



UT7422-H

Power MOSFET

40A, 30V N-CHANNEL POWER MOSFET

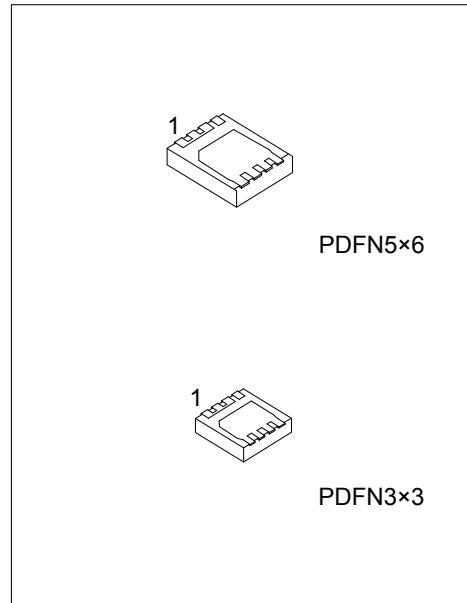
■ DESCRIPTION

The UTC **UT7422-H** is a N-channel Power Mosfet, it uses UTC's advanced technology to provide the customers with a minimum on state resistance, etc.

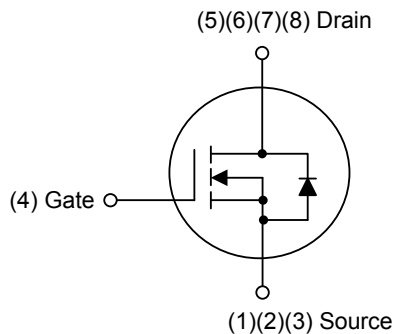
The UTC **UT7422-H** is suitable for load switch and battery protection applications.

■ FEATURES

- * $R_{DS(ON)} \leq 4.3 \text{ m}\Omega @ V_{GS}=10V, I_D=20A$
- $R_{DS(ON)} \leq 6.0 \text{ m}\Omega @ V_{GS}=4.5V, I_D=16A$
- * Low $R_{DS(ON)}$



■ SYMBOL



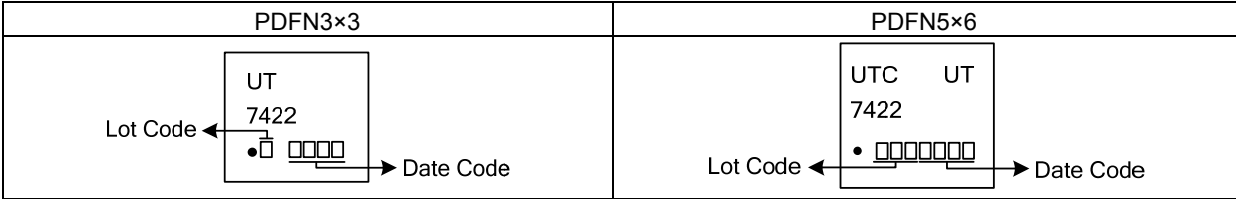
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT7422L-P3030-R	UT7422G-P3030-R	PDFN3x3	S	S	S	G	D	D	D	D	Tape Reel
UT7422L-P5060-R	UT7422G-P5060-R	PDFN5x6	S	S	S	G	D	D	D	D	Tape Reel

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

<p>UT7422G-P3030-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) P3030: PDFN3x3, P5060: PDFN5x6</p> <p>(3) G: Halogen Free and Lead Free, K: Lead Free</p>
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MARKING



