



UTT30N10

Power MOSFET

30A, 100V N-CHANNEL POWER MOSFET

DESCRIPTION

The UTC **UTT30N10** is a N-channel mode power MOSFET using UTC's advanced technology to provide customers with a minimum on-state resistance, low gate charge and high switching speed.

The UTC **UTT30N10** is suitable for high voltage synchronous rectifier and DC/DC converters, etc.

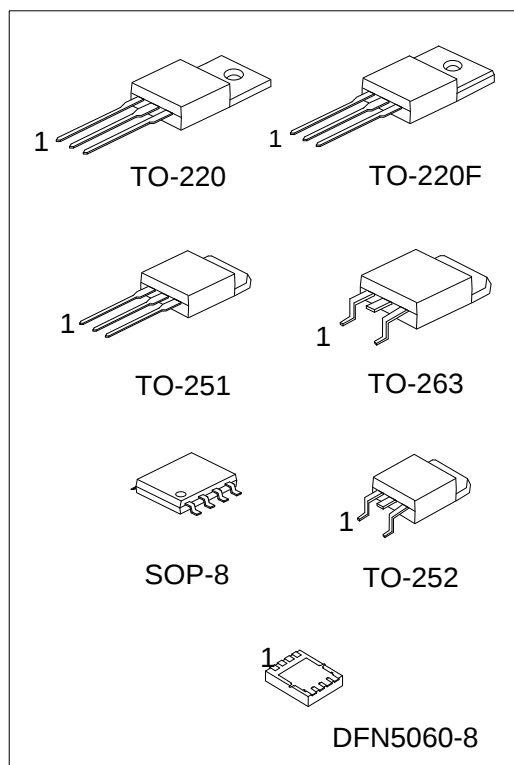
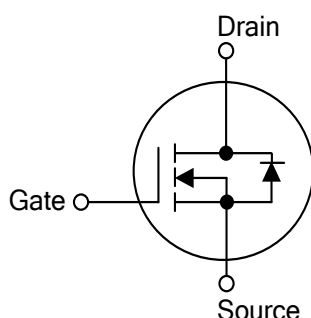
FEATURES

* $R_{DS(ON)} \leq 52 \text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=30\text{A}$

$R_{DS(ON)} \leq 72 \text{ m}\Omega$ @ $V_{GS}=4.5\text{V}$, $I_D=15\text{A}$

* High Switching Speed

SYMBOL



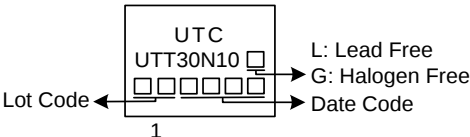
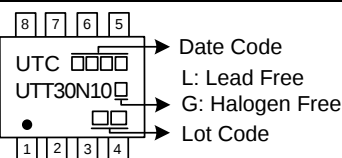
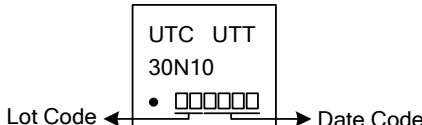
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UTT30N10L-TA3-T	UTT30N10G-TA3-T	TO-220	G	D	S	-	-	-	-	-	Tube
UTT30N10L-TF3-T	UTT30N10G-TF3-T	TO-220F	G	D	S	-	-	-	-	-	Tube
UTT30N10L-TM3-T	UTT30N10G-TM3-T	TO-251	G	D	S	-	-	-	-	-	Tube
UTT30N10L-TN3-R	UTT30N10G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UTT30N10L-TQ2-T	UTT30N10G-TQ2-T	TO-263	G	D	S	-	-	-	-	-	Tube
UTT30N10L-TQ2-R	UTT30N10G-TQ2-R	TO-263	G	D	S	-	-	-	-	-	Tape Reel
UTT30N10L-S08-R	UTT30N10G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel
UTT30N10L-K08-5060-R	UTT30N10G-K08-5060-R	DFN5060-8	S	S	S	G	D	D	D	D	Tape Reel

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

UTT30N10G-TA3-T (1)Packing Type (2)Package Type (3)Green Package	(1) T: Tube, R: Tape Reel
	(2) TA3: TO-220, TF3: TO-220F, TM3: TO-251 TN3: TO-252, TQ2: TO-263, S08: SOP-8, K08-5060: DFN5060-8
	(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

