



UTT50N06H

Power MOSFET

50A, 60V N-CHANNEL FAST SWITCHING MOSFET

DESCRIPTION

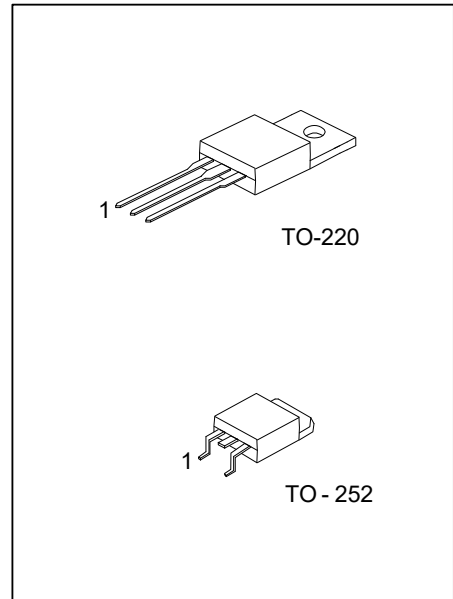
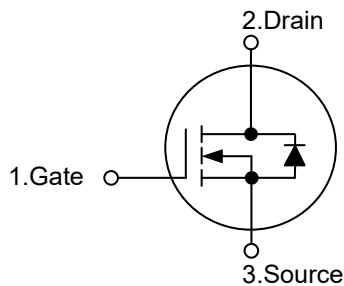
The UTC **UTT50N06H** is a N-Channel MOSFET, it uses UTC's advanced technology to provide customers with a minimum on-state resistance, high switching speed and low gate charge.

The UTC **UTT50N06H** is suitable for application in networking DC-DC power system and LCD/LED back light, etc.

FEATURES

- * $R_{DS(ON)} \leq 12\text{ m}\Omega @ V_{GS}=10\text{V}, I_D=25\text{A}$
- * Low gate charge
- * High switching speed

SYMBOL



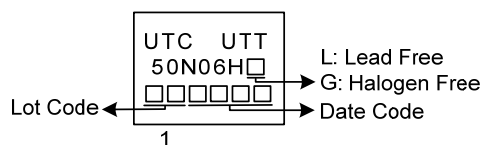
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT50N06HL-TA3-T	UTT50N06HG-TA3-T	TO-220	G	D	S	Tube
UTT50N06HL-TN3-R	UTT50N06HG-TN3-R	TO-252	G	D	S	Tape Reel

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

<p>UTT50N06HG-TA3-T</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TN3: TO-252 (3) G: Halogen Free and Lead Free L: Lead Free</p>
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MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	60	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current	Continuous	I_D	50	A
	Pulsed (Note 2)	I_{DM}	100	A
Avalanche Current (Note 2)		I_{AR}	10	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	54	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	2.3	V/ns
Power Dissipation (Note 4)	TO-220	P_D	146	W
	TO-252		56	W
Junction Temperature		T_J	+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. $L=0.1\text{mH}$, $I_{AS}=33\text{A}$, $V_{DD}=25\text{V}$, $R_G=25\ \Omega$, 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	θ_{JA}	62.5	$^\circ\text{C}/\text{W}$
	TO-252		110	$^\circ\text{C}/\text{W}$
Junction to Case	TO-220	θ_{JC}	0.85	$^\circ\text{C}/\text{W}$
	TO-252		2.2 (Note)	$^\circ\text{C}/\text{W}$

