



UF630-HC

Power MOSFET

9A, 200V N-CHANNEL POWER MOSFET

DESCRIPTION

The UTC **UF630-HC** is a N-channel enhancement 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.

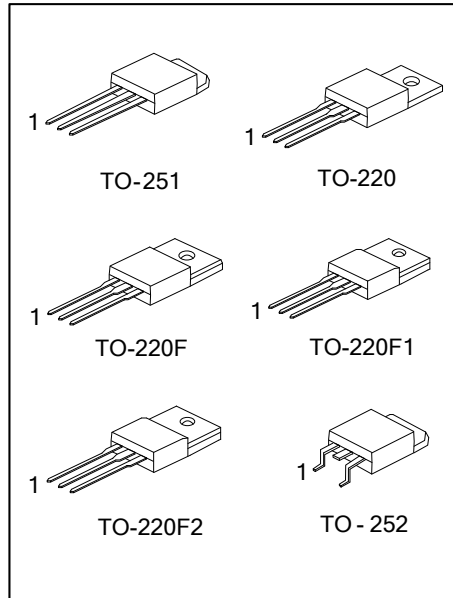
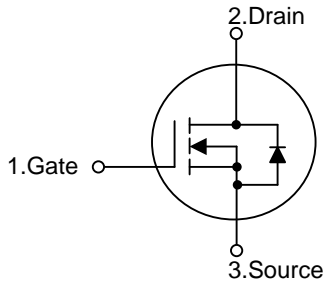
The UTC **UF630-HC** is universally applied in low voltage such as automotive, high efficiency switching for AC/DC converters and DC motor control, etc.

FEATURES

* $R_{DS(ON)} \leq 0.35 \Omega @ V_{GS}=10V, I_D=4.5A$

* High Switching Speed

SYMBOL



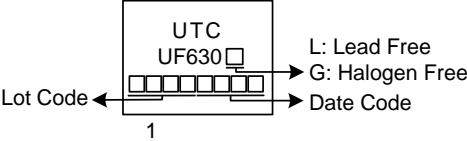
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UF630L-TA3-T	UF630G-TA3-T	TO-220	G	D	S	Tube
UF630L-TF1-T	UF630G-TF1-T	TO-220F1	G	D	S	Tube
UF630L-TF3-T	UF630G-TF3-T	TO-220F2	G	D	S	Tube
UF630L-TF3-T	UF630G-TF3-T	TO-220F	G	D	S	Tube
UF630L-TM3-T	UF630G-TM3-T	TO-251	G	D	S	Tube
UF630L-TN3-R	UF630G-TN3-R	TO-252	G	D	S	Tape Reel

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

<p>UF630G-TA3-T</p> <ul style="list-style-type: none"> (1) Packing Type (2) Package Type (3) Green Package 	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) TA3: TO-220, TF3: TO-220F, TF1: TO-220F1, TF2: TO-220F2, TM3: TO-251, TN3: TO-252</p> <p>(3) L: Lead Free, G: Halogen Free and Lead Free</p>
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■ MARKING



■ ABSOLUTE MAXIMUM RATINGS (T_c=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V _{DSS}	200	V
Gate-Source Voltage		V _{GSS}	±30	V
Continuous Drain Current	Continuous	I _D	9	A
	Pulsed	I _{DM}	18	A
Single Pulsed Avalanche Current		I _{AS}	4.2	A
Single Pulsed Avalanche Energy		E _{AS}	264	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	2.4	V/ns
Power Dissipation	TO-220	P _D	95	W
	TO-220F/TO-220F1		30	W
	TO-220F2		32	W
	TO-251/TO-252		50	W
Junction Temperature		T _J	+150	°C
Storage Temperature		T _{STG}	-55 ~ +150	°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=30mH, I_{AS}=4.2A, V_{DD}=50V, R_G=25Ω, Starting T_J = 25°C

4. I_{SD}≤9A, di/dt≤200A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C

■ THERMAL DATA

PARAMETER	PACKAGE	SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-220F	θ _{JA}	62.5	°C/W
	TO-220F1/TO-220F2			
	TO-251/TO-252		110	°C/W
Junction to Case	TO-220	θ _{JC}	1.31	°C/W
	TO-220F/TO-220F1		4.17	°C/W
	TO-220F2		3.91	°C/W
	TO-251/TO-252		2.5 (Note)	°C/W

