# 74LVC16245A; 74LVCH16245A

## 16-bit bus transceiver with direction pin; 5 V tolerant; 3-state

Rev. 13 — 13 February 2019 Product data sheet

## 1. General description

The 74LVC16245A; 74LVCH16245A are 16-bit transceivers featuring non-inverting 3-state bus compatible outputs in both send and receive directions. The device features two output enable ($n\overline{OE}$) inputs for easy cascading and two send/receive (nDIR) inputs for direction control. $n\overline{OE}$ controls the outputs so that the buses are effectively isolated. This device can be used as two 8-bit transceivers or one 16-bit transceiver.

Inputs can be driven from either 3.3 V or 5 V devices. When disabled, up to 5.5 V can be applied to the outputs. These features allow the use of these devices in mixed 3.3 V and 5 V applications.

The 74LVCH16245A bus hold on data inputs eliminates the need for external pull-up resistors to hold unused inputs.

## 2. Features and benefits

- 5 V tolerant inputs/outputs for interfacing with 5 V logic
- Wide supply voltage range from 1.2 V to 3.6 V
- CMOS low power consumption
- MULTIBYTE flow-through standard pin-out architecture
- Low inductance multiple power and ground pins for minimum noise and ground bounce
- Direct interface with TTL levels
- High-impedance when $V_{CC}$ = 0 V
- All data inputs have bus hold (74LVCH16245A only)
- Complies with JEDEC standard:
  - JESD8-7A (1.65 V to 1.95 V)
  - JESD8-5A (2.3 V to 2.7 V)
  - JESD8-C/JESD36 (2.7 V to 3.6 V)
- ESD protection:
  - HBM JESD22-A114F exceeds 2000 V
  - MM JESD22-A115-B exceeds 200 V
  - CDM ANSI/ESDA/Jedec JS-002 exceeds 1000 V
- Specified from -40 °C to +85 °C and -40 °C to +125 °C

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## 3. Ordering information

**Table 1. Ordering information**

| Type number | Temperature range | Package | | |
|---|---|---|---|---|
| | | Name | Description | Version |
| 74LVC16245ADL | -40 °C to +125 °C | SSOP48 | plastic shrink small outline package; 48 leads; body width 7.5 mm | SOT370-1 |
| 74LVCH16245ADL | | | | |
| 74LVC16245ADGG | -40 °C to +125 °C | TSSOP48 | plastic thin shrink small outline package; 48 leads; body width 6.1 mm | SOT362-1 |
| 74LVCH16245ADGG | | | | |
| 74LVC16245ADGV | -40 °C to +125 °C | TSSOP48 [1] | plastic thin shrink small outline package; 48 leads; body width 4.4 mm; lead pitch 0.4 mm | SOT480-1 |
| 74LVCH16245ADGV | | | | |

[1] Also known as TVSOP48.

## 4. Functional diagram

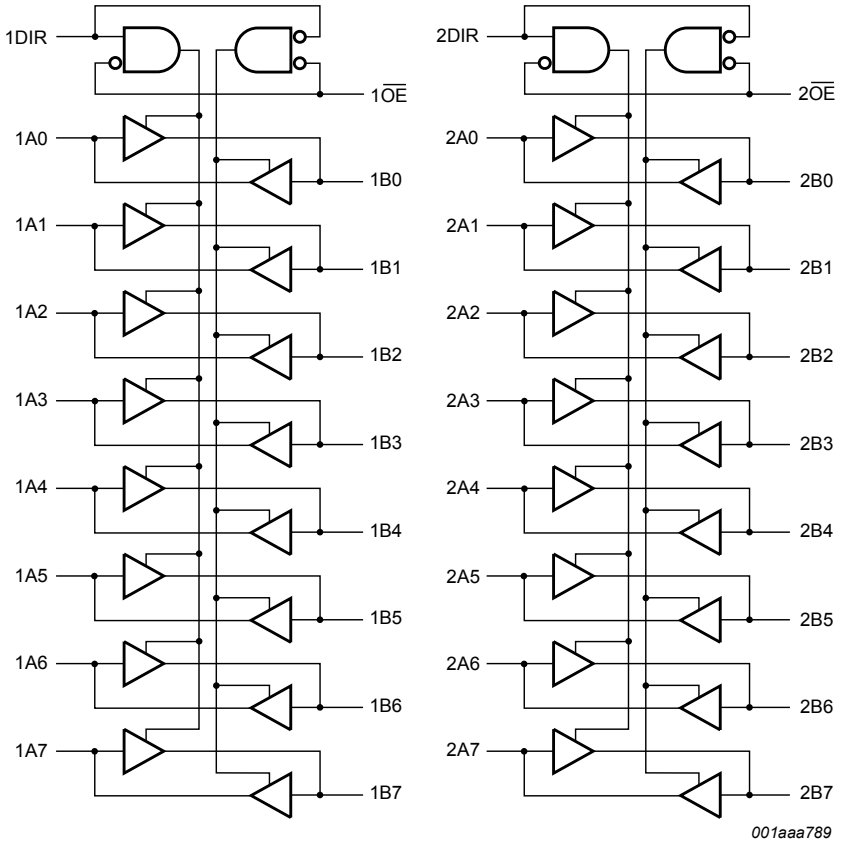


**Fig. 1. Logic symbol**


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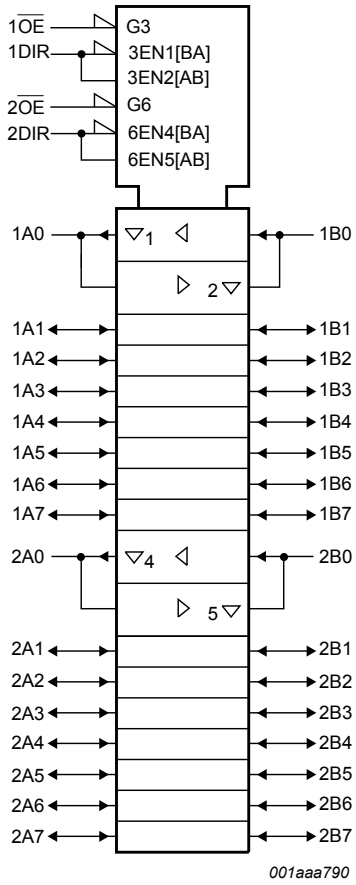


