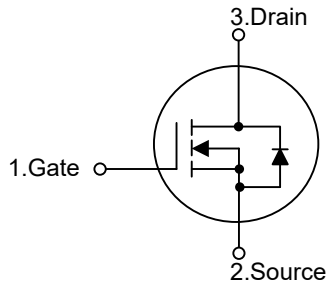


**UT2N06****POWER MOSFET****2.2A, 60V SHIELDED GATE
N-CHANNEL POWER MOSFET****DESCRIPTION**

The UTC **UT2N06** is N-Channel MOSFET produced using advanced Power process that incorporates Shielded Gate technology. This process has been optimized for $R_{DS(ON)}$, switching performance and ruggedness.

FEATURES

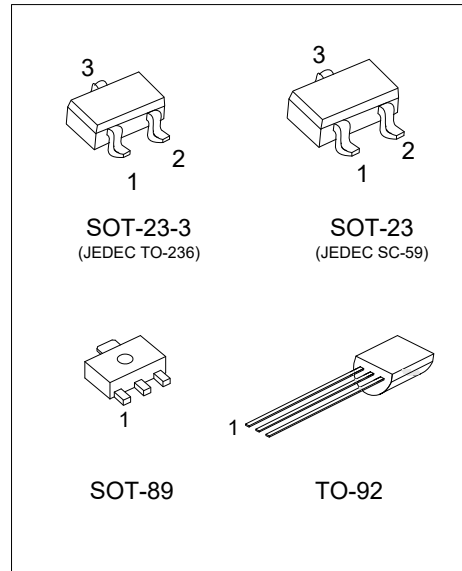
- * $R_{DS(ON)} \leq 235 \text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=2.2\text{A}$
- $R_{DS(ON)} \leq 280 \text{ m}\Omega$ @ $V_{GS}=4.5\text{V}$, $I_D=1.3\text{A}$
- * Simple drive requirement
- * Small package outline
- * Fast Switching Speed

SYMBOL**ORDERING INFORMATION**

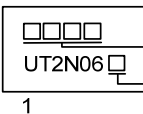
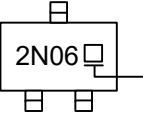
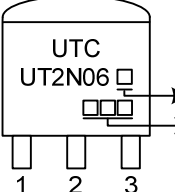
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT2N06L-AB3-R	UT2N06G-AB3-R	SOT-89	G	D	S	Tape Reel
UT2N06L-AE2-R	UT2N06G-AE2-R	SOT-23-3	G	S	D	Tape Reel
UT2N06L-AE3-R	UT2N06G-AE3-R	SOT-23	G	S	D	Tape Reel
UT2N06L-T92-B	UT2N06G-T92-B	TO-92	S	G	D	Tape Box
UT2N06L-T92-K	UT2N06G-T92-K	TO-92	S	G	D	Bulk

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

UT2N06G-AB3-R 		(1) R: Tape Reel, B: Tape Box, K: Bulk (2) AB3: SOT-89, AE2: SOT-23-3, AE3: SOT-23 T92: TO-92 (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING

PACKAGE	MARKING
SOT-89	 Date Code L: Lead Free G: Halogen Free
SOT-23-3 / SOT-23	 L: Lead Free G: Halogen Free
TO-92	 L: Lead Free G: Halogen Free Date Code

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	60	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current	Continuous	I_D	2.2	A
	Pulsed	I_{DM}	6.6	A
Avalanche Energy	Single Pulsed (Note 4)	E_{AS}	245	mJ
Peak Diode Recovery dv/dt (Note 5)		dv/dt	0.896	V/ns
Power Dissipation (Note 3)	SOT-23-3	P_D	400	mW
	SOT-23		500	mW
	SOT-89		1000	mW
	TO-92		625	mW
Junction Temperature		T_J	+150	$^{\circ}\text{C}$
Storage Temperature Range		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. Surface mounted on 1 in² copper pad of FR-4 board. 270 $^{\circ}\text{C}/\text{W}$ when mounted on minimum copper pad.

