



UT16N10

POWER MOSFET

16A, 100V N-CHANNEL POWER MOSFET

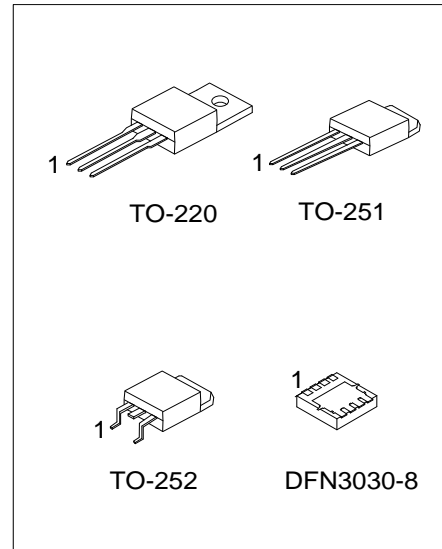
DESCRIPTION

The UTC **UT16N10** 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.

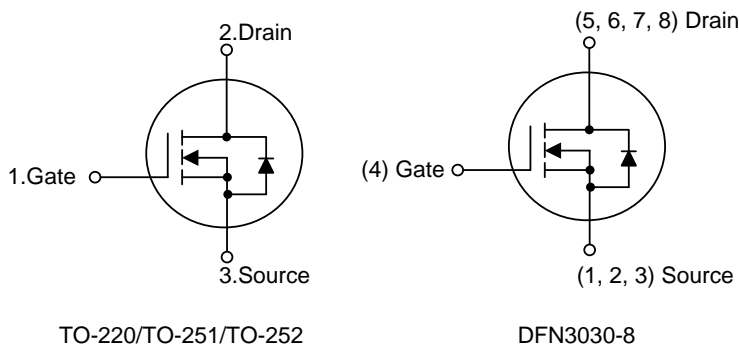
The UTC **UT16N10** is suitable for high voltage synchronous rectifier and DC/DC converters, etc.

FEATURES

- * $R_{DS(ON)} \leq 115 \text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=8.0\text{A}$
- $R_{DS(ON)} \leq 135 \text{ m}\Omega$ @ $V_{GS}=4.5\text{V}$, $I_D=8.0\text{A}$
- * 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	
UT16N10L-TA3-R	UT16N10G-TA3-R	TO-220	G	D	S	-	-	-	-	-	Tube
UT16N10L-TM3-T	UT16N10G-TM3-T	TO-251	G	D	S	-	-	-	-	-	Tube
UT16N10L-TN3-R	UT16N10G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UT16N10L-K08-3030-R	UT16N10G-K08-3030-R	DFN3030-8	S	S	S	G	D	D	D	D	Tape Reel

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

<p>UT16N10G-TA3-R</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) TA3: TO-220, TM3: TO-251, TN3: TO-252, K08-3030: DFN3030-8</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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UT16N10

Power MOSFET

MARKING

TO-220 / TO-251 / TO-252	DFN3030-8
<p>UTC UT16N10 □□□□□ 1 Lot Code Date Code L: Lead Free G: Halogen Free</p>	<p>UT 16N10 • □□□□ Date Code</p>

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■ 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	16	A
	Pulsed (Note 2)	I_{DM}	32	A
Avalanche Energy (Note 3)	Single Pulsed (Note 3)	E_{AS}	45	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	2.6	V/nS
Power Dissipation	TO-220	P_D	95	W
	TO-251/TO-252		43	W
	DFN3030-8		17.9	W
Junction Temperature		T_J	+100	$^{\circ}\text{C}$
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. $L=10\text{mH}$, $I_{AS}=3.0\text{A}$, $V_{DD}=50\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^{\circ}\text{C}$

4. $I_{SD} \leq 16\text{A}$, $di/dt \leq 100\text{A}/\mu\text{s}$, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq 25^{\circ}\text{C}$

