

**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.

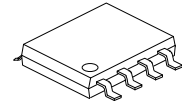
The UTC **UT4421** is suitable for load switch and battery protection applications.

FEATURES

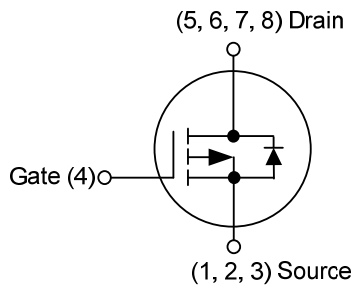
* $R_{DS(ON)} \leq 50 \text{ m}\Omega$ @ $V_{GS} = -10\text{V}$, $I_D = -15\text{A}$

$R_{DS(ON)} \leq 65 \text{ m}\Omega$ @ $V_{GS} = -4.5\text{V}$, $I_D = -15\text{A}$

* High switching speed



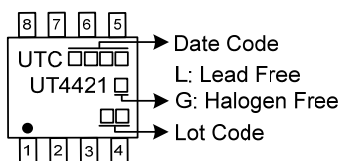
SOP-8

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

		(1) R: Tape Reel (2) S08: SOP-8 (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING

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

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			P_D	1	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}	125 (Note)	$^{\circ}\text{C/W}$
Junction to Case	θ_{JC}	27.7 (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 =-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 =-15A		34	50	mΩ
			V _{GS} =-4.5V, I _D =-15A		46	65	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
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)}			8		ns
Rise Time		t _R	V _{GS} =-10V, V _{DS} =-30V, R _L =4.7Ω,		17		ns
Turn-OFF Delay Time		t _{D(OFF)}	R _{GEN} =3Ω		40		ns
Fall-Time		t _F			21		ns

■ ELECTRICAL CHARACTERISTICS (Cont.)

