74HC153; 74HCT153

Dual 4-input multiplexer Rev. 5 — 23 January 2014

Product data sheet

1. **General description**

The 74HC153; 74HCT153 is a dual 4-input multiplexer. The device features independent enable inputs (nE) and common data select inputs (S0 and S1). For each multiplexer, the select inputs select one of the four binary inputs and routes it to the multiplexer output (nY). A HIGH on E forces the corresponding multiplexer outputs LOW. 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**

- Input levels:
 - ◆ For 74HC153: CMOS level
 - For 74HCT153: TTL level
- Non-inverting outputs
- Separate enable input for each output
- Common select inputs
- Complies with JEDEC standard no. 7A
- Permits multiplexing from n lines to 1 line
- Enable line provided for cascading (n lines to 1 line)
- ESD protection:
 - ◆ HBM JESD22-A114F exceeds 2000 V
 - MM JESD22-A115-A exceeds 200 V
- Multiple package options
- Specified from -40 °C to +85 °C and -40 °C to +125 °C.

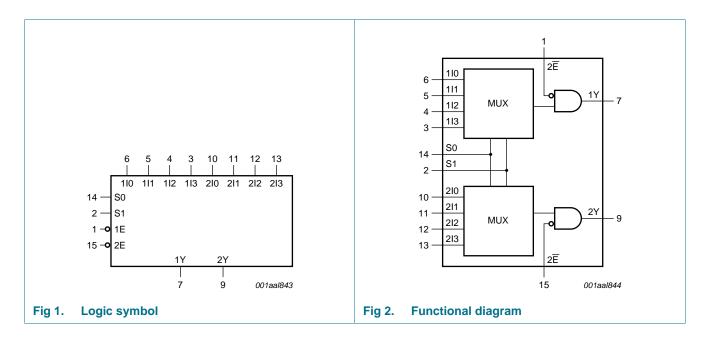


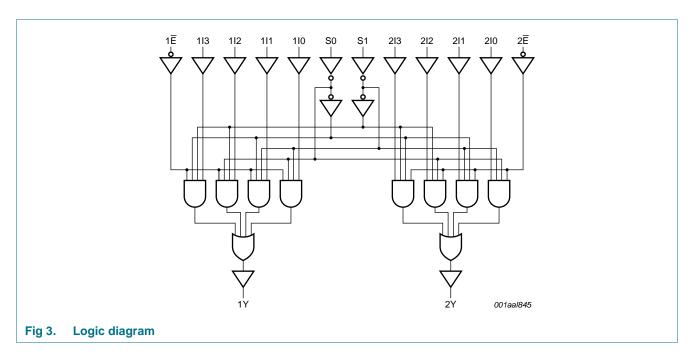
3. Ordering information

Table 1. Ordering information

Type number	Package										
	Temperature range	Name	Description	Version							
74HC153N	−40 °C to +125 °C	DIP16	plastic dual in-line package; 16 leads (300 mil)	SOT38-4							
74HCT153N											
74HC153D	–40 °C to +125 °C	SO16	plastic small outline package; 16 leads; body width	SOT109-1							
74HCT153D			3.9 mm								
74HC153DB	−40 °C to +125 °C	SSOP16	plastic shrink small outline package; 16 leads; body	SOT338-1							
74HCT153DB			width 5.3 mm								
74HC153PW	−40 °C to +125 °C	TSSOP16	plastic thin shrink small outline package; 16 leads;	SOT403-1							
74HCT153PW			body width 4.4 mm								

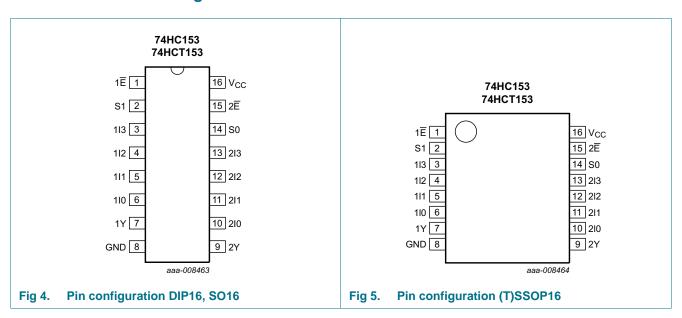
4. Functional diagram





5. Pinning information

5.1 Pinning



5.2 Pin description

Table 2. Pin description

Symbol	Pin	Description
1E, 2E	1, 15	output enable inputs (active LOW)
S0, S1	14, 2	data select inputs
110, 111, 112, 113	6, 5, 4, 3	data inputs source 1
1Y	7	multiplexer output source 1
GND	8	ground (0 V)
2Y	9	multiplexer output source 2
210, 211, 212, 213	10, 11, 12, 13	data inputs source 2
V _{CC}	16	supply voltage

