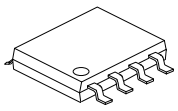
UT4421

Power MOSFET

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



SOP-8

■ DESCRIPTION

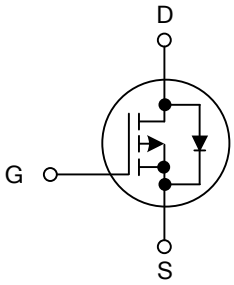
The UTC **UT4421** is a P-channel MOSFET, it uses UTC's advanced technology to provide the customers with a minimum on state resistance and high switching speed.

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

■ FEATURES

* $R_{DS(ON)}$ < 40mΩ @ V_{GS}= -10V, I_D= -6.2A
  $R_{DS(ON)}$ < 50mΩ @ V_{GS}= -4.5V, I_D= -5A
* High switching speed

■ SYMBOL



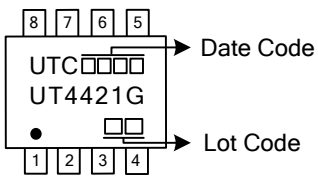
■ ORDERING INFORMATION

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

UT4421G-S08-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) S08: SOP-8 (3) G: Halogen Free and Lead Free

■ MARKING



■ ABSOLUTE MAXIMUM RATINGS (T_A=25°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°C	I_D	-6.2	A
		T_A=70°C		-5	A
	Pulsed (Note 2)		I_{DM}	-40	A
Power Dissipation (Note 1)			P_D	2	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 DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	75	°C/W
Junction to Case	θ_{JC}	30	°C/W

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

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
STATIC PARAMETERS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=-250μA, V_{GS}=0V	-60			V
Zero Gate Voltage Drain Current		I_{DSS}	V_{DS}=-48V, V_{GS}=0V			-1	μA
			V_{DS}=-48V, V_{GS}=0V, T_J=55°C			-5	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+20V, V_{DS}=0V			+100	nA
	Reverse		V_{GS}=-20V, V_{DS}=0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=-250μA	-1	-2	-3	V
On State Drain Current		$I_{D(ON)}$	V_{GS}=-10V, V_{DS}=-5V	-40			A
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=-10V, I_D=-6.2A		43	48	mΩ
			V_{GS}=-4.5V, I_D=-5A		58	63	mΩ
Forward Transconductance		g_{FS}	V_{DS}=-5V, I_D=-6.2A		18		S
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=-30V, f=1.0MHz		2417	2900	pF
Output Capacitance		C_{OSS}			179		pF
Reverse Transfer Capacitance		C_{RSS}			120		pF
Gate Resistance		R_G	V_{GS}=0V, V_{DS}=0V, f=1MHz		1.9	2.3	Ω
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	V_{GS}=-4.5V, V_{DS}=-30V, I_D=-6.2A		22.7		nC
Total Gate Charge		Q_G	V_{GS}=-10V, V_{DS}=-30V, I_D=-6.2A		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}=-10V, V_{DS}=-30V, R_L=4.7Ω, R_{GEN}=3Ω		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=-1A,V_{GS}=0V		-0.74	-1	V
Body Diode Reverse Recovery Time		t_{rr}	I_F=-6.2A, dI/dt=100A/μS		34	42	ns
Body Diode Reverse Recovery Charge		Q_{rr}			47		nC

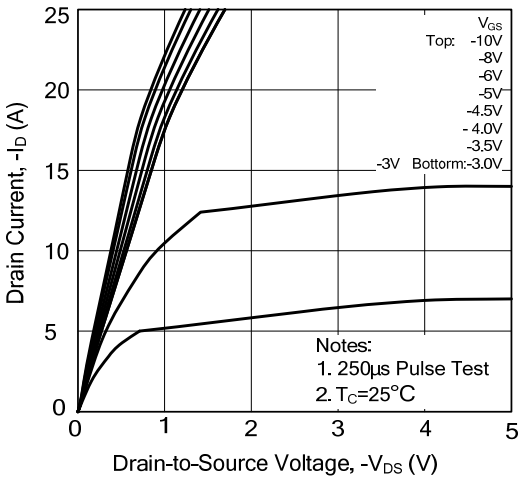
Notes: 1. The value of θ_{JA} is measured with the device mounted on 1in^{2}FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C.The value in any a given application depends on the user's specific board design. The current rating is based on the t ≤10s thermal resistance rating.

