

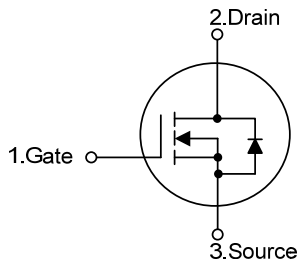
**12N80****Power MOSFET****12A, 800V N-CHANNEL
POWER MOSFET****DESCRIPTION**

The UTC **12N80** is an N-channel enhancement mode power MOSFET using UTC's advanced technology to provide customers with planar stripe and DMOS technology. This technology is specialized in allowing a minimum on-state resistance and superior switching performance. It also can withstand high energy pulse in the avalanche and commutation mode.

The UTC **12N80** is universally applied in high efficiency switch mode power supply.

FEATURES

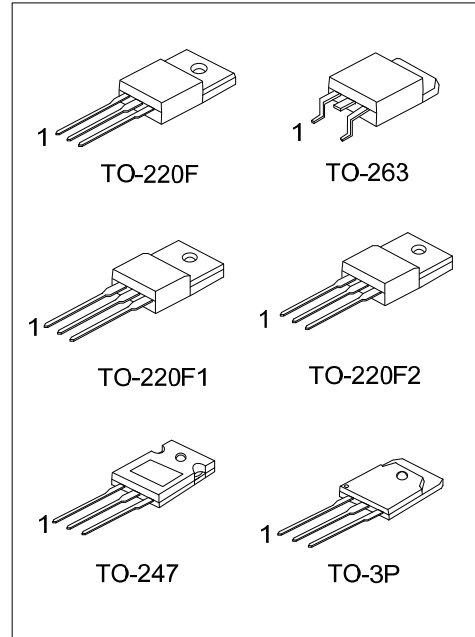
- * $R_{DS(on)} \leq 1.0 \Omega$ @ $V_{GS}=10V$, $I_D=6.0A$
- * High switching speed
- * Improved dv/dt capability
- * 100% avalanche tested

SYMBOL**ORDERING INFORMATION**

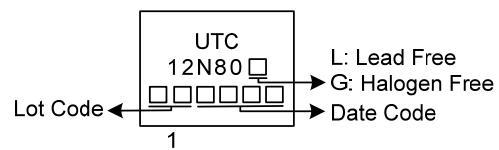
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
12N80L-TF1-T	12N80G-TF1-T	TO-220F1	G	D	S	Tube
12N80L-TF2-T	12N80G-TF2-T	TO-220F2	G	D	S	Tube
12N80L-TF3-T	12N80G-TF3-T	TO-220F	G	D	S	Tube
12N80L-TQ2-T	12N80G-TQ2-T	TO-263	G	D	S	Tube
12N80L-TQ2-R	12N80G-TQ2-R	TO-263	G	D	S	Tape Reel
12N80L-T47-T	12N80G-T47-T	TO-247	G	D	S	Tube
12N80L-T3P-T	12N80G-T3P-T	TO-3P	G	D	S	Tube

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

12N80G-TF1-T (1) Packing Type (2) Package Type (3) Green Package	(1) T: Tube, R: Tape Reel (2) TF1: TO-220F1, TF2: TO-220F2, TF3: TO-220F, TQ2: TO-263, T3P: TO-3P, T47: TO-247 (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	12	A
	Pulsed (Note 2)	I_{DM}	24	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	884	mJ
Power Dissipation	TO-220F/TO-220F1 TO-220F2	P_D	48	W
	TO-247		240	W
	TO-3P		260	W
	TO-263		150	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. $L=10\text{mH}$, $I_{AS}=13.3\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\ \Omega$, Starting $T_J = 25^\circ\text{C}$

■ **THERMAL DATA**

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220F/TO-220F1 TO-220F2	θ_{JA}	62.5	$^\circ\text{C/W}$
	TO-247		50	$^\circ\text{C/W}$
	TO-3P		40	$^\circ\text{C/W}$
	TO-263		62.5	$^\circ\text{C/W}$
Junction to Case	TO-220F/TO-220F1 TO-220F2	θ_{JC}	2.6	$^\circ\text{C/W}$
	TO-247		0.52	$^\circ\text{C/W}$
	TO-3P		0.48	$^\circ\text{C/W}$
	TO-263		0.75	$^\circ\text{C/W}$