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

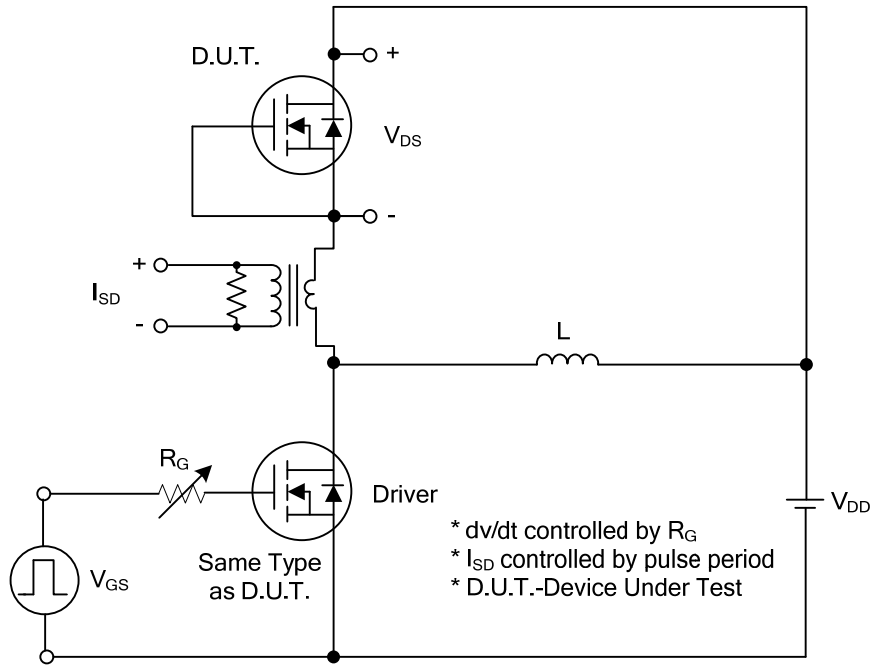
■ ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	60			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=60\text{V}$, $V_{GS}=0\text{V}$			1	μA
Gate-Source Leakage Current	Forward	I_{GSS}			+100	nA
	Reverse					
					-100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	2.0		4.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=25\text{A}$			12	$\text{m}\Omega$
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{GS}=0\text{V}$, $V_{DS}=25\text{V}$, $f=1.0\text{MHz}$		2350		pF
Output Capacitance	C_{OSS}			235		pF
Reverse Transfer Capacitance	C_{RSS}			165		pF
SWITCHING PARAMETERS						
Total Gate Charge (Note 1)	Q_G	$V_{DS}=48\text{V}$, $V_{GS}=10\text{V}$, $I_D=50\text{A}$		58		nC
