NXU0102

2-bit dual-supply buffer/level translator with Schmitt-trigger; 3-state

Rev. 1 — 30 October 2024 **Product data sheet**

1. General description

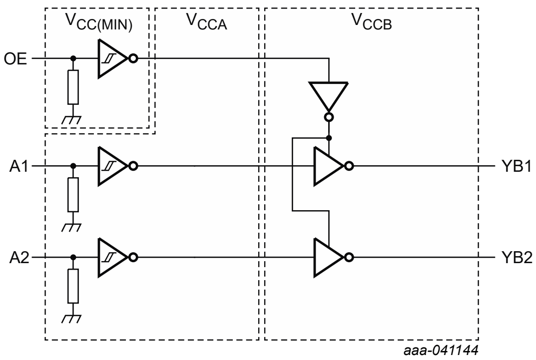
The NXU0102 is a 2-bit, dual-supply level translating buffer with Schmitt-trigger inputs and 3-state outputs. It features two data inputs (A1 and A2), two data outputs (YB1 and YB2), and an output enable input (OE).

Both V_{CCA} and V_{CCB} can be supplied at any voltage between 0.9 V and 5.5 V making the device suitable for translating between any of the voltage nodes (1.2 V, 1.5 V, 1.8 V, 2.5 V, 3.3 V and 5.0 V).

This device facilitates asynchronous communication between data buses. Transmit data with a fixed direction (unidirectionally) from the A bus to the B bus on two channels. The OE pin can be referenced to V_{CCA} and V_{CCB} domain and when OE pin is set LOW the outputs are disabled and enter a high-impedance OFF-state which isolates the buses. The OE pin can be left floating or externally pulled down to ground to ensure the high-impedance state of the outputs during power up or power down.

This device ensures low static and dynamic power consumption across the entire supply range and is fully specified for partial power down applications using I_{OFF}. The I_{OFF} circuitry prevents potentially damaging backflow current through the device when it is powered down or if one of the power supplies is disconnected (floating).

No power supply sequencing is required and output glitches during power supply transitions are prevented. As a result, glitches will not appear on the outputs for supply transitions during power-up/down.



2. Features and benefits

- Wide supply voltage range:
  - V_{CCA}: 0.9 V to 5.5 V
  - V_{CCB}: 0.9 V to 5.5 V
- Low power consumption for supply voltage range 1.1 V to 5.5 V
  - 3 μA (T_{amb} = 25 °C)
  - 5 μA (T_{amb} = -40 °C to +125 °C)
- Schmitt-trigger inputs with integrated static high ohmic pull-down resistor on the input
- Maximum data rates:
  - 250 Mbps (≥ 1.8 V to 5 V translation)
- High output drive 12 mA at 5 V
- Output enable (OE) allows connection to V_{CCA} or V_{CCB} domain
- Suspend mode when either one of the supply voltages is below 100 mV or disconnected (floating)
- Low noise overshoot and undershoot <10% of V_{CCO}
- I_{OFF} circuitry provides partial power-down mode operation
- Latch-up performance exceeds 100 mA per JESD78D Class II
- Complies with JEDEC standard:
  - JESD8-12 (0.9 V to 1.3 V)
  - JESD8-11 (1.4 V to 1.6 V)
  - 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)
  - JESD12-6 (4.5 V to 5.5 V)
- ESD protection:
  - HBM: ANSI/ESDA/JEDEC JS-001 class 2 exceeds 2500 V
  - CDM: ANSI/ESDA/JEDEC JS-002 class C3 exceeds 1500 V
- Specified from -40 °C to +85 °C and from -40 °C to +125 °C
- Similar function: NXU0202

3. Applications

- General purpose I/O level translation
- Noisy environments or slow input signals
- Supports push-pull voltage translation as 2-wire UART and 2-pin JTAG protocols
- Consumer

nexperia

4. Ordering information

Table 1. Ordering information

Type number	Package			
	Temperature range	Name	Description	Version
NXU0102DC	-40 °C to +125 °C	VSSOP8	plastic very thin shrink small outline package; 8 leads; body width 2.3 mm	SOT765-1
NXU0102GT	-40 °C to +125 °C	XSON8	plastic extremely thin small outline package; no leads; 8 terminals; body 1 × 1.95 × 0.5 mm	SOT833-1
NXU0102GX	-40 °C to +125 °C	X2SON8	plastic thermal enhanced extremely thin small outline package; no leads; 8 terminals; body 1.35 × 0.8 × 0.32 mm	SOT1233-2

5. Marking

Table 2. Marking

Type number	Marking code[1]
NXU0102DC	L2
NXU0102GT	L2
NXU0102GX	L2

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

6. Functional diagram

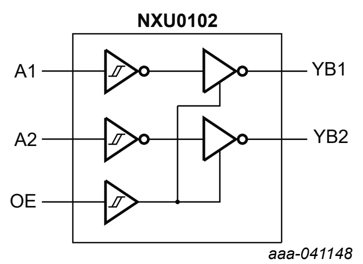


Fig. 1. Logic symbol

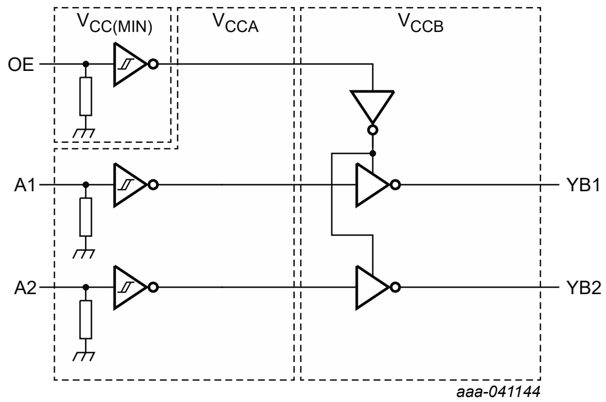
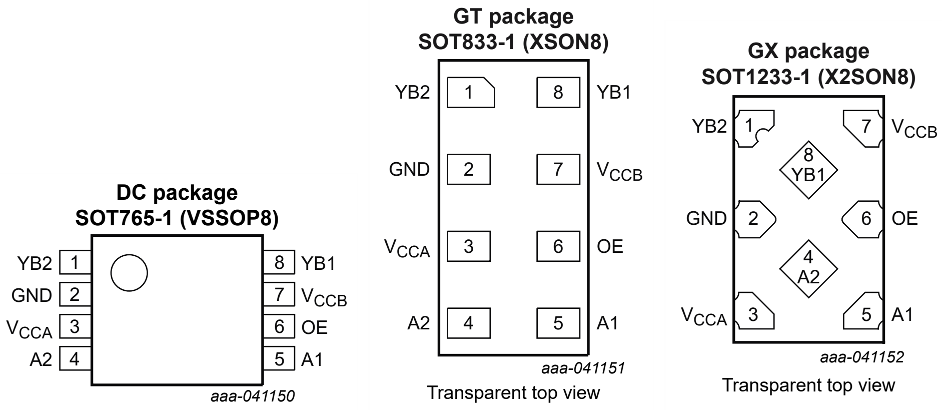


Fig. 2. Functional block diagram

7. Pinning information

7.1. Pinning



7.2. Pin description

Table 3. Pin description

Symbol	Pin	I/O	Description
YB2	1	O	data output B-side and referenced to V_{CCB}
GND	2	supply	ground (0 V)
V_{CCA}	3	supply	supply voltage A-side (pins A1, A2)
A2	4	I	data input A-side and referenced to V_{CCA}
A1	5	I	data input A-side and referenced to V_{CCA}
OE	6	I	output enable input (active HIGH)
V_{CCB}	7	-	supply voltage B-side (pins YB1, YB2)
YB1	8	O	data output B-side and referenced to V_{CCB}

8. Functional description

Table 4. Function table

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

Supply voltage	Input	Input	Output
V_{CCA}, V_{CCB}	**OE**	**An**	**YBn**
0.9 V to 5.5 V	H	L	L
0.9 V to 5.5 V	H	H	H
0.9 V to 5.5 V	L	X	Z
GND [1]	X	X	Z
Floating [2]	X	X	Z

[1] If either V_{CCA} or V_{CCB} is below 100 mV or GND, the device goes into suspend mode (Hi-Z).
[2] If either V_{CCA} or V_{CCB} disconnected (floating), the device goes into suspend mode (Hi-Z).

8.1. Overview

The NXU0102 is a 2-bit, dual-supply level translating buffer with Schmitt-trigger inputs and 3-state outputs. It features two data inputs (A1, A2), two data outputs (YB1, YB2), and an output enable input (OE). Both V_{CCA} and V_{CCB} can be supplied at any voltage between 0.9 V and 5.5 V.

8.2. Inputs

The inputs have integrated pull-down resistors of 6.5 MΩ (typical) which prevent an undefined state at the Schmitt-trigger input and the output. If an external pull-up is required, it should be no larger than 1 MΩ to avoid contention with the 6.5 MΩ internal pull-down.

Additionally, each input is provided with a through Schmitt-trigger which makes this device tolerant for slow and noisy input signals. Prolonged input slopes at a slow rate may lead to increased dynamic current consumption.

The output-enable input (OE) can be referenced to V_{CCA} and V_{CCB} domain by making use of the developed $V_{CC(MIN)}$ circuitry. When the OE pin is set LOW, the output is disabled and enters high-impedance OFF-state which isolates the output. The OE pin can be left floating or externally pulled down to ground to ensure outputs remain in the high-impedance state during power up or power down.

The input signals can be safely driven above the supply voltage, as long as the maximum input voltage value specified in the Recommended Operating Conditions is not exceeded.

