

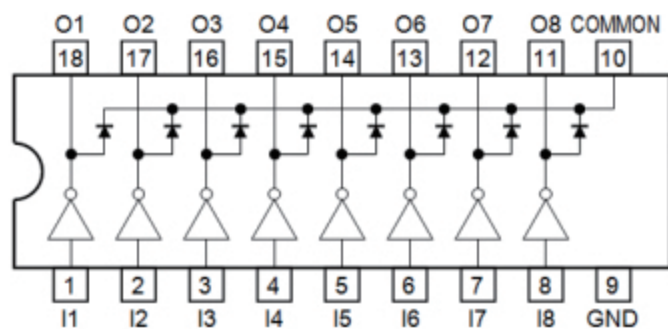
### 8channel sink type DMOS transistor array

62083/2803 series and 2084 series are DMOS transistor array with 8 circuits. It has a clamp diode for switching inductive loads built-in in each output. Please be careful about thermal conditions during use.

### Features

- 8 circuits built-in
- High voltage :  $V_{OUT} = 50\text{ V (MAX)}$
- High current :  $I_{OUT} = 500\text{ mA/ch (MAX)}$
- Input voltage(output on) : 62083/2803 series 2.5 V (MIN)  
 2084 series 7.0 V (MIN)
- Input voltage(output off) : 62083/2803 series 0.6 V (MAX)  
 2084 series 1.0 V (MAX)
- Package : PG type P-DIP18-300-2.54-001  
 FG type SOP18-P-375-1.27  
 FWG type P-SOP18-0812-1.27-001

### Pin connection (top view)



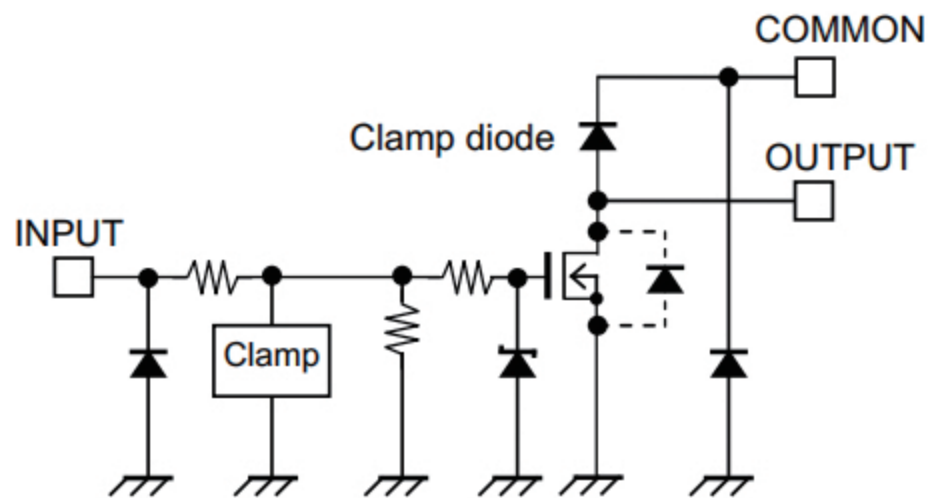
Pin connection may be simplified for explanatory purpose.

# XD2803 DIP-18 XD2804 DIP-18 XL2804 SOP18 XL62083/XL2803 SOP18

## Pin explanations

Pin No.	Pin name	Function
1	I1	Input pin
2	I2	Input pin
3	I3	Input pin
4	I4	Input pin
5	I5	Input pin
6	I6	Input pin
7	I7	Input pin
8	I8	Input pin
9	GND	GND pin
10	COMMON	Common pin
11	O8	Output pin
12	O7	Output pin
13	O6	Output pin
14	O5	Output pin
15	O4	Output pin
16	O3	Output pin
17	O2	Output pin
18	O1	Output pin

## Equivalent circuit (each driver)



Equivalent circuit may be simplified for explanatory purpose.

