Contactless Reader Module CA-CLM User's Manual

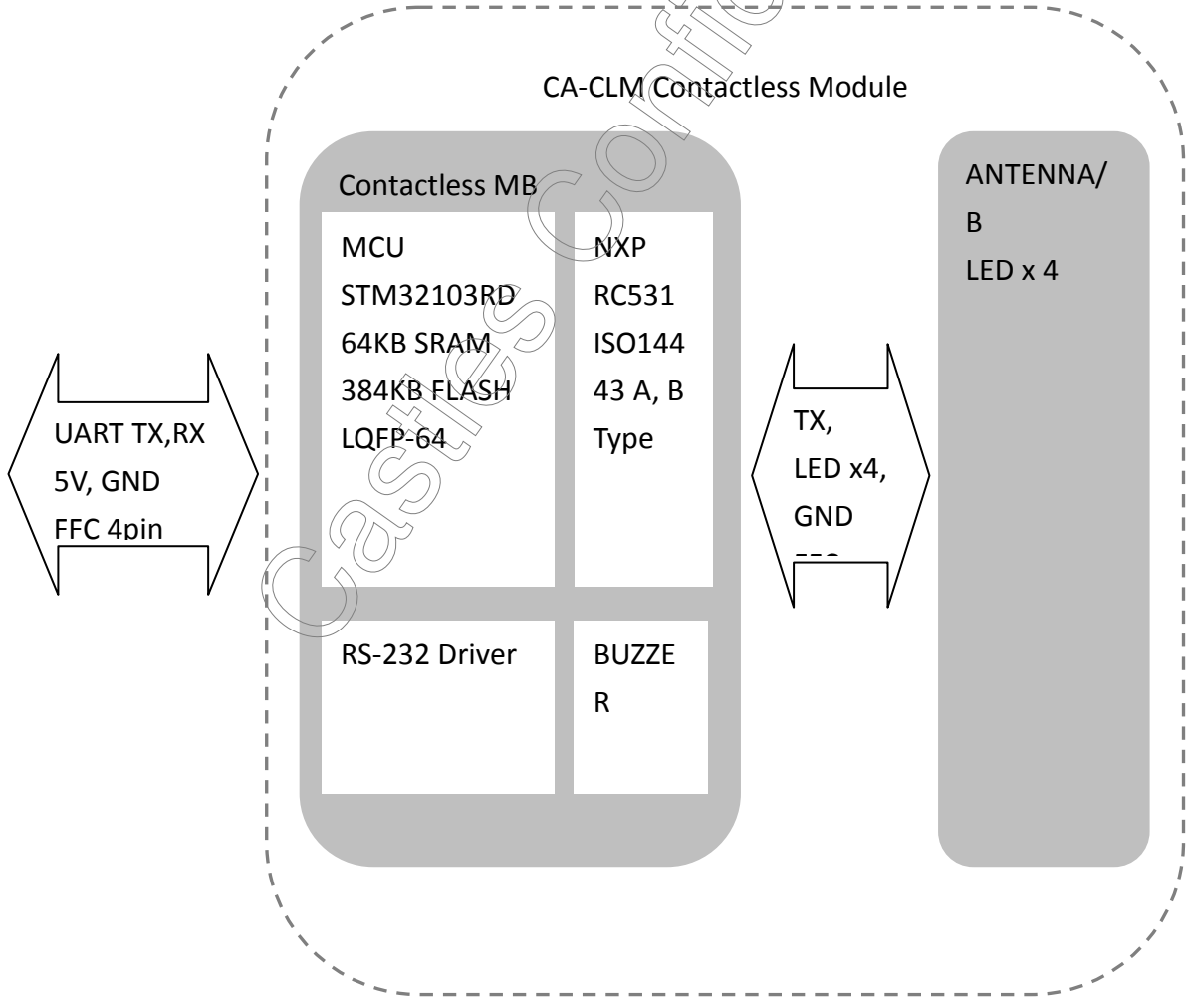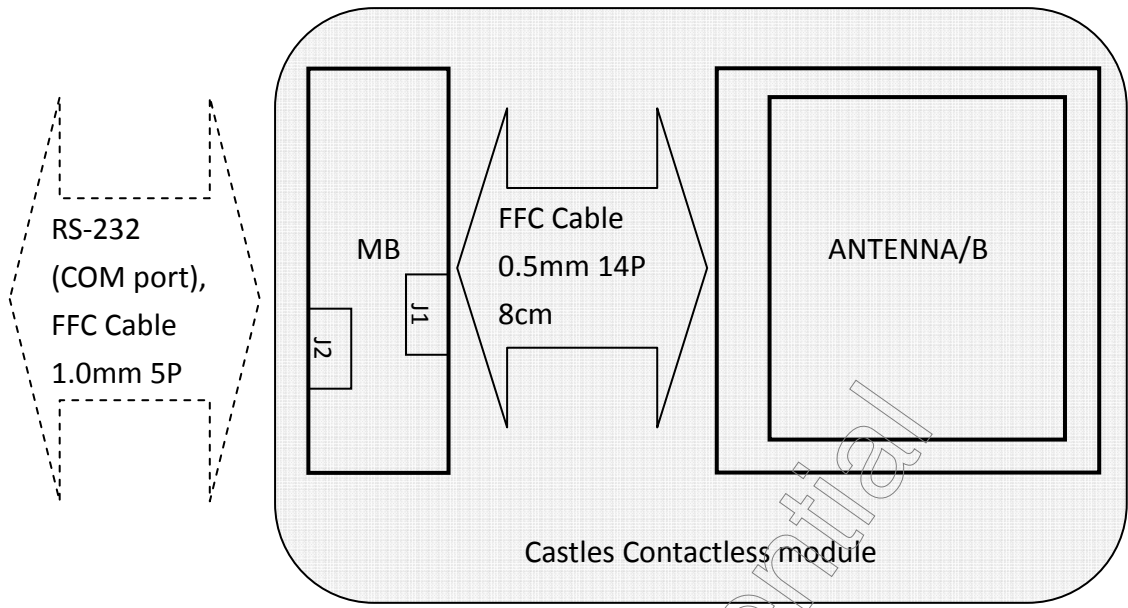警語
依據低功率電波輻射性電機管理辦法
第十二條　　經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。
第十四條　　低功率射頻電機之使用不得影響飛航安全及干擾合法通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

