

**UD4606-Q**

Preliminary

Power MOSFET

**DUAL ENHANCEMENT MODE
(N-CHANNEL/P-CHANNEL)****DESCRIPTION**

The UTC **UD4606-Q** provides excellent $R_{DS(ON)}$ and low gate charge by using advanced trench technology MOSFETs. The complementary MOSFETs may be help to form a level shifted high side switch and also for lots of other applications.

FEATURES

* N-Channel: 30V / 6.9A

$R_{DS(ON)} \leq 28 \text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=6.9\text{A}$

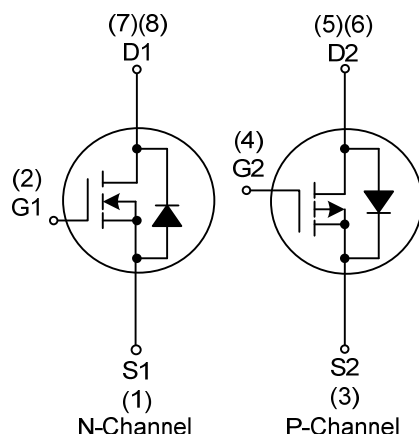
$R_{DS(ON)} \leq 42 \text{ m}\Omega$ @ $V_{GS}=4.5\text{V}$, $I_D=5.0\text{A}$

* P-Channel: -30V / -6.0A

$R_{DS(ON)} \leq 58 \text{ m}\Omega$ @ $V_{GS}=-10\text{V}$, $I_D=-6.0\text{A}$

$R_{DS(ON)} \leq 78 \text{ m}\Omega$ @ $V_{GS}=-4.5\text{V}$, $I_D=-5.0\text{A}$

* Reliable and rugged

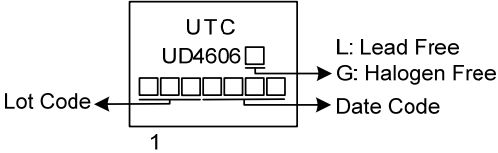
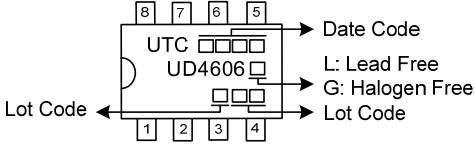
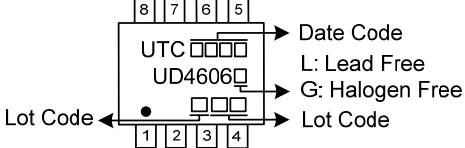
SYMBOL**ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UD4606L-TN4-R	UD4606G-TN4-R	TO-252-4	S1	G1	D	S2	G2	-	-	-	Tape Reel
UD4606L-D08-T	UD4606G-D08-T	DIP-8	S1	G1	S2	G2	D2	D2	D1	D1	Tube
UD4606L-S08-R	UD4606G-S08-R	SOP-8	S1	G1	S2	G2	D2	D2	D1	D1	Tape Reel

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

UD4606G-TN4-R	(1)Packing Type	(1) T: Tube, R: Tape Reel
	(2)Package Type	(2) TN4: TO-252-4, D08: DIP-8, S08: SOP-8
	(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

MARKING

PACKAGE	MARKING
TO-252-4	 Diagram showing the marking layout for the TO-252-4 package. The marking includes 'UTC' and 'UD4606' followed by a date code (two digits) and a lot code (four digits). The date code is located at the top right, and the lot code is at the bottom left. A small '1' is indicated below the lot code. Arrows point to the date code and lot code areas. Lot Code → UTC UD4606 → Date Code
DIP-8	 Diagram showing the marking layout for the DIP-8 package. The marking includes 'UTC' and 'UD4606' followed by a date code (two digits) and a lot code (four digits). The date code is located at the top right, and the lot code is at the bottom left. Arrows point to the date code and lot code areas. Lot Code → UTC UD4606 → Date Code
SOP-8	 Diagram showing the marking layout for the SOP-8 package. The marking includes 'UTC' and 'UD4606' followed by a date code (two digits) and a lot code (four digits). The date code is located at the top right, and the lot code is at the bottom left. Arrows point to the date code and lot code areas. Lot Code → UTC UD4606 → Date Code

