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# UT4421

Power MOSFET

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

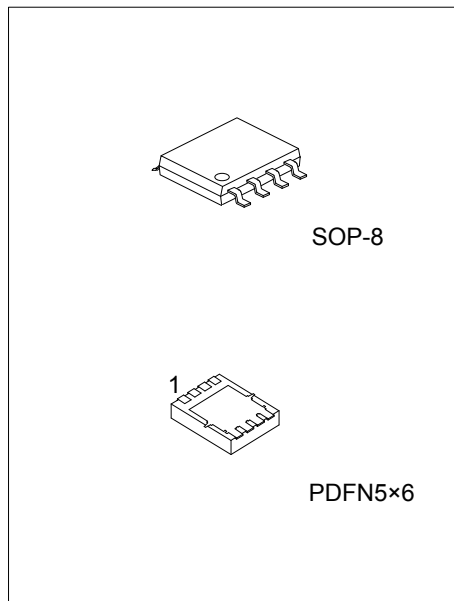
### DESCRIPTION

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.

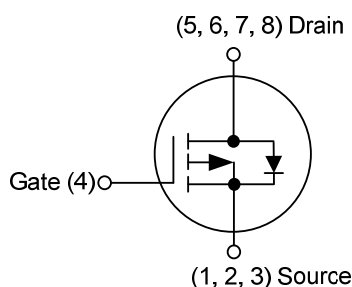
The UTC **UT4421** is suitable for load switch and battery protection applications.

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

SOP-8	PDFN5x6

### ■ ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub>=25°C unless otherwise noted)

PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage			V <sub>DSS</sub>	-60	V
Gate-Source Voltage			V <sub>GSS</sub>	±20	V
Drain Current	Continuous	T <sub>A</sub> =25°C	I <sub>D</sub>	-6.2	A
		T <sub>A</sub> =70°C		-5	A
	Pulsed		I <sub>DM</sub>	-40	A
Power Dissipation		SOP-8	P <sub>D</sub>	2	W
		PDFN5×6 (T <sub>C</sub> =25°C)		31	W
Junction Temperature			T <sub>J</sub>	-55 ~ +150	°C
Storage Temperature Range			T <sub>STG</sub>	-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	SOP-8	θ <sub>JA</sub>	75	°C/W
	PDFN5×6		65	°C/W
Junction to Case	SOP-8	θ <sub>JC</sub>	30 (Note)	°C/W
	PDFN5×6		4 (Note)	°C/W