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

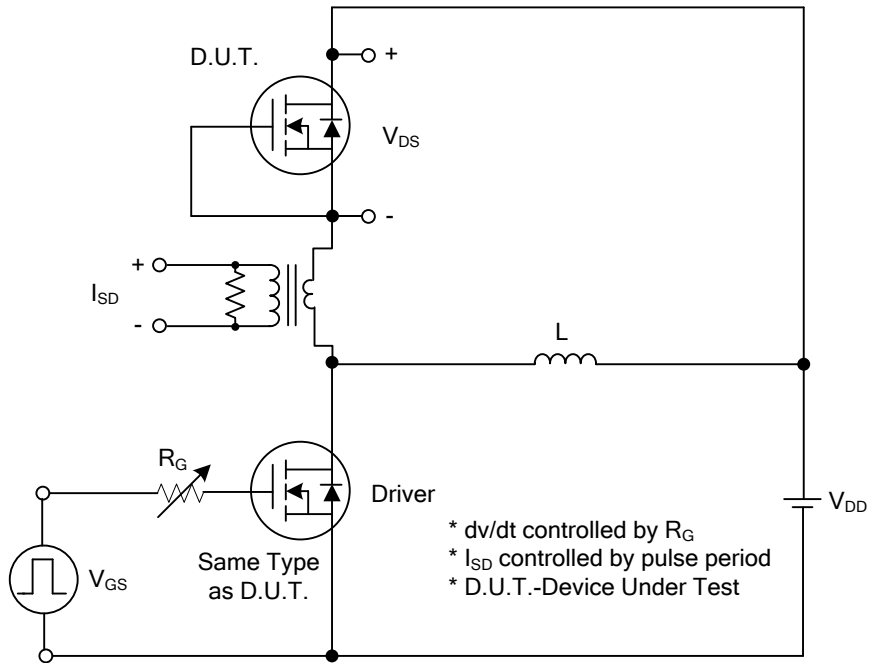
■ **ELECTRICAL CHARACTERISTICS** ($T_J=25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	200			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=200\text{V}$, $V_{GS}=0\text{V}$			10	μA
Gate-Source Leakage Current	Forward	$V_{GS}=+30\text{V}$, $V_{DS}=0\text{V}$			+100	nA
	Reverse	$V_{GS}=-30\text{V}$, $V_{DS}=0\text{V}$			-100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	2.0		4.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=4.5\text{A}$			0.35	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{GS}=0\text{V}$, $V_{DS}=25\text{V}$, $f=1.0\text{MHz}$		426		pF
Output Capacitance	C_{OSS}			80		pF
Reverse Transfer Capacitance	C_{RSS}			6		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	$V_{DS}=160\text{V}$, $V_{GS}=10\text{V}$, $I_D=9\text{A}$ $I_G=1\text{mA}$ (Note 1, 2)		12		nC
Gate to Source Charge	Q_{GS}			3.2		nC
Gate to Drain Charge	Q_{GD}			2		nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=100\text{V}$, $V_{GS}=10\text{V}$, $I_D=9\text{A}$, $R_G=25\Omega$ (Note 1, 2)		6		ns
Rise Time	t_R			17		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			25		ns
Fall-Time	t_F			20		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I_S				9	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				18	A
Drain-Source Diode Forward Voltage	V_{SD}	$I_S=9\text{A}$, $V_{GS}=0\text{V}$			1.4	V
Body Diode Reverse Recovery Time	t_{rr}	$I_S=9\text{A}$, $V_{GS}=0\text{V}$, $dI_F/dt=100\text{A}/\mu\text{s}$ (Note 1)		142		ns
Reverse Recovery Charge	Q_{rr}				0.9	

