



MMC 4071 MMC 4072 MMC 4075

OR Gates: QUAD 2 INPUT MMC 4071 DUAL 4 INPUT MMC 4072 TRIPLE 3 INPUT MMC 4075

GENERAL DESCRIPTION

These OR gates are monolithic complementary MOS (CMOS) integrated circuits. The N and P channel enhancement mode transistors provide a symmetrical circuit with output swings essentially equal to the supply voltage. This results in high noise immunity over a wide supply voltage range. No DC power other than that caused by leakage current is consumed during static conditions. All inputs are protected against static discharge and latching conditions.

The MMC 4071 MMC 4072 and MMC 4075E/F/G/H types are supplied in 14-lead hermetic dual-in-line ceramic or plastic packages.

The MMC 4071 MMC 4072 and MMC 4075E/F/G/H/OR gates provide the system designer with direct implementation of the OR function.

All inputs and outputs are buffered.

The MMC 4071, MMC 4072 and MMC 4075E/F/G/H types are supplied in 14-lead hermetic dual-in-line ceramic or plastic packages.

FEATURES

- Medium-Speed Operation- t_{PLH} , $t_{PLH} = 60$ ns (typ.) at $V_{DD} = 10$ V
- 100% tested for quiescent current

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

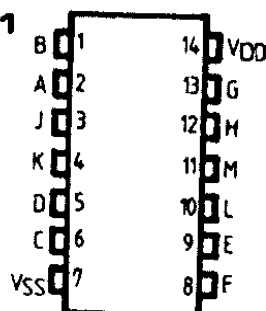
* All voltage values are referred to V_{SS} pin voltage

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

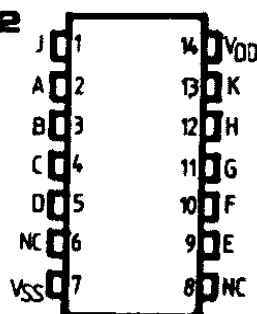
CONNECTION DIAGRAMS

MMC 4071



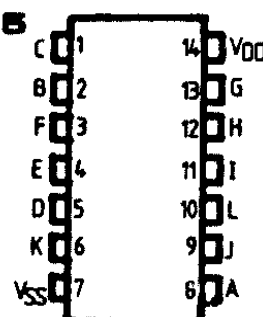
$$\begin{aligned} J &= A + B \\ K &= C + D \\ L &= E + F \\ M &= G + H \end{aligned}$$

