74HC366-Q100; 74HCT366-Q100

Hex buffer/line driver; 3-state; inverting

Rev. 1 — 7 August 2012 **Product data sheet**

1. General description

The 74HC366-Q100; 74HCT366-Q100 is a hex inverter/line driver with 3-state outputs controlled by the output enable inputs (OEn). A HIGH on 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}.

The 74HC366-Q100; 74HCT366-Q100 is functionally identical to:

- 74HC365-Q100; 74HCT365-Q100, but has inverted outputs

This product has been qualified to the Automotive Electronics Council (AEC) standard Q100 (Grade 1) and is suitable for use in automotive applications.

2. Features and benefits

- Automotive product qualification in accordance with AEC-Q100 (Grade 1)
  - Specified from –40 °C to +85 °C and from –40 °C to +125 °C
- Inverting outputs
- Input levels:
  - For 74HC366-Q100: CMOS level
  - For 74HC366-Q100: TTL level
- Complies with JEDEC standard no. 7A
- ESD protection:
  - MIL-STD-883, method 3015 exceeds 2000 V
  - HBM JESD22-A114F exceeds 2000 V
  - MM JESD22-A115-A exceeds 200 V (C = 200 pF, R = 0 Ω)
- Multiple package options

3. Ordering information

Table 1. Ordering information

Type number	Package			
	Temperature range	Name	Description	Version
74HC366-Q100				
74HC366D-Q100	–40 °C to +125 °C	SO16	plastic small outline package; 16 leads; body width 3.9 mm	SOT109-1
74HC366PW-Q100	–40 °C to +125 °C	TSSOP16	plastic thin shrink small outline package; 16 leads; body width 4.4 mm	SOT403-1
74HCT366-Q100				
74HCT366D-Q100	–40 °C to +125 °C	SO16	plastic small outline package; 16 leads; body width 3.9 mm	SOT109-1
74HCT366PW-Q100	–40 °C to +125 °C	TSSOP16	plastic thin shrink small outline package; 16 leads; body width 4.4 mm	SOT403-1

