

**UTT60N10****Power MOSFET**

60A, 100V N-CHANNEL ENHANCEMENT MODE POWER MOSFET TRANSISTOR

DESCRIPTION

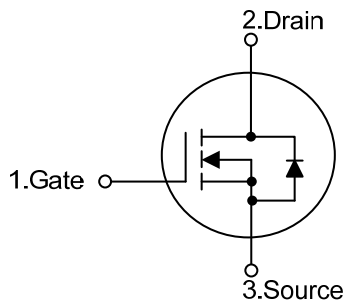
The UTC **UTT60N10** is an N-channel enhancement power MOSFET using UTC's advanced technology to provide the customers with perfect $R_{DS(ON)}$, high switching speed, high current capacity and low gate charge.

The UTC **UTT60N10** is suitable for motor control, DC-DC converters and audio amplifiers, etc.

FEATURES

- * $R_{DS(ON)} \leq 24 \text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=30\text{A}$
- * High Switching Speed
- * High Current Capacity

SYMBOL

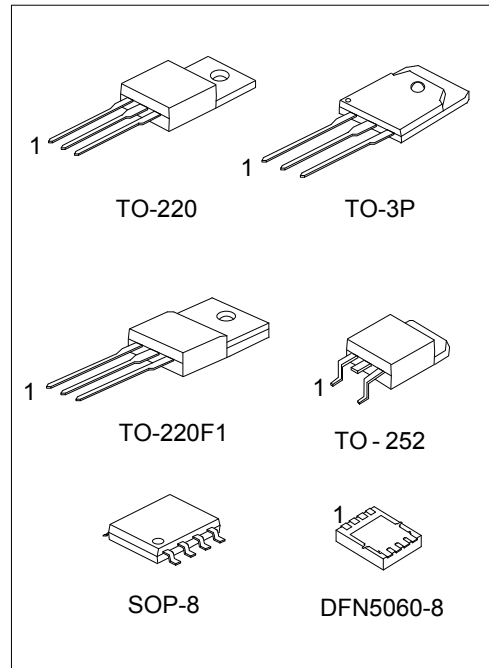


ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UTT60N10L-TA3-T	UTT60N10G-TA3-T	TO-220	G	D	S	-	-	-	-	-	Tube
UTT60N10L-TF1-T	UTT60N10G-TF1-T	TO-220F1	G	D	S	-	-	-	-	-	Tube
UTT60N10L-TN3-R	UTT60N10G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UTT60N10L-T3P-T	UTT60N10G-T3P-T	TO-3P	G	D	S	-	-	-	-	-	Tube
UTT60N10L-S08-R	UTT60N10G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel
UTT60N10L-K08-5060-R	UTT60N10G-K08-5060-R	DFN5060-8	S	S	S	G	D	D	D	D	Tape Reel

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

UTT60N10G-TA3-T 		(1) Packing Type (2) Package Type (3) Green Package
		(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TF1: TO-220F1, TN3: TO-252 T3P: TO-3P, S08: SOP-8, K08-5060: DFN5060-8 (3) G: Halogen Free and Lead Free, L: Lead Free



MARKING

PACKAGE	MARKING
TO-220 / TO-220F1 TO-252 / TO-3P	UTC UTT60N10 [5-digit date code] Lot Code ← → L: Lead Free → G: Halogen Free → Date Code
SOP-8	UTC UTT60N10 [5-digit date code] → Date Code → L: Lead Free → G: Halogen Free → Lot Code
DFN5060-8	UTC UTT 60N10 [5-digit date code] Lot Code ← → Date Code

■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	100	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current	Continuous	I_D	60	A
	Pulsed	I_{DM}	100	A
Avalanche Energy (Note 3)	Single Pulsed	E_{AS}	206	mJ
Power Dissipation	TO-220	P_D	125	W
	TO-220F1		30	W
	TO-252		50	W
	TO-3P		320	W
	SOP-8		6	W
	DFN5060-8		14	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. $L=0.5\text{mH}$, $I_{AS}=28.7\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\Omega$, Starting $T_J = 25^{\circ}\text{C}$

