



UT3P06Z

Power MOSFET

P-CHANNEL LOGIC LEVEL ENHANCEMENT MODE

DESCRIPTION

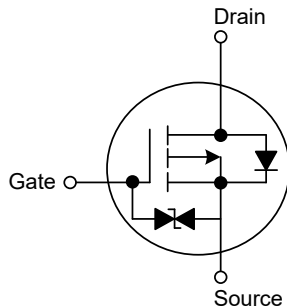
The **UT3P06Z** employs advanced MOSFET technology and features low gate charge while maintaining low on-resistance.

Optimized for switching applications, this device improves the overall efficiency of DC/DC converters and allows operation to higher switching frequencies.

FEATURES

- * $R_{DS(ON)} \leq 180 \text{ m}\Omega$ @ $V_{GS} = -10\text{V}$, $I_D = -1.5\text{A}$
 $R_{DS(ON)} \leq 240 \text{ m}\Omega$ @ $V_{GS} = -4.5\text{V}$, $I_D = -1.5\text{A}$
- * Low Capacitance
- * Low Gate Charge
- * Fast Switching Capability
- * Avalanche Energy Specified

SYMBOL

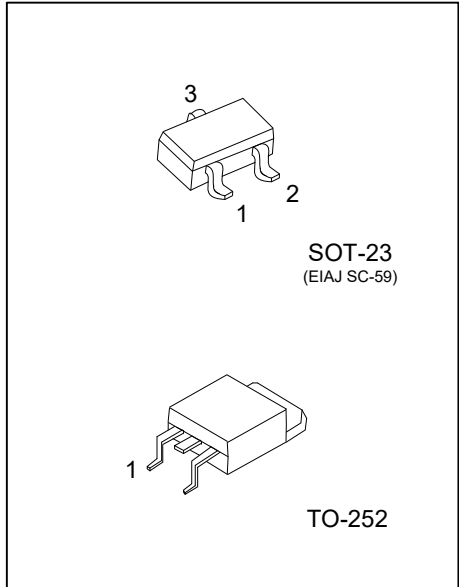


ORDERING INFORMATION

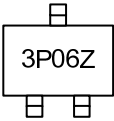
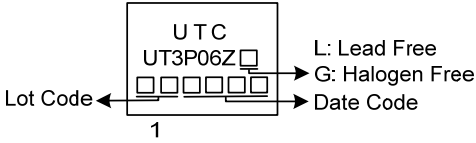
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT3P06ZL-AE3-R	UT3P06ZG-AE3-R	SOT-23	G	S	D	Tape Reel
UT3P06ZL-TN3-R	UT3P06ZG-TN3-R	TO-252	G	D	S	Tape Reel

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

UT3P06ZG-AE3-R		(1) Packing Type	(1) R: Tape Real
		(2) Package Type	(2) AE3: SOT-23, TN3: TO-252
		(3) Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free



MARKING

SOT-23	TO-252
	

■ 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
Continuous Drain Current	DC	I_D	-3	A
	Pulse		-10	A
Single Pulsed Avalanche Energy (Note 3)		E_{AS}	11	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	22	V/ns
Power Dissipation	SOT-23	P_D	1.25	W
	TO-252		30	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. $L = 1\text{mH}$, $I_{AS} = -4.6\text{A}$, $V_{DD} = -50\text{V}$, $R_G = 25\ \Omega$ Starting $T_J = 25^\circ\text{C}$

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

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-23	θ_{JA}	100	$^\circ\text{C}/\text{W}$
	TO-252		110	$^\circ\text{C}/\text{W}$

