



UT2316

Power MOSFET

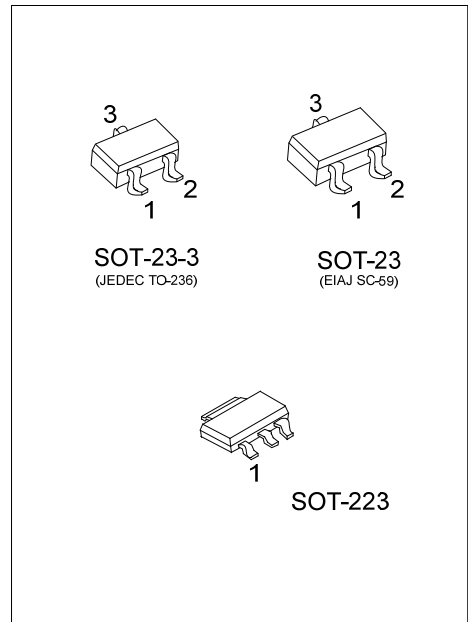
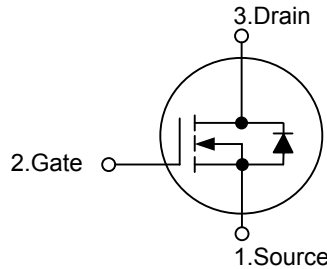
N-CHANNEL ENHANCEMENT MODE

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
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	66	mJ
Total Power Dissipation ($T_A = 25^\circ\text{C}$)	SOT-23-3	P_D	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	$^\circ\text{C}$

- 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. $L = 0.1\text{mH}$, $I_{AS} = 11.5\text{A}$, $V_{DD} = 100\text{V}$, $R_G = 25\ \Omega$, Starting $T_J = 25^\circ\text{C}$

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient (Note 3)	SOT-23-3	θ_{JA}	250	$^\circ\text{C/W}$
	SOT-23		208	$^\circ\text{C/W}$
	SOT-223		125	$^\circ\text{C/W}$

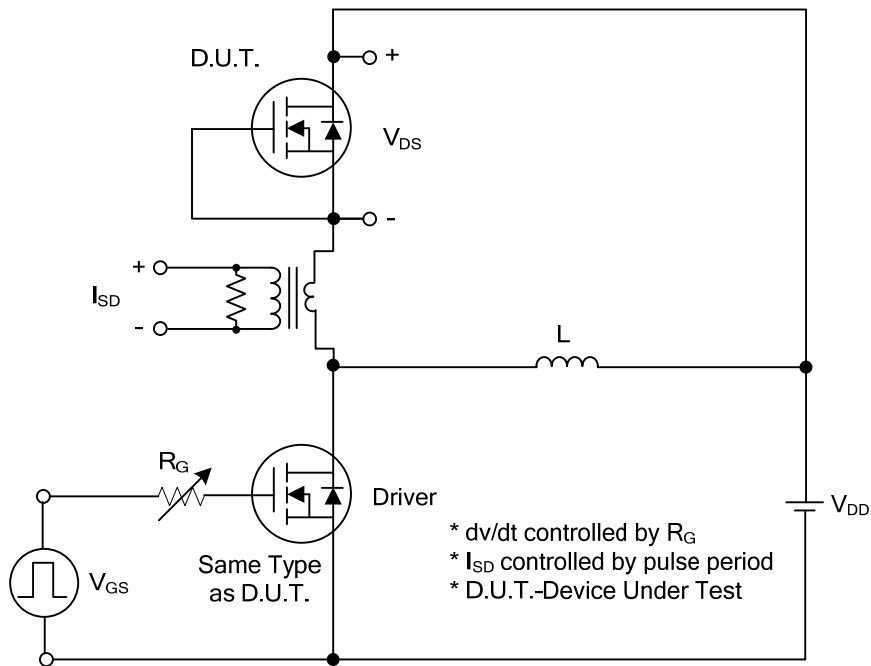
Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

