# 74HC366; 74HCT366

Hex buffer/line driver; 3-state; inverting Rev. 6 — 17 February 2021

**Product data sheet** 

### 1. General description

The 74HC366; 74HCT366 is a hex inverting buffer/line driver with 3-state outputs controlled by the output enable inputs ( $\overline{\text{OEn}}$ ). A HIGH on  $\overline{\text{OEn}}$  causes the outputs to assume a high impedance OFF-state. Inputs include clamp diodes. This enables the use of current limiting resistors to interface inputs to voltages in excess of  $V_{CC}$ .

#### 2. Features and benefits

- Wide supply voltage range from 2.0 V to 6.0 V
- CMOS low power dissipation
- · High noise immunity
- · Latch-up performance exceeds 100 mA per JESD 78 Class II Level B
- · Complies with JEDEC standards:
  - JESD8C (2.7 V to 3.6 V)
  - JESD7A (2.0 V to 6.0 V)
- · Inverting outputs
- Input levels:
  - For 74HC366: CMOS level
  - For 74HCT366: TTL level
- · ESD protection:
- HBM JESD22-A114F exceeds 2000 V
  - MM JESD22-A115-A exceeds 200 V
- Specified from -40 °C to +85 °C and from -40 °C to +125 °C

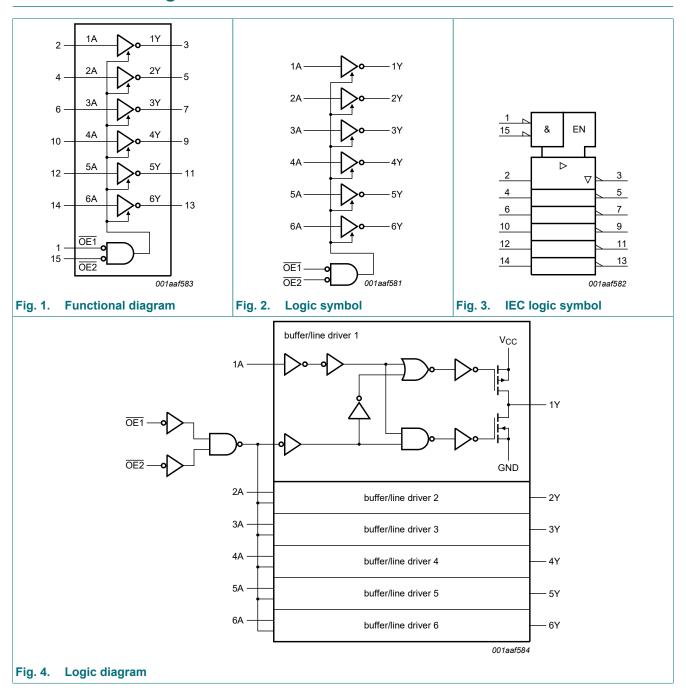
### 3. Ordering information

#### **Table 1. Ordering information**

Type number	Package			
	Temperature range	Name	Description	Version
74HC366D	-40 °C to +125 °C	SO16	plastic small outline package; 16 leads; body width 3.9 mm	SOT109-1
74HCT366D				
74HC366PW	-40 °C to +125 °C	TSSOP16	plastic thin shrink small outline package; 16 leads;	SOT403-1
74HCT366PW			body width 4.4 mm	

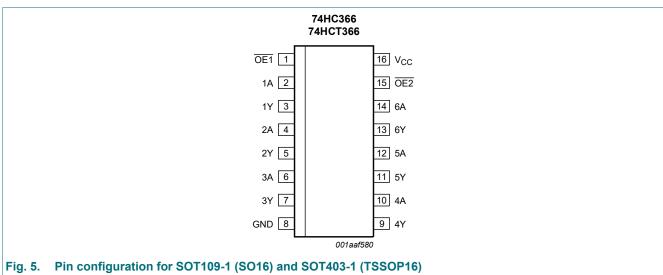


## 4. Functional diagram



### 5. Pinning information

#### 5.1. Pinning



### 5.2. Pin description

Table 2. Pin description

Symbol	Pin	Description
OE1, OE2	1, 15	output enable input (active LOW)
1A, 2A, 3A, 4A, 5A, 6A	2, 4, 6, 10, 12, 14	data input
1Y, 2Y, 3Y, 4Y, 5Y, 6Y	3, 5, 7, 9, 11, 13	data output
GND	8	ground (0 V)
V <sub>CC</sub>	16	supply voltage

### 6. Functional description

#### **Table 3. Function table**

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

		Input	Output
OE1	OE2	nA	nY
L	L	L	Н
L	L	Н	L
X	Н	X	Z
Н	X	X	Z

**Product data sheet** 

### 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 <sub>CC</sub>	supply voltage		-0.5	+7	V
I <sub>IK</sub>	input clamping current	$V_{I} < -0.5 \text{ V or } V_{I} > V_{CC} + 0.5 \text{ V}$	-	±20	mA
I <sub>OK</sub>	output clamping current	$V_{O} < -0.5 \text{ V or } V_{O} > V_{CC} + 0.5 \text{ V}$	-	±20	mA
Io	output current	$V_{O} = -0.5 \text{ V to } (V_{CC} + 0.5 \text{ V})$	-	±35	mA
I <sub>CC</sub>	supply current		-	70	mA
I <sub>GND</sub>	ground current		-	-70	mA
T <sub>stg</sub>	storage temperature		-65	+150	°C
P <sub>tot</sub>	total power dissipation	[1]	-	500	mW

