

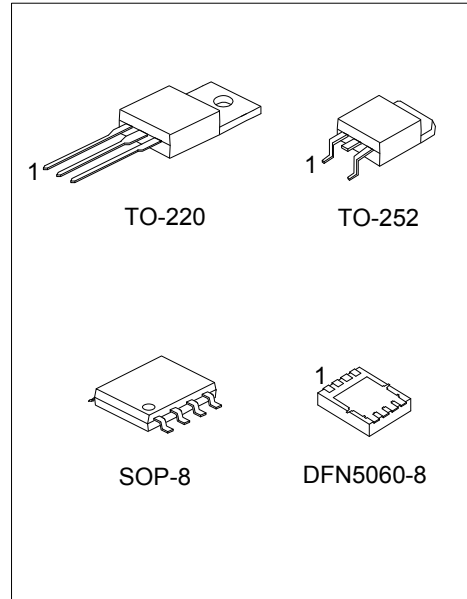
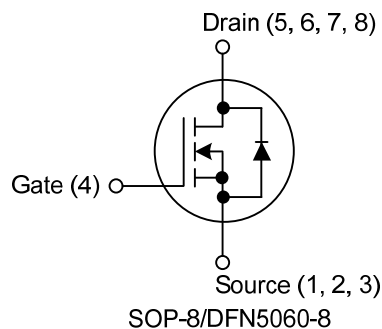
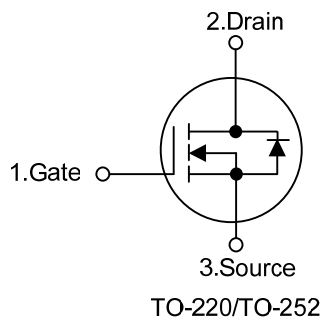
**UTM6016****Power MOSFET****12A, 60V N-CHANNEL FAST SWITCHING MOSFET****DESCRIPTION**

The UTC **UTM6016** is an N-Channel MOSFET, it uses UTC's advanced technology to provide customers with a minimum on-state resistance, high switching speed and low gate charge.

The UTC **UTM6016** is suitable for application in networking DC-DC power system and LCD/LED back light, etc.

FEATURES

- * $R_{DS(ON)} \leq 12m\Omega$ @ $V_{GS}=10V$, $I_D=8.0A$
- $R_{DS(ON)} \leq 15m\Omega$ @ $V_{GS}=4.5V$, $I_D=6.0A$
- * Low gate charge
- * Excellent CdV/dt effect decline
- * High switching speed

SYMBOL**ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UTM6016L-TA3-T	UTM6016G-TA3-T	TO-220	G	D	S	-	-	-	-	-	Tube
UTM6016L-TN3-R	UTM6016G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UTM6016L-S08-R	UTM6016G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel
UTM6016L-K08-5060-R	UTM6016G-K08-5060-R	DFN5060-8	S	S	S	G	D	D	D	D	Tape Reel

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

UTM6016G-TA3-T (1)Packing Type (2)Package Type (3)Green Package		(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TN3: TO-252, S08: SOP-8, K08-5060: DFN5060-8 (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING

Package	Marking
TO-220 TO-252	UTC UTM6016 Lot Code 1 L: Lead Free G: Halogen Free Date Code
SOP-8	8765 UTC UTM6016 1234 Date Code L: Lead Free G: Halogen Free Lot Code
DFN5060-8	UTC UTM 6016 Lot Code Date Code

■ 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
Drain Current	Continuous	I_D	12	A
	Pulsed (Note 2)	I_{DM}	32	A
Avalanche Current (Note 2)		I_{AR}	23	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	26	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	2.6	V/ns
Power Dissipation (Note 4)	TO-220	P_D	140	W
	TO-252		40	W
	SOP-8		5.2	W
	DFN5060-8		10.4	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.

