



UTT30N10

Power MOSFET

30A, 100V N-CHANNEL POWER MOSFET

■ DESCRIPTION

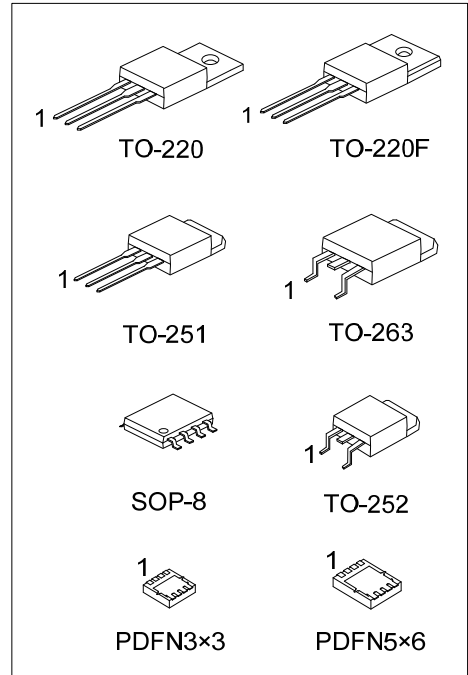
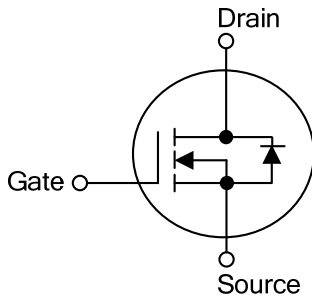
The UTC **UTT30N10** is a N-channel mode power MOSFET using UTC's advanced technology to provide customers with a minimum on-state resistance, low gate charge and high switching speed.

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

■ FEATURES

- * $R_{DS(ON)} \leq 40 \text{ m}\Omega @ V_{GS}=10V, I_D=30A$
- $R_{DS(ON)} \leq 52 \text{ m}\Omega @ V_{GS}=4.5V, I_D=15A$
- * 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-P3030-R	UTT30N10G-P3030-R	PDFN3x3	S	S	S	G	D	D	D	D	Tape Reel
UTT30N10L-P5060-R	UTT30N10G-P5060-R	PDFN5x6	S	S	S	G	D	D	D	D	Tape Reel

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

<p>UTT30N10G-TA3-T</p>	<p>(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, P3030: PDFN3x3, P5060: PDFN5x6 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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■ MARKING

<p>TO-220 / TO-220F TO-251 / TO-252 / TO-263</p>	<p>SOP-8</p>
<p>PDFN3×3</p>	<p>PDFN5×6</p>

■ 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}	28	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	3.2	V/ns
Power Dissipation	TO-220/TO-263	P_D	70	W
	TO-220F		28	W
	TO-251/TO-252		44	W
	SOP-8		5	W
	PDFN3×3		20	W
	PDFN5×6		25	W
Operating Junction Temperature		T_J	-40 ~ +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. $L=1\text{mH}$, $I_{AS}=7.5\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\Omega$, Starting $T_J = 25^\circ\text{C}$

