

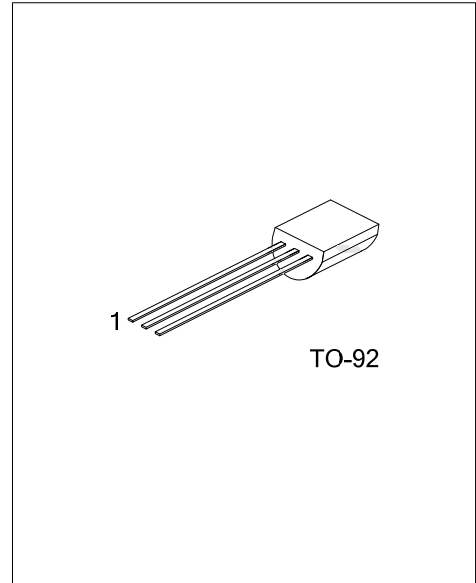
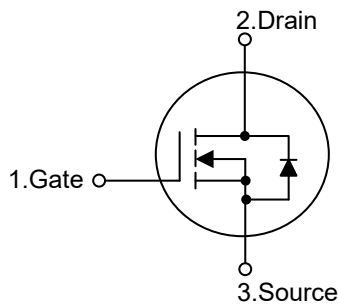
**02N50-TA****POWER MOSFET****0.2A, 500V N-CHANNEL
POWER MOSFET****DESCRIPTION**

The UTC **02N50-TA** is a high voltage power MOSFET and is designed to have better characteristics, such as fast switching time, low gate charge, low on-state resistance and have a high rugged avalanche characteristics. This power MOSFET is usually used at high speed switching applications in power supplies, PWM motor controls, high efficient DC to DC converters and bridge circuits.

FEATURES

* $R_{DS(ON)} \leq 18 \Omega$ @ $V_{GS}=10V$, $I_D=0.1A$

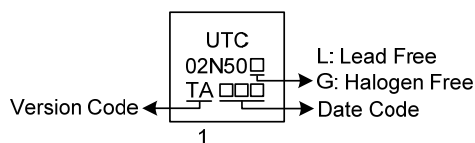
* High breakdown voltage

SYMBOL**ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
02N50L-TA-T92-B	02N50G-TA-T92-B	TO-92	G	D	S	Tape Box
02N50L-TA-T92-K	02N50G-TA-T92-K	TO-92	G	D	S	Bulk

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

02N50G-TA-T92-B	
(1) Packing Type	(1) B: Tape Box, K: Bulk
(2) Package Type	(2) T92: TO-92
(3) Version Code	(3) Version TA
(4) Green Package	(4) G: Halogen Free and Lead Free, L: Lead Free

MARKING

■ ABSOLUTE MAXIMUM RATINGS (T_A=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V _{DSS}	500	V
Gate-Source Voltage		V _{GSS}	±30	V
Drain Current	Continuous	I _D	0.2	A
	Pulsed	I _{DM}	1.2	A
Peak Diode Recovery dv/dt (Note 3)		dv/dt	3	V/ns
Power Dissipation		P _D	1	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. I_{SD} ≤ 0.2A, di/dt ≤ 200A/μs, V_{DD} ≤ BV_{DSS}, T_J ≤ T_{JMAX}, T_J = 25°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ _{JA}	160 (Note)	°C/W
Junction to Case	θ _{JC}	125 (Note)	°C/W

