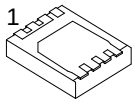
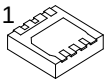
UT7422-H

Power MOSFET

40A, 30V N-CHANNEL POWER MOSFET



DFN5060-8



DFN3030-8

■ DESCRIPTION

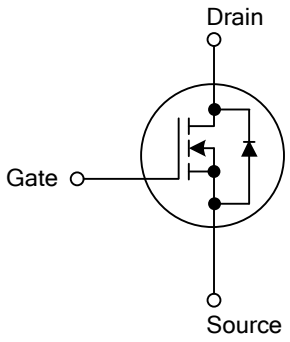
The UTC **UT7422-H** is a N-channel Power Mosfet, it uses UTC's advanced technology to provide the customers with a minimum on state resistance, etc.

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

■ FEATURES

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

■ SYMBOL



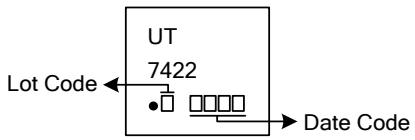
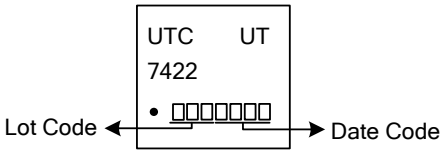
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT7422L-K08-3030-R	UT7422G-K08-3030-R	DFN3030-8	S	S	S	G	D	D	D	D	Tape Reel
UT7422L-K08-5060-R	UT7422G-K08-5060-R	DFN5060-8	S	S	S	G	D	D	D	D	Tape Reel

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

UT7422G-K08-3030-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) K08-3030: DFN3030-8, K08-5060: DFN5060-8 (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

DFN3030-8	DFN5060-8
	

■ ABSOLUTE MAXIMUM RATINGS (T_A=25°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°C		I_D	40	A
Pulsed Drain Current (Note 4)			I_{DM}	160	A
Avalanche Energy L=0.1mH (Note 4)			E_{AS}	101	mJ
Power Dissipation (Note 3)	T_C=25°C	DFN3030-8	P_D	36	W
		DFN5060-8		48	W
Junction Temperature			T_J	-55 ~ +150	°C
Storage Temperature Range			T_{STG}	-55 ~ +150	°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 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The Power dissipation P_{DSM} is based on θ_{JA} t≤10s 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°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°C. Ratings are based on low frequency and duty cycles to keep initial T_J=25°C.
5. The θ_{JA} is the sum of the thermal impedence 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)	DFN3030-8	θ_{JA}	75	°C/W
	DFN5060-8		62	°C/W
Junction to Case	DFN3030-8	θ_{JC}	3.4	°C/W
	DFN5060-8		2.6	°C/W

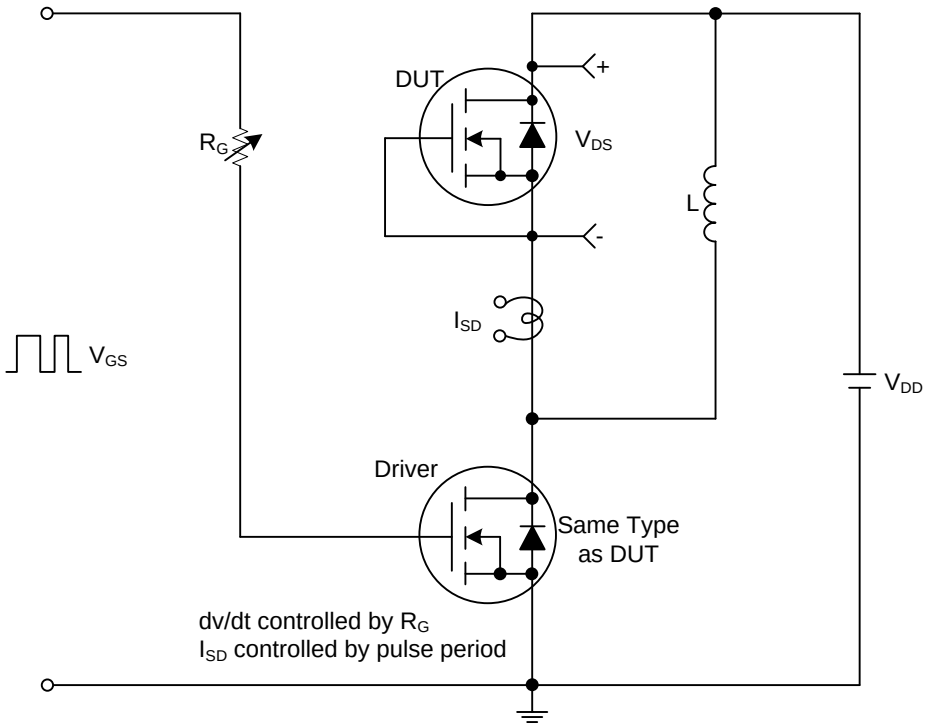
Notes: 1. The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.
2. The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2%.

