



UT4404V

Power MOSFET

8.5A, 30V N-CHANNEL ENHANCEMENT MODE POWER MOSFET

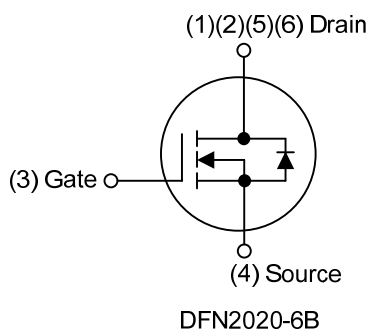
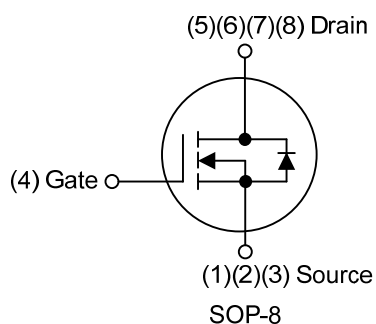
DESCRIPTION

The UTC **UT4404V** is a high voltage MOSFET and is designed to have better characteristics to achieve the lowest possible on-resistance and fast switching performance. It provides the designer with an extreme efficient device for use in a wide range of power applications. such as for voltage conversion or switch applications.

FEATURES

- * $R_{DS(ON)} \leq 20 \text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=8.5\text{A}$
- $R_{DS(ON)} \leq 21.5 \text{ m}\Omega$ @ $V_{GS}=4.5\text{V}$, $I_D=8.5\text{A}$
- $R_{DS(ON)} \leq 30 \text{ m}\Omega$ @ $V_{GS}=2.5\text{V}$, $I_D=5.0\text{A}$
- $R_{DS(ON)} \leq 43.5 \text{ m}\Omega$ @ $V_{GS}=1.8\text{V}$, $I_D=3.0\text{A}$
- * 1.8V Gate Drive BVDSS 30V
- * Lower Gate Charge
- * Fast Switching Characteristic

SYMBOL



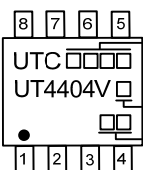
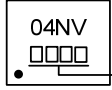
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT4404VL-S08-R	UT4404VG-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel
UT4404VL-K06B-2020-R	UT4404VG-K06B-2020-R	DFN2020-6B	D	D	G	S	D	D	-	-	Tape Reel

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

UT4404VG-S08-R (1) Packing Type (2) Package Type (3) Green Package		(1) R: Tape Reel (2) S08: SOP-8, K06B-2020: DFN2020-6B (3) G: Halogen Free and Lead Free L: Lead Free
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■ MARKING

SOP-8	DFN2020-6B
 UTC □ □ □ □ → Date Code UT4404V □ → L: Lead Free □ → G: Halogen Free ● □ □ → Lot Code	 04NV □ □ □ □ → Date Code

■ ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$, 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	8.5	A
	Pulsed (Note 2)	I_{DM}	17	A
Avalanche energy	Single Pulsed (Note 3)	E_{AS}	14	mJ
Power Dissipation	SOP-8	P_D	1	W
	DFN2020-8		1.8	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. $L=0.1\text{mH}$, $I_{AS}=17\text{A}$, $V_{DD}=20\text{V}$, $R_G=25\Omega$, Starting $T_J = 25^\circ\text{C}$

4. $I_{SD} \leq 2.0\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DS}$, Starting $T_J = 25^\circ\text{C}$

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOP-8	θ_{JA}	125	$^\circ\text{C}/\text{W}$
	DFN2020-8		69	$^\circ\text{C}/\text{W}$

