



UT2305-LV

Power MOSFET

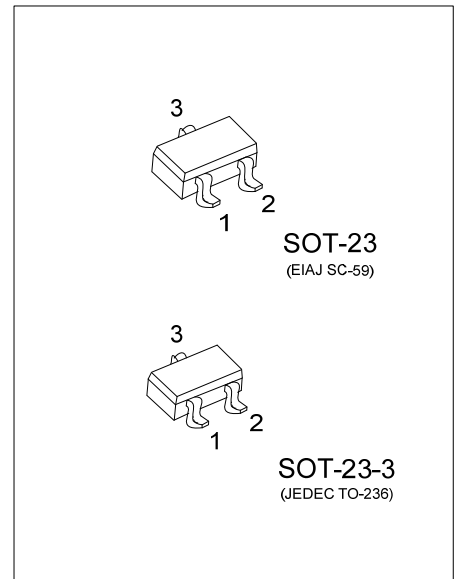
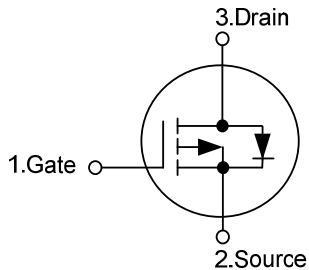
-4.2A, -20V P-CHANNEL ENHANCEMENT MODE

DESCRIPTION

The UTC **UT2305-LV** is P-channel enhancement mode power MOSFET, designed in serried ranks. With fast switching speed, low on-resistance, favorable stabilization.

Used in commercial and industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

SYMBOL



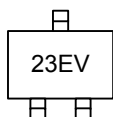
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT2305L-AE2-R	UT2305G-AE2-R	SOT-23-3	G	S	D	Tape Reel
UT2305L-AE3-R	UT2305G-AE3-R	SOT-23	G	S	D	Tape Reel

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

<p>UT2305G-AE2-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) R: Tape Reel (2) AE2: SOT-23-3, AE3: SOT-23 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING



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

PARAMETER	SYMBOL	RATING	UNITS
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 8	V
Continuous Drain Current (Note 3) ($T_A=25^\circ\text{C}$)	I_D	-4.2	A
Pulsed Drain Current (Note 1, 2)	I_{DM}	-10	A
Power Dissipation	SOT-23-3	0.83	W
	SOT-23	1.38	W
Junction Temperature	T_J	+150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55 ~ +150	$^\circ\text{C}$

Note: 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.

■ THERMAL DATA

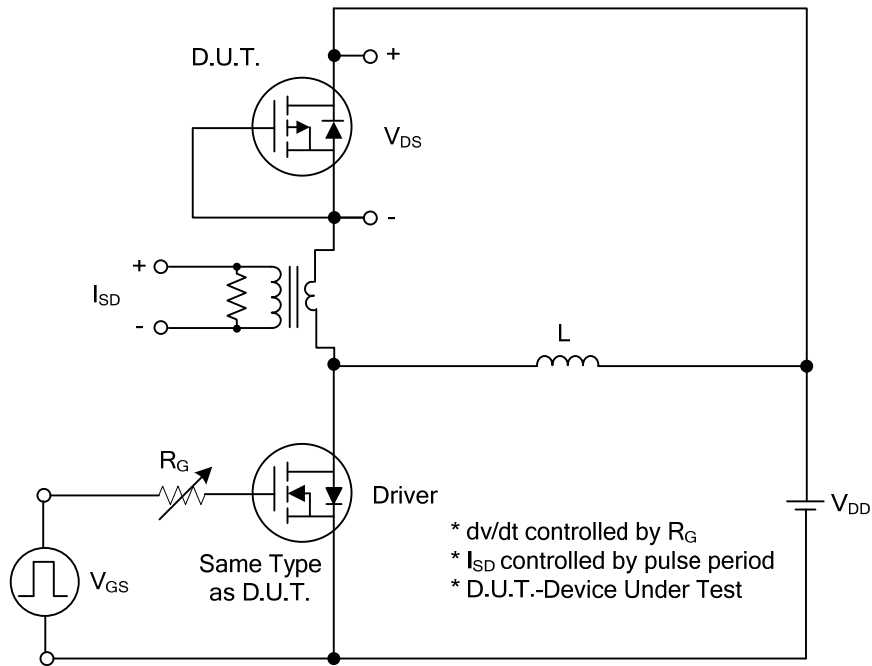
PARAMETER	SYMBOL	RATING	UNIT
Junction to Ambient (Note 3)	SOT-23-3	150	$^\circ\text{C/W}$
	SOT-23	90	$^\circ\text{C/W}$

