



UT9971P

Power MOSFET

5.0A, 60V N-CHANNEL POWER MOSFET

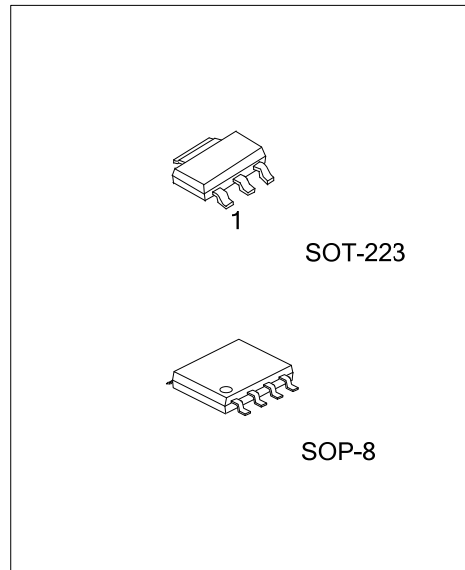
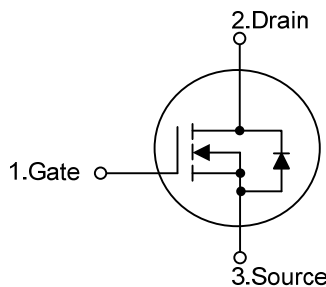
DESCRIPTION

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

- * $R_{DS(ON)} < 50 \text{ m}\Omega @ V_{GS}=10\text{V}, I_D=5.0\text{A}$
- * High switching speed

SYMBOL



ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT9971PL-AA3-R	UT9971PG-AA3-R	SOT-223	G	D	S	-	-	-	-	-	Tape Reel
UT9971PL-S08-R	UT9971PG-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

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

<p>UT9971PG-AA3-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) AA3: SOT-223, S08: SOP-8</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
---	--

MARKING

SOT-223	SOP-8
<p>UT9971P</p> <p>L: Lead Free</p> <p>G: Halogen Free</p> <p>Data Code</p>	<p>UTC</p> <p>UT9971P</p> <p>Lot Code</p>

■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	60	V
Gate-Source Voltage		V_{GSS}	± 25	V
Drain Current	Continuous $T_A=25^\circ\text{C}$	I_D	5	A
	Pulsed	I_{DM}	20	A
Power Dissipation ($T_A=25^\circ\text{C}$)		SOT-223	2.7	W
		SOP-8	1.92	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	SOT-223	θ_{JA}	45	$^\circ\text{C}/\text{W}$
	SOP-8		85	$^\circ\text{C}/\text{W}$

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 $\leq 2\%$.

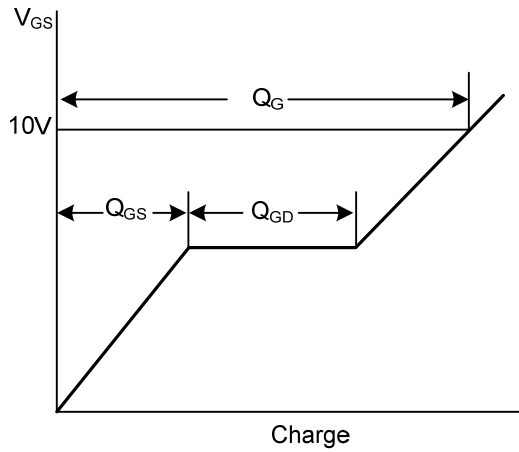
■ ELECTRICAL CHARACTERISTICS ($T_J=25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	60			V
Drain-Source Leakage Current		I_{DSS}	$V_{DS}=60\text{V}$, $V_{GS}=0\text{V}$, $T_J=25^\circ\text{C}$			1	μA
Gate-Source Leakage Current	Forward	I_{GSS}	$V_{GS}=+25\text{V}$			+100	nA
	Reverse		$V_{GS}=-25\text{V}$			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	1.0		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 Ω
			$V_{GS}=4.5\text{V}$, $I_D=2.5\text{A}$			60	m Ω
Forward Transconductance		g_{FS}	$V_{DS}=10\text{V}$, $I_D=5\text{A}$		7		S
DYNAMIC PARAMETERS							
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
SWITCHING PARAMETERS							
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
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Drain-Source Diode Forward Voltage (Note 2)		V_{SD}	$I_S=5\text{A}$, $V_{GS}=0\text{V}$			1.2	V

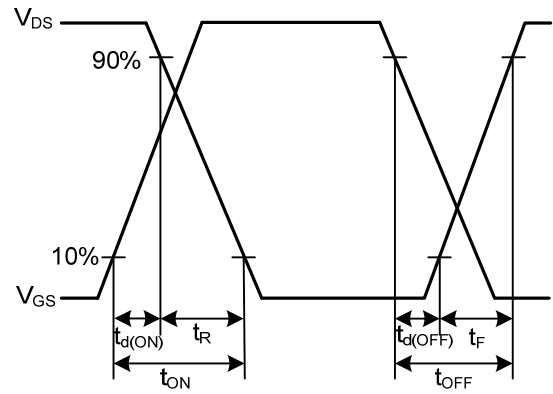
Notes: 1. Pulse width limited by Max. junction temperature.

2. Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$

■ TEST CIRCUITS AND WAVEFORMS

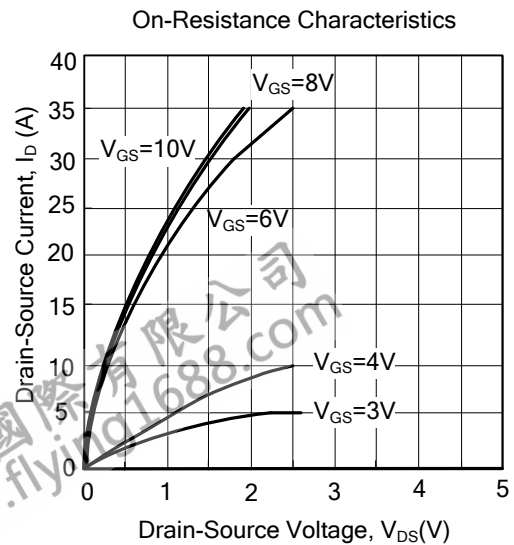
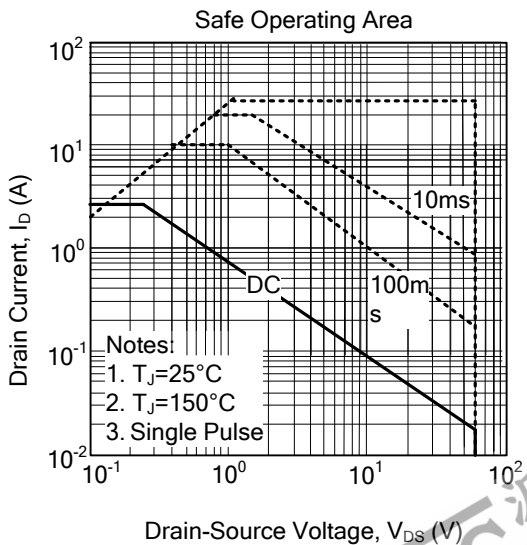
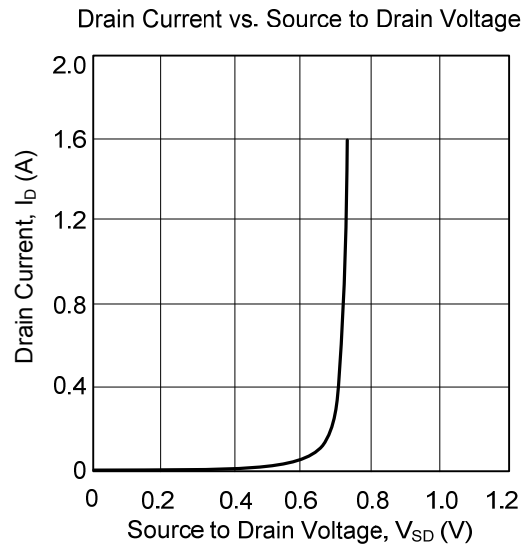
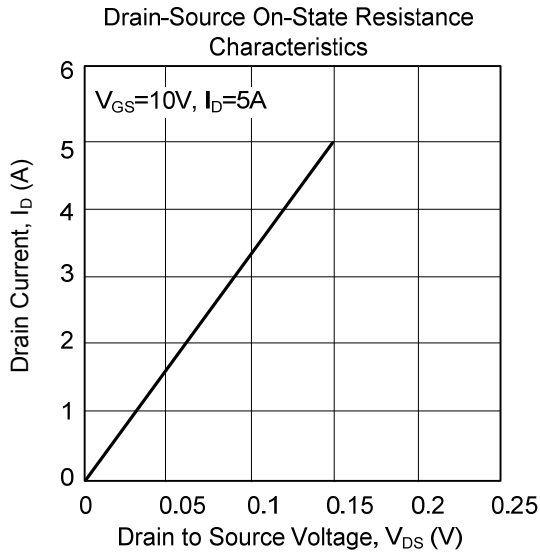
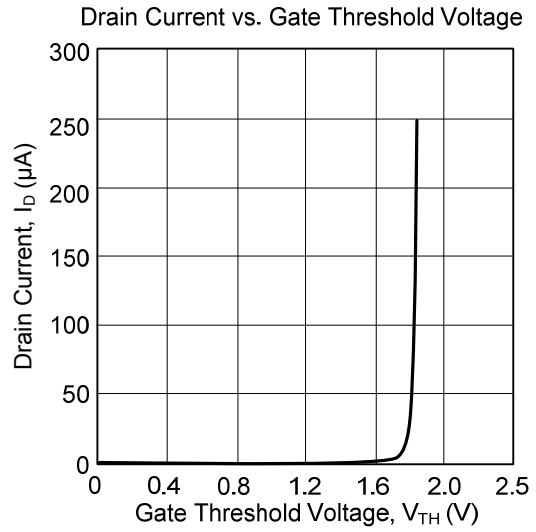
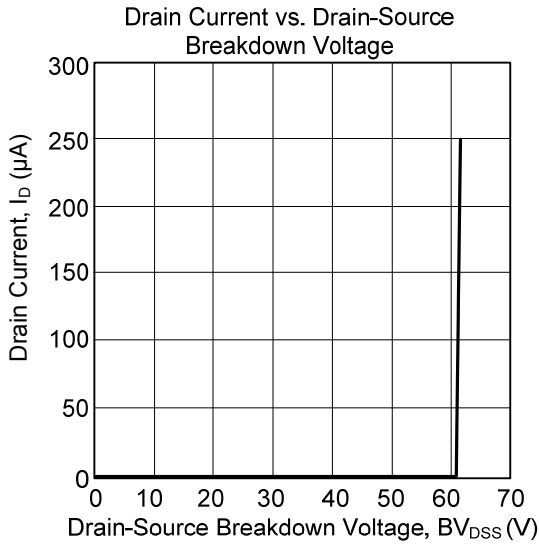


