



UT3P06

Power MOSFET

-3.0A, -60V (D-S) P-CHANNEL POWER MOSFET

DESCRIPTION

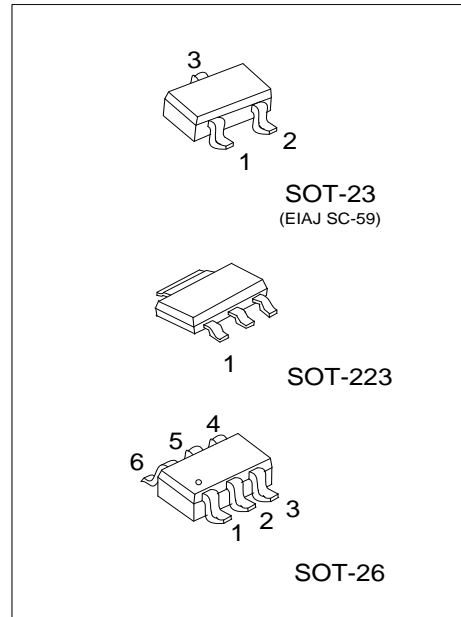
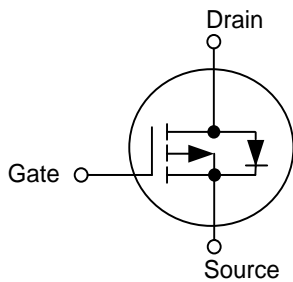
The UTC **UT3P06** is a P-channel enhancement power MOSFET using UTC's advanced technology to provide the customers with perfect $R_{DS(ON)}$ and low gate charge.

This UTC **UT3P06** can be operated with -4.5V low gate voltage.

FEATURES

- * $R_{DS(ON)} \leq 220 \text{ m}\Omega$ @ $V_{GS} = -10V, I_D = -3A$
- $R_{DS(ON)} \leq 310 \text{ m}\Omega$ @ $V_{GS} = -4.5V, I_D = -1.9A$

SYMBOL



ORDERING INFORMATION

Ordering Number		Package	Pin Assignment						Packing
Lead Free	Halogen Free		1	2	3	4	5	6	
UT3P06L-AA3-R	UT3P06G-AA3-R	SOT-223	G	D	S	-	-	-	Tape Reel
UT3P06L-AE3-R	UT3P06G-AE3-R	SOT-23	G	S	D	-	-	-	Tape Reel
UT3P06L-AG6-R	UT3P06G-AG6-R	SOT-26	D	D	G	S	D	D	Tape Reel

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

<p>UT3P06G-AA3-R</p>	<p>(1) R: Tape Reel</p> <p>(2) AA3: SOT-223, AE3: SOT-23, AG6: SOT-26</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING

SOT-223	SOT-23	SOT-26
<p>L: Lead Free G: Halogen Free Date Code</p>	<p>L: Lead Free G: Halogen Free</p>	<p>L: Lead Free G: Halogen Free</p>

■ **ABSOLUTE MAXIMUM RATINGS** ($T_A=25^{\circ}\text{C}$, 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	-3	A
	Pulsed	I_{DM}	-10	A
Avalanche Current ($L=0.1\text{mH}$)		I_{AR}	-7	A
Power Dissipation (Note 1, 2)	SOT-223	P_D	2.5	W
	SOT-23		0.35	W
	SOT-26		1.1	W
Junction Temperature		T_J	+150	$^{\circ}\text{C}$
Storage Temperature		T_{STG}	-55 ~ +150	$^{\circ}\text{C}$

■ **THERMAL DATA**

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient (Note 1,2)	SOT-223	θ_{JA}	50	$^{\circ}\text{C/W}$
	SOT-23		350	$^{\circ}\text{C/W}$
	SOT-26		110	$^{\circ}\text{C/W}$

- 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. Surface Mounted on FR4 Board.
 3. $t \leq 5$ sec.