<sup>[1]</sup> For SOT109-1 (SO16) package:  $P_{tot}$  derates linearly with 12.4 mW/K above 110 °C. For SOT403-1 (TSSOP16) package:  $P_{tot}$  derates linearly with 8.5 mW/K above 91 °C.

### 8. Recommended operating conditions

#### Table 5. Recommended operating conditions

Voltages are referenced to GND (ground = 0 V)

Symbol	Parameter	Conditions	74HC366			74HCT366			Unit
			Min	Тур	Max	Min	Тур	Max	
V <sub>CC</sub>	supply voltage		2.0	5.0	6.0	4.5	5.0	5.5	V
VI	input voltage		0	-	V <sub>CC</sub>	0	-	V <sub>CC</sub>	V
Vo	output voltage		0	-	V <sub>CC</sub>	0	-	V <sub>CC</sub>	V
T <sub>amb</sub>	ambient temperature		-40	+25	+125	-40	+25	+125	°C
Δt/ΔV	input transition rise and fall rate	V <sub>CC</sub> = 2.0 V	-	-	625	-	-	-	ns/V
		V <sub>CC</sub> = 4.5 V	-	1.67	139	-	1.67	139	ns/V
		V <sub>CC</sub> = 6.0 V	-	-	83	-	-	-	ns/V

### 9. Static characteristics

#### Table 6. Static characteristics 74HC366

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

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
T <sub>amb</sub> = 2	5 °C		'	ı		
V <sub>IH</sub>	HIGH-level input voltage	V <sub>CC</sub> = 2.0 V	1.5	1.2	-	V
		V <sub>CC</sub> = 4.5 V	3.15	2.4	- 0.5 1.35 1.8 	V
		V <sub>CC</sub> = 6.0 V	4.2	3.2		V
V <sub>IL</sub>	LOW-level input voltage	V <sub>CC</sub> = 2.0 V	-	0.8	0.5	V
		V <sub>CC</sub> = 4.5 V	-	2.1	1.35	V
		V <sub>CC</sub> = 6.0 V	-	2.8	1.8 - - - - -	V
V <sub>OH</sub>	HIGH-level output voltage	$V_I = V_{IH}$ or $V_{IL}$	-	-	1.2	
		I <sub>O</sub> = -20 μA; V <sub>CC</sub> = 2.0 V	1.9	2.0		V
		I <sub>O</sub> = -20 μA; V <sub>CC</sub> = 4.5 V	4.4	4.5		V
		I <sub>O</sub> = -20 μA; V <sub>CC</sub> = 6.0 V	5.9	6.0		V
		I <sub>O</sub> = -6.0 mA; V <sub>CC</sub> = 4.5 V	3.98	4.32		V
		I <sub>O</sub> = -7.8 mA; V <sub>CC</sub> = 6.0 V	5.48	5.81	-	V
V <sub>OL</sub>	LOW-level output voltage	$V_I = V_{IH}$ or $V_{IL}$				
		I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 2.0 V	-	0	0.1	V
		I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 4.5 V	-	0	- 0.5 1.35 1.8 	V
		I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 6.0 V	-	0	0.1	V
		I <sub>O</sub> = 6.0 mA; V <sub>CC</sub> = 4.5 V	-	0.15	0.26	V
		I <sub>O</sub> = 7.8 mA; V <sub>CC</sub> = 6.0 V	-	0.16	0.26	V
lį	input leakage current	$V_I = V_{CC}$ or GND; $V_{CC} = 6.0 \text{ V}$	-	-	±0.1	μΑ
l <sub>OZ</sub>	OFF-state output current	$V_I = V_{IH}$ or $V_{IL}$ ; $V_O = V_{CC}$ or GND; $V_{CC} = 6.0 \text{ V}$	-	-	±0.5	μΑ
I <sub>CC</sub>	supply current	$V_I = V_{CC}$ or GND; $I_O = 0$ A; $V_{CC} = 6.0$ V	-	-	8.0	μΑ
Cı	input capacitance		-	3.5	-	pF

