

# Sankyo



## SPECIFICATION

Type Name :  
**ICM350-3R1170**

Spec. No. **ASR-NP-06200-01**

Notes :

NSGH
1

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		ICM350-3R1170			<b>NIDEC SANKYO CORPORATION</b>			
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**Revision History**

C

Please read the description of "Sankyo" of this specification as "NIDEC SANKYO CORPORATION"

<u>Rev</u>	<u>Date</u>	<u>Author</u>	<u>Description</u>	
B	22.Jun.2006	T.Orii	The change of the combination of the specification	ALL
B	22.Jun.2006	T.Orii	Correction of the description	P1,P3,P4,P7~P11
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## 1. Model No.

: ICM350-3R1170

INTERFACE SPECIFICATION : ASL-NP-06179-02

## 2. Appearance

## 2.1 Appearance drawing

: T01A578A01

## 2.2 Weight

: 175 [g] approx.

## 3. Functions

## 3.1 Card operation

: Manual insert and pull out operation.

## 3.2 Output/Input signal

: RS232C compatible

## 3.3 Mag.-Stripe Read

: Simultaneous Read on ISO Track No.1 , 2 and 3.  
Read Operation speed : 10 - 100 cm/S (At flat card)

## 3.4 IC card Read/Write

: Protocol Handling (T=0 and T=1)  
: IC contact location (ISO7816 Front side only)  
: Dual Voltage Vcc (5V, 3V)

## 3.5 Memory card Read/Write

: Memory Card GPM896, SLE4442, SLE4428, I2C (24C01~24C256)  
The other cards are options.

## 3.6 LED controller

: It can be indicated in accordance with the command from HOST by three colors.  
When ICM is powered correctly and normally, LED shows Green with blinking.

## 3.7 Card Latch

: When a card is fully inserted , a card is latched during the communication with IC card.  
Normal Open (A card can be pulled out at the time of power off)  
Note1) When the card is not pushed in completely, it may not be able to latch.  
Note2) If a user is going to pull out a card forcibly during a latch,  
even if ICRW cancels a latch, a latch may not be able to open.  
In this case, once a user must push in a card, and then, pull out a card.

## 3.8 Download

: The host can change a program by the down load. Max 100 times.

## 3.9 SAM

: Security Access Module (Icc:10mA max./Module) Plug-in SIM type

#### 4. Applicable card

##### 4.1 Magnetic card

: ISO/IEC 7810 , 7811 , 7813

##### 4.2 IC card

: ISO/IEC 7816/1 -3 (Icc: 60mA max)

: EMV '96 Ver 3.1.1

: EMV2000 Ver 4.0

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

Communication speed is establishment of global parameters F and D of TA1 which is returning with ATR.

Vpp is isolated from other contacts.

##### 4.3 Memory card

: GPM896, SLE4442, SLE4428, I2C (24C01~24C256)

#### 5. Block diagram

: Refer to a Fig. 1.

#### 6. Basic performance

##### 6.1 Insulation resistance

: 10 [MΩ] or more at D.C. 250 [V]

##### 6.2 Insulation voltage proof

: No discrepancy for one minute at D.C. 250 [V]

##### 6.3 Vibration Amplitude

Test methods-Mounting of components, equipment and other articles for vibration, impact and similar dynamic tests :IEC 60068-2-47:

##### 6.3.1 Vibration amplitude during operating

:IEC 60068-2-64:Test methods-Test Fh: Vibration, broadband random (digital control) and guidance.

Test frequency range : 5-500 Hz.

Acceleration spectral density : 0.5 GRMS.

Shape of acceleration spectral density curve Flat.

Duration : axis z for 100 minutes.

6.3.2 Vibration amplitude during storage

:IEC 60068-2-64:Test methods-Test Fh: Vibration, broadband random (digital control) and guidance.

Test frequency range : 5-500 Hz.

Acceleration spectral density : 2.16 GRMS.

Shape of acceleration spectral density curve Flat.

Duration : total 100 minutes for three axis (x, y, z).

6.4 EMI

: EN55022 Radiated emission Class B

(Shielded cables are required )

6.5 EMS

:EN55024:1998;Information Technology Equipment-Immunity characteristics

-Limits and method of measurements.

