



UT2316

Power MOSFET

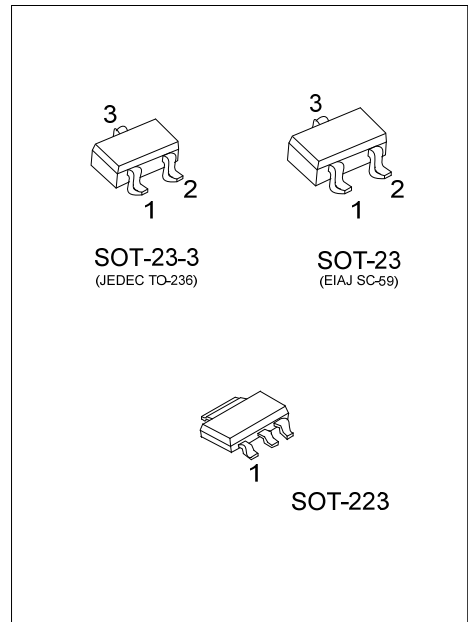
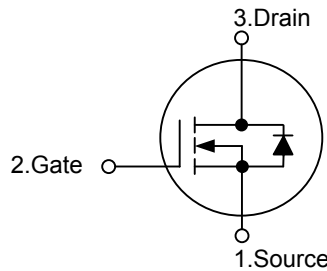
N-CHANNEL ENHANCEMENT MODE

DESCRIPTION

The UTC **UT2316** is N-channel enhancement mode Power MOSFET, designed in serried ranks with fast switching speed, low on-resistance and 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	
UT2316L-AA3-R	UT2316G-AA3-R	SOT-223	G	D	S	Tape Reel
UT2316L-AE2-R	UT2316G-AE2-R	SOT-23-3	G	S	D	Tape Reel
UT2316L-AE3-R	UT2316G-AE3-R	SOT-23	G	S	D	Tape Reel

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

<p>UT2316G-AA3-R</p> <p>(1)Packing Type (2)Package Type (3)Green Package</p>	<p>(1) R: Tape Reel (2) AA3: SOT-223, AE2: SOT-23-3, AE3: SOT-23 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING

SOT-23	SOT-223
<p>L: Lead Free G: Halogen Free</p>	<p>L: Lead Free G: Halogen Free Date Code</p>

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

PARAMETER	SYMBOL	RATING	UNIT
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current (Note 3)	I_D	3.6	A
Pulsed Drain Current (Note 1, 2)	I_{DM}	16	A
Total Power Dissipation ($T_A = 25^\circ\text{C}$)	SOT-23-3	0.5	W
	SOT-23	0.6	W
	SOT-223	1	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	RATINGS	UNIT
Junction to Ambient (Note 3)	SOT-23-3	250	$^\circ\text{C}/\text{W}$
	SOT-23	208	$^\circ\text{C}/\text{W}$
	SOT-223	125	$^\circ\text{C}/\text{W}$

