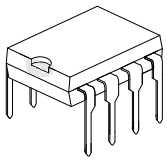
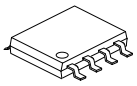
UP9971

Power MOSFET

5A, 60V N-CHANNEL POWER MOSFET



DIP-8



SOP-8

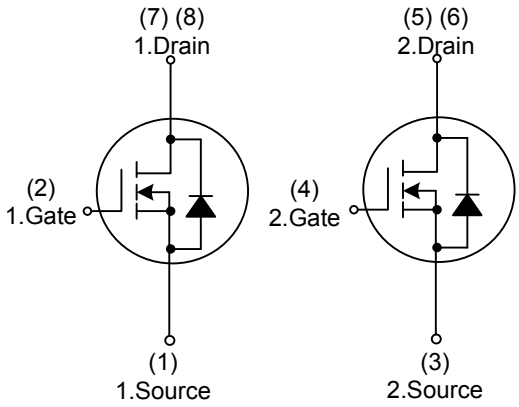
■ DESCRIPTION

The UTC **UP9971** uses UTC's advanced technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with low gate voltages. This device is suitable for being used as a load switch or in PWM applications.

■ FEATURES

* $R_{DS(ON)}$<60 mΩ @ V_{GS}=10V, I_D=5A
* $R_{DS(ON)}$<72 mΩ @ V_{GS}=4.5V, I_D=2.5A
* Ultra low gate charge (typical 32.5 nC)
* Low reverse transfer Capacitance (C_{RSS} = typical 109 pF)
* Fast switching capability
* Avalanche energy Specified
* Improved dv/dt capability, high ruggedness

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UP9971L-D08-T	UP9971G-D08-T	DIP-8	S	G	S	G	D	D	D	D	Tube
UP9971L-S08-R	UP9971G-S08-R	SOP-8	S	G	S	G	D	D	D	D	Tape Reel

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

UP9971G-D08-T

(1)Packing Type
(2)Package Type
(3)Green Package

(1) R: Tape Reel, T: Tube

(2) D08: DIP-8, S08: SOP-8

(3) G: Halogen Free and Lead Free, L: Lead Free

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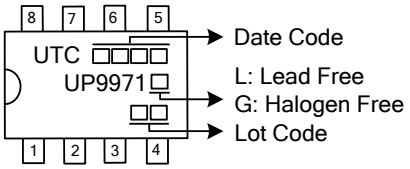
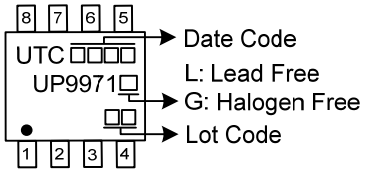
■ MARKING

DIP-8	SOP-8
	

■ ABSOLUTE MAXIMUM RATINGS (T_A=25℃, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	60	V
Gate-Source Voltage		V_{GSS}	±25	V
Continuous Drain Current (V_{GS}=10V)		I_D	5	A
Pulsed Drain Current (Note 2,3)	DIP-8	I_{DM}	20	A
	SOP-8		30	A
Power Dissipation		P_D	2	W
Junction Temperature		T_J	+150	°C
Storage Temperature		T_{STG}	-55 ~ +150	°C

Note: 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. Pulse width≦300μs, Duty cycle≦2%

