



UT9971P

Power MOSFET

5.0A, 60V N-CHANNEL POWER MOSFET

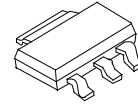
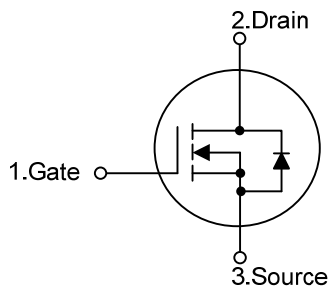
DESCRIPTION

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

- * $R_{DS(ON)} < 50m\Omega$ @ $V_{GS}=10V$, $I_D=5A$
- * High switching speed

SYMBOL



1

SOT-223

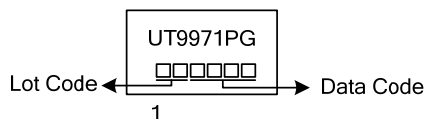
ORDERING INFORMATION

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

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

UT9971PG-AA3-R	(1)Packing Type	(1) R: Tape Reel
	(2)Package Type	(2) AA3: SOT-223
	(3)Green Package	(3) G: Halogen Free and Lead Free

MARKING



■ 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 ($T_A=25^\circ\text{C}$)			P_D	2.7	W
Junction Temperature			T_J	$-55\sim+150$	$^\circ\text{C}$
Storage Temperature Range			T_{STG}	$-55\sim+150$	$^\circ\text{C}$

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)	θ_{JA}	45	$^\circ\text{C/W}$

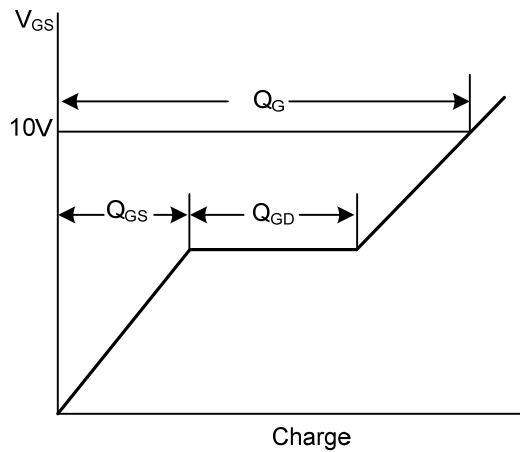
■ ELECTRICAL CHARACTERISTICS ($T_J=25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	$I_D=250\mu A$, $V_{GS}=0V$	60			V
Drain-Source Leakage Current		I_{DSS}	$V_{DS}=60V$, $V_{GS}=0V$, $T_J=25^{\circ}C$			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		$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=250\mu A$	1.0		3.0	V
Static Drain-Source On-State Resistance (Note 2)		$R_{DS(ON)}$	$V_{GS}=10V$, $I_D=5A$			50	m Ω
			$V_{GS}=4.5V$, $I_D=2.5A$			60	m Ω
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)		$t_{D(ON)}$	$V_{DS}=30V$, $I_D=1A$, $V_{GS}=10V$, $R_G=3.3\Omega$, $R_D=6\Omega$		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}	$I_S=5A$, $V_{GS}=0V$			1.2	V

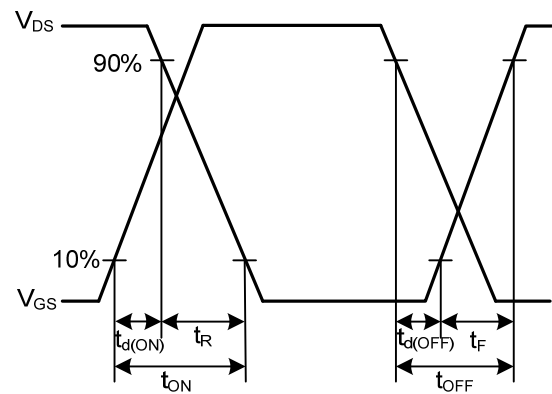
Notes: 1. Pulse width limited by Max. junction temperature.