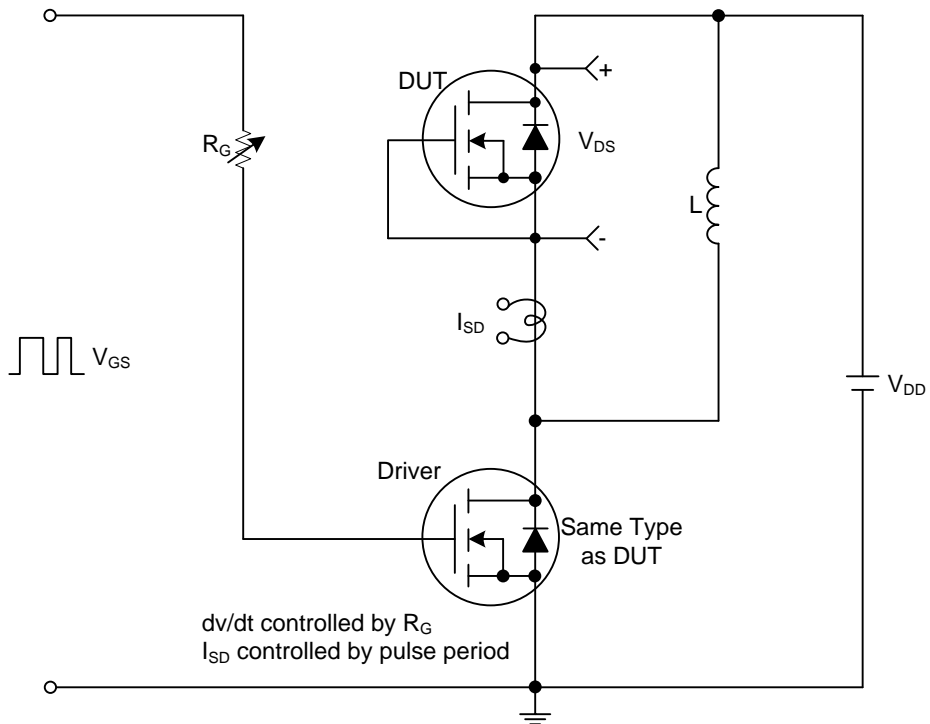
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

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} =-48V, V _{GS} =0V			-1	μA
		V _{DS} =-48V, V _{GS} =0V, T _J =150°C			-50	
Gate- Source Leakage Current	Forward	I _{GSS}				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 (Note 1)	R _{DS(ON)}	V _{GS} =-10V, I _D =-3A		120	220	mΩ
		V _{GS} =-4.5V, I _D =-1.9A		170	310	
On State Drain Current (Note 1)	I _{D(ON)}	V _{GS} =-10V, V _{DS} =-5V	-10			A
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{ISS}	V _{DS} = -25V, V _{GS} = 0V, f = 1MHz	450	540	650	pF
Output Capacitance	C _{OSS}		40	50	70	pF
Reverse Transfer Capacitance	C _{RSS}		30	38	55	pF
SWITCHING PARAMETERS (Note 2)						
Total Gate Charge	Q _G	V _{GS} =-10V, V _{DS} =-30V, I _D =-3A		13	18	nC
Gate to Source Charge	Q _{GS}		2.3			nC
Gate to Drain Charge	Q _{GD}		3.3			nC
Turn-ON Delay Time	t _{D(ON)}	V _{DD} =-30V, V _{GEN} =-10V, I _D =-1A, R _L =30 Ω, R _G =6Ω		5.6	16	ns
Rise Time	t _R		15	24	ns	
Turn-OFF Delay Time	t _{D(OFF)}		22	45	ns	
Fall-Time	t _F		15	25	ns	
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS (Note 2)						
Maximum Body-Diode Continuous Current	I _S				-1.7	A
Maximum Body-Diode Pulsed Current	I _{SM}				-10	A
Drain-Source Diode Forward Voltage	V _{SD}	I _S =-3A, V _{GS} =0V (Note 1)		-0.8	-1.2	V

