

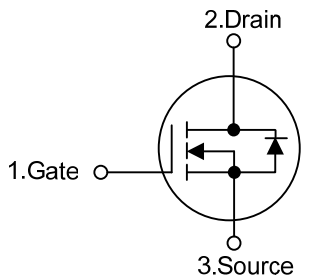
**UT30N06****POWER MOSFET****30A, 60V N-CHANNEL
POWER MOSFET****DESCRIPTION**

The UTC **UT30N06** is a N-channel enhancement MOSFET using UTC's advanced technology to provide the customers with perfect $R_{DS(ON)}$ and high switching speed.

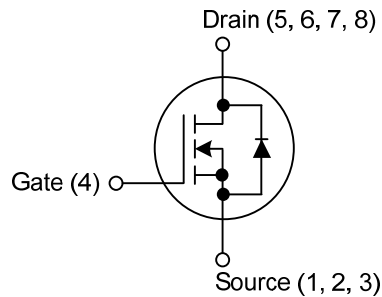
The UTC **UT30N06** is suitable for all commercial-industrial applications at power dissipation levels to approximately 50 watts, etc.

FEATURES

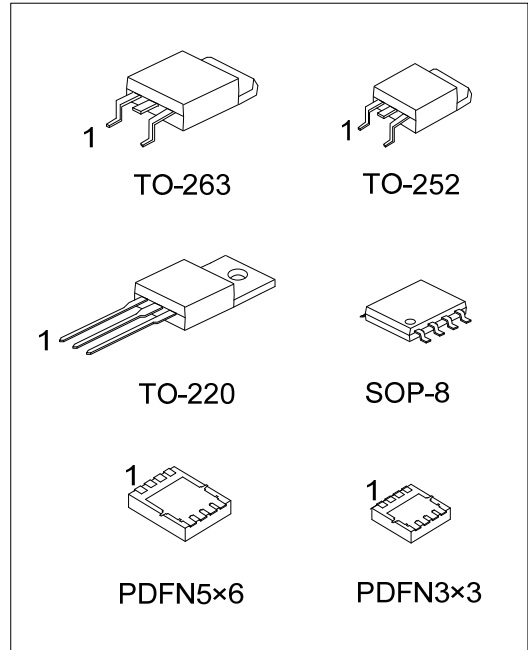
- * $R_{DS(ON)} \leq 25 \text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=15\text{A}$
- $R_{DS(ON)} \leq 35 \text{ m}\Omega$ @ $V_{GS}=4.5\text{V}$, $I_D=15\text{A}$
- * High Switching Speed

SYMBOL

TO-220 / TO-252 / TO-263



SOP-8/PDFN3x3/PDFN5x6

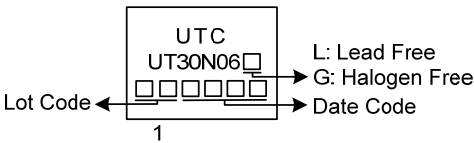
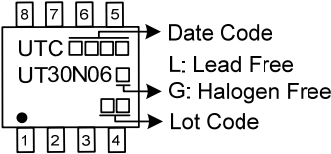
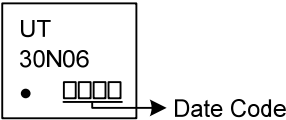
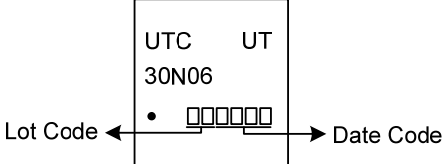
**ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT30N06L-TA3-T	UT30N06G-TA3-T	TO-220	G	D	S	-	-	-	-	-	Tube
UT30N06L-TN3-R	UT30N06G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UT30N06L-TQ2-T	UT30N06G-TQ2-T	TO-263	G	D	S	-	-	-	-	-	Tube
UT30N06L-TQ2-R	UT30N06G-TQ2-R	TO-263	G	D	S	-	-	-	-	-	Tape Reel
UT30N06L-S08-R	UT30N06G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel
UT30N06L-P3030-R	UT30N06G-P3030-R	PDFN3x3	S	S	S	G	D	D	D	D	Tape Reel
UT30N06L-P5060-R	UT30N06G-P5060-R	PDFN5x6	S	S	S	G	D	D	D	D	Tape Reel

