

EXHIBIT C

PRODUCT SPECIFICATIONS

Name: Automatic Loading Type Smart Card Reader/Writer
With SIM Reader/Writer

Model: M-660A,670A,680A

Hitachi, Ltd.

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Specifications will be changed without notice for improvement of the product.

1. Outline

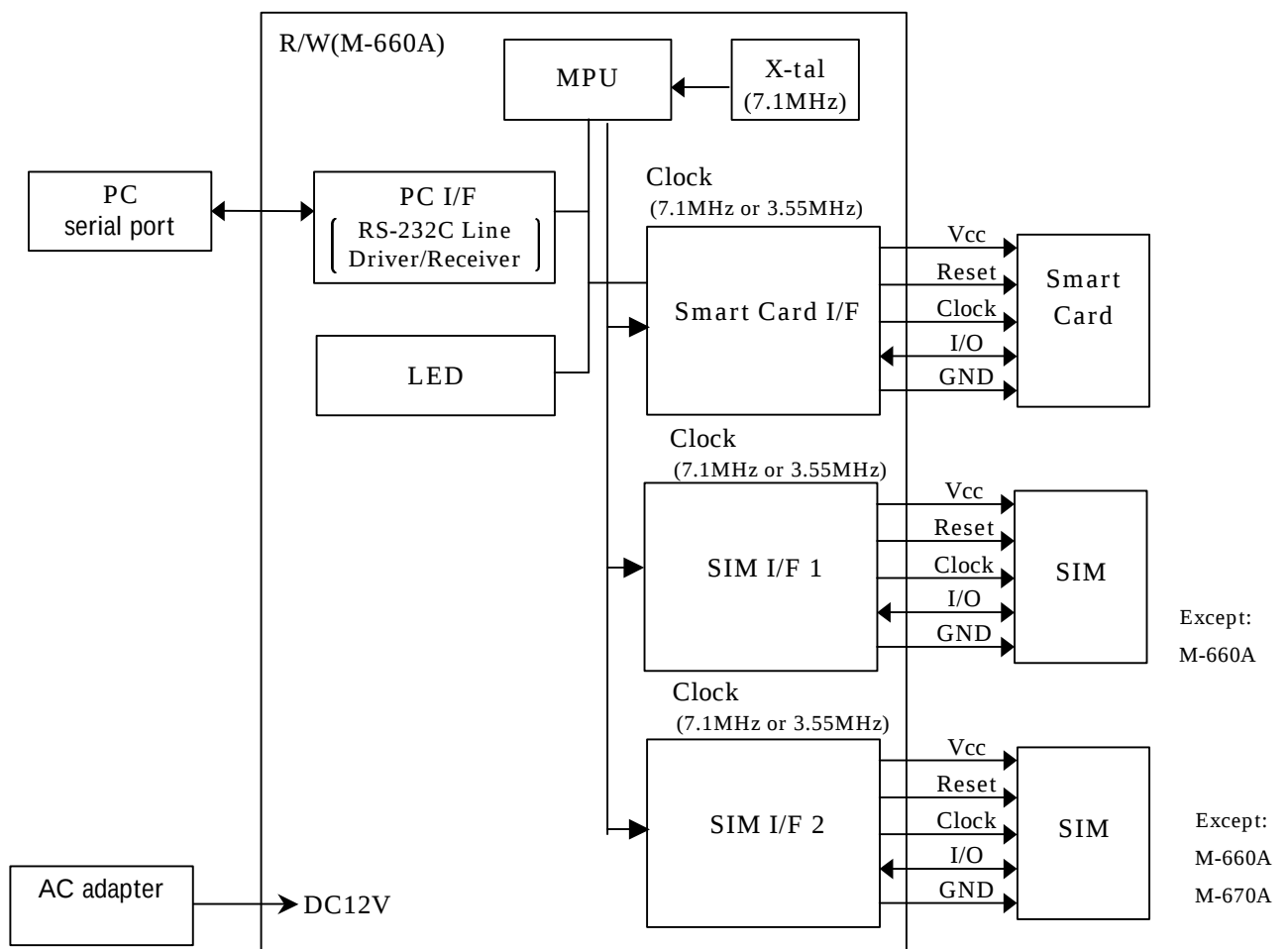
This product is an automatic loading insertion/ejection smart card reader/writer(R/W) (with SIM R/W) to organize smart card system with PC.

2. General Specifications

Name	Automatic Loading Type Smart Card Reader/Writer with SIM R/W		
Model	M-660M,670A,680A		
Card insertion/ejection	Motor drive		
Applicable smart card	Smart card conforming to ISO7816 with “T=0” and “T=1” protocol. But, use it after you confirm conformity with a smart card to use, and this product. Note: No Vpp control. And maximum value for card warp 2.0mm.		
Interface	Serial interface (conforming RS-232C D-sub 9pin)		
Power supply	DC12V $\pm$ 5%, 800mA max.		
Durability	Smart card insertion/ejection 250,000passes(number of insertion/ejection times, warranty for 6 months after supply) SIM insertion/ejection 100,000passes(number of insertion/ejection times, warranty for 6 months after supply, only,M-670A,M-680A)		
Outer dimensions	90mm(W) $\times$ 135mm(D) $\times$ 41mm(H)		
Weight	about 260g		
Operating conditions	5 ~ 40	30 ~ 85%RH (No condensation)	
Storage conditions	-10 ~ 50	30 ~ 90%RH (No condensation)	

3. Composition

Following figure shows block diagram of R/W.



