

Sankyo

SPECIFICATION

Type Name :

ICT3K5-3R6940

Spec. No.

ASR-NP-09085-01

Notes :

[illegible]

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1 Product

Motorized Magnetic stripe and IC Card Reader with Full Shutter Gate (Hereafter refer as ICR, customer's main system as HOST) The software interface is held in Flash PROM (F-ROM) and down-loadable from the HOST.

The down loading software has the security.

INTERFACE SPECIFICATION : see ASL-NP-09085-01

This unit is compliant to "RoHS" Instruction



2 Model Name

ICT3K5-3R6940

3 Function

3.1 Card Transport

Round trip and capture

3.2 Read / Write

1) Magnetic stripe : Read only on ISO Track #1,#2 and #3

NOTE It can read both lo-co and Hi-co.

Read only in card run forward. Do not touch the card when it is reading.

Automatic retry is impossible.

2) IC Card with contact : Read / Write

NOTE Method of Read / Write depends on Terminal C1 to C3 and C5 to C7

The specifications of IC card is Refer to "IC card control"

Vpp is not supported.

3.3 Interface

RS232C compatible

Interface connector : Ref. "Interface connector" section

Pin assignment : Ref. "Interface connector" section

4 Useable card

4.1 Magnetic card

Conform to ISO/IEC 7810:1995, ISO/IEC7811-1 to 5:1995 and ISO/IEC7811-6:1998

4.2 IC card

Conform to ISO/IEC 7816-1-3:1998 and/or EMV 2000 Ver.4.0

NOTE EMV standard is given priority if there are some difference in same item between ISO/IEC and EMV.

5 Transport

5.1 Appearance

Appearance dimensions : Drawing No. T03A849A01

5.2 Circuit

Show in block diagram refer as "Block diagram" section.

5.3 Mass

Approximately 480g

5.4 Power requirement

Voltage : + 12 V \pm 5 % DC

Ripple : Max. 200 mVp-p

Current consumption

At starting and inverting	: 2.0 A or less	
At run	: 1.0 A or less	
At ready	: 500 mA or less	
At solenoid	: 1.7 A or less	Added when "Capture"
At solenoid	: 0.16 A or less	Added when "Shutter on"
At IC card	: 60 mA or less	

NOTE Power supply for logic circuit is generated within ICR using +12V supply.

6 Basic Performance

6.1 Reading process

F/2F (FM) bit to bit decoding

6.2 Data capacity

Data capacities are

- ISO track 1 : 79 characters X 7 bits
- ISO track 2 : 40 characters X 5 bits
- ISO track 3 : 107 characters X 5 bits

6.3 Card feeding speed

250 mm/s \pm 20 %

NOTE Except rising and falling time speed

6.4 Magnetic head

- 1) Number of track : 3
- 2) Track width : 1.4 mm

6.5 Mechanical noise

Max. 70 dBA

NOTE Except action of IC contact and shutter operating noise.
Measured with microphone over 150 mm of motor.

6.6 Dielectric strength

To be no failure at DC 250 V, 1min

NOTE Measured between GND and frame

6.7 Insulation resistance

More than 10M Ω at DC 250V

NOTE Measured between GND and frame

7 Environment condition

7.1 Operating temperature and humidity

+5 to +50 °C, 30 to 80% RH

NOTE The highest wet bulb temperature and humidity is 29 °C, no dewing

7.2 Storage temperature and humidity

-20 to +70 °C, 30 to 80% RH

NOTE Storing ICR for 12 hours at the normal conditions without any operation after keeping it at the above storage temperature and humidity for 96 hours without operation, no functional error is found.

7.3 Maximum limit (high temperature and high humidity)

+40 ± 3 °C, 90 to 95%RH 96hours

NOTE Storing ICR for 12 hours at the normal conditions without any operation after keeping it at the above storage temperature and humidity for 96 hours without operation, no functional error is found.