**Fig. 2. IEC logic symbol**

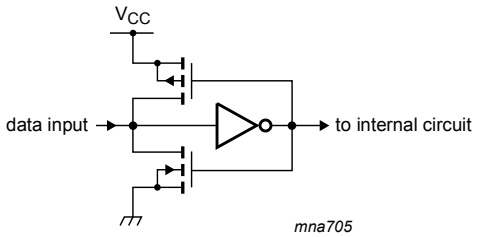


**Fig. 3. Bus hold circuit**


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# 5. Pinning information

## 5.1. Pinning

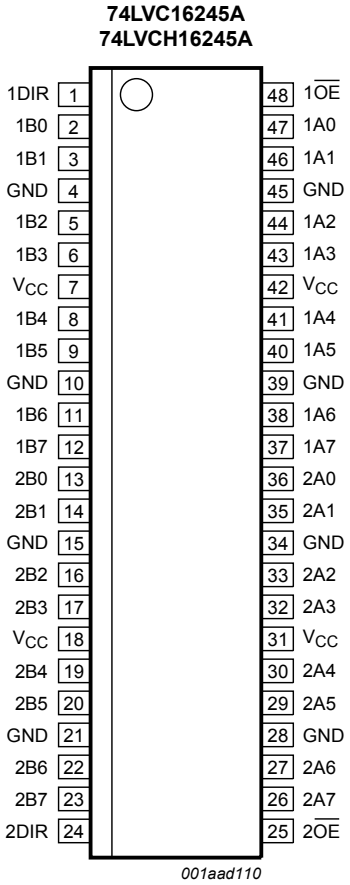


**Fig. 4. Pin configuration SOT370-1 (SSOP48), SOT362-1 (TSSOP48) and SOT480-1 (TSSOP48)**

## 5.2. Pin description

**Table 2. Pin description**

| Symbol | Pin | Description |
|---|---|---|
| 1DIR, 2DIR | 1, 24 | direction control input |
| 1B0 to 1B7 | 2, 3, 5, 6, 8, 9, 11, 12 | data input/output |
| 2B0 to 2B7 | 13, 14, 16, 17, 19, 20, 22, 23 | data input/output |
| GND | 4, 10, 15, 21, 28, 34, 39, 45 | ground (0 V) |
| $V_{CC}$ | 7, 18, 31, 42 | supply voltage |
| $1\overline{OE}$, $2\overline{OE}$ | 48, 25 | output enable input (active LOW) |
| 1A0 to 1A7 | 47, 46, 44, 43, 41, 40, 38, 37 | data input/output |
| 2A0 to 2A7 | 36, 35, 33, 32, 30, 29, 27, 26 | data input/output |


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# 6. Functional description

**Table 3. Function table**

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

| Inputs | | Outputs | |
|---|---|---|---|
| **n$\overline{OE}$** | **nDIR** | **nAn** | **nBn** |
| L | L | nAn = nBn | inputs |
| L | H | inputs | nBn = nAn |
| H | X | Z | Z |

# 7. Limiting values

**Table 4. 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 | $V_O > V_{CC}$ or $V_O < 0$ V | | - | ±50 | mA |
| $V_O$ | output voltage | output HIGH or LOW | [2] | -0.5 | $V_{CC}$ + 0.5 | V |
| | | output 3-state | [2] | -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 | [3] | - | 500 | mW |

[1] The minimum input voltage ratings may be exceeded if the input current ratings are observed.
[2] The output voltage ratings may be exceeded if the output current ratings are observed.
[3] Above 60 °C the value of $P_{tot}$ derates linearly with 5.5 mW/K.

# 8. Recommended operating conditions

**Table 5. Recommended operating conditions**

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| $V_{CC}$ | supply voltage | | 1.65 | - | 3.6 | V |
| | | functional | 1.2 | - | 3.6 | V |
| $V_I$ | input voltage | | 0 | - | 5.5 | V |
| $V_O$ | output voltage | output HIGH or LOW | 0 | - | $V_{CC}$ | V |
| | | output 3-state | 0 | - | 5.5 | V |
| $T_{amb}$ | ambient temperature | in free air | -40 | - | +125 | °C |
| $\Delta t/\Delta V$ | input transition rise and fall rate | $V_{CC}$ = 1.2 V to 2.7 V | 0 | - | 20 | ns/V |
| | | $V_{CC}$ = 2.7 V to 3.6 V | 0 | - | 10 | ns/V |