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

UT30N06G-TA3-T 		(1) R: Tape Reel, T: Tube (2) TA3: TO-220, TN3: TO-252, TQ2: TO-263, S08: SOP-8, P3030: PDFN3x3, P5060: PDFN5x6 (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING

TO-220 / TO-252 / TO-263	SOP-8
	
PDFN3x3	PDFN5x6
	

■ 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	I_D	30	A
	Pulsed (Note 2)	I_{DM}	60	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	26.9	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	2.26	V/ns
Power Dissipation	TO-220/TO-263	P_D	94	W
	TO-252		50	W
	SOP-8		1.7	W
	PDFN3×3		22	W
	PDFN5×6		25	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. $L = 0.1\text{mH}$, $I_{AS} = 23.2\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^{\circ}\text{C}$.

4. $I_{SD} \leq 10\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq V_{(BR)DSS}$, $T_J = 25^{\circ}\text{C}$.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-263	θ_{JA}	62.5	$^{\circ}\text{C}/\text{W}$
	TO-252		110	$^{\circ}\text{C}/\text{W}$
	SOP-8		125	$^{\circ}\text{C}/\text{W}$
	PDFN3×3		60	$^{\circ}\text{C}/\text{W}$
	PDFN5×6		65	$^{\circ}\text{C}/\text{W}$
Junction to Case	TO-220/TO-263	θ_{JC}	1.5	$^{\circ}\text{C}/\text{W}$
	TO-252		2.5 (Note)	$^{\circ}\text{C}/\text{W}$
	SOP-8		33.7 (Note)	$^{\circ}\text{C}/\text{W}$
	PDFN3×3		5.5 (Note)	$^{\circ}\text{C}/\text{W}$
	PDFN5×6		4.9 (Note)	$^{\circ}\text{C}/\text{W}$

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

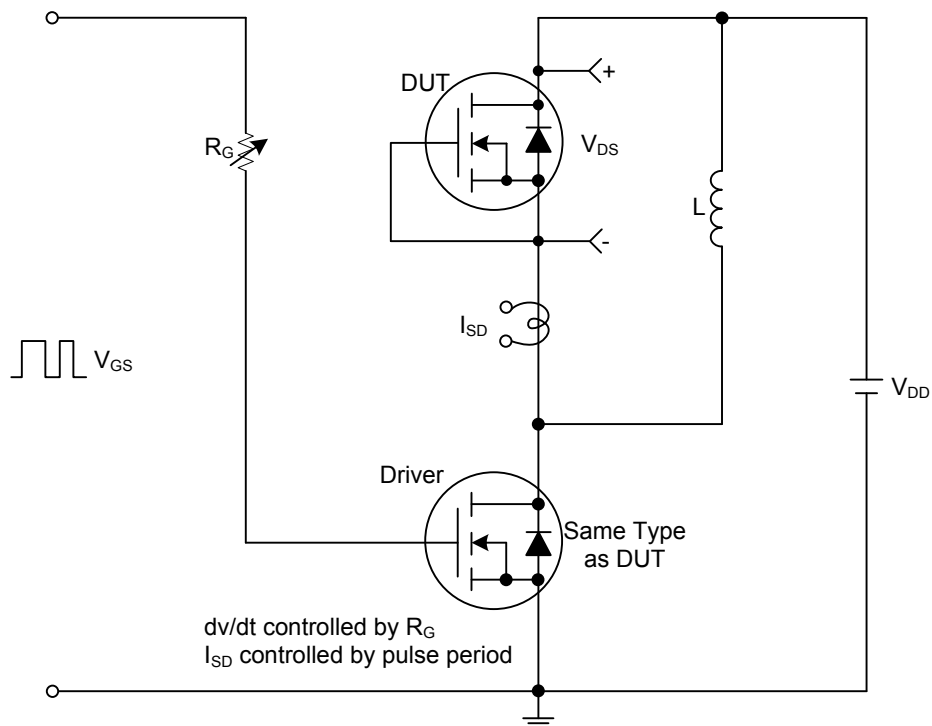
■ ELECTRICAL CHARACTERISTICS (T_J = 25°C, unless otherwise specified)

