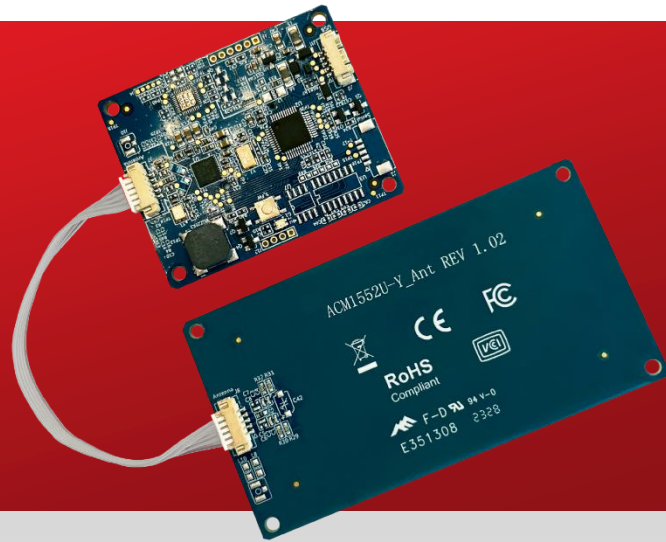




Advanced Card Systems Ltd.
Card & Reader Technologies

ACM1552U-Y

USB NFC Reader Module with Detachable Antenna Board



User Manual V1.02



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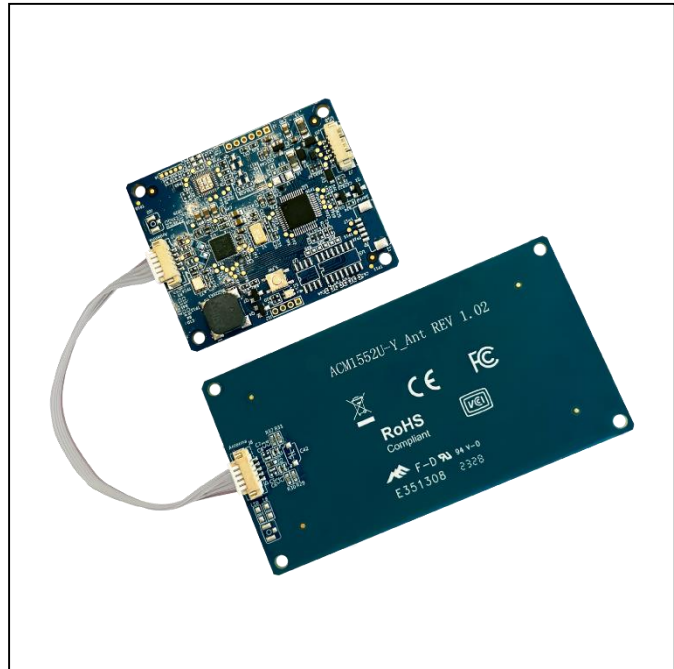


1.0. Introduction

The ACM1552U-Y USB NFC Reader Module with Detachable Antenna Board was developed based on the 13.56 MHz contactless technology. It can access contactless card and devices following the ISO 14443, ISO 15693 and ISO 18092 standards. This smart card reader module is designed for fast and easy integration to embedded systems.

ACM1552U-Y is a CCID & PC/SC compliant reader, this plug-and-play NFC reader makes use of high-speed communication for contactless cards at a maximum of 848 kbps, which makes it suitable for highly demanding applications. It also supports three modes: smart card reader/writer, keyboard emulation, and card emulation, making it a powerful all-in-one device that is cost-effective and flexible for many smart card applications.

ACM1552U-Y comes with a detachable antenna and an optional USB cable which allow it to be the perfect front-end interface module for NFC transaction applications including vending machine payment systems, kiosks, gaming machines, and other integrated systems.

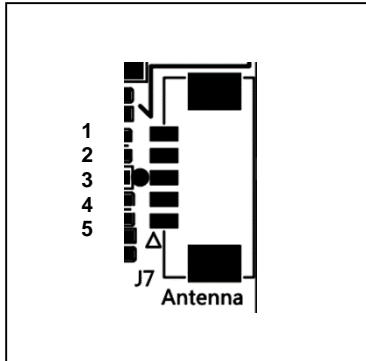


2.0. Detachable Antenna

The ACM1552U-Y is designed to offer a detachable antenna board that will best fit the embedded system. The detachable antenna board may be connected to any front-end interface module to enable NFC transactions.