4. $I_{SD} \leq 30\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$

■ THERMAL DATA

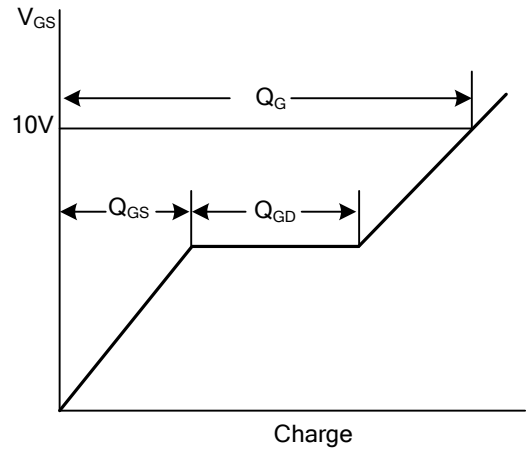
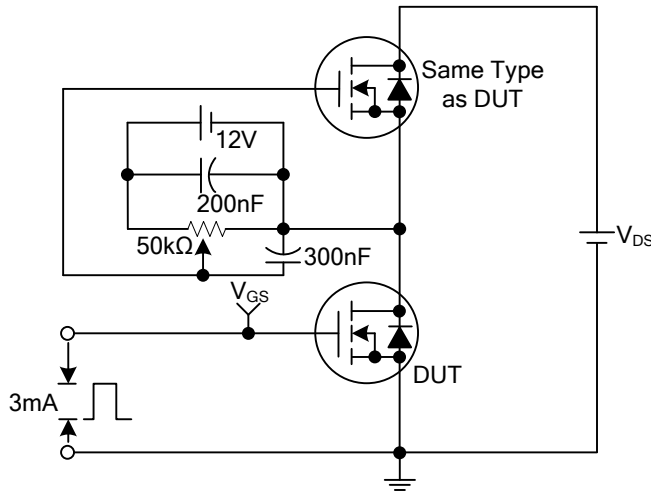
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-220F TO-263	θ_{JA}	62.5	$^\circ\text{C}/\text{W}$
	TO-251/TO-252		110	$^\circ\text{C}/\text{W}$
	SOP-8		125	$^\circ\text{C}/\text{W}$
	PDFN3×3		130	$^\circ\text{C}/\text{W}$
	PDFN5×6		65	$^\circ\text{C}/\text{W}$
Junction to Case	TO-220/TO-263	θ_{JC}	1.78	$^\circ\text{C}/\text{W}$
	TO-220F		4.46 (Note)	$^\circ\text{C}/\text{W}$
	TO-251/TO-252		2.85 (Note)	$^\circ\text{C}/\text{W}$
	SOP-8		25 (Note)	$^\circ\text{C}/\text{W}$
	PDFN3×3		6.25 (Note)	$^\circ\text{C}/\text{W}$
	PDFN5×6		5 (Note)	$^\circ\text{C}/\text{W}$

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

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

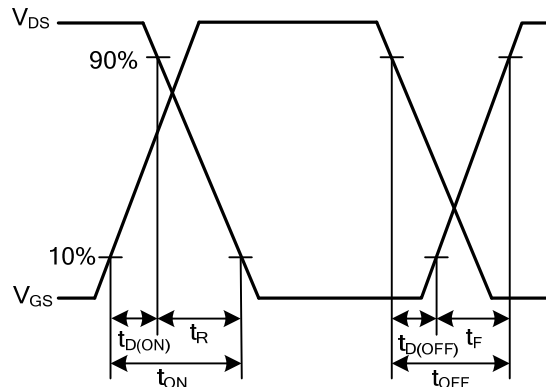
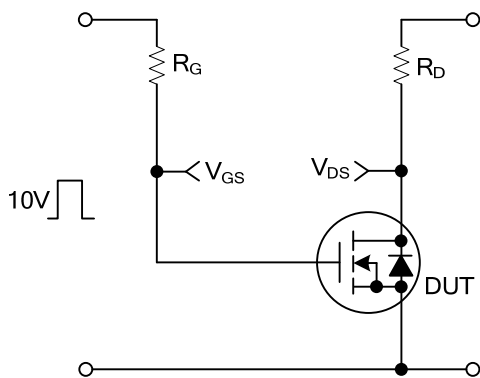
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	100			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =100V, V _{GS} =0V			1	μA
Gate- Source Leakage Current	Forward	I _{GSS}			+100	nA
	Reverse				-100	nA
ON 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			40	mΩ
		V _{GS} =4.5V, I _D =15A			52	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		1950		pF
Output Capacitance	C _{OSS}			130		pF
Reverse Transfer Capacitance	C _{RSS}			108		pF
SWITCHING PARAMETERS						
Total Gate Charge at 10V	Q _G	V _{DS} =80V, V _{GS} =10V, I _D =30A,		75		nC
Gate to Source Charge	Q _{GS}			10.5		nC
Gate to Drain Charge	Q _{GD}			20		nC
Turn-on Delay Time (Note 1)	t _{D(ON)}	V _{DD} =50V, V _{GS} =10V I _D =30A, R _{GS} =3.3Ω		9		ns
Rise Time	t _R			18		ns
Turn-off Delay Time	t _{D(OFF)}			40		ns
Fall-Time	t _F			20		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		45		ns
Body Diode Reverse Recovery Charge	Q _{rr}	dI _F /dt=100A/μs		44		nC