3. $L=0.1\text{mH}$, $I_{AS}=23\text{A}$, $V_{DD}=25\text{V}$, $R_G=25\ \Omega$, Starting $T_J = 25^\circ\text{C}$

4. $I_{SD}\leq 12\text{A}$, $di/dt\leq 200\text{A}/\mu\text{s}$, $V_{DD}\leq BV_{DS}$, Starting $T_J = 25^\circ\text{C}$

5. The power dissipation is limited by 150°C junction temperature.

■ THERMAL CHARACTERISTICS (Note 1)

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220	θ_{JA}	62.5	$^\circ\text{C}/\text{W}$
	TO-252		110	
	SOP-8/DFN5060-8		50	
Junction to Case	TO-220	θ_{JC}	0.89	$^\circ\text{C}/\text{W}$
	TO-252		3.13	
	SOP-8		24	
	DFN5060-8		12	

Notes: 1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.

2. The data tested by pulsed, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

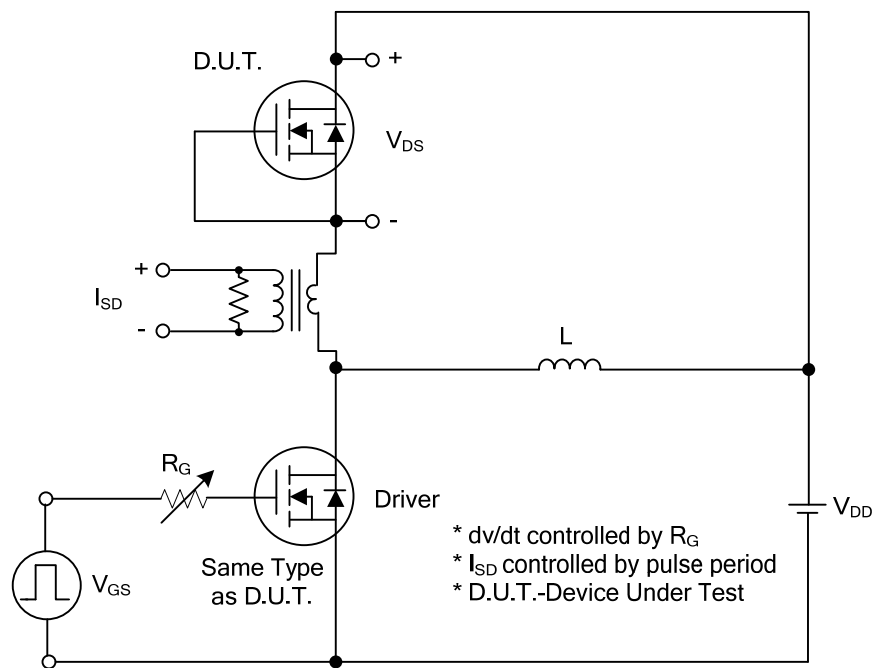
■ **ELECTRICAL CHARACTERISTICS** ($T_J=25^{\circ}\text{C}$, unless otherwise noted)

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} =48V, 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	1.2		2.5	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =8.0A			12	mΩ
			V _{GS} =4.5V, I _D =6.0A			15	mΩ
Forward Transconductance		g _{FS}	V _{DS} =5V, I _D =12A		45		S
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		3080		pF
Output Capacitance		C _{OSS}			235		pF
Reverse Transfer Capacitance		C _{RSS}			180		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)		Q _G	V _{DS} =30V, V _{GS} =10V, I _D =12A I _G =1mA		74		nC
Gate to Source Charge		Q _{GS}			9		nC
Gate to Drain Charge		Q _{GD}			12		nC
Turn-ON Delay Time (Note 1)		t _{D(ON)}	V _{DD} =30V, V _{GS} =0V, I _D =12A, R _G =25Ω (Note 1, 2)		11		ns
Rise Time		t _R			16		ns
Turn-OFF Delay Time		t _{D(OFF)}			48		ns
Fall-Time		t _F			20		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				12	A
Maximum Body-Diode Pulsed Current		I _{SM}				32	A
Drain-Source Diode Forward Voltage (Note 1)		V _{SD}	I _S =12A, V _{GS} =0V			1.2	V
Body Diode Reverse Recovery Time (Note 1)		t _{rr}	I _S =12A, V _{GS} =0V,		210		nS
Body Diode Reverse Recovery Charge		Q _{rr}	dl _F /dt=100A/μs		430		nC

