



## UT4114

Preliminary

Power MOSFET

### 20A, 20V N-CHANNEL POWER MOSFET

#### DESCRIPTION

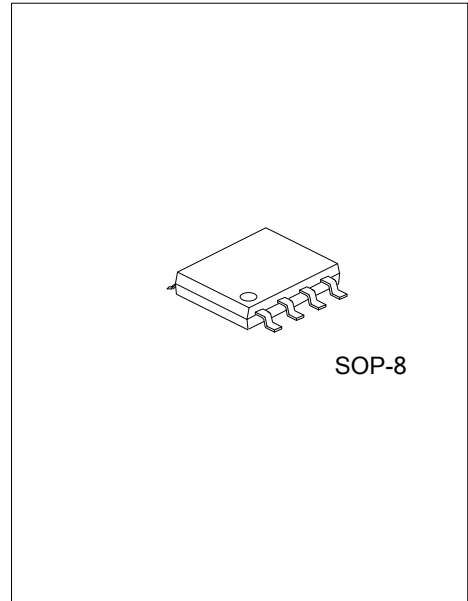
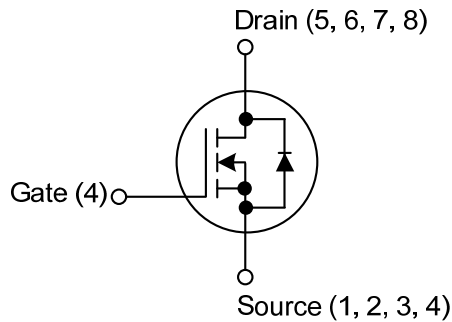
The UTC **UT4114** is an N-channel power MOSFET uses UTC's advanced trench technology to provide customers perfect  $R_{DS(ON)}$  and low gate charge.

This device can be applied in Game Machine or in PC.

#### FEATURES

- \*  $R_{DS(ON)} < 6\text{ m}\Omega$  @  $V_{GS}=10\text{V}$ ,  $I_D=10\text{A}$
- \*  $R_{DS(ON)} < 7\text{ m}\Omega$  @  $V_{GS}=4.5\text{V}$ ,  $I_D=7\text{A}$
- \* Typically 315pF low  $C_{RSS}$
- \* Typically 62nC low gate charge
- \* 100 %  $R_G$  and UIS Tested

#### SYMBOL



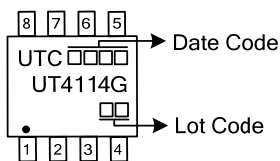
#### ORDERING INFORMATION

Ordering Number	Package	Pin Assignment								Packing
		1	2	3	4	5	6	7	8	
UT4114G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

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

<p>UT4114G-S08-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) R: Tape Reel</p> <p>(2) S08: SOP-8</p> <p>(3) G: Halogen Free and Lead Free</p>
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#### MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT	
Drain-Source Voltage		$V_{DSS}$	20	V	
Gate-Source Voltage		$V_{GSS}$	$\pm 16$	V	
Drain Current $I_D$	Continuous ( $T_J=150^{\circ}\text{C}$ )	$I_D$	$T_C=25^{\circ}\text{C}$	20	A
			$T_C=70^{\circ}\text{C}$	18.2	
	Pulsed		$I_{DM}$	50	A
Continuous Source - Drain Diode Current		$I_S$	$T_C=25^{\circ}\text{C}$	5.1	A
Single Pulsed Avalanche Current		$I_{AS}$	$L=0.1\text{mH}$	30	A
Single Pulsed Avalanche Energy		$E_{AS}$		45	mJ
Power Dissipation		$P_D$	$T_C=25^{\circ}\text{C}$	5.7	W
Junction Temperature		$T_J$		-55 ~ 150	$^{\circ}\text{C}$
Storage Temperature		$T_{STG}$		-55 ~ 150	$^{\circ}\text{C}$

Notes: 1. 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.

