74LVC2G34

Dual buffer gate

Rev. 11 — 7 October 2021

Product data sheet

1. General description

The 74LVC2G34 is a dual buffer. Inputs can be driven from either 3.3 V or 5 V devices. This feature allows the use of these devices as translators in mixed 3.3 V and 5 V environments.

Schmitt-trigger action at all inputs makes the circuit tolerant of slower input rise and fall times.

This device is fully specified for partial power down applications using I_{OFF} . The I_{OFF} circuitry disables the output, preventing the potentially damaging backflow current through the device when it is powered down.

2. Features and benefits

- Wide supply voltage range from 1.65 V to 5.5 V
- Overvoltage tolerant inputs to 5.5 V
- · High noise immunity
- · Complies with JEDEC standard:
 - JESD8-7 (1.65 V to 1.95 V)
 - JESD8-5 (2.3 V to 2.7 V)
 - JESD8C (2.7 V to 3.6 V)
 - JESD36 (4.5 V to 5.5 V)
- · ESD protection:
 - HBM JESD22-A114F exceeds 2 000 V
 - MM JESD22-A115-A exceeds 200 V
- \pm 24 mA output drive (V_{CC} = 3.0 V)
- CMOS low power dissipation
- I_{OFF} provides partial Power-down mode operation.
- · Latch-up performance exceeds 250 mA
- · Direct interface with TTL levels
- · Multiple package options
- Specified from -40 °C to +85 °C and -40 °C to +125 °C



Dual buffer gate

3. Ordering information

Table 1. Ordering information

Type number	Package			
	Temperature range	Name	Description	Version
74LVC2G34GW	-40 °C to +125 °C	SC-88	plastic surface-mounted package; 6 leads	SOT363
74LVC2G34GV	-40 °C to +125 °C	SC-74; TSOP6	plastic surface-mounted package; 6 leads	SOT457
74LVC2G34GM	-40 °C to +125 °C	XSON6	plastic extremely thin small outline package; no leads; 6 terminals; body 1 × 1.45 × 0.5 mm	SOT886
74LVC2G34GN	-40 °C to +125 °C	XSON6	extremely thin small outline package; no leads; 6 terminals; body 0.9 × 1.0 × 0.35 mm	SOT1115
74LVC2G34GS	-40 °C to +125 °C	XSON6	extremely thin small outline package; no leads; 6 terminals; body 1.0 × 1.0 × 0.35 mm	SOT1202
74LVC2G34GX	-40 °C to +125 °C	X2SON6	plastic thermal enhanced extremely thin small outline package; no leads; 6 terminals; body 1.0 × 0.8 × 0.32 mm	SOT1255-2

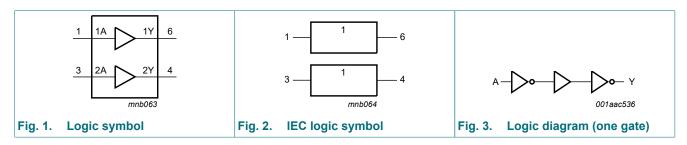
4. Marking

Table 2. Marking

Type number	Marking code[1]
74LVC2G34GW	YA
74LVC2G34GV	Y34
74LVC2G34GM	YA
74LVC2G34GN	YA
74LVC2G34GS	YA
74LVC2G34GX	YA

^[1] The pin 1 indicator is located on the lower left corner of the device, below the marking code.

5. Functional diagram



Dual buffer gate

6. Pinning information

6.1. Pinning





6.2. Pin description

Table 3. Pin description

Description
data input
ground (0 V)
data input
data output
supply voltage
data output

7. Functional description

Table 4. Function table

 $H = HIGH \ voltage \ level; \ L = LOW \ voltage \ level.$

Input	Output
nA	nY
L	L
Н	Н

Dual buffer gate

8. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134). Voltages are referenced to GND (ground = 0 V).