4. Functional diagram

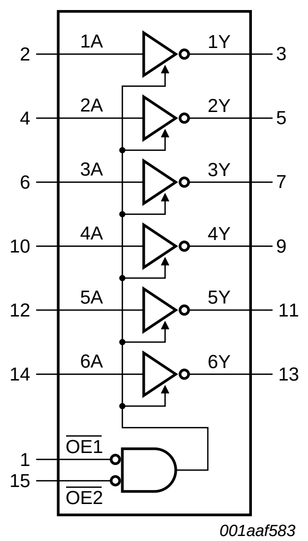


Fig 1. Functional diagram

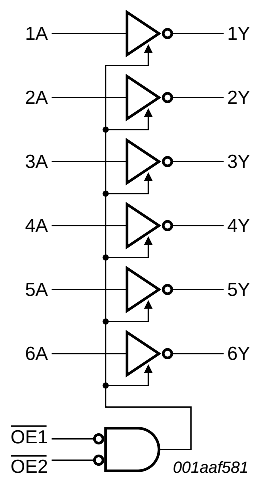


Fig 2. Logic symbol

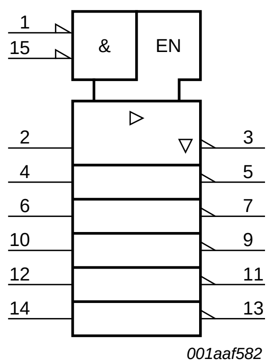


Fig 3. IEC logic symbol

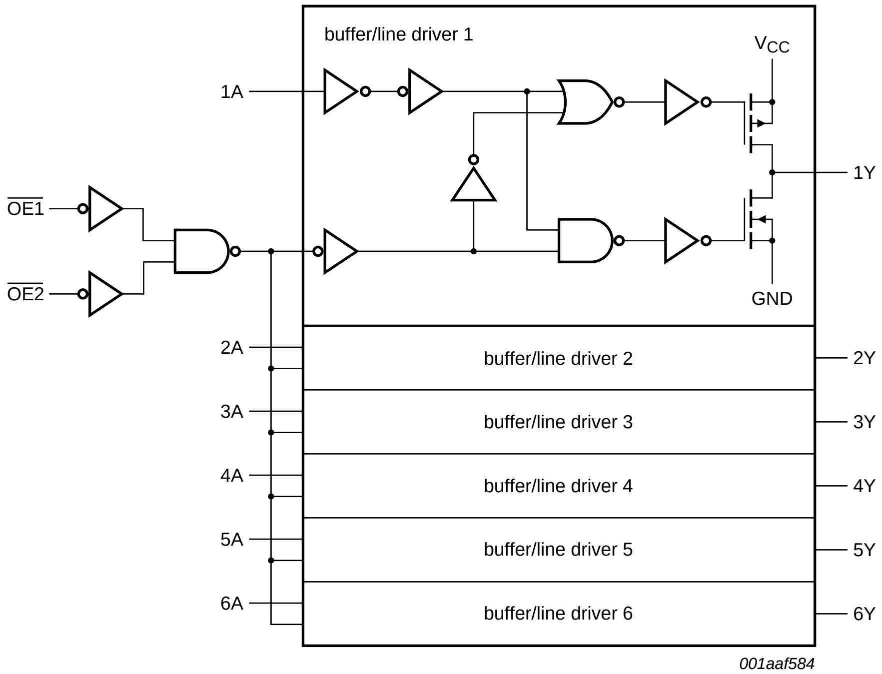


Fig 4. Logic diagram

5. Pinning information

5.1 Pinning

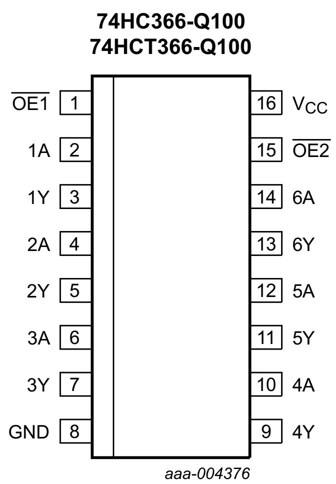


Fig 5. Pin configuration

5.2 Pin description

Table 2. Pin description

Symbol	Pin	Description
$\overline{OE1}$	1	output enable input 1 (active LOW)
1A	2	data input 1
1Y	3	data output 1
2A	4	data input 2
2Y	5	data output 2
3A	6	data input 3
3Y	7	data output 3
GND	8	ground (0 V)
4Y	9	data output 4
4A	10	data input 4
5Y	11	data output 5
5A	12	data input 5
6Y	13	data output 6
6A	14	data input 6
$\overline{OE2}$	15	output enable input 2 (active LOW)
V_{CC}	16	supply voltage

6. Functional description

Table 3. Function table[1]

Control		Input	Output
$\overline{OE1}$	$\overline{OE2}$	nA	nY
L	L	L	H
L	L	H	L
X	H	X	Z
H	X	X	Z

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

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	+7	V
I_{IK}	input clamping current	$V_I < -0.5$ V or $V_I > V_{CC} + 0.5$ V	-	±20	mA
I_{OK}	output clamping current	$V_O < -0.5$ V or $V_O > V_{CC} + 0.5$ V	-	±20	mA
I_O	output current	$V_O = -0.5$ V to ($V_{CC} + 0.5$ V)	-	±35	mA
I_{CC}	supply current		-	70	mA
I_{GND}	ground current		-	–70	mA
T_{stg}	storage temperature		–65	+150	°C
P_{tot}	total power dissipation	SO16 package [1]	-	500	mW
		TSSOP16 package [2]	-	500	mW

[1] For SO16 packages: P_{tot} derates linearly with 8 mW/K above 70 °C.

[2] For TSSOP16 packages: P_{tot} derates linearly with 5.5 mW/K above 60 °C.

8. Recommended operating conditions

Table 5. Recommended operating conditions

Voltages are referenced to GND (ground = 0 V)

Symbol	Parameter	Conditions	74HC366-Q100			74HCT366-Q100			Unit
			Min	Typ	Max	Min	Typ	Max	
V_{CC}	supply voltage		2.0	5.0	6.0	4.5	5.0	5.5	V
V_I	input voltage		0	-	V_{CC}	0	-	V_{CC}	V
V_O	output voltage		0	-	V_{CC}	0	-	V_{CC}	V
T_{amb}	ambient temperature		–40	+25	+125	–40	+25	+125	°C
$\Delta t/\Delta V$	input transition rise and fall rate	$V_{CC} = 2.0$ V	-	-	625	-	-	-	ns/V
		$V_{CC} = 4.5$ V	-	1.67	139	-	1.67	139	ns/V
		$V_{CC} = 6.0$ V	-	-	83	-	-	-	ns/V