To do this:

1. Connect antenna cable to **J7** of ACM1552U-Y main board (see **Figure 1**).



- 1 GND
- 2 ANT_1
- 3 ANT_GND
- 4 ANT_2
- 5 GND

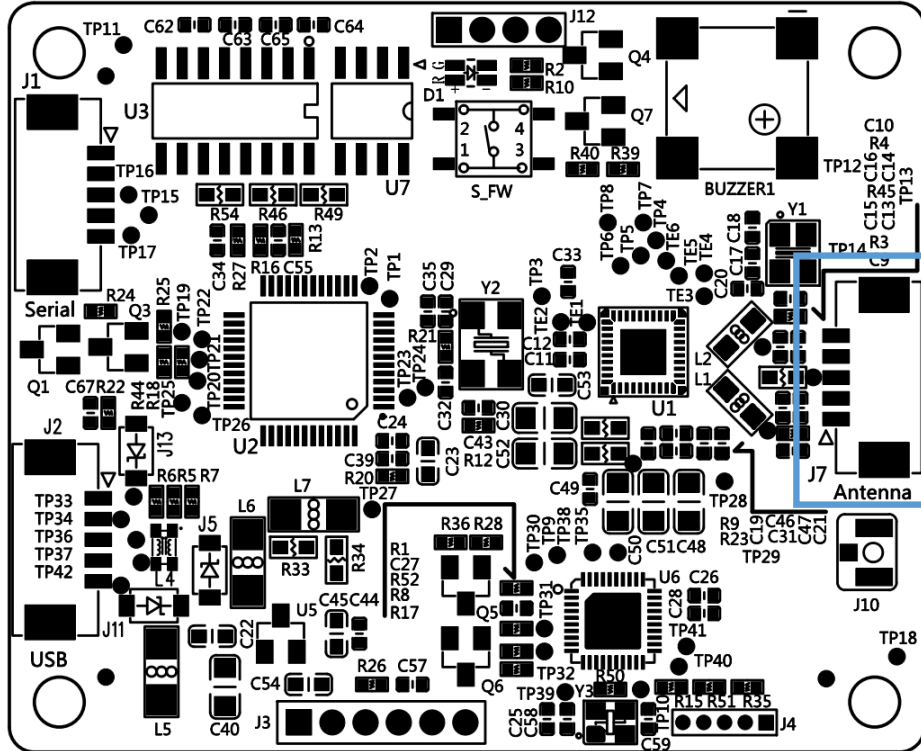
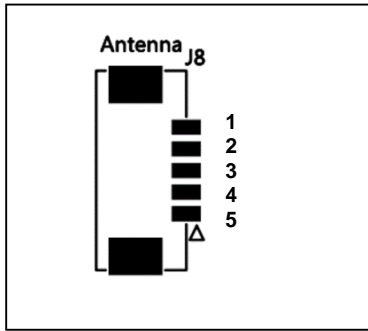