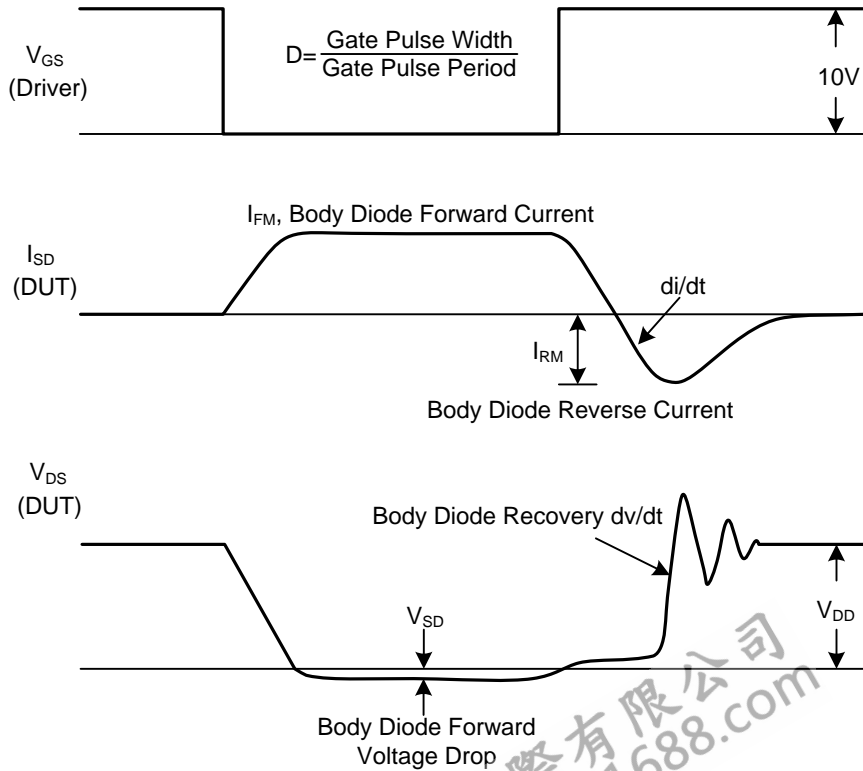
Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Guaranteed by design, not subject to production testing.

TEST CIRCUITS AND WAVEFORMS



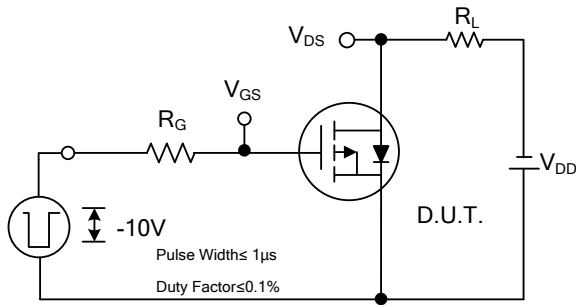
Peak Diode Recovery dv/dt Test Circuit



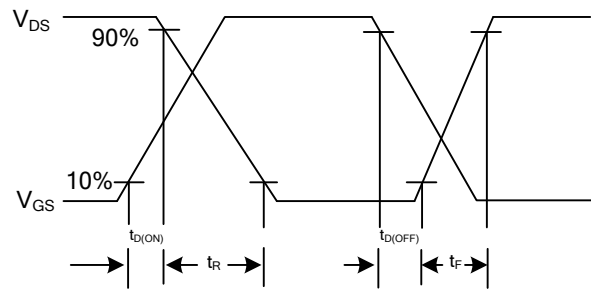
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