Gate to Source Charge	Q_{GS}			15		nC
Gate to Drain Charge	Q_{GD}			19		nC
Turn-ON Delay Time (Note 1)	$t_{D(ON)}$	$V_{DD}=30\text{V}$, $V_{GS}=10\text{V}$, $I_D=50\text{A}$, $R_G=3\Omega$		12		ns
Rise Time	t_R			18		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			33		ns
Fall-Time	t_F			21		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I_S				50	A
Maximum Body-Diode Pulsed Current	I_{SM}				100	A
Drain-Source Diode Forward Voltage (Note 1)	V_{SD}	$I_S=50\text{A}$, $V_{GS}=0\text{V}$			1.2	V
Body Diode Reverse Recovery Time (Note 1)	t_{rr}	$I_S=30\text{A}$, $V_{GS}=0\text{V}$,		28		nS
Body Diode Reverse Recovery Charge	Q_{rr}	$dI_F/dt=100\text{A}/\mu\text{s}$		15		nC

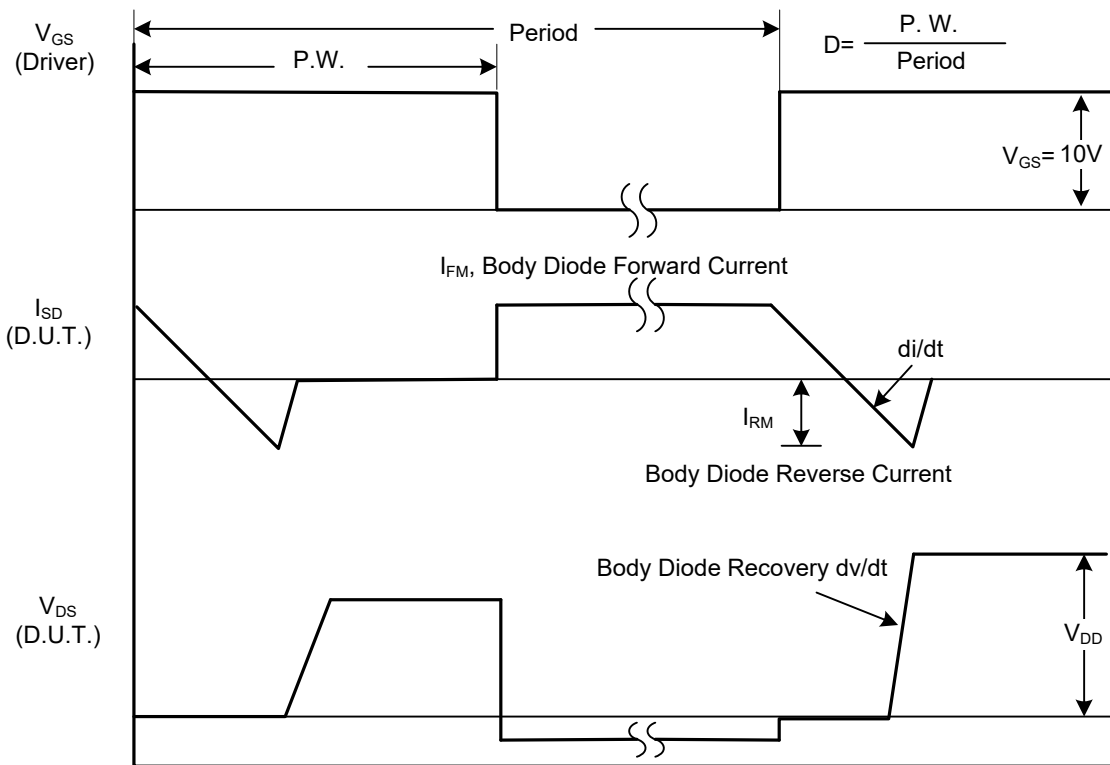
Notes: 1. The data tested by pulsed, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

