

Am8255A/8255A-5

Programmable Peripheral Interface

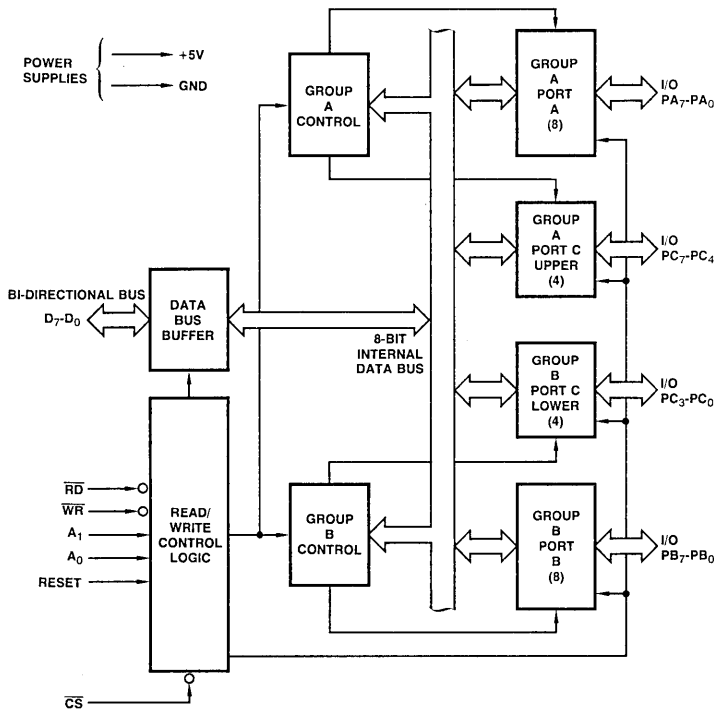
DISTINCTIVE CHARACTERISTICS

- Direct bit set/reset capability easing control application interface
- Reduces system package count
- Improved DC driving capability
- 24 programmable I/O pins
- Completely TTL compatible
- Fully compatible with 8080A and 8085A microprocessor families
- Improved timing characteristics
- Military version available

GENERAL DESCRIPTION

The Am8255A is a general purpose programmable I/O device designed for use with Am8080A and Am8085A microprocessors. It has 24 I/O pins which may be individually programmed in two groups of twelve and used in three major modes of operation. In the first mode, each group of twelve I/O pins may be programmed in sets of 4 and 8 to be input or output. In Mode 1, the second mode, each group may be programmed to have 8 lines of input or output. Of the remaining four pins three are used for handshaking and interrupt control signals. The third mode of operation (Mode 2) is a bi-directional bus mode which uses eight lines for a bi-directional bus, and five lines, borrowing one from the other group, for handshaking.

Am8255A BLOCK DIAGRAM

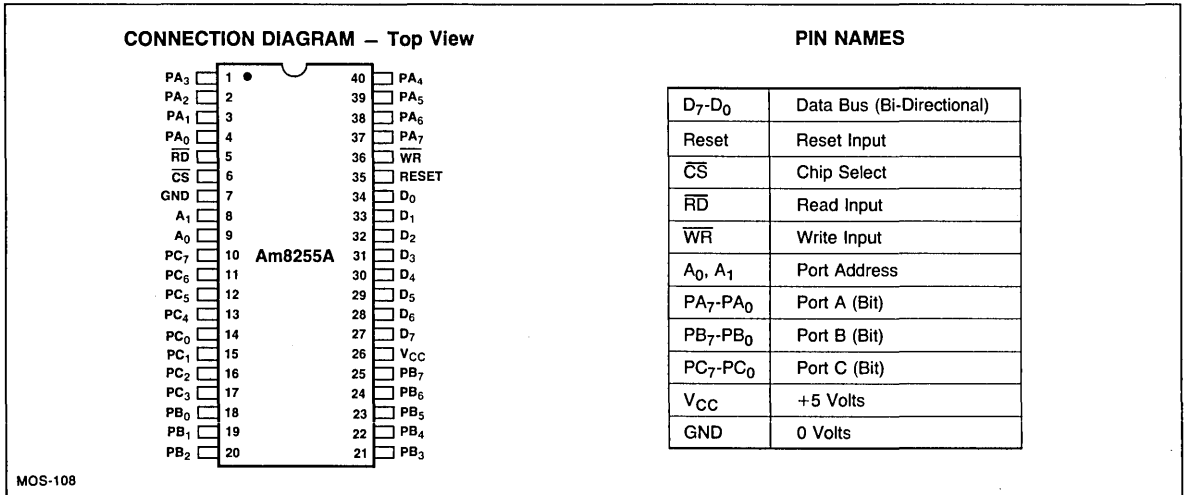


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ORDERING INFORMATION

Package Type	Ambient Temperature Specification	Order Numbers	
Hermetic DIP*	$0^{\circ}\text{C} \leq T_A \leq +70^{\circ}\text{C}$	AM8255ADC	AM8255A-5DC
Molded DIP		AM8255ACC	AM8255A-5CC
Hermetic DIP	$-55^{\circ}\text{C} \leq T_A \leq +125^{\circ}\text{C}$	AM8255APC	AM8255A-5PC
		AM9555ADM/M8255A	

*Hermetic = Ceramic = DC = CC = D-40-1.