PACKAGE	MARKING
TO-220 / TO-220F TO-251 / TO-252 TO-263	 UTC UTT30N10 □ □ □ □ □ □ Lot Code → Date Code 1
SOP-8	 8 7 6 5 UTC □ □ □ □ UTT30N10 □ □ □ □ □ □ Date Code L: Lead Free G: Halogen Free Lot Code 1 2 3 4
DFN5060-8	 UTC UTT 30N10 • □ □ □ □ □ Lot Code → Date Code

■ ABSOLUTE MAXIMUM RATINGS ($T_C=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	100	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current	Continuous ($V_{GS}=10\text{V}$) $T_C=25^{\circ}\text{C}$	I_D	30	A
	Pulsed	I_{DM}	60	A
Single Pulsed Avalanche Energy (Note 2)		E_{AS}	17	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	3.2	V/ns
Power Dissipation	TO-220/TO-263	P_D	95	W
	TO-220F		34	W
	TO-251/TO-252		44	W
	SOP-8		1.6	W
	DFN5060-8		13.6	W
Junction Temperature		T_J	$+150$	$^{\circ}\text{C}$
Storage Temperature		T_{STG}	$-55 \sim +150$	$^{\circ}\text{C}$

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. $L=1\text{mH}$, $I_{AS}=5.8\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\ \Omega$, Starting $T_J = 25^{\circ}\text{C}$

4. $I_{SD}\leq 11\text{A}$, $di/dt\leq 200\text{A}/\mu\text{s}$, $V_{DD}\leq BV_{DSS}$, Starting $T_J = 25^{\circ}\text{C}$

■ THERMAL DATA

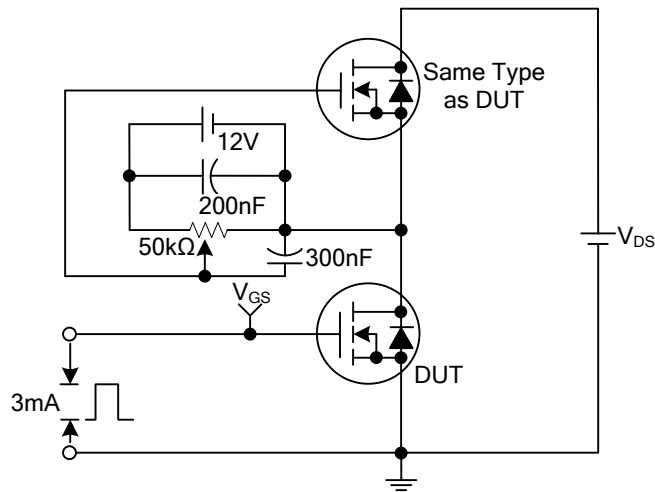
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-220F TO-263	θ_{JA}	62	$^{\circ}\text{C/W}$
	TO-251/TO-252		110	$^{\circ}\text{C/W}$
	SOP-8		50	$^{\circ}\text{C/W}$
	DFN5060-8		65	$^{\circ}\text{C/W}$
Junction to Case	TO-220/TO-263	θ_{JC}	1.31	$^{\circ}\text{C/W}$
	TO-220F		3.38	$^{\circ}\text{C/W}$
	TO-251/TO-252		2.85 (Note)	$^{\circ}\text{C/W}$
	SOP-8		78 (Note)	$^{\circ}\text{C/W}$
	DFN5060-8		9.1 (Note)	$^{\circ}\text{C/W}$