Input transfer characteristics

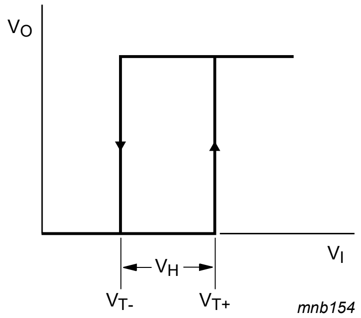


Fig. 3. Transfer characteristic

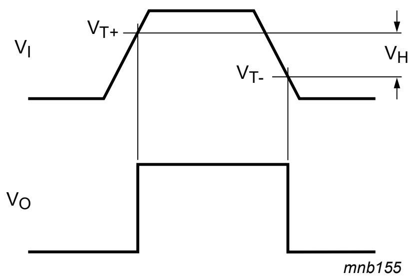
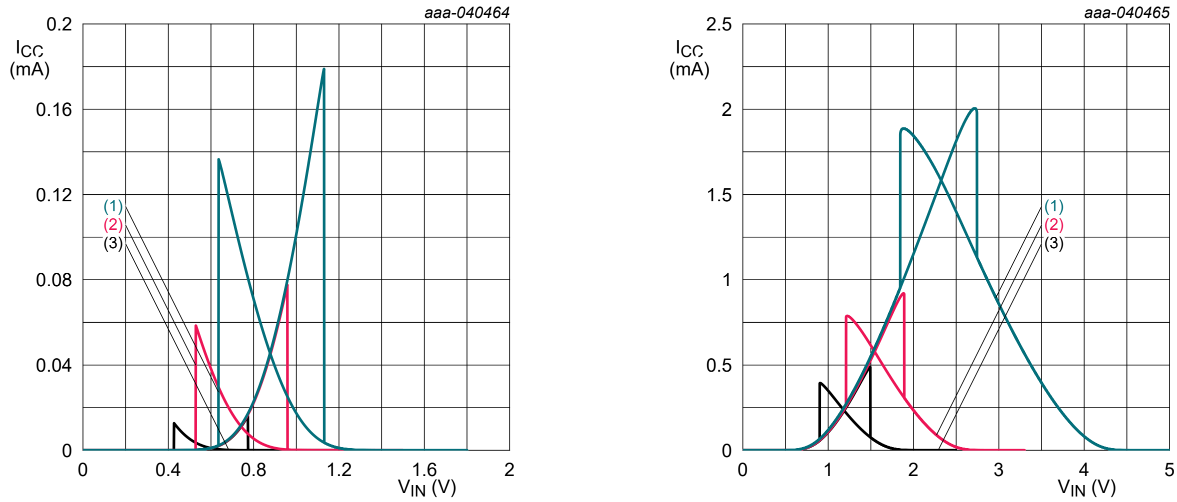


Fig. 4. The definitions of V_{T+}, V_{T-} and V_H



T_{amb} = 25 °C
(1) V_{CC} = 1.2 V
(2) V_{CC} = 1.5 V
(3) V_{CC} = 1.8 V

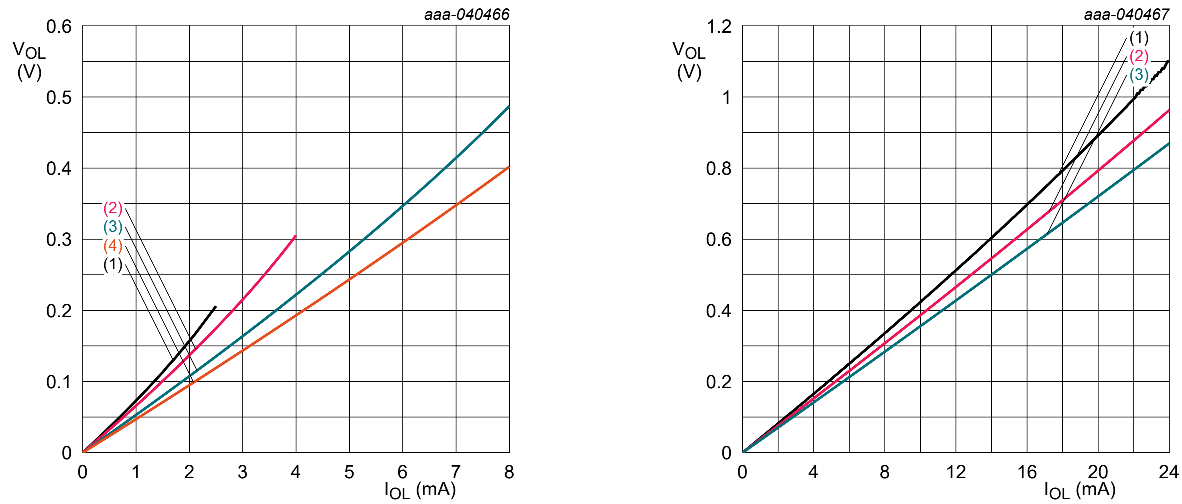
T_{amb} = 25 °C
(1) V_{CC} = 2.5 V
(2) V_{CC} = 3.3 V
(3) V_{CC} = 5.0 V

Fig. 5. Typical transfer characteristics for data inputs An

8.3. Outputs

Balanced output enables the device to both sink and source similar currents. The high drive capability of this device creates fast edges and capable of driving larger currents.

Output transfer characteristics



T_{amb} = 25 °C
(1) V_{CC} = 0.9 V
(2) V_{CC} = 1.2 V
(3) V_{CC} = 1.5 V
(4) V_{CC} = 1.8 V

T_{amb} = 25 °C
(1) V_{CC} = 2.5 V
(2) V_{CC} = 3.3 V
(3) V_{CC} = 5.0 V

Fig. 6. Typical LOW-level output voltage (V_{OL}) versus LOW-level output current (I_{OL}) for data outputs YBn

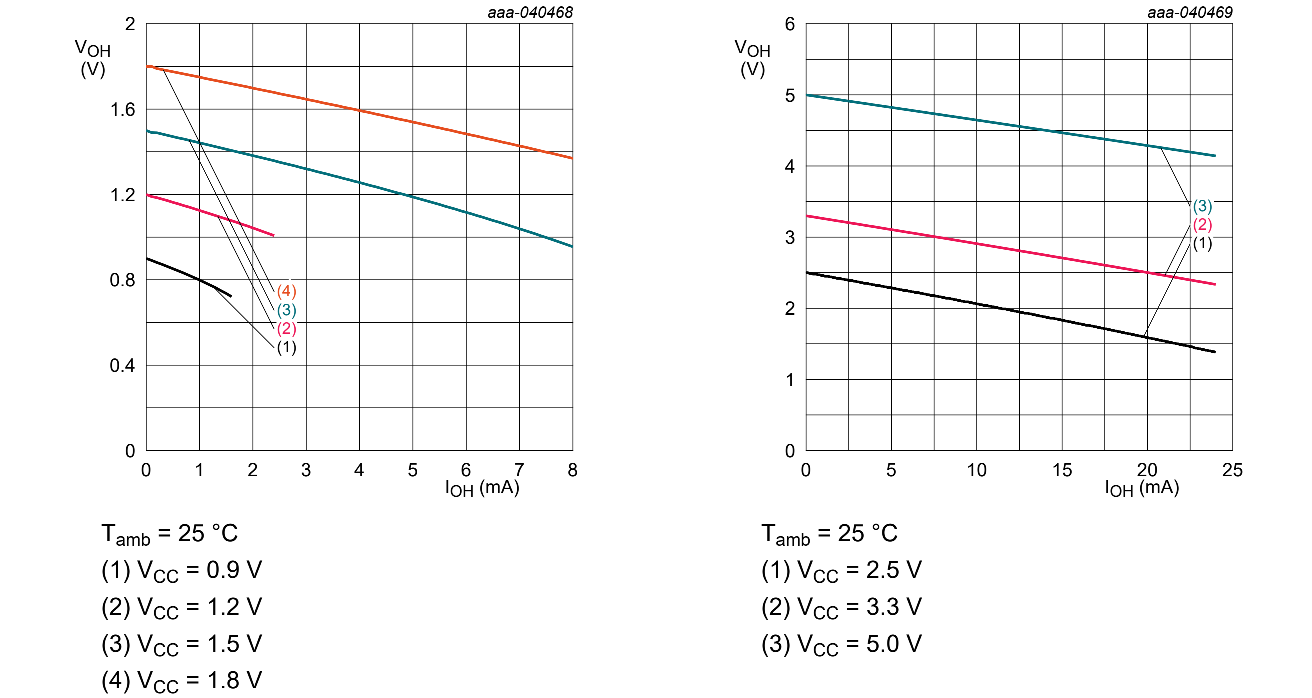


Fig. 7. Typical HIGH-level output voltage (V_{OH}) versus HIGH-level output current (I_{OH}) for data outputs YBn

8.4. Suspend mode and I_{OFF} protection circuitry

When either V_{CCA} or V_{CCB} drops below 100 mV or becomes disconnected (floating) the product enters suspend mode (Hi-Z). All outputs are disabled and in transition to a high-impedance OFF-state. The I_{OFF} circuitry prevents potentially damaging backflow current through the device when it is powered down or if one of the power supplies is disconnected (floating). It is advisable to keep the data inputs in low state before disconnecting (floating) either supply.