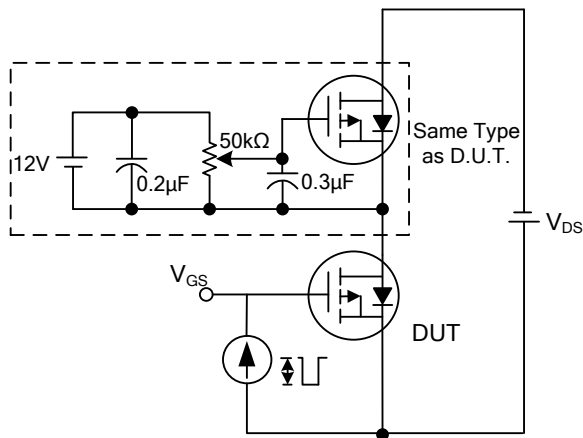
TEST CIRCUITS AND WAVEFORMS



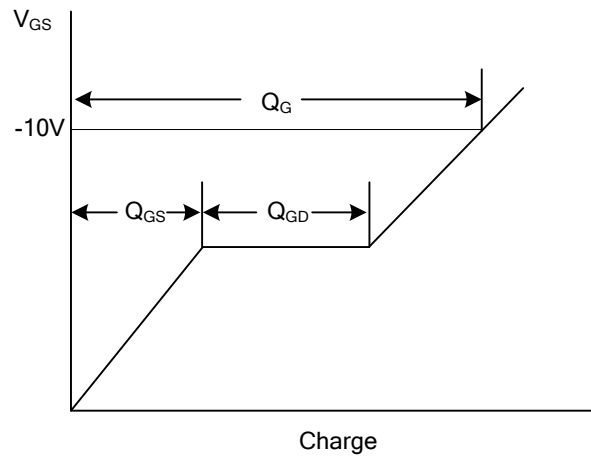
Switching Test Circuit



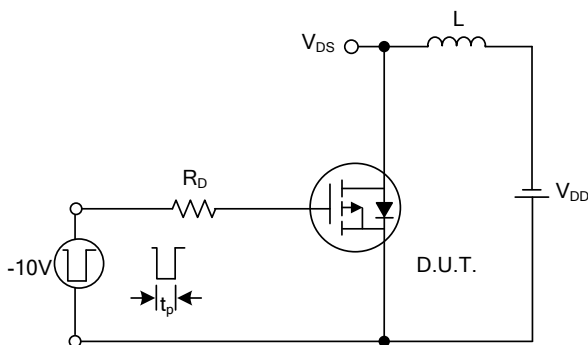
Switching Waveforms



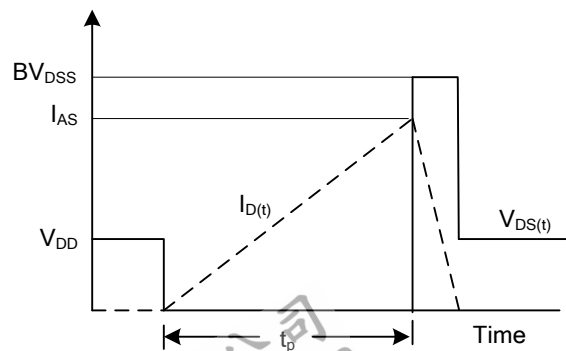
Gate Charge Test Circuit



