

1. General description

The 74LVC3G34-Q100 is a triple 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.

This product has been qualified to the Automotive Electronics Council (AEC) standard Q100 (Grade 1) and is suitable for use in automotive applications.

2. Features and benefits

- Automotive product qualification in accordance with AEC-Q100 (Grade 1)
 Specified from -40 °C to +85 °C and from -40 °C to +125 °C
- Wide supply voltage range from 1.65 V to 5.5 V
- Overvoltage tolerant inputs to 5.5 V
- High noise immunity
- ±24 mA output drive (V_{CC} = 3.0 V)
- CMOS low power consumption
- Latch-up performance exceeds 250 mA
- Direct interface with TTL levels
- 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: ANSI/ESDA/JEDEC JS-001 class 2 exceeds 2000 V
 - CDM: ANSI/ESDA/JEDEC JS-002 class C3 exceeds 1000 V

3. Ordering information

Table 1. Ordering information

Type number	Package						
	Temperature range	Name	Description	Version			
74LVC3G34DP-Q100	-40 °C to +125 °C	TSSOP8	plastic thin shrink small outline package; 8 leads; body width 3 mm; lead length 0.5 mm	<u>SOT505-2</u>			
74LVC3G34DC-Q100	-40 °C to +125 °C	VSSOP8	plastic very thin shrink small outline package; 8 leads; body width 2.3 mm	<u>SOT765-1</u>			

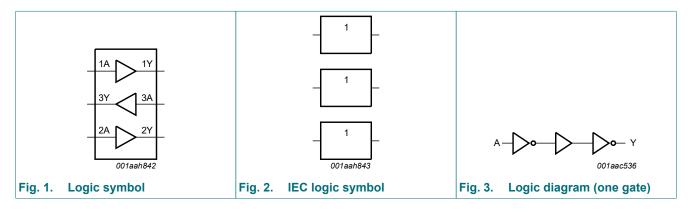
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4. Marking

Table 2. Marking codes				
Type number	Marking code [1]			
74LVC3G34DP-Q100	V34			
74LVC3G34DC-Q100	Y34			

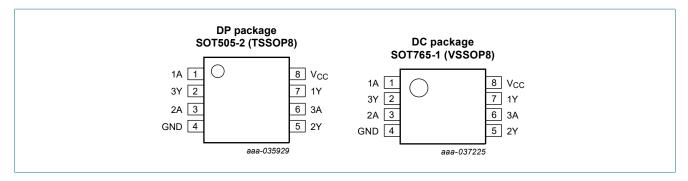
[1] The pin 1 indicator is located on the lower left corner of the device, below the marking code.

5. Functional diagram



6. Pinning information

6.1. Pinning



6.2. Pin description

Table 3. Pin description					
Symbol	Pin	Description			
1A, 2A, 3A	1, 3, 6	data input			
1Y, 2Y, 3Y	7, 5, 2	data output			
GND	4	ground (0 V)			
V _{CC}	8	supply voltage			

7. Functional description

Table 4. Function table

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

Input nA	Output nY
L	L
Н	Н

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 ₁ < 0 V		-50	-	mA
VI	input voltage		[1]	-0.5	+6.5	V
Ι _{ΟΚ}	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 _{CC} + 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 _{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 minimum input and output voltage ratings may be exceeded if the input and output current ratings are observed.

[2] For SOT505-2 (TSSOP8) package: P_{tot} derates linearly with 4.6 mW/K above 96 °C.

For SOT765-1 (VSSOP8) package: Ptot derates linearly with 4.9 mW/K above 99 °C.

