

## **1** General description

The 74LVC1G34 provides a low-power, low-voltage single buffer.

The input can be driven from either 3.3 V or 5 V devices. This feature allows the use of this device 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.

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

## 2 Features and benefits

- 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)
  - JESD8-B/JESD36 (2.7 V to 3.6 V).
- ESD protection:
  - HBM: ANSI/ESDA/JEDEC JS-001 Class 2 exceeds 2000 V
  - MM: JESD22-A115-A exceeds 200 V
- ±24 mA output drive (V<sub>CC</sub> = 3.0 V)
- CMOS low power consumption
- Latch-up performance exceeds 250 mA
- · Direct interface with TTL levels
- Inputs accept voltages up to 5 V
- Multiple package options
- Specified from -40 °C to +85 °C and -40 °C to +125 °C

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# **3** Ordering information

Type number	Package			
	Temperature range	Name	Description	Version
74LVC1G34GW	-40 °C to +125 °C	TSSOP5	plastic thin shrink small outline package; 5 leads; body width 1.25 mm	SOT353-1
74LVC1G34GV	-40 °C to +125 °C	SC-74A	plastic surface-mounted package; 5 leads	SOT753
74LVC1G34GM	-40 °C to +125 °C	XSON6	plastic extremely thin small outline package; no leads; 6 terminals; body 1 x 1.45 x 0.5 mm	SOT886
74LVC1G34GF	-40 °C to +125 °C	XSON6	plastic extremely thin small outline package; no leads; 6 terminals; body 1 x 1 x 0.5 mm	SOT891
74LVC1G34GN	-40 °C to +125 °C	XSON6	extremely thin small outline package; no leads; 6 terminals; body 0.9 x 1.0 x 0.35 mm	SOT1115
74LVC1G34GS	-40 °C to +125 °C	XSON6	extremely thin small outline package; no leads; 6 terminals; body 1.0 x 1.0 x 0.35 mm	SOT1202
74LVC1G34GX	-40 °C to +125 °C	X2SON5	plastic thermal enhanced extremely thin small outline package; no leads; 5 terminals; body 0.8 x 0.8 x 0.35 mm	SOT1226
74LVC1G34GX4	-40 °C to +125 °C	X2SON4	plastic thermal enhanced extremely thin small outline package; no leads; 4 terminals; body 0.6 x 0.6 x 0.32 mm	SOT1269-2

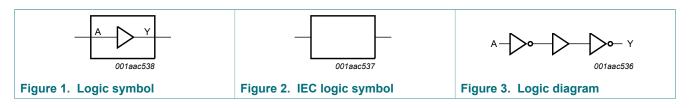
# 4 Marking

Table 2. Marking	
Type number	Marking code <sup>[1]</sup>
74LVC1G34GW	YN
74LVC1G34GV	YN
74LVC1G34GM	YN
74LVC1G34GF	YN
74LVC1G34GN	YN
74LVC1G34GS	YN
74LVC1G34GX	YN
74LVC1G34GX4	YN

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

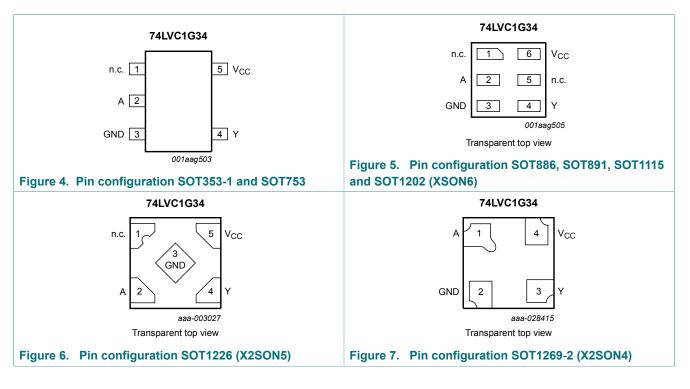
Single buffer

# 5 Functional diagram



# 6 **Pinning information**

## 6.1 Pinning



## 6.2 Pin description

Symbol	Pin			Description
	TSSOP5, SC-74A and X2SON	5 XSON6	X2SON4	
n.c.	1	1, 5	-	not connected
A	2	2	1	data input
GND	3	3	2	ground (0 V)
Y	4	4	3	data output
V <sub>CC</sub>	5	6	4	supply voltage

Table 3. Pin description

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#### **Functional description** 7