4. $L=10\text{mH}$, $I_{AS}=7.0\text{A}$, $V_{DD}=20\text{V}$, $R_G=25\ \Omega$, Starting $T_J = 25^{\circ}\text{C}$

5. $I_{SD}\leq 3.0\text{A}$, $di/dt\leq 200\text{A}/\mu\text{s}$, $V_{DD}\leq BV_{DSS}$, Starting $T_J = 25^{\circ}\text{C}$

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-23-3	θ_{JA}	312	$^{\circ}\text{C}/\text{W}$
	SOT-23		250	$^{\circ}\text{C}/\text{W}$
	SOT-89		125	$^{\circ}\text{C}/\text{W}$
	TO-92		200	$^{\circ}\text{C}/\text{W}$

Note: Surface mounted on 1 in² copper pad of FR-4 board. 270 $^{\circ}\text{C}/\text{W}$ when mounted on minimum copper pad.

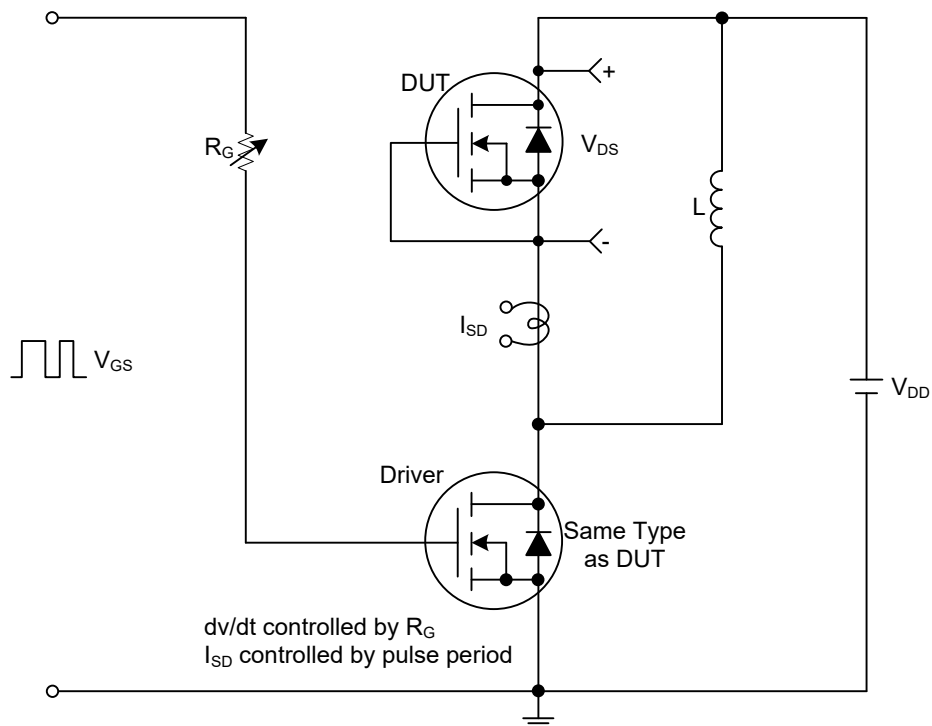
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250μA, V _{GS} =0V	60			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =60V, 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		2.5	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =2.2A			235	mΩ
			V _{GS} =4.5V, I _D =1.3A			280	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =30V, f=1.0MHz		112		pF
Output Capacitance		C _{OSS}			21		pF
Reverse Transfer Capacitance		C _{RSS}			14		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)		Q _G	V _{DS} =48V, V _{GS} =10V, I _D =2.2A I _G =1mA (Note 1, 2)		7.1		nC
Gate to Source Charge		Q _{GS}			1.0		nC
Gate to Drain Charge		Q _{GD}			1.6		nC
Turn-on Delay Time (Note 1)		t _{D(ON)}	V _{DD} =30V, V _{GS} =10V, I _D =3.0A, R _G =25Ω (Note 1, 2)		4.0		ns
Rise Time		t _R			15		ns
Turn-off Delay Time		t _{D(OFF)}			50		ns
Fall-Time		t _F			25		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				2.2	A
Maximum Body-Diode Pulsed Current		I _{SM}				6.6	A
Drain-Source Diode Forward Voltage (Note 1)		V _{SD}	I _S =0.45A, V _{GS} =0V			1.0	V
Reverse Recovery Time		t _{rr}	I _S =1.0A, V _{GS} =0V,		62.8		ns
Reverse Recovery Charge		Q _{rr}	dI _F /dI=100A/μs		0.34		μC