■ THERMAL DATA

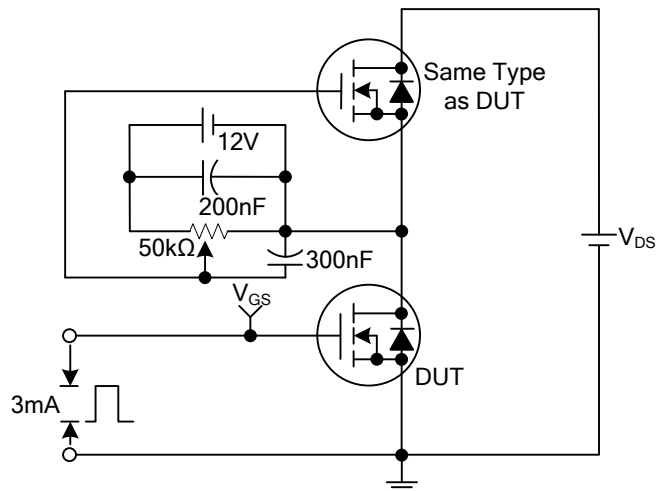
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/ TO-220F1	θ_{JA}	62.5	$^{\circ}\text{C/W}$
	TO-252		110	$^{\circ}\text{C/W}$
	TO-3P		30	$^{\circ}\text{C/W}$
	SOP-8		90	$^{\circ}\text{C/W}$
	DFN5060-8		65	$^{\circ}\text{C/W}$
Junction to Case	TO-220	θ_{JC}	1	$^{\circ}\text{C/W}$
	TO-220F1		4.17	$^{\circ}\text{C/W}$
	TO-252		2.5	$^{\circ}\text{C/W}$
	TO-3P		0.39	$^{\circ}\text{C/W}$
	SOP-8		20.8	$^{\circ}\text{C/W}$
	DFN5060-8		8.93	$^{\circ}\text{C/W}$

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

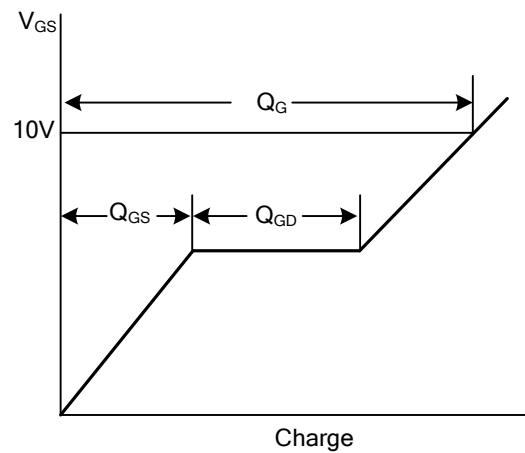
■ ELECTRICAL CHARACTERISTICS

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250μA, V _{GS} =0V	100			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =100V, V _{GS} =0V			1	μA
Gate- Source Leakage Current	Forward	I _{GSS}	V _{GS} =+20V, V _{DS} =0V			+100	nA
	Reverse		V _{GS} =-20V, V _{DS} =0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	2.0		4.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =30A			24	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		5780		pF
Output Capacitance		C _{OSS}			310		pF
Reverse Transfer Capacitance		C _{RSS}			190		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q _G	V _{DS} =80V, V _{GS} =10V, I _D =60A (Note1, 2)		110		nC
Gate to Source Charge		Q _{GS}			20		nC
Gate to Drain Charge		Q _{GD}			34		nC
Turn-ON Delay Time		t _{D(ON)}	V _{DS} =50V, V _{GS} =10V, I _D =60A, R _G =25Ω (Note1, 2)		60		ns
Rise Time		t _R			49.4		ns
Turn-OFF Delay Time		t _{D(OFF)}			300.6		ns
Fall-Time		t _F			125		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				60	A
Maximum Body-Diode Pulsed Current		I _{SM}				100	A
Drain-Source Diode Forward Voltage		V _{SD}	I _S =30A, V _{GS} =0V			1.5	V
Reverse Recovery Time (Note 1)		t _{rr}	I _S =30A, V _{GS} =0V, dI/dt=100A/μs		57		ns
Reverse Recovery Charge		Q _{rr}			254		nC