Symbol	Parameter	Conditions		Min	Max	Unit
V _{CC}	supply voltage			-0.5	+6.5	V
I _{IK}	input clamping current	V _I < 0 V		-50	-	mA
VI	input voltage		[1]	-0.5	+6.5	V
I _{OK}	output clamping current	$V_O > V_{CC}$ or $V_O < 0$ V		-	±50	mA
Vo	output voltage	Active mode	[1]	-0.5	V _{CC} + 0.5	V
		Power-down mode; V _{CC} = 0 V	[1]	-0.5	+6.5	V
Io	output current	$V_O = 0 \text{ V to } V_{CC}$		-	±50	mA
I _{CC}	supply current			-	100	mA
I _{GND}	ground current			-100	-	mA
P _{tot}	total power dissipation	T _{amb} = -40 °C to +125 °C	[2]	-	250	mW
T _{stg}	storage temperature			-65	+150	°C

^[1] The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

For SOT457 (SC-74; TSOP6) package: Ptot derates linearly with 4.1 mW/K above 89 °C.

For SOT886 (XSON6) package: P_{tot} derates linearly with 3.3 mW/K above 74 °C.

For SOT1115 (XSON6) package: P_{tot} derates linearly with 3.2 mW/K above 71 °C.

For SOT1202 (XSON6) package: Ptot derates linearly with 3.3 mW/K above 74 °C.

For SOT1255-2 (X2SON6) package: Ptot derates linearly with 3.3 mW/K above 75 °C.

9. Recommended operating conditions

Table 6. Recommended operating conditions

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
V _{CC}	supply voltage		1.65	-	5.5	V
VI	input voltage		0	-	5.5	V
Vo	output voltage	Active mode	0	-	V _{CC}	V
		Power-down mode; V _{CC} = 0 V	0	-	5.5	V
T _{amb}	ambient temperature		-40	-	+125	°C
Δt/ΔV	input transition rise and fall rate	V _{CC} = 1.65 V to 2.7 V	-	-	20	ns/V
		V _{CC} = 2.7 V to 5.5 V	-	-	10	ns/V

^[2] For SOT363 (SC-88) package: Ptot derates linearly with 3.7 mW/K above 83 °C.

Dual buffer gate

10. Static characteristics

Table 7. Static characteristics

At recommended operating conditions. Voltages are referenced to GND (ground = 0 V).