Below a graphical explanation:

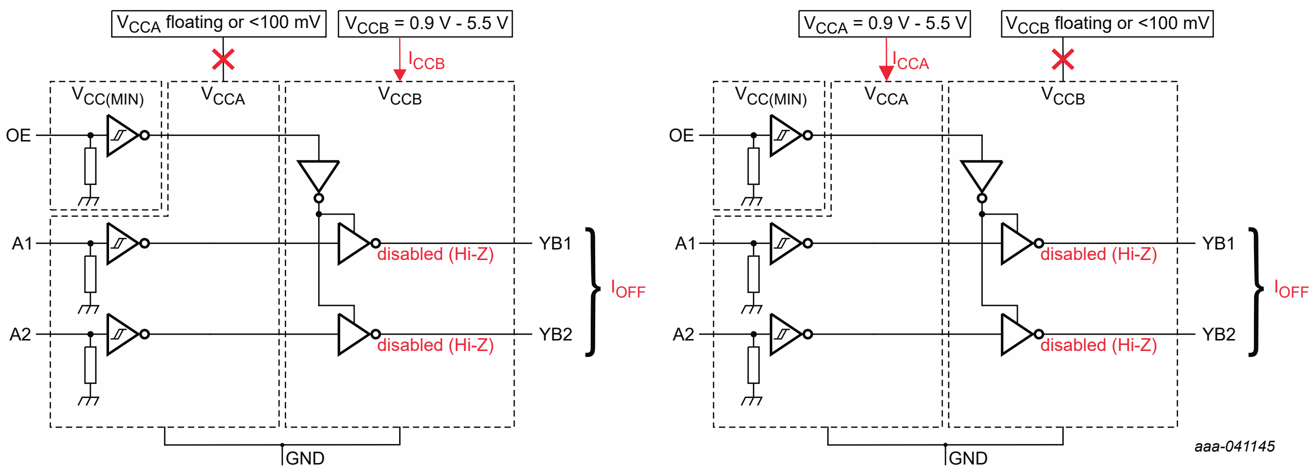


Fig. 8. Suspend mode and I_{OFF} protection circuitry

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_{CCA}	supply voltage A		-0.5	+6.5	V
V_{CCB}	supply voltage B		-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][2][3]	-0.5	V_{CCO} + 0.5	V
		Suspend or 3-state mode [1]	-0.5	+6.5	V
I_O	output current	V_O = 0 V to V_{CCO} [2]	-	±25	mA
I_{CC}	supply current	I_{CCA} or I_{CCB}; per V_{CC} pin	-	100	mA
I_{GND}	ground current	per GND pin	-100	-	mA
T_{stg}	storage temperature		-65	+150	°C
P_{tot}	total power dissipation	[4]	-	250	mW

[1] The minimum input voltage ratings and output voltage ratings may be exceeded if the input and output current ratings are observed.
[2] V_{CCO} is the supply voltage associated with the output pins (YBn).
[3] V_{CCO} + 0.5 V should not exceed 6.5 V.
[4] For SOT765-1 (VSSOP8) package: P_{tot} derates linearly with 5.3 mW/K above 103 °C.
For SOT833-1 (XSON8) package: P_{tot} derates linearly with 3.6 mW/K above 81 °C.
For SOT1233-2 (X2SON8) package: P_{tot} derates linearly with 4.6 mW/K above 95 °C.

10. ESD ratings

Table 6. ESD ratings

Symbol	Parameter	Conditions	Value	Unit
V_{ESD}	electrostatic discharge voltage	HBM: ANSI/ESDA/JEDEC JS-001 class 2	± 2500	V
		CDM: ANSI/ESDA/JEDEC JS-002 class C3	± 1500	V

11. Recommended operating conditions

Table 7. Recommended operating conditions

Symbol	Parameter	Conditions	Min	Max	Unit
V_{CCA}	supply voltage A		0.9	5.5	V
V_{CCB}	supply voltage B		0.9	5.5	V
V_I	input voltage		0	5.5	V
V_O	output voltage	Active mode [1]	0	V_{CCO}	V
		Suspend or 3-state mode	0	5.5	V
T_{amb}	ambient temperature		-40	+125	°C

[1] V_{CCO} is the supply voltage associated with the output pins (YBn).

12. Thermal characteristics

Table 8. Thermal characteristics

Symbol	Parameter	Condition	SOT765-1	SOT833-1	SOT1233-2	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air; JEDEC test board	189	276	219	°C/W
$R_{th(j-c)}$	thermal resistance from case (top) of package	in free air; JEDEC test board	98	121	118	°C/W
$\Psi_{j\text{-}top}$	thermal characterization parameter from junction to top of package	in free air; JEDEC test board	25	3.3	4.5	°C/W

13. Static characteristics

Table 9. Static characteristics

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

Symbol	Parameter	Conditions	+25 °C			-40 °C to +85 °C		-40 °C to +125 °C		Unit
			Min	Typ	Max	Min	Max	Min	Max	
V_{T+}	positive-going threshold voltage	An input								
		$V_{CCA} = V_{CCB}$ = 0.9 V	-	0.58	-	-	-	-	-	V
		$V_{CCA} = V_{CCB}$ = 1.1 V	-	0.71	-	0.44	0.88	0.44	0.88	V
		$V_{CCA} = V_{CCB}$ = 1.4 V	-	0.89	-	0.60	0.98	0.60	0.98	V
		$V_{CCA} = V_{CCB}$ = 1.65 V	-	1.05	-	0.76	1.13	0.76	1.13	V
		$V_{CCA} = V_{CCB}$ = 2.3 V	-	1.39	-	1.08	1.56	1.08	1.56	V
		$V_{CCA} = V_{CCB}$ = 3.0 V	-	1.75	-	1.48	1.92	1.48	1.92	V
		$V_{CCA} = V_{CCB}$ = 4.5 V	-	2.50	-	2.19	2.74	2.19	2.74	V
		$V_{CCA} = V_{CCB}$ = 5.5 V	-	3.02	-	2.65	3.33	2.65	3.33	V
		OE input (referenced to V_{CCA} or V_{CCB})								
		$V_{CCA} = V_{CCB}$ = 0.9 V	-	0.58	-	-	-	-	-	V
		$V_{CCA} = V_{CCB}$ = 1.1 V	-	0.70	-	0.44	0.88	0.44	0.88	V
		$V_{CCA} = V_{CCB}$ = 1.4 V	-	0.89	-	0.60	0.98	0.60	0.98	V
		$V_{CCA} = V_{CCB}$ = 1.65 V	-	1.04	-	0.76	1.13	0.76	1.13	V
		$V_{CCA} = V_{CCB}$ = 2.3 V	-	1.38	-	1.08	1.56	1.08	1.56	V
		$V_{CCA} = V_{CCB}$ = 3.0 V	-	1.74	-	1.48	1.92	1.48	1.92	V
		$V_{CCA} = V_{CCB}$ = 4.5 V	-	2.50	-	2.19	2.74	2.19	2.74	V
		$V_{CCA} = V_{CCB}$ = 5.5 V	-	3.03	-	2.65	3.33	2.65	3.33	V

Symbol	Parameter	Conditions	+25 °C			-40 °C to +85 °C		-40 °C to +125 °C		Unit
			Min	Typ	Max	Min	Max	Min	Max	
V_{T-}	negative-going threshold voltage	An input								
		$V_{CCA} = V_{CCB}$ = 0.9 V	-	0.33	-	-	-	-	-	V
		$V_{CCA} = V_{CCB}$ = 1.1 V	-	0.40	-	0.17	0.48	0.17	0.48	V
		$V_{CCA} = V_{CCB}$ = 1.4 V	-	0.50	-	0.28	0.59	0.28	0.59	V
		$V_{CCA} = V_{CCB}$ = 1.65 V	-	0.59	-	0.35	0.69	0.35	0.69	V
		$V_{CCA} = V_{CCB}$ = 2.3 V	-	0.84	-	0.56	0.97	0.56	0.97	V
		$V_{CCA} = V_{CCB}$ = 3.0 V	-	1.12	-	0.89	1.5	0.89	1.5	V
		$V_{CCA} = V_{CCB}$ = 4.5 V	-	1.71	-	1.51	1.97	1.51	1.97	V
		$V_{CCA} = V_{CCB}$ = 5.5 V	-	2.10	-	1.88	2.4	1.88	2.4	V
		OE input (referenced to V_{CCA} or V_{CCB})								
		$V_{CCA} = V_{CCB}$ = 0.9 V	-	0.33	-	-	-	-	-	V
		$V_{CCA} = V_{CCB}$ = 1.1 V	-	0.41	-	0.17	0.48	0.17	0.48	V
		$V_{CCA} = V_{CCB}$ = 1.4 V	-	0.51	-	0.28	0.59	0.28	0.59	V
		$V_{CCA} = V_{CCB}$ = 1.65 V	-	0.59	-	0.35	0.69	0.35	0.69	V
		$V_{CCA} = V_{CCB}$ = 2.3 V	-	0.84	-	0.56	0.97	0.56	0.97	V
		$V_{CCA} = V_{CCB}$ = 3.0 V	-	1.12	-	0.89	1.5	0.89	1.5	V
		$V_{CCA} = V_{CCB}$ = 4.5 V	-	1.69	-	1.51	1.97	1.51	1.97	V
		$V_{CCA} = V_{CCB}$ = 5.5 V	-	2.07	-	1.88	2.46	1.88	2.46	V

Symbol	Parameter	Conditions	+25 °C			-40 °C to +85 °C		-40 °C to +125 °C		Unit
			Min	Typ	Max	Min	Max	Min	Max	
V_H	hysteresis voltage	An input								
		V_{CCA} = V_{CCB} = 0.9 V	-	0.25	-	-	-	-	-	V
		V_{CCA} = V_{CCB} = 1.1 V	-	0.31	-	0.2	0.4	0.2	0.4	V
		V_{CCA} = V_{CCB} = 1.4 V	-	0.39	-	0.25	0.5	0.25	0.5	V
		V_{CCA} = V_{CCB} = 1.65 V	-	0.46	-	0.3	0.55	0.3	0.55	V
		V_{CCA} = V_{CCB} = 2.3 V	-	0.59	-	0.38	0.65	0.38	0.65	V
		V_{CCA} = V_{CCB} = 3.0 V	-	0.63	-	0.46	0.72	0.46	0.72	V
		V_{CCA} = V_{CCB} = 4.5 V	-	0.79	-	0.58	0.93	0.58	0.93	V
		V_{CCA} = V_{CCB} = 5.5 V	-	0.93	-	0.69	1.06	0.69	1.06	V
		OE input (referenced to V_{CCA} or V_{CCB})								
		V_{CCA} = V_{CCB} = 0.9 V	-	0.25	-	-	-	-	-	V
		V_{CCA} = V_{CCB} = 1.1 V	-	0.30	-	0.15	0.41	0.15	0.41	V
		V_{CCA} = V_{CCB} = 1.4 V	-	0.39	-	0.2	0.5	0.2	0.5	V
		V_{CCA} = V_{CCB} = 1.65 V	-	0.44	-	0.23	0.55	0.23	0.55	V
		V_{CCA} = V_{CCB} = 2.3 V	-	0.54	-	0.32	0.65	0.32	0.65	V
		V_{CCA} = V_{CCB} = 3.0 V	-	0.62	-	0.39	0.72	0.39	0.72	V
		V_{CCA} = V_{CCB} = 4.5 V	-	0.81	-	0.57	0.97	0.57	0.97	V
		V_{CCA} = V_{CCB} = 5.5 V	-	0.96	-	0.69	1.18	0.69	1.18	V
V_{OH}	HIGH-level output voltage	V_I = $V_{T+(MAX)}$ [1][2]								
		I_O = -0.1 mA; V_{CCO} = 0.9 V to 5.5 V	V_{CCO} - 0.1	0.9	-	V_{CCO} - 0.1	-	V_{CCO} - 0.1	-	V
		I_O = -1.5 mA; V_{CCO} = 1.1 V	0.825	1.0	-	0.825	-	0.825	-	V
		I_O = -3 mA; V_{CCO} = 1.4 V	1.05	1.2	-	1.05	-	1.05	-	V
		I_O = -4.5 mA; V_{CCO} = 1.65 V	1.2	1.4	-	1.2	-	1.2	-	V
		I_O = -8 mA; V_{CCO} = 2.3 V	1.7	1.94	-	1.7	-	1.7	-	V
		I_O = -10 mA; V_{CCO} = 3.0 V	2.2	2.6	-	2.2	-	2.2	-	V
		I_O = -12 mA; V_{CCO} = 4.5 V	3.7	4.1	-	3.7	-	3.7	-	V

