

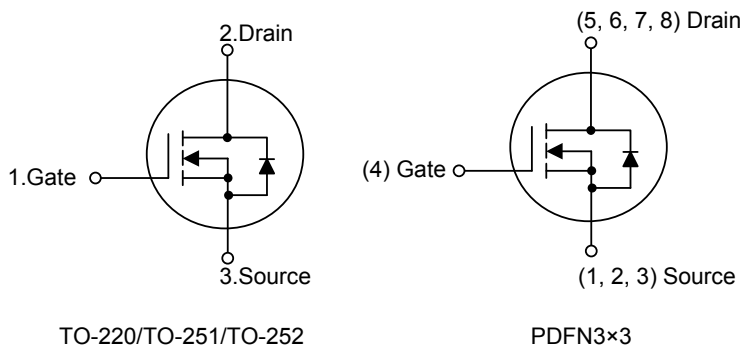
**UT7N10****POWER MOSFET****7.0A, 100V N-CHANNEL
POWER MOSFET****DESCRIPTION**

The UTC **UT7N10** 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 **UT7N10** is suitable for high voltage synchronous rectifier and DC/DC converters, etc.

FEATURES

- * $R_{DS(ON)} \leq 115 \text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=3.5\text{A}$
- $R_{DS(ON)} \leq 135 \text{ m}\Omega$ @ $V_{GS}=4.5\text{V}$, $I_D=3.5\text{A}$
- * High Switching Speed
- * High Cell Density Trench Technology

SYMBOL**ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT7N10L-TA3-T	UT7N10G-TA3-T	TO-220	G	D	S	-	-	-	-	-	Tube
UT7N10L-TM3-T	UT7N10G-TM3-T	TO-251	G	D	S	-	-	-	-	-	Tube
UT7N10L-TN3-R	UT7N10G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UT7N10L-P3030-R	UT7N10G-P3030-R	PDFN3x3	S	S	S	G	D	D	D	D	Tape Reel

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

		(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TM3: TO-251, TN3: TO-252, P3030: PDFN3x3 (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING

TO-220 / TO-251 / TO-252	PDFN3×3
UTC UT7N10 Lot Code ← [][][][][] → Date Code 1 L: Lead Free G: Halogen Free	UT 7N10 • [][][][] → Date Code

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current	Continuous	I_D	7	A
	Pulsed (Note 2)	I_{DM}	14	A
Peak Diode Recovery dv/dt (Note 4)		dv/dt	2.6	V/nS
Power Dissipation	TO-220	P_D	90	W
	TO-251/TO-252		43	W
	PDFN3×3		17.9	W
Junction Temperature		T_J	+150	$^{\circ}\text{C}$
Storage Temperature Range		T_{STG}	-55 ~ +100	$^{\circ}\text{C}$

- 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. $I_{SD} \leq 7.0\text{A}$, $di/dt \leq 100\text{A}/\mu\text{s}$, $V_{DD} \leq V_{(BR)DS}$, $T_J \leq 25^{\circ}\text{C}$

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220	θ_{JA}	62.5	$^{\circ}\text{C}/\text{W}$
	TO-251/TO-252		110	$^{\circ}\text{C}/\text{W}$
	PDFN3×3		130	$^{\circ}\text{C}/\text{W}$
Junction to Case (Note)	TO-220	θ_{JC}	1.39	$^{\circ}\text{C}/\text{W}$
	TO-251/TO-252		2.5 (Note)	$^{\circ}\text{C}/\text{W}$
	PDFN3×3		7 (Note)	$^{\circ}\text{C}/\text{W}$