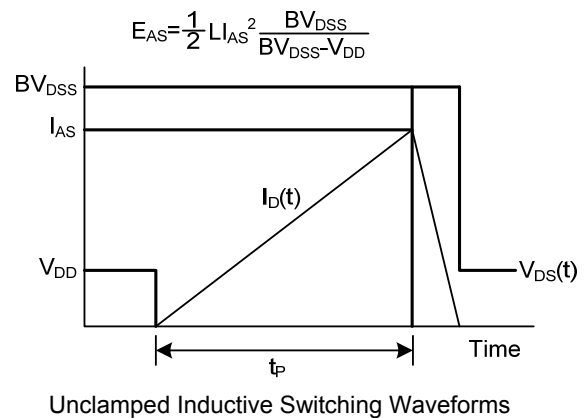
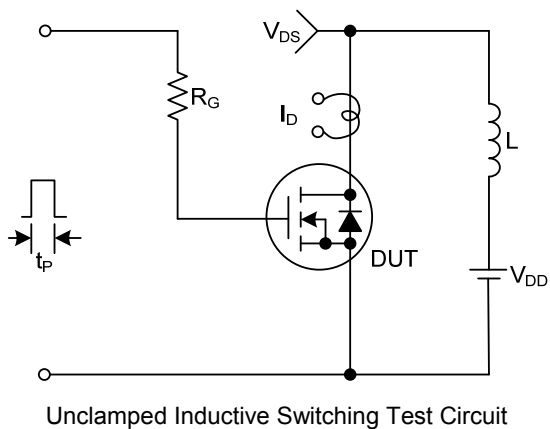
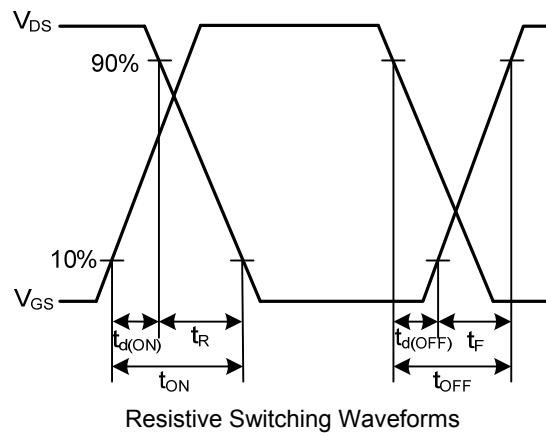
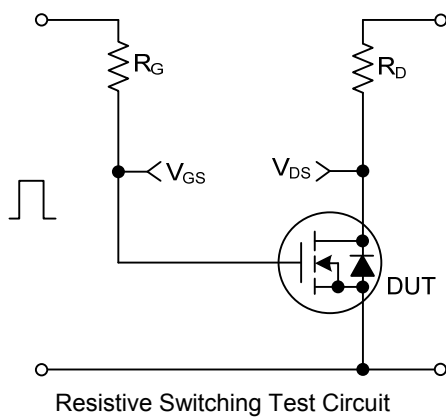
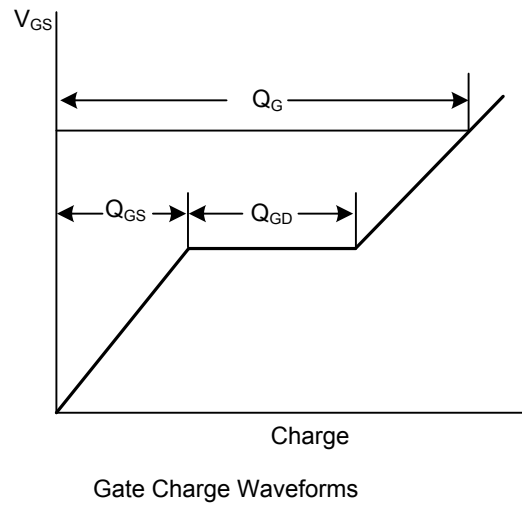
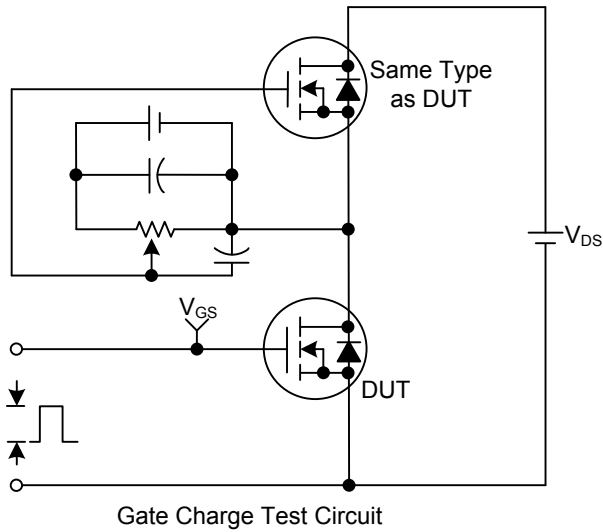
■ **ELECTRICAL CHARACTERISTICS** ($T_C = 25^\circ\text{C}$ unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250μA, V _{GS} =0V	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- 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	3.0		5.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =6.0A			1.0	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		2200		pF
Output Capacitance		C _{OSS}			200		pF
Reverse Transfer Capacitance		C _{RSS}			30		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q _G	V _{DS} =400V, V _{GS} =10V, I _D =12A I _G =1mA (Note 1, 2)		61		nC
Gate to Source Charge		Q _{GS}			12		nC
Gate to Drain Charge		Q _{GD}			21		nC
Turn-ON Delay Time		t _{D(ON)}	V _{DD} =100V, V _{GS} =10V, I _D =12A, R _G =25Ω (Note 1, 2)		38		ns
Rise Time		t _R			25		ns
Turn-OFF Delay Time		t _{D(OFF)}			180		ns
Fall-Time		t _F			64		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Continuous Drain-Source Diode Forward Current		I _S				12	A
Maximum Pulsed Drain-Source Diode Forward Current		I _{SM}				24	A
Drain-Source Diode Forward Voltage		V _{SD}	I _S =12A, V _{GS} =0V			1.4	V
Body Diode Reverse Recovery Time		t _{rr}	V _{GS} =0V, I _S =12A, dI _F /dt=100A/μs		630		ns
Body Diode Reverse Recovery Charge		Q _{rr}	(Note 1)		12		μC

