

SPEC,NO.MES-DG60B037

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MATUSHITA ELECTRIC INDUSTRIAL CO.,LTD.

MATUSHITA INDUSTRIAL EQUIPMENT CO.,LTD.

OSAKA JAPAN

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1. INTRODUCTION

This specification applies to the Panasonic magnetic card reader, featuring small size, light weight and high performance.

2. COMPOSITION

The magnetic card reader is composed of the mechanical portion, single circuit for read.

1) Mechanical portion

The mechanical portion is mainly composed of the following parts.

- 1. Body (Color : Transparence)
- 2. Card entrance slot (Color: Black)
- 3. Magnetic head (Core material: Permalloy)

2) Circuit portion

- 1. Read amplifier circuit for 2 tracks

3. SPECIFICATION

3.1 CARD STANDARD

Refer to Magnetic Card Specification (9).

3.2 FUNCTION

- (1) Read/Write : Read only
- (2) Read timing : Ejection
- (3) Compatibility : Cards and installation
- (4) Installation of the transport : Horizontal direction

### 3.3 BASIC PERFORMANCE

#### (1) Performance

	ZU-1870MA4T*	
	ISO 7811	
Card standard	ISO1	ISO2
Track used	Track 1st	Track 2nd
Recording method	FM	FM
Recording density	210 BPI	75 BPI
Recording capacity	79 characters (7-bit code)	40 characters (5-bit code)

- (2) Card operation speed : 10 ~ 100 cm/sec.
- (3) Magnetic head Channel : 2  
Channel width : 1.4mm
- (4) Insulation resistance : More than 10 MΩ at DC 250 V  
(Measured between P.C.B.  
ground terminal and frame)

### 3.4 ENVIRONMENT REQUIREMENTS

- (1) Temperature range : -20 ~ 60°C  
(Operation)
- (2) Temperature range : -30 ~ 70°C  
(Conservation)
- (3) Humidity range : 10 ~ 90%RH  
(Operation) (No condensation allowed)
- (4) Humidity range : 10 ~ 90%RH  
(Conservation) (No condensation allowed)
- (5) Vibration : Vibration sweep 10 ~ 50 Hz/mm  
X,Y,Z directions
- (6) Shock durability : 30G

3.5 PHYSICAL CHARACTERISTICS

- (1) Dimension : 90 (W) × 119.5 (D) × 46 (H)  
Unit: mm
- (2) Weight : Approx. 100g
- (3) Power supply : 5 V DC ± 10%  
Less than 25mA
- (4) Ripple : Within 50 mVp-p
- (5) Operating place : Indoor

3.6 ERROR RATE

(at indoor conditions by continuous running))

- (1) Error : Less than 0.5%  
\* Condition ..... In a clean office room.  
In damp or dusty atmosphere, the life may be  
1/3 to 1/5 of the above figure.

4. TERMINAL NO. OF CONNECTOR

4.1 OUTPUT SIGNAL

Connector Pin No.	Signal name	Connecto Pin No.	Signal name
1	+5 V	5	$\overline{RCL2}$
2	$\overline{RDT1}$	6	$\overline{CLD}$
3	$\overline{RCL1}$	7	GND
4	$\overline{RDT2}$		

Connector: BS7P-SHF-1AA JST

5. INTERFACE REQUIREMENTS

5.1 OUTPUT VOLTAGE

	Min (V)	Max (V)	Conditions
H level "0"	4.0	Vcc	I <sub>OH</sub> = -1.0 mA
L level "1"	-	0.4	I <sub>OL</sub> = 4.0 mA

## 5.2 OUTPUT SIGNALS

The following paragraphs describe the requirements and interface signals between the user terminal and the Magnetic Card Reader shown in Figure 1.

The general timing sequence for entering data from the Magnetic Card Reader to the user terminal is shown in Figure 2.

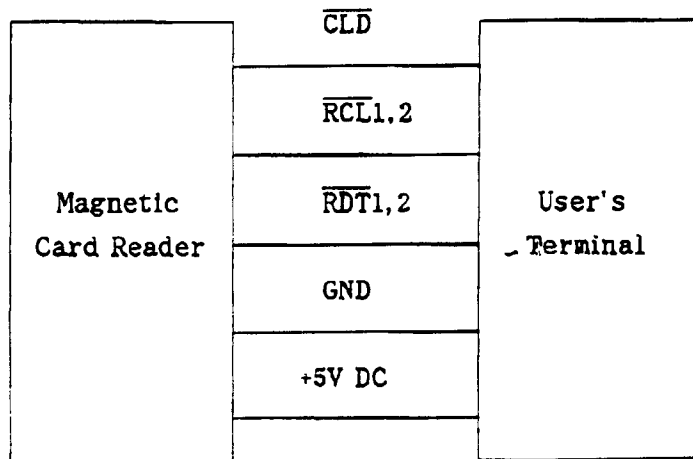


Figure 1

(1)  $\overline{\text{CLD}}$  (CARD LOAD)

The  $\overline{\text{CLD}}$  line will be High when a Magnetic Card is inserted in the end of Magnetic Card Reader. The  $\overline{\text{CLD}}$  line will be Low at all other times.

