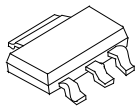
UT9971P

Power MOSFET

5.0A, 60V N-CHANNEL POWER MOSFET



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SOT-223

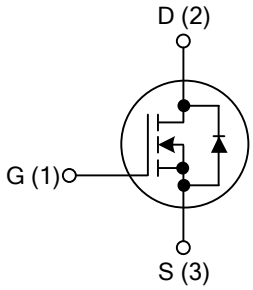
■ DESCRIPTION

The UTC **UT9971P** is an N-Channel enhancement mode power MOSFET providing customers with high switching speed, cost-effectiveness and minimum on-state resistance.

■ FEATURES

* $R_{DS(ON)}$ < 50mΩ @V_{GS} = 10 V
* High switching speed
* Halogen Free

■ SYMBOL



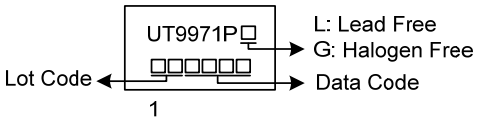
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT9971PL-AA3-R	UT9971PG-AA3-R	SOT-223	G	D	S	Tape Reel

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

UT9971PL-AA3-R (1)Packing Type (2)Package Type (3)Lead Free	(1) R: Tape Reel (2) AA3: SOT-223 (3) L: Lead Free, G: Halogen Free

■ MARKING INFORMATION

PACKAGE	MARKING
SOT-223	

■ ABSOLUTE MAXIMUM RATINGS

PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage			V_{DSS}	60	V
Gate-Source Voltage			V_{GSS}	±25	V
Drain Current	Continuous	T_A=25°C	I_D	5	A
	Pulsed		I_{DM}	20	A
Power Dissipation (T_A=25°C)			P_D	2.7	W
Junction Temperature			T_J	-55~+150	°C
Storage Temperature Range			T_{STG}	-55~+150	°C

Note: 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.

■ THERMAL CHARACTERISTICS

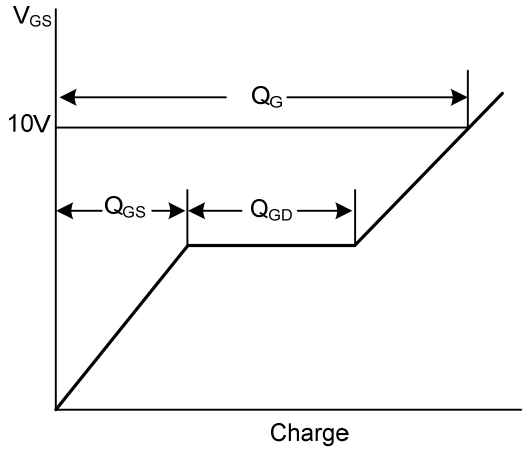
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient (Note 3)	θ_{JA}	45	°C/W

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

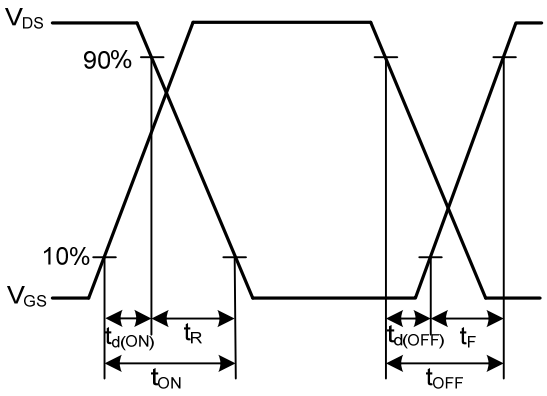
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{GS}=0V	60			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=60V, V_{GS}=0V, T_J=25°C			1	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+25V			+100	nA
	Reverse		V_{GS}=-25V			-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 (Note 2)		$R_{DS(ON)}$	V_{GS}=10V, I_D=5A			50	mΩ
			V_{GS}=4.5V, I_D=2.5A			60	mΩ
Forward Transconductance		g_{FS}	V_{DS}=10V, I_D=5A		7		S
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=25V, f=1.0MHz		760		pF
Output Capacitance		C_{OSS}			188		pF
Reverse Transfer Capacitance		C_{RSS}			35		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 2)		Q_G	V_{GS}=10V, V_{DS}=48V, I_D=5A		56		nC
Gate to Source Charge		Q_{GS}			5.5		nC
Gate to Drain Charge		Q_{GD}			8.8		nC
Turn-ON Delay Time (Note 2)		$t_{D(ON)}$	V_{DS}=30V, I_D=1A, V_{GS}=10V, R_G=3.3Ω, R_D=6Ω		40		ns
Rise Time		t_R			40		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			170		ns
Fall-Time		t_F			50		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Drain-Source Diode Forward Voltage (Note 2)		V_{SD}	I_S=5A, V_{GS}=0V			1.2	V