6.5.1 Immunity against electrostatic discharge

:IEC61000-4-2

Air Discharge +/- 8kV / Contact Discharge +/- 4kV

Discharge points (Front side of the Gate only)

Shielded RS232C cable is necessary. And FG is needed to connect completely between ICM330 and earth grounding through RS232C cable and host equipment. The level against ESD is changed due to FG connecting status or mounting posture. Then it is needed to confirm the ESD test requirement level at whole system.

6.5.2 Immunity against radiated field

:IEC61000-4-3 AM 3 V/m 80M-1GHz

6.5.3 Immunity against power frequency magnetic field

: IEC61000-4-8 3 A/m (50Hz/60Hz)

7. Power requirement

7.1 Power requirement

Voltage : D.C. +12 [V] ± 10 %

Ripple : Less than 100 [mVp-p].

Power impedance: 1 [Ω] or less.

7.2 Current consumption

Waiting(LED off) : Less than 150 [mA].

solenoid on : Less than 400 [mA].

rush (ICC on) : Less than 700 [mA] within 2mS

## 8. Environmental conditions

### 8.1 Operating temperature and humidity

: -20 [°C] ~ +50 [°C], 10 % ~ 95 % R.H. Non-condensation  
No permanent damage occurs between +50 ~ +60 [°C].

### 8.2 Storage temperature and humidity

: -20 [°C] ~ +70 [°C], 10 % ~ 95 % R.H., 96 [h]

### 8.3 Operating Maximum altitude

: 3,000 meters above sea level

### 8.4 Wet bulb temperature

: Less than +30 [°C]

## 9. Life

### 9.1 Unit life

: More than 1,200,000 passes. (Excepting Magnetic head and IC contacts.)  
Note) Unit life is limited to use in the office room and varies from the stained card.  
One pass is defined as operation of one time insertion and pull out of card.  
\* Magnetic head life : More than 300,000 passes.  
(Under Indoor and office use condition, more than 500,000 passes.)  
\* IC contacts life : More than 300,000 passes.  
(Under Indoor and office use condition, more than 500,000 passes.  
However, the guarantee against the wear of Gold Plating is up to  
300,000 passes though the communication with ICC can be possible  
up to 500,000 passes.)

### 9.2 Magnetic card life

: More than 1,000 passes.  
(In normal in office condition with ABA standard card)

### 9.3 IC card life

: More than 3,000 passes.

## 10. Failure rate

: Less than 10,000 Fit. (For P.C.B.)

## 11. Safety standard

: IEC60950 compliant

## 12. Mounting posture

: Card reader shall be set with the coin drop hole (debris hole) side down.

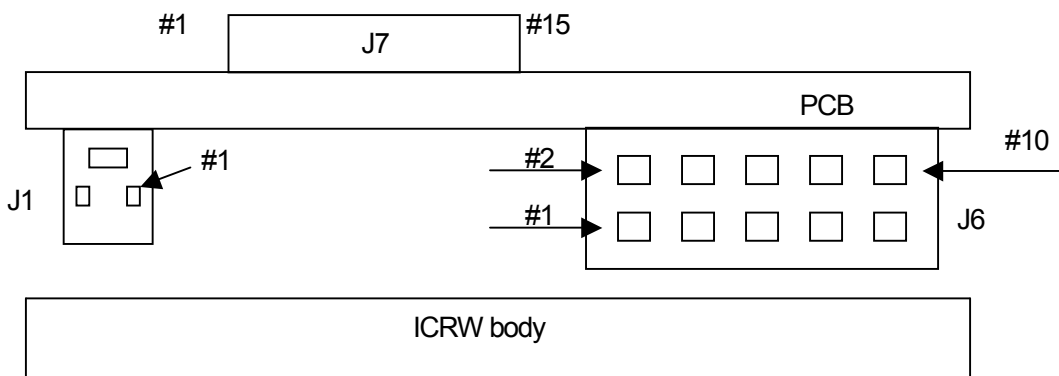
## 13. RoHS Directive

: RoHS compliance.