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

■ TEST CIRCUITS AND WAVEFORMS

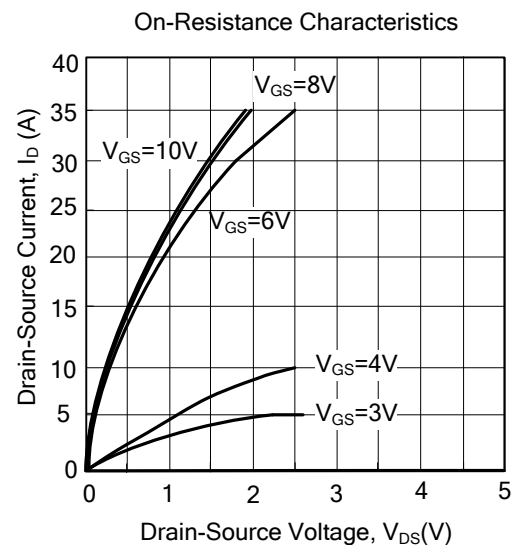
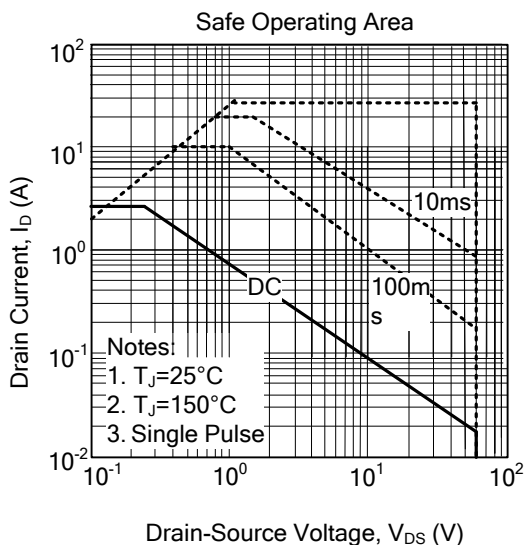
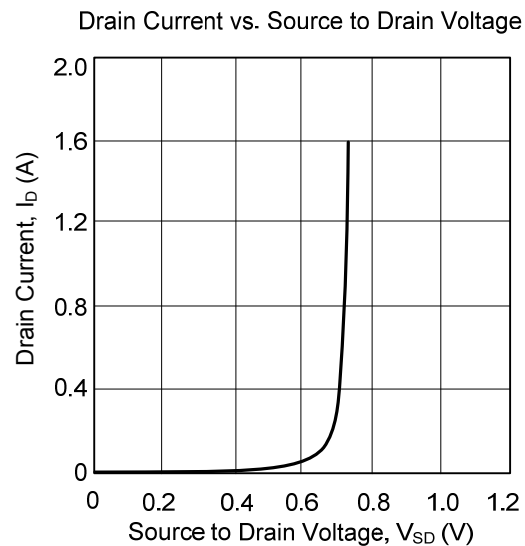
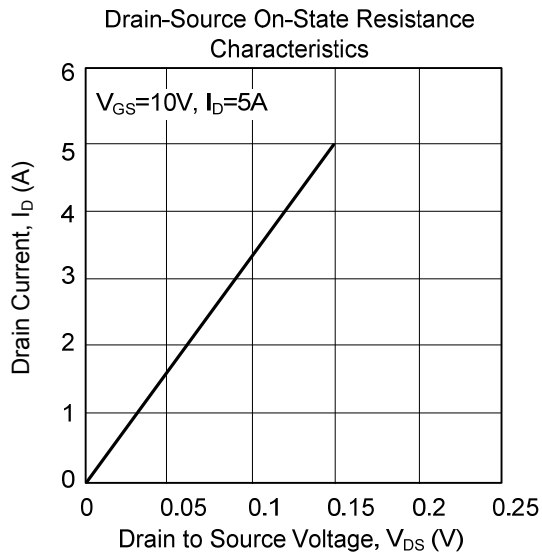
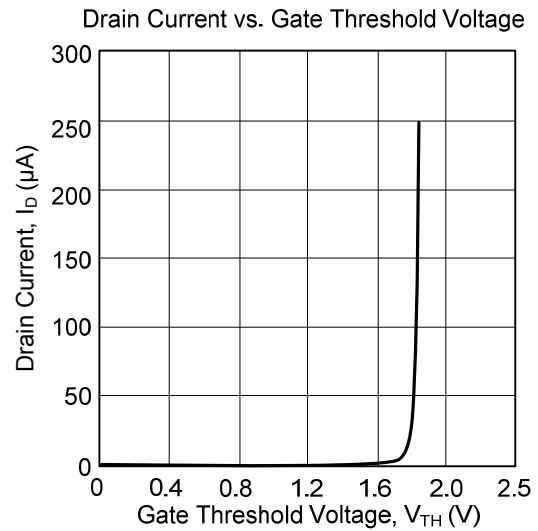
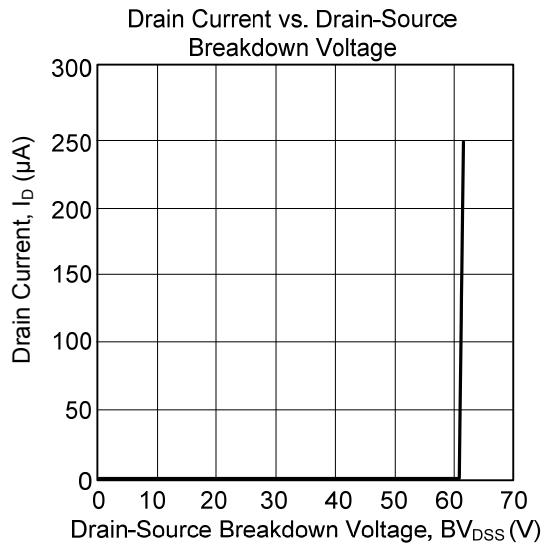


