

Am8279/Am8279-5

Programmable Keyboard/Display Interface

DISTINCTIVE CHARACTERISTICS

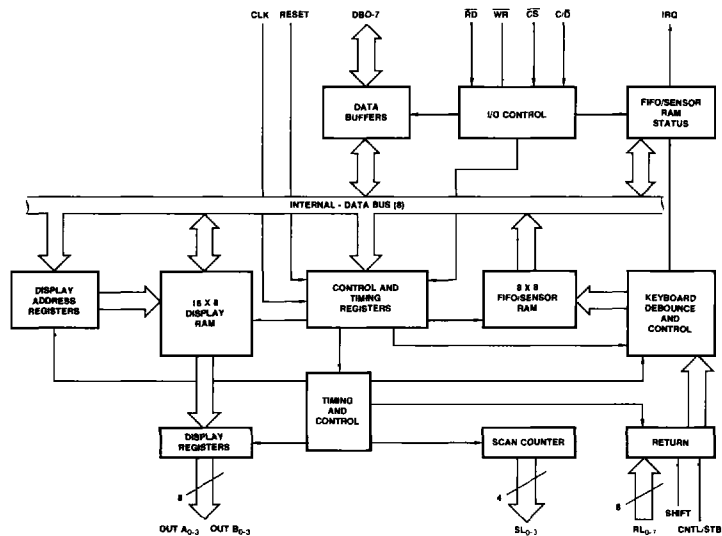
- Am8085A Compatible
- Simultaneous keyboard display operations
- Scanned keyboard mode
- Scanned sensor mode
- Strobed input entry mode
- 8 character keyboard FIFO
- 2 key lockout or N key rollover with contact debounce
- Dual 8 or 16 numerical display
- Single 16 character display
- Right or left entry 16-byte display RAM
- Mode programmable from CPU
- Programmable scan timing
- Interrupt output on key entry

GENERAL DESCRIPTION

The Am8279 is a general purpose programmable keyboard and display I/O interface device designed for use with Am8080A/8085A microprocessors. The keyboard portion can provide a scanned interface to a 64 contact key matrix which can be expanded to 128. The keyboard portion will also interface to an array of sensors or a strobed interface keyboard, such as the Hall effect and Ferrite variety. Key depressions can be 2 key lockout or N key rollover. Keyboard entries are debounced and stored in an 8 character FIFO. If more than 8 characters are entered, over run status is set. Key entries set the interrupt output line to the CPU.

The display portion provides a scanned display interface for LED, incandescent and other popular display technologies. Both numeric and alphanumeric segment displays may be used as well as simple indicators. The Am8279 has a 16 x 8 display RAM which can be organized into a dual 16 x 4. The RAM can be loaded or interrogated by the CPU. Both right entry, calculator and left entry typewriter display formats are possible. Both read and write of the display RAM can be done with auto-increment of the display RAM address.

