74LVC2G34

Dual buffer gate Rev. 7 — 4 July 2012

Product data sheet

1. **General description**

The 74LVC2G34 provides two buffers.

Inputs can be driven from either 3.3 V or 5 V devices. These features allow the use of these devices in a mixed 3.3 V and 5 V environment.

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

Features and benefits 2.

- Wide supply voltage range from 1.65 V to 5.5 V
- 5 V tolerant inputs for interfacing with 5 V logic
- 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)
 - ◆ JESD8B/JESD36 (2.7 V to 3.6 V)
- ESD protection:
 - ◆ HBM JESD22-A114F exceeds 2000 V
 - ♦ MM JESD22-A115-A exceeds 200 V
- \pm 24 mA output drive (V_{CC} = 3.0 V)
- CMOS low power consumption
- 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.



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	TSOP6	plastic surface-mounted package (TSOP6); 6 leads	SOT457				
74LVC2G34GM	–40 °C to +125 °C	XSON6	plastic extremely thin small outline package; no leads; 6 terminals; body 1 \times 1.45 \times 0.5 mm	SOT886				
74LVC2G34GF	–40 °C to +125 °C	XSON6	plastic extremely thin small outline package; no leads; 6 terminals; body 1 \times 1 \times 0.5 mm	SOT891				
74LVC2G34GN	–40 °C to +125 °C	XSON6	extremely thin small outline package; no leads; 6 terminals; body $0.9 \times 1.0 \times 0.35$ mm	SOT1115				
74LVC2G34GS	–40 °C to +125 °C	XSON6	extremely thin small outline package; no leads; 6 terminals; body $1.0 \times 1.0 \times 0.35$ mm	SOT1202				

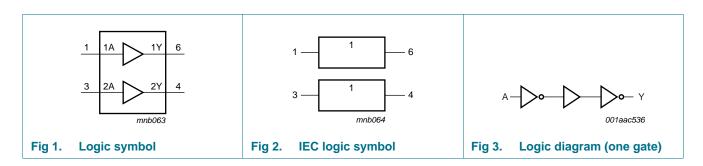
4. Marking

Table 2. Marking

Type number	Marking code ^[1]
74LVC2G34GW	YA
74LVC2G34GV	Y34
74LVC2G34GM	YA
74LVC2G34GF	YA
74LVC2G34GN	YA
74LVC2G34GS	YA

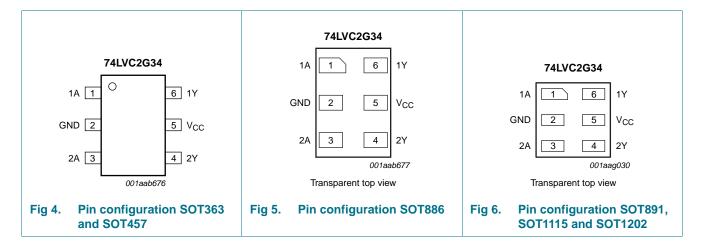
^[1] The pin 1 indicator is located on the lower left corner of the device, below the marking code.

5. Functional diagram



6. Pinning information

6.1 Pinning



6.2 Pin description

Table 3. Pin description

Symbol	Pin	Description
1A	1	data input
GND	2	ground (0 V)
2A	3	data input
2Y	4	data output
V _{CC}	5	supply voltage
1Y	6	data output

7. Functional description

Table 4. Function table[1]

Input	Output
nA	nY
L	L
Н	Н

[1] H = HIGH voltage level; L = LOW voltage level.

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
V_{I}	input voltage		<u>[1]</u> –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	[<u>1][2]</u> –0.5	$V_{CC} + 0.5$	V
		Power-down mode	[<u>1][2]</u> –0.5	+6.5	V
Io	output current	$V_O = 0 V \text{ to } V_{CC}$	-	±50	mA
I _{CC}	supply current		-	100	mA
I_{GND}	ground current		-100	-	mA
P _{tot}	total power dissipation	$T_{amb} = -40 ^{\circ}\text{C} \text{ to } +125 ^{\circ}\text{C}$	<u>[3]</u> _	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.

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
$\Delta t/\Delta V$	input transition rise and fall rate	$V_{CC} = 1.65 \text{ V to } 2.7 \text{ V}$	-	-	20	ns/V
		V _{CC} = 2.7 V to 5.5 V	-	-	10	ns/V

^[2] When $V_{CC} = 0 \text{ V}$ (Power-down mode), the output voltage can be 5.5 V in normal operation.

