# 74HC154; 74HCT154 4-to-16 line decoder/demultiplexer Rev. 7 — 29 February 2016

#### **General description** 1.

The 74HC154; 74HCT154 is a 4-to-16 line decoder/demultiplexer. It decodes four binary weighted address inputs (A0 to A3) to sixteen mutually exclusive outputs ( $\overline{Y0}$  to  $\overline{Y15}$ ). The device features two input enable (E0 and E1) inputs. A HIGH on either of the input enables forces the outputs HIGH. The device can be used as a 1-to-16 demultiplexer by using one of the enable inputs as the multiplexed data input. When the other enable input is LOW the addressed output will follow the state of the applied data. Inputs include clamp diodes. This enables the use of current limiting resistors to interface inputs to voltages in excess of V<sub>CC</sub>.

#### 2. Features and benefits

- 16-line demultiplexing capability
- Decodes 4 binary-coded inputs into 16 mutually-exclusive outputs
- Complies with JEDEC standard no. 7A
- Input levels:
  - For 74HC154: CMOS level
  - For 74HCT154: TTL level
- 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

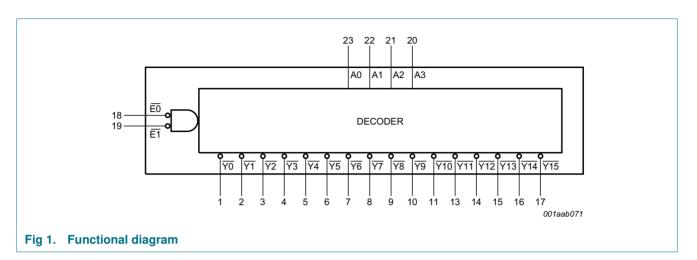
#### 3. Ordering information

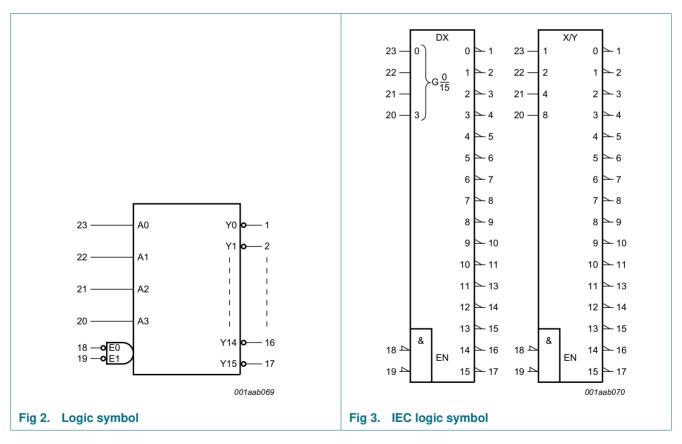
#### Table 1. **Ordering information**

Type number	Package			
	Temperature range	Name	Description	Version
74HC154D	–40 °C to +125 °C	SO24	plastic small outline package; 24 leads; body width 7.5 mm	SOT137-1
74HCT154D				
74HC154DB	–40 °C to +125 °C	SSOP24	plastic shrink small outline package; 24 leads; body width	SOT340-1
74HCT154DB			5.3 mm	
74HC154PW	–40 °C to +125 °C	TSSOP24	plastic thin shrink small outline package; 24 leads; body	SOT355-1
74HCT154PW			width 4.4 mm	
74HC154BQ	–40 °C to +125 °C	DHVQFN24	plastic dual in-line compatible thermal enhanced very thin	SOT815-1
74HCT154BQ			quad flat package; no leads; 24 terminals; body $3.5 \times 5.5 \times 0.85$ mm	