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			+100	nA
	Reverse		V _{GS} =-20V, V _{DS} =0V			-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 =15A			25	mΩ
			V _{GS} =4.5V, I _D =15A			35	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		1020		pF
Output Capacitance		C _{OSS}			118		pF
Reverse Transfer Capacitance		C _{RSS}			101		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)		Q _G	V _{DS} =48V, V _{GS} =10V, I _D =30A, I _G =1mA (Note 1, 2)		29		nC
Gate to Source Charge		Q _{GS}			1.2		nC
Gate to Drain Charge		Q _{GD}			5.4		nC
Turn-on Delay Time (Note 1)		t _{D(ON)}	V _{DD} =30V, V _{GS} =10V, I _D =30A, R _G =3Ω (Note 1, 2)		4.8		ns
Rise Time		t _R			16.6		ns
Turn-off Delay Time		t _{D(OFF)}			28		ns
Fall-Time		t _F			19		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				30	A
Maximum Body-Diode Pulsed Current		I _{SM}				60	A
Drain-Source Diode Forward Voltage (Note 1)		V _{SD}	I _S =30A, V _{GS} =0V			1.4	V
Reverse Recovery Time (Note 1)		t _{rr}	I _S =30A, V _{GS} =0V,		32		ns
Reverse Recovery Charge		Q _{rr}	dl _F /dt =100A/μs		58		nC

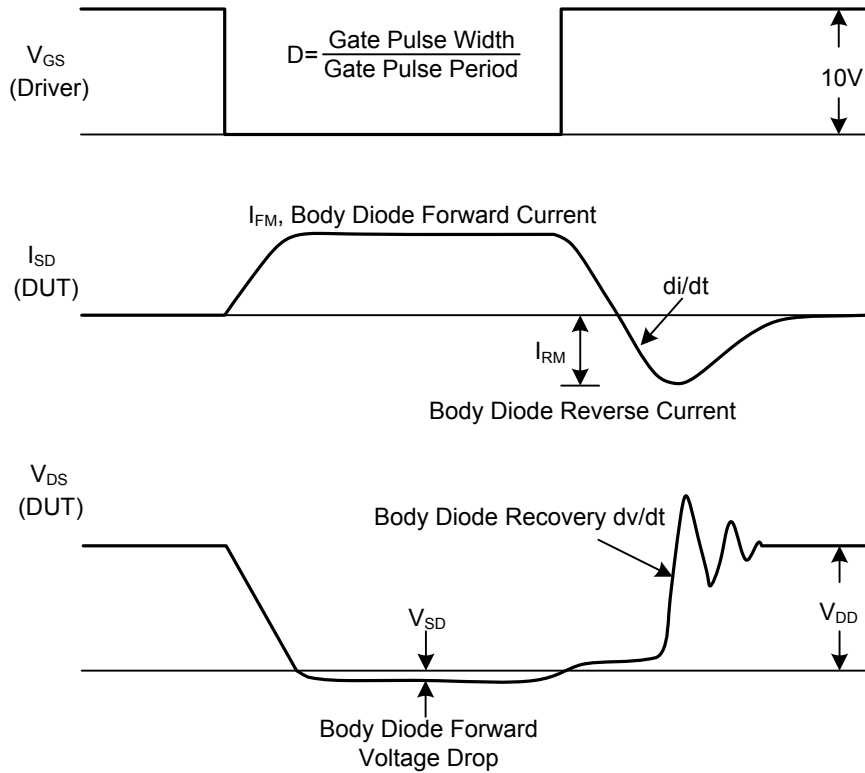
Notes: 1. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating ambient temperature.