9. Static characteristics

Table 6. Static characteristics 74HC366-Q100

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
T_{amb} = 25 °C						
V_{IH}	HIGH-level input voltage	V_{CC} = 2.0 V	1.5	1.2	-	V
		V_{CC} = 4.5 V	3.15	2.4	-	V
		V_{CC} = 6.0 V	4.2	3.2	-	V
V_{IL}	LOW-level input voltage	V_{CC} = 2.0 V	-	0.8	0.5	V
		V_{CC} = 4.5 V	-	2.1	1.35	V
		V_{CC} = 6.0 V	-	2.8	1.8	V
V_{OH}	HIGH-level output voltage	V_I = V_{IH} or V_{IL}	-	-	-	
		I_O = –20 μA; V_{CC} = 2.0 V	1.9	2.0	-	V
		I_O = –20 μA; V_{CC} = 4.5 V	4.4	4.5	-	V
		I_O = –20 μA; V_{CC} = 6.0 V	5.9	6.0	-	V
		I_O = –6.0 mA; V_{CC} = 4.5 V	3.98	4.32	-	V
		I_O = –7.8 mA; V_{CC} = 6.0 V	5.48	5.81	-	V
V_{OL}	LOW-level output voltage	V_I = V_{IH} or V_{IL}				
		I_O = 20 μA; V_{CC} = 2.0 V	-	0	0.1	V
		I_O = 20 μA; V_{CC} = 4.5 V	-	0	0.1	V
		I_O = 20 μA; V_{CC} = 6.0 V	-	0	0.1	V
		I_O = 6.0 mA; V_{CC} = 4.5 V	-	0.15	0.26	V
		I_O = 7.8 mA; V_{CC} = 6.0 V	-	0.16	0.26	V
I_I	input leakage current	V_I = V_{CC} or GND; V_{CC} = 6.0 V	-	-	±0.1	μA
I_{OZ}	OFF-state output current	V_I = V_{IH} or V_{IL}; V_O = V_{CC} or GND; V_{CC} = 6.0 V	-	-	±0.5	μA
I_{CC}	supply current	V_I = V_{CC} or GND; I_O = 0 A; V_{CC} = 6.0 V	-	-	8.0	μA
C_I	input capacitance		-	3.5	-	pF
T_{amb} = –40 °C to +85 °C						
V_{IH}	HIGH-level input voltage	V_{CC} = 2.0 V	1.5	-	-	V
		V_{CC} = 4.5 V	3.15	-	-	V
		V_{CC} = 6.0 V	4.2	-	-	V
V_{IL}	LOW-level input voltage	V_{CC} = 2.0 V	-	-	0.5	V
		V_{CC} = 4.5 V	-	-	1.35	V
		V_{CC} = 6.0 V	-	-	1.8	V
V_{OH}	HIGH-level output voltage	V_I = V_{IH} or V_{IL}				
		I_O = –20 μA; V_{CC} = 2.0 V	1.9	-	-	V
		I_O = –20 μA; V_{CC} = 4.5 V	4.4	-	-	V
		I_O = –20 μA; 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

Table 6. Static characteristics 74HC366-Q100 *...continued*

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
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
		$I_O = 6.0\ mA$; $V_{CC} = 4.5\ V$	-	-	0.33	V
		$I_O = 7.8\ mA$; $V_{CC} = 6.0\ V$	-	-	0.33	V
I_I	input leakage current	$V_I = V_{CC}$ or GND; $V_{CC} = 6.0\ V$;	-	-	±1.0	μA
I_{OZ}	OFF-state output current	$V_I = V_{IH}$ or V_{IL}; $V_O = V_{CC}$ or GND; $V_{CC} = 6.0\ V$	-	-	±5.0	μA
I_{CC}	supply current	$V_I = V_{CC}$ or GND; $I_O = 0\ A$; $V_{CC} = 6.0\ V$	-	-	80	μA
T_{amb} = –40 °C to +125 °C						
V_{IH}	HIGH-level input voltage	$V_{CC} = 2.0\ V$	1.5	-	-	V
		$V_{CC} = 4.5\ V$	3.15	-	-	V
		$V_{CC} = 6.0\ V$	4.2	-	-	V
V_{IL}	LOW-level input voltage	$V_{CC} = 2.0\ V$	-	-	0.5	V
		$V_{CC} = 4.5\ V$	-	-	1.35	V
		$V_{CC} = 6.0\ V$	-	-	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
		$I_O = -6.0\ mA$; $V_{CC} = 4.5\ V$	3.7	-	-	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}				
		$I_O = 20\ \mu A$; $V_{CC} = 2.0\ V$	-	-	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
		$I_O = 6.0\ mA$; $V_{CC} = 4.5\ V$	-	-	0.4	V
		$I_O = 7.8\ mA$; $V_{CC} = 6.0\ V$	-	-	0.4	V
I_I	input leakage current	$V_I = V_{CC}$ or GND; $V_{CC} = 6.0\ V$	-	-	±1.0	μA
I_{OZ}	OFF-state output current	$V_I = V_{IH}$ or V_{IL}; $V_O = V_{CC}$ or GND; $V_{CC} = 6.0\ V$	-	-	±10.0	μA
I_{CC}	supply current	$V_I = V_{CC}$ or GND; $I_O = 0\ A$; $V_{CC} = 6.0\ V$	-	-	160	μA