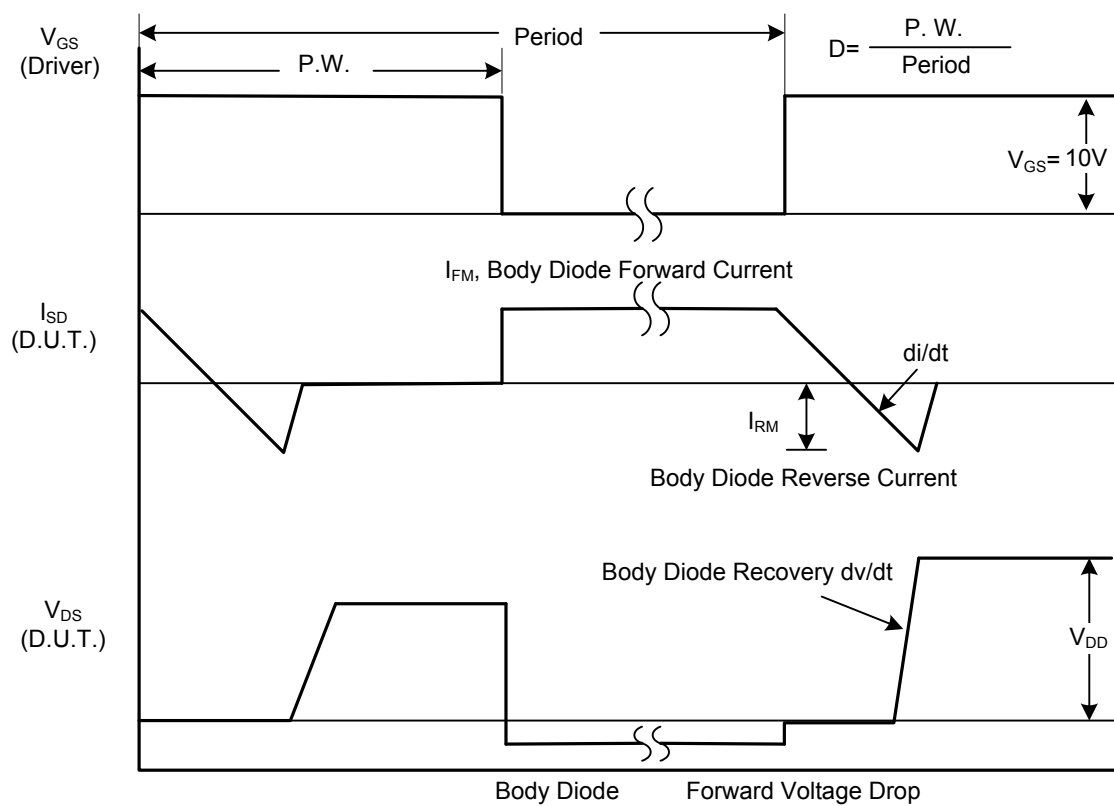
Notes: 1. Pulse Test : Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