Symbol	Parameter	Conditions	-40	°C to +8	5 °C	-40 °C to +125 °C		Unit
			Min	Typ [1]	Max	Min	Max	
V _{IH}	HIGH-level input	V _{CC} = 1.65 V to 1.95 V	0.65V _{CC}	-	-	0.65V _{CC}	-	V
	voltage	V _{CC} = 2.3 V to 2.7 V	1.7	-	-	1.7	-	V
		V _{CC} = 2.7 V to 3.6 V	2.0	-	-	2.0	-	V
		V _{CC} = 4.5 V to 5.5 V	0.7V _{CC}	-	-	0.7V _{CC}	-	V
V _{IL}	LOW-level input	V _{CC} = 1.65 V to 1.95 V	-	-	0.35V _{CC}	-	0.35V _{CC}	V
	voltage	V _{CC} = 2.3 V to 2.7 V	-	-	0.7	-	0.7	V
		V _{CC} = 2.7 V to 3.6 V	-	-	0.8	-	0.8	V
		V _{CC} = 4.5 V to 5.5 V	-	-	0.3V _{CC}	-	0.3V _{CC}	V
V _{OH}	HIGH-level	V _I = V _{IH} or V _{IL}						
	output voltage	I _O = -100 μA; V _{CC} = 1.65 V to 5.5 V	V _{CC} - 0.1	-	-	V _{CC} - 0.1	-	V
		I _O = -4 mA; V _{CC} = 1.65 V	1.2	-	-	0.95	-	V
		I _O = -8 mA; V _{CC} = 2.3 V	1.9	-	-	1.7	-	V
		I _O = -12 mA; V _{CC} = 2.7 V	2.2	-	-	1.9	-	V
		I _O = -24 mA; V _{CC} = 3.0 V	2.3	-	-	2.0	-	V
		I _O = -32 mA; V _{CC} = 4.5 V	3.8	-	-	3.4	-	V
V _{OL}	LOW-level output	V _I = V _{IH} or V _{IL}						
	voltage	I _O = 100 μA; V _{CC} = 1.65 V to 5.5 V	-	-	0.10	-	0.10	V
		I _O = 4 mA; V _{CC} = 1.65 V	-	-	0.45	-	0.70	V
		I _O = 8 mA; V _{CC} = 2.3 V	-	-	0.30	-	0.45	V
		I _O = 12 mA; V _{CC} = 2.7 V	-	-	0.40	-	0.60	V
		I _O = 24 mA; V _{CC} = 3.0 V	-	-	0.55	-	0.80	V
		I _O = 32 mA; V _{CC} = 4.5 V	-	-	0.55	-	0.80	V
I _I	input leakage current	V _I = 5.5 V or GND; V _{CC} = 0 V to 5.5 V	-	±0.1	±1	-	±1	μA
l _{OFF}	power-off leakage current	$V_{CC} = 0 \text{ V}; V_{I} \text{ or } V_{O} = 5.5 \text{ V}$	-	±0.1	±2	-	±2	μΑ
I _{CC}	supply current	V _I = 5.5 V or GND; I _O = 0 A; V _{CC} = 1.65 V to 5.5 V	-	0.1	4	-	4	μΑ
ΔI _{CC}	additional supply current	per pin; V _{CC} = 2.3 V to 5.5 V; V _I = V _{CC} - 0.6 V; I _O = 0 A	-	5	500	-	500	μA
Cı	input capacitance	V_{CC} = 3.3 V; V_I = GND to V_{CC}	-	2.5	-	-	-	pF

^[1] All typical values are measured at V $_{CC}$ = 3.3 V and T_{amb} = 25 $^{\circ}C.$

5/16

Dual buffer gate

11. Dynamic characteristics

Table 8. Dynamic characteristics

Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 9.

Symbol	Parameter	Conditions		°C to +85	5 °C	-40 °C to	Unit	
			Min	Typ[1]	Max	Min	Max	
t _{pd}	propagation delay	nA to nY; see Fig. 8 [2]						
		V _{CC} = 1.65 V to 1.95 V	1.0	3.8	8.6	1.0	10.8	ns
		V _{CC} = 2.3 V to 2.7 V	0.5	2.4	4.4	0.5	5.5	ns
		V _{CC} = 2.7 V	0.5	2.5	5.0	0.5	6.3	ns
		V _{CC} = 3.0 V to 3.6 V	0.5	2.2	4.1	0.5	5.1	ns
		V _{CC} = 4.5 V to 5.5 V	0.5	1.9	3.2	0.5	4.0	ns
C _{PD}	power dissipation capacitance	$V_{I} = GND \text{ to } V_{CC}; V_{CC} = 3.3 \text{ V} [3]$	-	20	-	-	-	pF

- Typical values are measured at T_{amb} = 25 °C and V_{CC} = 1.8 V, 2.5 V, 2.7 V, 3.3 V and 5.0 V respectively.
- t_{pd} is the same as t_{PLH} and t_{PHL} . C_{PD} is used to determine the dynamic power dissipation (P_D in μW).

 $P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \sum (C_L \times V_{CC}^2 \times f_o)$ where:

f_i = input frequency in MHz;

 f_o = output frequency in MHz;

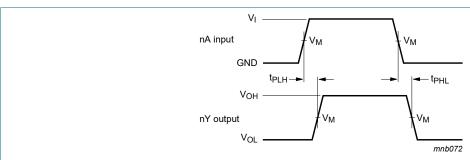
C_L = output load capacitance in pF;

V_{CC} = supply voltage in V;

N = number of inputs switching;

 $\sum (C_L \times V_{CC})^2 \times f_0 = \text{sum of outputs}.$

11.1. Waveform and test circuit



Measurement points are given in Table 9.