Table 7. Static characteristics 74HCT366-Q100

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
T_{amb} = 25 °C						
V_{IH}	HIGH-level input voltage	$V_{CC} = 4.5\ V$ to $5.5\ V$	2.0	1.6	-	V
V_{IL}	LOW-level input voltage	$V_{CC} = 4.5\ V$ to $5.5\ V$	-	1.2	0.8	V
V_{OH}	HIGH-level output voltage	$V_I = V_{IH}$ or V_{IL}; $V_{CC} = 4.5\ V$				
		$I_O = -20\ \mu A$	4.4	4.5	-	V
		$I_O = -6.0\ mA$	3.98	4.32	-	V

Table 7. Static characteristics 74HCT366-Q100 *…continued*

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{OL}	LOW-level output voltage	$V_I = V_{IH}$ or V_{IL}; V_{CC} = 4.5 V				
		I_O = 20 μA	-	0	0.1	V
		I_O = 6.0 mA	-	0.16	0.26	V
I_I	input leakage current	$V_I = V_{CC}$ or GND; V_{CC} = 5.5 V	-	-	±0.1	μA
I_{OZ}	OFF-state output current	$V_I = V_{IH}$ or V_{IL}; $V_O = V_{CC}$ or GND per input pin; other inputs at GND or V_{CC}; I_O = 0 A; V_{CC} = 5.5 V	-	-	±0.5	μA
I_{CC}	supply current	$V_I = V_{CC}$ or GND; I_O = 0 A; V_{CC} = 5.5 V	-	-	8.0	μA
ΔI_{CC}	additional supply current	$V_I = V_{CC}$ − 2.1 V; other inputs at V_{CC} or GND; I_O = 0 A				
		pins nA	-	100	360	μA
		pin $\overline{OE1}$	-	100	360	μA
		pin $\overline{OE2}$	-	90	320	μA
C_I	input capacitance		-	3.5	-	pF
T_{amb} = −40 °C to +85 °C						
V_{IH}	HIGH-level input voltage	V_{CC} = 4.5 V to 5.5 V	2.0	-	-	V
V_{IL}	LOW-level input voltage	V_{CC} = 4.5 V to 5.5 V	-	-	0.8	V
V_{OH}	HIGH-level output voltage	$V_I = V_{IH}$ or V_{IL}; V_{CC} = 4.5 V				
		I_O = −20 μA	4.4	-	-	V
		I_O = −6.0 mA	3.84	-	-	V
V_{OL}	LOW-level output voltage	$V_I = V_{IH}$ or V_{IL}; V_{CC} = 4.5 V				
		I_O = 20 μA	-	-	0.1	V
		I_O = 6.0 mA	-	-	0.33	V
I_I	input leakage current	$V_I = V_{CC}$ or GND; V_{CC} = 5.5 V	-	-	±1.0	μA
I_{OZ}	OFF-state output current	$V_I = V_{IH}$ or V_{IL}; $V_O = V_{CC}$ or GND per input pin; other inputs at GND or V_{CC}; I_O = 0 A; V_{CC} = 5.5 V			±5.0	μA
I_{CC}	supply current	$V_I = V_{CC}$ or GND; I_O = 0 A; V_{CC} = 5.5 V	-	-	80	μA
ΔI_{CC}	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 $\overline{OE1}$	-	-	450	μA
		pin $\overline{OE2}$	-	-	400	μA
T_{amb} = −40 °C to +125 °C						
V_{IH}	HIGH-level input voltage	V_{CC} = 4.5 V to 5.5 V	2.0	-	-	V
V_{IL}	LOW-level input voltage	V_{CC} = 4.5 V to 5.5 V	-	-	0.8	V
V_{OH}	HIGH-level output voltage	$V_I = V_{IH}$ or V_{IL}; V_{CC} = 4.5 V				
		I_O = −20 μA	4.4	-	-	V
		I_O = −6.0 mA	3.7	-	-	V
V_{OL}	LOW-level output voltage	$V_I = V_{IH}$ or V_{IL}; V_{CC} = 4.5 V				
		I_O = 20 μA	-	-	0.1	V
		I_O = 6.0 mA	-	-	0.4	V
I_I	input leakage current	$V_I = V_{CC}$ or GND; V_{CC} = 5.5 V	-	-	±1.0	μA
I_{OZ}	OFF-state output current	$V_I = V_{IH}$ or V_{IL}; $V_O = V_{CC}$ or GND per input pin; other inputs at GND or V_{CC}; I_O = 0 A; V_{CC} = 5.5 V	-	-	±10.0	μA