7.4 Vibration

1) Operation

No functional failure at,

Max. 1.96 m/s² {0.2G} X,Y and Z directions

Sweep : 10 to 50 Hz/min

2) Ready

No functional failure at,

after 3.92 m/s² {0.4G} constant X,Y and Z directions 30 minutes

Sweep : 10 to 50 Hz/min

3) Storage

No functional failure at,

after 29.4 m/s² {3.0G} constant X,Y and Z directions 30 minutes

Sweep : 10 to 50 Hz/min

7.5 Shock

No functional failure at,

after 294 m/s² {30G} 11ms Once in X,Y and Z directions

8 Life

8.1 Transport

600,000 passes

NOTE One card pass is a forward and a reverse, at indoor environment.

8.2 Main parts

Magnetic head : 600,000 Card passes (1 piece)

DC motor : 1,000,000 Card passes (1 piece)

Rubber roller : 600,000 Card passes (1 piece)

IC contact : 300,000 ON/OFF (1 piece)

8.3 Card

1) Magnetic card : 1,000 times

2) IC card : *3,000 times (Read / Write Life)

NOTE * Ref. value depend on card specification

9 Reliability

9.1 Error rate

1) Magnetic stripe read : Less than 5 errors per 5,000 cycles

NOTE SANACARD-T5 flat

Room temperature and humidity

2) IC R/W : Less than 5 errors per 5,000 cycles

NOTE Flat card

Except an error caused by dirtiness

9.2 MTBF

More than 1.0×10^5 hrs (Electronic part only)

NOTE 250 times / day, 25 days / month, 250 hrs / month

10 Warped card

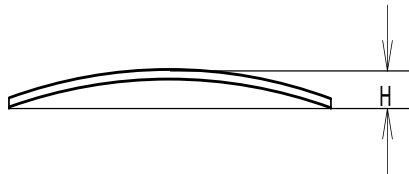
This condition refers to an evenly warped card having a height, "H".

1) Possible to R/W IC data : "H" = less than 2.0 mm

2) Possible to read Mag. Stripe : "H" = less than 2.0 mm

3) Possible to capture : "H" = less than 2.5 mm

4) Possible to run the Card : "H" = less than 3.5 mm



11 Power down mode

11.1 Definition of power down

1) Supply voltage : 9-10 V DC

2) Time out : over 50 ms

11.2 Operation

ICR dose compulsory card eject (toward card throat portion) regardless of card presence within ICR.

Card eject is not available if ICR is in "disable" mode (pd=31H) under initialize command.

During power down mode, DTR keeps low level(Off).

11.3 Recovery

It's necessary to initialize ICR under "Initialize command" to return to normal operation mode.

11.4 Backup power supply Capacitor



More than 0.068F : Operating temperature +20 to +30(flat card only)

More than 0.120F : Operating temperature +20 to +30

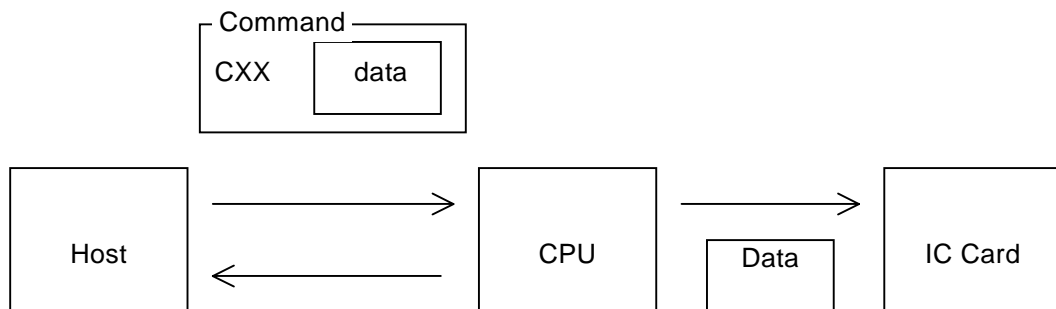
More than 0.220 F : Operating temperature +5 to +50

Charging a capacitor from ICR

NOTE Battery is T.B.D.

