



UT4801

POWER MOSFET

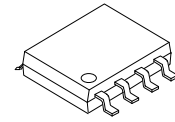
-5.0A, -30V P-CHANNEL POWER MOSFET

DESCRIPTION

The UTC **UT4801** combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. This device is suitable for use as a load switch or in PWM applications.

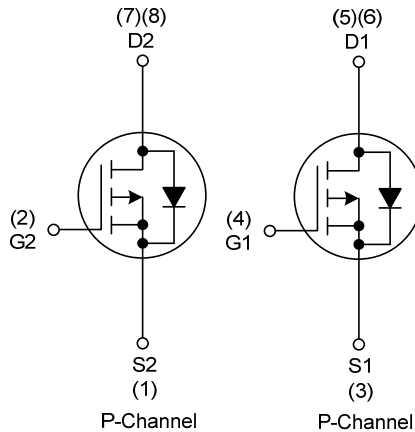
FEATURES

- * $R_{DS(ON)} \leq 48 \text{ m}\Omega$ @ $V_{GS} = -10\text{V}$, $I_D = -5.0\text{A}$
- $R_{DS(ON)} \leq 57 \text{ m}\Omega$ @ $V_{GS} = -4.5\text{V}$, $I_D = -3.5\text{A}$
- $R_{DS(ON)} \leq 80 \text{ m}\Omega$ @ $V_{GS} = -2.5\text{V}$, $I_D = -2.5\text{A}$
- * High Switching Speed
- * High Cell Density Trench Technology



SOP-8

SYMBOL



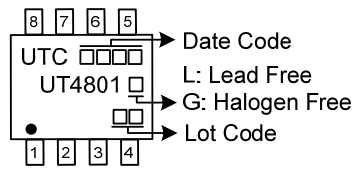
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT4801L-S08-R	UT4801G-S08-R	SOP-8	S2	G2	S1	G1	D1	D1	D2	D2	Tape Reel

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

UT4801G-S08-R (1) Packing Type (2) Package Type (3) Green Package		(1) R: Tape Reel (2) S08: SOP-8 (3) G: Halogen Free and Lead Free, L: Lead Free
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■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	± 12	V
Drain Current	Continuous	I_D	-5	A
	Pulsed	I_{DM}	-20	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	11	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	1.7	V/ns
Power Dissipation (Note 1, 2)		P_D	1.2	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. $L=0.1\text{mH}$, $I_{AS}=-15\text{A}$, $V_{DD}=-25\text{V}$, $R_G=25\Omega$, Starting $T_J = 25^{\circ}\text{C}$.

4. $I_{SD} \leq -5.0\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq V_{(BR)DSS}$, $T_J = 25^{\circ}\text{C}$.

■ **THERMAL DATA**

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	125	$^{\circ}\text{C}/\text{W}$
Junction to Case	θ_{JC}	104	$^{\circ}\text{C}/\text{W}$

