_{DSS}, Starting T_J=25°C

■ THERMAL CHARACTERISTICS

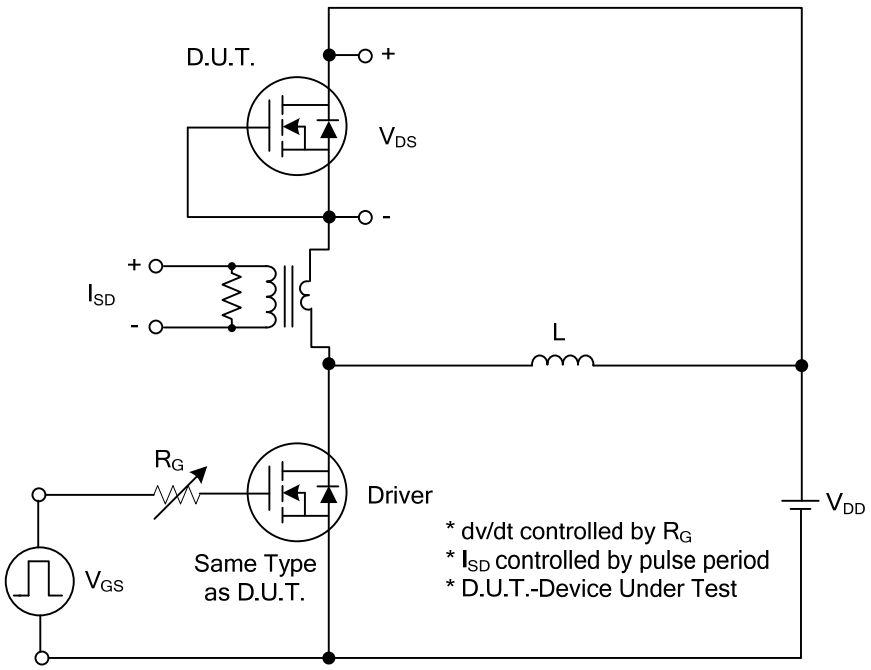
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220F1 TO-220F2 TO-263	θ_{JA}	62.5	°C/W
	TO-3P		40	
Junction to Case	TO-220F1 TO-220F2	θ_{JC}	4.2	°C/W
	TO-263		0.86	
	TO-3P		0.52	

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

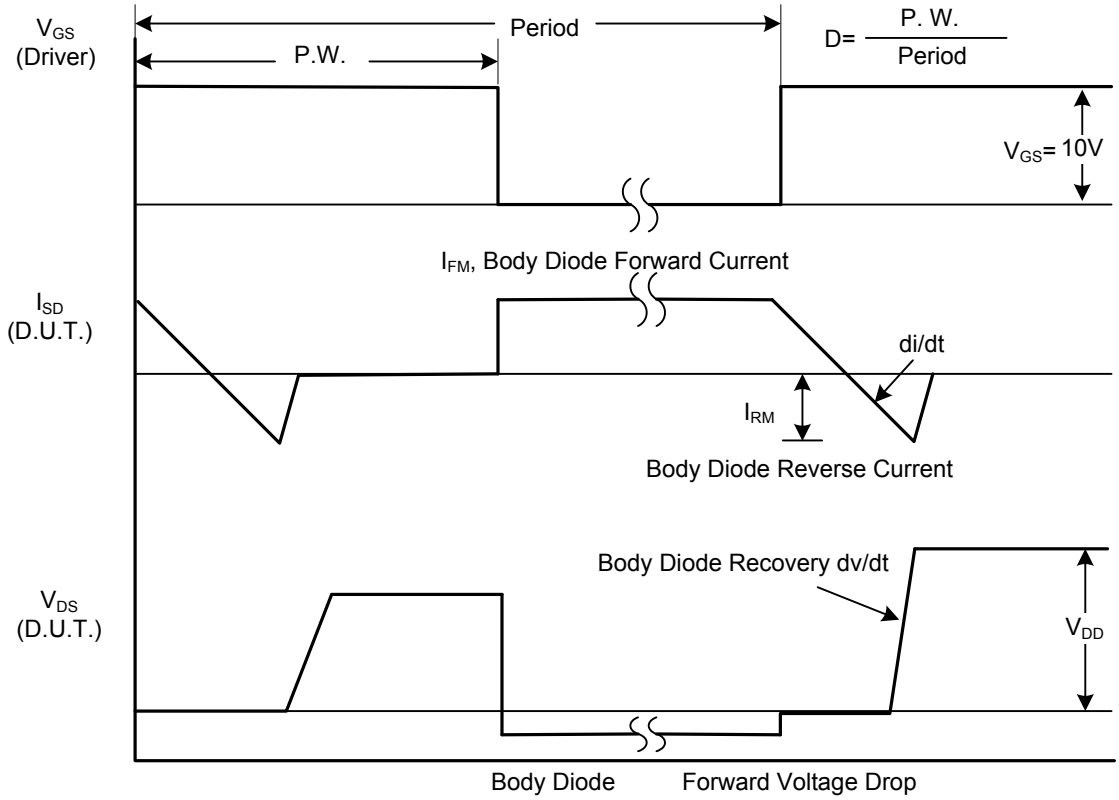
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250 μA	800			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=800V, V_{GS}=0V			10	μA
		V_{DS}=640V, T_C=125°C			100	
Gate-Body Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±30V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	3.0		5.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=5.0A			1.1	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{DS}=25V, V_{GS}=0V, f=1MHz		2100		pF
Output Capacitance	C_{OSS}			230		pF
Reverse Transfer Capacitance	C_{RSS}			36		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	V_{DS}=640V, V_{GS}=10V, I_D=10A I_G=1mA (Note 1,2)		61		nC
Gate Source Charge	Q_{GS}			12		
Gate Drain Charge	Q_{GD}			20		
Turn-ON Delay Time	$t_{D(ON)}$	V_{DD}=100V, V_{GS}=10V, I_D=10A, R_G=25Ω (Note 1,2)		38		ns
Turn-ON Rise Time	t_R			27		
Turn-OFF Delay Time	$t_{D(OFF)}$			180		
Turn-OFF Fall-Time	t_F			60		
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I_S				10	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				20	
Drain-Source Diode Forward Voltage	V_{SD}	I_S=10.0 A,V_{GS}=0V			1.4	V
Reverse Recovery Time	t_{rr}	V_{GS} = 0V, dI_F /dt = 100 A/μs, I_S = 10.0A (Note 1)		530		ns
Reverse Recovery Charge	Q_{rr}			9.8		nC

