

**4-BIT AND/OR SELECTOR**  
 or  
**QUAD 2-CHANNEL DATA SELECTOR**  
 or  
**QUAD EXCLUSIVE "NOR" GATE**

The MC14519B is constructed with MOS P-channel and N-channel enhancement mode devices in a monolithic structure. These complementary MOS logic gates find primary use where low power dissipation and/or high noise immunity is desired.

This device provides three functions in one package; a 4-Bit AND/OR Selector, a Quad 2-Channel Data Selector, or a Quad Exclusive NOR Gate.

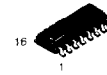
- Diode Protection on All Inputs
- Supply Voltage Range = 3.0 Vdc to 18 Vdc
- Capable of Driving Two Low-power TTL Loads or One Low-power Schottky TTL Load Over the Rated Temperature Range
- Plug-In Replacement for CD4019 in Most Applications



L SUFFIX  
CERAMIC  
CASE 620



P SUFFIX  
PLASTIC  
CASE 648

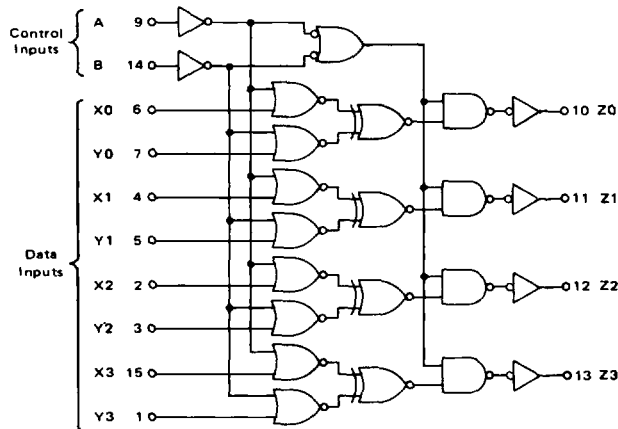


D SUFFIX  
SOIC  
CASE 751B

**ORDERING INFORMATION**

MC14XXXBCP Plastic  
MC14XXXBCL Ceramic  
MC14XXXBD SOIC

T<sub>A</sub> = -55° to 125°C for all packages.

**LOGIC DIAGRAM**


V<sub>DD</sub> = Pin 16  
V<sub>SS</sub> = Pin 8

**TRUTH TABLE**

CONTROL INPUTS		OUTPUT
A	B	Z <sub>n</sub>
0	0	0
0	1	Y <sub>n</sub>
1	0	X <sub>n</sub>
1	1	X <sub>n</sub> ⊕ Y <sub>n</sub>

Note:

X<sub>n</sub> ⊕ Y<sub>n</sub> means X<sub>n</sub> (Exclusive-NOR) Y<sub>n</sub>

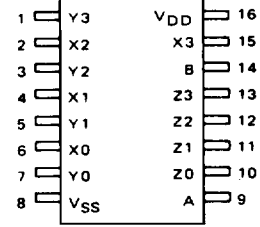
# MC14519B

## MAXIMUM RATINGS\* (Voltages Referenced to V<sub>SS</sub>)

Symbol	Parameter	Value	Unit
V <sub>DD</sub>	DC Supply Voltage	-0.5 to +18.0	V
V <sub>in</sub> , V <sub>out</sub>	Input or Output Voltage (DC or Transient)	-0.5 to V <sub>DD</sub> + 0.5	V
I <sub>in</sub> , I <sub>out</sub>	Input or Output Current (DC or Transient), per Pin	±10	mA
P <sub>D</sub>	Power Dissipation, per Package†	500	mW
T <sub>stg</sub>	Storage Temperature	-65 to +150	°C
T <sub>L</sub>	Lead Temperature (8-Second Soldering)	260	°C

\*Maximum Ratings are those values beyond which damage to the device may occur.  
 †Temperature Derating: Plastic "P" and D/DW" Packages: -7.0 mW/°C From 65°C To 125°C  
 Ceramic "L" Packages: -12 mW/°C From 100°C To 125°C