# nexperia

# 4. Functional diagram

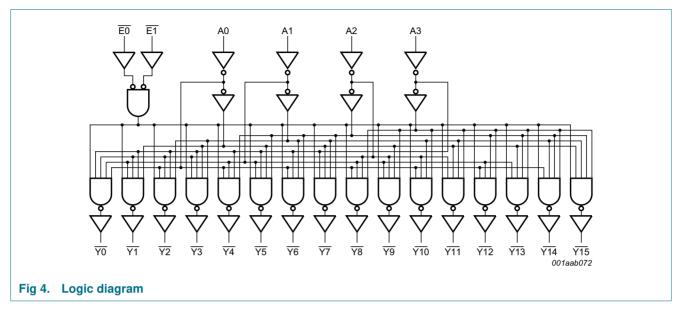




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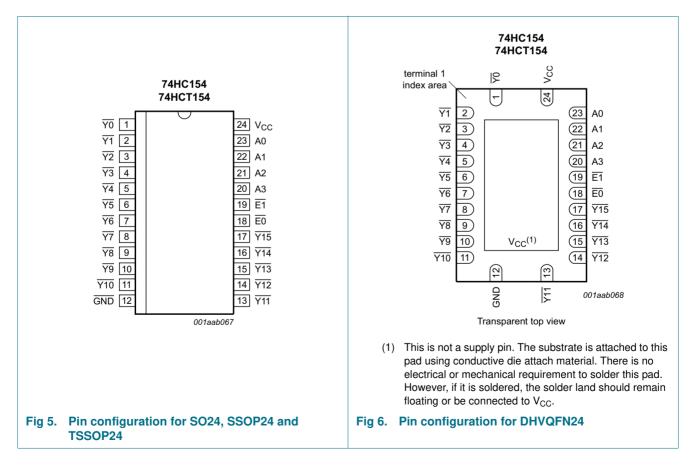
# 74HC154; 74HCT154

4-to-16 line decoder/demultiplexer



## 5. Pinning information

## 5.1 Pinning



## 5.2 Pin description

Table 2.   Pin description		
Symbol	Pin	Description
$\frac{\overline{Y0}, \overline{Y1}, \overline{Y2}, \overline{Y3}, \overline{Y4}, \overline{Y5}, \overline{Y6}, \overline{Y7}, \overline{Y8}, \overline{Y9},}{\overline{Y10}, \overline{Y11}, \overline{Y12}, \overline{Y13}, \overline{Y14}, \overline{Y15}}$	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17	data output (active LOW)
GND	12	ground (0 V)
<u>E0, E1</u>	18, 19	enable input (active LOW)
A0, A1, A2, A3	23, 22, 21, 20	address input
V <sub>CC</sub>	24	supply voltage

# 6. Functional description

Tabl	e 3.	Fu	nctio	on tal	ole <sup>[1]</sup>																
Inpu	Jt					Out	put														
E0	<b>E1</b>	<b>A</b> 0	<b>A1</b>	A2	A3	<u>Y0</u>	<b>Y1</b>	Y2	<b>Y</b> 3	<b>Y</b> 4	Y5	<u>Y6</u>	Y7	Y8	<u>Y9</u>	Y10	Y11	Y12	Y13	Y14	Y15
Н	Н	Х	Х	Х	Х	Н	Н	Н	Н	Н	н	н	н	н	н	н	н	н	н	Н	Н
Н	L	Х	Х	Х	Х	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н
L	Н	Х	Х	Х	Х	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н
L	L	L	L	L	L	L	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н
		Н	L	L	L	Н	L	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н
		L	Н	L	L	Н	Н	L	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н
		Н	Н	L	L	Н	Н	Н	L	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н
		L	L	Н	L	Н	Н	Н	Н	L	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н
		Н	L	Н	L	Н	Н	Н	Н	Н	L	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н
		L	Н	Н	L	Н	Н	Н	Н	Н	Н	L	Н	Н	Н	Н	Н	Н	Н	Н	Н
		Н	Н	Н	L	Н	Н	Н	Н	Н	Н	Н	L	Н	Н	Н	Н	Н	Н	Н	Н
		L	L	L	Н	Н	Н	Н	Н	Н	Н	Н	Н	L	Н	Н	Н	Н	Н	Н	Н
		Н	L	L	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	L	Н	Н	Н	Н	Н	Н
		L	Н	L	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	L	Н	Н	Н	Н	Н
		Н	Н	L	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	L	Н	Н	Н	Н
		L	L	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	L	Н	Н	Н
		Н	L	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	L	Н	Н
		L	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	L	Н
		Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	L

[1] H = HIGH voltage level

L = LOW voltage level

X = don't care.

## 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	+7.0	V
I <sub>IK</sub>	input clamping current	$V_{\rm I} < -0.5$ V or $V_{\rm I} > V_{\rm CC}$ + 0.5 V	<u>[1]</u>	-	±20	mA
I <sub>ОК</sub>	output clamping current	$V_O < -0.5$ V or $V_O > V_{CC}$ + 0.5 V	<u>[1]</u>	-	±20	mA
lo	output current	$-0.5 \text{ V} < \text{V}_{\text{O}} < \text{V}_{\text{CC}} + 0.5 \text{ V}$	<u>[1]</u>	-	±25	mA
I <sub>CC</sub>	supply current		<u>[1]</u>	-	50	mA
I <sub>GND</sub>	ground current		<u>[1]</u>	-	-50	mA
T <sub>stg</sub>	storage temperature			-65	+150	°C
P <sub>tot</sub>	total power dissipation	$T_{amb} = -40 \text{ °C to } +125 \text{ °C}$	[2]	-	300	mW