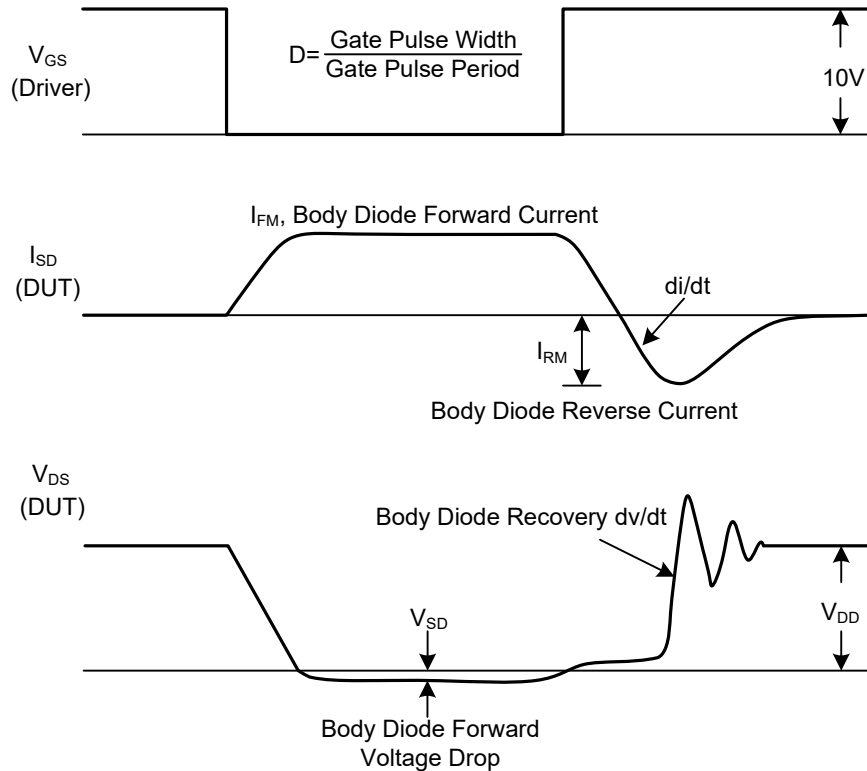
Notes: 1. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS



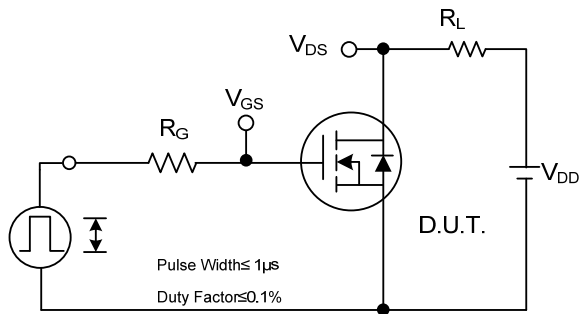
Peak Diode Recovery dv/dt Test Circuit



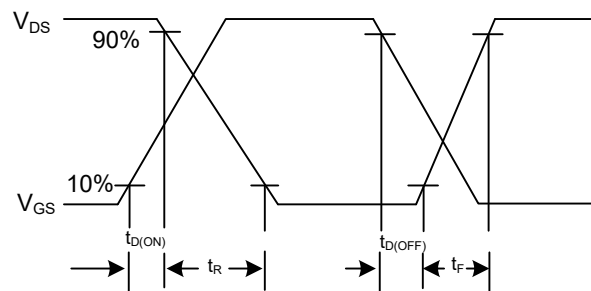
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