BLOCK DIAGRAM

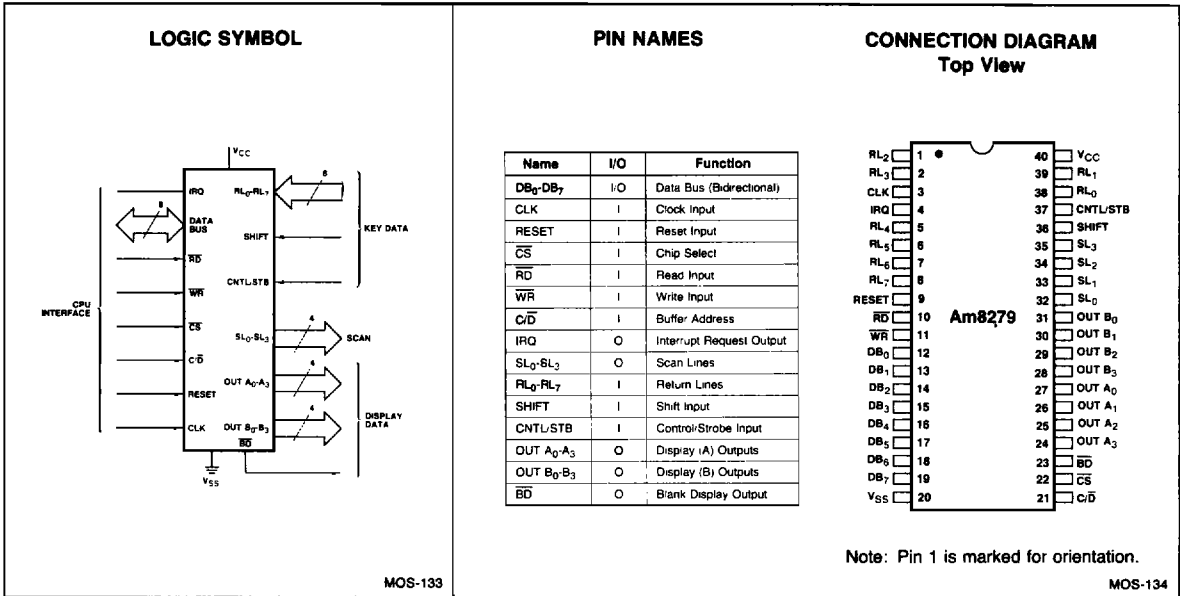


MOS-132

ORDERING INFORMATION

Package Type	Ambient Temperature Specification	Order Numbers	
Hermetic DIP*	0°C ≤ T _A ≤ +70°C	AM8279DC	AM8279-5DC
		AM8279CC	AM8279-5CC
Molded DIP		AM8279PC	AM8279-5PC

*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	1W

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.



DC CHARACTERISTICS T_A = 0°C to +70°C, V_{SS} = 0V (Note 1)

Parameter	Description	Test Conditions	Min.	Typ.	Max.	Units
V _{IL1}	Input Low Voltage for Return lines Only		-0.5		1.4	V
V _{IL2}	Input Low Voltage for All Others		-0.5		0.8	V
V _{IH1}	Input High Voltage for Return lines Only		2.2			V
V _{IH2}	Input High Voltage for All Others		2.0			V
V _{OL}	Output Low Voltage	Note 2			.45	V
V _{OH}	Output High Voltage on Interrupt Line	Note 3	3.5			V
I _{IL1}	Input Current on Shift, Control and Returns	V _{IN} = V _{CC} V _{IN} = 0V			+10 -100	μA μA
I _{IL2}	Input Leakage Current on All Others	V _{IN} = V _{CC} to 0V			±10	μA
I _{OFL}	Output Float Leakage	V _{OUT} = V _{CC} to 0V			±10	μA
I _{CC}	Power Supply Current				120	mA

- Notes: 1. Am8279, V_{CC} = +5.0V ±5%; Am8279-5, V_{CC} = +5.0V ±10%.
 2. Am8279, I_{OL} = 1.6mA; Am8279-5, I_{OL} = 2.2mA.
 3. Am8279, I_{OH} = -100μA; Am8279-5, I_{OH} = -400μA.

CAPACITANCE

Parameter	Description	Test Conditions	Min.	Typ.	Max.	Units
C _{IN}	Input Capacitance	V _{IN} = V _{CC}		5	10	pF
C _{OUT}	Output Capacitance	V _{OUT} = V _{CC}		10	20	pF

Am8279/Am8279-5

AC CHARACTERISTICS ($T_A = 0^\circ\text{C}$ to 70°C , $V_{SS} = 0\text{V}$) (Note 1)

BUS PARAMETERS

Read Cycle:

Parameter	Description	Am8279		Am8279-5		Units
		Min.	Max.	Min.	Max.	
t_{AR}	Address Stable Before $\overline{\text{READ}}$	50		0		ns
t_{RA}	Address Hold Time for $\overline{\text{READ}}$	5		0		ns
t_{RR}	$\overline{\text{READ}}$ Pulse Width	420		250		ns
t_{RD}	Data Delay from $\overline{\text{READ}}$ (Note 2)		300		150	ns
t_{AD}	Address to Data Valid (Note 2)		450		250	ns
t_{DF}	$\overline{\text{READ}}$ to Data Floating	10	100	10	100	ns
t_{RCY}	Read Cycle Time	1		1		μs

Write Cycle:

Parameter	Description	Am8279		Am8279-5		Units
		Min.	Max.	Min.	Max.	
t_{AW}	Address Stable Before $\overline{\text{WRITE}}$	50		0		ns
t_{WA}	Address Hold Time for $\overline{\text{WRITE}}$	20		0		ns
t_{WW}	$\overline{\text{WRITE}}$ Pulse Width	400		250		ns
t_{DW}	Data Set-up Time for $\overline{\text{WRITE}}$	300		150		ns
t_{WD}	Data Hold Time for $\overline{\text{WRITE}}$	40		0		ns

Notes: 1. Am8279, $V_{CC} = +5.0\text{V} \pm 5\%$; Am8279-5, $V_{CC} = +5.0\text{V} \pm 10\%$.