■ ABSOLUTE MAXIMUM RATINGS ($T_A=25^\circ\text{C}$, unless otherwise noted)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	30	V
Gate-Source Voltage		V_{GSS}	± 20	V
Continuous Drain Current (Note 6)	$T_C=25^\circ\text{C}$	I_D	40	A
Pulsed Drain Current (Note 4)		I_{DM}	160	A
Avalanche Energy $L=0.1\text{mH}$ (Note 4)		E_{AS}	101	mJ
Power Dissipation (Note 3)	$T_C=25^\circ\text{C}$	PDFN3x3	36	W
		PDFN5x6	48	W
Junction Temperature		T_J	-55 ~ +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. The value of θ_{JA} is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ\text{C}$. The Power dissipation P_{DSM} is based on $\theta_{JA} \leq 10\text{s}$ value and the maximum allowed junction temperature of 150°C . The value in any given application depends on the user's specific board design, and the maximum temperature of 150°C may be used if the PCB allows it.
3. The power dissipation P_D is based on $T_{J(MAX)}=150^\circ\text{C}$, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.
4. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}=150^\circ\text{C}$. Ratings are based on low frequency and duty cycles to keep initial $T_J=25^\circ\text{C}$.
5. The θ_{JA} is the sum of the thermal impedance from junction to case θ_{JC} and case to ambient.
6. The maximum current rating is package limited.

■ THERMAL CHARACTERISTICS

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient (Note 2, 5)	PDFN3x3	θ_{JA}	75	$^\circ\text{C/W}$
	PDFN5x6		62	$^\circ\text{C/W}$
Junction to Case	PDFN3x3	θ_{JC}	3.4	$^\circ\text{C/W}$
	PDFN5x6		2.6	$^\circ\text{C/W}$

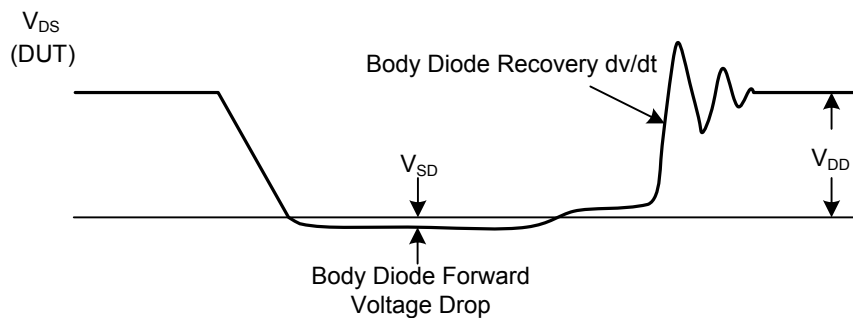