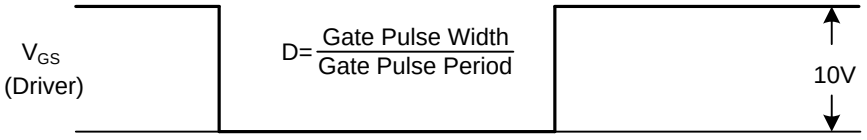
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise noted)

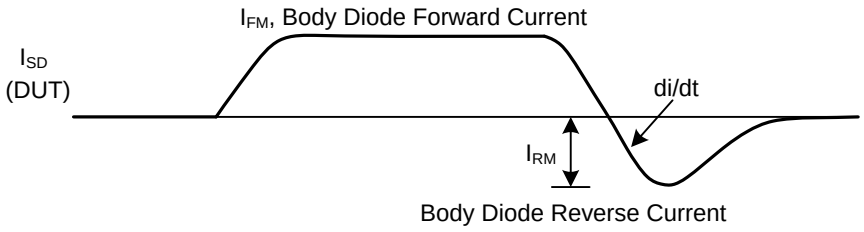
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D=250μA, V_{GS}=0V	30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V			1	μA
		V_{DS}=30V, V_{GS}=0V, T_J=55°C			5	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, 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	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	nC

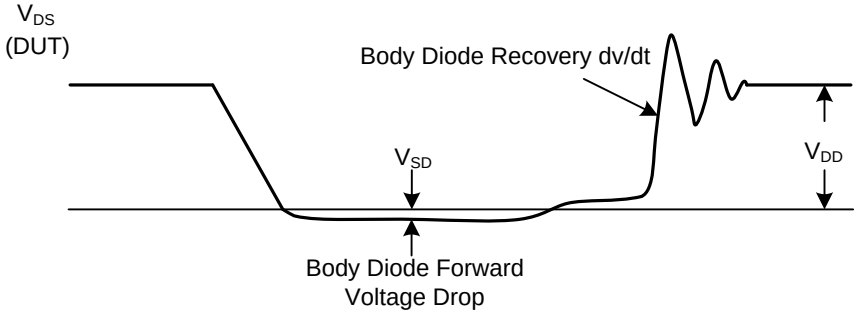
Notes: 1. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%.
2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS



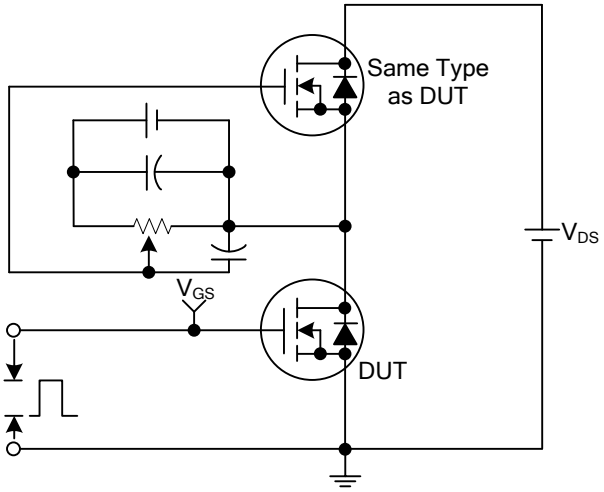




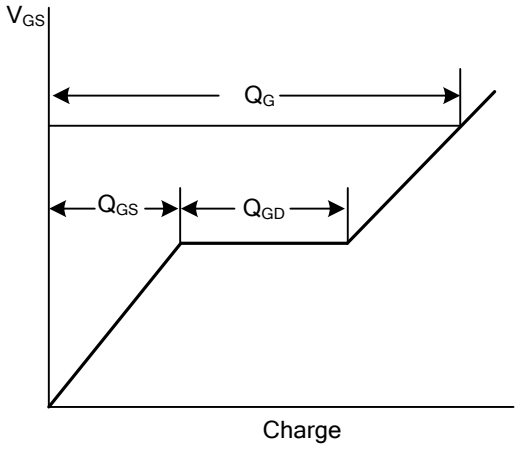


Peak Diode Recovery dv/dt Test Circuit and Waveforms

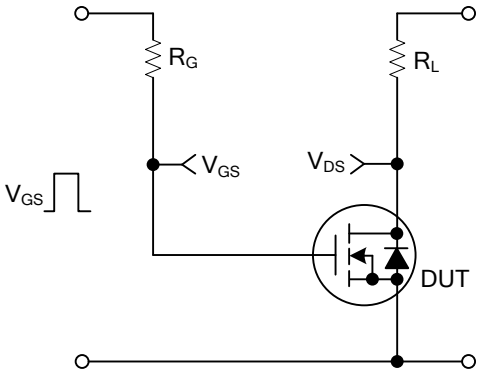
■ TEST CIRCUITS AND WAVEFORMS



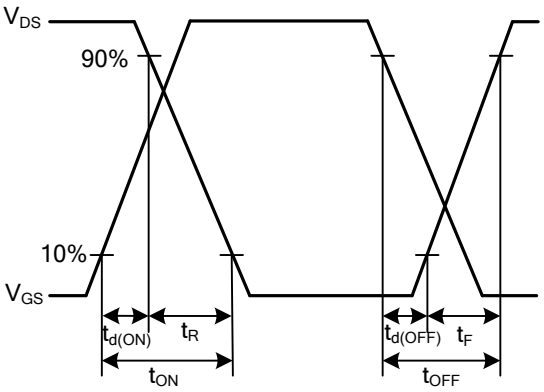
Gate Charge Test Circuit



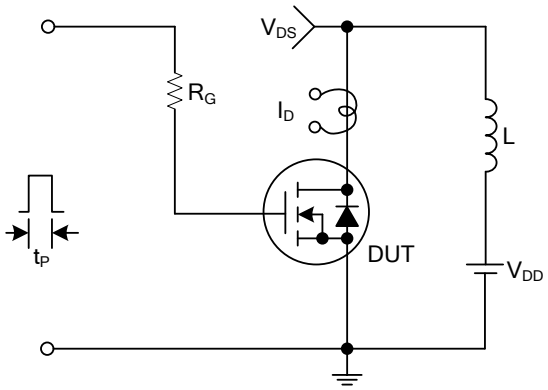
Gate Charge Waveforms



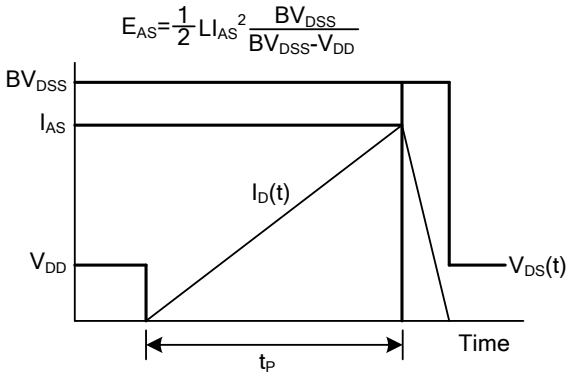
Resistive Switching Test Circuit