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

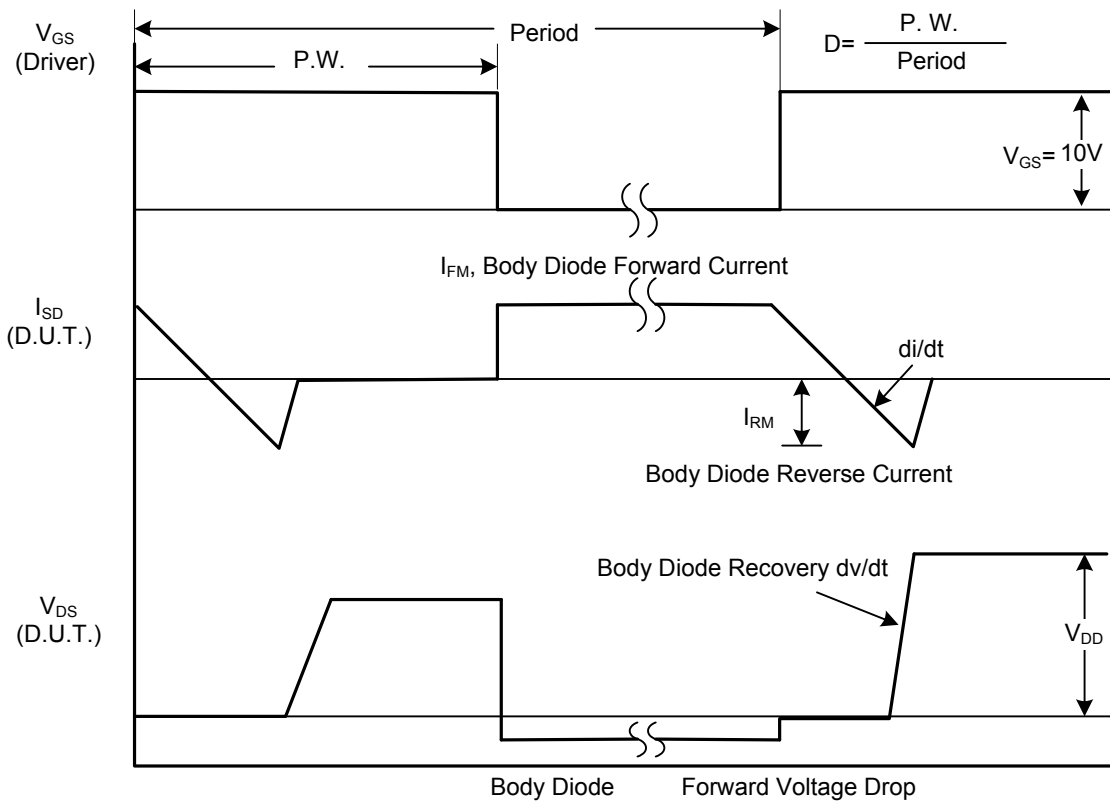
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0\text{ V}$, $I_D=250\ \mu\text{A}$	30			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=24\text{ V}$, $V_{GS}=0\text{ V}$			1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20\text{ V}$, $V_{DS}=0\text{ V}$			100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=250\ \mu\text{A}$	1.0		3.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{ V}$, $I_D=3.6\text{ A}$			65	m Ω
		$V_{GS}=4.5\text{ V}$, $I_D=2.8\text{ A}$			85	m Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{DS}=15\text{ V}$, $V_{GS}=0\text{ V}$, $f=1\text{MHz}$		145		pF
Output Capacitance	C_{OSS}			43		pF
Reverse Transfer Capacitance	C_{RSS}			35		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	$V_{DS}=24\text{ V}$, $V_{GS}=10\text{ V}$, $I_D=3.6\text{ A}$ (Note 1, 2)		9.7		nC
Gate Source Charge	Q_{GS}			1.5		nC
Gate Drain Charge	Q_{GD}			0.7		nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DS}=15\text{ V}$, $V_{GS}=10\text{ V}$, $I_D=3.6\text{ A}$ $R_G=3\ \Omega$ (Note 1, 2)		4		ns
Turn-ON Rise Time	t_R			14		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			6		ns
Turn-OFF Fall-Time	t_F			18		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I_S				3.6	A
Maximum Body-Diode Pulsed Current	I_{SM}				16	A
Drain-Source Diode Forward Voltage	V_{SD}	$I_S=1.0\text{ A}$			1.0	V

