

DATA SHEET

74LVC1G126

Bus buffer/line driver; 3-state

Product specification
Supersedes data of 2002 Oct 02

2004 Sep 21

Bus buffer/line driver; 3-state

74LVC1G126

FEATURES

- Wide supply voltage range from 1.65 V 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)
 - JESD8B/JESD36 (2.7 V to 3.6 V).
- ± 24 mA output drive ($V_{CC} = 3.0$ 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
- ESD protection:
 - HBM EIA/JESD22-A114-B exceeds 2000 V
 - MM EIA/JESD22-A115-A exceeds 200 V.
- Specified from -40 °C to $+85$ °C and -40 °C to $+125$ °C.

DESCRIPTION

The 74LVC1G126 is a high-performance, low-power, low-voltage, Si-gate CMOS device, superior to most advanced CMOS compatible TTL families.

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.

The 74LVC1G126 provides one non-inverting buffer/line driver with 3-state output. The 3-state output is controlled by the output enable input (OE). A low level at pin OE causes the output to assume a high-impedance OFF-state.

QUICK REFERENCE DATA

GND = 0 V; $T_{amb} = 25$ °C; $t_r = t_f \leq 2.5$ ns.

| SYMBOL | PARAMETER | CONDITIONS | TYPICAL | UNIT |
|-------------------|---------------------------------------|---|---------|------|
| t_{PHL}/t_{PLH} | propagation delay input A to output Y | $V_{CC} = 1.8$ V; $C_L = 30$ pF; $R_L = 1$ k Ω | 3.0 | ns |
| | | $V_{CC} = 2.5$ V; $C_L = 30$ pF; $R_L = 500$ Ω | 2.1 | ns |
| | | $V_{CC} = 2.7$ V; $C_L = 50$ pF; $R_L = 500$ Ω | 2.3 | ns |
| | | $V_{CC} = 3.3$ V; $C_L = 50$ pF; $R_L = 500$ Ω | 2.0 | ns |
| | | $V_{CC} = 5.0$ V; $C_L = 50$ pF; $R_L = 500$ Ω | 1.7 | ns |
| C_I | input capacitance | | 5 | pF |
| C_{PD} | power dissipation capacitance | output enabled; notes 1 and 2 | 25 | pF |
| | | output disabled; notes 1 and 2 | 6 | pF |

Notes

1. C_{PD} is used to determine the dynamic power dissipation (P_D in μ W).

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

f_i = input frequency in MHz;

f_o = output frequency in MHz;

C_L = output load capacitance in pF;

V_{CC} = supply voltage in Volts;

N = total switching outputs;

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

2. The condition is $V_i = \text{GND}$ to V_{CC} .

Bus buffer/line driver; 3-state

74LVC1G126

FUNCTION TABLE

See note 1.

| INPUT | | OUTPUT |
|-------|---|--------|
| OE | A | Y |
| H | L | L |
| H | H | H |
| L | X | Z |

Note

1. H = HIGH voltage level;
L = LOW voltage level;
X = don't care;
Z = high-impedance OFF-state.

ORDERING INFORMATION

| TYPE NUMBER | PACKAGE | | | | | |
|--------------|-------------------|------|---------|----------|--------|---------|
| | TEMPERATURE RANGE | PINS | PACKAGE | MATERIAL | CODE | MARKING |
| 74LVC1G126GW | -40 °C to +125 °C | 5 | TSSOP5 | plastic | SOT353 | VN |
| 74LVC1G126GV | -40 °C to +125 °C | 5 | SC-74A | plastic | SOT753 | V26 |
| 74LVC1G126GM | -40 °C to +125 °C | 6 | XSON6 | plastic | SOT886 | VN |

PINNING

| PIN TSSOP5; SC-74A | PIN XSON6 | SYMBOL | DESCRIPTION |
|--------------------|-----------|-----------------|---------------------|
| 1 | 1 | OE | output enable input |
| 2 | 2 | A | data input A |
| 3 | 3 | GND | ground (0 V) |
| 4 | 4 | Y | data output Y |
| - | 5 | n.c. | not connected |
| 5 | 6 | V _{CC} | supply voltage |

Bus buffer/line driver; 3-state

74LVC1G126

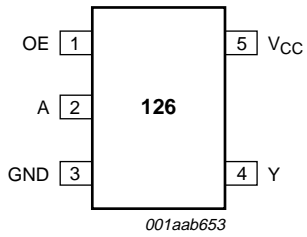


Fig.1 Pin configuration SC-88A; SC-74A.

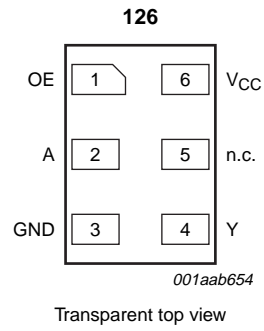


Fig.2 Pin configuration XSON6.