Resistive Switching Waveforms



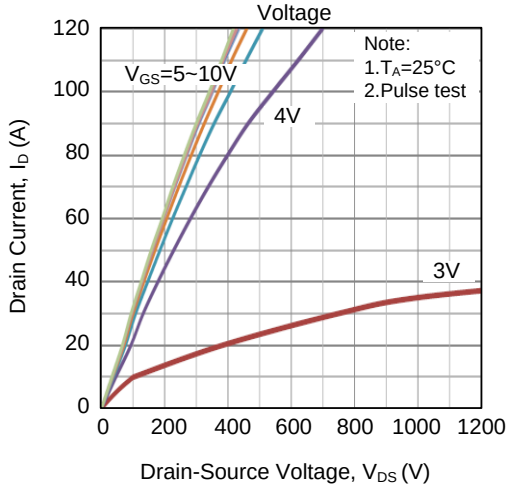
Unclamped Inductive Switching Test Circuit



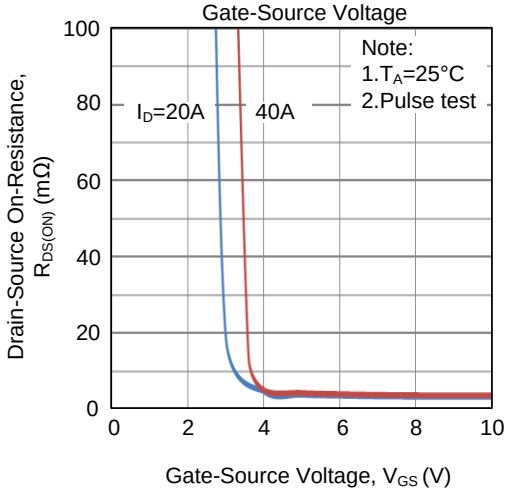
Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS

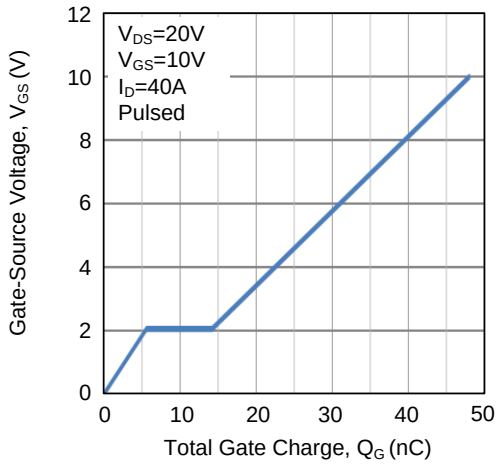
Drain Current vs. Drain-Source Voltage



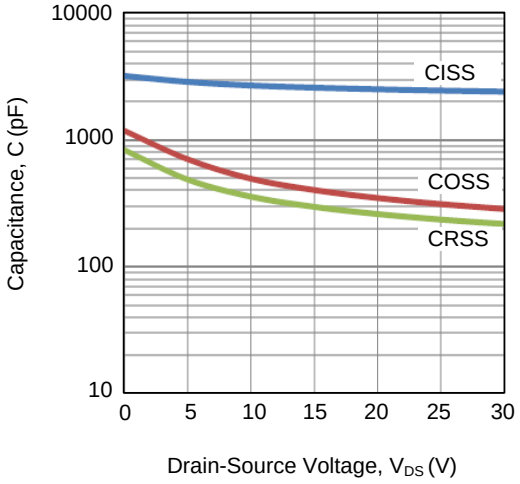
Drain-Source On-Resistance vs. Gate-Source Voltage