^[3] For SC-88 and SC-74A packages: above 87.5 °C the value of P_{tot} derates linearly with 4.0 mW/K. For XSON6 packages: above 118 °C the value of P_{tot} derates linearly with 7.8 mW/K.

10. Static characteristics

Table 7. Static characteristics

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

Symbol	Parameter	Conditions	-40	-40 °C to +85 °C		-40 °C to +125 °C		Unit	
			Min	Typ[1]	Max	Min	Max		
V_{IH}	HIGH-level	V _{CC} = 1.65 V to 1.95 V	0.65V _{CC}	-	-	0.65V _{CC}	-	V	
	input 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	V _{CC} = 1.65 V to 1.95 V	-	-	0.35V _{CC}	-	0.35V _{CC}	V	
	input voltage	$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$	-	-	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	$I_O = -100 \mu A;$ $V_{CC} = 1.65 \text{ V to 5.5 V}$	V _{CC} – 0.1	-	-	V _{CC} - 0.1	-	V	
		$I_{O} = -4 \text{ mA}; V_{CC} = 1.65 \text{ V}$	1.2	-	-	0.95	-	V	
		$I_{O} = -8 \text{ mA}; V_{CC} = 2.3 \text{ V}$	1.9	-	-	1.7	-	V	
		$I_{O} = -12 \text{ mA}; V_{CC} = 2.7 \text{ V}$	2.2	-	-	1.9	-	V	
		$I_{O} = -24 \text{ mA}; V_{CC} = 3.0 \text{ V}$	2.3	-	-	2.0	-	V	
		$I_{O} = -32 \text{ mA}; V_{CC} = 4.5 \text{ V}$	3.8	-	-	3.4	-	V	
V_{OL}	LOW-level	$V_I = V_{IH}$ or V_{IL}							
	output voltage	$I_O = 100 \mu A;$ $V_{CC} = 1.65 \text{ V to } 5.5 \text{ V}$	-	-	0.10	-	0.10	V	
		$I_O = 4 \text{ mA}; V_{CC} = 1.65 \text{ V}$	-	-	0.45	-	0.70	V	
		$I_O = 8 \text{ mA}; V_{CC} = 2.3 \text{ V}$	-	-	0.30	-	0.45	V	
		$I_O = 12 \text{ mA}; V_{CC} = 2.7 \text{ V}$	-	-	0.40	-	0.60	V	
		$I_{O} = 24 \text{ mA}; V_{CC} = 3.0 \text{ V}$	-	-	0.55	-	0.80	V	
		$I_O = 32 \text{ mA}; V_{CC} = 4.5 \text{ V}$	-	-	0.55	-	0.80	V	
II	input leakage current	$V_I = 5.5 \text{ V or GND};$ $V_{CC} = 0 \text{ V to } 5.5 \text{ V}$	-	±0.1	±5	-	±20	μА	
I _{OFF}	power-off leakage current	$V_{CC} = 0 \text{ V}; V_{I} \text{ or } V_{O} = 5.5 \text{ V}$	-	±0.1	±10	-	±20	μА	
I _{CC}	supply current	$V_{I} = 5.5 \text{ V or GND}; I_{O} = 0 \text{ A};$ $V_{CC} = 1.65 \text{ V to } 5.5 \text{ V}$	-	0.1	10	-	40	μΑ	
ΔI_{CC}	additional supply current	per pin; $V_{CC} = 2.3 \text{ V to } 5.5 \text{ V};$ $V_{I} = V_{CC} - 0.6 \text{ V}; I_{O} = 0 \text{ A}$	-	5	500	-	5000	μА	
C _I	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 °C.

11. Dynamic characteristics

Table 8. Dynamic characteristics

Voltages are referenced to GND (ground = 0 V); for load circuit see Figure 8.

Symbol	ymbol Parameter Conditions			-40 °C to +85 °C			-40 °C to +125 °C		Unit
				Min	Typ[1]	Max	Min	Max	
t_{pd}	propagation delay	nA to nY; see Figure 7	[2]						
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$		1.0	3.8	8.6	1.0	10.8	ns
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$		0.5	2.4	4.4	0.5	5.5	ns
		$V_{CC} = 2.7 \text{ V}$		0.5	2.5	5.0	0.5	6.3	ns
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$		0.5	2.2	4.1	0.5	5.1	ns
		$V_{CC} = 4.5 \text{ V to } 5.5 \text{ V}$		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

^[1] 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.