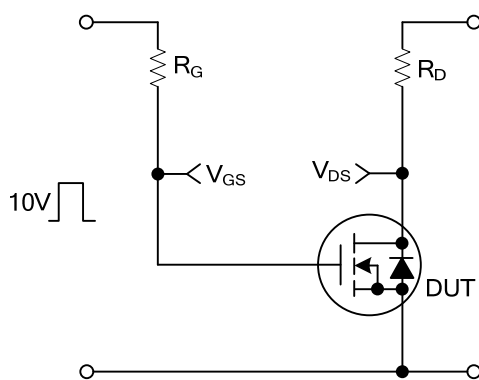
■ TEST CIRCUITS AND WAVEFORMS



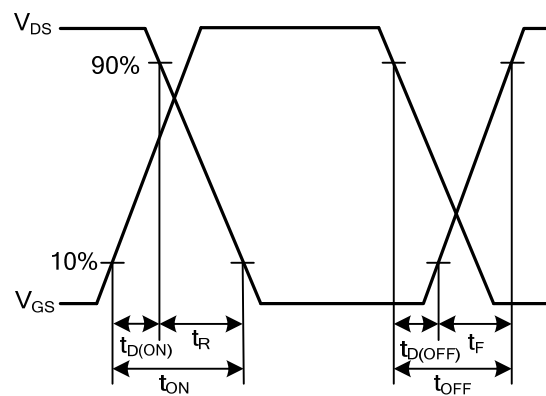
Gate Charge Test Circuit



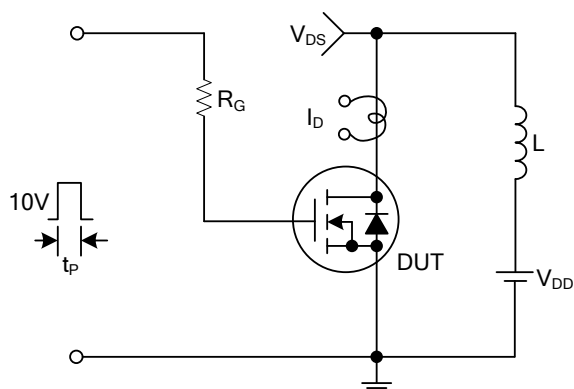
Gate Charge Waveforms