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-251	θ_{JA}	110	$^{\circ}\text{C}/\text{W}$
	TO-252			
	DFN3030-8			
Junction to Case (Note)	TO-220	θ_{JC}	1.3	$^{\circ}\text{C}/\text{W}$
	TO-251/TO-252		2.5	$^{\circ}\text{C}/\text{W}$
	DFN3030-8		7	$^{\circ}\text{C}/\text{W}$

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

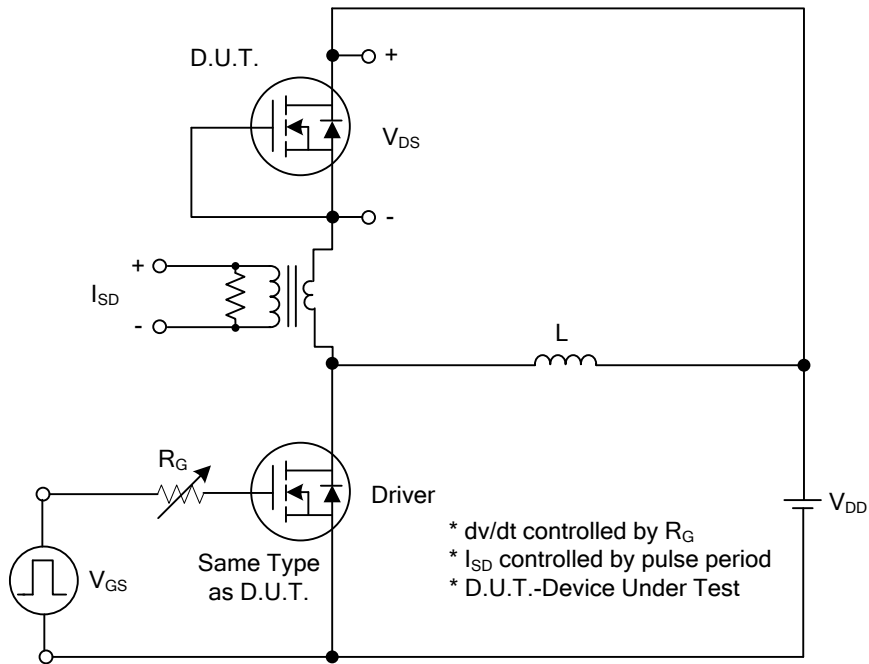
■ **ELECTRICAL CHARACTERISTICS** ($T_J = 25^\circ\text{C}$, unless otherwise specified)

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}	$V_{DS}=100\text{V}$, $V_{GS}=0\text{V}$			1	μA
Gate-Source Leakage Current	Forward	I_{GSS}			+100	nA
	Reverse				-100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	1.0		3.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=8.0\text{A}$			115	$\text{m}\Omega$
		$V_{GS}=4.5\text{V}$, $I_D=8.0\text{A}$			135	$\text{m}\Omega$
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{GS}=0\text{V}$, $V_{DS}=25\text{V}$, $f=1.0\text{MHz}$		400		pF
Output Capacitance	C_{OSS}			48		pF
Reverse Transfer Capacitance	C_{RSS}			36		pF
SWITCHING PARAMETERS						
Total Gate Charge (Note 1)	Q_G	$V_{DS}=80\text{V}$, $V_{GS}=10\text{V}$, $I_D=16\text{A}$ $I_G=1\text{mA}$ (Note 1, 2)		17		nC
Gate to Source Charge	Q_{GS}			2.5		nC
Gate to Drain Charge	Q_{GD}			6		nC
Turn-on Delay Time (Note 1)	$t_{D(ON)}$	$V_{DS}=50\text{V}$, $V_{GS}=10\text{V}$, $I_D=16\text{A}$, $R_G=25\Omega$ (Note 1, 2)		24		ns
Rise Time	t_R			27		ns
Turn-off Delay Time	$t_{D(OFF)}$			84		ns
Fall-Time	t_F			48		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I_S				16	A
Maximum Body-Diode Pulsed Current	I_{SM}				32	A
Drain-Source Diode Forward Voltage (Note 1)	V_{SD}	$I_S=16\text{A}$, $V_{GS}=0\text{V}$			1.4	V
Reverse Recovery Time (Note 1)	t_{rr}	$I_S=16\text{A}$, $V_{GS}=0\text{V}$,		33		nS
Reverse Recovery Charge	Q_{rr}	$di/dt=100\text{A}/\mu\text{s}$		34		nC

