



UTT16N15

POWER MOSFET

16A, 150V N-CHANNEL POWER MOSFET

DESCRIPTION

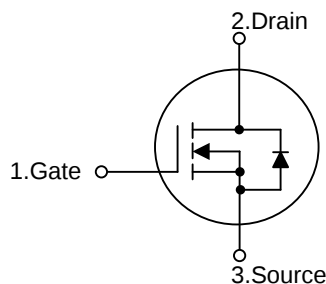
The UTC **UTT16N15** is a N-channel mode power MOSFET using UTC's advanced technology to provide customers with a minimum on-state resistance, low gate charge and high switching speed.

The UTC **UTT16N15** is suitable for high voltage synchronous rectifier and AC/DC converters, etc.

FEATURES

- * $R_{DS(ON)} \leq 150 \text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=4.0\text{A}$
- $R_{DS(ON)} \leq 170 \text{ m}\Omega$ @ $V_{GS}=4.5\text{V}$, $I_D=4.0\text{A}$
- * High Switching Speed
- * High Cell Density Trench Technology

SYMBOL



ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UTT16N15L-AA3-R	UTT16N15G-AA3-R	SOT-223	G	D	S	-	-	-	-	-	Tape Reel
UTT16N15L-K08-3030-R	UTT16N15G-K08-3030-R	DFN3030-8	S	S	S	G	D	D	D	D	Tape Reel

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

UTT16N15G-AA3-R 		(1) R: Tape Reel (2) AA3: SOT-223, K08-3030: DFN3030-8 (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING

SOT-223	DFN3030-8

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

PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage			V _{DSS}	150	V
Gate-Source Voltage			V _{GSS}	±20	V
Drain Current	Continuous	T _A =25°C	I _D	4	A
		T _C =25°C		16	A
	Pulsed (Note 2) (T _C =25°C)		I _{DM}	48	A
Avalanche Energy	Single Pulsed (Note 3)		E _{AS}	1.6	mJ
Peak Diode Recovery dv/dt (Note 4)			dv/dt	2.4	V/nS
Power Dissipation		SOT-223	P _D	2.5	W
		DFN3030-8		20	W
Junction Temperature			T _J	+150	°C
Storage Temperature Range			T _{STG}	-55 ~ +150	°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. $L = 0.1\text{mH}$, $I_{AS} = 5.7\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\ \Omega$, Starting $T_J = 25^\circ\text{C}$

4. $I_{SD} \leq 20\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DS}$, Starting $T_J = 25^\circ\text{C}$

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-223	θ_{JA}	140	$^\circ\text{C}/\text{W}$
	DFN3030-8		130	$^\circ\text{C}/\text{W}$
Junction to Case	SOT-223	θ_{JC}	50	$^\circ\text{C}/\text{W}$
	DFN3030-8		6.25	$^\circ\text{C}/\text{W}$