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

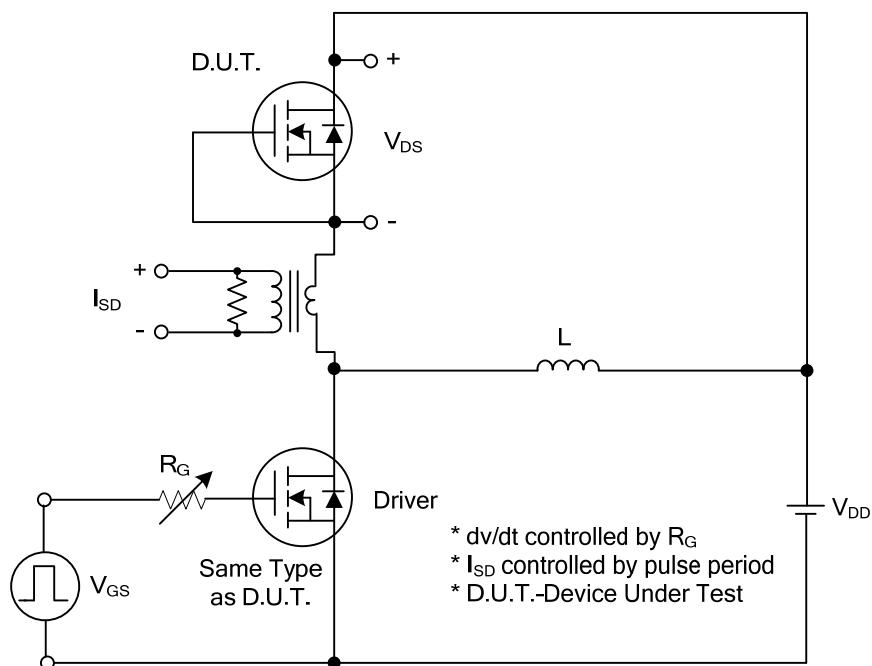
■ ELECTRICAL CHARACTERISTICS ($T_J=25^\circ\text{C}$, unless otherwise specified)

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	0.75	1.2	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =8.5A			20	mΩ
			V _{GS} =4.5V, I _D =8.5A			21.5	mΩ
			V _{GS} =2.5V, I _D =5.0A			30	mΩ
			V _{GS} =1.8V, I _D =3.0A			43.5	mΩ
DYNAMIC CHARACTERISTICS							
Input Capacitance		C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1MHz		677		pF
Output Capacitance		C _{OSS}			82		pF
Reverse Transfer Capacitance		C _{RSS}			71		pF
SWITCHING CHARACTERISTICS							
Total Gate Charge (Note 1)		Q _G	V _{DS} =24V, V _{GS} =4.5V, I _D =8.5A (Note 1, 2)		18		nC
Gate to Source Charge		Q _{GS}			3		nC
Gate to Drain Charge		Q _{GD}			5		nC
Turn-ON Delay Time (Note 1)		t _{D(ON)}	V _{DD} =15V, V _{GS} =10V, I _D =8.5A, R _G =3Ω (Note 1, 2)		5		ns
Rise Time		t _R			17		ns
Turn-OFF Delay Time		t _{D(OFF)}			28		ns
Fall-Time		t _F			20		ns
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS							
Maximum Body-Diode Continuous Current		I _S				8.5	A
Maximum Body-Diode Pulsed Current (Note 1)		I _{SM}				17	A
Drain-Source Diode Forward Voltage (Note 1)		V _{SD}	I _S =8.5A, V _{GS} =0V			1.4	V

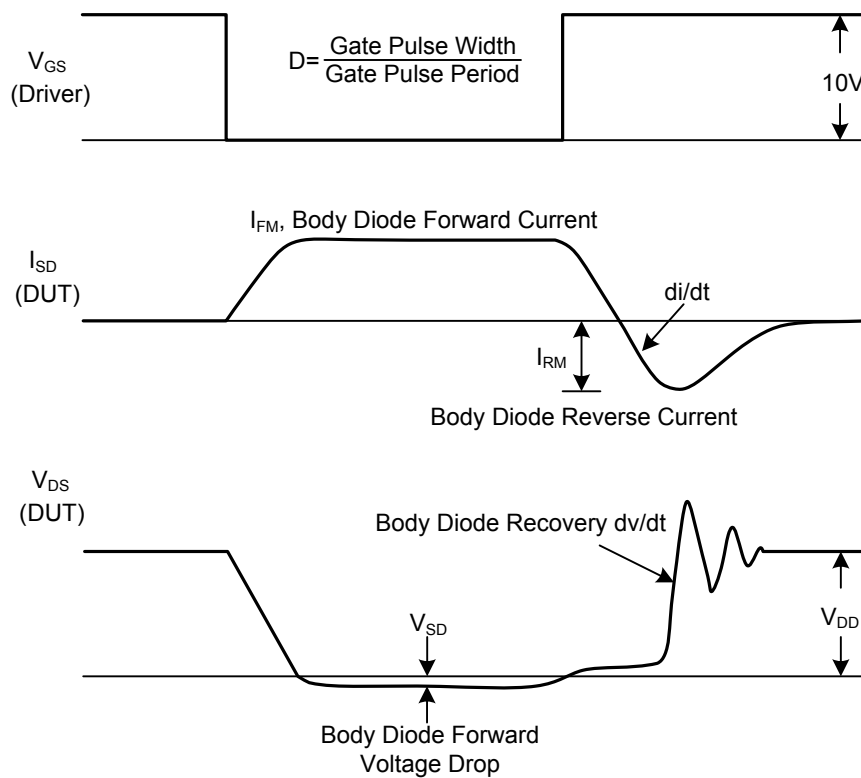
Notes: 1. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