Symbol	Parameter	Conditions		+25 °C			-40 °C to +85 °C		-40 °C to +125 °C		Unit
				Min	Typ	Max	Min	Max	Min	Max	
V_{OL}	LOW-level output voltage	$V_I = V_{T-(MIN)}$	[1][2]								
		I_O = 0.1 mA; V_{CCO} = 0.9 V to 5.5 V		-	0	0.1	-	0.1	-	0.1	V
		I_O = 1.5 mA; V_{CCO} = 1.1 V		-	0.12	0.275	-	0.275	-	0.275	V
		I_O = 3 mA; V_{CCO} = 1.4 V		-	0.17	0.35	-	0.35	-	0.35	V
		I_O = 4.5 mA; V_{CCO} = 1.65 V		-	0.23	0.45	-	0.45	-	0.45	V
		I_O = 8 mA; V_{CCO} = 2.3 V		-	0.35	0.7	-	0.7	-	0.7	V
		I_O = 10 mA; V_{CCO} = 3.0 V		-	0.39	0.8	-	0.8	-	0.8	V
		I_O = 8 mA; V_{CCO} = 4.5 V		-	0.28	0.5	-	0.5	-	0.5	V
		I_O = 12 mA; V_{CCO} = 4.5 V		-	0.43	0.8	-	0.8	-	0.8	V
I_I	input leakage current	An input; V_I = 0 V to 5.5 V; V_{CCI} = 0.9 V to 5.5 V	[3]	-0.1	1	1.5	-0.1	1.85	-0.1	2	µA
		OE input; V_I = 0 V to 5.5 V; V_{CCI} = 0.9 V to 5.5 V	[3]	-0.1	1	1.5	-0.1	1.85	-0.1	2	µA
I_{OZ}	OFF-state output current	Suspend mode YBn output; V_{CCA} = V_{CCB} = 0.9 V to 5.5 V; V_I = 0 V or V_{CCI}; V_O = 0 V or V_{CCO} OE = GND	[1]	-0.1	-	0.1	-0.5	0.5	-2	2	µA
I_{OFF}	power-off leakage current	YBn output; V_I or V_O = 0 V to 5.5 V; V_{CCA} = 0 V; V_{CCB} = 0.9 V to 5.5 V		-1.5	-	1.5	-1.85	1.85	-2	2	µA
		YBn output; V_I or V_O = 0 V to 5.5 V; V_{CCB} = 0 V; V_{CCA} = 0.9 V to 5.5 V		-1.5	-	1.5	-1.85	1.85	-2	2	µA
		YBn output; V_I or V_O = GND; V_{CCA} = floating; V_{CCB} = 0.9 V to 5.5 V	[4]	-1.5	-	1.5	-1.85	1.85	-2	2	µA
		YBn output; V_I or V_O = GND; V_{CCB} = floating; V_{CCA} = 0.9 V to 5.5 V	[4]	-1.5	-	1.5	-1.85	1.85	-2	2	µA

Symbol	Parameter	Conditions		+25 °C			-40 °C to +85 °C		-40 °C to +125 °C		Unit
				Min	Typ	Max	Min	Max	Min	Max	
I_{CC}	supply current	I_{CCA}; V_I = 0 V or V_{CCI}; I_O = 0 A	[3]								
		V_{CCA}, V_{CCB} = 0.9 V to 5.5 V		-	1	1.8	-	2.5	-	3	µA
		V_{CCA} = 5.5 V; V_{CCB} = 0 V		-	1	1.8	-	2.5	-	3	µA
		V_{CCA} = 0 V; V_{CCB} = 5.5 V		-0.1	-	0.1	-0.4	0.4	-1	1	µA
		I_{CCB}; V_I = 0 V or V_{CCI}; I_O = 0 A	[3]								
		V_{CCA}, V_{CCB} = 0.9 V to 5.5 V		-	1	1.8	-	2.5	-	3	µA
		V_{CCB} = 5.5 V; V_{CCA} = 0 V		-	1	1.8	-	2.5	-	3	µA
		V_{CCB} = 0 V; V_{CCA} = 5.5 V		-0.1	-	0.1	-0.4	0.4	-1	1	µA
		I_{CCA} or I_{CCB}; V_I or V_O = GND; I_O = 0 A									
		I_{CCA}; V_{CCB} = floating; V_{CCB} = 5.5 V	[4]	-	1	1.5	-	2.5	-	3	µA
		I_{CCB}; V_{CCA} = floating; V_{CCA} = 5.5 V	[4]	-	1	1.5	-	2.5	-	3	µA
		I_{CCA} + I_{CCB} combined; V_I = 0 V or V_{CCI}; I_O = 0 A; V_{CCA} = V_{CCB} = 0.9 V to 5.5 V	[3]	-	2	3	-	4.5	-	5	µA

[1] V_{CCO} is the supply voltage associated with the output pins (YBn).
[2] Typical values for V_{OL} and V_{OH} are measured at V_{CCO} is 0.9 V.
[3] V_{CCI} is the supply voltage associated with the control input or input pins (An).
[4] Floating is defined, if one of the supply pins is not actively driven externally and has a leakage not exceeding 10 nA

Table 10. Typical total supply current I_{CCA} at T_{amb} = 25 °C

Voltages are referenced to GND (ground = 0 V).

V_{CCA}	V_{CCB}								Unit
	0 V	0.9 V	1.2 V	1.5 V	1.8 V	2.5 V	3.3 V	5.0 V	
0 V	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	μA
0.9 V	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	μA
1.2 V	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	μA
1.5 V	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	μA
1.8 V	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	μA
2.5 V	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	μA
3.3 V	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	μA
.0 V	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	μA

Table 11. Typical total supply current I_{CCB} at T_{amb} = 25 °C

Voltages are referenced to GND (ground = 0 V).

V_{CCA}	V_{CCB}								Unit
	0 V	0.9 V	1.2 V	1.5 V	1.8 V	2.5 V	3.3 V	5.0 V	
0 V	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	μA
0.9 V	0.01	0.2	0.25	0.3	0.4	0.45	0.5	0.7	μA
1.2 V	0.01	0.2	0.25	0.3	0.4	0.45	0.5	0.7	μA
1.5 V	0.01	0.2	0.25	0.3	0.4	0.45	0.5	0.7	μA
1.8 V	0.01	0.2	0.25	0.3	0.4	0.45	0.5	0.7	μA
2.5 V	0.01	0.2	0.25	0.3	0.4	0.45	0.5	0.7	μA
3.3 V	0.01	0.2	0.25	0.3	0.4	0.45	0.5	0.7	μA
5.0 V	0.01	0.2	0.25	0.3	0.4	0.45	0.5	0.9	μA

14. Dynamic characteristics

Table 12. Maximum data rate and output skew

Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 12.

Symbol	Parameter	Conditions		T_{amb} = -40 °C to +125 °C			Unit
				Min	Typ	Max	
f_{data}	data rate	50% duty cycle input; one channel switching; 20% of pulse > $0.7xV_{CCO}$; 20% of pulse < $0.3xV_{CCO}$	[1]				
		Up translation	[1][2]				
		V_{CCI} = 3.0 V to 3.6 V; V_{CCO} = 4.5 V to 5.5 V		-	350	250	Mbps
		V_{CCI} = 1.65 V to 1.95 V; V_{CCO} = 4.5 V to 5.5 V		-	350	250	Mbps
		V_{CCI} = 1.1 V to 1.3 V; V_{CCO} = 4.5 V to 5.5 V		-	220	100	Mbps
		V_{CCI} = 1.65 V to 1.95 V; V_{CCO} = 3.0 V to 3.6 V		-	230	150	Mbps
		V_{CCI} = 1.1 V to 1.3 V; V_{CCO} = 3.0 V to 3.6 V		-	300	140	Mbps
		V_{CCI} = 1.1 V to 1.3 V; V_{CCO} = 1.65 V to 1.95 V		-	100	40	Mbps
		Down translation	[1][2]				
		V_{CCI} = 4.5 V to 5.5 V; V_{CCO} = 3.0 V to 3.6 V		-	250	170	Mbps
		V_{CCI} = 4.5 V to 5.5 V; V_{CCO} = 1.65 V to 1.95 V		-	150	60	Mbps
		V_{CCI} = 4.5 V to 5.5 V; V_{CCO} = 1.1 V to 1.3 V		-	80	30	Mbps
		V_{CCI} = 3.0 V to 3.6 V; V_{CCO} = 1.65 V to 1.95 V		-	150	60	Mbps
		V_{CCI} = 3.0 V to 3.6 V; V_{CCO} = 1.1 V to 1.3 V		-	80	30	Mbps
		V_{CCI} = 1.65 V to 1.95 V; V_{CCO} = 1.1 V to 1.3 V		-	70	30	Mbps
$t_{sk(o)}$	output skew time	Timing skew between any switching outputs on the rising or falling edge					
		Up translation	[1][2]				
		V_{CCI} = 3.0 V to 3.6 V; V_{CCO} = 4.5 V to 5.5 V		-	0.15	0.7	ns
		V_{CCI} = 1.65 V to 1.95 V; V_{CCO} = 4.5 V to 5.5 V		-	0.25	1	ns
		V_{CCI} = 1.1 V to 1.3 V; V_{CCO} = 4.5 V to 5.5 V		-	0.5	2.1	ns
		V_{CCI} = 1.65 V to 1.95 V; V_{CCO} = 3.0 V to 3.6 V		-	0.25	1	ns
		V_{CCI} = 1.1 V to 1.3 V; V_{CCO} = 3.0 V to 3.6 V		-	0.5	2.1	ns
		V_{CCI} = 1.1 V to 1.3 V; V_{CCO} = 1.65 V to 1.95 V		-	0.5	2.1	ns
		Down translation	[1][2]				
		V_{CCI} = 4.5 V to 5.5 V; V_{CCO} = 3.0 V to 3.6 V		-	0.15	0.8	ns
		V_{CCI} = 4.5 V to 5.5 V; V_{CCO} = 1.65 V to 1.95 V		-	0.25	1.1	ns
		V_{CCI} = 4.5 V to 5.5 V; V_{CCO} = 1.1 V to 1.3 V		-	0.6	2.5	ns
		V_{CCI} = 3.0 V to 3.6 V; V_{CCO} = 1.65 V to 1.95 V		-	0.25	2.5	ns
		V_{CCI} = 3.0 V to 3.6 V; V_{CCO} = 1.1 V to 1.3 V		-	0.6	2.5	ns
		V_{CCI} = 1.65 V to 1.95 V; V_{CCO} = 1.1 V to 1.3 V		-	0.6	2.5	ns