■ TEST CIRCUITS AND WAVEFORMS



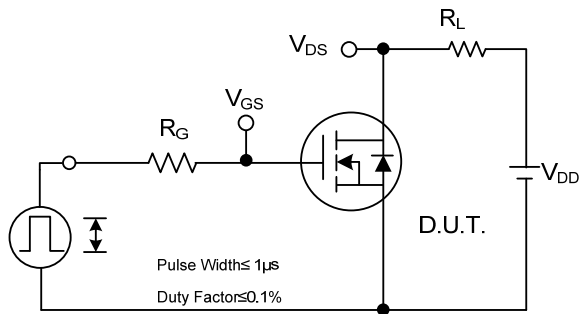
Peak Diode Recovery dv/dt Test Circuit



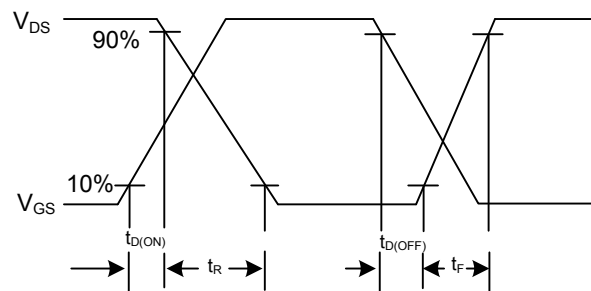
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