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

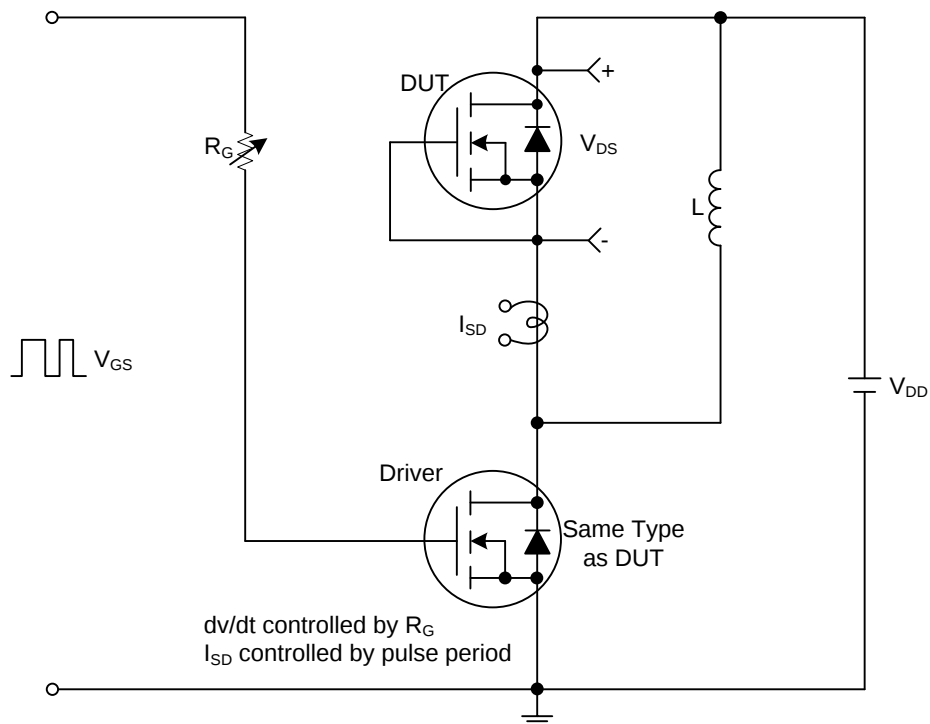
■ ELECTRICAL CHARACTERISTICS (T_C =25°C, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250μA, V _{GS} =0V	150			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =150V, V _{GS} =0V			1	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{GS} =+20V, V _{DS} =0V			+100	nA
	Reverse		V _{GS} =-20V, V _{DS} =0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	1.0		3.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =4.0A			150	mΩ
			V _{GS} =4.5V, I _D =4.0A			170	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		900		pF
Output Capacitance		C _{OSS}			63		pF
Reverse Transfer Capacitance		C _{RSS}			40		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)		Q _G	V _{DS} =120V, V _{GS} =10V, I _D =16A I _G =1mA (Note 1, 2)		22		nC
Gate to Source Charge		Q _{GS}			3		nC
Gate to Drain Charge		Q _{GD}			4.5		nC
Turn-on Delay Time (Note 1)		t _{D(ON)}	V _{DD} =30V, V _{GS} =10V, I _D =16A, R _G =25Ω (Note 1, 2)		8		ns
Rise Time		t _R			20		ns
Turn-off Delay Time		t _{D(OFF)}			85		ns
Fall-Time		t _F			48		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				16	A
Maximum Body-Diode Pulsed Current		I _{SM}				48	A
Drain-Source Diode Forward Voltage (Note 1)		V _{SD}	I _S =16A, V _{GS} =0V			1.4	V
Reverse Recovery Time (Note 1)		t _{rr}	I _S =16A, V _{GS} =0V,		66		nS
Reverse Recovery Charge		Q _{rr}	dI/dt=100A/μs		245		nC

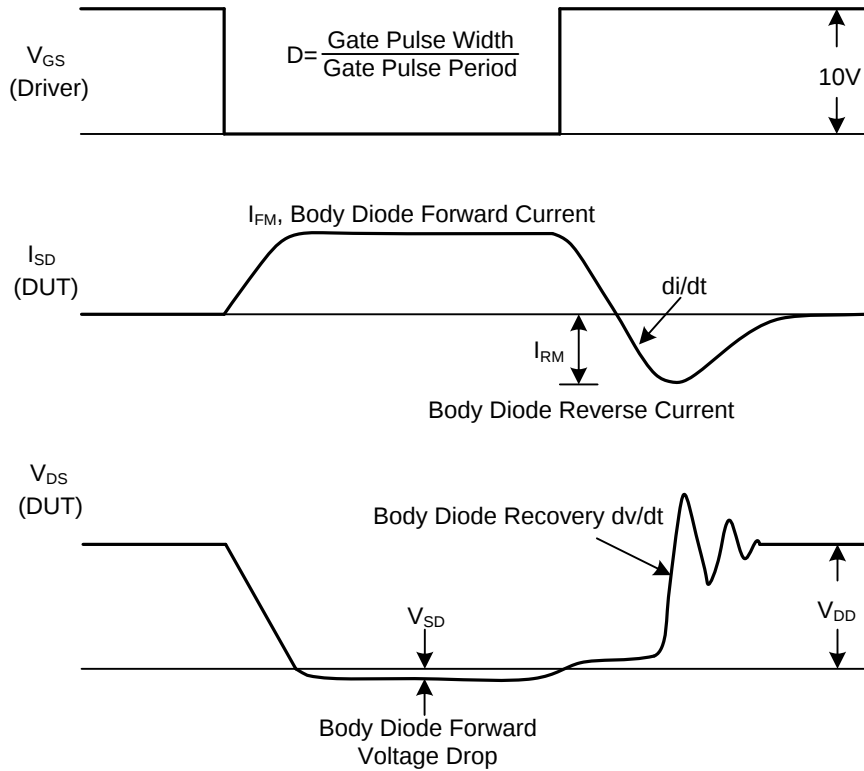
Notes: 1. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS