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

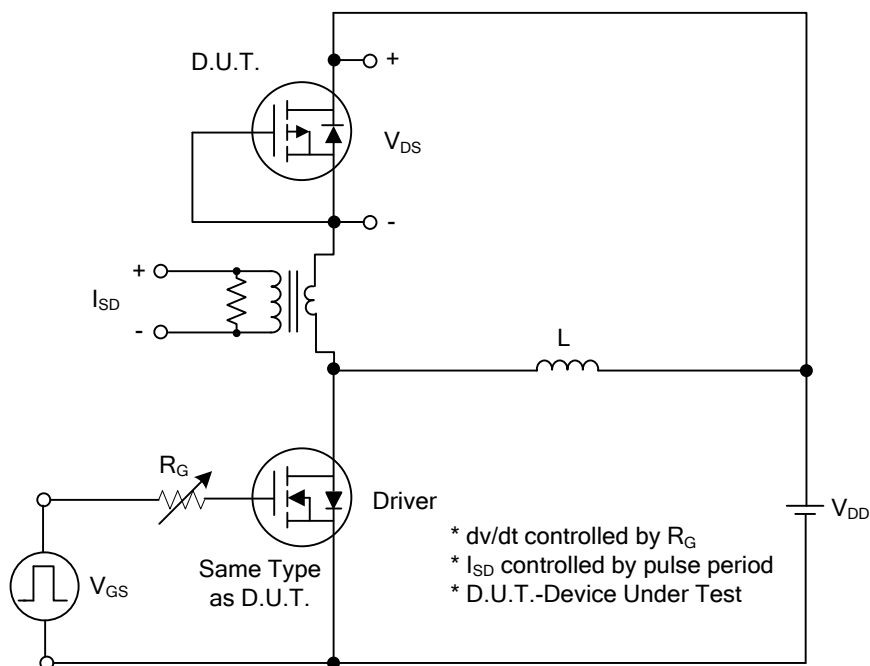
■ ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} =0V, I _D =-250μA	-60			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =-48V, V _{GS} =0V			-1	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{GS} =+20V, V _{DS} =0V			+10	μA
	Reverse		V _{GS} =-20V, V _{DS} =0V			-10	μA
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 =-1.5A			180	mΩ
			V _{GS} =-4.5V, I _D =-1.5A			240	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =-25V, f=1.0MHz		590		pF
Output Capacitance		C _{OSS}			50		pF
Reverse Transfer Capacitance		C _{RSS}			34		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q _G	V _{DS} =-48V, V _{GS} =-10V, I _D =-3A , (Note 1, 2)		12		nC
