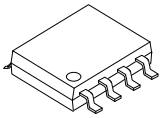
UT4414

Power MOSFET

N-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR



SOP-8

■ DESCRIPTION

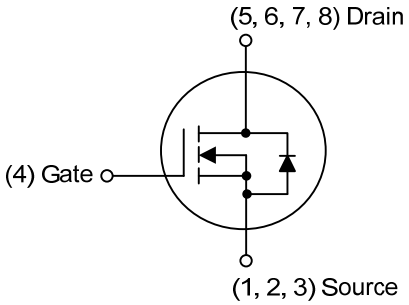
The UTC **UT4414** is an N-channel enhancement mode FET with excellent trench technology to provide customers perfect $R_{DS(ON)}$ and low gate charge. The source leads are separated to allow a Kelvin connection to the source, which may be used to bypass the source inductance.

This device can be applied in a load switch or in PWM applications.

■ FEATURES

* V_{DSS} = 30V
* I_D=8.5A @V_{GS}=10V
* $R_{DS(ON)}$ < 26mΩ @ V_{GS}=10V,I_D=8.5A
* $R_{DS(ON)}$ < 40mΩ @ V_{GS}=4.5V, I_D=5A

■ SYMBOL



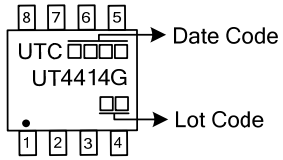
■ ORDERING INFORMATION

Ordering Number	Package	Pin Assignment								Packing
		1	2	3	4	5	6	7	8	
UT4414G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

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

UT4414G-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



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■ ABSOLUTE MAXIMUM RATING (T_A =25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain to Source Voltage		V_{DSS}	30	V
Gate to Source Voltage		V_{GSS}	±20	V
Continuous Drain Current (Note 1)	T_A =25°C	I_D	8.5	A
	T_A =70°C	I_D	7.1	A
Pulsed Drain Current (Note 1)		I_{DM}	50	A
Total Power Dissipation	T_A =25°C	P_D	3	W
	T_A =70°C		2.1	W
Junction Temperature		T_J	+150	°C
Storage Temperature		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	MIN	TYP	MAX	UNIT
Junction to Ambient (Note 1)	t ≤10s	θ_{JA}		31	40	°C/W
	Steady-State			59	75	°C/W

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	30			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=24V,V_{GS}=0V		0.004	1	μA
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V ,V_{GS}=±20V			100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}= V_{GS}, I_D=250μA	1	1.9	3	V
On State Drain Current	$I_{D(ON)}$	V_{GS}=4.5V, V_{DS}=5V	20			A
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V,I_D=8.5A		20	26	mΩ
		V_{GS}=4.5V, I_D=5A		31	40	mΩ
Forward Transconductance	g_{FS}	V_{DS}=5V, I_D=5A	10	17		S
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{DS}=15V,V_{GS}=0V,f =1MHz		680	820	pF
Output Capacitance	C_{OSS}			102		pF
Reverse Transfer Capacitance	C_{RSS}			77		pF
Gate Resistance	R_G	V_{DS}=0V,V_{GS}=0V,f =1MHz		3	3.6	Ω
SWITCHING PARAMETERS						
Total Gate Charge (10V)	Q_G	V_{DS}=15V, V_{GS}=10V, I_D=8.5A		13.84	17	nC
Total Gate Charge (4.5V)	Q_G			6.74	8.1	nC
Gate-Source Charge	Q_{GS}			1.84		nC
Gate-Drain Charge	Q_{GD}			3.32		nC
Turn-ON Delay Time	$t_{D(ON)}$	V_{DS}=15V,V_{GS}=10V,R_G=3Ω, R_L=1.8Ω		4.5	6.5	ns
Turn-ON Rise Time	t_R			4.2	6.3	ns
Turn-OFF Delay Time	$t_{D(OFF)}$			20.1	30	ns
Turn-OFF Fall Time	t_F			4.9	7.5	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I_S				4.3	A
Drain-Source Diode Forward Voltage	V_{SD}	I_S =1A, V_{GS}=0V		0.76	1	V
Body Diode Reverse Recovery Time	t_{RR}	I_F=8.5A, dI/dt=100A/μs		17.2	21	ns
Body Diode Reverse Recovery Charge	Q_{RR}	I_F=8.5A, dI/dt=100A/μs		8.6	10	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 given application depends on the user's specific boar design. The current rating is based on the t ≤ 10s thermal resistance rating.

2. Repetitive Rating : Pulse width limited by T_J.

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

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