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

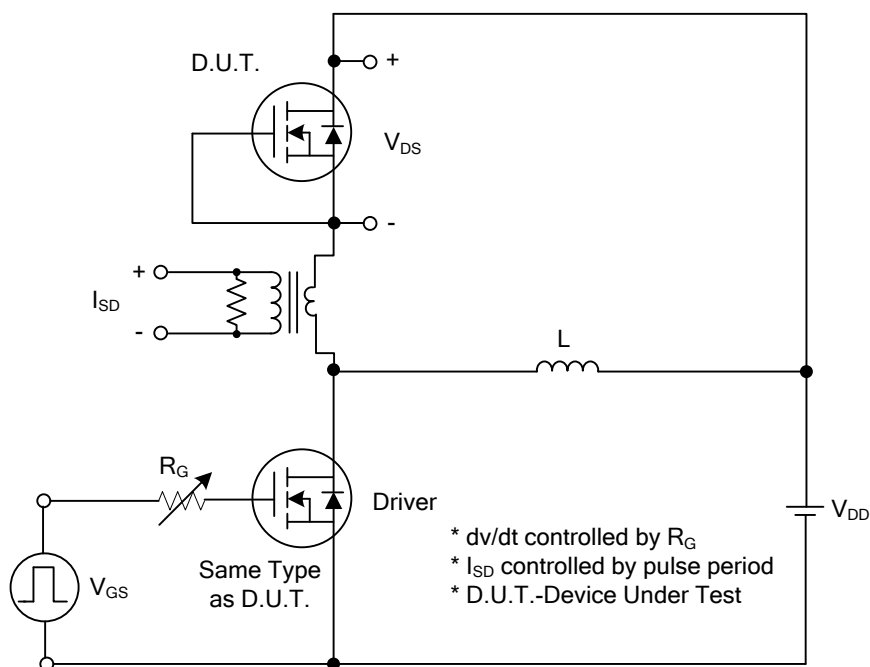
■ ELECTRICAL CHARACTERISTICS (T_J = 25°C, unless otherwise specified)

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}	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 =3.5A			115	mΩ
			V _{GS} =4.5V, I _D =3.5A			135	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		370		pF
Output Capacitance		C _{OSS}			48		pF
Reverse Transfer Capacitance		C _{RSS}			36		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)		Q _G	V _{DS} =80V, V _{GS} =10V, I _D =7.0A I _G =1mA (Note 1, 2)		13.6		nC
Gate to Source Charge		Q _{GS}			2.2		nC
Gate to Drain Charge		Q _{GD}			4.3		nC
Turn-on Delay Time (Note 1)		t _{D(ON)}	V _{DS} =50V, V _{GS} =10V, I _D =7.0A, R _G =25Ω (Note 1, 2)		6		ns
Rise Time		t _R			15		ns
Turn-off Delay Time		t _{D(OFF)}			42		ns
Fall-Time		t _F			29		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				7	A
Maximum Body-Diode Pulsed Current		I _{SM}				14	A
Drain-Source Diode Forward Voltage (Note 1)		V _{SD}	I _S =7.0A, V _{GS} =0V			1.4	V
Reverse Recovery Time (Note 1)		t _{rr}	I _S =7.0A, V _{GS} =0V,		33		nS
Reverse Recovery Charge		Q _{rr}	dI/dt=100A/μs		73		nC

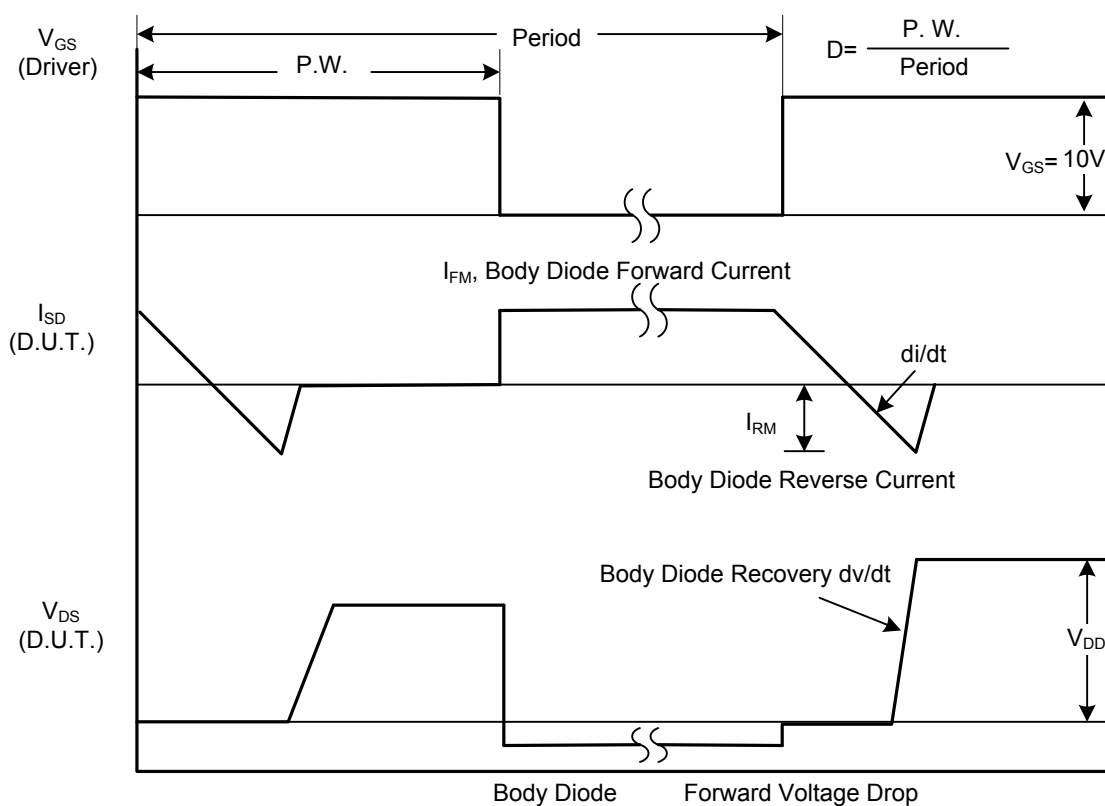
Notes: 1. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