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

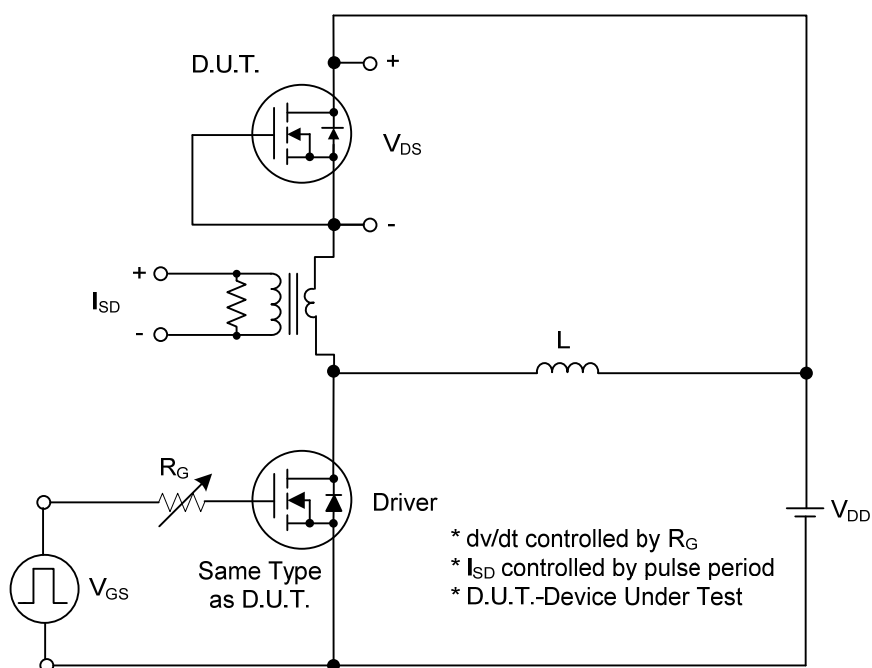
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250μA, V _{GS} =0V	500			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =500V, V _{GS} =0V			10	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{GS} =+30V, V _{DS} =0V			+100	nA
	Reverse		V _{GS} =-30V, V _{DS} =0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	2.0		4.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =0.1A			18	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		58		pF
Output Capacitance		C _{OSS}			13		pF
Reverse Transfer Capacitance		C _{RSS}			2.1		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q _G	V _{DS} = 400V, V _{GS} = 10V, I _D = 0.2A, (Note 1, 2)		8		nC
Gate to Source Charge		Q _{GS}			1		nC
Gate to Drain Charge		Q _{GD}			3		nC
Turn-ON Delay Time		t _{D(ON)}	V _{DS} = 100V, V _{GS} = 10V, I _D = 0.2A, R _G = 25Ω (Note 1, 2)		3.2		ns
Rise Time		t _R			17		ns
Turn-OFF Delay Time		t _{D(OFF)}			26		ns
Fall-Time		t _F			126		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				0.2	A
Maximum Body-Diode Pulsed Current		I _{SM}				1.2	A
Drain-Source Diode Forward Voltage		V _{SD}	I _S =0.2A, V _{GS} =0V			1.4	V
Reverse Recovery Time		t _{RR}	V _{GS} =0V, I _S =0.2A, di/dt=100A/μs		92		ns
Reverse Recovery Charge		Q _{RR}			110		nC

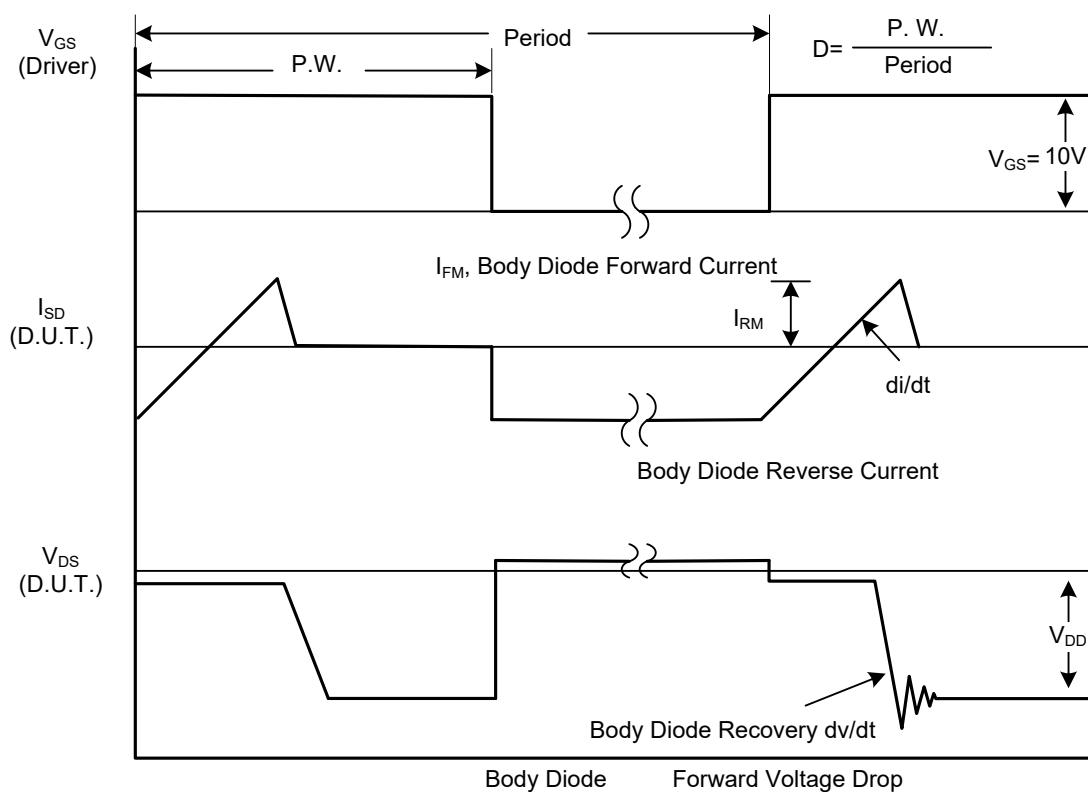
Notes: 1. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