12 IC card control

Vcc : DC 5 V \pm 5%
 : DC 3 V \pm 3%
 (selected by command)
 Icc : 60 mA Max. at 5V operation
 : 50 mA Max. at 3V operation
 Vpp : Terminal is isolated
 CLK : 3.58 MHz (basis), 7.16 MHz (automatically selected by software)
 Unused terminal : C4, C8 Terminals are isolated.



This magnetic / IC card reader (ICR) is designed to read and write an IC card which meets the standards defined by ISO/IEC 7816 part 1, 2 and 3. Although we have made many evaluations, we would like the customer to verify the card reader by using the vender's specific card, to avoid unexpected problem, which depend on the card.

Notes:

Recommendatory conditions

Temperature : 20 \pm 5 °C

Humidity : 35 -60 % RH

Mounting : Horizontal (To be sited at an angle of less than 10 degrees)

+5 to +35 °C temperature and 30 to 80 % humidity are the permissible on condition that no problem.

The details of evaluation, standard, guarantee for products etc. are specified by another contact.

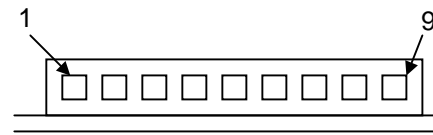
The agreement concerning the industrial property, know-how etc. are specified by the general purchasing contact.

Basically, maintenance is to be done by the supplier. Exceptions are mode in another agreement.

13 Interface connector

13.1 Interface

Pin No.	Host/ICR	Signal
1	←	/DTR(ER)
2	→	/CTS(CS)
3	←	/TXD(SD)
4	←	/RTS(RS)
5	→	/RXD(RD)
6	→	/DSR(DR)
7	-	SGN
8	→	/RESET
9	-	FG



~~S0B-PH-SM3-TB or equivalent~~
S9B-PH-SM4-TB or equivalent

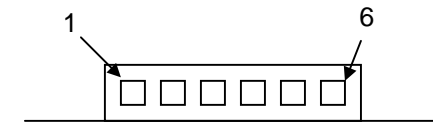


RXD Received Data from HOST
TXD Output data to HOST
CTS Executes transmission during ON
RTS Request to send
DSR Data set ready
DTR Terminal ready
RESET CPU reset (active Low)

Keep low level minimum 100ms when reset ICR

13.2 Power

Pin No.	Host/ICR	Signal
1	-	GND
2	-	GND
3	-	+12V
4	-	+12V
5	-	BACKUP
6	-	GND



~~S6B-PH-SM3-TB or equivalent~~
S6B-PH-SM4-TB or equivalent



+12V Power
GND Ground
BACKUP Backup Power supply

13.3 Extension

Pin No.	Host/ICR	Signal
1	-	GND
2	-	+12V OUT
3	←	LED2
4	←	LED3
5	←	BUZZER
6	-	R.F.U.
7	-	SGN
8	-	R.F.U.
9	-	+5V OUT
10	-	R.F.U.
11	-	N.C.
12	-	N.C.
13	-	N.C.
14	-	N.C.
15	-	N.C.
16	-	N.C.
17	-	N.C.
18	-	N.C.
19	-	N.C.
20	-	N.C.



+12V OUT

Power to the HOST

+5V OUT

Power to the HOST

GND

Signal Ground

SGN

Frame ground

R.F.U.

Reserve for future use

N.C.

Not connected

Function

Output current limit of +12V OUT is less than 100mA

Output current limit of +5V OUT is less than 50mA

LED2, LED3 and BUZZER signals are transistor's open collector output.