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
T <sub>amb</sub> = -	40 °C to +85 °C		'			
V <sub>IH</sub>	HIGH-level input voltage	V <sub>CC</sub> = 2.0 V	1.5	-	-	V
		V <sub>CC</sub> = 4.5 V	3.15	-	-	V
		V <sub>CC</sub> = 6.0 V	4.2	-	-	V
V <sub>IL</sub>	LOW-level input voltage	V <sub>CC</sub> = 2.0 V	-	-	0.5	V
		V <sub>CC</sub> = 4.5 V	-	-	1.35	V
		$V_{CC} = 6.0 \text{ V}$	-	-	1.8	V
$V_{OH}$	HIGH-level output voltage	$V_I = V_{IH}$ or $V_{IL}$				
		$I_{O}$ = -20 $\mu$ A; $V_{CC}$ = 2.0 $V$	1.9	-	-	V
		$I_{O} = -20 \mu A; V_{CC} = 4.5 V$	4.4	-	-	V
		$I_{O} = -20 \mu A; V_{CC} = 6.0 V$	5.9	-	-	V
		$I_{O}$ = -6.0 mA; $V_{CC}$ = 4.5 V	3.84	•	-	V
		$I_{O}$ = -7.8 mA; $V_{CC}$ = 6.0 V	5.34	-	-	V
$V_{OL}$	LOW-level output voltage	$V_I = V_{IH}$ or $V_{IL}$				
		$I_{O} = 20 \mu A; V_{CC} = 2.0 V$	-	-	0.1	V
		$I_{O} = 20 \mu A; V_{CC} = 4.5 V$	-	-	0.1	V
		$I_{O} = 20 \mu A; V_{CC} = 6.0 V$	-	-	0.1	V
		$I_{O} = 6.0 \text{ mA}; V_{CC} = 4.5 \text{ V}$	-	-	0.33	V
		$I_{O} = 7.8 \text{ mA}; V_{CC} = 6.0 \text{ V}$	-	-	0.33	V
l <sub>l</sub>	input leakage current	$V_I = V_{CC}$ or GND; $V_{CC} = 6.0 \text{ V}$ ;	-	-	±1.0	μΑ
l <sub>oz</sub>	OFF-state output current	$V_I = V_{IH}$ or $V_{IL}$ ; $V_O = V_{CC}$ or GND; $V_{CC} = 6.0 \text{ V}$	-	-	±5.0	μΑ
I <sub>CC</sub>	supply current	$V_I = V_{CC}$ or GND; $I_O = 0$ A; $V_{CC} = 6.0$ V	-	-	80	μΑ
T <sub>amb</sub> = -	40 °C to +125 °C					
$V_{IH}$	HIGH-level input voltage	V <sub>CC</sub> = 2.0 V	1.5	-	-	V
		V <sub>CC</sub> = 4.5 V	3.15	-	-	V
		$V_{CC} = 6.0 \text{ V}$	4.2	-	-	V
$V_{IL}$	LOW-level input voltage	$V_{CC} = 2.0 \text{ V}$	-	-	0.5	V
		V <sub>CC</sub> = 4.5 V	-	-	1.35	V
		V <sub>CC</sub> = 6.0 V	-	-	1.35 1.8	V
$V_{OH}$	HIGH-level output voltage	$V_I = V_{IH}$ or $V_{IL}$				
		$I_{O} = -20 \mu A; V_{CC} = 2.0 V$	1.9	-	-	V
		$I_{O} = -20 \mu A; V_{CC} = 4.5 V$	4.4	•	-	V
		$I_{O} = -20 \mu A; V_{CC} = 6.0 V$	5.9	-	-	V
		$I_{O}$ = -6.0 mA; $V_{CC}$ = 4.5 V	3.7	•	-	V
		$I_{O}$ = -7.8 mA; $V_{CC}$ = 6.0 V	5.2	-	-	V
$V_{OL}$	LOW-level output voltage	$V_I = V_{IH}$ or $V_{IL}$				
		I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 2.0 V	-	-	0.1	V
		I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 4.5 V	-	-	0.1	V
		I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 6.0 V	-	-	0.1	V
		I <sub>O</sub> = 6.0 mA; V <sub>CC</sub> = 4.5 V	-	_	0.4	V
		I <sub>O</sub> = 7.8 mA; V <sub>CC</sub> = 6.0 V	-	-	0.4	V
l <sub>l</sub>	input leakage current	$V_I = V_{CC}$ or GND; $V_{CC} = 6.0 \text{ V}$	-	_	±1.0	μΑ
l <sub>oz</sub>	OFF-state output current	$V_I = V_{IH}$ or $V_{IL}$ ; $V_O = V_{CC}$ or GND; $V_{CC} = 6.0 \text{ V}$	-	-	±10.0	μΑ
I <sub>CC</sub>	supply current	$V_{I} = V_{CC}$ or GND; $I_{O} = 0$ A; $V_{CC} = 6.0$ V	-	-	160	μΑ