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

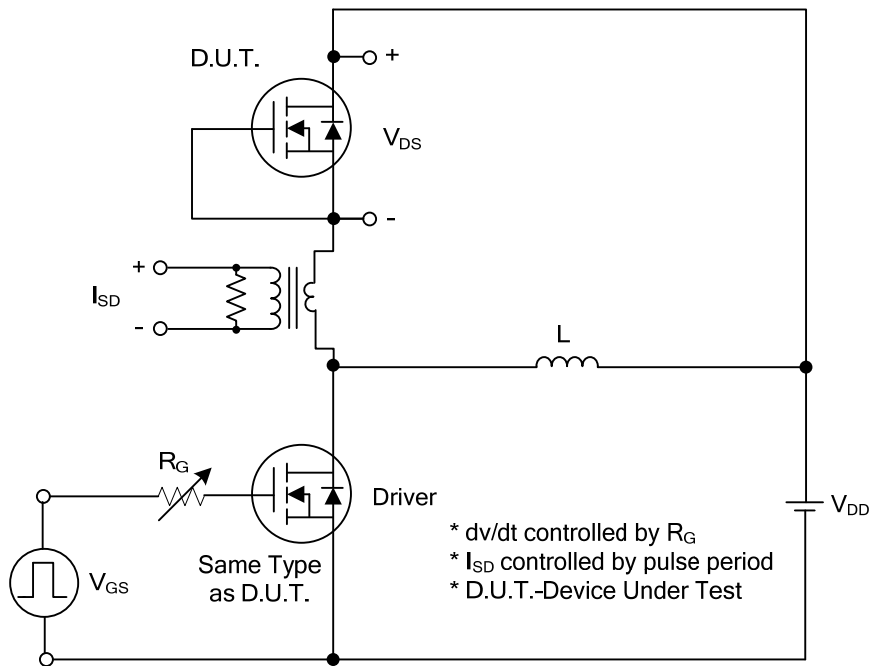
■ ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0\text{V}, I_D=250\mu\text{A}$	30			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=24\text{V}, V_{GS}=0\text{V}$			1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{DS}=0\text{V}, V_{GS}=\pm 20\text{V}$			± 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
On-State Drain Current	$I_{D(ON)}$	$V_{DS} = 4.5\text{V}, V_{GS} = 10\text{V}$	6			A
		$V_{DS} = 4.5\text{V}, V_{GS} = 4.5\text{V}$	4			A
Drain-Source On-State Resistance (Note 2)	$R_{DS(ON)}$	$V_{GS}=10\text{V}, I_D=3.4\text{A}$			50	m Ω
		$V_{GS}=4.5\text{V}, I_D=2.6\text{A}$			85	m Ω
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	$V_{DS}=15\text{V}, V_{GS}=0\text{V}, f=1.0\text{MHz}$		154		pF