(2)  $\overline{\text{RCL}}_{1,2}$  (READ CLOCK)

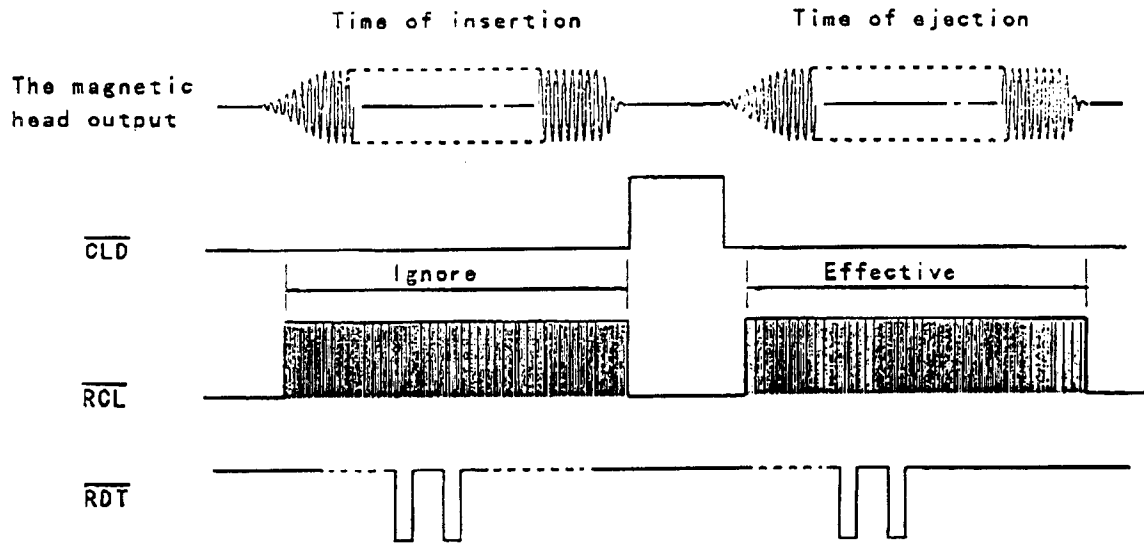
This is used to sample the data line by its falling edges. The time relationship of the clock with respect to the other signals is shown in Figure 2.

User's Terminal starts to carry out sampling of the read data by the falling edge of the signal. In case of performing sampling other than the falling edge sampling method (such as detecting "L" of  $\overline{\text{RCL}}$  by means of polling) to read  $\overline{\text{RDT}}$ , check  $\overline{\text{RCL}}$  width if it is appropriate.

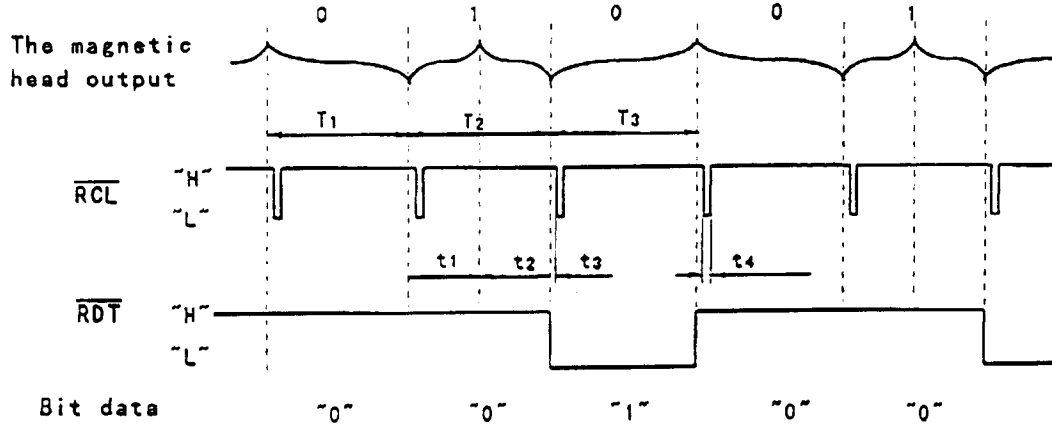
(3)  $\overline{\text{RDT}}_{1,2}$  (READ DATA)

At the moment  $\overline{\text{RCL}}$  change from High to Low ;  
 $\overline{\text{RDT}}$  is "1" when the  $\overline{\text{RDT}}$  line is Low, and  
 $\overline{\text{RDT}}$  is "0" when the  $\overline{\text{RDT}}$  line is High.