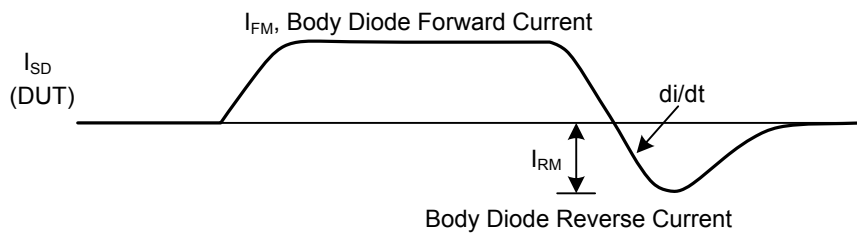
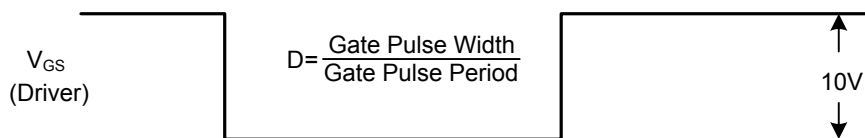
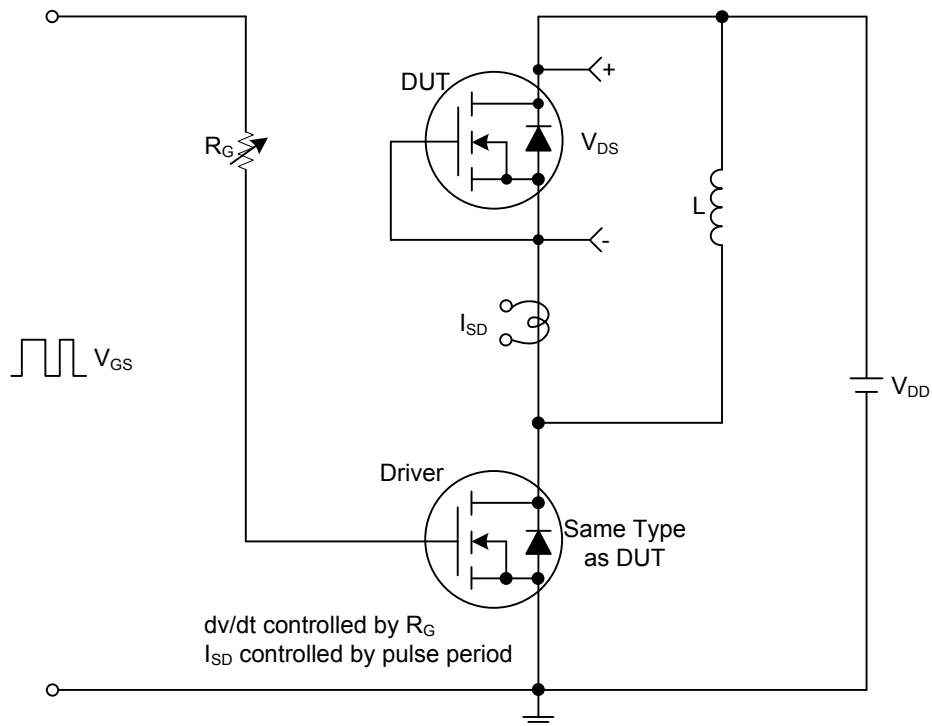
- Notes: 1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
2. The data tested by pulsed, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V			1	μA
		V _{DS} =30V, V _{GS} =0V, T _J =55°C			5	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V			100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	1.3	1.85	2.4	V
On State Drain Current	I _{D(ON)}	V _{GS} =10V, V _{DS} =5V	200			A
Static Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =20A		3.5	4.3	mΩ
		V _{GS} =10V, I _D =20A, T _J =125°C		5.5	6.8	mΩ
		V _{GS} =4.5V, I _D =16A		4.5	6.0	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =15V, f=1.0MHz		2500		pF
Output Capacitance	C _{OSS}			400		pF
Reverse Transfer Capacitance	C _{RSS}			295		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q _G	V _{GS} =10V, V _{DS} =15V, I _D =40A I _G =1mA		48		nC
Total Gate Charge	Q _G	V _{DS} =15V, V _{GS} =4.5V, I _D =40A I _G =1mA		25		nC
Gate to Source Charge	Q _{GS}			5.7		nC
Gate to Drain Charge	Q _{GD}			8.3		nC
Turn-ON Delay Time	t _{D(ON)}	V _{DD} =15V, V _{GS} =10V, I _D =40A, R _G =3.3Ω (Note 1, 2)		19		ns
Rise Time	t _R			16		ns
Turn-OFF Delay Time	t _{D(OFF)}			53		ns
Fall-Time	t _F			18		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current (Note)	I _S				40	A
Maximum Body-Diode Pulsed Current	I _{SM}				160	A
Diode Forward Voltage	V _{SD}	I _S =1A, V _{GS} =0V		0.7	1	V
Body Diode Reverse Recovery Time	t _{rr}	I _F =20A, dI/dt=500A/μs		17.5	22	ns
Body Diode Reverse Recovery Charge	Q _{rr}				31	40