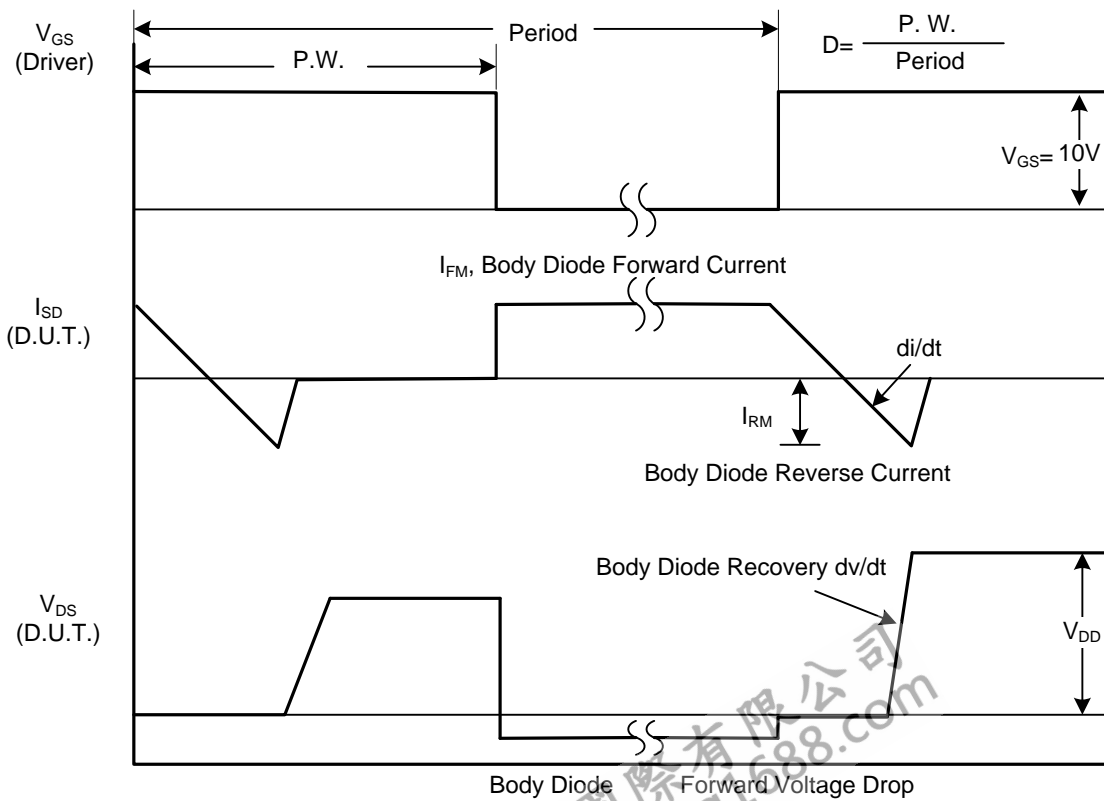
Notes: 1. Pulse Test : Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

