



UTT60N06

Power MOSFET

N-CHANNEL ENHANCEMENT MODE POWER MOSFET

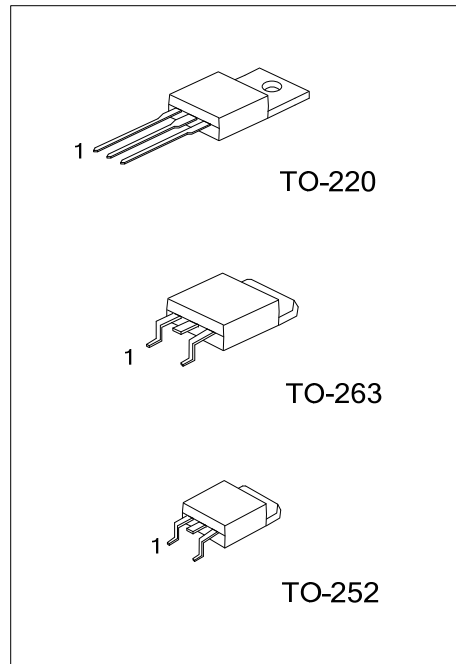
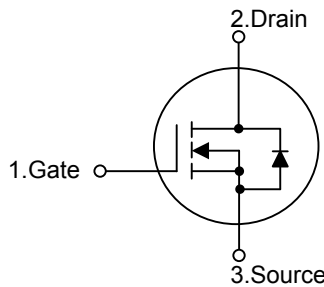
DESCRIPTION

The UTC **UTT60N06** is n-channel enhancement mode power field effect transistors with stable off-state characteristics, fast switching speed and low thermal resistance. usually used at telecom and computer applications.

FEATURES

- * $R_{DS(ON)} < 18m\Omega @ V_{GS} = 10 V$
- * Fast switching capability
- * Avalanche energy Specified

SYMBOL



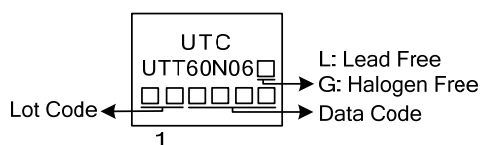
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT60N06L-TA3-T	UTT60N06G-TA3-T	TO-220	G	D	S	Tube
UTT60N06L-TN3-R	UTT60N06G-TN3-R	TO-252	G	D	S	Tape Reel
UTT60N06L-TQ2-T	UTT60N06G-TQ2-T	TO-263	G	D	S	Tube
UTT60N06L-TQ2-R	UTT60N06G-TQ2-R	TO-263	G	D	S	Tape Reel

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

<p>UTT60N06L-TA3-T</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, TN3: TO-252, TQ2: TO-263</p> <p>(3) L: Lead Free, G: Halogen Free and 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 to Source Voltage	V_{DSS}	60	V
Gate to Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	$T_C = 25^\circ\text{C}$	A
		$T_C = 100^\circ\text{C}$	A
Drain Current Pulsed (Note 2)	I_{DM}	120	A
Avalanche Energy	Single Pulsed	100	mJ
Power Dissipation ($T_C=25^\circ\text{C}$)	TO-220/TO-263	100	W
	TO-252	70	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. Repeativity rating: pulse width limited by junction temperature

■ THERMAL DATA

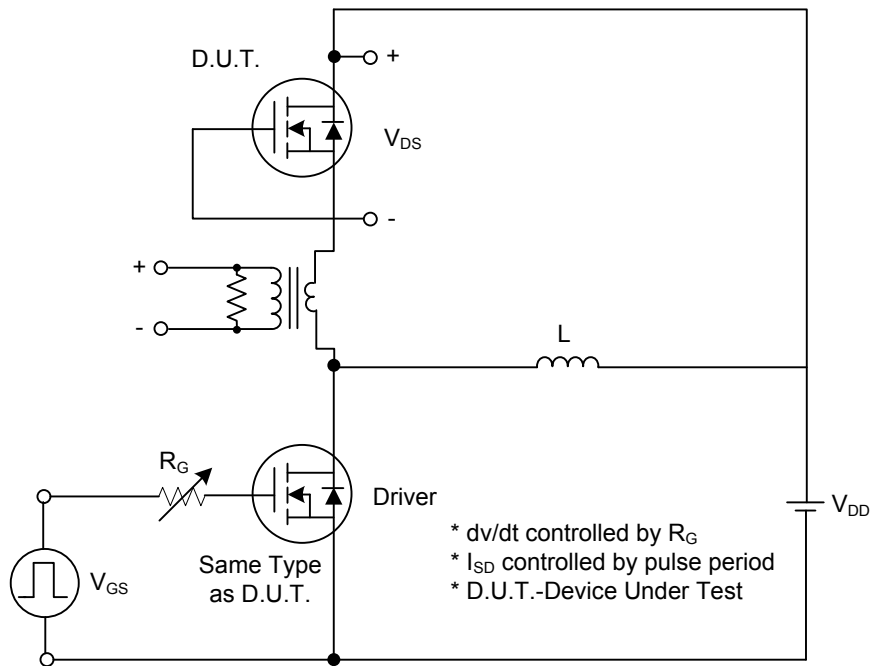
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	TO-220/TO-263	$^\circ\text{C}/\text{W}$
		TO-252	$^\circ\text{C}/\text{W}$
Junction to Case	θ_{JC}	TO-220/TO-263	$^\circ\text{C}/\text{W}$
		TO-252	$^\circ\text{C}/\text{W}$

