



UT15N10

POWER MOSFET

15A, 100V N-CHANNEL POWER MOSFET

■ DESCRIPTION

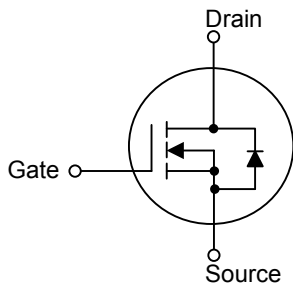
The UTC **UT15N10** is a N-channel mode power MOSFET using UTC's advanced technology to provide customers with a minimum on-state resistance, low gate charge and high switching speed.

The UTC **UT15N10** is suitable for high voltage synchronous rectifier and DC/DC converters, etc.

■ FEATURES

- * $R_{DS(ON)} \leq 72 \text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=7.5\text{A}$
- $R_{DS(ON)} \leq 84 \text{ m}\Omega$ @ $V_{GS}=4.5\text{V}$, $I_D=7.5\text{A}$
- * High Switching Speed
- * High Cell Density Trench Technology

■ SYMBOL

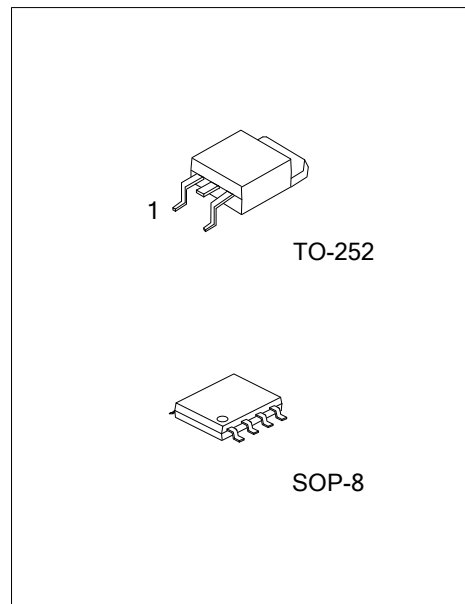


■ ORDERING INFORMATION

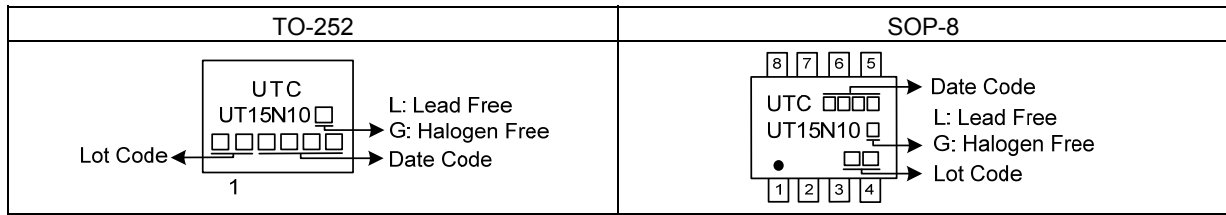
Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT15N10L-TN3-R	UT15N10G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UT15N10L-S08-R	UT15N10G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

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

<p>UT15N10G-TN3-R</p>	<p>(1) R: Tape Reel</p> <p>(2) TN3: TO-252, S08: SOP-8</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	100	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current	Continuous	I_D	15	A
	Pulsed (Note 2)	I_{DM}	30	A
Avalanche Energy (Note 3)	Single Pulsed (Note 3)	E_{AS}	7	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	4.5	V/nS
Power Dissipation	TO-252	P_D	44	W
	SOP-8		4.7	W
Junction Temperature		T_J	+150	$^{\circ}\text{C}$
Storage Temperature Range		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. $L=0.1\text{mH}$, $I_{AS}=10\text{A}$, $V_{DD}=50\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^{\circ}\text{C}$

4. $I_{SD} \leq 15\text{A}$, $di/dt \leq 100\text{A}/\mu\text{s}$, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq 25^{\circ}\text{C}$

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-252	θ_{JA}	80	$^{\circ}\text{C}/\text{W}$
	SOP-8		125	$^{\circ}\text{C}/\text{W}$
Junction to Case	TO-252	θ_{JC}	2.85	$^{\circ}\text{C}/\text{W}$
	SOP-8		26.6	$^{\circ}\text{C}/\text{W}$

Note: Surface mounted on FR4 board using 1 sq in pad size, (Cu Area 1.127 sq in [2 oz] including traces)..

