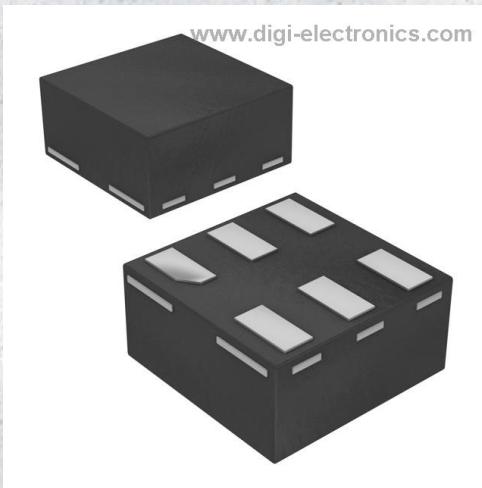


74LVC2G17GF,132 Datasheet



<https://www.DiGi-Electronics.com>

DiGi Electronics Part Number	74LVC2G17GF,132-DG
Manufacturer	Nexperia USA Inc.
Manufacturer Product Number	74LVC2G17GF,132
Description	IC BUFFER NON-INVERT 5.5V 6XSON
Detailed Description	Buffer, Non-Inverting 2 Element 1 Bit per Element Push-Pull Output 6-XSON, SOT891 (1x1)



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RFQ Email: Info@DiGi-Electronics.com

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Purchase and inquiry

Manufacturer Product Number:

74LVC2G17GF,132

Series:

74LVC

Logic Type:

Buffer, Non-Inverting

Number of Bits per Element:

1

Output Type:

Push-Pull

Voltage - Supply:

1.65V ~ 5.5V

Mounting Type:

Surface Mount

Supplier Device Package:

6-XSON, SOT891 (1x1)

Manufacturer:

Nexperia USA Inc.

Product Status:

Obsolete

Number of Elements:

2

Input Type:

Schmitt Trigger

Current - Output High, Low:

32mA, 32mA

Operating Temperature:

-40°C ~ 125°C (TA)

Package / Case:

6-XFDN

Base Product Number:

74LVC2G17

Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8542.39.0001

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99

74LVC2G17

Dual non-inverting Schmitt trigger with 5 V tolerant input

Rev. 12 — 21 August 2023

Product data sheet

1. General description

The 74LVC2G17 is a dual buffer with Schmitt-trigger inputs. 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.

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
- ± 24 mA output drive ($V_{CC} = 3.0$ V)
- CMOS low-power consumption
- Latch-up performance exceeds 250 mA
- Direct interface with TTL levels
- I_{OFF} circuitry provides partial Power-down mode operation
- Complies with JEDEC standard:
 - JESD8-7 (1.65 V to 1.95 V)
 - JESD8-5 (2.3 V to 2.7 V)
 - JESD-8B/JESD36 (2.7 V to 3.6 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
- Multiple package options
- Specified from -40 °C to $+85$ °C and -40 °C to $+125$ °C

3. Applications

- Wave and pulse shapers for highly noisy environments

4. Ordering information

Table 1. Ordering information

Type number	Package			Version
	Temperature range	Name	Description	
74LVC2G17GW	-40 °C to +125 °C	TSSOP6	plastic thin shrink small outline package; 6 leads; body width 1.25 mm	SOT363-2
74LVC2G17GV	-40 °C to +125 °C	SC-74; TSOP6	plastic surface-mounted package; 6 leads	SOT457
74LVC2G17GM	-40 °C to +125 °C	XSON6	plastic extremely thin small outline package; no leads; 6 terminals; body 1 × 1.45 × 0.5 mm	SOT886
74LVC2G17GN	-40 °C to +125 °C	XSON6	extremely thin small outline package; no leads; 6 terminals; body 0.9 × 1.0 × 0.35 mm	SOT1115
74LVC2G17GS	-40 °C to +125 °C	XSON6	extremely thin small outline package; no leads; 6 terminals; body 1.0 × 1.0 × 0.35 mm	SOT1202

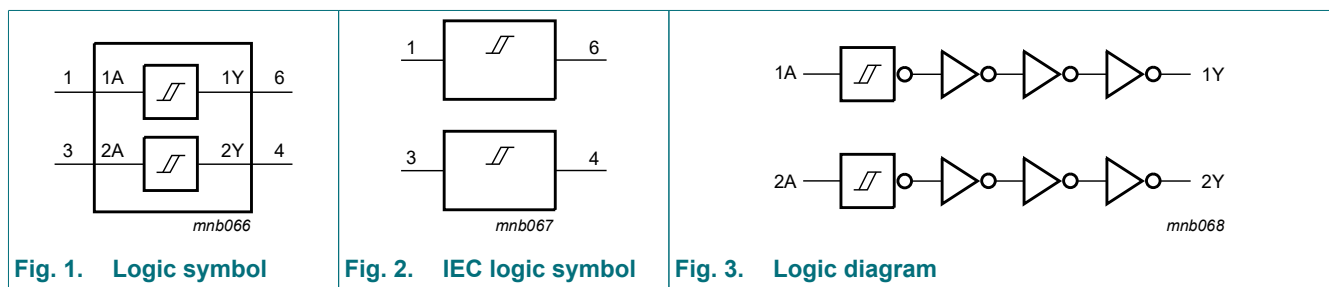
5. Marking

Table 2. Marking codes

Type number	Marking code [1]
74LVC2G17GW	VV
74LVC2G17GV	VV
74LVC2G17GM	VV
74LVC2G17GN	VV
74LVC2G17GS	VV