[3] 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;

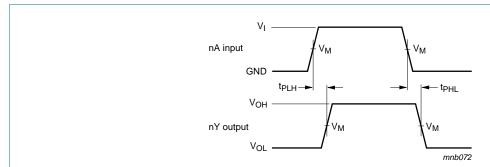
C_L = output load capacitance in pF;

 V_{CC} = supply voltage in V;

N = number of inputs switching;

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

12. Waveforms



Measurement points are given in Table 9.

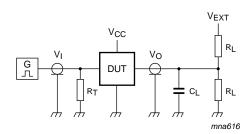
Logic levels: V_{OL} and V_{OH} are typical output voltage levels that occur with the output load.

Fig 7. The data input (nA) to output (nY) propagation delays

^[2] t_{pd} is the same as t_{PLH} and t_{PHL} .

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_0 of the pulse generator.

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

Fig 8. Test circuit for measuring switching times

Table 10. Test data

Supply voltage	Input		Load	Load	
V _{CC}	VI	$t_r = t_f$	CL	R_L	t _{PLH} , t _{PHL}
1.65 V to 1.95 V	V_{CC}	\leq 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

13. Package outline

Plastic surface-mounted package; 6 leads

SOT363

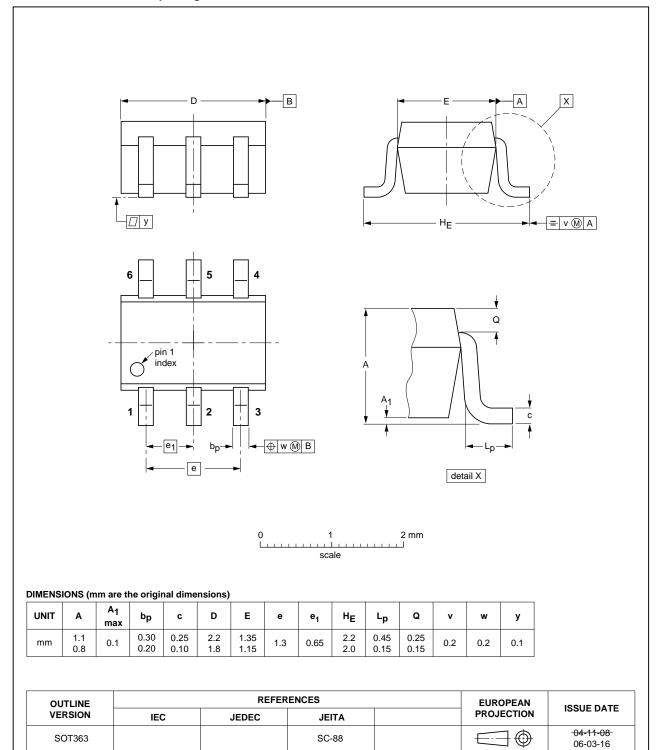


Fig 9. Package outline SOT363 (SC-88)

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Plastic surface-mounted package (TSOP6); 6 leads

SOT457

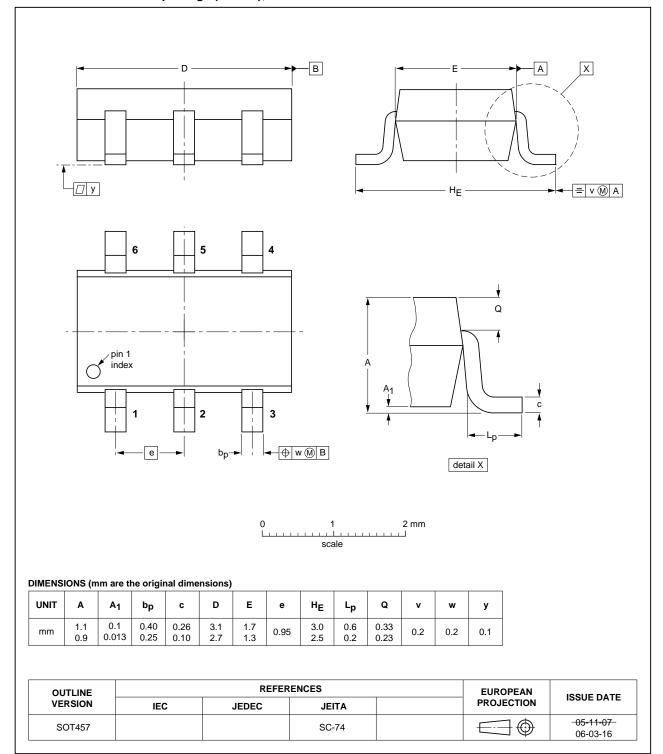


Fig 10. Package outline SOT457 (TSOP6)