# XD2803 DIP-18 XD2804 DIP-18 XL2804 SOP18 XL62083/XL2803 SOP18

## Absolute Maximum Ratings (Ta = 25 °C)

Characteristics		Symbol	Rating	Unit
Output voltage		V <sub>OUT</sub>	50	V
COMMON pin voltage		V <sub>COM</sub>	-0.5 to 50	V
Output current		I <sub>OUT</sub>	500	mA/ch
Input voltage		V <sub>IN</sub>	-0.5 to 30	V
Clamp diode reverse voltage		V <sub>R</sub>	50	V
Clamp diode forward current		I <sub>F</sub>	500	mA
Power dissipation	DIP(Note1)	P <sub>D</sub>	1.47	W
	SOP(Note2)		0.96	
	SOP (Note3)		0.96	
	SOP (Note4)		1.31	
Operating temperature		T <sub>opr</sub>	-40 to 85	°C
Storage temperature		T <sub>stg</sub>	-55 to 150	°C

Note1: Device alone. When Ta exceeds 25 °C, it is necessary to do the derating with 11.8 mW/°C.

Note2: Device alone. When Ta exceeds 25 °C, it is necessary to do the derating with 7.7 mW/°C.

Note3: On PCB (Size: 50 mm × 50 mm × 1.6 mm, Cu area: 40 %, single-side glass epoxy).

When Ta exceeds 25 °C, it is necessary to do the derating with 7.7 mW/°C.

Note4: On PCB (Size: 75 mm × 114 mm × 1.6 mm, Cu area: 20 %, single-side glass epoxy).

When Ta exceeds 25 °C, it is necessary to do the derating with 10.48 mW/°C.

# XD2803 DIP-18 XD2804 DIP-18 XL2804 SOP18 XL62083/XL2803 SOP18

## Operating Ranges (Ta = -40 to 85 °C)

Characteristics		Symbol	Condition	Min	Typ.	Max	Unit	
Output voltage		V <sub>OUT</sub>	—	—	—	50	V	
COMMON pin voltage		V <sub>COM</sub>	—	0	—	50	V	
Output current	DIP (Note1)	I <sub>OUT</sub>	1 circuits ON, Ta = 25°C	0	—	400	mA/ch	
			t <sub>pw</sub> = 25 ms 8 circuits ON Ta = 85°C T <sub>j</sub> = 120°C	Duty = 10%	0	—		390
				Duty = 50%	0	—		170
			SOP (Note1)	1 circuits ON, Ta = 25°C	0	—		400
	t <sub>pw</sub> = 25 ms 8 circuits ON Ta = 85°C T <sub>j</sub> = 120°C			Duty = 10%	0	—		320
				Duty = 50%	0	—		140
	SOP (Note2)			1 circuits ON, Ta = 25°C	0	—		400
			t <sub>pw</sub> = 25 ms 8 circuits ON Ta = 85°C T <sub>j</sub> = 120°C	Duty = 10%	0	—		320
		Duty = 50%		0	—	140		
		SOP (Note3)	1 circuits ON, Ta = 25°C	0	—	400		
	t <sub>pw</sub> = 25 ms 8 circuits ON Ta = 85°C T <sub>j</sub> = 120°C		Duty = 10%	0	—	370		
			Duty = 50%	0	—	160		
Input voltage (Output on)	62083/2803 series		V <sub>IN</sub> (ON)	I <sub>OUT</sub> = 100 mA or upper, V <sub>OUT</sub> = 2 V	2.5	—	25	V
	2804 series	I <sub>OUT</sub> = 100 mA or upper, V <sub>OUT</sub> = 2 V		7.0	—	25		
Input voltage (Output off)	62083/2803 series	V <sub>IN</sub> (OFF)	I <sub>OUT</sub> = 100 μA or less, V <sub>OUT</sub> = 2 V	0	—	0.6	V	
	2804 series		I <sub>OUT</sub> = 100 μA or less, V <sub>OUT</sub> = 2 V	0	—	1.0		
Clamp diode forward current		I <sub>F</sub>	—	—	—	400	mA	



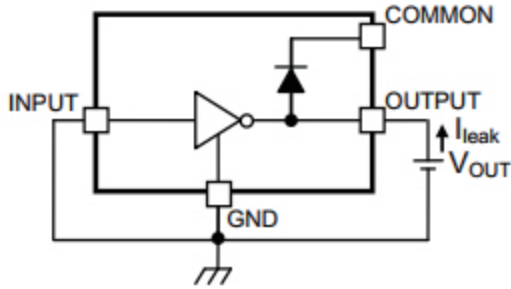
**XD2803 DIP-18 XD2804 DIP-18  
XL2804 SOP18 XL62083/XL2803 SOP18**

