



UT05P06MZ

Power MOSFET

-0.5A, -60V P-CHANNEL POWER MOSFET

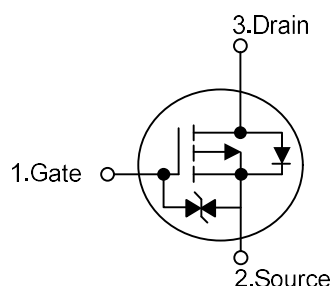
DESCRIPTION

The UTC **UT05P06MZ** is a P-channel enhancement mode power MOSFET with fast switching speed, low on-resistance and favorable stabilization. It can be used in commercial and industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

FEATURES

- * $R_{DS(ON)} \leq 1.8 \Omega$ @ $V_{GS} = -10V$, $I_D = -0.25A$
- * $R_{DS(ON)} \leq 3.3 \Omega$ @ $V_{GS} = -4.5V$, $I_D = -0.25A$
- * Low on-resistance
- * Low drive current
- * High speed switching
- * With ESD protection

SYMBOL



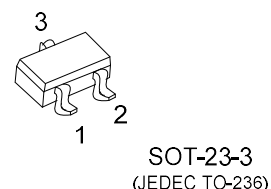
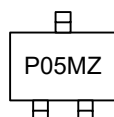
ORDERING INFORMATION

Ordering Number	Package	Pin Assignment			Packing
		1	2	3	
UT05P06MZG-AE2-R	SOT-23-3	G	S	D	Tape Reel

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

UT05P06MZG-AE2-R	(1) Packing Type (2) Package Type (3) Green Package	(1) R: Tape Reel (2) AE2: SOT-23-3 (3) G: Halogen Free and Lead Free
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MARKING



SOT-23-3
(JEDEC TO-236)

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DS}	-60	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	Continuous	I_D	-0.5	A
Pulsed Drain Current	Pulsed (Note 2)	I_{DM}	-2	A
Power Dissipation		P_D	0.4	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.

■ THERMAL DATA

PARAMETER	SYMBOL	RATING	UNIT
Junction to Ambient	θ_{JA}	625 (Note)	$^\circ\text{C/W}$

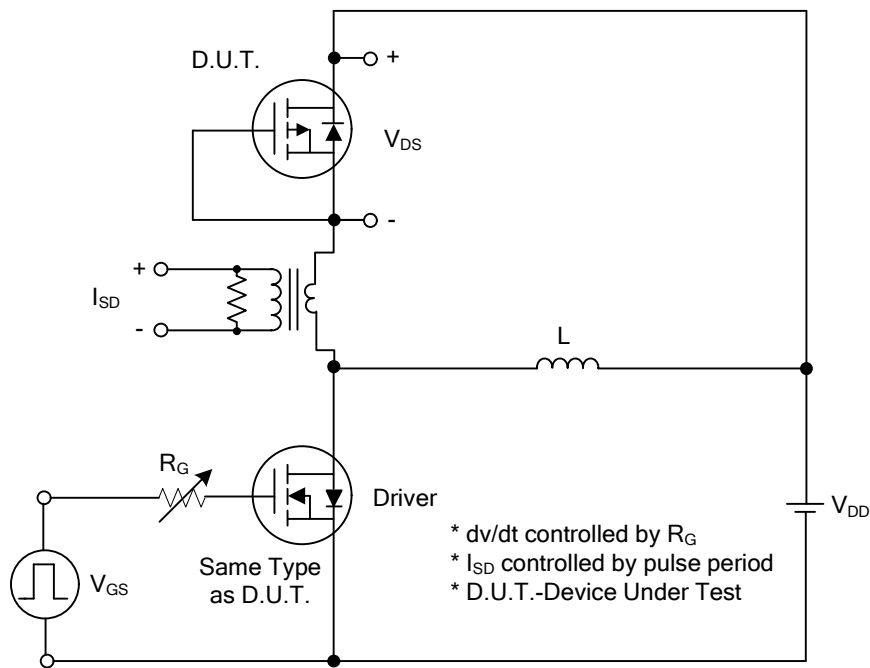
Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

■ ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$, unless otherwise specified)