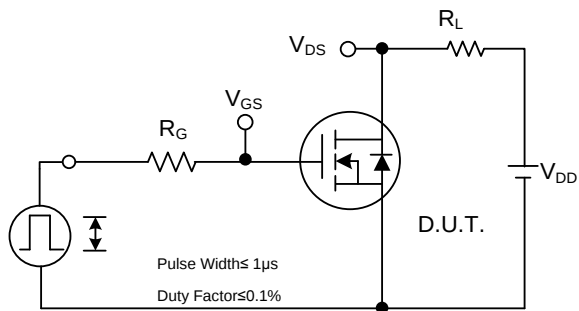
Peak Diode Recovery dv/dt Test Circuit



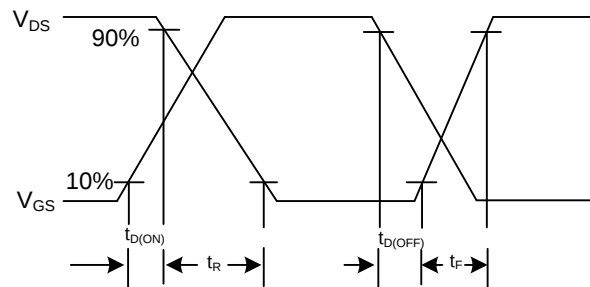
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