6. Functional description

Table 3. Function table

H = HIGH voltage level; L = LOW voltage level; X = don't care.

select Inputs	3	data inputs				output enable	output
S0	S1	nI0	nl1	nl2	nl3	nE	nY
Χ	X	X	X	X	X	Н	L
L	L	L	X	X	X	L	L
L	L	Н	Χ	Χ	Χ	L	Н
Н	L	X	L	X	X	L	L
Н	L	X	Н	X	X	L	Н
L	Н	Χ	Χ	L	Χ	L	L
L	Н	Χ	Χ	Н	Χ	L	Н
Н	Н	Χ	Χ	Χ	L	L	L
Н	Н	X	X	X	Н	L	Н

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	$V_I < -0.5 \text{ V or } V_I > V_{CC} + 0.5 \text{ V}$	<u>[1]</u> -	±20	mA
I _{OK}	output clamping current	$V_O < -0.5 \text{ V or } V_O > V_{CC} + 0.5 \text{ V}$	<u>[1]</u> -	±20	mA
I _O	output current	$-0.5 \text{ V} < \text{V}_{\text{O}} < \text{V}_{\text{CC}} + 0.5 \text{ V}$	-	±25	mA
I _{CC}	supply current		-	50	mA
I_{GND}	ground current		-50	-	mA
T _{stg}	storage temperature		–65	+150	°C

Table 4. Limiting values ...continued

In accordance with the Absolute Maximum Rating System (IEC 60134). Voltages are referenced to GND (ground = 0 V).

Symbol	Parameter	Conditions	Min	Max	Unit
P _{tot}	total power dissipation		[2]		
	DIP16 package		-	750	mW
	SO16 and (T)SSOP16 packages		-	500	mW

^[1] The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

8. Recommended operating conditions

Table 5. Recommended operating conditions

Voltages are referenced to GND (ground = 0 V)

Symbol	Parameter	Conditions	74HC153		7	3	Unit		
			Min	Тур	Max	Min	Тур	Max	
V_{CC}	supply voltage		2.0	5.0	6.0	4.5	5.0	5.5	V
VI	input voltage		0	-	V_{CC}	0	-	V_{CC}	V
Vo	output voltage		0	-	V_{CC}	0	-	V_{CC}	V
T _{amb}	ambient temperature		-40	+25	+125	-40	+25	+125	°C
Δt/ΔV	input transition rise and fall rate	$V_{CC} = 2.0 \text{ V}$	-	-	625	-	-	-	ns/V
		$V_{CC} = 4.5 \text{ V}$	-	1.67	139	-	1.67	139	ns/V
		$V_{CC} = 6.0 \text{ V}$	-	-	83	-	-	-	ns/V

9. Static characteristics

Table 6. 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	Тур	Max	Min	Max	Min	Max	
74HC1	53									
V_{IH}	HIGH-level	$V_{CC} = 2.0 \text{ V}$	1.5	1.2	-	1.5	-	1.5	-	V
input voltage	$V_{CC} = 4.5 \text{ V}$	3.15	2.4	-	3.15	-	3.15	-	V	
		$V_{CC} = 6.0 \text{ V}$	4.2	3.2	-	4.2	-	4.2	-	V
V_{IL}	LOW-level	$V_{CC} = 2.0 \text{ V}$	-	8.0	0.5	-	0.5	-	0.5	V
input voltage	V _{CC} = 4.5 V	-	2.1	1.35	-	1.35	-	1.35	V	
		V _{CC} = 6.0 V	-	2.8	1.8	-	1.8	-	1.8	V

^[2] For DIP16 package: P_{tot} derates linearly with 12 mW/K above 70 °C.
For SO16 package: P_{tot} derates linearly with 8 mW/K above 70 °C.
For (T)SSOP16 packages: P_{tot} derates linearly with 5.5 mW/K above 60 °C.

