

CD4043 CMOS Quad 3 State R/S Latches

1. General Description

1.1 Description

CD4043 types are quad cross-coupled 3-state CMOS NOR latches. Each latch has a separate Q output and individual SET and RESET inputs. The Q outputs are controlled by a common ENABLE input. A logic "1" or high on the ENABLE input connects the latch states to the Q outputs. A logic "0" or low on the ENABLE input disconnects the latch states from the Q outputs, resulting in an open circuit condition on the Q outputs. The open circuit feature allows common busing of the outputs.

1.2 Features

- 3-state outputs with common output ENABLE
- Separate SET and RESET inputs for each

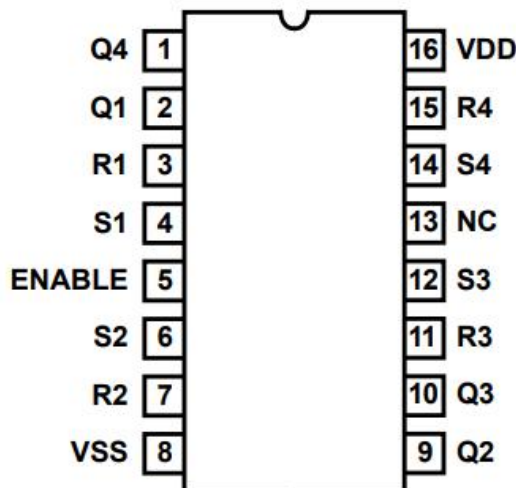
latch

- NOR and NAND configurations
- Standardized symmetrical output characteristics
- 100% tested for quiescent current at 18V
- Maximum input current of 1μA at 18V and 25°C
- 5V, 10V, and 15V parametric ratings

1.3 Device Information

PART NUMBER	PACKAGE
CD4043	DIP
	SOP
	TSSOP

2. Pin Description and Functional Diagram



NC = NO CONNECTION

Figure 2.1 Top View

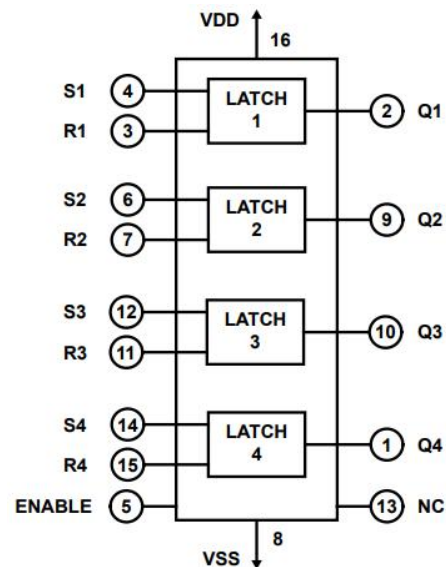


Figure 2.2 Functional Diagram

PIN No.	NAME	I/O	FUNCTION
1	Q4	O	3-State Buffered Latch Output
2	Q1	O	3-State Buffered Latch Output
3	R1	I	Reset Input
4	S1	I	Set Input
5	ENABLE	I	Common Output Enable Input
6	S2	I	Set Input
7	R2	I	Reset Input
8	VSS		Ground
9	Q2	O	3-State Buffered Latch Output
10	Q3	O	3-State Buffered Latch Output
11	R3	I	Reset Input
12	S3	I	Set Input
13	NC		Not Connected
14	S4	I	Set Input
15	R4	I	Reset Input
16	VDD		Supply Voltage