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

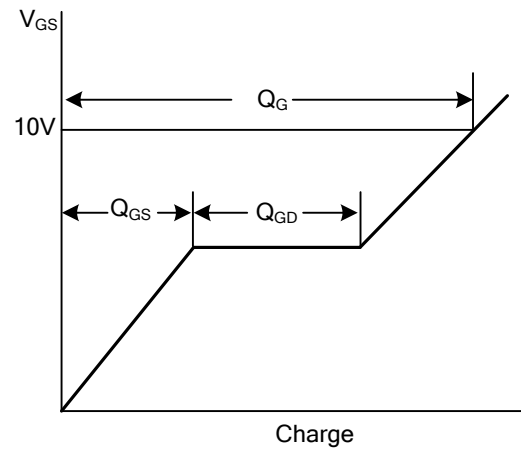
■ ELECTRICAL CHARACTERISTICS (T_C=25°C, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250μA, V _{GS} =0V	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	1.0		3.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =30A			52	mΩ
			V _{GS} =4.5V, I _D =15A			72	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		2200		pF
Output Capacitance		C _{OSS}			110		pF
Reverse Transfer Capacitance		C _{RSS}			75		pF
SWITCHING PARAMETERS							
Total Gate Charge at 10V		Q _G	V _{DS} =80V, V _{GS} =10V, I _D =30A, I _G =1mA		43		nC
Gate to Source Charge		Q _{GS}			6.5		nC
Gate to Drain Charge		Q _{GD}			9		nC
Turn-ON Time		t _{ON}	V _{DD} =50V, V _{GS} =10V I _D =10A, R _{GS} =3.3Ω		10		ns
Turn-ON Delay Time		t _{D(ON)}			15		ns
Rise Time		t _R			35		ns
Turn-OFF Delay Time		t _{D(OFF)}			16		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				30	A
Maximum Body-Diode Pulsed Current		I _{SM}				60	A
Drain-Source Diode Forward Voltage		V _{SD}	I _{SD} =30A			1.25	V
Body Diode Reverse Recovery Time		t _{rr}	I _S =30A, V _{GS} =0V		36		ns
Body Diode Reverse Recovery Charge		Q _{rr}	dl _F /dt=100A/μs		50		μC