- 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

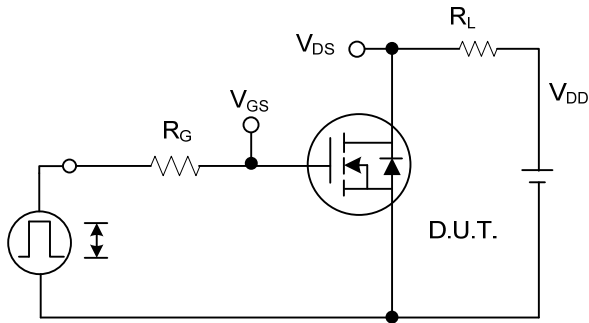


Peak Diode Recovery dv/dt Test Circuit

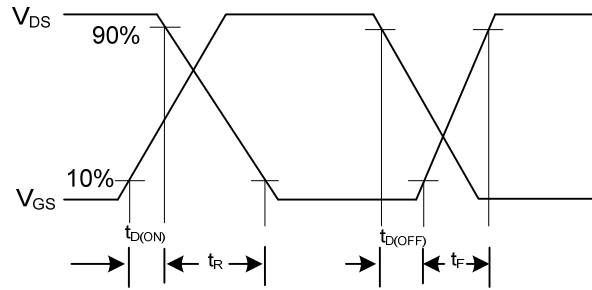


Peak Diode Recovery dv/dt Waveforms

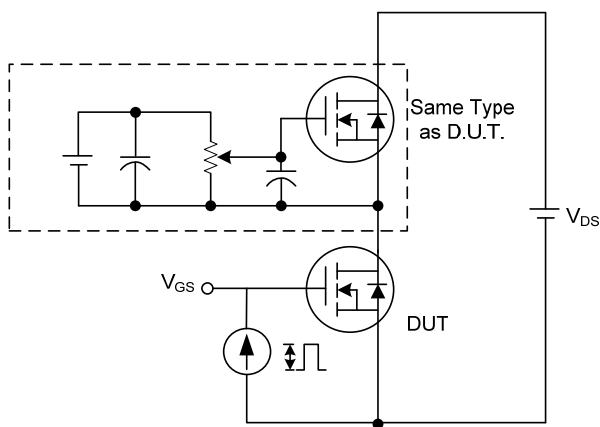
■ TEST CIRCUITS AND WAVEFORMS



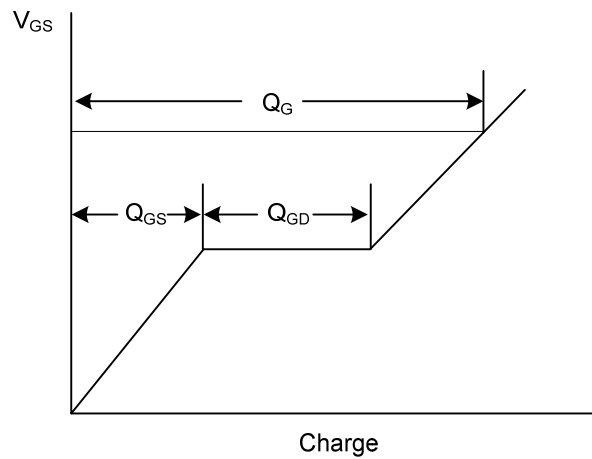
Switching Test Circuit



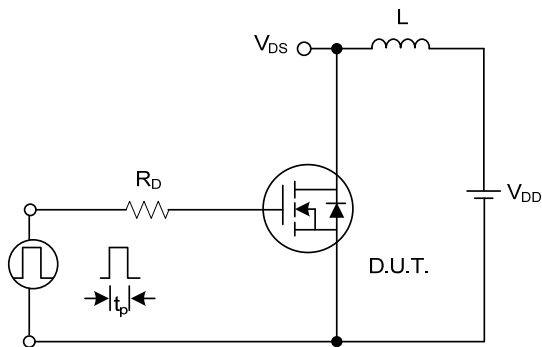