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

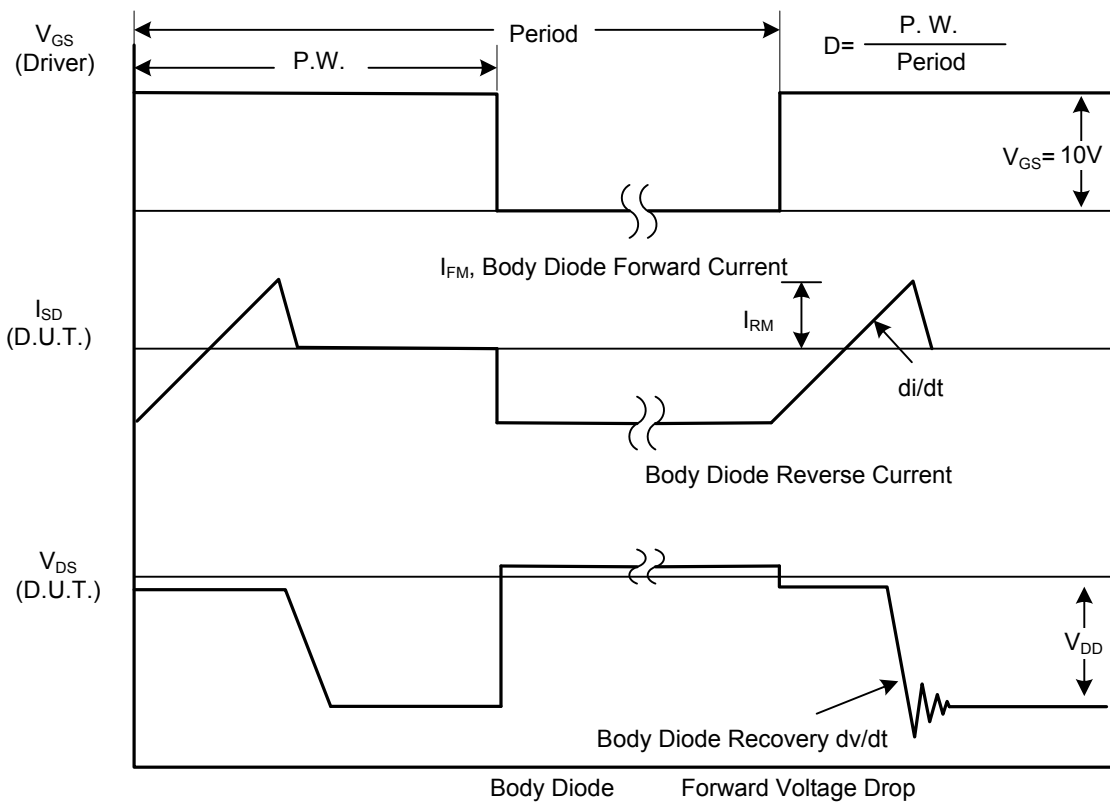
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0\text{V}, I_D=-250\mu\text{A}$	-20			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=-20\text{V}, V_{GS}=0\text{V}$			-1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 8\text{V}, V_{DS}=0\text{V}$			± 100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=-250\mu\text{A}$	-0.45		-1.2	V
Drain-Source On-State Resistance (Note 2)	$R_{DS(ON)}$	$V_{GS}=-4.5\text{V}, I_D=-4.2\text{A}$			65	$\text{m}\Omega$
		$V_{GS}=-2.5\text{V}, I_D=-3.4\text{A}$			90	$\text{m}\Omega$
		$V_{GS}=-1.8\text{V}, I_D=-2.0\text{A}$			125	$\text{m}\Omega$
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	$V_{GS}=0\text{V}, V_{DS}=-20\text{V}, f=1\text{MHz}$		932		pF
Output Capacitance	C_{OSS}			100		pF
Reverse Transfer Capacitance	C_{RSS}			87		pF
SWITCHING CHARACTERISTICS						
Total Gate Charge (Note 2)	Q_G	$V_{DS}=-4\text{V}, V_{GS}=-4.5\text{V}, I_D=-3.5\text{A}$		12.5		nC
Gate-Source Charge	Q_{GS}			2.5		nC
Gate-Drain Charge	Q_{GD}			1.8		nC
Turn-ON Delay Time (Note 2)	$t_{D(ON)}$	$V_{DS}=-4\text{V}, V_{GS}=-4.5\text{V}, I_D=-1\text{A}, R_G=6\Omega, R_D=4\Omega$		10		ns
Turn-ON Rise Time	t_R			39		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			42		ns
Turn-OFF Fall Time	t_F			28		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I_S				-4.2	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				-10	A
Drain-Source Diode Forward Voltage(Note2)	V_{SD}	$V_{GS}=0\text{V}, I_S=-1.2\text{A}$			-1.2	V