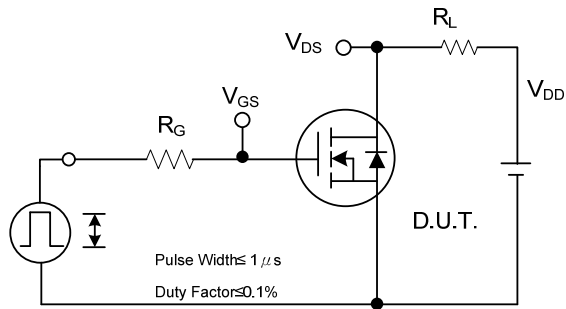


Peak Diode Recovery dv/dt Test Circuit

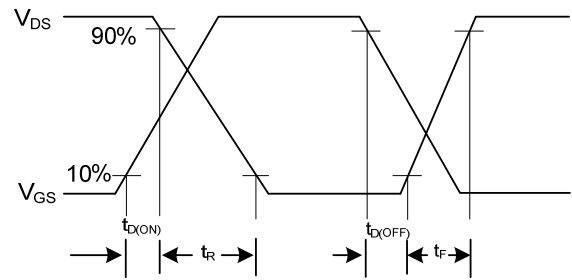


Peak Diode Recovery dv/dt Waveforms

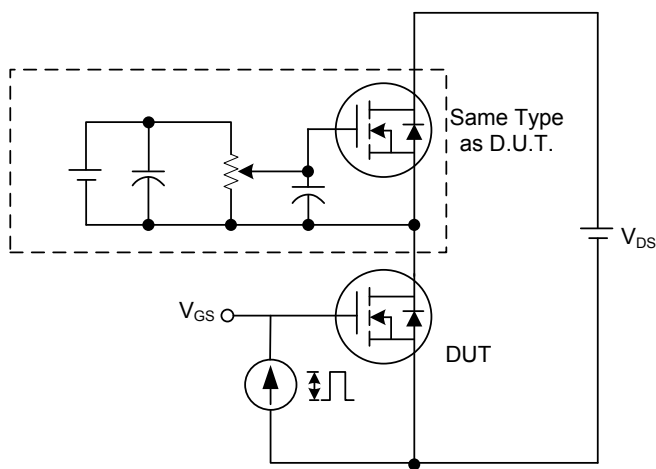
■ TEST CIRCUITS AND WAVEFORMS



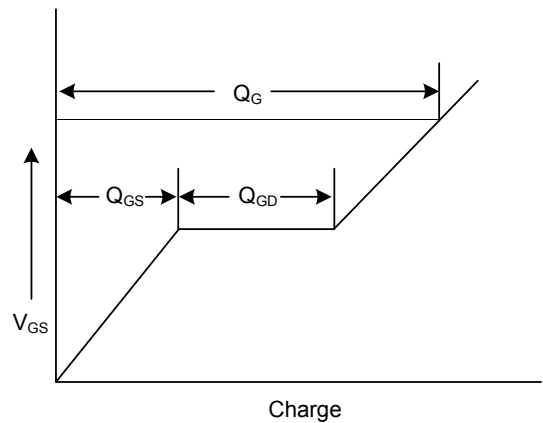
Switching Test Circuit



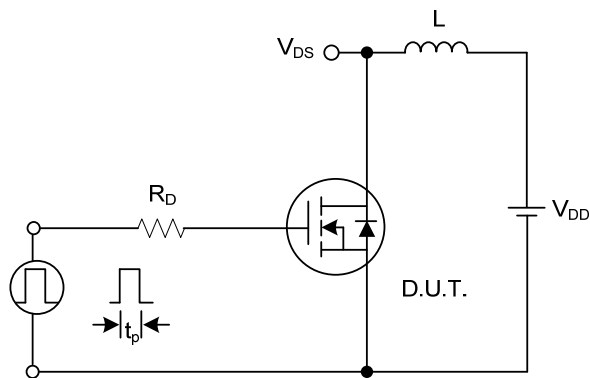