Gate Charge Waveform

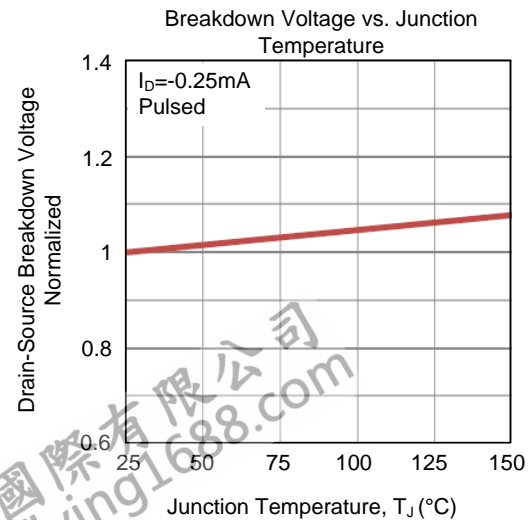
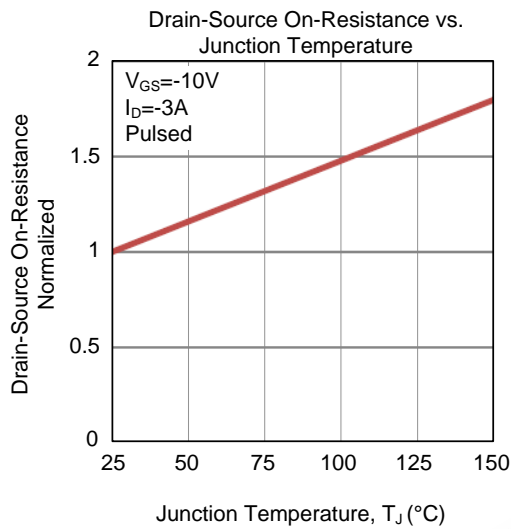
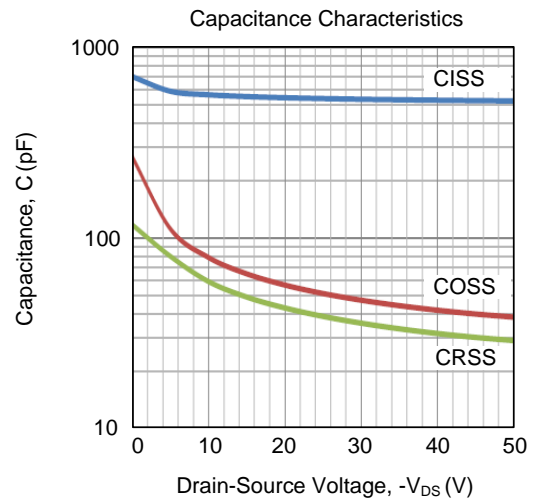
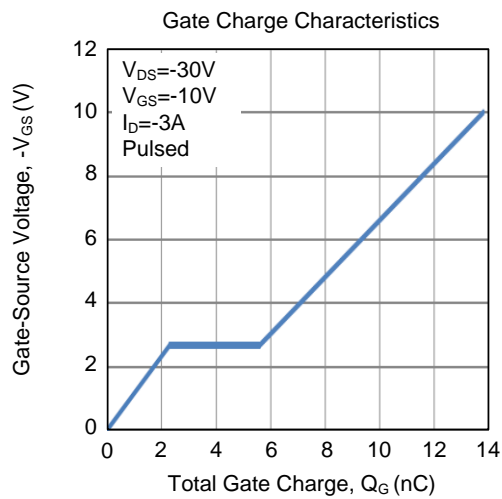
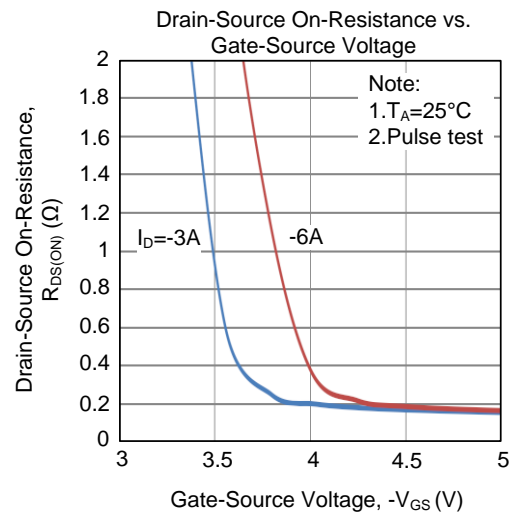
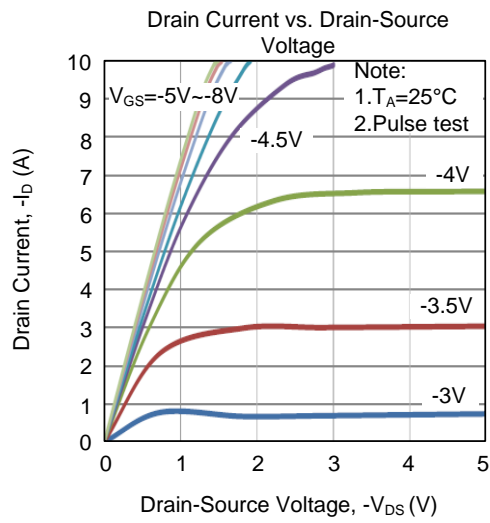


