

74HC153 Dual 4-to-1-line Data Selectors/Multiplexers

1. General Description

1.1 Description

Each of these data selectors/multiplexers contains inverters and drivers to supply full binary decoding data selection to the AND-OR gates. Separate strobe ($\overline{G}$) inputs are provided for each of the two 4-line sections.

1.2 Features

- Buffered Inputs
- Wide operating voltage range $V_{CC}=2V$ to $6V$
- Wide operating temperature range of $-40^{\circ}C$ to $85^{\circ}C$

- Low Input Current: $1\mu A$ max
- Enable line provided for cascading (n lines to 1 line)
- Permits multiplexing from n lines to 1 line
- Performs parallel-to-serial conversion

1.3 Device Information

PART NUMBER	PACKAGE
74HC153	DIP
	SOP
	TSSOP

2. Connection Diagrams and Pin Description

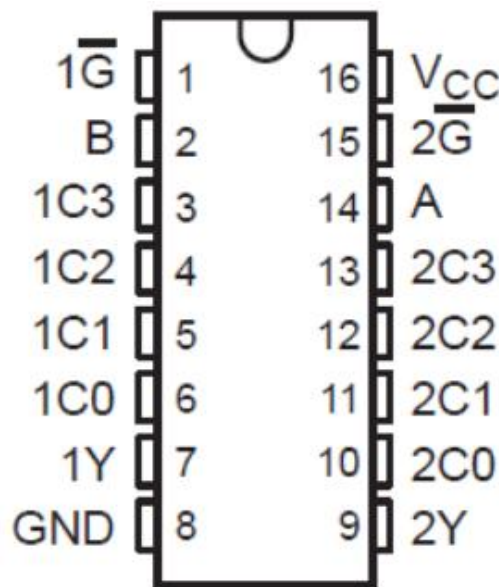


Figure 2.1 Top View

PIN No.	NAME	I/O	FUNCTION
1	$\overline{1G}$	I	Output Enable Input (active LOW)
2	B	I	Data Select Input
3	1C3	I	Data Input Source 1
4	1C2	I	Data Input Source 1
5	1C1	I	Data Input Source 1
6	1C0	I	Data Input Source 1
7	1Y	O	Multiplexer Output source 1
8	GND		Ground
9	2Y	O	Multiplexer Output source 2
10	2C0	I	Data Input Source 2
11	2C1	I	Data Input Source 2
12	2C2	I	Data Input Source 2
13	2C3	I	Data Input Source 2
14	A	I	Data Select Input
15	$\overline{2G}$	I	Output Enable Input (active LOW)
16	VCC		Supply Voltage