 Table 6.
 Static characteristics ...continued

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

Symbol	Parameter	Conditions		25 °C		–40 °C t	o +85 °C	-40 °C to +125 °C		Un
			Min	Тур	Max	Min	Max	Min	Max	
′он	HIGH-level	$V_I = V_{IH}$ or V_{IL}								
	output voltage	$I_O = -20 \mu A$; $V_{CC} = 2.0 \text{ V}$	1.9	2.0	-	1.9	-	1.9	-	V
		$I_O = -20 \mu A$; $V_{CC} = 4.5 \text{ V}$	4.4	4.5	-	4.4	-	4.4	-	V
		$I_O = -20 \mu A$; $V_{CC} = 6.0 \text{ V}$	5.9	6.0	-	5.9	-	5.9	-	V
		$I_{O} = -4.0 \text{ mA}; V_{CC} = 4.5 \text{ V}$	3.98	4.32	-	3.84	-	3.7	-	V
		$I_{O} = -5.2 \text{ mA}; V_{CC} = 6.0 \text{ V}$	5.48	5.81	-	5.34	-	5.2	-	V
/ _{OL}	LOW-level	$V_I = V_{IH}$ or V_{IL}								
	output voltage	$I_O = 20 \mu A; V_{CC} = 2.0 V$	-	0	0.1	-	0.1	-	0.1	٧
		$I_O = 20 \mu A; V_{CC} = 4.5 V$	-	0	0.1	-	0.1	-	0.1	٧
		$I_O = 20 \mu A; V_{CC} = 6.0 \text{ V}$	-	0	0.1	-	0.1	-	0.1	٧
		$I_O = 4.0 \text{ mA}; V_{CC} = 4.5 \text{ V}$	-	0.15	0.26	-	0.33	-	0.4	٧
		$I_O = 5.2 \text{ mA}; V_{CC} = 6.0 \text{ V}$	-	0.16	0.26	-	0.33	-	0.4	٧
I	input leakage current	$V_I = V_{CC}$ or GND; $V_{CC} = 6.0 \text{ V}$	-	-	±0.1	-	±1	-	±1	μΑ
СС	supply current	$V_I = V_{CC}$ or GND; $I_O = 0$ A; $V_{CC} = 6.0 \text{ V}$	-	-	8.0	-	80	-	160	μΑ
Cı	input capacitance		-	3.5	-	-	-	-	-	рF
74HCT1	53									
V _{IH}	HIGH-level input voltage	$V_{CC} = 4.5 \text{ V to } 5.5 \text{ V}$	2.0	1.6	-	2.0	-	2.0	-	٧
V _{IL}	LOW-level input voltage	$V_{CC} = 4.5 \text{ V to } 5.5 \text{ V}$	-	1.2	8.0	-	0.8	-	0.8	V
√он	HIGH-level	$V_I = V_{IH}$ or V_{IL} ; $V_{CC} = 4.5 \text{ V}$								
	output voltage	$I_{O} = -20 \mu A$	4.4	4.5	-	4.4	-	4.4	-	٧
		$I_{O} = -4.0 \text{ mA}$	3.98	4.32	-	3.84	-	3.7	-	٧
/ _{OL}	LOW-level	$V_I = V_{IH}$ or V_{IL} ; $V_{CC} = 4.5 \text{ V}$								
	output voltage	$I_O = 20 \mu A; V_{CC} = 4.5 V$	-	0	0.1	-	0.1	-	0.1	٧
		$I_O = 5.2 \text{ mA}; V_{CC} = 6.0 \text{ V}$	-	0.15	0.26	-	0.33	-	0.4	٧
I	input leakage current	$V_I = V_{CC}$ or GND; $V_{CC} = 5.5 \text{ V}$	-	-	±0.1	-	±1	-	±1	μΑ
CC	supply current	$V_I = V_{CC}$ or GND; $I_O = 0$ A; $V_{CC} = 5.5 \text{ V}$	-	-	8	-	80	-	160	μΑ
7l ^{CC}	additional supply current	per input pin; $V_1 = V_{CC} - 2.1 \text{ V}; I_O = 0 \text{ A};$ other inputs at V_{CC} or GND; $V_{CC} = 4.5 \text{ V}$ to 5.5 V								
		1ln, 2ln	-	45	162	-	203	-	221	μΑ
		nE	-	60	216	-	270	-	294	μΑ
		Sn	-	135	486	-	608	-	662	μΑ
Cı	input capacitance		-	3.5	-	-	-	-	-	pF

74HC_HCT153

All information provided in this document is subject to legal disclaimers.