## PIN ASSIGNMENT



## ELECTRICAL CHARACTERISTICS (Voltages Referenced to V<sub>SS</sub>)

Characteristic	Symbol	V <sub>DD</sub> Vdc	-55°C		25°C			125°C		Unit	
			Min	Max	Min	Typ #	Max	Min	Max		
Output Voltage V <sub>in</sub> = V <sub>DD</sub> or 0 "0" Level	V <sub>OL</sub>	5.0	—	0.05	—	0	0.05	—	0.05	Vdc	
		10	—	0.05	—	0	0.05	—	0.05		
		15	—	0.05	—	0	0.05	—	0.05		
V <sub>in</sub> = 0 or V <sub>DD</sub> "1" Level	V <sub>OH</sub>	5.0	4.95	—	4.95	5.0	—	4.95	—	Vdc	
		10	9.95	—	9.95	10	—	9.95	—		
		15	14.95	—	14.95	15	—	14.95	—		
Input Voltage (V <sub>O</sub> = 4.5 or 0.5 Vdc) (V <sub>O</sub> = 9.0 or 1.0 Vdc) (V <sub>O</sub> = 13.5 or 1.5 Vdc) "0" Level	V <sub>IL</sub>	5.0	—	1.5	—	2.25	1.5	—	1.5	Vdc	
		10	—	3.0	—	4.50	3.0	—	3.0		
		15	—	4.0	—	6.75	4.0	—	4.0		
	"1" Level (V <sub>O</sub> = 0.5 or 4.5 Vdc) (V <sub>O</sub> = 1.0 or 9.0 Vdc) (V <sub>O</sub> = 1.5 or 13.5 Vdc)	V <sub>IH</sub>	5.0	3.5	—	3.5	2.75	—	3.5	—	Vdc
			10	7.0	—	7.0	5.50	—	7.0	—	
			15	11	—	11	8.25	—	11	—	
Output Drive Current (V <sub>OH</sub> = 2.5 Vdc) (V <sub>OH</sub> = 4.6 Vdc) (V <sub>OH</sub> = 9.5 Vdc) (V <sub>OH</sub> = 13.5 Vdc) Source	I <sub>OH</sub>	5.0	-3.0	—	-2.4	-4.2	—	-1.7	—	mAdc	
		10	-0.64	—	-0.51	-0.88	—	-0.36	—		
		15	-1.6	—	-1.3	-2.25	—	-0.9	—		
	Sink (V <sub>OL</sub> = 0.4 Vdc) (V <sub>OL</sub> = 0.5 Vdc) (V <sub>OL</sub> = 1.5 Vdc)	I <sub>OL</sub>	5.0	0.64	—	0.51	0.88	—	0.36	—	mAdc
			10	1.6	—	1.3	2.25	—	0.9	—	
			15	4.2	—	3.4	8.8	—	2.4	—	
Input Current	I <sub>in</sub>	15	—	±0.1	—	±0.00001	±0.1	—	±1.0	μAdc	
Input Capacitance (V <sub>in</sub> = 0)	C <sub>in</sub>	—	—	—	—	5.0	7.5	—	—	pF	
Quiescent Current (Per Package)	I <sub>DD</sub>	5.0	—	5.0	—	0.005	5.0	—	150	μAdc	
		10	—	10	—	0.010	10	—	300		
		15	—	20	—	0.015	20	—	600		
Total Supply Current**† (Dynamic plus Quiescent, Per Package) (C <sub>L</sub> = 50 pF on all outputs, all buffers switching)	I <sub>T</sub>	5.0	I <sub>T</sub> = (1.2 μA/kHz) f + I <sub>DD</sub>							μAdc	
		10	I <sub>T</sub> = (2.4 μA/kHz) f + I <sub>DD</sub>								
		15	I <sub>T</sub> = (3.6 μA/kHz) f + I <sub>DD</sub>								

#Data labelled "Typ" is not to be used for design purposes but is intended as an indication of the IC's potential performance.

\*\*The formulas given are for the typical characteristics only at 25°C.

†To calculate total supply current at loads other than 50 pF:

$$I_T(C_L) = I_T(50 \text{ pF}) + (C_L - 50) V/k$$

where: I<sub>T</sub> is in μA (per package), C<sub>L</sub> in pF, V = (V<sub>DD</sub> - V<sub>SS</sub>) in volts, f in kHz is input frequency, and k = 0.004.

# MC14519B

## SWITCHING CHARACTERISTICS\* ( $C_L = 50 \text{ pF}, T_A = 25^\circ\text{C}$ )

Characteristic	Symbol	V <sub>DD</sub>	Min	Typ #	Max	Unit
Output Rise and Fall Time	$t_{TLH}, t_{THL}$					ns
$t_{TLH}, t_{THL} = (1.5 \text{ ns/pF}) C_L + 25 \text{ ns}$		5.0	—	100	200	
$t_{TLH}, t_{THL} = (0.75 \text{ ns/pF}) C_L + 12.5 \text{ ns}$		10	—	50	100	
$t_{TLH}, t_{THL} = (0.55 \text{ ns/pF}) C_L + 9.5 \text{ ns}$		15	—	40	80	
Propagation Delay Time	$t_{PLH}, t_{PHL}$					ns
$t_{PLH}, t_{PHL} = (1.7 \text{ ns/pF}) C_L + 165 \text{ ns}$		5.0	—	250	500	
$t_{PLH}, t_{PHL} = (0.66 \text{ ns/pF}) C_L + 82$		10	—	115	225	
$t_{PLH}, t_{PHL} = (0.5 \text{ ns/pF}) C_L + 65 \text{ ns}$		15	—	90	165	

\*The formulas given are for the typical characteristics only at 25°C.