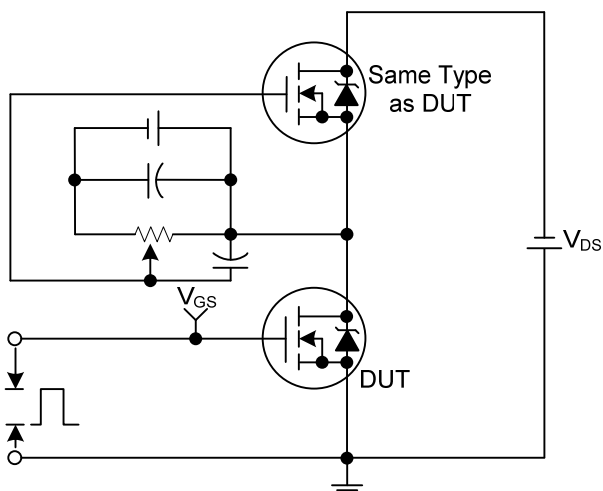


Peak Diode Recovery dv/dt Test Circuit

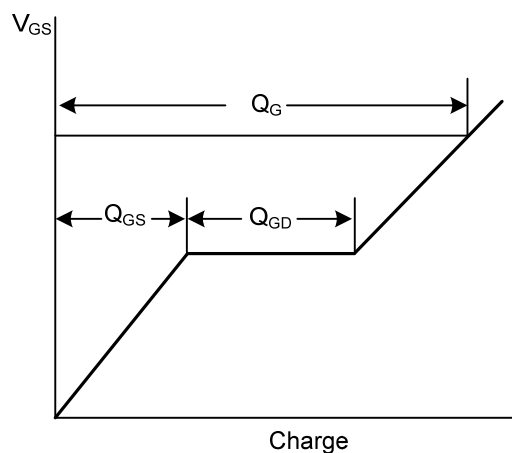


Peak Diode Recovery dv/dt Waveforms

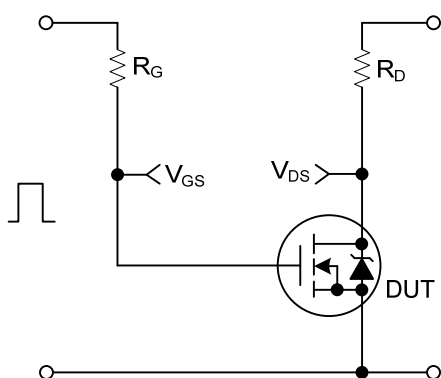
■ TEST CIRCUITS AND WAVEFORMS



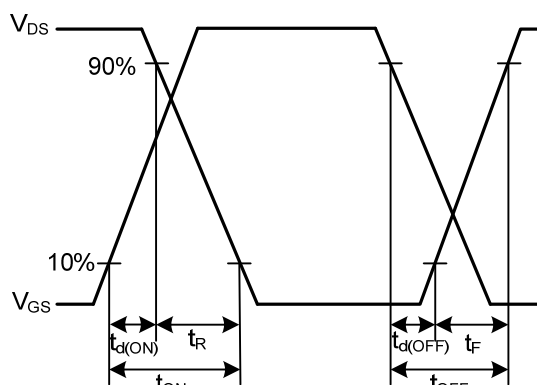
Gate Charge Test Circuit



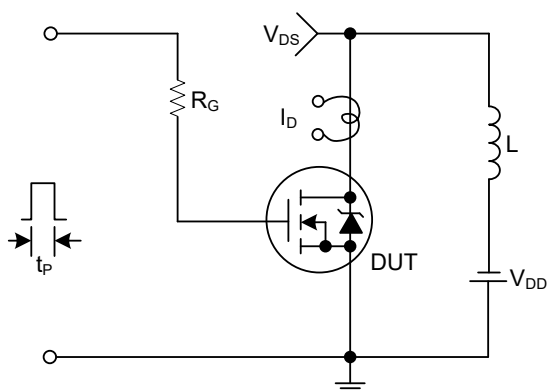
Gate Charge Waveforms



