



UTT48NN06

POWER MOSFET

48A, 60V N-CHANNEL POWER MOSFET

■ DESCRIPTION

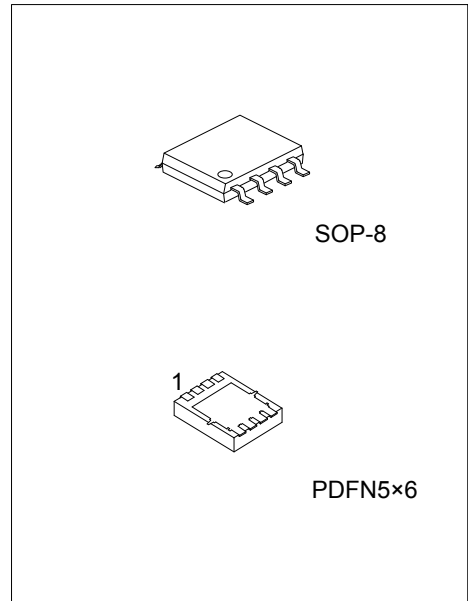
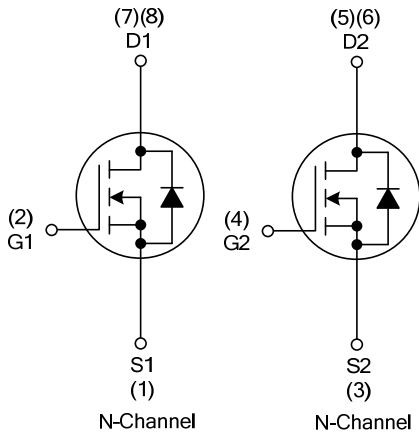
The UTC **UTT48NN06** is a N-channel mode power MOSFET using UTC's advanced technology to provide customers with a minimum on-state resistance, low gate charge and high switching speed.

The UTC **UTT48NN06** is suitable for high voltage synchronous rectifier and DC/DC converters, etc.

■ FEATURES

- * $R_{DS(ON)} \leq 20\text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=24\text{A}$
- $R_{DS(ON)} \leq 30\text{ m}\Omega$ @ $V_{GS}=4.5\text{V}$, $I_D=24\text{A}$
- * High Switching Speed
- * High Cell Density Trench Technology

■ SYMBOL



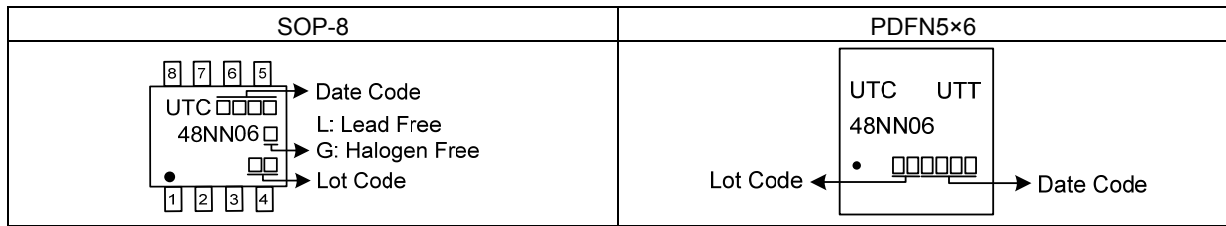
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UTT48NN06L-S08-R	UTT48NN06G-S08-R	SOP-8	S1	G1	S2	G2	D2	D2	D1	D1	Tape Reel
UTT48NN06L-P5060-R	UTT48NN06G-P5060-R	PDFN5x6	S1	G1	S2	G2	D2	D2	D1	D1	Tape Reel

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

<p>UTT48NN06G-S08-R</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p>	<p>(1) R: Tape Reel</p> <p>(2) S08: SOP-8, P5060: PDFN5x6</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	60	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current	Continuous	Total	48	A
		Single	24	A
	Pulsed (Note 2)	Single	I_{DM}	108
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	303	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	2.33	V/nS
Power Dissipation (Note 5)	SOP-8	P_D	6.9	W
	PDFN5x6		35	W
Junction Temperature		T_J	+150	$^{\circ}\text{C}$
Storage Temperature Range		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. $L=30\text{mH}$, $I_{AS}=4.5\text{A}$, $V_{DD}=50\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^{\circ}\text{C}$