Switching Waveforms



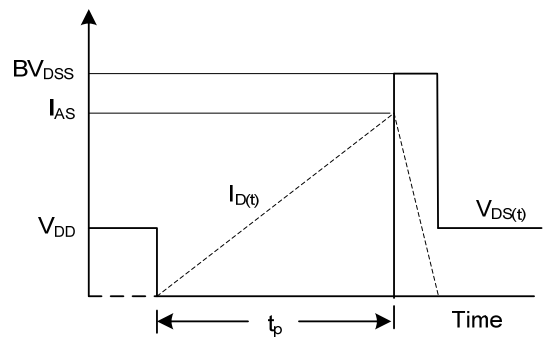
Gate Charge Test Circuit



Gate Charge Waveform

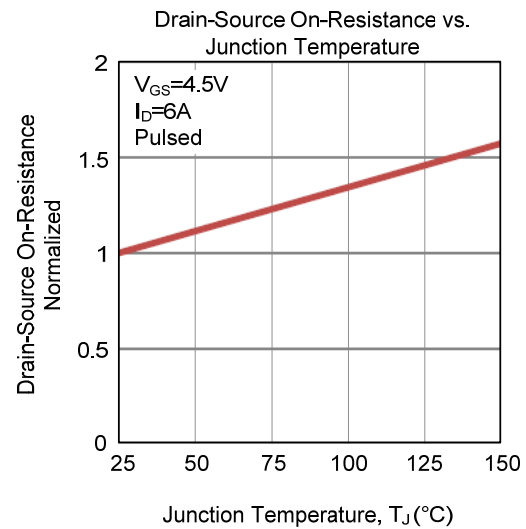
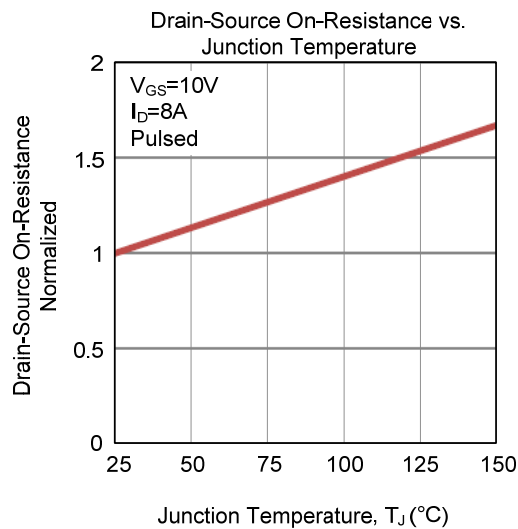
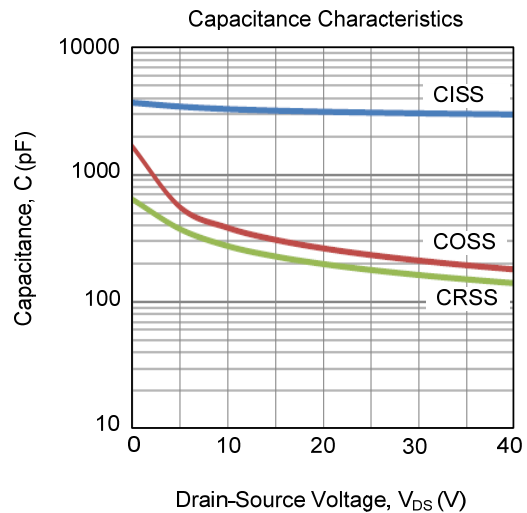
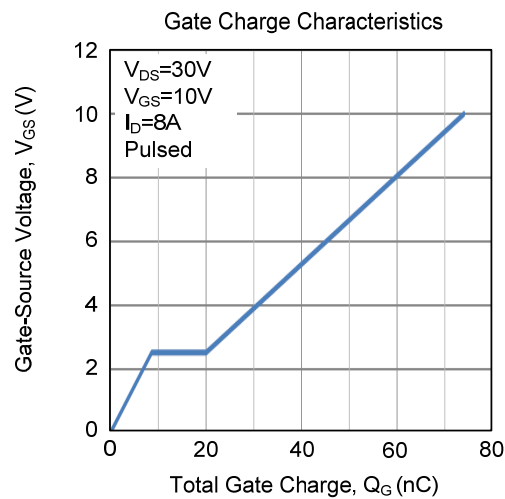
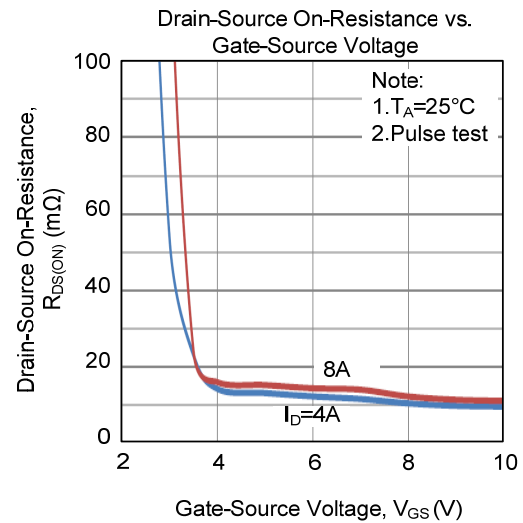
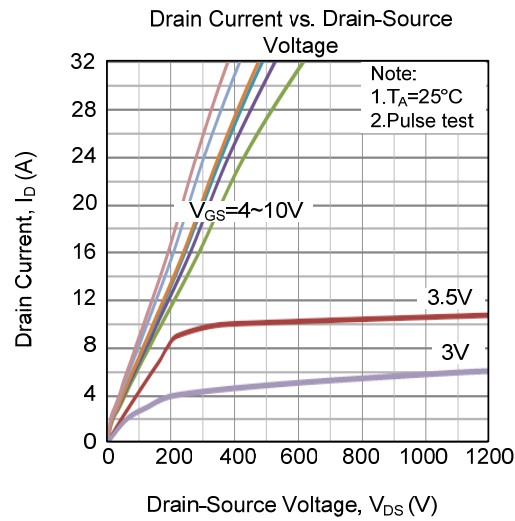