4. Interface

4.1 PC interface

Following table shows data transmission specification between PC and R/W.

Table. Data transmission specifications between PC-R/W

#	Item	Specifications
1	Transmission method	half duplex transmission method
2	Character format	ST + Data + P + SP ST : start bit 1 bit Data : data bit 8 bit P : parity bit 1 bit SP : stop bit 1 bit
3	Synchronous method	Asynchronous method(RS-232C,non-procedural)
4	Transfer rate	9600bps, 19200bps
5	Error detection	vertical parity(even number) horizontal parity(exclusive OR)
6	Bit detection	LSB first positive logic

Table. Pin assaign of RS-232C connector (D-sub 9pin)

Pin No.	Pin Name	Signal direction	
		R/W	PC
1			
2	RD	→	
3	SD	←	
4			
5	SG	-	
6	DR	→	
7	RS	←	
8	CS	→	
9			

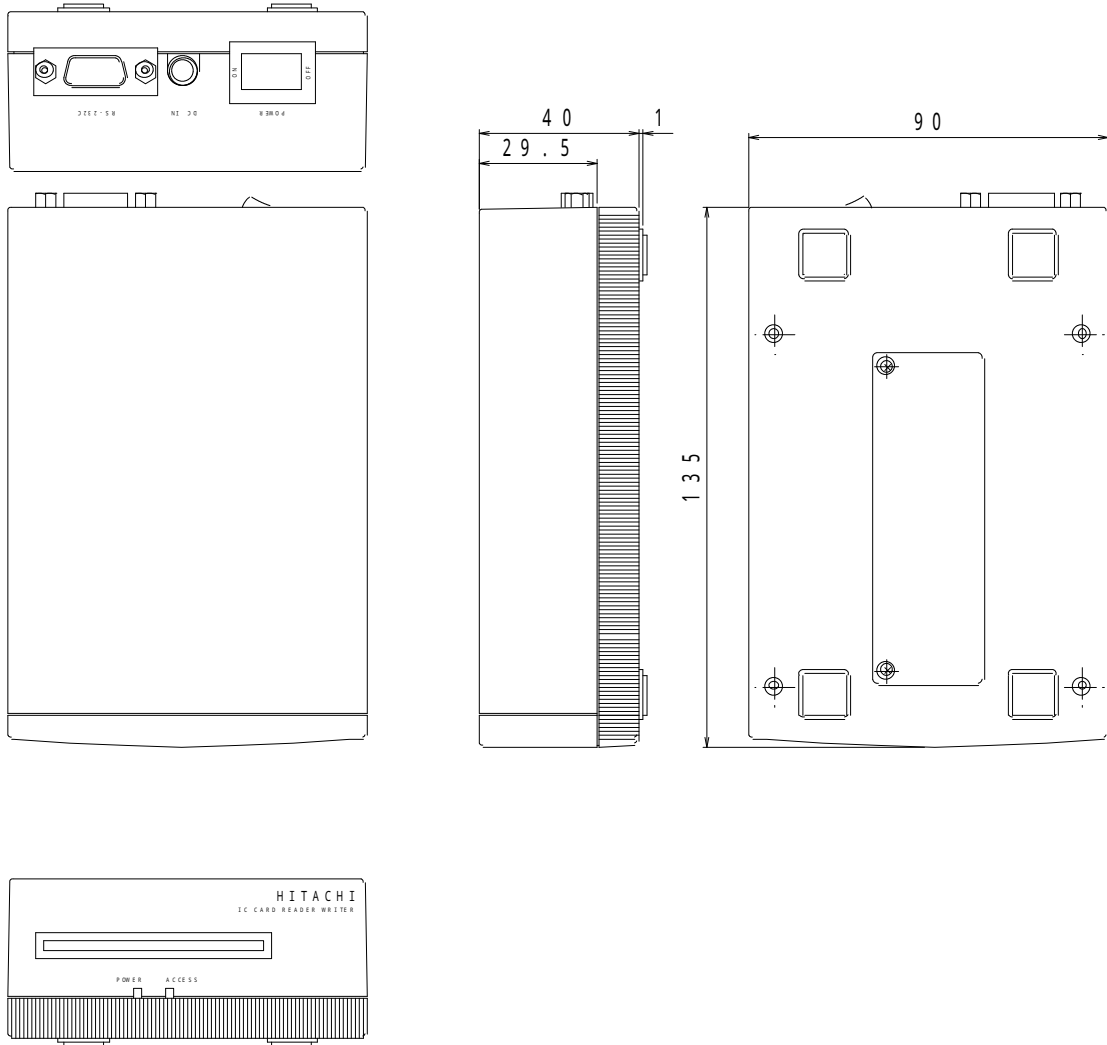
4.2 Smart card and SIM interface

Following table shows data transmission specification between R/W and smart card.

