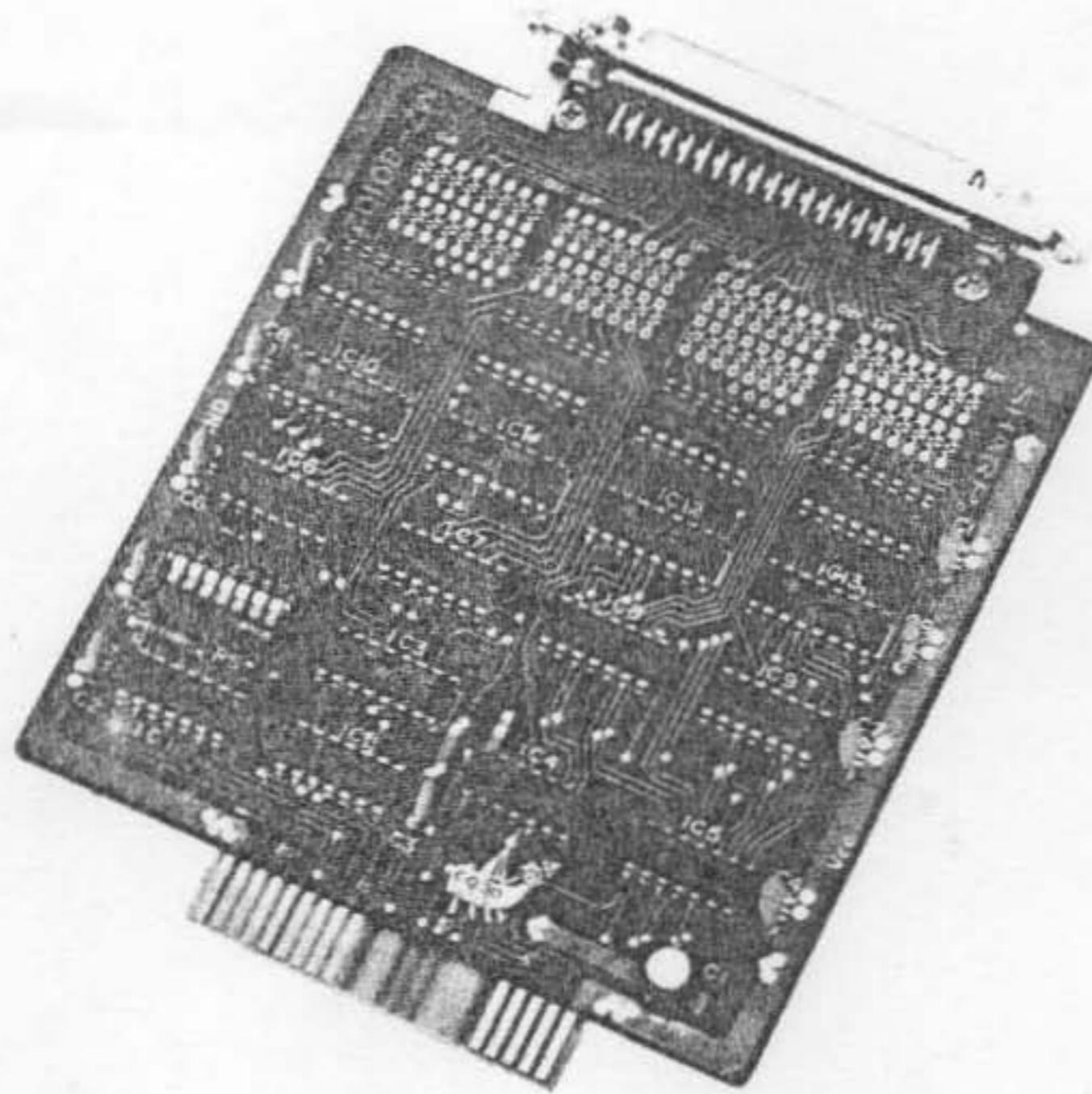


UNIVERSAL INTERFACE CARD

Model **11Z-80102**

Instruction Manual



SHARP CORPORATION

Introduction

Thank you very much for purchasing Sharp Universal Interface Card.

Read this instruction manual carefully before using the card.

We hope you will use it to its fullest potential.

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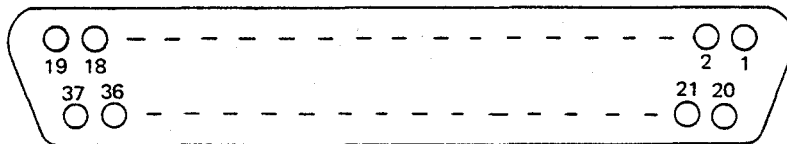
What is a Universal Interface Card?