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FIGURE 1 – DYNAMIC POWER DISSIPATION TEST CIRCUIT AND WAVEFORM

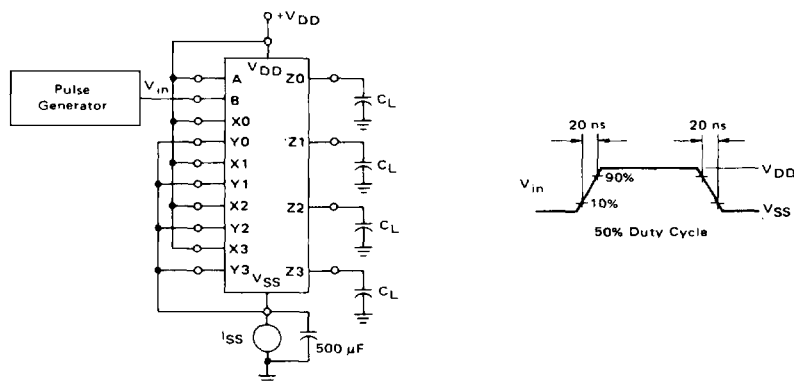
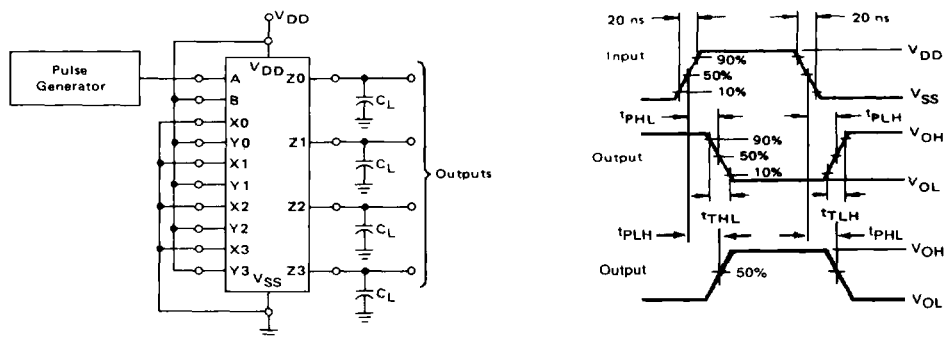


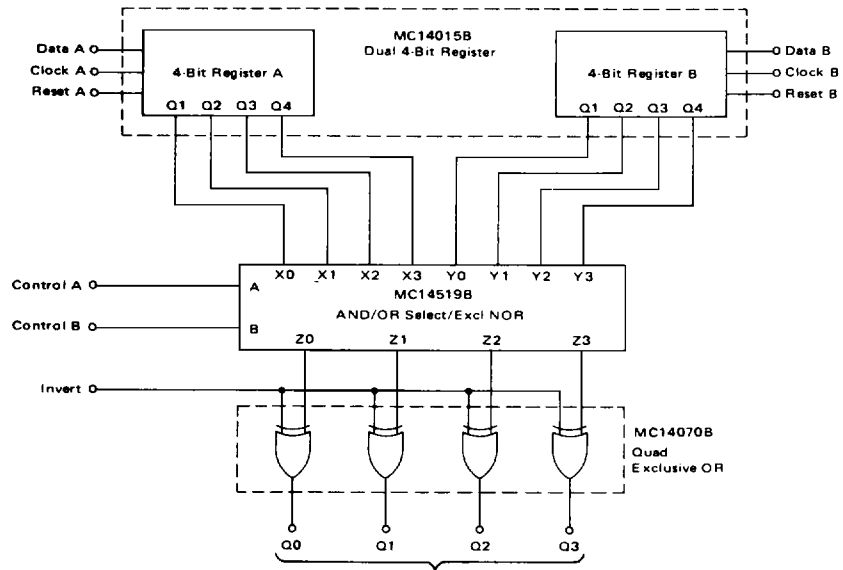
FIGURE 2 – SWITCHING TIME TEST CIRCUIT AND WAVEFORMS



# MC14519B

## TYPICAL CIRCUIT APPLICATIONS

### DATA REGISTER SELECTION COMPARISON



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CONVERSION TABLE

OPERATION CODE			OUTPUT				FUNCTION
A	B	INV	Q0	Q1	Q2	Q3	
0	0	0	0	0	0	0	Inhibit, all zeros
0	0	1	1	1	1	1	Inhibit, all ones
1	0	0	X0	X1	X2	X3	Control A
1	0	1	$\bar{X}0$	$\bar{X}1$	$\bar{X}2$	$\bar{X}3$	Control A and Invert
0	1	0	Y0	Y1	Y2	Y3	Control B
0	1	1	$\bar{Y}0$	$\bar{Y}1$	$\bar{Y}2$	$\bar{Y}3$	Control B and Invert
1	1	0	X0 ⊕ Y0	X1 ⊕ Y1	X2 ⊕ Y2	X3 ⊕ Y3	Exclusive NOR
1	1	1	X0 ⊕ Y0	X1 ⊕ Y1	X2 ⊕ Y2	X3 ⊕ Y3	Exclusive OR

This device contains protection circuitry to guard against damage due to high static voltages or electric fields. However, precautions must be taken to avoid applications of any voltage higher than maximum rated voltages to this high-impedance circuit. For proper operation,  $V_{in}$  and  $V_{out}$  should be constrained to the range  $V_{SS} \approx (V_{in} \text{ or } V_{out}) \approx V_{DD}$ . Unused inputs must always be tied to an appropriate logic voltage level (e.g., either  $V_{SS}$  or  $V_{DD}$ ). Unused outputs must be left open.