14. Interface connection

14.1 Connector pin assignment



14.2 Explanation of signal

(J6)

Pin No.	Signal Name	I/O Direction	Mean
1	+12V	IN	Vcc
2	GND	--	Vcc ground
3	TXD (SD)	OUT	Send data
4	RXD (RD)	IN	Receive data
5	RTS (RS)	OUT	Request to send
6	CTS (CS)	IN	Clear to send
7	Reset	IN	Reset signal
8	S.G.	--	Signal ground
9	N.C.	--	Not connected
10	F.G.	--	Frame ground

\* SG is connected to GND at the inside of ICRW.

\*\* Usable connector : 3662-5002LCSC(3M)

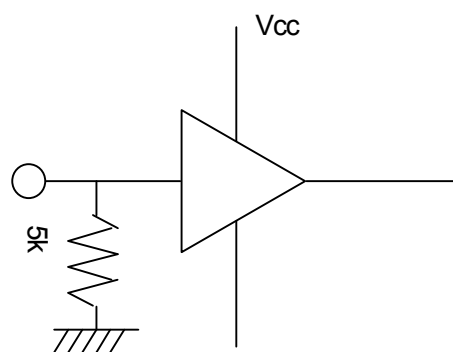
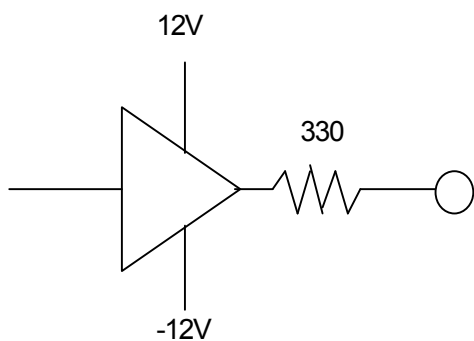
- 1) TXD (SD) Data transmission line and being effective when CS stays ON.  
Does not make any data transmission when CS stays OFF.  
Stays "MARK" condition when no data transmission is being taken place.
- 2) RXD (RD) Data reception line and being effective when RS stays ON.  
Should be hold "MARK" condition when on data transmission is being taken place.
- 3) RTS (RS) Should become ON when ICRW is available to receive data.
- 4) CTS (CS) Should become ON when HOST is available to receive data.
- 5) Reset Should become RESET status when Reset stays Mark/1/OFF.  
Also should become RESET status when Reset signal is not connected anywhere.
- 6) FG FG must be connected in short circuit using thick wire to the Host Frame ground.  
There is a capacitor (4700pF/250V) connection between SG and FG on main board.

14.3 Signal level

Name	Space	Mark
Mean	0 / ON	1 / OFF
*Output	+5 to +15 [V]	-15 to -5 [V]
Input	+3 to +20 [V]	-20 to -3 [V]

\*Typical value of ICRW  
output level is ± 9 [V]

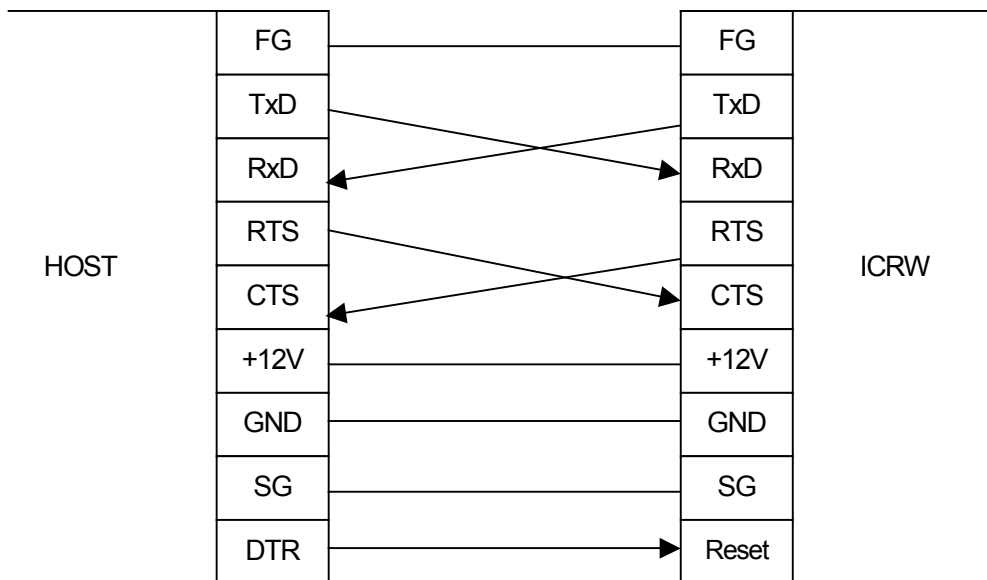
14.4 Input / Output



ST207EBTR(ST Microelectronics) or equivalent.