Table 7. Static characteristics 74HCT366-Q100 *…continued*

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I_{CC}	supply current	$V_I = V_{CC}$ or GND; $I_O = 0$ A; $V_{CC} = 5.5$ V	-	-	160	μA
ΔI_{CC}	additional supply current	$V_I = V_{CC} - 2.1$ V; other inputs at V_{CC} or GND; $I_O = 0$ A				
		pins nA	-	-	490	μA
		pin $\overline{OE1}$	-	-	490	μA
		pin $\overline{OE2}$	-	-	441	μA

10. Dynamic characteristics

Table 8. Dynamic characteristics 74HC366-Q100

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

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
T_{amb} = 25 °C							
t_{pd}	propagation delay	nA to nY; see Figure 6	[1]				
		$V_{CC} = 2.0$ V		-	33	100	ns
		$V_{CC} = 4.5$ V		-	12	20	ns
		$V_{CC} = 5$ V; $C_L = 15$ pF		-	10	-	ns
		$V_{CC} = 6.0$ V		-	10	17	ns
t_{en}	enable time	$\overline{OEn}$ to nY; see Figure 7	[2]				
		$V_{CC} = 2.0$ V		-	44	150	ns
		$V_{CC} = 4.5$ V		-	16	30	ns
		$V_{CC} = 6.0$ V		-	13	26	ns
t_{dis}	disable time	$\overline{OEn}$ to nY; see Figure 7	[3]				
		$V_{CC} = 2.0$ V		-	55	150	ns
		$V_{CC} = 4.5$ V		-	20	30	ns
		$V_{CC} = 6.0$ V		-	16	26	ns
t_t	transition time	see Figure 6	[4]				
		$V_{CC} = 2.0$ V		-	14	60	ns
		$V_{CC} = 4.5$ V		-	5	12	ns
		$V_{CC} = 6.0$ V		-	4	10	ns
C_{PD}	power dissipation capacitance	per buffer; V_I = GND to V_{CC}	[5]	-	30	-	pF
T_{amb} = −40 °C to +85 °C							
t_{pd}	propagation delay	nA to nY; see Figure 6	[1]				
		$V_{CC} = 2.0$ V		-	-	125	ns
		$V_{CC} = 4.5$ V		-	-	25	ns
		$V_{CC} = 6.0$ V		-	-	21	ns
t_{en}	enable time	$\overline{OEn}$ to nY; see Figure 7	[2]				
		$V_{CC} = 2.0$ V		-	-	190	ns
		$V_{CC} = 4.5$ V		-	-	38	ns
		$V_{CC} = 6.0$ V		-	-	33	ns

Table 8. Dynamic characteristics 74HC366-Q100 *…continued*

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

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
t_{dis}	disable time	$\overline{OEn}$ to nY; see Figure 7	[3]				
		V_{CC} = 2.0 V		-	-	190	ns
		V_{CC} = 4.5 V		-	-	38	ns
		V_{CC} = 6.0 V		-	-	33	ns
t_t	transition time	see Figure 6	[4]				
		V_{CC} = 2.0 V		-	-	75	ns
		V_{CC} = 4.5 V		-	-	15	ns
		V_{CC} = 6.0 V		-	-	13	ns
T_{amb} = –40 °C to +125 °C							
t_{pd}	propagation delay	nA to nY; see Figure 6	[1]				
		V_{CC} = 2.0 V		-	-	150	ns
		V_{CC} = 4.5 V		-	-	30	ns
		V_{CC} = 6.0 V		-	-	26	ns
t_{en}	enable time	$\overline{OEn}$ to nY; see Figure 7	[2]				
		V_{CC} = 2.0 V		-	-	225	ns
		V_{CC} = 4.5 V		-	-	45	ns
		V_{CC} = 6.0 V		-	-	38	ns
t_{dis}	disable time	$\overline{OEn}$ to nY; see Figure 7	[3]				
		V_{CC} = 2.0 V		-	-	225	ns
		V_{CC} = 4.5 V		-	-	45	ns
		V_{CC} = 6.0 V		-	-	38	ns
t_t	transition time	see Figure 6	[4]				
		V_{CC} = 2.0 V		-	-	90	ns
		V_{CC} = 4.5 V		-	-	18	ns
		V_{CC} = 6.0 V		-	-	15	ns

[1] t_{pd} is the same as t_{PHL} and t_{PLH}.

[2] t_{en} is the same as t_{PZH} and t_{PZL}.

[3] t_{dis} is the same as t_{PHZ} and t_{PLZ}.

[4] t_t is the same as t_{THL} and t_{TLH}.