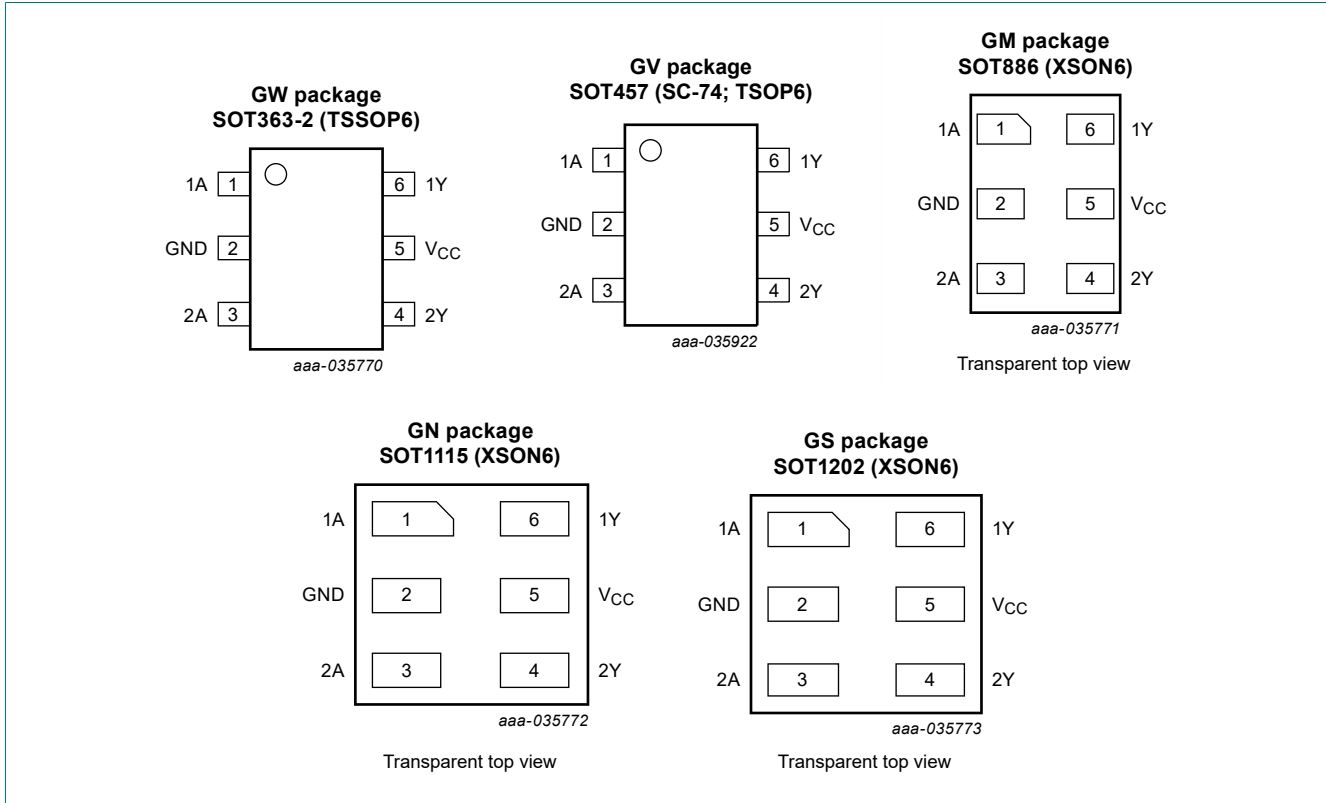
[1] The pin 1 indicator is located on the lower left corner of the device, below the marking code.

6. Functional diagram



7. Pinning information

7.1. Pinning



7.2. 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

8. Functional description

Table 4. Function table

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

Input	Output
nA	nY
L	L
H	H

9. 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		[1] -0.5	+6.5	V
I_{OK}	output clamping current	$V_O < 0$ V	-	-50	mA
V_O	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
I_O	output current	$V_O = 0$ V to V_{CC}	-	± 50	mA
I_{CC}	supply current		-	100	mA
I_{GND}	ground current		-	-100	mA
T_{stg}	storage temperature		-65	+150	°C
P_{tot}	total power dissipation	$T_{amb} = -40$ °C to +125 °C	[2] -	250	mW

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

[2] For SOT363-2 (TSSOP6) package: P_{tot} derates linearly with 3.7 mW/K above 83 °C.

For SOT457 (SC-74; TSOP6) package: P_{tot} 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: P_{tot} derates linearly with 3.3 mW/K above 74 °C.

10. Recommended operating conditions

Table 6. Recommended operating conditions

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{CC}	supply voltage		1.65	-	5.5	V
V_I	input voltage		0	-	5.5	V
V_O	output voltage		0	-	V_{CC}	V
T_{amb}	ambient temperature		-40	-	+125	°C