4. $I_{SD} \leq 30\text{A}$, $di/dt \leq 100\text{A}/\mu\text{s}$, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq 25^{\circ}\text{C}$

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

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOP-8	θ_{JA}	125	$^{\circ}\text{C}/\text{W}$
	PDFN5x6		35	$^{\circ}\text{C}/\text{W}$
Junction to Case	SOP-8	θ_{JC}	18 (Note)	$^{\circ}\text{C}/\text{W}$
	PDFN5x6		3.5 (Note)	$^{\circ}\text{C}/\text{W}$

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

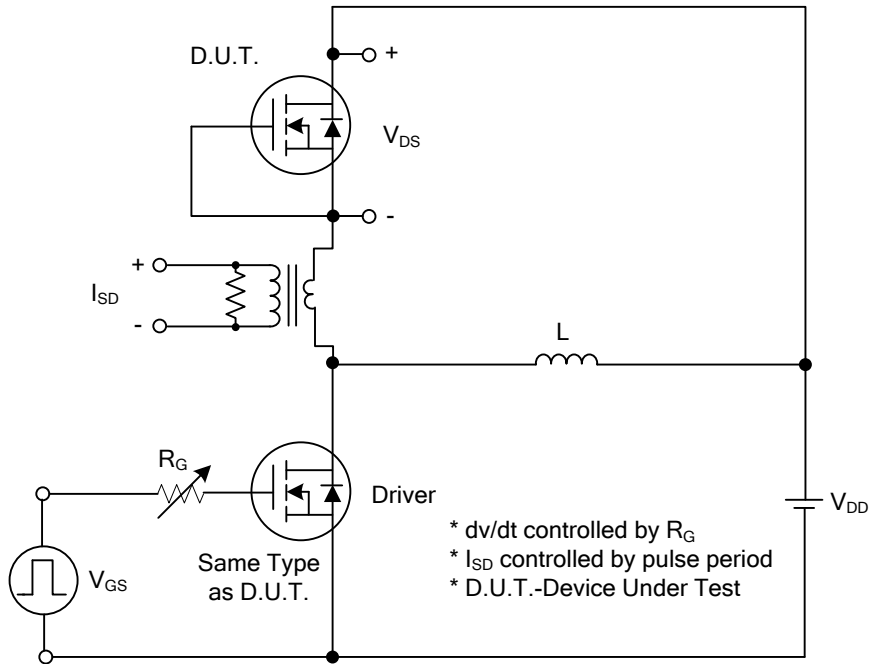
■ ELECTRICAL CHARACTERISTICS (T_J = 25°C, unless otherwise specified)

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} =60V, V _{GS} =0V			1	μA
Gate-Source Leakage Current	Forward	I _{GSS} V _{GS} =+20V, V _{DS} =0V V _{GS} =-20V, V _{DS} =0V			+100	nA
	Reverse				-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	R _{DS(ON)}	V _{GS} =10V, I _D =24A			20	mΩ
		V _{GS} =4.5V, I _D =24A			30	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		1926		pF
Output Capacitance	C _{OSS}			180		pF
Reverse Transfer Capacitance	C _{RSS}			140		pF
SWITCHING PARAMETERS						
Total Gate Charge (Note 1)	Q _G	V _{DS} =30V, V _{GS} =10V, I _D =48A I _G =1mA (Note 1, 2)		42		nC
Gate to Source Charge	Q _{GS}			6.4		nC
Gate to Drain Charge	Q _{GD}			8.2		nC
Turn-on Delay Time (Note 1)	t _{D(ON)}	V _{DS} =30V, V _{GS} =10V, I _D =48A, R _G =3Ω (Note 1, 2)		9		ns
Rise Time	t _R			15		ns
Turn-off Delay Time	t _{D(OFF)}			32		ns
Fall-Time	t _F			17		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I _S				24	A
Maximum Body-Diode Pulsed Current	I _{SM}				48	A
Drain-Source Diode Forward Voltage (Note 1)	V _{SD}	I _S =48A, V _{GS} =0V			1.4	V
Reverse Recovery Time (Note 1)	t _{rr}	I _S =48A, V _{GS} =0V,		40		nS
Reverse Recovery Charge	Q _{rr}	dI/dt=100A/μs		24		nC

