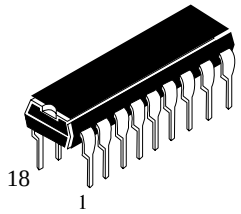
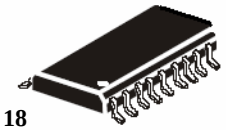
8-channel Darlington current driver

(Functional equivalent of TD62783AFN, TD67084AFN Toshiba)



MS-001AC package



MS-013AB package

Fig. 1 – View of ICs in MS-001AC, MS-001AC packages

The ILN62783D, ILN62783N, ILN62784D, ILN62784N are 8- channel current driver with common supply and ground.

The ILN62783D, ILN62783N, ILN62784D, ILN62784N are purposed in different devices: relays, lamps, displays (LED & gas discharge cells), telecommunication lines and logic devices.

Main features:

- The ILN62783D, ILN62784D are realized in 18-pin SO - package MS-013AB, ILN62783N, ILN62784N – in 18-pin DIP – package MS-001AC;
- output sustaining voltage up to 50 V;
- one channel output current up to 500 mA;
- output clamp diodes;
- single supply voltage of drivers.

Allowable value of electrostatic potential 2000V

Table 1 – Electric circuitry difference of ICs

IC marking	Number of serially connected diodes	Applicable with ICs
ILN62783D, ILN62783N	3	TTL, 5 V CMOS
ILN62784D, ILN62784N	6	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	Vcc	Supply voltage pin
10	GND	Common pin (ground)
11	OUT 8	Output
12	OUT 7	Output
13	OUT 6	Output
14	OUT 5	Output
15	OUT 4	Output
16	OUT 3	Output
17	OUT 2	Output
18	OUT 1	Output