10. Dynamic characteristics

Table 7. Dynamic characteristics

 $GND = 0 \ V; \ t_r = t_f = 6 \ ns; \ C_L = 50 \ pF; \ for \ test \ circuit, \ see \ Figure 8; \ unless \ otherwise \ specified$

Symbol	Parameter	Conditions			25 °C		-40 °C t	o +85 °C	-40 °C to	o +125 °C	Unit
				Min	Тур	Max	Min	Max	Min	Max	
74HC153	3	'		'			'			'	'
t _{pd}	propagation delay	1In to nY, 2In to nY; see Figure 6	[1]								
		$V_{CC} = 2.0 \text{ V}$		-	47	145	-	180	-	220	ns
		$V_{CC} = 4.5 \text{ V}$		-	17	29	-	36	-	44	ns
		$V_{CC} = 5.0 \text{ V}; C_L = 15 \text{ pF}$		-	14	-	-	-	-	-	ns
		$V_{CC} = 6.0 \text{ V}$		-	14	25	-	31	-	38	ns
		Sn to nY; see Figure 7									
		$V_{CC} = 2.0 \text{ V}$		-	50	150	-	190	-	225	ns
		V _{CC} = 4.5 V		-	18	30	-	38	-	45	ns
		$V_{CC} = 5.0 \text{ V}; C_L = 15 \text{ pF}$		-	15	-	-	-	-	-	ns
		$V_{CC} = 6.0 \text{ V}$		-	14	26	-	33	-	38	ns
		nE to nY; see Figure 7									
		$V_{CC} = 2.0 \text{ V}$		-	33	100	-	125	-	150	ns
		V _{CC} = 4.5 V		-	12	20	-	25	-	30	ns
		$V_{CC} = 5.0 \text{ V}; C_L = 15 \text{ pF}$		-	10	-	-	-	-	-	ns
		$V_{CC} = 6.0 \text{ V}$		-	10	17	-	21	-	26	ns
t _t	transition time	see Figure 6	[2]								
		$V_{CC} = 2.0 \text{ V}$		-	19	75	-	95	-	110	ns
		$V_{CC} = 4.5 V$		-	7	15	-	19	-	22	ns
		$V_{CC} = 6.0 \text{ V}$		-	6	13	-	16	-	19	ns
C _{PD}	power dissipation capacitance	per package; $V_I = GND$ to V_{CC}	<u>[3]</u>	-	30	-	-	-	-	-	pF
74HCT1	53										
t _{PHL}	HIGH to LOW propagation	1In to nY, 2In to nY; see Figure 6	[1]								
	delay	$V_{CC} = 4.5 \text{ V}$		-	19	34	-	43	-	51	ns
		$V_{CC} = 5.0 \text{ V}; C_L = 15 \text{ pF}$		-	16	-	-	-	-	-	ns
t _{PLH}	LOW to HIGH propagation	1In to nY, 2In to nY; see Figure 6	[1]								
	delay	$V_{CC} = 4.5 \text{ V}$		-	13	24	-	30	-	36	ns
		$V_{CC} = 5.0 \text{ V}; C_L = 15 \text{ pF}$		-	16	-	-	-	-	-	ns

Table 7. Dynamic characteristics ...continued

GND = 0 V; $t_r = t_f = 6$ ns; $C_L = 50$ pF; for test circuit, see Figure 8; unless otherwise specified

Symbol	Parameter	Conditions			25 °C		-40 °C t	o +85 °C	–40 °C to	+125 °C	Unit
				Min	Тур	Max	Min	Max	Min	Max	
t _{pd}	propagation	Sn to nY; see Figure 7	[1]					1			
	delay	$V_{CC} = 4.5 \text{ V}$		-	20	34	-	43	-	51	ns
		$V_{CC} = 5.0 \text{ V}; C_L = 15 \text{ pF}$		-	17	-	-	-	-	-	ns
		nE to nY; see Figure 7	[1]								
		$V_{CC} = 4.5 \text{ V}$		-	14	27	-	34	-	41	ns
		$V_{CC} = 5.0 \text{ V}; C_L = 15 \text{ pF}$		-	11	-	-	-	-	-	ns
t _t	transition time	see Figure 6	[2]								
		$V_{CC} = 4.5 \text{ V}$		-	7	15	-	19	-	22	ns
C_{PD}	power dissipation capacitance	per package; $V_I = GND$ to $V_{CC} - 1.5 V$	[3]	-	30	-	-	-	-	-	pF