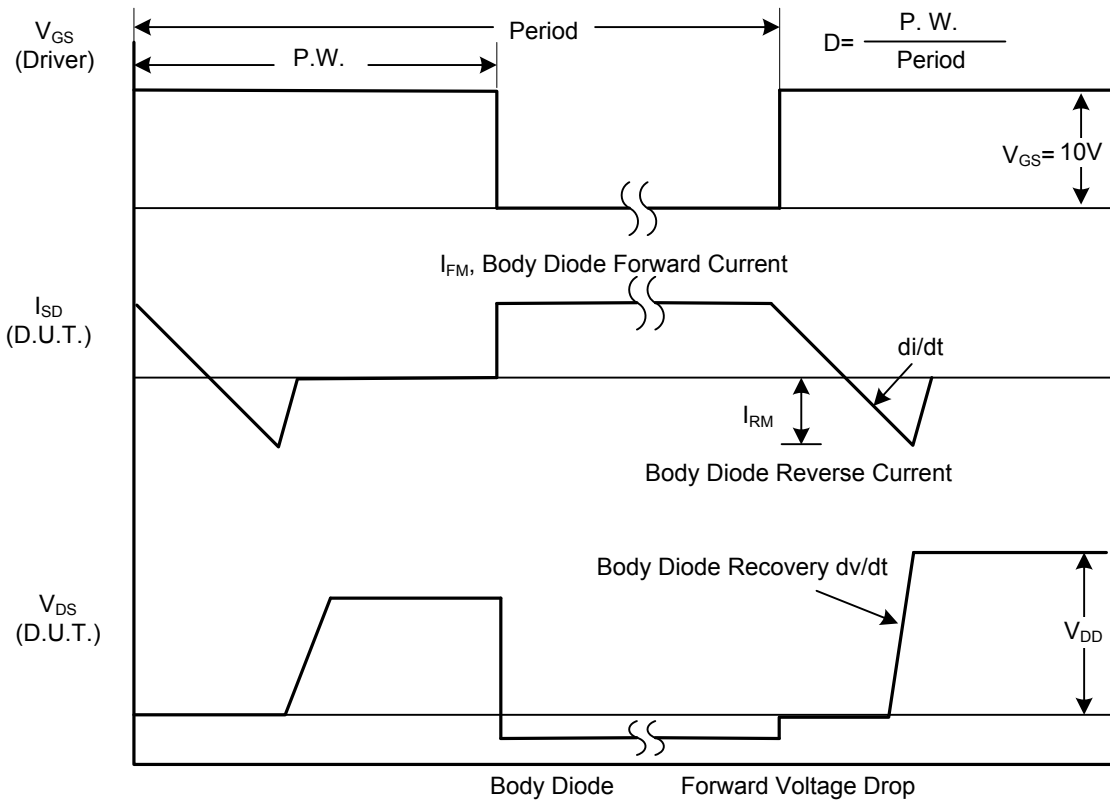
Notes: 1. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