Notes: 1. Pulse width limited by $T_{J(MAX)}$
 2. Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
 3. Surface mounted on 1 in² copper pad of FR4 board; 270 $^\circ\text{C/W}$ when mounted on min.

■ TEST CIRCUITS AND WAVEFORMS

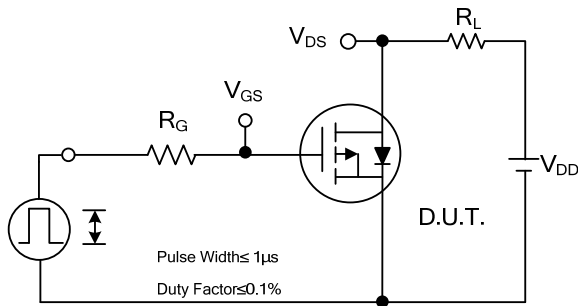


Peak Diode Recovery dv/dt Test Circuit

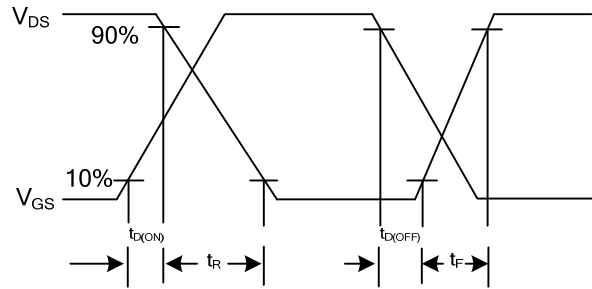


Peak Diode Recovery dv/dt Waveforms

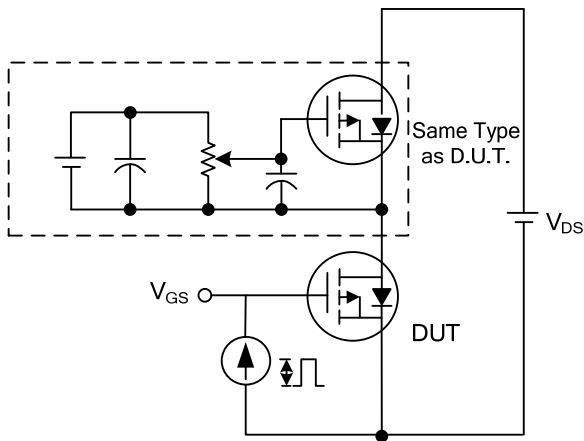
■ TEST CIRCUITS AND WAVEFORMS



