

## MC74BC230 • MC74BC231

**DC CHARACTERISTICS** (unless otherwise specified,  $T_A = -40$  to  $+85^\circ\text{C}$ ,  $V_{CC} = 4.5$  to  $5.5$  V)

Parameter		Symbol	Test Condition	$V_{CC}$ (V)	Min	Typ*	Max	Unit
Input Voltage	"H" Level	$V_{IH}$			2.0	—	—	V
	"L" Level	$V_{IL}$			—	—	0.8	V
Input Clamp Diode Voltage		$V_{IK}$	$I_{IK} = -18$ mA	4.5	—	—	-1.2	V
Output Voltage	"H" Level	$V_{OH}$	$I_{OH} = -3.0$ mA	4.5	2.4	3.4	—	V
			$I_{OH} = -3.0$ mA	4.75	2.7	3.4	—	
			$I_{OH} = -15$ mA	4.5	2.0	—	—	
	"L" Level	$V_{OL}$	$I_{OL} = 24$ mA	4.5	—	—	0.5	V
$I_{OL} = 48$ mA			4.5	—	—	0.55		
Input Current		$I_I$	$V_{IN} = V_{CC}$ or GND	5.5	—	—	$\pm 1.0$	$\mu\text{A}$
3-State Output Off Current			$V_{OUT} = 2.7$ V	5.5	—	—	50	$\mu\text{A}$
			$V_{OUT} = 0.5$ V	5.5	—	—	-50	$\mu\text{A}$
Short Circuit Current (Note 1)				5.5	—	—	-255	mA
Static Power Supply Current (total)			$V_{IN} = V_{CC}$ or GND All Output "L"	5.5	—	20	27	mA
			$V_{IN} = V_{CC}$ or GND All Output "H"	5.5	—	10	50	$\mu\text{A}$
			$V_{IN} = V_{CC}$ or GND All Output High Impedance	5.5	—	10	50	$\mu\text{A}$
Static Power Supply Current (per bit) (Note 2)			Per Input: $V_{IN} = 0.5$ V Other Input: $V_{CC}$ or GND	5.5	—	—	1.5	mA
			Per Input: $V_{IN} = V_{CC} - 2.1$ V Other Input: $V_{CC}$ or GND	5.5	—	—	1.5	mA

\*All typical values are at  $V_{CC} = 5.0$  V,  $T_A = 25^\circ\text{C}$

(Note 1) Not more than one output should be shorted at a time, nor for more than 1 second.

(Note 2)  $\Delta I_{CC}$  specification is the increase in  $I_{CCH}$ ,  $I_{CCL}$ ,  $I_{CCZ}$

### MC74BC230 AC CHARACTERISTICS (Input $t_r = t_f = 2.5$ ns)

Parameter	Symbol	Test Condition	$T_A = +25^\circ\text{C}$ $V_{CC} = 5.0$ V			$T_A = -40$ to $+85^\circ\text{C}$ $V_{CC} = 5.0$ V $\pm 10\%$		Unit
			Min	Typ	Max	Min	Max	
Propagation Delay	1A - 1Y	$t_{PHL}$	3.0	5.2	6.5	3.0	7.5	ns
		$t_{PLH}$	2.0	5.2	6.5	2.0	7.5	
	2A - 2Y	$t_{PHL}$	2.0	4.5	5.8	2.0	6.8	ns
		$t_{PLH}$	2.0	5.0	6.3	2.0	7.5	
3-State Output Enable Time	1G - 1Y	$t_{PZH}$	2.0	8.0	10	2.0	11.5	ns
		$t_{PZL}$	2.0	6.5	9.0	2.0	10	
	2G - 2Y	$t_{PZH}$	2.0	8.0	10	2.0	11.5	ns
		$t_{PZL}$	2.0	6.5	9.0	2.0	10	
3-State Output Disable Time	1G - 1Y	$t_{PHZ}$	2.0	6.0	9.0	2.0	10	ns
		$t_{PLZ}$	2.0	5.0	8.5	2.0	9.5	
	2G - 2Y	$t_{PHZ}$	2.0	6.0	9.0	2.0	10	ns
		$t_{PLZ}$	2.0	5.0	8.5	2.0	9.5	

(\*) • Measurement of  $t_{PLH}$ ,  $t_{PHL}$ ,  $t_{PZH}$ ,  $t_{PHZ}$  connect output as Note 1.