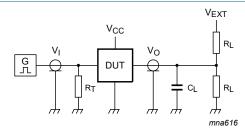
Logic levels: V_{OL} and V_{OH} are typical output voltage levels that occur with the output load.

The data input (nA) to output (nY) propagation delays

Dual buffer gate

Table 9. Measurement points

Supply voltage	Input	Output	
V _{CC}	V _M	V _M	
1.65 V to 1.95 V	0.5V _{CC}	0.5V _{CC}	
2.3 V to 2.7 V	0.5V _{CC}	0.5V _{CC}	
2.7 V	1.5 V	1.5 V	
3.0 V to 3.6 V	1.5 V	1.5 V	
4.5 V to 5.5 V	0.5V _{CC}	0.5V _{CC}	



Test data is given in Table 10.

Definitions for test circuit:

R_L = Load resistance.

C_L = Load capacitance including jig and probe capacitance.

 R_T = Termination resistance should be equal to the output impedance Z_o of the pulse generator.

 V_{EXT} = External voltage for measuring switching times.

Fig. 9. Test circuit for measuring switching times

Table 10. Test data

Supply voltage	Input		Load	V _{EXT}	
V _{CC}	V _I	$t_r = t_f$	CL	R_L	t _{PLH} , t _{PHL}
1.65 V to 1.95 V	V _{CC}	≤ 2.0 ns	30 pF	1 kΩ	open
2.3 V to 2.7 V	V _{CC}	≤ 2.0 ns	30 pF	500 Ω	open
2.7 V	2.7 V	≤ 2.5 ns	50 pF	500 Ω	open
3.0 V to 3.6 V	2.7 V	≤ 2.5 ns	50 pF	500 Ω	open
4.5 V to 5.5 V	V _{CC}	≤ 2.5 ns	50 pF	500 Ω	open

Dual buffer gate

12. Package outline

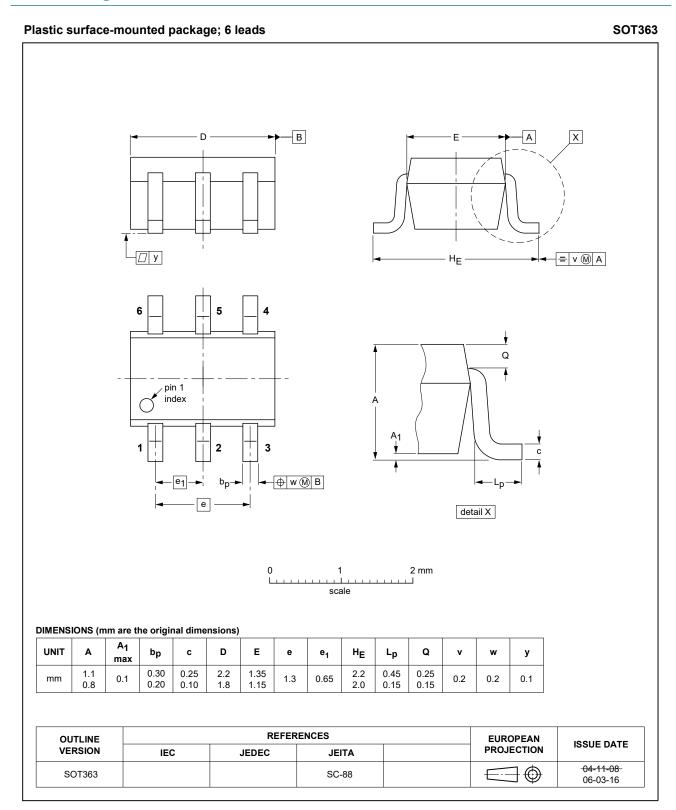


Fig. 10. Package outline SOT363 (SC-88)