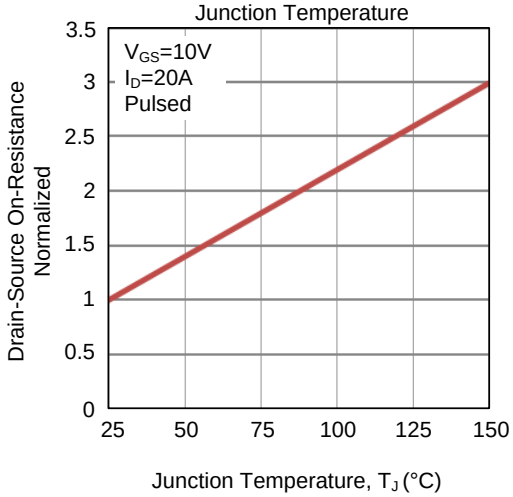
Gate Charge Characteristics



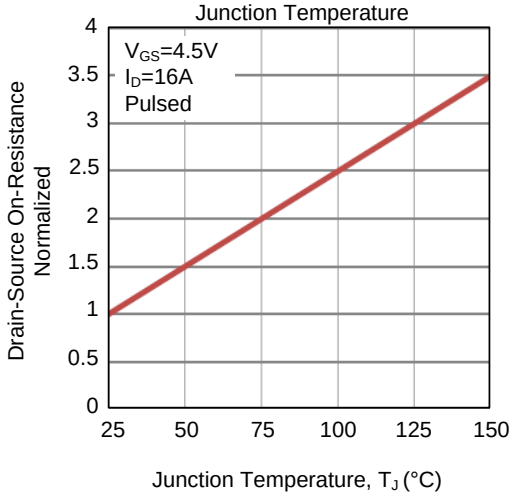
Capacitance Characteristics



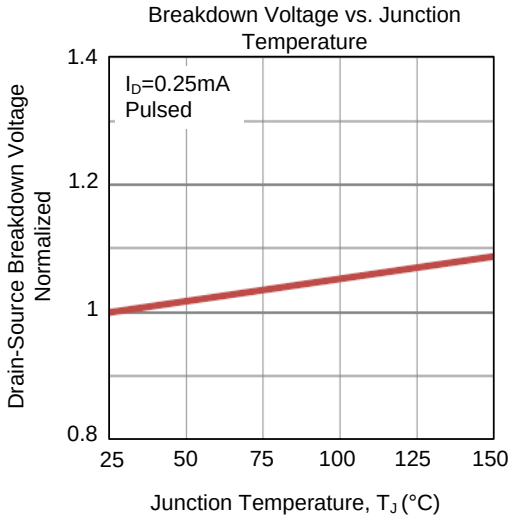
Drain-Source On-Resistance vs. Junction Temperature