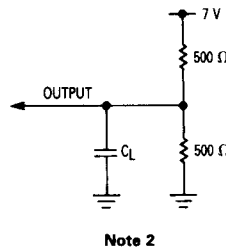
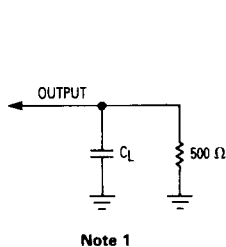
• Measurement of  $t_{PZL}$ ,  $t_{PLZ}$  connect output as Note 2.

## MC74BC230 • MC74BC231

### MC74BC231 AC CHARACTERISTICS (Input $t_r = t_f = 2.5$ ns)

Parameter	Symbol	Test Condition	$T_A = +25^\circ\text{C}$ $V_{CC} = 5.0$ V			$T_A = -40$ to $+85^\circ\text{C}$ $V_{CC} = 5.0$ V $\pm 10\%$		Unit
			Min	Typ	Max	Min	Max	
Propagation Delay	A- $\bar{Y}$	$t_{PHL}$	3.0	5.2	6.5	3.0	7.5	ns
		$t_{PLH}$	2.0	5.2	6.5	2.0	7.5	
3-State Output Enable Time	$1\bar{G}-1\bar{Y}$	$t_{PZH}$	2.0	8.0	10	2.0	11.5	ns
		$t_{PZL}$	2.0	6.5	9.0	2.0	10	
	$2G-2\bar{Y}$	$t_{PZH}$	2.0	8.0	10	2.0	11.5	ns
		$t_{PZL}$	2.0	7.2	10	2.0	11.5	
3-State Output Disable Time	$1\bar{G}-1\bar{Y}$	$t_{PHZ}$	2.0	6.0	9.0	2.0	10	ns
		$t_{PLZ}$	2.0	5.0	8.5	2.0	9.5	
	$2G-2\bar{Y}$	$t_{PHZ}$	2.0	6.0	9.0	2.0	10	ns
		$t_{PLZ}$	2.0	5.7	9.0	2.0	10	

(\*) • Measurement of  $t_{PLH}$ ,  $t_{PHL}$ ,  $t_{PZH}$ ,  $t_{PHZ}$  connect output as Note 1.  
 • Measurement of  $t_{PZL}$ ,  $t_{PLZ}$  connect output as Note 2.





**MOTOROLA**

*Advance Information*

# Octal Bus Buffers

**MC74BC240 3-State, Inverting**

**MC74BC241 3-State, Non-Inverting**

**MC74BC244 3-State, Non-Inverting**

**MC74BC240  
MC74BC241  
MC74BC244**

**OCTAL  
BUS BUFFERS  
3-STATE INVERTING/  
NON-INVERTING**

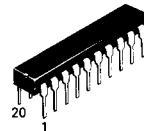
The MC74BC240/241/244 are octal bus buffers with 3-state outputs utilizing silicon gate BiCMOS technology to achieve operating speed equivalent to Advanced Schottky parts.

The '240 is an inverted buffer, and the '241 and '244 are non-inverted buffers. The designer has a choice of selected combinations of inverting and non-inverting outputs, symmetrical G inputs, and complementary G and  $\bar{G}$  inputs. Each G input controls four bus buffers.

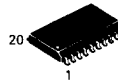
These drivers are designated to be used with 3-state memory address drivers, etc.

All inputs are equipped with protection circuit against static discharge or transient excess voltage.