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

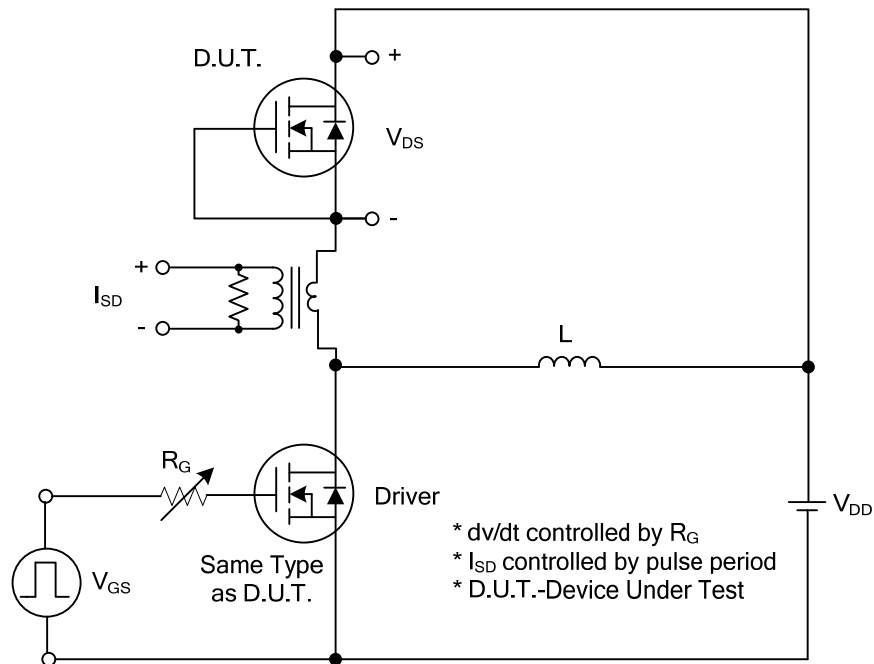
■ **ELECTRICAL CHARACTERISTICS** ($T_J=25^{\circ}\text{C}$ unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} =0V, I _D =-250μA	-30			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =-30V, V _{GS} =0V			-1	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{GS} =+12V, V _{DS} =0V			+100	nA
	Reverse		V _{GS} =-12V, V _{DS} =0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} = V _{GS} , I _D =-250μA	-0.5		-1.3	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =-10V, I _D =-5.0A			48	mΩ
			V _{GS} =-4.5V, I _D =-3.5A			57	mΩ
			V _{GS} =-2.5V, I _D =-2.5A			80	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =-15V, f=1.0MHz		993		pF
Output Capacitance		C _{OSS}			128		pF
Reverse Transfer Capacitance		C _{RSS}			112		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q _G	V _{DS} =-24V, V _{GS} =-10V, I _D =-5A , (Note 1, 2)		28		nC
Gate to Source Charge		Q _{GS}			3		nC
Gate to Drain Charge		Q _{GD}			5		nC
Turn-ON Delay Time		t _{D(ON)}	V _{DD} =-15V, V _{GS} =-10V, I _D =-5A, R _G =6Ω (Note 1, 2)		5		ns
Rise Time		t _R			19		ns
Turn-OFF Delay Time		t _{D(OFF)}			46		ns
Fall-Time		t _F			25		ns
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Continuous Drain-Source Diode Forward Current		I _S				-5	A
Maximum Pulsed Drain-Source Diode Forward Current		I _{SM}				-10	A
Diode Forward Voltage		V _{SD}	I _F =-5.0A, V _{GS} =0V			-1.4	V
Reverse Recovery Time		t _{rr}	I _S =-5.0A, V _{GS} =0V		332		ns
Reverse Recovery Charge		Q _{rr}	dl _F /dt=-100A/μs (Note 1)		850		nC

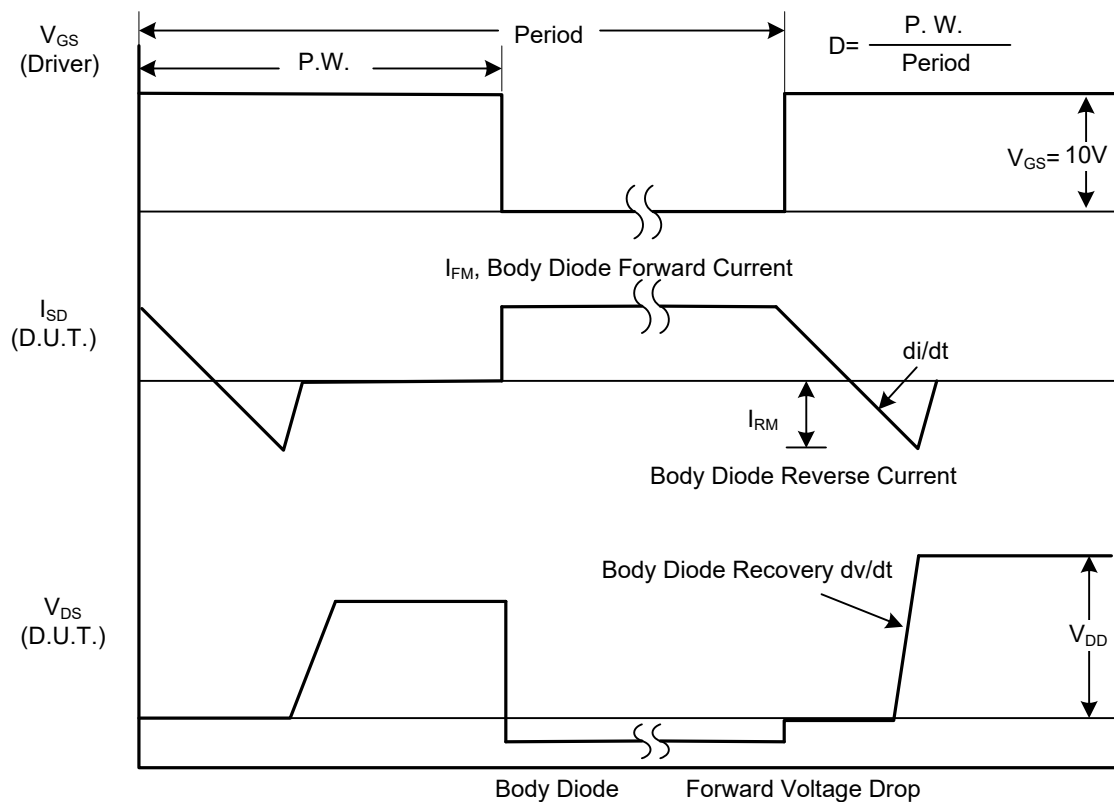
Notes: 1. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