This card is a circuit board that is available for 8 bits parallel interface. The card is inserted into any connector of Sharp Extension Unit MZ-80EU which is installed in Sharp Personal Computer MZ-80B, and is used for interface between MZ-80B and your peripheral device. For details of connection, refer to the manual for MZ-80B.

Port address can be set up by a port address selector on the board. However, this card needs some modification — wiring, soldering, etc. — to match use.

How to use

- (a) On the standard board, there are ICs 7404N that are mounted in the IC sockets at the output stage of output port. However, ^{*)}these ICs should be changed with the following ICs in response to the load condition. 7405N, 7406N, 7407N, 7416N, 7417N, etc.
- (b) Resistors at input/output stage
At the input/output stage, pull-up, pull-down or terminal resistors can be mounted on the board. ^{*)}You should mount suitable resistors in response to load conditions.
- (c) Input/output terminal connector
The card has a input/output terminal connector. Each pin is numbered as follows. For correspondence between each signal and pins, refer to the circuit diagram.



- (d) Port address setting
Port address setting depends on a port address selector (marked with "PS") that consists of multiple switches. The numbers described on the selector correspond to the following address bus respectively.

Switch No.	7	6	5	4	3	2	1
Address bus	A ₇	A ₆	A ₅	A ₄	A ₃	A ₂	A ₁

The OFF condition of a switch corresponds to logic "1", and the ON condition to logic "0". For example, when setting up a port address to decimal value (100)₁₀, the condition of each switch will be as follows.

Switch No.	7	6	5	4	3	2	1
Condition	ON	OFF	OFF	ON	ON	OFF	ON

Because the decimal value (100)₁₀ is binary value (01100100)₂.

$$(100)_{10} = (0 \quad 1 \quad 1 \quad 0 \quad 0 \quad 1 \quad 0 \quad 0)_{2}$$

$\begin{matrix} \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ S_7 & S_6 & S_5 & S_4 & S_3 & S_2 & S_1 & A_0 \end{matrix}$

Therefore, the condition of the selector should be as illustrated below.



: ON condition
 : OFF condition

Port address range can be 0 to 255 (00H to FFH). ^{*)}However, you should specify a port address in the range 0 to 127 (00H to 7FH).

- (e) Port address
- | | | |
|------------------------------------|---------------|----------------|
| I ₁₀ to I ₁₇ | (input port) | : even address |
| I ₂₀ to I ₂₇ | (input port) | : odd address |
| O ₁₀ to O ₁₇ | (output port) | : even address |
| O ₂₀ to O ₂₇ | (output port) | : odd address |

(f) Control

BASIC SB-5510 or SB-6510 has the following input/output commands.

INP @PORT, X

This command means that 8 bits data is input from the specified port address "PORT" and then is set to variable X as decimal value (0 to 255).

OUT @PORT, X

This command means that value X (0 to 255) is output to the specified port address "PORT" as 8 bits binary value. With executing the above command, the port address code is changed to a binary code, which is output to address bus A₀ to A₇.

I/O control can be also available with Z80 machine language.

*** Notes ***

Incorrect operation may damage the card. Pay special attention to the modifications and handling.

- *1) Always insert the ICs in the correct direction when changing other ICs. Reverse insertion damages them.
- *2) Do not use unsuitable pull-up, pull-down or terminal resistor.
- *3) Do not use two or more interface cards with the same port address at a time. ICs may be broken because of the correspondence of port address.
- *4) Port addresses 80H to FFH will be occupied with Sharp optional peripherals etc.
- *5) We assume no responsibility for any trouble which is caused by the universal interface cards altered by the user.