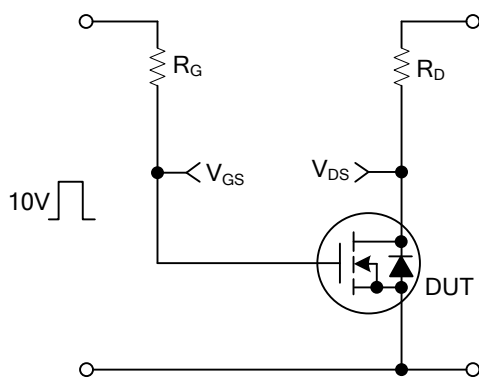
■ TEST CIRCUITS AND WAVEFORMS



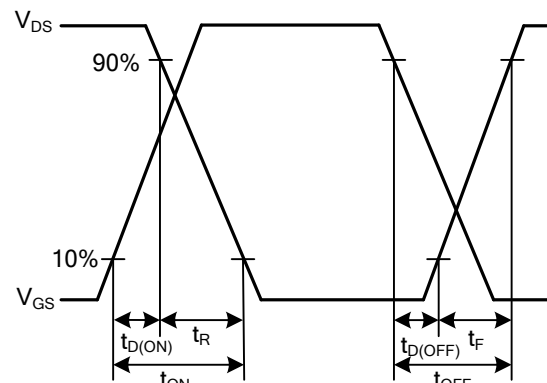
Gate Charge Test Circuit



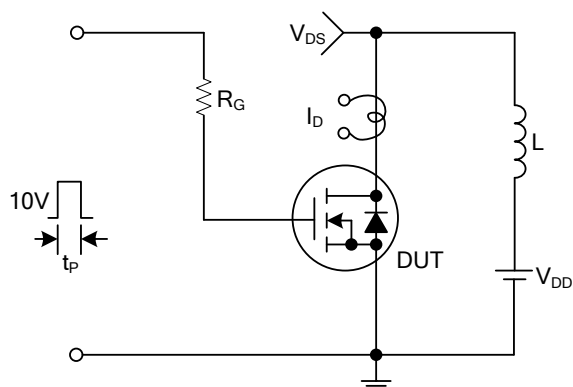
Gate Charge Waveforms



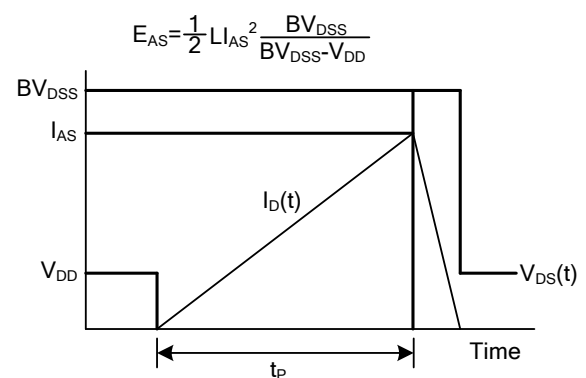