Introduction

Castles Technology CA-CLM contactless reader module is based on RFID (Radio Frequency Identification) technology and adopted HF (High Frequency) 13.56MHz band to have the communication protocol ISO14443 type A, B standard to interact the contactless smart card (a specified RFID tag) for specified applications like payment control and scheme. The reader has a baseband processer to handle host communication through RS232 interface, and to communicate RF analog front end (RF band chip) through SPI interface. RF chip is charged of air interface protocol and modulation to handle the communication with contactless smart card or so-called RFID tag through antenna. When the reader is operating, RF energy is transmitted by RF chip through antenna continually, and also the polling of response of card landing, once card is close to reader antenna, card will be energized by reader antenna RF energy, and responses to reader in specified standard for application required from host. The reading or writing of card will be occurred frequently during card landing on the reader. Also the indication LEDs and buzzer are included in this module for application need. Following is a block diagram about CA-CLM contactless reader to show the structure of RFID reader did.

RS-232
(COM port),
FFC Cable
1.0mm 5P

Castles Contactless module

MB

J1

J2

FFC Cable
0.5mm 14P
8cm

ANTENNA/B

CA-CLM Contactless Module

Contactless MB

MCU
STM32103RD
64KB SRAM
384KB FLASH
LQFP-64

NXP
RC531
ISO144
43 A, B
Type

UART TX,RX
5V, GND
FFC 4pin

RS-232 Driver

BUZZE
R

TX,
LED x4,
GND

ANTENNA/
B
LED x 4

Operation

This module only allow 5V DC power source for operating power used, and a battery backup 3V DC for RTC used (backup power is required if necessary). The host side has a RS232 interface for host connection to receive or transmit relevant data from or to host may be like PC or Embedded system which AP (Application Program) executed. Antenna board should be connected to MB with a FFC cable when you received. The blue LED on antenna board will be on and buzzer beep when power on normally. At the meantime, this reader is operating and transmits RF (radio frequency) signal for card reading. Once contactless card landing or closing within reading distance, the orange LED will show the reading processing, and the green LED will show the success of reading. Alternative the red LED will show any error when reading process. May be buzzer beep also combine the LED indications in some case.