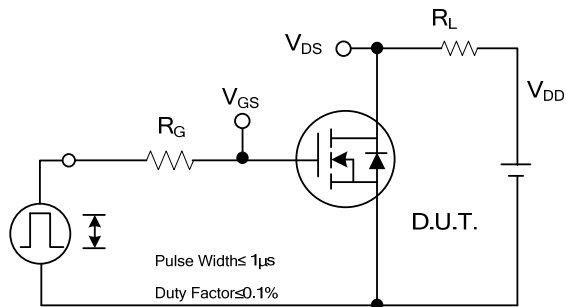


Peak Diode Recovery dv/dt Test Circuit

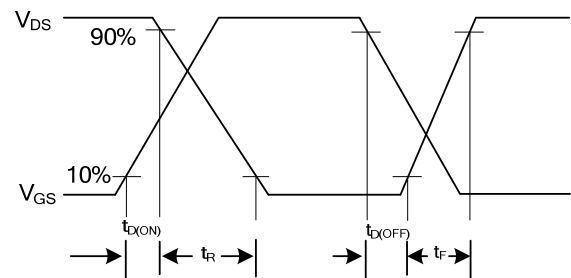


Peak Diode Recovery dv/dt Waveforms

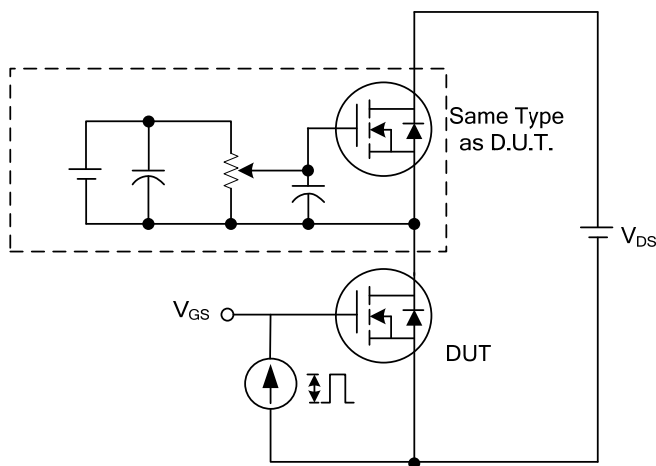
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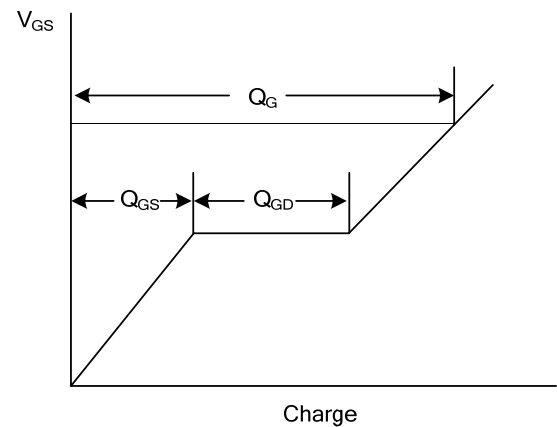
Switching Test Circuit