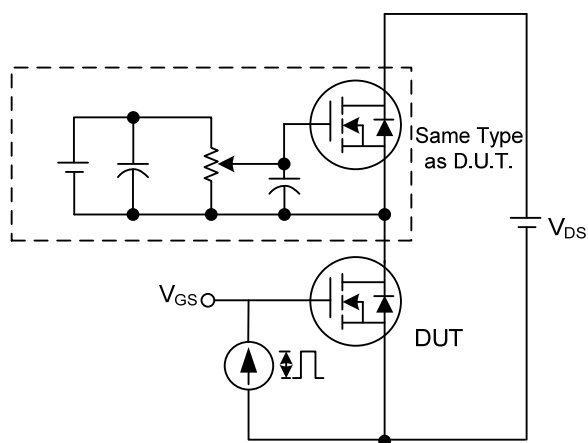
■ TEST CIRCUITS AND WAVEFORMS



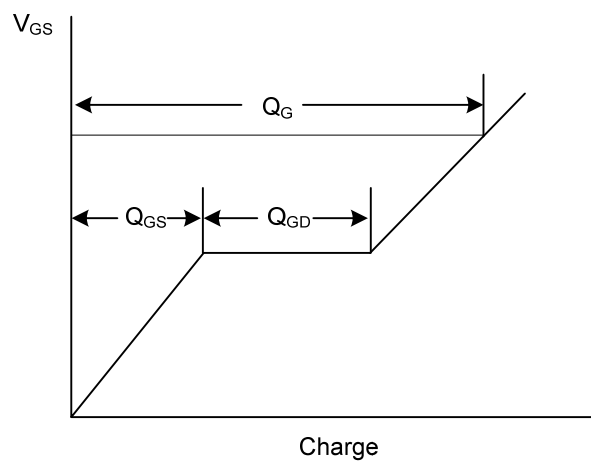
Switching Test Circuit



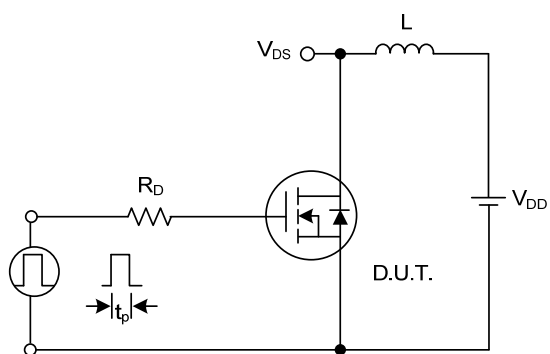
Switching Waveforms



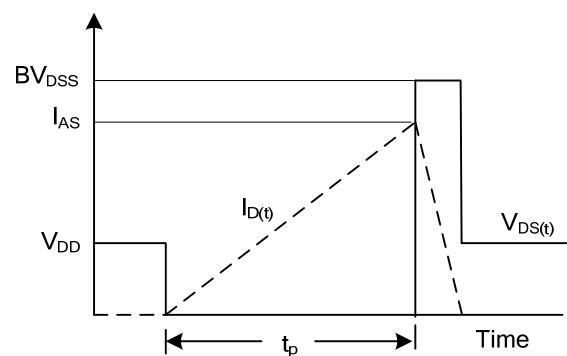
Gate Charge Test Circuit