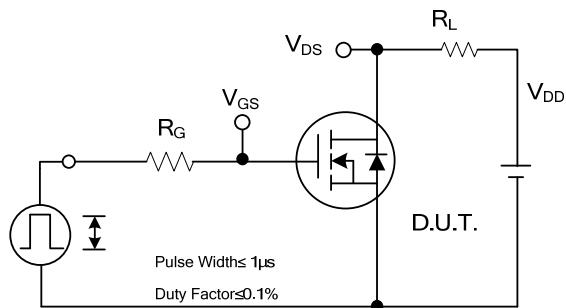


Peak Diode Recovery dv/dt Test Circuit

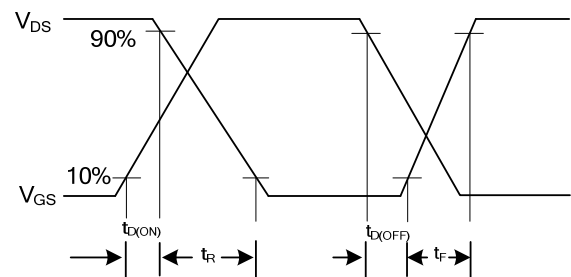


Peak Diode Recovery dv/dt Waveforms

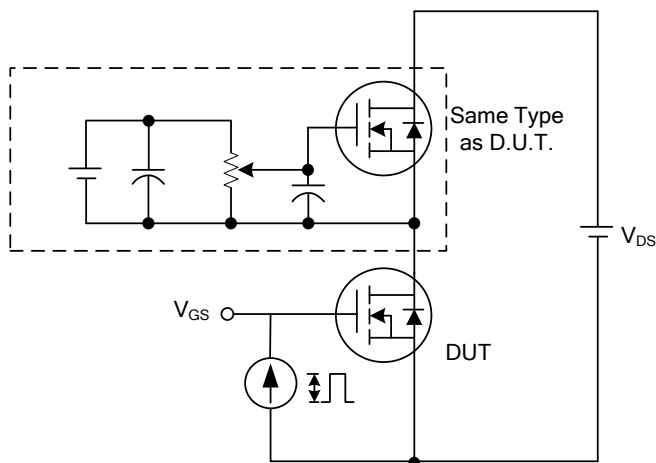
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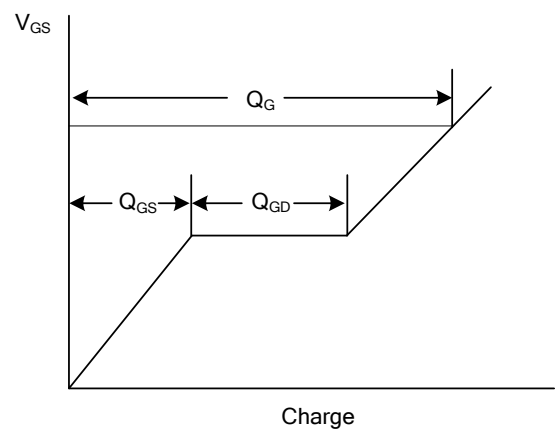
Switching Test Circuit