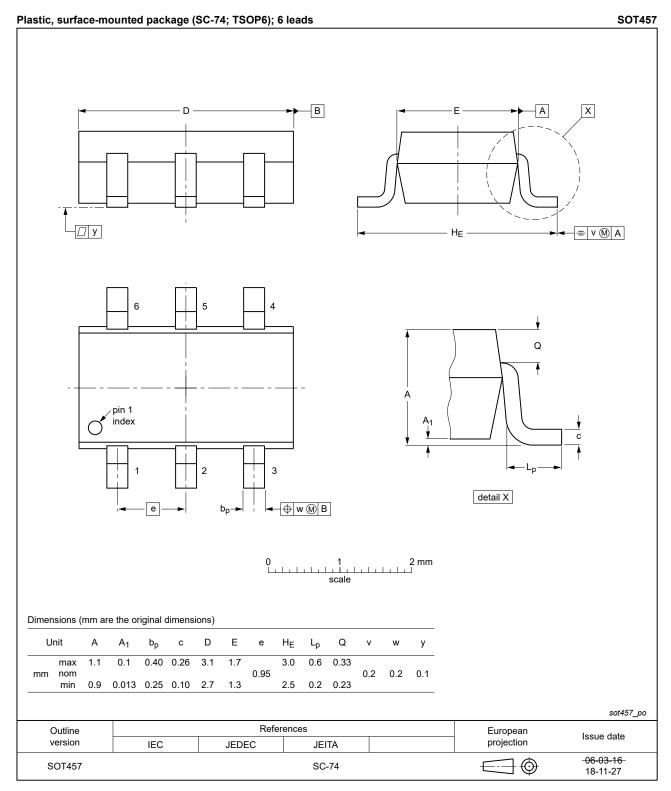


Fig. 11. Package outline SOT457 (SC-74; TSOP6)

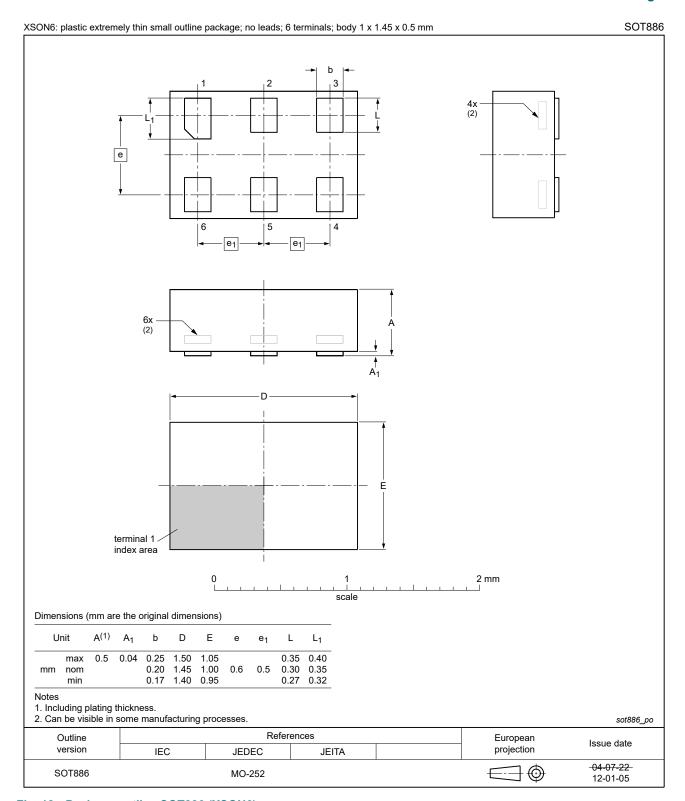


Fig. 12. Package outline SOT886 (XSON6)