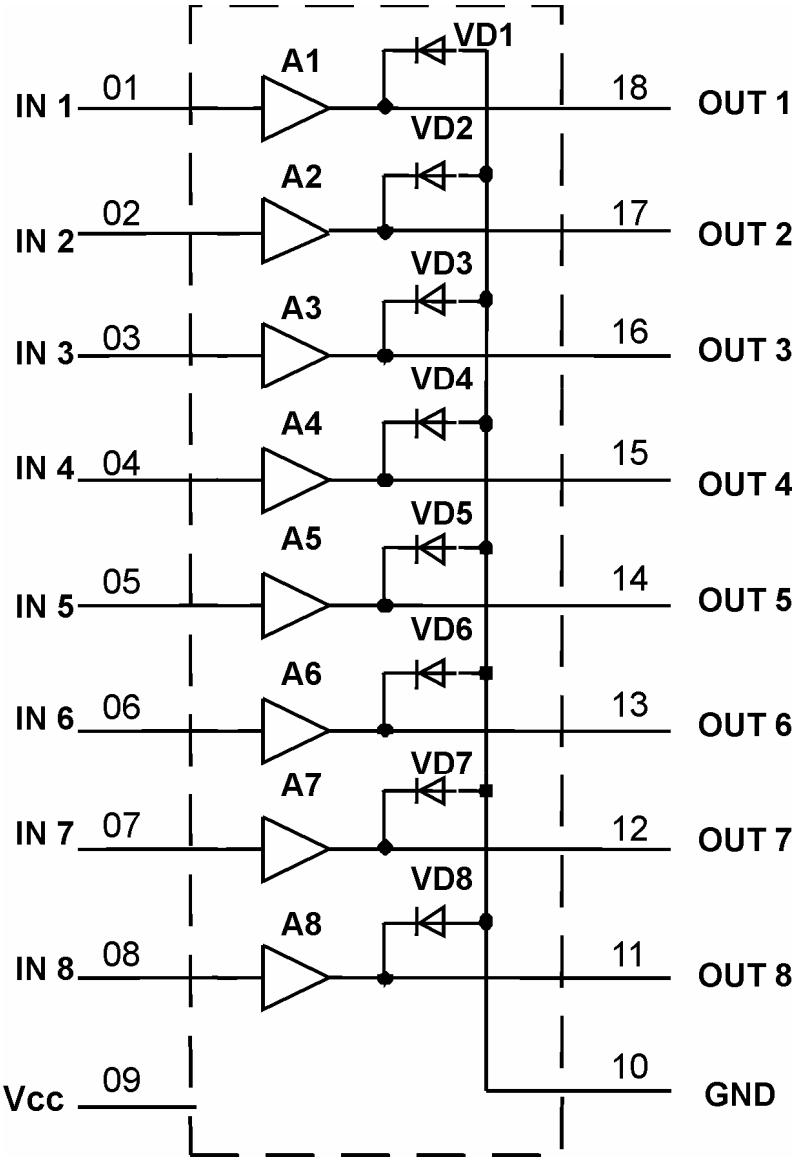


Fig 2 – Electric block diagram

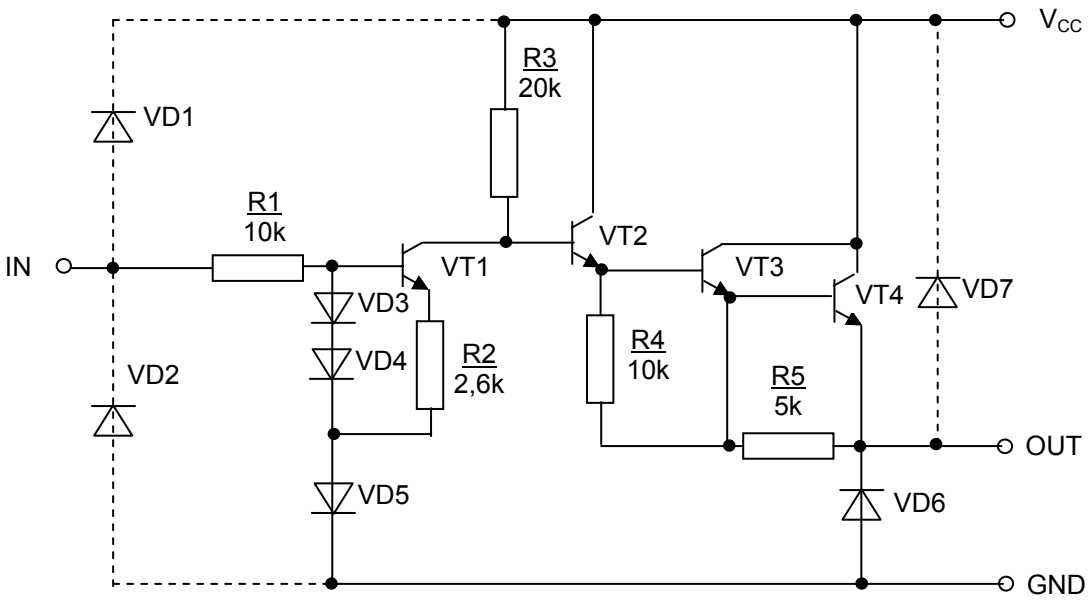


Fig. 3 – Electrical scheme of one channel of ILN62783D, ILN62783N

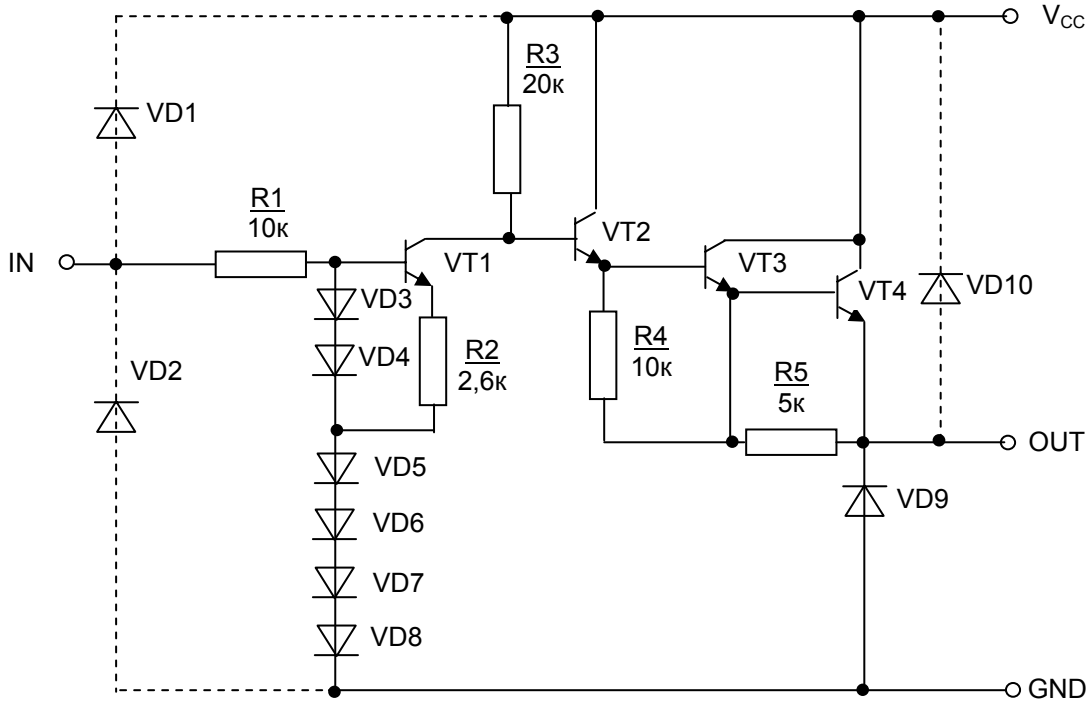


Fig. 4 – Electrical scheme of one channel of ILN62784D, ILN62784N

Table 3 –Maximum ratings

Symbol	Parameter	Norm		Unit
		Min	Max	
V_{CC}	Supply voltage	-0,5	50	V
I_{OUT}	Output current (one channel)	-	-500*	mA
V_{IN}	Input voltage ILN62783D, ILN62783N	-0,5	15	V