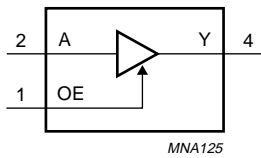


Fig.3 Logic symbol.

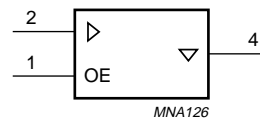


Fig.4 IEE/IEC logic symbol.

Bus buffer/line driver; 3-state

74LVC1G126

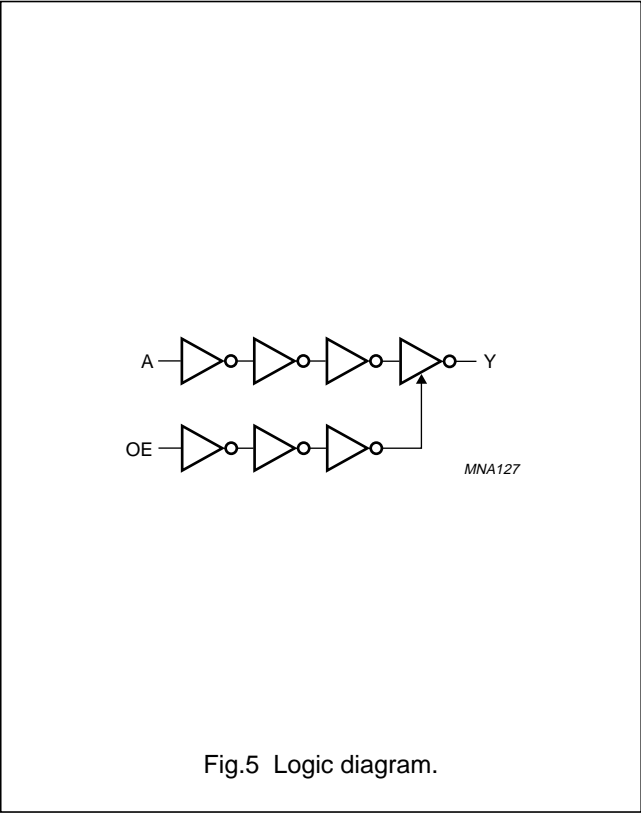


Fig.5 Logic diagram.

Bus buffer/line driver; 3-state

74LVC1G126

RECOMMENDED OPERATING CONDITIONS

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|------------|-------------------------------|---|------|----------|------|
| V_{CC} | supply voltage | | 1.65 | 5.5 | V |
| V_I | input voltage | | 0 | 5.5 | V |
| V_O | output voltage | $V_{CC} = 1.65\text{ V to }5.5\text{ V}$; enable mode | 0 | V_{CC} | V |
| | | $V_{CC} = 1.65\text{ V to }5.5\text{ V}$; disable mode | 0 | 5.5 | V |
| | | $V_{CC} = 0\text{ V}$; Power-down mode | 0 | 5.5 | V |
| T_{amb} | operating ambient temperature | | -40 | +125 | °C |
| t_r, t_f | input rise and fall times | $V_{CC} = 1.65\text{ V to }2.7\text{ V}$ | 0 | 20 | ns/V |
| | | $V_{CC} = 2.7\text{ V to }5.5\text{ V}$ | 0 | 10 | ns/V |

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 diode current | $V_I < 0\text{ V}$ | - | -50 | mA |
| V_I | input voltage | note 1 | -0.5 | +6.5 | V |
| I_{OK} | output diode current | $V_O > V_{CC}$ or $V_O < 0\text{ V}$ | - | ±50 | mA |
| V_O | output voltage | enable mode; notes 1 and 2 | -0.5 | $V_{CC} + 0.5$ | V |
| | | disable mode; notes 1 and 2 | -0.5 | +6.5 | V |
| | | Power-down mode; notes 1 and 2 | -0.5 | +6.5 | V |
| I_O | output source or sink current | $V_O = 0\text{ V to }V_{CC}$ | - | ±50 | mA |
| I_{CC}, I_{GND} | V_{CC} or GND current | | - | ±100 | mA |
| T_{stg} | storage temperature | | -65 | +150 | °C |
| P_{tot} | power dissipation | $T_{amb} = -40\text{ °C to }+125\text{ °C}$ | - | 250 | mW |

Notes

1. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.
2. When $V_{CC} = 0\text{ V}$ (Power-down mode), the output voltage can be 5.5 V in normal operation.