TEST CIRCUITS AND WAVEFORMS

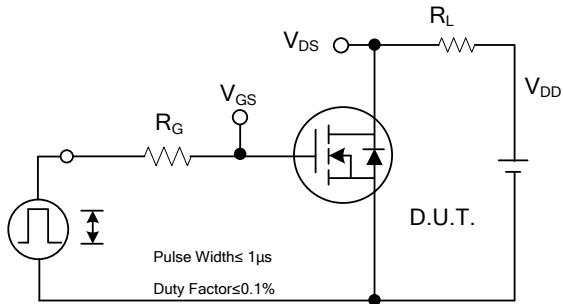


Peak Diode Recovery dv/dt Test Circuit

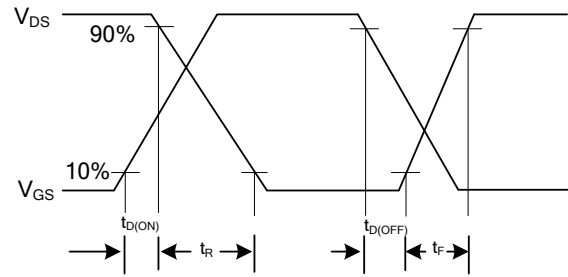


Peak Diode Recovery dv/dt Waveforms

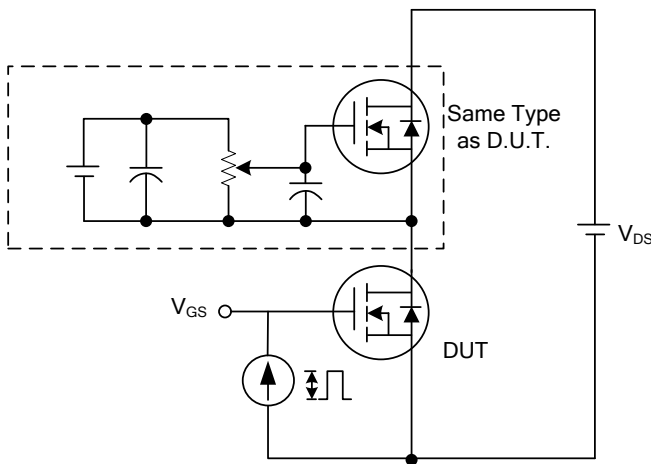
TEST CIRCUITS AND WAVEFORMS



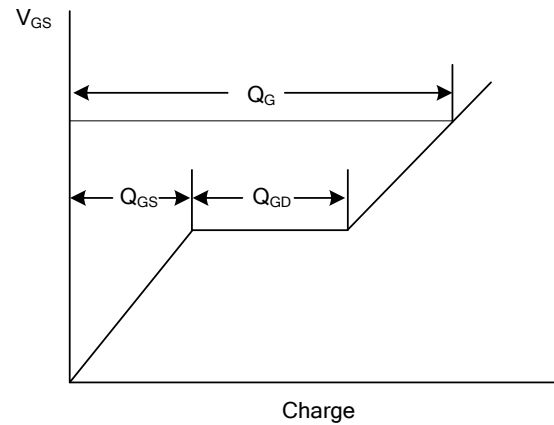
Switching Test Circuit



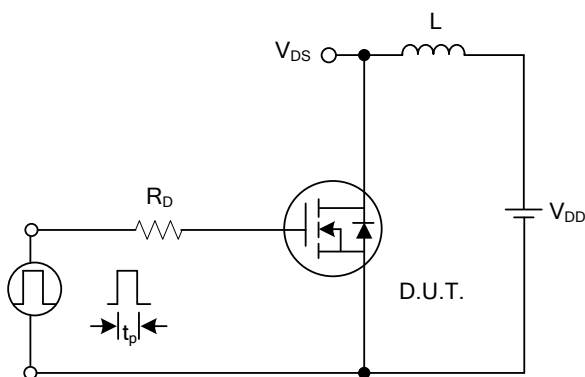