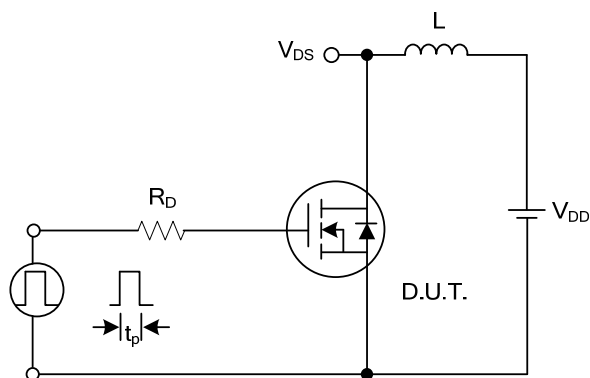
Switching Waveforms



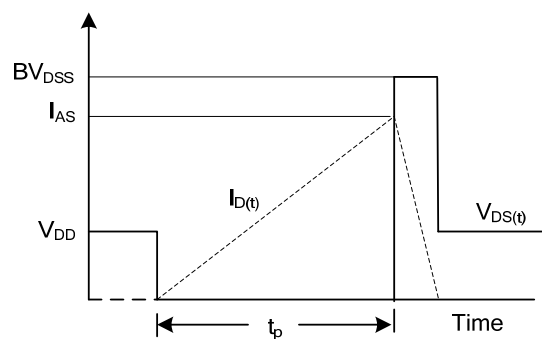
Gate Charge Test Circuit



Gate Charge Waveform

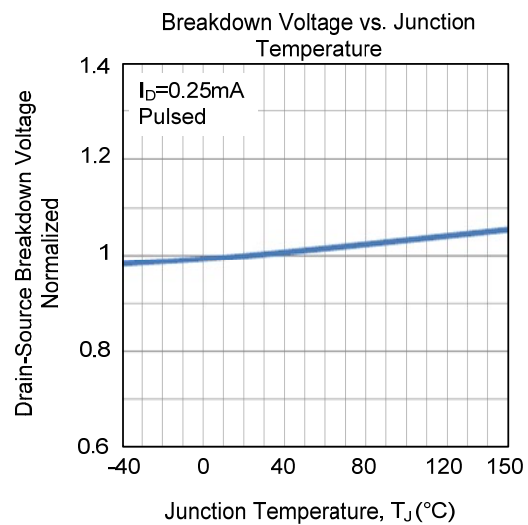
