



**UT9971P**

*Power MOSFET*

**5.0A, 60V N-CHANNEL  
POWER MOSFET**

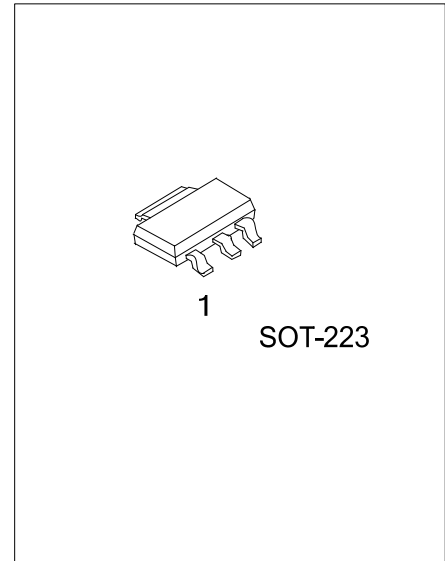
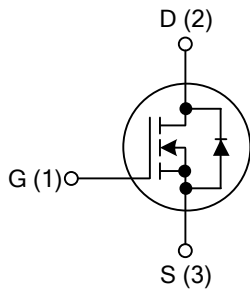
■ DESCRIPTION

The UTC **UT9971P** is a n N-Channel enhancement mode power MOSF ET providing customers with hi gh s witching speed, cost-effectiveness and minimum on-state resistance.

■ FEATURES

- \*  $R_{DS(ON)} < 50m\Omega @ V_{GS} = 10 V$
- \* 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

<p>UT9971PL-AA3-R</p> <ul style="list-style-type: none"> <li>(1)Packing Type</li> <li>(2)Package Type</li> <li>(3)Lead Free</li> </ul>	<ul style="list-style-type: none"> <li>(1) R: Tape Reel</li> <li>(2) AA3: SOT-223</li> <li>(3) L: Lead Free, G: Halogen Free</li> </ul>
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■ MARKING INFORMATION

PACKAGE MARKING	
SOT-223	

### ■ ABSOLUTE MAXIMUM RATINGS

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

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

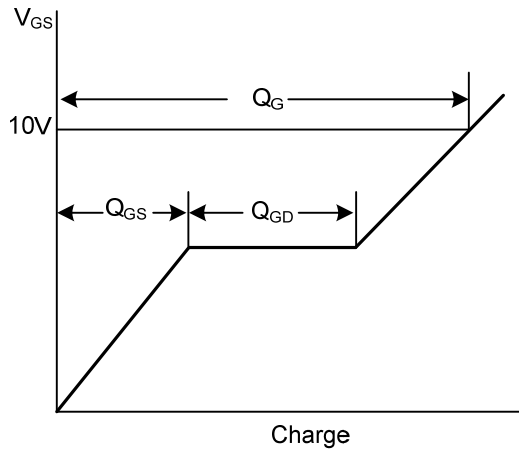
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient (Note 3)	$\theta_{JA}$	45	$^\circ\text{C/W}$

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

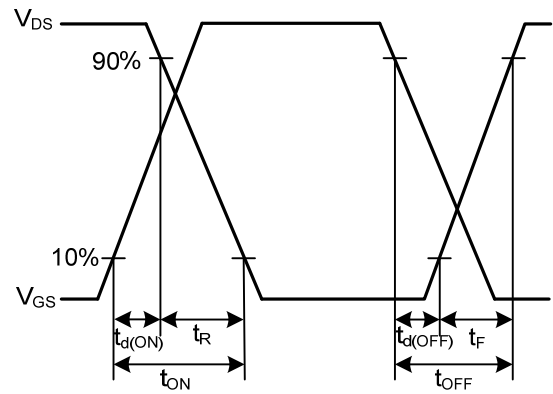
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
<b>OFF CHARACTERISTICS</b>							
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D=250\mu\text{A}$ , $V_{GS}=0\text{V}$	0			V	
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=60\text{V}$ , $V_{GS}=0\text{V}$ , $T_J=25^\circ\text{C}$			1	$\mu\text{A}$	
Gate-Source Leakage Current	Forward	$I_{GSS}$ $V_{GS}=+25\text{V}$ $V_{GS}=-25\text{V}$			+100	nA	
	Reverse V				-100	nA	
<b>ON CHARACTERISTICS</b>							
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$ , $I_D=250\mu\text{A}$			3.0	V	
Static Drain-Source On-State Resistance (Note 2)	$R_{DS(ON)}$	$V_{GS}=10\text{V}$ , $I_D=5\text{A}$			50	m $\Omega$	
		$V_{GS}=4.5\text{V}$ , $I_D=2.5\text{A}$			60	m $\Omega$	
Forward Transconductance	$g_{FS}$	$V_{DS}=10\text{V}$ , $I_D=5\text{A}$		7		S	
<b>DYNAMIC PARAMETERS</b>							
Input Capacitance	$C_{ISS}$	$V_{GS}=0\text{V}$ , $V_{DS}=25\text{V}$ , $f=1.0\text{MHz}$	760			pF	
Output Capacitance	$C_{OSS}$			188			pF
Reverse Transfer Capacitance	$C_{RSS}$				35		pF
<b>SWITCHING PARAMETERS</b>							
Total Gate Charge (Note 2)	$Q_G$	$V_{GS}=10\text{V}$ , $V_{DS}=48\text{V}$ , $I_D=5\text{A}$	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)	$t_{D(ON)}$	$V_{DS}=30\text{V}$ , $I_D=1\text{A}$ , $V_{GS}=10\text{V}$ , $R_G=3.3\Omega$ , $R_D=6\Omega$	40			ns	
Rise Time	$t_R$			40			ns
Turn-OFF Delay Time	$t_{D(OFF)}$			170			ns
Fall-Time t	F			50			ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>							
Drain-Source Diode Forward Voltage (Note 2)	$V_{SD}$	$I_S=5\text{A}$ , $V_{GS}=0\text{V}$			1.2	V	