#### Table 4. Function table

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

Input	Output
A	Y
L	L
Н	Н

#### **Limiting values** 8

#### 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 <sub>CC</sub>	supply voltage			-0.5	+6.5	V
I <sub>IK</sub>	input clamping current	V <sub>1</sub> < 0 V		-50	-	mA
VI	input voltage		[1]	-0.5	+6.5	V
I <sub>ОК</sub>	output clamping current	$V_{\rm O}$ > $V_{\rm CC}$ or $V_{\rm O}$ < 0 V		-	±50	mA
Vo	output voltage	Active mode	[1]	-0.5	V <sub>CC</sub> + 0.5	V
		Power-down mode; $V_{CC}$ = 0 V	[1]	-0.5	+6.5	V
lo	output current	$V_{O}$ = 0 V to $V_{CC}$		-	±50	mA
I <sub>CC</sub>	supply current			-	100	mA
I <sub>GND</sub>	ground current			-100	-	mA
T <sub>stg</sub>	storage temperature			-65	+150	°C
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> = -40 °C to +125 °C				
		TSSOP5, SC-74A, XSON6 and X2SON5 package	[2]	-	250	mW
		X2SON4 package	[3]	-	150	mW

The minimum input and output voltage ratings may be exceeded if the input and output current ratings are observed.
 For TSSOP5 and SC-74A packages: above 87.5 °C the value of P<sub>tot</sub> derates linearly with 4.0 mW/K.

For XSON6 and X2SON5 package: above 118 °C the value of P<sub>tot</sub> derates linearly with 7.8 mW/K. [3] For X2SON4 package: above 57 °C the value of P<sub>tot</sub> derates linearly with 1.7 mW/K.

Single buffer

# 9 Recommended operating conditions

#### Table 6. Recommended operating conditions

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
V <sub>CC</sub>	supply voltage		1.65	-	5.5	V
VI	input voltage		0	-	5.5	V
Vo	output voltage	Active mode	0	-	V <sub>CC</sub>	Vo
		Power-down mode; $V_{CC}$ = 0 V	0	-	5.5	Vo
T <sub>amb</sub>	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 <sub>CC</sub> = 2.7 V to 5.5 V	-	-	10	ns/V

# **10 Static characteristics**

#### Table 7. Static characteristics

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

Symbol	Parameter	Conditions	Min	Typ <sup>[1]</sup>	Max	Unit
T <sub>amb</sub> = -4	10 °C to +85 °C					
VIH	HIGH-level input voltage	V <sub>CC</sub> = 1.65 V to 1.95 V	$0.65 \times V_{CC}$	-	-	V
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.7	-	-	V
		V <sub>CC</sub> = 2.7 V to 3.6 V	2.0	-	-	V
		V <sub>CC</sub> = 4.5 V to 5.5 V	$0.7 \times V_{CC}$	-	-	V
VIL	LOW-level input voltage	V <sub>CC</sub> = 1.65 V to 1.95 V	-	-	0.35 × V <sub>CC</sub>	V
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	-	0.7	V
		V <sub>CC</sub> = 2.7 V to 3.6 V	-	-	0.8	V
		V <sub>CC</sub> = 4.5 V to 5.5 V	-	-	0.3 × V <sub>CC</sub>	V
V <sub>OH</sub>	HIGH-level output voltage	$V_{I} = V_{IH} \text{ or } V_{IL}$				
		$I_{O}$ = -100 µA; $V_{CC}$ = 1.65 V to 5.5 V	V <sub>CC</sub> - 0.1	-	-	V
		I <sub>O</sub> = -4 mA; V <sub>CC</sub> = 1.65 V	1.2	1.54	-	V
		$I_{\rm O}$ = -8 mA; $V_{\rm CC}$ = 2.3 V	1.9	2.15	-	V
		$I_{O}$ = -12 mA; $V_{CC}$ = 2.7 V	2.2	2.50	-	V
		$I_{O}$ = -24 mA; $V_{CC}$ = 3.0 V	2.3	2.62	-	V
		$I_{\rm O}$ = -32 mA; $V_{\rm CC}$ = 4.5 V	3.8	4.11	-	V
V <sub>OL</sub>	LOW-level output voltage	$V_{I} = V_{IH} \text{ or } V_{IL}$				-
		$I_{O}$ = 100 µA; $V_{CC}$ = 1.65 V to 5.5 V	-	-	0.10	V
		I <sub>O</sub> = 4 mA; V <sub>CC</sub> = 1.65 V	-	0.07	0.45	V
		I <sub>O</sub> = 8 mA; V <sub>CC</sub> = 2.3 V	-	0.12	0.30	V
		$I_0$ = 12 mA; $V_{CC}$ = 2.7 V	-	0.17	0.40	V
		I <sub>O</sub> = 24 mA; V <sub>CC</sub> = 3.0 V	-	0.33	0.55	V
		I <sub>O</sub> = 32 mA; V <sub>CC</sub> = 4.5 V	-	0.39	0.55	V