Output Capacitance	C_{OSS}			45		pF
Reverse Transfer Capacitance	C_{RSS}			36		pF
SWITCHING CHARACTERISTICS						
Total Gate Charge	Q_G	$V_{DS}=15\text{V}, V_{GS}=10\text{V}, I_D=3.6\text{A}$		9.7		nC
Gate-Source Charge	Q_{GS}			1.8		nC
Gate-Drain Charge	Q_{GD}			1.5		nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=15\text{V}, V_{GS}=10\text{V}, I_D=3.6\text{A}, R_G=3\Omega$		3		ns
Turn-ON Rise Time	t_R			14		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			8		ns
Turn-OFF Fall Time	t_F			56		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I_S	$V_D=V_G=0\text{V}, V_S=1.2\text{V}$		0.8		A
Drain-Source Diode Forward Voltage(Note2)	V_{SD}	$V_{GS}=0\text{V}, I_S=0.8\text{A}$			1.2	V

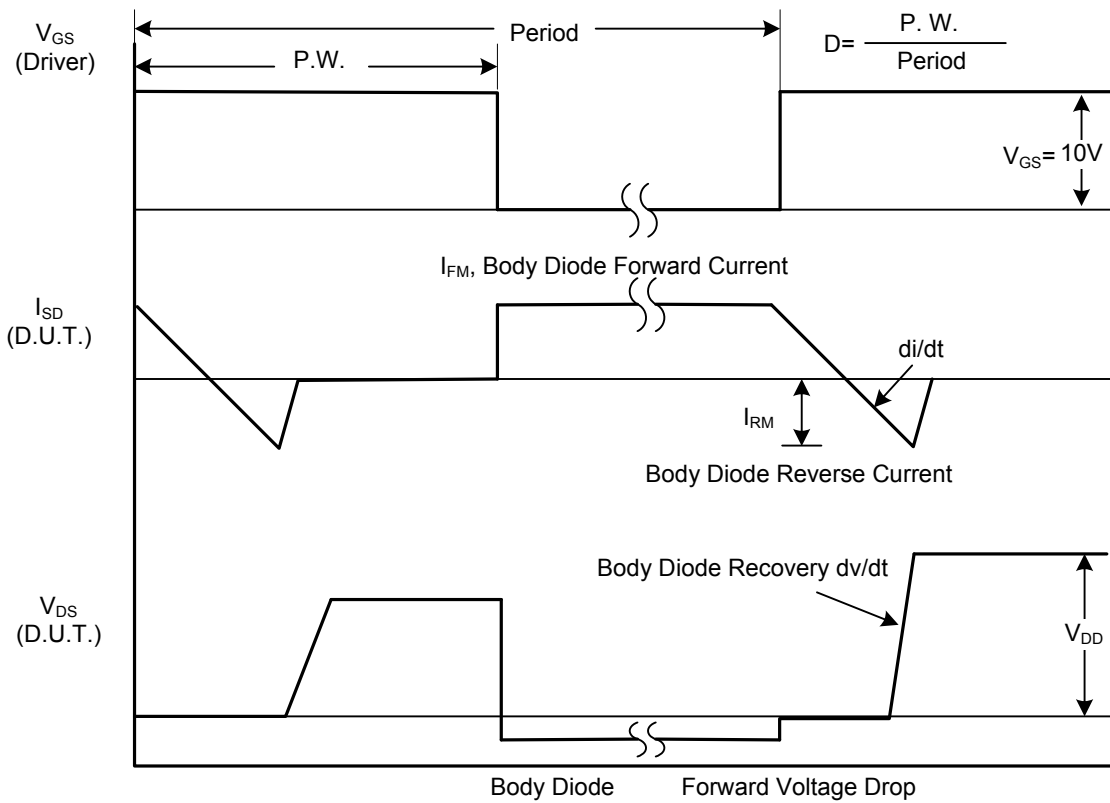
Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

2. Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

■ TEST CIRCUITS AND WAVEFORMS

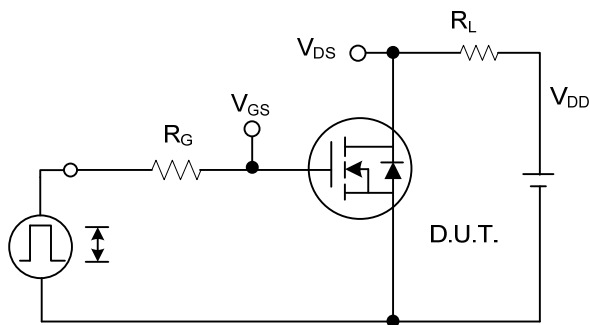


Peak Diode Recovery dv/dt Test Circuit

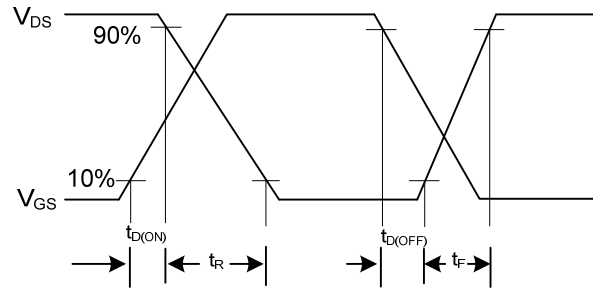


Peak Diode Recovery dv/dt Waveforms

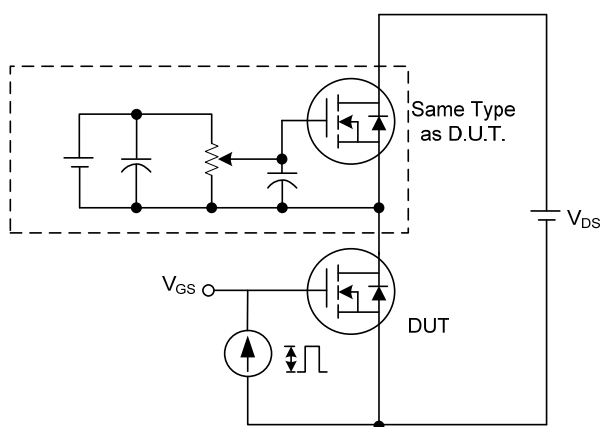
■ TEST CIRCUITS AND WAVEFORMS



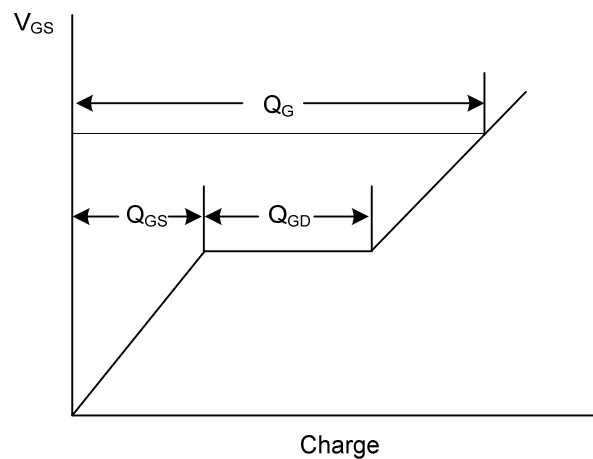
Switching Test Circuit