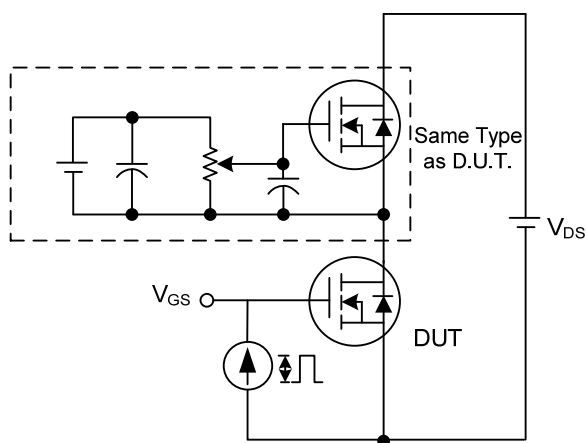
■ TEST CIRCUITS AND WAVEFORMS



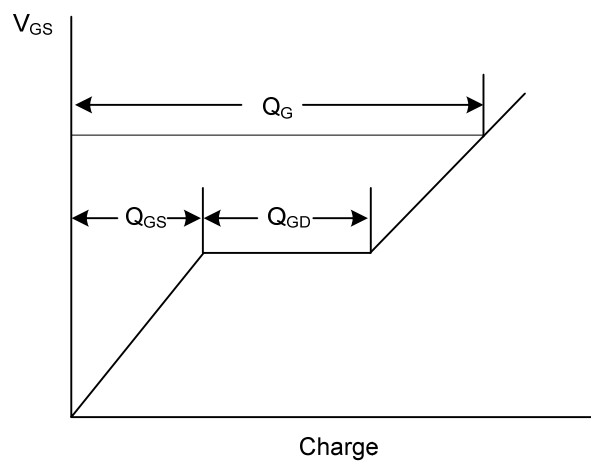
Switching Test Circuit



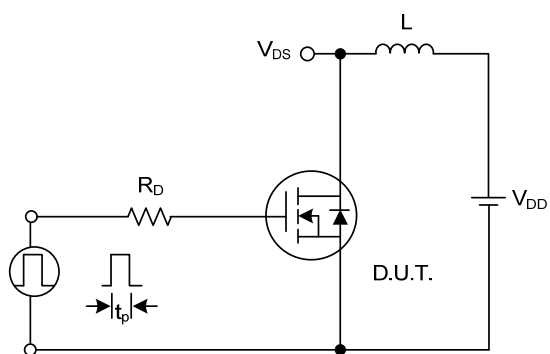
Switching Waveforms



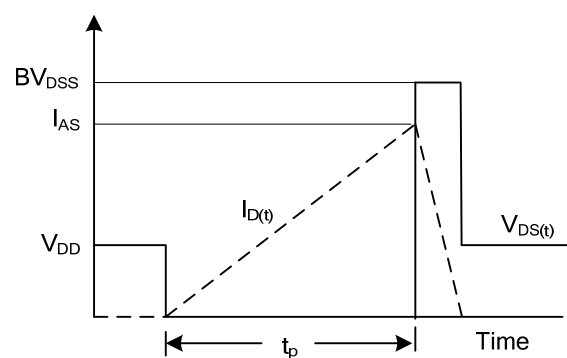
Gate Charge Test Circuit