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

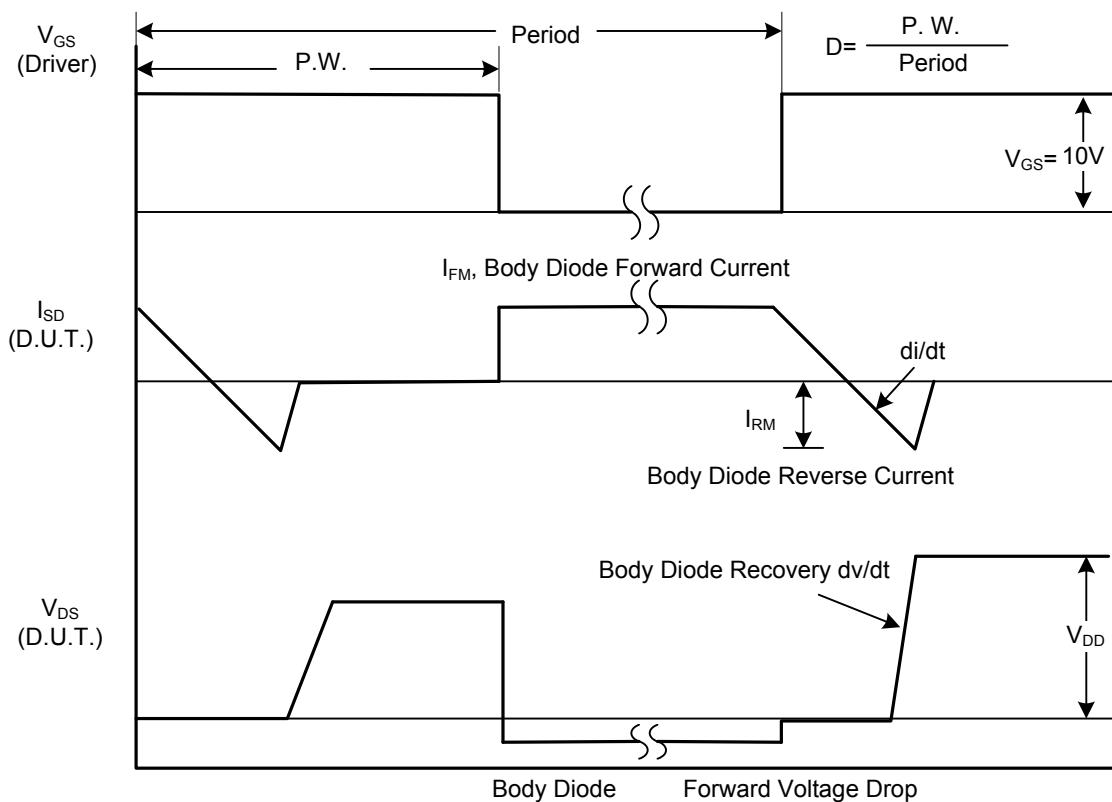
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0\text{ V}, I_D = 250\mu\text{A}$	60			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS} = 60\text{ V}, V_{GS} = 0\text{ V}$			1	μA
Gate-Source Leakage Current	Forward	$V_{GS} = 20\text{ V}, V_{DS} = 0\text{ V}$			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	$R_{DS(ON)}$	$V_{GS} = 10\text{ V}, I_D = 30\text{ A}$		14	18	$\text{m}\Omega$
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		2000		pF
Output Capacitance	C_{OSS}			400		pF
Reverse Transfer Capacitance	C_{RSS}			115		pF
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{D(ON)}$	$V_{DD} = 48\text{ V}, I_D = 60\text{ A}, R_L = 0.5\Omega,$ $V_{GS} = 10\text{ V}$ (Note 1, 2)		12	30	ns
Rise Time	t_R			11	30	ns
Turn-Off Delay Time	$t_{D(OFF)}$			25	50	ns
Fall Time	t_F			15	30	ns
Total Gate Charge	Q_G	$V_{DS} = 30\text{ V}, V_{GS} = 10\text{ V}$ $I_D = 60\text{ A}$ (Note 1, 2)		39	60	nC
Gate-Source Charge	Q_{GS}			12		nC
Gate-Drain Charge (Miller Charge)	Q_{GD}			10		nC
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS						
Diode Forward Voltage	V_{SD}	$V_{GS} = 0\text{ V}, I_S = 60\text{ A}$			1.6	V
Continuous Source Current	I_S				60	A
Pulsed Source Current	I_{SM}				120	
Reverse Recovery Time	t_{RR}	$I_S = 60\text{ A}, V_{GS} = 0\text{ V},$ $di_F/dt = 100\text{ A}/\mu\text{s}$ (Note 1)		60		ns
Reverse Recovery Charge	Q_{RR}			3.4		μC