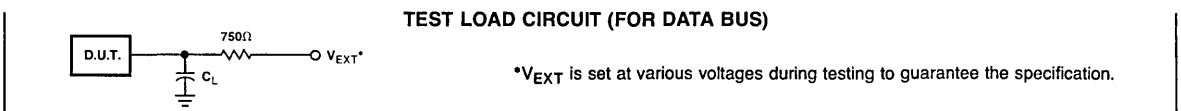
MAXIMUM RATINGS above which useful life may be impaired

Storage Temperature	-65°C to +150°C
Ambient Temperature Under Bias	-55°C to +125°C
V _{CC} with Respect to V _{SS}	-0.5V to +7.0V
All Signal Voltages with Respect to V _{SS}	-0.5V to +7.0V
Power Dissipation	1.0W

The products described by this specification include internal circuitry designed to protect input devices from damaging accumulations of static charge. It is suggested, nevertheless, that conventional precautions be observed during storage, handling and use in order to avoid exposure to excessive voltages.

CAPACITANCE T_A = 25°C; V_{CC} = GND = 0V

Parameter	Description	Test Conditions	Min.	Typ.	Max.	Unit
C _{IN}	Input Capacitance	f _c = 1MHz			10	pF
C _{I/O}	I/O Capacitance	Unmeasured pins returned to GND			20	pF



OPERATING RANGE

Part Number	T _A	V _{CC}	V _{SS}
Am8255ACC/PC	0°C to +70°C	+5V ±5%	0V
Am9555ADM	-55°C to +125°C	+5V ±10%	0V

DC CHARACTERISTICS Over Operating Range

Parameter	Description	Test Conditions	Min.	Typ.	Max.	Units
V _{IL}	Input Low Voltage		-0.5		0.8	Volts
V _{IH}	Input High Voltage		2.0		V _{CC}	Volts
V _{OL} (DB)	Output Low Voltage (Data Bus)	I _{OL} = 2.5mA			0.45	Volts
V _{OL} (PER)	Output Low Voltage (Peripheral Port)	I _{OL} = 1.7mA			0.45	Volts
V _{OH} (DB)	Output High Voltage (Data Bus)	I _{OH} = -400μA	2.4			Volts
V _{OH} (PER)	Output High Voltage (Peripheral Port)	I _{OH} = -200μA	2.4			Volts
I _{DAR} (Note 1)	Darlington Drive Current	R _{EXT} = 750Ω; V _{EXT} = 1.5V	-1.0		-4.0	mA
I _{CC}	Power Supply Current				120	mA
I _{IL}	Input Load Current	V _{IN} = V _{CC} to 0V			±10	μA
I _{OFL}	Output Float Leakage	V _{OUT} = V _{CC} to 0V			±10	μA

Note 1: Available on any 8 pins from Port B and C.

AC CHARACTERISTICS Over Operating Range**BUS PARAMETERS:**

Read:

Parameter	Description	Am8255A		Am8255A-5		Am9555ADM		Unit
		Min.	Max.	Min.	Max.	Min.	Max.	
t _{AR}	Address Stable Before READ	0		0		0		ns
t _{RA}	Address Stable After READ	0		0		0		ns
t _{RR}	READ Pulse Width	300		300		300		ns
t _{RD}	Data Valid From READ (Note 1)		250		200		250	ns
t _{DF}	Data Float After READ	10	150	10	100	10	150	ns
t _{RV}	Time Between READs and/or WRITEs	850		850		850		ns

Write:

Parameter	Description	Am8255A		Am8255A-5		Am9555ADM		Unit
		Min.	Max.	Min.	Max.	Min.	Max.	
t _{AW}	Address Stable Before WRITE	0		0		0		ns
t _{WA}	Address Stable After WRITE	20		20		20		ns
t _{WW}	WRITE Pulse Width	400		300		400		ns
t _{DW}	Data Valid to WRITE (T.E.)	100		100		100		ns
t _{WD}	Data Valid After WRITE	30		30		30		ns

Other Timings:

Parameter	Description	Am8255A		Am8255A-5		Am9555ADM		Unit
		Min.	Max.	Min.	Max.	Min.	Max.	
t _{WB}	WR = 1 to Output (Note 1)		350		350		350	ns
t _{IR}	Peripheral Data Before RD	0		0		0		ns
t _{HR}	Peripheral Data After RD	0		0		0		ns
t _{AK}	ACK Pulse Width	300		300		300		ns
t _{ST}	STB Pulse Width	500		500		500		ns
t _{PS}	Per. Data Before T.E. of STB	0		0		0		ns
t _{PH}	Per. Data After T.E. of STB	180		180		180		ns
t _{AD}	ACK = 0 to Output (Note 1)		300		300		300	ns
t _{KD}	ACK = 1 to Output Float	20	250	20	250	20	250	ns
t _{WOB}	WR = 1 to OBF = 0 (Note 1)		650		650		650	ns
t _{AOB}	ACK = 0 to OBF = 1 (Note 1)		350		350		350	ns
t _{SIB}	STB = 0 to IBF = 1 (Note 1)		300		300		300	ns
t _{RIB}	RD = 1 to IBF = 0 (Note 1)		300		300		300	ns
t _{RIT}	RD = 0 to INTR = 0 (Note 1)		400		400		400	ns
t _{SIT}	STB = 1 to INTR = 1 (Note 1)		300		300		300	ns
t _{AIT}	ACK = 1 to INTR = 1 (Note 1)		350		350		350	ns
t _{WIT}	WR = 0 to INTR = 0 (Note 1)		850		850		850	ns

Notes: 1. Test Conditions: Am8255A/Am9555ADM: C_L = 100pF; Am8255A-5: C_L = 150pF.

2. Period of Reset pulse must be at least 50μs during or after power on. Subsequent Reset pulse can be 500ns min.

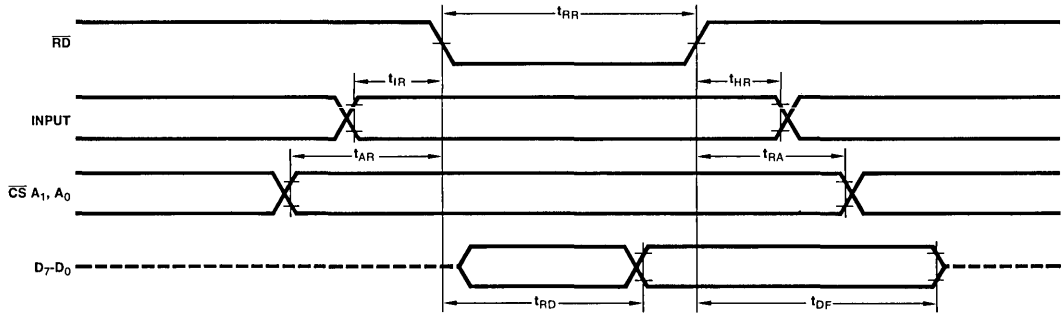
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WAVEFORMS



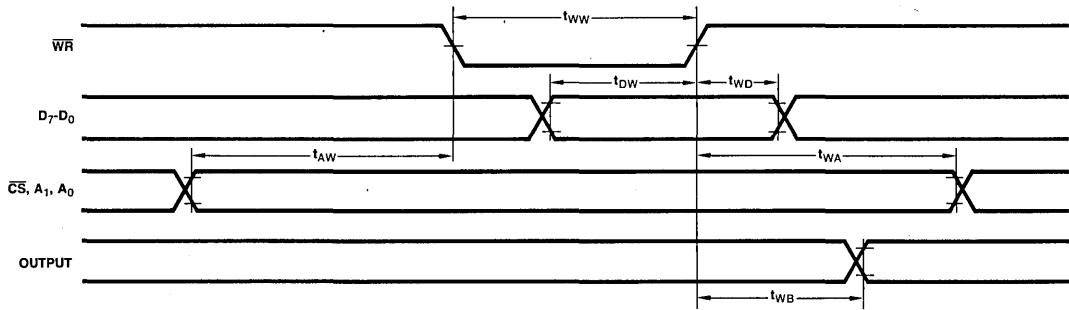
Input Waveforms For A.C. Tests

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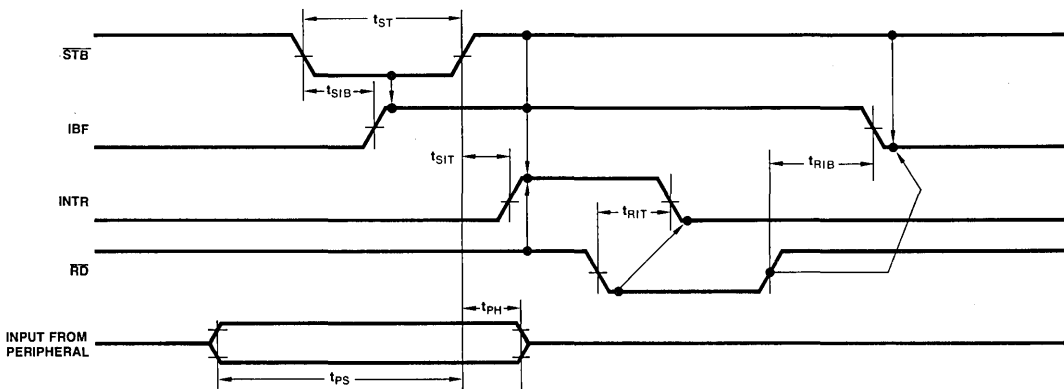
Mode 0 (Basic Input)

