



UT4421

Power MOSFET

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

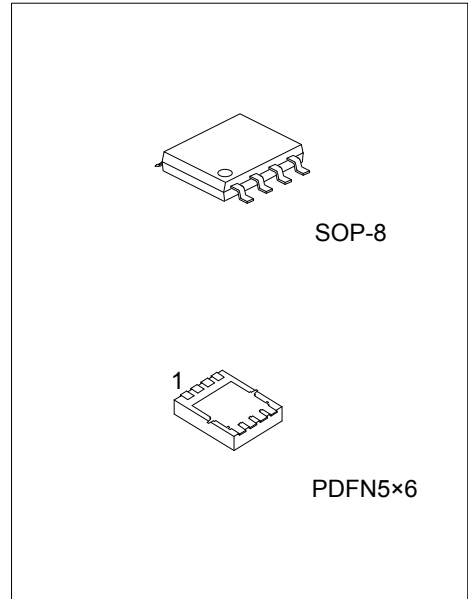
DESCRIPTION

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.

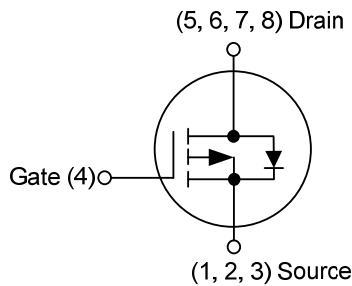
The UTC **UT4421** is suitable for load switch and battery protection applications.

FEATURES

- * $R_{DS(ON)} \leq 48 \text{ m}\Omega @ V_{GS} = -10\text{V}, I_D = -6.2\text{A}$
- $R_{DS(ON)} \leq 63 \text{ m}\Omega @ V_{GS} = -4.5\text{V}, I_D = -5.0\text{A}$
- * High switching speed



SYMBOL



ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT4421L-S08-R	UT4421G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel
UT4421L-P5060-R	UT4421G-P5060-R	PDFN5x6	S	S	S	G	D	D	D	D	Tape Reel

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

<p>UT4421G-S08-R</p> <ul style="list-style-type: none"> (1) Packing Type (2) Package Type (3) Green Package 	<ul style="list-style-type: none"> (1) R: Tape Reel (2) S08: SOP-8, P5060: PDFN5x6 (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING

SOP-8	PDFN5x6

■ 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	$T_A=25^\circ\text{C}$	I_D	-6.2	A
		$T_A=70^\circ\text{C}$		-5	A
	Pulsed		I_{DM}	-40	A
Power Dissipation		SOP-8	P_D	2	W
		PDFN5x6 ($T_C=25^\circ\text{C}$)		31	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	SOP-8	θ_{JA}	75	$^\circ\text{C/W}$
	PDFN5x6		65	$^\circ\text{C/W}$
Junction to Case	SOP-8	θ_{JC}	30 (Note)	$^\circ\text{C/W}$
	PDFN5x6		4 (Note)	$^\circ\text{C/W}$

Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

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

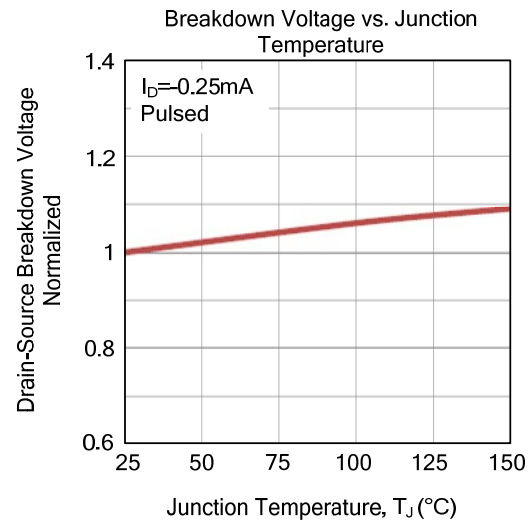
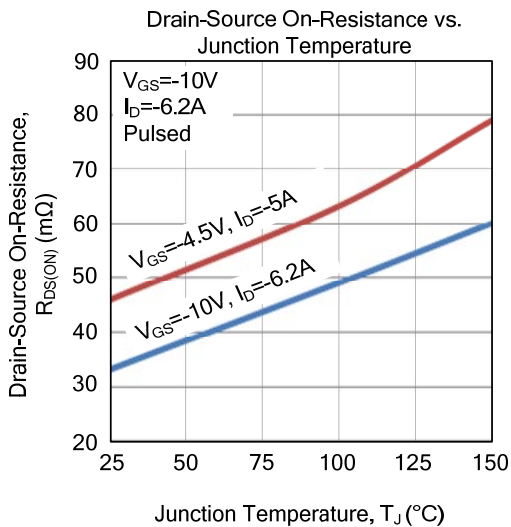
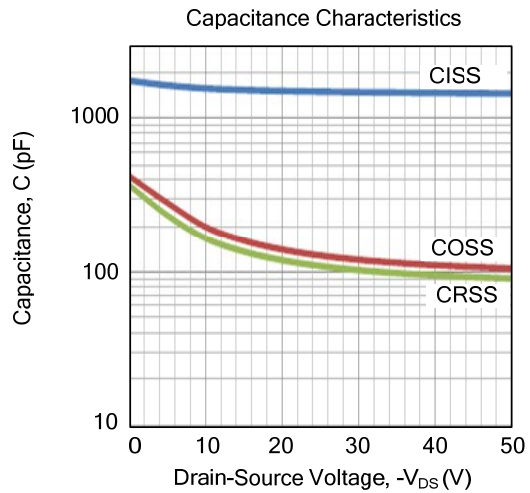
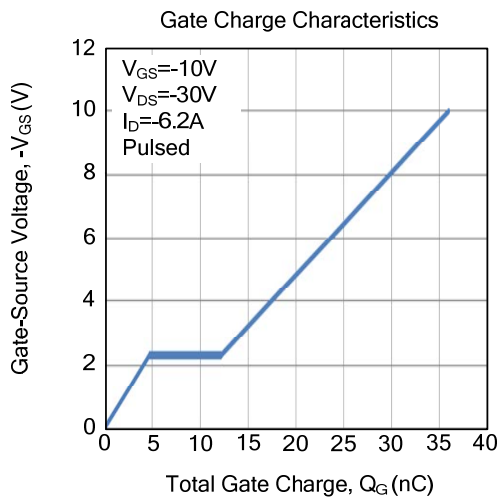
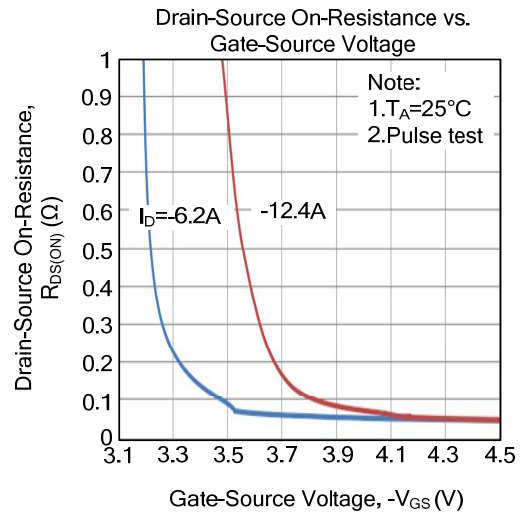
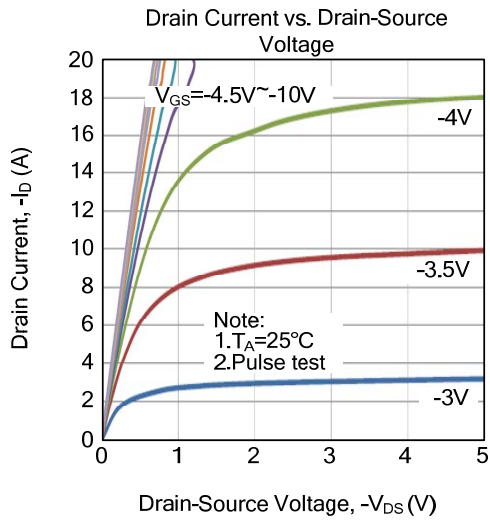
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
STATIC PARAMETERS							
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=-250\mu\text{A}$, $V_{GS}=0\text{V}$	-60			V	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-48\text{V}$, $V_{GS}=0\text{V}$			-1	μA	
		$V_{DS}=-48\text{V}$, $V_{GS}=0\text{V}$, $T_J=55^\circ\text{C}$			-5	μA	
Gate-Source Leakage Current	Forward	I_{GSS}				nA	
	Reverse						$V_{GS}=+20\text{V}$, $V_{DS}=0\text{V}$
						-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=-250\mu\text{A}$	-1.0		-3.0	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	$R_{DS(ON)}$	$V_{GS}=-10\text{V}$, $I_D=-6.2\text{A}$		34	48	$\text{m}\Omega$	