Figure 1: ACM1552U-Y Main Board

2. Connect antenna cable to **J8** of the ACM1552U-Y antenna board (see **Figure 2**).



- 1 GND
- 2 ANT_2
- 3 ANT_GND
- 4 ANT_1
- 5 GND

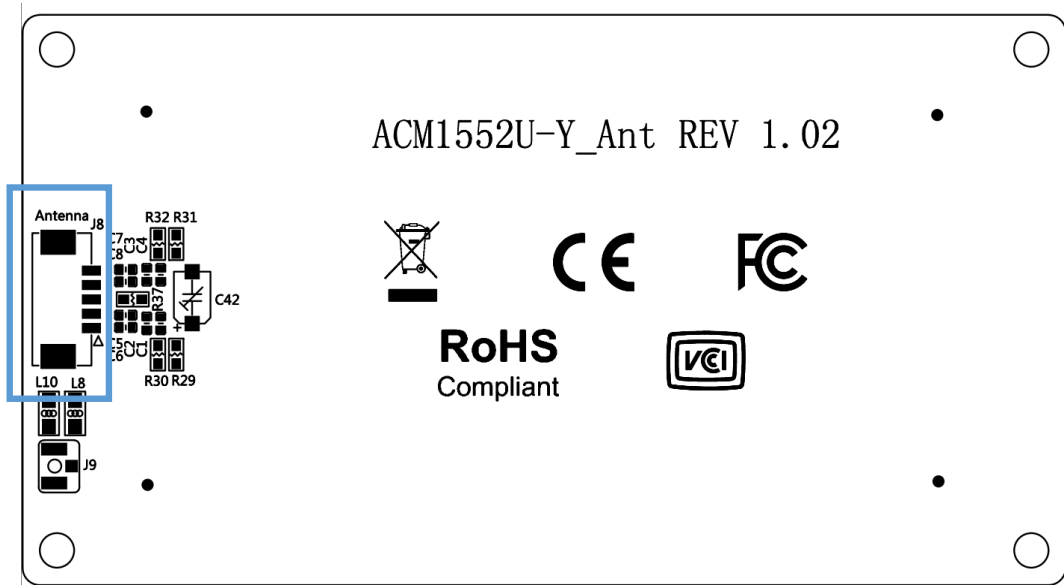


Figure 2: ACM1552U-Y Antenna Board

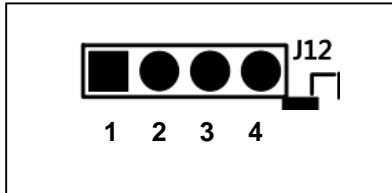
3.0. PIN Assignment

3.1. LED Configuration

There is a bi-color LED on ACM1552U-Y to display and control its operation status. These are Blue and Green in which can be extended to other peripherals as well.

To do this:

1. Connect jumper to **J12** for the LED status of power and card signals (see **Figure 3** and **Figure 4**).



- | | |
|---|-----------|
| 1 | 3.3 V |
| 2 | Blue LED |
| 3 | Green LED |
| 4 | GND |