Switching Waveforms



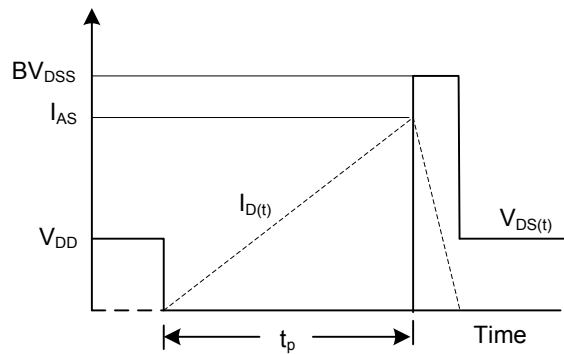
Gate Charge Test Circuit



Gate Charge Waveform

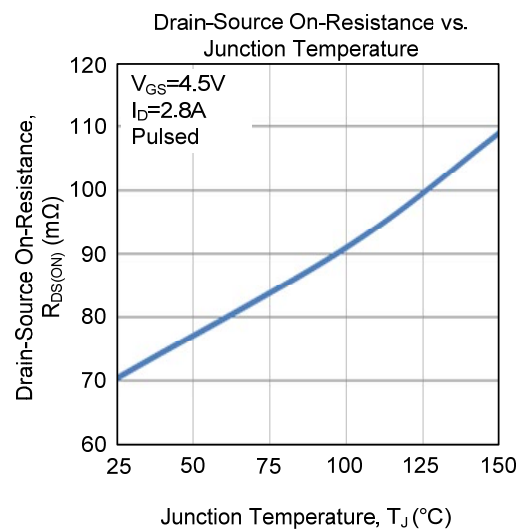
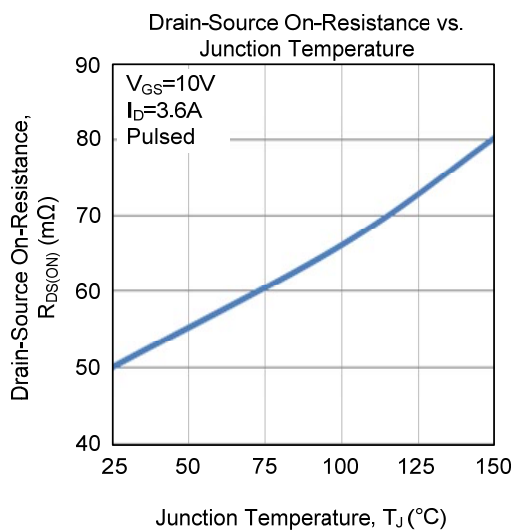
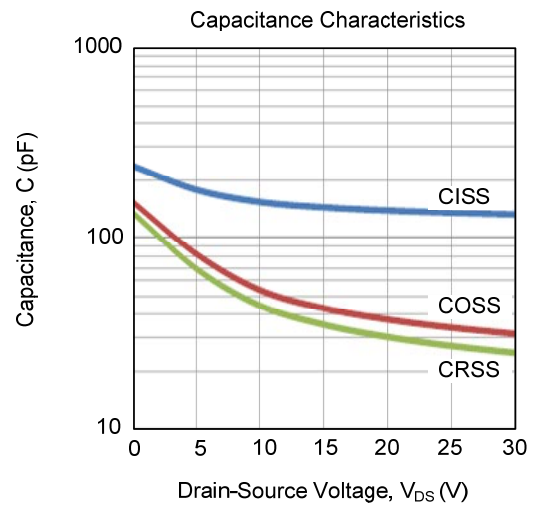
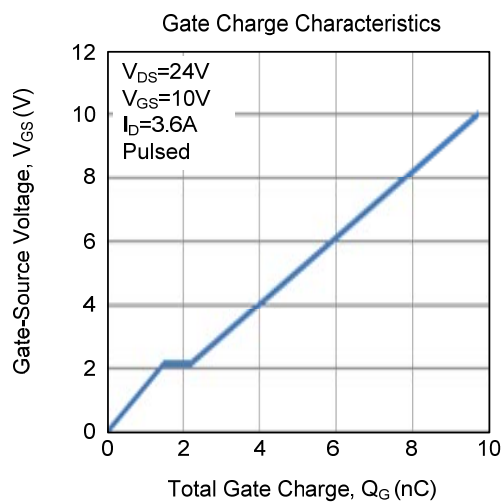
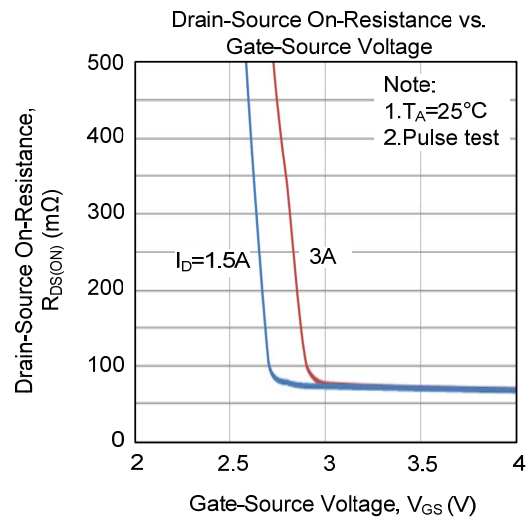
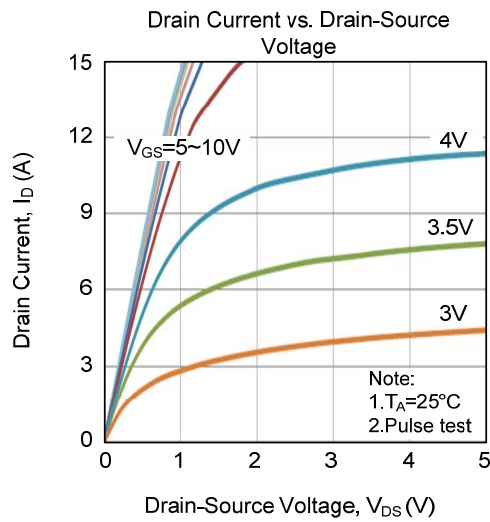