ST207EBTR(ST Microelectronics) or equivalent.

14.5 Connection Example



14.6 SAM Interface

14.6.1 4 more SAMs available on another board. (option)

I/F connector (J7)

Pin No.	Signal name	I/O
1	SEDCT	IN
2	PWRON	OUT
3	MCINT	IN
4	RDYMOD	I/O
5	RST	OUT
6	IO	I/O
7	GND	-
8	N.C.	-
9	SYNCLK	OUT
10	CSE	OUT
11	CSA	OUT
12	CSB	OUT
13	SEIN	IN
14	SECON	IN
15	+12V	-

Usable connector : 53261-1590 (MOLEX) : for Flat Cable

The SAM BOARD is able to handle maximum 4 SAMs. Each SAM is managed by means common multiplexed signals. For this reason, the SAM must be selected before to access to it. In order to maintain the SAM state, the handling of RST,VCC,CLK,VPP signals is on latches. All 4 SAMs are Plug-in SIM types. SAM Icc maximum is 10mA per module.

\* Board dimension 158mm x 61.5mm x 14.6mm

14.6.2 SAM connector on the main board pin assign

Connector ID1A-6S-2.54SF(21) (HIROSE) for Plug-in SIM type (GSM11.11)

Pin No	Mean
1	C1 VCC
2	C2 RST
3	C3 CLK
4	C5 GND
5	C6 VPP
6	C7 I/O

14.7 Capacitor connector for power failure transaction

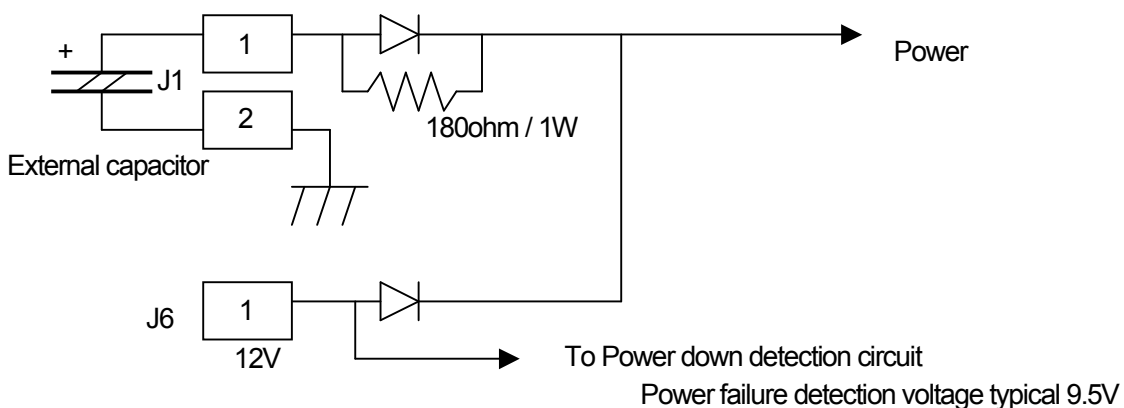
This model can operate power failure transaction using outside capacitor for future card application or something another purpose.

14.7.1 Pin assignment (J1)

J1 Connector 5046-02A (MOLEX)

Pin No	Signal name	Function
1	ECP	External capacitor +
2	ECM	External capacitor -