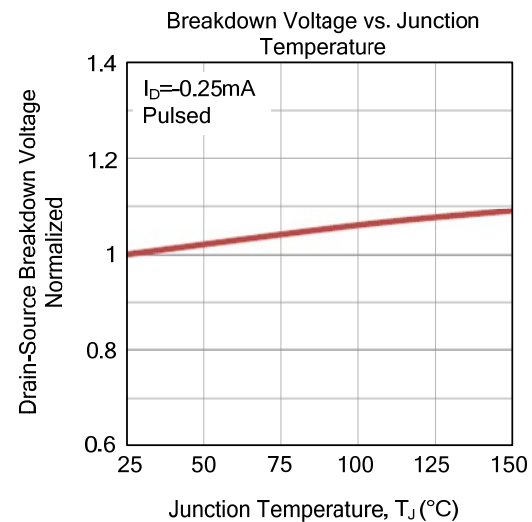
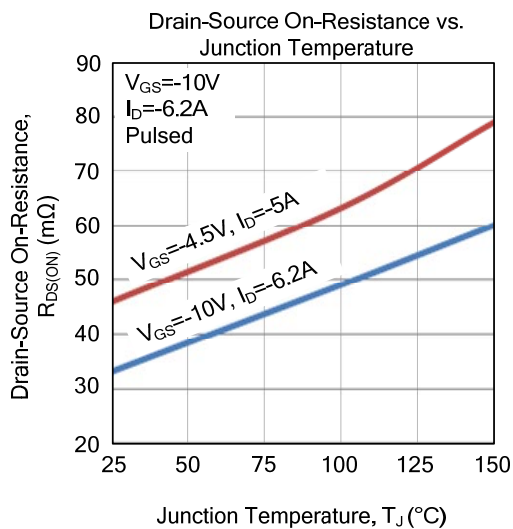
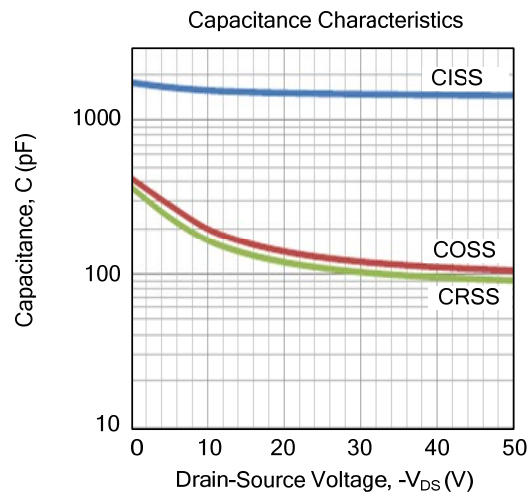
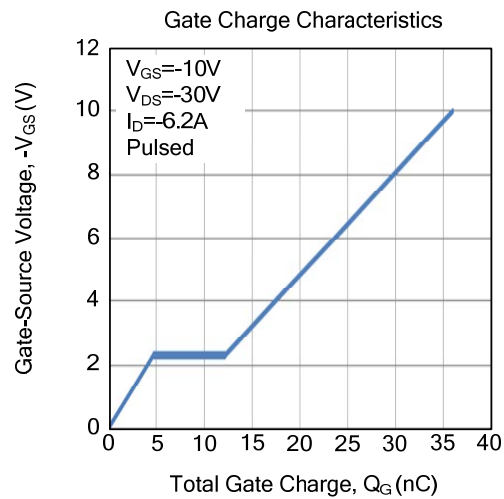
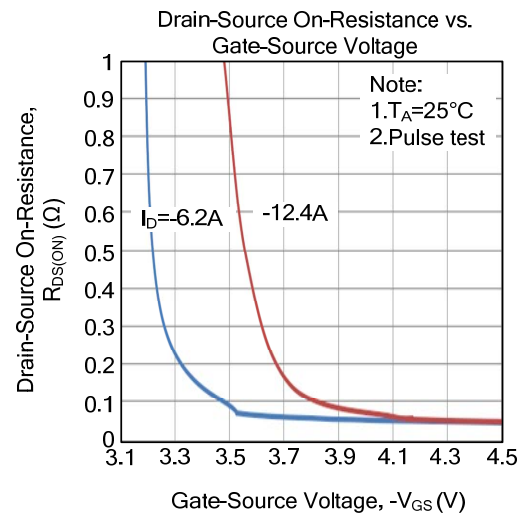
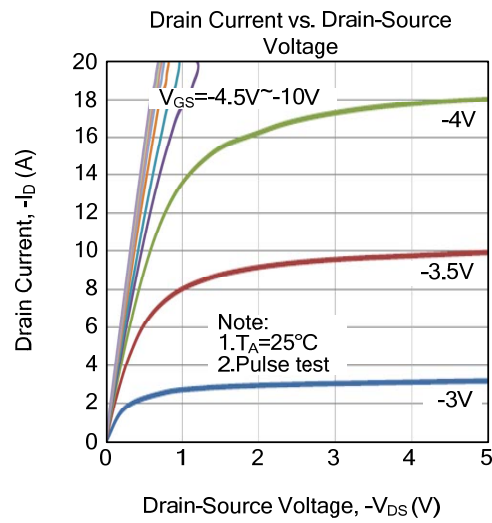
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I_S				-4.2	A
Diode Forward Voltage	V_{SD}	$I_S=-1.0A, V_{GS}=0V$		-0.74	-1	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F=-6.2A, dI/dt=100A/\mu S$		70		ns
Body Diode Reverse Recovery Charge	Q_{rr}			190		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 $T_A=25^{\circ}C$. The value in any a given application depends on the user's specific board design. The current rating is based on the $t \leq 10s$ thermal resistance rating.