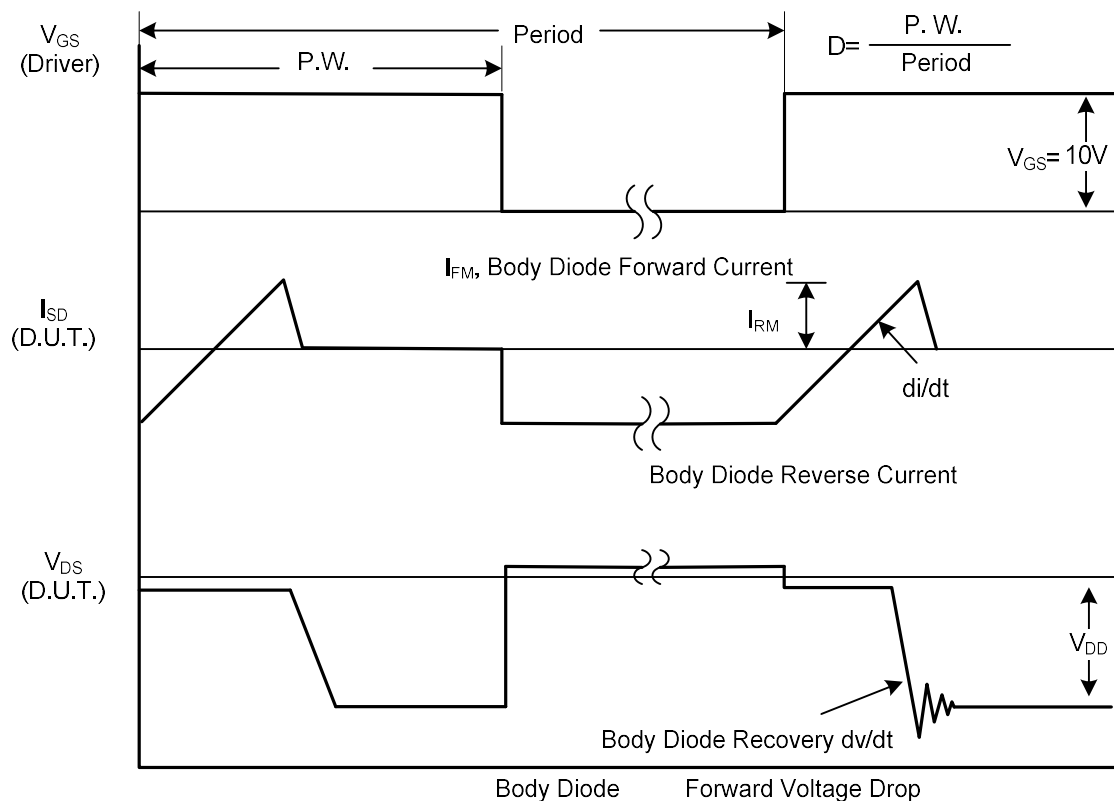
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} =0 V, I _D =-250μA	-60			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =-60V, V _{GS} =0V			-1	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{DS} =0V, V _{GS} =+20V			10	μA
	Reverse		V _{DS} =0V, V _{GS} =-20V			-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 =-0.25A			1.8	Ω
			V _{GS} =-4.5V, I _D =-0.25A			3.3	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =-25V, f=1.0MHz		41		nF
Output Capacitance		C _{OSS}			12		nF
Reverse Transfer Capacitance		C _{RSS}			6		nF
SWITCHING PARAMETERS							
Total Gate Charge		Q _G	V _{DS} =-48V, V _{GS} =-10V, I _D =-0.5A (Note 1, 2)		9		nC
Gate to Source Charge		Q _{GS}			1		nC
Gate to Drain Charge		Q _{GD}			1		nC
Turn-ON Delay Time		t _{D(ON)}	V _{DS} =-30V, V _{GS} =-10V, I _D =-0.5A, R _G =3Ω (Note 1, 2)		8		ns
Rise Time		t _R			17		ns
Turn-OFF Delay Time		t _{D(OFF)}			37		ns
Fall-Time		t _F			23		ns
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Continuous Drain-Source Diode Forward Current		I _S				-0.5	A
Diode Forward Voltage		V _{SD}	I _S =-0.5A, V _{GS} =0V			-1.2	V

Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.
2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

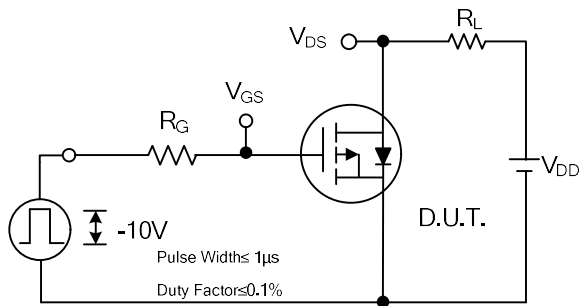


Peak Diode Recovery dv/dt Test Circuit

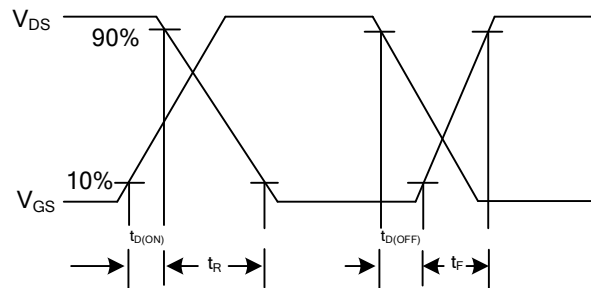


Peak Diode Recovery dv/dt Waveforms

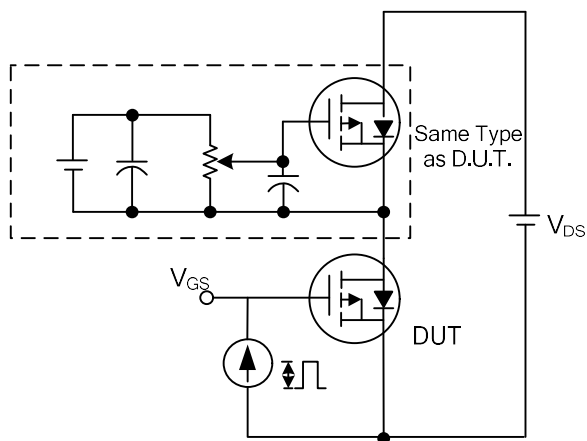
■ TEST CIRCUITS AND WAVEFORMS



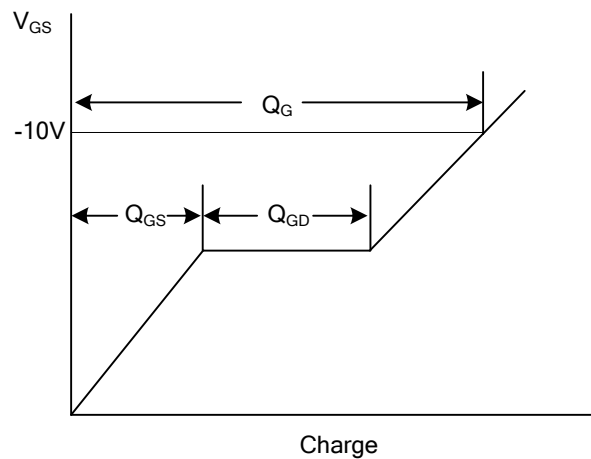
Switching Test Circuit