- [1] t_{pd} is the same as t_{PHL} and t_{PLH} .
- [2] t_t is the same as t_{THL} and t_{TLH} .
- [3] C_{PD} is used to determine the dynamic power dissipation (P_D in μW):

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

f_i = input frequency in MHz;

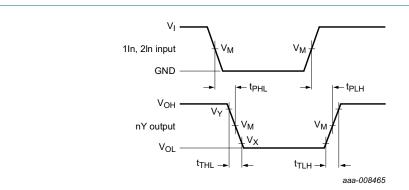
 f_o = output frequency in MHz;

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.



(1) Measurement points are given in Table 8.

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

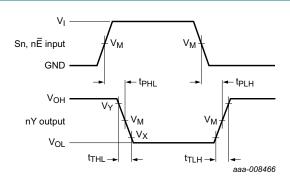
Fig 6. Waveforms showing the input (1In, 2In) to output (1Y, 2Y) propagation delays and output transition times

Table 8. Measurement points

Туре	Input	Output					
	V _M	V _M	V _X	V _Y			
74HC153	0.5V _{CC}	0.5V _{CC}	0.1V _{CC}	0.9V _{CC}			
74HCT153	1.3 V	1.3 V	0.1V _{CC}	0.9V _{CC}			

74HC_HCT153

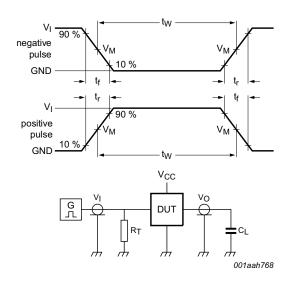
All information provided in this document is subject to legal disclaimers.



(1) Measurement points are given in Table 8.

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

Fig 7. Waveforms showing the input (Sn, nE) to output (nY) propagation delays



Test data is given in Table 9.

Definitions test circuit:

 R_T = termination resistance should be equal to output impedance Z_0 of the pulse generator.

 C_L = load capacitance including jig and probe capacitance.

Fig 8. Test circuit for measuring switching times

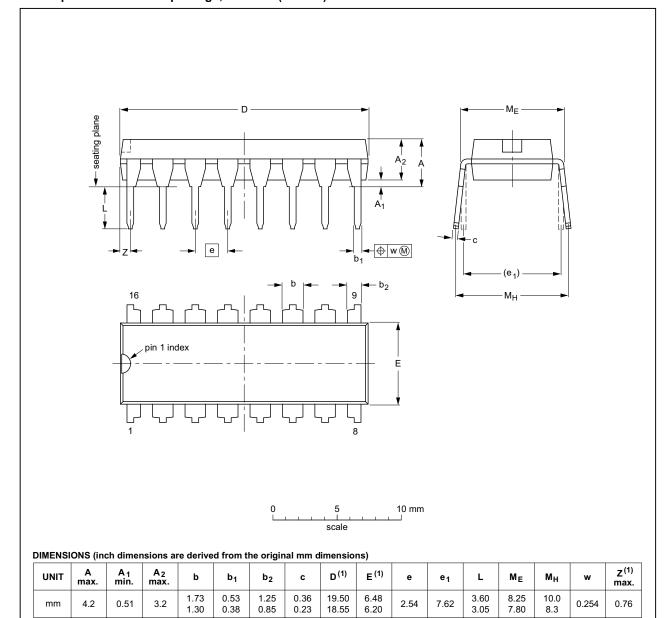
Table 9. Test data

Туре	Input		Load	Test
	V _I	t _r , t _f	CL	
74HC153	V _{CC}	6.0 ns	15 pF, 50 pF	t _{PLH} , t _{PHL}
74HCT153	3.0 V	6.0 ns	15 pF, 50 pF	t _{PLH} , t _{PHL}

11. Package outline

DIP16: plastic dual in-line package; 16 leads (300 mil)

SOT38-4



Note

inches

0.17

1. Plastic or metal protrusions of 0.25 mm (0.01 inch) maximum per side are not included.

0.021

0.049

0.033

0.014

0.068

0.13

OUTLINE		REFER	RENCES	EUROPEAN	ISSUE DATE
VERSION	IEC	JEDEC	JEITA	PROJECTION	ISSUE DATE
SOT38-4					95-01-14 03-02-13

0.77

0.26

0.1

Fig 9. Package outline SOT38-4 (DIP16)

0.02

74HC_HCT153

All information provided in this document is subject to legal disclaimers.