Resistive Switching Test Circuit



Resistive Switching Waveforms

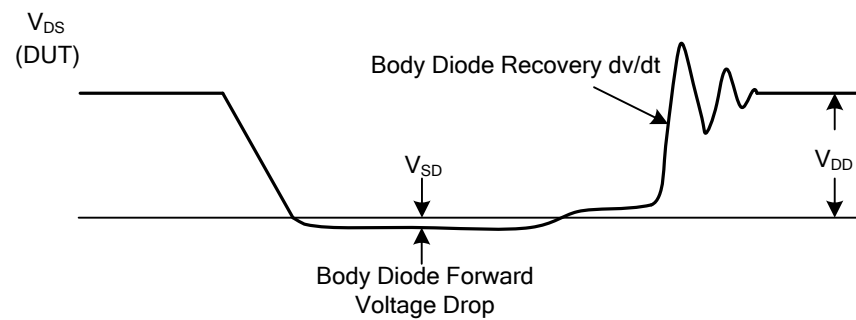
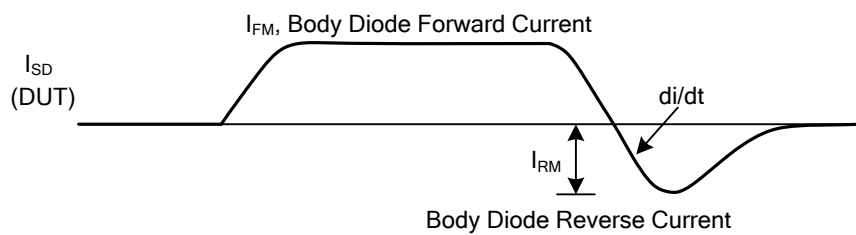
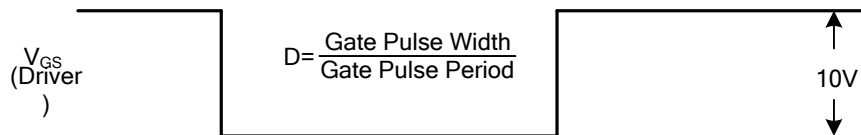
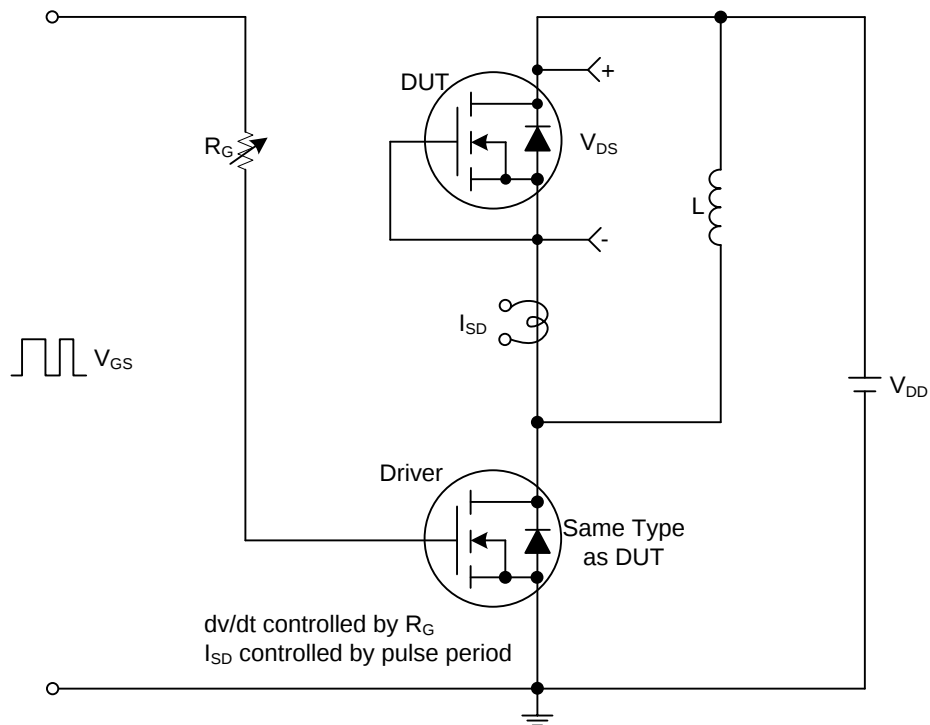