	ILN62784D, ILN62784N	-0,5	30	
V_R	Clamp diode reverse voltage	-	50	V
I_F	Clamp 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_{CC}	Supply 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	Duty 10%	-	-180*	
		Duty 50%	-	-38*	
V_R	Clamp diode reverse voltage		-	50	V
I_F	Clamp diode forward current		-	400	mA
P_D	Power dissipation **		-	0,4*	W

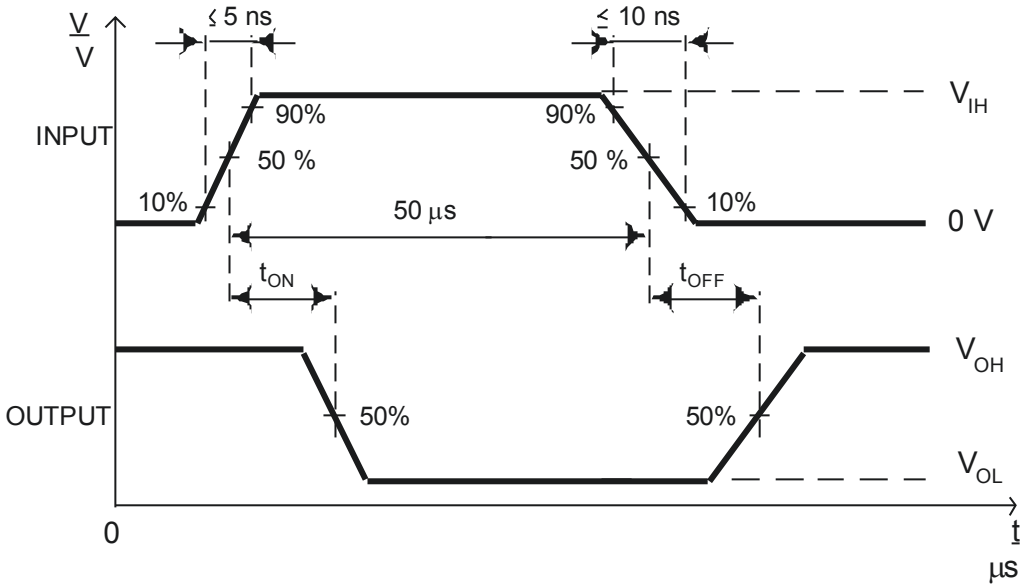
*On PCB with dimensions 50 × 50 × 1,6 mm, 40% Cu.
** Of ILN62083D, ILN62084D