© NXP B.V. 2014. All rights reserved.

0.32

0.14

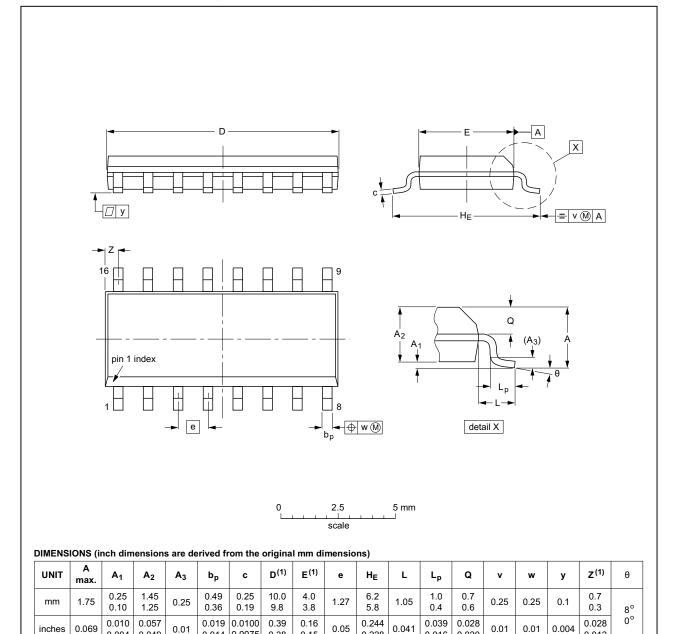
0.39

0.01

0.03

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

SOT109-1



Note

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

0.014 0.0075

0.38

0.15

OUTLINE		REFER	RENCES	EUROPEAN	ISSUE DATE		
VERSION	IEC	JEDEC	JEITA	PROJECTION	1990E DATE		
SOT109-1	076E07	MS-012			99-12-27 03-02-19		

0.228

0.016

0.020

Fig 10. Package outline SOT109-1 (SO16)

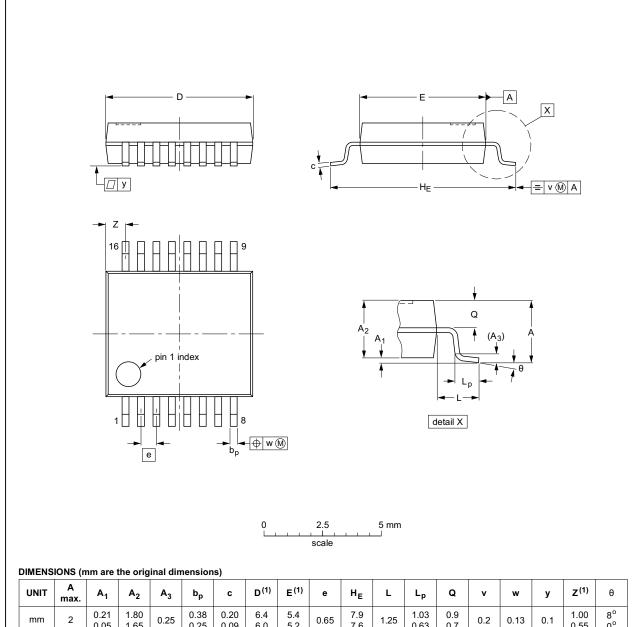
0.004

0.049

74HC_HCT153 All information provided in this document is subject to legal disclaimers.

SSOP16: plastic shrink small outline package; 16 leads; body width 5.3 mm

SOT338-1



						-,												
UNIT	A max.	A ₁	A ₂	A ₃	b _p	С	D ⁽¹⁾	E ⁽¹⁾	е	HE	L	Lp	Q	v	w	у	Z ⁽¹⁾	θ
mm	2	0.21 0.05	1.80 1.65	0.25	0.38 0.25	0.20 0.09	6.4 6.0	5.4 5.2	0.65	7.9 7.6	1.25	1.03 0.63	0.9 0.7	0.2	0.13	0.1	1.00 0.55	8° 0°

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

OUTLINE		REFER	RENCES	EUROPEAN	ISSUE DATE	
VERSION	IEC	JEDEC	JEITA	PROJECTION	ISSUE DATE	
SOT338-1		MO-150			99-12-27 03-02-19	