Gate to Source Charge		Q _{GS}			3		nC
Gate to Drain Charge		Q _{GD}			2		nC
Turn-ON Delay Time		t _{D(ON)}	V _{DD} =-30V, V _{GS} =-10V, I _D =-3A, R _G =-3Ω (Note 1, 2)		0.8		ns
Rise Time		t _R			17		ns
Turn-OFF Delay Time		t _{D(OFF)}			8		ns
Fall-Time		t _F			19		ns
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				-3	A
Maximum Body-Diode Pulsed Current		I _{SM}				-10	A
Diode Forward Voltage		V _{SD}	I _S =-3.0A, V _{GS} =0V (Note 1)			-1.2	V
Body Diode Reverse Recovery Time		t _{rr}	I _F =-3.0A, V _{GS} =0V, di/dt=100A/μs		14		ns
Body Diode Reverse Recovery Charge		Q _{rr}			1330		μC

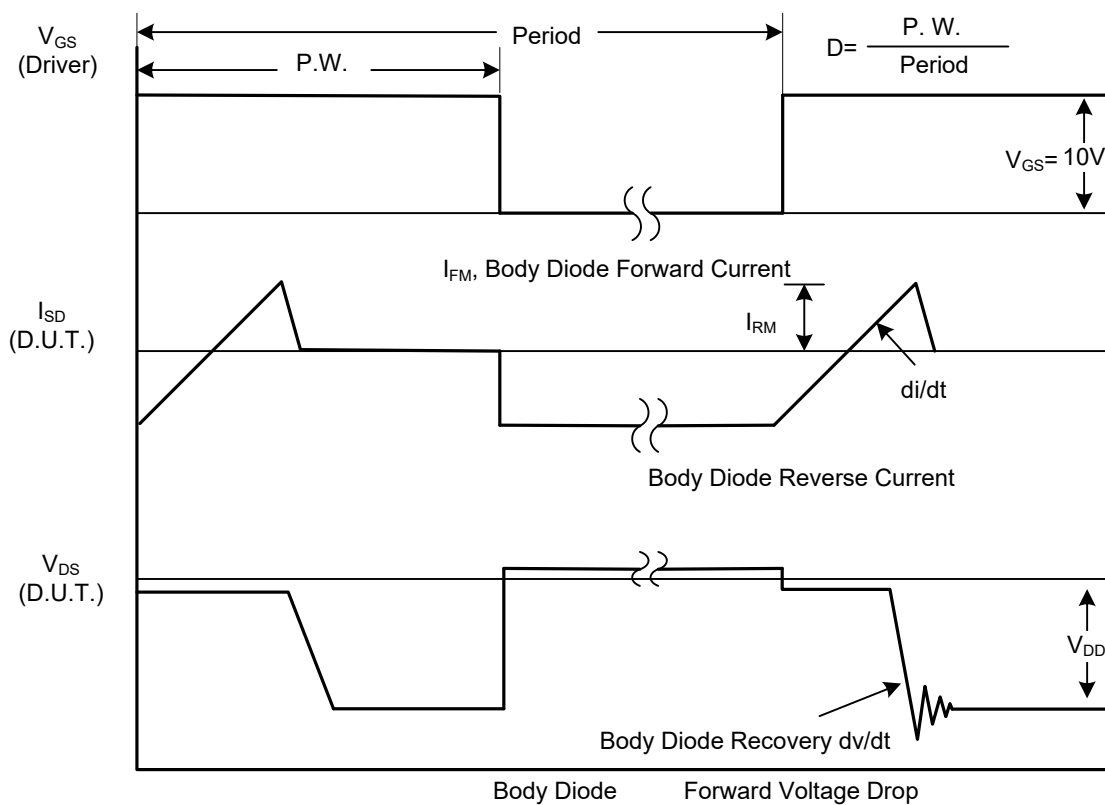
Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