MMC 4072



$$\begin{aligned} J &= A + B + C + D \\ K &= E + F + G + H \end{aligned}$$

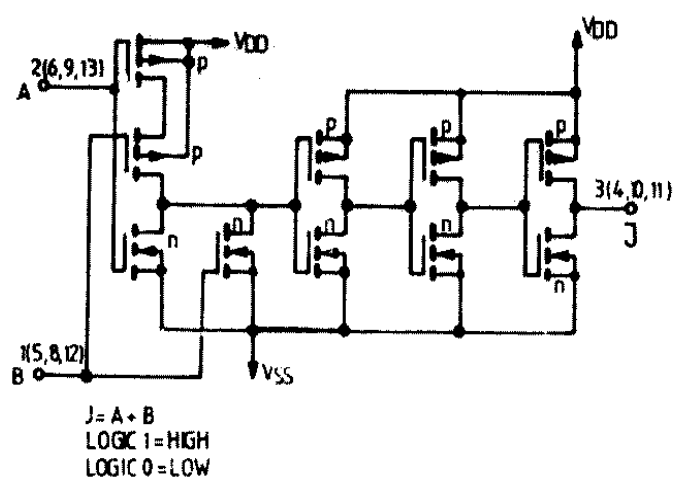
MMC 4075



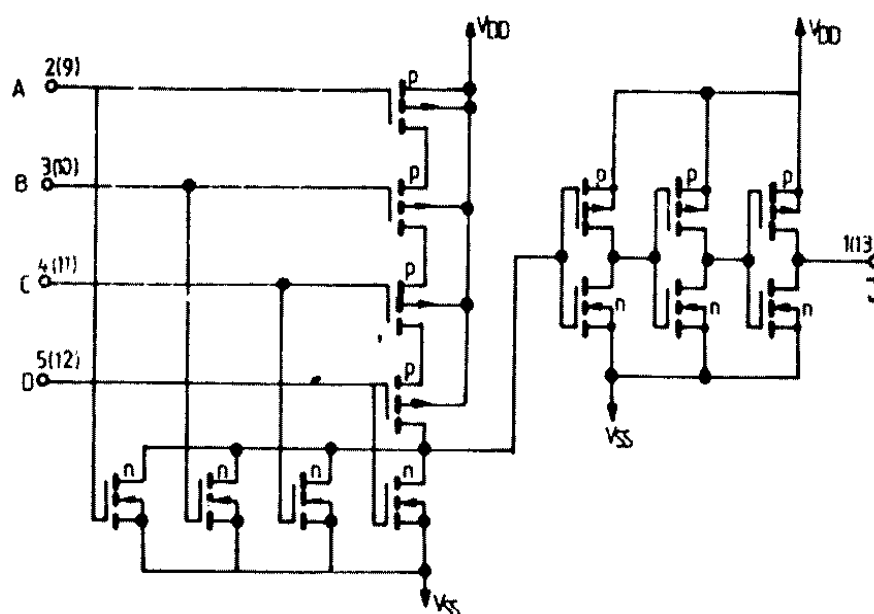
$$\begin{aligned} J &= A + B + C \\ K &= D + E + F \\ L &= G + H + I \end{aligned}$$

SCHEMATIC DIAGRAMS

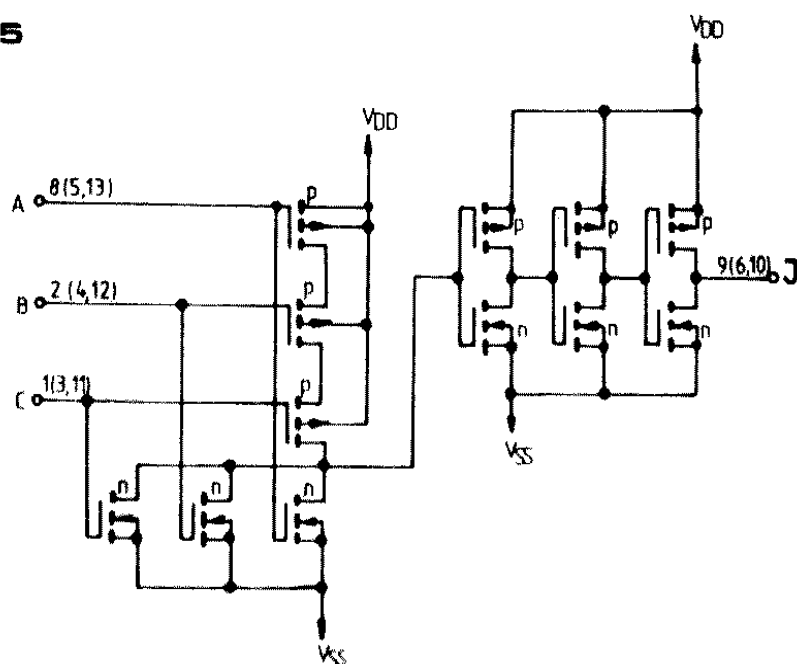
MMC 4071



MMC 4072



MMC 4075



1 = HIGH LEVEL
 0 = LOW LEVEL

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.
I _L	Quiescent current	G, H types	0/ 5			5		0.25		0.01	0.25		7.5	μA
			0/10			10		0.5		0.01	0.5		15	
			0/15			15		1		0.01	1		30	
			0/20			20		5		0.02	5		150	
	E, F types	0/ 5			5		1		0.01	1		7.5		
		0/10			10		2		0.01	2		15		
			0/15			15		4		0.01	4		30	
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
				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	
C _I	Input capacitance			Any input						5	7.5			pF

* T_{LOW} = -55°C for G, H devices; -40°C for E, F devices.* T_{HIGH} = +125°C for G, H devices; +85°C for E, F devices.

The Noise Margin for both "1" and "0" level is:

1 V min. with V_{DD} = 5 V2 V min. with V_{DD} = 10 V2.5 V min. with V_{DD} = 15 V

MMC 4071 MMC 4072 MMC 4075**DYNAMIC ELECTRICAL CHARACTERISTICS**

($T_A = 25^\circ\text{C}$, $C_L = 50\text{ pF}$, $R_L = 200\text{ kohm}$, typical temperature coefficient for all $V_{DD} = 0.3\%/^\circ\text{C}$ values, all input rise and fall times = 20 ns).

PARAMETER	TEST CONDITIONS	VALUES			UNIT
	V_{DD} (V)	min.	typ.	max.	
t_{PHL} Propagation delay-time	5		125	250	ns
	10		60	120	
	15		45	90	
t_{PLH} Propagation delay time	5		175	350	ns
	10		70	140	
	15		50	110	
t_{THL} Transition time t_{TLH}	5		100	200	ns
	10		50	100	
	15		40	80	