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# 74LVC1G34

## Single buffer

Symbol	Parameter	Conditions	Min	Typ <sup>[1]</sup>	Max	Unit
l <sub>l</sub>	input leakage current	$V_{CC} = 0 V \text{ to } 5.5 V; V_1 = 5.5 V \text{ or GND}$ <sup>[2]</sup>	-	±0.1	±1	μA
I <sub>OFF</sub>	power-off leakage current	$V_{CC}$ = 0 V; V <sub>I</sub> or V <sub>O</sub> = 5.5 V	-	±0.1	±2	μA
I <sub>CC</sub>	supply current	$V_{CC}$ = 1.65 V to 5.5 V; I <sub>O</sub> = 0 A; V <sub>I</sub> = 5.5 V or GND	-	0.1	4	μA
ΔI <sub>CC</sub>	additional supply current	$V_{CC}$ = 2.3 V to 5.5 V; V <sub>I</sub> = V <sub>CC</sub> - 0.6 V; <sup>[2]</sup> I <sub>O</sub> = 0 A	-	5	500	μA
Cı	input capacitance	$V_{CC}$ = 3.3 V; $V_{I}$ = GND to $V_{CC}$	-	4	-	pF
T <sub>amb</sub> = -4	0 °C to +125 °C					
V <sub>IH</sub>	HIGH-level input voltage	V <sub>CC</sub> = 1.65 V to 1.95 V	$0.65 \times V_{CC}$	-	-	V
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.7	-	-	V
		V <sub>CC</sub> = 2.7 V to 3.6 V	2.0	-	-	V
		V <sub>CC</sub> = 4.5 V to 5.5 V	$0.7 \times V_{CC}$	-	-	V
VIL	LOW-level input voltage	V <sub>CC</sub> = 1.65 V to 1.95 V	-	-	$0.35 \times V_{CC}$	V
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	-	0.7	V
		V <sub>CC</sub> = 2.7 V to 3.6 V	-	-	0.8	V
		V <sub>CC</sub> = 4.5 V to 5.5 V	-	-	$0.3 \times V_{CC}$	V
V <sub>OH</sub>	HIGH-level output voltage	$V_{I} = V_{IH} \text{ or } V_{IL}$				
		$I_{O}$ = -100 µA; $V_{CC}$ = 1.65 V to 5.5 V	V <sub>CC</sub> - 0.1	-	-	V
		I <sub>O</sub> = -4 mA; V <sub>CC</sub> = 1.65 V	0.95	-	-	V
		I <sub>O</sub> = -8 mA; V <sub>CC</sub> = 2.3 V	1.7	-	-	V
		$I_{\rm O}$ = -12 mA; $V_{\rm CC}$ = 2.7 V	1.9	-	-	V
		I <sub>O</sub> = -24 mA; V <sub>CC</sub> = 3.0 V	2.0	-	-	V
		I <sub>O</sub> = -32 mA; V <sub>CC</sub> = 4.5 V	3.4	-	-	V
V <sub>OL</sub>	LOW-level output voltage	$V_{I} = V_{IH} \text{ or } V_{IL}$				
		$I_{O}$ = 100 µA; $V_{CC}$ = 1.65 V to 5.5 V	-	-	0.10	V
		I <sub>O</sub> = 4 mA; V <sub>CC</sub> = 1.65 V	-	-	0.70	V
		I <sub>O</sub> = 8 mA; V <sub>CC</sub> = 2.3 V	-	-	0.45	V
		I <sub>O</sub> = 12 mA; V <sub>CC</sub> = 2.7 V	-	-	0.60	V
		I <sub>O</sub> = 24 mA; V <sub>CC</sub> = 3.0 V	-	-	0.80	V
		I <sub>O</sub> = 32 mA; V <sub>CC</sub> = 4.5 V	-	-	0.80	V
l <sub>l</sub>	input leakage current	$V_{CC}$ = 0 V to 5.5 V; $V_{I}$ = 5.5 V or GND	-	-	±1	μA
I <sub>OFF</sub>	power-off leakage current	$V_{CC}$ = 0 V; V <sub>1</sub> or V <sub>0</sub> = 5.5 V	-	-	±2	μA
I <sub>CC</sub>	supply current	$V_{CC}$ = 1.65 V to 5.5 V; I <sub>O</sub> = 0 A; V <sub>I</sub> = 5.5 V or GND	-	-	4	μA
ΔI <sub>CC</sub>	additional supply current	$V_{CC}$ = 2.3 V to 5.5 V; V <sub>I</sub> = V_{CC} - 0.6 V; $I_O$ = 0 A	-	-	500	μA