Unclamped Inductive Switching Test Circuit

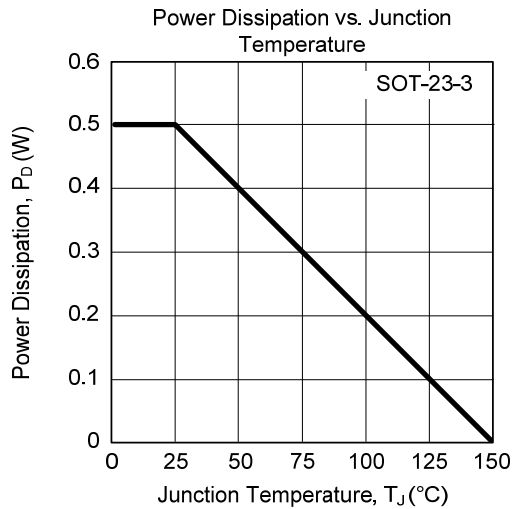
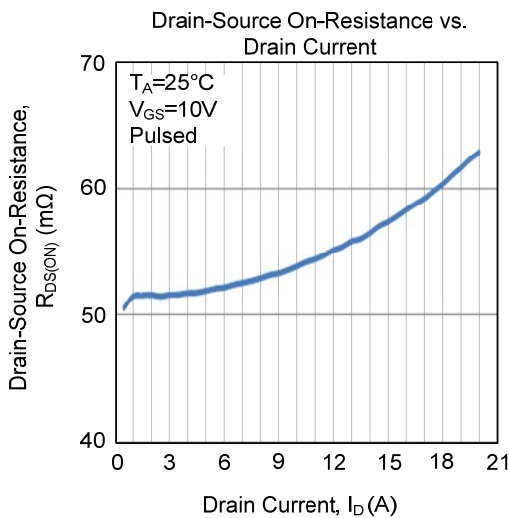
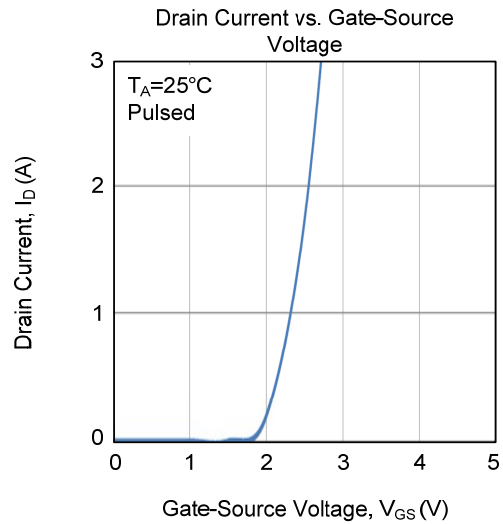
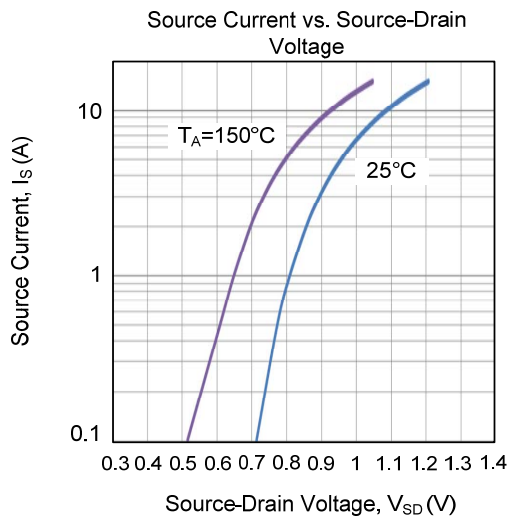
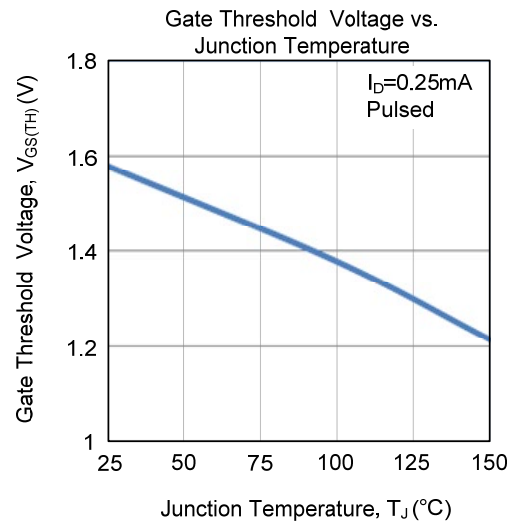
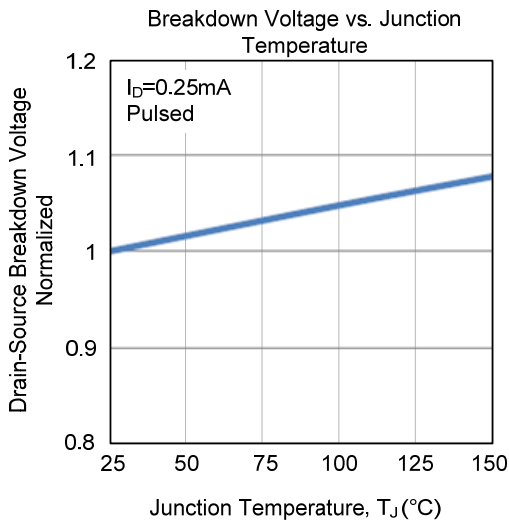