Specifications

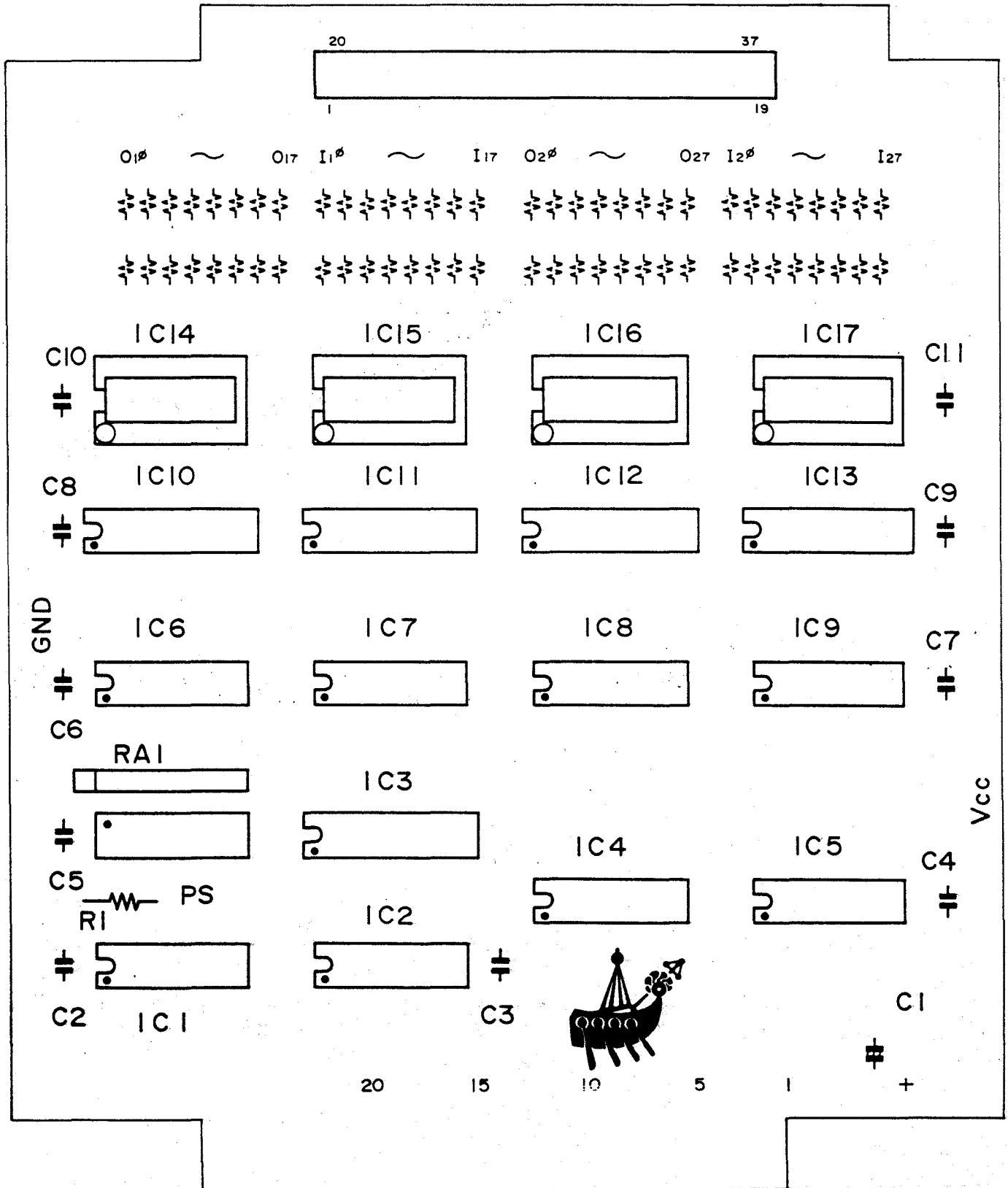
- (1) Number of ports
Input : 2 ports
Output : 2 ports
- (2) Port address setting
Whole address setting possible
- (3) Connection with bus line

Bus	Symbols	IC used
Data bus	D ₀ to D ₇	LS04N, LS125N
Address bus	A ₀ to A ₇	LS266N
Control bus	IOREQ RD WR RESET	LS266N LS42N LS42N LS04N

