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SPECIFICATION
FOR
MAGNETIC CARD READER
(Manual Insertion and 2 Sensors type)

Z U - M 2 1 2 1 S 3 5 2

MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.

MATSUSHITA INDUSTRIAL EQUIPMENT CO., LTD.
OSAKA JAPAN

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1. INTRODUCTION

This specification describes about manual Insertion type magnetic card reader, featuring small size, light weight and high performance which enable to read card data encoded by following ISO 2 standard.

2. PRODUCT NAME

- 2.1 Product Name : Manual Insertion type magnetic card reader
- 2.2 Model No. : ZU-M2121S352

3. FUNCTION

- 3.1 Card operation : Insertion & Ejection
- 3.2 Read/Write : Read only
- 3.3 Read direction : Insertion

4. EQUIPMENT SPECIFICATION

- 4.1 Out dimension : (W) 102 mm x (D) 100 mm x (H) 26 mm
- 4.2 Mass : Approx. 55 g
- 4.3 Supplied voltage
 - (1) Supplied voltage : DC 5 V \pm 0.5 V / Ripple (Less than 50 mVp-p)
 - (2) Current consumption : TYP. 20 mA, MAX.25 mA
 - (3) Absolute maximum applied voltage : +7 VDC
- 4.4 Connector : IRISO Electronics Corporation
IMSA-9204B-2-13Z080-T (Refer to 7.5)
- 4.5 Environment requirement : At indoor
- 4.6 Material of bezel : Conductive material

5. BASIC FEATURES

- 5.1 Card operating speed : 10 cm/sec ~ 120 cm/sec
- 5.2 Magnetic head
 - (1) Numbers of channel : 1
 - (2) Core width : 1.5 mm
 - (3) Core material : Permalloy

6.CARD STANDARD

6.1 Card standard

Card Standard	ISO2
	Track 2 nd
Recording density	75 BPI
Recording capacity	23 Characters (5bit code)
Recording method	F2F

6.2 Location of tracks

ISO (2nd track) ISO 7810, ISO 7811

Coercive force(Hc) : 2.4×10^4 A/m ~ 2.4×10^5 A/m
(300 Oe ~ 3000 Oe)