9. Recommended operating conditions

Table 6. Operating conditions

Symbol	Parameter	Conditions	Min	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

10. Static characteristics

Table 7. Static characteristics

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

Symbol	Parameter	Conditions	T _{amb} =	T _{amb} = -40 °C to +85 °C			T _{amb} = -40 °C to +125 °C	
			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 output	$V_{I} = V_{IH} \text{ or } V_{IL}$						
	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	$V_{I} = V_{IH} \text{ or } V_{IL}$						
	voltage	I _O = 100 μA; V _{CC} = 1.65 V to 5.5 V	-	-	0.1	-	0.1	V
		I _O = 4 mA; V _{CC} = 1.65 V	-	-	0.45	-	0.7	V
		I _O = 8 mA; V _{CC} = 2.3 V	-	-	0.3	-	0.45	V
		I _O = 12 mA; V _{CC} = 2.7 V	-	-	0.4	-	0.6	V
		I _O = 24 mA; V _{CC} = 3.0 V	-	-	0.55	-	0.8	V
		I _O = 32 mA; V _{CC} = 4.5 V	-	-	0.55	-	0.8	V
lı	input leakage current	V _I = 5.5 V or GND; V _{CC} = 0 V to 5.5 V	-	±0.1	±1	-	±1	μA
I _{OFF}	power-off leakage current	V_{CC} = 0 V; V _I or V _O = 5.5 V	-	±0.1	±2	-	±2	μA
I _{CC}	supply current	V _I = 5.5 V or GND; V _{CC} = 1.65 V to 5.5 V; I _O = 0 A	-	0.1	4	-	4	μA
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
CI	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 test circuit see Fig. 5.

Symbol	Parameter	arameter Conditions		-40 °C to	+85 °C	T _{amb} = -40 °C to +125 °C		Unit
			Min	Typ [1]	Max	Min	Мах	
t _{pd}	propagation delay	nA to nY; see Fig. 4 [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	$V_{I} = GND$ to V_{CC} ; $V_{CC} = 3.3 V$ [3]	-	14	-	-	-	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.

[1] Typical values are increasing a simple and 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 μ W). $P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \Sigma (C_L \times V_{CC}^2 \times f_o)$ where:

 f_i = input frequency in MHz;

 f_0 = output frequency in MHz;

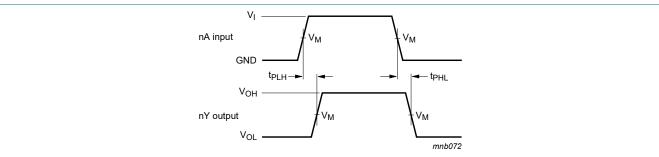
 C_L = output load capacitance in pF;

V_{CC} = supply voltage in V;

N = number of inputs switching;

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

11.1. Waveforms and test circuit



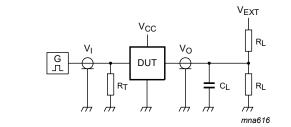
Measurement points are given in <u>Table 9</u>.

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

Fig. 4. The data input (nA) to output (nY) propagation delays

Table 9. Measurement points

Supply voltage	Input	Output
V _{cc}	V _M	V _M
1.65 V to 1.95 V	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$
2.3 V to 2.7 V	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$
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	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$



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. 5. Test circuit for measuring switching times

Supply voltage	Input	Input		Load	
V _{cc}	VI	$t_r = t_f$	CL	RL	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