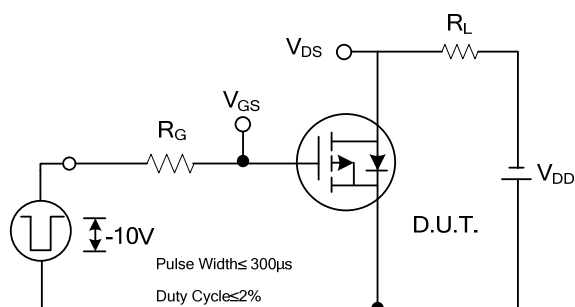


Peak Diode Recovery dv/dt Test Circuit

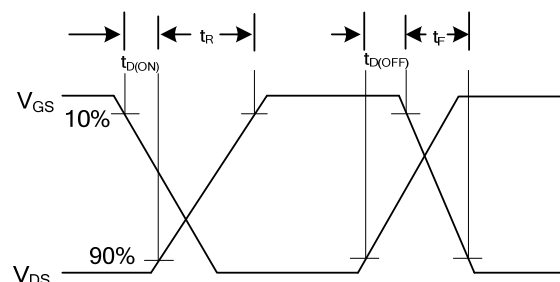


Peak Diode Recovery dv/dt Waveforms

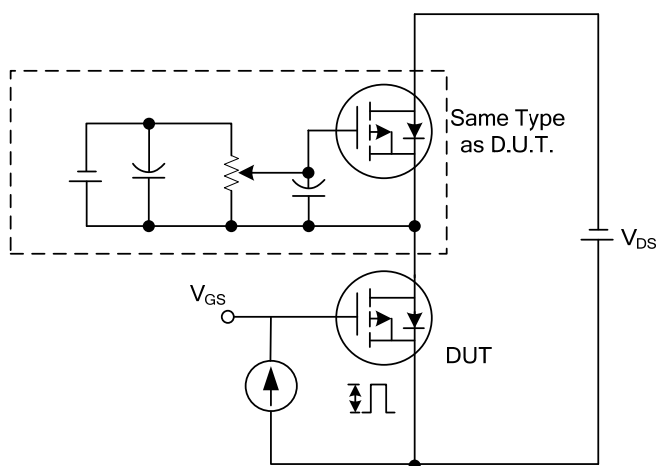
■ TEST CIRCUITS AND WAVEFORMS



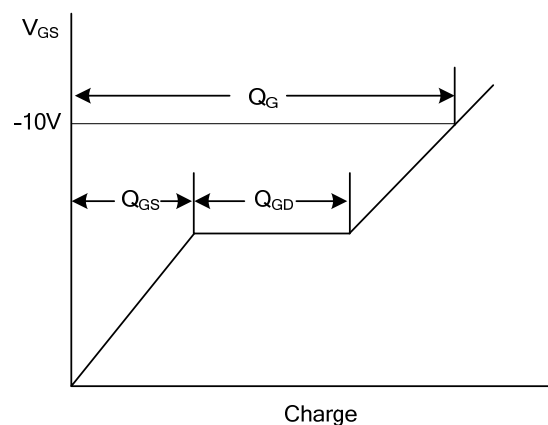
Switching Test Circuit



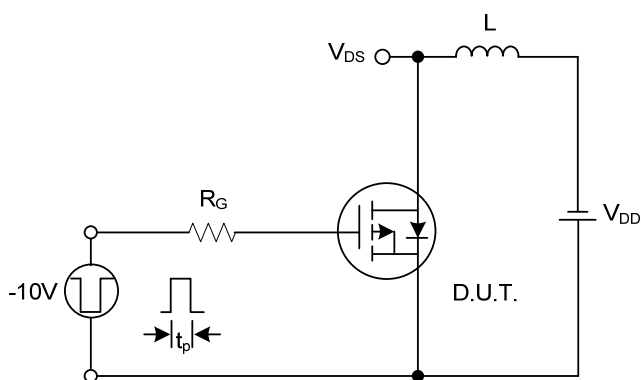