Gate Charge Waveform

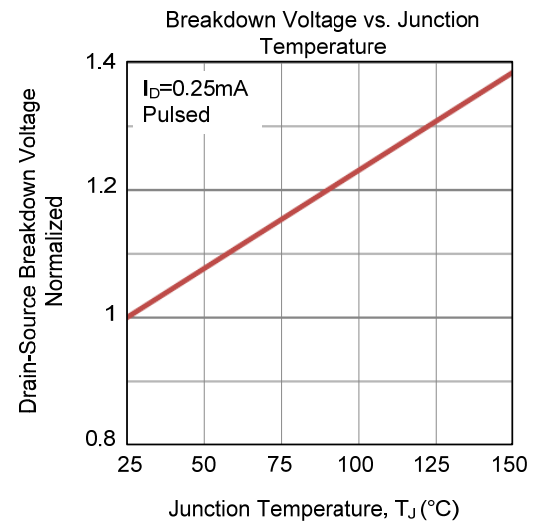
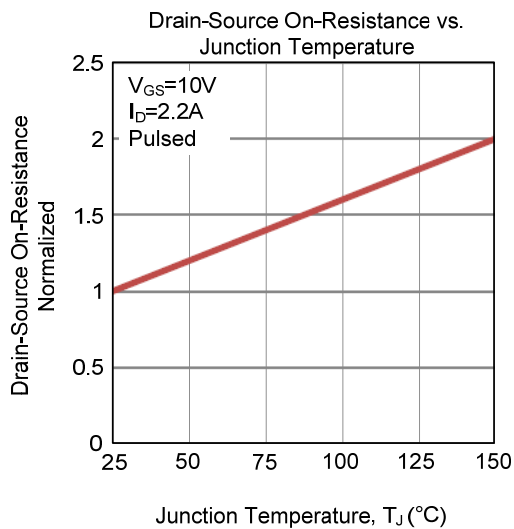
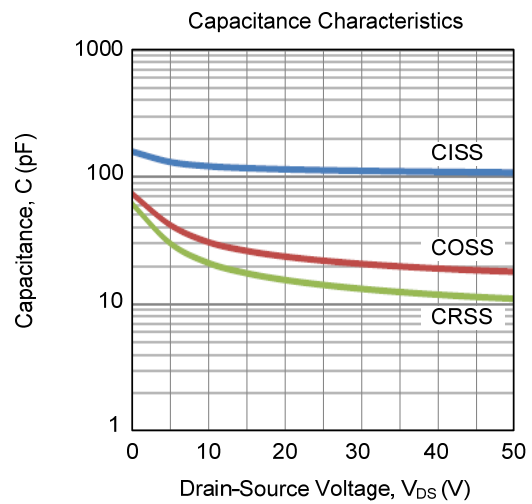
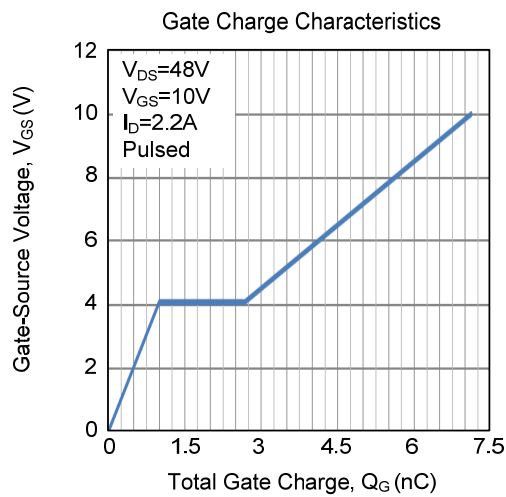
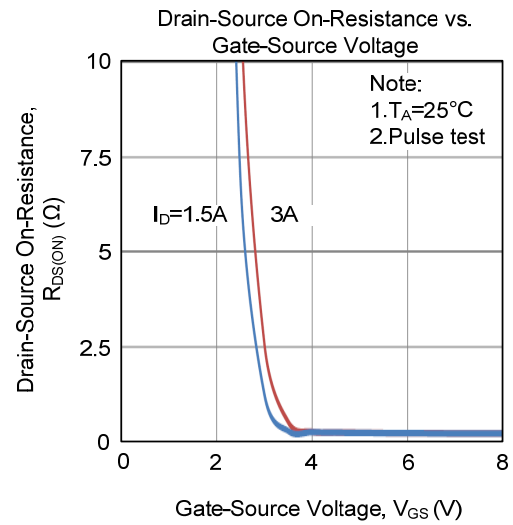
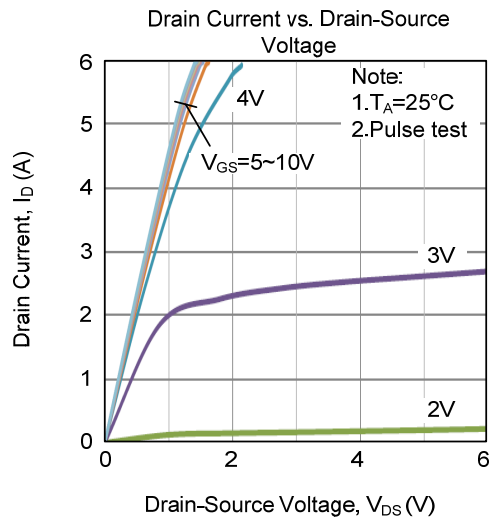