Table 5 – Electric parameters of ICs

Symbol	Parameter	Measurement mode	Norm Min	Norm Max	Ambient, temperature °C	Unit
$V_{IN(ON)}$	Input voltage ILN62783D, ILN62783N	V_{CE} = 2 V V_{CE} = 2,4 V I_{OUT} = 350 mA	-	2,0 2,4	25±10 -40 85	V
	ILN62784D, ILN62784N		-	4,5 5,4		
$V_{IN(OFF)}$	Input voltage ILN62783D, ILN62783N	I_{OUT} = 500 μA	0,8 0,64	-		
	ILN62784D, ILN62784N		2,0 1,6	-		
$I_{CC(ON)}$	Supply current ILN62783D, ILN62783N	V_{IN} = 2 V V_{CC} = 50 V	-	2,5 3,0	25±10 -40 85	mA
	ILN62784D, ILN62784N	V_{IN} = 4,5 V V_{CC} = 50 V				
$V_{CE(sat)}$	Output saturation voltage ILN62783D, ILN62783N	I_{OUT} = -100 mA V_{IN} = 2 V	-	1,8 2,16		V
		I_{OUT} = -225 mA V_{IN} = 2 V	-	1,9 2,28		
		I_{OUT} = -350 mA V_{IN} = 2 V	-	2,0 2,4		
	ILN62784D, ILN62784N	I_{OUT} = -100 mA V_{IN} = 4,5 V	-	1,8 2,16		
		I_{OUT} = -225 mA V_{IN} = 4,5 V	-	1,9 2,28		
		I_{OUT} = -350 mA V_{IN} = 4,5 V	-	2,0 2,4		
I_{CEX}	Output leakage current	V_{CC} = 50 V V_{IN} = 0,4 V	-	100	25±10	μA
V_F	Clamp diode forward voltage	I_F = 350 mA	-	2,0 2,4	25±10 -40 85	V
		I_F = 400 mA	-	3,0 3,6		
$I_{IN((ON)}$	Input current ILN62783D, ILN62783N	V_{IN} = 2,4 V	-	0,052 0,062		mA
		V_{IN} = 3,85 V		0,26 0,31		
	ILN62784D, ILN62784N	V_{IN} = 5 V	-	0,13 0,156		
		V_{IN} = 12 V	-	1,13 1,356		
I_R	Clamp diode reverse current	V_R = 50 V	-	50 60		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	0,15	μs
t_{OFF}	Turn-OFF delay	C_L = 15 pF	3,0	μs



Note

Pulse width is 50 μs, ratio (duty cycle) 100% • t_W / T = 10% (t_W – pulse width, μs; T – period , μs)

Fig. 5 – Time diagram of ILN62783D, ILN62784D, ILN62783N, ILN62784N at measurement of signal delay at turn -ON t_{ON} and turn-OFF switching t_{OFF}