		$V_{GS}=-4.5\text{V}$, $I_D=-5.0\text{A}$		46	63	$\text{m}\Omega$	
Forward Transconductance	g_{FS}	$V_{DS}=-5\text{V}$, $I_D=-6.2\text{A}$		18		S	
DYNAMIC PARAMETERS							
Input Capacitance	C_{ISS}	$V_{GS}=0\text{V}$, $V_{DS}=-30\text{V}$, $f=1.0\text{MHz}$		1500		pF	
Output Capacitance	C_{OSS}			115		pF	
Reverse Transfer Capacitance	C_{RSS}			100		pF	
Gate Resistance	R_G	$V_{GS}=0\text{V}$, $V_{DS}=0\text{V}$, $f=1\text{MHz}$			10	Ω	
SWITCHING PARAMETERS							
Total Gate Charge	Q_G	$V_{GS}=-4.5\text{V}$, $V_{DS}=-30\text{V}$, $I_D=-6.2\text{A}$		19		nC	
Total Gate Charge	Q_G	$V_{GS}=-10\text{V}$, $V_{DS}=-30\text{V}$, $I_D=-6.2\text{A}$		36	55	nC	
Gate to Source Charge	Q_{GS}			5		nC	
Gate to Drain Charge	Q_{GD}			8		nC	
Turn-ON Delay Time	$t_{D(ON)}$	$V_{GS}=-10\text{V}$, $V_{DS}=-30\text{V}$, $R_L=4.7\Omega$, $R_{GEN}=3\Omega$		8		ns	
Rise Time	t_R			17		ns	
Turn-OFF Delay Time	$t_{D(OFF)}$			40		ns	
Fall-Time	t_F			21		ns	