Table 7. Static characteristics 74HCT366

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

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
T <sub>amb</sub> = 2	5 °C					
V <sub>IH</sub>	HIGH-level input voltage	V <sub>CC</sub> = 4.5 V to 5.5 V	2.0	1.6	-	V
V <sub>IL</sub>	LOW-level input voltage	V <sub>CC</sub> = 4.5 V to 5.5 V	-	1.2	0.8	V
V <sub>OH</sub>	HIGH-level output	$V_I = V_{IH}$ or $V_{IL}$ ; $V_{CC} = 4.5 \text{ V}$				
	voltage	I <sub>O</sub> = -20 μA	4.4	4.5	-	V
		I <sub>O</sub> = -6.0 mA	3.98	4.32	-	V
V <sub>OL</sub>	LOW-level output voltage	$V_I = V_{IH}$ or $V_{IL}$ ; $V_{CC} = 4.5 \text{ V}$				
		Ι <sub>Ο</sub> = 20 μΑ	-	0	0.1	V
		I <sub>O</sub> = 6.0 mA	-	0.16	0.26	V
I <sub>I</sub>	input leakage current	$V_I = V_{CC}$ or GND; $V_{CC} = 5.5 \text{ V}$	-	-	±0.1	μΑ
l <sub>OZ</sub>	OFF-state output current	$V_I = V_{IH}$ or $V_{IL}$ ; $V_O = V_{CC}$ or GND; $V_{CC} = 5.5 \text{ V}$	-	-	±0.5	μΑ
I <sub>CC</sub>	supply current	$V_I = V_{CC}$ or GND; $I_O = 0$ A; $V_{CC} = 5.5$ V	-	-	8.0	μΑ
ΔI <sub>CC</sub>	additional supply current	$V_I = V_{CC}$ - 2.1 V; other inputs at $V_{CC}$ or GND; $I_O = 0$ A			0 360	
		pins nA	-	100	360	μΑ
		pin <del>OE1</del>	-	100	360	μΑ
		pin OE2	-	90	320	μΑ
Cı	input capacitance		-	3.5	-	pF
T <sub>amb</sub> = -4	40 °C to +85 °C			•		
V <sub>IH</sub>	HIGH-level input voltage	V <sub>CC</sub> = 4.5 V to 5.5 V	2.0	-	-	V
V <sub>IL</sub>	LOW-level input voltage	V <sub>CC</sub> = 4.5 V to 5.5 V	-	-	0.8	V
V <sub>OH</sub>	HIGH-level output voltage	$V_I = V_{IH}$ or $V_{IL}$ ; $V_{CC} = 4.5 \text{ V}$				
		I <sub>O</sub> = -20 μA	4.4	-	-	V
		I <sub>O</sub> = -6.0 mA	3.84	-	- 0.1 0.26 ±0.1 ±0.5 8.0 360 320 - 0.8	V
V <sub>OL</sub>	LOW-level output voltage	$V_I = V_{IH}$ or $V_{IL}$ ; $V_{CC} = 4.5 \text{ V}$				
		Ι <sub>Ο</sub> = 20 μΑ	-	-	0.1	V
		I <sub>O</sub> = 6.0 mA	-	-	0.33	V
lį	input leakage current	$V_I = V_{CC}$ or GND; $V_{CC} = 5.5 \text{ V}$	-	-	±1.0	μΑ
l <sub>oz</sub>	OFF-state output current	$V_I = V_{IH}$ or $V_{IL}$ ; $V_O = V_{CC}$ or GND; $V_{CC} = 5.5 \text{ V}$			±5.0	μΑ
Icc	supply current	$V_{I} = V_{CC}$ or GND; $I_{O} = 0$ A; $V_{CC} = 5.5 \text{ V}$	-	-	80	μΑ
ΔI <sub>CC</sub>	additional supply current	$V_I = V_{CC}$ - 2.1 V; other inputs at $V_{CC}$ or GND; $I_O = 0$ A				
		pins nA	-	-	450	μA
		pin OE1	-	-	450	μΑ
		pin OE2	-	-	400	μA

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
T <sub>amb</sub> = -4	0 °C to +125 °C		'			
V <sub>IH</sub>	HIGH-level input voltage	V <sub>CC</sub> = 4.5 V to 5.5 V	2.0	-	-	V
V <sub>IL</sub>	LOW-level input voltage	V <sub>CC</sub> = 4.5 V to 5.5 V	-	-	0.8	V
V <sub>OH</sub>	HIGH-level output voltage	$V_I = V_{IH}$ or $V_{IL}$ ; $V_{CC} = 4.5 V$				
		I <sub>O</sub> = -20 μA	4.4	-	0.8 - - 0.1 0.4 ±1.0 ±10.0 160 490	V
		I <sub>O</sub> = -6.0 mA	3.7	-	-	V
V <sub>OL</sub>	LOW-level output voltage	$V_I = V_{IH}$ or $V_{IL}$ ; $V_{CC} = 4.5 \text{ V}$				
		Ι <sub>Ο</sub> = 20 μΑ	-	-		V
		I <sub>O</sub> = 6.0 mA	-	-	0.4	V
I <sub>I</sub>	input leakage current	$V_I = V_{CC}$ or GND; $V_{CC} = 5.5 \text{ V}$	-	-	±1.0	μΑ
l <sub>OZ</sub>	OFF-state output current	$V_I = V_{IH}$ or $V_{IL}$ ; $V_O = V_{CC}$ or GND; $V_{CC} = 5.5 \text{ V}$	-	-	±10.0	μΑ
I <sub>CC</sub>	supply current	$V_{I} = V_{CC}$ or GND; $I_{O} = 0$ A; $V_{CC} = 5.5$ V	-	-	160	μΑ
ΔI <sub>CC</sub>	additional supply current	$V_I = V_{CC}$ - 2.1 V; other inputs at $V_{CC}$ or GND; $I_O = 0$ A				
		pins nA	-	-	490	μΑ
		pin <del>OE1</del>	-	-	490	μΑ
		pin OE2	-	-	441	μΑ