74LVC3G34_Q100

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12. Package outline

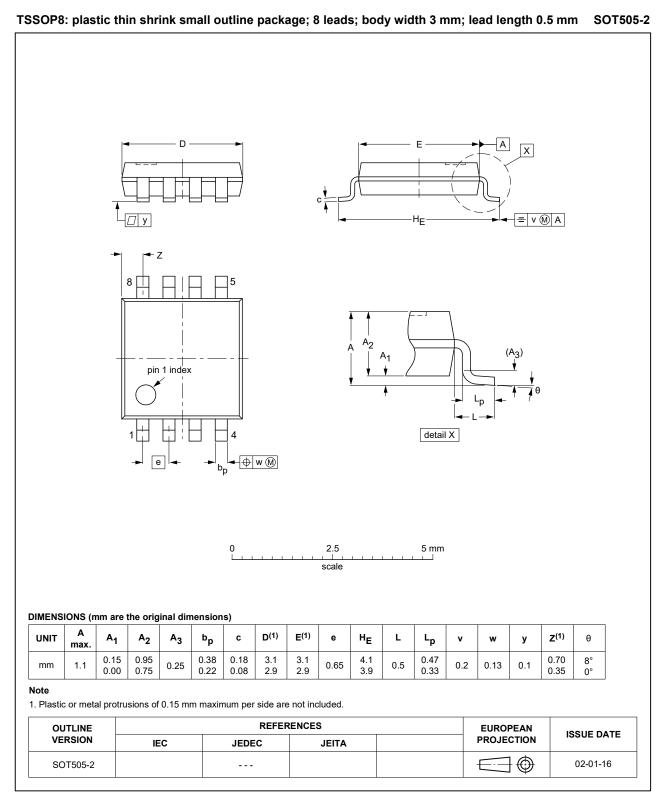
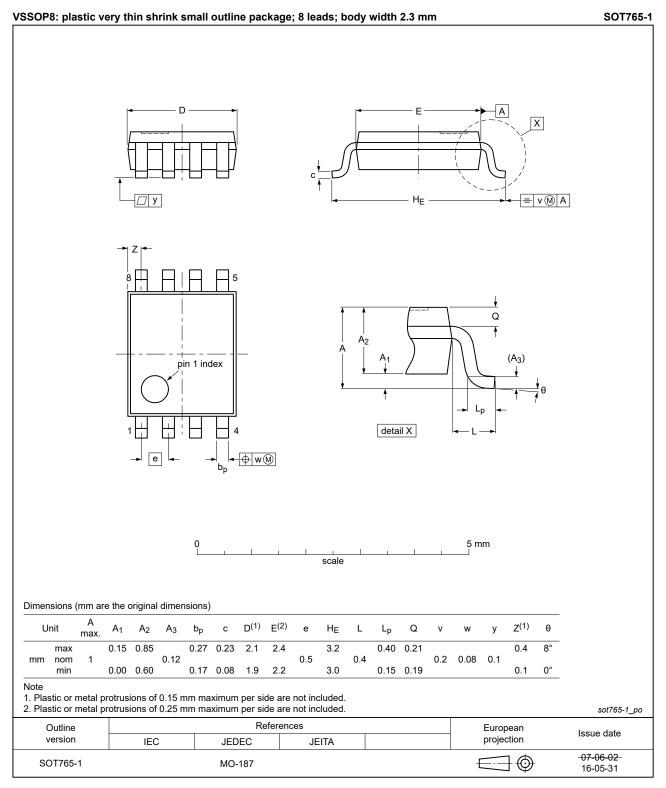


Fig. 6. Package outline SOT505-2 (TSSOP8)

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13. Abbreviations

Table 11. Abbreviatio	Table 11. Abbreviations				
Acronym	Description				
ANSI	American National Standards Institute				
CMOS	Complementary Metal-Oxide Semiconductor				
DUT	Device Under Test				
ESD	ElectroStatic Discharge				
ESDA	ElectroStatic Discharge Association				
HBM	Human Body Model				
JEDEC	Joint Electron Device Engineering Council				
TTL	Transistor-Transistor Logic				

14. Revision history

Table 12. Revision history							
Document ID	Release date	Data sheet status	Change notice	Supersedes			
74LVC3G34_Q100 v.5.1	20240812	Product data sheet	-	74LVC3G34_Q100 v.5			
74LVC3G34_Q100 v.5	20230824	Product data sheet	-	74LVC3G34_Q100 v.4			
Modifications:	• <u>Section 2</u> : E	• <u>Section 2</u> : ESD specification updated according to the latest JEDEC standard.					
74LVC3G34_Q100 v.4	20210825	Product data sheet	-	74LVC3G34_Q100 v.3			
Modifications:		 <u>Section 1</u> and <u>Section 2</u> updated. <u>Section 8</u>: Derating values for P_{tot} total power dissipation updated. 					
74LVC3G34_Q100 v.3	20181026	Product data sheet	-	74LVC3G34_Q100 v.2			
Modifications:	guidelines o	 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. 					
74LVC3G34_Q100 v.2	20161214	20161214 Product data sheet - 74LVC3G34_Q100 v.1					
Modifications:	• <u>Table 7</u> : The	• <u>Table 7</u> : The maximum limits for leakage current and supply current have changed.					
74LVC3G34_Q100 v.1	20130516	Product data sheet	-	-			

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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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Product [short] data sheet	Production	This document contains the product specification.

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