2. The power dissipation is limited by 150°C junction temperature.

TEST CIRCUITS AND WAVEFORMS

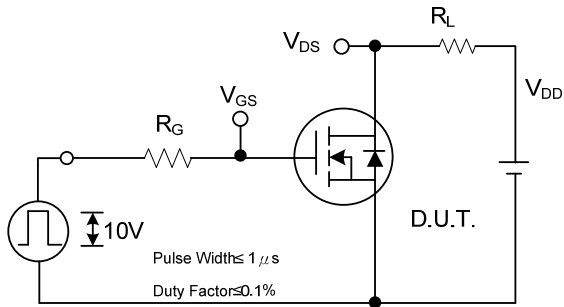


Peak Diode Recovery dv/dt Test Circuit

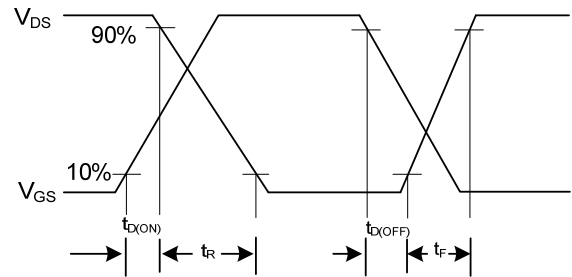


Peak Diode Recovery dv/dt Waveforms

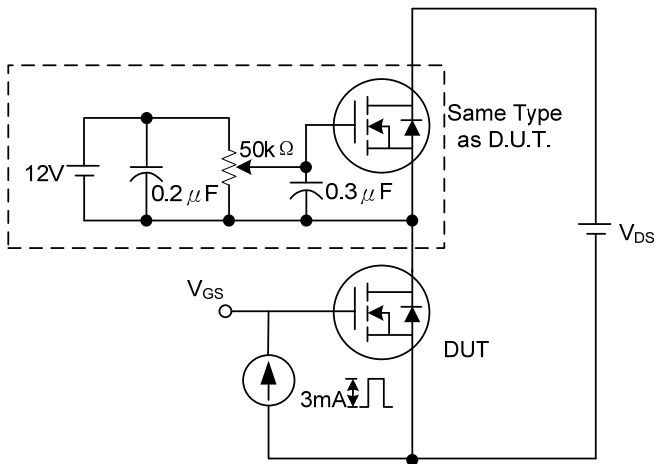
TEST CIRCUITS AND WAVEFORMS



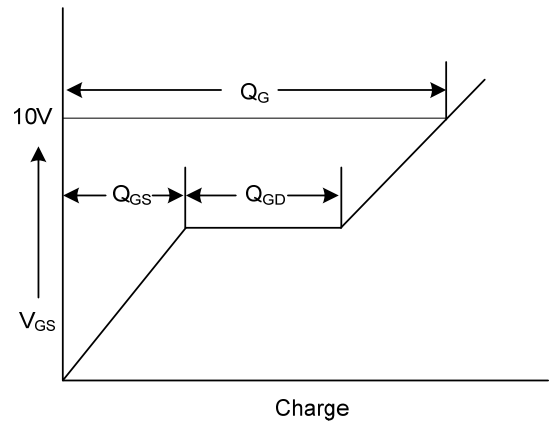
Switching Test Circuit