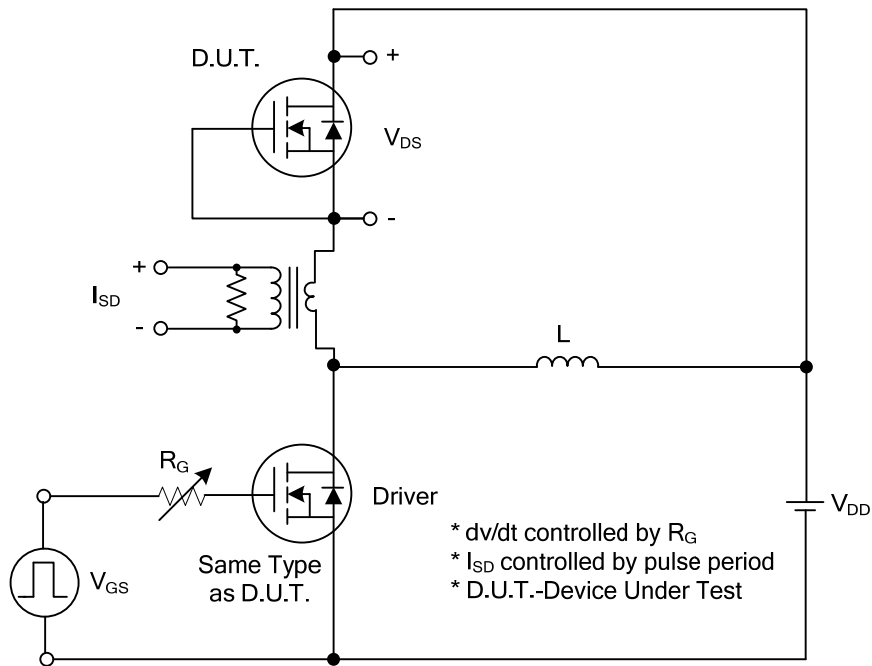
■ ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	100			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=100\text{V}$, $V_{GS}=0\text{V}$			10	μA
Gate-Source Leakage Current	Forward	$V_{GS}=+20\text{V}$, $V_{DS}=0\text{V}$			+100	nA
	Reverse	$V_{GS}=-20\text{V}$, $V_{DS}=0\text{V}$			-100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	1.0		3.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=7.5\text{A}$			72	m Ω
		$V_{GS}=4.5\text{V}$, $I_D=7.5\text{A}$			84	m Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{GS}=0\text{V}$, $V_{DS}=25\text{V}$, $f=1.0\text{MHz}$		1310		pF
Output Capacitance	C_{OSS}			72		pF
Reverse Transfer Capacitance	C_{RSS}			54		pF
SWITCHING PARAMETERS						
Total Gate Charge (Note 1)	Q_G	$V_{DS}=80\text{V}$, $V_{GS}=10\text{V}$, $I_D=15\text{A}$ $I_G=1\text{mA}$ (Note 1, 2)		38		nC
Gate to Source Charge	Q_{GS}			6		nC
Gate to Drain Charge	Q_{GD}			9		nC
Turn-on Delay Time (Note 1)	$t_{D(ON)}$	$V_{DS}=50\text{V}$, $V_{GS}=10\text{V}$, $I_D=15\text{A}$, $R_G=6\Omega$ (Note 1, 2)		7		ns
Rise Time	t_R			17		ns
Turn-off Delay Time	$t_{D(OFF)}$			32		ns
Fall-Time	t_F			20		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I_S				15	A
Maximum Body-Diode Pulsed Current	I_{SM}				30	A
Drain-Source Diode Forward Voltage (Note 1)	V_{SD}	$I_S=15\text{A}$, $V_{GS}=0\text{V}$			1.4	V
Reverse Recovery Time (Note 1)	t_{rr}	$I_S=15\text{A}$, $V_{GS}=0\text{V}$,		63		nS
Reverse Recovery Charge	Q_{rr}	$di/dt=100\text{A}/\mu\text{s}$		88		nC

