



**UD4606Z**

Preliminary

*Power MOSFET*

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

■ DESCRIPTION

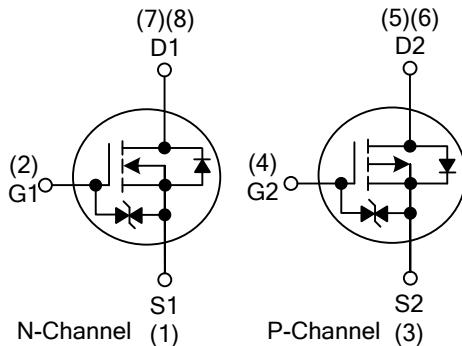
The UTC **UD4606Z** is a dual enhancement mode Power MOSFET using UTC perfect trench technology to provide customers with advanced  $R_{DS(ON)}$  and low gate charge. This device has ESD protection function.

These complementary MOSFETs can be used to form a level shifted high side switch and for other applications.

■ FEATURES

- \* N-Channel: 30V/6.9A  
 $R_{DS(ON)}=22.5m\Omega$  (TYP.) ( $V_{GS}=10V$ )  
 $R_{DS(ON)}=34.5m\Omega$  ((TYP.) ( $V_{GS}=4.5V$ )
- \*P-Channel: -30V/-6A  
 $R_{DS(ON)}=28m\Omega$ (TYP.) ( $V_{GS}=-10V$  )  
 $R_{DS(ON)}=44m\Omega$ (TYP.) ( $V_{GS}=-4.5V$ )
- \* Reliable and rugged
- \* ESD protection

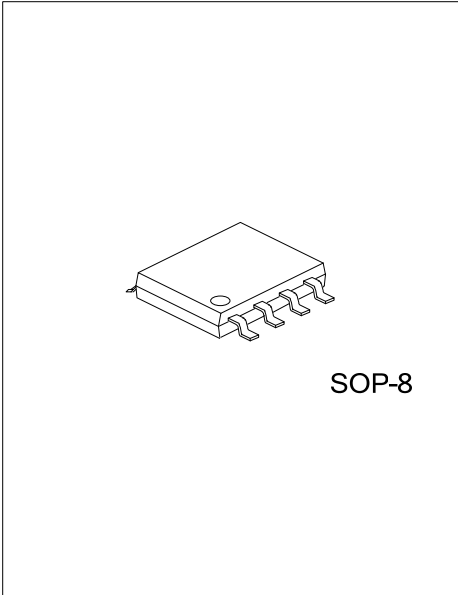
■ SYMBOL



■ ORDERING INFORMATION

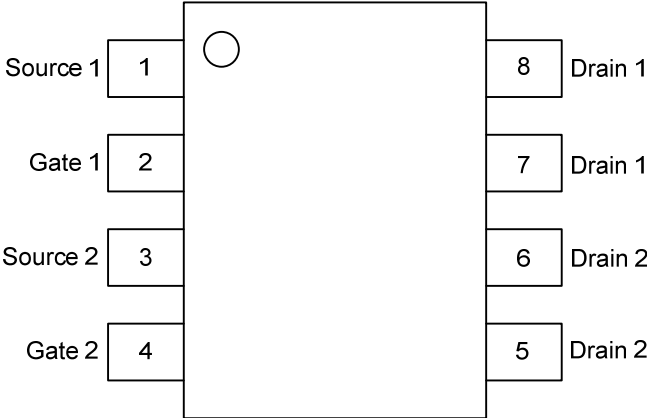
Ordering Number		Package	Pin Assignment								Packing
Lead Free Plating	Halogen Free		1	2	3	4	5	6	7	8	
UD4606ZL-S08-R	UD4606ZG-S08-R	SOP-8	S1	G1	S2	G2	D2	D2	D1	D1	Tape Reel

<p>UD4606ZL - S08 - R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Halogen Free</p>	<p>(1) R: Tape Reel, T: Tube</p> <p>(2) S08: SOP-8</p> <p>(3) G: Halogen Free</p>
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SOP-8

■ PIN CONFIGURATION



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

**N-CHANNEL**

PARAMETER	SYMBOL	RATINGS	UNIT
Drain to Source Voltage	$V_{DSS}$	30	V
Gate to Source Voltage	$V_{GSS}$	$\pm 20$	V
Continuous Drain Current <sup>2</sup>	$I_D$	6.9	A
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	30	A
Total Power Dissipation	$P_D$	2	W
Junction Temperature	$T_J$	+150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55 ~ +150	$^\circ\text{C}$