Switching Waveforms



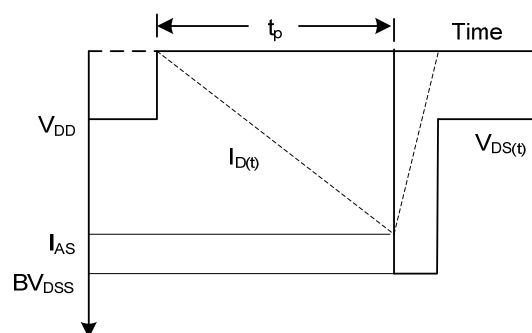
Gate Charge Test Circuit



Gate Charge Waveform

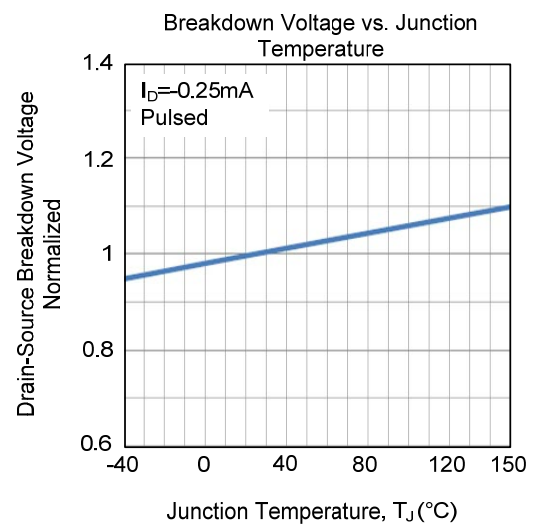
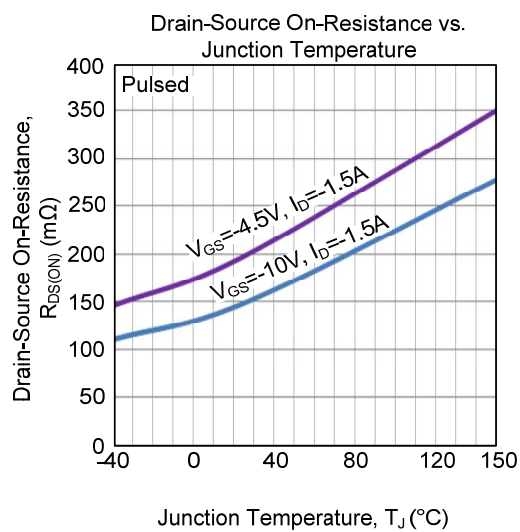
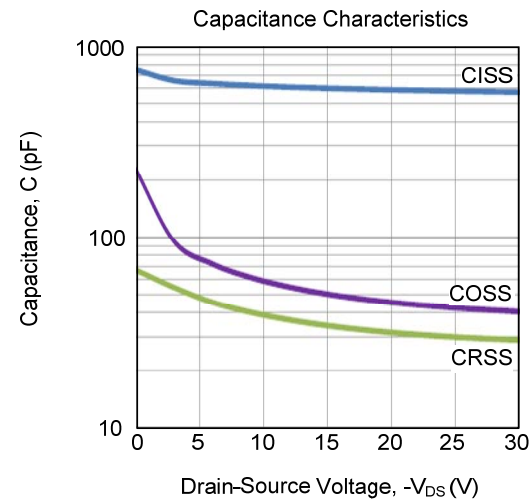
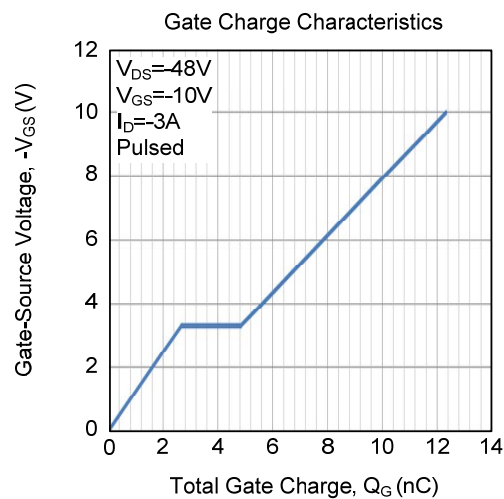
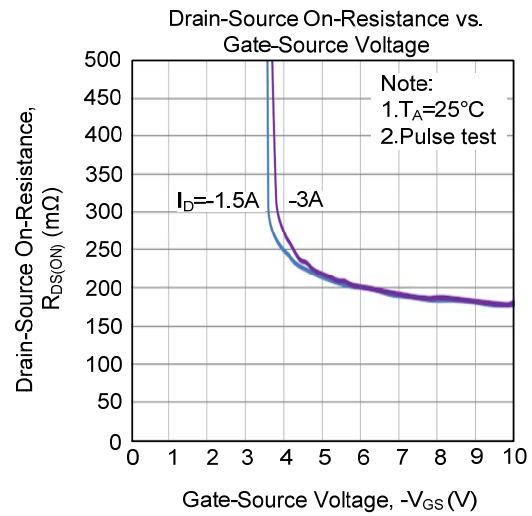
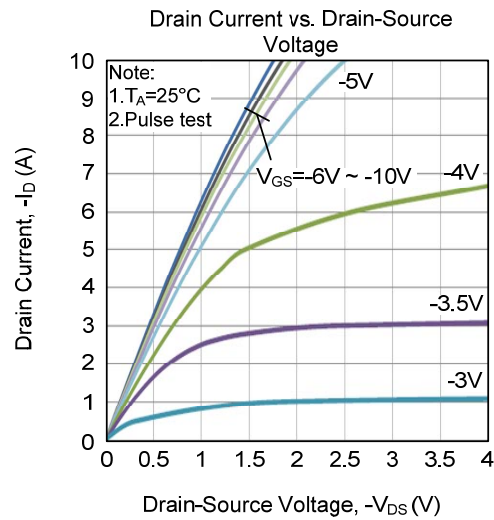