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	62.5	°C/W

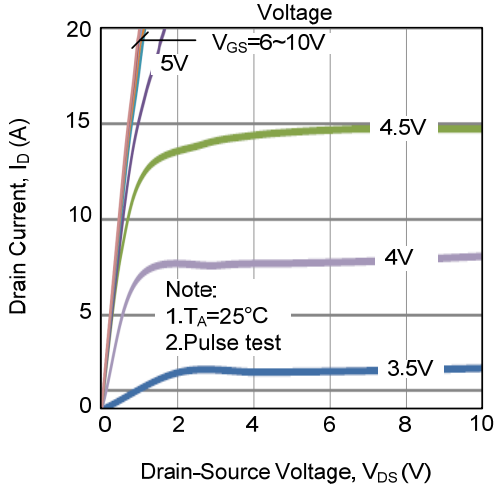
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	60			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=60 V, V_{GS}=0V			1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±25V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	1.5		3	V
Static Drain-Source On-Resistance (Note)	$R_{DS(ON)}$	V_{GS}=10V, I_D=5A			60	mΩ
		V_{GS}=4.5V, I_D=2.5A			72	
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{DS}=25V, V_{GS}=0V, f =1.0MHz		740		pF
Output Capacitance	C_{OSS}			175		pF
Reverse Transfer Capacitance	C_{RSS}			30		pF
SWITCHING PARAMETERS						
Total Gate Charge (Note)	Q_G	V_{DS}=48V, V_{GS}=5V, I_D=5A I_G=1mA		12.6		nC
Total Gate Charge (Note)	Q_G	V_{DS}=48V, V_{GS}=10V, I_D=5A I_G=1mA		21.4		nC
Gate Source Charge	Q_{GS}			4.8		nC
Gate Drain Charge	Q_{GD}			3.6		nC
Turn-ON Delay Time (Note)	$t_{D(ON)}$	V_{GS}=10V, V_{DS}=30V, R_D=6Ω, R_G=3.3Ω, I_D=5A		9.6		ns
Turn-ON Rise Time	t_R			10		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			30		ns
Turn-OFF Fall-Time	t_F			5.5		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Diode Forward Voltage (Note)	V_{SD}	I_S =1.6A,V_{GS} =0V			1.2	V
Body Diode Reverse Recovery Time	t_{rr}	I_S=5A, V_{GS}=0V, di/dt=100A/μs		29.2		ns
Body Diode Reverse Recovery Charge	Q_{rr}			48		nC

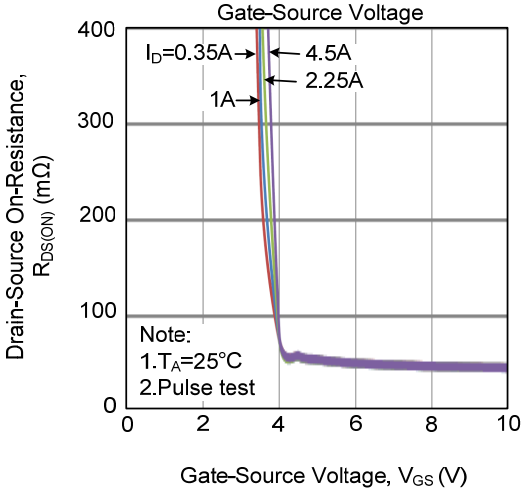
Note: Pulse width≦300μs, Duty cycle≦2%.

■ TYPICAL CHARACTERISTICS

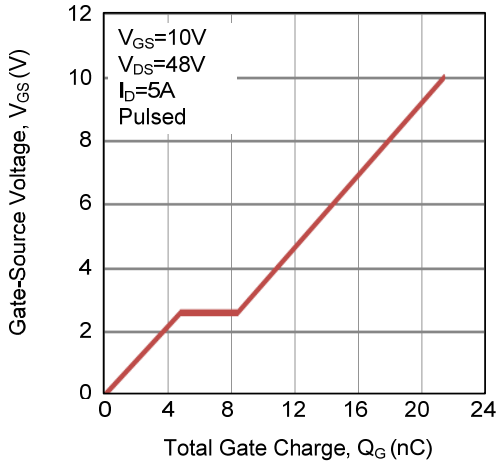
Drain Current vs. Drain-Source Voltage



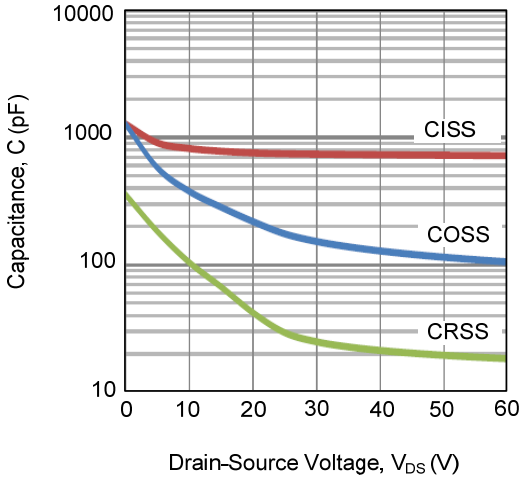
Drain-Source On-Resistance vs. Gate-Source Voltage