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

[2] For SO24 packages: P<sub>tot</sub> derates linearly at 8 mW/K above 70 ×°C.
 For SSOP24 and TSSOP24 packages: P<sub>tot</sub> derates linearly at 5.5 mW/K above 60 ×°C.
 For DHVQFN24 packages: P<sub>tot</sub> derates linearly at 4.5 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		74HC154	ŀ	7	4	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	$V_{CC} = 2.0 V$	-	-	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 74HC154

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

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
T <sub>amb</sub> = 25	°C					
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	-	V
		$V_{CC} = 6.0 \text{ V}$	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
		$V_{CC} = 6.0 \text{ V}$	-	2.8	1.8	V
V <sub>OH</sub>	HIGH-level output voltage	$V_{I} = V_{IH} \text{ or } V_{IL}$				
		$V_{CC} = 2.0 \text{ V}; \text{ I}_{O} = -20 \mu\text{A}$	1.9	2.0	-	V
		$V_{CC} = 4.5 \text{ V}; \text{ I}_{O} = -20 \mu\text{A}$	4.4	4.5	-	V
		$V_{CC} = 6.0 \text{ V}; \text{ I}_{O} = -20 \mu\text{A}$	5.9	6.0	-	V
		$V_{CC} = 4.5 \text{ V}; \text{ I}_{O} = -4.0 \text{ mA}$	3.98	4.32	-	V
		$V_{CC} = 6.0 \text{ V}; \text{ I}_{O} = -5.2 \text{ mA}$	5.48	5.81	-	V
V <sub>OL</sub>	LOW-level output voltage	$V_{I} = V_{IH} \text{ or } V_{IL}$				
		$V_{CC} = 2.0 \text{ V}; \text{ I}_{O} = 20 \mu\text{A}$	-	0	0.1	V
		$V_{CC} = 4.5 \text{ V}; \text{ I}_{O} = 20 \ \mu\text{A}$	-	0	0.1	V
		$V_{CC} = 6.0 \text{ V}; \text{ I}_{O} = 20 \mu\text{A}$	-	0	0.1	V
		$V_{CC} = 4.5 \text{ V}; I_{O} = 4.0 \text{ mA}$		0.15	0.26	V
		$V_{CC} = 6.0 \text{ V}; \text{ I}_{O} = 5.2 \text{ mA}$	-	0.16	0.26	V
I	input leakage current	$V_{CC} = 6.0 \text{ V}; \text{ V}_{I} = V_{CC} \text{ or GND}$	-	-	±0.1	μA
I <sub>CC</sub>	supply current	$V_{CC} = 6.0 \text{ V}; \text{ V}_{I} = V_{CC} \text{ or } \text{GND}; \text{ I}_{O} = 0 \text{ A}$	-	-	8.0	μA
CI	input capacitance		-	3.5	-	pF
$T_{amb} = -40$	) °C to +85 °C			1		
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 <sub>CC</sub> = 6.0 V	-	-	1.8	V
V <sub>OH</sub>	HIGH-level output voltage	$V_{I} = V_{IH} \text{ or } V_{IL}$				
		$V_{CC} = 2.0 \text{ V}; \text{ I}_{O} = -20 \mu\text{A}$	1.9	-	-	V
		$V_{CC} = 4.5 \text{ V}; \text{ I}_{O} = -20 \mu\text{A}$	4.4	-	-	V
		$V_{CC} = 6.0 \text{ V}; \text{ I}_{O} = -20 \mu\text{A}$	5.9	-	-	V
		$V_{CC} = 4.5 \text{ V}; I_{O} = -4.0 \text{ mA}$	3.84	-	-	V
		$V_{CC} = 6.0 \text{ V}; I_{O} = -5.2 \text{ mA}$	5.34	-	-	V

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#### Table 6. Static characteristics 74HC154 ...continued