#### **Dynamic characteristics** 11

#### Table 8. Dynamic characteristics

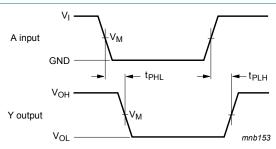
Voltages are referenced to GND (ground = 0 V). For test circuit see Figure 9.

Symbol	Parameter	Conditions	-40	°C to +85	5 °C	-40 °C to	+125 °C	Unit
			Min	Typ <sup>[1]</sup>	Мах	Min	Max	
t <sub>pd</sub>	propagation delay	A to Y; see Figure 8 [2]						
		V <sub>CC</sub> = 1.65 V to 1.95 V	1.0	4.0	8.6	1.0	11.0	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	0.5	2.6	4.4	0.5	5.6	ns
		V <sub>CC</sub> = 2.7 V	0.5	2.3	4.5	0.5	5.6	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	0.5	2.0	4.1	0.5	5.2	ns
		V <sub>CC</sub> = 4.5 V to 5.5 V	0.5	1.6	3.2	0.5	4.1	ns
C <sub>PD</sub>	power dissipation capacitance	$V_{I}$ = GND to $V_{CC}$ ; $V_{CC}$ = 3.3 V <sup>[3]</sup>	-	15	-	-	-	pF

[1] Typical values are measured at T<sub>amb</sub> = 25 °C and V<sub>CC</sub> = 1.8 V, 2.5 V, 2.7 V, 3.3 V, and 5.0 V respectively.

[2]  $t_{pd}$  is the same as  $t_{PLH}$  and  $t_{PHL}$ . [3]  $C_{PD}$  is used to determine the dynamic power dissipation ( $P_D$  in  $\mu$ W).  $P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \sum (C_L \times V_{CC}^2 \times f_o)$  where:  $f_i$  = input frequency in MHz;  $f_o$  = output frequency in MHz;  $C_{L}$  = output load capacitance in pF; V<sub>CC</sub> = supply voltage in V; N = number of inputs switching;  $\Sigma(C_L \times V_{CC}^2 \times f_0)$  = sum of outputs.

## 11.1 Waveform and test circuit



Measurement points are given in Table 9.

 $V_{\text{OL}}$  and  $V_{\text{OH}}$  are typical output voltage levels that occur with the output load.

Figure 8. The data input (A) to output (Y) propagation delays

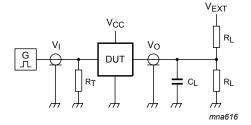
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# 74LVC1G34

Single buffer

#### Table 9. Measurement points

Supply voltage	Input	Output
V <sub>cc</sub>	V <sub>M</sub>	V <sub>M</sub>
1.65 V to 1.95 V	0.5 x V <sub>CC</sub>	0.5 x V <sub>CC</sub>
2.3 V to 2.7 V	0.5 x V <sub>CC</sub>	$0.5 \times V_{CC}$
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	0.5 x V <sub>CC</sub>	$0.5 \times V_{CC}$



Test data is given in <u>Table 10</u>.

Definitions for test circuit:

R<sub>L</sub> = 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<sub>EXT</sub> = External voltage for measuring switching times.

Figure 9. Test circuit for measuring switching times

#### Table 10. Test data

Supply voltage	voltage Input		Load		V <sub>EXT</sub>
V <sub>cc</sub>	VI	t <sub>r</sub> = t <sub>f</sub>	CL	RL	t <sub>PLH</sub> , t <sub>PHL</sub>
1.65 V to 1.95 V	V <sub>CC</sub>	≤ 2.0 ns	30 pF	1 kΩ	open
2.3 V to 2.7 V	V <sub>CC</sub>	≤ 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 <sub>CC</sub>	≤ 2.5 ns	50 pF	500 Ω	open