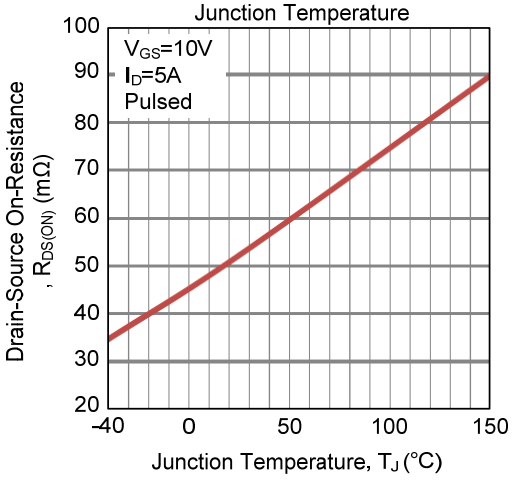
Gate Charge Characteristics



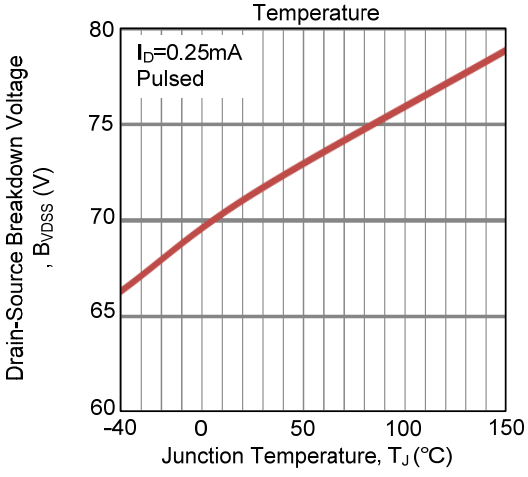
Capacitance Characteristics



Drain-Source On-Resistance vs. Junction Temperature

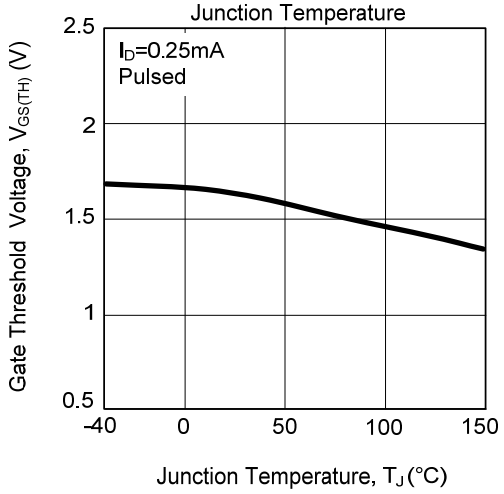


Breakdown Voltage vs. Junction Temperature

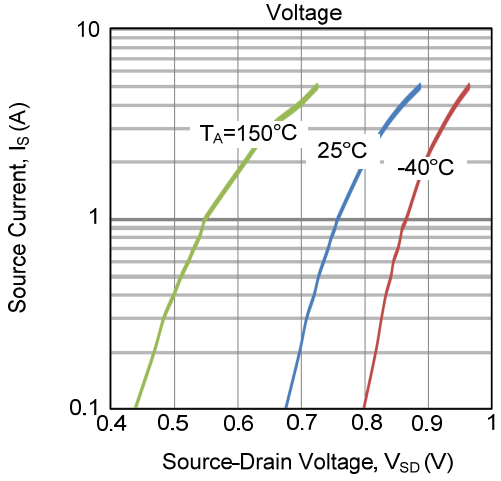


■ TYPICAL CHARACTERISTICS (Cont.)