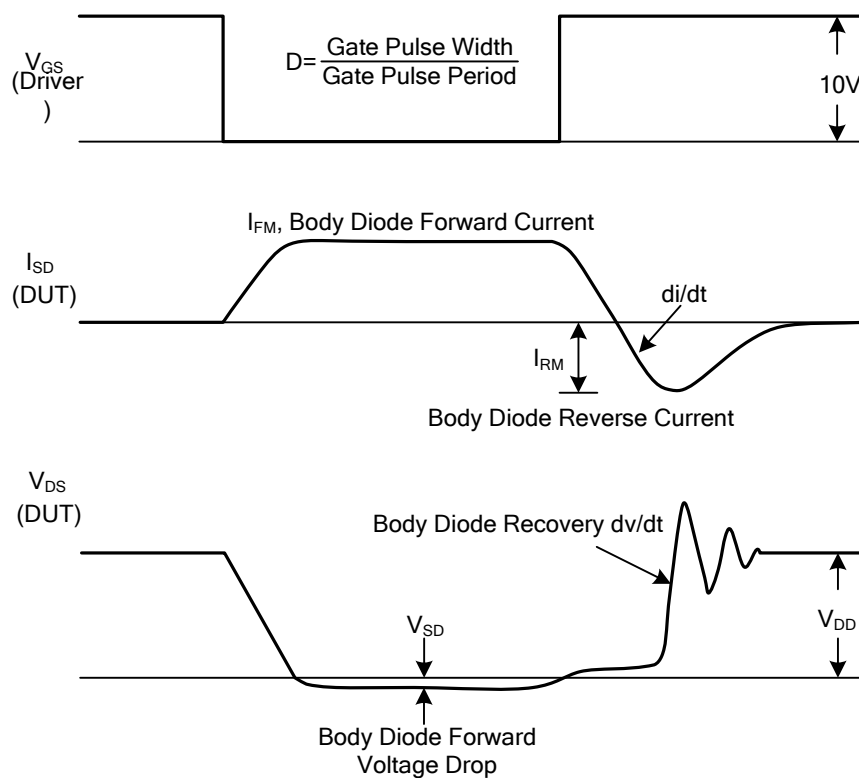
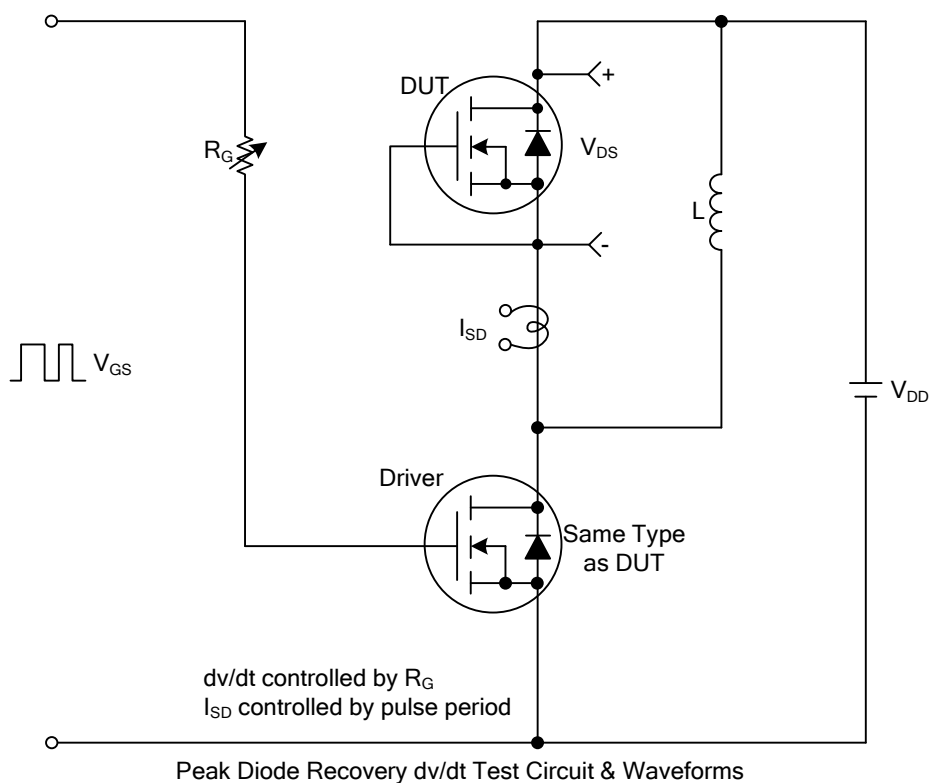
Notes: 1. Pulse Test: Pulse width $\leq 250\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