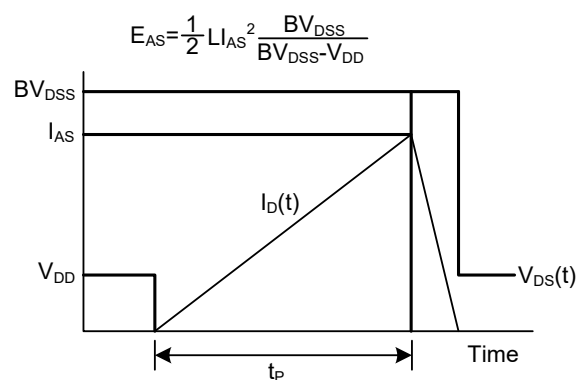
Resistive Switching Test Circuit



Resistive Switching Waveforms

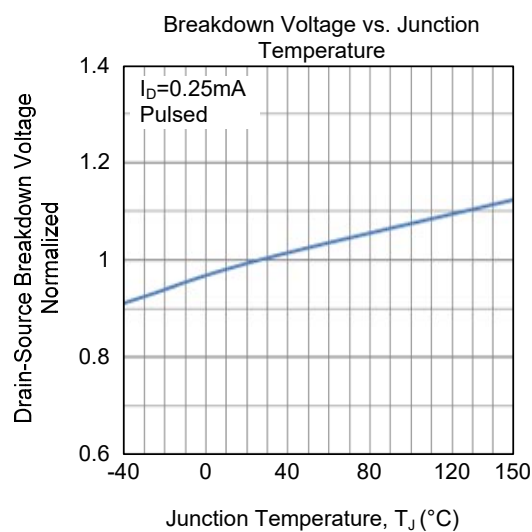
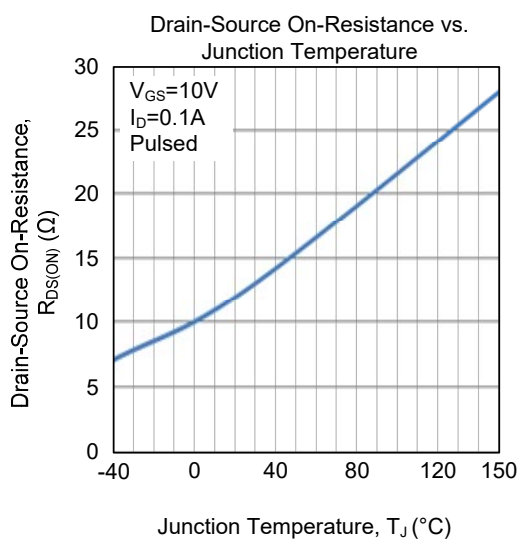
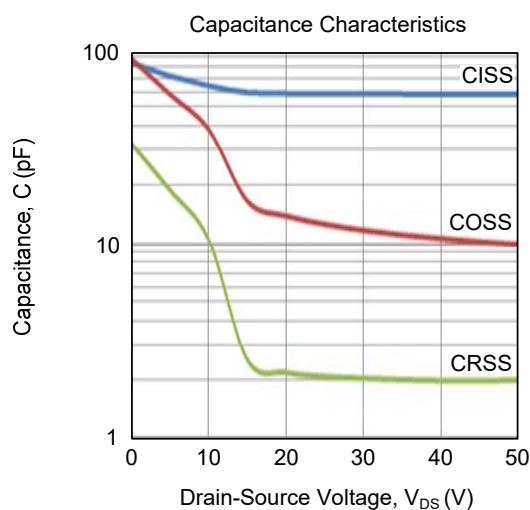
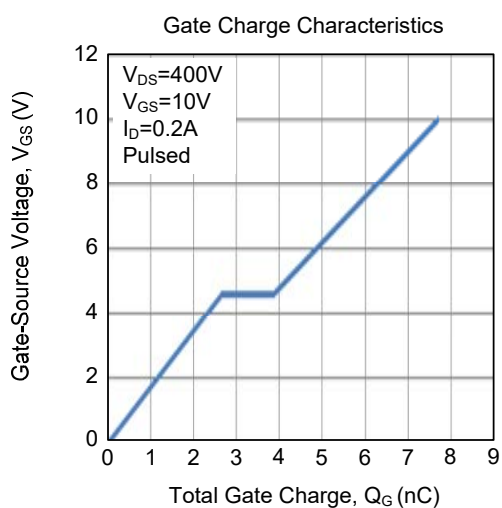
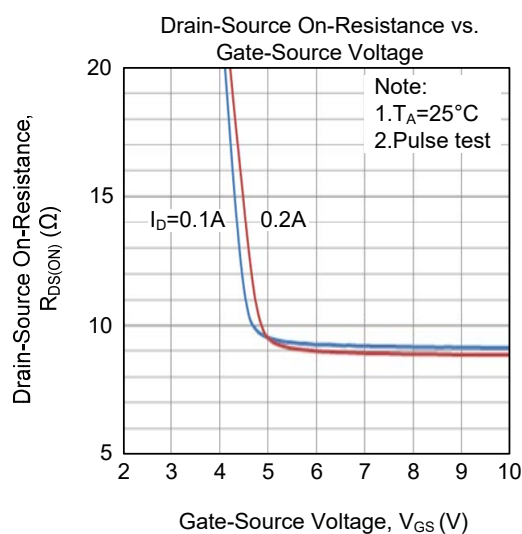
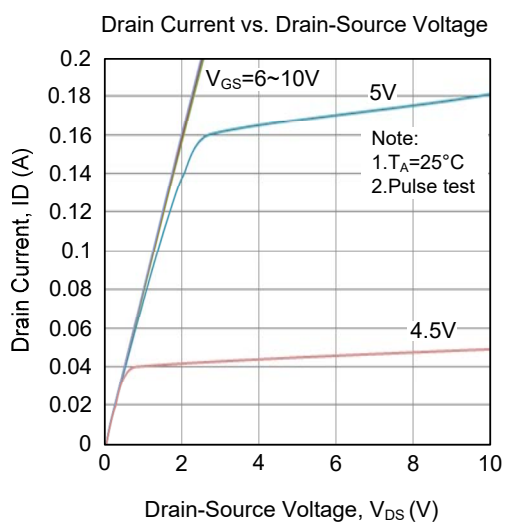