Characteristics	Symbol	Test Circuit	Condition	Min	Typ.	Max	Unit	
Output leakage current	$I_{leak}$	1	$V_{OUT} = 50V, T_a = 85^{\circ}C$ $V_{IN} = 0 V$	—	—	1.0	$\mu A$	
Output voltage (Output ON-resistance)	62083/2803 series	$V_{DS}$ ( $R_{ON}$ )	2	$I_{OUT} = 350 mA, V_{IN} = 5.0V$	—	0.7 (2.0)	1.14 (3.25)	V ( $\Omega$ )
				$I_{OUT} = 200 mA, V_{IN} = 5.0V$	—	0.4 (2.0)	0.65 (3.25)	
				$I_{OUT} = 100 mA, V_{IN} = 5.0V$	—	0.2 (2.0)	0.325 (3.25)	
	2804 series			$I_{OUT} = 350 mA, V_{IN} = 7.0V$	—	0.7 (2.0)	1.14 (3.25)	
				$I_{OUT} = 200 mA, V_{IN} = 7.0V$	—	0.4 (2.0)	0.65 (3.25)	
				$I_{OUT} = 100 mA, V_{IN} = 7.0V$	—	0.2 (2.0)	0.325 (3.25)	
Input current (Output on)	62083/2803 series	$I_{IN (ON)}$	3	$V_{IN} = 2.5 V$	—	—	0.1	mA
	2804 series			$V_{IN} = 7.0 V$	—	—	0.5	
Input current(Output off)	$I_{IN (OFF)}$	4	$V_{IN} = 0 V, T_a = 85^{\circ}C$	—	—	1.0	$\mu A$	
Input voltage (Output on)	62083/2803 series	$V_{IN (ON)}$	5	$I_{OUT} = 100 mA, V_{OUT} = 2 V$	—	—	2.5	V
	2804 series				—	—	7.0	
Clamp diode reverse current	$I_R$	6	$V_R = 50 V, T_a = 85^{\circ}C$	—	—	1.0	$\mu A$	
Clamp diode forward voltage	$V_F$	7	$I_F = 350 mA$	—	—	2.0	V	
Turn-on delay	$t_{ON}$	8	$V_{OUT} = 50 V$ $R_L = 125 \Omega$ $C_L = 15 pF$	—	0.4	—	$\mu s$	
Turn-off delay	$t_{OFF}$			—	0.8	—		

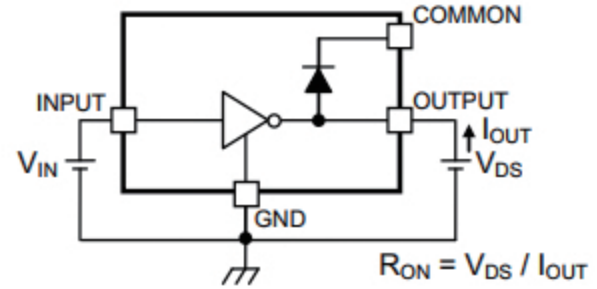
# XD2803 DIP-18 XD2804 DIP-18 XL2804 SOP18 XL62083/XL2803 SOP18