11. Static characteristics

Table 7. Static characteristics

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

Symbol	Parameter	Conditions	Min	Typ[1]	Max	Unit
T_{amb} = -40 °C to +85 °C						
V _{OL}	LOW-level output voltage	V _I = V _{T+} or V _{T-}				
		I _O = 100 μA; V _{CC} = 1.65 V to 5.5 V	-	-	0.1	V
		I _O = 4 mA; V _{CC} = 1.65 V	-	-	0.45	V
		I _O = 8 mA; V _{CC} = 2.3 V	-	-	0.3	V
		I _O = 12 mA; V _{CC} = 2.7 V	-	-	0.4	V
		I _O = 24 mA; V _{CC} = 3.0 V	-	-	0.55	V
		I _O = 32 mA; V _{CC} = 4.5 V	-	-	0.55	V
V _{OH}	HIGH-level output voltage	V _I = V _{T+} or V _{T-}				
		I _O = -100 μA; V _{CC} = 1.65 V to 5.5 V	V _{CC} - 0.1	-	-	V
		I _O = -4 mA; V _{CC} = 1.65 V	1.2	-	-	V
		I _O = -8 mA; V _{CC} = 2.3 V	1.9	-	-	V
		I _O = -12 mA; V _{CC} = 2.7 V	2.2	-	-	V
		I _O = -24 mA; V _{CC} = 3.0 V	2.3	-	-	V
		I _O = -32 mA; V _{CC} = 4.5 V	3.8	-	-	V
I _I	input leakage current	V _I = 5.5 V or GND; V _{CC} = 5.5 V	-	±0.1	±1	μA
I _{OFF}	power-off leakage current	V _I or V _O = 5.5 V; V _{CC} = 0 V	-	±0.1	±2	μA
I _{CC}	supply current	V _I = V _{CC} or GND; I _O = 0 A; V _{CC} = 5.5 V	-	0.1	4	μA
ΔI _{CC}	additional supply current	V _I = V _{CC} - 0.6 V; I _O = 0 A; V _{CC} = 2.3 V to 5.5 V	-	5	500	μA
C _I	input capacitance		-	3.5	-	pF

Dual non-inverting Schmitt trigger with 5 V tolerant input

Symbol	Parameter	Conditions	Min	Typ[1]	Max	Unit
T_{amb} = -40 °C to +125 °C						
V _{OL}	LOW-level output voltage	V _I = V _{T+} or V _{T-}				
		I _O = 100 μA; V _{CC} = 1.65 V to 5.5 V	-	-	0.1	V
		I _O = 4 mA; V _{CC} = 1.65 V	-	-	0.70	V
		I _O = 8 mA; V _{CC} = 2.3 V	-	-	0.45	V
		I _O = 12 mA; V _{CC} = 2.7 V	-	-	0.60	V
		I _O = 24 mA; V _{CC} = 3.0 V	-	-	0.80	V
V _{OH}	HIGH-level output voltage	V _I = V _{T+} or V _{T-}				
		I _O = -100 μA; V _{CC} = 1.65 V to 5.5 V	V _{CC} - 0.1	-	-	V
		I _O = -4 mA; V _{CC} = 1.65 V	0.95	-	-	V
		I _O = -8 mA; V _{CC} = 2.3 V	1.7	-	-	V
		I _O = -12 mA; V _{CC} = 2.7 V	1.9	-	-	V
		I _O = -24 mA; V _{CC} = 3.0 V	2.0	-	-	V
I _I	input leakage current	V _I = 5.5 V or GND; V _{CC} = 5.5 V	-	±0.1	±1	μA
		V _I or V _O = 5.5 V; V _{CC} = 0 V	-	-	±2	μA
I _{OFF}	power-off leakage current	V _I or V _O = 5.5 V; V _{CC} = 0 V	-	-	±2	μA
I _{CC}	supply current	V _I = V _{CC} or GND; I _O = 0 A; V _{CC} = 5.5 V	-	-	4	μA
ΔI _{CC}	additional supply current	V _I = V _{CC} - 0.6 V; I _O = 0 A; V _{CC} = 2.3 V to 5.5 V	-	-	500	μA

[1] All typical values are measured at V_{CC} = 3.3 V and T_{amb} = 25 °C.

12. Dynamic characteristics

Table 8. Dynamic characteristics

Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 5.

Symbol	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 Fig. 4 [2]						
		V _{CC} = 1.65 V to 1.95 V	1.5	5.6	10.5	1.5	13.1	ns
		V _{CC} = 2.3 V to 2.7 V	1.0	3.7	6.5	1.0	8.5	ns
		V _{CC} = 2.7 V	1.0	3.8	6.5	1.0	8.5	ns
		V _{CC} = 3.0 V to 3.6 V	1.0	3.6	5.7	1.0	7.1	ns
		V _{CC} = 4.5 V to 5.5 V	1.0	2.7	4.3	1.0	5.4	ns
C _{PD}	power dissipation capacitance	per buffer; V _{CC} = 3.3 V; [3] V _I = GND to V _{CC}	-	16.3	-	-	-	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.

[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 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;

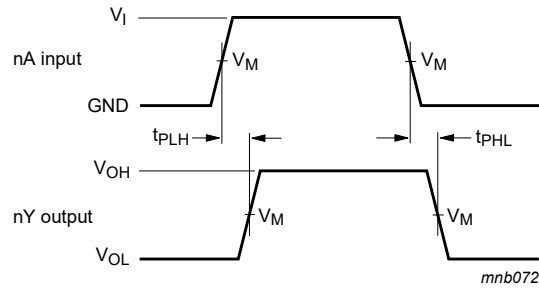
C_L = output load capacitance in pF;

V_{CC} = supply voltage in V;

N = number of inputs switching;

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

12.1. Waveforms and test circuit



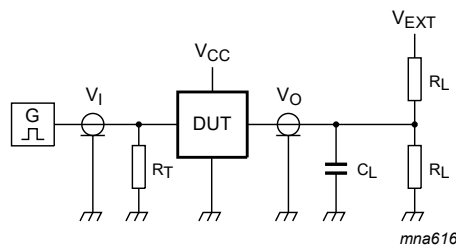
Measurement points are given in [Table 9](#).