## 10. Dynamic characteristics

#### Table 8. Dynamic characteristics 74HC366

Voltages are referenced to GND (ground = 0 V);  $C_L$  = 50 pF unless otherwise specified; see test circuit Fig. 8.

Symbol	Parameter	Conditions		Min	Тур	Max	Unit
T <sub>amb</sub> = 2	5 °C				1	1	
t <sub>pd</sub>	propagation delay	nA to nY; see Fig. 6	[1]				
		V <sub>CC</sub> = 2.0 V		-	33	100	ns
		V <sub>CC</sub> = 4.5 V		-	12	20	ns
		V <sub>CC</sub> = 5 V; C <sub>L</sub> = 15 pF		-	10	-	ns
		V <sub>CC</sub> = 6.0 V		-	10	17	ns
t <sub>en</sub>	enable time	OEn to nY; see Fig. 7	[2]				
		V <sub>CC</sub> = 2.0 V		-	44	150 30 26	ns
		V <sub>CC</sub> = 4.5 V		-	16		ns
		V <sub>CC</sub> = 6.0 V		-	13		ns
t <sub>dis</sub>	disable time	OEn to nY; see Fig. 7	[3]				
		V <sub>CC</sub> = 2.0 V		-	55	150	ns
		V <sub>CC</sub> = 4.5 V		-	20	150 30 26	ns
		V <sub>CC</sub> = 6.0 V		-	16	26	ns
t <sub>t</sub>	transition time	see <u>Fig. 6</u>	[4]			20 - 17 150 30 26 150 30 26	
		V <sub>CC</sub> = 2.0 V		-	14	60	ns
		V <sub>CC</sub> = 4.5 V		-	5	12	ns
		V <sub>CC</sub> = 6.0 V		-	4	10	ns
C <sub>PD</sub>	power dissipation capacitance	per buffer; $V_I$ = GND to $V_{CC}$	[5]	-	30	-	pF

Symbol	Parameter	Conditions		Min	Тур	Max	Unit
T <sub>amb</sub> = -4	40 °C to +85 °C					'	
t <sub>pd</sub>	propagation delay	nA to nY; see Fig. 6	[1]				
		V <sub>CC</sub> = 2.0 V		-	-	125	ns
		V <sub>CC</sub> = 4.5 V		-	-	25	ns
		V <sub>CC</sub> = 6.0 V		-	-	21	ns
t <sub>en</sub>	enable time	OEn to nY; see Fig. 7	[2]				
		V <sub>CC</sub> = 2.0 V		-	-	190	ns
		V <sub>CC</sub> = 4.5 V		-	-	38	ns
		V <sub>CC</sub> = 6.0 V		-	-	33	ns
t <sub>dis</sub>	disable time	OEn to nY; see Fig. 7	[3]				
		V <sub>CC</sub> = 2.0 V		-	-	190	ns
		V <sub>CC</sub> = 4.5 V		-	-	38	ns
		V <sub>CC</sub> = 6.0 V		-	-	33	ns
t <sub>t</sub>	transition time	see <u>Fig. 6</u>	[4]				
		V <sub>CC</sub> = 2.0 V		-	-	75 15	ns
		V <sub>CC</sub> = 4.5 V		-	-		ns
		V <sub>CC</sub> = 6.0 V		-	-	13	ns
T <sub>amb</sub> = -4	40 °C to +125 °C						
t <sub>pd</sub>	propagation delay	nA to nY; see Fig. 6	[1]				
		V <sub>CC</sub> = 2.0 V		-	-	150	ns
		V <sub>CC</sub> = 4.5 V		-	-	30	ns
		V <sub>CC</sub> = 6.0 V		-	-	25 21 190 38 33 190 38 33 75 15 13 26 225 45 38 225 45 38	ns
t <sub>en</sub>	enable time	OEn to nY; see Fig. 7	[2]				
		V <sub>CC</sub> = 2.0 V		-	-	225	ns
		V <sub>CC</sub> = 4.5 V		-	-	45	ns
		V <sub>CC</sub> = 6.0 V		-	-	38	ns
t <sub>dis</sub>	disable time	OEn to nY; see Fig. 7	[3]				
		V <sub>CC</sub> = 2.0 V		-	-	225	ns
		V <sub>CC</sub> = 4.5 V		-	-	45	ns
		V <sub>CC</sub> = 6.0 V		-	-	38	ns
t <sub>t</sub>	transition time	see Fig. 6	[4]				
		V <sub>CC</sub> = 2.0 V		-	-	90	ns
		V <sub>CC</sub> = 4.5 V		-	-		ns
		V <sub>CC</sub> = 6.0 V		-	-	15	ns