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

PARAMETER		SYMBOL	RATINGS		UNIT
			N-CHANNEL	P-CHANNEL	
Drain to Source Voltage		V_{DSS}	30	-30	V
Gate to Source Voltage		V_{GSS}	± 20	± 20	
Drain Current (Note 3)	Continuous	I_D	6.9	-6	A
Drain Current (Note 1)	Pulsed	I_{DM}	30	-30	
Power Dissipation @ $T_A=25^{\circ}\text{C}$	TO-252-4	P_D	1.14		W
	DIP-8		1.19		W
	SOP-8		1.39		W
Junction Temperature		T_J	$-55 \sim +150$		$^{\circ}\text{C}$
Storage Temperature Range		T_{STG}	$-55 \sim +150$		$^{\circ}\text{C}$

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. Surface Mounted on 1in^2 pad area, $t \leq 10\text{sec}$

■ **THERMAL DATA**

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-252-4	θ_{JA}	50	$^{\circ}\text{C/W}$
	DIP-8		105	$^{\circ}\text{C/W}$
	SOP-8		90	$^{\circ}\text{C/W}$

Note: Surface Mounted on 1in^2 pad area, $t \leq 10\text{sec}$.

■ **ELECTRICAL CHARACTERISTICS** ($T_A=25^{\circ}\text{C}$, unless otherwise specified)

N-CHANNEL

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250uA	30			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =24V, V _{GS} =0V			1	uA
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 =250uA	1.0		3.0	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =6.9A			28	mΩ
		V _{GS} =4.5V, I _D =5.0A			42	mΩ
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =15V, f=1.0MHz		295		pF
Output Capacitance	C _{OSS}			82		pF
Reverse Transfer Capacitance	C _{RSS}			63		pF
SWITCHING CHARACTERISTICS						
Total Gate Charge (Note2)	Q _G	V _{DS} =15V, V _{GS} =10V, I _D =6.9A		16.5		nC
Gate-Source Charge	Q _{GS}			2.5		nC
Gate-Drain Charge	Q _{GD}			2.7		nC
Turn-ON Delay Time (Note2)	t _{D(ON)}	V _{DS} =15V, V _{GS} =10V, I _D =6.9A, R _G =3Ω		4		ns
Turn-ON Rise Time	t _R			14.8		ns
Turn-OFF Delay Time	t _{D(OFF)}			16		ns
Turn-OFF Fall Time	t _F			21		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Diode Continuous Forward Current (Note3)	I _S				4.5	A
Drain-Source Diode Forward Voltage(Note2)	V _{SD}	I _S =1.0A, V _{GS} =0V			1.0	V

■ ELECTRICAL CHARACTERISTICS (Cont.)

P-CHANNEL

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =-250uA	-30			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =-24V, V _{GS} =0V			-1	uA
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 =-250uA	-1.2		-2.4	V
Drain-Source On-State Resistance (Note2)	R _{DS(ON)}	V _{GS} =-10V, I _D =-6.0A			58	mΩ
		V _{GS} =-4.5V, I _D =-5.0A			78	mΩ
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =-15V, f=1.0MHz		485		pF
Output Capacitance	C _{OSS}			106		pF
Reverse Transfer Capacitance	C _{RSS}			88		pF
SWITCHING CHARACTERISTICS						
Total Gate Charge (Note2)	Q _G	V _{DS} =-15V, V _{GS} =-10V, I _D =-6.0A		13.3		nC
Gate-Source Charge	Q _{GS}			2.0		nC
Gate-Drain Charge	Q _{GD}			2.6		nC
Turn-ON Delay Time (Note2)	t _{D(ON)}	V _{DS} =-15V, V _{GS} =-10V, I _D =-6.0A R _G =3Ω		4.8		ns
Turn-ON Rise Time	t _r			15.6		ns
Turn-OFF Delay Time	t _{D(OFF)}			19.2		ns
Turn-OFF Fall Time	t _f			19.8		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Diode Continuous Forward Current (Note3)	I _s				-4.2	A
Drain-Source Diode Forward Voltage(Note2)	V _{SD}	I _s =-1.0A, V _{GS} =0V			-1.0	V

Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

2. Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

3. Surface Mounted on 1in² pad area, $t \leq 10sec$.

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