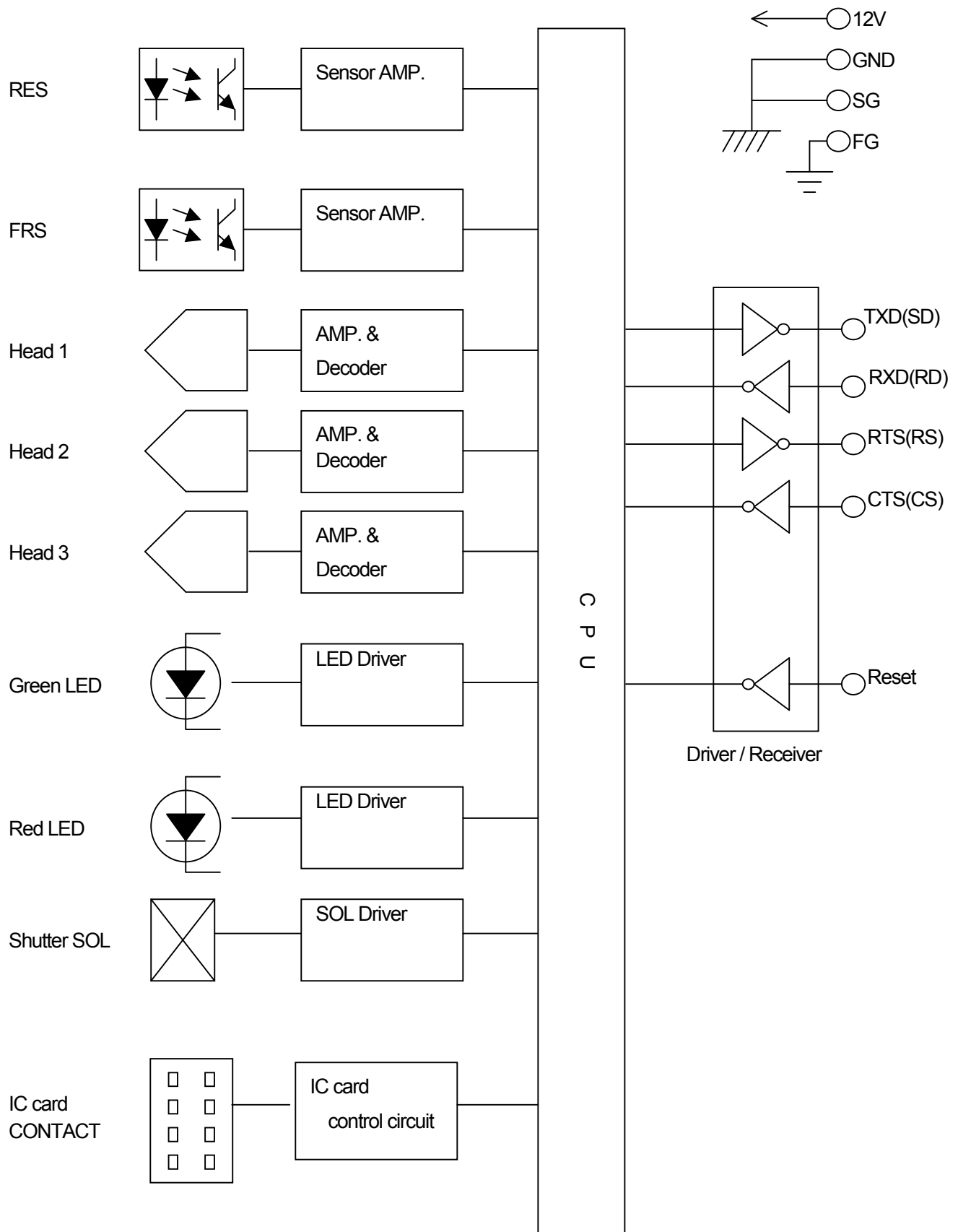
14.7.2 Power circuit



14.8 Cables requirement

All connecting cables are required less than 3 meters. I/F cable is needed shielded one for EMC. In case of using option SAM expansion board, this cable length is recommended less than 0.2 meters.