Bus buffer/line driver; 3-state

74LVC1G126

DC CHARACTERISTICS

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

| SYMBOL | PARAMETER | TEST CONDITIONS | | MIN. | TYP. ⁽¹⁾ | MAX. | UNIT |
|---|---|--|---------------------|------------------------|---------------------|------------------------|------|
| | | OTHER | V _{CC} (V) | | | | |
| T_{amb} = -40 °C to +85 °C | | | | | | | |
| V _{IH} | HIGH-level input voltage | | 1.65 to 1.95 | 0.65 × V _{CC} | – | – | V |
| | | | 2.3 to 2.7 | 1.7 | – | – | V |
| | | | 2.7 to 3.6 | 2.0 | – | – | V |
| | | | 4.5 to 5.5 | 0.7 × V _{CC} | – | – | V |
| V _{IL} | LOW-level input voltage | | 1.65 to 1.95 | – | – | 0.35 × V _{CC} | V |
| | | | 2.3 to 2.7 | – | – | 0.7 | V |
| | | | 2.7 to 3.6 | – | – | 0.8 | V |
| | | | 4.5 to 5.5 | – | – | 0.3 × V _{CC} | V |
| V _{OL} | LOW-level output voltage | V _I = V _{IH} or V _{IL} I _O = 100 μA | 1.65 to 5.5 | – | – | 0.1 | V |
| | | I _O = 4 mA | 1.65 | – | – | 0.45 | V |
| | | I _O = 8 mA | 2.3 | – | – | 0.3 | V |
| | | I _O = 12 mA | 2.7 | – | – | 0.4 | V |
| | | I _O = 24 mA | 3.0 | – | – | 0.55 | V |
| | | I _O = 32 mA | 4.5 | – | – | 0.55 | V |
| V _{OH} | HIGH-level output voltage | V _I = V _{IH} or V _{IL} I _O = -100 μA | 1.65 to 5.5 | V _{CC} - 0.1 | – | – | V |
| | | I _O = -4 mA | 1.65 | 1.2 | – | – | V |
| | | I _O = -8 mA | 2.3 | 1.9 | – | – | V |
| | | I _O = -12 mA | 2.7 | 2.2 | – | – | V |
| | | I _O = -24 mA | 3.0 | 2.3 | – | – | V |
| | | I _O = -32 mA | 4.5 | 3.8 | – | – | V |
| I _{LI} | input leakage current | V _I = 5.5 V or GND | 5.5 | – | ±0.1 | ±5 | μA |
| I _{OZ} | 3-state output OFF-state current | V _I = V _{IH} or V _{IL} ; V _O = 5.5 V or GND | 5.5 | – | ±0.1 | ±10 | μA |
| I _{off} | power OFF leakage current | V _I or V _O = 5.5 V | 0 | – | ±0.1 | ±10 | μA |
| I _{CC} | quiescent supply current | V _I = V _{CC} or GND; I _O = 0 A | 5.5 | – | 0.1 | 10 | μA |
| ΔI _{CC} | additional quiescent supply current per pin | V _I = V _{CC} - 0.6 V; I _O = 0 A | 2.3 to 5.5 | – | 5 | 500 | μA |

Bus buffer/line driver; 3-state

74LVC1G126

| SYMBOL | PARAMETER | TEST CONDITIONS | | MIN. | TYP. ⁽¹⁾ | MAX. | UNIT |
|--|---|--|---------------------|------------------------|---------------------|------------------------|------|
| | | OTHER | V _{CC} (V) | | | | |
| T_{amb} = -40 °C to +125 °C | | | | | | | |
| V _{IH} | HIGH-level input voltage | | 1.65 to 1.95 | 0.65 × V _{CC} | – | – | V |
| | | | 2.3 to 2.7 | 1.7 | – | – | V |
| | | | 2.7 to 3.6 | 2.0 | – | – | V |
| | | | 4.5 to 5.5 | 0.7 × V _{CC} | – | – | V |
| V _{IL} | LOW-level input voltage | | 1.65 to 1.95 | – | – | 0.35 × V _{CC} | V |
| | | | 2.3 to 2.7 | – | – | 0.7 | V |
| | | | 2.7 to 3.6 | – | – | 0.8 | V |
| | | | 4.5 to 5.5 | – | – | 0.3 × V _{CC} | V |
| V _{OL} | LOW-level output voltage | V _I = V _{IH} or V _{IL} I _O = 100 μA | 1.65 to 5.5 | – | – | 0.1 | V |
| | | I _O = 4 mA | 1.65 | – | – | 0.70 | V |
| | | I _O = 8 mA | 2.3 | – | – | 0.45 | V |
| | | I _O = 12 mA | 2.7 | – | – | 0.60 | V |
| | | I _O = 24 mA | 3.0 | – | – | 0.80 | V |
| | | I _O = 32 mA | 4.5 | – | – | 0.80 | V |
| V _{OH} | HIGH-level output voltage | V _I = V _{IH} or V _{IL} I _O = -100 μA | 1.65 to 5.5 | V _{CC} - 0.1 | – | – | V |
| | | I _O = -4 mA | 1.65 | 0.95 | – | – | V |
| | | I _O = -8 mA | 2.3 | 1.7 | – | – | V |
| | | I _O = -12 mA | 2.7 | 1.9 | – | – | V |
| | | I _O = -24 mA | 3.0 | 2.0 | – | – | V |
| | | I _O = -32 mA | 4.5 | 3.4 | – | – | V |
| I _{LI} | input leakage current | V _I = 5.5 V or GND | 5.5 | – | – | ±100 | μA |
| I _{OZ} | 3-state output OFF-state current | V _I = V _{IH} or V _{IL} ; V _O = 5.5 V or GND | 5.5 | – | – | ±200 | μA |
| I _{off} | power OFF leakage current | V _I or V _O = 5.5 V | 0 | – | – | ±200 | μA |
| I _{CC} | quiescent supply current | V _I = V _{CC} or GND; I _O = 0 A | 5.5 | – | – | 200 | μA |
| ΔI _{CC} | additional quiescent supply current per pin | V _I = V _{CC} - 0.6 V; I _O = 0 A | 2.3 to 5.5 | – | – | 5000 | μA |