Unclamped Inductive Switching Test Circuit

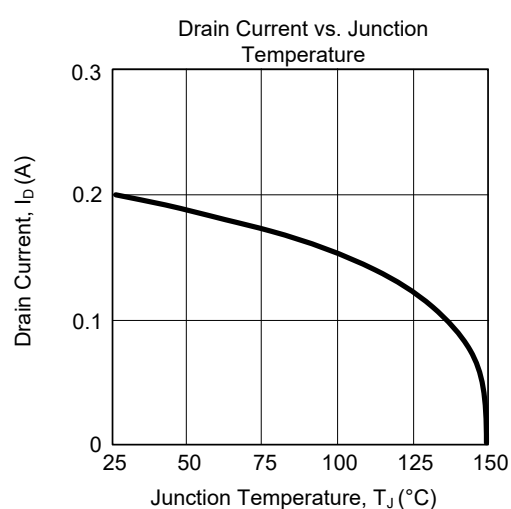
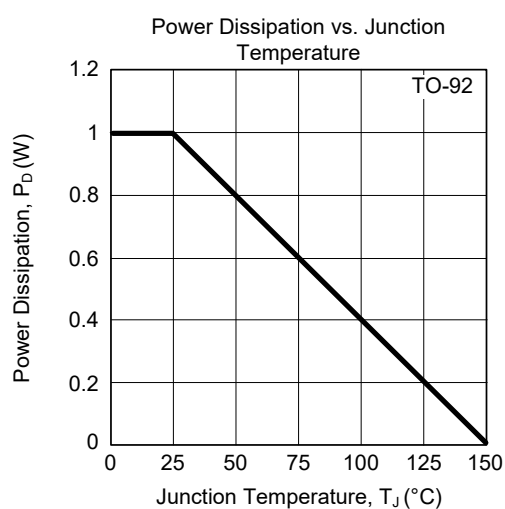
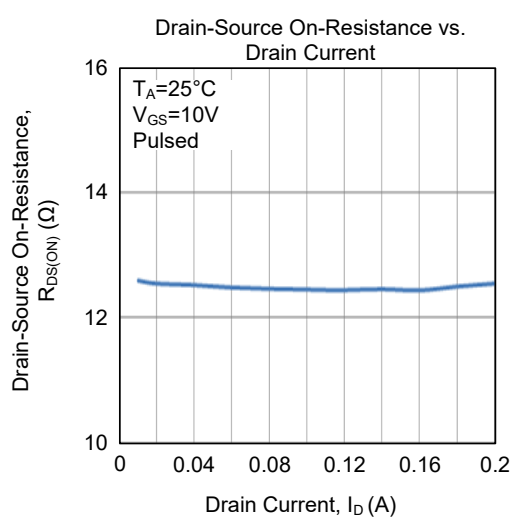
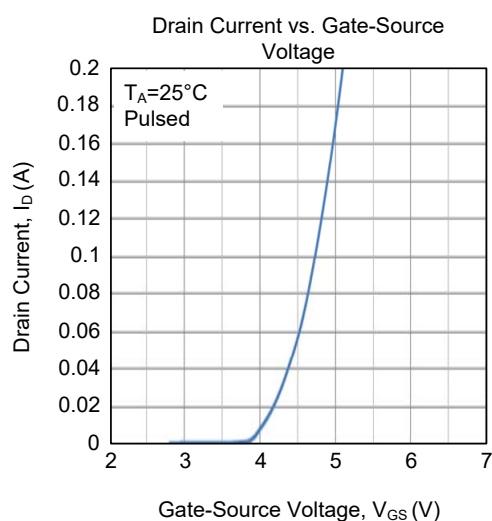