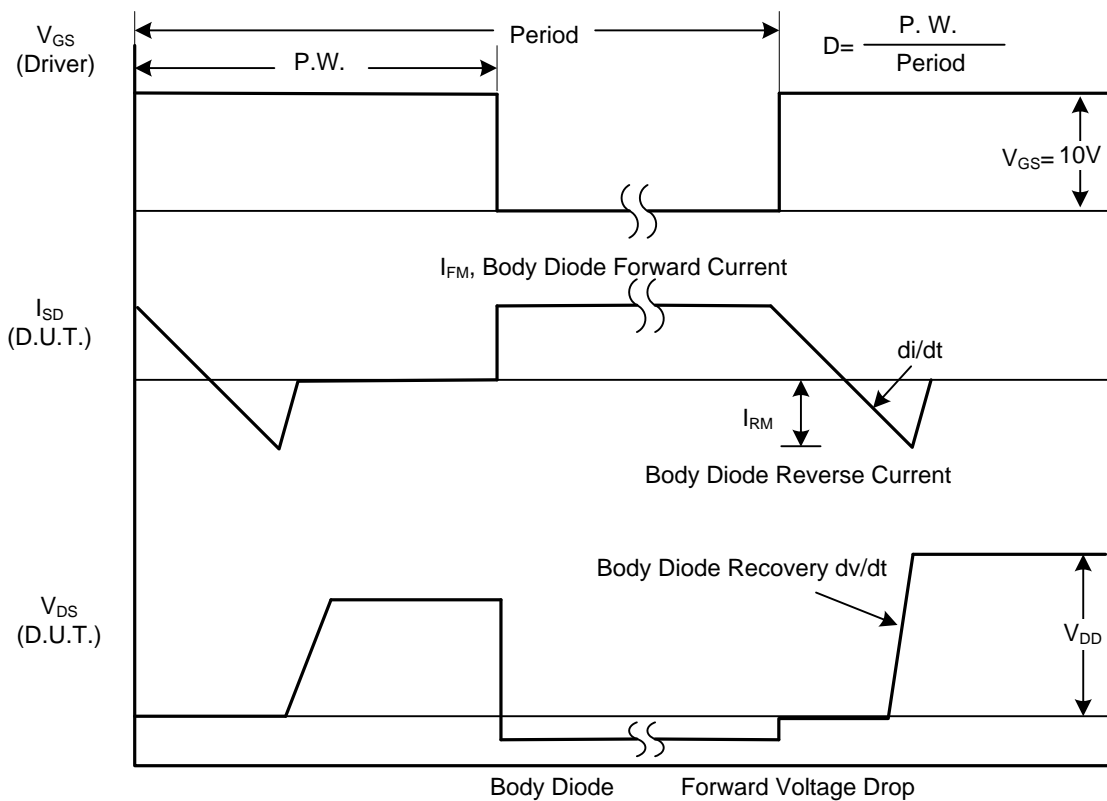
Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

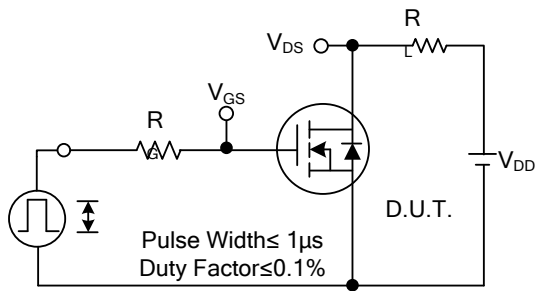


Peak Diode Recovery dv/dt Test Circuit

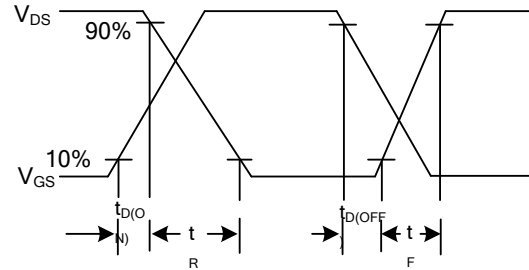


Peak Diode Recovery dv/dt Waveforms

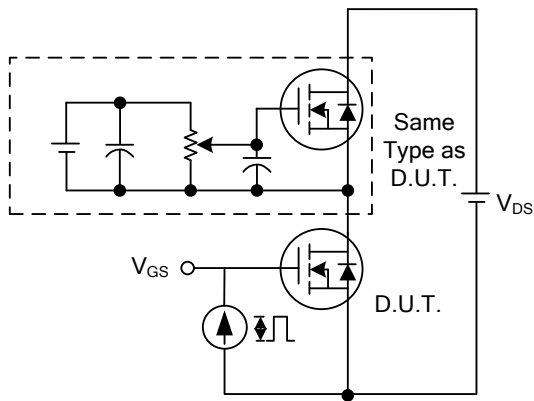
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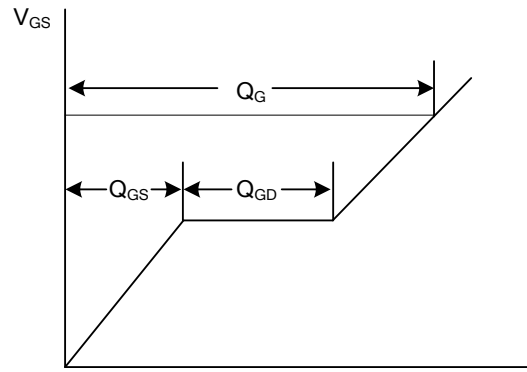
Switching Test Circuit