- $t_{\text{pd}}$  is the same as  $t_{\text{PHL}}$  and  $t_{\text{PLH}}$ .
- $\dot{t}_{en}$  is the same as  $t_{PZH}$  and  $t_{PZL}$ .
- [3]  $t_{dis}$  is the same as  $t_{PHZ}$  and  $t_{PLZ}$ .
- t<sub>dis</sub> is the same as t<sub>THL</sub> and t<sub>TLH</sub>.
   C<sub>PD</sub> is used to determine the dynamic power dissipation (P<sub>D</sub> in μW).
   P<sub>D</sub> = C<sub>PD</sub> x V<sub>CC</sub><sup>2</sup> x f<sub>i</sub> x N + Σ(C<sub>L</sub> x V<sub>CC</sub><sup>2</sup> x f<sub>o</sub>) where:

 $f_i$  = input frequency in MHz;

f<sub>o</sub> = output frequency in MHz;

C<sub>L</sub> = output load capacitance in pF;

V<sub>CC</sub> = supply voltage in V;

N = number of inputs switching;

 $\Sigma(C_L \times V_{CC}^2 \times f_0) = \text{sum of outputs.}$ 

#### Table 9. Dynamic characteristics 74HCT366

Voltages are referenced to GND (ground = 0 V);  $C_L$  = 50 pF unless otherwise specified; see test circuit Fig. 8.

Symbol	Parameter	Conditions		Min	Тур	Max	Unit
T <sub>amb</sub> = 2	5 °C	,					
t <sub>pd</sub>	propagation delay	nA to nY; see Fig. 6	[1]				
		V <sub>CC</sub> = 4.5 V		-	13	24	ns
		V <sub>CC</sub> = 5 V; C <sub>L</sub> = 15 pF		-	11	-	ns
t <sub>en</sub>	enable time	OEn to nY; V <sub>CC</sub> = 4.5 V; see Fig. 7	[2]	-	16	35	ns
t <sub>dis</sub>	disable time	OEn to nY; V <sub>CC</sub> = 4.5 V; see Fig. 7	[3]	-	20	35	ns
t <sub>t</sub>	transition time	V <sub>CC</sub> = 4.5 V; see <u>Fig. 6</u>	[4]	-	5	12	ns
C <sub>PD</sub>	power dissipation capacitance	per buffer; V <sub>I</sub> = GND to (V <sub>CC</sub> - 1.5 V)	[5]	-	30	-	pF
T <sub>amb</sub> = -4	10 °C to +85 °C						
t <sub>pd</sub>	propagation delay	nA to nY; V <sub>CC</sub> = 4.5 V; see Fig. 6	[1]	-	-	30	ns
t <sub>en</sub>	enable time	OEn to nY; V <sub>CC</sub> = 4.5 V; see Fig. 7	[2]	-	-	44	ns
t <sub>dis</sub>	disable time	OEn to nY; V <sub>CC</sub> = 4.5 V; see Fig. 7	[3]	-	-	44	ns
t <sub>t</sub>	transition time	V <sub>CC</sub> = 4.5 V; see <u>Fig. 6</u>	[4]	-	-	15	ns
T <sub>amb</sub> = -4	10 °C to +125 °C				•		
t <sub>pd</sub>	propagation delay	nA to nY; V <sub>CC</sub> = 4.5 V; see Fig. 6	[1]	-	-	36	ns
t <sub>en</sub>	enable time	OEn to nY; V <sub>CC</sub> = 4.5 V; see Fig. 7	[2]	-	-	53	ns
t <sub>dis</sub>	disable time	OEn to nY; V <sub>CC</sub> = 4.5 V; see Fig. 7	[3]	-	-	53	ns
t <sub>t</sub>	transition time	V <sub>CC</sub> = 4.5 V; see <u>Fig. 6</u>	[4]	-	-	18	ns

- [1]  $t_{pd}$  is the same as  $t_{PHL}$  and  $t_{PLH}$ .
- [2]  $\dot{t}_{en}$  is the same as  $t_{PZH}$  and  $t_{PZL}$ .
- [3]  $t_{\text{dis}}$  is the same as  $t_{\text{PHZ}}$  and  $t_{\text{PLZ}}.$
- tdis is the same as t<sub>PHZ</sub> and t<sub>PLZ</sub>.
   t<sub>t</sub> is the same as t<sub>THL</sub> and t<sub>TLH</sub>.
   C<sub>PD</sub> is used to determine the dynamic power dissipation (P<sub>D</sub> in μW).
   P<sub>D</sub> = C<sub>PD</sub> x V<sub>CC</sub><sup>2</sup> x f<sub>i</sub> x N + Σ(C<sub>L</sub> x V<sub>CC</sub><sup>2</sup> x f<sub>o</sub>) where:
   f<sub>i</sub> = input frequency in MHz;

f<sub>o</sub> = output frequency in MHz;