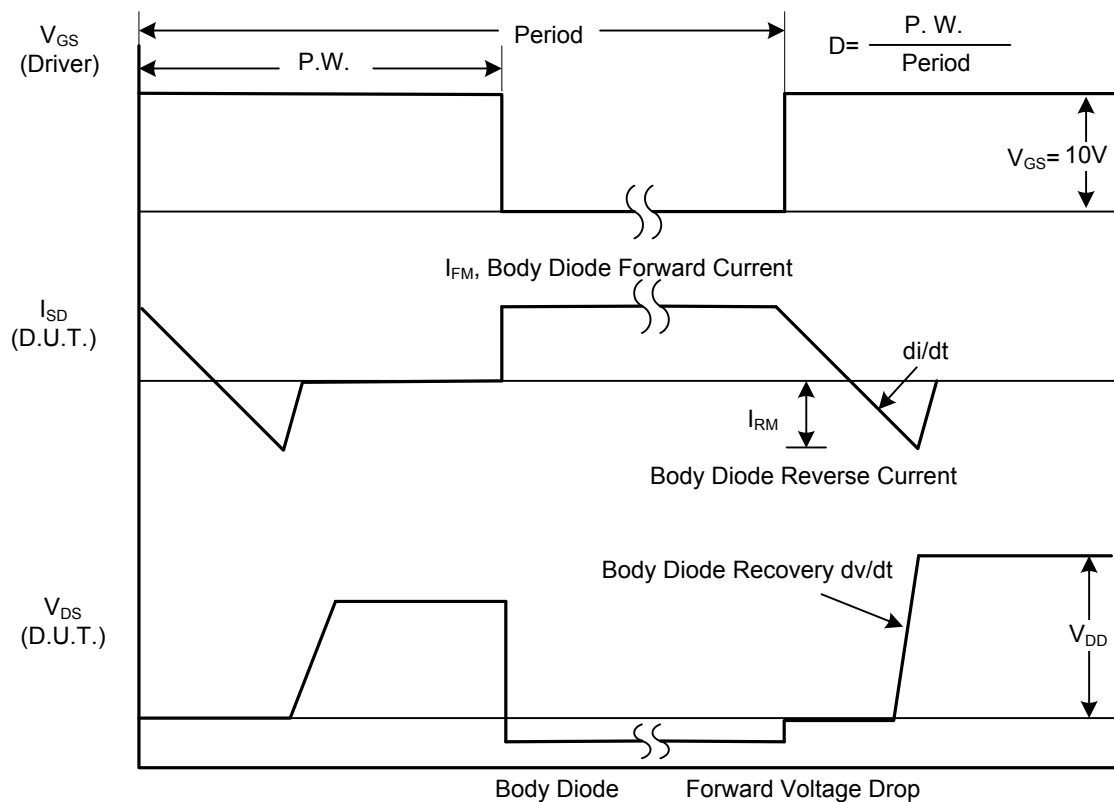
Notes: 1. Pulse Test : Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