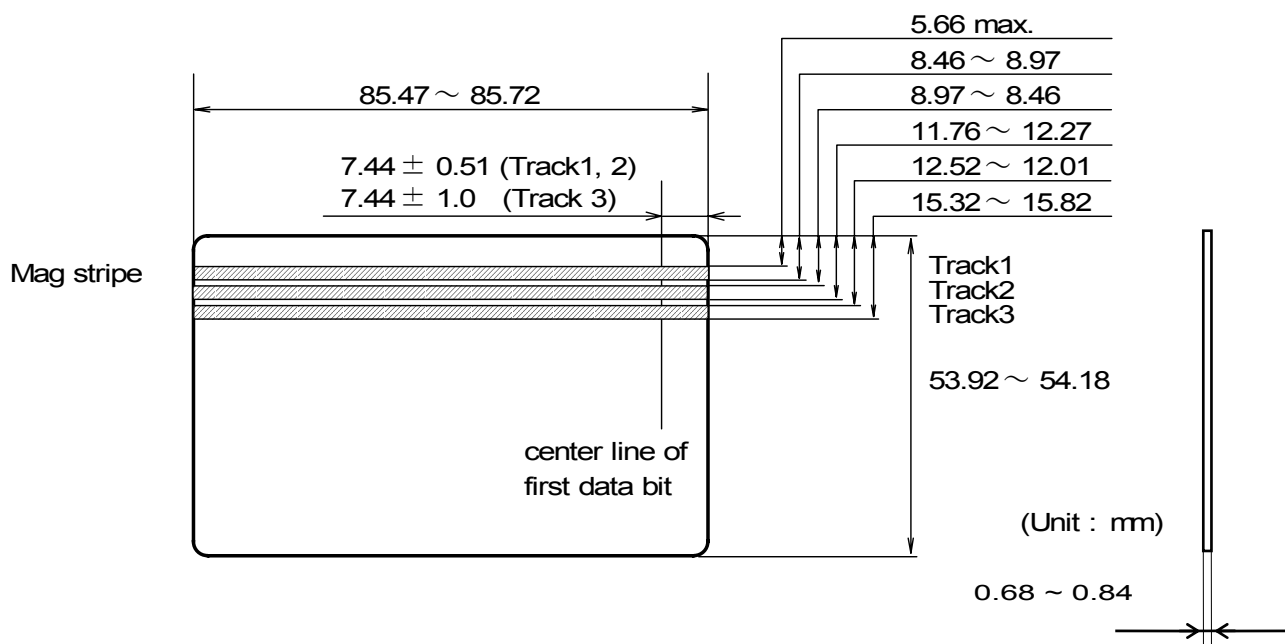


Figure 6.2 Location of Tracks

7. CIRCUIT CONSTRUCTION

7.1 Block diagram

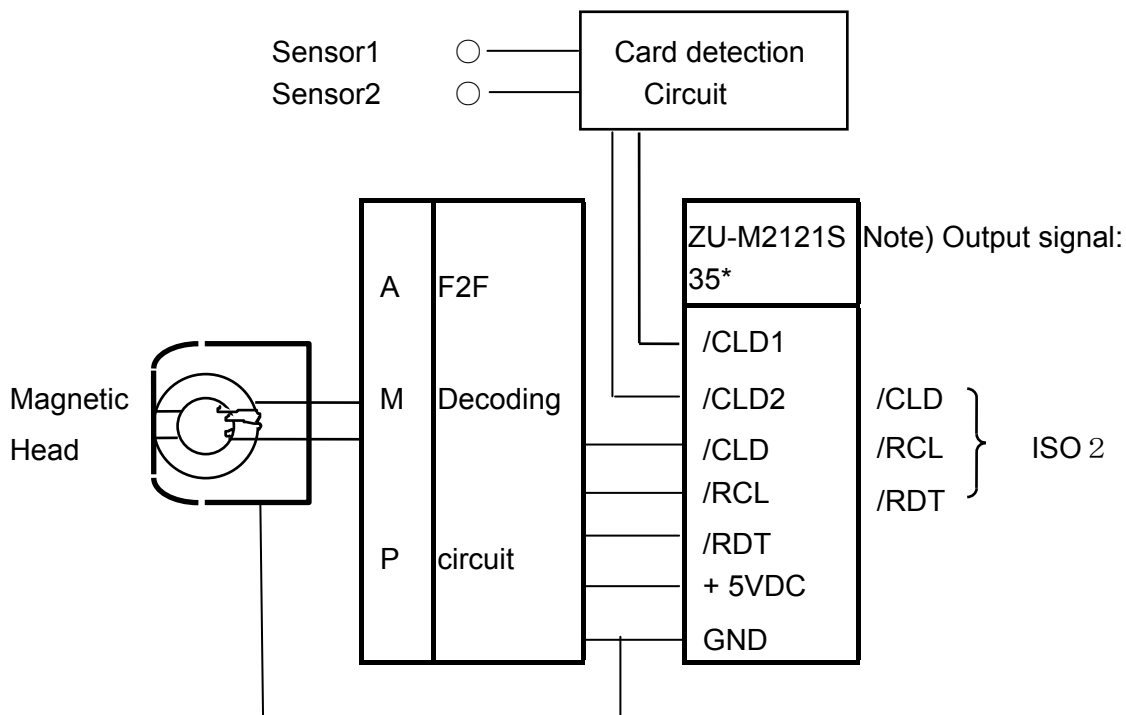


Fig 7.1 Block diagram

7.2 Interface requirement

- (1) Signal Level : CMOS level
- (2) Signal Logic : Low active
- (3) Connection condition