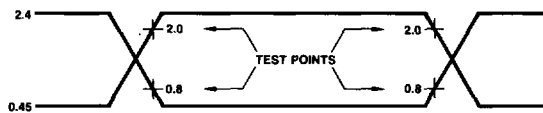
2. Am8279, $C_L = 100\text{pF}$; Am8279-5, $C_L = 150\text{pF}$.

Other Timings:

Parameter	Description	Am8279		Am8279-5		Units
		Min.	Max.	Min.	Max.	
$t_{\phi W}$	Clock Pulse Width	230		120		ns
t_{CY}	Clock Period	500		320		ns

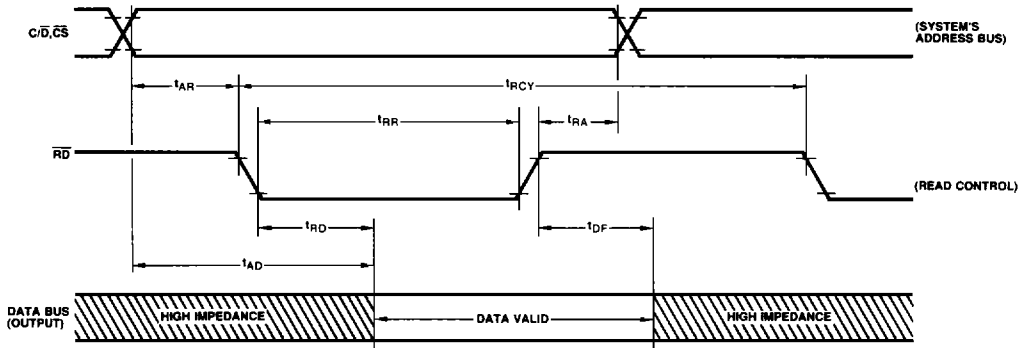
Keyboard Scan Time	5.1msec	Digit-on Time	480 μsec
Keyboard Debounce Time	10.3msec	Blanking Time	160 μsec
Key Scan Time	80 μsec	Internal Clock Cycle	10 μsec
Display Scan Time	10.3msec		

INPUT WAVEFORMS FOR AC TESTS



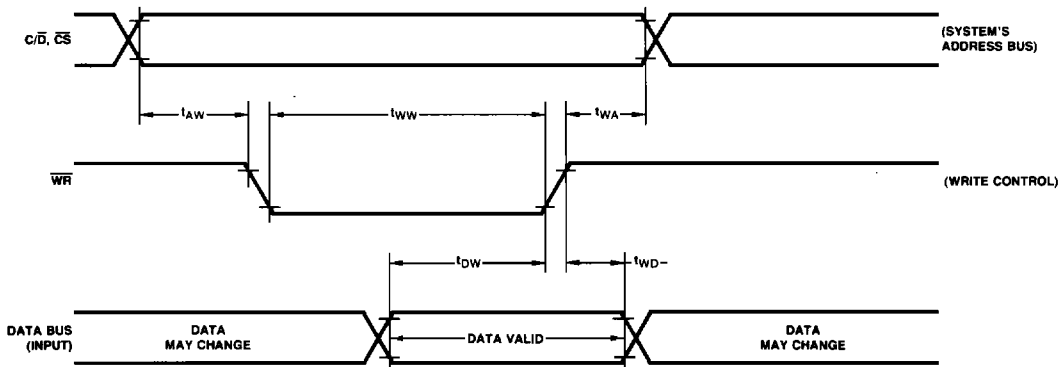
WAVEFORMS

READ OPERATION



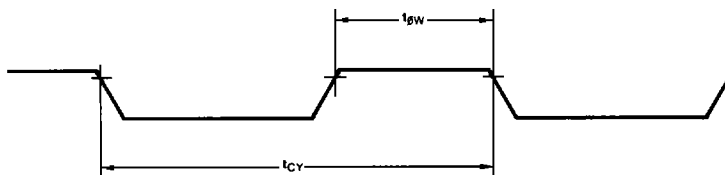
MOS-136

WRITE OPERATION



MOS-137

CLOCK INPUT



MOS-138

7