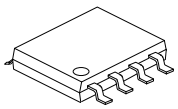
UT4421

Power MOSFET

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



SOP-8

■ DESCRIPTION

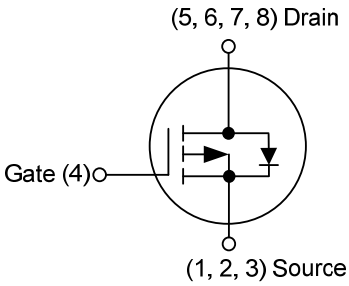
The UTC **UT4421** is a P-channel MOSFET, it uses UTC's advanced technology to provide the customers with a minimum on state resistance and high switching speed.

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

■ FEATURES

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

■ SYMBOL



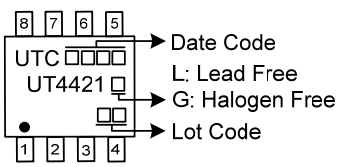
■ ORDERING INFORMATION

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

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, L: 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 (Note)

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

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

■ 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	-1.0		-3.0	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		34	48	mΩ
			V_{GS}=-4.5V, I_D=-5.0A		46	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		1500		pF
Output Capacitance		C_{OSS}			115		pF
Reverse Transfer Capacitance		C_{RSS}			100		pF
Gate Resistance		R_G	V_{GS}=0V, V_{DS}=0V, f=1MHz			10	Ω

■ ELECTRICAL CHARACTERISTICS (Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	V_{GS}=-4.5V, V_{DS}=-30V, I_D=-6.2A		19		nC
Total Gate Charge	Q_G	V_{GS}=-10V, V_{DS}=-30V, I_D=-6.2A		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}=-10V, V_{DS}=-30V, R_L=4.7Ω, R_{GEN}=3Ω		8		ns
Rise Time	t_R			17		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			40		ns
Fall-Time	t_F			21		ns

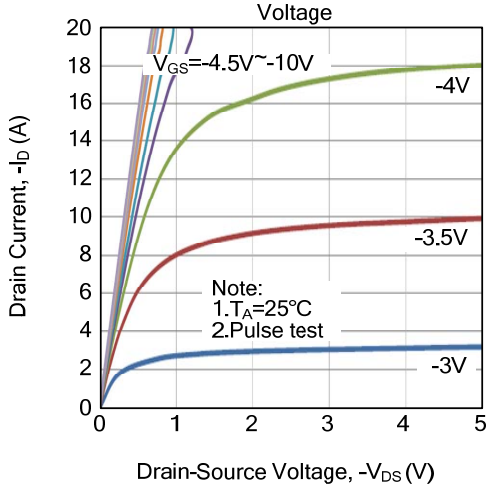
Notes: 1. The value of θ_{JA} is measured with the device mounted on 1in^{2}FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C.The value in any a given application depends on the user's specific board design. The current rating is based on the t ≤10s thermal resistance rating.

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

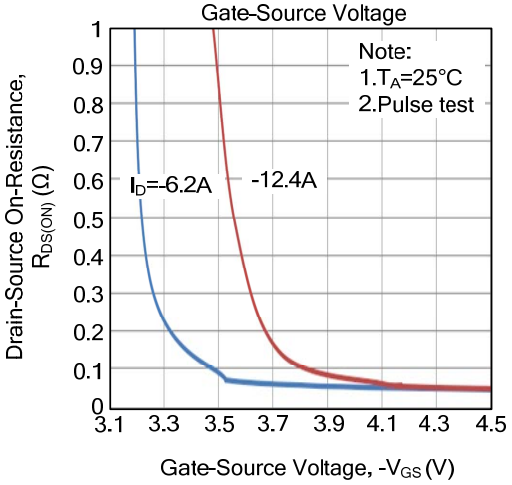
3. The θ_{JA} is the sum of the thermal impedence from junction to lead θ_{JL} and lead to ambient.