[1] V_{CCO} is the supply voltage associated with the output pins (YBn).
[2] V_{CCI} is the supply voltage associated with the input pins (An).

Table 13. Typical dynamic characteristics at V_{CCA} = 0.9 V and T_{amb} = 25 °C

Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 12; for waveforms see Fig. 9, Fig. 11 and Fig. 10.

Symbol	Parameter	Conditions		V_{CCB}							Unit
				0.9 V	1.2 V	1.5 V	1.8 V	2.5 V	3.3 V	5.0 V	
t_{pd}	propagation delay	An to YBn	[1]	61	44	41	39.5	38.5	38.5	39.4	ns
t_{dis}	disable time	OE to YBn	[1]	67	51	47	47	44	44	42	ns
t_{en}	enable time	OE to YBn	[1]	67	51	47	47	44	44	42	ns

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

Table 14. Typical dynamic characteristics at V_{CCB} = 0.9 V and T_{amb} = 25 °C

Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 12; for waveforms see Fig. 9, Fig. 11 and Fig. 10.

Symbol	Parameter	Conditions		V_{CCA}							Unit
				0.9 V	1.2 V	1.5 V	1.8 V	2.5 V	3.3 V	5.0 V	
t_{pd}	propagation delay	An to YBn	[1]	61	44	41	39.5	38.5	38.5	39.4	ns
t_{dis}	disable time	OE to YBn	[1]	67	68	70	72	76	81	94	ns
t_{en}	enable time	OE to YBn	[1]	70	60	52	52	52	50	50	ns

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

Table 15. Typical dynamic characteristics at T_{amb} = 25 °C

Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 12.

Symbol	Parameter	Conditions	Supply voltage (V_{CCA} = V_{CCB})							Unit
			0.9 V	1.2 V	1.5 V	1.8 V	2.5 V	3.3 V	5.0 V	
C_{PD}	power dissipation capacitance	V_{CCA} [1][2][3] f_i = 10 MHz; V_I = GND to V_{CCI}; t_r = t_f = 1 ns; C_L = 0 pF; R_L = ∞ Ω								
		An to YBn; output disabled	1.5	1.6	1.7	1.7	1.9	2.1	2.7	pF
		An to YBn; output enabled	1.5	1.6	1.7	1.7	1.9	2.1	2.7	pF
		V_{CCB} [1][2][3] f_i = 10 MHz; V_I = GND to V_{CCI}; t_r = t_f = 1 ns; C_L = 0 pF; R_L = ∞ Ω								
		An to YBn; output disabled	1.5	1.6	1.7	1.7	1.9	2.1	2.7	pF
		An to YBn; output enabled	10	10.4	10.6	10.7	10.9	11.3	12.1	pF
C_I	input capacitance	V_I = 0 V or V_{CCI} [2]	1.9	1.9	1.9	1.9	1.9	1.9	1.9	pF
C_O	output capacitance	OE = GND; V_{CCA} = 3.3 V; V_{CCB} = 3.3 V; V_O = 0 V or V_{CCI}	3.2	3.2	3.2	3.2	3.2	3.2	3.2	pF

[1] C_{PD} per channel is used to determine the dynamic power dissipation (P_{DYN} in μW).
$P_{DYN} = N \times (C_{PD} \times V_{CCI}^2 \times f_i) + N \times (C_L \times V_{CCO}^2 \times f_o)$ where:
f_i = input frequency in MHz;
f_o = output frequency in MHz;
C_L = load capacitance in pF;
V_{CCI} = the supply voltage associated with the input pins in V;
V_{CCO} = the supply voltage associated with the output pins in V;
N = total number of inputs or outputs switching.

[2] V_{CCI} is the supply voltage associated with the input pins (An).

[3] V_{CCO} is the supply voltage associated with the output pins (YBn).

Table 16. Dynamic characteristics for temperature range -40 °C to +85 °C

Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 12; for waveforms see Fig. 9, Fig. 11 and Fig. 10.

Symbol	Parameter	Conditions	V_{CCB}												Unit
			1.2 V ± 0.1 V		1.5 V ± 0.1 V		1.8 V ± 0.15 V		2.5 V ± 0.2 V		3.3 V ± 0.3 V		5.0 V ± 0.5 V		
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
t_{pd}	propagation delay	An to YBn [1]													
		V_{CCA} = 1.2 V ± 0.1 V	6.0	42.1	5.3	30.1	5.0	26.5	4.7	22.8	4.7	21.5	4.7	21.9	ns
		V_{CCA} = 1.5 V ± 0.1 V	5.3	33.4	4.6	21.4	4.2	18.1	3.8	14.6	3.8	13.3	3.8	12.7	ns
		V_{CCA} = 1.8 V ± 0.15 V	5.0	31.3	4.3	19.2	3.5	15.6	3.4	12.4	3.4	11.2	3.4	10.1	ns
		V_{CCA} = 2.5 V ± 0.2 V	4.6	29.5	3.7	17.3	3.4	13.6	3.0	10.1	2.9	8.8	2.9	7.7	ns
		V_{CCA} = 3.3 V ± 0.3 V	4.6	29.1	3.8	16.6	3.5	12.9	3.1	9.4	2.9	7.9	2.8	6.8	ns
		V_{CCA} = 5.0 V ± 0.5 V	4.8	29.6	4.1	16.3	3.7	12.5	3.2	8.7	2.9	7.3	2.6	6.1	ns
t_{en}	enable time	OE to YBn [1]													
		V_{CCA} = 1.2 V ± 0.1 V	8.5	42.8	7.7	31.8	7.4	28.5	7.2	25.5	7.2	24.6	7.2	24.2	ns
		V_{CCA} = 1.5 V ± 0.1 V	7.9	39.4	6.4	23.1	5.8	19.8	5.6	16.7	5.6	15.7	5.6	15.2	ns
		V_{CCA} = 1.8 V ± 0.15 V	7.5	38.5	6.1	22.2	5.2	17.2	4.7	13.7	4.6	12.5	4.6	11.8	ns
		V_{CCA} = 2.5 V ± 0.2 V	7.1	37.5	5.3	21.3	4.4	16.1	3.9	10.7	3.7	9.5	3.7	8.6	ns
		V_{CCA} = 3.3 V ± 0.3 V	6.6	37.1	5.1	20.8	4.1	15.5	3.4	10.1	3.3	8.2	3.2	7.3	ns
		V_{CCA} = 5.0 V ± 0.5 V	6.2	36.5	4.5	20.2	3.6	15.1	2.9	9.4	2.6	7.4	2.6	6.2	ns
t_{dis}	disable time	OE to YBn [1]													
		V_{CCA} = 1.2 V ± 0.1 V	11.6	58.7	11.6	58.7	11.6	58.7	11.6	58.7	11.6	58.7	11.6	58.7	ns
		V_{CCA} = 1.5 V ± 0.1 V	10.8	50.5	8.5	39.4	8.5	39.4	8.5	39.4	8.7	39.4	8.7	39.4	ns
		V_{CCA} = 1.8 V ± 0.15 V	7.5	49.5	7.5	37.9	7.5	34.3	5.0	34.3	5.0	34.3	4.0	27.0	ns
		V_{CCA} = 2.5 V ± 0.2 V	7.5	44.5	7.5	32.5	5.0	28.9	5.0	25.1	5.0	16.1	2.6	19.5	ns
		V_{CCA} = 3.3 V ± 0.3 V	7.5	39.6	7.5	27.2	5.0	22.4	5.0	15.0	5.0	14.9	4.7	18.1	ns
		V_{CCA} = 5.0 V ± 0.5 V	7.5	33.7	7.5	20.4	4.9	16.5	4.9	12.3	4.9	11.9	3.6	12.3	ns

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

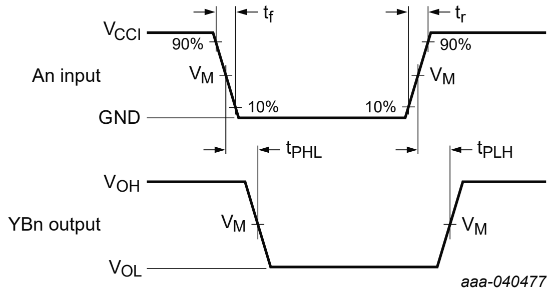
Table 17. Dynamic characteristics for temperature range -40 °C to +125 °C

Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 12; for waveforms see Fig. 9, Fig. 11 and Fig. 10.