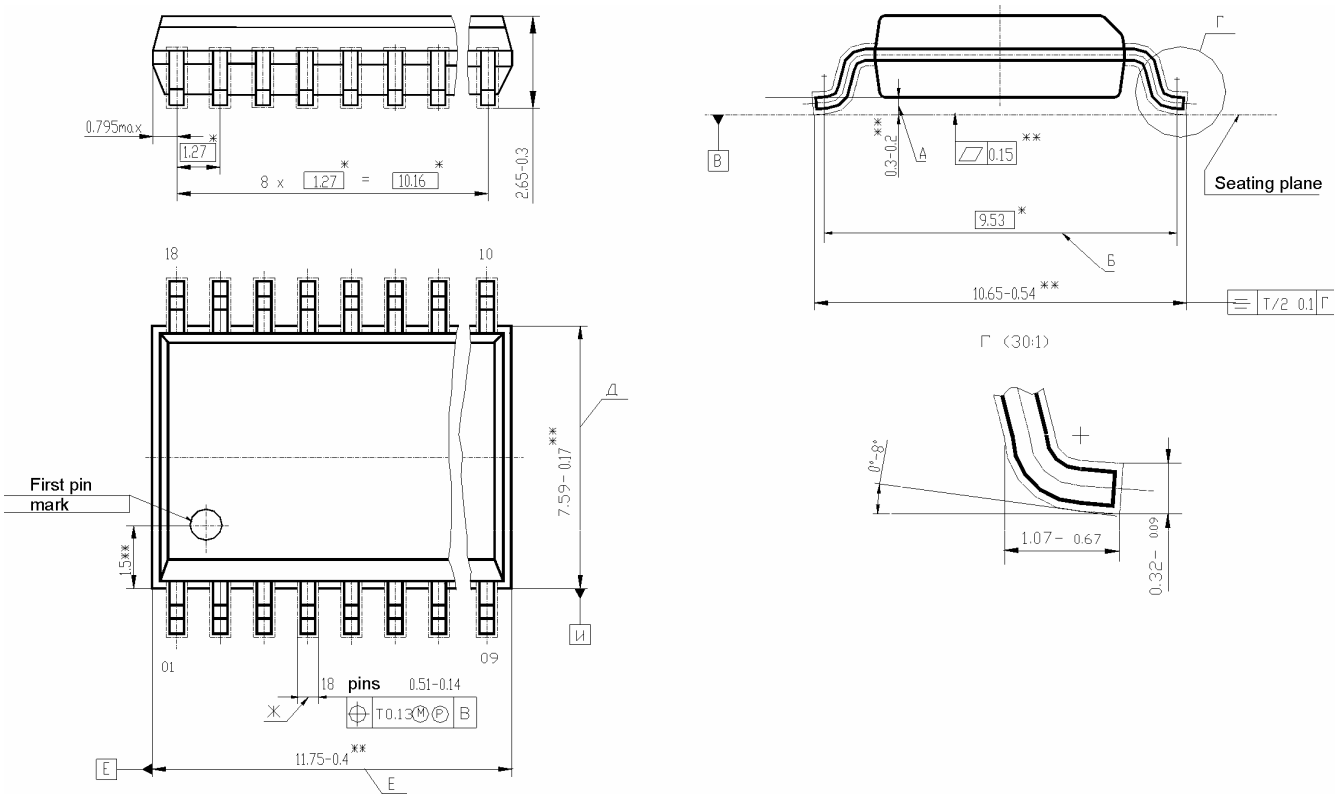


Fig. 6 - MS-013AB package outline drawing

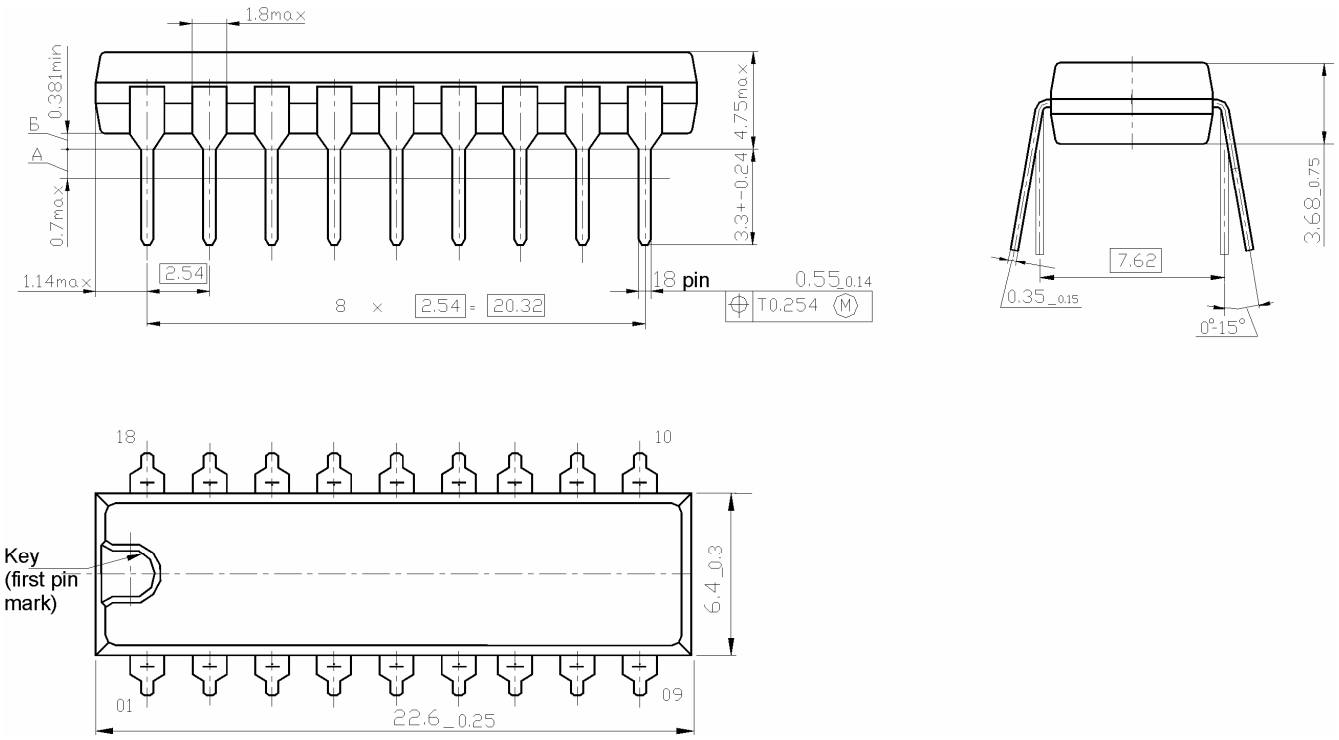
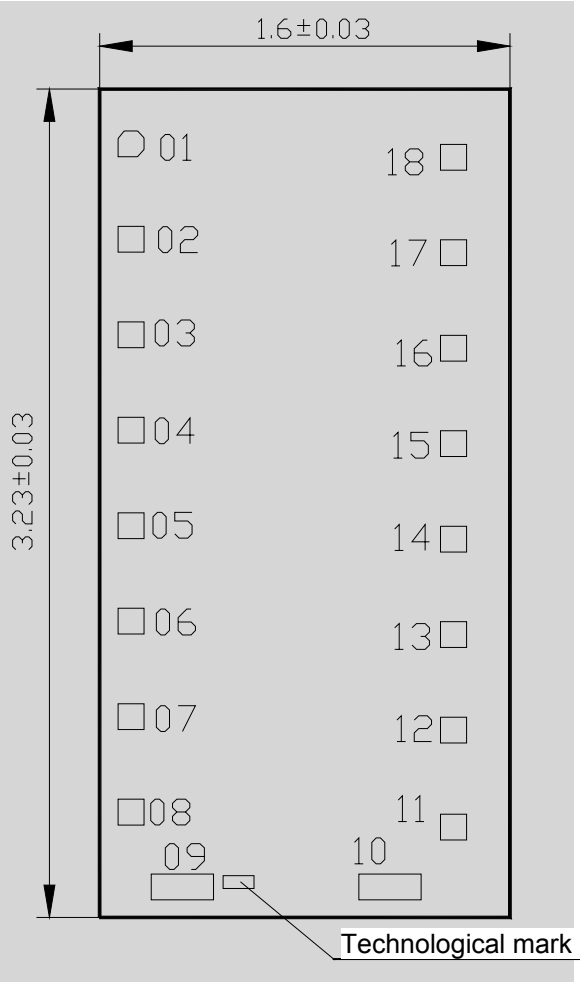