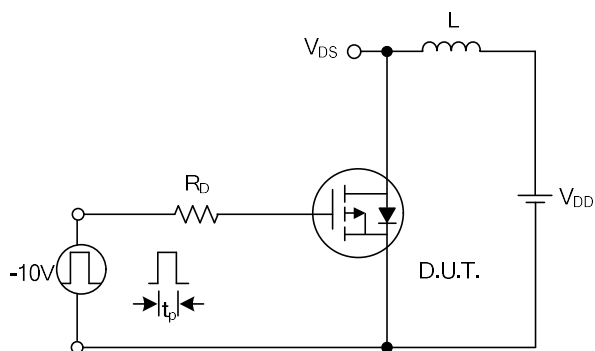
Switching Waveforms



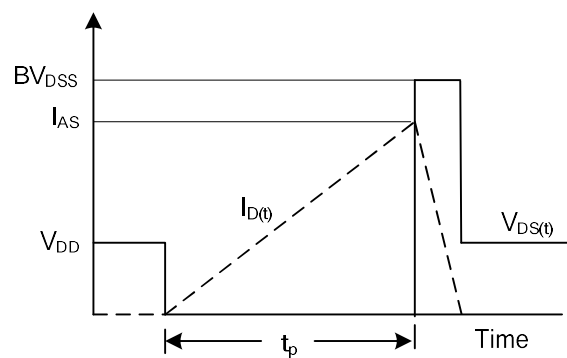
Gate Charge Test Circuit



Gate Charge Waveform

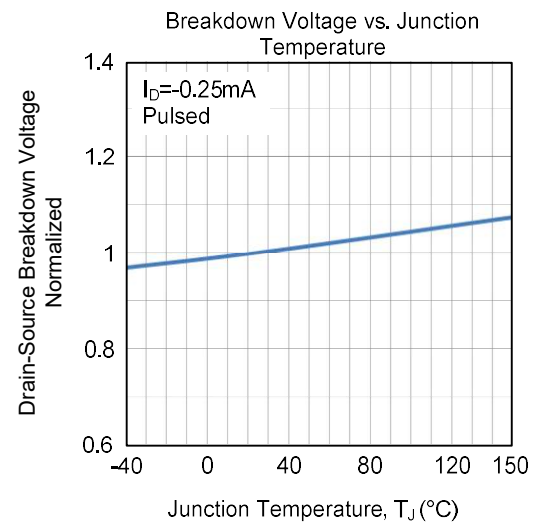
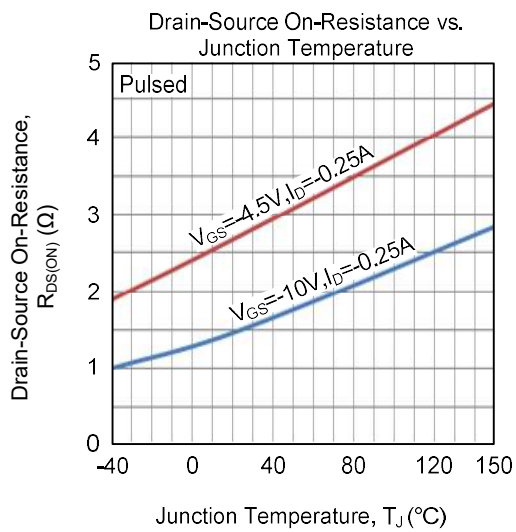
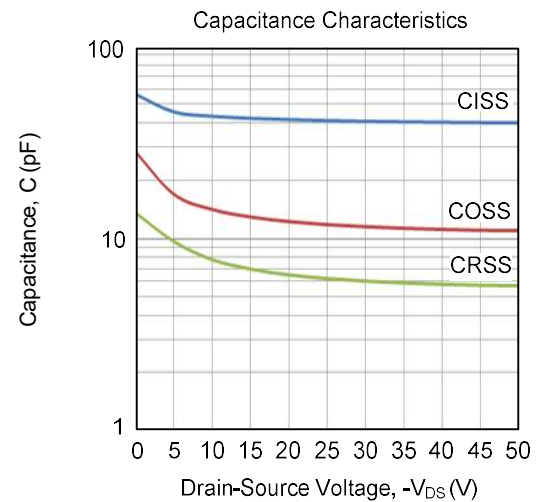
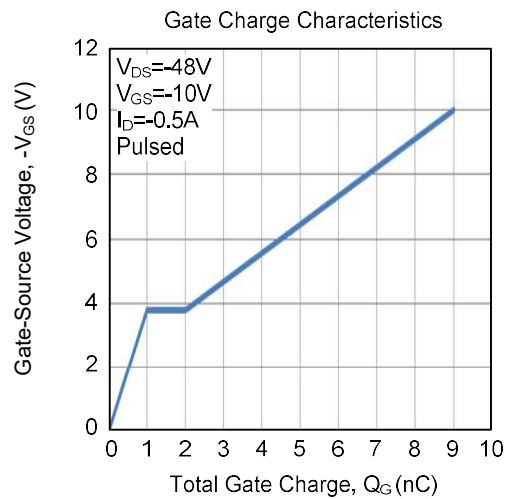
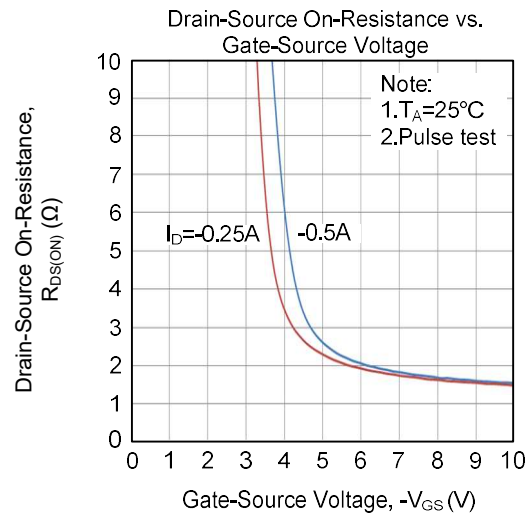
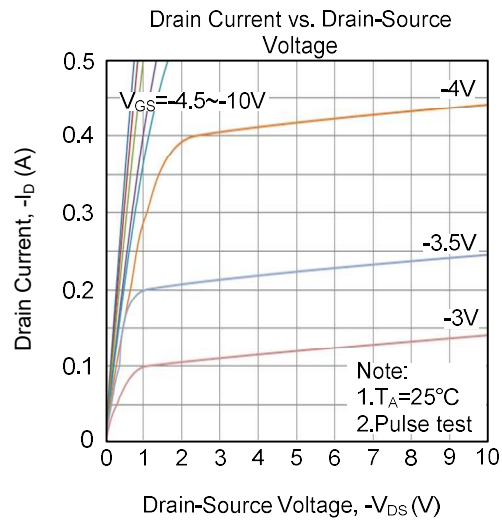