Symbol	Parameter	Conditions	V_{CCB}												Unit
			1.2 V ± 0.1 V		1.5 V ± 0.1 V		1.8 V ± 0.15 V		2.5 V ± 0.2 V		3.3 V ± 0.3 V		5.0 V ± 0.5 V		
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
t_{pd}	propagation delay	An to YBn [1]													
		V_{CCA} = 1.2 V ± 0.1 V	6.0	42.1	5.3	31.1	5.0	27.4	4.7	23.6	4.7	22.2	4.7	22.3	ns
		V_{CCA} = 1.5 V ± 0.1 V	5.3	34.1	4.6	22.6	4.2	19.2	3.8	15.7	3.8	14.2	3.8	13.4	ns
		V_{CCA} = 1.8 V ± 0.15 V	5.0	31.8	4.3	20.4	3.5	16.6	3.4	13.3	3.4	12.1	3.4	10.7	ns
		V_{CCA} = 2.5 V ± 0.2 V	4.6	29.9	3.7	18.3	3.4	14.5	3.0	10.9	2.9	9.4	2.9	8.2	ns
		V_{CCA} = 3.3 V ± 0.3 V	4.6	29.5	3.8	17.6	3.5	13.7	3.1	10.1	2.9	8.5	2.8	7.2	ns
		V_{CCA} = 5.0 V ± 0.5 V	4.8	29.9	4.1	17.2	3.7	13.2	3.2	9.3	2.9	7.7	2.6	6.4	ns
t_{en}	enable time	OE to YBn [1]													
		V_{CCA} = 1.2 V ± 0.1 V	8.5	43.3	7.7	32.7	7.4	29.4	7.2	26.2	7.2	25.3	7.2	24.8	ns
		V_{CCA} = 1.5 V ± 0.1 V	7.9	39.8	6.4	24.3	6.1	21.1	5.6	17.6	5.6	16.5	5.6	15.9	ns
		V_{CCA} = 1.8 V ± 0.15 V	7.5	38.9	6.1	23.4	5.2	18.2	4.7	14.6	4.6	13.3	4.6	12.6	ns
		V_{CCA} = 2.5 V ± 0.2 V	7.1	37.9	5.3	22.4	4.4	17.2	3.9	11.5	3.7	10.2	3.7	9.2	ns
		V_{CCA} = 3.3 V ± 0.3 V	6.6	37.4	5.1	21.9	4.1	16.5	3.4	10.8	3.3	8.8	3.2	7.7	ns
		V_{CCA} = 5.0 V ± 0.5 V	6.2	36.9	4.5	21.4	3.6	16.1	2.9	10.2	2.6	8.1	2.6	6.5	ns
t_{dis}	disable time	OE to YBn [1]													
		V_{CCA} = 1.2 V ± 0.1 V	11.7	45.2	10.9	38.2	11.5	36.8	10.6	33.2	10.8	33.9	9.9	33.4	ns
		V_{CCA} = 1.5 V ± 0.1 V	11.6	45.2	8.5	27.8	8.9	26.3	7.4	22.6	7.4	23.2	7.4	21.2	ns
		V_{CCA} = 1.8 V ± 0.15 V	11.6	45.4	8.4	27.8	6.9	22.6	5.3	19.2	5.3	19.5	6.3	17.3	ns
		V_{CCA} = 2.5 V ± 0.2 V	11.6	45.8	8.3	27.9	7.1	22.6	4.7	18.9	6.0	16.0	4.6	14.1	ns
		V_{CCA} = 3.3 V ± 0.3 V	11.3	46.4	8.2	28.2	6.7	22.7	4.1	15.5	4.9	15.0	4.1	12.8	ns
		V_{CCA} = 5.0 V ± 0.5 V	11.3	59.2	8.4	28.8	6.4	25.6	3.4	16.9	4.9	17.1	3.1	13.3	ns

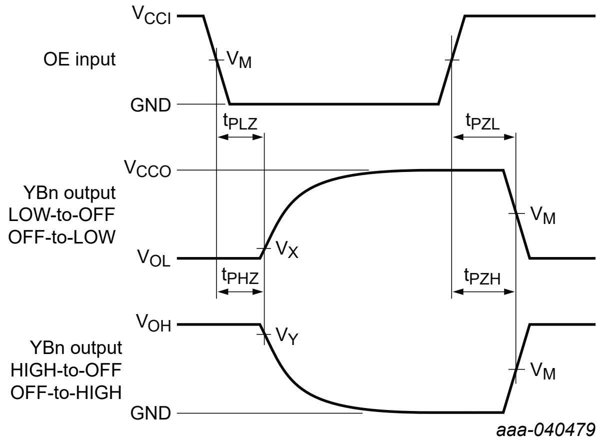
[1] t_{pd} is the same as t_{PLH} and t_{PHL}; t_{dis} is the same as t_{PLZ} and t_{PHZ}; t_{en} is the same as t_{PZL} and t_{PZH}.

14.1. Waveforms and test circuit



V_{CCI} is the supply voltage associated with the control input or input port.
V_{OL} and V_{OH} are typical output voltage levels that occur with the output load.
Measurement points are given in Table 18.

Fig. 9. Input (An) to output (YBn) propagation delay times



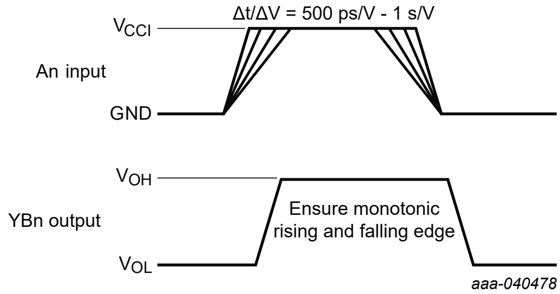
V_{CCI} is the supply voltage associated with the control input or input port.
V_{OL} and V_{OH} are typical output voltage levels that occur with the output load.
Measurement points are given in Table 18.

Fig. 10. Enable and disable times

Table 18. Measurement points

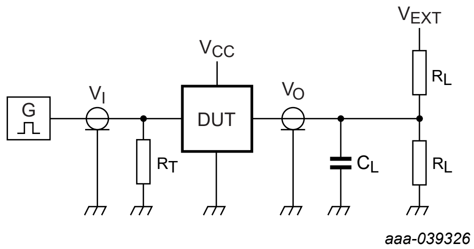
Supply voltage	Input[1]	Output[2]		
V_{CCA}, V_{CCB}	V_M	V_M	V_X	V_Y
0.9 V to 1.6 V	0.5 × V_{CCI}	0.5 × V_{CCO}	V_{OL} + 0.1 V	V_{OH} - 0.1 V
1.65 V to 2.7 V	0.5 × V_{CCI}	0.5 × V_{CCO}	V_{OL} + 0.15 V	V_{OH} - 0.15 V
3.0 V to 5.5 V	0.5 × V_{CCI}	0.5 × V_{CCO}	V_{OL} + 0.3 V	V_{OH} - 0.3 V

[1] V_{CCI} is the supply voltage associated with the control input or input pins (An).
[2] V_{CCO} is the supply voltage associated with the output pins (YBn).



V_{CCI} is the supply voltage associated with the control input or input port.
V_{OL} and V_{OH} are typical output voltage levels that occur with the output load.

Fig. 11. Input transition rise and fall rate



Test data is given in Table 19.
R_L = Load resistance;
C_L = Load capacitance including jig and probe capacitance;
R_T = Termination resistance;
V_{EXT} = External voltage for measuring switching times.

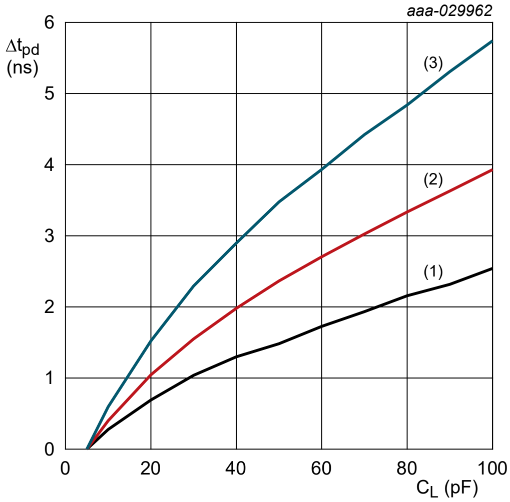
Fig. 12. Test circuit for measuring switching times

Table 19. Test data

Supply voltage	Load		Input		V_{EXT}		
V_{CCA}, V_{CCB}	C_L	R_L	t_r, t_f	V_I [1]	t_{PLH}, t_{PHL}	t_{PZH}, t_{PHZ}	t_{PZL}, t_{PLZ} [2]
0.9 V to 5.5 V	5 pF	10 kΩ	≤1.0 ns/V	V_{CCI}	open	GND	2 × V_{CCO}

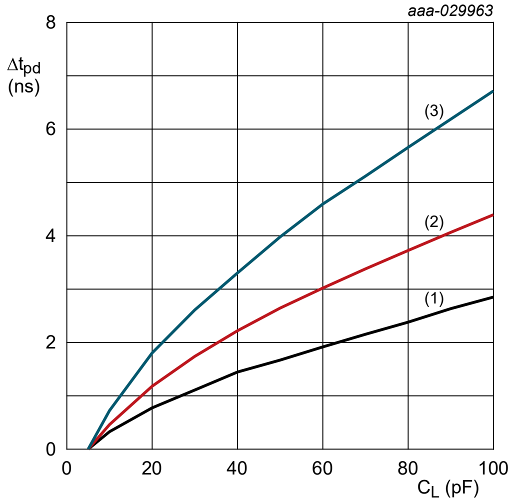
[1] V_{CCI} is the supply voltage associated with the control input or input pins (An).
[2] V_{CCO} is the supply voltage associated with the output pins (YBn).