TEST CIRCUITS AND WAVEFORMS

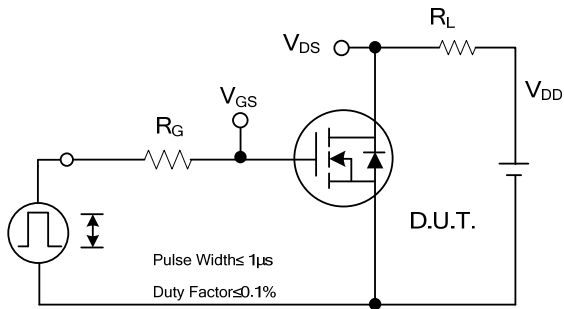


Peak Diode Recovery dv/dt Test Circuit

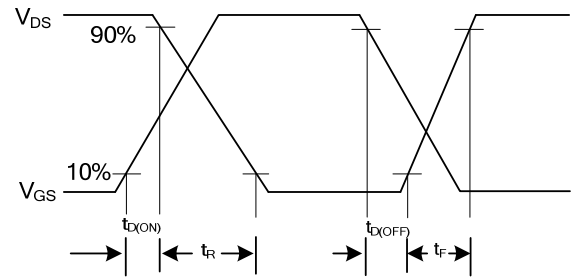


Peak Diode Recovery dv/dt Waveforms

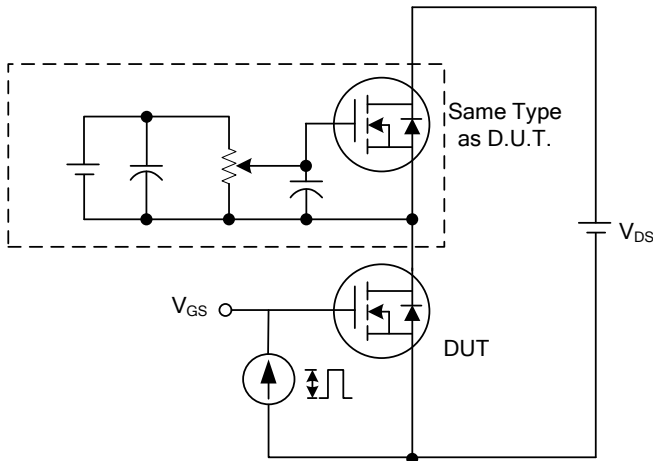
TEST CIRCUITS AND WAVEFORMS



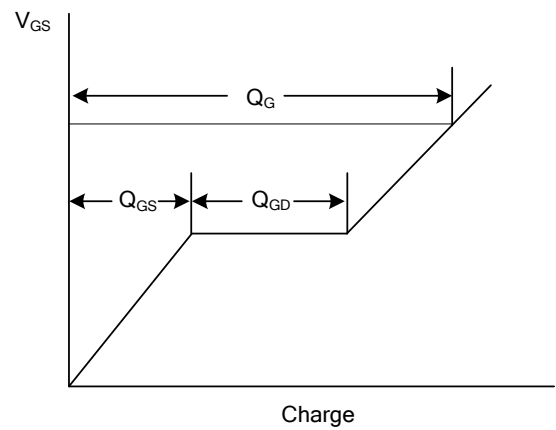
Switching Test Circuit



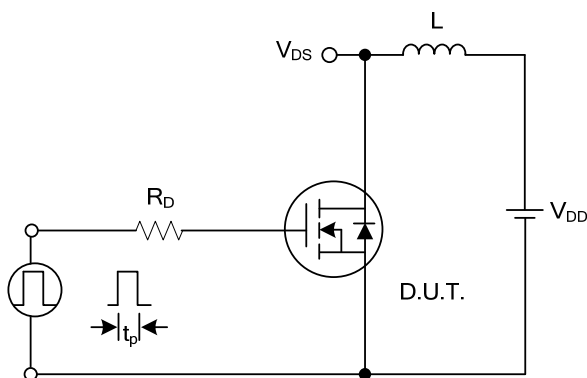