Unclamped Inductive Switching Test Circuit

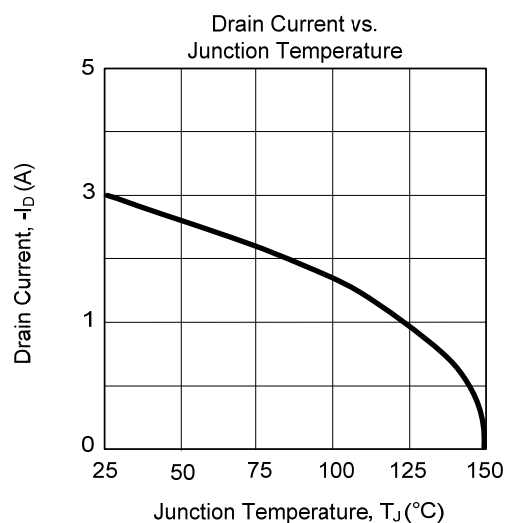
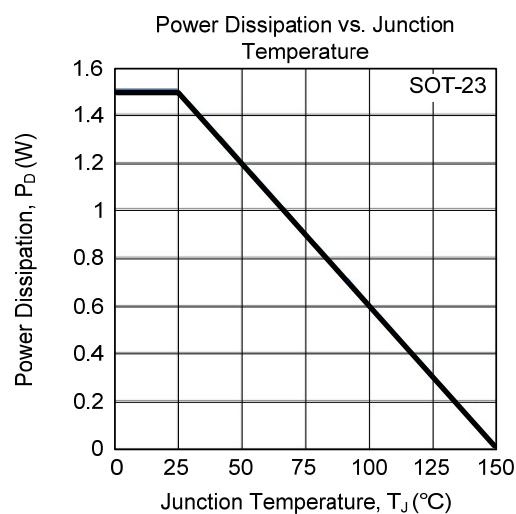
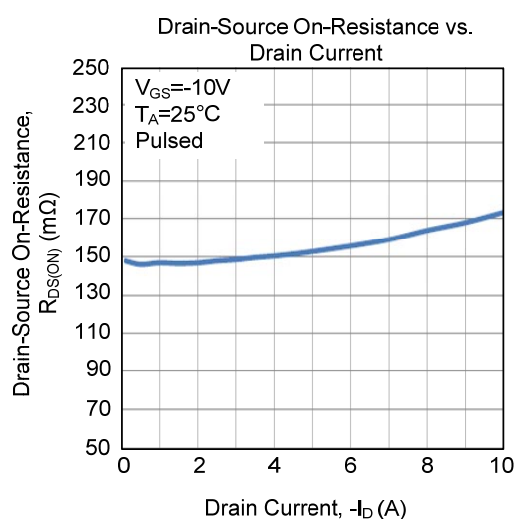
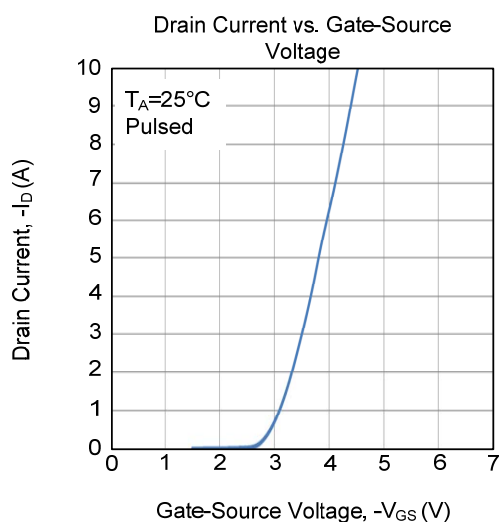
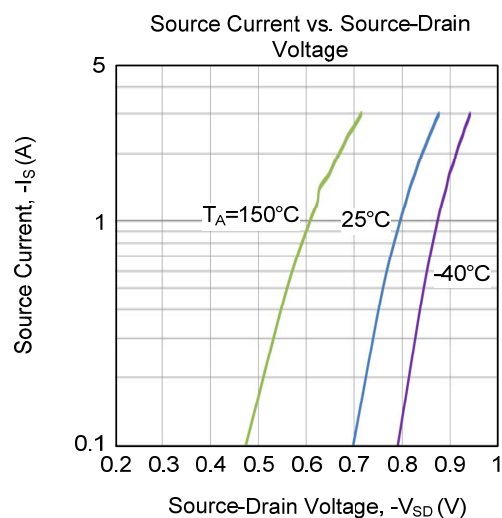
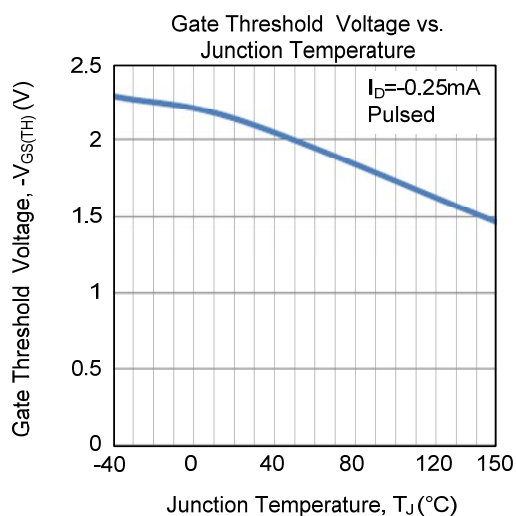


Unclamped Inductive Switching Waveforms

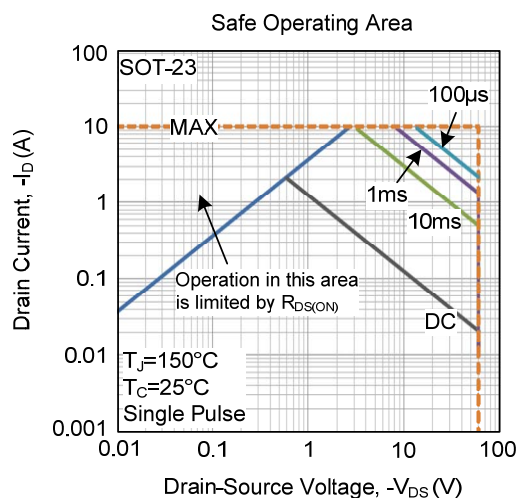
TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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