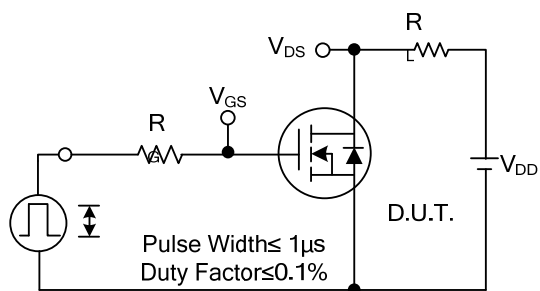


Peak Diode Recovery dv/dt Test Circuit

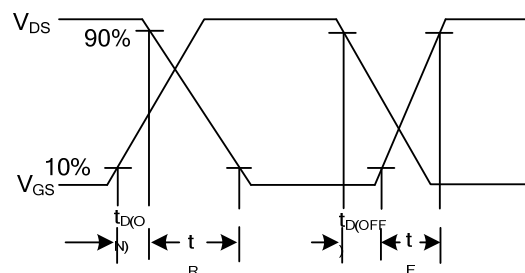


Peak Diode Recovery dv/dt Waveforms

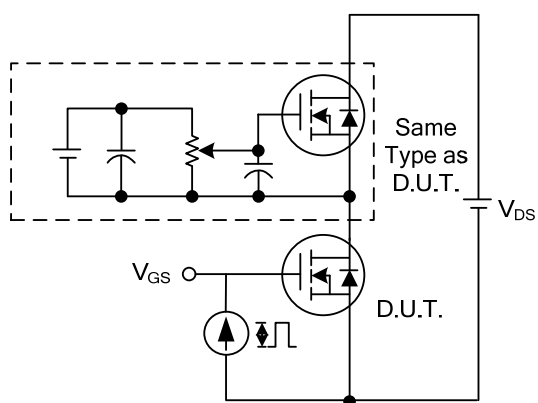
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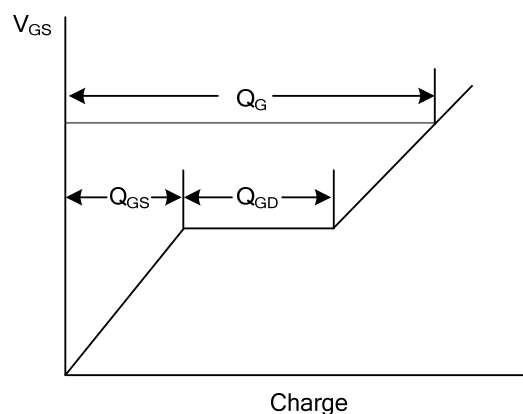
Switching Test Circuit