3. System Diagram

3.1 Logic Diagram

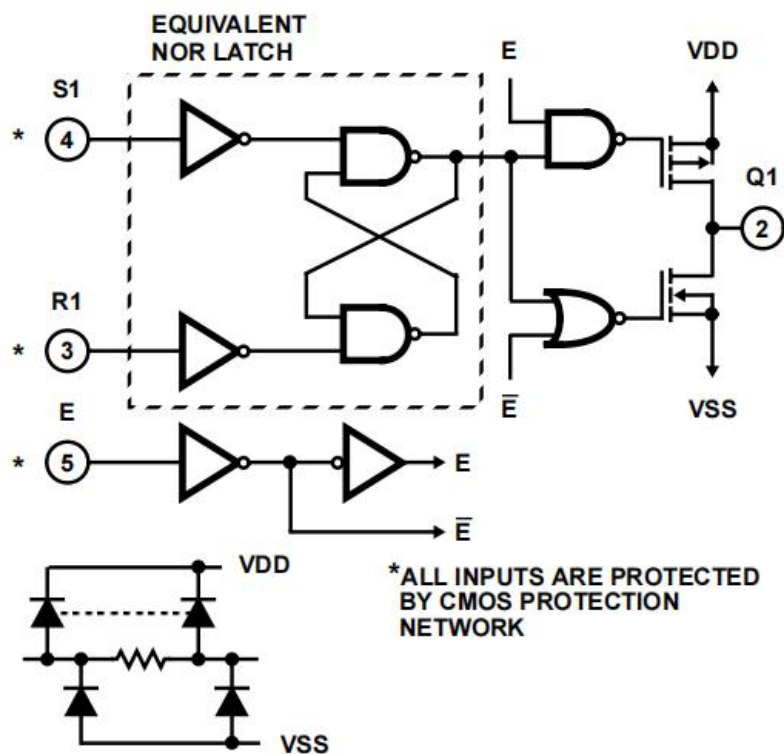


Figure 3.1: CD4043 Logic Diagram



3.2 Truth Table

Input			Output
S	R	E	Q
X	X	0	Open Circuit
0	0	1	No Change
1	0	1	1
0	1	1	0
1	1	1	Dominated by S = 1 Input

X = Don't Care, 1 $\equiv$ High State, 0 $\equiv$ Low State



4. Specifications

4.1 Absolute Maximum Ratings

Symbol	Parameter	MIN	MAX	Unit
V _{DD}	DC Supply Voltage Range (Voltage Referenced to VSS Terminals)	-0.5	20	V
V _I	Input Voltage Range, All Inputs	0.5	V _{DD} +0.5	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°C, voltages are referenced to VSS (ground=0V), unless otherwise specified)

Symbol	Parameter	Test Condition			MIN	TYP	MAX	Unit
		V _O	V _{IN}	V _{DD}				
I _{DD}	Supply Current	--	0,5	5	--	0	1	uA
		--	0,10	10	--	0	1	uA
		--	0,18	18	--	0	2	uA
I _{OL}	Low Level Output Current	0.4	0,5	5	1	3	--	mA
		0.5	0,10	10	3.5	7	--	mA
		1.5	0,15	15	13	25	--	mA
I _{OH}	High Level Output Current	4.6	0,5	5	-0.5	-1.5	--	mA
		2.5	0,5	5	-3	-7	--	mA
		9.5	0,10	10	-1.5	-3.5	--	mA
		13.5	0,15	15	-7	-14	--	mA
V _{OL}	Low Level Output Voltage	--	0,5	5	--	0	0.05	V
		--	0,10	10	--	0	0.05	V
		--	0,15	15	--	0	0.05	V
V _{OH}	High Level Output Voltage	--	0,5	5	4.95	5	--	V
		--	0,10	10	9.95	10	--	V
		--	0,15	15	14.95	15	--	V
V _{IL}	Low Level Input Voltage	0.5,4.5	--	5	--	--	1.5	V
		1,9	--	10	--	--	3	V
		1.5,13.5	--	15	--	--	4	V
V _{IH}	High Level Input Voltage	0.5,4.5	--	5	3.5	--	--	V
		1,9	--	10	7	--	--	V
		1.5,13.5	--	15	11	--	--	V
I _{IN}	Input Leakage Current	--	0,18	18	--	0	±1	uA
I _{OUT}	3-State Output Leakage Current	0,18	0,18	18	--	0	±2	uA