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

■ TEST CIRCUITS AND WAVEFORMS

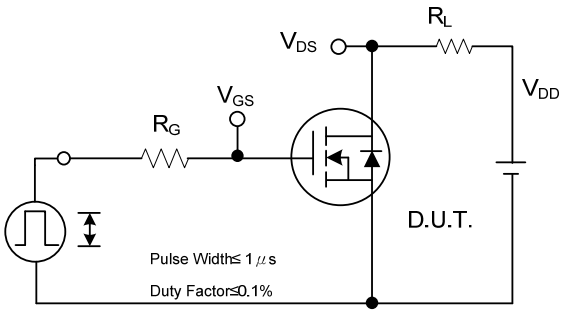


Peak Diode Recovery dv/dt Test Circuit

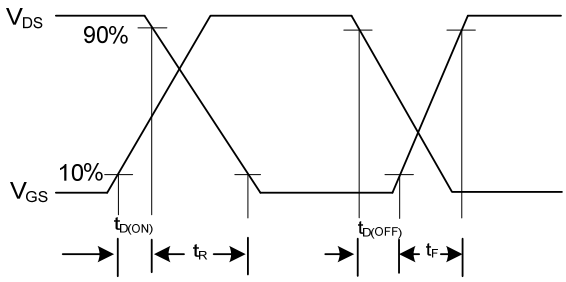


Peak Diode Recovery dv/dt Waveforms

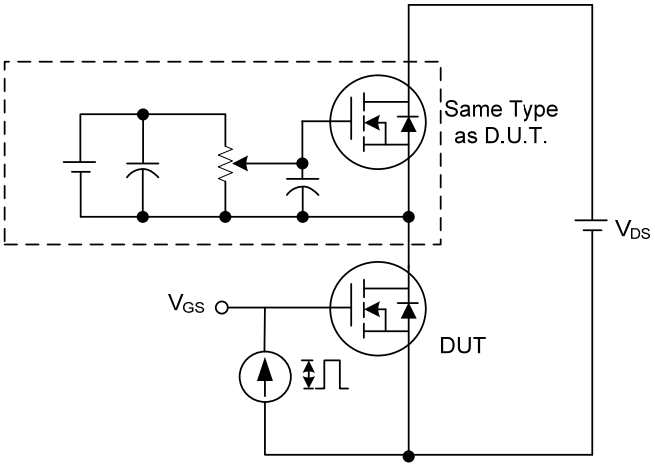
■ TEST CIRCUITS AND WAVEFORMS



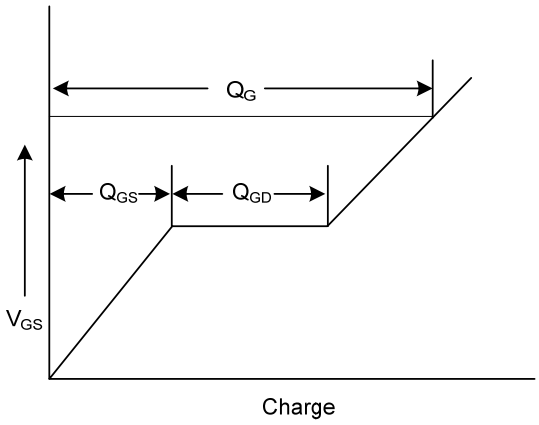
Switching Test Circuit



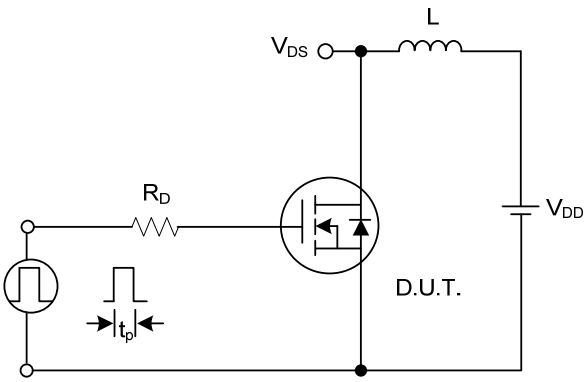
Switching Waveforms



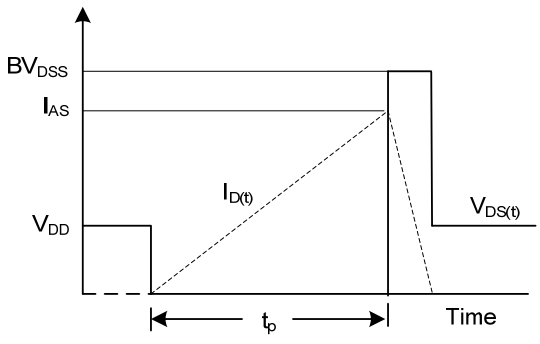
Gate Charge Test Circuit



Gate Charge Waveform



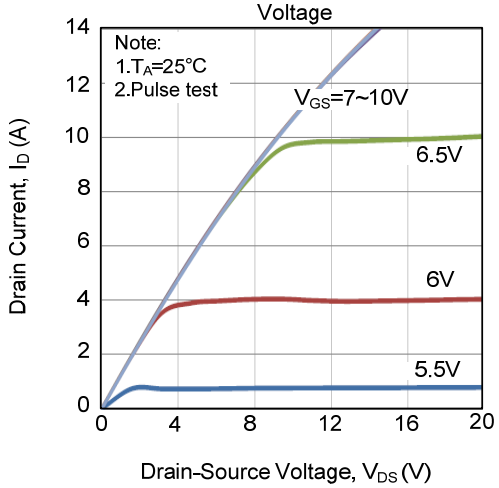
Unclamped Inductive Switching Test Circuit



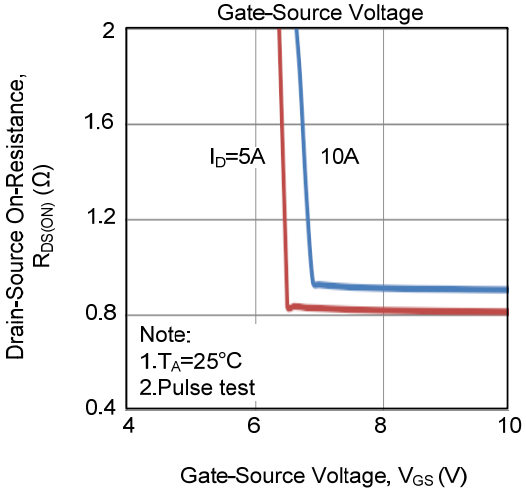
Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS

