



ULD2003

Advance

CMOS IC

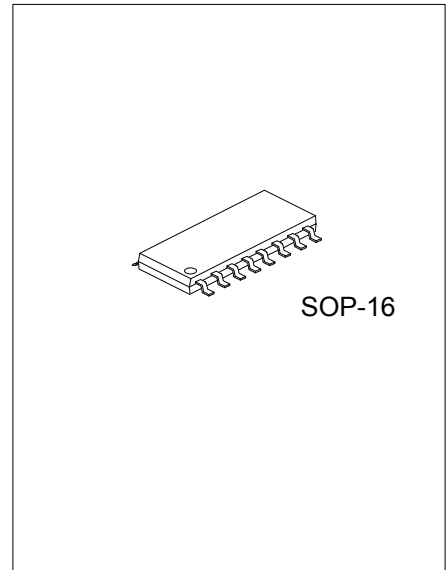
7 CHANNEL SINK TYPE DMOS TRANSISTOR ARRAY

DESCRIPTION

The UTC **ULD2003** is DMOS transistor array with 7 circuits. It has a clamp diode for switching inductive loads built-in in each output. Please be careful about thermal conditions during use.

FEATURES

- * 7 circuits built-in
- * High voltage: $V_{OUT} = 50V$ (MAX)
- * High current: $I_{OUT} = 500mA/ch$ (MAX)
- * Input voltage(output on): 2.5V (MIN)
- * Input voltage(output off): 0.6V (MAX)

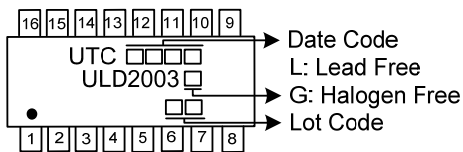


ORDERING INFORMATION

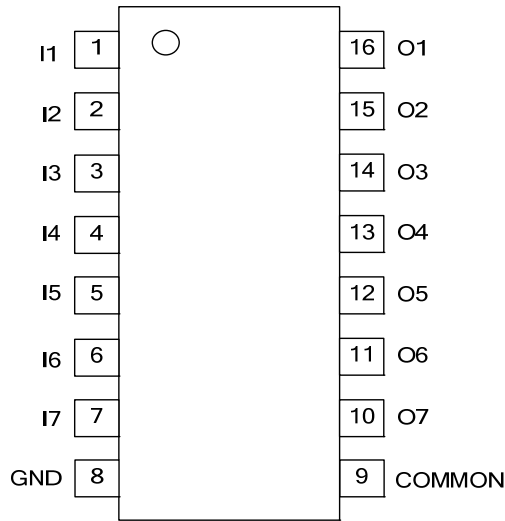
Ordering Number		Package	Packing
Lead Free	Halogen Free		
ULD2003L-S16-R	ULD2003G-S16-R	SOP-16	Tape Reel

<p>ULD2003G-S16-R</p> <ul style="list-style-type: none"> (1) Packing Type (2) Package Type (3) Green Package 	<ul style="list-style-type: none"> (1) R: Tape Reel (2) S16: SOP-16 (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING



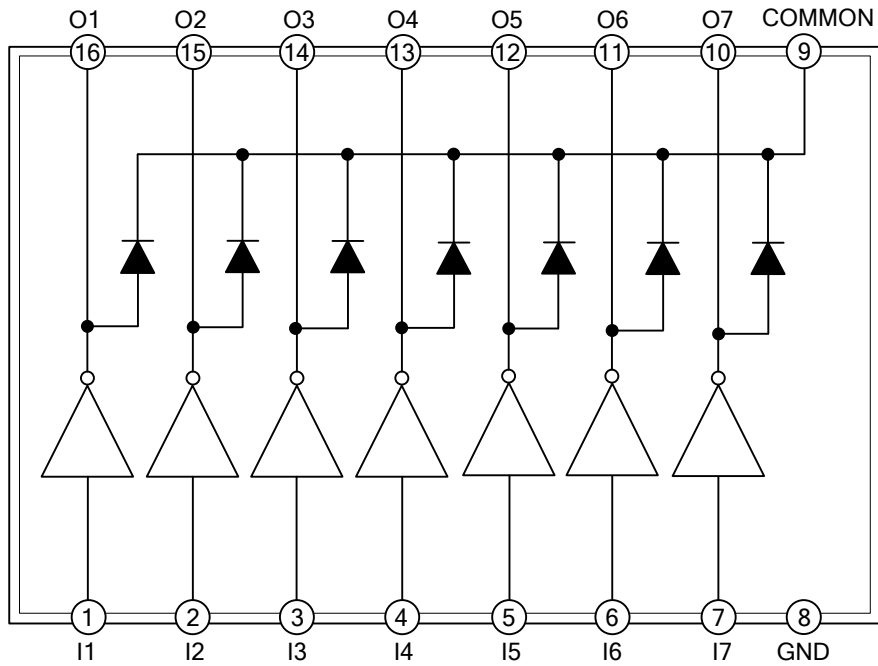
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	I1	1 Channel Input pin
2	I2	2 Channel Input pin
3	I3	3 Channel Input pin
4	I4	4 Channel Input pin
5	I5	5 Channel Input pin
6	I6	6 Channel Input pin
7	I7	7 Channel Input pin
8	GND	GND pin
9	COMMON	Common pin
10	Q7	7 Channel Output pin
11	Q6	6 Channel Output pin
12	Q5	5 Channel Output pin
13	Q4	4 Channel Output pin
14	Q3	3 Channel Output pin
15	Q2	2 Channel Output pin
16	Q1	1 Channel Output pin