TEST CIRCUITS AND WAVEFORMS



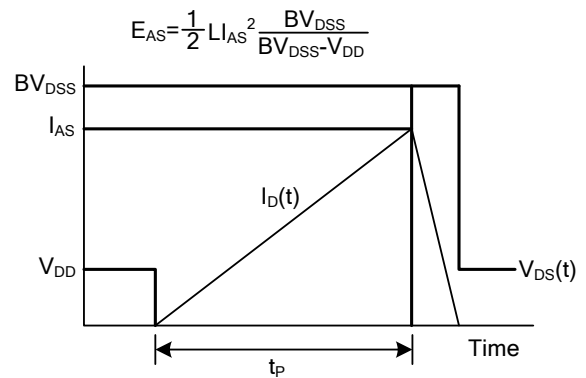
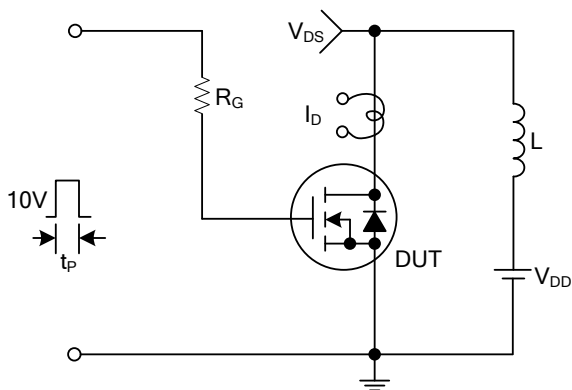
Gate Charge Test Circuit

Gate Charge Waveforms



Resistive Switching Test Circuit

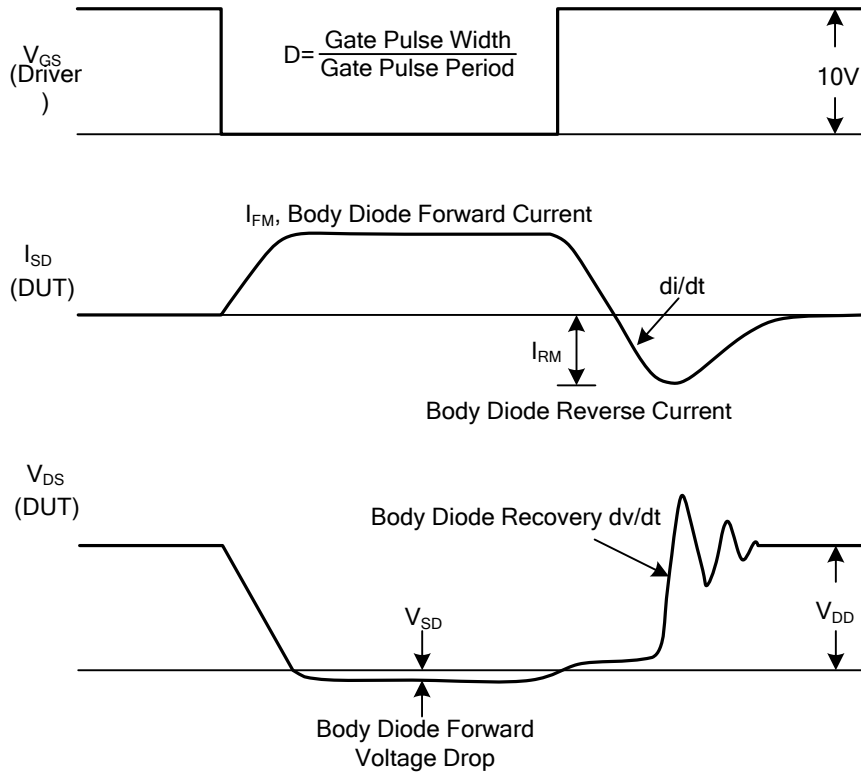
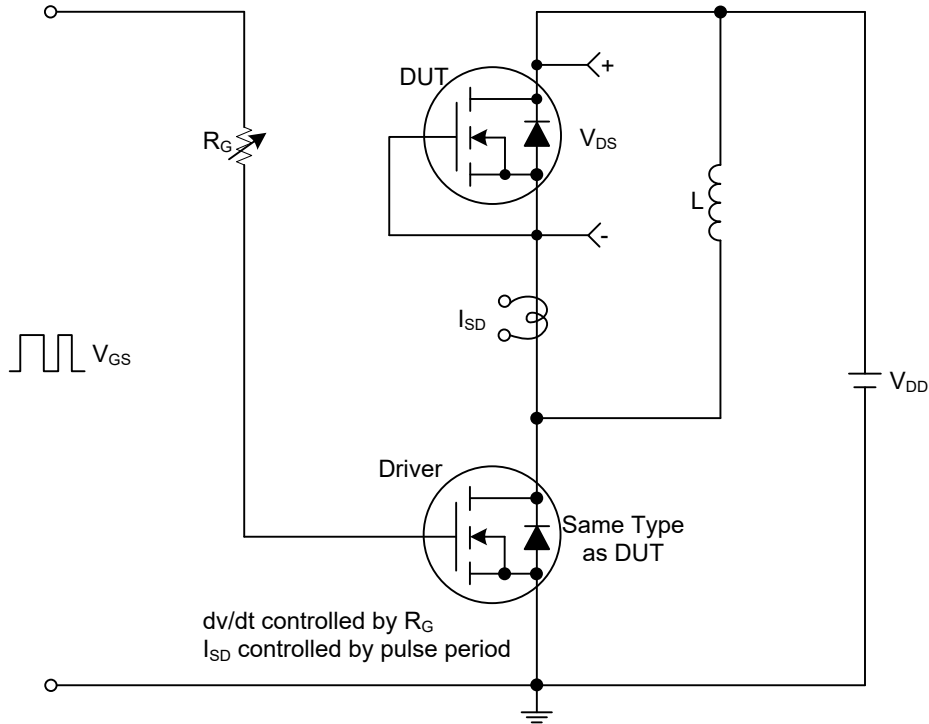
Resistive Switching Waveforms