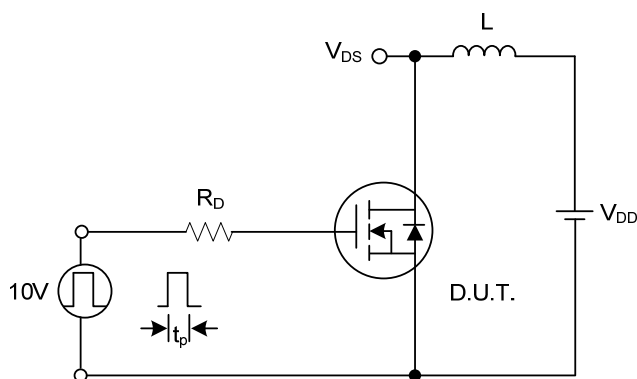
Switching Waveforms



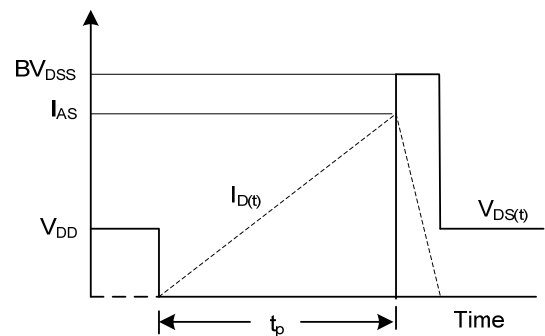
Gate Charge Test Circuit



Gate Charge Waveform

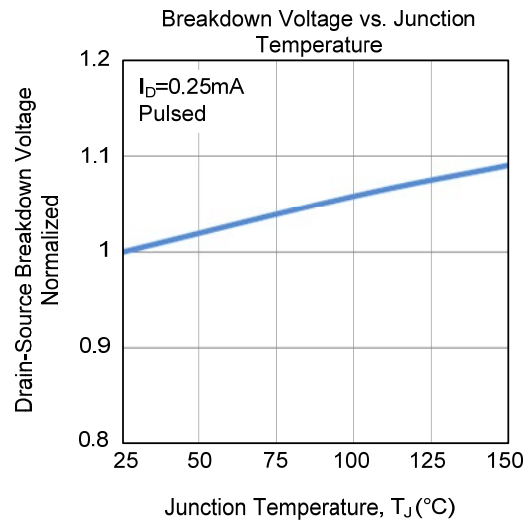
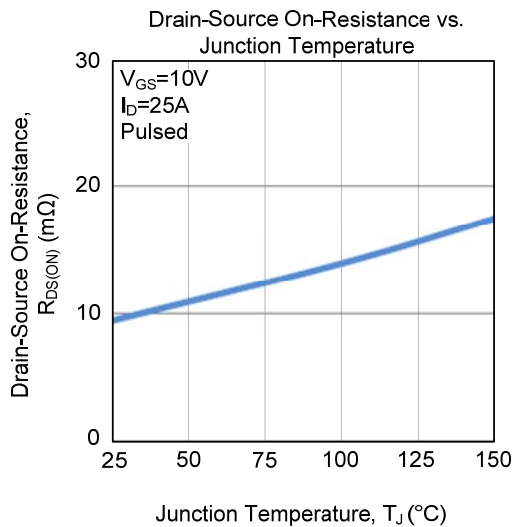
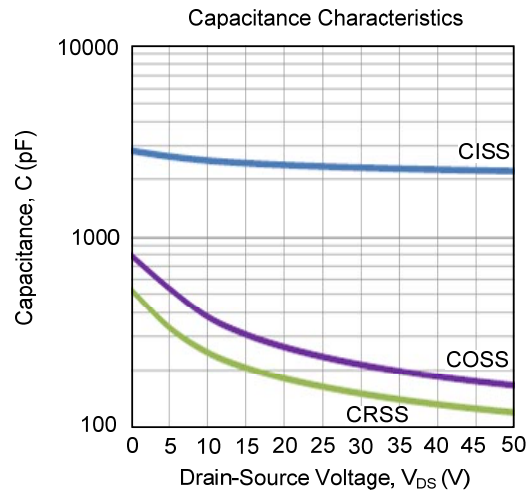
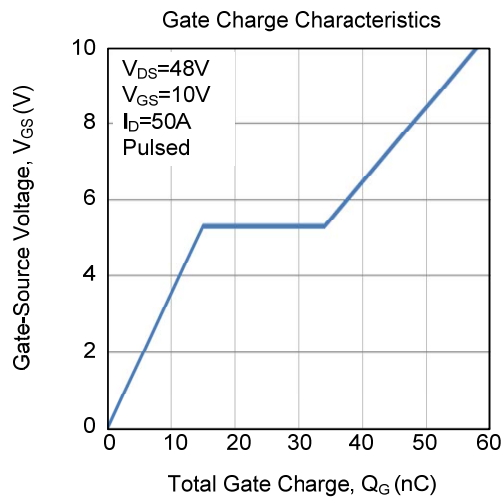
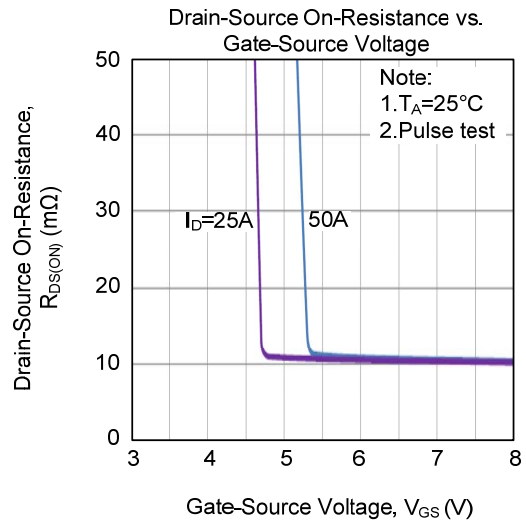
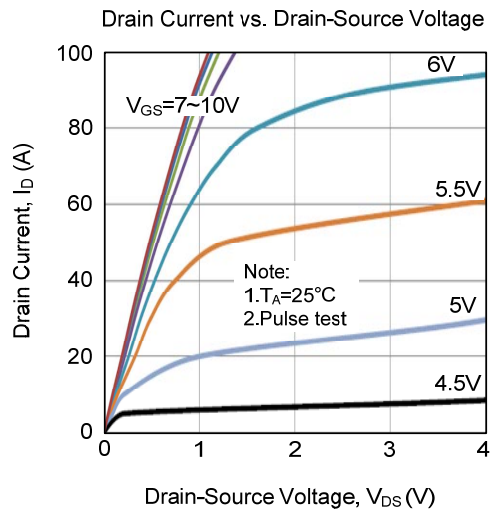