■ TYPICAL CHARACTERISTICS

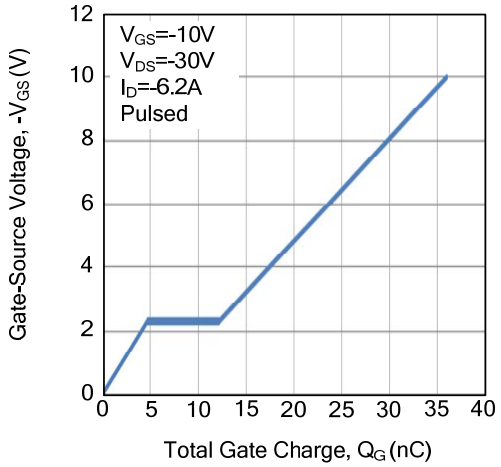
Drain Current vs. Drain-Source Voltage



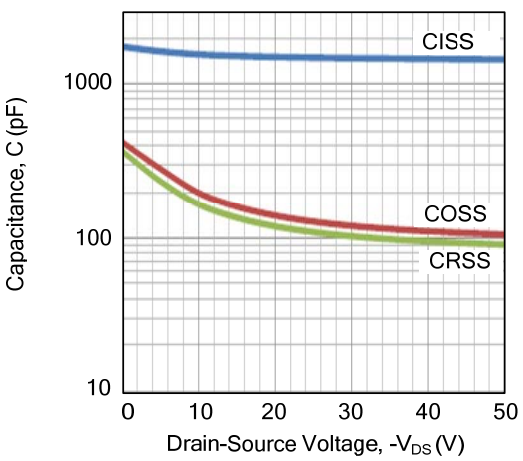
Drain-Source On-Resistance vs. Gate-Source Voltage



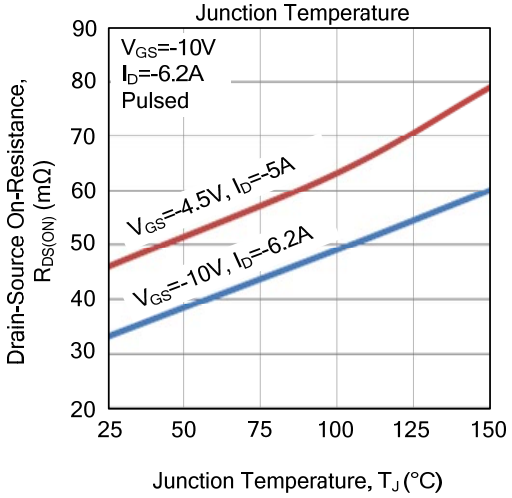
Gate Charge Characteristics



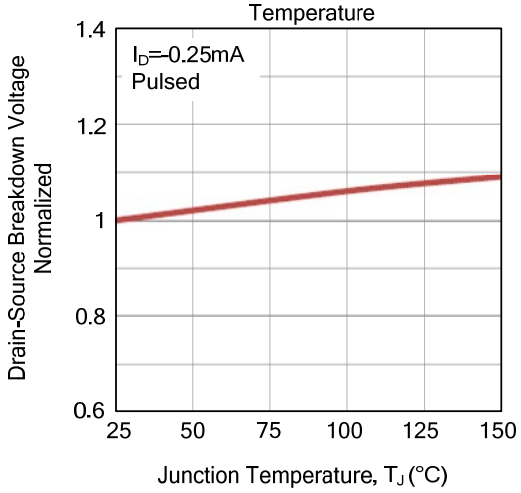
Capacitance Characteristics



Drain-Source On-Resistance vs. Junction Temperature

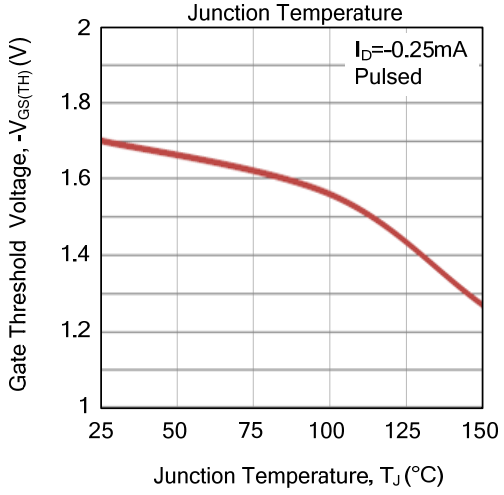


Breakdown Voltage vs. Junction Temperature

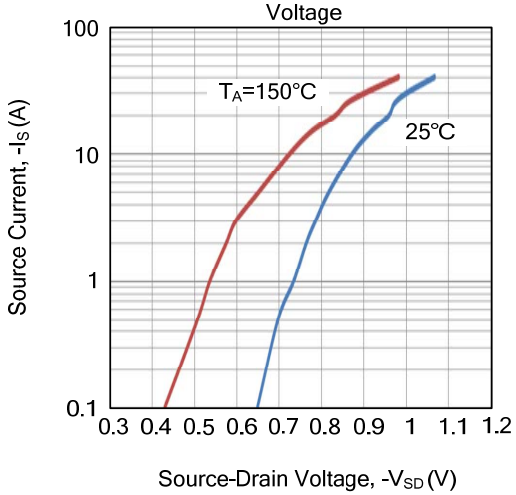


■ TYPICAL CHARACTERISTICS (Cont.)