Note

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

Bus buffer/line driver; 3-state

74LVC1G126

AC CHARACTERISTICS

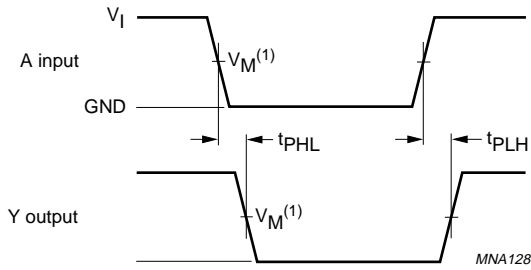
GND = 0 V; $t_r = t_f \leq 2.0$ ns.

| SYMBOL | PARAMETER | TEST CONDITIONS | | MIN. | TYP. | MAX. | UNIT |
|--|--|------------------|---------------------|------|------|------|------|
| | | WAVEFORMS | V _{CC} (V) | | | | |
| T_{amb} = -40 °C to +85 °C | | | | | | | |
| t _{PHL} /t _{PLH} | propagation delay A to Y | see Figs 6 and 8 | 1.65 to 1.95 | 1.0 | 3.0 | 8.0 | ns |
| | | | 2.3 to 2.7 | 0.5 | 2.1 | 5.5 | ns |
| | | | 2.7 | 0.5 | 2.3 | 5.5 | ns |
| | | | 3.0 to 3.6 | 0.5 | 2.0 | 4.5 | ns |
| | | | 4.5 to 5.5 | 0.5 | 1.7 | 4.0 | ns |
| t _{PZH} /t _{PZL} | 3-state output enable time input OE to Y | see Figs 7 and 8 | 1.65 to 1.95 | 1.0 | 3.2 | 9.4 | ns |
| | | | 2.3 to 2.7 | 0.5 | 2.2 | 6.6 | ns |
| | | | 2.7 | 0.5 | 2.4 | 6.6 | ns |
| | | | 3.0 to 3.6 | 0.5 | 2.1 | 5.3 | ns |
| | | | 4.5 to 5.5 | 0.5 | 1.6 | 5.0 | ns |
| t _{PHZ} /t _{PLZ} | 3-state output disable time input OE to Y | see Figs 7 and 8 | 1.65 to 1.95 | 1.0 | 4.3 | 9.2 | ns |
| | | | 2.3 to 2.7 | 0.5 | 2.7 | 5.5 | ns |
| | | | 2.7 | 0.5 | 3.4 | 5.5 | ns |
| | | | 3.0 to 3.6 | 0.5 | 3.0 | 5.5 | ns |
| | | | 4.5 to 5.5 | 0.5 | 2.2 | 4.2 | ns |
| T_{amb} = -40 °C to +125 °C | | | | | | | |
| t _{PHL} /t _{PLH} | propagation delay A to Y | see Figs 6 and 8 | 1.65 to 1.95 | 1.0 | – | 10.5 | ns |
| | | | 2.3 to 2.7 | 0.5 | – | 7 | ns |
| | | | 2.7 | 0.5 | – | 7 | ns |
| | | | 3.0 to 3.6 | 0.5 | – | 6 | ns |
| | | | 4.5 to 5.5 | 0.5 | – | 5.5 | ns |
| t _{PZH} /t _{PZL} | 3-state output enable time input OE to Y | see Figs 7 and 8 | 1.65 to 1.95 | 1.0 | – | 12 | ns |
| | | | 2.3 to 2.7 | 0.5 | – | 8.5 | ns |
| | | | 2.7 | 0.5 | – | 8.5 | ns |
| | | | 3.0 to 3.6 | 0.5 | – | 7 | ns |
| | | | 4.5 to 5.5 | 0.5 | – | 6.5 | ns |
| t _{PHZ} /t _{PLZ} | 3-state output disable time input OE to Y | see Figs 7 and 8 | 1.65 to 1.95 | 1.0 | – | 12 | ns |
| | | | 2.3 to 2.7 | 0.5 | – | 7 | ns |
| | | | 2.7 | 0.5 | – | 7 | ns |
| | | | 3.0 to 3.6 | 0.5 | – | 7 | ns |
| | | | 4.5 to 5.5 | 0.5 | – | 5.5 | ns |