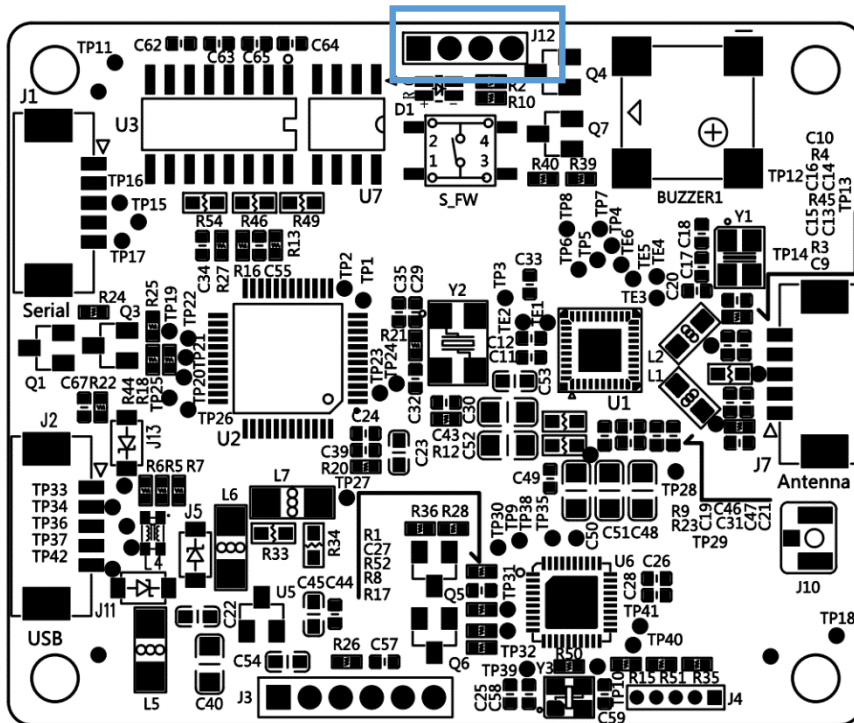


Figure 3: ACM1552U-Y LED Configuration

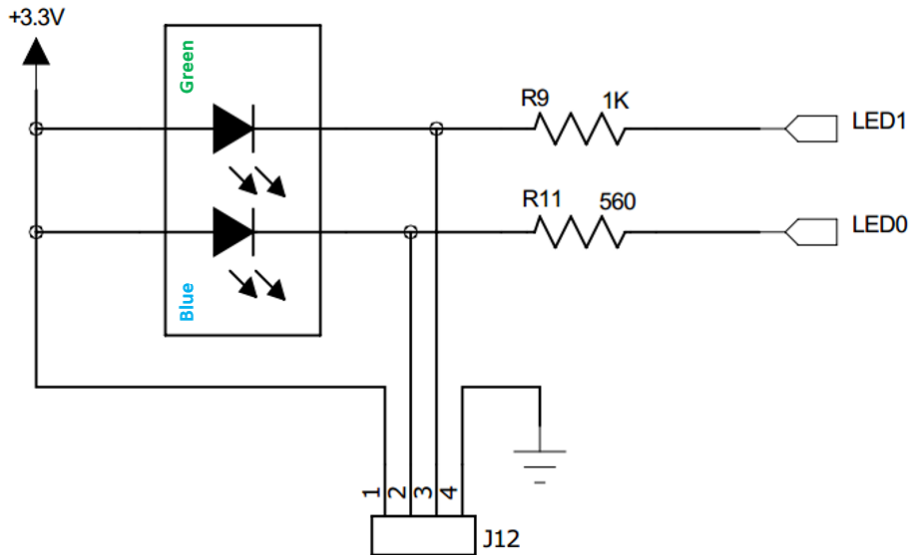


Figure 4: ACM1552U-Y LED Circuit

3.1.1. LED for Power status

The default LED setting are fast blinking **Blue** and **Green** when the power is on and then remain **Blue**. These LEDs cannot be controlled.

3.1.2. LED for smart card operation status

To control the LED's output and check the LED's behavior for smart card operation status (**J12**), please refer to *ACR1552U Series Reference Manual*. This reference manual will discuss the detail how PC/SC APDU commands were implemented for the contactless interface and device peripherals of ACM1552U-Y.

3.1.3. Default LED Behaviors

a) PICC

Below shows the default LED behaviors for readers with PICC Interface.

Behavior	PICC Interface
1. Standby Mode (No Card Detected)	Blue ON
2. Card Detected	Blue ON
3. Communication	Blue BLINK (Fast)
Additional Remarks	Color can be changed via application (using bi-color LED) Behavior (On/Off) can be configured via app

Note: User configurable interval for LED Flashing is not recommended as it may affect polling interval.

b) PICC + SAM

Note: SAM slot is an optional feature.

Below is the default LED behavior for readers with PICC + SAM slots.

Behavior	PICC Interface	SAM Interface
1. Standby Mode (No Card Detected)	Blue ON	OFF
2. Card Detected	Blue ON	OFF
3. Communication	Blue BLINK (Fast)	N/A
Additional Remarks	Color can be changed via app (using bi-color LED) Behavior (On/Off) can be configured via application	

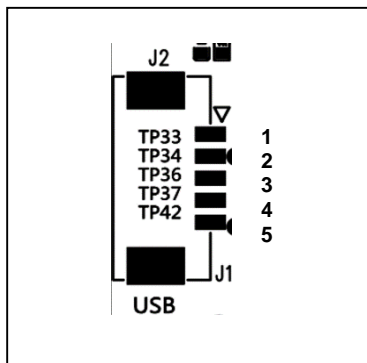
Note: User configurable interval for LED Flashing is not recommended as it may affect polling interval.

3.2. Connect ACM1552U-Y to another device via USB

A USB port is available to connect the ACM1552U-Y to other peripheral or device.