Dual buffer gate

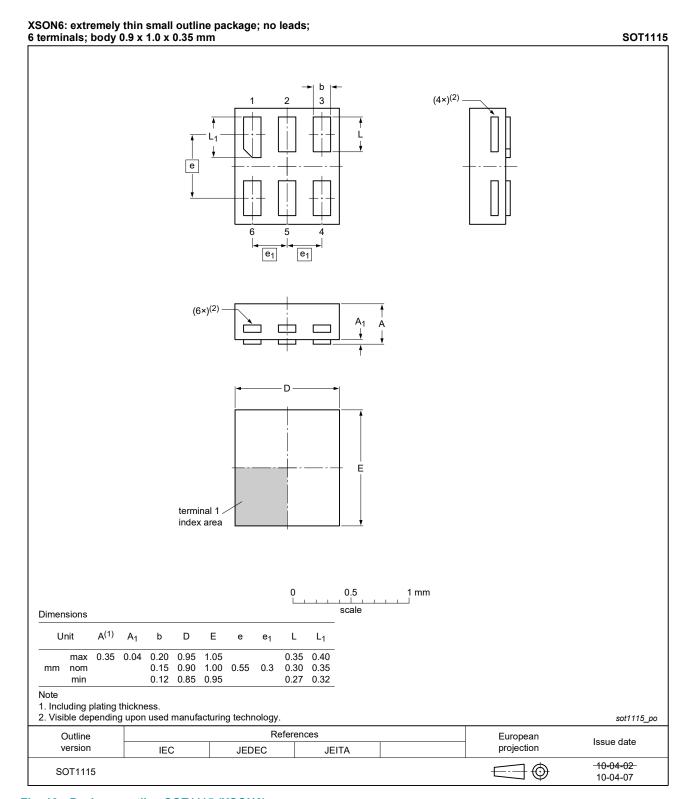


Fig. 13. Package outline SOT1115 (XSON6)

11 / 16

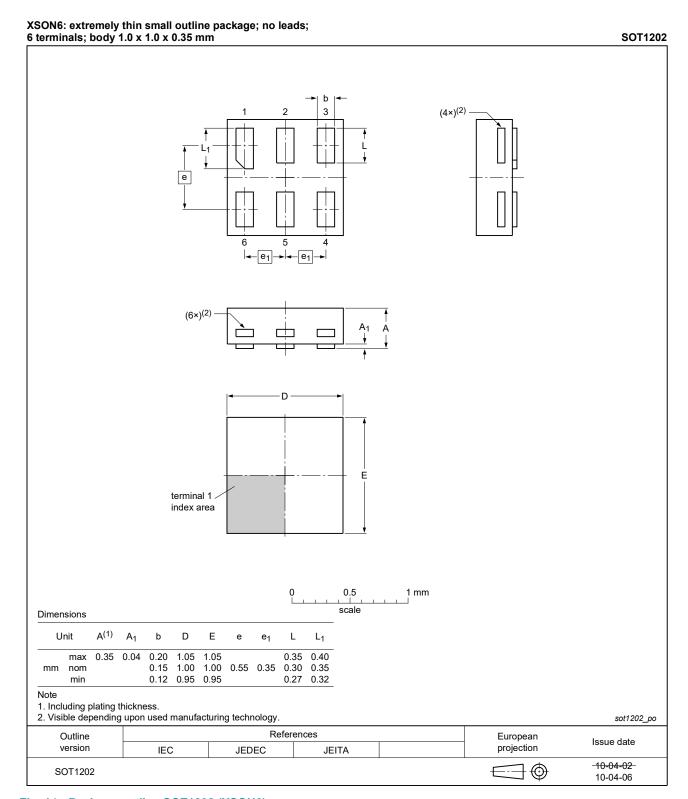


Fig. 14. Package outline SOT1202 (XSON6)