Switching Waveforms



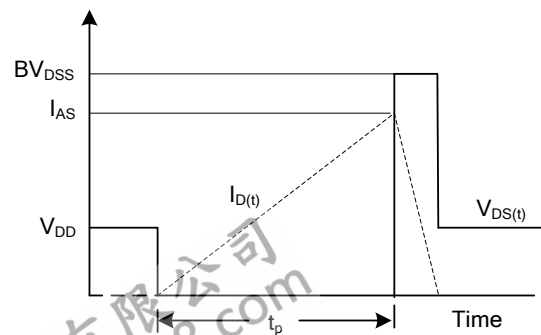
Gate Charge Test Circuit



Gate Charge Waveform

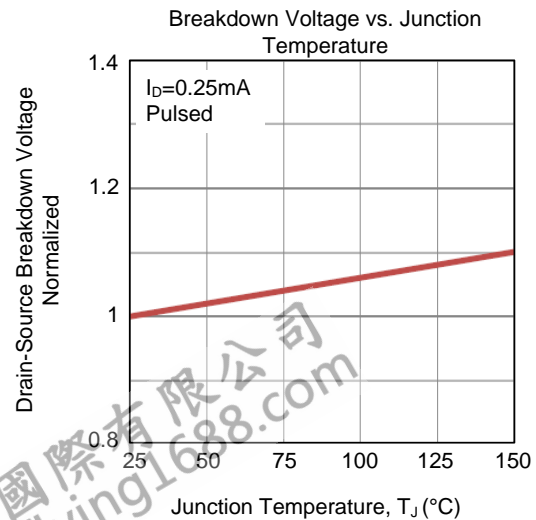
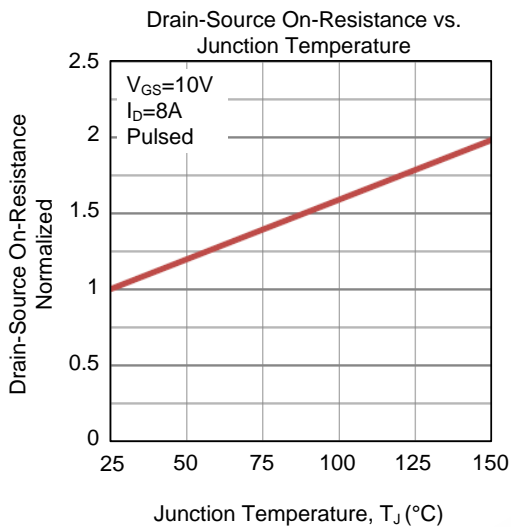
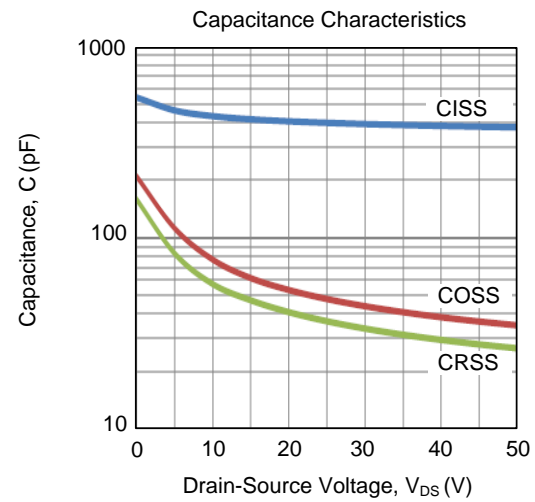
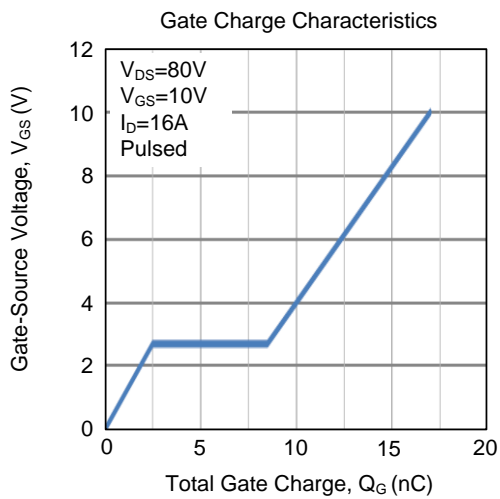
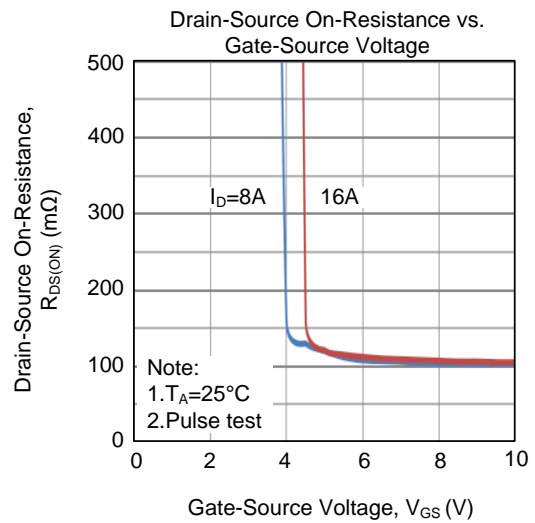
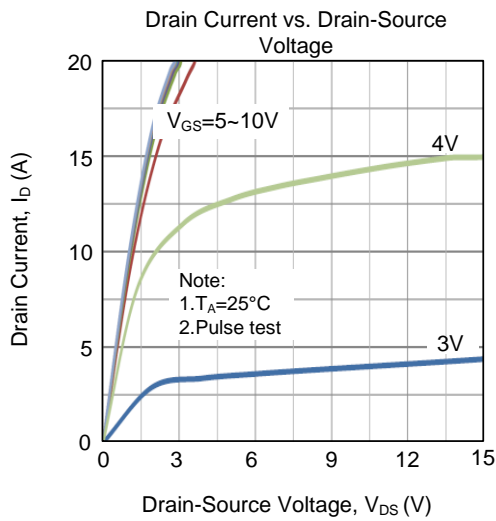