Unclamped Inductive Switching Test Circuit

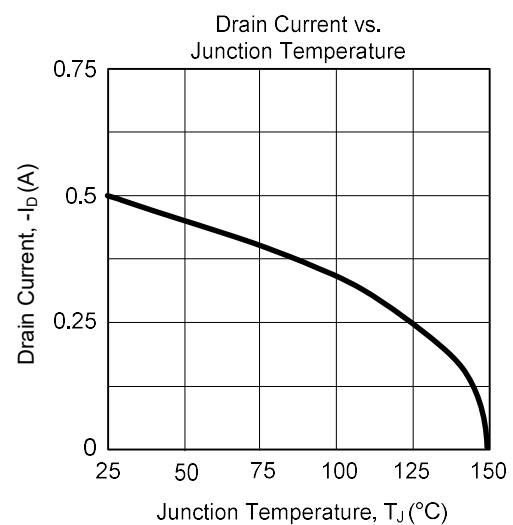
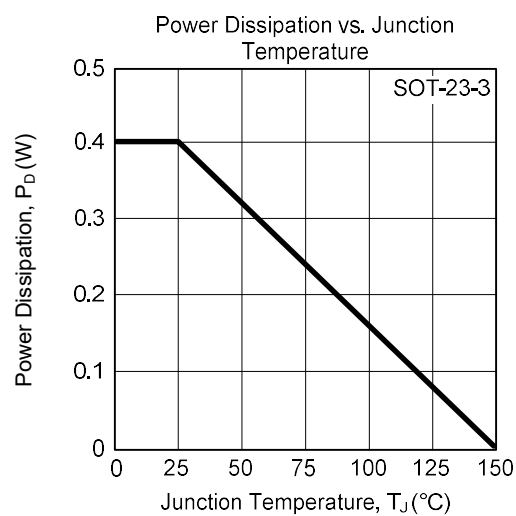
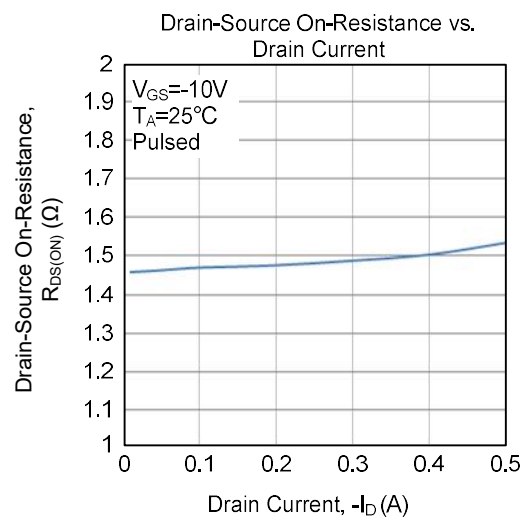
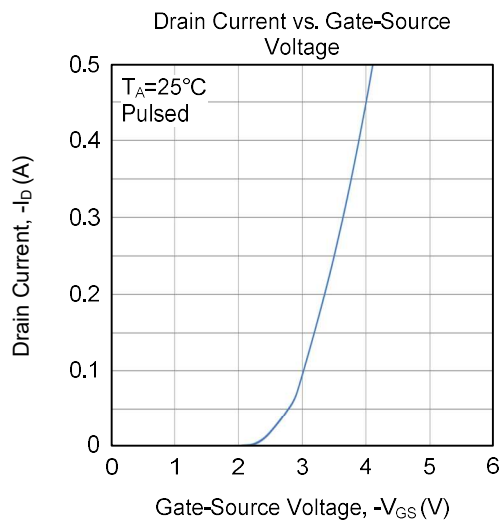
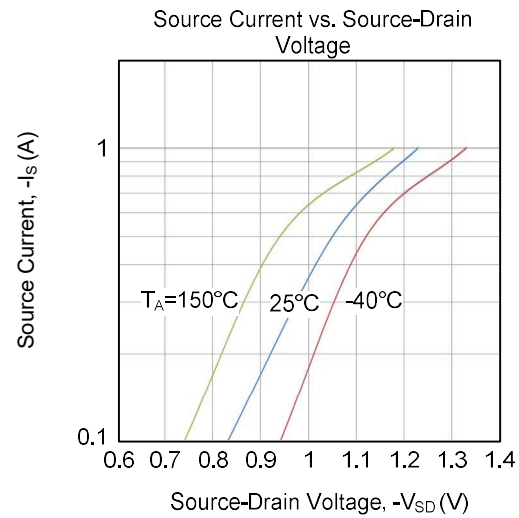