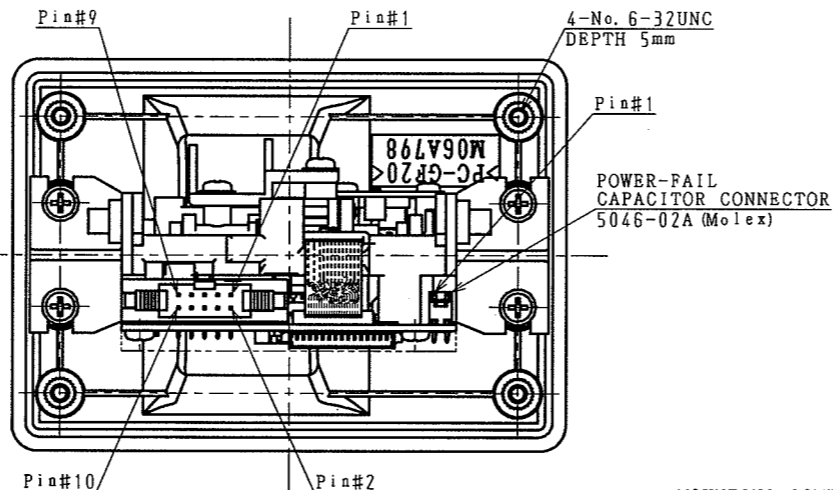
Fig.1. Block diagram



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PIN No.	SIGNAL NAME
1	C1 (Vcc)
2	C2 (RST)
3	C3 (CLK)
4	C5 (GND)
5	C6 (Vpp)
6	C7 (I/O)

CONNECTION (SAM CONNECTOR)

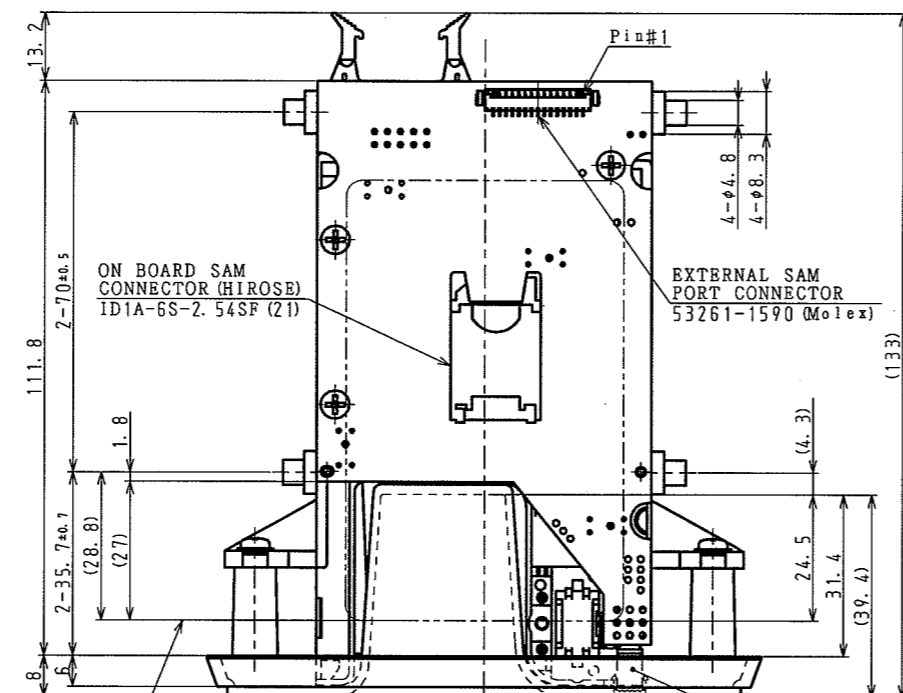
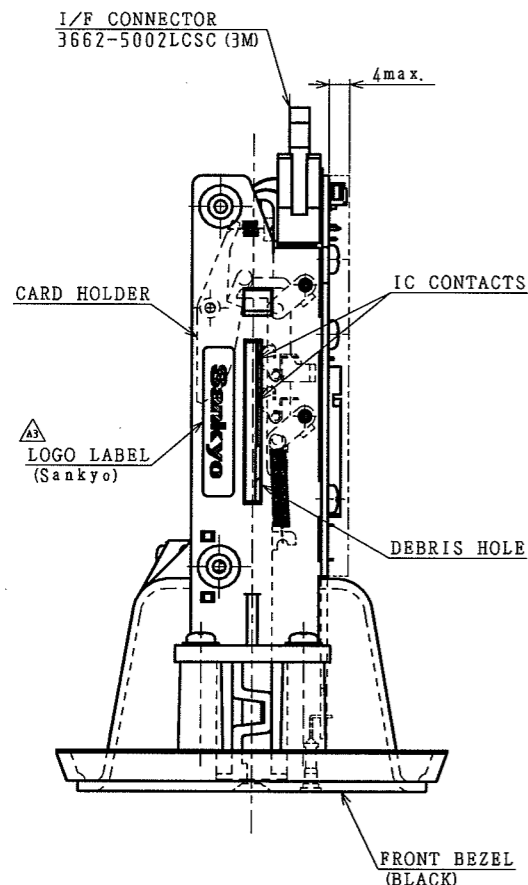