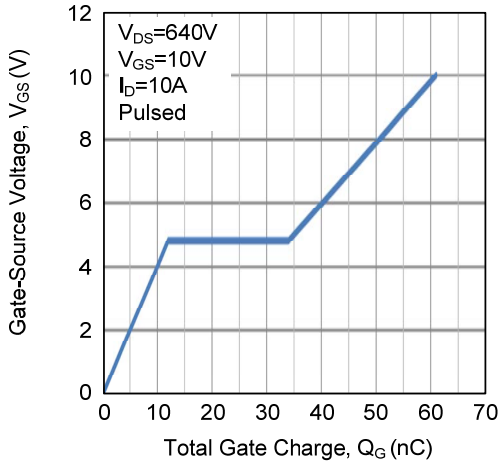
Drain Current vs. Drain-Source Voltage



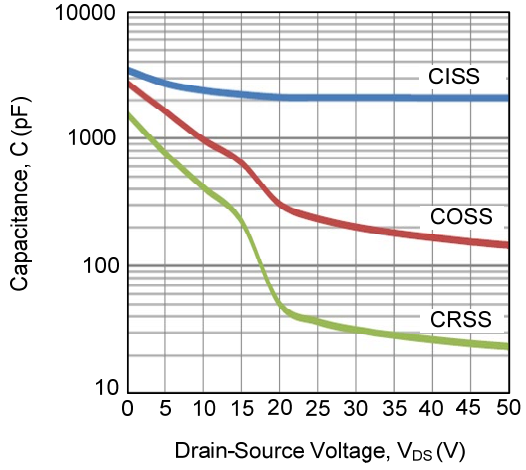
Drain-Source On-Resistance vs. Gate-Source Voltage



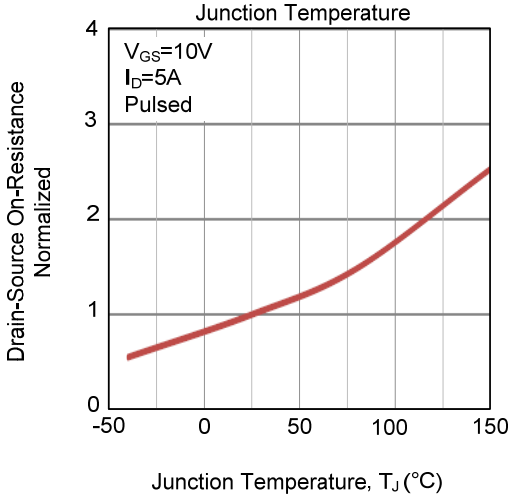
Gate Charge Characteristics



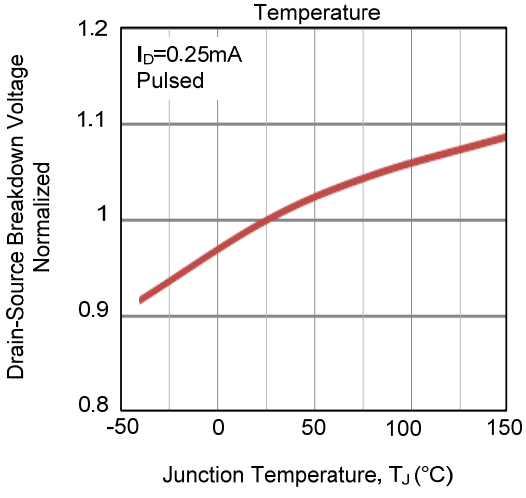
Capacitance Characteristics



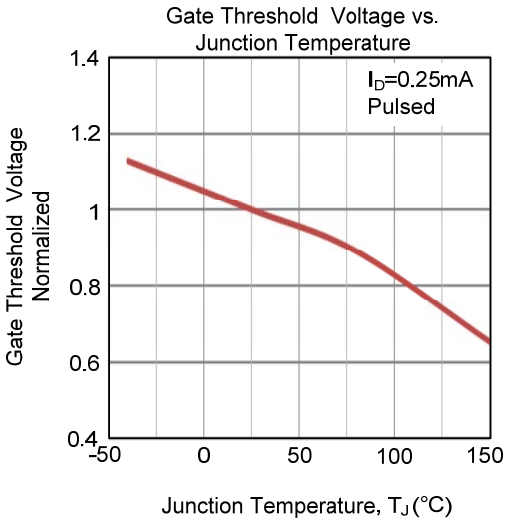
Drain-Source On-Resistance vs. Junction Temperature

