

8-channel Darlington current driver

(Functional equivalent of TD62083AFN, TD62084AFN Toshiba)

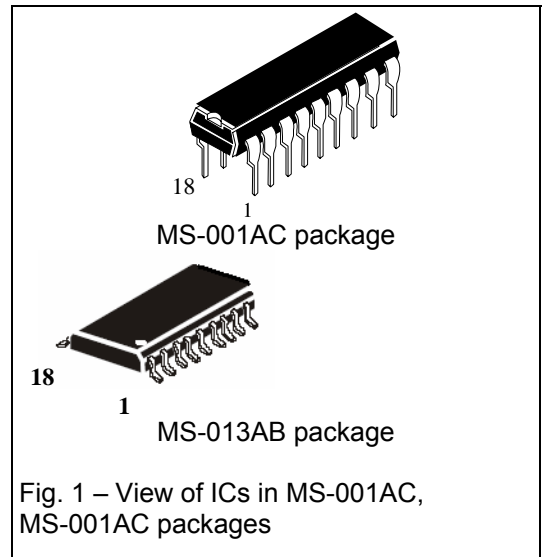
The ILN62083D, ILN62083N, ILN62084D, ILN62084N are 8- channel current driver, consisting of Darlington transistors.

Transistors, having high-voltage outputs with high-current load are coupled in common-cathode circuit for commutation of inductive load.

The ILN62083D, ILN62083N, ILN62084D, ILN62084N are purposed in different devices: relays, lamps, displays (LED & gas discharge cells), telecommunication lines and logic devices.

Main features:

- the ILN62083D, ILN62084D are realized in 18-pin SO - package MS-013AB, ILN62083N, ILN62084N – in 18-pin DIP – package MS-001AC;
- output sustaining voltage up to 50 V;
- one channel output current up to 500 mA;



Allowable value of electrostatic potential 2000 V

Table 1 – Electric circuitry difference of ICs

IC marking	Input resistor, kΩ	Applicable with ICs
ILN62083D, ILN62083N	2,7	TTL, 5 V CMOS
ILN62084D, ILN62084N	10,5	6 ÷ 15 V P-MOS, CMOS

Table 2 – Package pins

Pin number (MS-013AB, MS-001AC packages)	Symbol	Description
01	IN 1	Input
02	IN 2	Input
03	IN 3	Input
04	IN 4	Input
05	IN 5	Input
06	IN 6	Input
07	IN 7	Input
08	IN 8	Input
09	GND	Common pin (ground)
10	COM	Control pin
11	$\overline{\text{OUT 8}}$	Output
12	$\overline{\text{OUT 7}}$	Output
13	$\overline{\text{OUT 6}}$	Output
14	$\overline{\text{OUT 5}}$	Output
15	$\overline{\text{OUT 4}}$	Output
16	$\overline{\text{OUT 3}}$	Output
17	$\overline{\text{OUT 2}}$	Output
18	$\overline{\text{OUT 1}}$	Output