Unclamped Inductive Switching Test Circuit

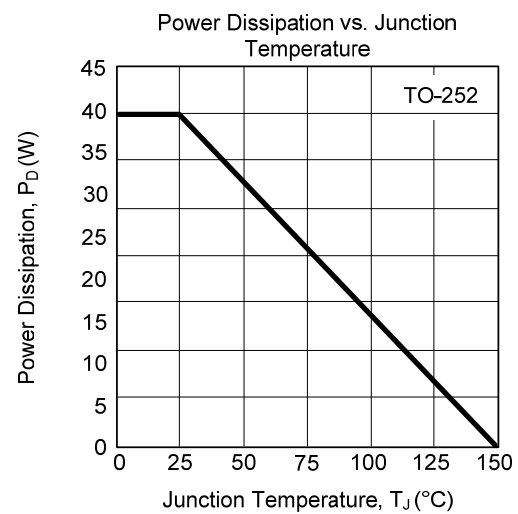
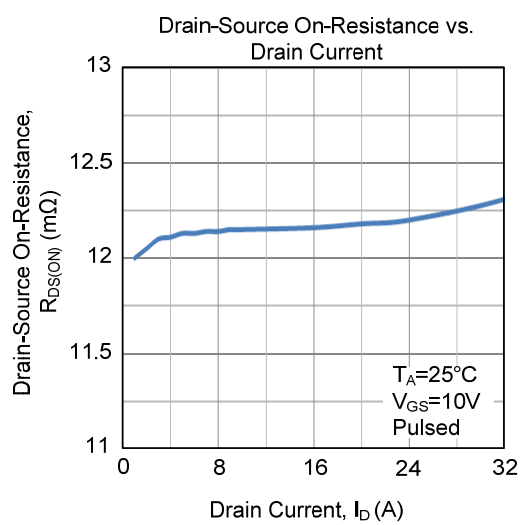
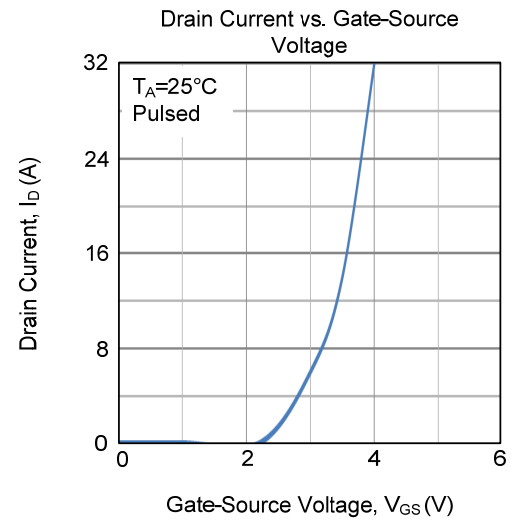
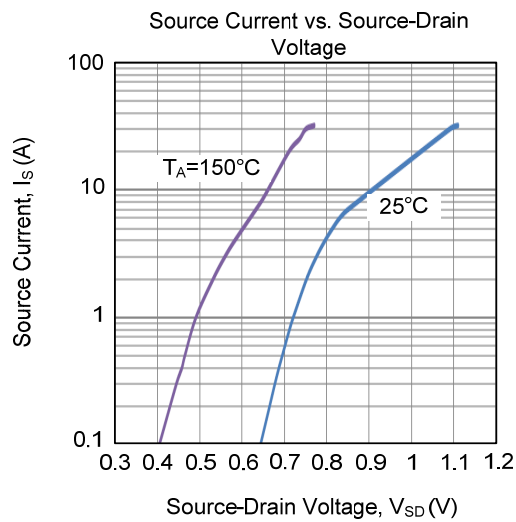
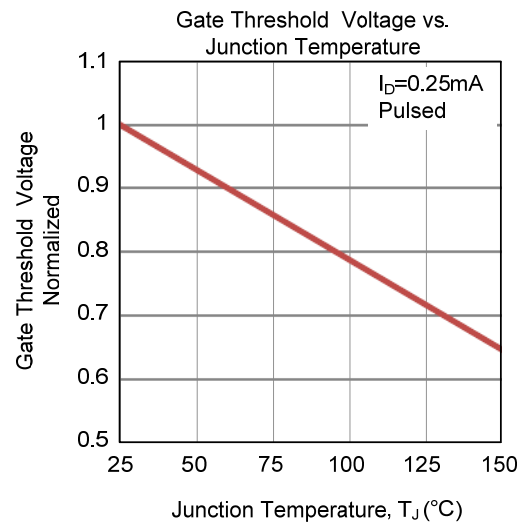
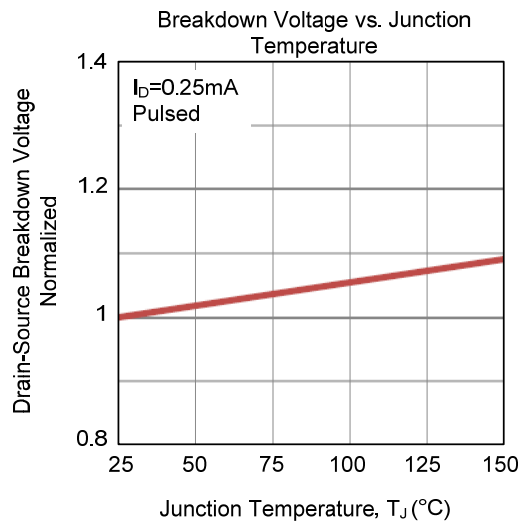