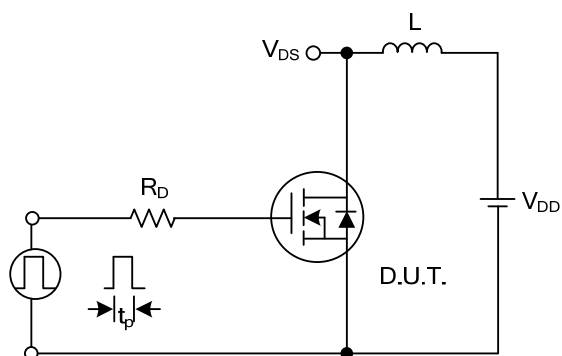
Switching Waveforms



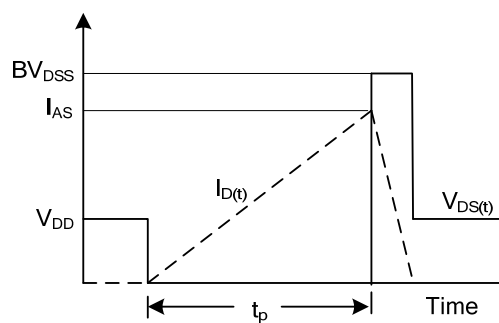
Gate Charge Test Circuit



Gate Charge Waveform

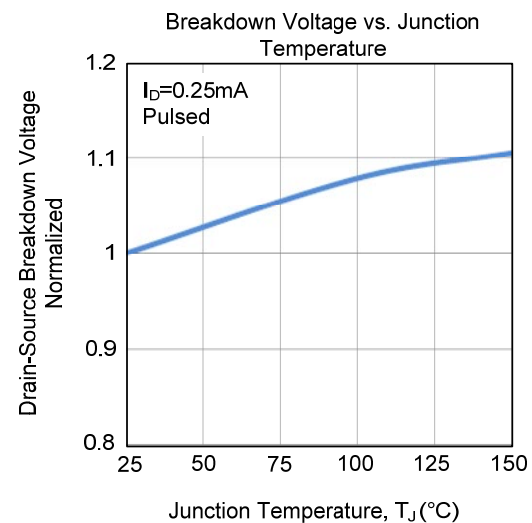