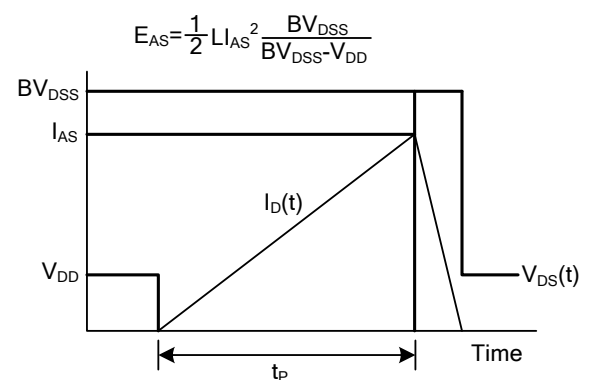
Resistive Switching Test Circuit



Resistive Switching Waveforms

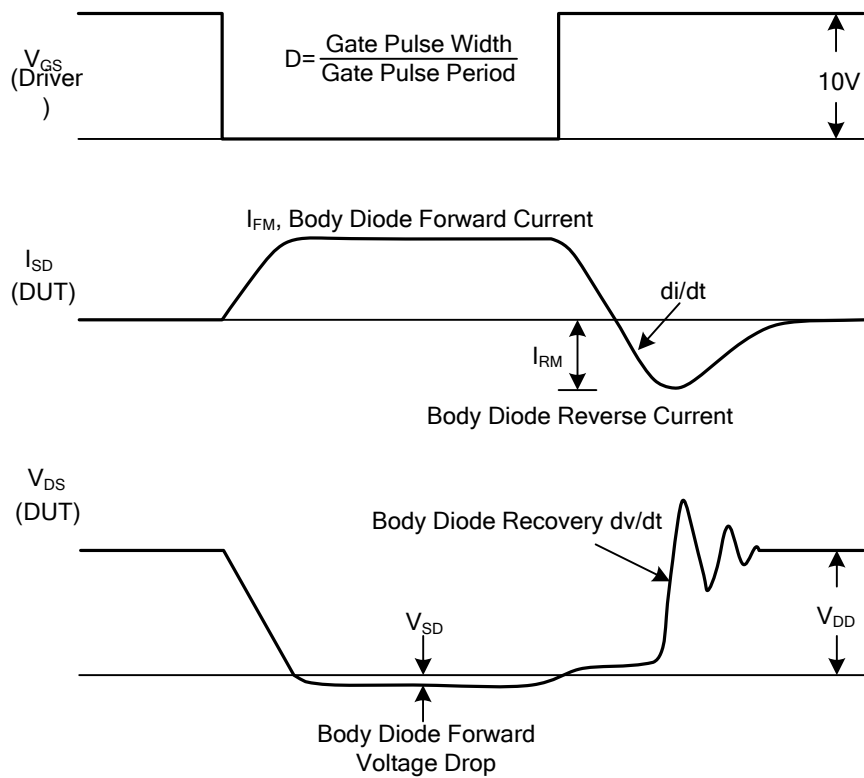
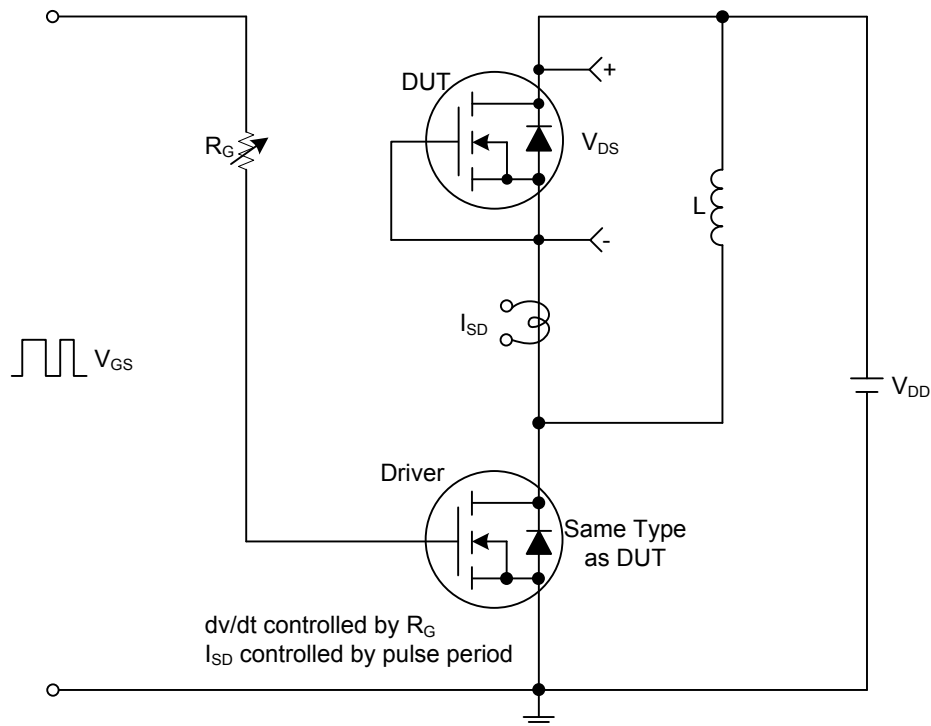