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

### ■ ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C, unless otherwise specified)

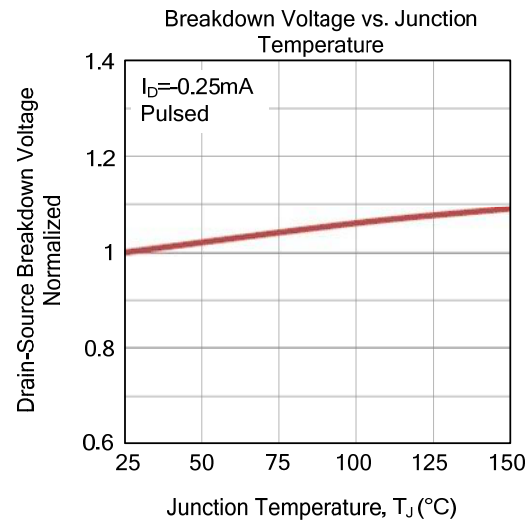
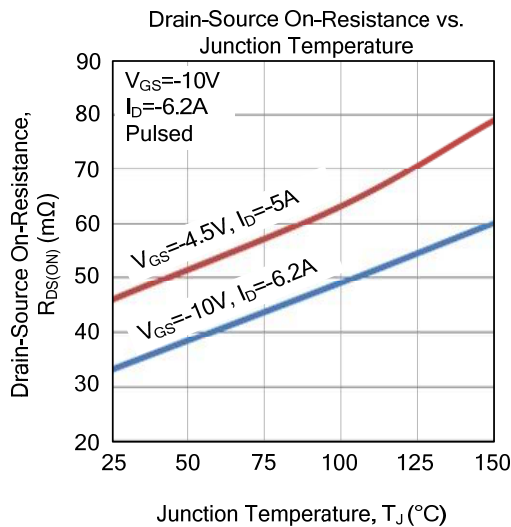
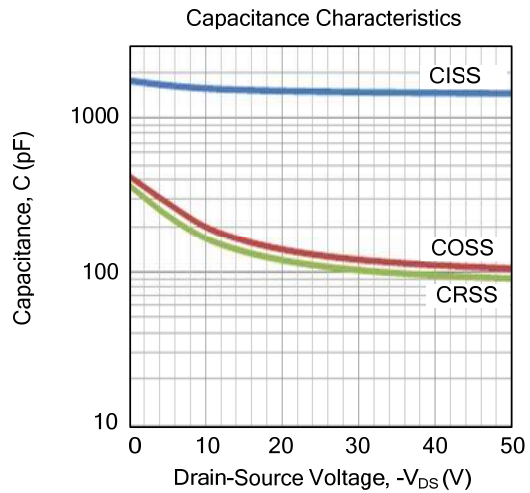
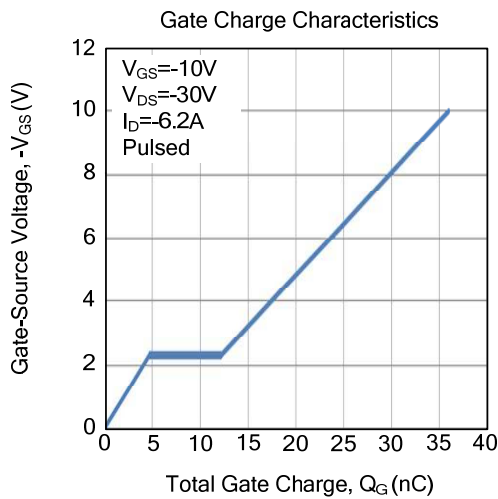
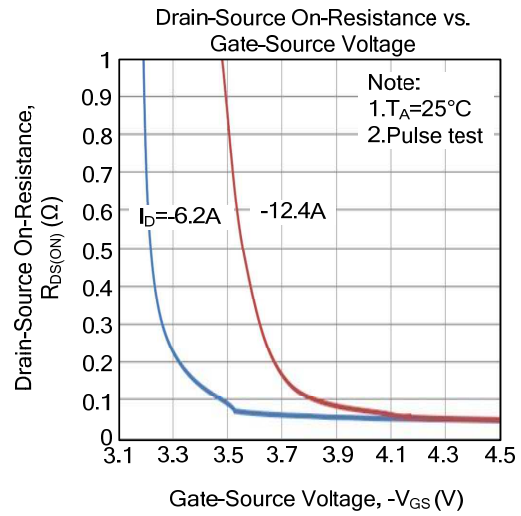
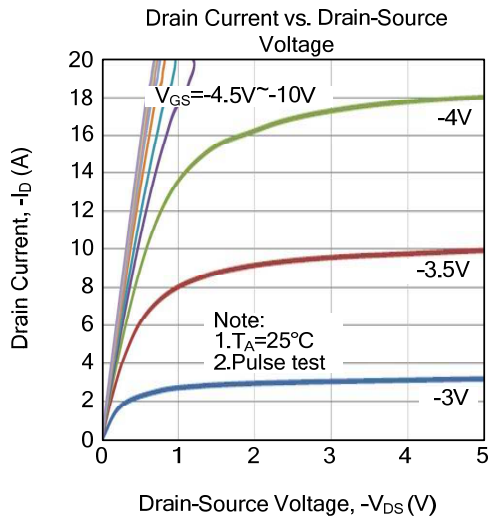
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>STATIC PARAMETERS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	I <sub>D</sub> =-250μA, V <sub>GS</sub> =0V	-60			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-48V, V <sub>GS</sub> =0V			-1	μA
		V <sub>DS</sub> =-48V, V <sub>GS</sub> =0V, T <sub>J</sub> =55°C			-5	μA
Gate-Source Leakage Current	Forward	I <sub>GSS</sub>				
	Reverse					
		V <sub>GS</sub> =-20V, V <sub>DS</sub> =0V			-100	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA	-1.0		-3.0	V
On State Drain Current	I <sub>D(ON)</sub>	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-5V	-40			A
Static Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-6.2A		34	48	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-5.0A		46	63	mΩ
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =-5V, I <sub>D</sub> =-6.2A		18		S
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =-30V, f=1.0MHz		1500		pF
Output Capacitance	C <sub>OSS</sub>			115		pF
Reverse Transfer Capacitance	C <sub>RSS</sub>			100		pF
Gate Resistance	R <sub>G</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz			10	Ω
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge	Q <sub>G</sub>	V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-30V, I <sub>D</sub> =-6.2A		19		nC
Total Gate Charge	Q <sub>G</sub>	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-30V, I <sub>D</sub> =-6.2A		36	55	nC
Gate to Source Charge	Q <sub>GS</sub>			5		nC
Gate to Drain Charge	Q <sub>GD</sub>			8		nC
Turn-ON Delay Time	t <sub>D(ON)</sub>	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-30V, R <sub>L</sub> =4.7Ω, R <sub>GEN</sub> =3Ω		8		ns
Rise Time	t <sub>R</sub>			17		ns
Turn-OFF Delay Time	t <sub>D(OFF)</sub>			40		ns
Fall-Time	t <sub>F</sub>			21		ns