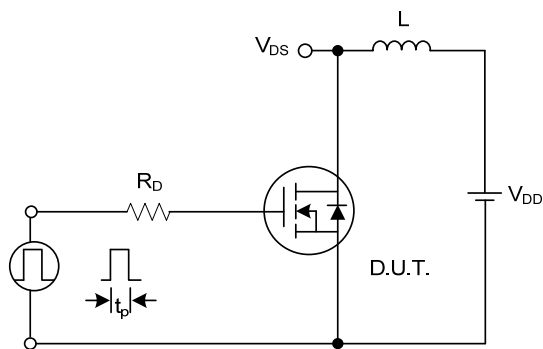
Switching Waveforms



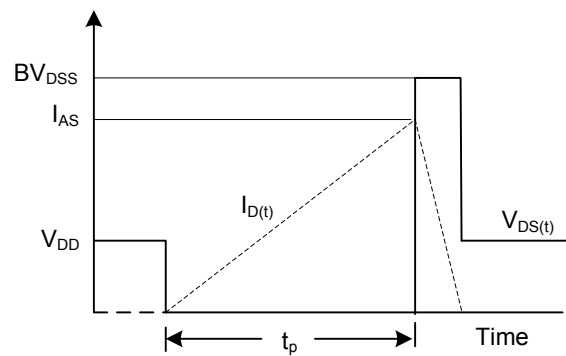
Gate Charge Test Circuit



Gate Charge Waveform

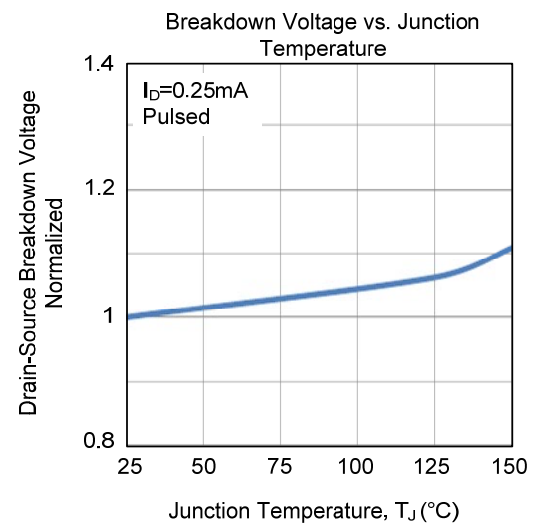
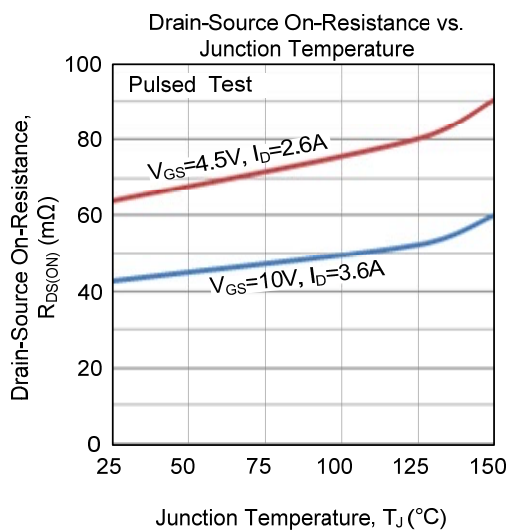
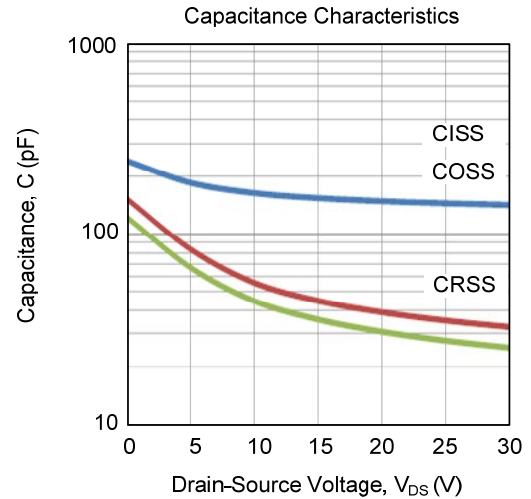
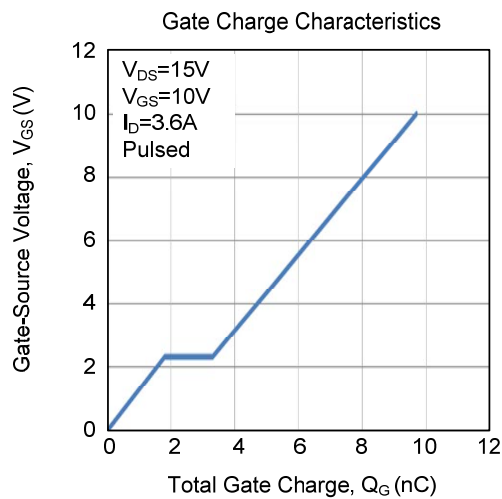
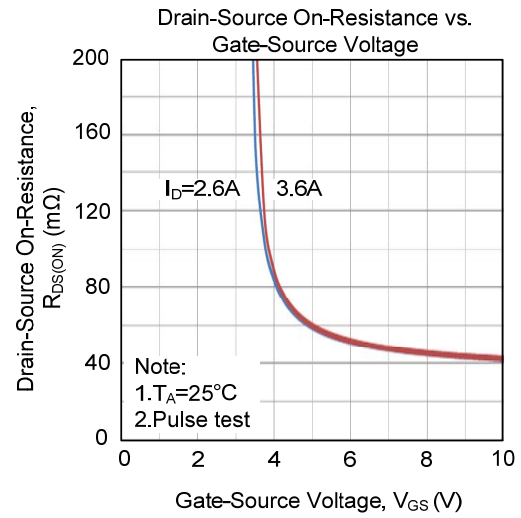
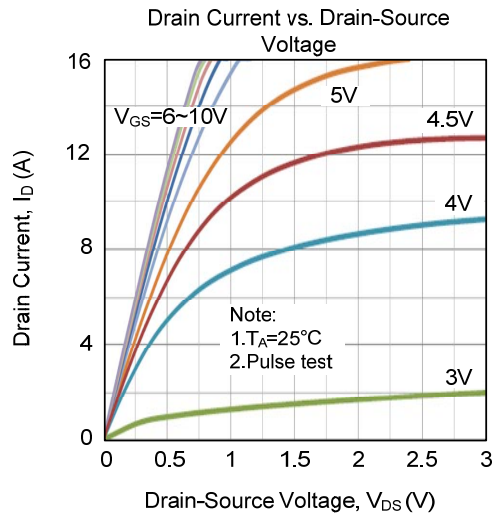