Gate Charge Waveforms

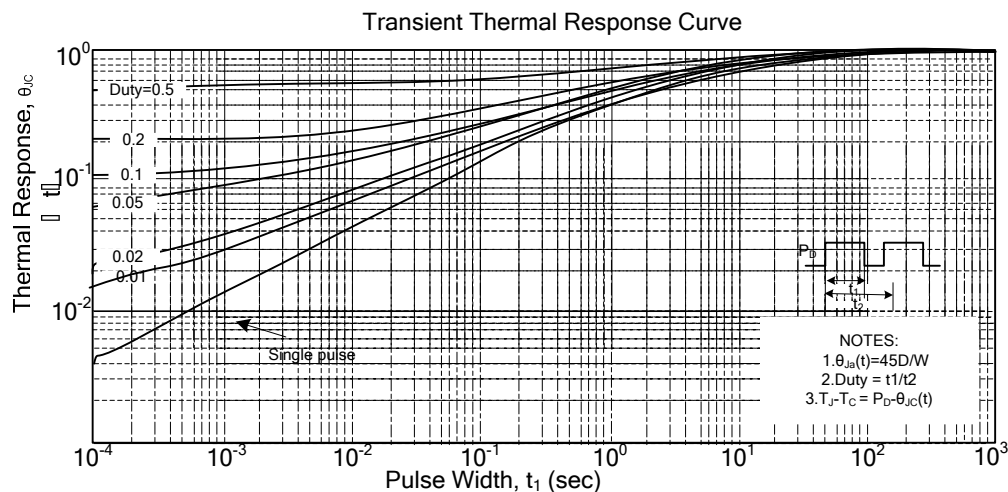
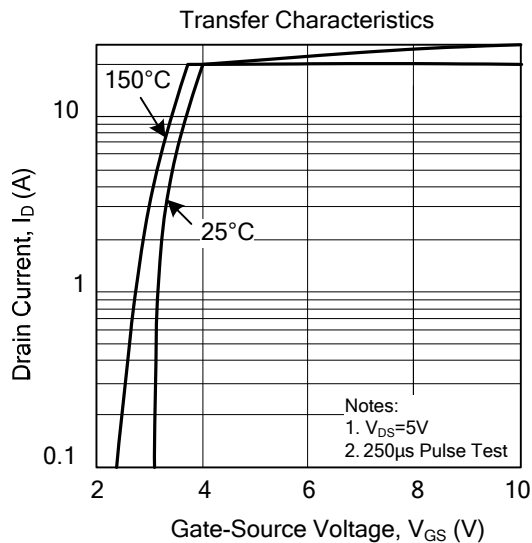


Resistive Switching Waveforms

TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS (Cont.)



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