Unclamped Inductive Switching Waveforms

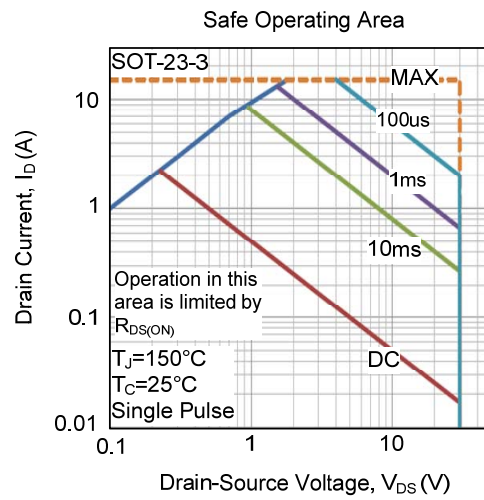
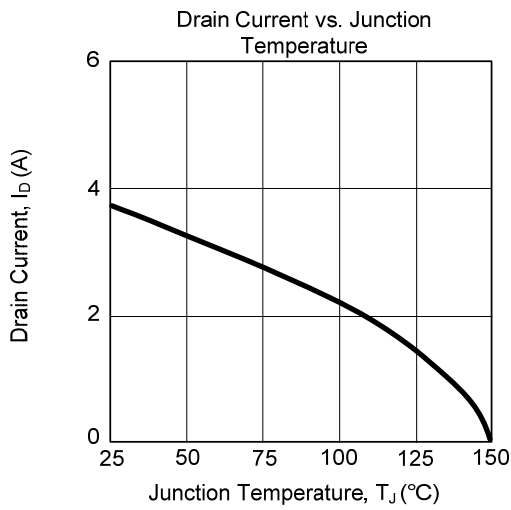
■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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