Unclamped Inductive Switching Waveforms

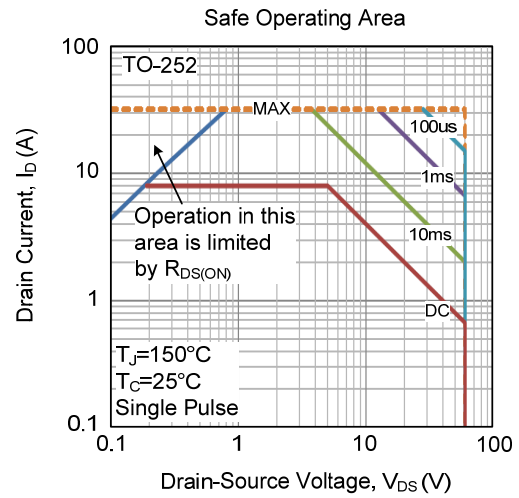
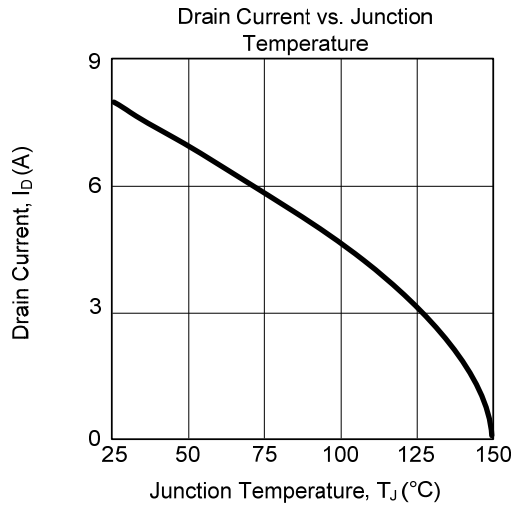
TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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