To do this:

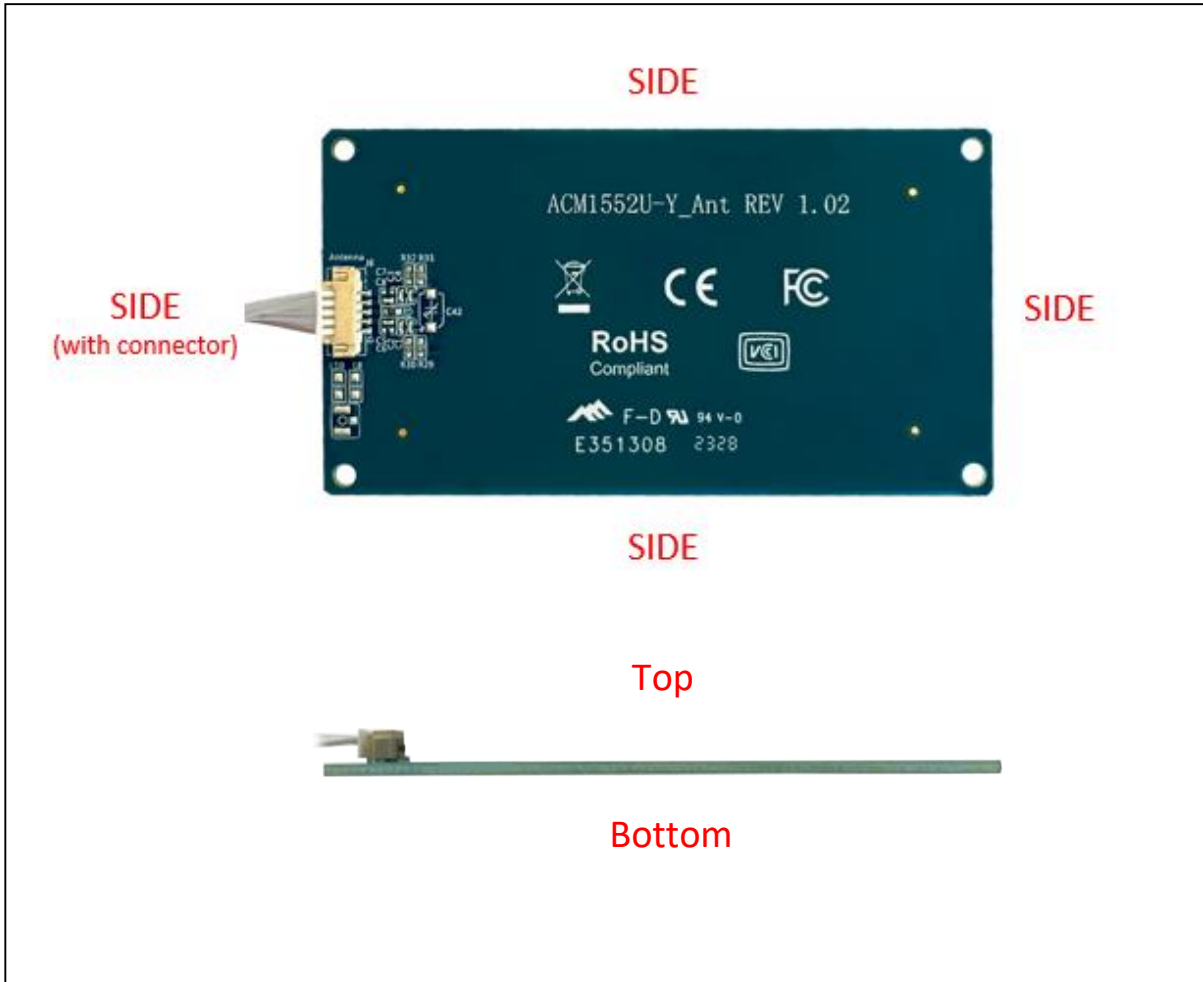
1. Connect socket (**J2**) via USB cable to another peripheral device (see **Figure 5**).



- 1 USB VCC
- 2 USB D-
- 3 USB D+
- 4 USB GND
- 5 USB shielding

4.0. Minimum Distances from Conductive Materials

The table below illustrates the recommended minimum distances of the ACM1552U-Y Antenna Board from conductive materials.