PIN No.	SIGNAL NAME	I/O DIRECTION
1	ECP	IN
2	ECM	OUT

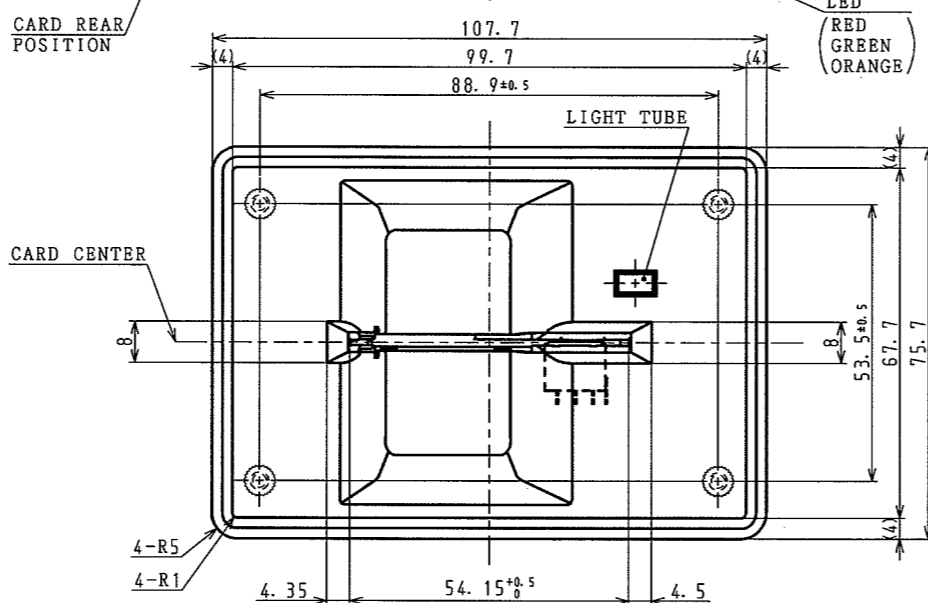
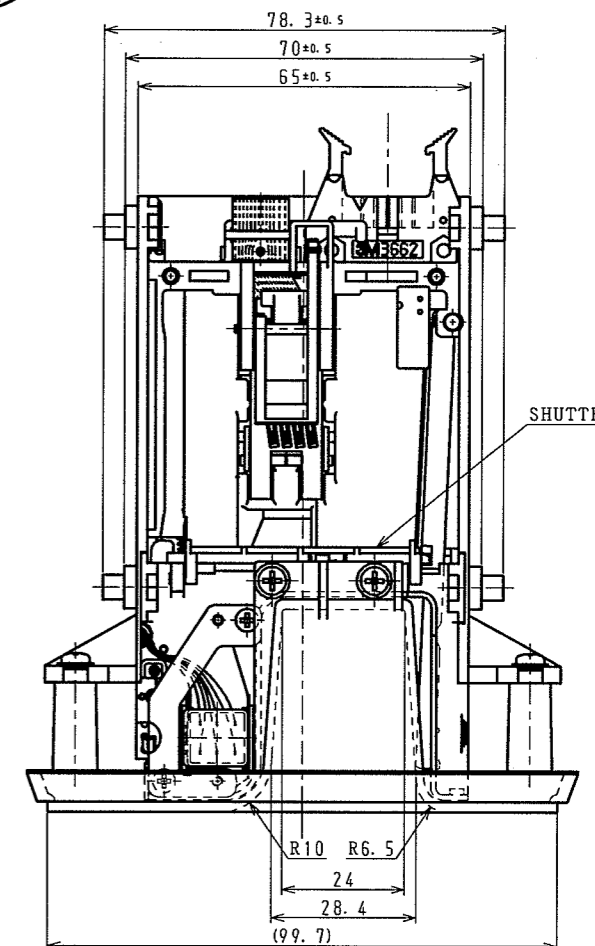
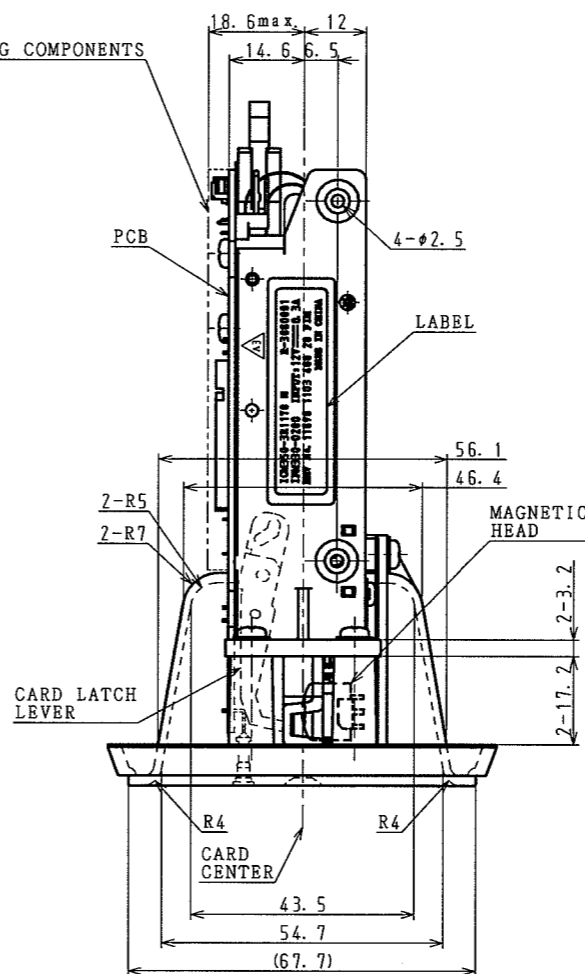
CONNECTION (CAPACITOR CONNECTOR)