### 5.3 TIMING CHART



#### Detail Chart



	75 BPI	210 BPI
t3	9.5 μs	3.8 μs
t4	19.0 μs	7.7 μs

(Typical value)

Figure 2 Timing Sequence

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

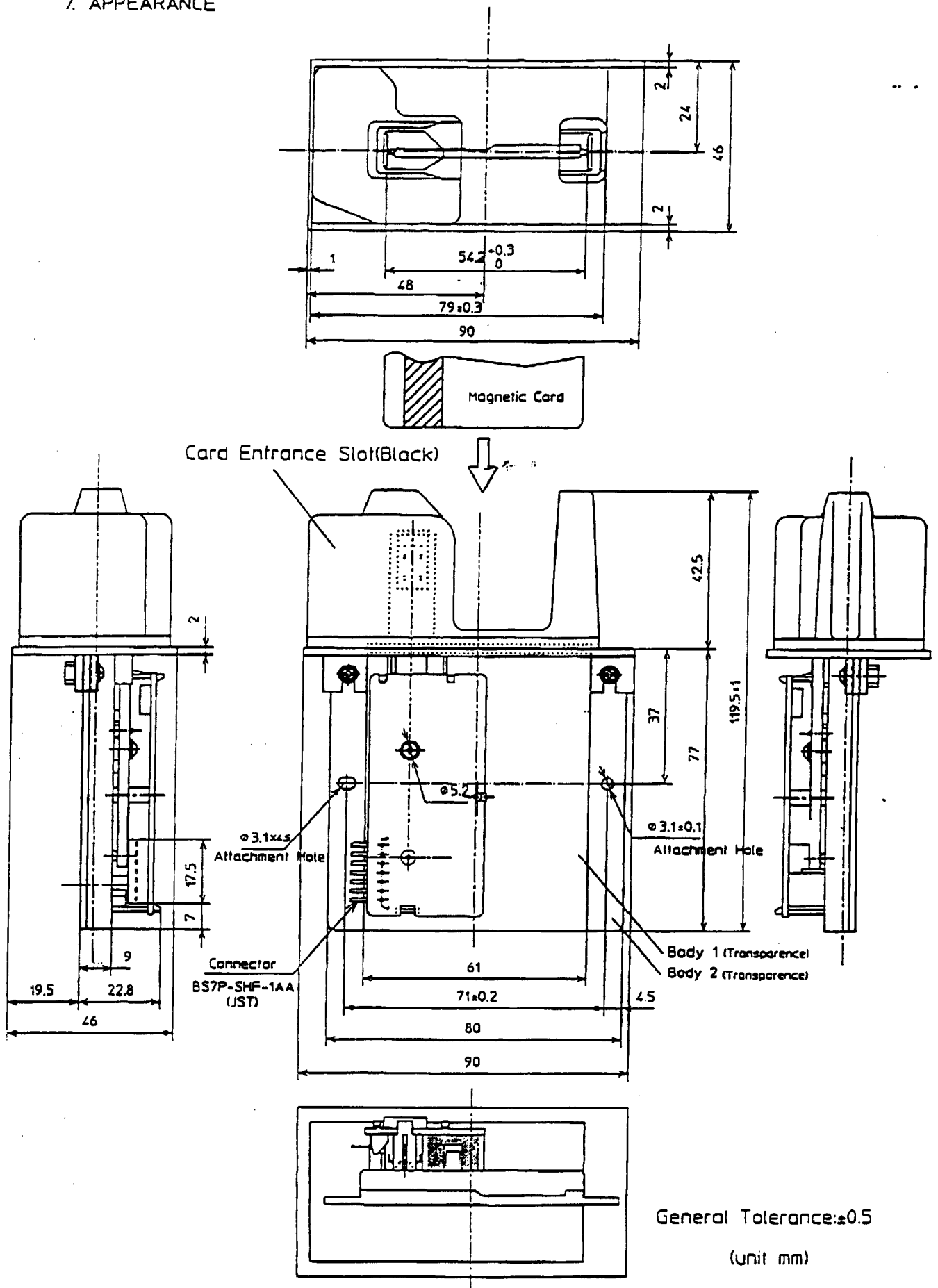
$$T = T_1 = T_2 = T_3, t_1 = t_2$$

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

### 6. NOTES FOR BETTER OPERATION

- (1) The card should be inserted in the specified direction.
- (2) Cards which meet standards should be used.
- (3) Cards should not be dirty, scratched or deformed.