Connection

Type: FFC ZIF 1.0mm pitch 5 pin 90D upper contact (SCG BL113-05RU-TAND)
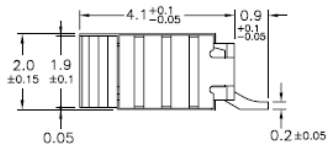
Pin definition:

| Pin No.	Name	Type	Remarks
1	GND	Input	
2	RS232 RX	Input	
3	RS232 TX	Output	
4	VCC_5V	Input	DC 5±0.05V Max. 350mA
5	VCC_BKP_3V	Input	RTC power 1.8V (MIN.) 3.6V(MAX.) Max. 5uA

RF sensitive area in 2D, 3D

In order to maintain good reading ability of contactless module for the requirements from EMV contactless certificate, the antenna board should be positioned and considered in specified area as following described.

2D: Any metal or conductive material is forbidden in the operating area shown as below.
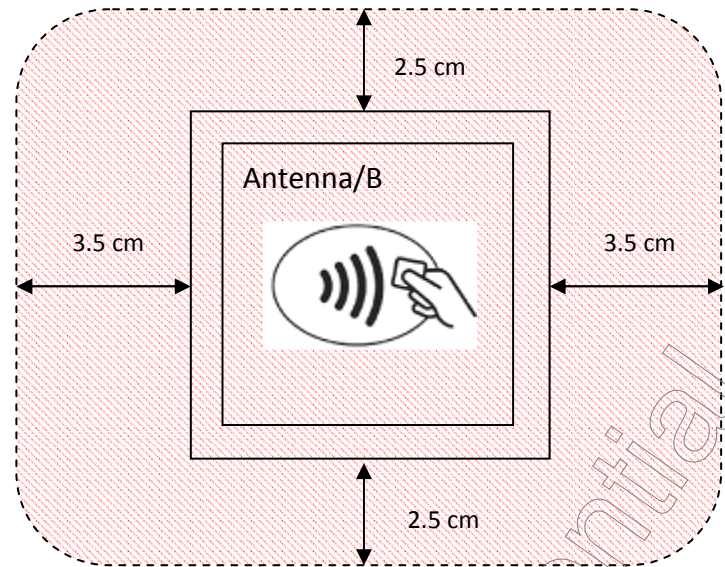
3D: Any metal or conductive material is forbidden in the operating volume shown as below.
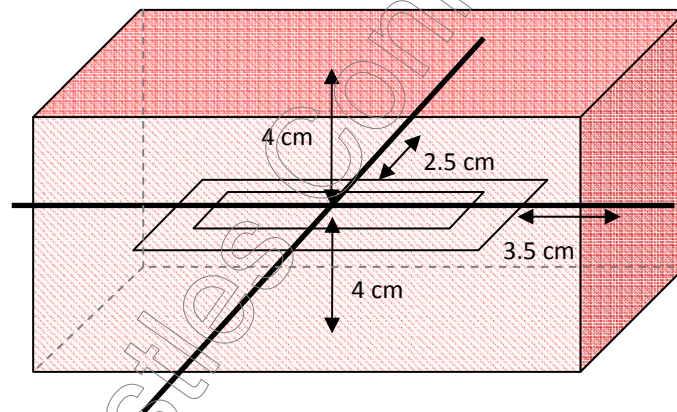
Environmental

- Operating temperature: 0℃ to 40℃
- Storage temperature: -20℃ to 80℃
- Operating humidity: 15% to 90%, non-condensing

Certificate Compliant

- EMVCo 2.0
- EMC (CE、FCC CLASS B)

Vendor Information

- 虹堡科技股份有限公司 (Castles Technology Co., Ltd)
- 辛華熙 (Kevin Xin)
- 231 新北市新店區北新路三段 205 號 2 樓 (2F, No.205, Sec.3, Beixin Rd., Xindian District, New Taipei City 23143, Taiwan)

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依據低功率電波輻射性電機管理辦法 第十二條 經型式認證合格之低功率射頻
電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原
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合法通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電
機設備之干擾。

Notice

This device complies with Part 15 of FCC rules. Operation is subject to the following
two conditions: (1) This device may not cause harmful interference, and (2) this
device must accept any interference received, including interference that may cause
undesired operation.

Warning:

Changes or modifications not expressly approved by the party responsible for
compliance could void the user's authority to operate the equipment.
 End Product Labeling:

The final end product must be labeled in a visible area with the following:

"Contains TX FCC ID: WIYVEGA5000"

Manual Information to the end User: The OEM integrator has to be aware not to provide
information to the end user regarding how to install or remove this RF module in the user's
manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.

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