QUAD 3-STATE R/S LATCHES: QUAD NOR R/S LATCH-MMC 4043 QUAD NAND R/S LATCH-MMC 4044

GENERAL DESCRIPTION

The MMC 4043 types are quad cross-coupled 3-state COS/MOS NOR latches and MMC 4044 types are quad cross-coupled 3—state COS/MOS NAND 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.
The MMC 4043 and MMC 4044 types are supplied in 16 — lead hermetic dual — in — line ceramic or plastic packages.

FEATURES

- 3-state outputs with common output ENABLE
- Separate SET and RESET inputs for each latch
- NOR and NAND configurations

APPLICATIONS

- Holding register in multi-register system
- Four-bits of independent storage with output enable
- Strobed register
- General digital logic

ABSOLUTE MAXIMUM RATINGS

V_{DD}*	Supply voltage:	G and H types	-0.5 to	20	V
		E and F types	-0.5 to	18	V
V_I	Input voltage		-0.5 to	V_{DD}+0.5	V
I_I	DC input current (any one input)			±10	mA
P_{tot}	Total power dissipation (per package)			200	mW
	Dissipation per output transistor				
	for T_A = full package-temperature range			100	mW
T_A	Operating				
	temperature:	G and H types	-55 to	125	°C
		E and F types	-40 to	85	°C
T_{stg}	Storage temperature		-65 to	150	°C

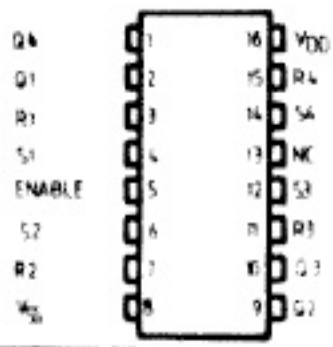
* All voltage values are referred to V_{SS} pin voltage

RECOMMENDED OPERATING CONDITIONS

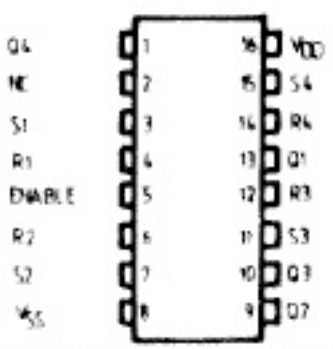
V_{DD}*	Supply voltage	G and H types	3 to	18	V
		E and F types	3 to	15	V
V_I	Input voltage		0 to	V_{DD}	V
T_A	Operating				
	temperature	G and H types	-55 to	125	°C
		E and F types	-40 to	85	°C