5. Applications information

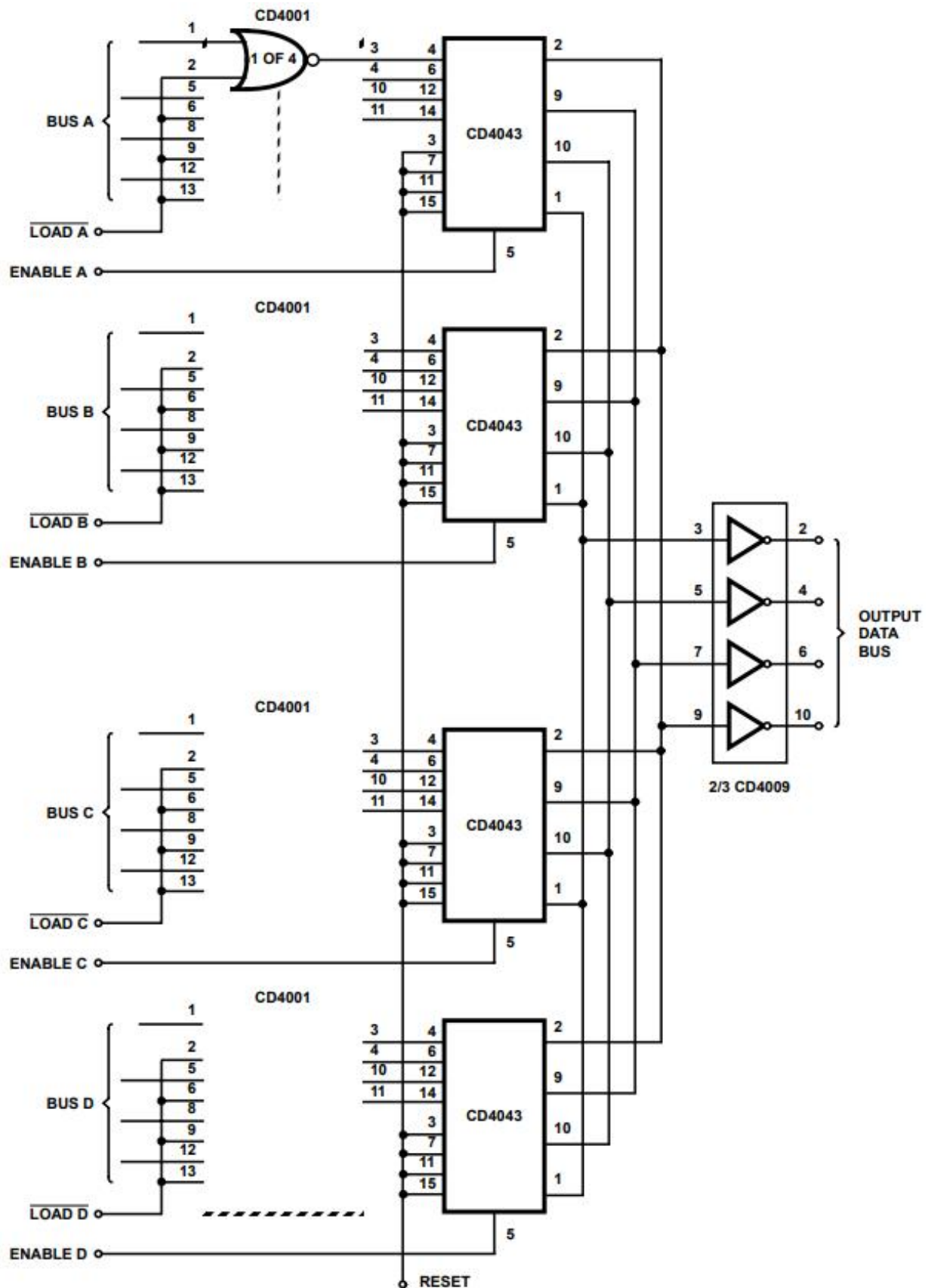


Figure 5.1 : Multiple bus storage



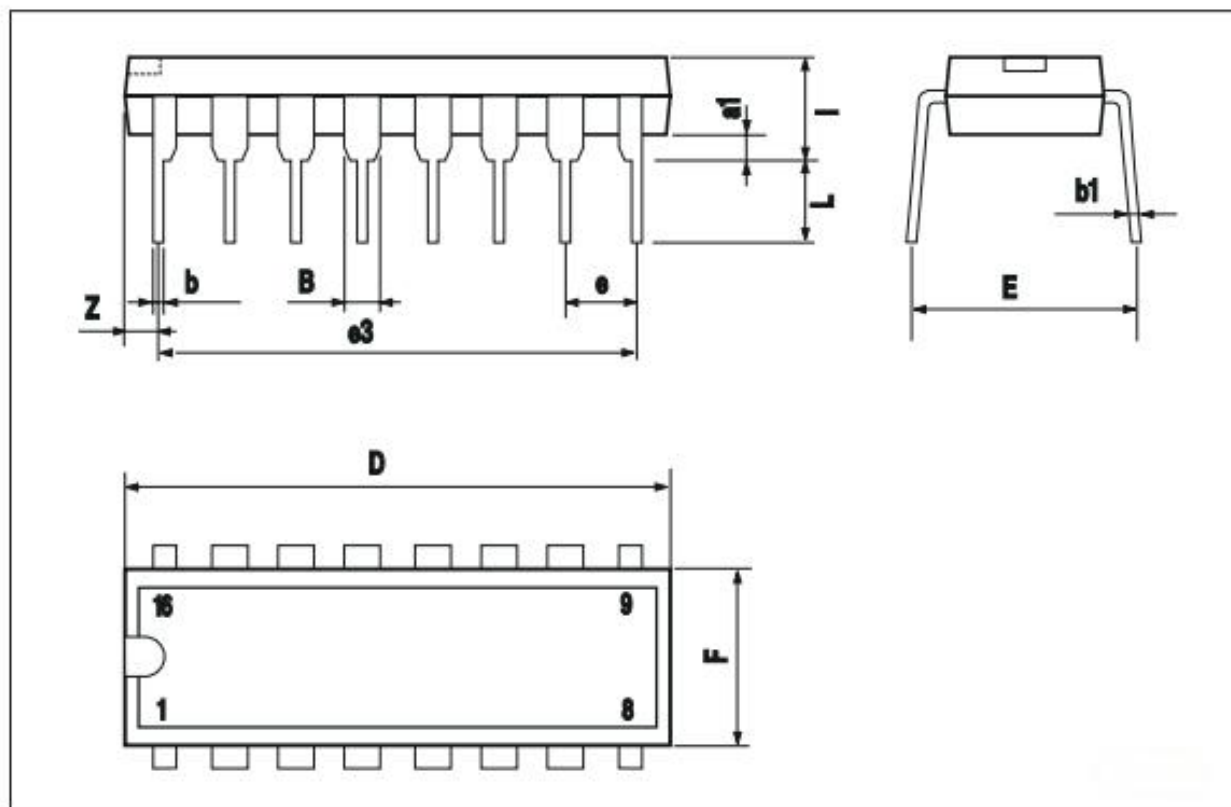
6. Ordering Information

Orderable Device	Package Type	Pins	Packing	Package Qty
CD4043ND16ATBE	DIP	16	Tube	25
CD4043NS16ARDQ	SOP	16	Tape & Reel	4000