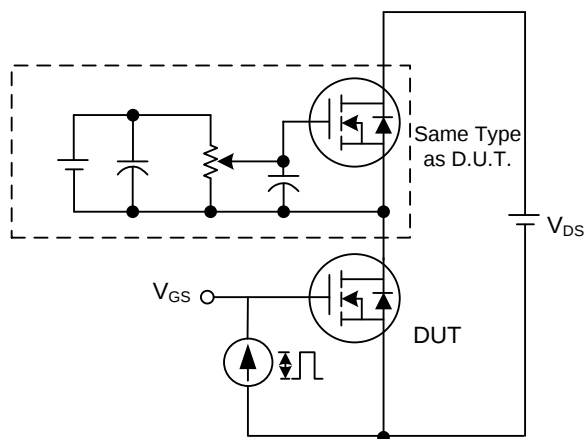
■ TEST CIRCUITS AND WAVEFORMS



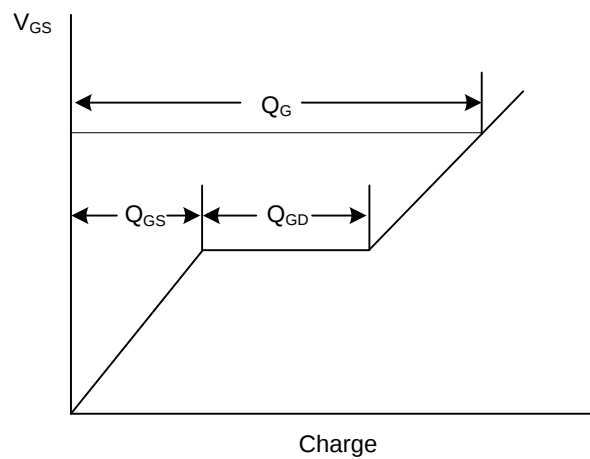
Switching Test Circuit



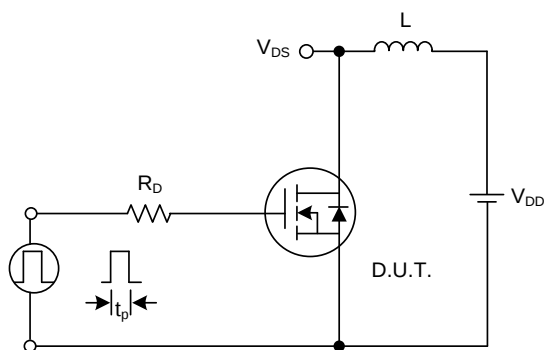
Switching Waveforms



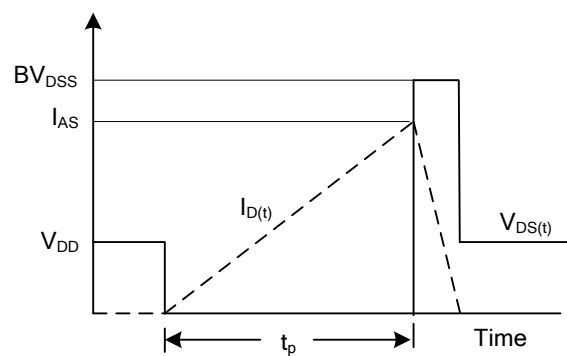
Gate Charge Test Circuit