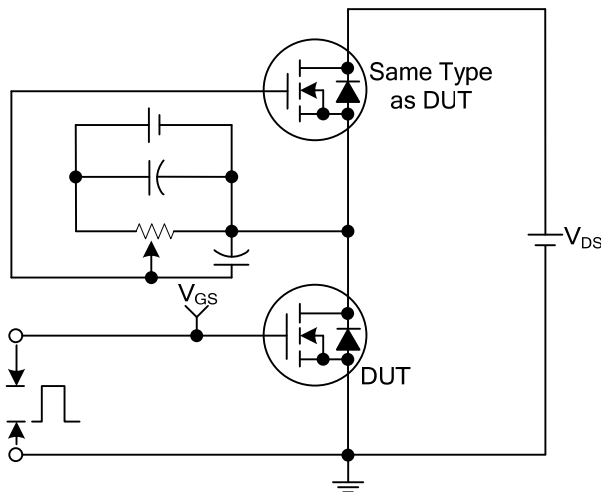
Notes: 1. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%.
2. Essentially independent of operating temperature.

TEST CIRCUITS AND WAVEFORMS

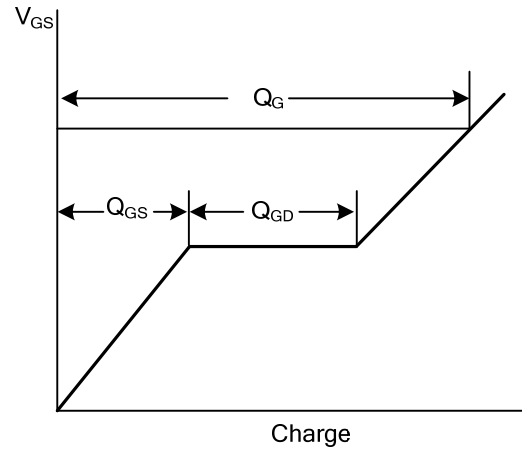


Peak Diode Recovery dv/dt Test Circuit and Waveforms

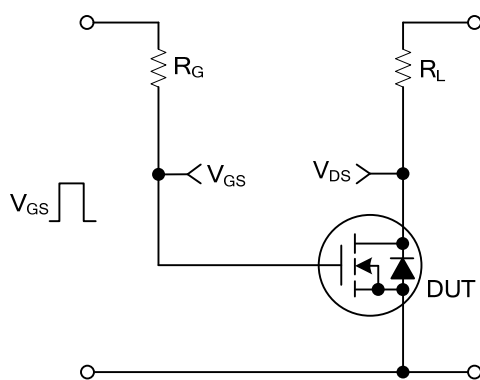
TEST CIRCUITS AND WAVEFORMS



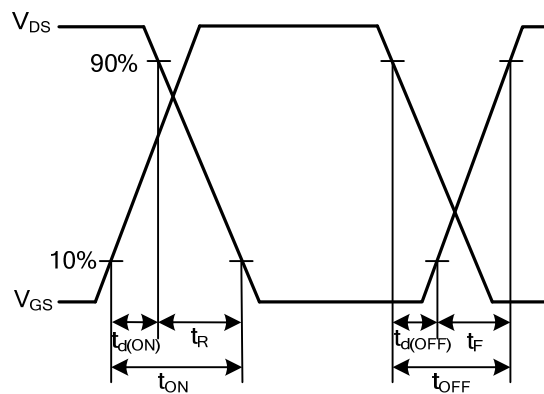
Gate Charge Test Circuit