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

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
V <sub>OL</sub>	LOW-level output voltage	$V_{I} = V_{IH} \text{ or } V_{IL}$				
		$V_{CC} = 2.0 \text{ V}; \text{ I}_{O} = 20 \mu\text{A}$	-	-	0.1	V
		$V_{CC} = 4.5 \text{ V}; \text{ I}_{O} = 20 \mu\text{A}$	-	-	0.1	V
		$V_{CC} = 6.0 \text{ V}; \text{ I}_{O} = 20 \mu\text{A}$	-	-	0.1	V
		$V_{CC} = 4.5 \text{ V}; \text{ I}_{O} = 4.0 \text{ mA}$	-	-	0.33	V
		$V_{CC} = 6.0 \text{ V}; \text{ I}_{O} = 5.2 \text{ mA}$	-	-	0.33	V
lı	input leakage current	$V_{CC} = 6.0 \text{ V}; \text{ V}_{I} = V_{CC} \text{ or GND}$	-	-	±1.0	μA
lcc	supply current	$V_{CC} = 6.0 \text{ V}; \text{ V}_{I} = V_{CC} \text{ or GND}; \text{ I}_{O} = 0 \text{ A}$	-	-	80	μA
T <sub>amb</sub> = -40	) °C to +125 °C					
VIH	HIGH-level input voltage	V <sub>CC</sub> = 2.0 V	1.5	-	-	V
		$V_{CC} = 4.5 V$	3.15	-	-	V
		$V_{CC} = 6.0 V$	4.2	-	-	V
V <sub>IL</sub>	LOW-level input voltage	V <sub>CC</sub> = 2.0 V	-	-	0.5	V
		$V_{CC} = 4.5 V$	-	-	1.35	V
		$V_{CC} = 6.0 V$	-	-	1.8	V
V <sub>OH</sub>	HIGH-level output voltage	$V_{I} = V_{IH} \text{ or } V_{IL}$				
		$V_{CC} = 2.0 \text{ V}; \text{ I}_{O} = -20 \mu\text{A}$	1.9	-	-	V
		$V_{CC} = 4.5 \text{ V}; \text{ I}_{O} = -20 \mu\text{A}$	4.4	-	-	V
		$V_{CC} = 6.0 \text{ V}; \text{ I}_{O} = -20 \mu\text{A}$	5.9	-	-	V
		$V_{CC}$ = 4.5 V; I <sub>O</sub> = -4.0 mA	3.7	-	-	V
		$V_{CC} = 6.0 \text{ V}; \text{ I}_{O} = -5.2 \text{ mA}$	5.2	-	-	V
V <sub>OL</sub>	LOW-level output voltage	$V_{I} = V_{IH} \text{ or } V_{IL}$				
		$V_{CC} = 2.0 \text{ V}; \text{ I}_{O} = 20 \mu\text{A}$	-	-	0.1	V
		$V_{CC} = 4.5 \text{ V}; \text{ I}_{O} = 20 \mu\text{A}$	-	-	0.1	V
		$V_{CC} = 6.0 \text{ V}; \text{ I}_{O} = 20 \mu\text{A}$	-	-	0.1	V
		$V_{CC} = 4.5 \text{ V}; \text{ I}_{O} = 4.0 \text{ mA}$	-	-	0.4	V
		$V_{CC} = 6.0 \text{ V}; \text{ I}_{O} = 5.2 \text{ mA}$	-	-	0.4	V
lı	input leakage current	$V_{CC} = 6.0 \text{ V}; \text{ V}_{I} = V_{CC} \text{ or GND}$	-	-	±0.1	μA
I <sub>CC</sub>	supply current	$V_{CC} = 6.0 \text{ V}; \text{ V}_{I} = V_{CC} \text{ or GND}; \text{ I}_{O} = 0 \text{ A}$	-	-	160	μA