74LVC1G34 Single buffer

# 12 Package outline

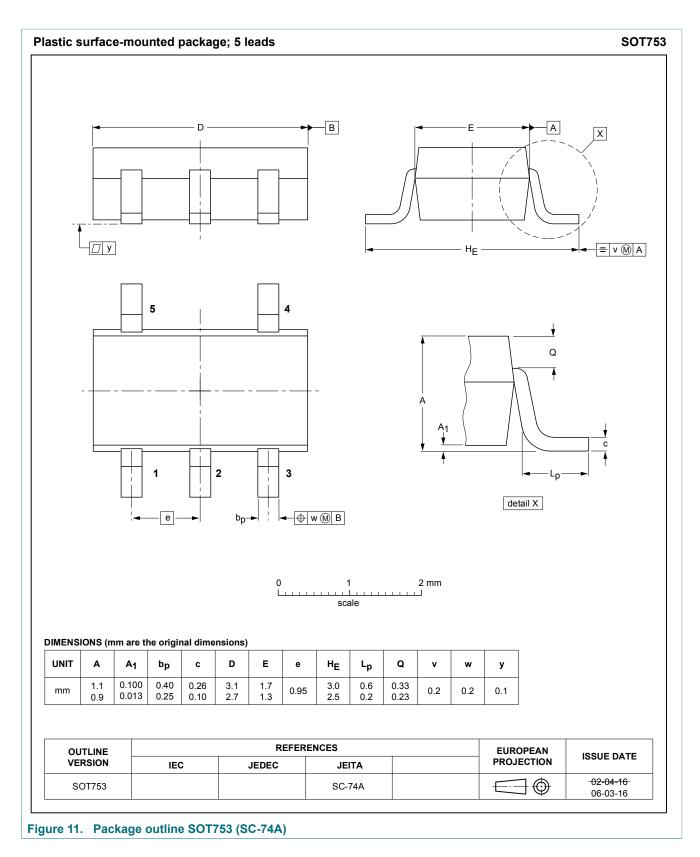
	5: plas	tic thi	in shr	ink sr	nall o	utline	packa	age; 5	lead	s; boc	ly wid	th 1.2	5 mm	1			SC	DT353
		ŧ	y						с	¥ •				X	) (m) A			
		-		- Z		4 	0				A₁ ¥	detail	Lp +L + X	(A <sub>3</sub> )	A A A A A A A A A A A A A A A A A A A			
					0		1.5  sca			3 mm 								
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DIMENS	IONS (n A max	nm are t A <sub>1</sub>	the orig A <sub>2</sub>	inal din A <sub>3</sub>	nension b <sub>p</sub>	s) c	D <sup>(1)</sup>	E <sup>(1)</sup>	e	e <sub>1</sub>	н <sub>Е</sub>	L	Lp	v	w	у	Z <sup>(1)</sup>	θ
	1		<b>A<sub>2</sub></b> 1.0		<b>b</b> р 0.30	<b>c</b> 0.25	2.25	1.35	<b>e</b> 0.65	<mark>е</mark> 1 1.3	H <sub>E</sub> 2.25 2.0	<b>L</b> 0.425	Lp 0.46 0.21	<b>v</b> 0.3	<b>w</b> 0.1	<b>y</b> 0.1	<b>Z<sup>(1)</sup></b> 0.60 0.15	7°
UNIT mm Note	A max. 1.1	<b>A<sub>1</sub></b> 0.1 0	<b>A<sub>2</sub></b> 1.0 0.8	<b>A</b> 3 0.15	<b>b</b> р 0.30 0.15	<b>c</b> 0.25 0.08	2.25 1.85	1.35 1.15	0.65		2.25		0.46				0.60	
UNIT mm Note	A max.	<b>A<sub>1</sub></b> 0.1 0	<b>A<sub>2</sub></b> 1.0 0.8	<b>A</b> 3 0.15	<b>b</b> р 0.30 0.15	<b>c</b> 0.25 0.08	2.25 1.85 side are	1.35 1.15	0.65 luded.		2.25		0.46		0.1	0.1	0.60 0.15	7° 0°
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74LVC1G34 Product data sheet