Notes: 1. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycles $\leq 2\%$
 2. Essentially independent of operating temperature.

TEST CIRCUITS AND WAVEFORMS

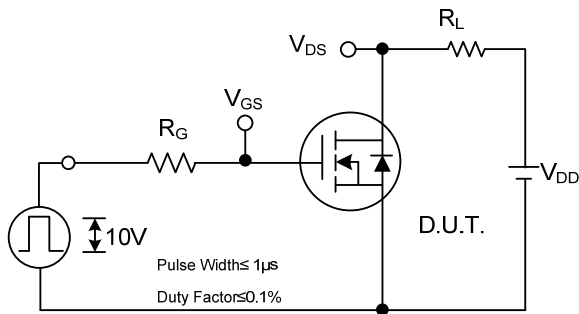


Peak Diode Recovery dv/dt Test Circuit

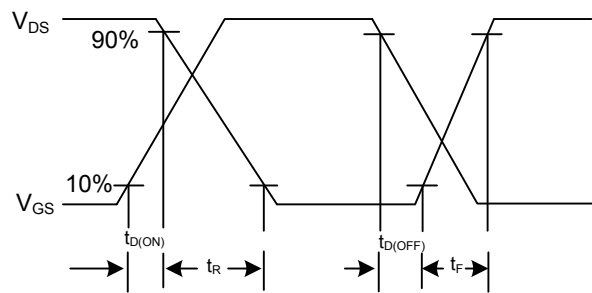


Peak Diode Recovery dv/dt Waveforms

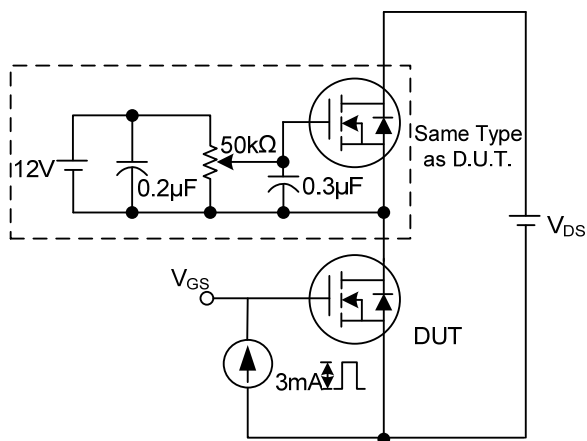
TEST CIRCUITS AND WAVEFORMS (Cont.)