Switching Waveforms

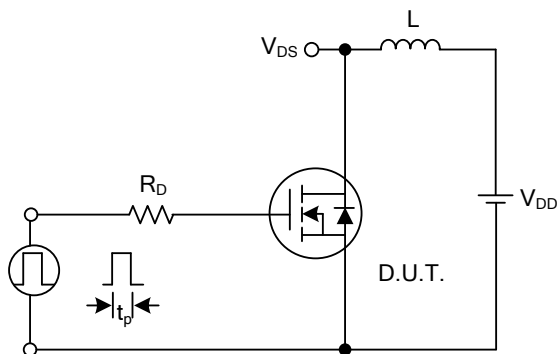


Gate Charge Test Circuit

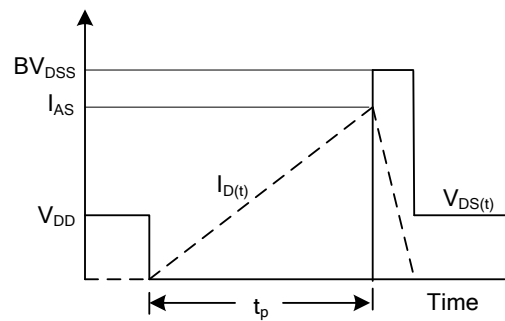


Charge

Gate Charge Waveform

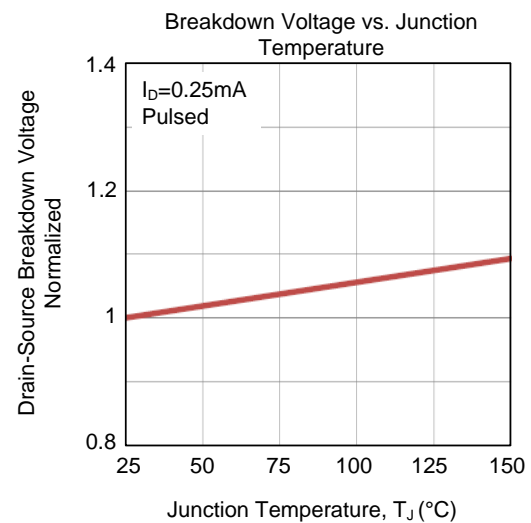