Unclamped Inductive Switching Test Circuit

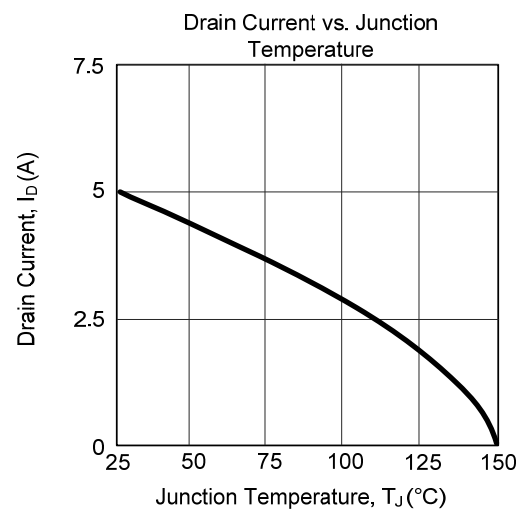
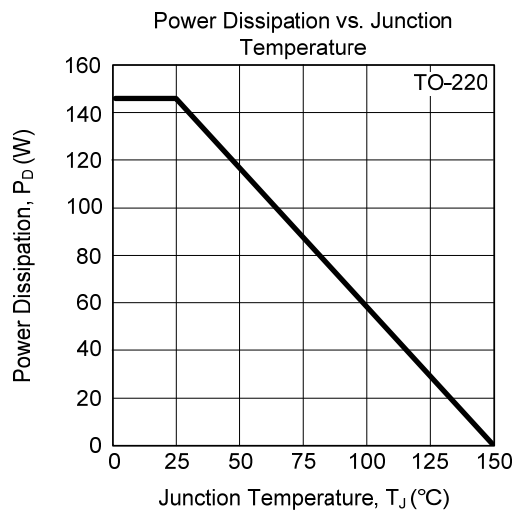
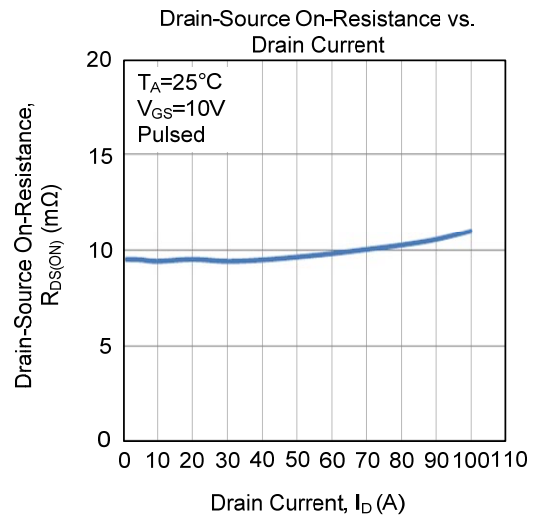
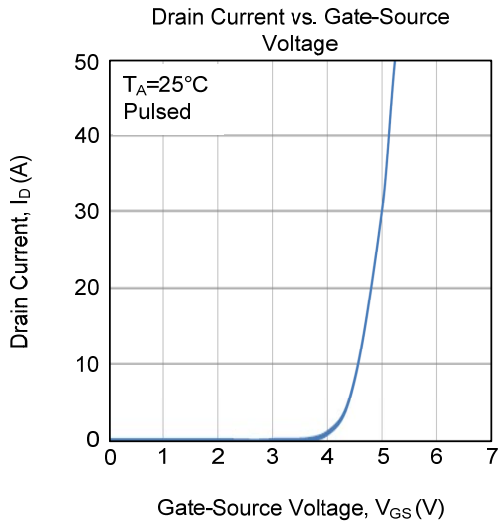
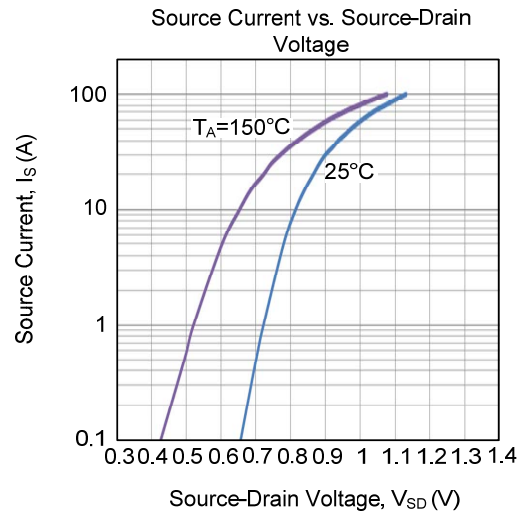
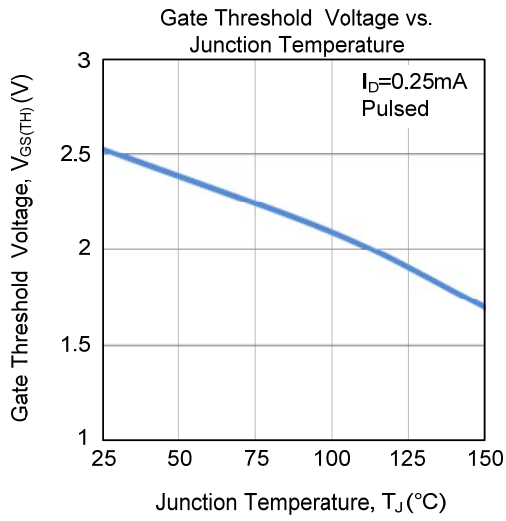


Unclamped Inductive Switching Waveforms

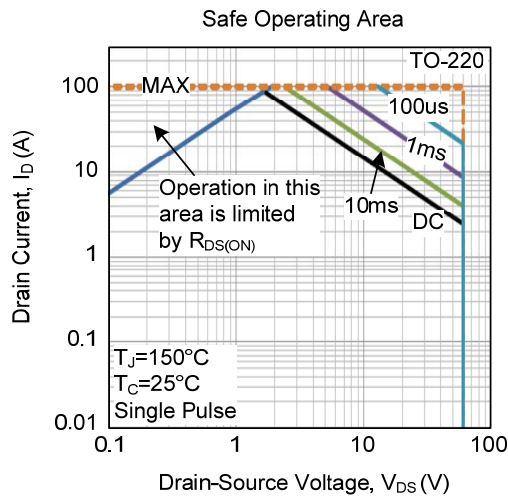
TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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