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Output Voltage	V _{OUT}	50	V
COMMON Pin Voltage	V _{COM}	-0.5 ~ 50	V
Output Current	I _{OUT}	500	mA/ch
Input Voltage	V _{IN}	-0.5 ~ 30	V
Clamp Diode Reverse Voltage	V _R	50	V
Clamp Diode Forward Current	I _F	500	mA
Power Dissipation (Note 1)	P _D	1.25	W
Operating Temperature	T _{OPR}	-40 ~ +85	°C
Storage Temperature	T _{STG}	-55 ~ +150	°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.

■ OPERATING RANGES (T_A=-40~+85°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Output Voltage	V _{OUT}				50	V	
COMMON Pin Voltage	V _{COM}		0		50	V	
Output Current (Note 1)	I _{OUT}	1 Circuits ON, T _a =25°C	0		400	mA/ch	
		t _{PW} =25ms 7 Circuits ON T _A =85°C		Duty = 10%	0	390	mA/ch
		T _J =120°C		Duty = 50%	0	170	mA/ch
Input Voltage (Output On)	V _{IN(ON)}	I _{OUT} =100mA or Upper, V _{OUT} =2V	2.5		25	V	
Input Voltage (Output Off)	V _{IN(OFF)}	I _{OUT} =100µA or Less, V _{OUT} =2V	0		0.6	V	
Clamp Diode Forward Current	I _F				400	mA	

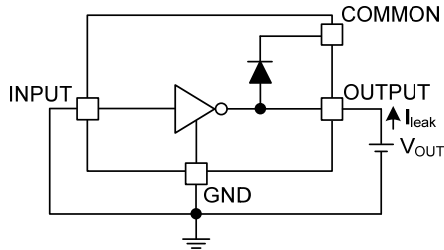
Note: On PCB (JEDEC 2s2p).

■ ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise noted)

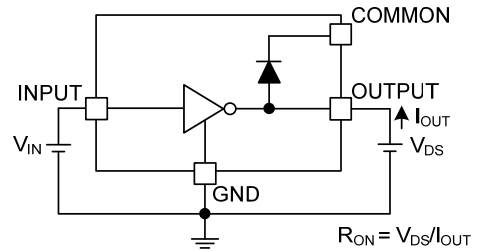
PARAMETER	SYMBOL	Test Circuit	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Leakage Current	I _{leak}	1	V _{OUT} =50V, T _A =85°C, V _{IN} =0V			1.0	µA
Output Voltage (Output ON-Resistance)	V _{DS} (R _{ON})	2	I _{OUT} =350mA, V _{IN} =5.0V		0.7 (2.0)	1.14 (3.25)	V (Ω)
			I _{OUT} =200mA, V _{IN} =5.0V		0.4 (2.0)	0.65 (3.25)	V (Ω)
			I _{OUT} =100mA, V _{IN} =5.0V		0.2 (2.0)	0.325 (3.25)	V (Ω)
Input Current (Output On)	I _{IN(ON)}	3	V _{IN} =2.5V			0.1	mA
Input Current (Output Off)	I _{IN(OFF)}	4	V _{IN} =0V, T _A =85°C			1.0	µA
Input Voltage (Output On)	V _{IN(ON)}	5	I _{OUT} =100mA, V _{OUT} =2V			2.5	V
Clamp Diode Reverse Current	I _R	6	V _R =50V, T _A =85°C			1.0	µA
Clamp Diode Forward Voltage	V _F	7	I _F =350mA			2.0	V
Turn-On Delay	t _{ON}	8	V _{OUT} =50V, R _L =125Ω, C _L =15pF		0.4		µs
Turn-Off Delay	t _{OFF}				0.8		µs