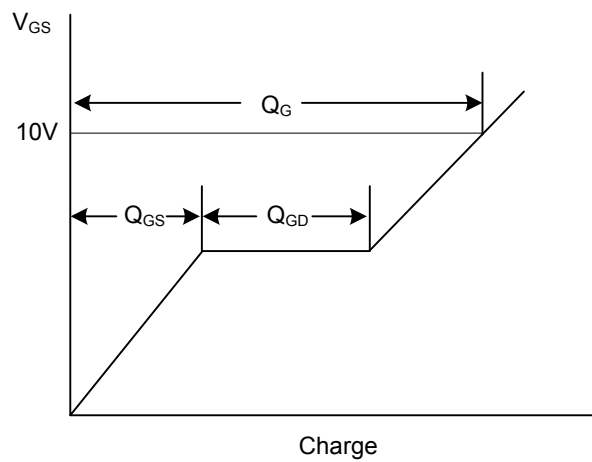
Switching Test Circuit



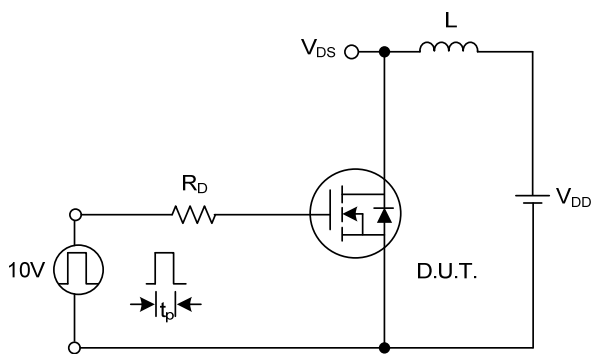
Switching Waveforms



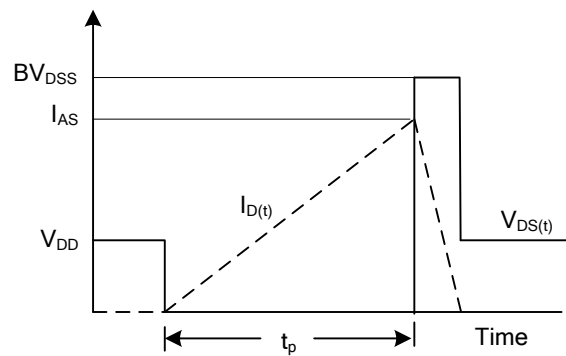
Gate Charge Test Circuit



Gate Charge Waveform