Bus buffer/line driver; 3-state

74LVC1G126

AC WAVEFORMS



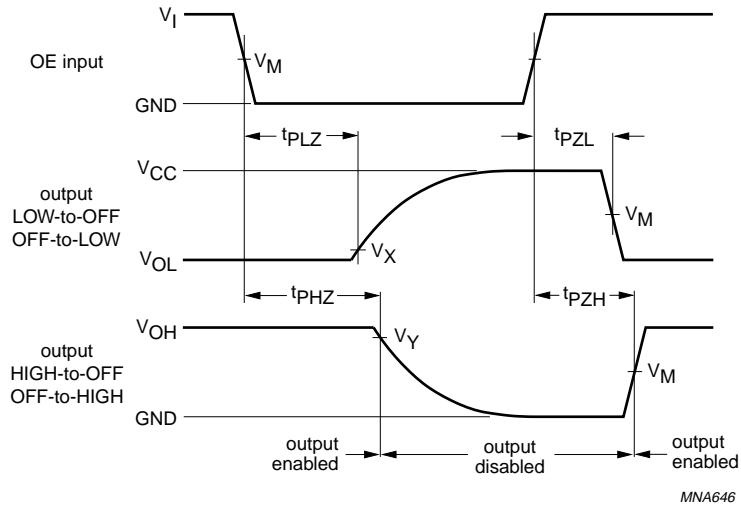
| V _{CC} | V _M | INPUT | |
|------------------|-----------------------|-----------------|---------------------------------|
| | | V _I | t _r = t _f |
| 1.65 V to 1.95 V | 0.5 × V _{CC} | V _{CC} | ≤ 2.0 ns |
| 2.3 V to 2.7 V | 0.5 × V _{CC} | V _{CC} | ≤ 2.0 ns |
| 2.7 V | 1.5 V | 2.7 V | ≤ 2.5 ns |
| 3.0 V to 3.6 V | 1.5 V | 2.7 V | ≤ 2.5 ns |
| 4.5 V to 5.5 V | 0.5 × V _{CC} | V _{CC} | ≤ 2.5 ns |

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

Fig.6 Input A to output Y propagation delay times.

Bus buffer/line driver; 3-state

74LVC1G126



| V _{CC} | V _M | INPUT | |
|------------------|-----------------------|-----------------|---------------------------------|
| | | V _I | t _r = t _f |
| 1.65 V to 1.95 V | 0.5 × V _{CC} | V _{CC} | ≤ 2.0 ns |
| 2.3 V to 2.7 V | 0.5 × V _{CC} | V _{CC} | ≤ 2.0 ns |
| 2.7 V | 1.5 V | 2.7 V | ≤ 2.5 ns |
| 3.0 V to 3.6 V | 1.5 V | 2.7 V | ≤ 2.5 ns |
| 4.5 V to 5.5 V | 0.5 × V _{CC} | V _{CC} | ≤ 2.5 ns |

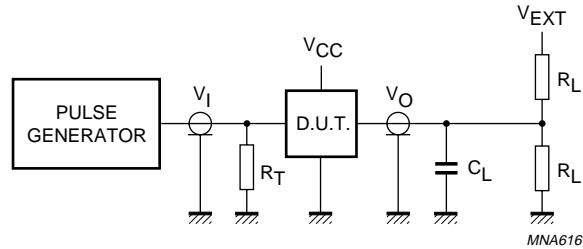
V_X = V_{OL} + 0.3 V at V_{CC} ≥ 2.7 V;
 V_X = V_{OL} + 0.15 V at V_{CC} < 2.7 V;
 V_Y = V_{OH} - 0.3 V at V_{CC} ≥ 2.7 V;
 V_Y = V_{OH} - 0.15 V at V_{CC} < 2.7 V.

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

Fig.7 3-state enable and disable times.

Bus buffer/line driver; 3-state

74LVC1G126



| V _{CC} | V _I | C _L | R _L | V _{EXT} | | |
|------------------|-----------------|----------------|----------------|------------------------------------|------------------------------------|------------------------------------|
| | | | | t _{PLH} /t _{PHL} | t _{PZH} /t _{PHZ} | t _{PZL} /t _{PLZ} |
| 1.65 V to 1.95 V | V _{CC} | 30 pF | 1 kΩ | open | GND | 2 × V _{CC} |
| 2.3 V to 2.7 V | V _{CC} | 30 pF | 500 Ω | open | GND | 2 × V _{CC} |
| 2.7 V | 2.7 V | 50 pF | 500 Ω | open | GND | 6 V |
| 3.0 V to 3.6 V | 2.7 V | 50 pF | 500 Ω | open | GND | 6 V |
| 4.5 V to 5.5 V | V _{CC} | 50 pF | 500 Ω | open | GND | 2 × V _{CC} |

Definitions for test circuits:

R_L = Load resistor.

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.