Unclamped Inductive Switching Test Circuit

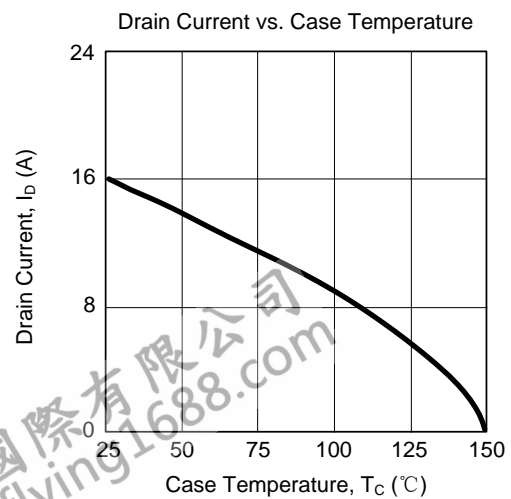
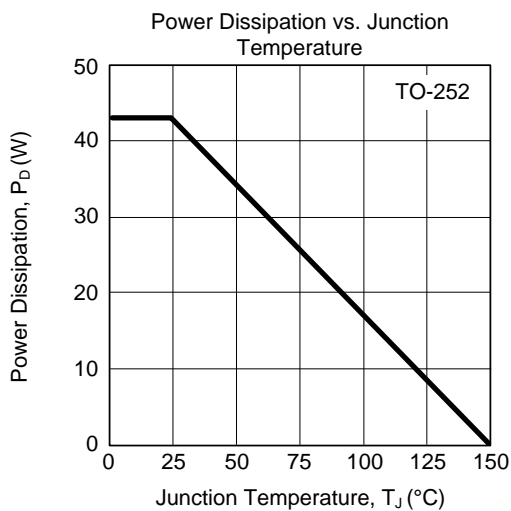
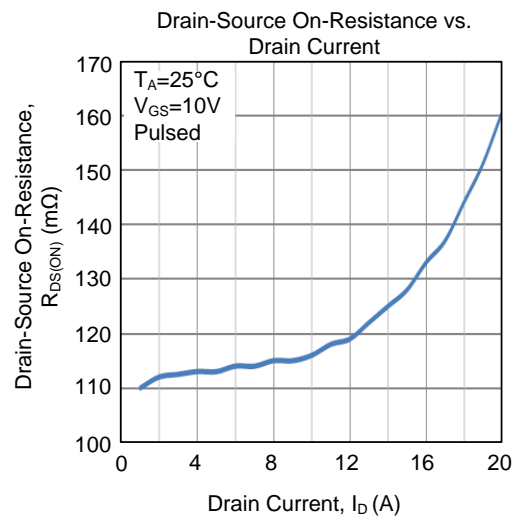
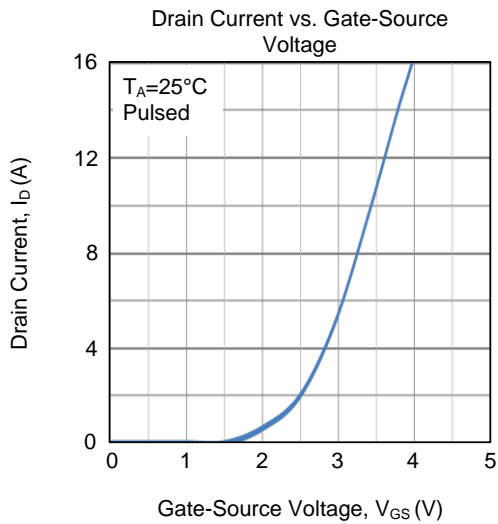
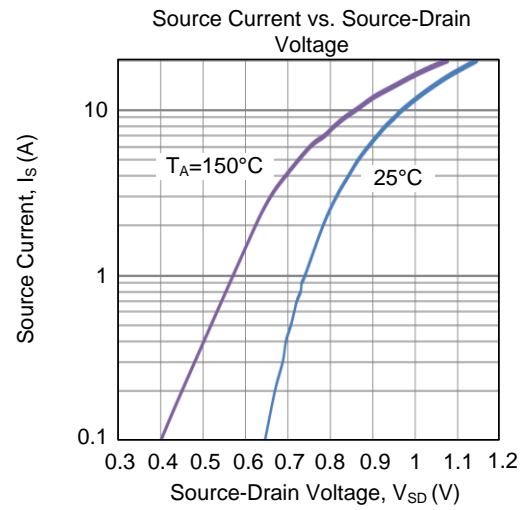