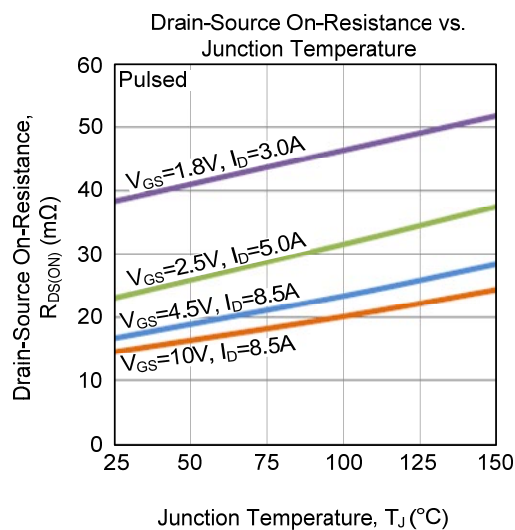
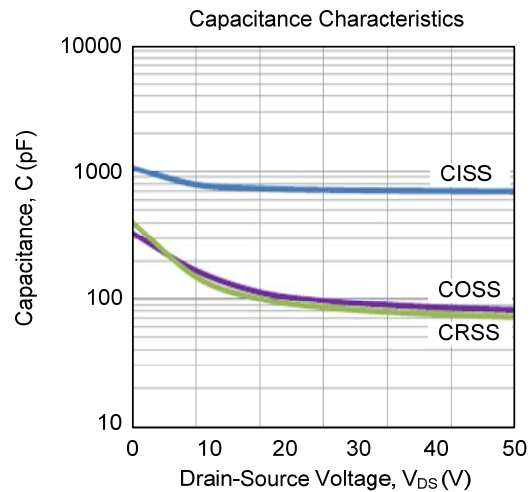
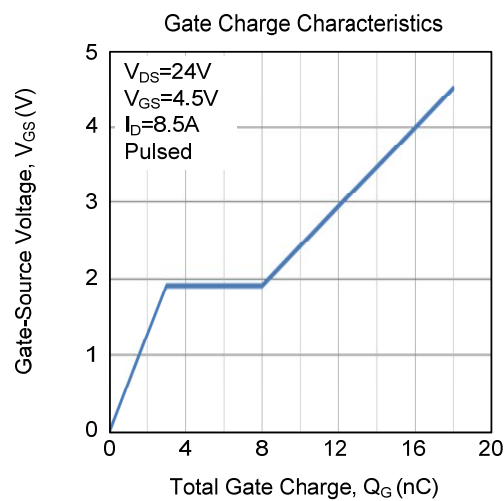
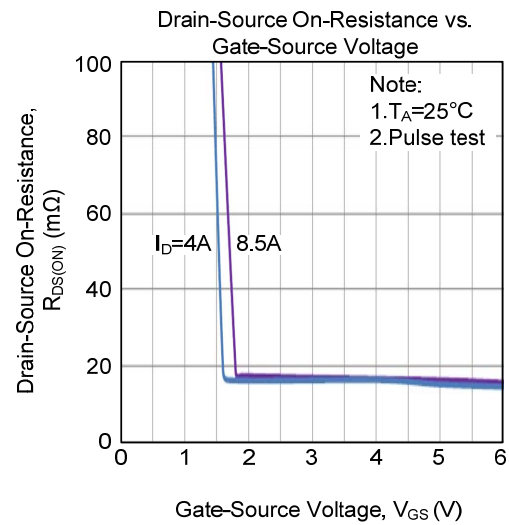
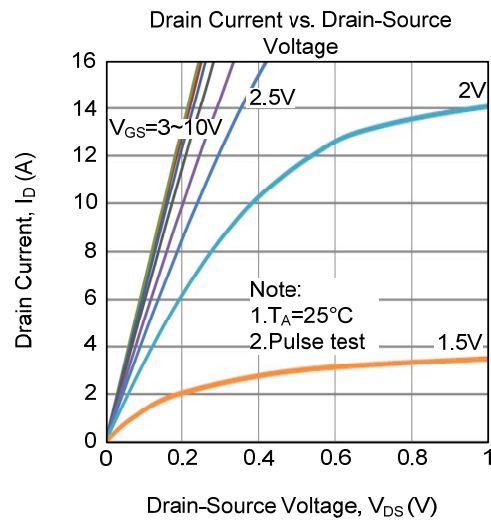