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

Fig. 4. The input (nA) to output (nY) propagation delays and the output transition times

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	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$



Measurement points are 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 output impedance Z_o of the pulse generator.

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

Fig. 5. Test circuit for measuring switching times

Table 10. Test data

Supply voltage	Input	Load		V_{EXT}	
V_{CC}	V_I	t_r, t_f	C_L	R_L	t_{PLH}, t_{PHL}
1.65 V to 1.95 V	V_{CC}	≤ 2.0 ns	30 pF	1 k Ω	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. Transfer characteristics

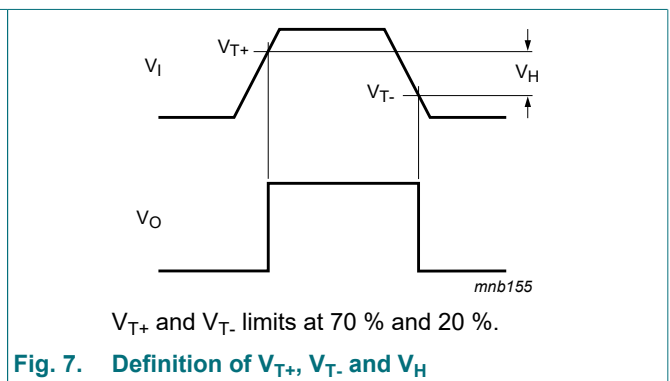
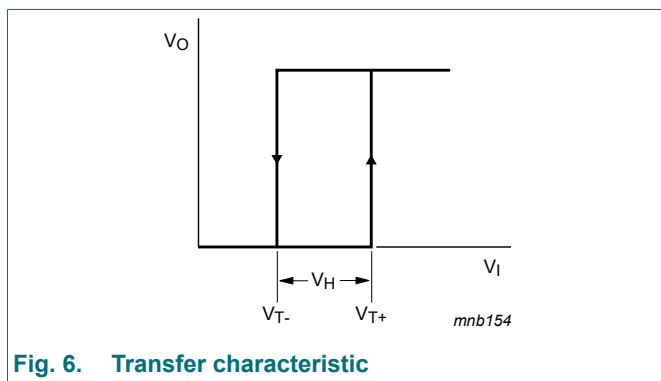
Table 11. Transfer characteristics

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

Symbol	Parameter	Conditions	-40 °C to +85 °C			-40 °C to +125 °C		Unit
			Min	Typ[1]	Max	Min	Max	
V_{T+}	positive-going threshold voltage	see Fig. 6 and Fig. 7						
		$V_{CC} = 1.8 \text{ V}$	0.70	1.10	1.50	0.70	1.70	V
		$V_{CC} = 2.3 \text{ V}$	1.00	1.40	1.80	1.00	2.00	V
		$V_{CC} = 3.0 \text{ V}$	1.30	1.76	2.20	1.30	2.40	V
		$V_{CC} = 4.5 \text{ V}$	1.90	2.47	3.10	1.90	3.30	V
V_{T-}	negative-going threshold voltage	see Fig. 6 and Fig. 7						
		$V_{CC} = 1.8 \text{ V}$	0.25	0.61	0.90	0.25	1.10	V
		$V_{CC} = 2.3 \text{ V}$	0.40	0.80	1.15	0.40	1.35	V
		$V_{CC} = 3.0 \text{ V}$	0.60	1.04	1.50	0.60	1.70	V
		$V_{CC} = 4.5 \text{ V}$	1.00	1.55	2.00	1.00	2.20	V
V_H	hysteresis voltage	$(V_{T+} - V_{T-})$; see Fig. 6 , Fig. 7 and Fig. 8						
		$V_{CC} = 1.8 \text{ V}$	0.15	0.49	1.00	0.15	1.20	V
		$V_{CC} = 2.3 \text{ V}$	0.25	0.60	1.10	0.25	1.30	V
		$V_{CC} = 3.0 \text{ V}$	0.40	0.73	1.20	0.40	1.40	V
		$V_{CC} = 4.5 \text{ V}$	0.60	0.92	1.50	0.60	1.70	V
		$V_{CC} = 5.5 \text{ V}$	0.70	1.02	1.70	0.70	1.90	V

[1] All typical values are measured at $T_{amb} = 25 \text{ °C}$.

13.1. Waveforms transfer characteristics



Dual non-inverting Schmitt trigger with 5 V tolerant input

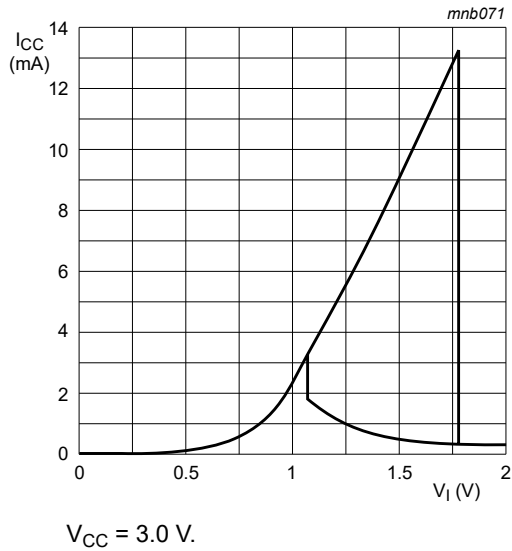
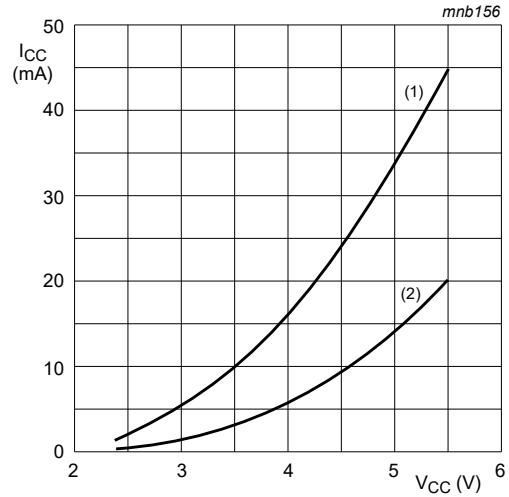


Fig. 8. Typical transfer characteristic



(1) Positive-going edge

(2) Negative-going edge

Linear change of V_I between 0.8 V to 2.0 V. All values given are typical unless otherwise specified.