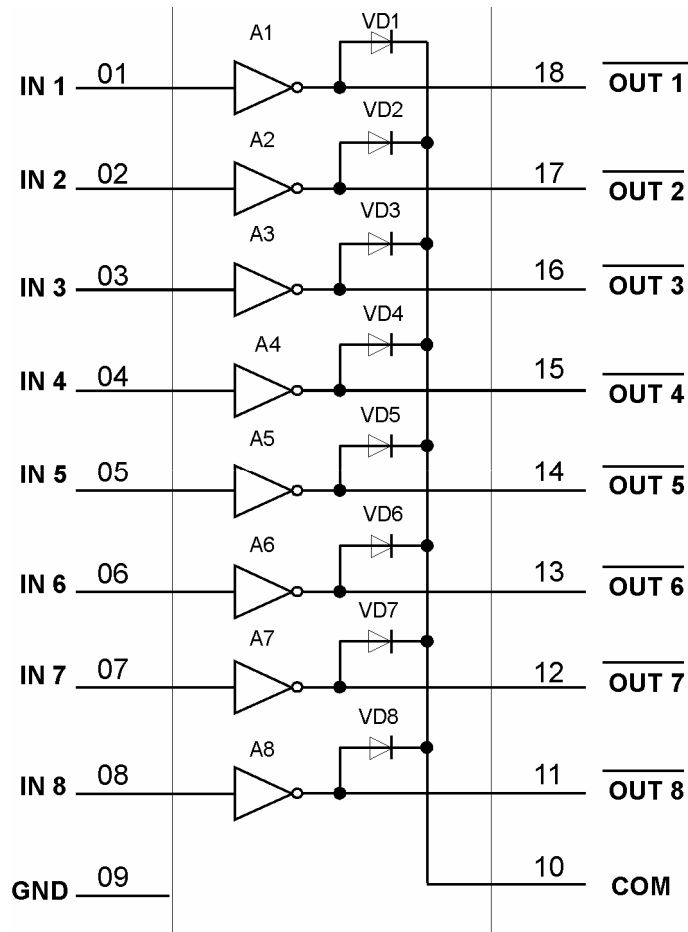
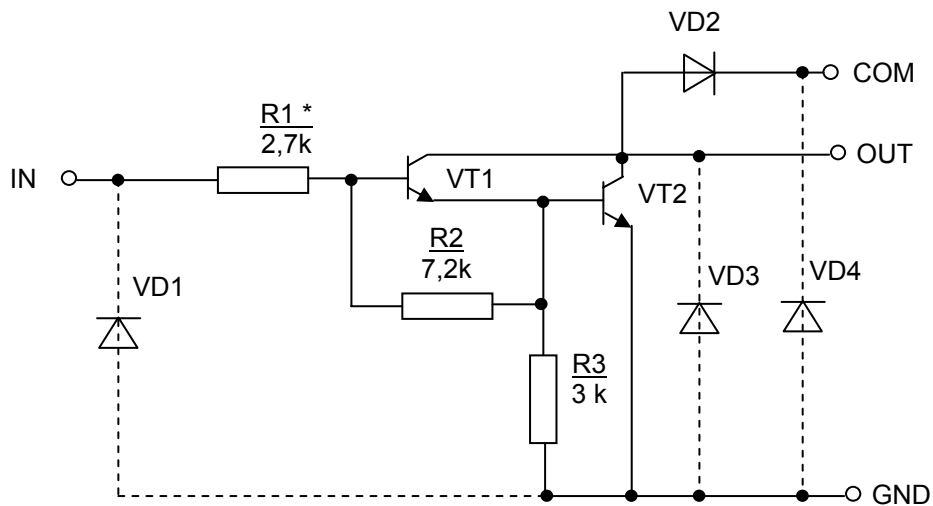


Fig 2 – Electric block diagram



* For ICs ILN62084D, ILN62084N - 10,5 kΩ.

Fig. 3 – Electrical scheme of one Darlington channel of ILN62083D, ILN62083N, ILN62084D, ILN62084N

Table 3 –Maximum ratings

Symbol	Parameter	Norm		Unit
		Min	Max	
$V_{CE(SUS)}$	Output sustaining voltage	-0,5	50	V
I_{OUT}	Output current (one channel)	-	500*	mA
V_{IN}	Input voltage	-0,5	30	V
V_R	Clamp pin diode reverse voltage	-	50	V
I_F	Clamp pin diode forward current	-	500	mA
T_{stg}	Storage temperature	-60	150	°C
P_D	Power dissipation**	-	0,96*	W

*On PCB with dimensions 50 × 50 × 1,6 mm, 40% Cu.
 ** Of ILN62083D, ILN62084D

Table 4 – Recommended operation modes

Symbol	Parameter	Norm		Unit
		Min	Max	
$V_{CE(SUS)}$	Output sustaining voltage	0	50	V
I_{OUT}	Output current (one channel)	-	350*	mA
	8 channels at $T_{pw} = 25$ ms, $T_a = 85$ °C, $T_j = 120$ °C Output pulse duration 10%	-	260*	
	Output pulse duration 50%	-	90*	
V_{IN}	Input voltage	0	30	V
V_R	Clamp diode reverse voltage	-	50	V
I_F	Clamp pin diode forward current	-	400	mA
P_D	Power dissipation**	-	0,4*	W