Switching Waveforms



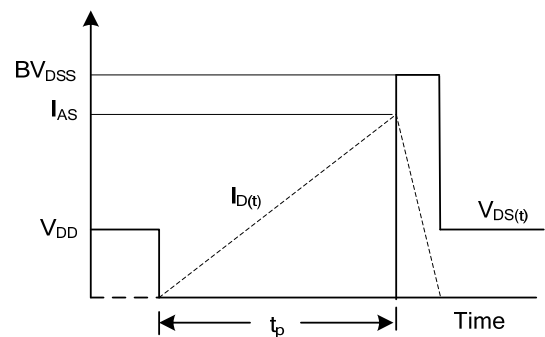
Gate Charge Test Circuit



Gate Charge Waveform

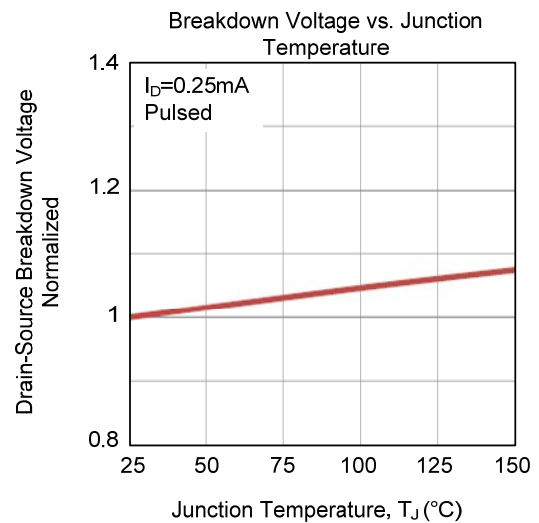
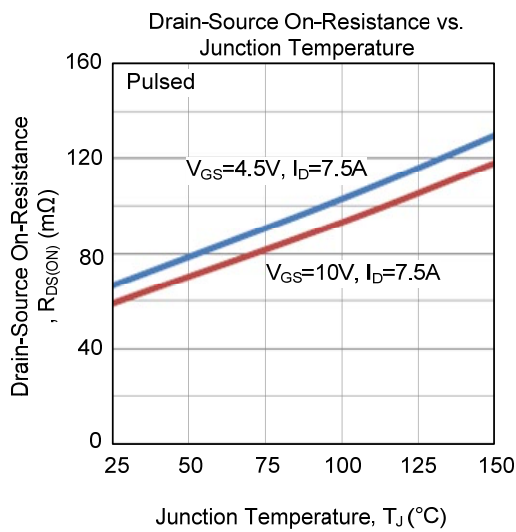
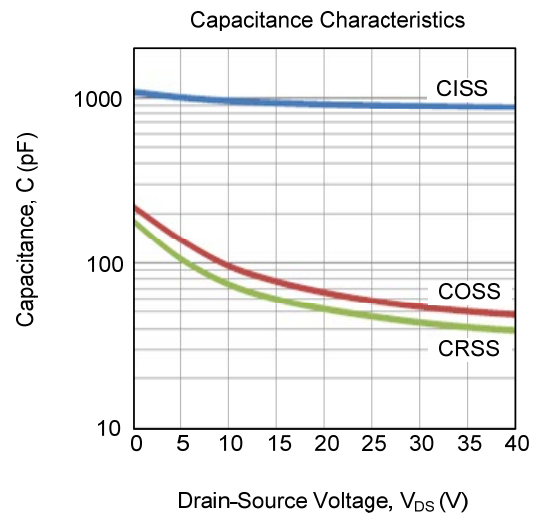
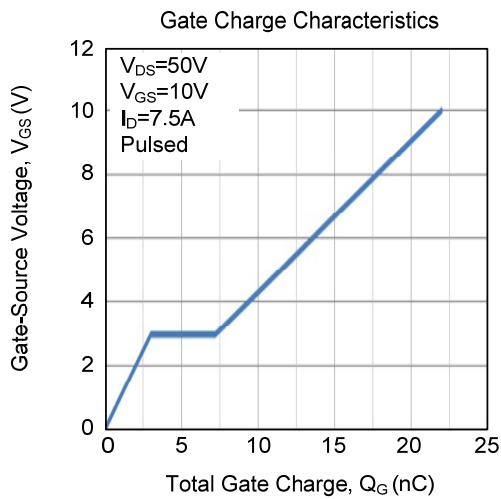
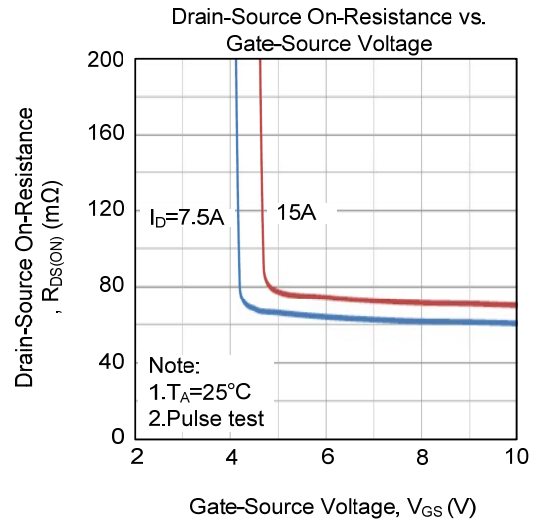
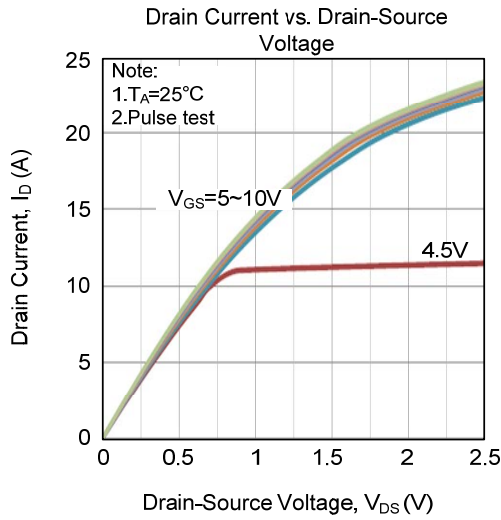