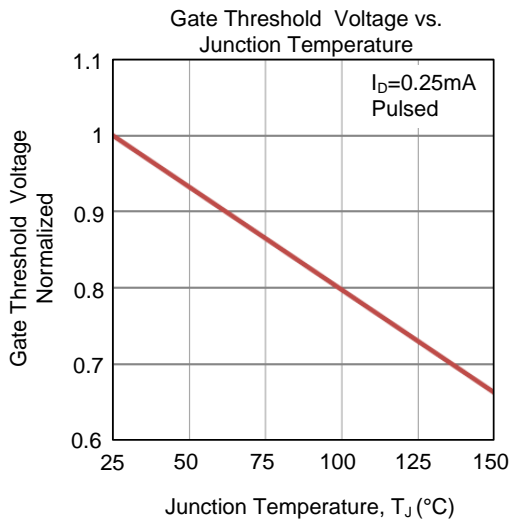


Unclamped Inductive Switching Waveforms

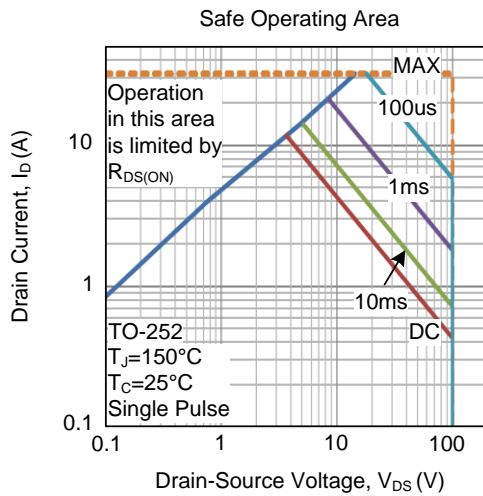
TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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