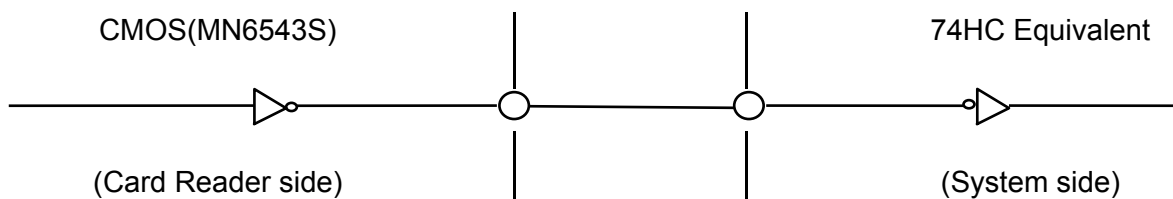


Fig 7.2 Connection of output circuit

(4) Output voltage

Table 7.2 Output voltage

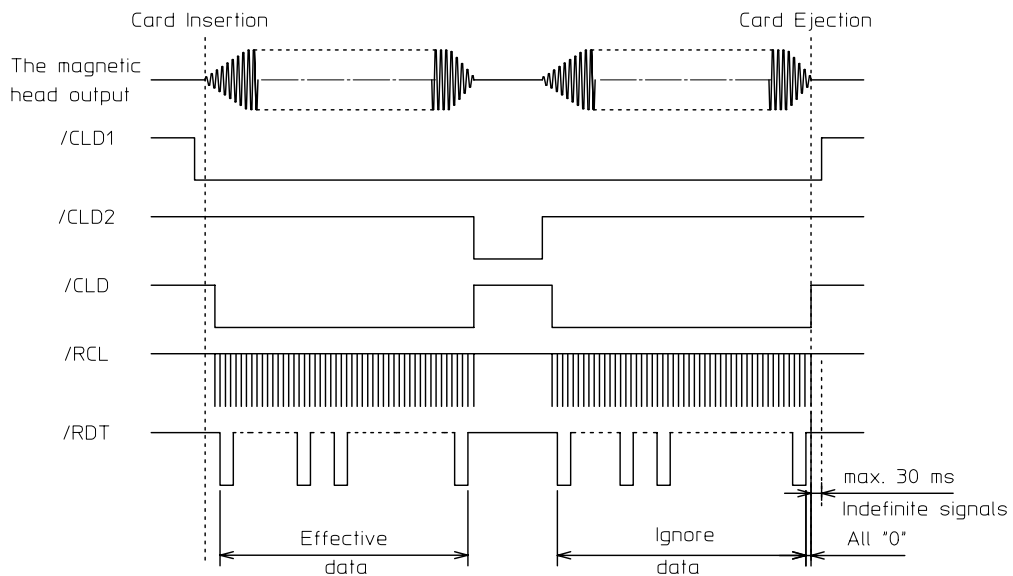
	Min(V)	Max(V)	Conditions
H level "0"	4.0	Vcc	$I_{OH} = -1.0mA$
L level "1"	-	0.4	$I_{OL} = 4.0mA$

7.3 Explanation of input/output signal

Input/output signals are /CLD1, /CLD2, /CLD, /RCL, /RDT and effective operation mode for each of these signals shall be "L" level for all.

- (1) /CLD1 (CARD LOAD) : The /CLD line will be Low when a Magnetic Card inserts in the Magnetic Card Reader.
The /CLD line will be High at all other times.
- (2) /CLD2 (CARD LOAD) : The /CLD line will be Low when a Magnetic Card is inserted in the end of Magnetic Card Reader.
The /CLD line will be High at all other times.
- (3) /CLD(CARD LOAD) : When the /CLD line will be Low when a encoded Magnetic Card Reader, and when a encoded Magnetic Card inserts in the end of Magnetic Card Reader the /CLD line will be High.
- (4) /RCL(READ CLOCK) : This is used to sample the data line by it's falling edges. The time relationship of the clock with respect to the order signals is shown in Figure 7.4
- (5) /RDT(READ DATA) : The moment /RCL change from High to Low ; /RDT is "1" when the /RDT line is Low , and /RDT is "0" when the /RDT line is High.

7.4 Output signal timing chart



Detail the /RCL & /RDT timing chart

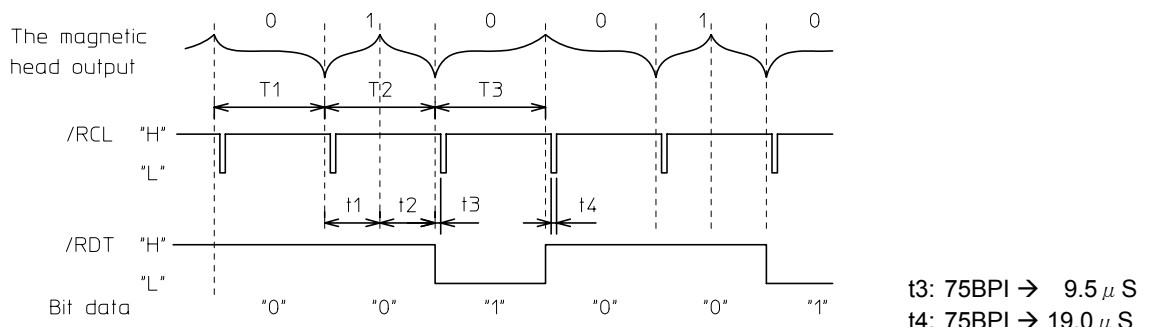


Fig 7.4 Timing chart

When the jitter of the magnetic head output is 0% , the following equation is satisfied.