C<sub>L</sub> = output load capacitance in pF;

V<sub>CC</sub> = supply voltage in V;

N = number of inputs switching;

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

#### 10.1. Waveforms and test circuit

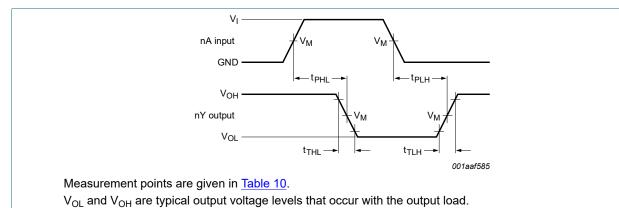


Fig. 6. Propagation delay data input (nA) to output (nY) and output transition time

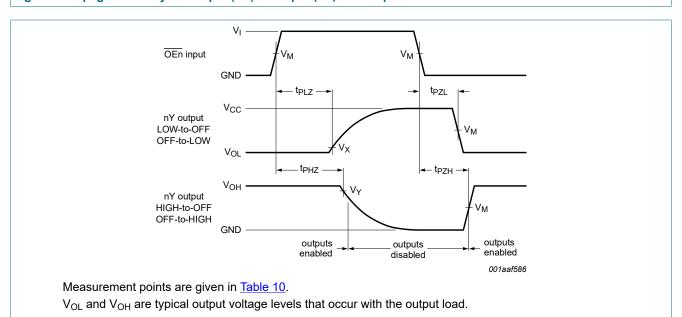
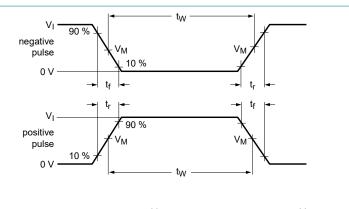
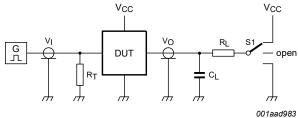


Fig. 7. 3-state enable and disable times

**Table 10. Measurement points** 

Туре	Input	Output		
	V <sub>M</sub>	V <sub>M</sub>	V <sub>X</sub>	V <sub>Y</sub>
74HC366	0.5V <sub>CC</sub>	0.5V <sub>CC</sub>	0.1 x V <sub>CC</sub>	0.9 x V <sub>CC</sub>
74HCT366	1.3 V	1.3 V	0.1 x V <sub>CC</sub>	0.9 x V <sub>CC</sub>





Test data is given in Table 11.

Definitions test circuit:

 $R_T$  = Termination resistance should be equal to output impedance  $Z_o$  of the pulse generator

C<sub>L</sub> = Load capacitance including jig and probe capacitance

R<sub>L</sub> = Load resistance

S1 = Test selection switch

#### Fig. 8. Test circuit for measuring switching times

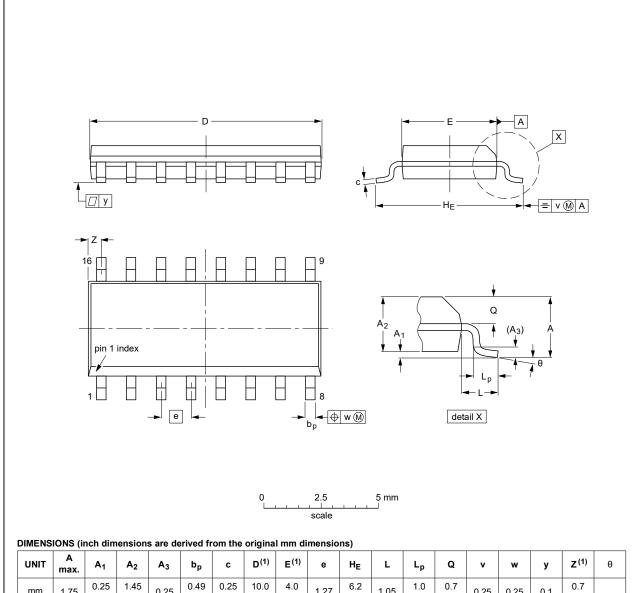
Table 11. Test data

Туре	Input		Load		S1 position		
	V <sub>I</sub>	t <sub>r</sub> , t <sub>f</sub>	C <sub>L</sub>	R <sub>L</sub>	t <sub>PHL</sub> , t <sub>PLH</sub>	t <sub>PZH</sub> , t <sub>PHZ</sub>	t <sub>PZL</sub> , t <sub>PLZ</sub>
74HC366	V <sub>CC</sub>	6 ns	15 pF, 50 pF	1 kΩ	open	GND	V <sub>CC</sub>
74HCT366	3 V	6 ns	15 pF, 50 pF	1 kΩ	open	GND	V <sub>CC</sub>