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# 9. Static characteristics

**Table 6. Static 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 | |
| $V_{IH}$ | HIGH-level input voltage | $V_{CC}$ = 1.2 V | 1.08 | - | - | 1.08 | - | V |
| | | $V_{CC}$ = 1.65 V to 1.95 V | $0.65V_{CC}$ | - | - | $0.65V_{CC}$ | - | V |
| | | $V_{CC}$ = 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 |
| $V_{IL}$ | LOW-level input voltage | $V_{CC}$ = 1.2 V | - | - | 0.12 | - | 0.12 | V |
| | | $V_{CC}$ = 1.65 V to 1.95 V | - | - | $0.35V_{CC}$ | - | $0.35V_{CC}$ | V |
| | | $V_{CC}$ = 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 |
| $V_{OH}$ | HIGH-level output voltage | $V_I = V_{IH}$ or $V_{IL}$ | | | | | | |
| | | $I_O$ = -100 µA; $V_{CC}$ = 1.65 V to 3.6 V | $V_{CC}$ - 0.2 | - | - | $V_{CC}$ - 0.3 | - | V |
| | | $I_O$ = -4 mA; $V_{CC}$ = 1.65 V | 1.2 | - | - | 1.05 | - | V |
| | | $I_O$ = -8 mA; $V_{CC}$ = 2.3 V | 1.8 | - | - | 1.65 | - | V |
| | | $I_O$ = -12 mA; $V_{CC}$ = 2.7 V | 2.2 | - | - | 2.05 | - | V |
| | | $I_O$ = -18 mA; $V_{CC}$ = 3.0 V | 2.4 | - | - | 2.25 | - | V |
| | | $I_O$ = -24 mA; $V_{CC}$ = 3.0 V | 2.2 | - | - | 2.0 | - | V |
| $V_{OL}$ | LOW-level output voltage | $V_I = V_{IH}$ or $V_{IL}$ | | | | | | |
| | | $I_O$ = 100 µA; $V_{CC}$ = 1.65 V to 3.6 V | - | - | 0.2 | - | 0.3 | V |
| | | $I_O$ = 4 mA; $V_{CC}$ = 1.65 V | - | - | 0.45 | - | 0.65 | V |
| | | $I_O$ = 8 mA; $V_{CC}$ = 2.3 V | - | - | 0.6 | - | 0.8 | 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 |
| $I_I$ | input leakage current | $V_I$ = 5.5 V or GND; $V_{CC}$ = 3.6 V [2] | - | ±0.1 | ±5 | - | ±20 | µA |
| $I_{OZ}$ | OFF-state output current | $V_I = V_{IH}$ or $V_{IL}$; $V_O$ = 5.5 V or GND; $V_{CC}$ = 3.6 V [2] [3] | - | ±0.1 | ±5 | - | ±20 | µA |
| $I_{OFF}$ | power-off leakage current | $V_I$ or $V_O$ = 5.5 V; $V_{CC}$ = 0.0 V | - | ±0.1 | ±10 | - | ±20 | µA |
| $I_{CC}$ | supply current | $V_I = V_{CC}$ or GND; $I_O$ = 0 A; $V_{CC}$ = 3.6 V | - | 0.1 | 20 | - | 80 | µA |
| $\Delta I_{CC}$ | additional supply current | per input pin; $V_I = V_{CC}$ - 0.6 V; $I_O$ = 0 A; $V_{CC}$ = 2.7 V to 3.6 V | - | 5 | 500 | - | 5000 | µA |
| $C_I$ | input capacitance | $V_{CC}$ = 0 V to 3.6 V; $V_I$ = GND to $V_{CC}$ | - | 5.0 | - | - | - | pF |
| $C_{I/O}$ | input/output capacitance | $V_{CC}$ = 0 V to 3.6 V; $V_I$ = GND to $V_{CC}$ | - | 10 | - | - | - | pF |
| $I_{BHL}$ | bus hold LOW current | $V_{CC}$ = 1.65; $V_I$ = 0.58 V [4] [5] | 10 | - | - | 10 | - | µA |
| | | $V_{CC}$ = 2.3; $V_I$ = 0.7 V | 30 | - | - | 25 | - | µA |
| | | $V_{CC}$ = 3.0; $V_I$ = 0.8 V | 75 | - | - | 60 | - | µA |


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| Symbol | Parameter | Conditions | -40 °C to +85 °C | | | -40 °C to +125 °C | | Unit |
|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ [1] | Max | Min | Max | |
| $I_{BHH}$ | bus hold HIGH current | $V_{CC}$ = 1.65; $V_I$ = 1.07 V [4] [5] | -10 | - | - | -10 | - | µA |
| | | $V_{CC}$ = 2.3; $V_I$ = 1.7 V | -30 | - | - | -25 | - | µA |
| | | $V_{CC}$ = 3.0; $V_I$ = 2.0 V | -75 | - | - | -60 | - | µA |
| $I_{BHLO}$ | bus hold LOW overdrive current | $V_{CC}$ = 1.95 V [4] [6] | 200 | - | - | 200 | - | µA |
| | | $V_{CC}$ = 2.7 V | 300 | - | - | 300 | - | µA |
| | | $V_{CC}$ = 3.6 V | 500 | - | - | 500 | - | µA |
| $I_{BHHO}$ | bus hold HIGH overdrive current | $V_{CC}$ = 1.95 V [4] [6] | -200 | - | - | -200 | - | µA |
| | | $V_{CC}$ = 2.7 V | -300 | - | - | -300 | - | µA |
| | | $V_{CC}$ = 3.6 V | -500 | - | - | -500 | - | µA |

[1] All typical values are measured at $V_{CC}$ = 3.3 V (unless stated otherwise) and $T_{amb}$ = 25 °C.
[2] The bus hold circuit is switched off when $V_I > V_{CC}$ allowing 5.5 V on the input terminal.
[3] For I/O ports the parameter $I_{OZ}$ includes the input leakage current.
[4] Valid for data inputs of bus hold parts only (74LVCH16245A). Note that control inputs do not have a bus hold circuit.
[5] The specified sustaining current at the data input holds the input below the specified $V_I$ level.
[6] The specified overdrive current at the data input forces the data input to the opposite input state.