Unclamped Inductive Switching Test Circuit



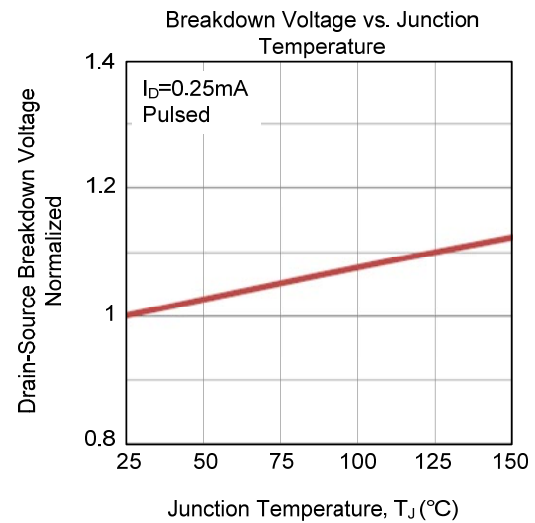
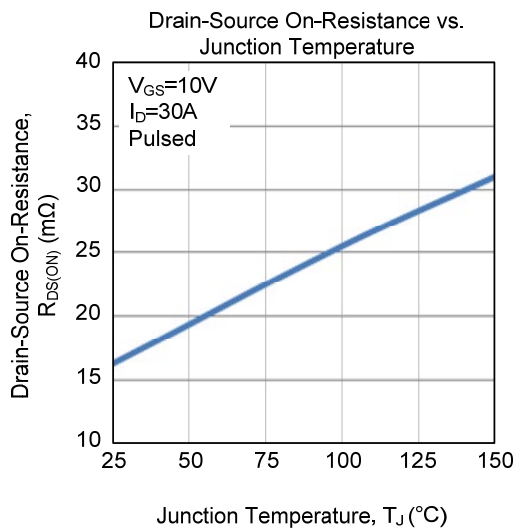
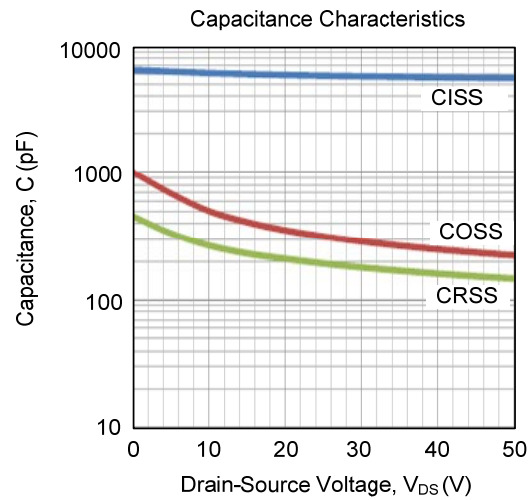
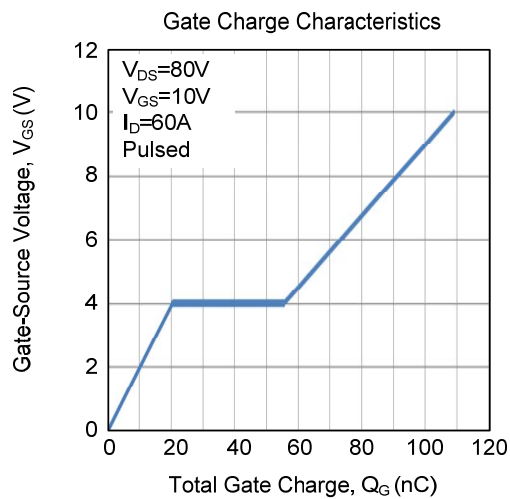
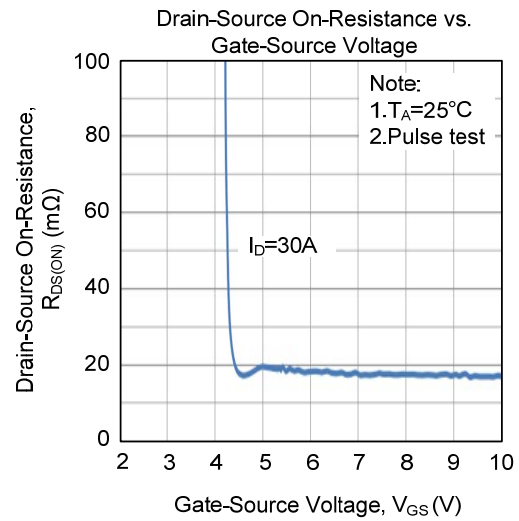
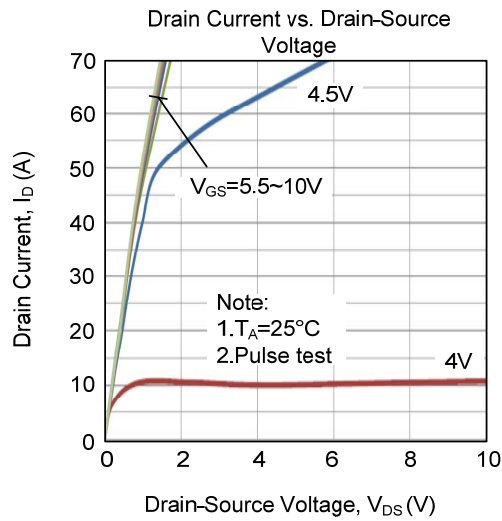
Unclamped Inductive Switching Waveforms