CONNECTION DIAGRAMS

MMC 4043

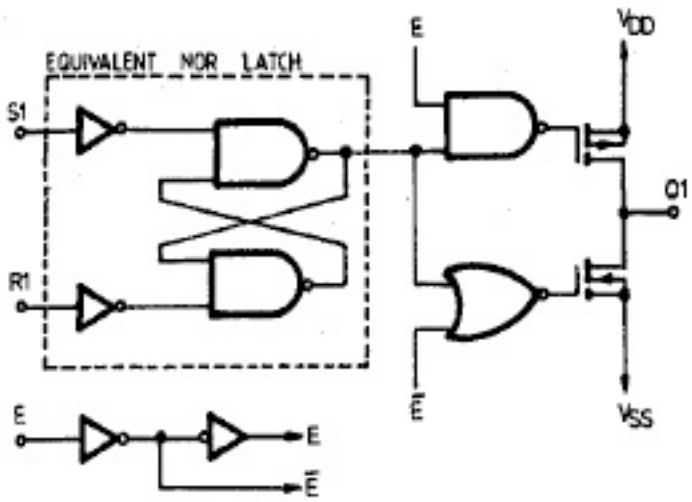


MMC 4044

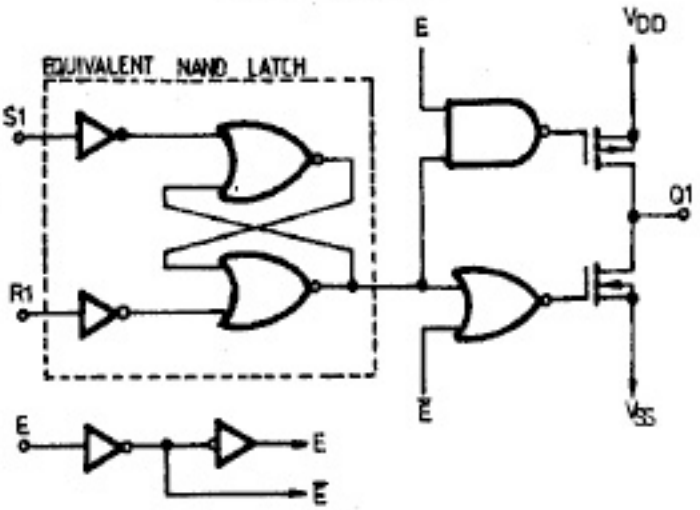


LOGIC DIAGRAMS

MMC 4043

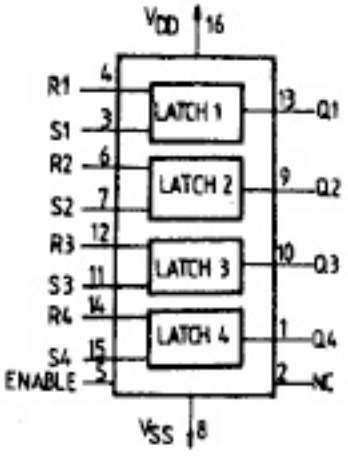


MMC 4044

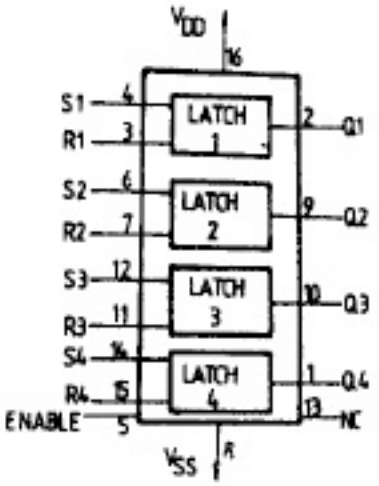


FUNCTIONAL DIAGRAMS

For 4043



For 4044



STATIC ELECTRICAL CHARACTERISTICS

(over recommended operating conditions)

PARAMETER			TEST CONDITIONS				VALUES							UNIT
			V_I (V)	V_O (V)	I_O (μA)	V_{DD} (V)	T_{LOW}		25°C			T^*_{HIGH}		
							min.	max.	min	typ	max.	min.	max.	
	Quiescent current	G, H types	0/ 5			5		1		0.02	1		30	μA
			0/10			10		2		0.02	2		60	
			0/15			15		4		0.02	4		120	
			0/20			20		20		0.04	20		600	
		E, F types	0/ 5			5		4		0.02	4		30	
			0/10			10		8		0.02	8		60	
			0/15			15		16		0.02	16		120	
V_{OH}	Output high voltage		0/ 5		< 1	5	4.95		4.95			4.95		V
			0/10		< 1	10	9.95		9.95			9.95		
			0/15		< 1	15	14.95		14.95			14.95		
V_{OL}	Output low voltage		5 /0		< 1	5		0.05			0.05		0.05	V
			10/0		< 1	10		0.05			0.05		0.05	
			15/0		< 1	15		0.05			0.05		0.05	
V_{IH}	Input high voltage			0.5/4.5	< 1	5	3.5		3.5			3.5		V_I
				1/9	< 1	10	7		7			7		
				1.5/13.5	< 1	15	11		11			11		
V_{IL}	Input low voltage			4.5/0.5	< 1	5		1.5			1.5		1.5	V
				9/1	< 1	10		3			3		3	
				13.5/1.5	< 1	15		4			4		4	
I_{OH}	Output drive current	G, H types	0/ 5	2.5		5	-2		-1.6	-3.2		-1.15		mA
			0/ 5	4.6		5	-0.64		-0.51	-1		-0.36		
			0/10	9.5		10	-1.6		-1.3	-2.6		-0.9		
			0/15	13.5		15	-4.2		-3.4	-6.8		-2.4		
		E, F types	0/ 5	2.5		5	-1.53		-1.36	-3.2		-1.1		
			0/ 5	4.6		5	-0.52		-0.44	-1		-0.36		
			0/10	9.5		10	-1.3		-1.1	-2.6		-0.9		
			0/15	13.5		15	-3.6		-3.0	-6.8		-2.4		
I_{OL}	Output sink current	G, H types	0/ 5	0.4		5	0.64		0.51	1		0.36		mA
			0/10	0.5		10	1.6		1.3	2.6		0.9		
			0/15	1.5		15	4.2		3.4	6.8		2.4		
		E, F types	0/ 5	0.4		5	0.52		0.44	1		0.36		
			0/10	0.5		10	1.3		1.1	2.6		0.9		
			0/15	1.5		15	3.6		3.0	6.8		2.4		
I_{IH}, I_{IL}	Input leakage current	G, H types	0/18	Any input		18		±0.1		$±10^{-5}$	±0.1		±1	μA
		E, F types	0/15			15		±0.3		$±10^{-5}$	±0.3		±1	
I_{OH}	3-state output	G, H types	0/18	0/18		18		±0.4		$±10^{-4}$	±0.4		±12	μA
		E, F types	0/15	0/15		15		±1.0		$±10^{-4}$	±1.0		±7.5	