4-to-16 line decoder/demultiplexer

#### Table 7. Static characteristics 74HCT154

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

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
T <sub>amb</sub> = 25 °	O					
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 voltage	$V_{I} = V_{IH}$ or $V_{IL}$				
		$V_{CC} = 4.5 \text{ V}; \text{ I}_{O} = -20 \mu\text{A}$	4.4	4.5	-	V
		$V_{CC} = 4.5 \text{ V}; \text{ I}_{O} = -4 \text{ mA}$	3.98	4.32	-	V
V <sub>OL</sub>	LOW-level output voltage	$V_{I} = V_{IH}$ or $V_{IL}$				
		$V_{CC} = 4.5 \text{ V}; \text{ I}_{O} = 20 \mu\text{A}$	-	0	0.1	V
		V <sub>CC</sub> = 4.5 V; I <sub>O</sub> = 4 mA	-	0.15	0.25	V
I <sub>I</sub>	input leakage current	$V_{CC} = 5.5 \text{ V}; \text{ V}_{I} = V_{CC} \text{ or GND}$	-	-	±0.1	μA
I <sub>CC</sub>	supply current	$V_{CC} = 5.5 \text{ V}; \text{ V}_{\text{I}} = \text{V}_{CC} \text{ or GND}; \text{ I}_{\text{O}} = 0 \text{ A}$	-	-	8.0	μA
Δl <sub>CC</sub>	additional supply current	per input pin; $V_{CC} = 4.5$ V to 5.5 V; V <sub>I</sub> = V <sub>CC</sub> - 2.1 V; I <sub>O</sub> = 0 A	-	-	360	μA
Cı	input capacitance		-	3.5	-	pF
T <sub>amb</sub> = -40	0 °C to +85 °C	1		1	1	
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	$V_{I} = V_{IH} \text{ or } V_{IL}$				
		$V_{CC} = 4.5 \text{ V}; \text{ I}_{O} = -20 \mu\text{A}$	4.4	-	-	V
		$V_{CC} = 4.5 \text{ V}; \text{ I}_{O} = -4 \text{ mA}$	3.84	-	-	V
V <sub>OL</sub>	LOW-level output voltage	$V_{I} = V_{IH} \text{ or } V_{IL}$				
-		$V_{CC} = 4.5 \text{ V}; I_{O} = 20 \mu\text{A}$	-	-	0.1	V
		$V_{CC} = 4.5 \text{ V}; \text{ I}_{O} = 4 \text{ mA}$	-	-	0.33	V
	input leakage current	$V_{CC} = 5.5 \text{ V}; \text{ V}_{I} = V_{CC} \text{ or GND}$	-	-	±1.0	μA
lcc	supply current	$V_{CC} = 5.5 \text{ V}; \text{ V}_{I} = V_{CC} \text{ or GND}; I_{O} = 0 \text{ A}$	-	-	80	μA
Δl <sub>CC</sub>	additional supply current	per input pin; $V_{CC} = 4.5$ V to 5.5 V; V <sub>I</sub> = V <sub>CC</sub> - 2.1 V; I <sub>O</sub> = 0 A	-	-	450	μA
T <sub>amb</sub> = -40	°C to +125 °C		I	1		_
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	$V_{I} = V_{IH} \text{ or } V_{IL}$				
		$V_{CC} = 4.5 \text{ V}; \text{ I}_{O} = -20 \mu\text{A}$	4.4	-	-	V
		$V_{CC} = 4.5 \text{ V}; \text{ I}_{O} = -4 \text{ mA}$	3.7	-	-	V
V <sub>OL</sub>	LOW-level output voltage	$V_{I} = V_{IH}$ or $V_{IL}$				
		$V_{CC} = 4.5 \text{ V}; I_{O} = 20 \mu\text{A}$	-	-	0.1	V
		$V_{CC} = 4.5 \text{ V}; \text{ I}_{O} = 4 \text{ mA}$	-	-	0.4	V
l <sub>l</sub>	input leakage current	$V_{CC} = 5.5 \text{ V}; \text{ V}_{I} = \text{V}_{CC} \text{ or GND}$	-	-	±1.0	μA
I <sub>CC</sub>	supply current	$V_{CC} = 5.5 \text{ V}; \text{ V}_{I} = \text{V}_{CC} \text{ or GND}; \text{ I}_{O} = 0 \text{ A}$	-	-	160	μA
Δl <sub>CC</sub>	additional supply current	per input pin; $V_{CC} = 4.5$ V to 5.5 V; V <sub>I</sub> = V <sub>CC</sub> - 2.1 V; I <sub>O</sub> = 0 A	-	-	490	μA

# **10. Dynamic characteristics**

#### Table 8. Dynamic characteristics

GND (ground = 0 V);  $C_L$  = 50 pF unless otherwise specified; for test circuit, see <u>Figure 9</u>.

Symbol	Parameter	Conditions			25 °C		-4	0 °C to +1	25 °C	Unit
				Min	Тур	Max	Min	Max (85 °C)	Max (125 °C)	
74HC154										
t <sub>pd</sub>	propagation delay	An to $\overline{Yn}$ ; see Figure 7	[1]							
		V <sub>CC</sub> = 2.0 V		-	36	150	-	190	225	ns
		$V_{CC} = 4.5 V$		-	13	30	-	38	45	ns
		$V_{CC} = 5 \text{ V}; \text{ C}_{L} = 15 \text{ pF}$		-	11	-	-	-	-	ns
		$V_{CC} = 6.0 V$		-	10	26	-	33	38	ns
		En to Yn; see Figure 8								
		V <sub>CC</sub> = 2.0 V		-	39	150	-	190	225	ns
		V <sub>CC</sub> = 4.5 V		-	14	30	-	38	45	ns
		$V_{CC} = 5 \text{ V}; \text{ C}_{L} = 15 \text{ pF}$		-	11	-	-	-	-	ns
		$V_{CC} = 6.0 V$		-	11	26	-	33	38	ns
t <sub>t</sub> transition time		see Figure 7 and 8	[2]							
		V <sub>CC</sub> = 2.0 V		-	19	75	-	95	110	ns
		V <sub>CC</sub> = 4.5 V		-	7	15	-	19	22	ns
		$V_{CC} = 6.0 V$		-	6	13	-	16	19	ns
C <sub>PD</sub>	power dissipation capacitance	per gate; $V_I = GND$ to $V_{CC}$	[3]	-	60	-	-	-	-	pF
74HCT15	4								-	4
t <sub>pd</sub>	propagation delay	An to Yn; see Figure 7	<u>[1]</u>							
		V <sub>CC</sub> = 4.5 V		-	16	35	-	44	53	ns
		V <sub>CC</sub> = 5 V; C <sub>L</sub> = 15 pF		-	13	-	-	-	-	ns
		En to Yn; see Figure 8								
		V <sub>CC</sub> = 4.5 V		-	15	32	-	40	48	ns
		V <sub>CC</sub> = 5 V; C <sub>L</sub> = 15 pF		-	13	-	-	-	-	ns
t <sub>t</sub>	transition time	see Figure 7 and 8	[2]							
		V <sub>CC</sub> = 4.5 V		-	7	15	-	19	22	ns
C <sub>PD</sub>	power dissipation capacitance	per gate; $V_I = GND$ to $(V_{CC} - 1.5 V)$	<u>[3]</u>	-	60	-	-	-	-	pF