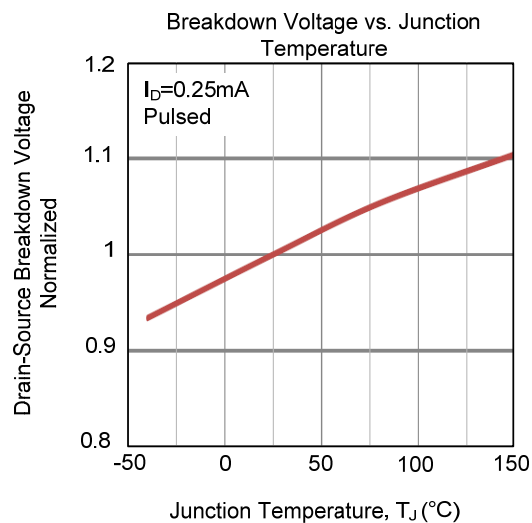
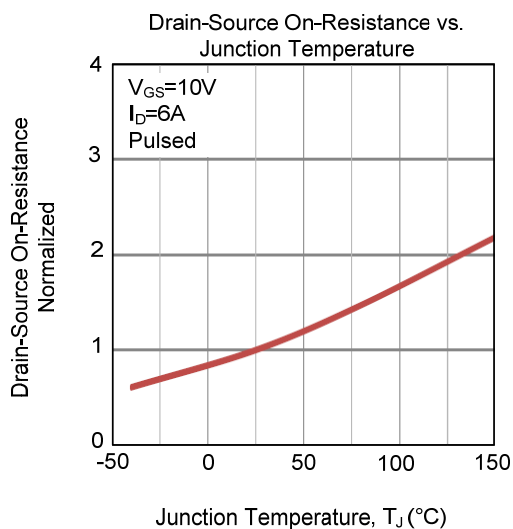
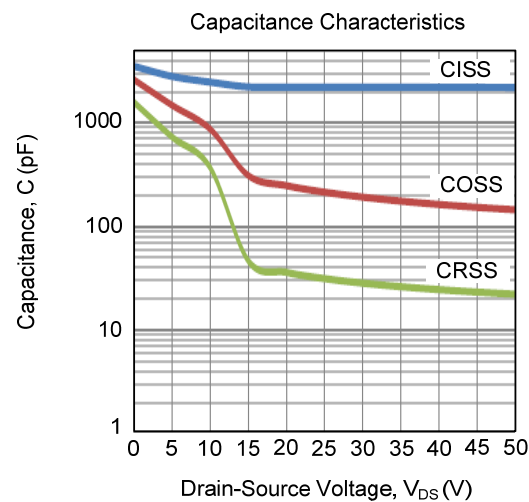
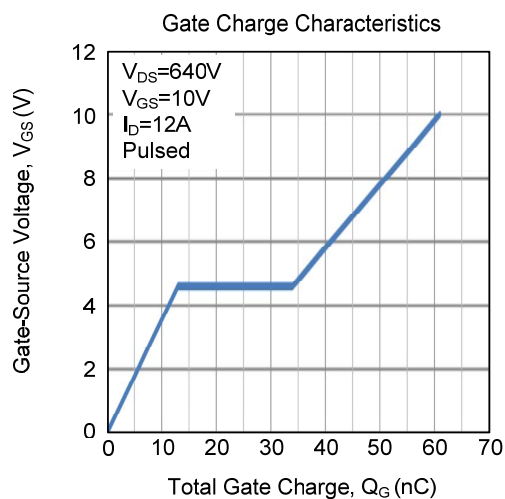
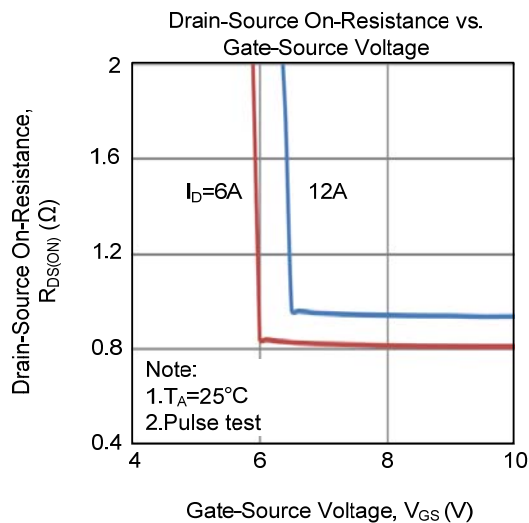
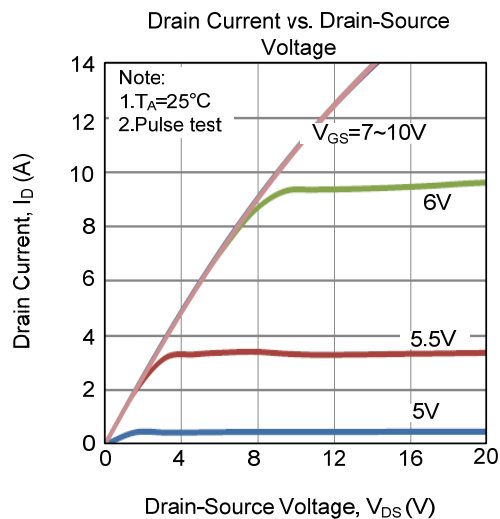
■ TEST CIRCUITS AND WAVEFORMS