## 10. Dynamic characteristics

**Table 7. Dynamic characteristics**

*Voltages are referenced to GND (ground = 0 V). For test circuit see Fig. 7.*

| Symbol | Parameter | Conditions | -40 °C to +85 °C | | | -40 °C to +125 °C | | Unit |
|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ [1] | Max | Min | Max | |
| $t_{pd}$ | propagation delay | nAn to nBn; nBn to nAn; see Fig. 5 [2] | | | | | | |
| | | $V_{CC}$ = 1.2 V | - | 13.0 | - | - | - | ns |
| | | $V_{CC}$ = 1.65 V to 1.95 V | 1.5 | 5.2 | 12.2 | 1.5 | 13.8 | ns |
| | | $V_{CC}$ = 2.3 V to 2.7 V | 1.0 | 2.8 | 6.0 | 1.0 | 6.7 | ns |
| | | $V_{CC}$ = 2.7 V | 1.0 | 2.7 | 4.7 | 1.0 | 6.0 | ns |
| | | $V_{CC}$ = 3.0 V to 3.6 V | 1.0 | 2.4 | 4.5 | 1.0 | 6.0 | ns |
| $t_{en}$ | enable time | $n\overline{OE}$ to nAn, nBn; see Fig. 6 [2] | | | | | | |
| | | $V_{CC}$ = 1.2 V | - | 15.0 | - | - | - | ns |
| | | $V_{CC}$ = 1.65 V to 1.95 V | 1.5 | 5.9 | 15.0 | 1.5 | 16.9 | ns |
| | | $V_{CC}$ = 2.3 V to 2.7 V | 1.0 | 3.3 | 7.9 | 1.0 | 8.8 | ns |
| | | $V_{CC}$ = 2.7 V | 1.5 | 3.5 | 6.7 | 1.5 | 8.5 | ns |
| | | $V_{CC}$ = 3.0 V to 3.6 V | 1.0 | 2.7 | 5.5 | 1.0 | 7.0 | ns |
| $t_{dis}$ | disable time | $n\overline{OE}$ to nAn, nBn; see Fig. 6 [2] | | | | | | |
| | | $V_{CC}$ = 1.2 V | - | 11.0 | - | - | - | ns |
| | | $V_{CC}$ = 1.65 V to 1.95 V | 1.0 | 4.9 | 13.1 | 1.0 | 14.7 | ns |
| | | $V_{CC}$ = 2.3 V to 2.7 V | 0.5 | 2.7 | 7.1 | 0.5 | 7.9 | ns |
| | | $V_{CC}$ = 2.7 V | 1.5 | 3.4 | 6.6 | 1.5 | 8.5 | ns |
| | | $V_{CC}$ = 3.0 V to 3.6 V | 1.5 | 3.3 | 5.6 | 1.5 | 7.0 | ns |


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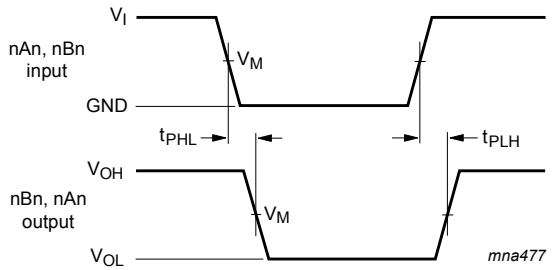
| Symbol | Parameter | Conditions | -40 °C to +85 °C | | | -40 °C to +125 °C | | Unit |
|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ [1] | Max | Min | Max | |
| $C_{PD}$ | power dissipation capacitance | per input; $V_I$ = GND to $V_{CC}$ [3] | | | | | | |
| | | $V_{CC}$ = 1.65 V to 1.95 V | - | 11.5 | - | - | - | pF |
| | | $V_{CC}$ = 2.3 V to 2.7 V | - | 15.2 | - | - | - | pF |
| | | $V_{CC}$ = 3.0 V to 3.6 V | - | 18.5 | - | - | - | pF |

[1] Typical values are measured at $T_{amb}$ = 25 °C and $V_{CC}$ = 1.2 V, 1.8 V, 2.5 V, 2.7 V and 3.3 V respectively.

[2] $t_{pd}$ is the same as $t_{PLH}$ and $t_{PHL}$.
$t_{en}$ is the same as $t_{PZL}$ and $t_{PZH}$.
$t_{dis}$ is the same as $t_{PLZ}$ and $t_{PHZ}$.

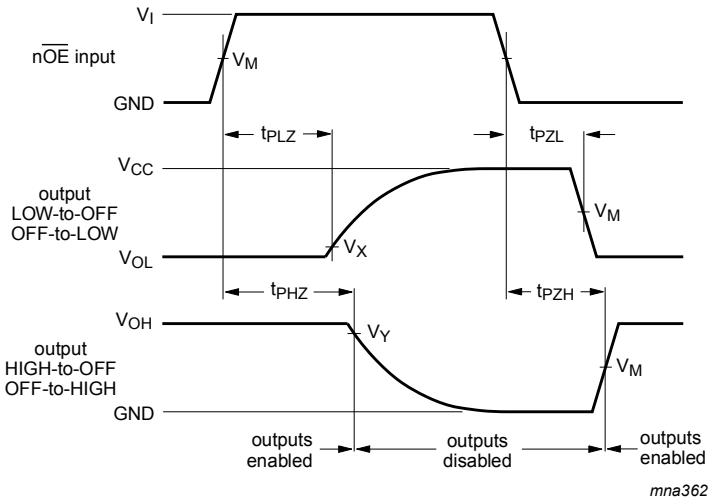
[3] $C_{PD}$ is used to determine the dynamic power dissipation ($P_D$ in µW).
$P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \Sigma(C_L \times V_{CC}^2 \times f_o)$ where:
$f_i$ = input frequency in MHz; $f_o$ = output frequency in MHz
$C_L$ = output load capacitance in pF
$V_{CC}$ = supply voltage in Volts
N = number of inputs switching
$\Sigma(C_L \times V_{CC}^2 \times f_o)$ = sum of the outputs.