Location	Minimum Distance
Sides	15 mm
Side (with connector)	5 mm
Top and Bottom	30 mm

Table 1: Recommended Minimum Distances from Conductive Materials

Appendix A. Connector Specification

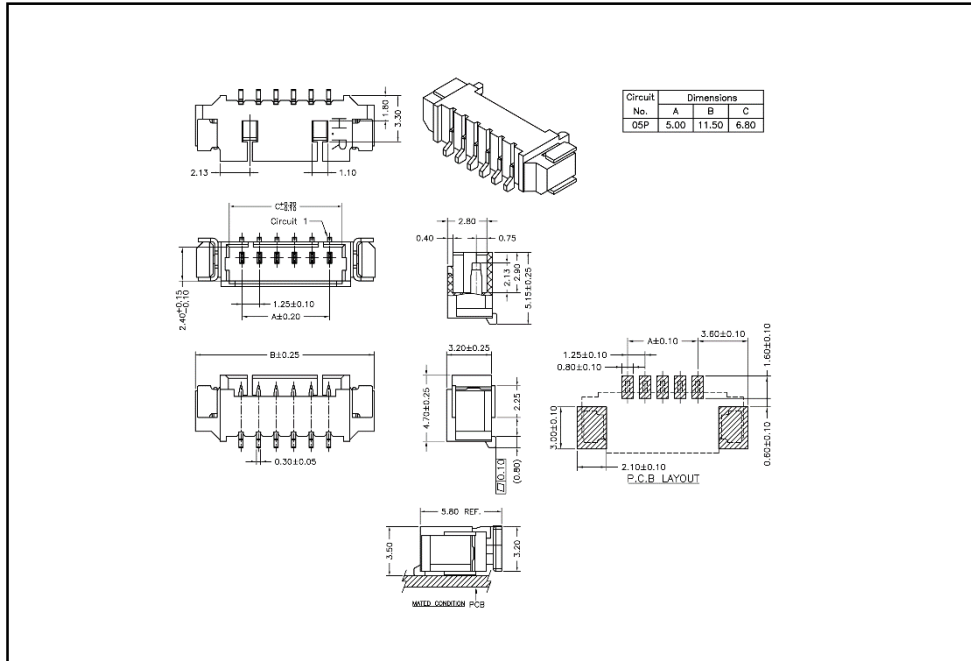


Figure 6: ACM1552U-Y USB Connector (Male) Specification

Note:

- Connector on **Figure 6** is attached to the PCB.
- It is compatible with JST-GH series, 5-pin, 1.25mm pitch connector.

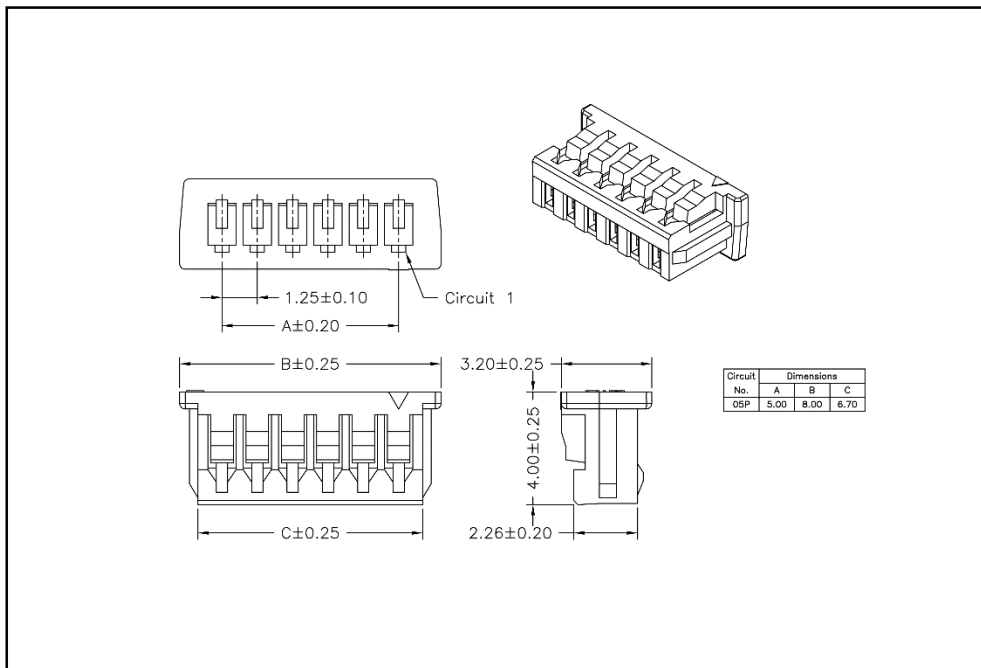


Figure 7: ACM1552U-Y Cable Connector (Female) Specification