Fig. 9. Average I_{CC} as a function of V_{CC}

14. Package outline

TSSOP6: plastic thin shrink small outline package; 6 leads; body width 1.25 mm

SOT363-2

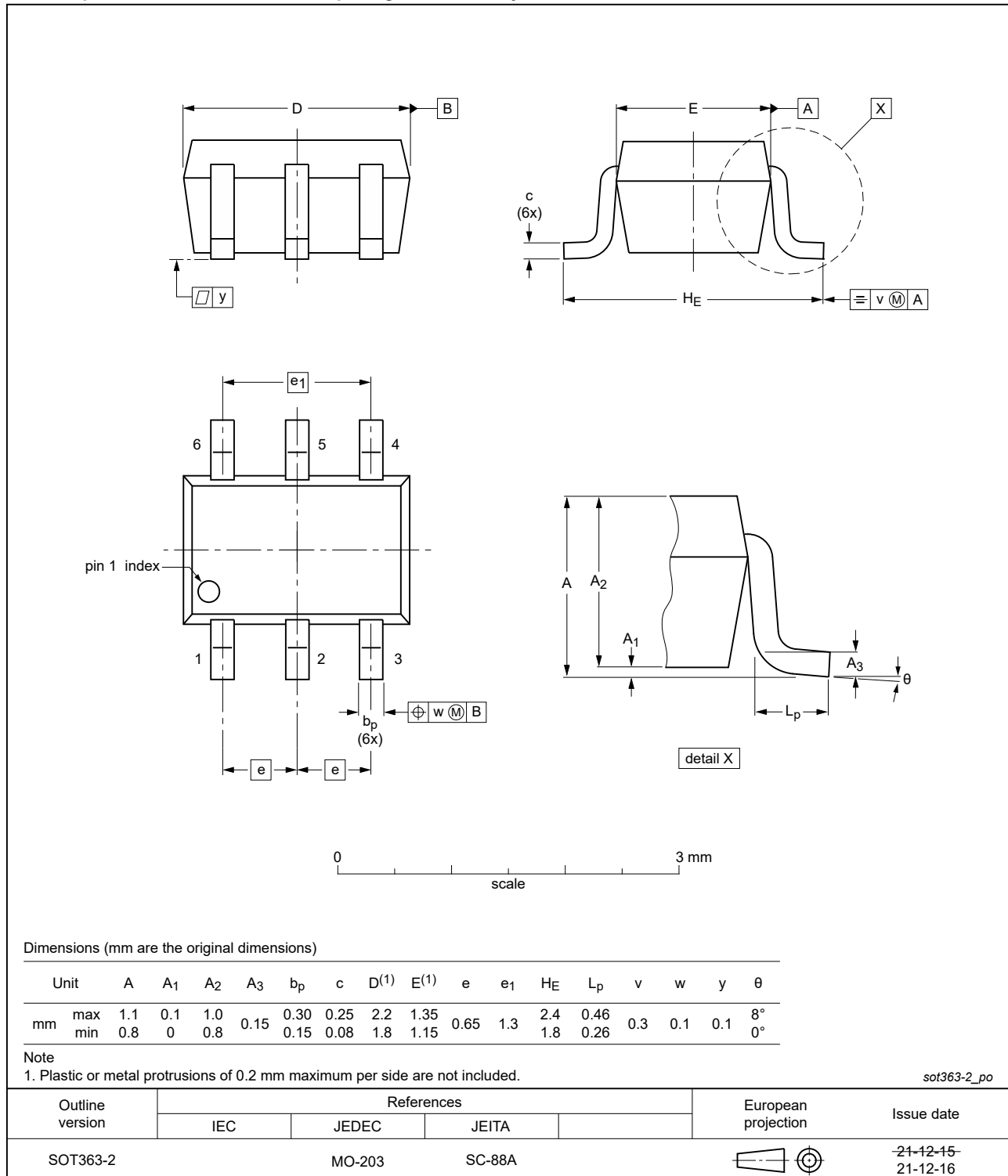


Fig. 10. Package outline SOT363-2 (TSSOP6)