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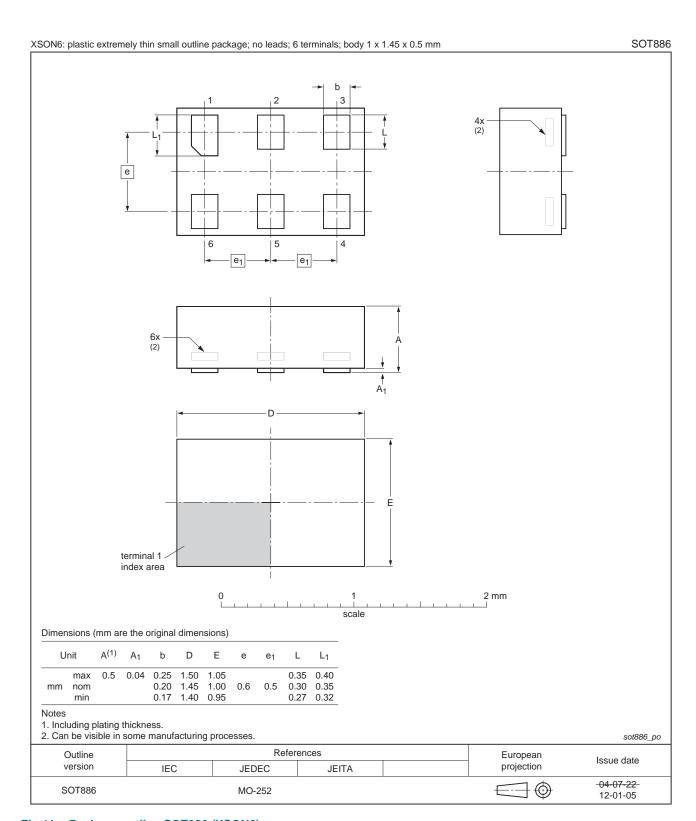


Fig 11. Package outline SOT886 (XSON6)

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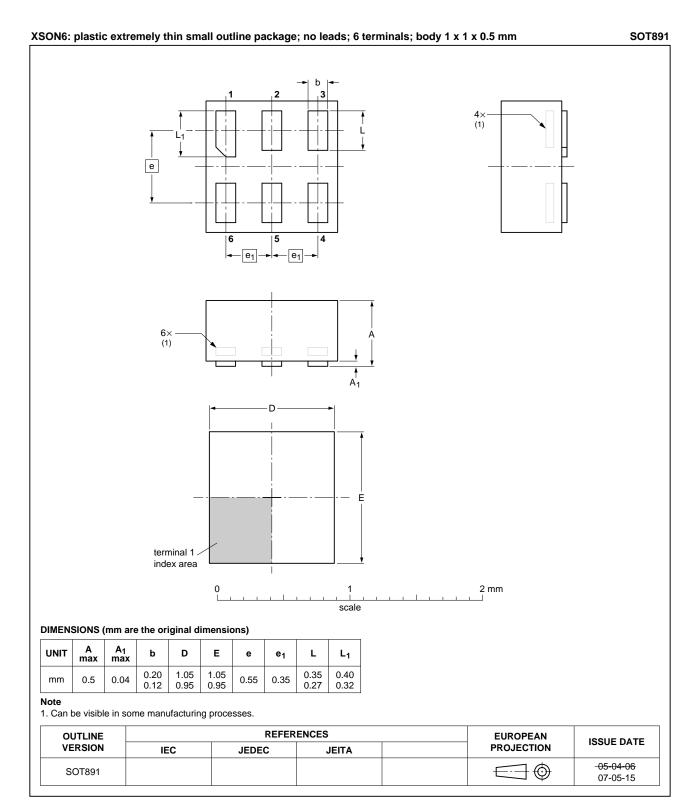


Fig 12. Package outline SOT891 (XSON6)