Fig 7 – MS-001AC package outline drawing



Coordinates of contact pads are indicated in table 7.

Technological mark on chip has coordinates, mm: left bottom corner x = 0,484 , y = 0,120.

Chip thickness 0,35 ± 0,02 mm.

Fig. 8 – 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	2,958	0,10 x 0,10
02	0,081	2,558	0,10 x 0,10
03	0,081	2,218	0,10 x 0,10
04	0,081	1,848	0,10 x 0,10
05	0,081	1,478	0,10 x 0,10
06	0,081	1,108	0,10 x 0,10
07	0,081	0,738	0,10 x 0,10
08	0,081	0,368	0,10 x 0,10
09	0,209	0,078	0,10 x 0,24
10	1,008	0,078	0,10 x 0,24
11	1,323	0,316	0,10 x 0,10
12	1,323	0,686	0,10 x 0,10
13	1,323	1,056	0,10 x 0,10
14	1,323	1,426	0,10 x 0,10
15	1,323	1,796	0,10 x 0,10
16	1,323	2,166	0,10 x 0,10
17	1,323	2,536	0,10 x 0,10
18	1,323	2,906	0,10 x 0,10
Note - Contact pad dimensions and coordinates are indicated under “Passivation” layer			

Table 8 - Technological mark

IC marking	Technological mark
ILN62783D, ILN62783N	62783
ILN62784D, ILN62784N	62784

Table 9 – Contact pad description

Contact pad number	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	Vcc	Supply voltage pin
10	GND	Common pin (ground)
11	OUT 8	Output
12	OUT 7	Output
13	OUT 6	Output
14	OUT 5	Output
15	OUT 4	Output
16	OUT 3	Output
17	OUT 2	Output
18	OUT 1	Output