Unclamped Inductive Switching Test Circuit

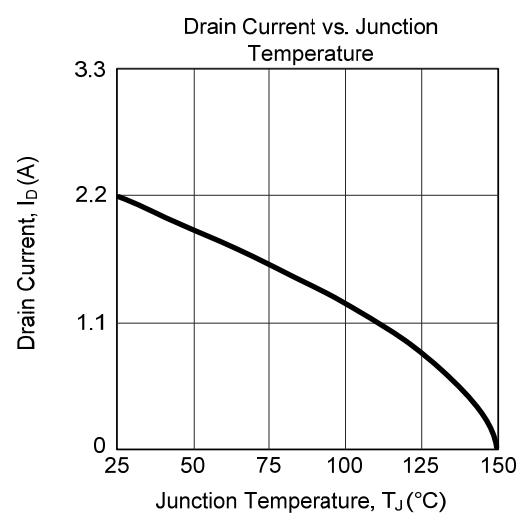
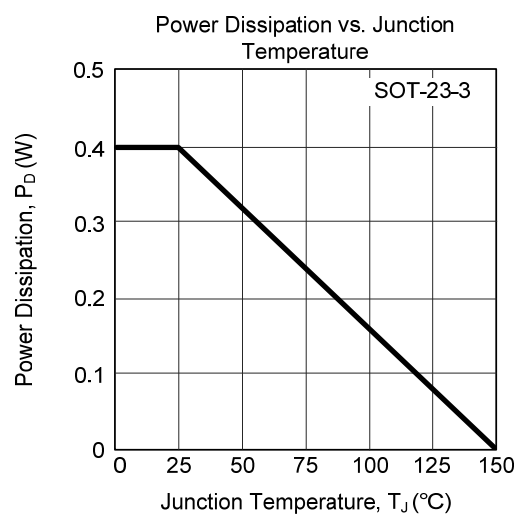
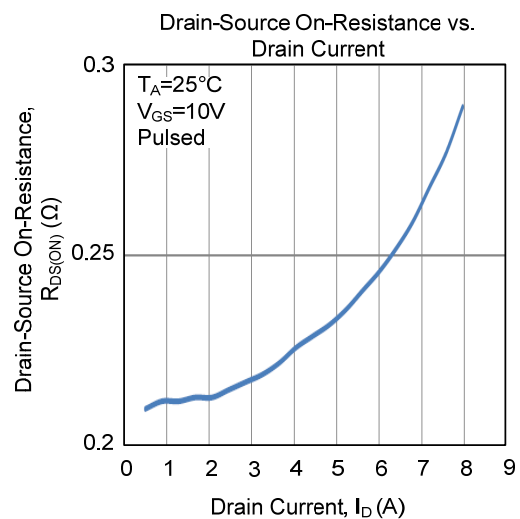
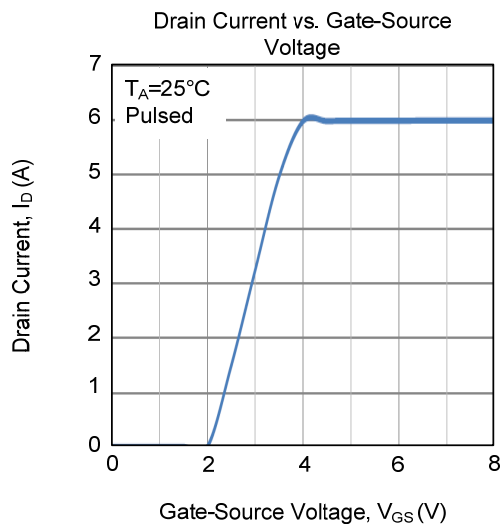
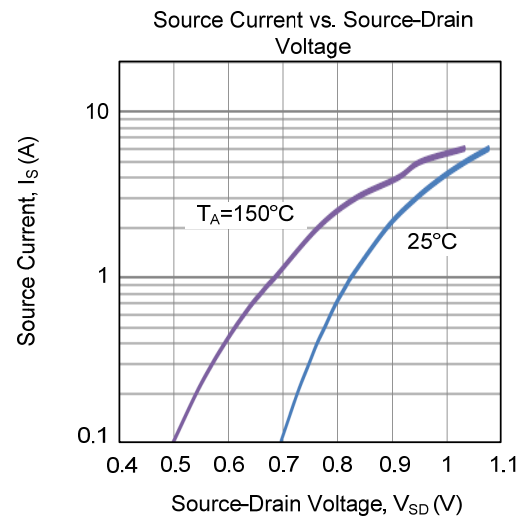