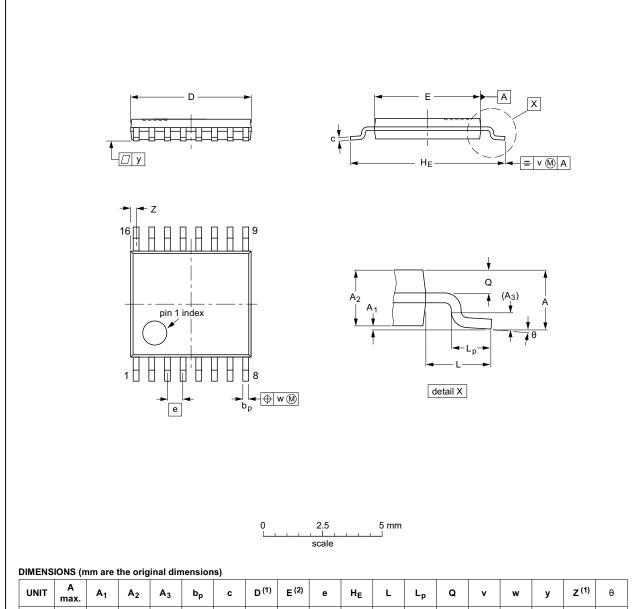
Fig 11. Package outline SOT338-1 (SSOP16)

74HC_HCT153

All information provided in this document is subject to legal disclaimers.

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

SOT403-1



UN	IIT	A max.	A ₁	A ₂	A ₃	bp	С	D ⁽¹⁾	E (2)	е	HE	L	Lp	Q	٧	w	у	Z ⁽¹⁾	θ
mı	m	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	RENCES	EUROPEAN	ISSUE DATE
VERSION	IEC	JEDEC	JEITA	PROJECTION	ISSUE DATE
SOT403-1		MO-153			99-12-27 03-02-18

Fig 12. Package outline SOT403-1 (TSSOP16)

74HC_HCT153

All information provided in this document is subject to legal disclaimers.

12. Abbreviations

Table 10. Abbreviations

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

13. Revision history

Table 11. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
74HC_HCT153 v.5	20140123	Product data sheet	-	74HC_HCT153 v.4
Modifications:	• <u>Table 1</u> and	Section 11: all references to	o 14 pin packages r	emoved.
74HC_HCT153 v.4	20131128	Product data sheet	-	74HC_HCT153 v.3
74HC_HCT153 v.3	20130722	Product data sheet	-	74HC_HCT153_CNV v.2
74HC_HCT153_CNV v.2	19970827	Product specification	-	-

14. Legal information

14.1 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.nxp.com.

14.2 Definitions

Draft — The document is a draft version only. The content is still under internal review and subject to formal approval, which may result in modifications or additions. NXP Semiconductors does not give any representations or warranties as to the accuracy or completeness of information included herein and shall have no liability for the consequences of use of such information.

Short data sheet — A short data sheet is an extract from a full data sheet with the same product type number(s) and title. A short data sheet is intended for quick reference only and should not be relied upon to contain detailed and full information. For detailed and full information see the relevant full data sheet, which is available on request via the local NXP Semiconductors sales office. In case of any inconsistency or conflict with the short data sheet, the full data sheet shall prevail.

Product specification — The information and data provided in a Product data sheet shall define the specification of the product as agreed between NXP Semiconductors and its customer, unless NXP Semiconductors and customer have explicitly agreed otherwise in writing. In no event however, shall an agreement be valid in which the NXP Semiconductors product is deemed to offer functions and qualities beyond those described in the Product data sheet.

14.3 Disclaimers

Limited warranty and liability — Information in this document is believed to be accurate and reliable. However, NXP Semiconductors does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information. NXP Semiconductors takes no responsibility for the content in this document if provided by an information source outside of NXP Semiconductors.

In no event shall NXP Semiconductors be liable for any indirect, incidental, punitive, special or consequential damages (including - without limitation - lost profits, lost savings, business interruption, costs related to the removal or replacement of any products or rework charges) whether or not such damages are based on tort (including negligence), warranty, breach of contract or any other legal theory.

Notwithstanding any damages that customer might incur for any reason whatsoever, NXP Semiconductors' aggregate and cumulative liability towards customer for the products described herein shall be limited in accordance with the *Terms and conditions of commercial sale* of NXP Semiconductors.