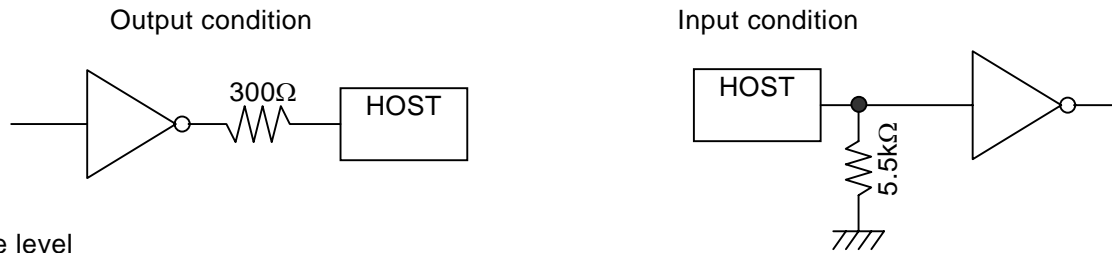
ON="L", $V_{OH}=30V$, $I_{OL}\leq 20mA$

Keep open at R.F.U. signals for future use.

14 Electrical characteristics of interface

14.1 TXD RXD RTX CTS DTR DSR

1) I/O Circuit

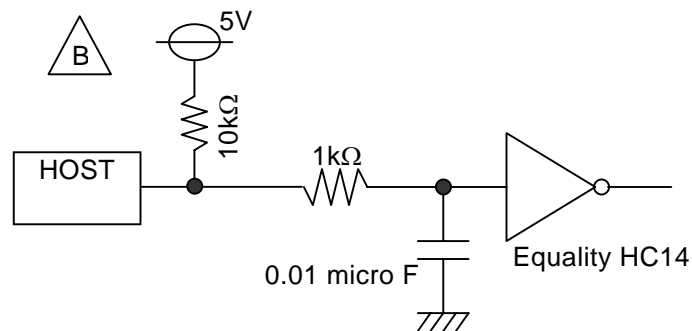


2) Voltage level

Name	Space	Mark	Condition
Meaning	0 / ON	1 / OFF	
Output condition	+5 to +15 V	-15 to -5 V	$R_L = 3$ to $7k\Omega$
Input condition	+3 to +30 V	-30 to -3 V	$R_{IN} = 3$ to $7k\Omega$