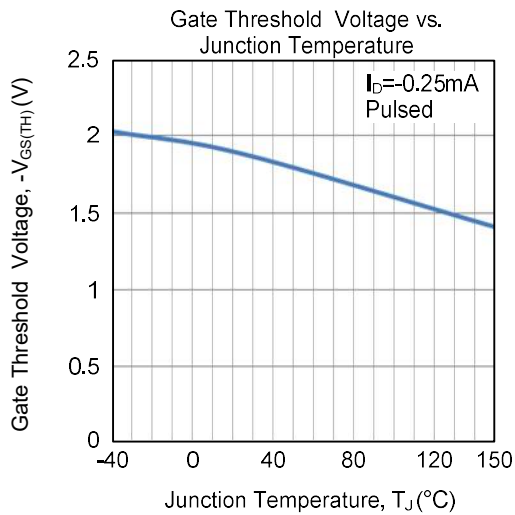


Unclamped Inductive Switching Waveforms

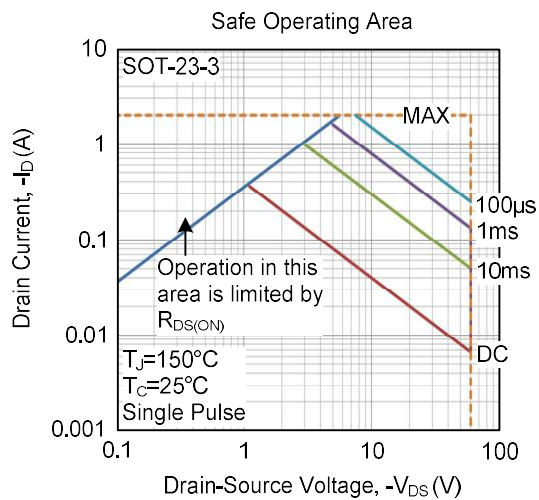
TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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