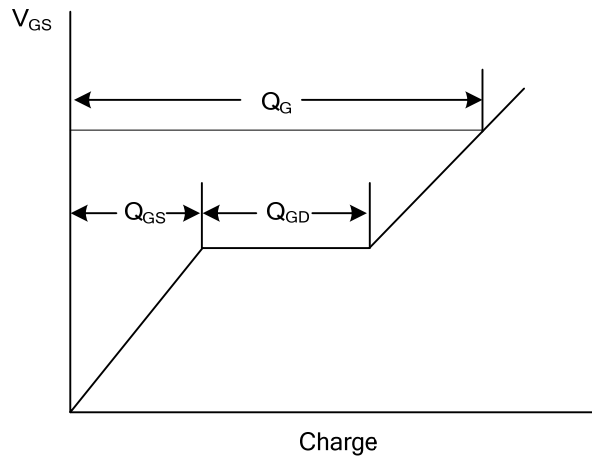
Switching Test Circuit



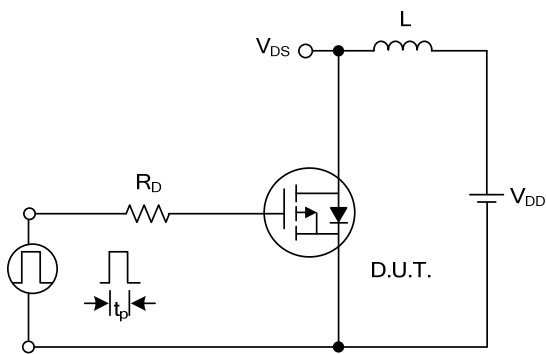
Switching Waveforms



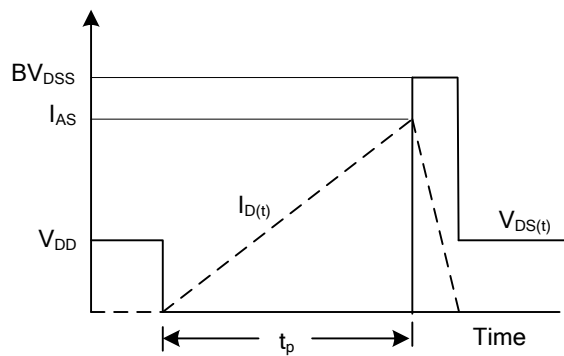
Gate Charge Test Circuit



Gate Charge Waveform

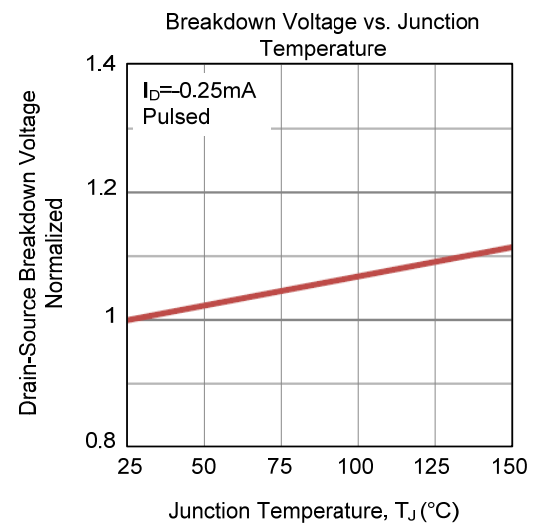
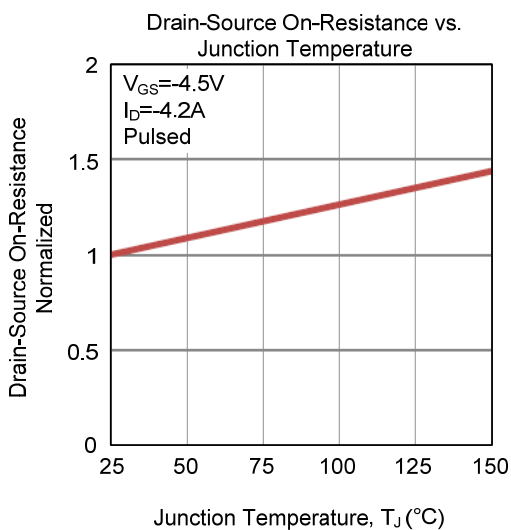
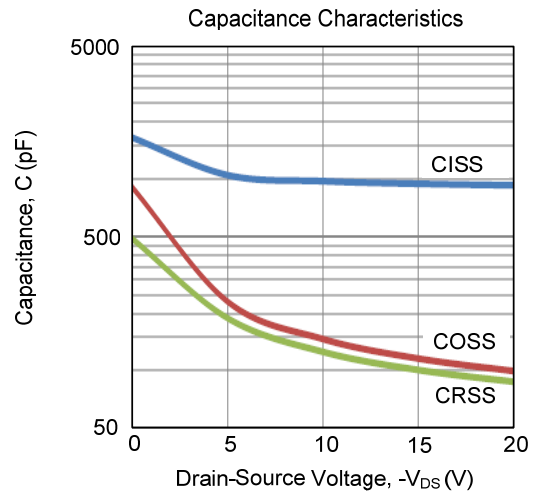
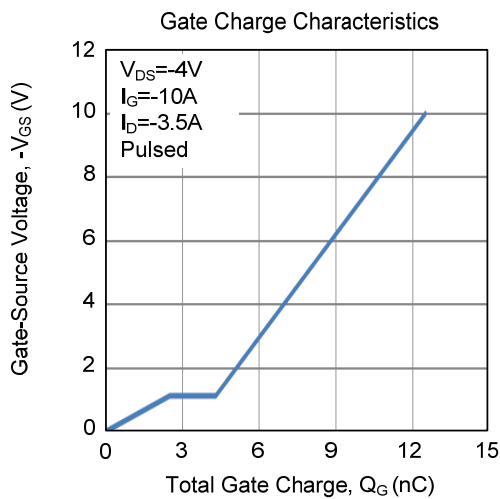
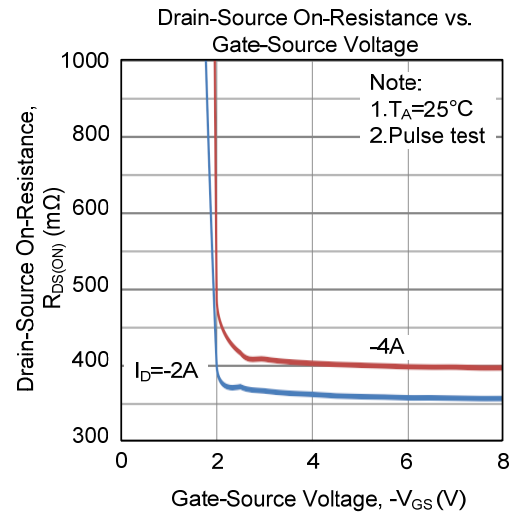
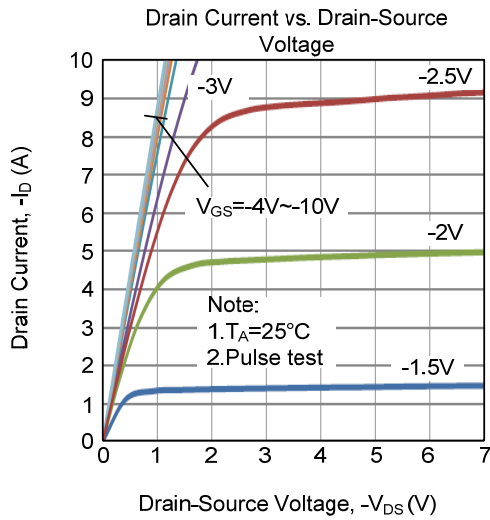