$$T=T_1=T_2=T_3, \quad t_1=t_2$$

$$T(\text{sec}) = \frac{2.54 \text{ cm/inch}}{\text{Recording density (BPI)}} \times \frac{1}{\text{Card speed (cm/sec)}}$$

7.5 Terminal No. of connector

- (1) Maker : IRISO Electronics Corporation
- (2) Model No: IMSA-9204B-2-13Z080-T
- (3) Pin No. & Signal Name

(Card reader side)

Connector Pin No.	Signal Name	Connector Pin No.	Signal Name
1	/RDT	2	NC
3	/RCL	4	NC
5	/CLD1	6	NC
7	/CLD2	8	X
9	+5VDC	10	GND
11	NC	12	NC
13	/CLD	14	NC

(Note) : Make sure to use the connection cable of less than 300 mm length for the card reader.

8. ENVIRONMENTAL CHARACTERISTICS

- 8.1 Operating temperature Range : -20 °C ~ 60 °C
- 8.2 Operating humidity Range : 10 % ~ 90 % RH (No condensation allowed)
- 8.3 Storage temperature Range : -30 °C ~ 70 °C
- 8.4 Storage humidity Range : 10 % ~ 95 % RH (No condensation allowed)
 - *Place the card reader in the standard environment (temperature: 20 °C±5 °C, humidity: 35 % ~ 60 %RH).
 - Leave it for 12 hours, and measure the functions. Make sure no abnormality is found.
- 8.5 Vibration : Vibration sweep 10 H/z ~ 50 H/z, 10 m/s², 0.5 oct/min
X,Y,Z directions
- 8.6 Shock durability : 294 m/s²(30 G)
- 8.7 Others : Make sure any source of noise that may deteriorate the characteristics of the card reader is not present around the card reader.

9. UNIT LIFE AND RELIABILITY

9.1 Life Magnetic head : 300,000 times pass
(conditions) In a clean office room.

In damp or dirty atmosphere, the life may be 1/3 to 1/5 of the above figure.

9.2 Error rate : Less than 0.1 %

(conditions) This error rate is obtained when a new normal card (data "1010··") is horizontally passed at the standard speed (30 cm/sec ~ 60cm/sec) by manual operation in the clean environment at delivery from our company.

10. GUARANTEE

If defects should occur within one year after the delivery of the card reader due to improper material or bad workmanship, the defective parts shall be replaced or repaired, free of charge.

11. MAINTENANCE

Because of difficulty in changing components on the P.C Board, replacement of whole unit is recommended for service and maintenance.

12. CAUTIONS ON THE USE

Please be noted that we do not guarantee proper performance of the card reader if it is used other than the indicated specification range.

12.1 At the installation

- (1) Do not drop or bump anything against a card reader. Otherwise, failure may be the result.
- (2) Do not touch the P.C.B. with bare hands.
- (3) Be sure to install on a flat surface so as to prevent any force to be applied to the Card reader at the installation.
- (4) Do not drop or bump anything against a card reader. Otherwise, failure may be the result.
- (5) The card reader should avoid installation of the following environment.
 - Watery, humid or dusty place.
 - Near machines which generate magnetic field or inducted noise. (Printer, LED display, CRT etc.)
 - Place which gets direct sunlight.

12.2 At the use

- (1) Be sure to use a card which conforms ISO standard.
Coercive force of the applied card should be 2.4×10^4 A/m $\sim 2.4 \times 10^5$ A/m
(300 Oe \sim 3000 Oe) of ISO standard.
- (2) Card operation speed should be within the specification range.
Forced stop or change of speed during the card operation may cause a read error.
Appropriate speed to maintain stable operation is 30 cm/sec \sim 60 cm/sec.
- (3) Store the card with caution to prevent dirt, scratch and distortion.
Especially, no foreign matter shall be stuck on the magnetic stripe surface.
Use of such card may result in a read error.
- (4) Insert a cleaning card and clean the head periodically to prevent wearing of the magnetic head.
Head cleaning using the cleaning card should be performed about once a week if the room is not dusty.
- (5) Depends on installation environment (incorporation condition) or operation condition, external noise or electrostatics and so on may affect the machine, and which may cause an error or a wrong operation.
Check the level of noise resistance and electrostatic resistance of your factory before using the card reader.

13. APPEARANCE