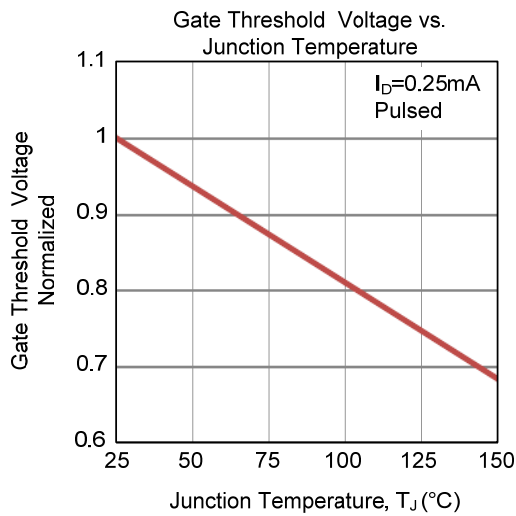


Unclamped Inductive Switching Waveforms

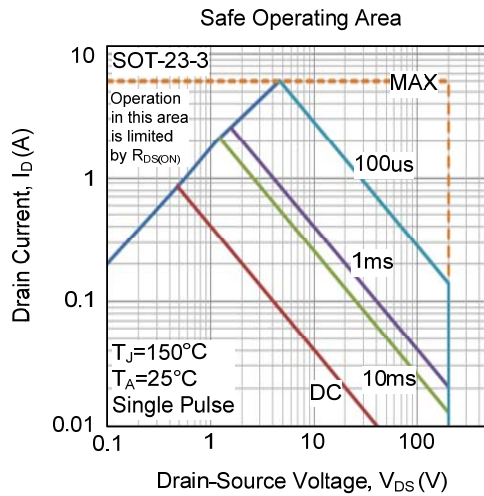
TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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