Plastic, surface-mounted package (SC-74; TSOP6); 6 leads

SOT457

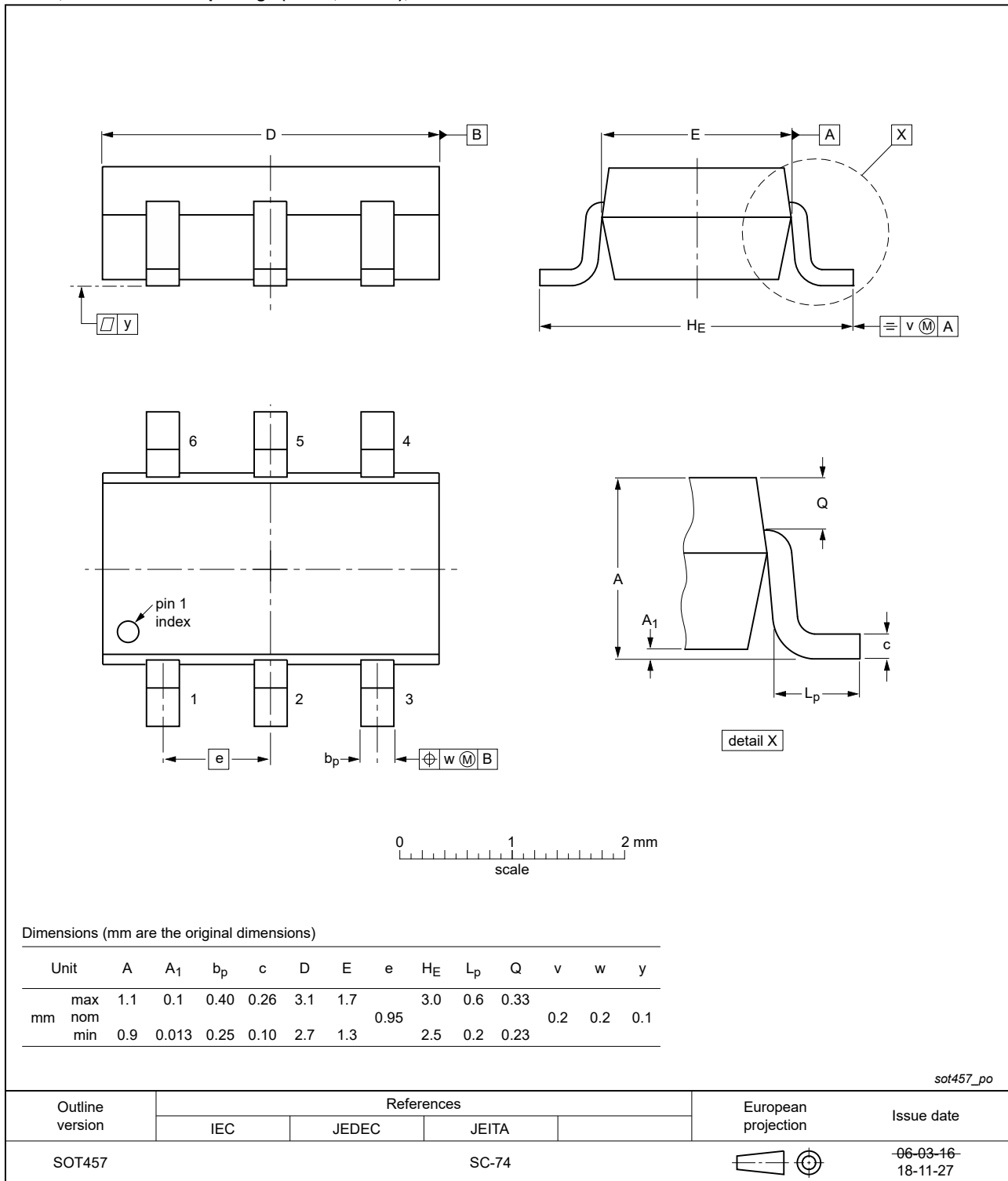


Fig. 11. Package outline SOT457 (SC-74; TSOP6)

XSON6: plastic extremely thin small outline package; no leads; 6 terminals; body 1 x 1.45 x 0.5 mm