## 10.1. Waveforms and test circuit




Measurement points are given in Table 8.
$V_{OL}$ and $V_{OH}$ are typical output voltage levels that occur with the output load.

**Fig. 5. The input (nAn, nBn) to output (nBn, nAn) propagation delays**




Measurement points are given in Table 8.
$V_{OL}$ and $V_{OH}$ are typical output voltage levels that occur with the output load.

**Fig. 6. 3-state enable and disable times**


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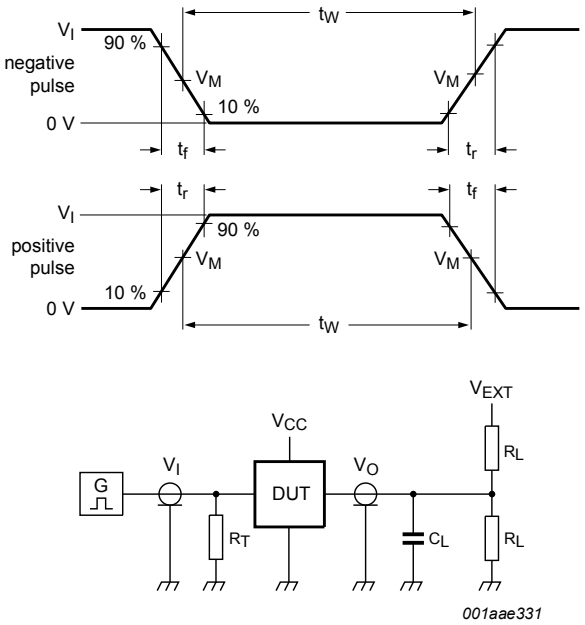
**Table 8. Measurement points**

| Supply voltage | Input | | Output | | |
|---|---|---|---|---|---|
| $V_{CC}$ | $V_M$ | $V_I$ | $V_M$ | $V_X$ | $V_Y$ |
| 1.2 V | 0.5 × $V_{CC}$ | $V_{CC}$ | 0.5 × $V_{CC}$ | $V_{OL}$ + 0.15 V | $V_{OH}$ - 0.15 V |
| 1.65 V to 1.95 V | 0.5 × $V_{CC}$ | $V_{CC}$ | 0.5 × $V_{CC}$ | $V_{OL}$ + 0.15 V | $V_{OH}$ - 0.15 V |
| 2.3 V to 2.7 V | 0.5 × $V_{CC}$ | $V_{CC}$ | 0.5 × $V_{CC}$ | $V_{OL}$ + 0.15 V | $V_{OH}$ - 0.15 V |
| 2.7 V | 1.5 V | 2.7 V | 1.5 V | $V_{OL}$ + 0.3 V | $V_{OH}$ - 0.3 V |
| 3.0 V to 3.6 V | 1.5 V | 2.7 V | 1.5 V | $V_{OL}$ + 0.3 V | $V_{OH}$ - 0.3 V |




Test data is given in Table 9.

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. 7. Test circuit for measuring switching times**