[5] 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 V;
N = number of inputs switching;
$\Sigma(C_L \times V_{CC}^2 \times f_o)$ = sum of outputs.

Table 9. Dynamic characteristics 74HCT366-Q100

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

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
T_{amb} = 25 °C							
t_{pd}	propagation delay	nA to nY; see Figure 6	[1]				
		V_{CC} = 4.5 V		-	13	24	ns
		V_{CC} = 5 V; C_L = 15 pF		-	11	-	ns
t_{en}	enable time	$\overline{OEn}$ to nY; V_{CC} = 4.5 V; see Figure 7	[2]	-	16	35	ns
t_{dis}	disable time	$\overline{OEn}$ to nY; V_{CC} = 4.5 V; see Figure 7	[3]	-	20	35	ns
t_t	transition time	V_{CC} = 4.5 V; see Figure 6	[4]	-	5	12	ns
C_{PD}	power dissipation capacitance	per buffer; V_I = GND to (V_{CC} − 1.5 V)	[5]	-	30	-	pF
T_{amb} = −40 °C to +85 °C							
t_{pd}	propagation delay	nA to nY; V_{CC} = 4.5 V; see Figure 6	[1]	-	-	30	ns
t_{en}	enable time	$\overline{OEn}$ to nY; V_{CC} = 4.5 V; see Figure 7	[2]	-	-	44	ns
t_{dis}	disable time	$\overline{OEn}$ to nY; V_{CC} = 4.5 V; see Figure 7	[3]	-	-	44	ns
t_t	transition time	V_{CC} = 4.5 V; see Figure 6	[4]	-	-	15	ns
T_{amb} = −40 °C to +125 °C							
t_{pd}	propagation delay	nA to nY; V_{CC} = 4.5 V; see Figure 6	[1]	-	-	36	ns
t_{en}	enable time	$\overline{OEn}$ to nY; V_{CC} = 4.5 V; see Figure 7	[2]	-	-	53	ns
t_{dis}	disable time	$\overline{OEn}$ to nY; V_{CC} = 4.5 V; see Figure 7	[3]	-	-	53	ns
t_t	transition time	V_{CC} = 4.5 V; see Figure 6	[4]	-	-	18	ns

[1] t_{pd} is the same as t_{PHL} and t_{PLH}.

[2] t_{en} is the same as t_{PZH} and t_{PZL}.

[3] t_{dis} is the same as t_{PHZ} and t_{PLZ}.

[4] t_t is the same as t_{THL} and t_{TLH}.

[5] C_{PD} is used to determine the dynamic power dissipation (P_D in μW).

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

f_i = input frequency in MHz;

f_o = output frequency in MHz;

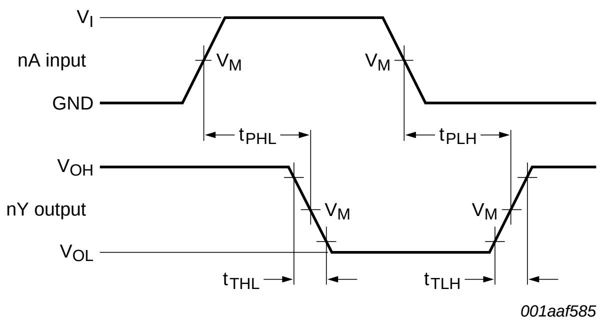
C_L = output load capacitance in pF;

V_{CC} = supply voltage in V;

N = number of inputs switching;

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

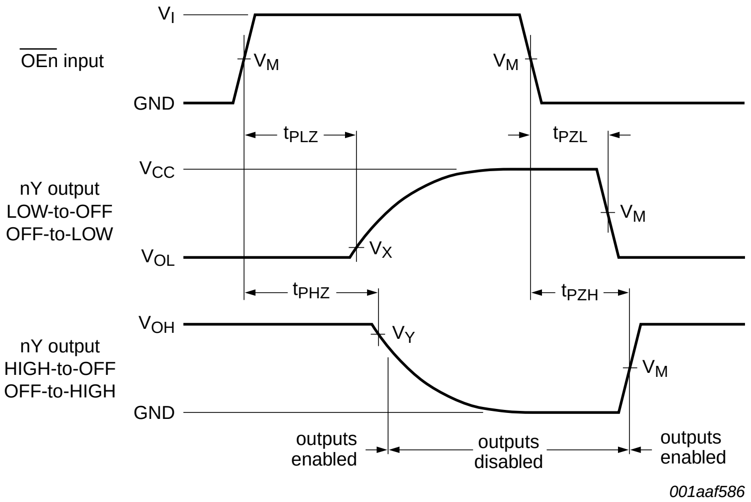
11. Waveforms



Measurement points are given in Table 10.