Gate Charge Waveform

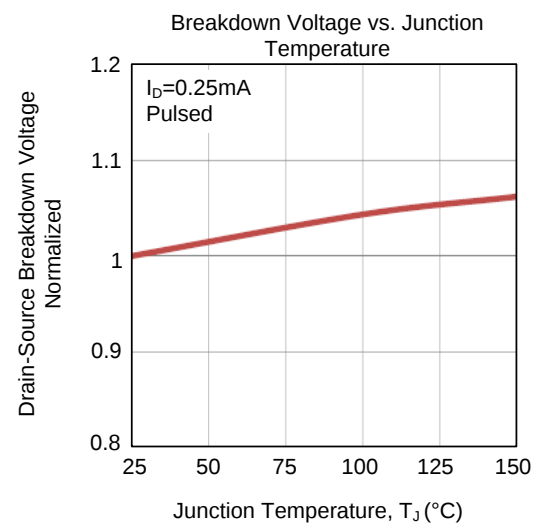
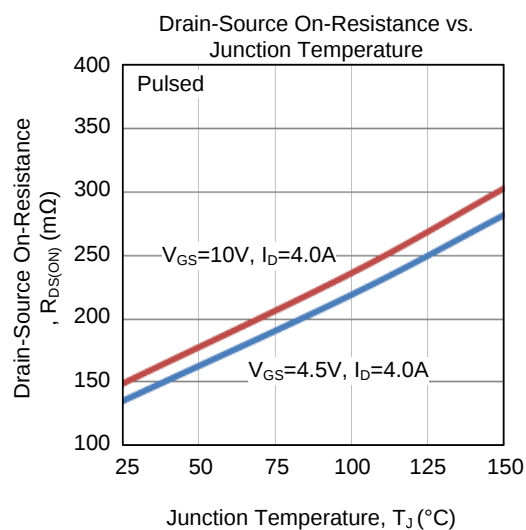
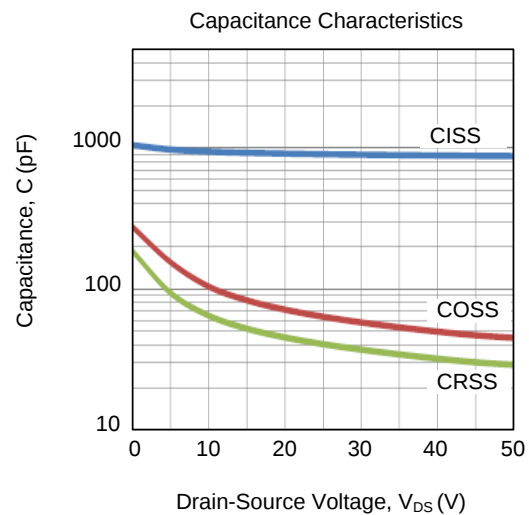
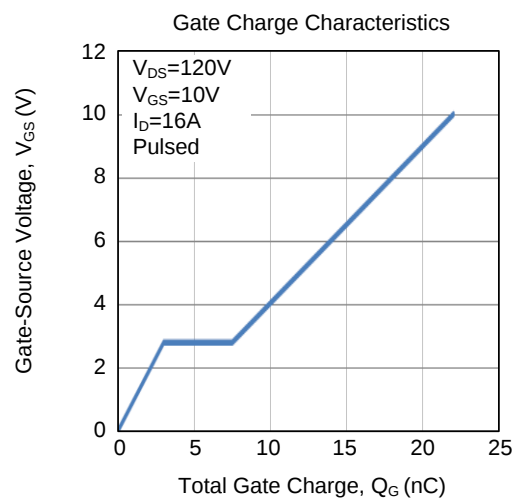
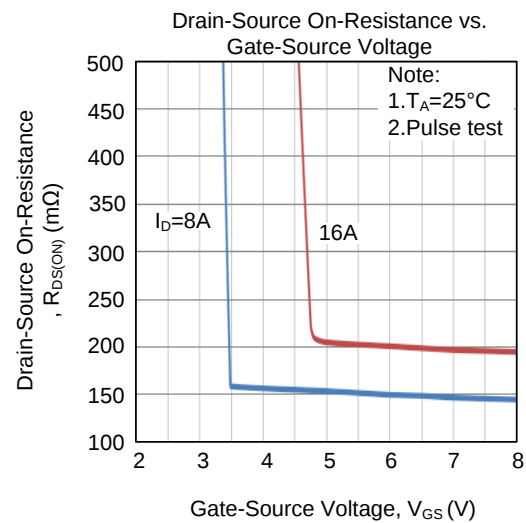
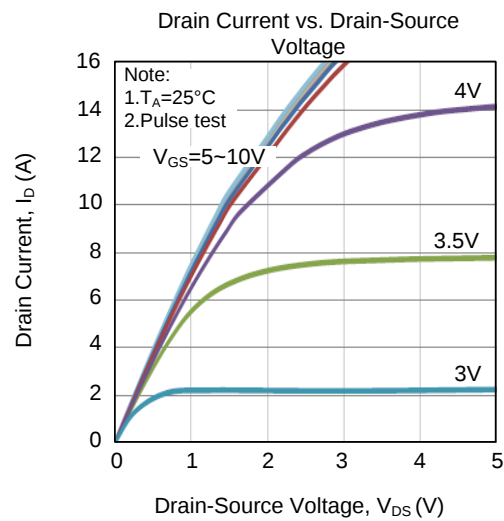