*On PCB with dimensions 50 × 50 × 1,6 mm, 40% Cu.
 ** Of ILN62083D, ILN62084D

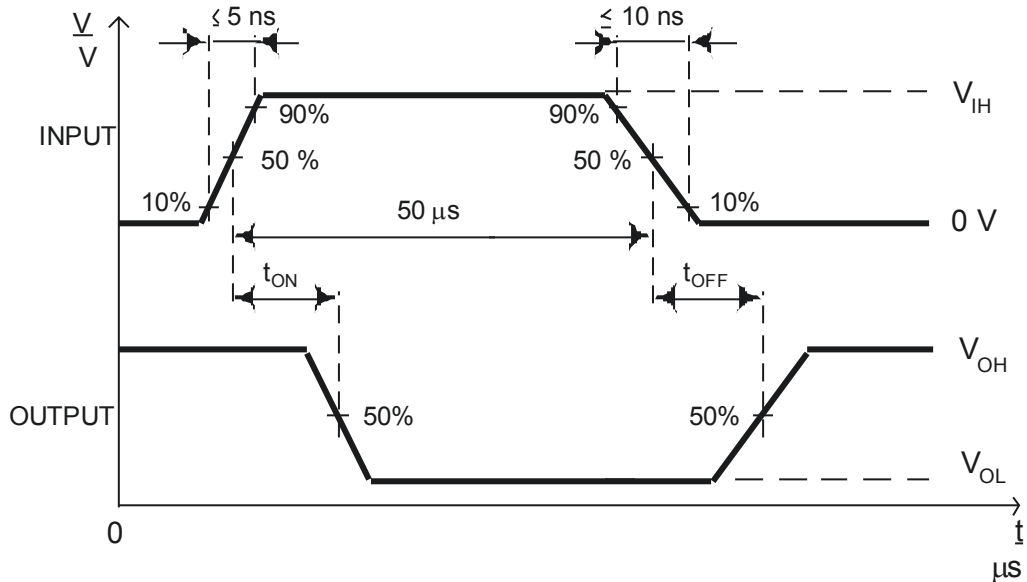


Table 5 – Electric parameters of ICs

Symbol	Parameter	Measurement mode	Norm		Ambient, temperature °C	Unit	
			Min	Max			
$V_{IN(ON)}$	Input voltage	$I_{OUT} = 200 \text{ mA}$ $V_{CE} = 2 \text{ V}$	-	<u>2,4</u> 2,9	<u>25±10</u> -40 85	V	
		ILN62083D, ILN62083N	$I_{OUT} = 250 \text{ mA}$ $V_{CE} = 2 \text{ V}$	-			<u>2,7</u> 3,24
		$I_{OUT} = 300 \text{ mA}$ $V_{CE} = 2 \text{ V}$	-	<u>3,0</u> 3,6			
	ILN62084D, ILN62084N	$I_{OUT} = 125 \text{ mA}$ $V_{CE} = 2 \text{ V}$	-	<u>5,0</u> 6,0			
		$I_{OUT} = 200 \text{ mA}$ $V_{CE} = 2 \text{ V}$	-	<u>6,0</u> 7,2			
		$I_{OUT} = 275 \text{ mA}$ $V_{CE} = 2 \text{ V}$	-	<u>7,0</u> 8,4			
		$I_{OUT} = 350 \text{ mA}$ $V_{CE} = 2 \text{ V}$	-	<u>8,0</u> 9,6			
h_{FE}	DC current transfer ratio	$I_{OUT} = 350 \text{ mA}$ $V_{GCE} = 2 \text{ V}$	1000	-	25±10 -40 85	-	
$V_{CE(sat)}$	Output saturation voltage	$I_{OUT} = 100 \text{ mA}$ $I_{IN} = 250 \text{ } \mu\text{A}$	-	<u>1,1</u> 1,32	<u>25±10</u> -40 85	V	
		$I_{OUT} = 200 \text{ mA}$ $I_{IN} = 350 \text{ mKA} \mu\text{A}$	-	<u>1,3</u> 1,56			
		$I_{OUT} = 350 \text{ mA}$ $I_{IN} = 500 \text{ } \mu\text{A}$	-	<u>1,6</u> 1,92			
I_{CEX}	Output leakage current	$V_{CE} = 50 \text{ V}$ $V_{IN} = 0 \text{ V}$	-	<u>50</u> 100		μA	
	ILN62083D, ILN62083N	$V_{CE} = 50 \text{ V}$ $V_{IN} = 1 \text{ V}$	-	<u>500</u> 600			
V_F	Clamp diode forward voltage	$I_F = 350 \text{ mA}$	-	<u>2,0</u> 2,4		V	
		$I_F = 400 \text{ mA}$		<u>3,0</u> 3,6			
$I_{IN(OFF)}$	Input current	$V_{CE} = 50 \text{ V}$ $I_{OUT} = 500 \text{ } \mu\text{A}$	50	-	85	μA	
$I_{IN(ON)}$	Input current	ILN62083D, ILN62083N	$V_{IN} = 3,85 \text{ V}$	-	<u>1,35</u> 1,62	<u>25±10</u> -40 85	mA
		ILN62084D, ILN62084N	$V_{IN} = 5 \text{ V}$	-	<u>0,5</u> 0,6		
		$V_{IN} = 12 \text{ V}$	-	<u>1,45</u> 1,74			
I_R	Clamp diode reverse current	$V_R = 50 \text{ V}$	-	<u>50</u> 100	<u>25±10</u> 85	μA	