Gate Charge Waveforms

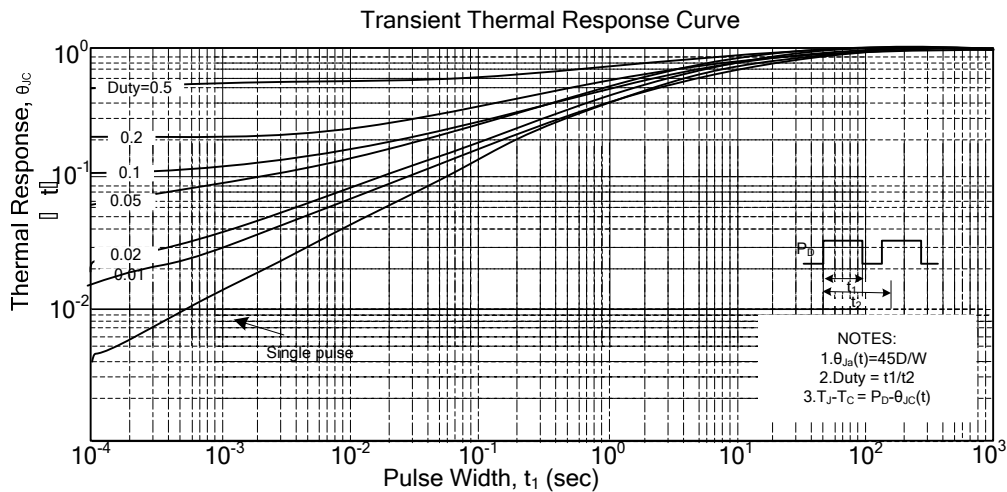
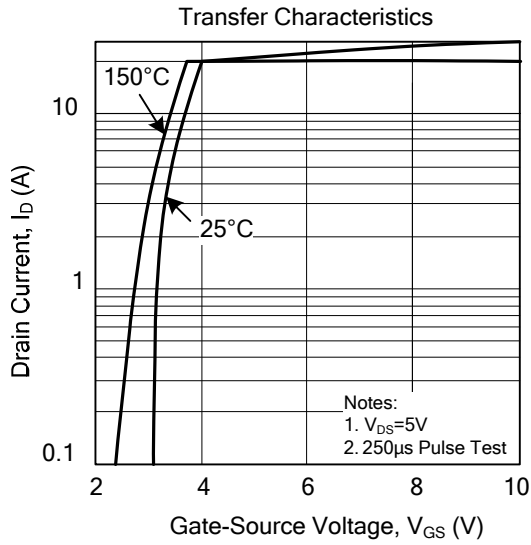


Resistive Switching Waveforms

TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.