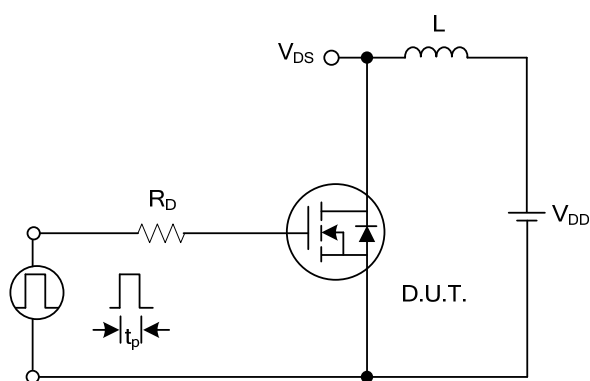
Switching Waveforms



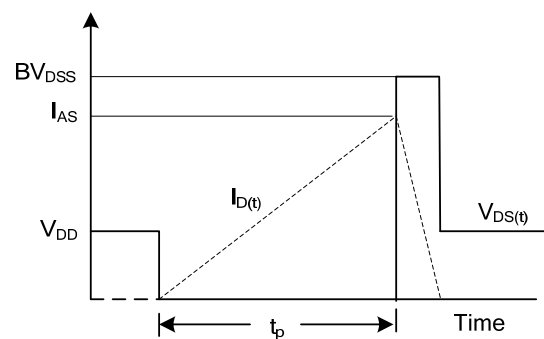
Gate Charge Test Circuit



Gate Charge Waveform

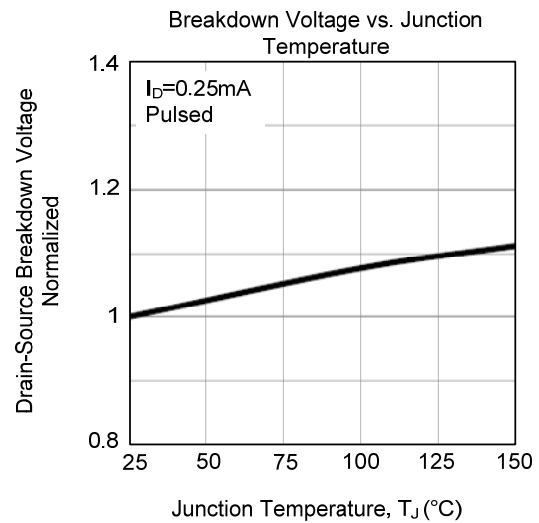