14.2 RESET

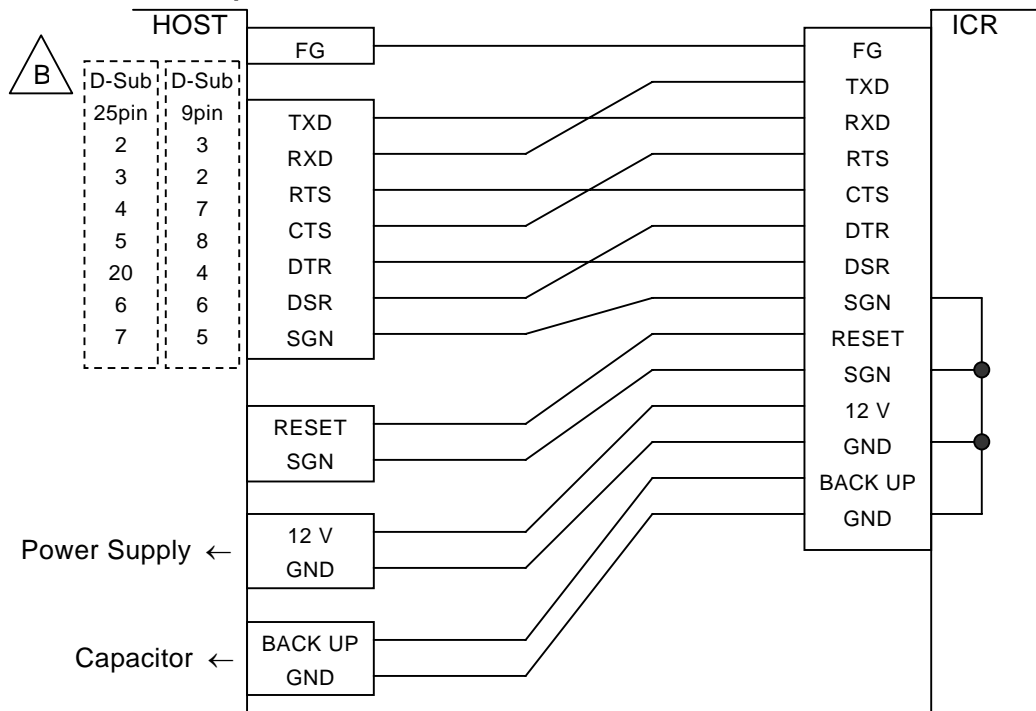
1) Input condition



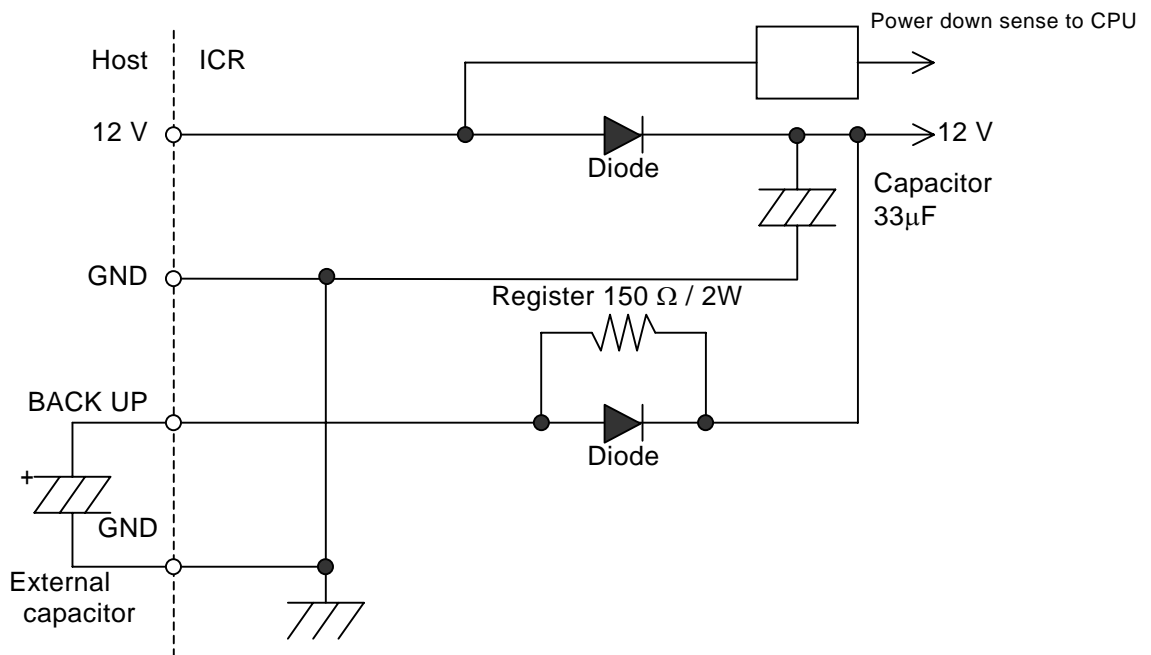
2) Voltage level

L	H
≤ 0.8 V	≥ 3.5 V

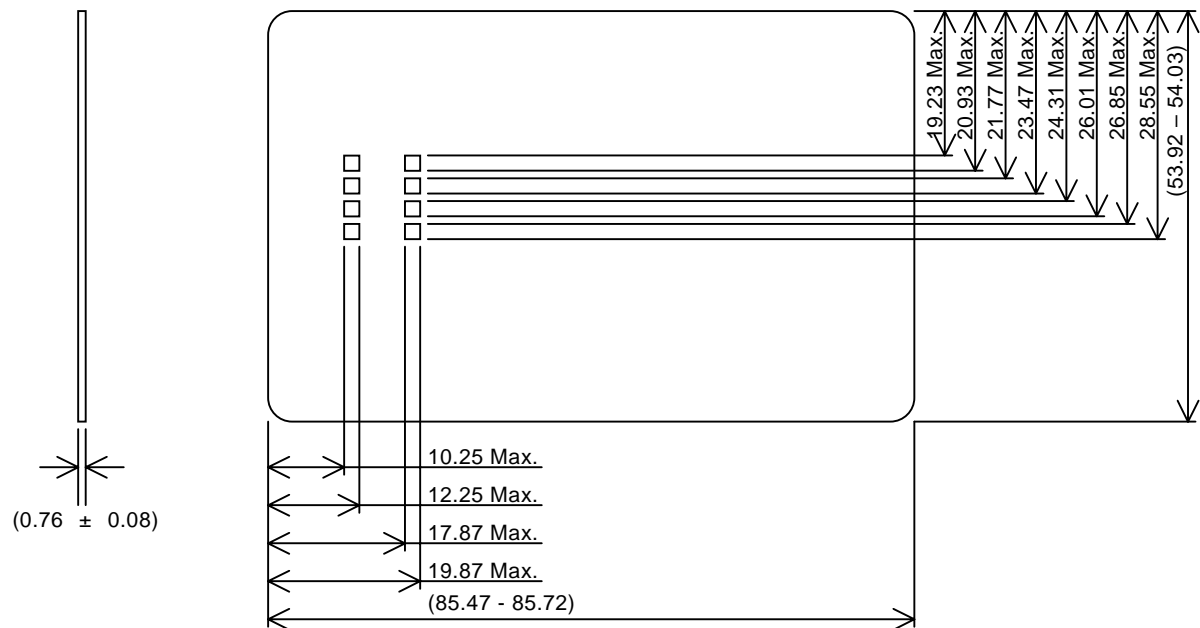
14.3 Connection example



14.4 Power down back up circuit

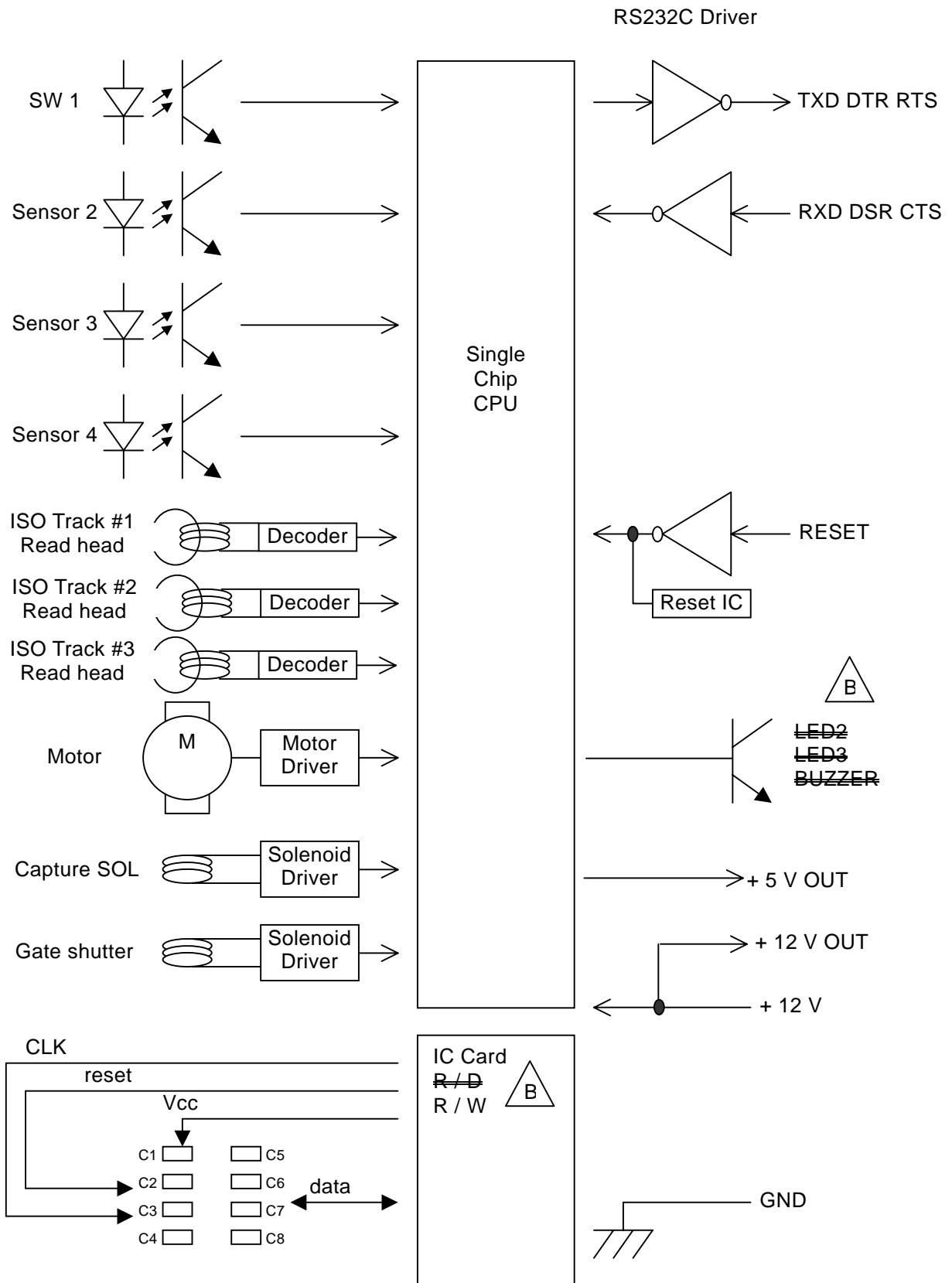


15 IC card connection point



NOTE No point of the IC contact surface shall be higher than 0.05mm above or lower than 0.1mm below the adjacent surface of the card.
 Connections come to contact with terminals in the range of squares.
 But there are no connections on IC card writer side which contact with terminals C4 and C8.

16 Block diagram



17 Periodical Maintenance

Dusts and oils on Magnetic Head, IC card contacts, rubber roller etc. may cause unexpected wrong motion and errors on magnetic / IC card readers. To prevent these, Sankyo recommend periodical cleaning on parts described below.