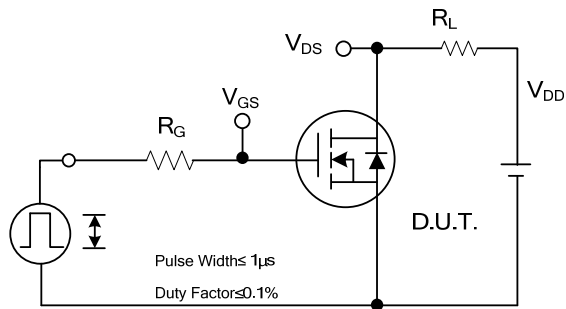


Peak Diode Recovery dv/dt Test Circuit

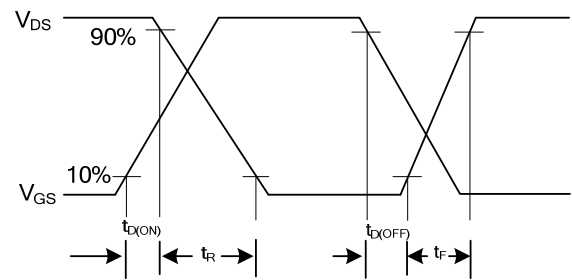


Peak Diode Recovery dv/dt Waveforms

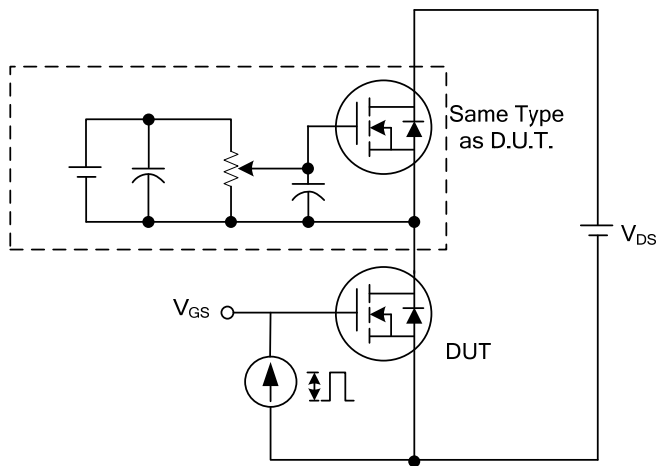
TEST CIRCUITS AND WAVEFORMS



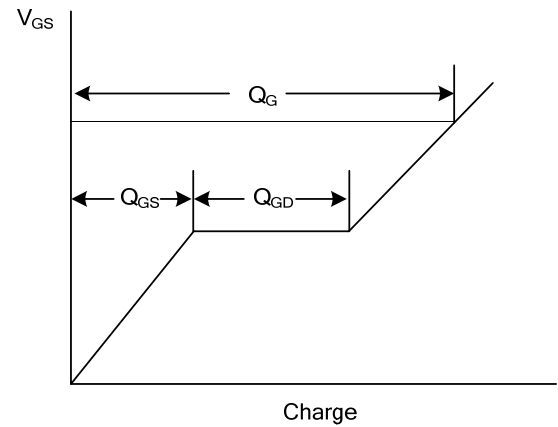
Switching Test Circuit



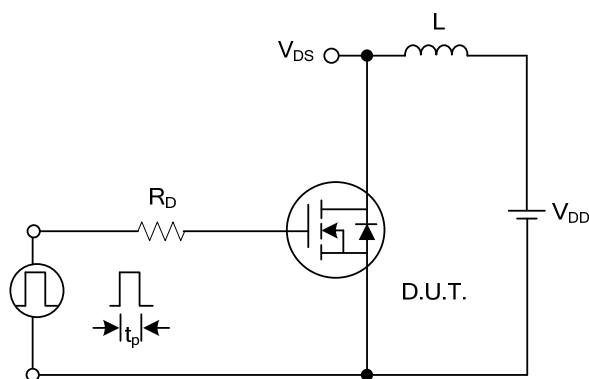