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Mode 0 (Basic Output)

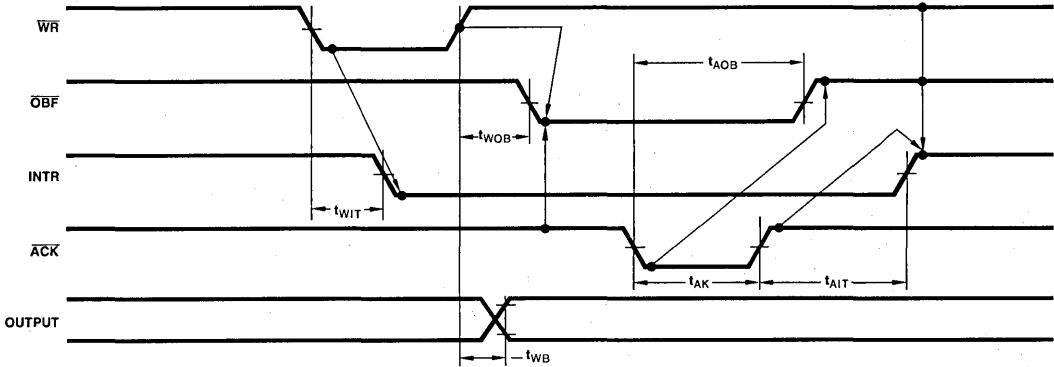
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Mode 1 (Strobed Input)

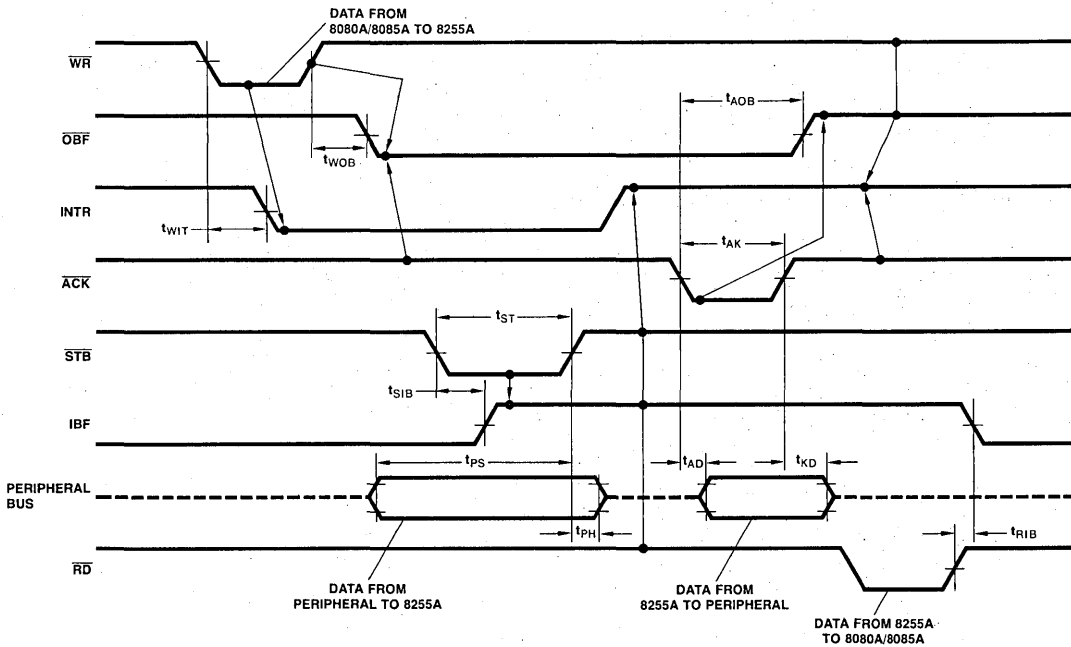
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WAVEFORMS (Cont.)



Mode 1 (Strobed Output)

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Note: Any sequence where \overline{WR} occurs before \overline{ACK} and \overline{STB} occurs before \overline{RD} is permissible.
 $(INTR = IBF \cdot MASK \cdot STB \cdot RD + \overline{OBF} \cdot MASK \cdot ACK \cdot \overline{WR})$

Mode 2 (Bi-directional)

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