



N-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR

DESCRIPTION

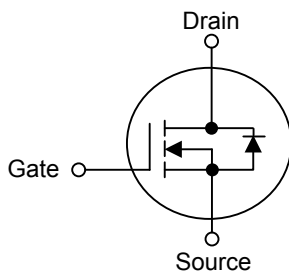
The UTC **UT4414** is an N-channel enhancement mode FET with excellent trench technology to provide customers perfect $R_{DS(ON)}$ and low gate charge. The source leads are separated to allow a Kelvin connection to the source, which may be used to bypass the source inductance.

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

FEATURES

- * $V_{DSS} = 30V$
- * $I_D = 8.5A$ @ $V_{GS} = 10V$
- * $R_{DS(ON)} < 26m\Omega$ @ $V_{GS} = 10V$
- * $R_{DS(ON)} < 40m\Omega$ @ $V_{GS} = 4.5V$

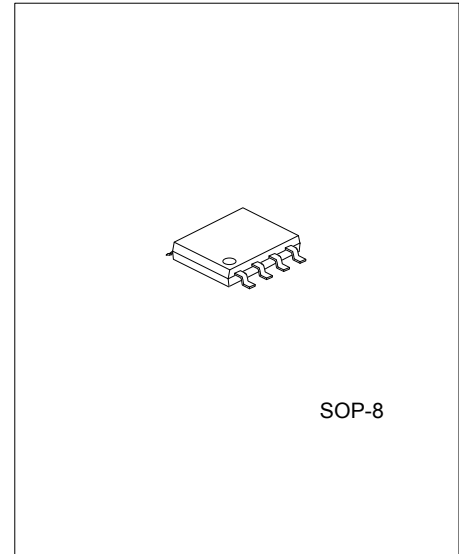
SYMBOL



ORDERING INFORMATION

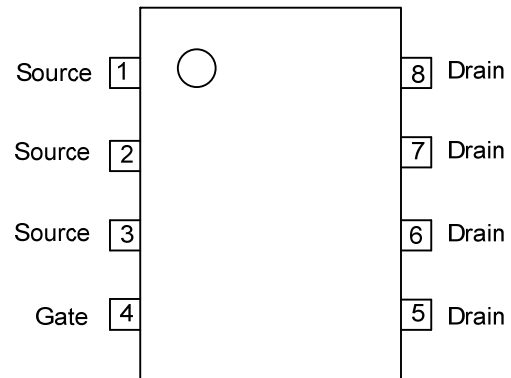
Ordering Number	Package	Packing
UT4414G-S08-R	SOP-8	Tape Reel

UT4414G-S08-R	(1) Packing Type	(1) R: Tape Reel
	(2) Package Type	(2) S08: SOP-8
	(3) Halogen Free	(3) G: Halogen Free



SOP-8

■ PIN CONFIGURATION



■ **ABSOLUTE MAXIMUM RATING** ($T_A = 25^\circ\text{C}$, 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)	$T_A = 25^\circ\text{C}$	I_D	8.5	A
	$T_A = 70^\circ\text{C}$	I_D	7.1	A
Pulsed Drain Current (Note 1)		I_{DM}	50	A
Total Power Dissipation	$T_A = 25^\circ\text{C}$	P_D	3	W
	$T_A = 70^\circ\text{C}$		2.1	W
Junction Temperature		T_J	+150	$^\circ\text{C}$
Storage Temperature		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	MIN	TYP	MAX	UNIT
Junction to Ambient (Note 1)	$t \leq 10\text{s}$	θ_{JA}		31	40	$^\circ\text{C/W}$
	Steady-State			59	75	$^\circ\text{C/W}$

■ **ELECTRICAL CHARACTERISTICS** ($T_J = 25^\circ\text{C}$, 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

Note: 1. The value of θ_{JA} is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ\text{C}$. The value in any given application depends on the user's specific board design.

The current rating is based on the $t \leq 10\text{s}$ 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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