Unclamped Inductive Switching Test Circuit



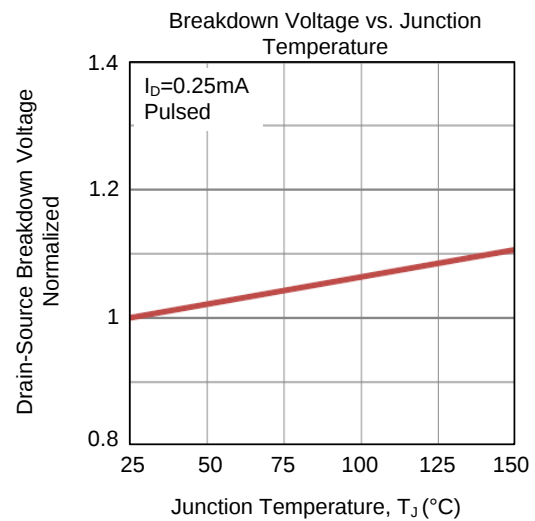
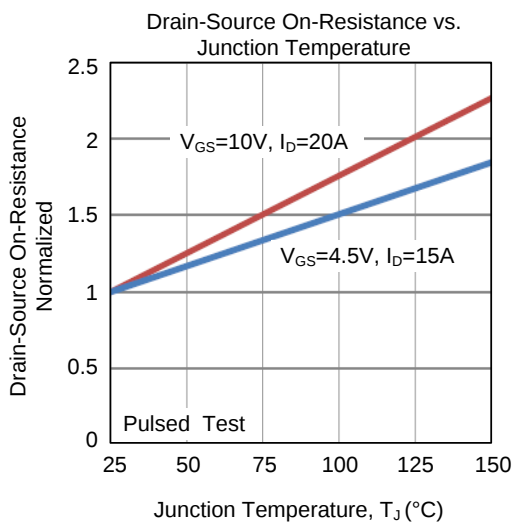
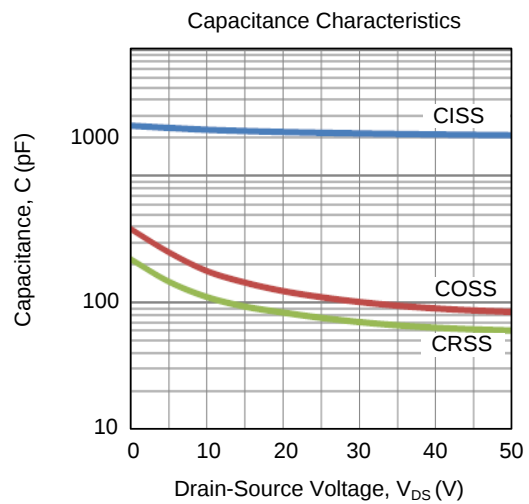
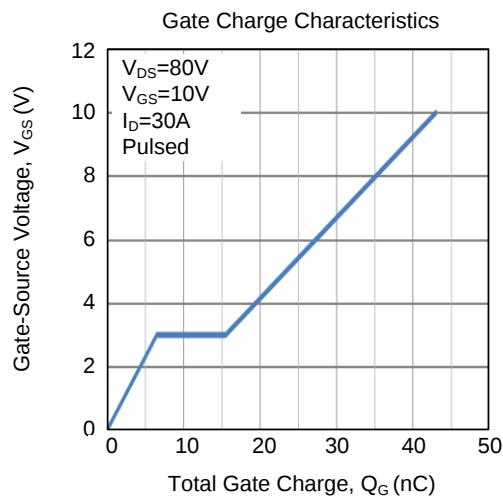
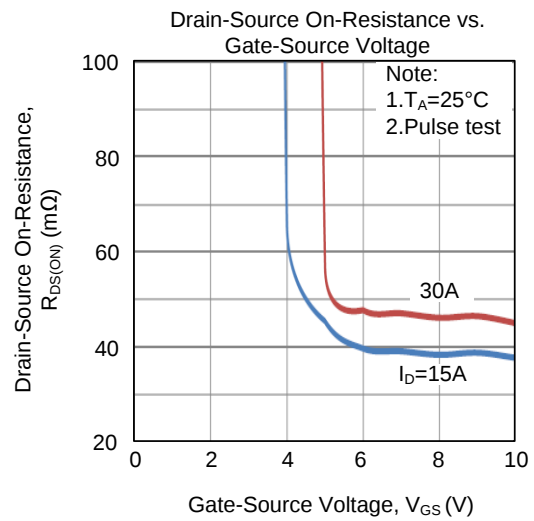
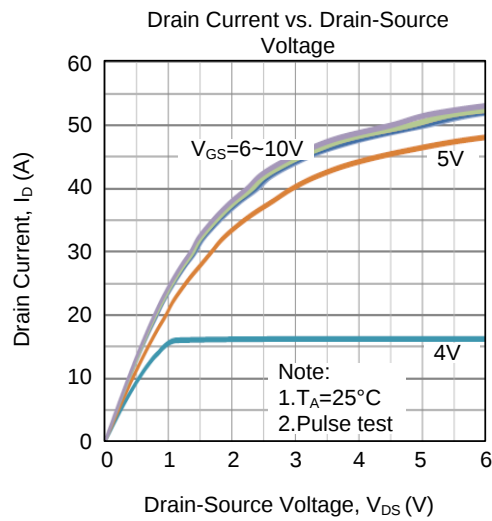
Unclamped Inductive Switching Waveforms