Unclamped Inductive Switching Test Circuit

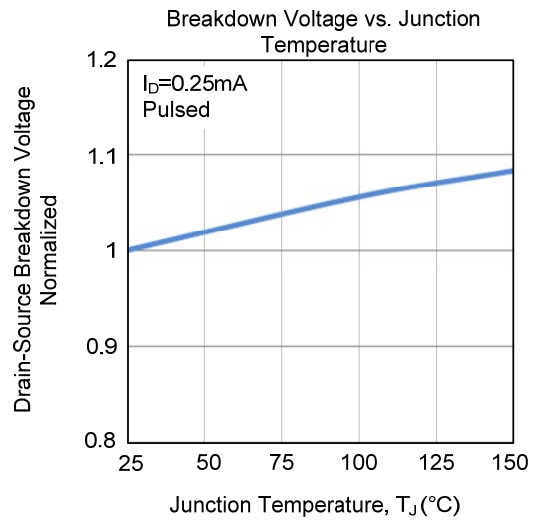
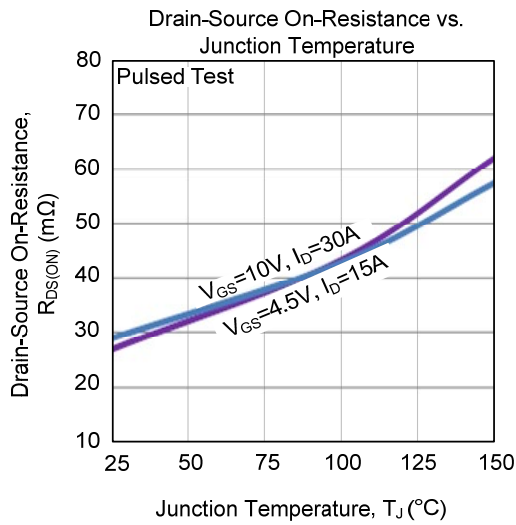
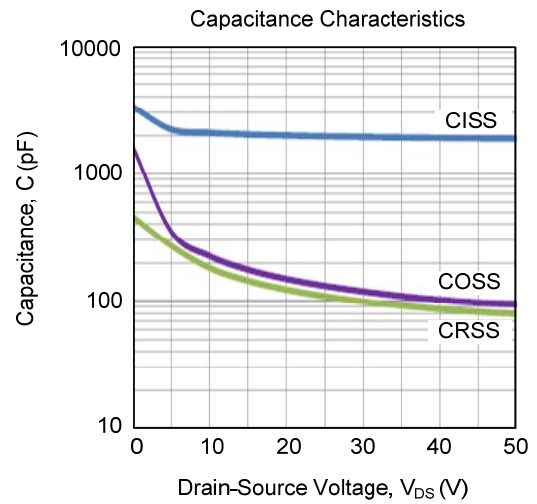
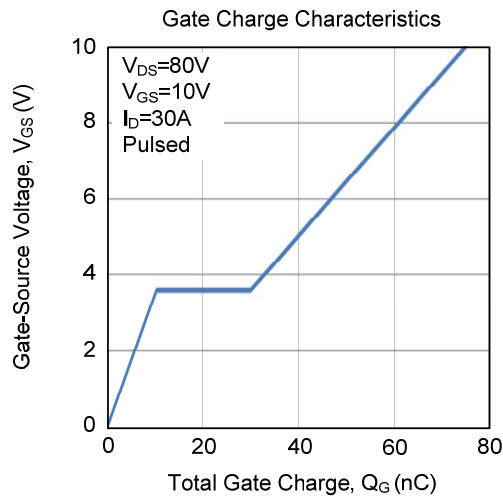
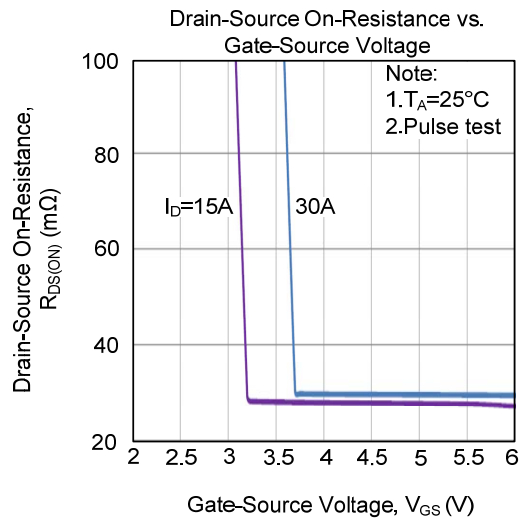
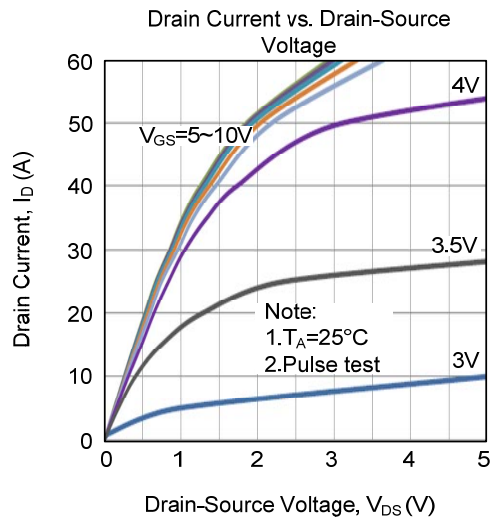
Unclamped Inductive Switching Waveforms