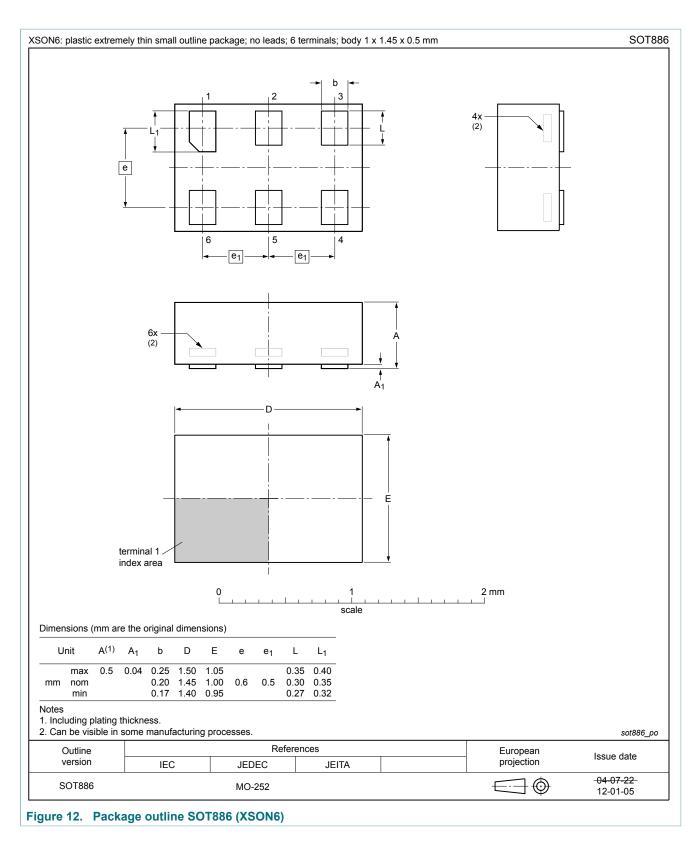
9 / 20

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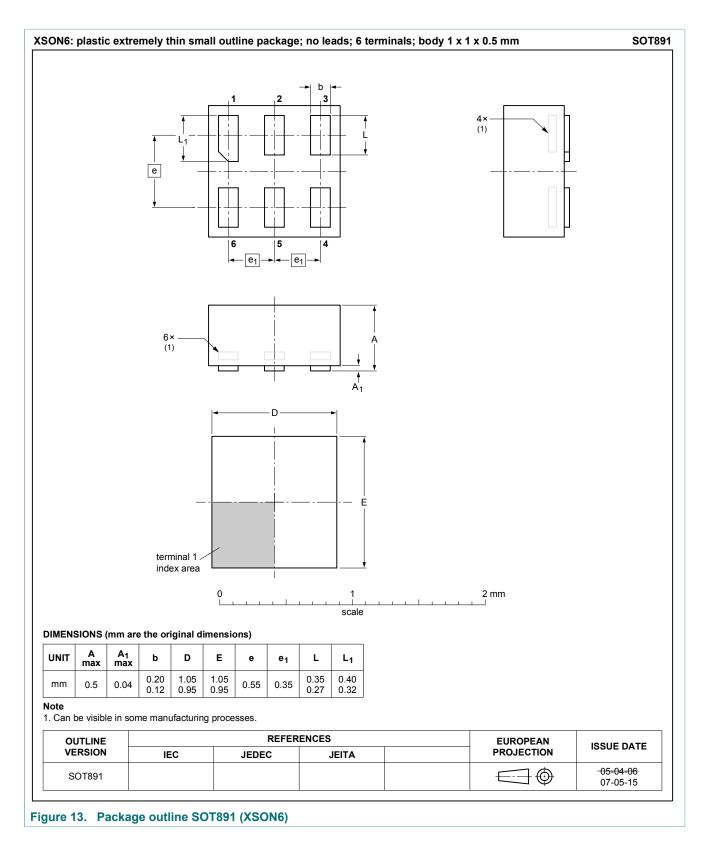
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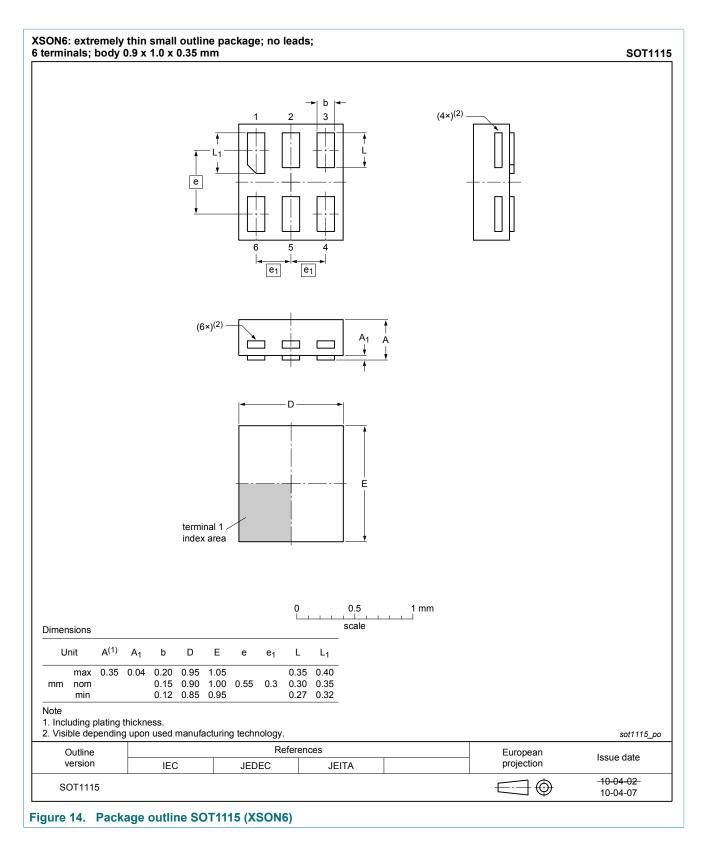