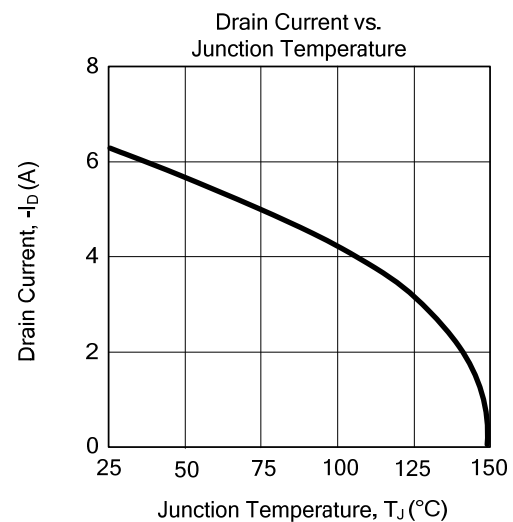
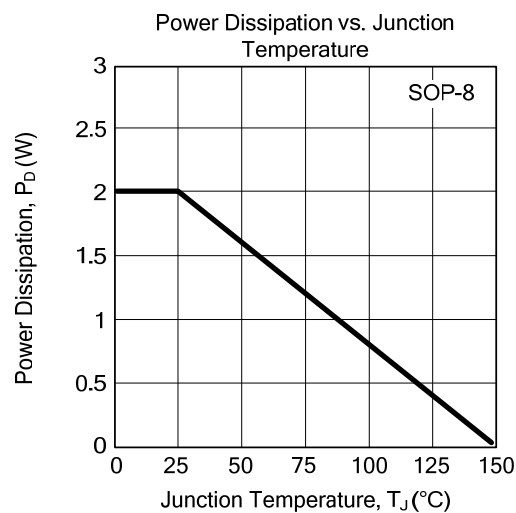
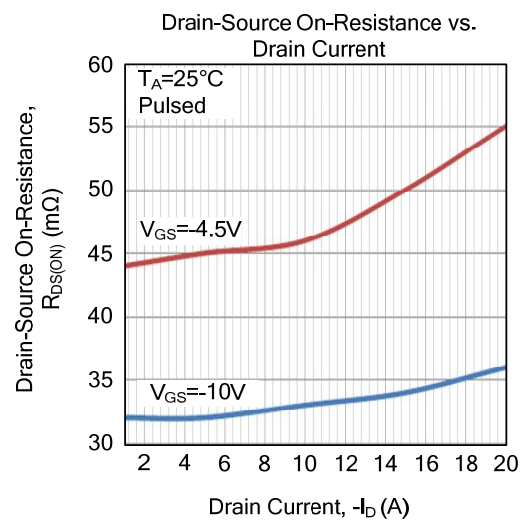
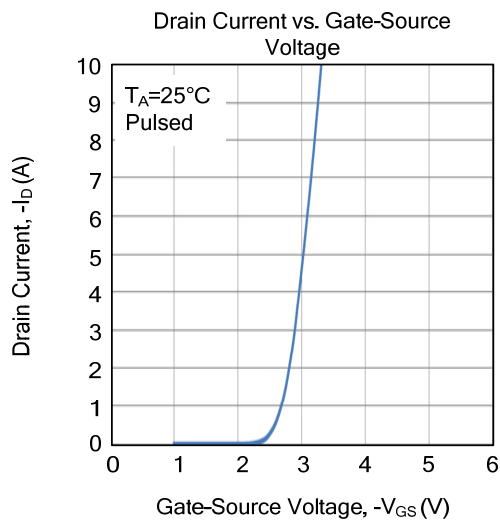
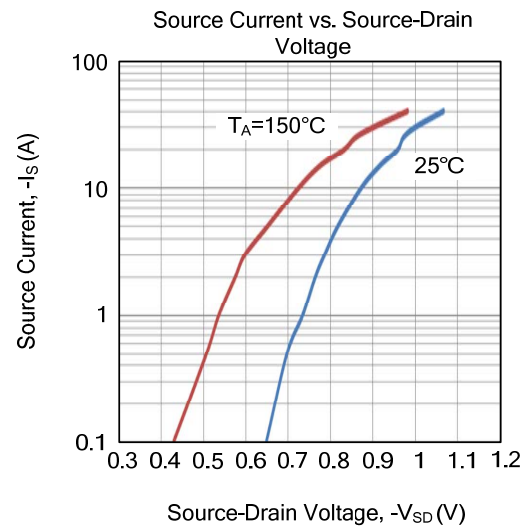
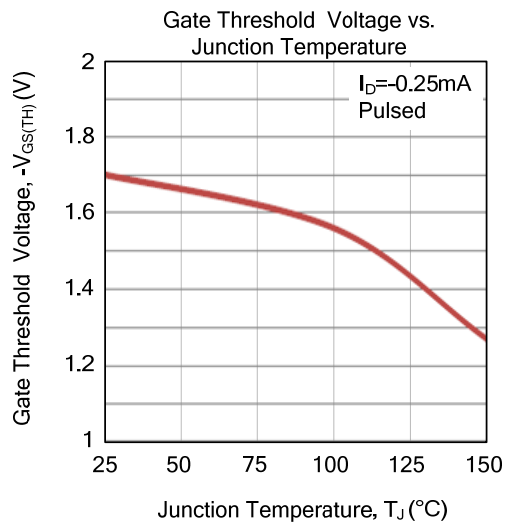
2. Repetitive rating, pulse width limited by junction temperature.

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

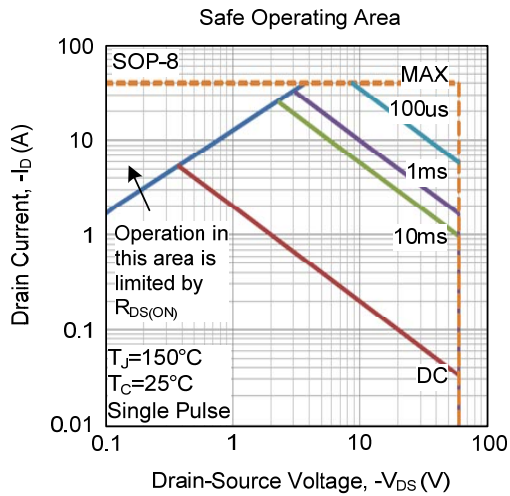
TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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