Fig.8 Load circuitry for switching times.

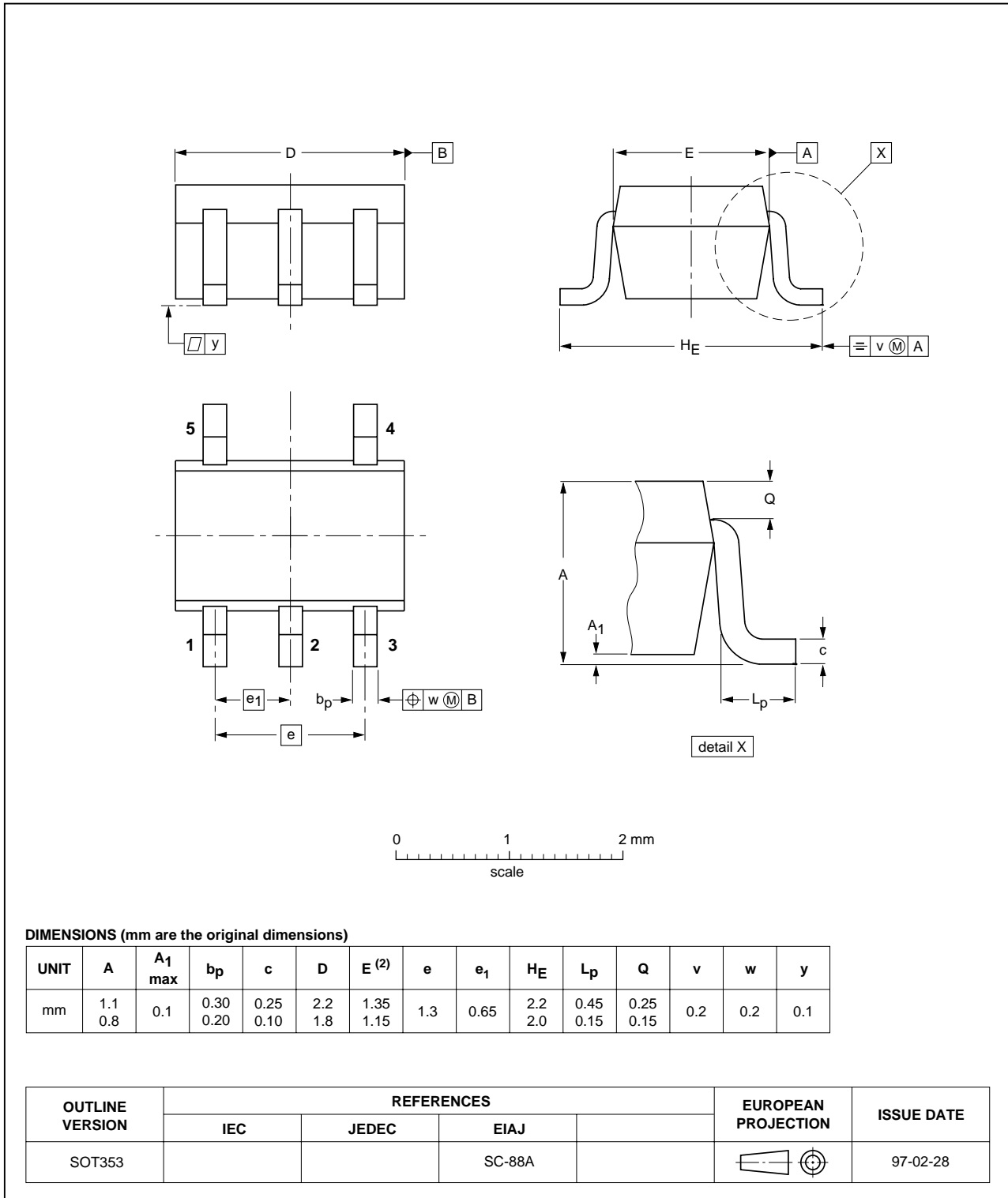
Bus buffer/line driver; 3-state

74LVC1G126

PACKAGE OUTLINES

Plastic surface mounted package; 5 leads

SOT353

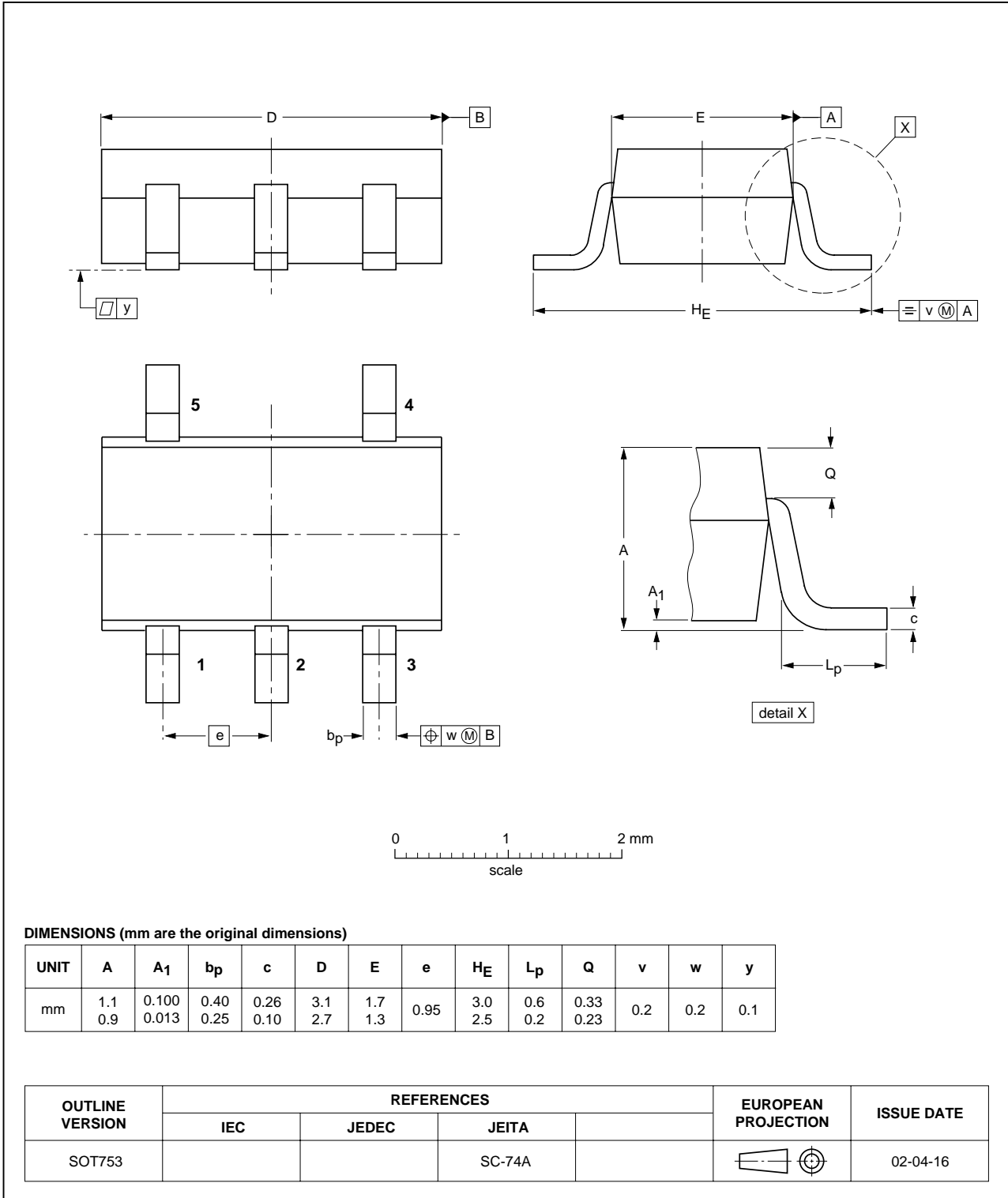


Bus buffer/line driver; 3-state

74LVC1G126

Plastic surface mounted package; 5 leads

SOT753

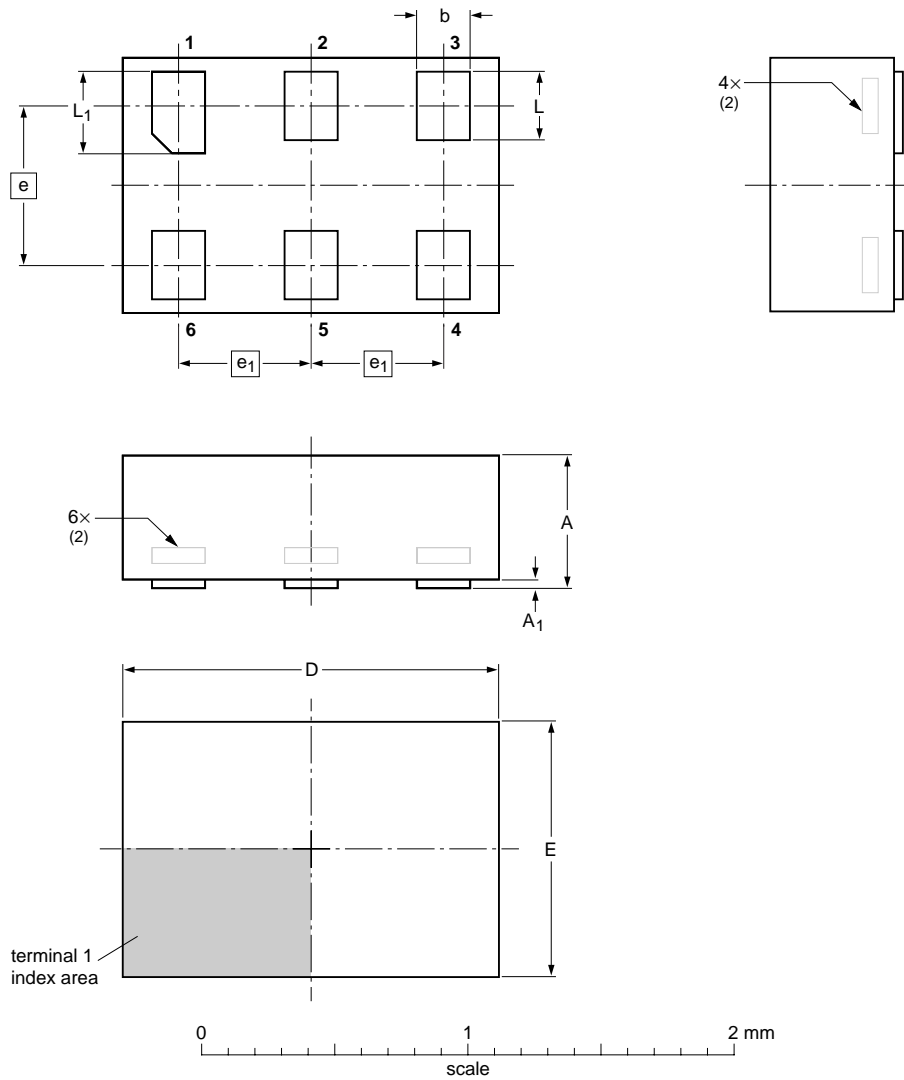


Bus buffer/line driver; 3-state

74LVC1G126

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

SOT886



DIMENSIONS (mm are the original dimensions)

| UNIT | A ⁽¹⁾ max | A ₁ max | b | D | E | e | e ₁ | L | L ₁ |
|------|-------------------------|-----------------------|--------------|------------|--------------|-----|----------------|--------------|----------------|
| mm | 0.5 | 0.04 | 0.25 0.17 | 1.5 1.4 | 1.05 0.95 | 0.6 | 0.5 | 0.35 0.27 | 0.40 0.32 |

Notes

- 1. Including plating thickness.
- 2. Can be visible in some manufacturing processes.

| OUTLINE VERSION | REFERENCES | | | EUROPEAN PROJECTION | ISSUE DATE |
|--------------------|------------|--------|-------|------------------------|----------------------|
| | IEC | JEDEC | JEITA | | |
| SOT886 | | MO-252 | | | 04-07-15 04-07-22 |

Bus buffer/line driver; 3-state

74LVC1G126

DATA SHEET STATUS

| LEVEL | DATA SHEET STATUS ⁽¹⁾ | PRODUCT STATUS ⁽²⁾⁽³⁾ | DEFINITION |
|-------|----------------------------------|----------------------------------|--|
| I | Objective data | Development | This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice. |