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

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



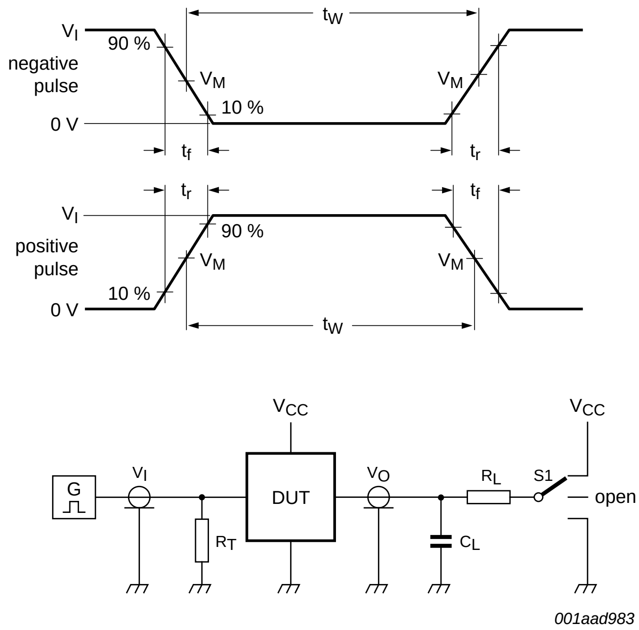
Measurement points are given in Table 10.

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

Fig 7. 3-state enable and disable times

Table 10. Measurement points

Type	Input	Output		
	V_M	V_M	V_X	V_Y
74HC366-Q100	$0.5V_{CC}$	$0.5V_{CC}$	$0.1 \times V_{CC}$	$0.9 \times V_{CC}$
74HCT366-Q100	1.3 V	1.3 V	$0.1 \times V_{CC}$	$0.9 \times V_{CC}$



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_L = Load capacitance including jig and probe capacitance

R_L = Load resistor

S1 = Test selection switch

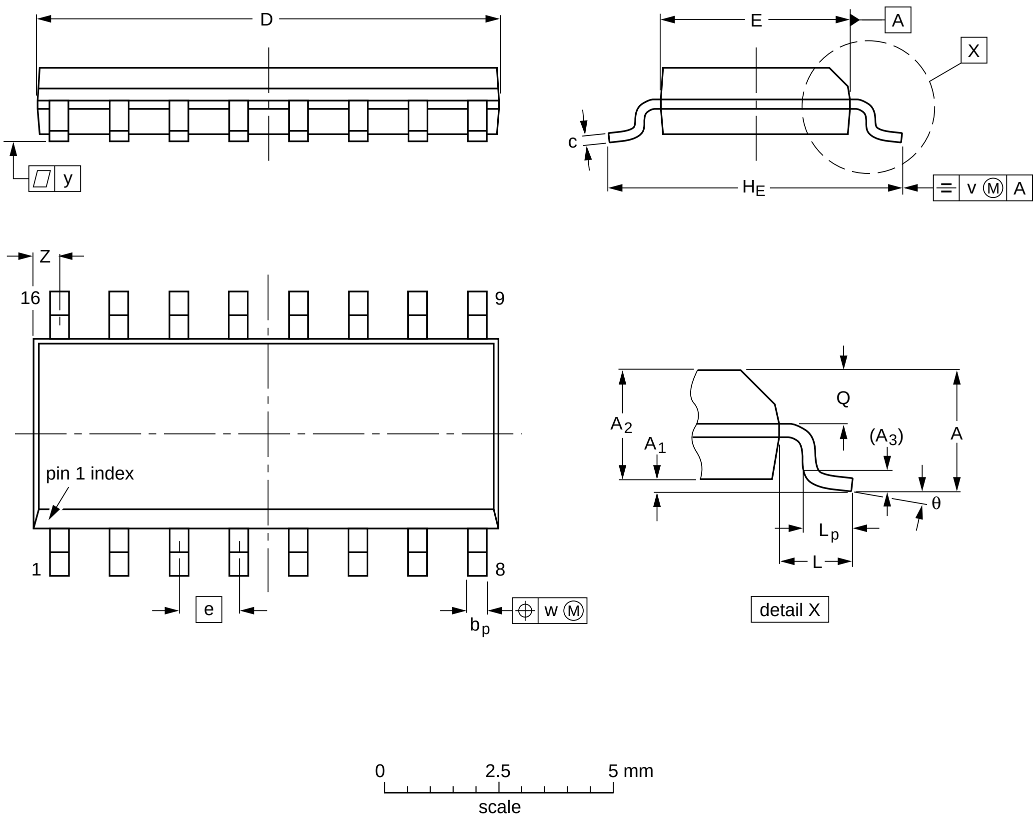
Fig 8. Load circuitry for measuring switching times