TEST CIRCUITS AND WAVEFORMS

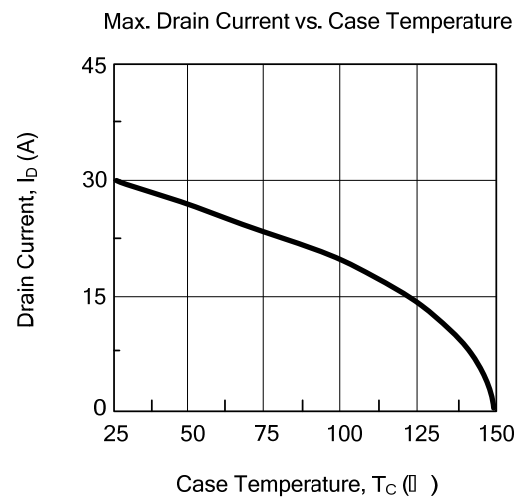
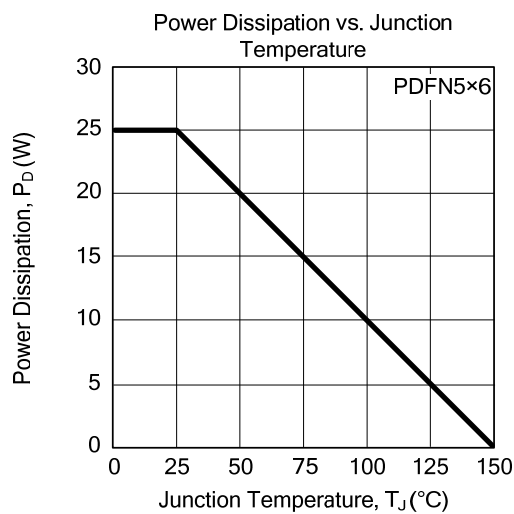
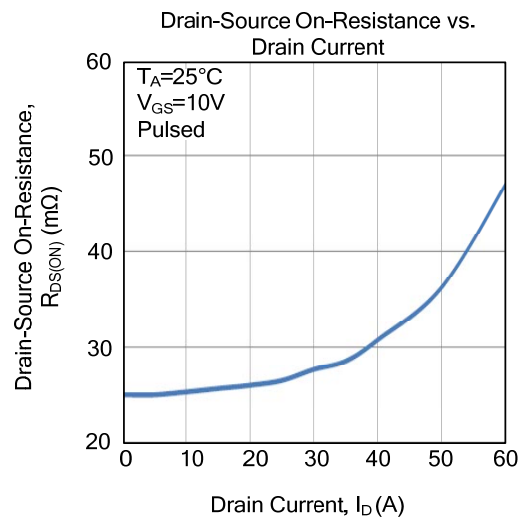
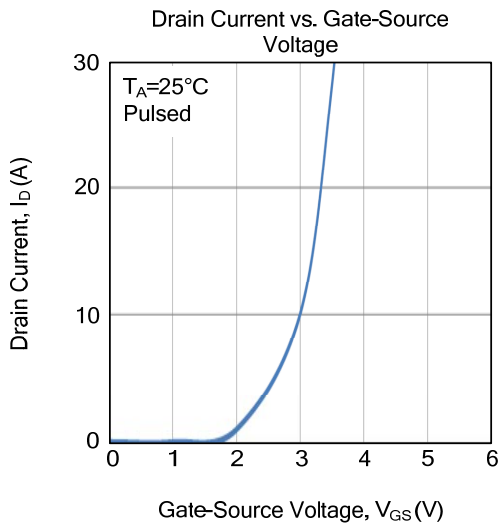
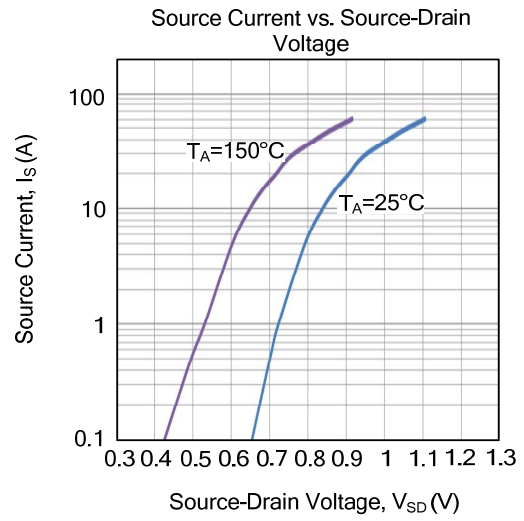