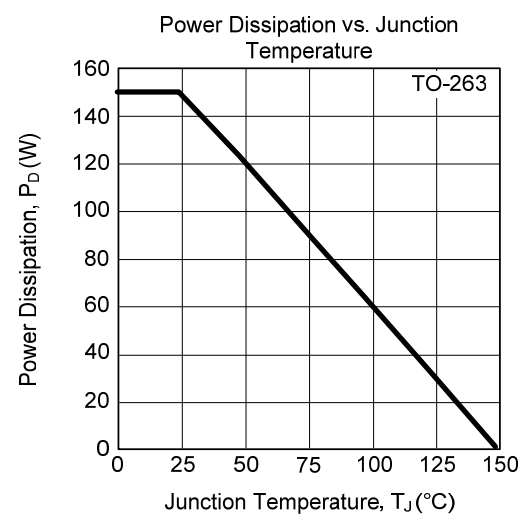
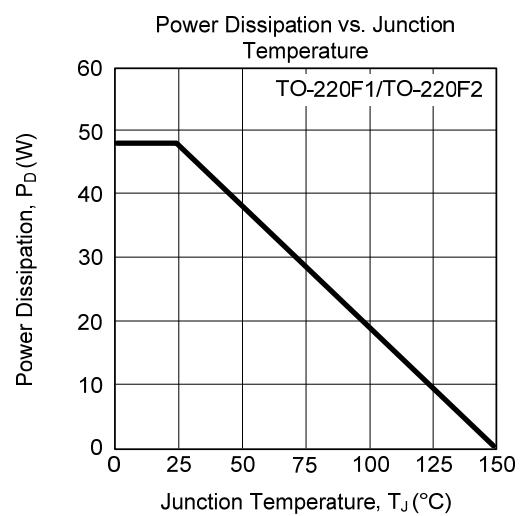
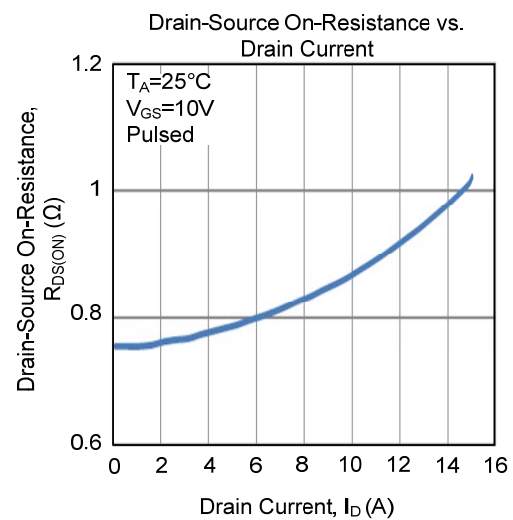
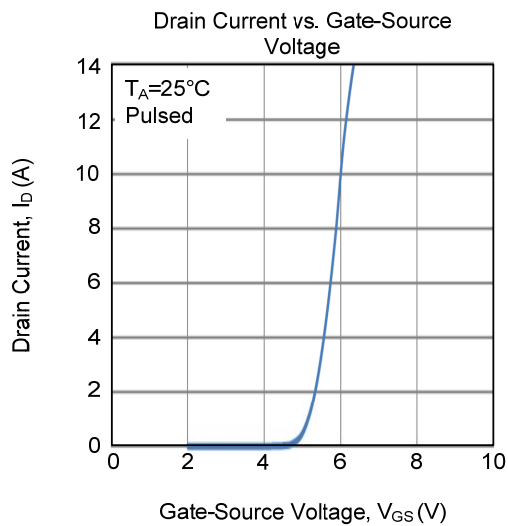
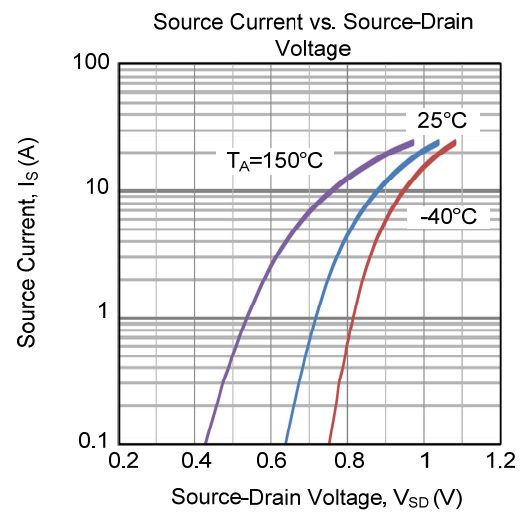
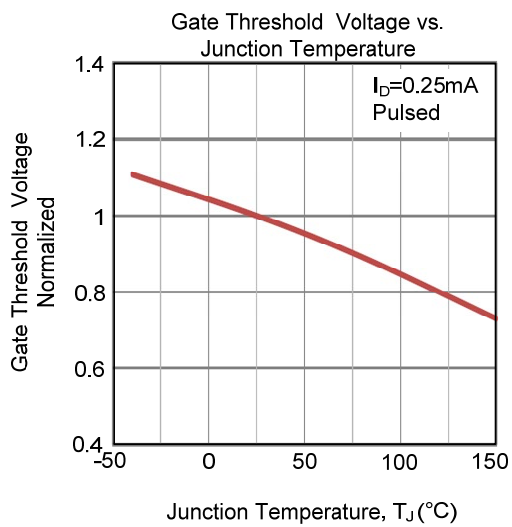
TEST CIRCUITS AND WAVEFORMS