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

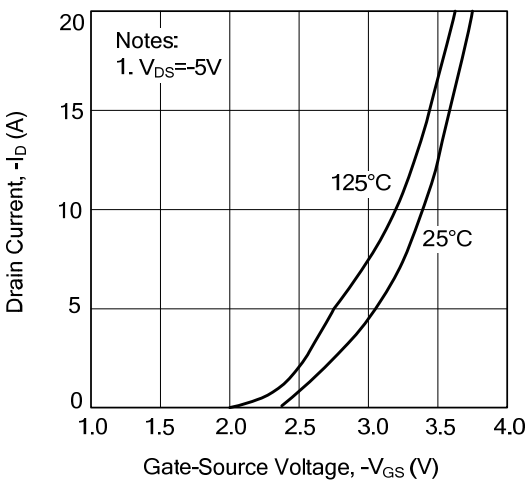
3. The θ_{JA} is the sum of the thermal impedence from junction to lead θ_{JL} and lead to ambient.

■ TYPICAL CHARACTERISTICS

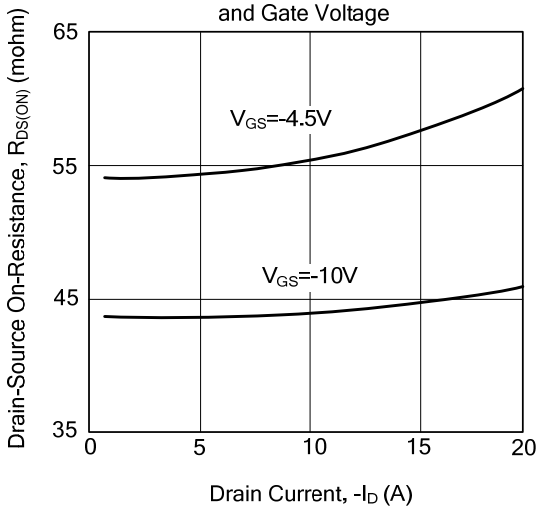
On-State Characteristics



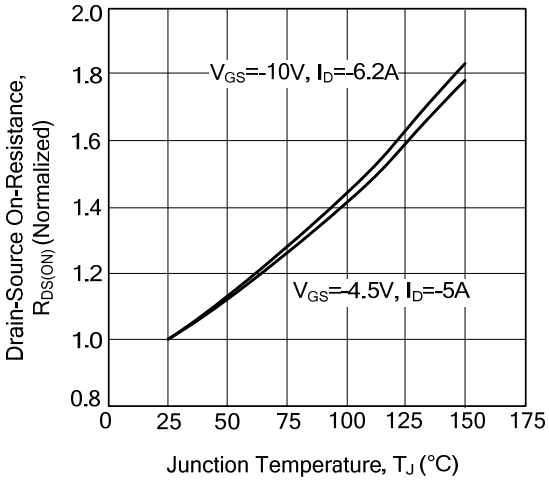
Transfer Characteristics



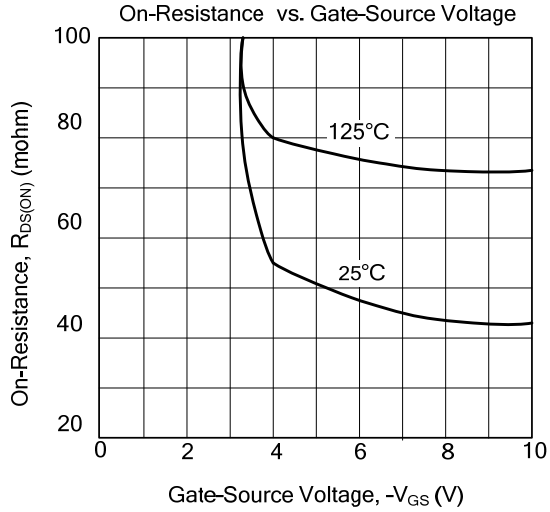
On-Resistance Variation vs. Drain Current and Gate Voltage



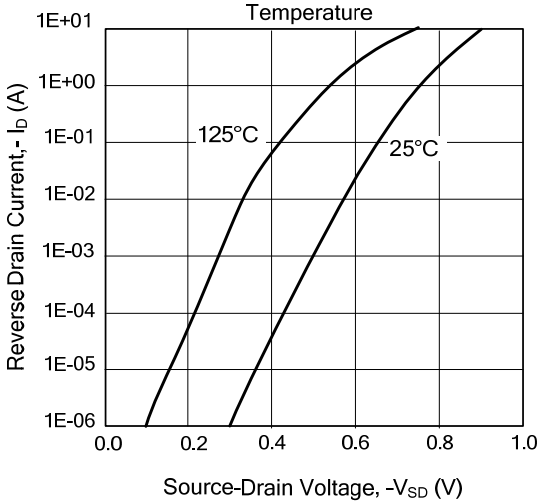
On-Resistance Junction Temperature



On-Resistance vs. Gate-Source Voltage



On State Current vs. Allowable Case Temperature



■ TYPICAL CHARACTERISTICS (Cont.)