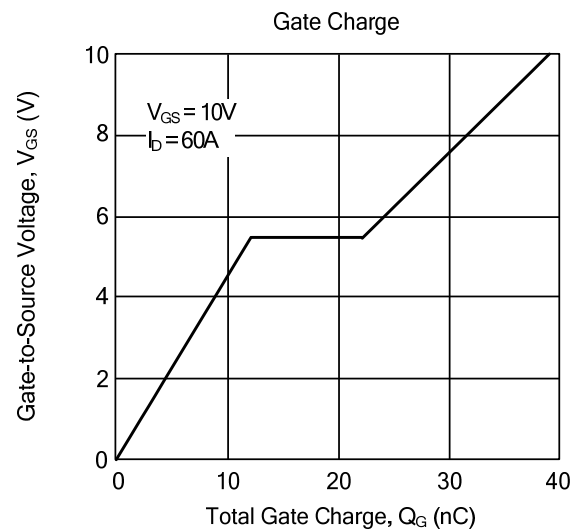
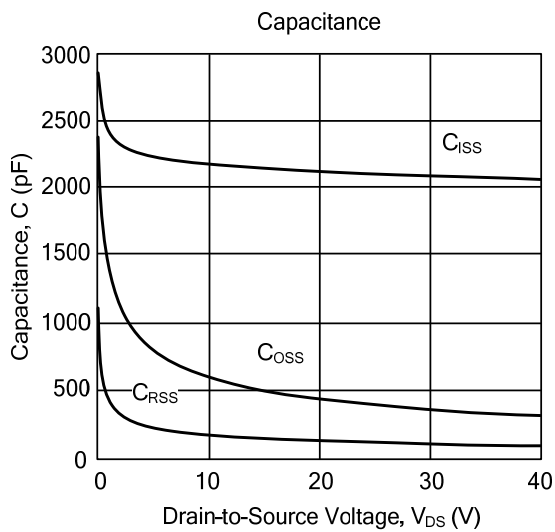
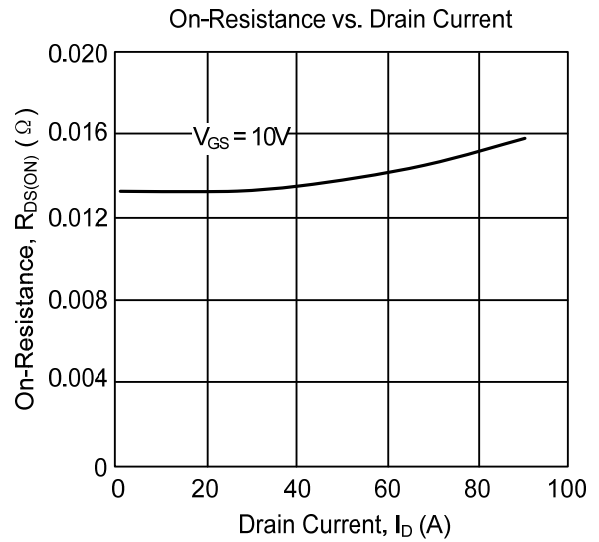
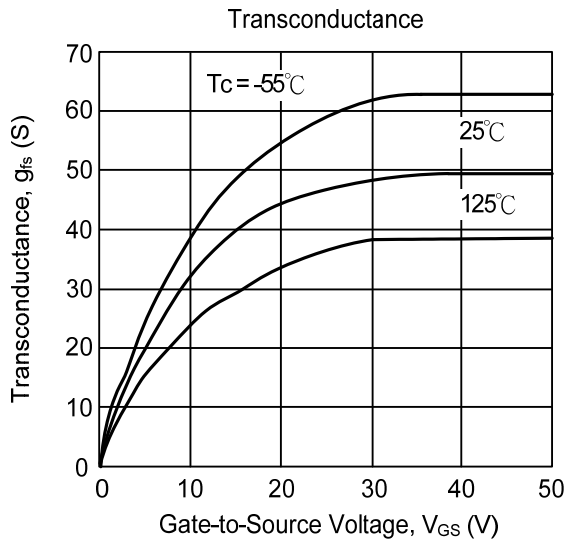
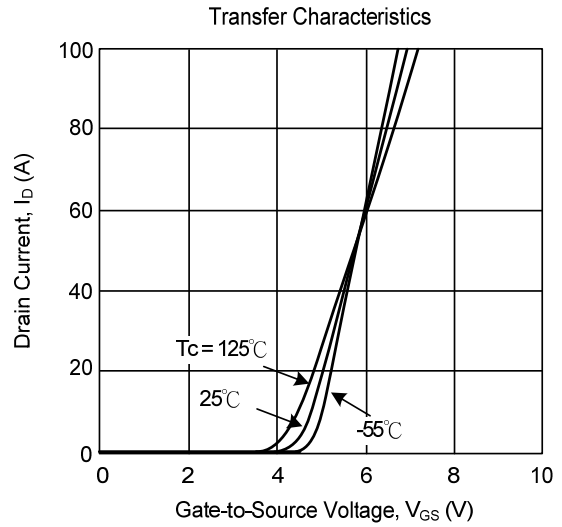
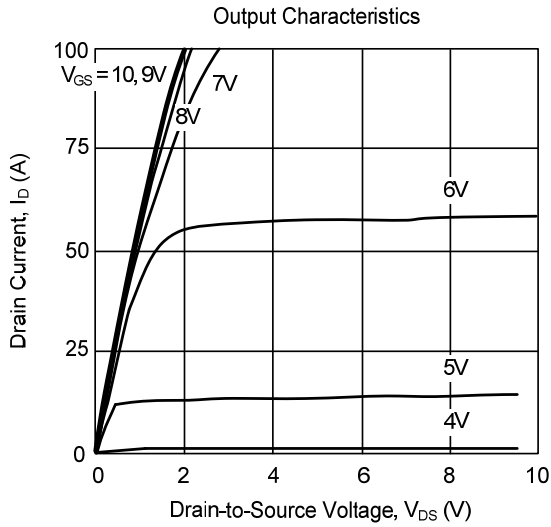