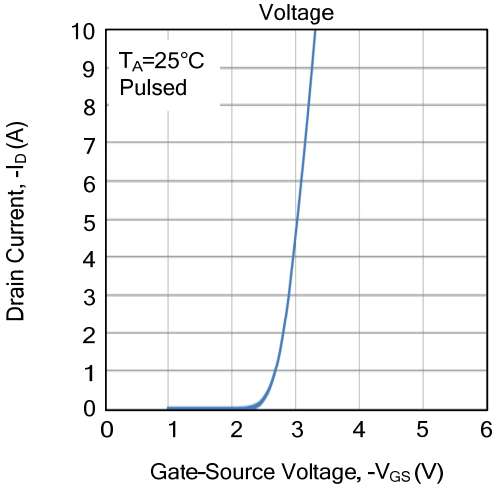
Gate Threshold Voltage vs. Junction Temperature



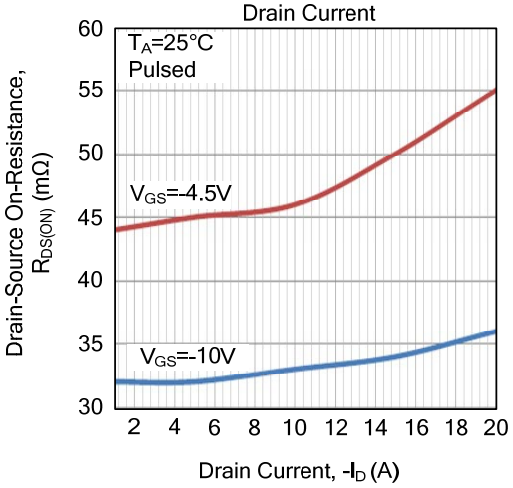
Source Current vs. Source-Drain Voltage



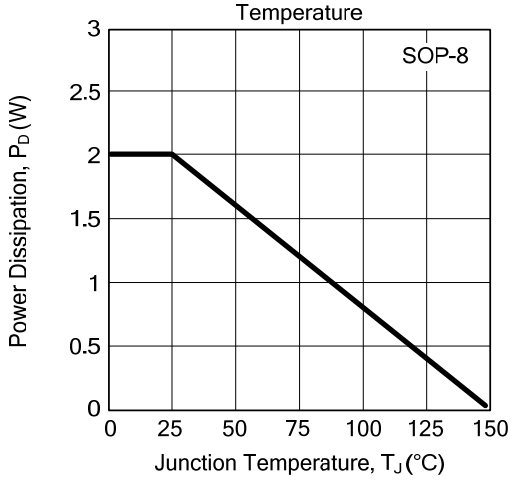
Drain Current vs. Gate-Source Voltage



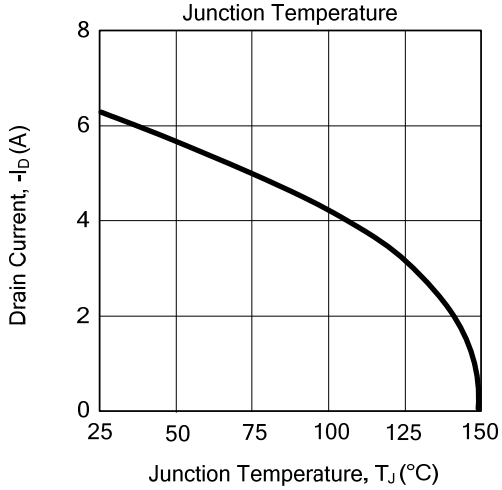
Drain-Source On-Resistance vs. Drain Current



Power Dissipation vs. Junction Temperature



Drain Current vs. Junction Temperature



■ TYPICAL CHARACTERISTICS (Cont.)