Switching Waveforms



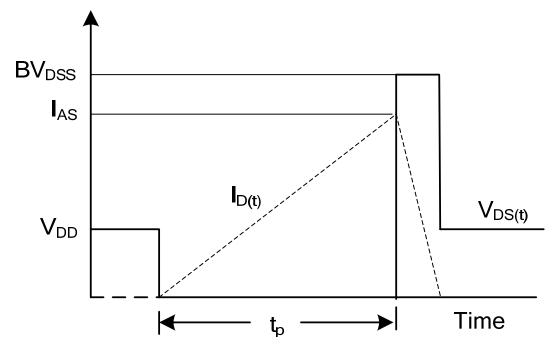
Gate Charge Test Circuit



Gate Charge Waveform

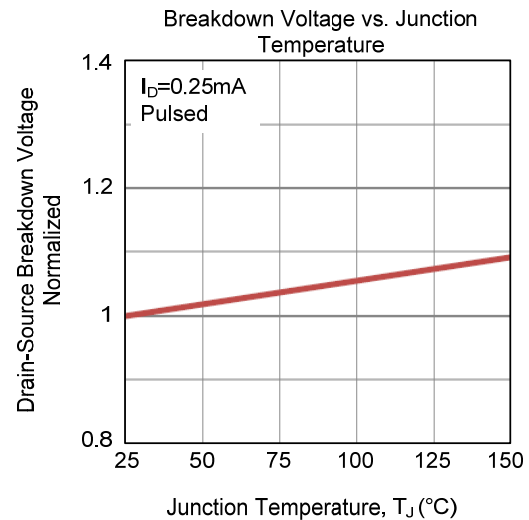
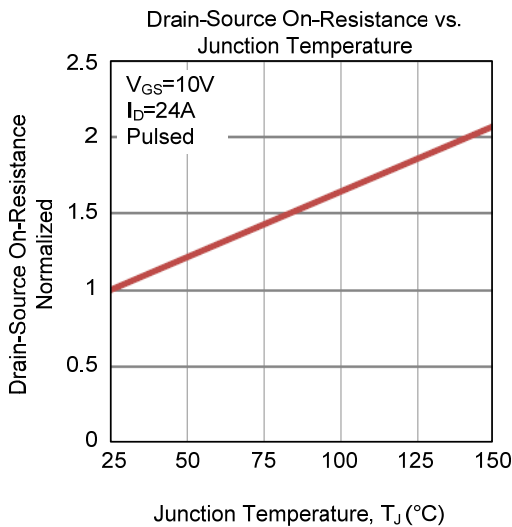
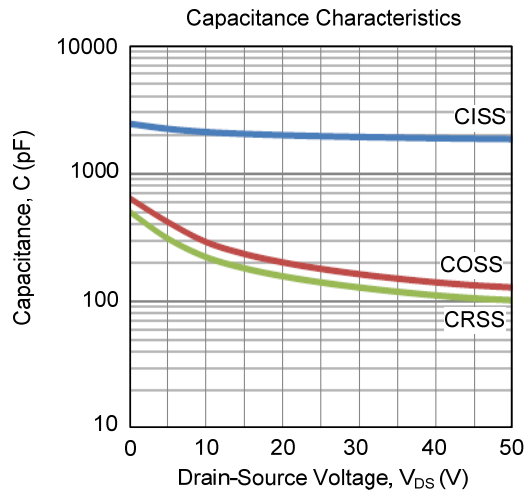
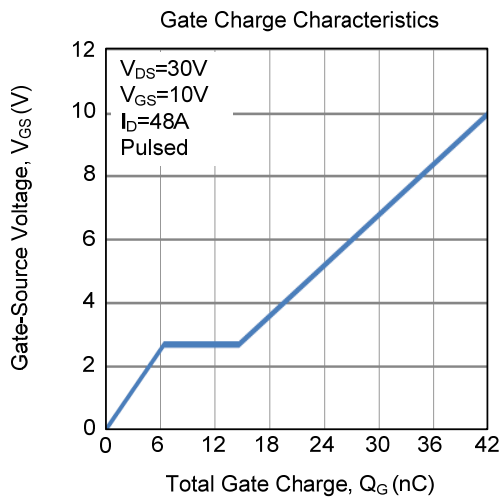
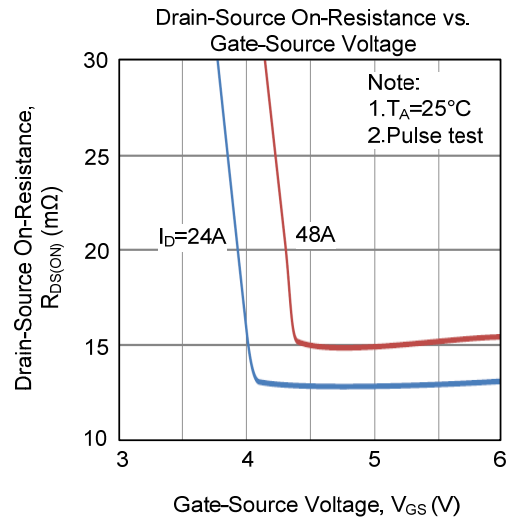
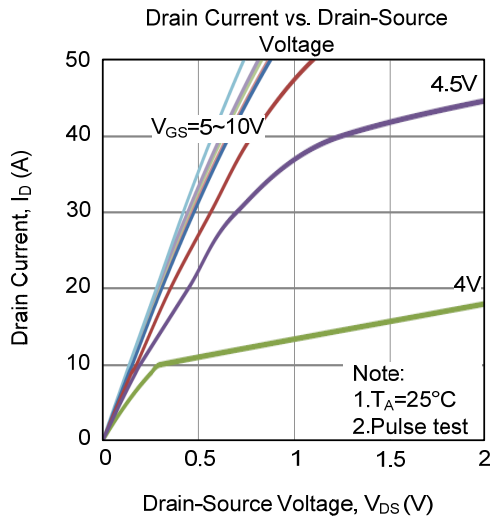