**Table 9. Test data**

| Supply voltage | Input | | Load | | $V_{EXT}$ | | |
|---|---|---|---|---|---|---|---|
| | $V_I$ | $t_r$, $t_f$ | $C_L$ | $R_L$ | $t_{PLH}$, $t_{PHL}$ | $t_{PLZ}$, $t_{PZL}$ | $t_{PHZ}$, $t_{PZH}$ |
| 1.2 V | $V_{CC}$ | ≤ 2 ns | 30 pF | 1 kΩ | open | 2 × $V_{CC}$ | GND |
| 1.65 V to 1.95 V | $V_{CC}$ | ≤ 2 ns | 30 pF | 1 kΩ | open | 2 × $V_{CC}$ | GND |
| 2.3 V to 2.7 V | $V_{CC}$ | ≤ 2 ns | 30 pF | 500 Ω | open | 2 × $V_{CC}$ | GND |
| 2.7 V | 2.7 V | ≤ 2.5 ns | 50 pF | 500 Ω | open | 2 × $V_{CC}$ | GND |
| 3.0 V to 3.6 V | 2.7 V | ≤ 2.5 ns | 50 pF | 500 Ω | open | 2 × $V_{CC}$ | GND |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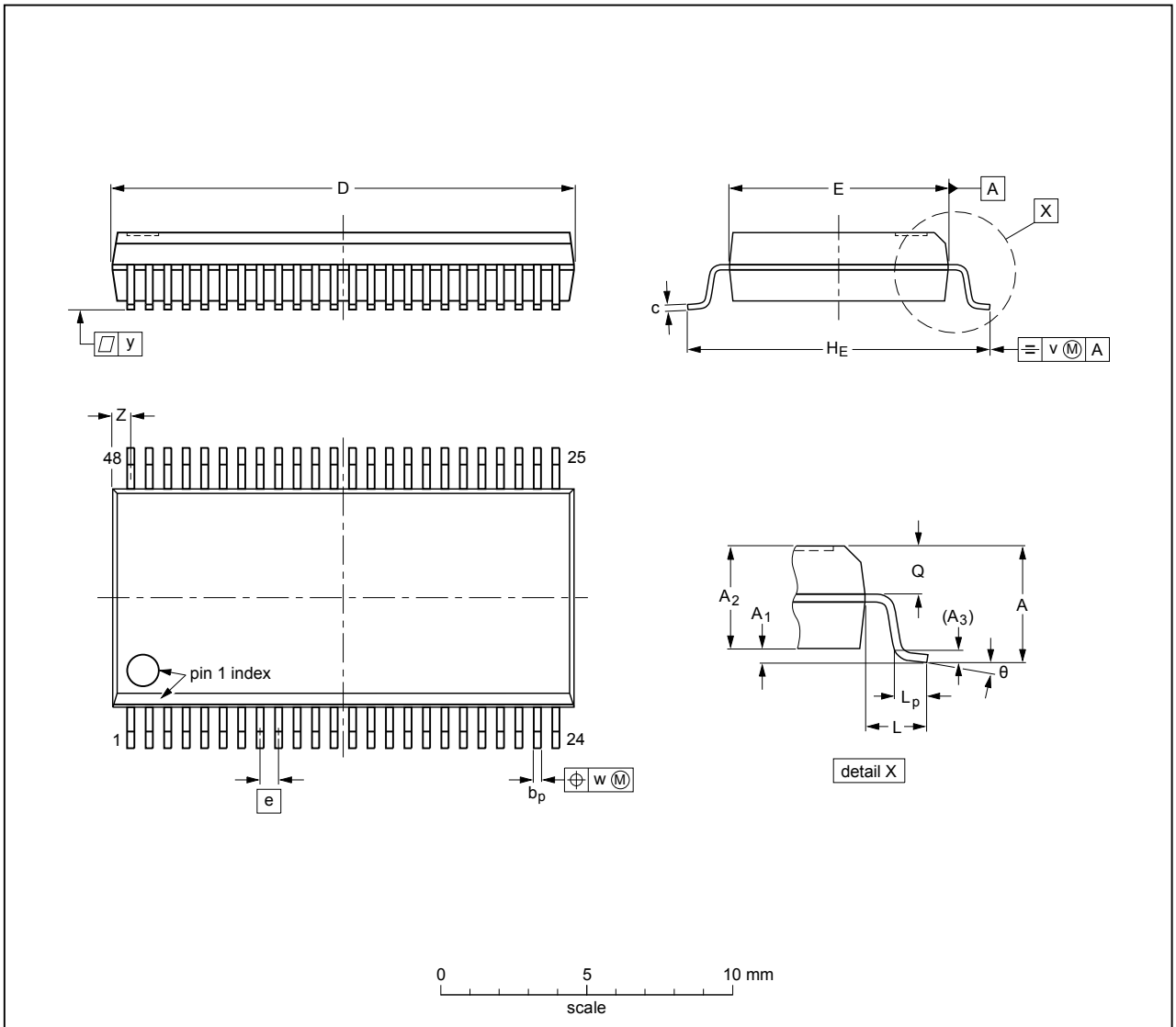
## 11. Package outline

**SSOP48: plastic shrink small outline package; 48 leads; body width 7.5 mm** **SOT370-1**




**DIMENSIONS (mm are the original dimensions)**

| UNIT | A max. | $A_1$ | $A_2$ | $A_3$ | $b_p$ | c | D (1) | E (1) | e | $H_E$ | L | $L_p$ | Q | v | w | y | Z (1) | θ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | 2.8 | 0.4<br>0.2 | 2.35<br>2.20 | 0.25 | 0.3<br>0.2 | 0.22<br>0.13 | 16.00<br>15.75 | 7.6<br>7.4 | 0.635 | 10.4<br>10.1 | 1.4 | 1.0<br>0.6 | 1.2<br>1.0 | 0.25 | 0.18 | 0.1 | 0.85<br>0.40 | 8°<br>0° |

**Note**

1. Plastic or metal protrusions of 0.25 mm maximum per side are not included.

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | JEITA | | | |
| SOT370-1 | | MO-118 | | | | ~~99-12-27~~<br>03-02-19 |