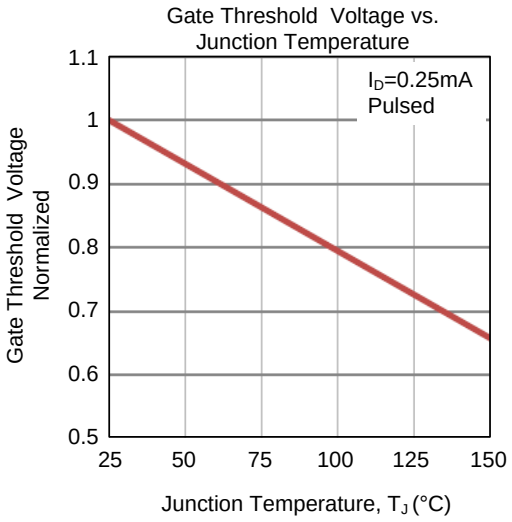


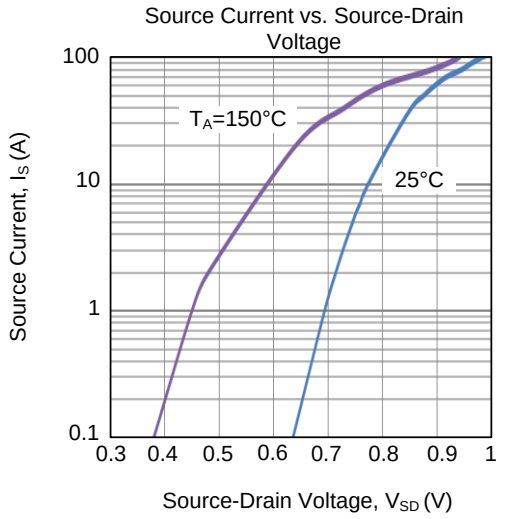
Drain-Source On-Resistance vs. Junction Temperature

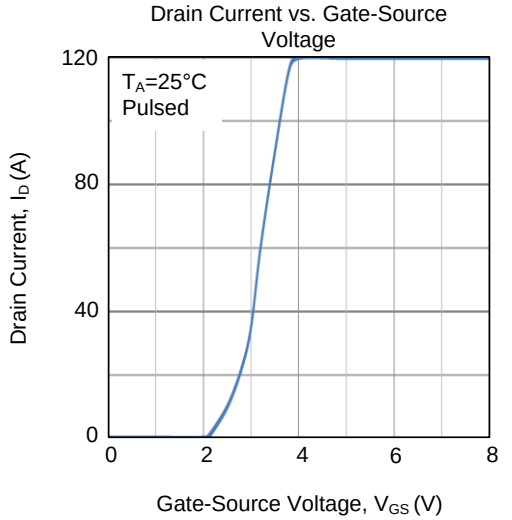


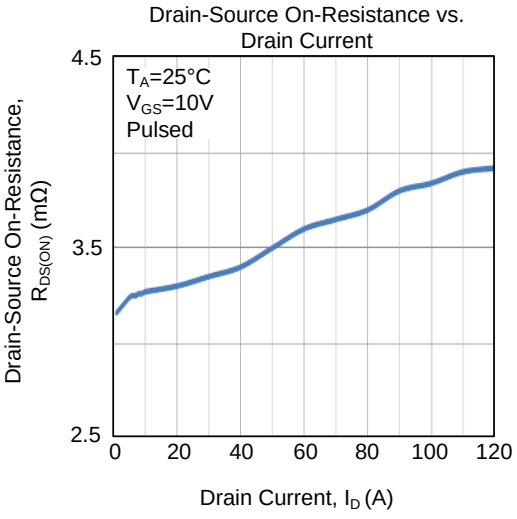
■ TYPICAL CHARACTERISTICS (Cont.)

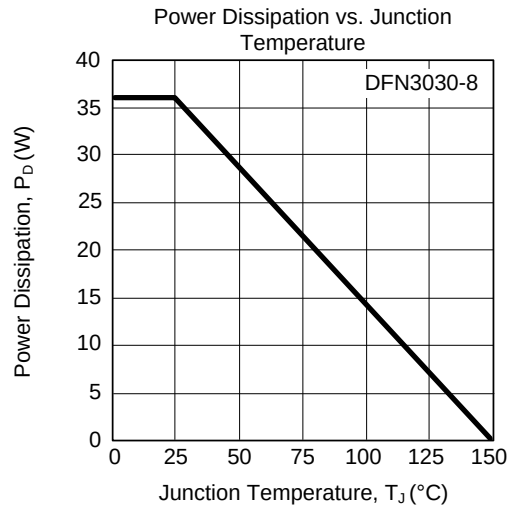












■ TYPICAL CHARACTERISTICS (Cont.)