Unclamped Inductive Switching Test Circuit

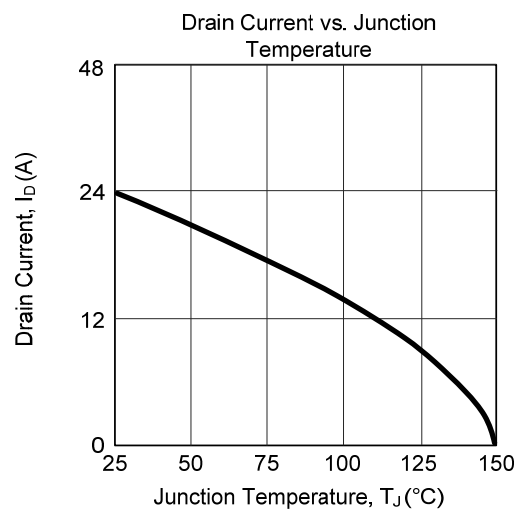
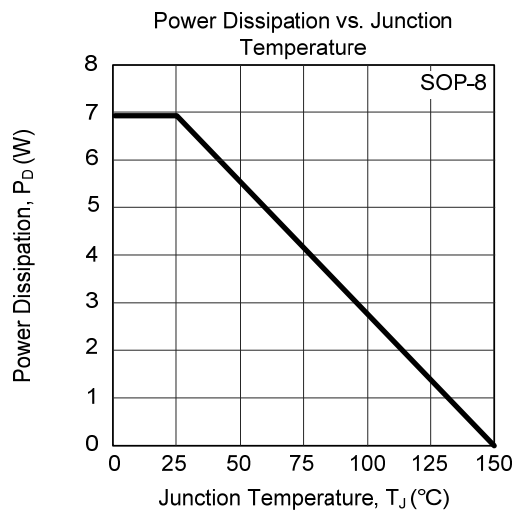
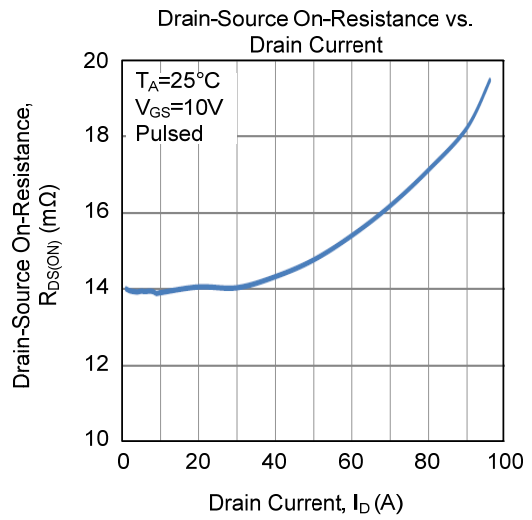
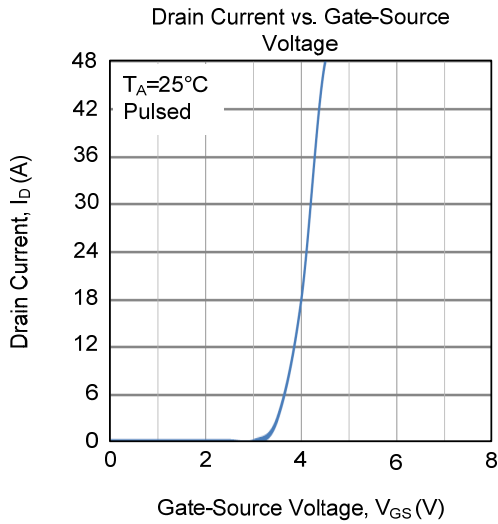
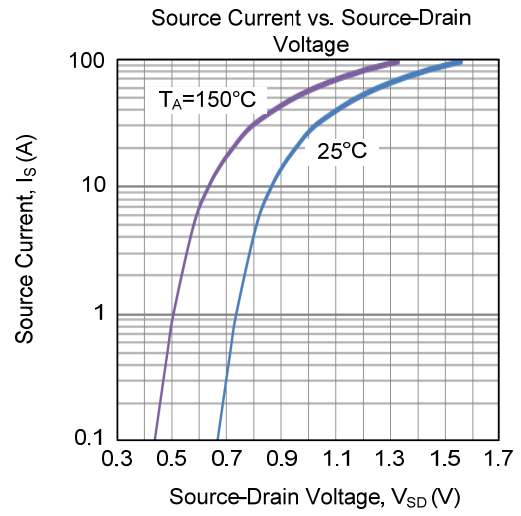