**Fig. 8. Package outline SOT370-1 (SSOP48)**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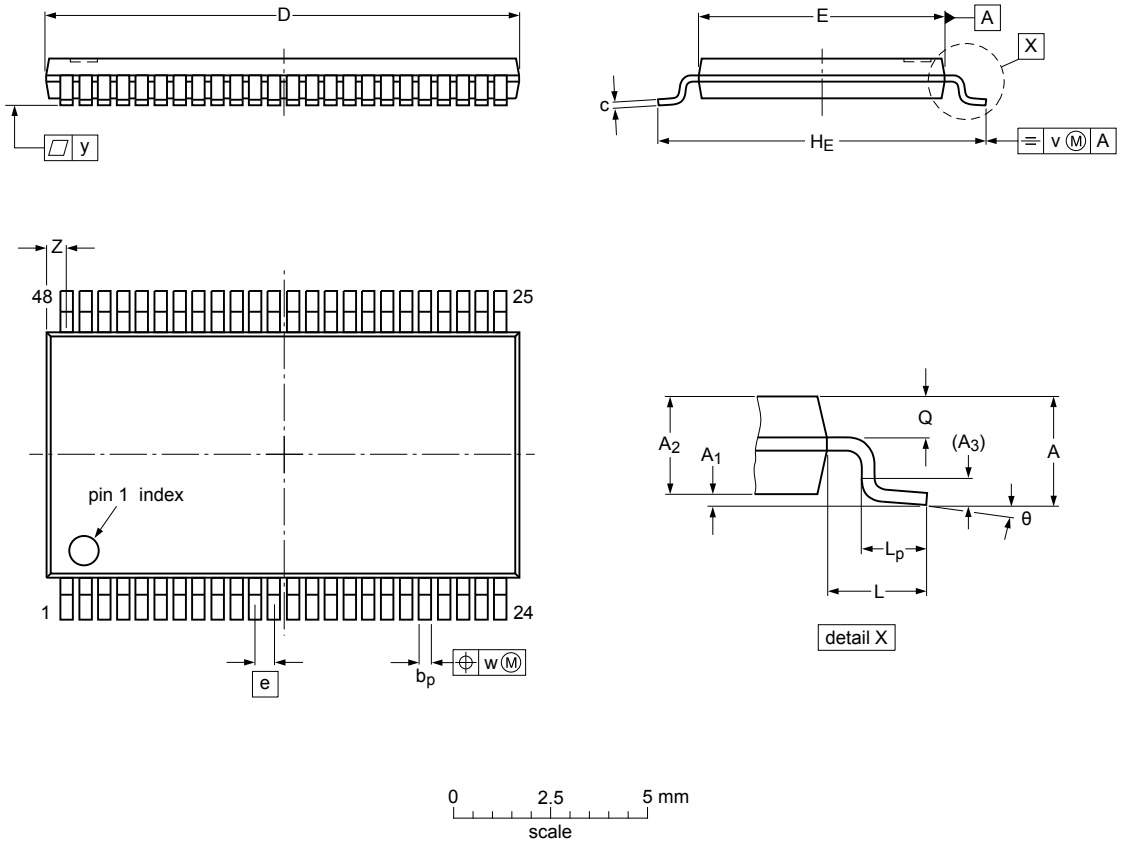
**TSSOP48: plastic thin shrink small outline package; 48 leads; body width 6.1 mm** **SOT362-1**




Dimensions (mm are the original dimensions)

| Unit | | A | $A_1$ | $A_2$ | $A_3$ | $b_p$ | c | $D^{(1)}$ | $E^{(2)}$ | e | $H_E$ | L | $L_p$ | Q | v | w | y | Z | θ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | max | 1.2 | 0.15 | 1.05 | 0.25 | 0.28 | 0.2 | 12.6 | 6.2 | 0.5 | 8.3 | 1 | 0.8 | 0.50 | 0.25 | 0.08 | 0.1 | 0.8 | 8° |
| | nom | | | | | | | | | | | | | | | | | | |
| | min | | 0.05 | 0.85 | | 0.17 | 0.1 | 12.4 | 6.0 | | 7.9 | | 0.4 | 0.35 | | | | 0.4 | 0° |

Note
1. Plastic or metal protrusions of 0.15 mm maximum per side are not included.
2. Plastic interlead protrusions of 0.25 mm maximum per side are not included.

*sot362-1_po*

| Outline version | References | | | | European projection | Issue date |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | JEITA | | | |
| SOT362-1 | | MO-153 | | | | ~~03-02-19~~ 13-08-05 |

**Fig. 9. Package outline SOT362-1 (TSSOP48)**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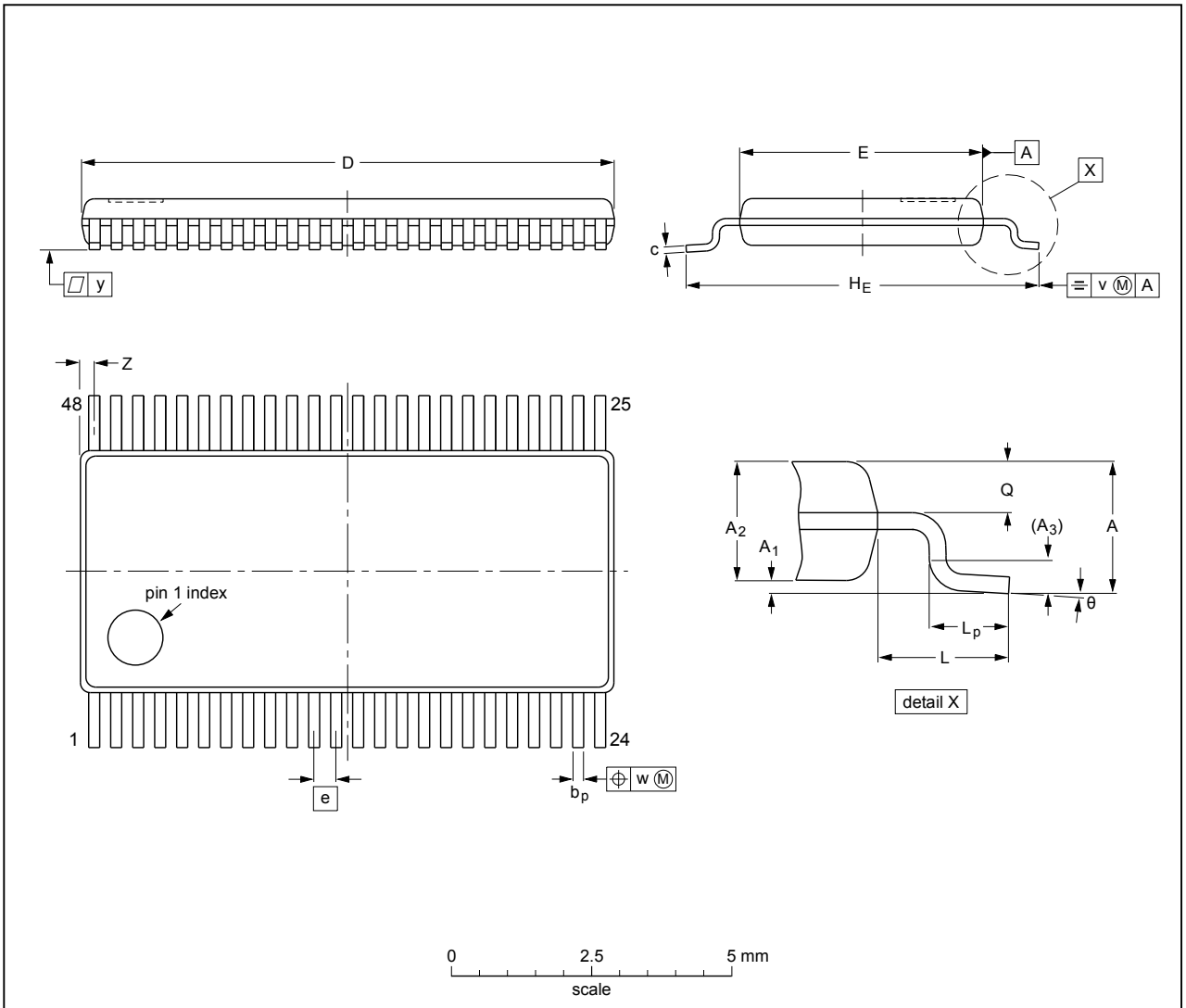
**TSSOP48: plastic thin shrink small outline package; 48 leads; body width 4.4 mm; lead pitch 0.4 mm** **SOT480-1**