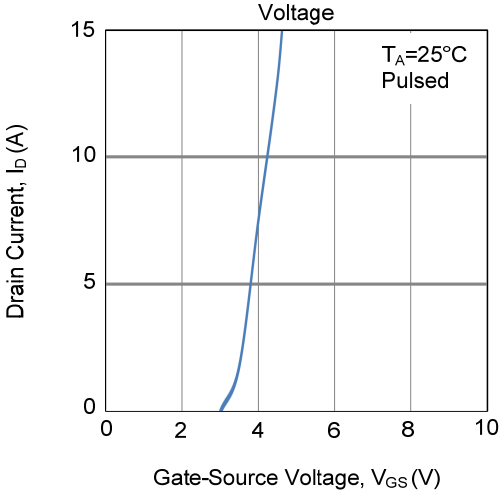
Gate Threshold Voltage vs. Junction Temperature



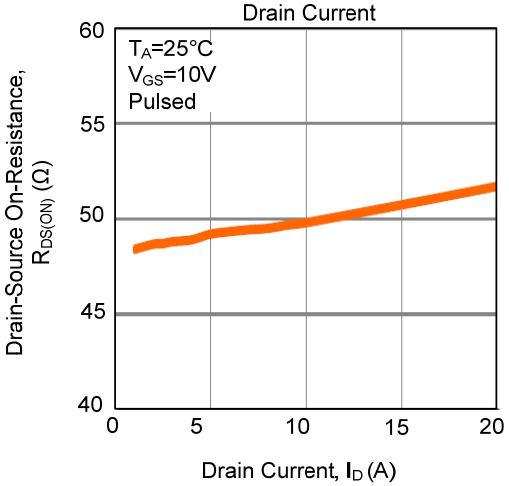
Source Current vs. Source-Drain Voltage



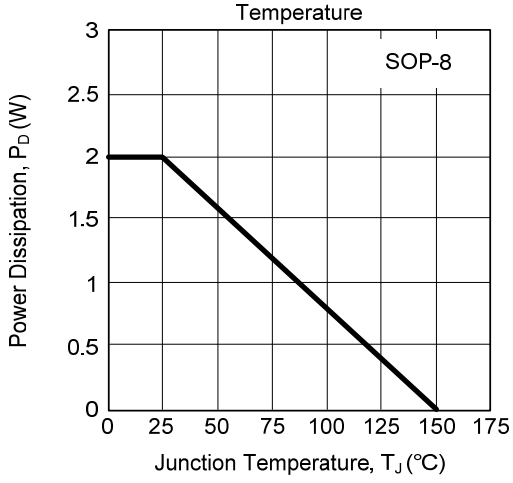
Drain Current vs. Gate-Source Voltage



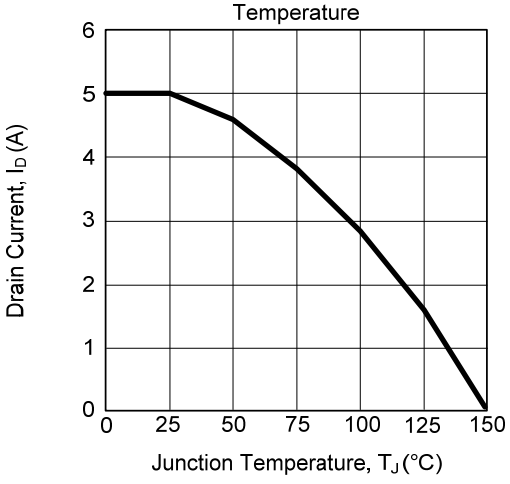
Drain-Source On-Resistance vs. Drain Current



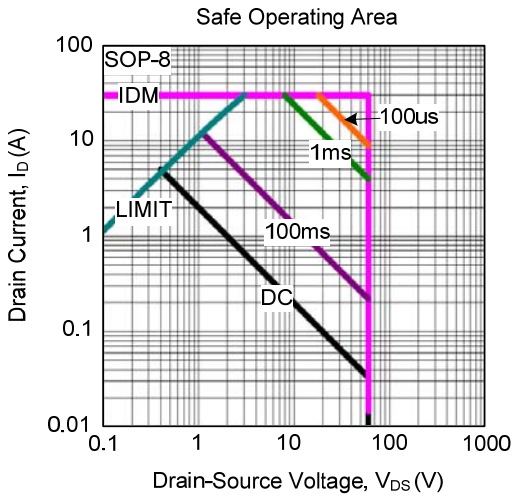
Power Dissipation vs. Junction Temperature



Drain Current vs. Junction Temperature



■ TYPICAL CHARACTERISTICS (Cont.)



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