Notes: 1. Pulse width limited by Max. junction temperature.
2. Pulse width ≤ 300μs, Duty cycle ≤ 2%

■ TEST CIRCUITS AND WAVEFORMS



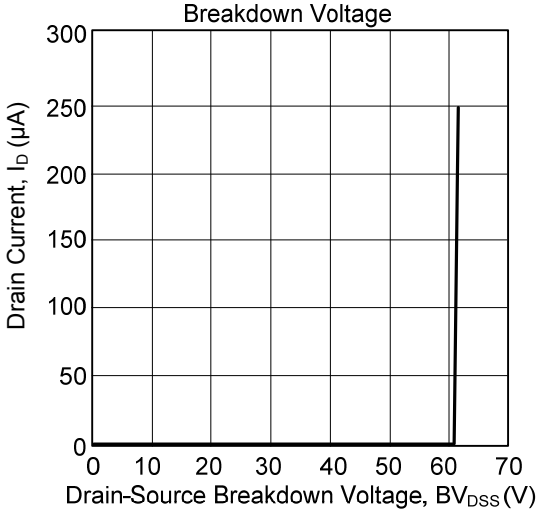
Gate Charge Waveforms



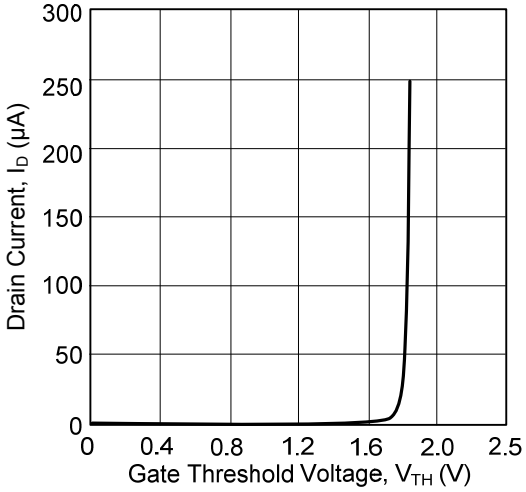
Resistive Switching Waveforms

■ TYPICAL CHARACTERISTICS

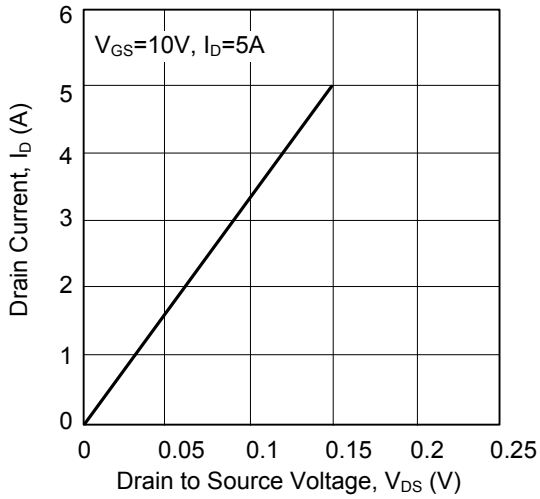
Drain Current vs. Drain-Source Breakdown Voltage



Drain Current vs. Gate Threshold Voltage



Drain-Source On-State Resistance Characteristics



Drain Current vs. Source to Drain Voltage