7. APPEARANCE

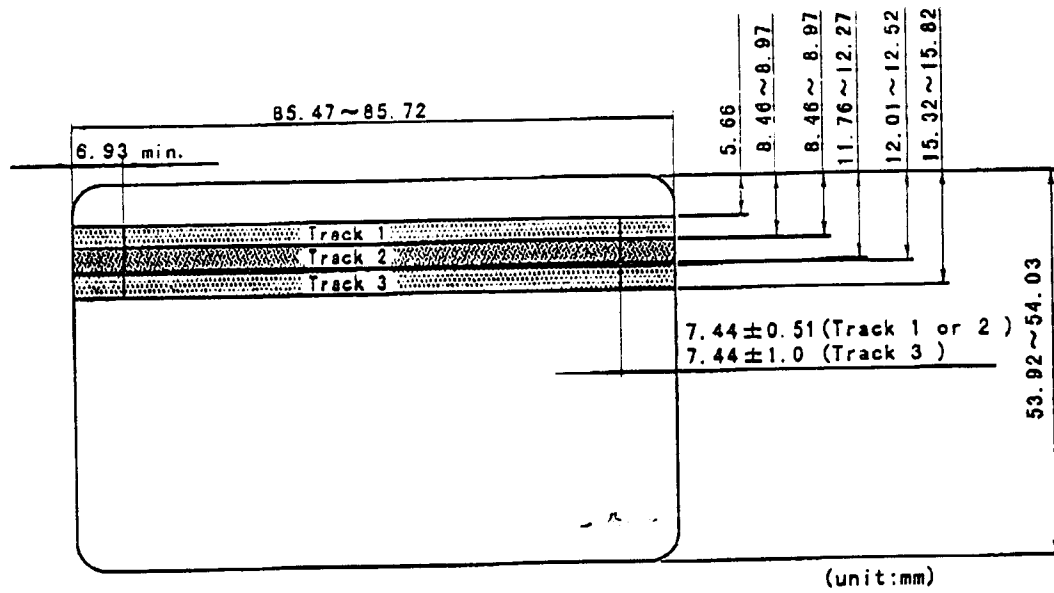






### 9. MAGNETIC CARD SPECIFICATION

#### 9.1 CARD SPECIFICATION



- (1) Thickness :  $0.76 \pm 0.08$
- (2) Transformation : 2 mm max.
- (3) Impermeability rate : More than 2.0  
(Measured by light permeance desitometer)

#### 9.2 MAGNETIC CHARACTERISTICS

- (1) Coercive force (Hc) :  $2.4 \times 10^4$  A/m (300 Oe  $\pm$  12%)
- (2) Residual flux ( $\phi r$ ) :  $1.25 \pm 0.15$  maxwell/cm
- (3) Squareness ratio : More than 0.70  
( $\phi r / \phi m$ )

10. LIFE OF PARTS

Magnetic head : 300,000 passes

\*Condition . . . . . In a clean office room.

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

11. MAINTENANCE METHOD

When replacing parts, exchange the card reader unit.

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) Installation of a card guide plate at the both (front and back) sides of the card running part may reinforce stability.
- (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.  
Anti-magnetic of the applied card should be  $2.4 \times 10^4 \sim 2.4 \times 10^5$  A/m (300 ~ 3000(Oe)) of ISO standard.

- (2) Pulse width of the period "L" of  $\overline{RCL}$  is about  $7.7 \mu S$  for the card conformable to IS01 (210 Bpi specification), and about  $19 \mu S$  in case of IS02(75 Bpi specification). If sampling method other than falling edge sampling (such as a method detecting "L" of  $\overline{RCL}$  by means of polling) is used, please check with us since data may not be read depending on polling frequency at the host side.
- (3) 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 ~ 60 cm/sec.
- (4) 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.
- (5) 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.
- (6) Depends on installation environment (incorporation condition) or operation condition, external noise or electrostatic 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.

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