Unclamped Inductive Switching Test Circuit

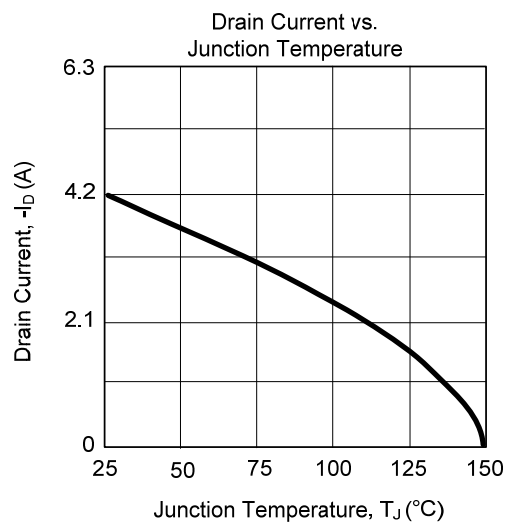
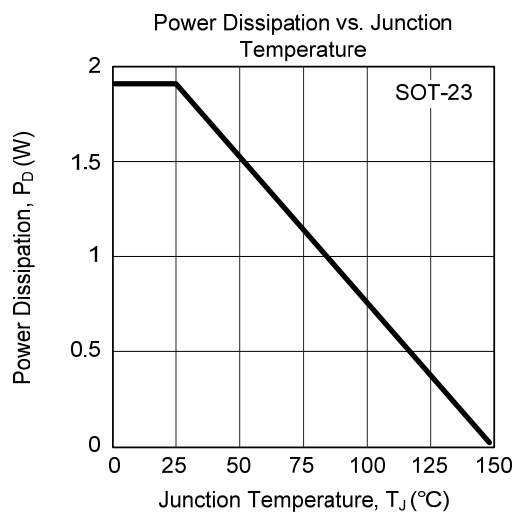
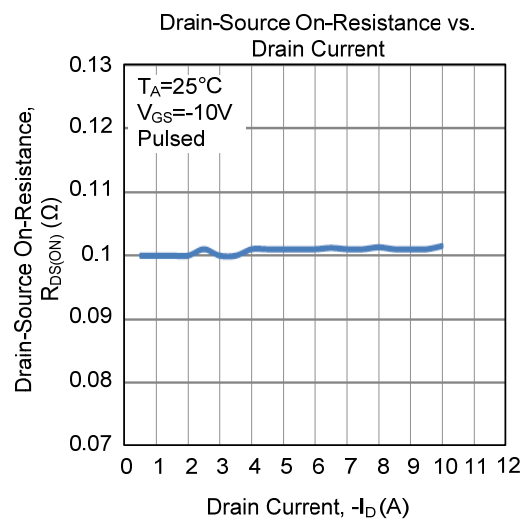
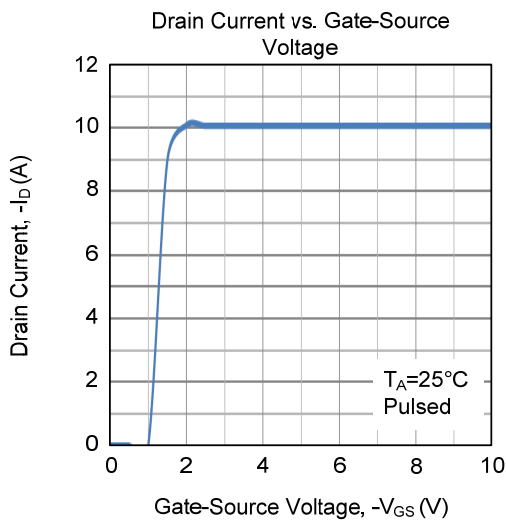
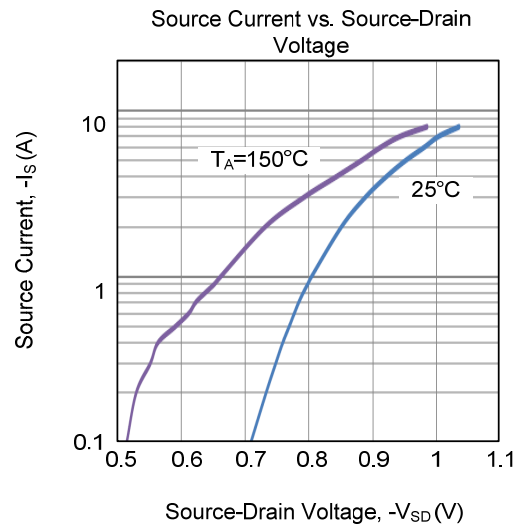
