



UT4421

Preliminary

Power MOSFET

-6.2A, -60V P-CHANNEL POWER MOSFET

DESCRIPTION

The UTC **UT4421** is a P-channel MOSFET, it uses UTC's advanced technology to provide the customers with a minimum on state resistance and high switching speed.

The UTC **UT4421** is suitable for load switch and battery protection applications.

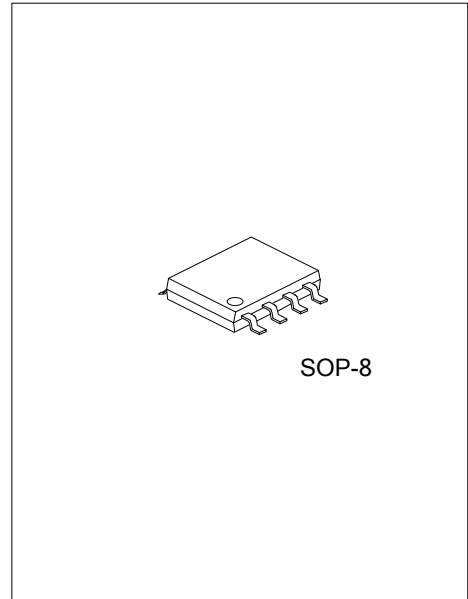
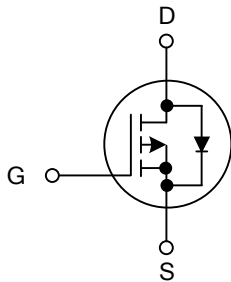
FEATURES

* $R_{DS(ON)} < 40m\Omega @ V_{GS} = -10V, I_D = -6.2A$

$R_{DS(ON)} < 50m\Omega @ V_{GS} = -4.5V, I_D = -5A$

* High switching speed

SYMBOL



SOP-8

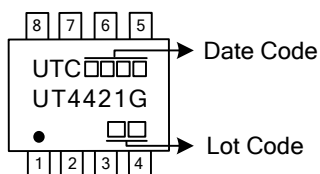
ORDERING INFORMATION

Ordering Number	Package	Pin Assignment								Packing
		1	2	3	4	5	6	7	8	
UT4421G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

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

<p>UT4421G-S08-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) S08: SOP-8</p> <p>(3) G: Halogen Free and Lead Free</p>
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MARKING



■ ABSOLUTE MAXIMUM RATINGS ($T_A=25^\circ\text{C}$ unless otherwise noted)

PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage			V_{DSS}	-60	V
Gate-Source Voltage			V_{GSS}	± 20	V
Drain Current	Continuous (Note 1)	$T_A=25^\circ\text{C}$	I_D	-6.2	A
		$T_A=70^\circ\text{C}$		-5	A
	Pulsed (Note 2)		I_{DM}	-40	A
Power Dissipation (Note 1)			P_D	2	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 DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient		θ_{JA}	75	$^\circ\text{C/W}$
Junction to Case		θ_{JC}	30	$^\circ\text{C/W}$

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=-250\mu\text{A}$, $V_{GS}=0\text{V}$	-60			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-48\text{V}$, $V_{GS}=0\text{V}$			-1	μA
		$V_{DS}=-48\text{V}$, $V_{GS}=0\text{V}$, $T_J=55^\circ\text{C}$			-5	μA
Gate-Source Leakage Current	Forward	I_{GSS}				
	Reverse					
		$V_{GS}=+20\text{V}$, $V_{DS}=0\text{V}$			+100	nA
		$V_{GS}=-20\text{V}$, $V_{DS}=0\text{V}$			-100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=-250\mu\text{A}$	-1	-2	-3	V
On State Drain Current	$I_{D(ON)}$	$V_{GS}=-10\text{V}$, $V_{DS}=-5\text{V}$	-40			A
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-10\text{V}$, $I_D=-6.2\text{A}$		43	48	m Ω
		$V_{GS}=-4.5\text{V}$, $I_D=-5\text{A}$		58	63	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=-5\text{V}$, $I_D=-6.2\text{A}$		18		S
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{GS}=0\text{V}$, $V_{DS}=-30\text{V}$, $f=1.0\text{MHz}$		2417	2900	pF
Output Capacitance	C_{OSS}			179		pF
Reverse Transfer Capacitance	C_{RSS}			120		pF
Gate Resistance	R_G	$V_{GS}=0\text{V}$, $V_{DS}=0\text{V}$, $f=1\text{MHz}$		1.9	2.3	Ω
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	$V_{GS}=-4.5\text{V}$, $V_{DS}=-30\text{V}$, $I_D=-6.2\text{A}$		22.7		nC
Total Gate Charge	Q_G	$V_{GS}=-10\text{V}$, $V_{DS}=-30\text{V}$, $I_D=-6.2\text{A}$		46.5	55	nC
Gate to Source Charge	Q_{GS}			9.1		nC
Gate to Drain Charge	Q_{GD}			9.2		nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{GS}=-10\text{V}$, $V_{DS}=-30\text{V}$, $R_L=4.7\Omega$, $R_{GEN}=3\Omega$		9.8		ns
Rise Time	t_R			6.1		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			44		ns
Fall-Time	t_F			12.7		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I_S				-4.2	A
Diode Forward Voltage	V_{SD}	$I_S=-1\text{A}$, $V_{GS}=0\text{V}$		-0.74	-1	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F=-6.2\text{A}$, $dI/dt=100\text{A}/\mu\text{S}$		34	42	ns
Body Diode Reverse Recovery Charge	Q_{rr}			47		nC

Notes: 1. The value of θ_{JA} is measured with the device mounted on 1in²FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ\text{C}$. The value in any a given application depends on the user's specific board design. The current rating is based on the $t \leq 10\text{s}$ thermal resistance rating.

2. Repetitive rating, pulse width limited by junction temperature.

3. The θ_{JA} is the sum of the thermal impedance from junction to lead θ_{JL} and lead to ambient.

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