14.2. Additional propagation delay versus load capacitance graphs



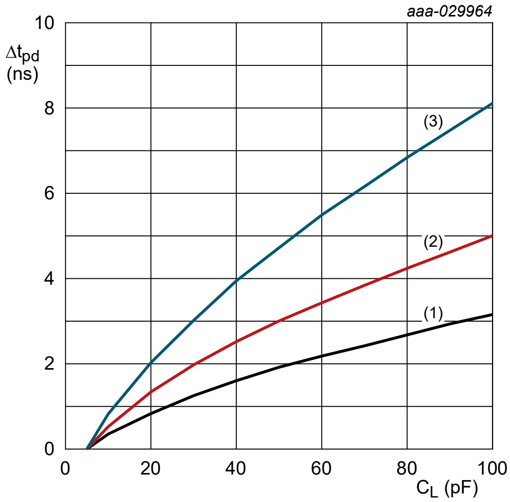
T_{amb} = -40 °C to +125 °C
For t_{PLH}, t_{PHL}, t_{PZH} and t_{PZL}.
(1) Minimum: V_{CCO} = 5.5 V
(2) Typical: T_{amb} = 25 °C; V_{CCO} = 5 V
(3) Maximum: V_{CCO} = 4.5 V

Fig. 13. Additional propagation delay versus load capacitance



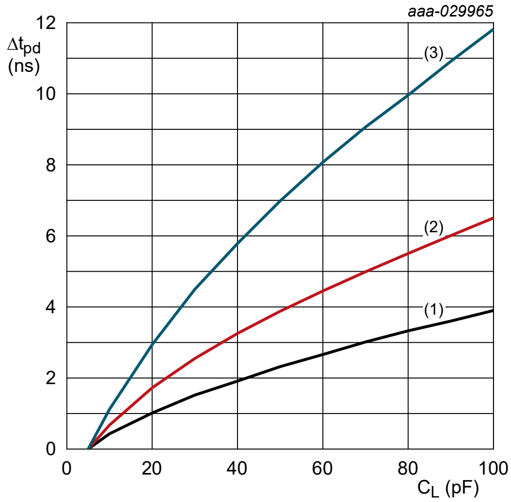
T_{amb} = -40 °C to +125 °C
For t_{PLH}, t_{PHL}, t_{PZH} and t_{PZL}.
(1) Minimum: V_{CCO} = 3.6 V
(2) Typical: T_{amb} = 25 °C; V_{CCO} = 3.3 V
(3) Maximum: V_{CCO} = 3 V

Fig. 14. Additional propagation delay versus load capacitance



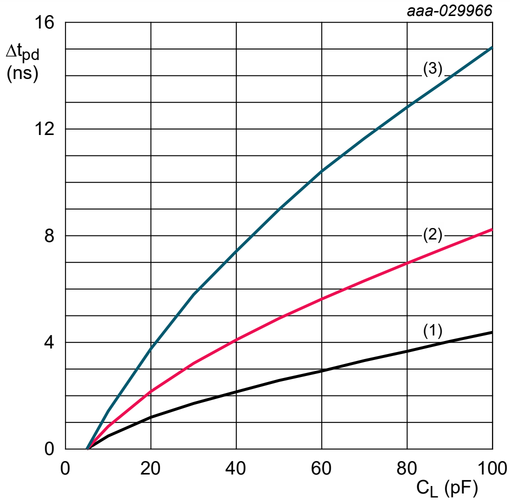
T_{amb} = -40 °C to +125 °C
For t_{PLH}, t_{PHL}, t_{PZH} and t_{PZL}.
(1) Minimum: V_{CCO} = 2.7 V
(2) Typical: T_{amb} = 25 °C; V_{CCO} = 2.5 V
(3) Maximum: V_{CCO} = 2.3 V

Fig. 15. Additional propagation delay versus load capacitance



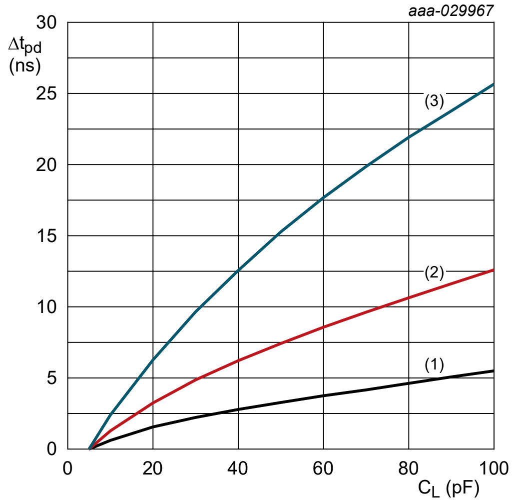
T_{amb} = -40 °C to +125 °C
For t_{PLH}, t_{PHL}, t_{PZH} and t_{PZL}.
(1) Minimum: V_{CCO} = 1.95 V
(2) Typical: T_{amb} = 25 °C; V_{CCO} = 1.8 V
(3) Maximum: V_{CCO} = 1.65 V

Fig. 16. Additional propagation delay versus load capacitance



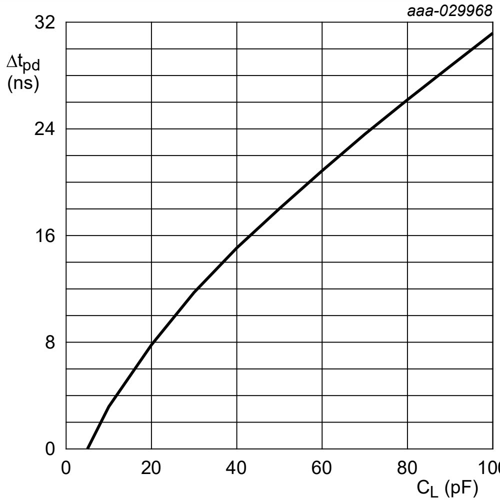
T_{amb} = -40 °C to +125 °C
For t_{PLH}, t_{PHL}, t_{PZH} and t_{PZL}.
(1) Minimum: V_{CCO} = 1.6 V
(2) Typical: T_{amb} = 25 °C; V_{CCO} = 1.5 V
(3) Maximum: V_{CCO} = 1.4 V

Fig. 17. Additional propagation delay versus load capacitance



T_{amb} = -40 °C to +125 °C
For t_{PLH}, t_{PHL}, t_{PZH} and t_{PZL}.
(1) Minimum: V_{CCO} = 1.3 V
(2) Typical: T_{amb} = 25 °C; V_{CCO} = 1.2 V
(3) Maximum: V_{CCO} = 1.1 V

Fig. 18. Additional propagation delay versus load capacitance



T_{amb} = 25 °C;
For t_{PLH}, t_{PHL}, t_{PZH} and t_{PZL}.
V_{CCO} = 0.9 V

Fig. 19. Additional propagation delay versus load capacitance

15. Application information

NXU0102

The NXU0102 is a 2-bit level-shifting transceiver suitable for level-translation purposes. This device is ideal in any application requiring level-shifting between two voltage domains and especially designed for applications where push-pull drivers are utilized to the data input pins. Below an example of possible GPIO application.

Typical GPIO application

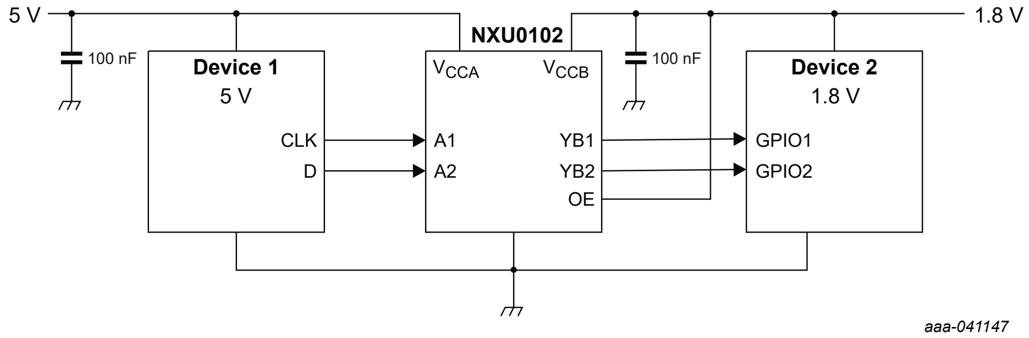
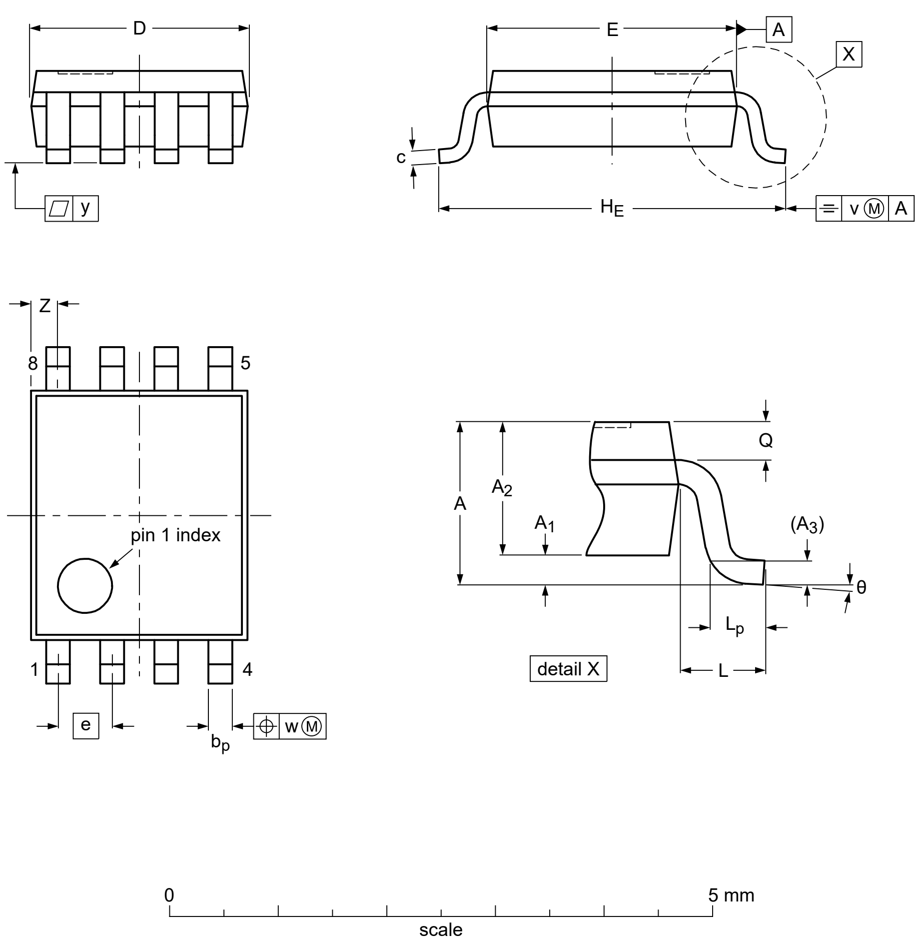