■ TEST CIRCUITS AND WAVEFORMS

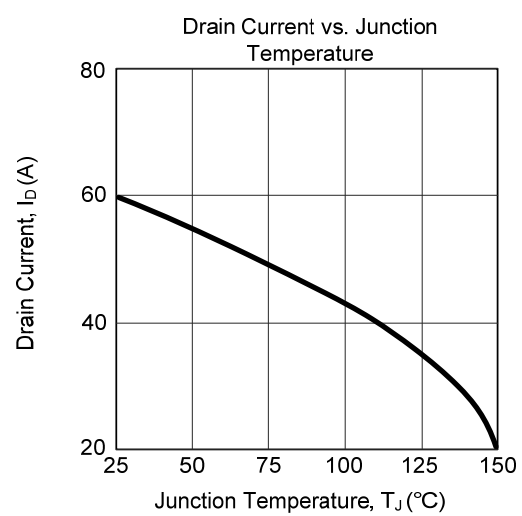
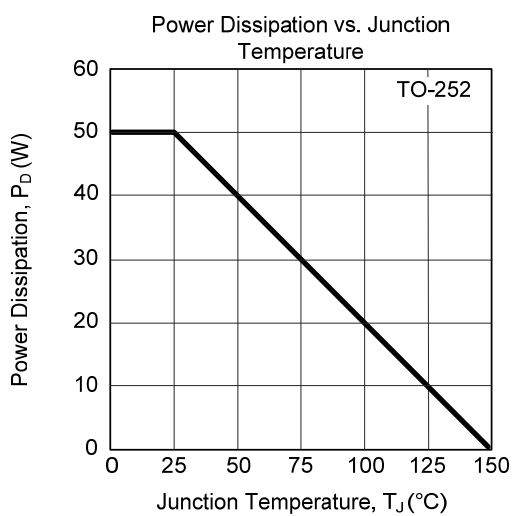
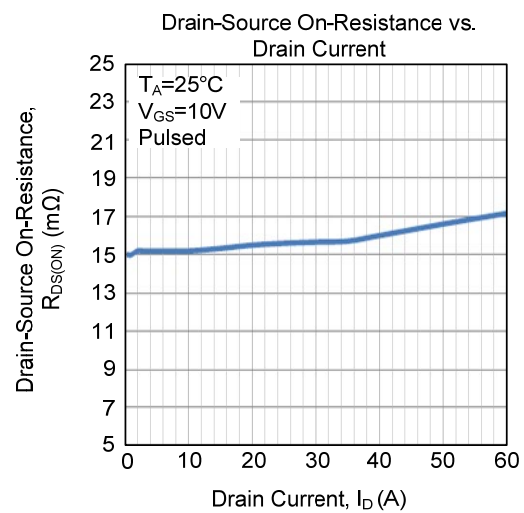
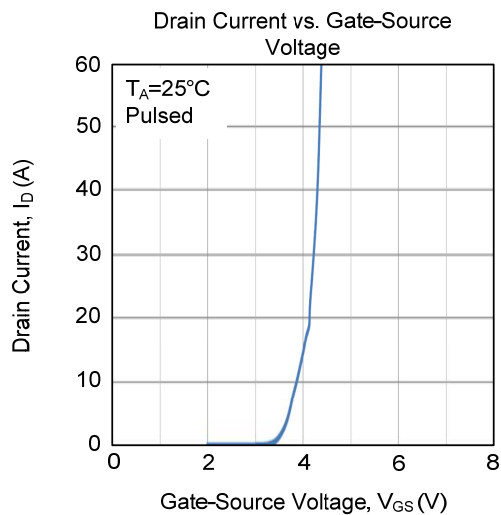
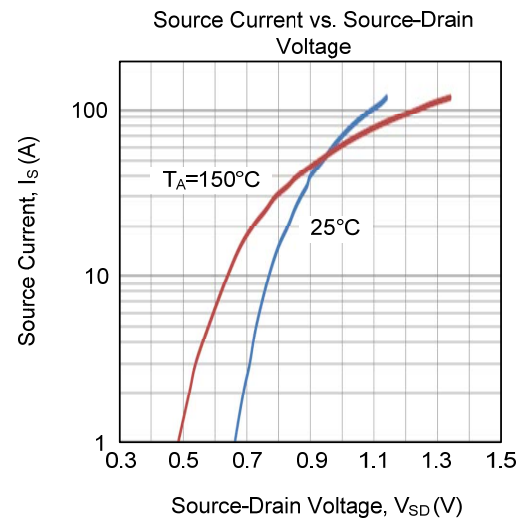