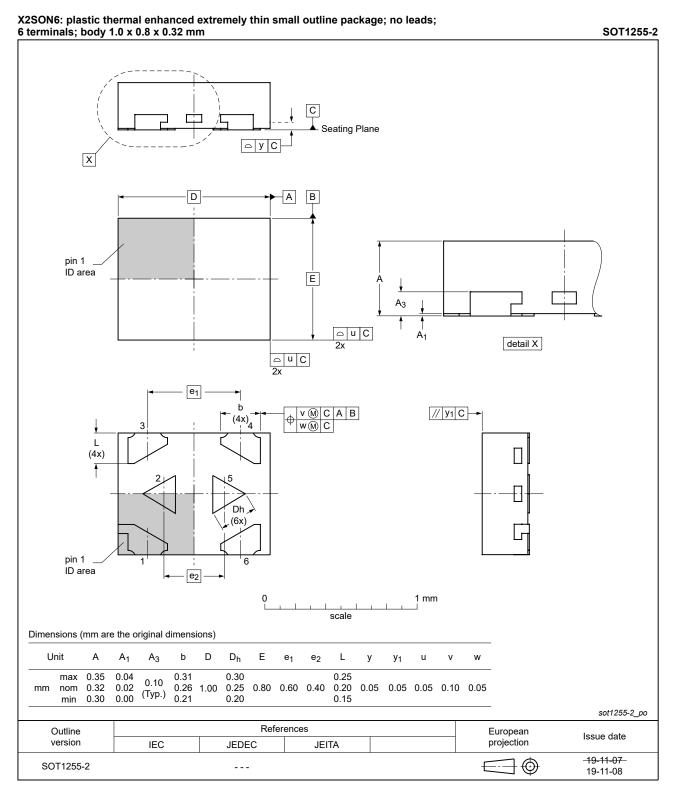


Fig. 15. Package outline SOT1255-2 (X2SON6)

Dual buffer gate

13. Abbreviations

Table 11. Abbreviations

Acronym	Description			
CMOS	Complementary Metal Oxide Semiconductor			
DUT	ice Under Test			
ESD	ElectroStatic Discharge			
HBM	Human Body Model			
MM	Machine Model			
TTL	Transistor-Transistor Logic			

14. Revision history

Table 12. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes			
74LVC2G34 v.11	20211007	Product data sheet	-	74LVC2G34 v.10			
Modifications:	SOT1255 (X<u>Table 5</u>: Der	nd Section 2 updated. (2SON6) package changed ating values for P _{tot} total part or 74LVC2G34GF (SOT891	ower dissipation up	odated.			
74LVC2G34 v.10	20180223	Product data sheet	-	74LVC2G34 v.9			
Modifications:	of Nexperia.	 The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia. Legal texts have been adapted to the new company name where appropriate. 					
74LVC2G34 v.9	20161215	Product data sheet	-	74LVC2G34 v.8			
Modifications:	• <u>Table 7</u> : The	maximum limits for leakaç	ge current and sup	ply current have changed.			
74LVC2G34 v.8	20160210	Product data sheet	-	74LVC2G34 v.7			
Modifications:	Added type	number 74LVC2G34GX (S	OT1255/X2SON6)).			
74LVC2G34 v.7	20120704	Product data sheet	-	74LVC2G34 v.6			
Modifications:	Package out	tline drawing of SOT886 (F	ig. 12) modified.				
74LVC2G34 v.6	20111129	Product data sheet	-	74LVC2G34 v.5			
Modifications:	 Legal pages 	updated.					
74LVC2G34 v.5	20100902	Product data sheet	-	74LVC2G34 v.4			
74LVC2G34 v.4	20070720	Product data sheet	-	74LVC2G34 v.3			
74LVC2G34 v.3	20070321	Product data sheet	-	74LVC2G34 v.2			
74LVC2G34 v.2	20040910	Product specification	-	74LVC2G34 v.1			
74LVC2G34 v.1	20030725	Product specification	-	-			

14 / 16

Dual buffer gate

15. Legal information

Data sheet status

Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
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Dual buffer gate

Contents

1.	General description	1
2.	Features and benefits	1
3.	Ordering information	2
4.	Marking	2
5.	Functional diagram	2
6.	Pinning information	3
6.1	. Pinning	3
6.2	Pin description	3
7.	Functional description	3
8.	Limiting values	4
9.	Recommended operating conditions	4
10.	Static characteristics	5
11.	Dynamic characteristics	6
11.	Waveform and test circuit	6
12.	Package outline	8
13.	Abbreviations	14
14.	Revision history	14
15.	Legal information	15

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