Unclamped Inductive Switching Test Circuit

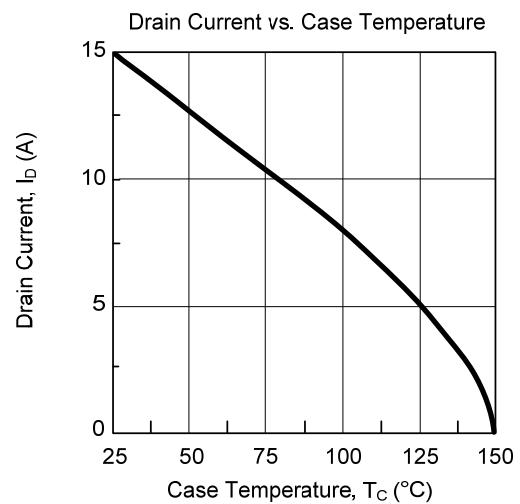
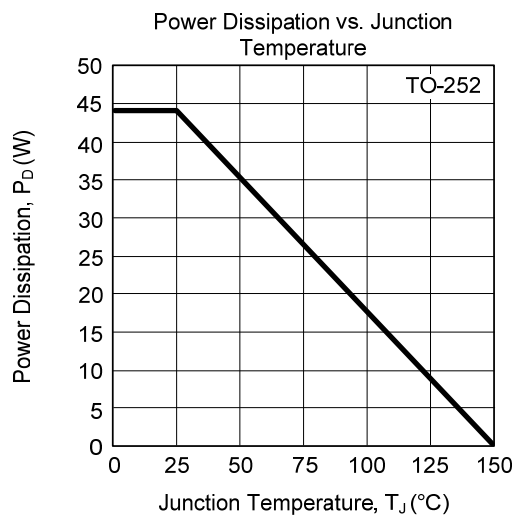
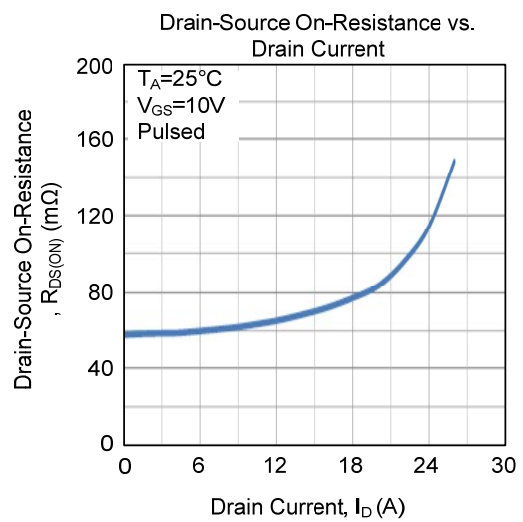
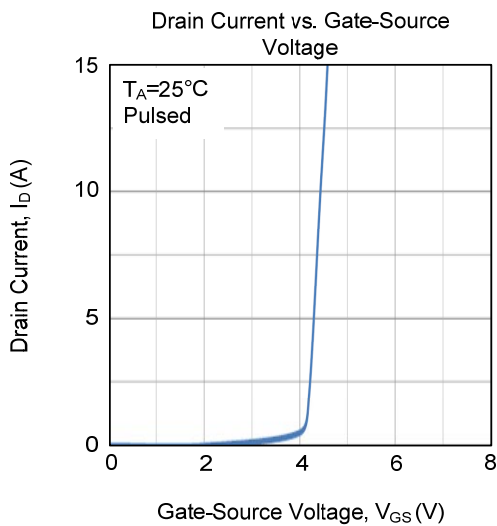
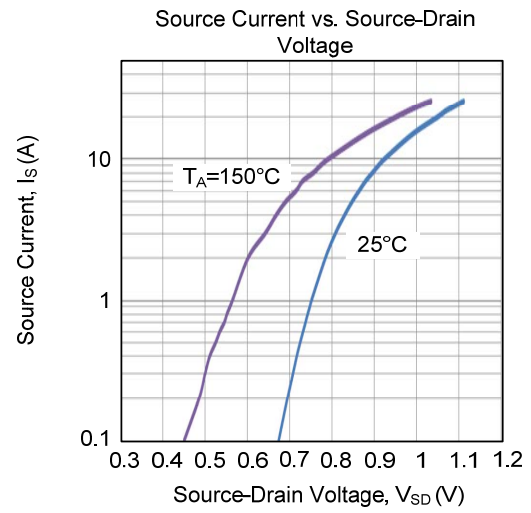