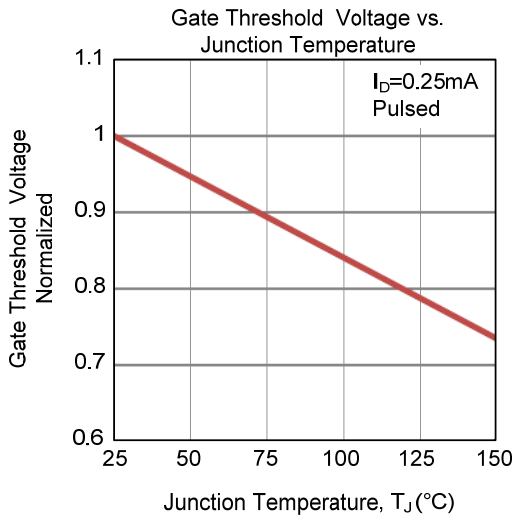


Unclamped Inductive Switching Waveforms

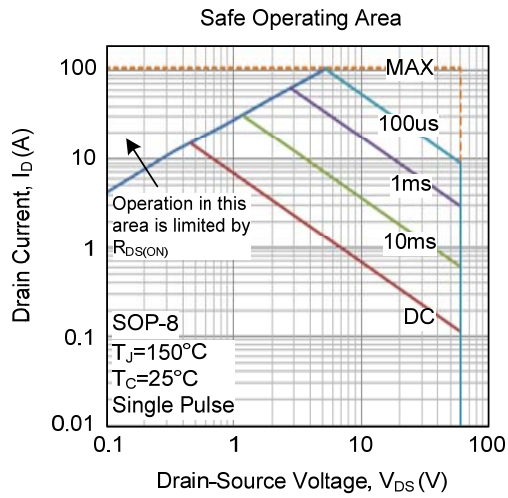
TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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