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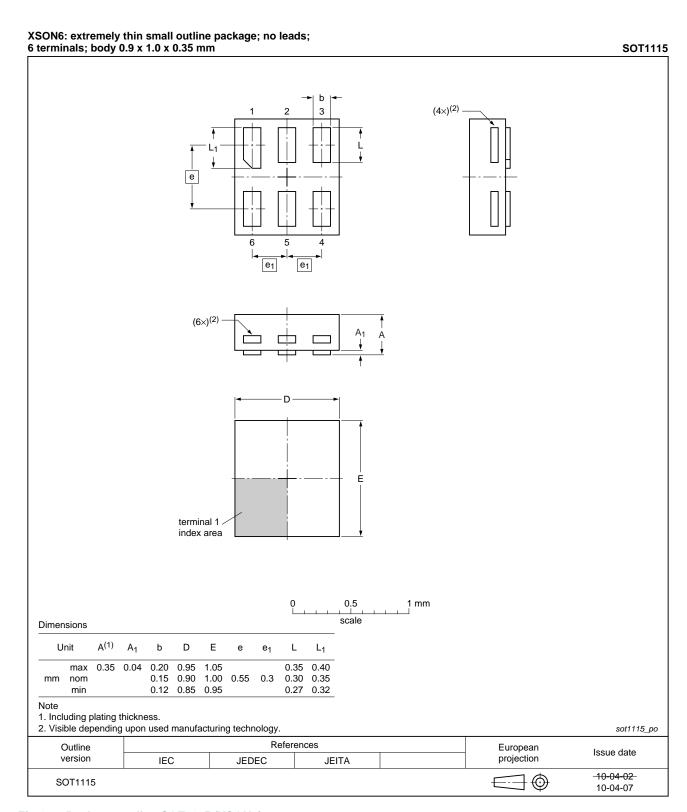


Fig 13. Package outline SOT1115 (XSON6)

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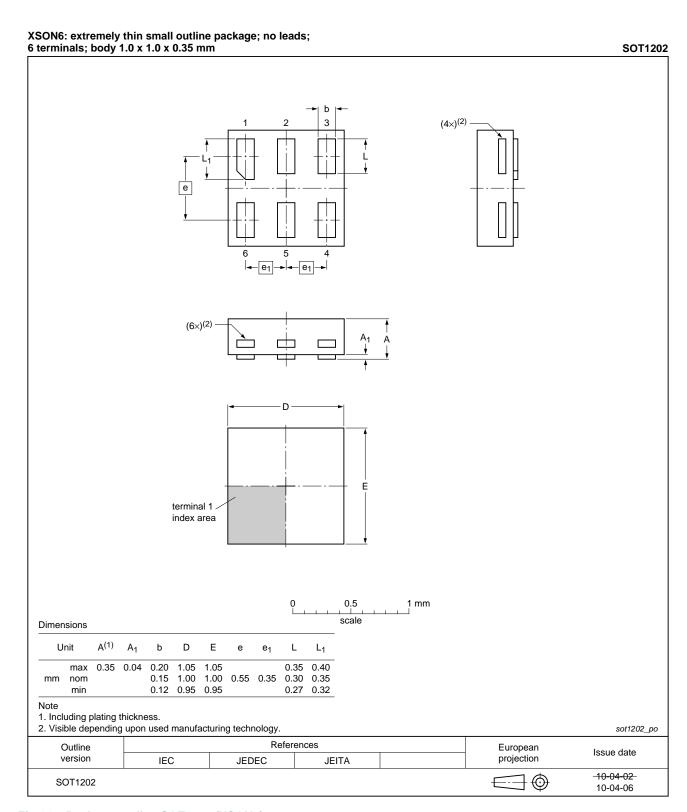


Fig 14. Package outline SOT1202 (XSON6)

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14. Abbreviations

Table 11. Abbreviations

Acronym	Description
DUT	Device Under Test
ESD	ElectroStatic Discharge
НВМ	Human Body Model
MM	Machine Model
TTL	Transistor-Transistor Logic

15. Revision history

Table 12. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
74LVC2G34 v.7	20120704	Product data sheet	-	74LVC2G34 v.6
Modifications:	 Package outline 	drawing of SOT886 (Figure 11) r	modified.	
74LVC2G34 v.6	20111129	Product data sheet	-	74LVC2G34 v.5
Modifications:	 Legal pages upo 	lated.		
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	-	-

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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

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Dual buffer gate

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