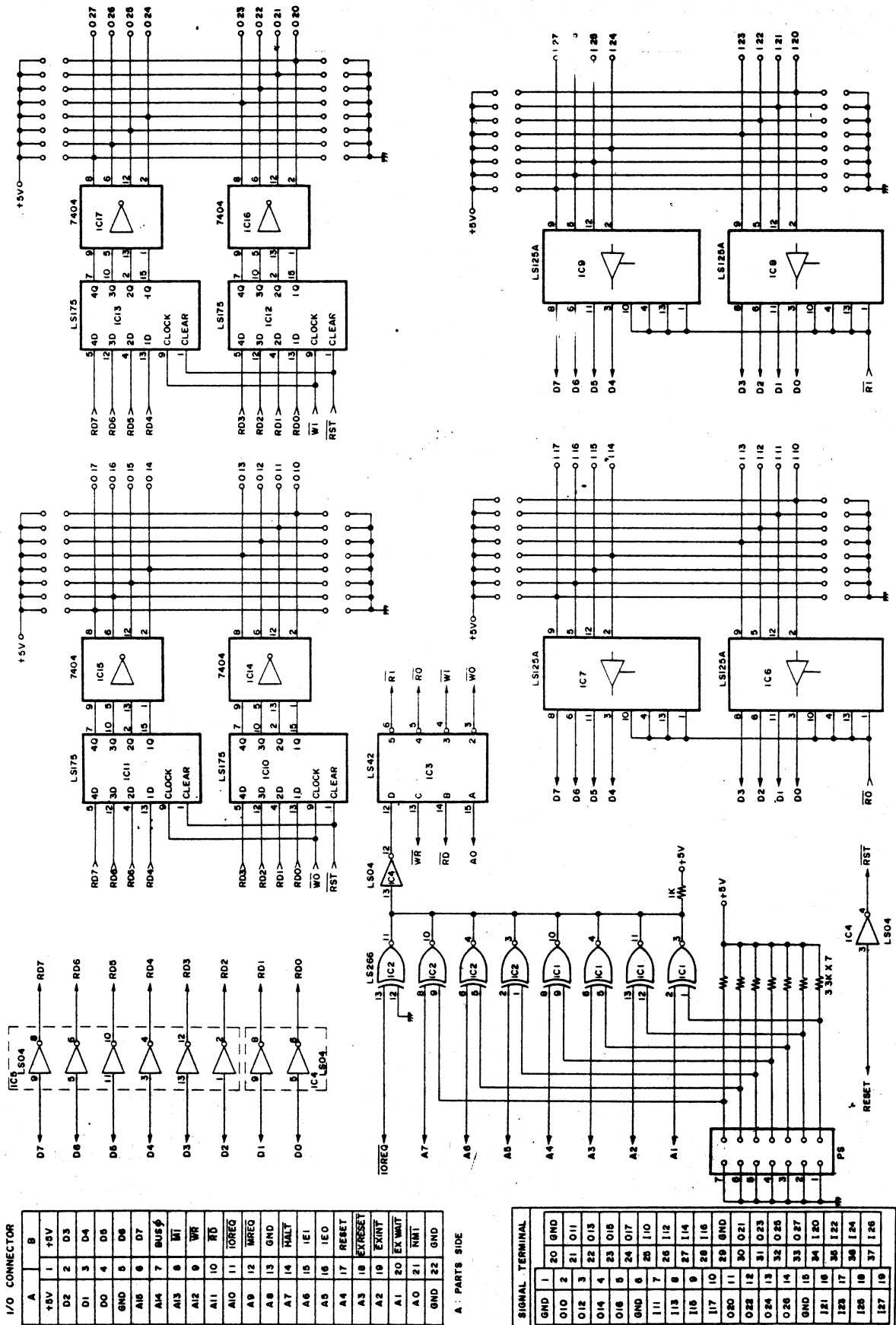
Each signal is as per TTL level. The electrical specifications are in accord with those of ICs employed.

- (4) Port input
TTL level, non latch system
Signals are input to the data bus via IC LS125 with the same logic. The electrical specifications are in accord with those of IC LS125.
- (5) Port output
TTL level, latch system
Signals are output via IC 04 with the same logic.
The electrical specifications are in accord with those of IC 04.
- (6) Bus line terminals and ICs used
Refer to the Circuit Diagram.
- (7) Operating temperature
0 to 35°C
- (8) Storage temperature
-15 to 60°C
- (9) Power source
DC +5V (supplied from Personal Computer MZ-80B)

Parts arrangement pattern



Circuit diagram



I/O CONNECTOR

A	B
+5V	1 +5V
D2	2 D3
D1	3 D4
DO	4 D6
D8	5 D6
A16	6 D7
A14	7 BUS
A13	8 INT
A12	9 WR
A11	10 RD
A10	11 IOREG
A9	12 MREG
A8	13 GND
A7	14 HALT
A6	15 IEI
A5	16 IEO
A4	17 RESET
A3	18 EXRESET
A2	19 EXINT
A1	20 EXINT
A0	21 NMT
GND	22 GND

A: PARTS SIDE

SIGNAL TERMINAL	
GND	1
O10	2
O12	3
O14	4
O16	5
O18	6
GND	7
O11	8
O13	9
O15	10
O17	11
GND	12
O19	13
O21	14
O23	15
O25	16
O27	17
O29	18
O31	19
O33	20
O35	21
O37	22
O39	23
O41	24
O43	25
O45	26
O47	27
O49	28
O51	29
O53	30
O55	31
O57	32
O59	33
O61	34
O63	35
O65	36
O67	37
O69	38
O71	39
O73	40
O75	41
O77	42
O79	43
O81	44
O83	45
O85	46
O87	47
O89	48
O91	49
O93	50
O95	51
O97	52
O99	53
O101	54
O103	55
O105	56
O107	57
O109	58
O111	59
O113	60
O115	61
O117	62
O119	63
O121	64
O123	65
O125	66
O127	67
O129	68
O131	69
O133	70
O135	71
O137	72
O139	73
O141	74
O143	75
O145	76
O147	77
O149	78
O151	79
O153	80
O155	81
O157	82
O159	83
O161	84
O163	85
O165	86
O167	87
O169	88
O171	89
O173	90
O175	91
O177	92
O179	93
O181	94
O183	95
O185	96
O187	97
O189	98
O191	99
O193	100

UNIVERSAL I/O CARD