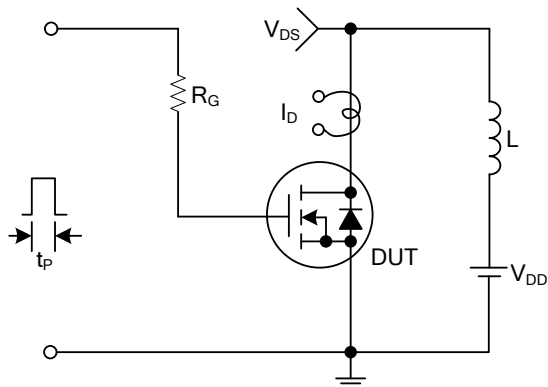
Gate Charge Waveforms



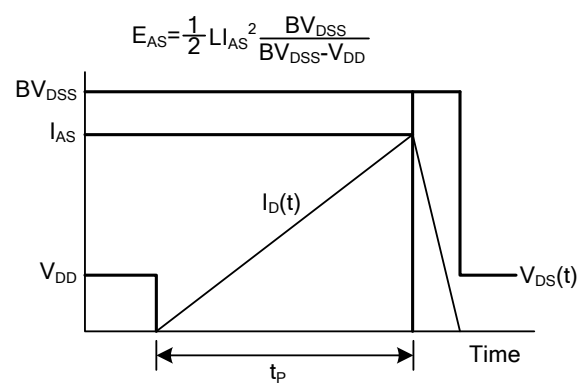
Resistive Switching Test Circuit



Resistive Switching Waveforms

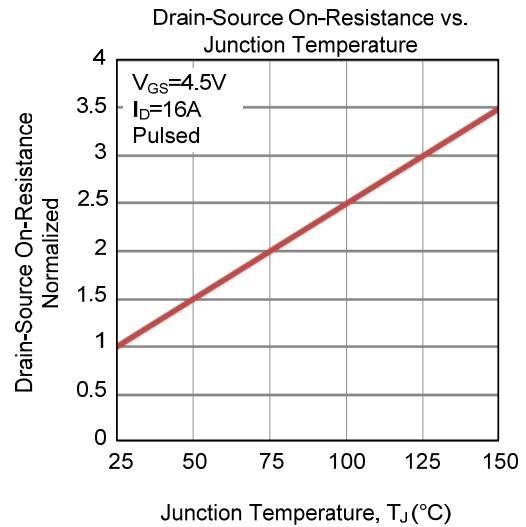
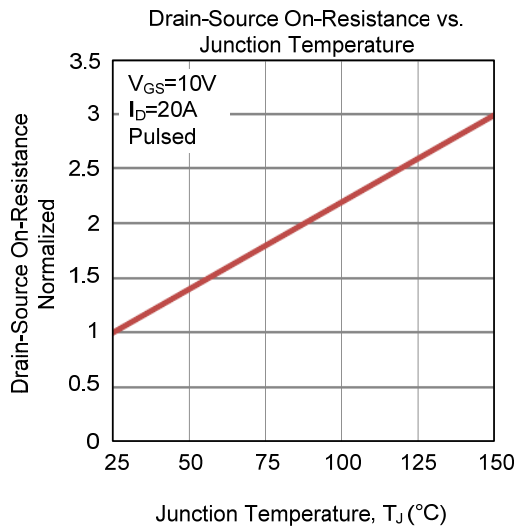
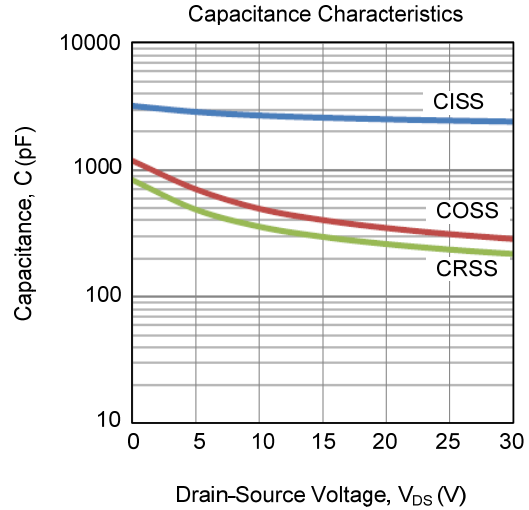
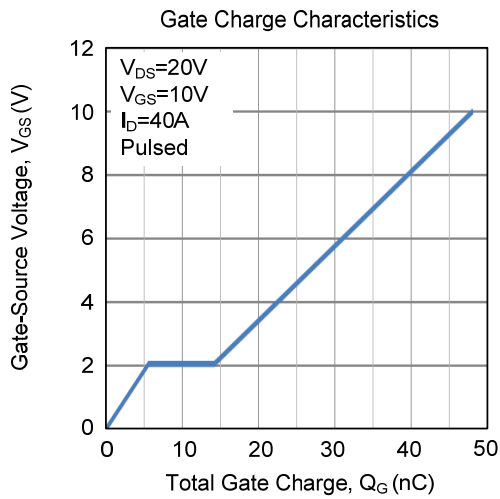
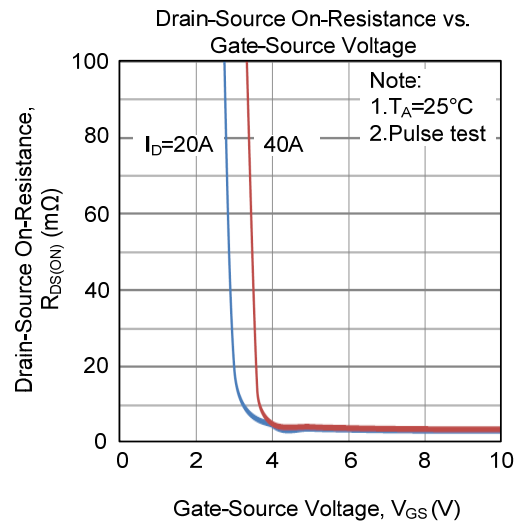
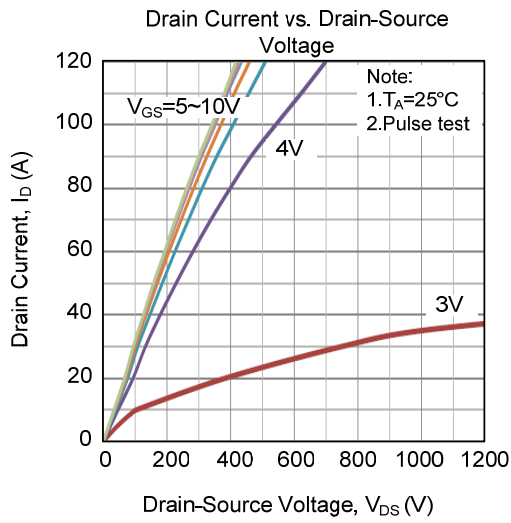