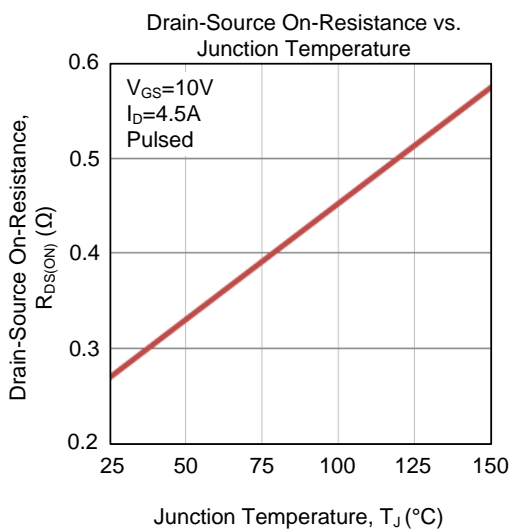
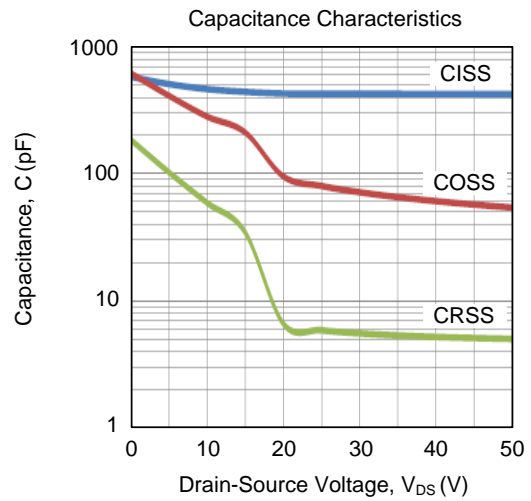
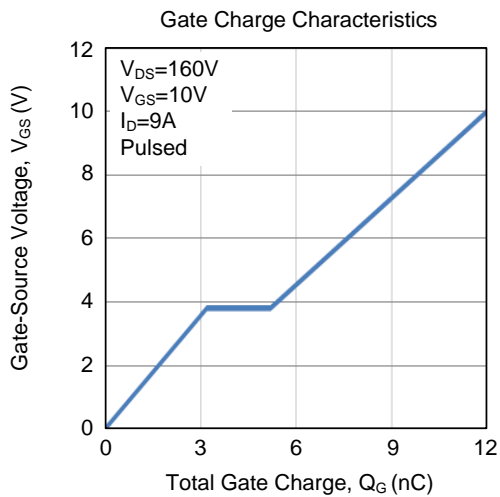
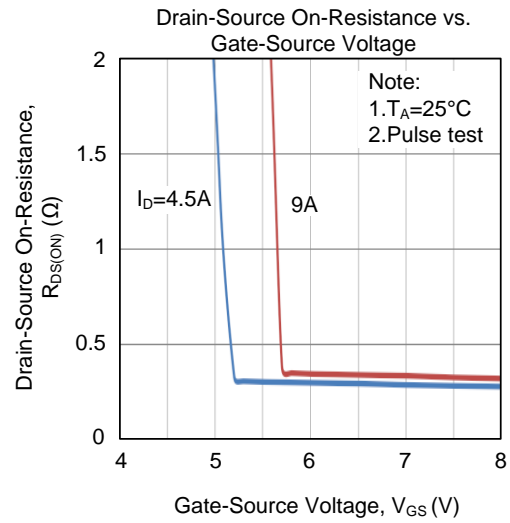
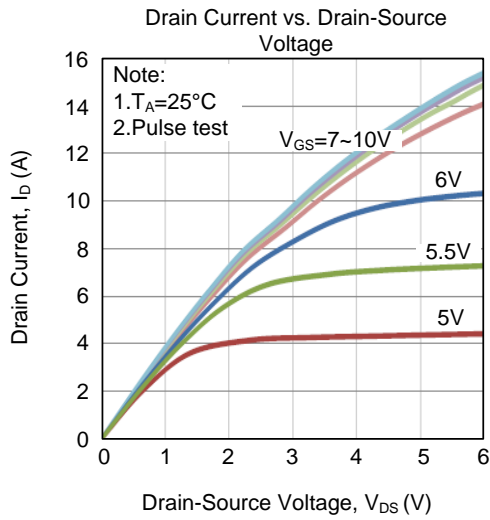