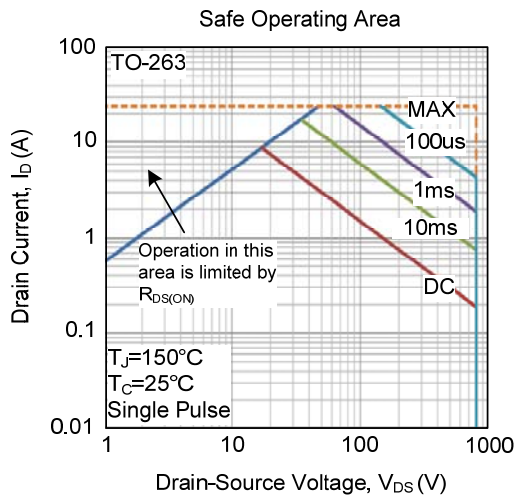
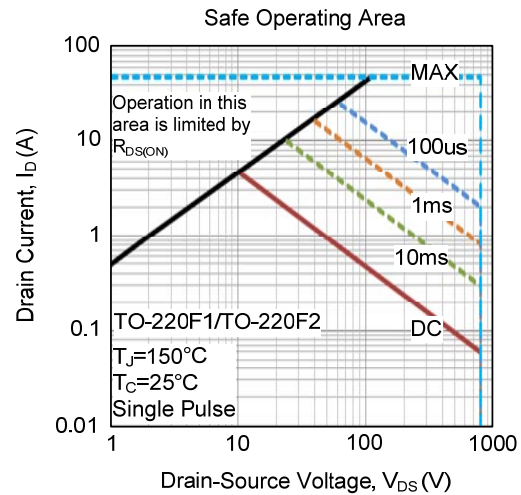
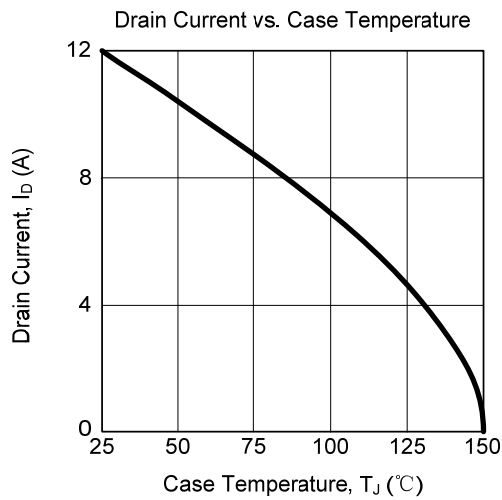
TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS (Cont.)



TYPICAL CHARACTERISTICS (Cont.)



UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.