Table 6 – Typical electric parameters at Ta = 25 °C

Symbol	Parameter	Measurement mode	Typical value	Unit
t _{ON}	Turn -ON delay	R _L = 125 Ω, V _{OUT} = 50 V	0,1	μs
t _{OFF}	Turn-OFF delay		0,2	μs



Note - $V_{IH} = 3 V$ for ILN62083D, ILN62083N and $V_{IH} = 8 V$ for ILN62084D, ILN62084N.
 Pulse width $50 \mu s$, ratio (duty cycle) $100\% \cdot t_w / T = 10\%$ (t_w – pulse width, μs ; T – period, μs)

Fig. 4 – Time diagram of ILN62083D, ILN62084D, ILN62083N, ILN62084N at measurement of signal delay at turn -ON t_{ON} and turn-OFF switching t_{OFF}

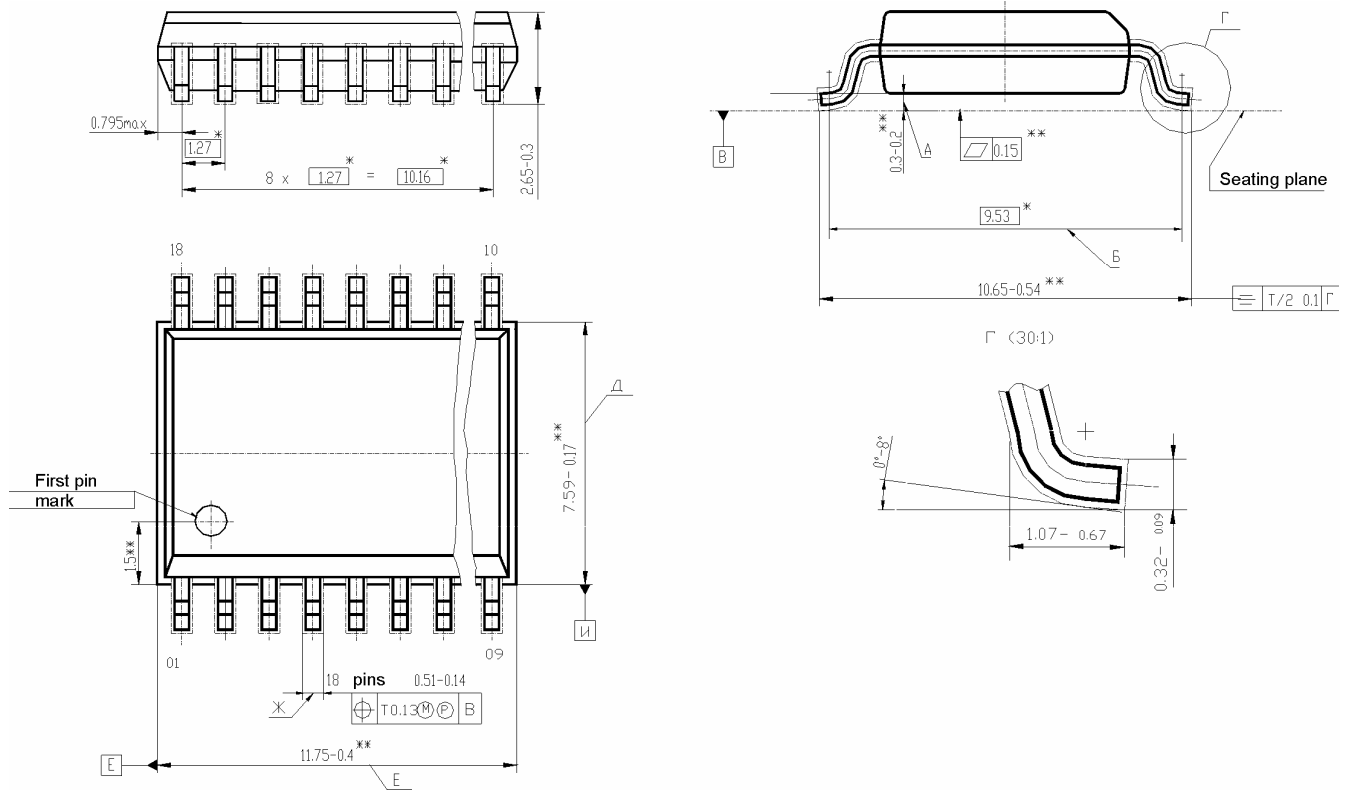


Fig. 5 - MS-013AB package outline drawing

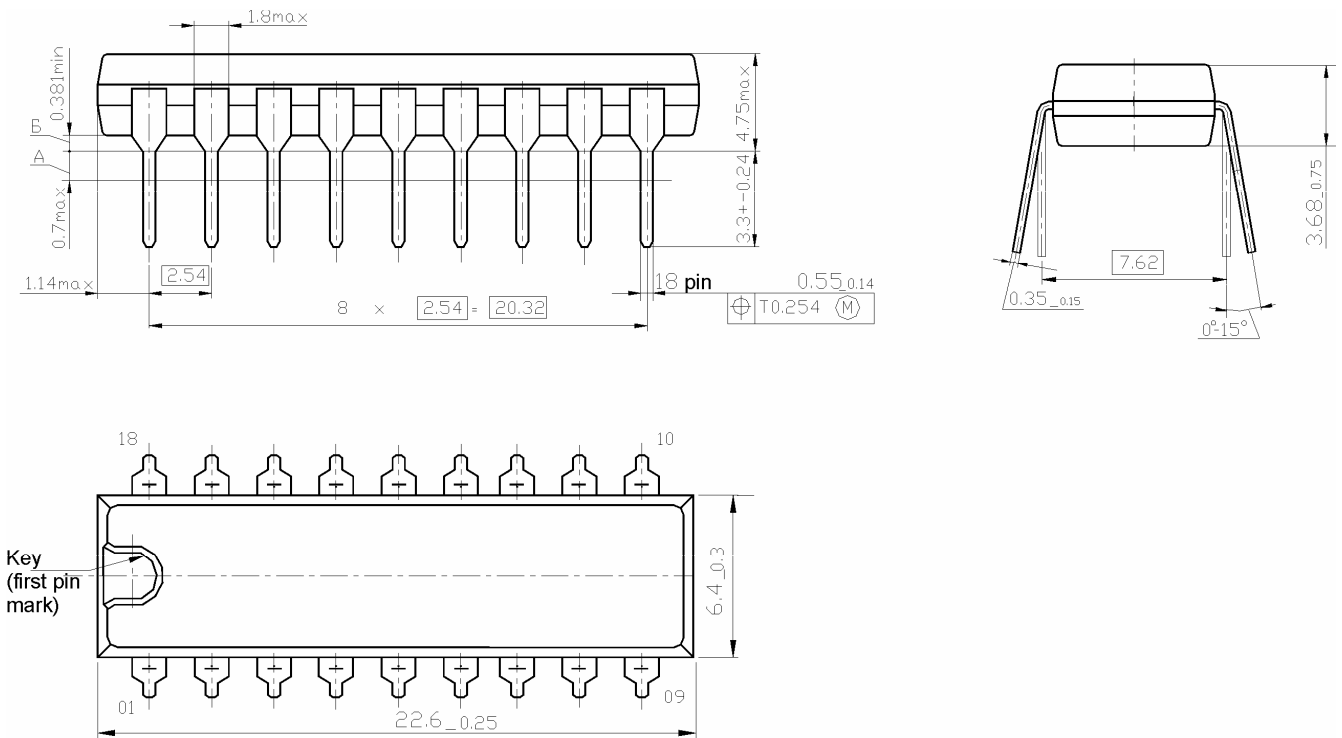
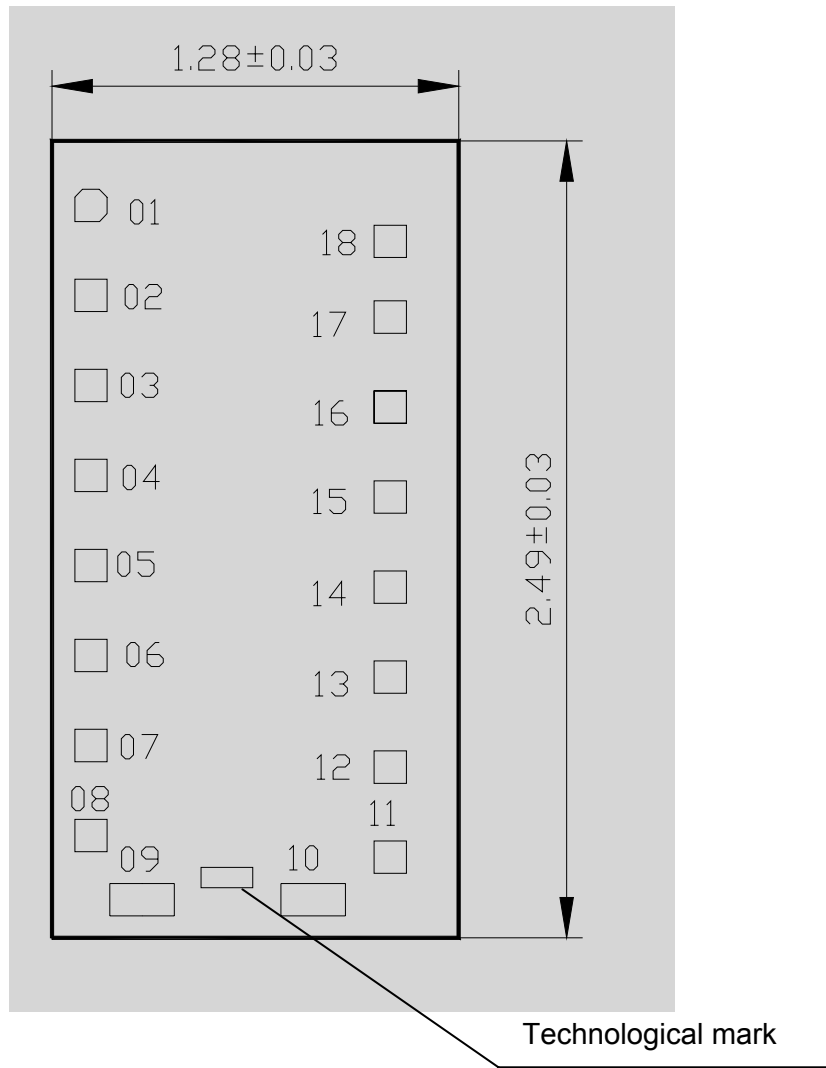