Unclamped Inductive Switching Test Circuit

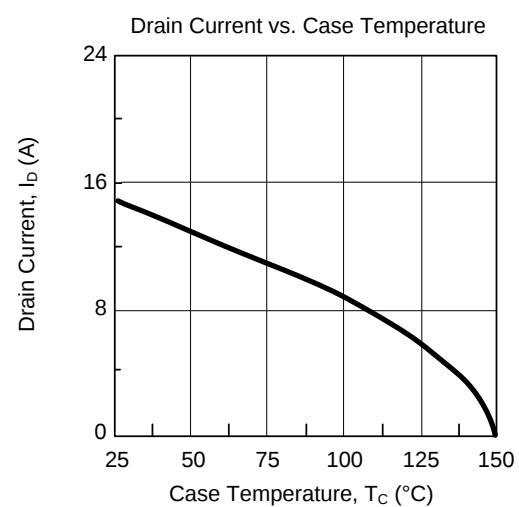
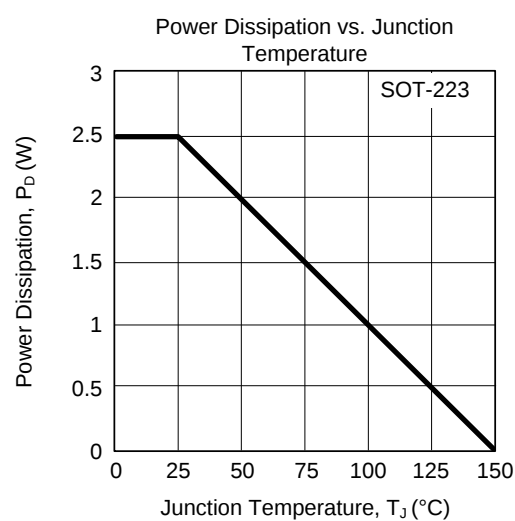
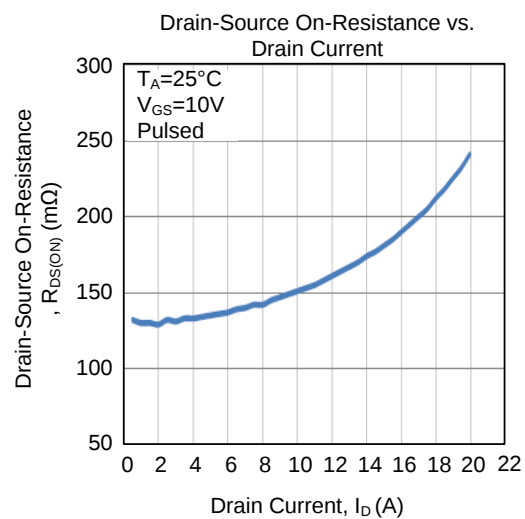
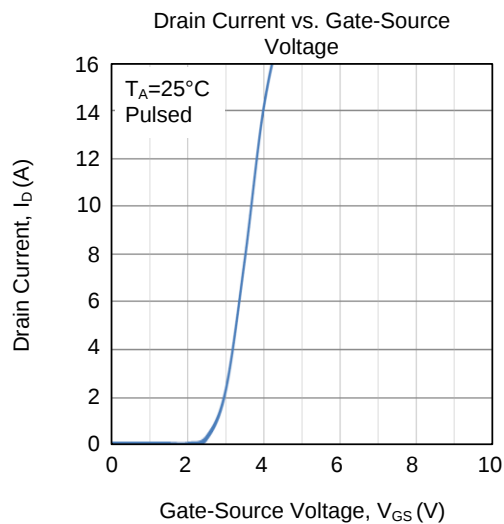
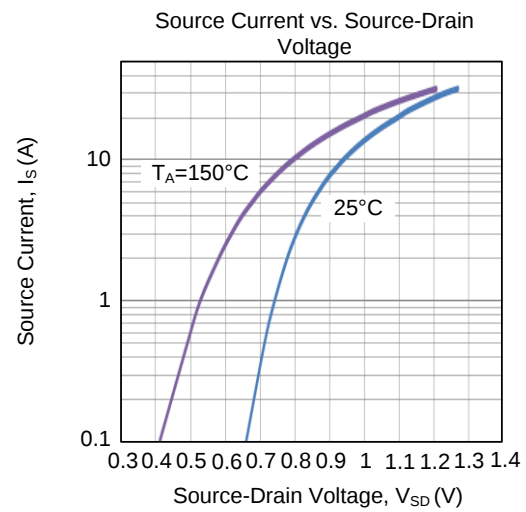
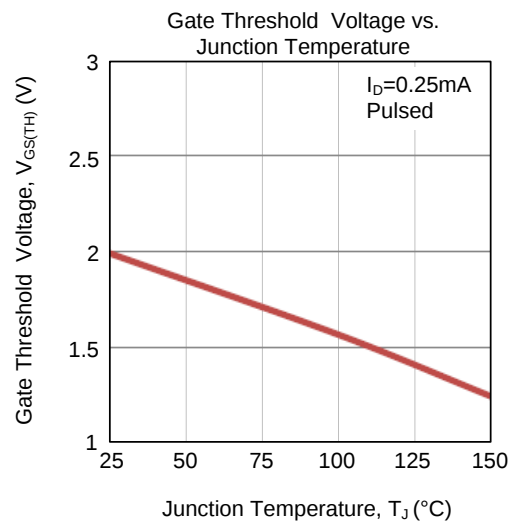


Unclamped Inductive Switching Waveforms

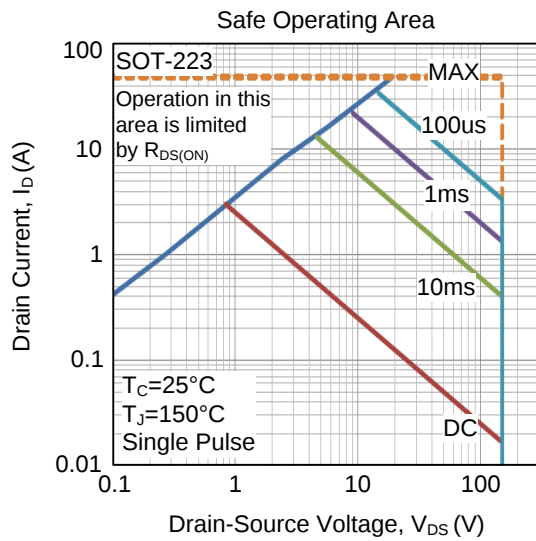
TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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