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

[2]  $t_t$  is the same as  $t_{TLH}$  and  $t_{THL}$ 

[3]  $C_{PD}$  is used to determine the dynamic power dissipation (P<sub>D</sub> in  $\mu$ W).

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

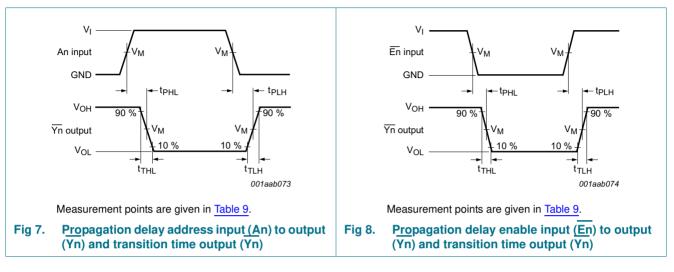
N = number of load switching outputs;

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

**Product data sheet** 

4-to-16 line decoder/demultiplexer

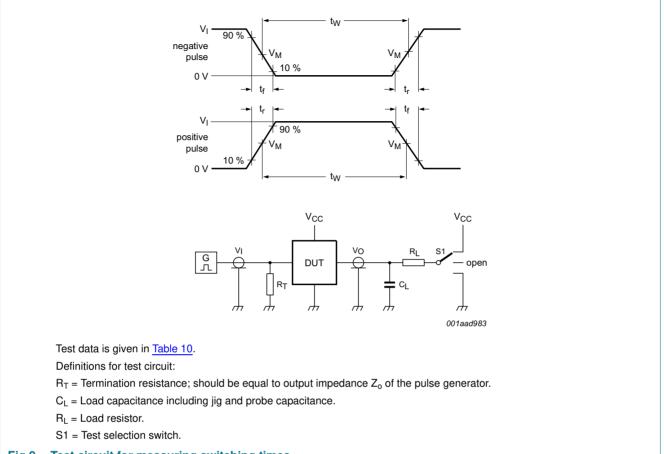
## 11. Waveforms



#### Table 9.Measurement points

Туре	Input	Output
	V <sub>M</sub>	V <sub>M</sub>
74HC154	0.5V <sub>CC</sub>	0.5V <sub>CC</sub>
74HCT154	1.3 V	1.3 V

#### 4-to-16 line decoder/demultiplexer



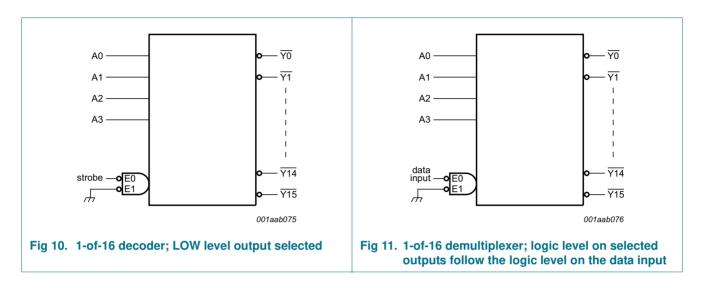
## Fig 9. Test circuit for measuring switching times

#### Table 10. Test data

Туре	Input		Load	S1 position	
	VI	t <sub>r</sub> , t <sub>f</sub>	CL	RL	t <sub>PHL</sub> , t <sub>PLH</sub>
74HC154	V <sub>CC</sub>	6 ns	15 pF, 50 pF	1 kΩ	open
74HCT154	3 V	6 ns	15 pF, 50 pF	1 kΩ	open