PIN No.	SIGNAL NAME	I/O DIRECTION
1	+12V	IN
2	GND	---
3	TXD (SD)	OUT
4	RXD (RD)	IN
5	RTS (RS)	OUT
6	CTS (CS)	IN
7	Reset	IN
8	SG	---
9	N. C.	---
10	FG	---

CONNECTION (I/F CONNECTOR)

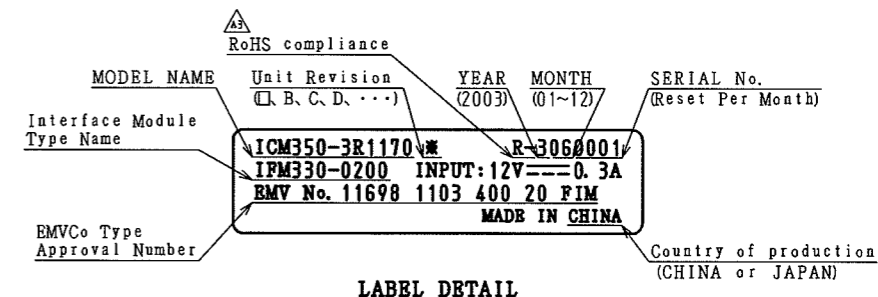


MOUNTING COMPONENTS



PIN No.	SIGNAL NAME	I/O DIRECTION
1	SEDCT	IN
2	PWRON	OUT
3	MCINT	IN
4	RDYMOD	I/O
5	RST	OUT
6	I/O	I/O
7	GND	---
8	N. C.	---
9	SYNCLK	OUT
10	CSE	OUT
11	CSA	OUT
12	CSB	OUT
13	SEIN	IN
14	SECON	IN
15	+12V	---

CONNECTION (EXTERNAL SAM CONNECTOR)



LABEL DETAIL

REF. DRAWING T01A157A01	PROJECT No.	TITLE OUTSIDE_DRAWING
PROJECTION UNIT SCALE TOLERANCE	SECTION CRD	DRAWING No. T01A578A01
DESIGN E. Hirasawa Aug. 06. 2003	CADCHK T. Taitai Aug. 06. 2003	ID No. 01/01

No. PER UNIT	No. OF REQUIRED	SYM	No. OF REV.	DESCRIPTION	EC No.	DATE	DESIGN	APPR
3				Environmental correspondence	BB-03378-06	Mar. 17. 2006	E. Hirasawa	T. Taitai