Unclamped Inductive Switching Test Circuit

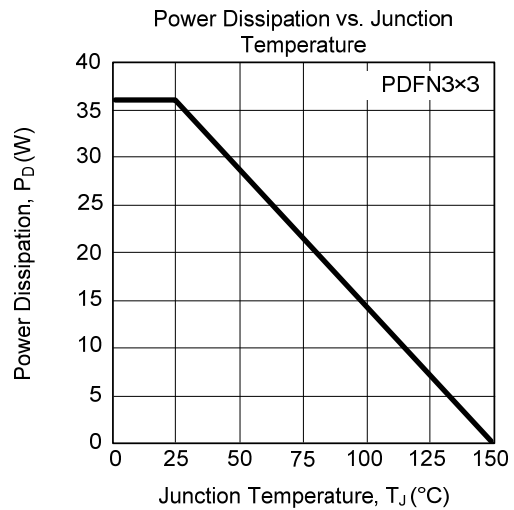
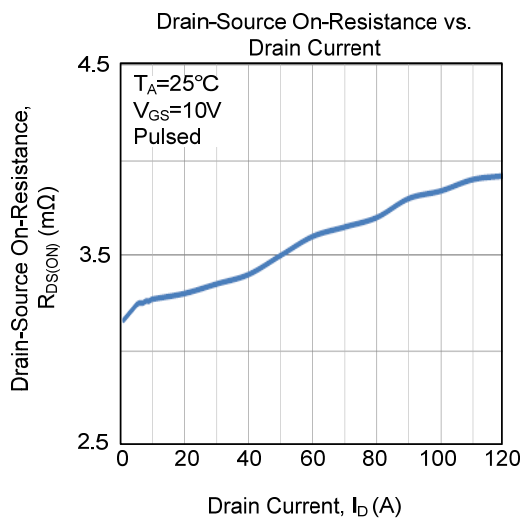
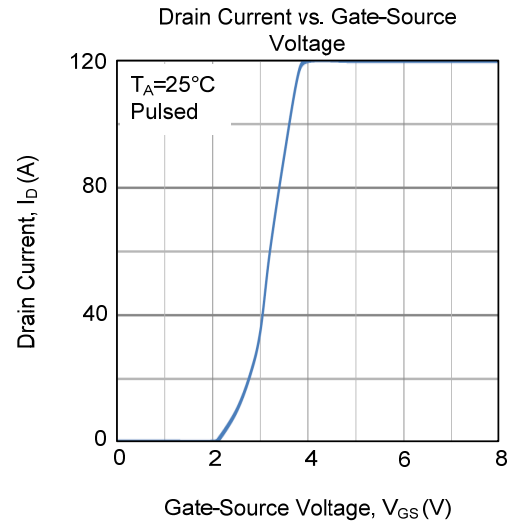
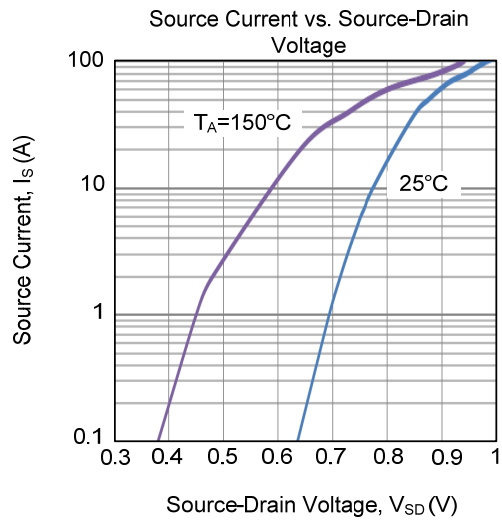
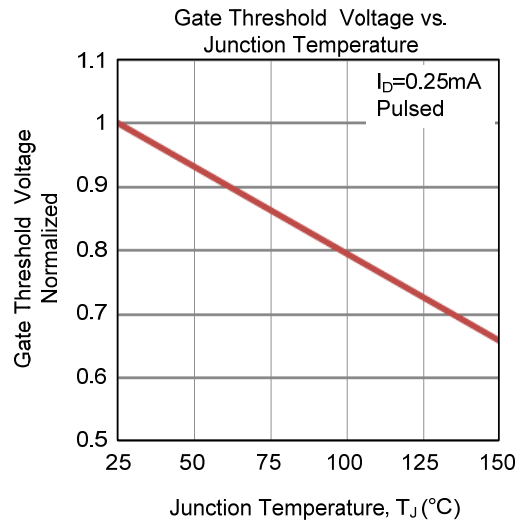
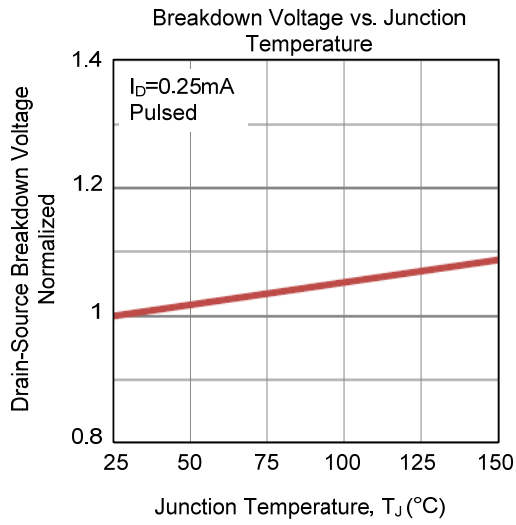