Gate Charge Waveform

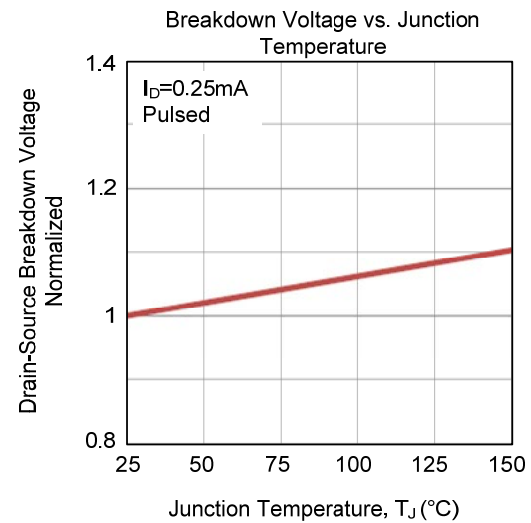
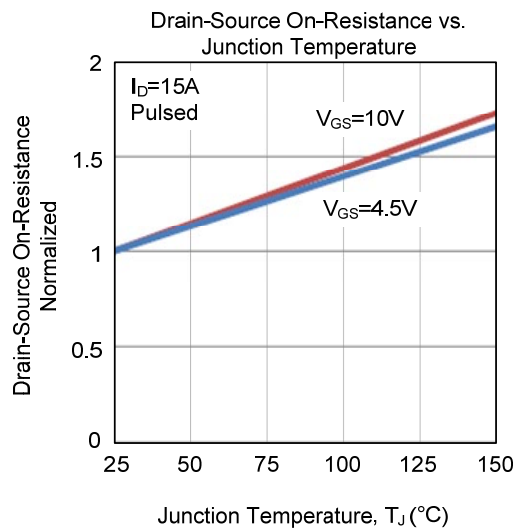
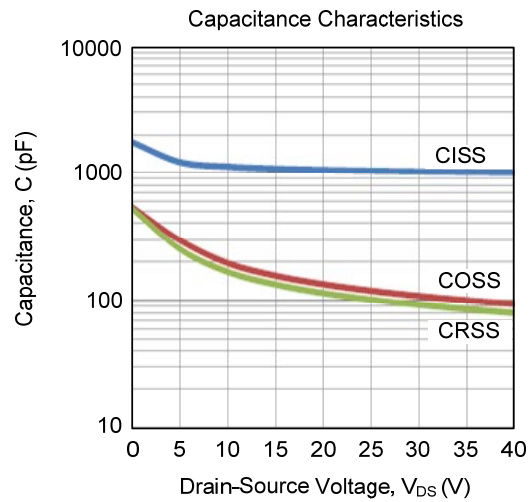
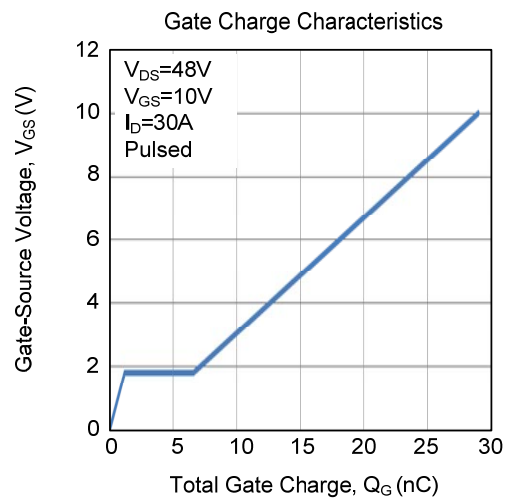
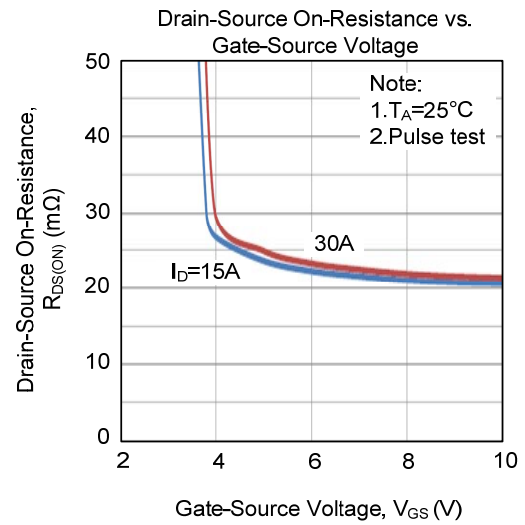
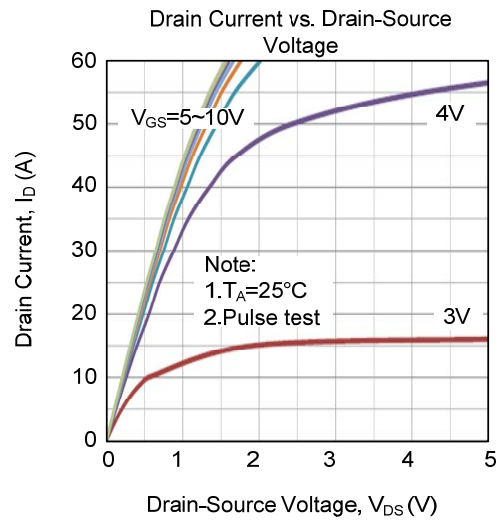