Notes: 1. Pulse width limited by Max. junction temperature.  
2. Pulse width  $\leq 300\mu\text{s}$ , Duty cycle  $\leq 2\%$

### ■ TEST CIRCUITS AND WAVEFORMS

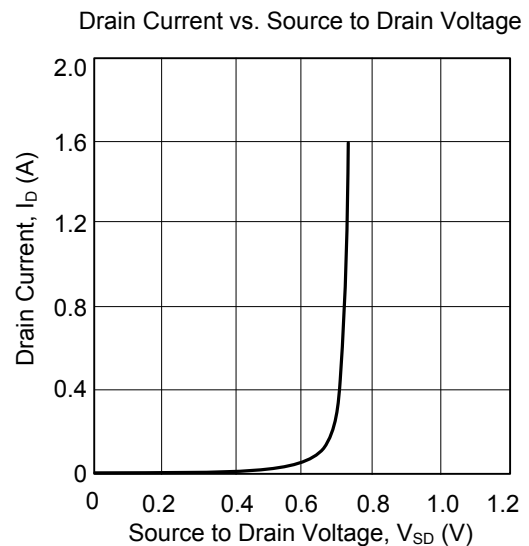
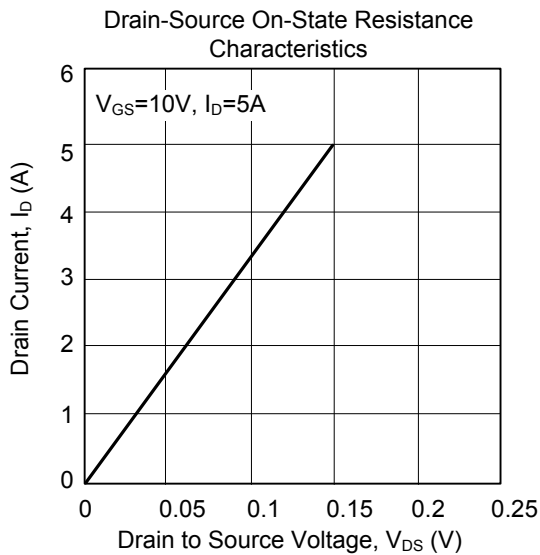
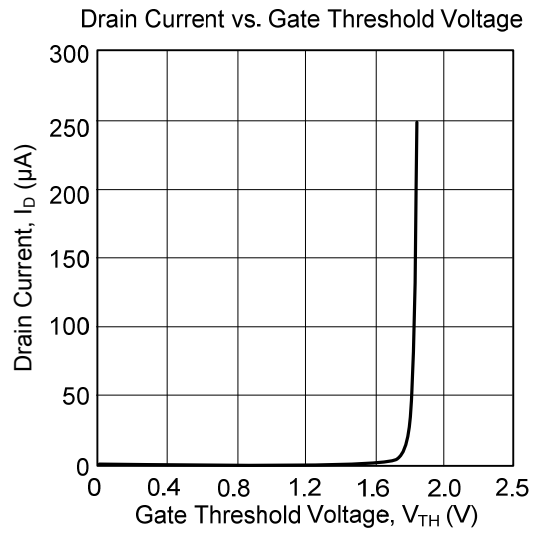
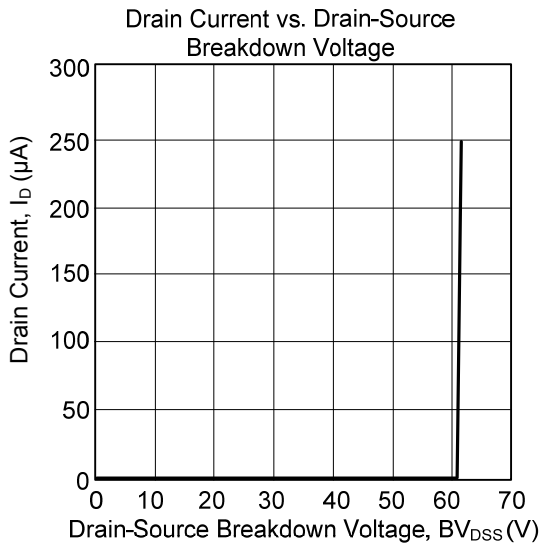


Gate Charge Waveforms



Resistive Switching Waveforms

## ■ TYPICAL CHARACTERISTICS



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