SOT886

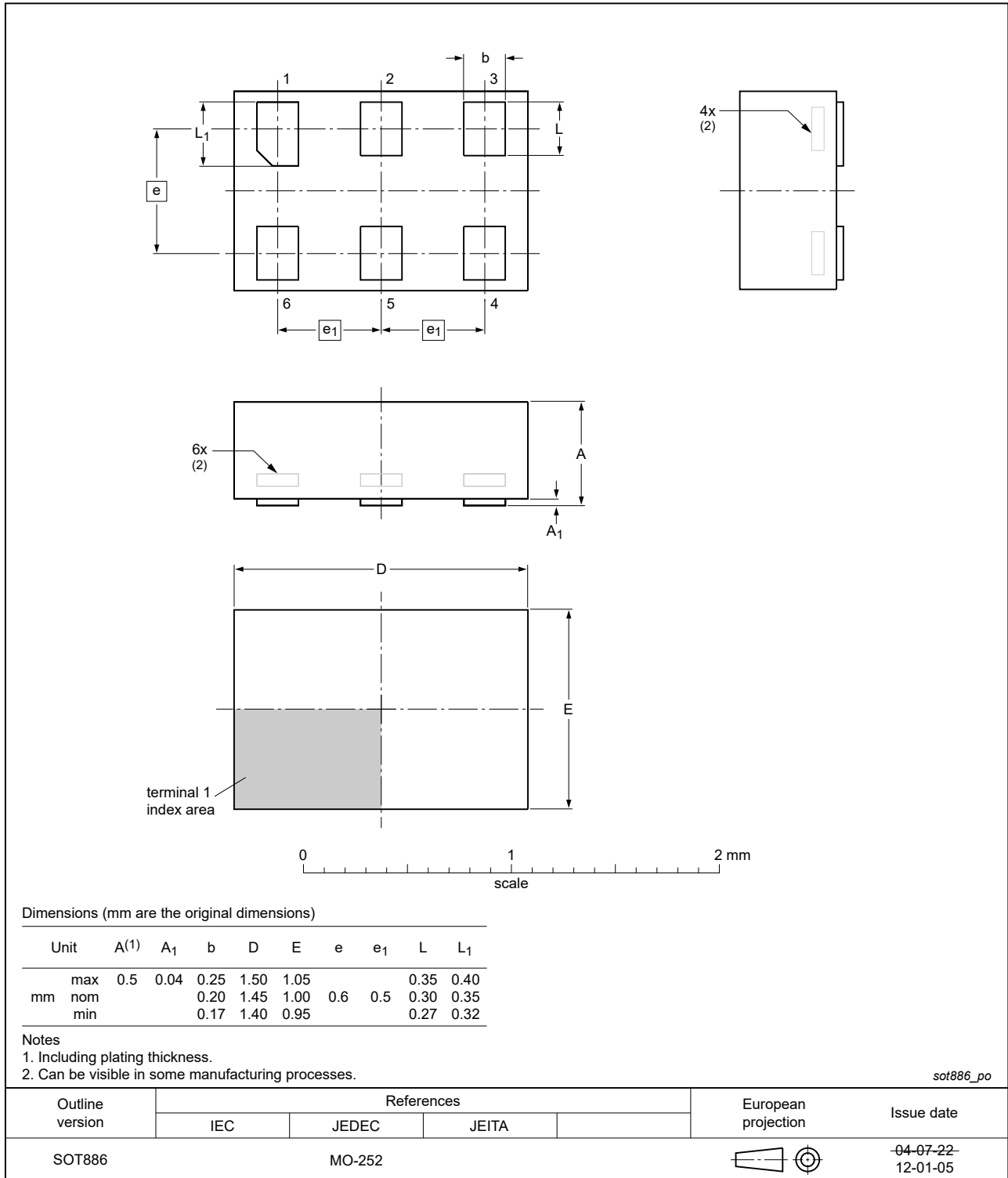
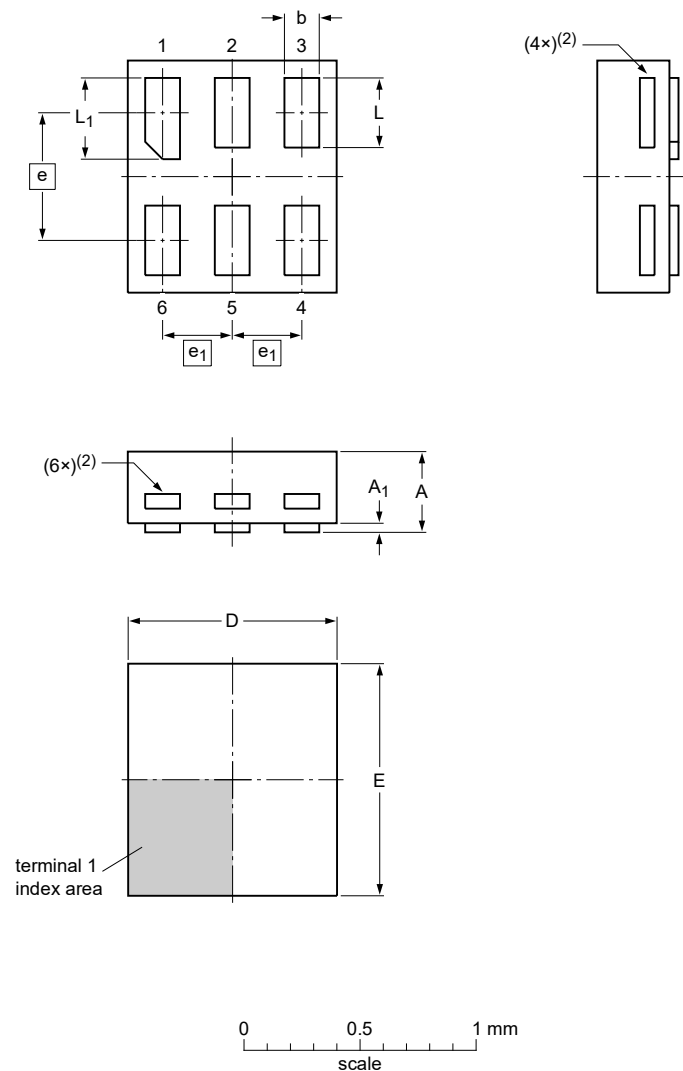


Fig. 12. Package outline SOT886 (XSON6)

XSON6: extremely thin small outline package; no leads;
6 terminals; body 0.9 x 1.0 x 0.35 mm

SOT1115



Dimensions

Unit	A ⁽¹⁾	A ₁	b	D	E	e	e ₁	L	L ₁
mm	max 0.35	0.04	0.20	0.95	1.05			0.35	0.40
	nom		0.15	0.90	1.00	0.55	0.3	0.30	0.35
	min		0.12	0.85	0.95			0.27	0.32

Note

- Including plating thickness.
- Visible depending upon used manufacturing technology.