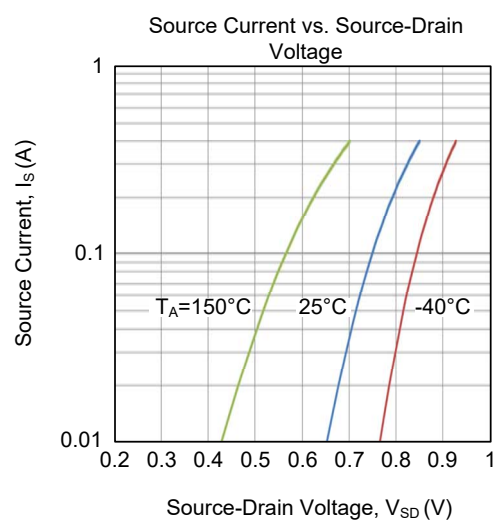
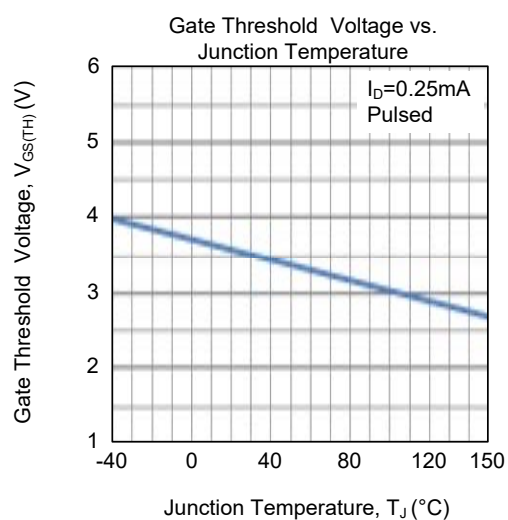


Unclamped Inductive Switching Waveforms

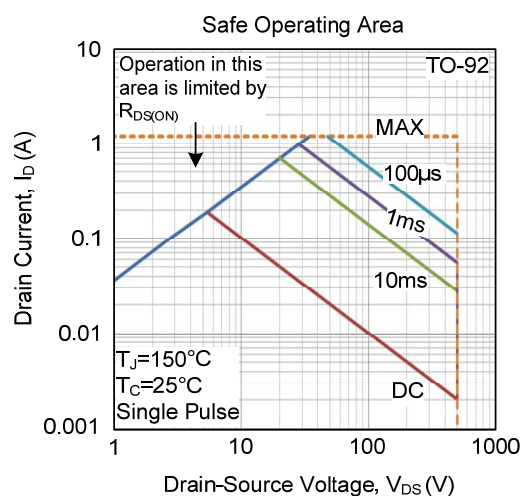
■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.