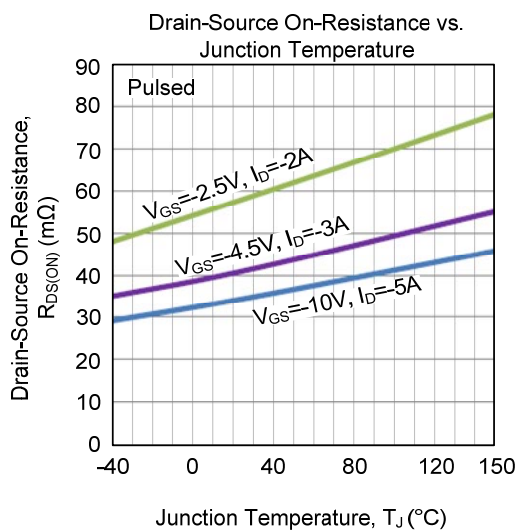
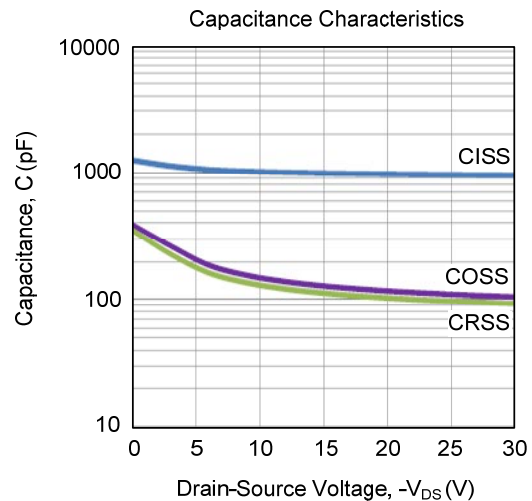
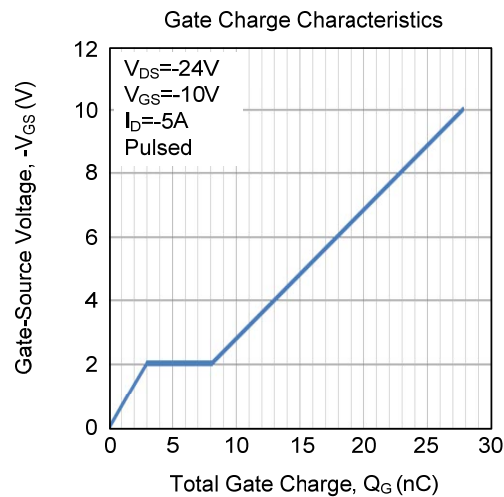
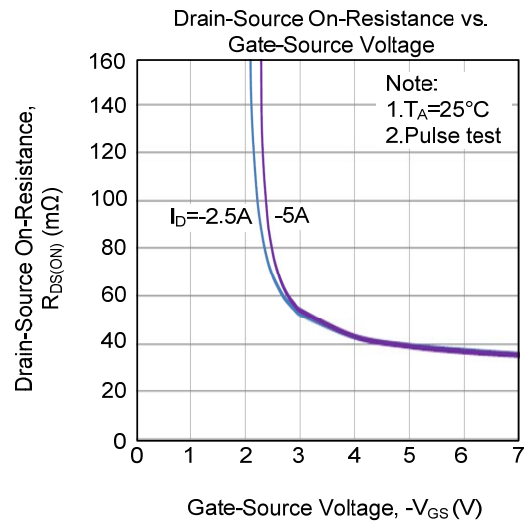
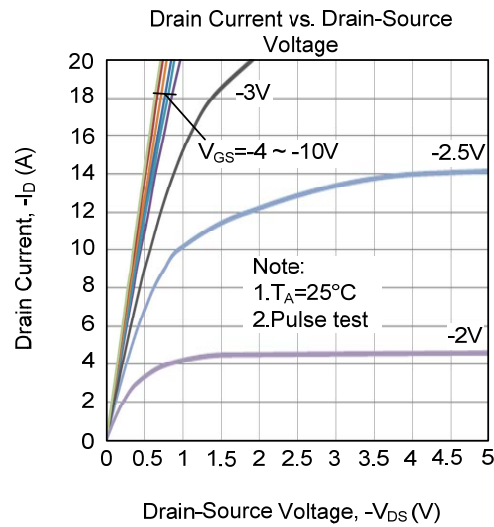