Right to make changes — NXP Semiconductors reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

Suitability for use — NXP Semiconductors products are not designed, authorized or warranted to be suitable for use in life support, life-critical or safety-critical systems or equipment, nor in applications where failure or malfunction of an NXP Semiconductors product can reasonably be expected to result in personal injury, death or severe property or environmental damage. NXP Semiconductors and its suppliers accept no liability for inclusion and/or use of NXP Semiconductors products in such equipment or applications and therefore such inclusion and/or use is at the customer's own risk.

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

Customers are responsible for the design and operation of their applications and products using NXP Semiconductors products, and NXP Semiconductors accepts no liability for any assistance with applications or customer product design. It is customer's sole responsibility to determine whether the NXP Semiconductors product is suitable and fit for the customer's applications and products planned, as well as for the planned application and use of customer's third party customer(s). Customers should provide appropriate design and operating safeguards to minimize the risks associated with their applications and products.

NXP Semiconductors does not accept any liability related to any default, damage, costs or problem which is based on any weakness or default in the customer's applications or products, or the application or use by customer's third party customer(s). Customer is responsible for doing all necessary testing for the customer's applications and products using NXP Semiconductors products in order to avoid a default of the applications and the products or of the application or use by customer's third party customer(s). NXP does not accept any liability in this respect.

Limiting values — Stress above one or more limiting values (as defined in the Absolute Maximum Ratings System of IEC 60134) will cause permanent damage to the device. Limiting values are stress ratings only and (proper) operation of the device at these or any other conditions above those given in the Recommended operating conditions section (if present) or the Characteristics sections of this document is not warranted. Constant or repeated exposure to limiting values will permanently and irreversibly affect the quality and reliability of the device.

Terms and conditions of commercial sale — NXP Semiconductors products are sold subject to the general terms and conditions of commercial sale, as published at http://www.nxp.com/profile/terms, unless otherwise agreed in a valid written individual agreement. In case an individual agreement is concluded only the terms and conditions of the respective agreement shall apply. NXP Semiconductors hereby expressly objects to applying the customer's general terms and conditions with regard to the purchase of NXP Semiconductors products by customer.

No offer to sell or license — Nothing in this document may be interpreted or construed as an offer to sell products that is open for acceptance or the grant, conveyance or implication of any license under any copyrights, patents or other industrial or intellectual property rights.

74HC_HCT153

All information provided in this document is subject to legal disclaimers.

Export control — This document as well as the item(s) described herein may be subject to export control regulations. Export might require a prior authorization from competent authorities.

Non-automotive qualified products — Unless this data sheet expressly states that this specific NXP Semiconductors product is automotive qualified, the product is not suitable for automotive use. It is neither qualified nor tested in accordance with automotive testing or application requirements. NXP Semiconductors accepts no liability for inclusion and/or use of non-automotive qualified products in automotive equipment or applications.

In the event that customer uses the product for design-in and use in automotive applications to automotive specifications and standards, customer (a) shall use the product without NXP Semiconductors' warranty of the product for such automotive applications, use and specifications, and (b) whenever customer uses the product for automotive applications beyond

NXP Semiconductors' specifications such use shall be solely at customer's own risk, and (c) customer fully indemnifies NXP Semiconductors for any liability, damages or failed product claims resulting from customer design and use of the product for automotive applications beyond NXP Semiconductors' standard warranty and NXP Semiconductors' product specifications.

Translations — A non-English (translated) version of a document is for reference only. The English version shall prevail in case of any discrepancy between the translated and English versions.

14.4 Trademarks

Notice: All referenced brands, product names, service names and trademarks are the property of their respective owners.

15. Contact information

For more information, please visit: http://www.nxp.com

For sales office addresses, please send an email to: salesaddresses@nxp.com

16. Contents

1	General description
2	Features and benefits
3	Ordering information
4	Functional diagram
5	Pinning information
5.1	Pinning
5.2	Pin description
6	Functional description
7	Limiting values
8	Recommended operating conditions
9	Static characteristics
10	Dynamic characteristics
11	Package outline
12	Abbreviations14
13	Revision history
14	Legal information
14.1	Data sheet status
14.2	Definitions
14.3	Disclaimers
14.4	Trademarks16
15	Contact information 16
46	Contents

Please be aware that important notices concerning this document and the product(s) described herein, have been included in section 'Legal information'.