## Test circuit

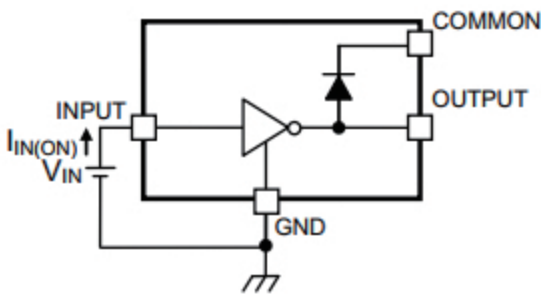
### 1. $I_{leak}$



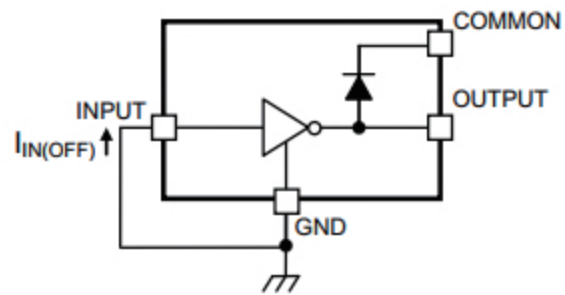
### 2. $V_{DS} (R_{ON})$



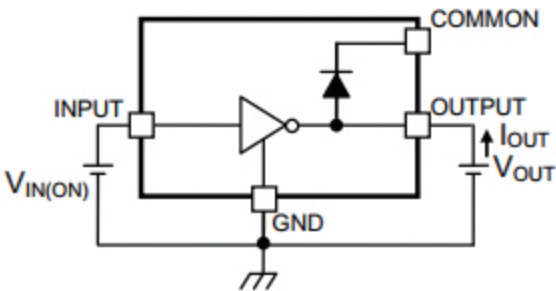
### 3. $I_{IN} (ON)$



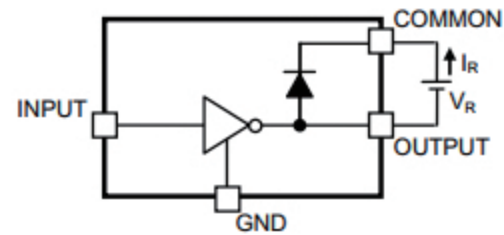
### 4. $I_{IN} (OFF)$



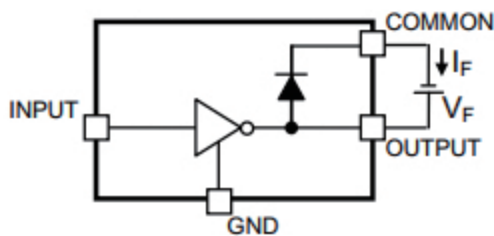
### 5. $V_{IN} (ON)$



### 6. $I_R$



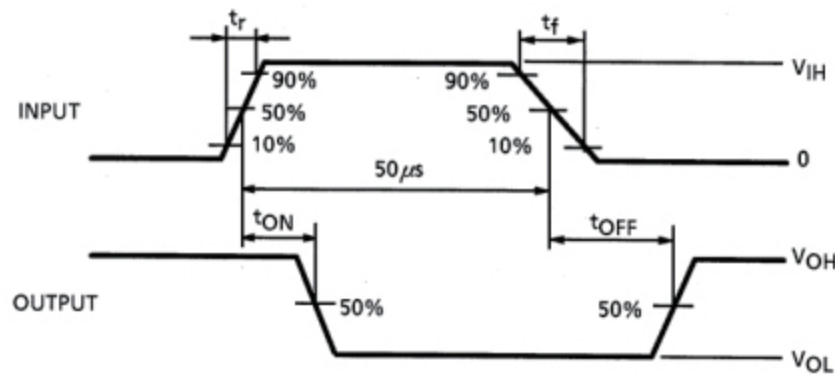
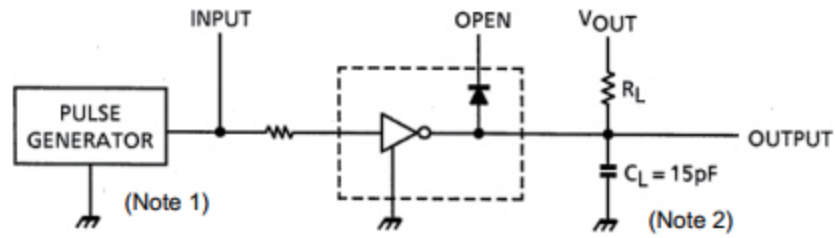
### 7. $V_F$



Test circuit may be simplified for explanatory purpose.

# XD2803 DIP-18 XD2804 DIP-18 XL2804 SOP18 XL62083/XL2803 SOP18

## 8. $t_{ON}$ , $t_{OFF}$



Note 1: Pulse width 50  $\mu$ s, Duty cycle 10%

Output impedance 50  $\Omega$ ,  $t_r \leq 5$  ns,  $t_f \leq 10$  ns  
Please refer to the following table for the  $V_{IH}$  condition.

Product	$V_{IH}$
62083/2803 series	5.0 V
2804 series	7.0 V

Note 2:  $C_L$  includes the probe and the test board capacitance.

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

### Precautions for Using

This IC does not include built-in protection circuits for excess current or overvoltage. If this IC is subjected to excess current or overvoltage, it may be destroyed. Hence, the utmost care must be taken when systems which incorporate this IC are designed. Utmost care is necessary in the design of the output line, COMMON and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.

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