■ TEST CIRCUITS AND WAVEFORMS

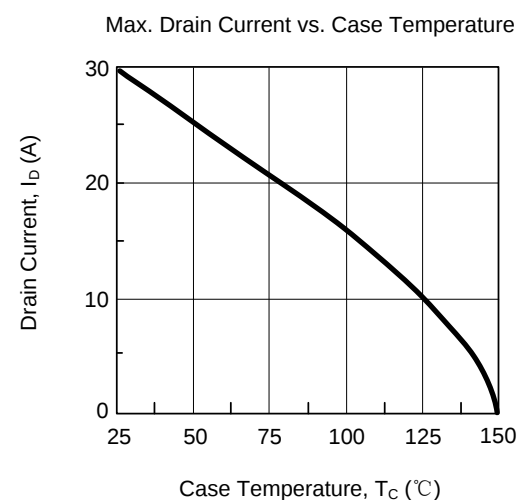
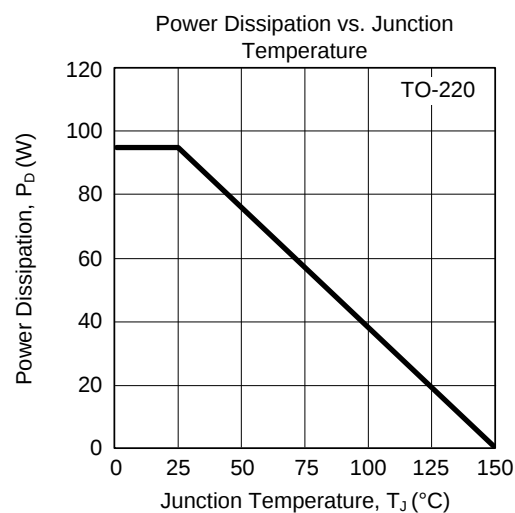
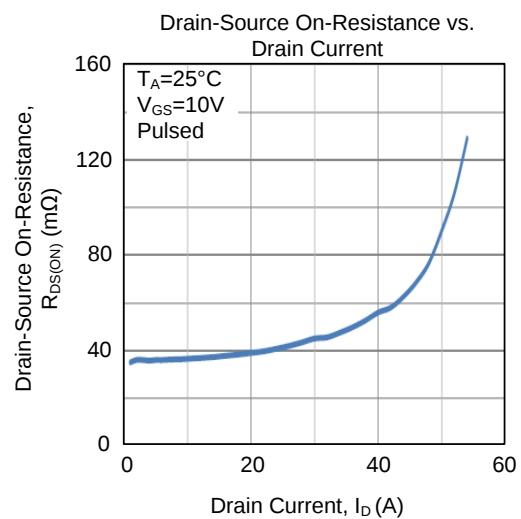
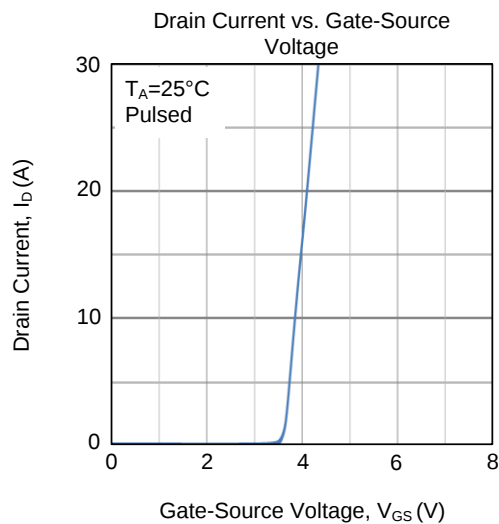
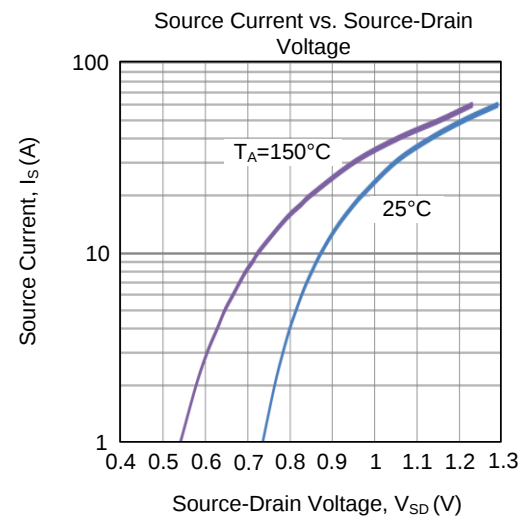
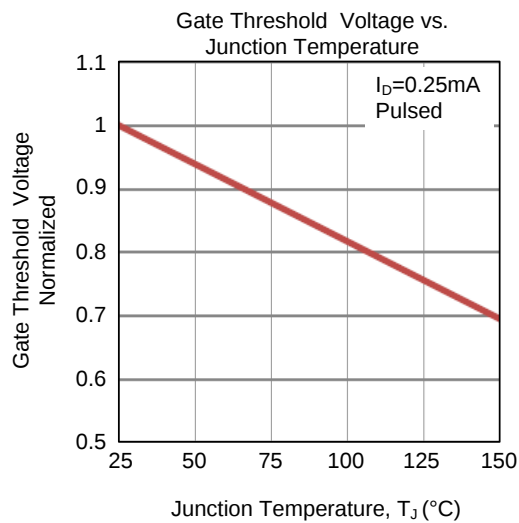


Peak Diode Recovery dv/dt Test Circuit and Waveforms

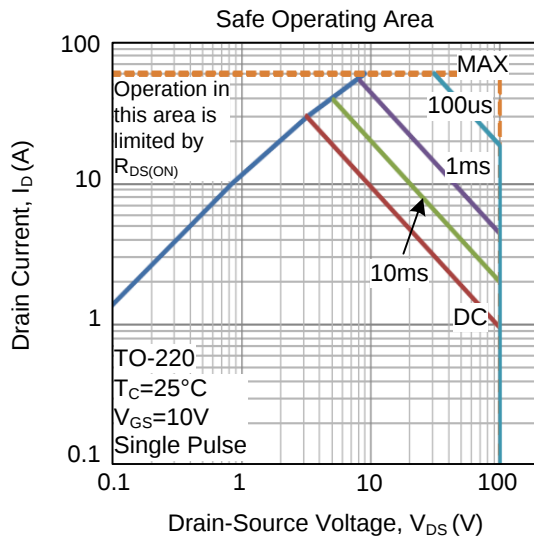
TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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