Unclamped Inductive Switching Test Circuit

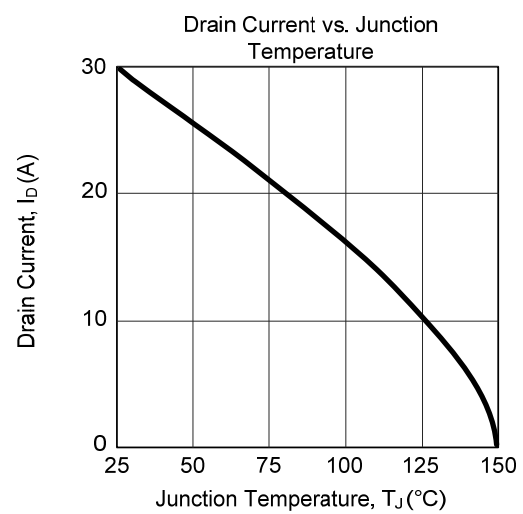
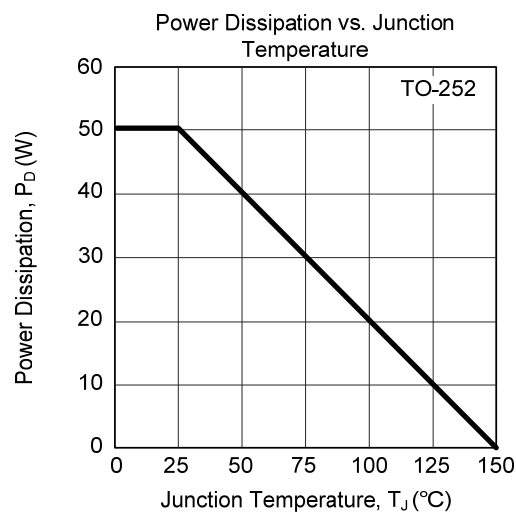
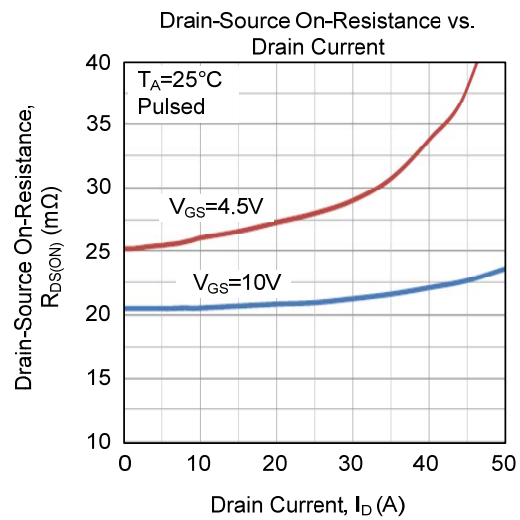
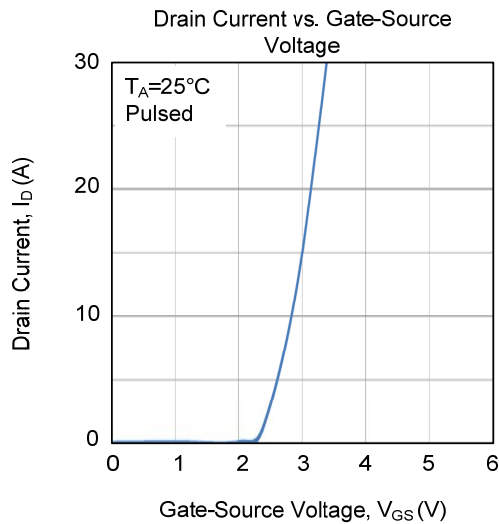
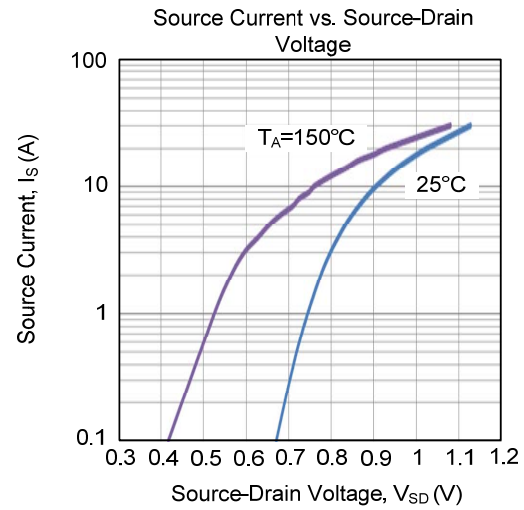
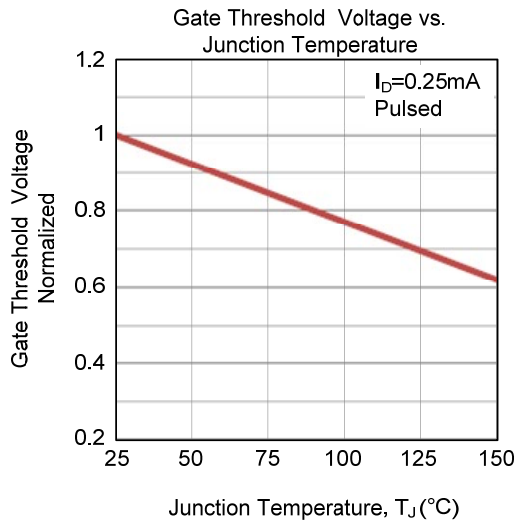


Unclamped Inductive Switching Waveforms

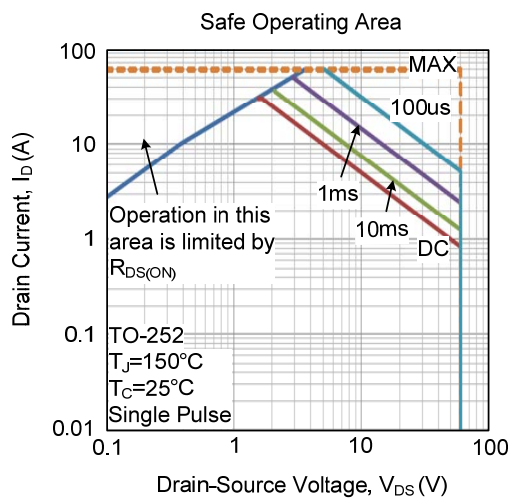
TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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