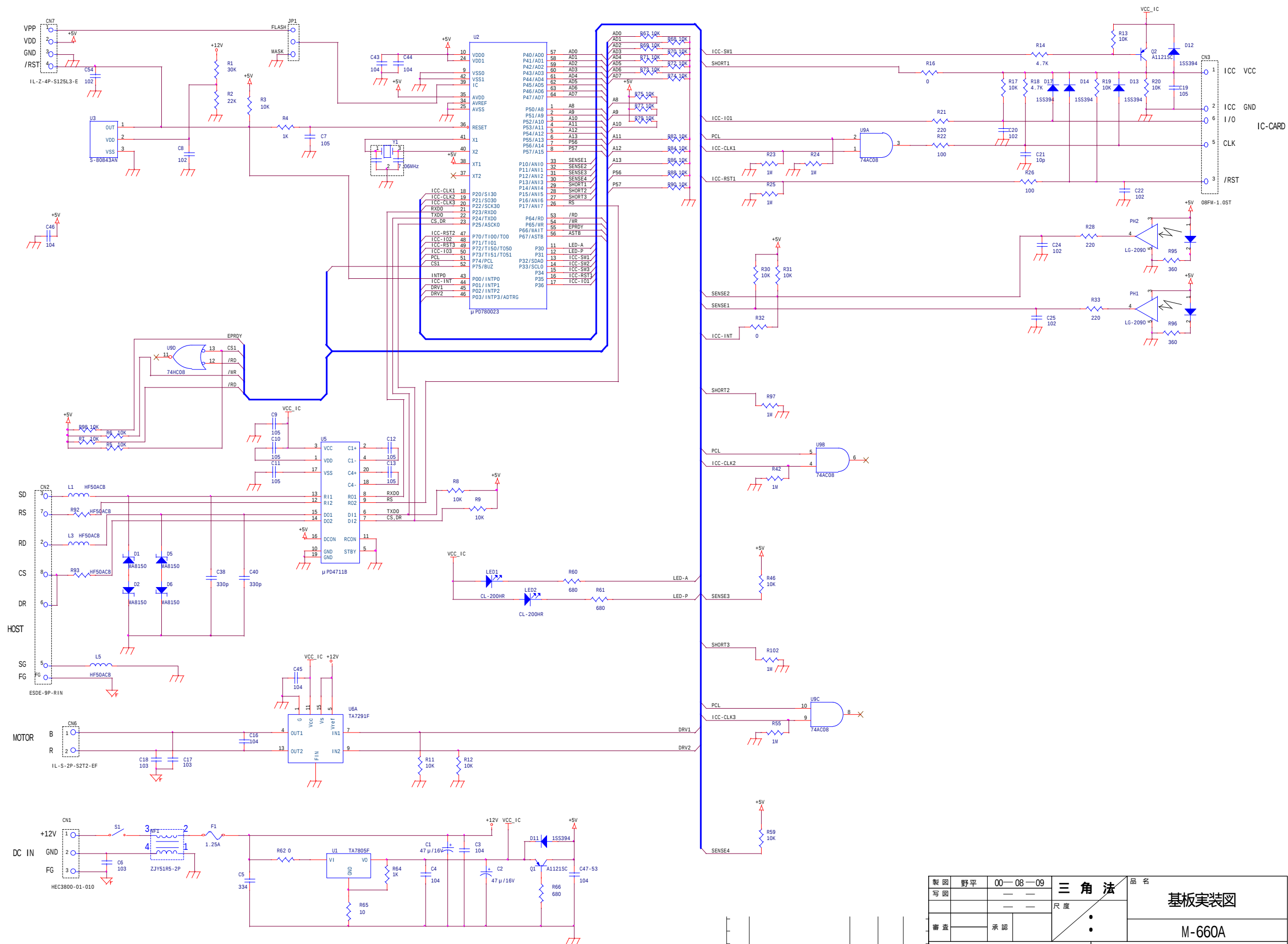
Table. Data transmission specifications between R/W-Smart card and SIM

#	Item	Specifications
1	Transmission method	half duplex transmission method
2	Character format	ST + Data + P + GT ST : start bit 1 bit Data: data bit 8 bit P : parity bit 1 bit GT : guard time variable
3	Synchronous method	Asynchronous method
4	Transfer rate	9600bps, 19200bps
5	Error detection	vertical parity LSB first: even number MSB first: odd number horizontal parity(exclusive OR)
6	Bit detection	LSB first positive logic or MSB first negative logic
7	Card power supply	5V ± 10%
8	Card supply clock	3.55MHz ± 3%, 7.10MHz ± 3%

5.Device Dimensions



unit: mm



1. ICノ電源八指定無キモノハ+5Vトスル
2. C47-53/HC**ノ電源近クニ配置スル事

cf.

記号	来歴	年月日	訂正	承認

製図	野平	00-08-09	三角法	品名
写図			尺度	基板実装図
審査	承認		：	M-660A
マクセル精器株式会社				図番