Unclamped Inductive Switching Test Circuit

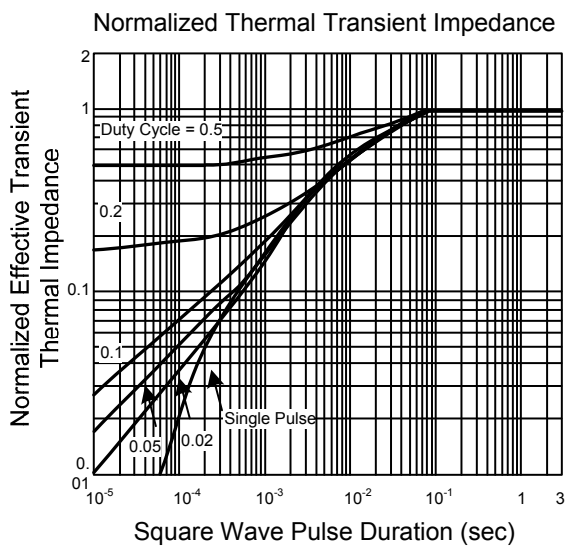
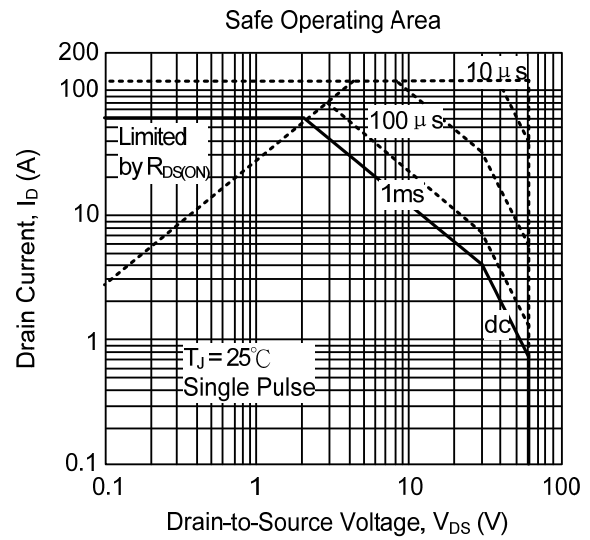
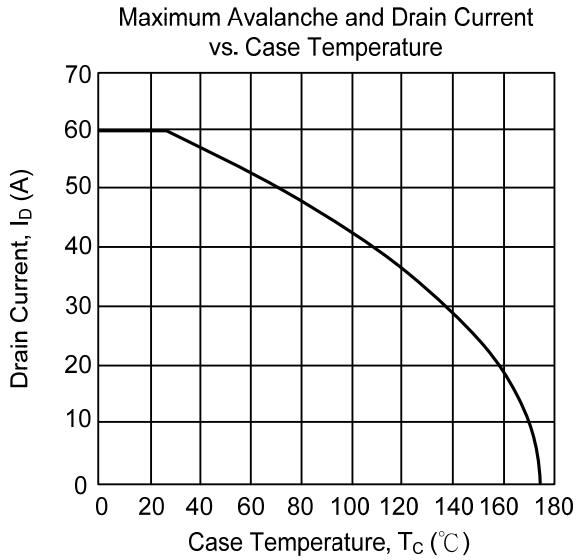
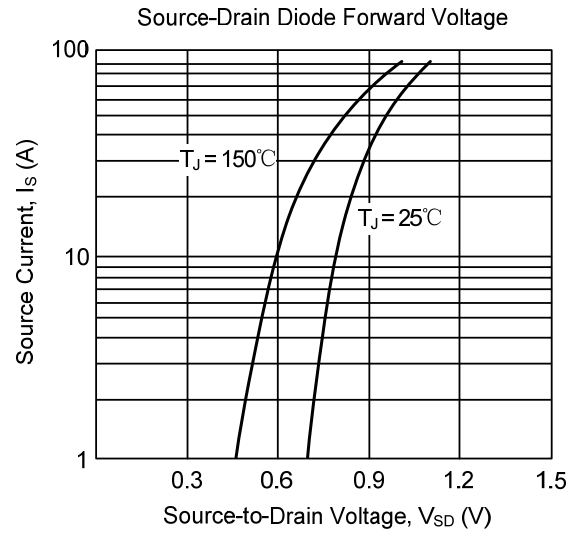
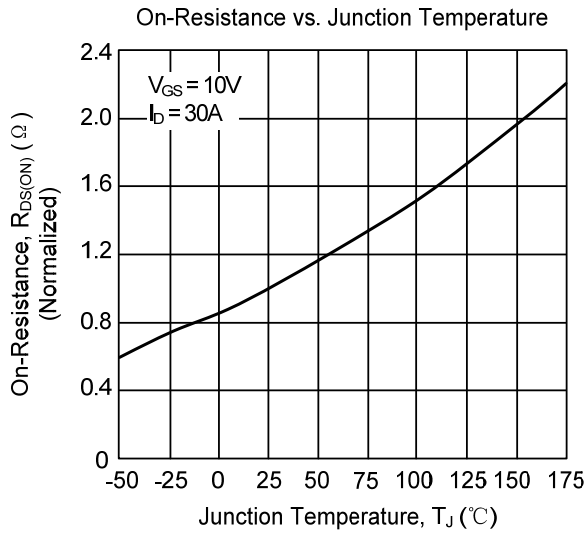


Unclamped Inductive Switching Waveforms

TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS(Cont.)



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