Table 11. Test data

Type	Input		Load		S1 position		
	V_I	t_r, t_f	C_L	R_L	t_{PHL}, t_{PLH}	t_{PZH}, t_{PHZ}	t_{PZL}, t_{PLZ}
74HC366-Q100	V_{CC}	6 ns	15 pF, 50 pF	1 kΩ	open	GND	V_{CC}
74HCT366-Q100	3 V	6 ns	15 pF, 50 pF	1 kΩ	open	GND	V_{CC}

12. Package outline

SO16: plastic small outline package; 16 leads; body width 3.9 mm **SOT109-1**



DIMENSIONS (inch dimensions are derived from the original mm 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	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° 0°
inches	0.069	0.010 0.004	0.057 0.049	0.01	0.019 0.014	0.0100 0.0075	0.39 0.38	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	

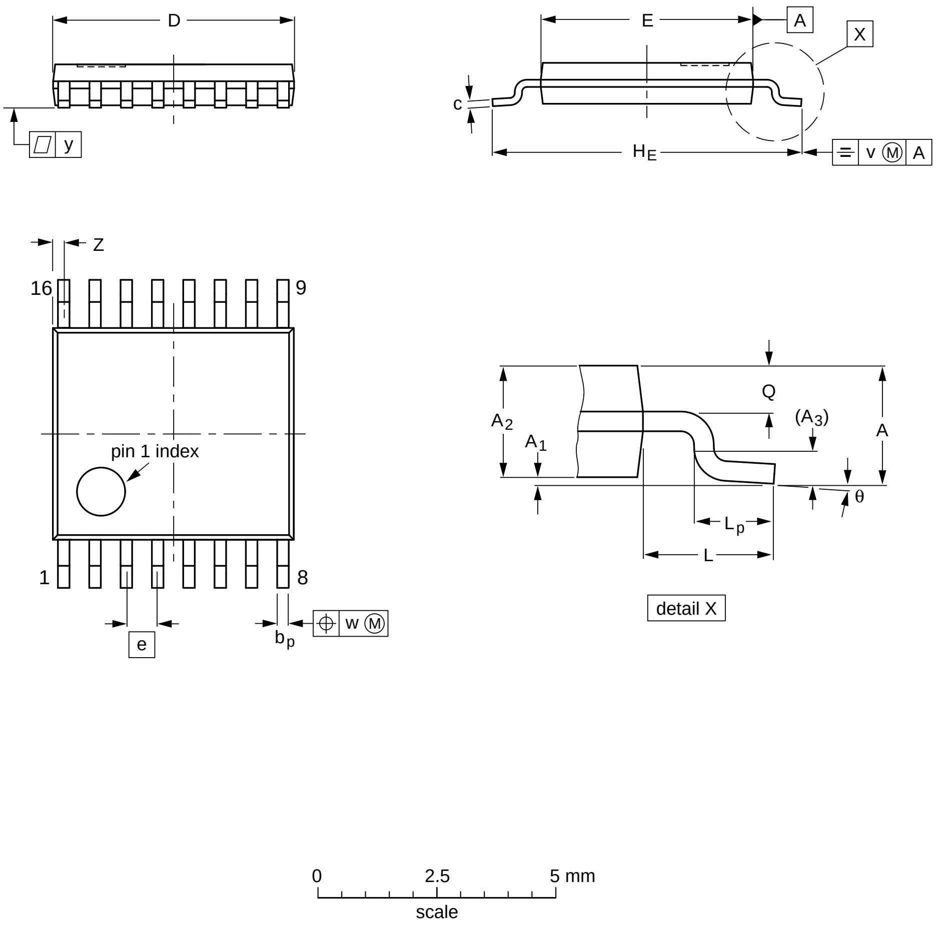
Note

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

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT109-1	076E07	MS-012				~~99-12-27~~ 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**



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 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 VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT403-1		MO-153				~~99-12-27~~ 03-02-18

Fig 10. Package outline SOT403-1 (TSSOP16)

13. Abbreviations

Table 12. Abbreviations

Acronym	Description
CMOS	Complementary Metal Oxide Semiconductor
DUT	Device Under Test
ESD	ElectroStatic Discharge
HBM	Human Body Model
LSTTL	Low-power Schottky Transistor-Transistor Logic
MM	Machine Model
MIL	Military

14. Revision history

Table 13. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
74HC_HCT366_Q100 v.1	20120807	Product data sheet	-	-

15. Legal information

15.1 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 URL http://www.nexperia.com.

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17. Contents

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