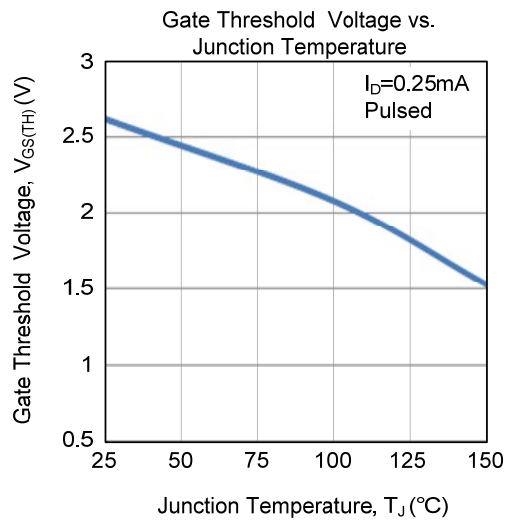


Peak Diode Recovery dv/dt Test Circuit and Waveforms

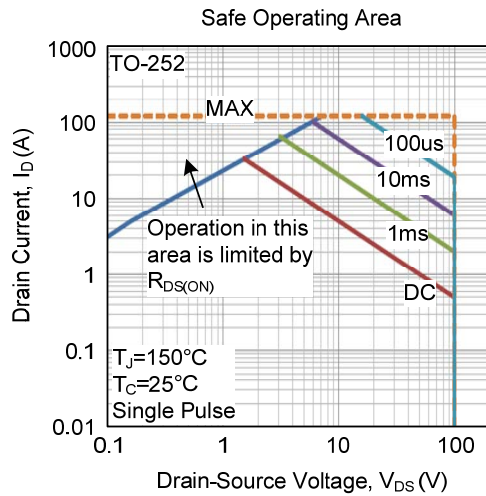
TYPICAL CHARACTERISTICS



■ 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.