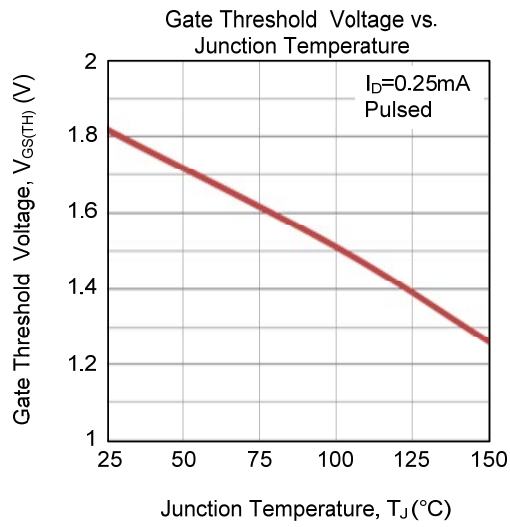


Unclamped Inductive Switching Waveforms

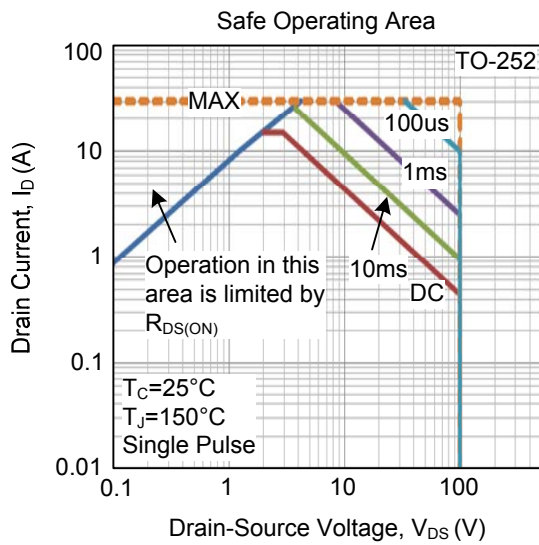
TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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