- High Speed Operation:  $t_{pd} = 5.2$  ns
- High Driveability:  $I_{OL} = 48$  mA  
 $I_{OH} = -15$  mA
- Low Power Consumption
- ESD Protection Exceeds 2000 V (MIL Standard)
- The Same Pin Connection and the Same Function as ALS (MC74ALS240, MC74ALS241, MC74ALS244)
- Wide Operation Temperature:  $-40$  to  $+85^{\circ}\text{C}$



**P SUFFIX  
CASE 738-03  
PLASTIC**



**DW SUFFIX  
CASE 751D-03  
PLASTIC**

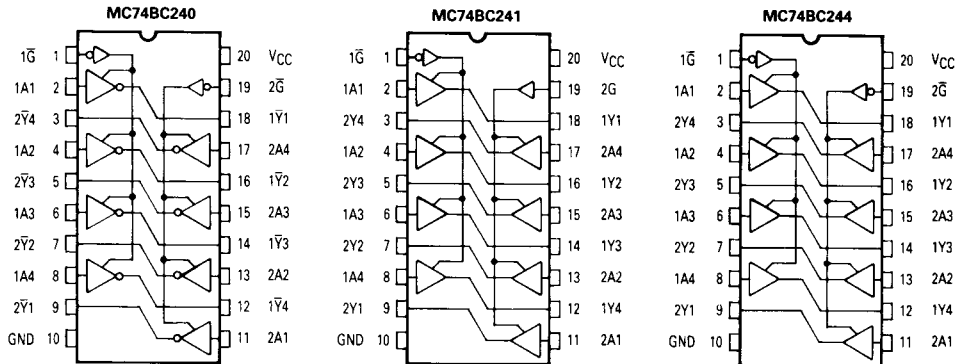
### TRUTH TABLE

Inputs			Outputs	
$\bar{G}$	G $\Delta$	A $n$	Y $n$	$\bar{Y}n\Delta\Delta$
L	H	L	L	H
L	H	H	H	L
H	L	X	Z	Z

$\Delta\Delta$ : 240  $\Delta$ : 241

X: Don't Care

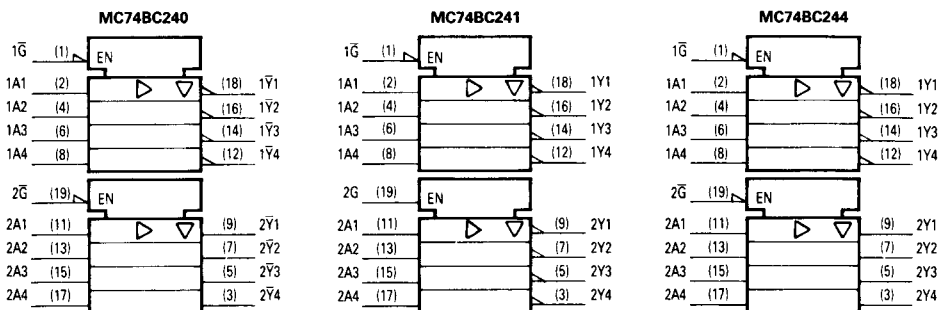
H: High Impedance



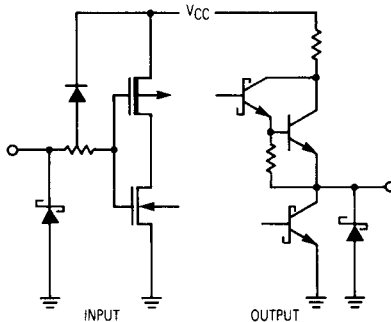
This document contains information on a new product. Specifications and information herein are subject to change without notice.

# MC74BC240 • MC74BC241 • MC74BC244

## LOGIC SYMBOLS



## INPUT AND OUTPUT EQUIVALENT CIRCUIT



## MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Supply Voltage	$V_{CC}$	-0.5 to +7.0	V
Input Voltage	$V_{IN}$	-0.5 to $V_{CC} + 0.5$	V
Output Voltage	Output High	-0.5 to $V_{CC}$	V
	Output Disabled	-0.5 to 5.5	
Input Clamp Diode Current	$I_{IK}$	$\pm 30$	mA
Output Diode Current	$I_{OK}$	-30	mA
Output Current in Low State	$I_O$	96	mA
Storage Temperature	$T_{stg}$	-65 to +150	$^{\circ}C$

## RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	$V_{CC}$	4.5	5.0	5.5	V
Input Voltage	$V_{IN}$	0	—	$V_{CC}$	V
Output Voltage	$V_{OUT}$	0	—	$V_{CC}$	V
Output Current	"H" Level	$I_{OH}$	—	-15	mA
	"L" Level	$I_{OL}$	—	48	mA
Operating Temperature	$T_{opr}$	-40	25	85	$^{\circ}C$