Fig. 20. GPIO application

16. Package outline

VSSOP8: plastic very thin shrink small outline package; 8 leads; body width 2.3 mm **SOT765-1**



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
	max		0.15	0.85		0.27	0.23	2.1	2.4		3.2		0.40	0.21				0.4	8°
mm	nom	1			0.12					0.5		0.4			0.2	0.08	0.1		
	min		0.00	0.60		0.17	0.08	1.9	2.2		3.0		0.15	0.19				0.1	0°

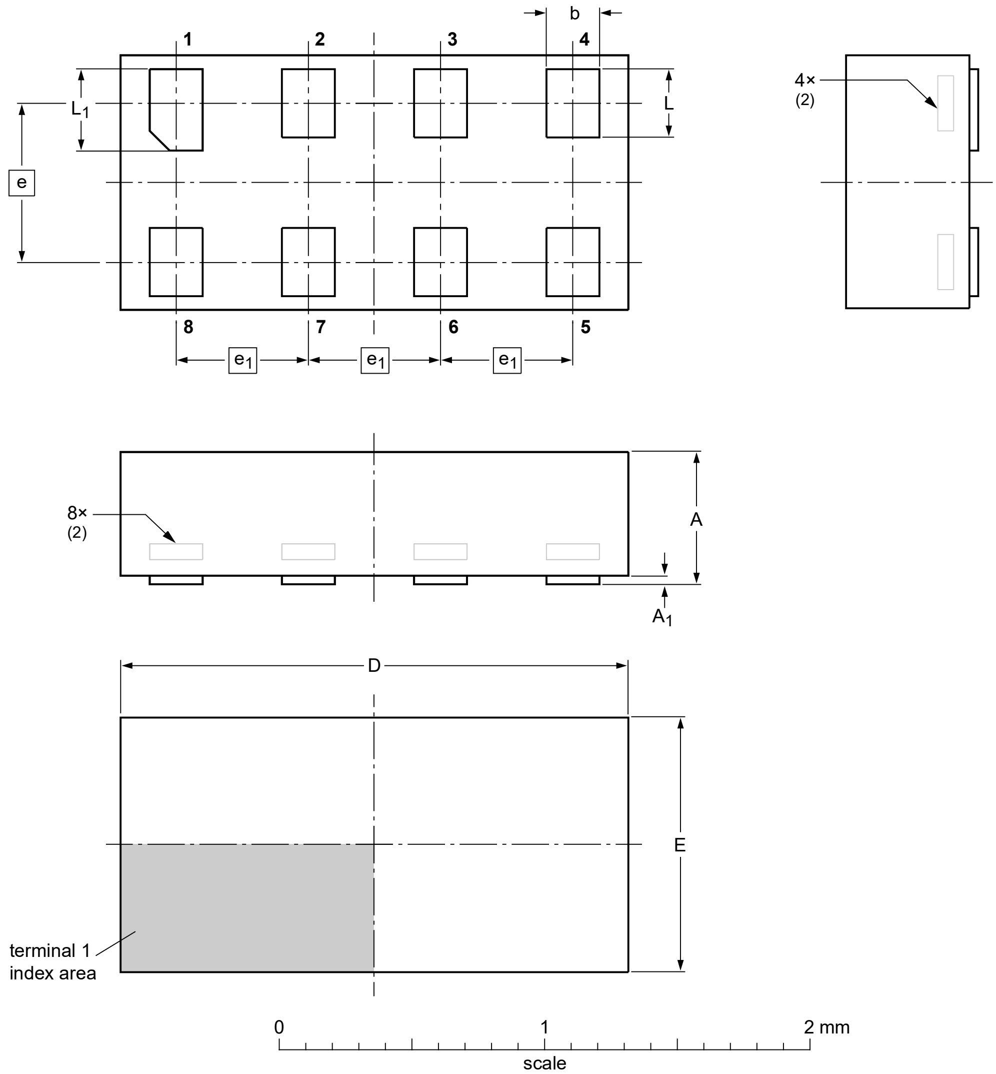
Note
1. Plastic or metal protrusions of 0.15 mm maximum per side are not included.
2. Plastic or metal protrusions of 0.25 mm maximum per side are not included.

sot765-1_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT765-1		MO-187				~~07-06-02~~ 16-05-31

Fig. 21. Package outline SOT765-1 (VSSOP8)

XSON8: plastic extremely thin small outline package; no leads; 8 terminals; body 1 x 1.95 x 0.5 mm **SOT833-1**



DIMENSIONS (mm are the original dimensions)

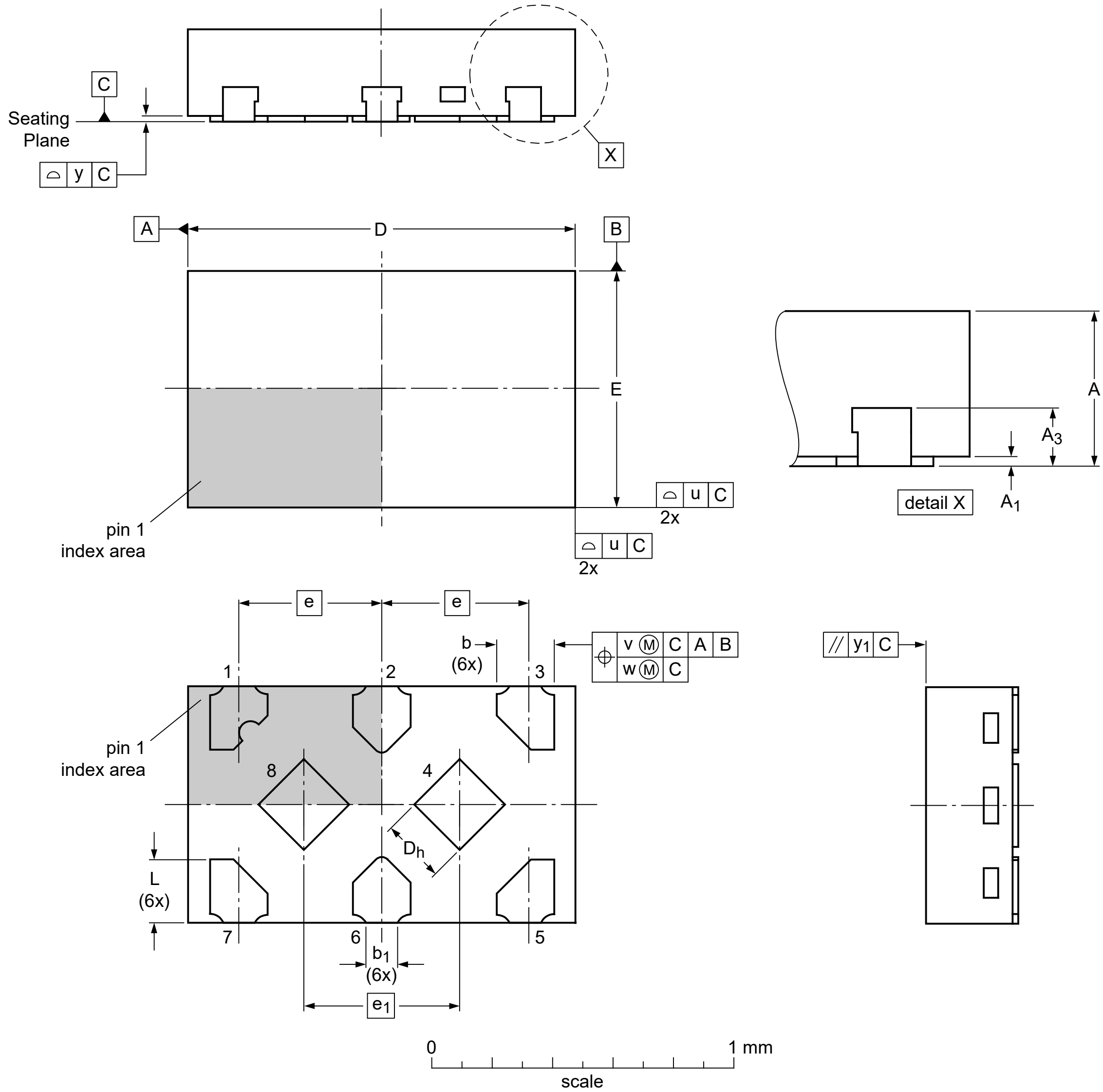
UNIT	A(1) max	A_1 max	b	D	E	e	e_1	L	L_1
mm	0.5	0.04	0.25 0.17	2.0 1.9	1.05 0.95	0.6	0.5	0.35 0.27	0.40 0.32

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

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT833-1	- - -	MO-252	- - -			~~07-11-14~~ 07-12-07

Fig. 22. Package outline SOT833-1 (XSON8)

X2SON8: plastic thermal enhanced extremely thin small outline package; no leads; 8 terminals; body 1.35 x 0.8 x 0.32 mm **SOT1233-2**



Dimensions (mm are the original dimensions)

Unit		A	A1	A3	b	b1	D	Dh	E	e	e1	L	u	v	w	y	y1
mm	max	0.35	0.04		0.25			0.27				0.27					
	nom	0.32	0.02	0.10 (Typ.)	0.20	0.11 (ref)	1.35	0.22	0.80	0.50	0.54	0.22	0.05	0.10	0.05	0.05	0.05
	min	0.30	0.00		0.15			0.17				0.17					

sot1233-2_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT1233-2		- - -				19-11-12

Fig. 23. Package outline SOT1233-2 (X2SON8)

17. Abbreviations

Table 20. Abbreviations

Acronym	Description
ANSI	American National Standards Institute
CDM	Charged Device Model
DUT	Device Under Test
ESD	ElectroStatic Discharge
ESDA	Earth Sciences Data Standards
HBM	Human Body Model
JEDEC	Joint Electron Device Engineering Council
JTAG	Joint Test Action Group
UART	Universal Asynchronous Receiver/Transmitter

18. Revision history

Table 21. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
NXU0102 v.1	20241030	Product data sheet	-	-

19. 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: 30 October 2024