Unclamped Inductive Switching Test Circuit

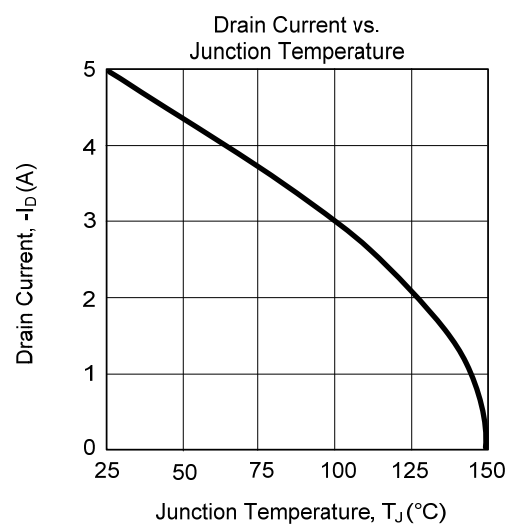
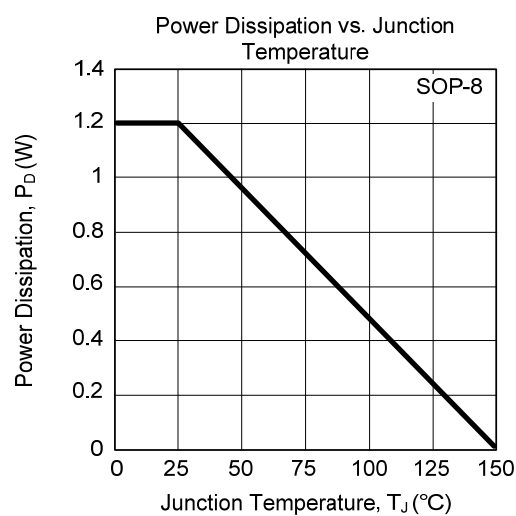
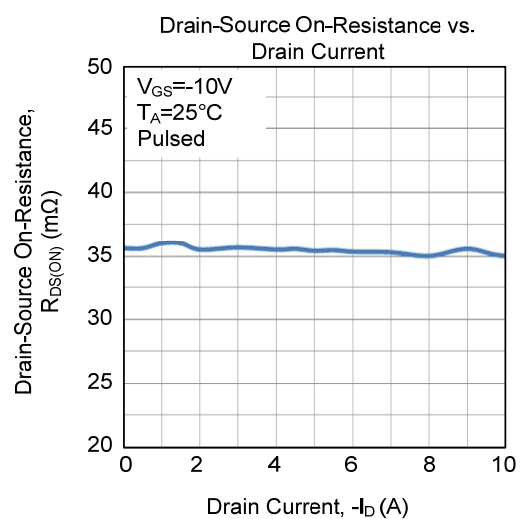
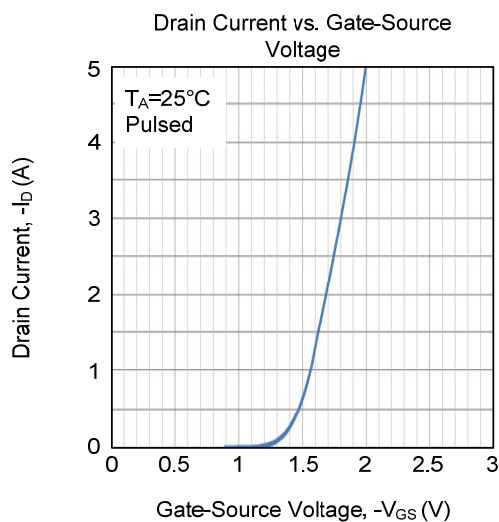
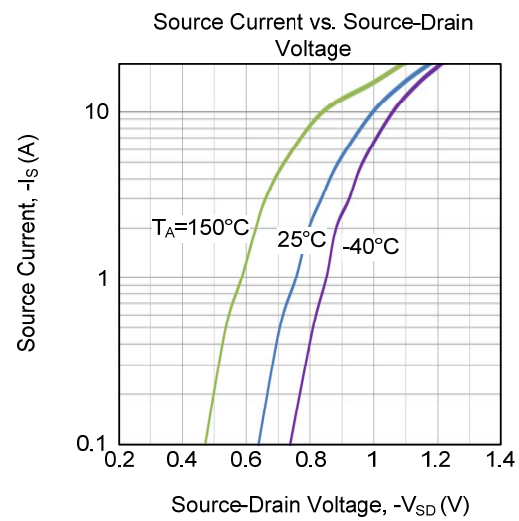
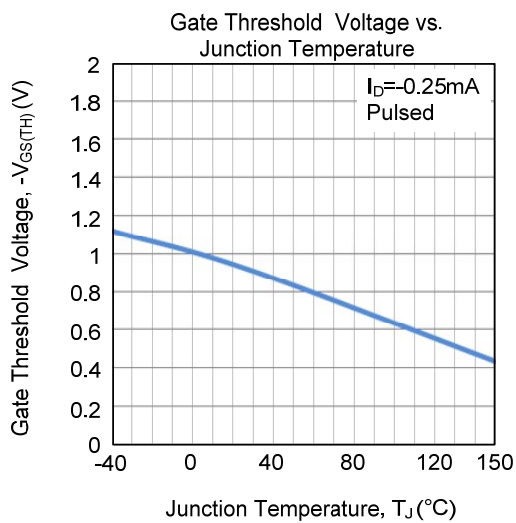


Unclamped Inductive Switching Waveforms

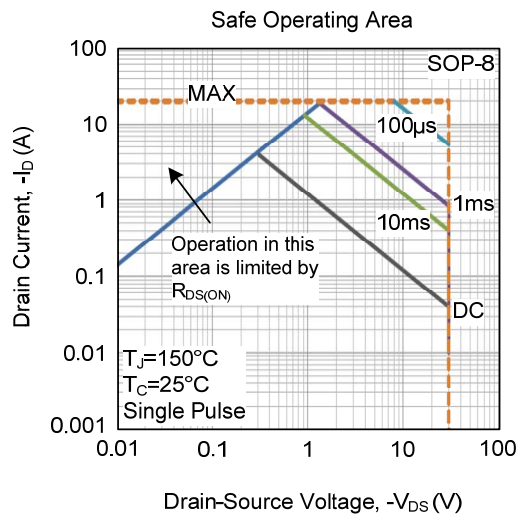
TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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