Unclamped Inductive Switching Test Circuit

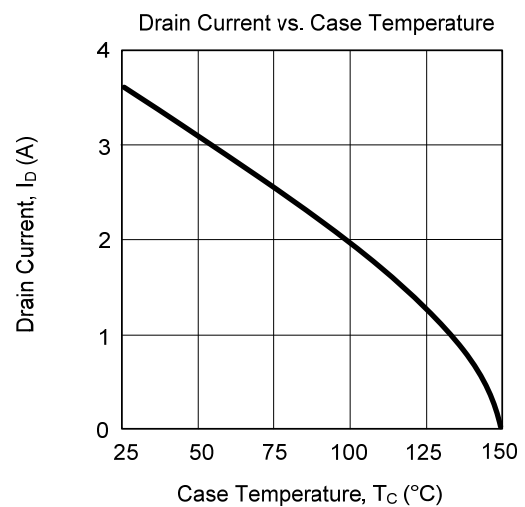
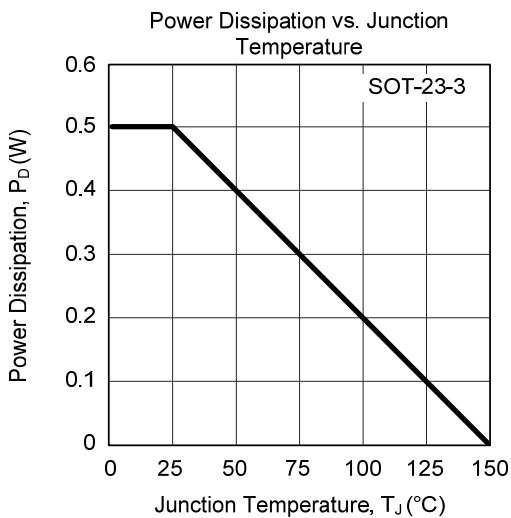
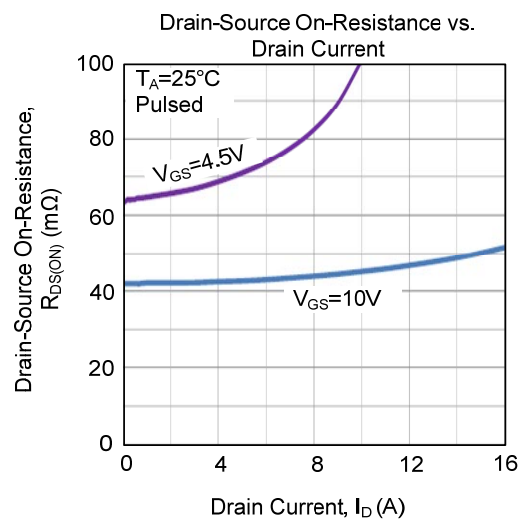
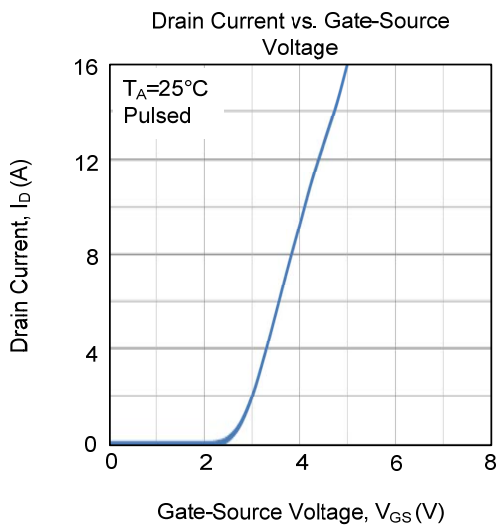
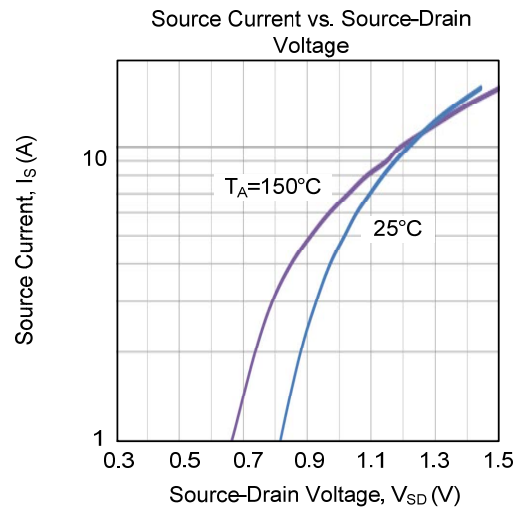
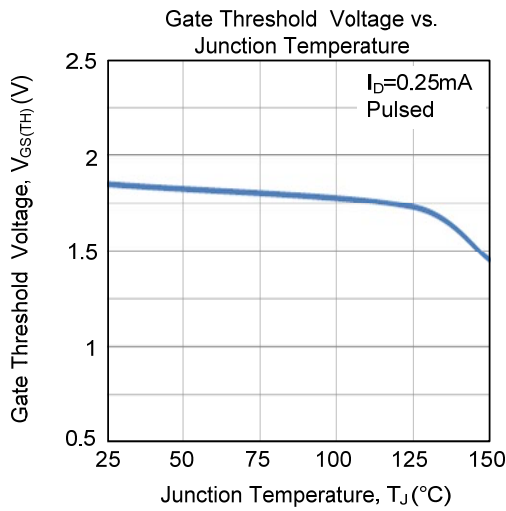


Unclamped Inductive Switching Waveforms

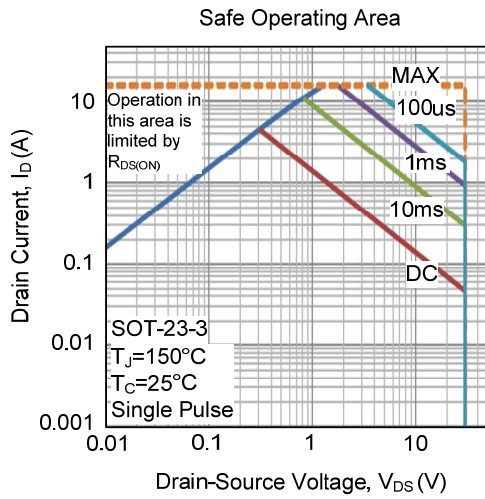
TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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