### 11. Package outline

#### SO16: plastic small outline package; 16 leads; body width 3.9 mm

SOT109-1



UNIT	A max.	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	bp	С	D <sup>(1)</sup>	E <sup>(1)</sup>	е	HE	L	Lp	Q	v	w	у	Z <sup>(1)</sup>	θ
mm	1.75	0.25 0.10	1.45 1.25	0.25	0.49 0.36	0.25 0.19	10.0 9.8	4.0 3.8	1.27	6.2 5.8	1.05	1.0 0.4	0.7 0.6	0.25	0.25	0.1	0.7 0.3	8°
inches	0.069	0.010 0.004	0.057 0.049	0.01		0.0100 0.0075		0.16 0.15	0.05	0.244 0.228	0.041	0.039 0.016	0.028 0.020	0.01	0.01	0.004	0.028 0.012	0°

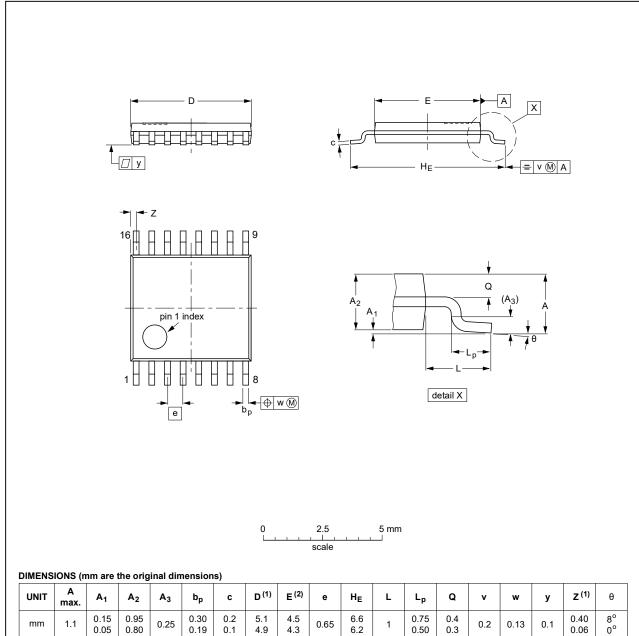
1. Plastic or metal protrusions of 0.15 mm (0.006 inch) maximum per side are not included.

OUTLINE		REFER	RENCES	EUROPEAN	ISSUE DATE
VERSION	IEC	JEDEC	JEITA	PROJECTION	1330E DATE
SOT109-1	076E07	MS-012			<del>99-12-27</del> 03-02-19

Fig. 9. Package outline SOT109-1 (SO16)

TSSOP16: plastic thin shrink small outline package; 16 leads; body width 4.4 mm

SOT403-1



UNIT	A max.	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	bp	С	D <sup>(1)</sup>	E (2)	е	HE	L	Lp	Q	v	w	у	Z <sup>(1)</sup>	θ
mm	1.1	0.15 0.05	0.95 0.80	0.25	0.30 0.19	0.2 0.1	5.1 4.9	4.5 4.3	0.65	6.6 6.2	1	0.75 0.50	0.4 0.3	0.2	0.13	0.1	0.40 0.06	8° 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		REFER	ENCES	EUROPEAN	ISSUE DATE
VERSION	IEC	JEDEC	JEITA	PROJECTION	ISSUE DATE
SOT403-1		MO-153			<del>99-12-27</del> 03-02-18

Fig. 10. Package outline SOT403-1 (TSSOP16)

### 12. Abbreviations

#### **Table 12. Abbreviations**

Acronym	Description
CMOS	Complementary Metal Oxide Semiconductor
DUT	Device Under Test
ESD	ElectroStatic Discharge
НВМ	Human Body Model
MM	Machine Model

### 13. Revision history

#### Table 13. Revision history

	1	I	1	1_
Document ID	Release date	Data sheet status	Change notice	Supersedes
74HC_HCT366 v.6	20210217	Product data sheet	-	74HC_HCT366 v.5
Modifications:	Nexperia.  Legal texts have Section 2 updates Section 7: Der	this data sheet has been redes we been adapted to the new co ated. ating values for P <sub>tot</sub> total powe 74HCT366DB (SOT338-1 / SS	ompany name where	appropriate.
74HC_HCT366 v.5	20160202	Product data sheet	-	74HC_HCT366 v.4
Modifications:	<ul> <li>Type numbers</li> </ul>	74HC366N and 74HCT366N	(SOT38-4) removed	
74HC_HCT366 v.4	20120904	Product data sheet	-	74HC_HCT366 v.3
Modifications:	<ul> <li>Legal pages u</li> </ul>	pdated.		
74HC_HCT366 v.3	20061121	Product data sheet	-	74HC_HCT366_CNV v.2
74HC_HCT366_CNV v.2	19901201	Product specification	-	-

### 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.

- Please consult the most recently issued document before initiating or completing a design.
- [2] The term 'short data sheet' is explained in section "Definitions".
- 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 <a href="https://www.nexperia.com">https://www.nexperia.com</a>.

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