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.

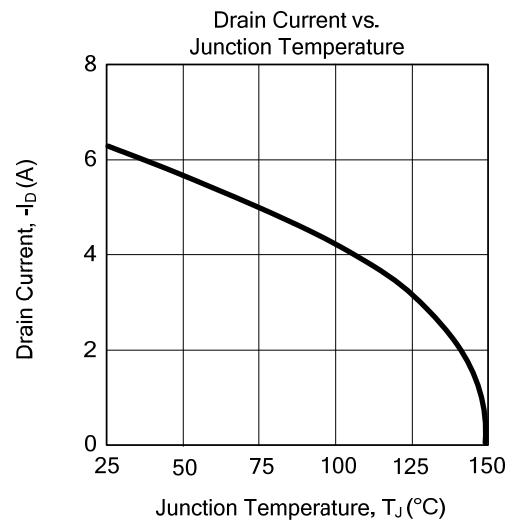
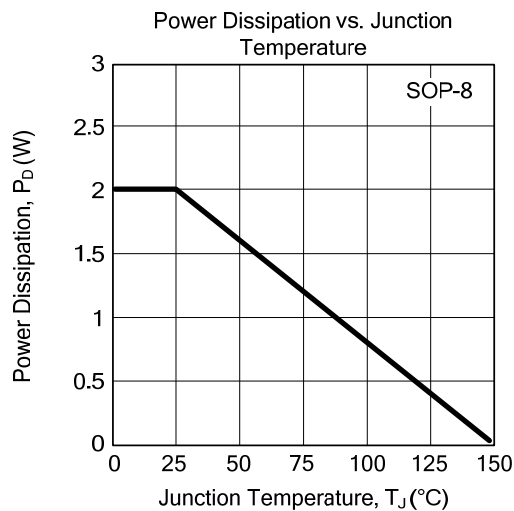
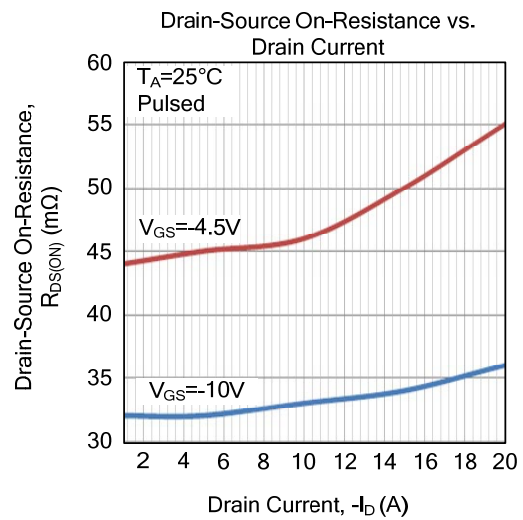
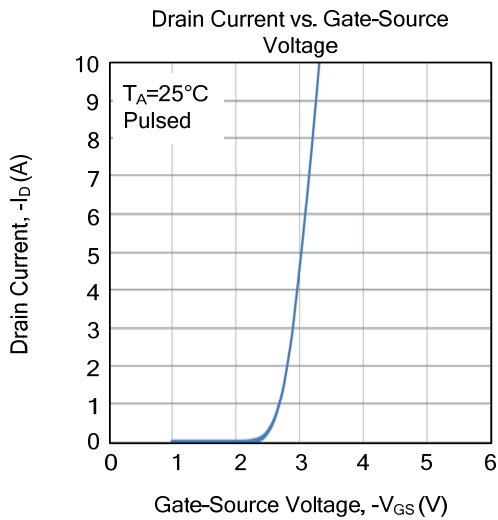
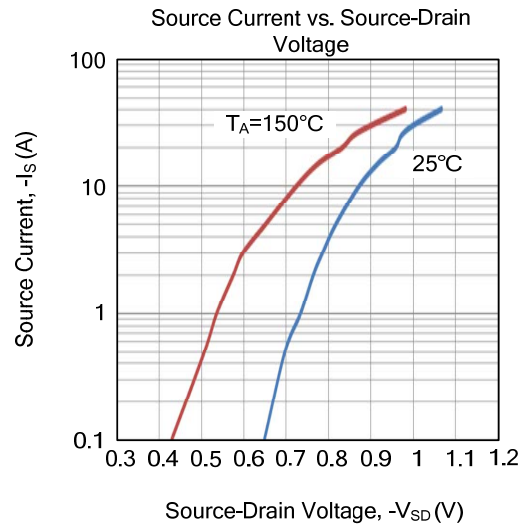
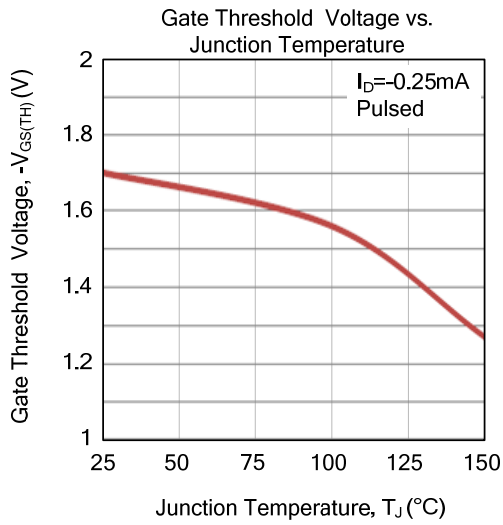
2. Repetitive rating, pulse width limited by junction temperature.

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

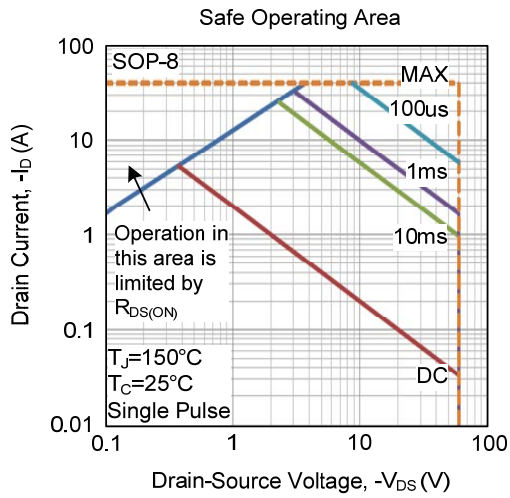
TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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