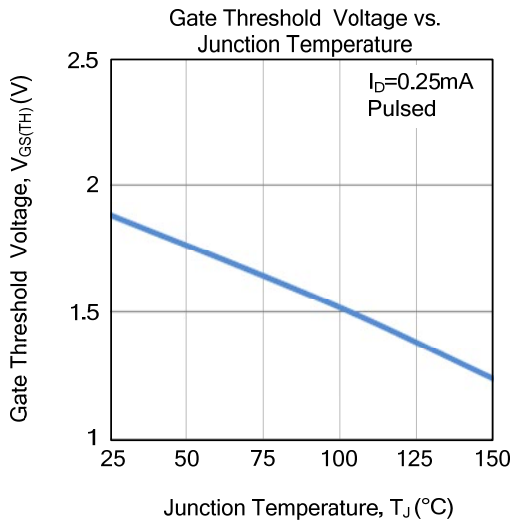


Peak Diode Recovery dv/dt Test Circuit and Waveforms

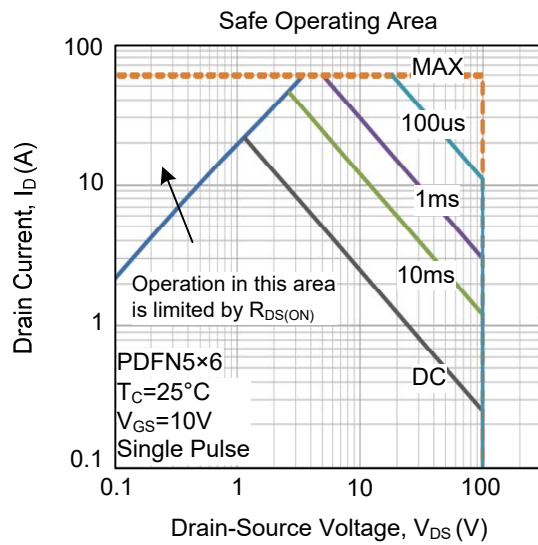
TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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