CD4043TS16ARDQ	TSSOP	16	Tape & Reel	4000

7. Package Information

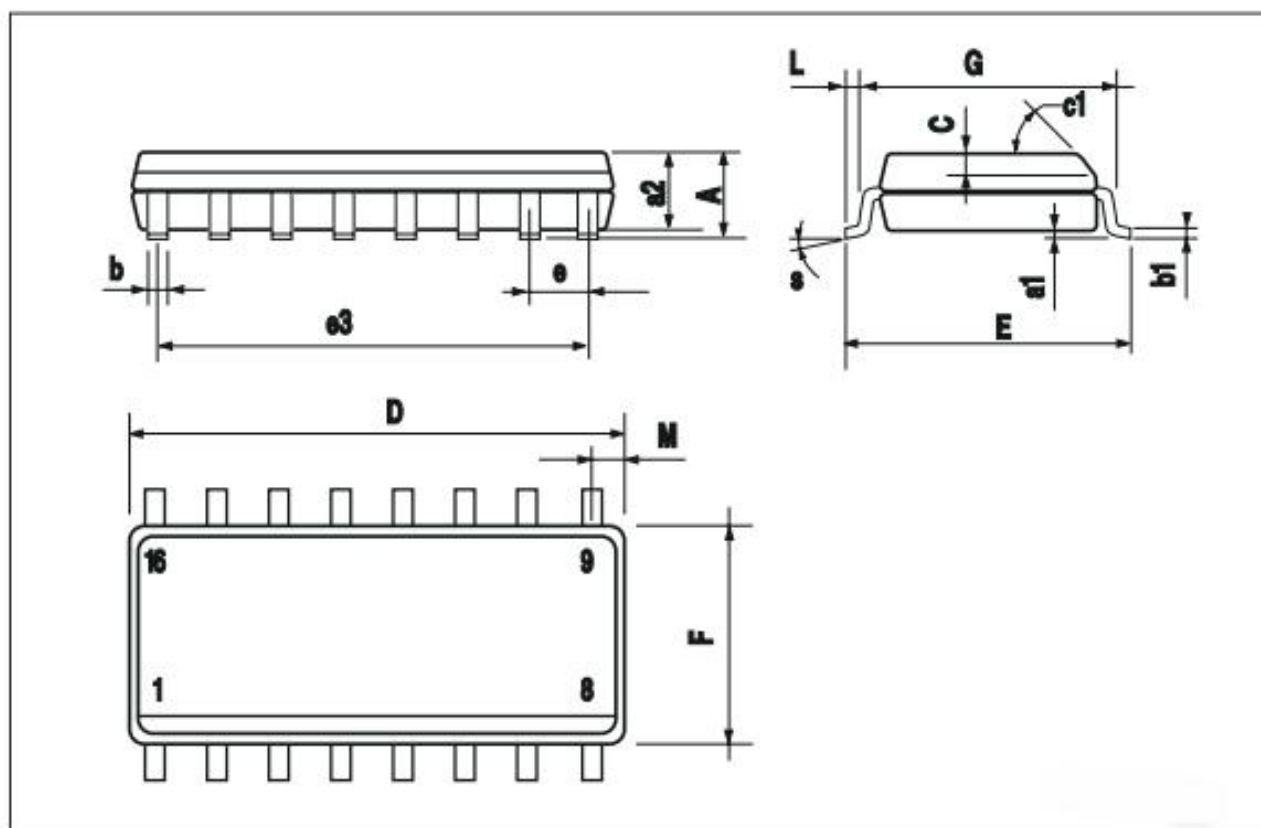
7.1 DIP16

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



7.2 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.)					



7.3 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