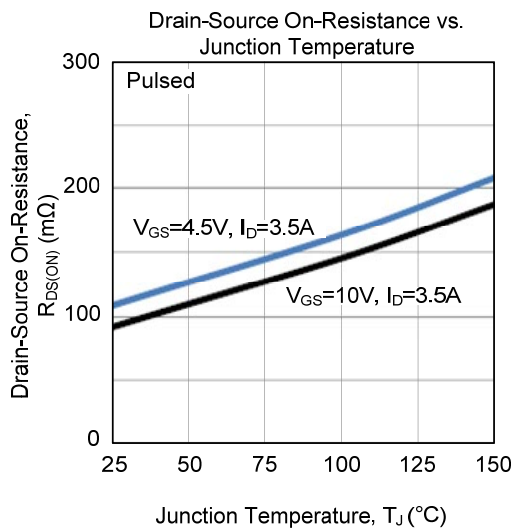
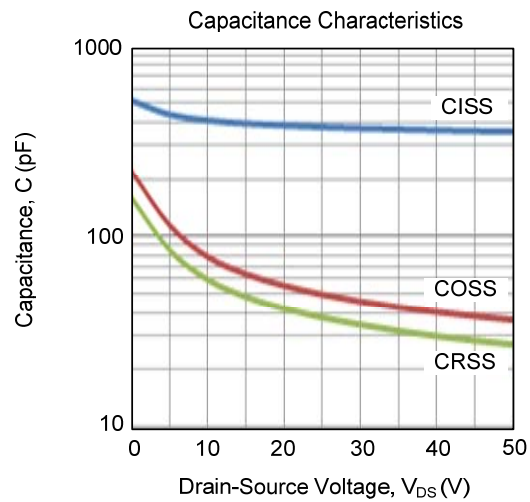
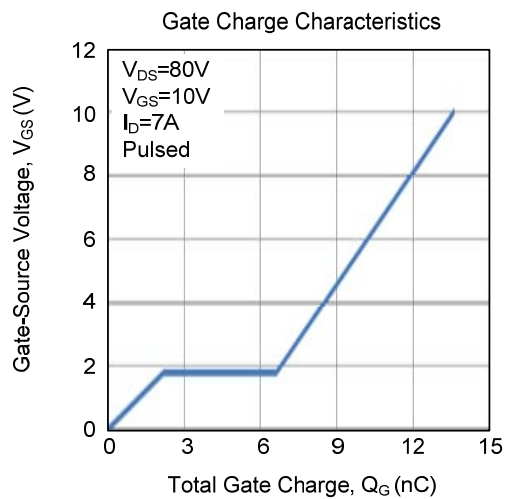
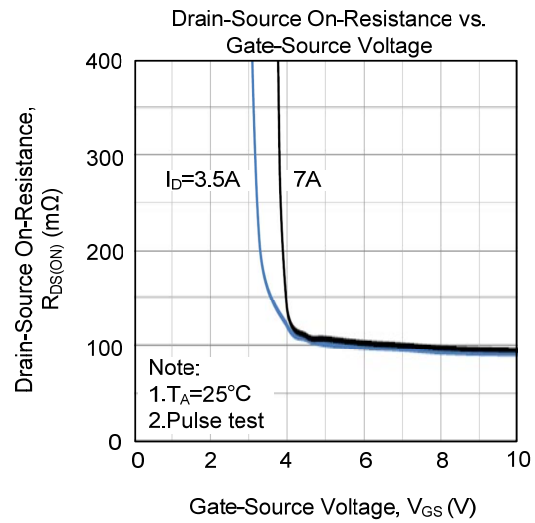
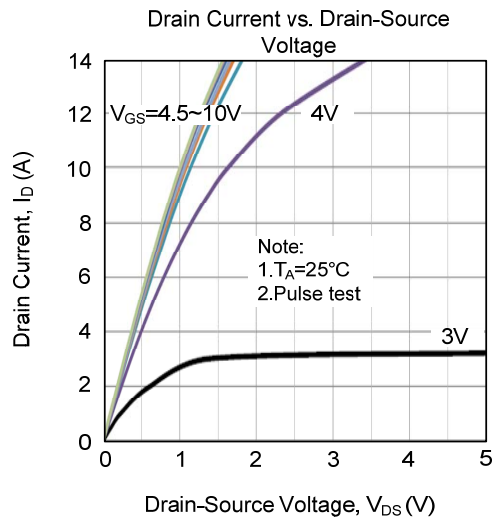