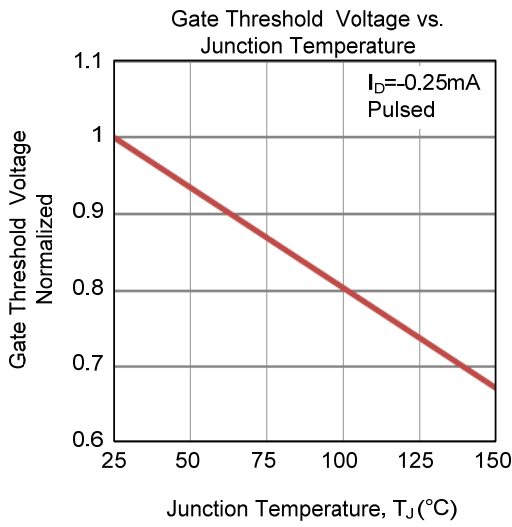


Unclamped Inductive Switching Waveforms

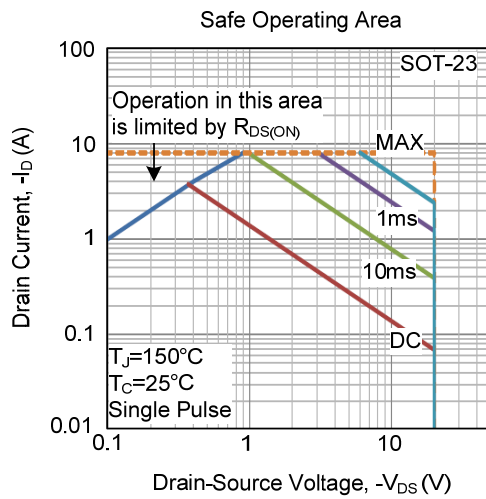
TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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