3. System Diagram

3.1 Logic Diagram

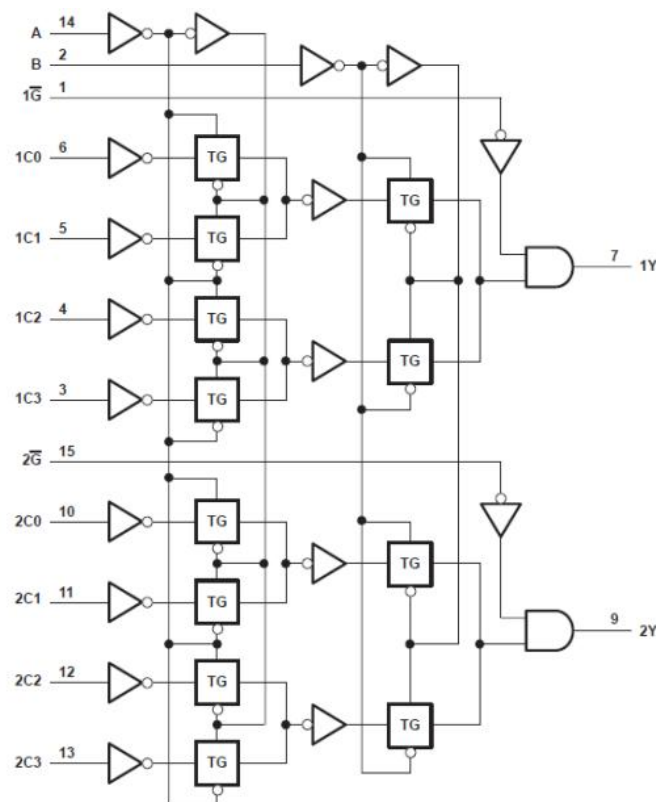


Figure 3.1: 74HC153 Logic Diagram



3.2 Truth Table

Input							Output
B	A	C0	C1	C2	C3	$\overline{G}$	Y
X	X	X	X	X	X	1	0
0	0	0	X	X	X	0	0
0	0	1	X	X	X	0	1
0	1	X	0	X	X	0	0
0	1	X	1	X	X	0	1
1	0	X	X	0	X	0	0
1	0	X	X	1	X	0	1
1	1	X	X	X	0	0	0
1	1	X	X	X	1	0	1

Z=High Impedance, 1≡High State, 0≡Low State

(1)Select inputs A and B are common to both sections.

4. Specifications

4.1 Absolute Maximum Ratings

Symbol	Parameter	MIN	MAX	Unit
V _{CC}	Supply Voltage	-0.5	7	V
P _D	Power Dissipation		500	mW
T _J	Junction Temperature		125	°C
T _{OP}	Operating Temperature	-40	85	°C

Absolute maximum ratings are those values beyond which the device could be permanently damaged, These are stress ratings only, which do not imply functional operation of the device at these or any other conditions beyond those indicated under Recommended Operating Conditions.



4.2 Electrical Characteristics

4.2.1 DC Specifications

($T_a=25^{\circ}\text{C}$, voltages are referenced to GND (ground=0V), unless otherwise specified)

Symbol	Parameter	Test Condition	MIN	TYP	MAX	Unit
V_{IH}	High Level Input Voltage	$V_{CC}=2V$	1.5	--	--	V
		$V_{CC}=4.5V$	3.15	--	--	V
		$V_{CC}=6V$	4.2	--	--	V
V_{IL}	Low Level Input Voltage	$V_{CC}=2V$	--	--	0.5	V
		$V_{CC}=4.5V$	--	--	1.35	V
		$V_{CC}=6V$	--	--	1.8	V
V_{OH}	High Level Output Voltage	$V_{CC}=2V, I_o=-20\mu A$	1.9	--	--	V
		$V_{CC}=4.5V, I_o=-20\mu A$	4.4	--	--	V
		$V_{CC}=6V, I_o=-20\mu A$	5.9	--	--	V
		$V_{CC}=4.5V, I_o=-4mA$	4.0	--	--	V
		$V_{CC}=6V, I_o=-5.2mA$	5.5	--	--	V
V_{OL}	Low Level Output Voltage	$V_{CC}=2V, I_o=20\mu A$	--	--	0.1	V
		$V_{CC}=4.5V, I_o=20\mu A$	--	--	0.1	V
		$V_{CC}=6V, I_o=20\mu A$	--	--	0.1	V
		$V_{CC}=4.5V, I_o=4mA$	--	--	0.4	V
		$V_{CC}=6V, I_o=5.2mA$	--	--	0.4	V
I_I	Input Leakage Current	$V_{CC}=6V, V_i=V_{CC}$ or GND	--	0	± 1	μA
I_{CC}	Quiescent Supply Current	$V_{CC}=6V, V_i=V_{CC}/GND$	--	0	10	μA