Fig 6 – MS-001AC package outline drawing



Coordinates of contact pads are indicated in table 7.

Technological mark on chip has coordinates, mm: left bottom corner $x = 0,473$, $y = 0,128$.

Chip thickness $0,35 \pm 0,02$ mm.

Fig. 7 – Contact pad layout and coordinates

Table 7 Coordinates of contact pads

Contact pad number	Coordinates(left bottom corner), mm		Contact pad size, mm
	X	Y	
01	0,081	2,230	0,10 x 0,10
02	0,081	1,951	0,10 x 0,10
03	0,081	1,672	0,10 x 0,10
04	0,081	1,393	0,10 x 0,10
05	0,081	1,114	0,10 x 0,10
06	0,081	0,835	0,10 x 0,10
07	0,081	0,556	0,10 x 0,10
08	0,081	0,277	0,10 x 0,10
09	0,189	0,078	0,10 x 0,24
10	0,719	0,078	0,10 x 0,24
11	1,008	0,210	0,10 x 0,10
12	1,008	0,489	0,10 x 0,10
13	1,008	0,768	0,10 x 0,10
14	1,008	1,047	0,10 x 0,10
15	1,008	1,326	0,10 x 0,10
16	1,008	1,605	0,10 x 0,10
17	1,008	1,884	0,10 x 0,10
18	1,008	2,163	0,10 x 0,10

Note - Contact pad dimensions and coordinates are indicated under "Passivation" layer

Table 8 Technological mark

IC marking	Technological mark
ILN62083D, ILN62083N	62083
ILN62084D, ILN62084N	62084



Table 9 – Contact pad description

Contact pad number	Symbol	Description
01	IN 1	Input
02	IN 2	Input
03	IN 3	Input
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06	IN 6	Input
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