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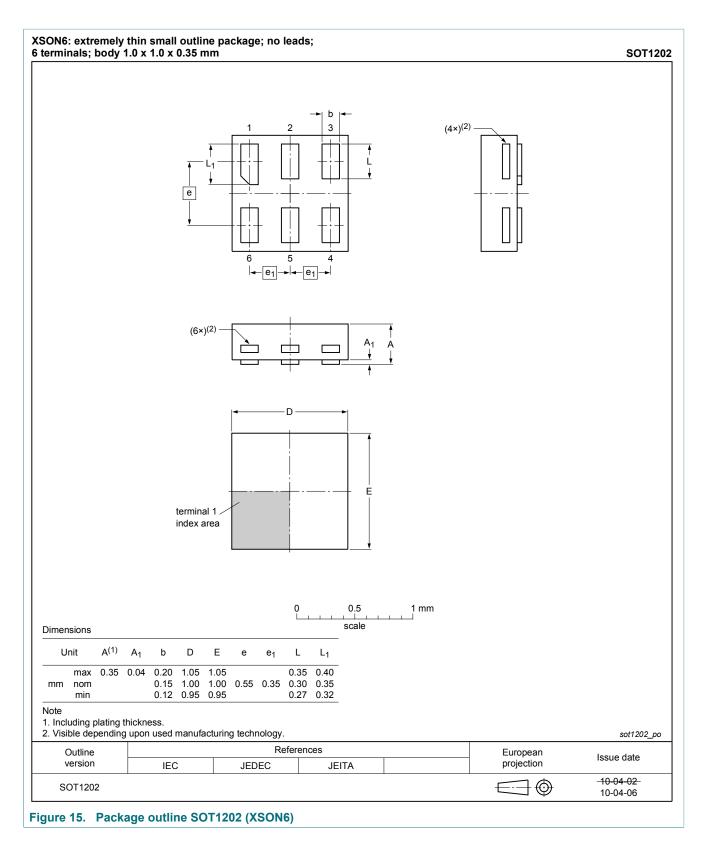
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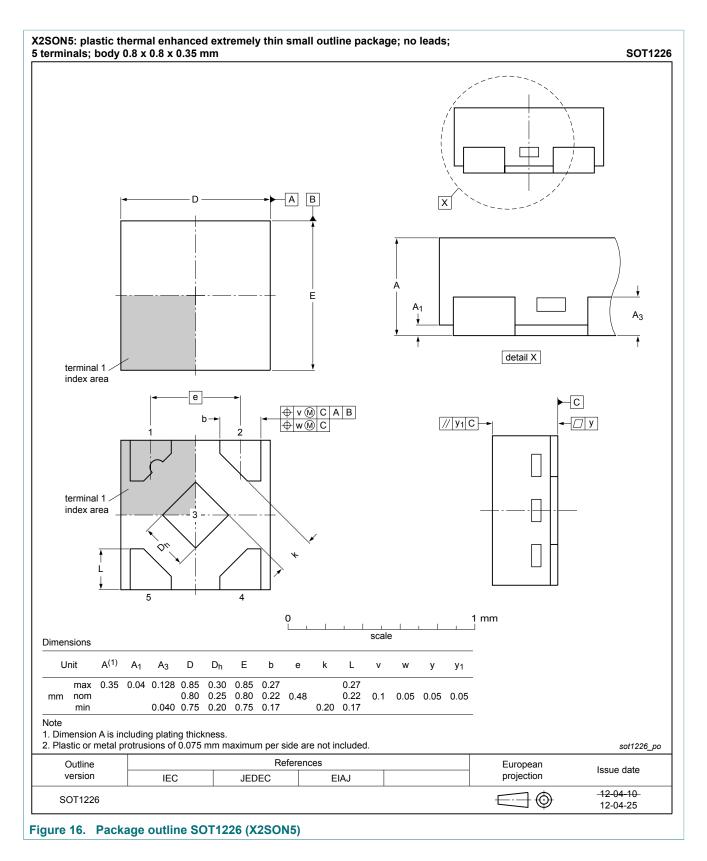
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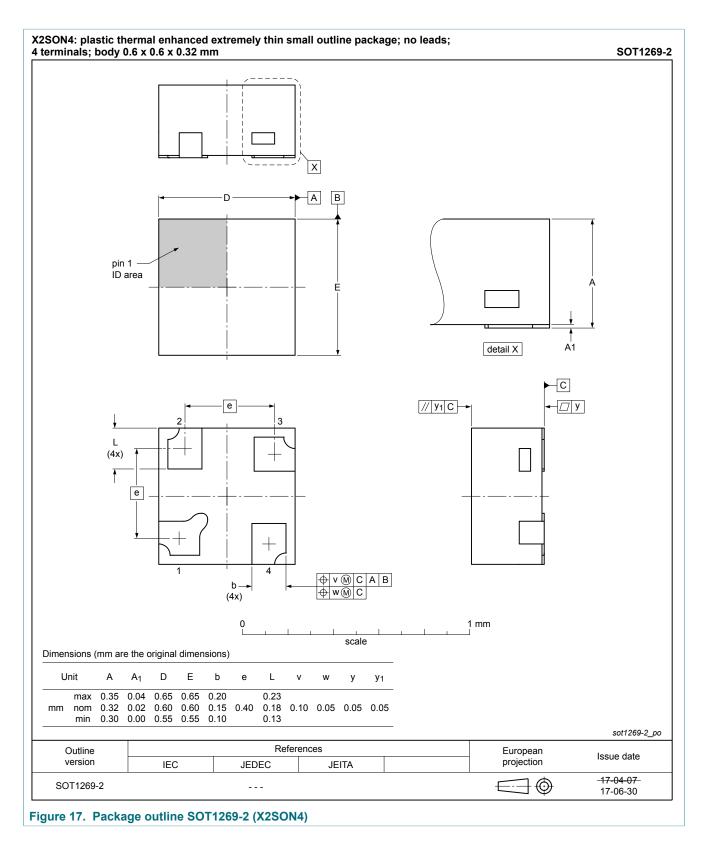
#### Single buffer