| II | Preliminary data | Qualification | This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Philips Semiconductors reserves the right to change the specification without notice, in order to improve the design and supply the best possible product. |
| III | Product data | Production | This data sheet contains data from the product specification. Philips Semiconductors reserves the right to make changes at any time in order to improve the design, manufacturing and supply. Relevant changes will be communicated via a Customer Product/Process Change Notification (CPCN). |

Notes

1. Please consult the most recently issued data sheet before initiating or completing a design.
2. The product status of the device(s) described in this data sheet may have changed since this data sheet was published. The latest information is available on the Internet at URL <http://www.semiconductors.philips.com>.
3. For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

DEFINITIONS

Short-form specification — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

Application information — Applications that are described herein for any of these products are for illustrative purposes only. Philips Semiconductors make no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

DISCLAIMERS

Life support applications — These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips Semiconductors customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips Semiconductors for any damages resulting from such application.

Right to make changes — Philips Semiconductors reserves the right to make changes in the products - including circuits, standard cells, and/or software - described or contained herein in order to improve design and/or performance. When the product is in full production (status 'Production'), relevant changes will be communicated via a Customer Product/Process Change Notification (CPCN). Philips Semiconductors assumes no responsibility or liability for the use of any of these products, conveys no licence or title under any patent, copyright, or mask work right to these products, and makes no representations or warranties that these products are free from patent, copyright, or mask work right infringement, unless otherwise specified.

Philips Semiconductors – a worldwide company

Contact information

For additional information please visit <http://www.semiconductors.philips.com>. Fax: +31 40 27 24825

For sales offices addresses send e-mail to: sales.addresses@www.semiconductors.philips.com.

© Koninklijke Philips Electronics N.V. 2004

SCA76

All rights are reserved. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner.

The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice. No liability will be accepted by the publisher for any consequence of its use. Publication thereof does not convey nor imply any license under patent- or other industrial or intellectual property rights.

Printed in The Netherlands

R20/05/pp17

Date of release: 2004 Sep 21

Document order number: 9397 750 13759

Let's make things better.

**Philips
Semiconductors**



PHILIPS