Unclamped Inductive Switching Test Circuit

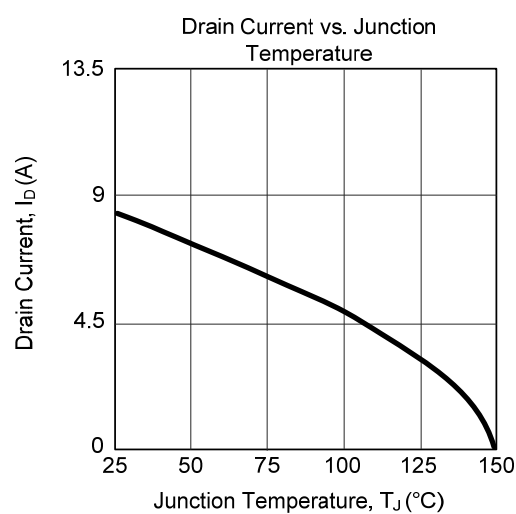
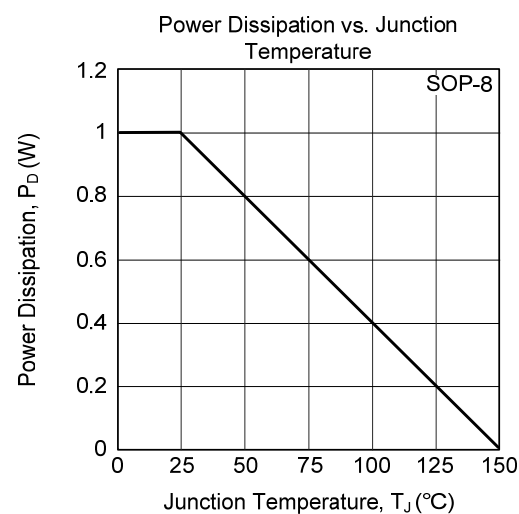
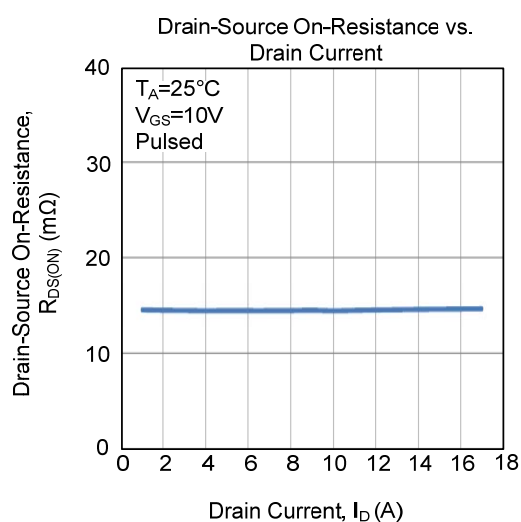
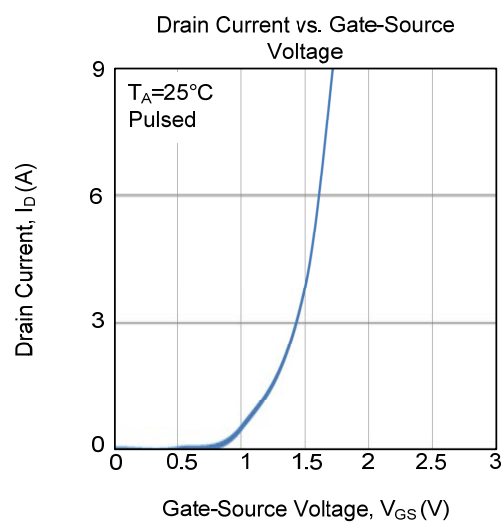
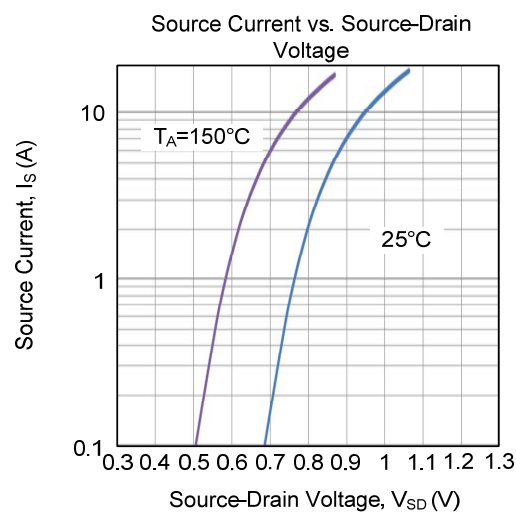
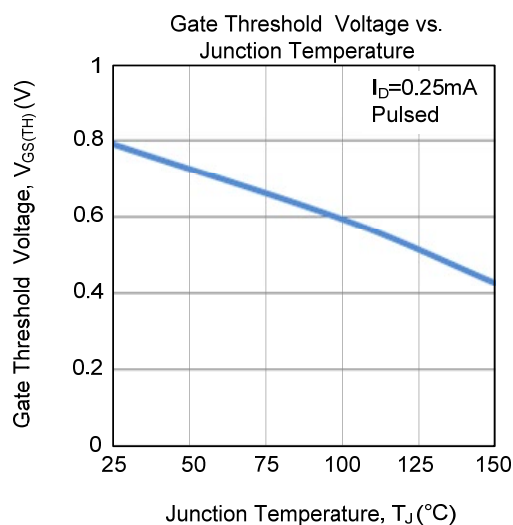


Unclamped Inductive Switching Waveforms

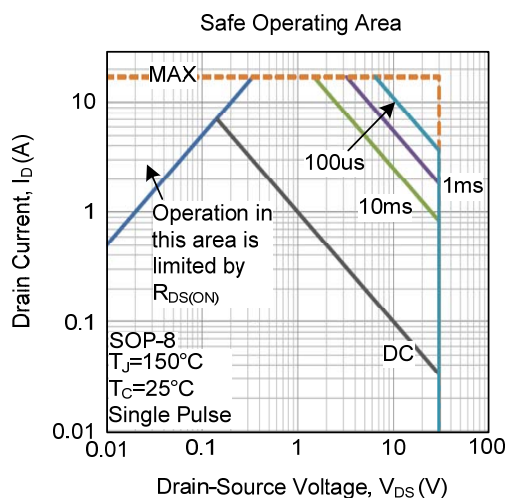
TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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