Single buffer



#### Single buffer



# **13 Abbreviations**

Table 11. Abbreviations			
Acronym	Description		
CMOS	Complementary Metal-Oxide Semiconductor		
DUT	Device Under Test		
ESD	ElectroStatic Discharge		
НВМ	Human Body Model		
MM	Machine Model		
TTL	Transistor-Transistor Logic		

# 14 Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes		
74LVC1G34 v.7	20180608	Product data sheet	-	74LVC1G34 v.6		
Modifications:	Nexperia. <ul> <li>Legal texts has</li> </ul>					
74LVC1G34 v.6	20161205	Product data sheet	-	74LVC1G34 v.5		
Modifications:	• <u>Section 10</u> : The maximum limits for leakage current and supply current have changed.					
74LVC1G34 v.5	20120702	Product data sheet	-	74LVC1G34 v.4		
Modifications:	<ul> <li>Added type number 74LVC1G34GX (SOT1226)</li> <li>Package outline drawing of SOT886 (Figure 12) modified.</li> </ul>					
74LVC1G34 v.4	20111206	Product data sheet	-	74LVC1G34 v.3		
Modifications:	Legal pages updated					
74LVC1G34 v.3	20100902	Product data sheet	-	74LVC1G34 v.2		
74LVC1G34 v.2	20070521	Product data sheet	-	74LVC1G34 v.1		
74LVC1G34 v.1	20050907	Product data sheet	-	-		

# 15 Legal information

## 15.1 Data sheet status

Document status <sup>[1][2]</sup>	Product status <sup>[3]</sup>	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

Please consult the most recently issued document before initiating or completing a design. [1]

The term 'short data sheet' is explained in section "Definitions".

[2] [3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL http://www.nexperia.com.

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