Unclamped Inductive Switching Test Circuit

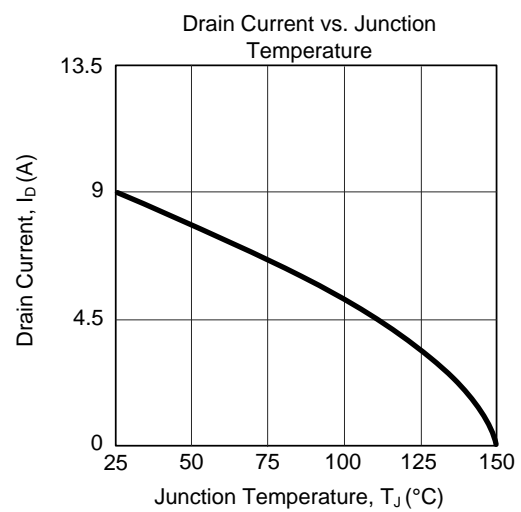
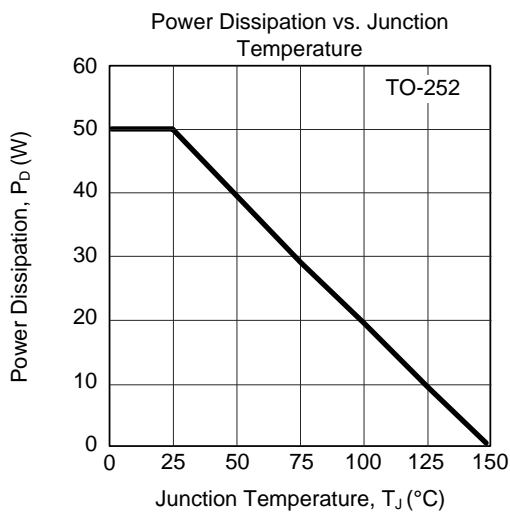
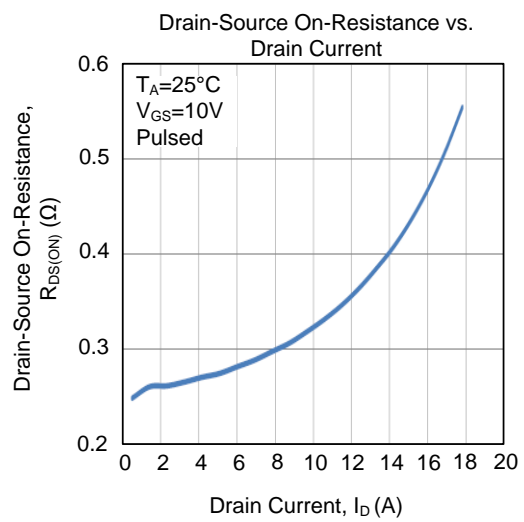
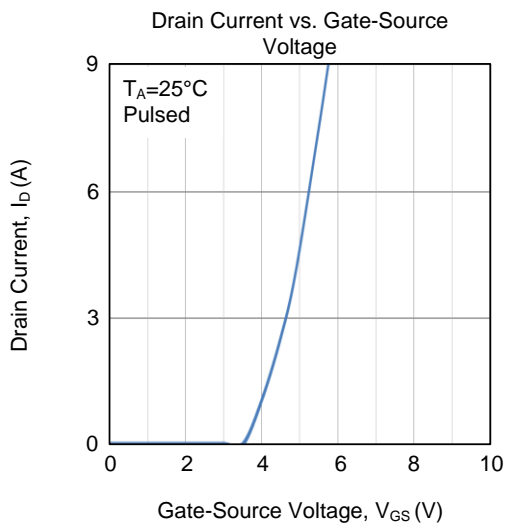
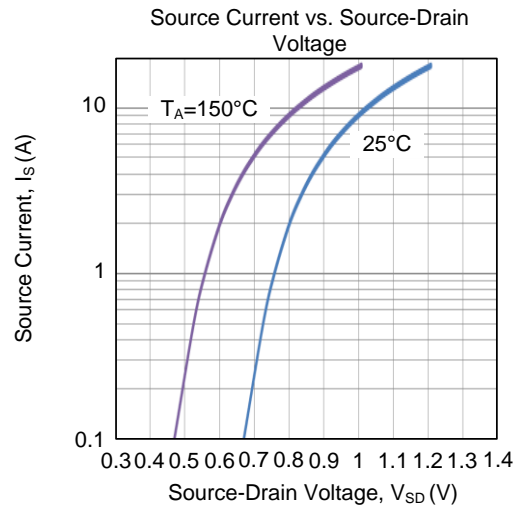
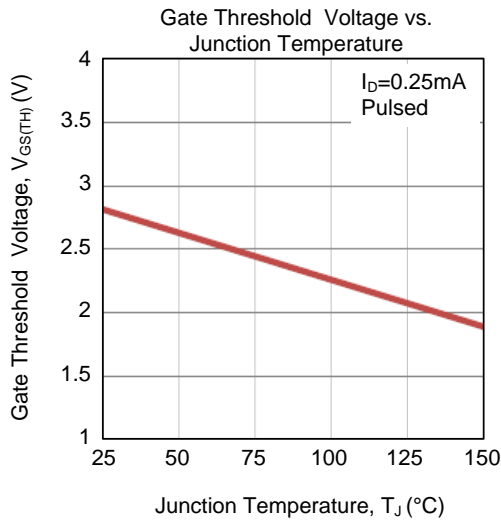


Unclamped Inductive Switching Waveforms

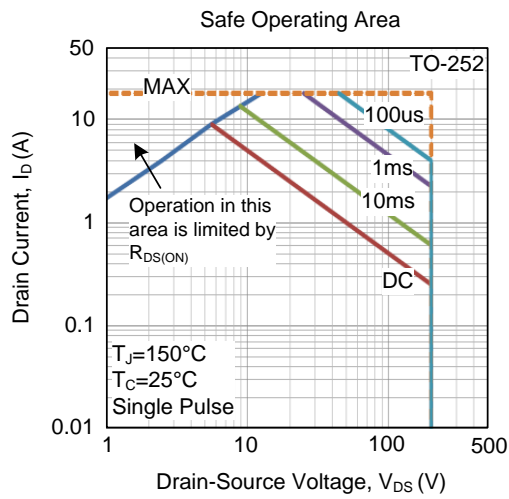
TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ **TYPICAL CHARACTERISTICS (Cont.)**



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