sot1115_po


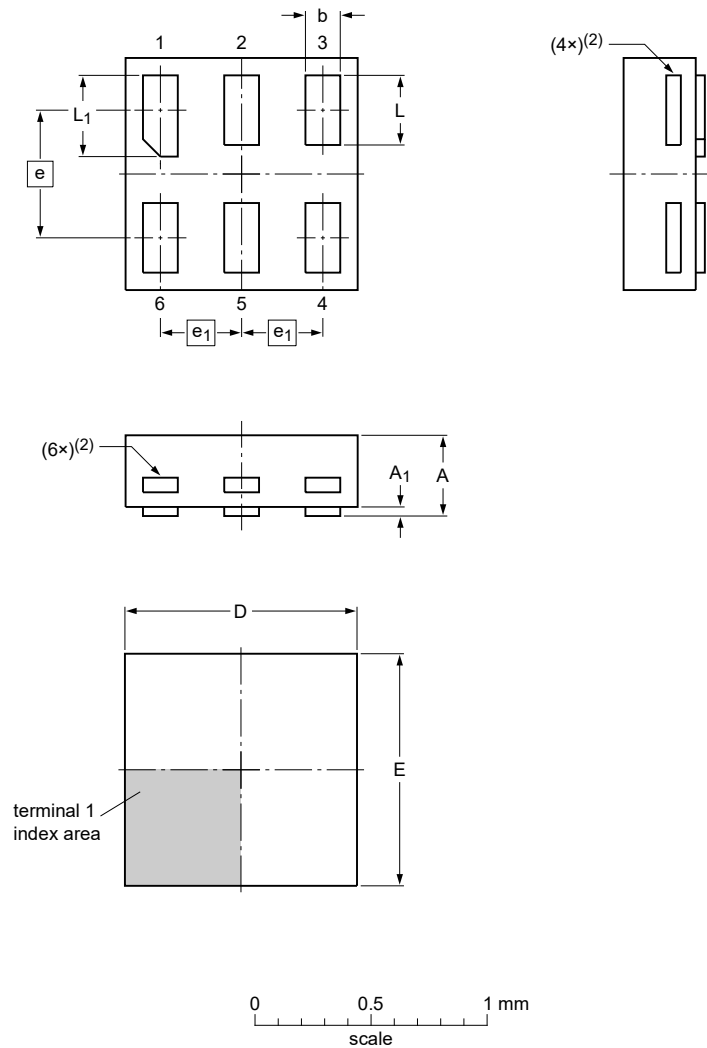
Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT1115						10-04-02 10-04-07

Fig. 13. Package outline SOT1115 (XSON6)

**XSON6: extremely thin small outline package; no leads;
6 terminals; body 1.0 x 1.0 x 0.35 mm**

SOT1202



Dimensions

Unit	A ⁽¹⁾	A ₁	b	D	E	e	e ₁	L	L ₁
mm	max	0.35	0.04	0.20	1.05	1.05		0.35	0.40
	nom			0.15	1.00	1.00	0.55	0.30	0.35
	min			0.12	0.95	0.95		0.27	0.32

Note

- Including plating thickness.
- Visible depending upon used manufacturing technology.

sot1202_po

Outline version	References			European projection	Issue date
	IEC	JEDEC	JEITA		
SOT1202					10-04-02 10-04-06

Fig. 14. Package outline SOT1202 (XSON6)

15. Abbreviations

Table 12. Abbreviations

Acronym	Description
CDM	Charged Device Model
CMOS	Complementary Metal-Oxide Semiconductor
DUT	Device Under Test
ESD	ElectroStatic Discharge
HBM	Human Body Model
TTL	Transistor-Transistor Logic

16. Revision history

Table 13. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
74LVC2G17 v.12	20230821	Product data sheet	-	74LVC2G17 v.11
Modifications:	<ul style="list-style-type: none"> Section 2: ESD specification updated according to the latest JEDEC standard. 			
74LVC2G17 v.11	20220124	Product data sheet	-	74LVC2G17 v.10
Modifications:	<ul style="list-style-type: none"> Package SOT363 (SC-88) changed to SOT363-2 (TSSOP6). 			
74LVC2G17 v.10	20210621	Product data sheet	-	74LVC2G17 v.9
Modifications:	<ul style="list-style-type: none"> 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. Type number 74LVC2G17GF (SOT891 / XSON6) removed. Section 1 and Section 2 updated. Section 9: Derating values for P_{tot} total power dissipation updated. Fig. 11: Package outline drawing SOT457 (SC-74; TSOP6) updated. 			
74LVC2G17 v.9	20161215	Product data sheet	-	74LVC2G17 v.8
Modifications:	<ul style="list-style-type: none"> Table 7: The maximum limits for leakage current and supply current have changed. 			
74LVC2G17 v.8	20130502	Product data sheet	-	74LVC2G17 v.7
Modifications:	<ul style="list-style-type: none"> Table 3: the description of pin 6 changed from data input to data output. 			
74LVC2G17 v.6	20110921	Product data sheet	-	74LVC2G17 v.5
74LVC2G17 v.5	20100806	Product data sheet	-	74LVC2G17 v.4
74LVC2G17 v.4	20061009	Product data sheet	-	74LVC2G17 v.3
74LVC2G17 v.3	20050926	Product data sheet	-	74LVC2G17 v.2
74LVC2G17 v.2	20040908	Product specification	-	74LVC2G17 v.1
74LVC2G17 v.1	20030813	Product specification	-	-

17. 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.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

- [1] Please consult the most recently issued document before initiating or completing a design.
- [2] The term 'short data sheet' is explained in section "Definitions".
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Contents

1. General description	1
2. Features and benefits	1
3. Applications	1
4. Ordering information	2
5. Marking	2
6. Functional diagram	2
7. Pinning information	3
7.1. Pinning.....	3
7.2. Pin description.....	3
8. Functional description	3
9. Limiting values	4
10. Recommended operating conditions	4
11. Static characteristics	5
12. Dynamic characteristics	6
12.1. Waveforms and test circuit.....	7
13. Transfer characteristics	8
13.1. Waveforms transfer characteristics.....	8
14. Package outline	10
15. Abbreviations	15
16. Revision history	15
17. Legal information	16

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