

**UT4114**

Preliminary

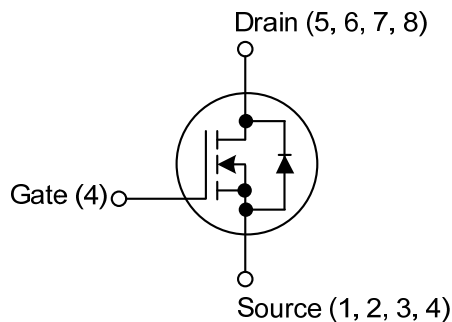
Power MOSFET**20A, 20V N-CHANNEL
POWER MOSFET****DESCRIPTION**

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

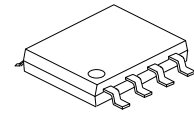
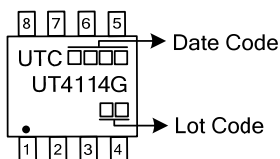
- * $R_{DS(ON)} < 6\text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=10\text{A}$
- * $R_{DS(ON)} < 7\text{ m}\Omega$ @ $V_{GS}=4.5\text{V}$, $I_D=7\text{A}$
- * Typically 315pF low C_{RSS}
- * Typically 62nC low gate charge
- * 100 % R_G and UIS Tested

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

UT4114G-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
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MARKING

SOP-8

■ 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}	±16	V
Drain Current t	Continuous (T _J =150°C)	T _C = 25°C	I _D	20	A
		T _C = 70°C		18.2	
	Pulsed		I _{DM}	50	A
Continuous Source - Drain Diode Current		T _C = 25°C	I _S	5.1	A
Single Pulsed Avalanche Current		L = 0.1mH	I _{AS}	30	A
Single Pulsed Avalanche Energy			E _{AS}	45	mJ
Power Dissipation		T _C = 25°C	P _D	5.7	W
Junction Temperature			T _J	-55 ~ 150	°C
Storage Temperature			T _{STG}	-55 ~ 150	°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°C/W .

4. Package limited.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient (Note)	$t \leq 10\text{ s}$	θ_{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
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250μA, V _{GS} =0V	20			V
V _{DS} Temperature Coefficient		△V _{DS} /T _J	I _D =250μA		19		mV/°C
Drain-Source Leakage Current		I _{DSS}	V _{DS} =20V, V _{GS} =0V			1	μA
			V _{DS} =20V, V _{GS} =0V, T _J =55°C			10	
Gate- Source Leakage Current	Forward	I _{GSS}	V _{GS} =+16V, V _{DS} =0V			+100	nA
	Reverse		V _{GS} =-16V, V _{DS} =0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	1.0		2.1	V
V _{GS(TH)} Temperature Coefficient		△V _{GS} /T _J	I _D =250μA		-5.3		mV/°C
Static Drain-Source On-State Resistance (Note 1)		R _{DS(ON)}	V _{GS} =10V, I _D =10A		4.9	6	mΩ
			V _{GS} =4.5V, I _D =7A		5.6	7	mΩ
Forward Transconductance (Note 1)		g _{FS}	V _{DS} =10V, I _D =10A		55		S
On State Drain Current (Note 1)		I _{D(ON)}	V _{GS} =10V, V _{DS} ≥5V	30			A
DYNAMIC PARAMETERS (Note 2)							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =10V, f=1.0MHz		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
SWITCHING PARAMETERS						
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	Ω
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
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
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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