**P-CHANNEL**

PARAMETER	SYMBOL	RATINGS	UNIT
Drain to Source Voltage	$V_{DSS}$	-30	V
Gate to Source Voltage	$V_{GSS}$	$\pm 20$	V
Continuous Drain Current <sup>2</sup>	$I_D$	-6	A
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	-30	A
Total Power Dissipation	$P_D$	2	W
Junction Temperature	$T_J$	+150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55 ~ +150	$^\circ\text{C}$

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

■ THERMAL DATA

PARAMETER	SYMBOL	PATINGS	UNIT
Junction to Ambient (Note)	$R_{\theta JA}$	110	$^\circ\text{C}/\text{W}$

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

■ ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C, unless otherwise specified)

**N-CHANNEL**

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	30			V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =24V, V <sub>GS</sub> =0V			1	μA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±5	μA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1	1.9	3	V
Drain-Source On-State Resistance <sup>2</sup>	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =6.9A		22.5	28	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =5A		34.5	42	mΩ
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f = 1MHz		680		pF
Output Capacitance	C <sub>OSS</sub>			102		pF
Reverse Transfer Capacitance	C <sub>RSS</sub>			77		pF
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge <sup>2</sup>	Q <sub>G</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =10V, I <sub>D</sub> =6.9A		13.8		nC
Gate-Source Charge	Q <sub>GS</sub>			1.82		nC
Gate-Drain Charge	Q <sub>GD</sub>			3.2		nC
Turn-ON Delay Time <sup>2</sup>	t <sub>D(ON)</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =10V, R <sub>G</sub> =3Ω, R <sub>L</sub> =2.2Ω		4.6		ns
Turn-ON Rise Time	t <sub>R</sub>			4.1		ns
Turn-OFF Delay Time	t <sub>D(OFF)</sub>			20.6		ns
Turn-OFF Fall Time	t <sub>F</sub>			5.2		ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Diode Continuous Forward Current <sup>3</sup>	I <sub>S</sub>				3	A
Drain-Source Diode Forward Voltage <sup>2</sup>	V <sub>SD</sub>	I <sub>S</sub> = 6.9A, V <sub>GS</sub> =0V		0.76	1	V

**P-CHANNEL**

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =-250μA	-30			V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =-24V, V <sub>GS</sub> =0V			-1	μA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±5	μA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA	-1.2	-2	-2.4	V
Drain-Source On-State Resistance <sup>2</sup>	R <sub>DS(ON)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-6A		28	35	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-5A		44	58	mΩ
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> =-15V, V <sub>GS</sub> =0V, f = 1MHz		920		pF
Output Capacitance	C <sub>OSS</sub>			190		pF
Reverse Transfer Capacitance	C <sub>RSS</sub>			122		pF
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge <sup>2</sup>	Q <sub>G</sub>	V <sub>DS</sub> =-15V, V <sub>GS</sub> =-10V, I <sub>D</sub> =-6A		18.5		nC
Gate-Source Charge	Q <sub>GS</sub>			2.7		nC
Gate-Drain Charge	Q <sub>GD</sub>			4.5		nC
Turn-ON Delay Time <sup>2</sup>	t <sub>D(ON)</sub>	V <sub>DS</sub> =-15V, V <sub>GS</sub> =-10V, R <sub>G</sub> =3Ω, R <sub>L</sub> =2.7Ω		7.7		ns
Turn-ON Rise Time	t <sub>R</sub>			5.7		ns
Turn-OFF Delay Time	t <sub>D(OFF)</sub>			20.2		ns
Turn-OFF Fall Time	t <sub>F</sub>			9.5		ns

■ ELECTRICAL CHARACTERISTICS(Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Diode Continuous Forward Current <sup>3</sup>	$I_S$				-4.2	A
Drain-Source Diode Forward Voltage <sup>2</sup>	$V_{SD}$	$I_S = -6A, V_{GS} = 0V$		-0.76	-1	V

Notes:

1. Pulse width limited by  $T_{J(MAX)}$ .
2. Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
3. Surface Mounted on  $1in^2$  pad area,  $t \leq 10sec$ .

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