Unclamped Inductive Switching Waveforms

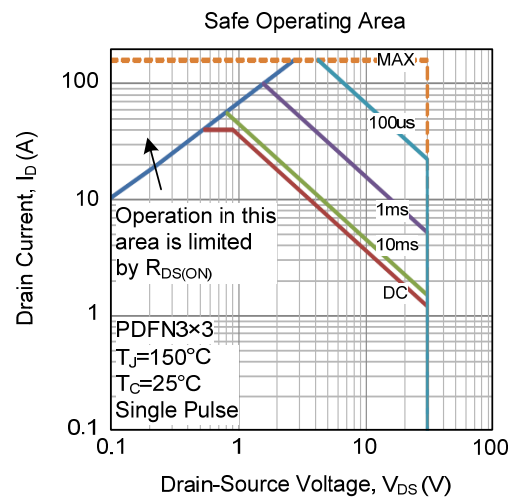
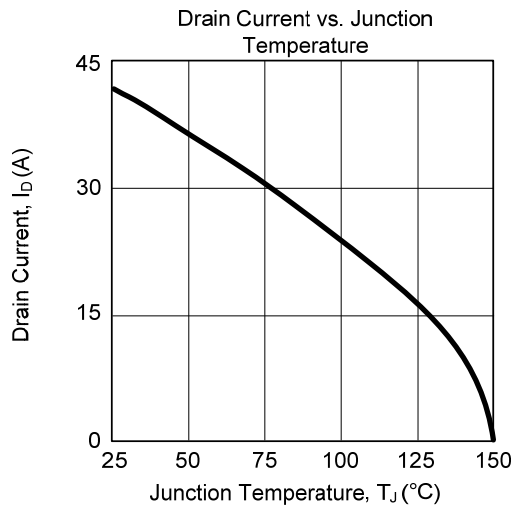
TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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