Unclamped Inductive Switching Test Circuit

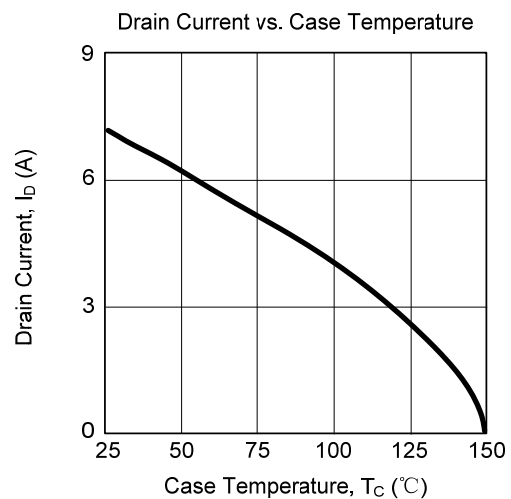
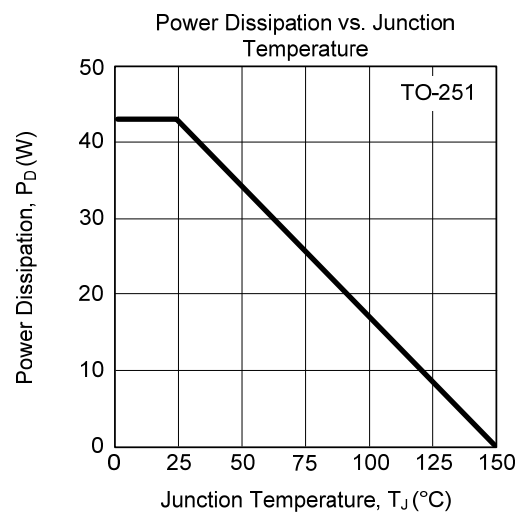
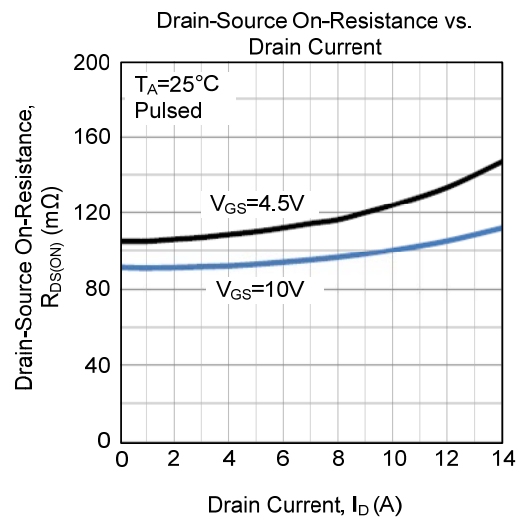
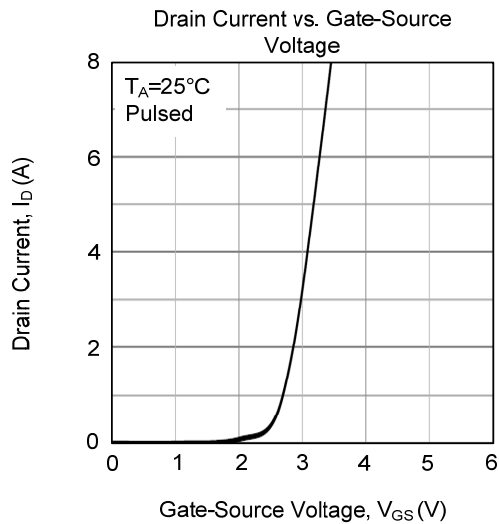
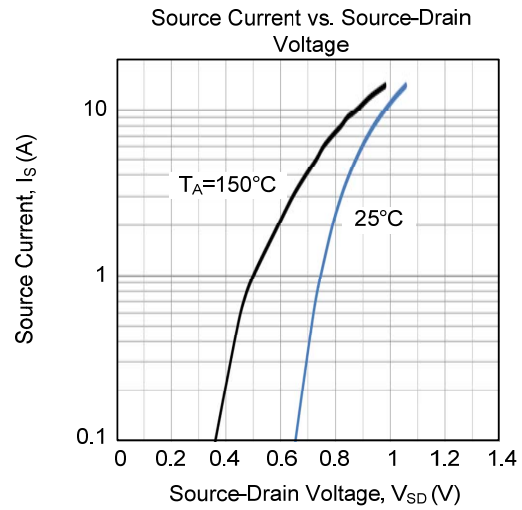
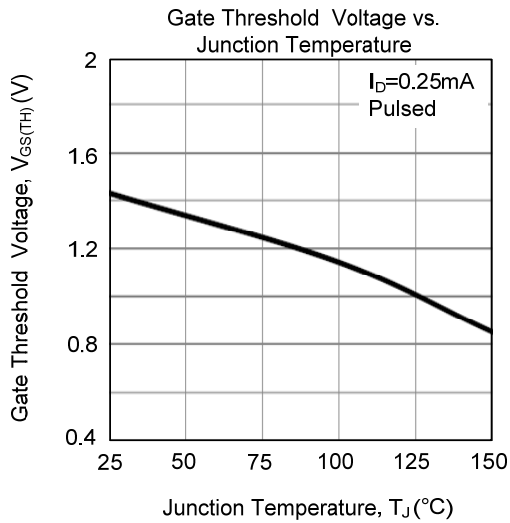


Unclamped Inductive Switching Waveforms

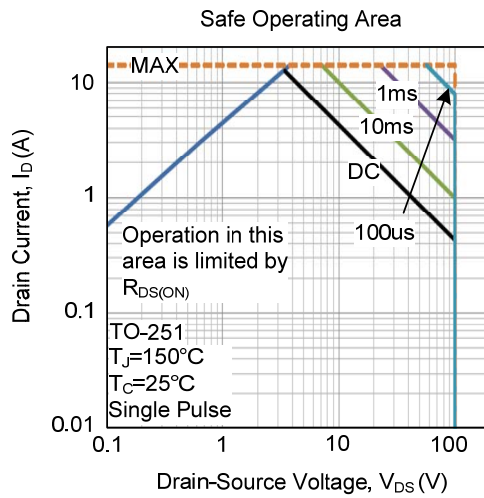
TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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