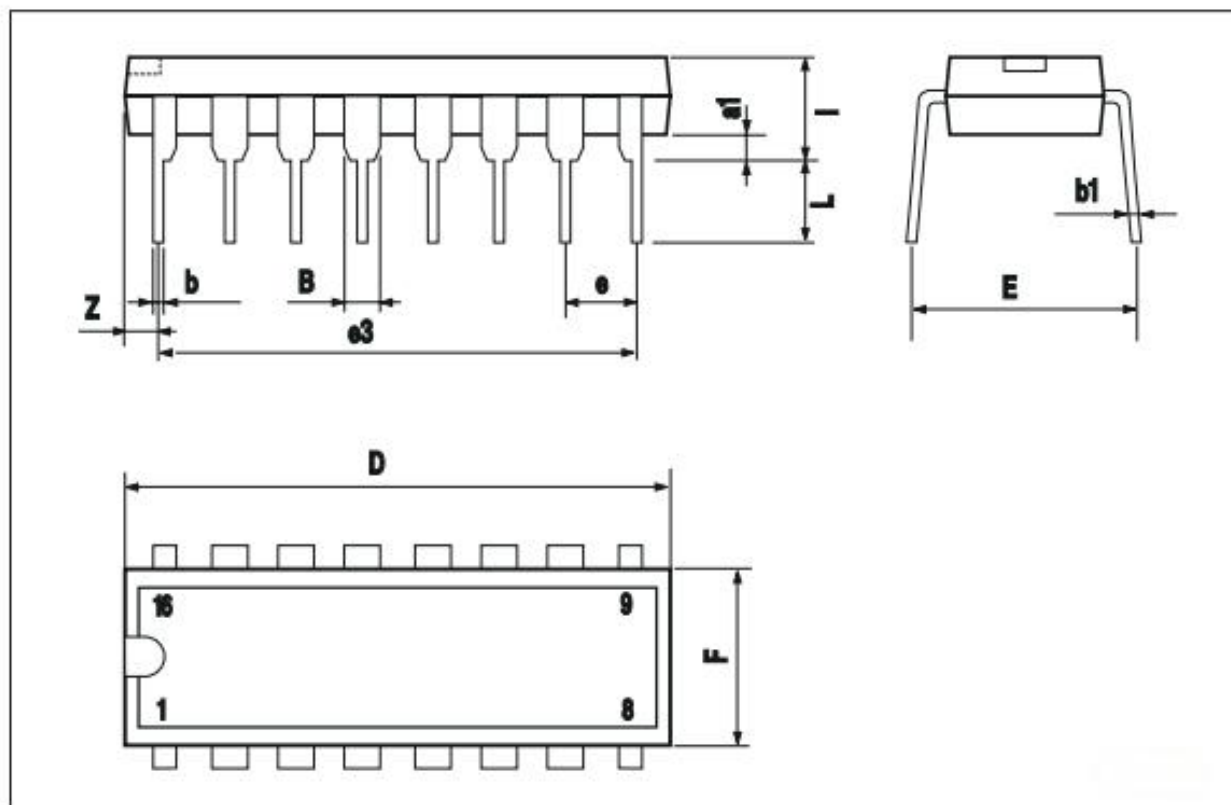
5. Ordering Information

Orderable Device	Package Type	Pins	Packing	Package Qty
74HC153ND16ATBE	DIP	16	Tube	25
74HC153NS16ARDQ	SOP	16	Tape & Reel	4000
74HC153TS16ARDQ	TSSOP	16	Tape & Reel	4000