■ TEST CIRCUIT

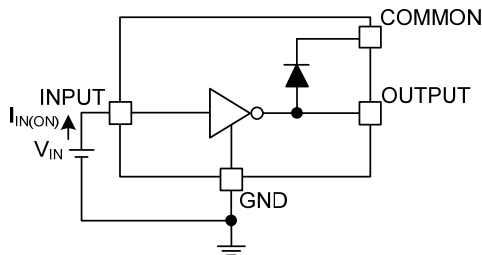
1. I_{leak}



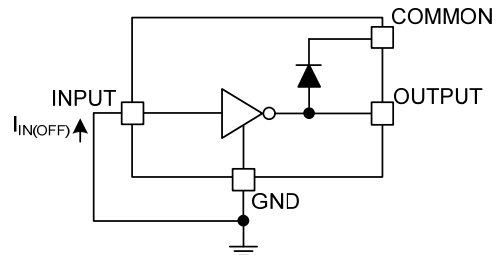
2. $V_{DS} (R_{ON})$



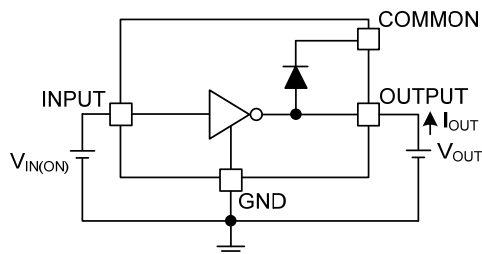
3. $I_{IN(ON)}$



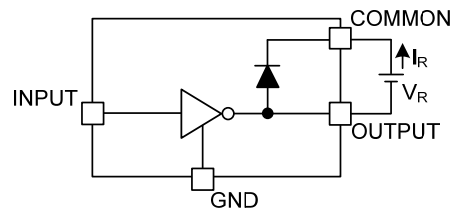
4. $I_{IN(OFF)}$



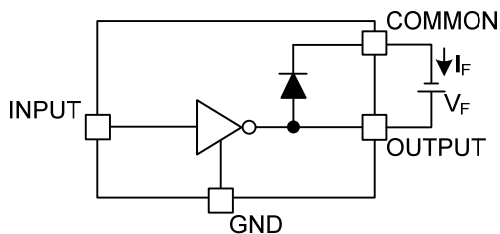
5. $V_{IN(ON)}$



6. I_R



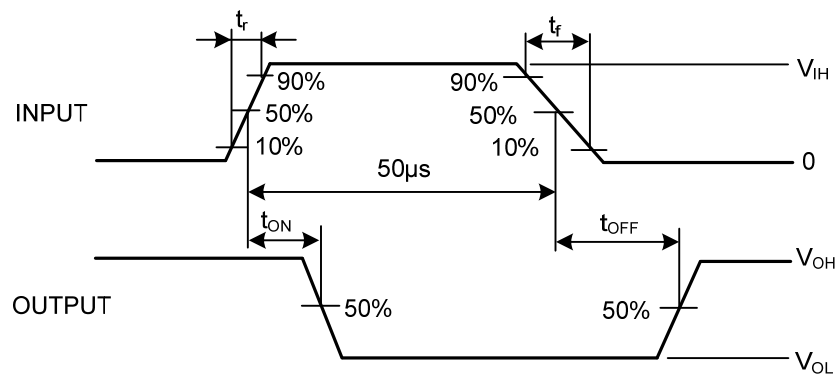
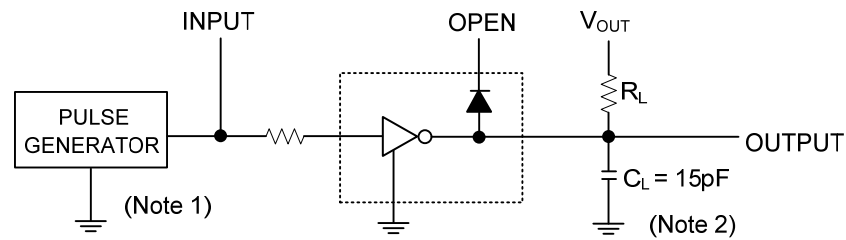
7. V_F



Test circuit may be simplified for explanatory purpose.

■ TEST CIRCUIT (Cont.)

8. t_{ON} , t_{OFF}



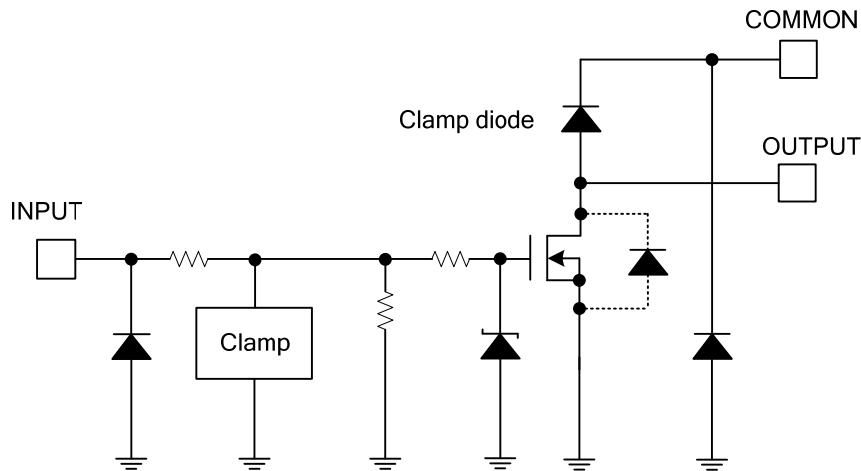
Note 1: Pulse width 50µs, Duty cycle 10%
 Output impedance 50Ω, $t_r \leq 5ns$, $t_f \leq 10ns$
 Please refer to the following table for the V_{IH} condition.

Product	V_{IH}
ULD2003	5.0V

2. C_L includes the probe and the test board capacitance.

Test circuit and timing chart may be simplified for explanatory purpose.

■ EQUIVALENT CIRCUIT (EACH DRIVER)



Equivalent circuit may be simplified for explanatory purpose.

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