	Parts to be cleaned	Cleaning Frequency
1	Magnetic Read Head	Once per 2000 passes (Recommended)
2	Card Position Detect Sensor (S1-S4)	
3	IC Card Contact	
4	Rubber Roller	

"One pass" in this specification defines a forward and a reverse (a round transfer).

Maintenance shall be carried out at standard indoor environment.

17.1 Cleaning method

Cleaning by air blowing and/or by cleaning card. (Refer 17.3 for cleaning card)

If the cleaning by air blowing and/or by cleaning card is not effective and dirt remains on rollers, wipe rollers by cloth or cotton penetrated with a few cleaning liquid (Methanol etc.) on rotating rollers by hand. And, swipe cleaning liquid quickly.

17.2 Notes

- 1) Do not use cleaning cards shorter than standard when the card is transferred manually by rotating rollers with hand while the power is off. If a short card is inserted, it may be jammed in the ICR.
- 2) Do not use any cleaning liquid(Methanol etc.) on cleaning cards when the card is transferred by command control , such as "Entry" command or "Eject" command without sending "Mag. Read" command.
- 3) Check and confirm that ICR is well dried when ICR is operated after the cleaning.
- 4) Do not use cleaning cards which has breaks, cracks, separations of cleaning cloth, pills on surface, dirt etc. These may reduce cleaning effectiveness and may worsen situations.

17.3 Available cleaning cards and effectiveness

Manufacturer : MUSASHI CO.,LTD.

Product name : Tellac cleaning card /Dry for ATM card (Sankyo P/N: EGC219101)

Cleaning cards	Head	Sensors	IC Contacts	Rollers	Conditions
Tellac cleaning card	yes	yes	yes	Yes*	Transferred by command control

Marks in table above shows cleaning effectiveness.

yes : Can be cleaned

yes* : Can be cleaned with conditions

no : Can not be cleaned

yes* : Effective for only oils (hand oils) on surface of rubber rollers