Notes: 1. The value of θ<sub>JA</sub> is measured with the device mounted on 1in<sup>2</sup>FR-4 board with 2oz. Copper, in a still air environment with T<sub>A</sub>=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.

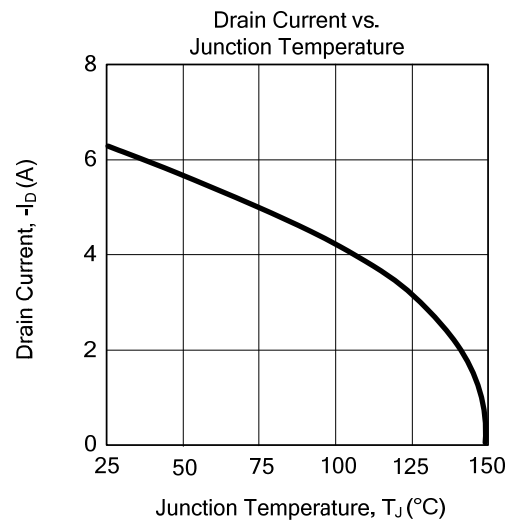
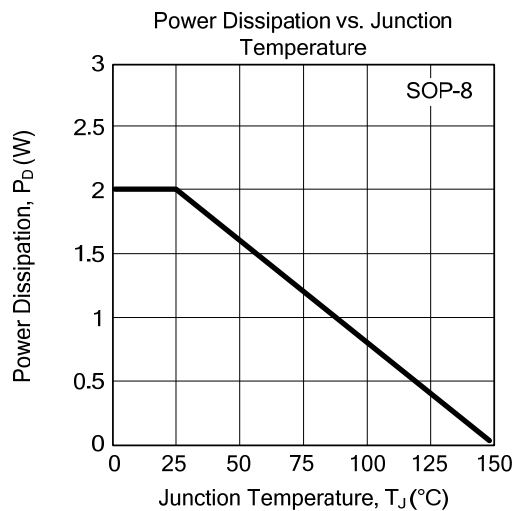
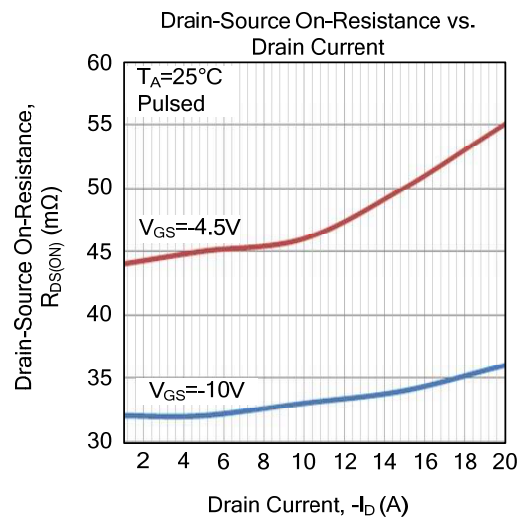
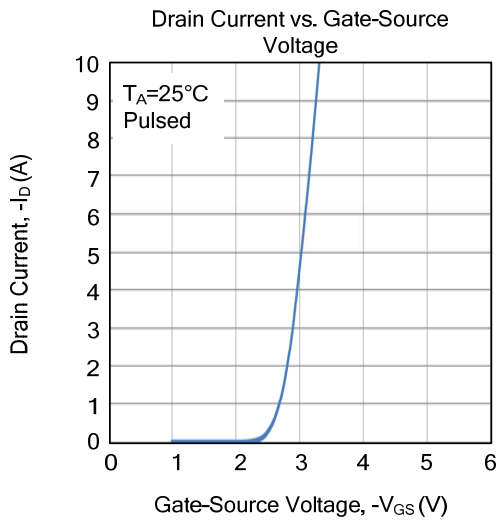
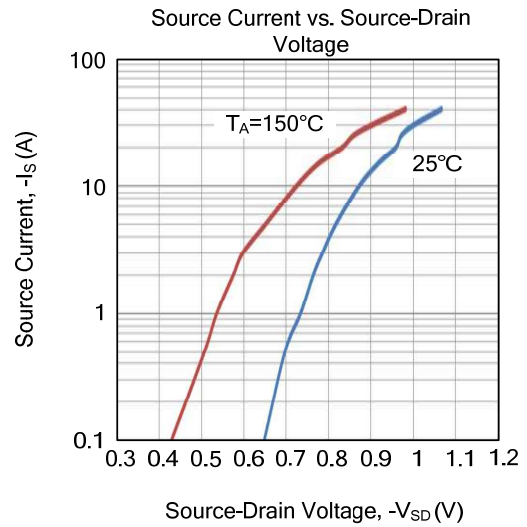
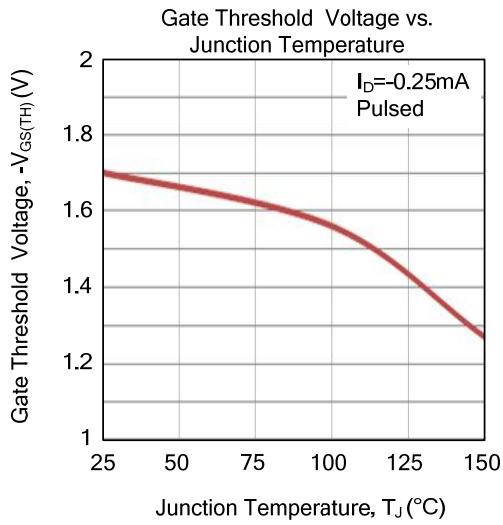
2. Repetitive rating, pulse width limited by junction temperature.

3. The θ<sub>JA</sub> is the sum of the thermal impedance from junction to lead θ<sub>JL</sub> and lead to ambient.

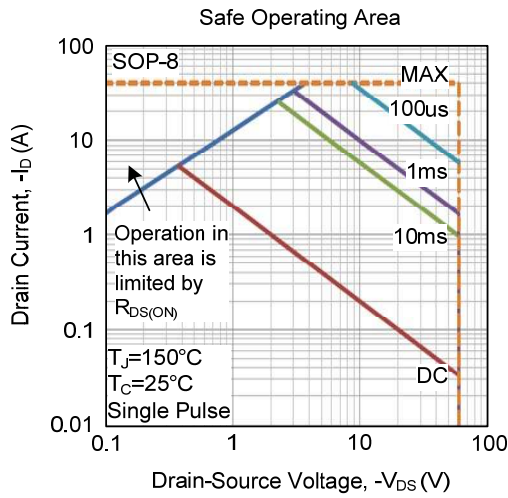
## TYPICAL CHARACTERISTICS



## ■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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