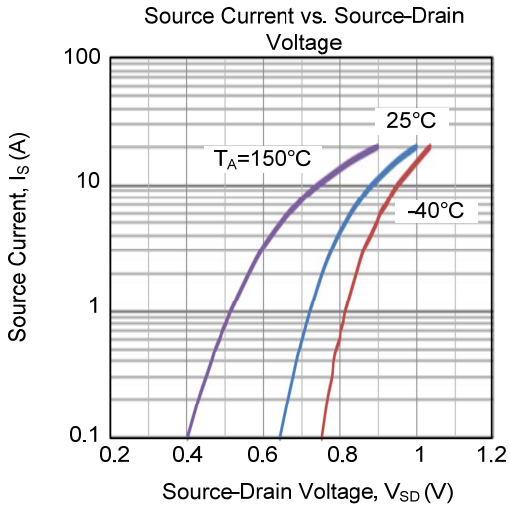


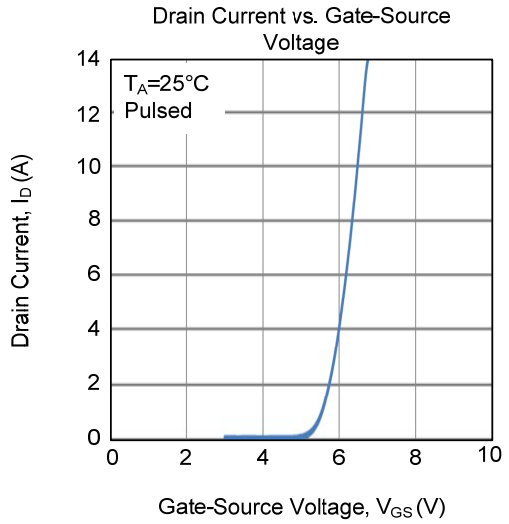
Breakdown Voltage vs. Junction Temperature

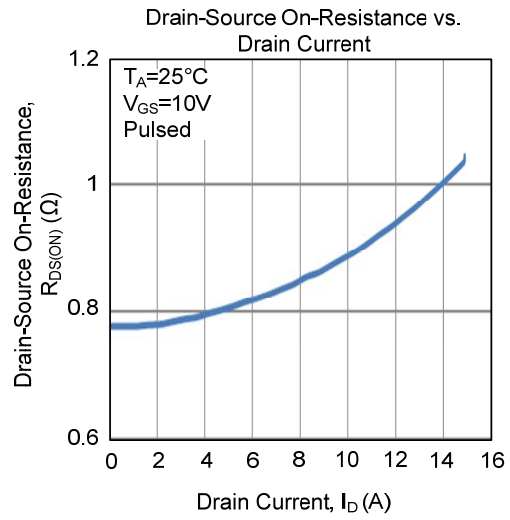


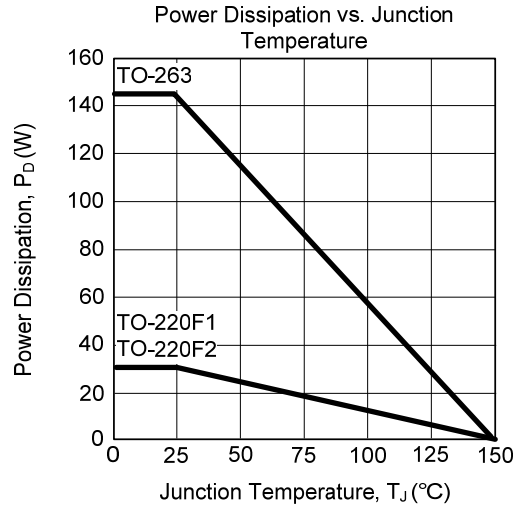
■ TYPICAL CHARACTERISTICS (Cont.)

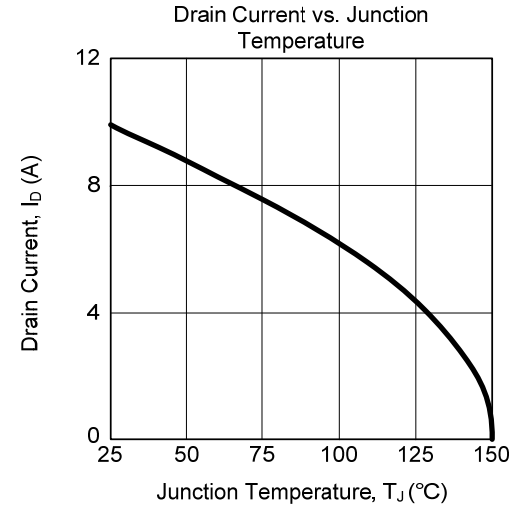












■ TYPICAL CHARACTERISTICS (Cont.)