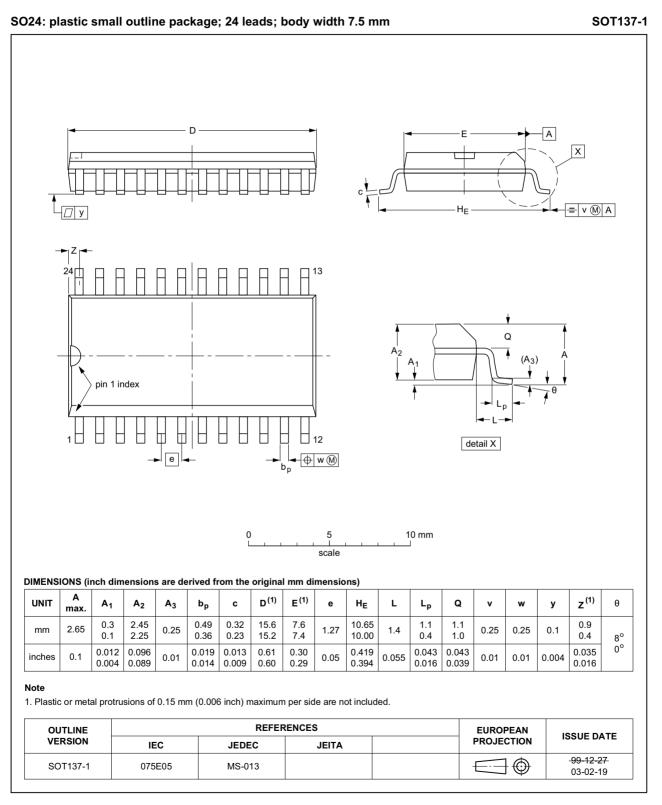
4-to-16 line decoder/demultiplexer

# 12. Application information



4-to-16 line decoder/demultiplexer

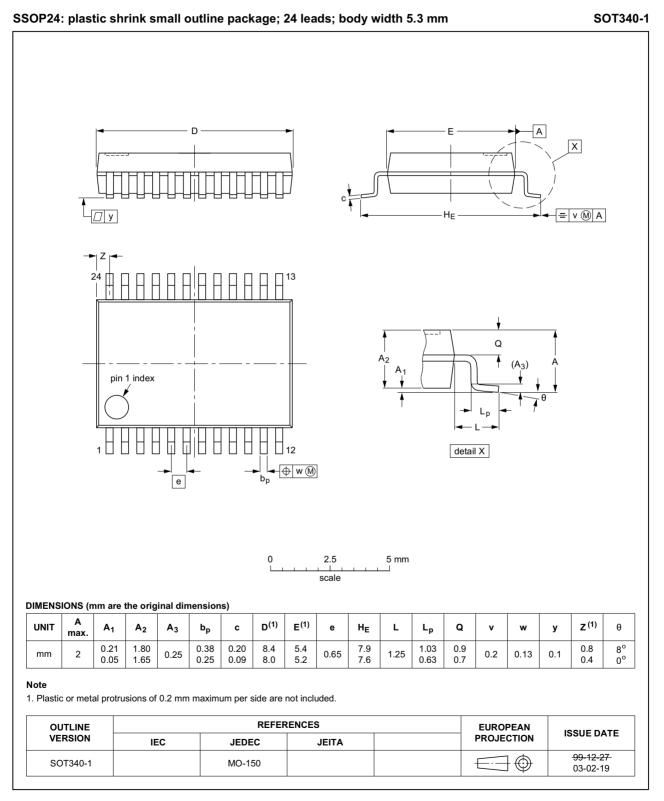
## 13. Package outline



#### Fig 12. Package outline SOT137-1 (SO24)

74HC\_HCT154 Product data sheet

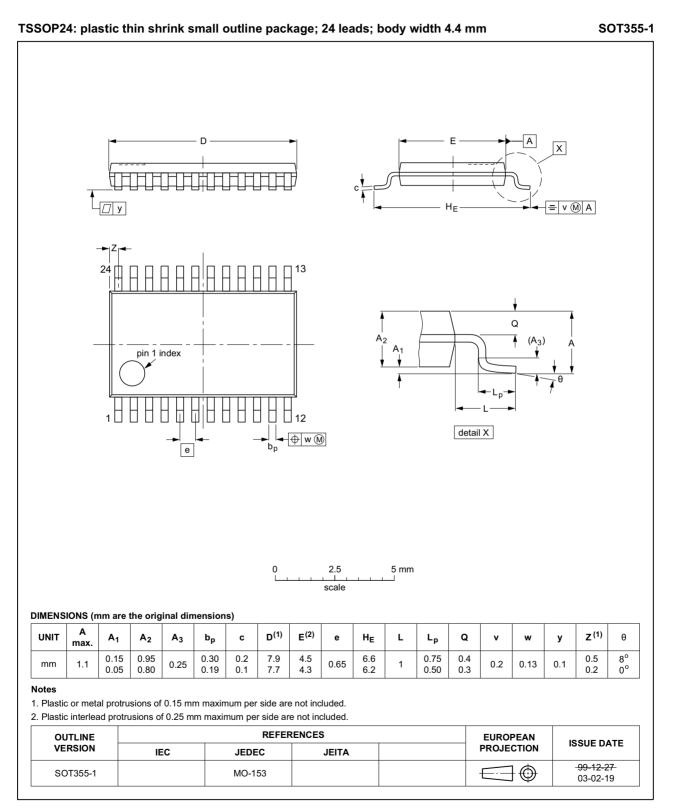
4-to-16 line decoder/demultiplexer



#### Fig 13. Package outline SOT340-1 (SSOP24)

74HC\_HCT154 Product data sheet

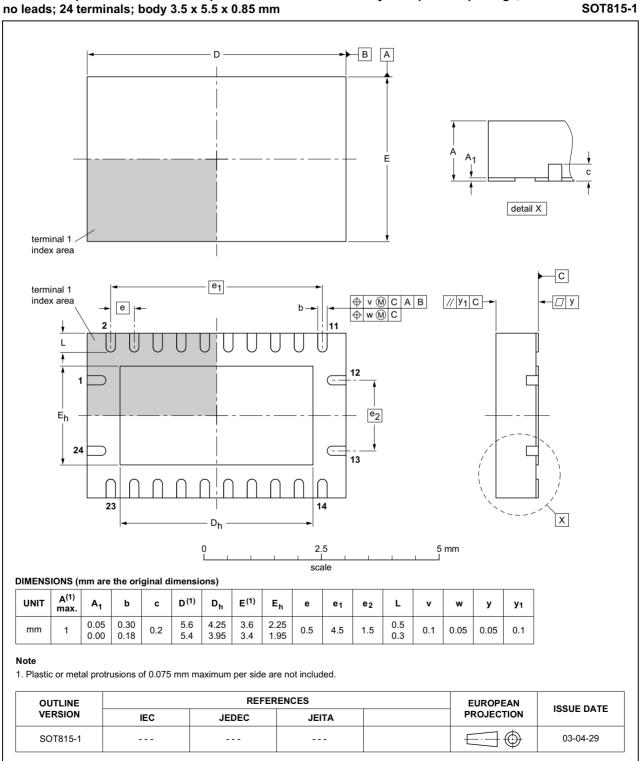
4-to-16 line decoder/demultiplexer



#### Fig 14. Package outline SOT355-1 (TSSOP24)

74HC\_HCT154

Product data sheet



#### DHVQFN24: plastic dual in-line compatible thermal enhanced very thin quad flat package; no leads; 24 terminals; body 3.5 x 5.5 x 0.85 mm

Fig 15. Package outline SOT815-1 (DHVQFN24)

74HC\_HCT154

## 14. Abbreviations

Table 11. Abbreviations					
Acronym	Description				
CMOS	Complementary Metal Oxide Semiconductor				
DUT	Device Under Test				
ESD	ElectroStatic Discharge				
HBM	Human Body Model				
TTL	Transistor-Transistor Logic				
MM	Machine Model				

# 15. Revision history

#### Table 12.Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes	
74HC_HCT154 v.7	20160229	Product data sheet	-	74HC_HCT154 v.6	
Modifications:	Type numbers 74HC154N and 74HCT154N (SOT101-1) removed.				
74HC_HCT154 v.6	20070212	Product data sheet	-	74HC_HCT154 v.5	
Modifications:	<ul> <li>The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors.</li> <li>Legal texts have been adapted to the new company name where appropriate.</li> </ul>				
	<ul> <li><u>Table 3 on page 4</u>: Corrected errors in output information.</li> </ul>				
74HC_HCT154 v.5	20041012	Product specification	-	74HC_HCT154 v.4	
74HC_HCT154 v.4	20041005	Product specification	-	74HC_HCT154 v.3	
74HC_HCT154 v.3	20040601	Product specification	-	74HC_HCT154_CNV v.2	

# 16. Legal information

#### 16.1 Data sheet status

Document status[1][2]	Product status <sup>[3]</sup>	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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#### 4-to-16 line decoder/demultiplexer

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