Unclamped Inductive Switching Test Circuit

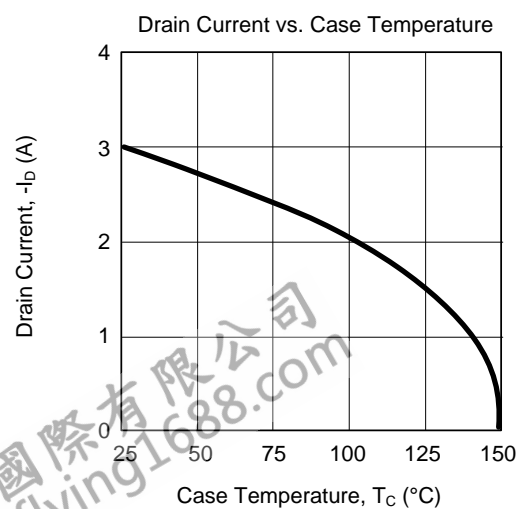
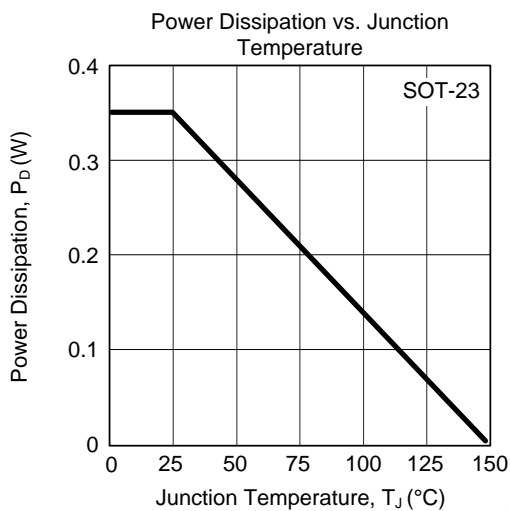
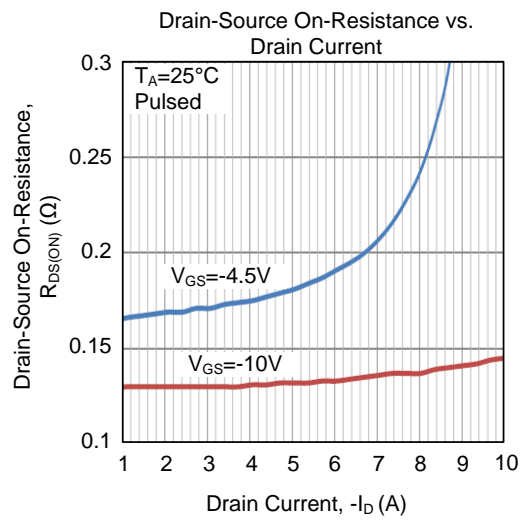
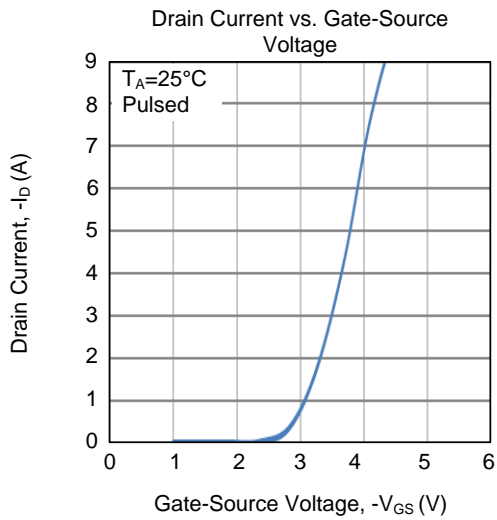
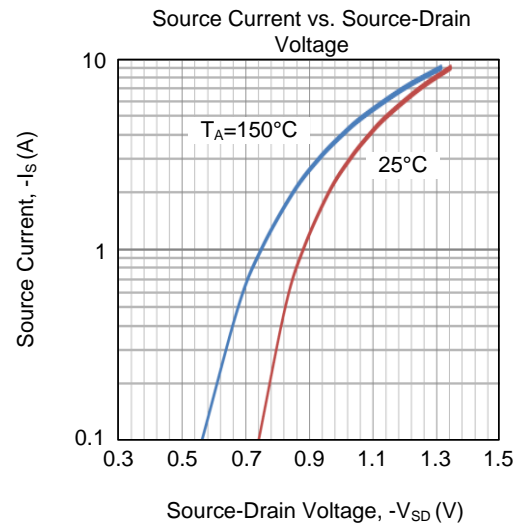
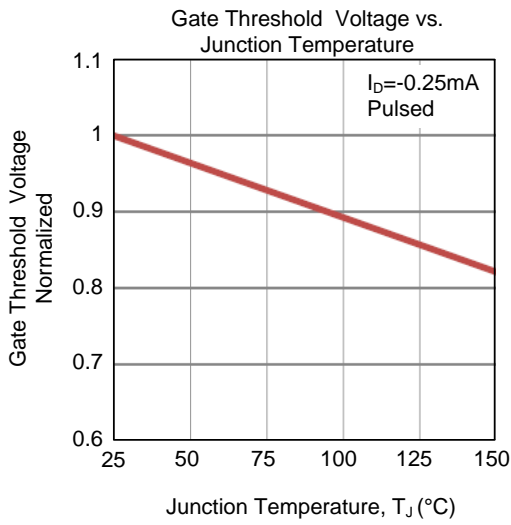


Unclamped Inductive Switching Waveforms

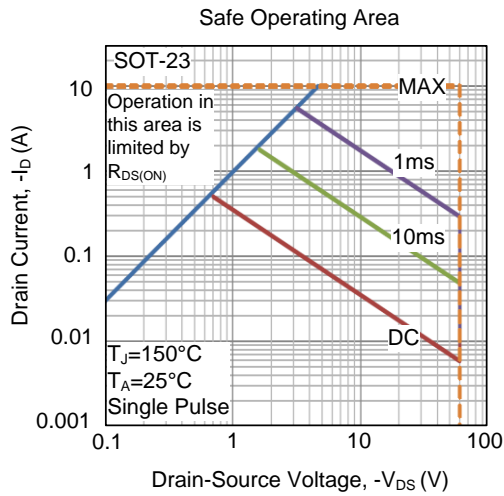
TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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