6. Package Information

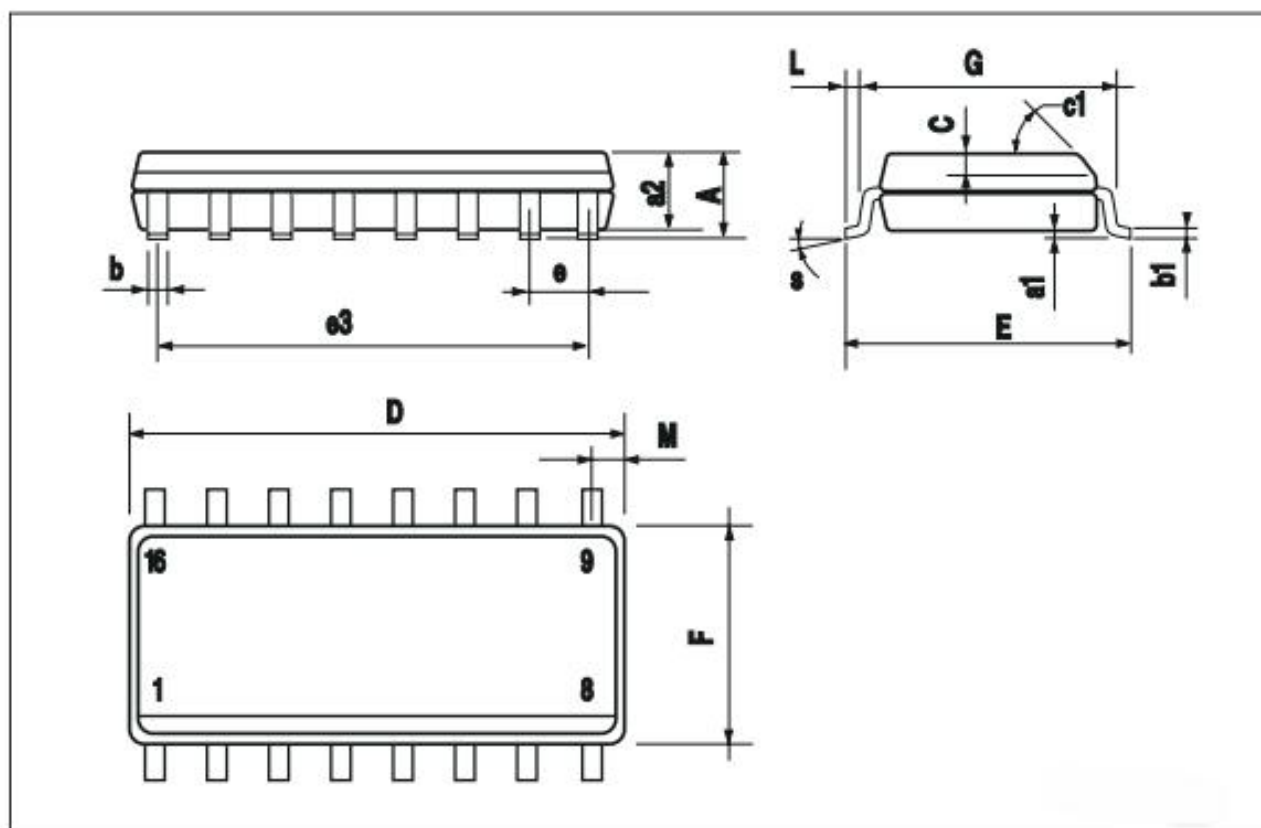
6.1 DIP16

Dim.	mm.			inch.		
	Min.	Typ.	Max.	Min.	Typ.	Max.
a1	0.51			0.020		
B	0.77		1.65	0.030		0.065
b		0.5			0.020	
b1		0.25			0.010	
D			20			0.787
E		8.5			0.335	
e		2.54			0.100	
e3		17.78			0.700	
F			7.1			0.280
I			5.1			0.201
L		3.3			0.130	
Z			1.27			0.050



6.2 SOP16

Dim.	mm.			inch.		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			1.75			0.068
a1	0.1		0.25	0.004		0.010
a2			1.64			0.063
b	0.35		0.46	0.013		0.018
b1	0.19		0.25	0.007		0.010
C		0.5			0.019	
c1	45° (typ.)					
D	9.8		10	0.385		0.393
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		8.89			0.350	
F	3.8		4.0	0.149		0.157
G	4.6		5.3	0.181		0.208
L	0.5		1.27	0.019		0.050
M			0.62			0.024
S	8° (max.)					



6.3 TSSOP16

Dim.	mm.			inch.		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			1.2			0.047
A1	0.05		0.15	0.002	0.004	0.006
A2	0.8	1	1.05	0.031	0.039	0.041
b	0.19		0.30	0.007		0.012
c	0.09		0.20	0.004		0.0079
D	4.9	5	5.1	0.193	0.197	0.201
E	6.2	6.4	6.6	0.244	0.252	0.260
E1	4.3	4.4	4.48	0.169	0.173	0.176
e		0.65 BSC			0.0256 BSC	
K	0°		8°	0°		8°
L	0.45	0.60	0.75	0.018	0.024	0.030