**DIMENSIONS (mm are the original dimensions)**

| UNIT | A max. | $A_1$ | $A_2$ | $A_3$ | $b_p$ | c | D (1) | E (2) | e | $H_E$ | L | $L_p$ | Q | v | w | y | Z (1) | θ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | 1.1 | 0.15<br>0.05 | 0.95<br>0.85 | 0.25 | 0.23<br>0.13 | 0.20<br>0.09 | 9.8<br>9.6 | 4.5<br>4.3 | 0.4 | 6.6<br>6.2 | 1 | 0.7<br>0.5 | 0.4<br>0.3 | 0.2 | 0.07 | 0.08 | 0.4<br>0.1 | 8°<br>0° |

**Notes**

1. Plastic or metal protrusions of 0.15 mm maximum per side are not included.
2. Plastic interlead protrusions of 0.25 mm maximum per side are not included.

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | JEITA | | | |
| SOT480-1 | | MO-153 | | | | ~~99-12-27~~<br>03-02-18 |

**Fig. 10. Package outline SOT480-1 (TSSOP48)**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## 12. Abbreviations

**Table 10. Abbreviations**

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

## 13. Revision history

**Table 11. Revision history**

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|---|---|---|---|---|
| 74LVC_LVCH16245A v.13 | 20190213 | Product data sheet | - | 74LVC_LVCH16245A v.12 |
| Modifications: | • The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia.<br>• Legal texts have been adapted to the new company name where appropriate.<br>• Type numbers 74LVC16245AEV and 74LVCH16245AEV (SOT702-1) removed.<br>• Type numbers 74LVC16245ABX and 74LVCH16245ABX (SOT1134-2) removed.<br>• Type numbers 74LVC16245ADGV and 74LVCH16245ADGV (SOT480-1) added.<br>• Package outline drawing SOT362-1 (TSSOP48) updated. | | | |
| 74LVC_LVCH16245A v.12 | 20120213 | Product data sheet | - | 74LVC_LVCH16245A v.11 |
| Modifications: | • For type number 74LVC16245ABX and 74LVCH16245ABX the sot code has changed to SOT1134-2. | | | |
| 74LVC_LVCH16245A v.11 | 20111208 | Product data sheet | - | 74LVC_LVCH16245A v.10 |
| Modifications: | • Table 4, Table 5, Table 6, Table 7, and Table 9: values added for lower voltage ranges. | | | |
| 74LVC_LVCH16245A v.10 | 20110623 | Product data sheet | - | 74LVC_LVCH16245A v.9 |
| Modifications: | • type numbers 74LVC16245ABQ and 74LVCH16245ABQ changed to 74LVC16245ABX and 74LVCH16245ABX.<br>• Pin configuration SOT1134-2 (HXQFN60): figure note 1 changed. | | | |
| 74LVC_LVCH16245A v.9 | 20100329 | Product data sheet | - | 74LVC_LVCH16245A v.8 |
| 74LVC_LVCH16245A v.8 | 20081106 | Product data sheet | - | 74LVC_LVCH16245A v.7 |
| 74LVC_LVCH16245A v.7 | 20031125 | Product specification | - | 74LVC_LVCH16245A v.6 |
| 74LVC_LVCH16245A v.6 | 20030130 | Product specification | - | 74LVC_LVCH16245A v.5 |
| 74LVC_LVCH16245A v.5 | 20021030 | Product specification | - | 74LVC_H16245A v.4 |
| 74LVC_H16245A v.4 | 19970925 | Product specification | - | 74LVC16245A_ 74LVCH16245A v.3 |
| 74LVC16245A_ 74LVCH16245A v.3 | 19970925 | Product specification | - | 74LVC16245A v.2 |
| 74LVC16245A v.2 | 19970801 | Product specification | - | 74LVC16245A v.1 |
| 74LVC16245A v.1 | - | - | - | - |


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# 14. 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".
[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 https://www.nexperia.com.

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**Date of release: 13 February 2019**