2. Based on  $T_C=25^{\circ}\text{C}$

3. Maximum under steady state conditions is  $85^{\circ}\text{C/W}$ .

4. Package limited.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient (Note)	$t \leq 10\text{ s}$	$\theta_{JA}$	50	$^{\circ}\text{C/W}$

Note: Surface Mounted on 1x1 FR4 board.

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

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>							
Drain-Source Breakdown Voltage		$BV_{DSS}$	$I_D=250\mu\text{A}, V_{GS}=0\text{V}$	20			V
$V_{DS}$ Temperature Coefficient		$\Delta V_{DS}/T_J$	$I_D=250\mu\text{A}$		19		$\text{mV}/^{\circ}\text{C}$
Drain-Source Leakage Current		$I_{DSS}$	$V_{DS}=20\text{V}, V_{GS}=0\text{V}$			1	$\mu\text{A}$
			$V_{DS}=20\text{V}, V_{GS}=0\text{V}, T_J=55^{\circ}\text{C}$			10	
Gate- Source Leakage Current	Forward	$I_{GSS}$	$V_{GS}=+16\text{V}, V_{DS}=0\text{V}$			+100	nA
	Reverse		$V_{GS}=-16\text{V}, V_{DS}=0\text{V}$			-100	nA
<b>ON CHARACTERISTICS</b>							
Gate Threshold Voltage		$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	1.0		2.1	V
$V_{GS(TH)}$ Temperature Coefficient		$\Delta V_{GS}/T_J$	$I_D=250\mu\text{A}$		-5.3		$\text{mV}/^{\circ}\text{C}$
Static Drain-Source On-State Resistance (Note 1)		$R_{DS(ON)}$	$V_{GS}=10\text{V}, I_D=10\text{A}$		4.9	6	$\text{m}\Omega$
			$V_{GS}=4.5\text{V}, I_D=7\text{A}$		5.6	7	$\text{m}\Omega$
Forward Transconductance (Note 1)		$g_{FS}$	$V_{DS}=10\text{V}, I_D=10\text{A}$		55		S
On State Drain Current (Note 1)		$I_{D(ON)}$	$V_{GS}=10\text{V}, V_{DS} \geq 5\text{V}$	30			A
<b>DYNAMIC PARAMETERS (Note 2)</b>							
Input Capacitance		$C_{ISS}$	$V_{GS}=0\text{V}, V_{DS}=10\text{V},$ $f=1.0\text{MHz}$		3700		pF
Output Capacitance		$C_{OSS}$			745		pF
Reverse Transfer Capacitance		$C_{RSS}$			315		pF

■ ELECTRICAL CHARACTERISTICS (Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge	$Q_G$	$V_{GS}=10V, V_{DS}=10V, I_D=10A$		62	95	nC
Gate to Source Charge	$Q_{GS}$	$V_{GS}=4.5V, V_{DS}=10V, I_D=10A$		27.5	42	nC
Gate to Drain Charge	$Q_{GD}$			8.0		nC
Gate Resistance	$R_G$	$f=1.0MHz$	0.15	0.7	1.4	$\Omega$
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=10V, R_L=2\Omega, I_D\approx 5A, V_{GEN}=4.5V, R_G=1\Omega$		30	55	ns
Rise Time	$t_R$			13	25	ns
Turn-OFF Delay Time	$t_{D(OFF)}$			60	100	ns
Fall-Time	$t_F$			30	55	ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Maximum Body-Diode Continuous Current	$I_S$	$T_C=25^\circ C$			5.1	A
Maximum Body-Diode Pulsed Current (Note 1)	$I_{SM}$				50	A
Drain-Source Diode Forward Voltage	$V_{SD}$	$I_S=2A$		0.71	1.1	V

Notes: 1. Pulse test; pulse width  $\leq 300 \mu s$ , duty cycle  $\leq 2 \%$

2. Guaranteed by design, not subject to production testing.

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