



BoT-cDA110

AT COMMAND MANUAL

V 1.0.6

Table of Contents

BoT-cDA110 User Manual

1	DOCUMENT OVERVIEW.....	4
2	PRODUCT OVERVIEW.....	4
2.1	INITIAL SETTING VALUE	4
2.2	OPERATION MODE	4
2.3	DATA TRANSFER.....	5
2.4	QUIET MODE.....	5
3	AT COMMAND	6
3.1	BASIC RULE	6
3.2	AT COMMAND LIST	6
3.2.1	AT.....	6
3.2.2	ATZ.....	6
3.2.3	AT&F.....	7
3.2.4	AT+VER?	7
3.2.5	AT+UART.....	7
3.2.6	AT+NAME.....	7
3.2.7	AT+INFO1?	8
3.2.8	AT+INFO2?	8
3.2.9	AT+OPMODE.....	8
3.2.10	AT+PIN	9
3.2.11	AT+INQ.....	9
3.2.12	AT+SCAN.....	9
3.2.13	AT+CONN.....	10
3.2.14	AT+DISC.....	11
3.2.15	AT+OL.....	11
3.2.16	AT+OPCANCEL	11
3.2.17	AT+RSSI.....	11
3.2.18	AT+ES	11
3.2.19	AT+BTMITM.....	12
3.2.20	AT+BTUC	12
3.2.21	AT+BTLP	13
3.2.22	AT+TADDR.....	13

3.2.23	<i>AT+QM</i>	13
3.2.24	<i>AT+SSP</i>	14
3.2.25	<i>+++ (Escape sequence)</i>	14
4	PIN AND LED	15
4.1	PIN MAP	15
4.2	LED	15
4.3	FACTORY RESET.....	16
4.4	BLUETOOTH DISCONNECT.....	16
5	APPENDIX 1. LIMITATION OF LIABILITY AND LEGAL NOTICES	17

1 Document Overview

This document describes how to set up the cDA110 with AT commands and communicate data through "CHIPSEN BoT-cDA110"(hereinafter referred to as "cDA110") and the UART interface.

The AT command of the cDA110 provides only minimal functionality to satisfy the operation requirements.

2 Product Overview

The cDA110 is a product that can transmit and receive data with other Bluetooth devices using Bluetooth SPP. The **cDA110 supports only 1:1 communication, and one device serves to attempt a connection, and the other device accepts a connection.**

The cDA110 may set and control the device using the AT command.

2.1 Initial Setting Value

- Baud rate: 9600bps
- Data bit: 8
- Parity bit: none
- Stop bit: 1
- Hardware flow control: none
- Supports Secure Simple Pairing
- PIN code: 1234
- Operation Mode: OPMODE 0
- Escape sequence
- Bluetooth low power mode is disabled.

2.2 Operation Mode

The cDA110 has four operation modes: OPMODE 0, OPMODE 1, OPMODE 2 , and OPMODE 3.

- OPMODE 0

When the system starts, the Bluetooth function is stopped, and it is a mode that can be used while controlling the cDA110 with AT command.

- OPMODE 1
As soon as the system starts, it immediately becomes connectable, and it is not discoverable from other devices.
- OPMODE 2
As soon as the system starts, it immediately becomes connectable and discoverable from other devices.
- OPMODE 3
When the system starts, it immediately tries to connect to the stored Bluetooth address. **If the connection target is not set, it cannot be set to this operation mode.**

2.3 Data Transfer

After connecting to other Bluetooth devices, the cDA110 transmits data received through UART to the remote device as is. However, if the cDA110 is set to check the Escape Sequence, you can switch to AT command mode while Bluetooth is connected by checking whether the escape sequence is input in the following way below.

- Escape sequence
Escape sequence is three bytes of data consisting of '+' characters. The Escape sequence must be transmitted to the cDA110 without delay between each byte, and must be given a sufficient margin of more than 1second before transmitting the Escape Sequence so that it can be recognized as Escape Sequence and converted from Bluetooth connection state to the state that AT commands can be input.
The default setting value is to inspect the Escape Sequence.
For reference, when a user enters Escape Sequence in a terminal program, it is recommended to use the 'Paste' function of the terminal program so that there is no delay between each string.

2.4 Quiet mode

Basically, the cDA110 is supposed to output the processing result of the AT commands, connection, disconnection and so on by UART. However, in some cases, these messages may be unnecessary, and the state in which the output of messages such as OK, ERROR, +CONN, +DISC is set to not be output is called Quiet mode in this document. The Quiet mode can be activated/deactivated using AT command. (see AT+QM command)

3 AT Command

3.1 Basic rule

- Communication rules
 - All protocols consist of a combination of ASCII values and announce the end of the command through **Carriage Return(0x0D, hereinafter referred to as <CR>.)**
Ex) AT<CR>
 - The response message of the cDA110 is wrapped in **CR, Line Feed (0x0A, hereinafter referred to as <LF>)** and delivered.
Ex) <CR><LF>OK<CR><LF>
 - If the command is received normally, respond with <CR><LF>OK<CR><LF> and if not, respond with <CR><LF>ERROR<CR><LF>.
 - For setup commands, a '=' character is added between the AT command and the parameter.
 - If you read the settings, a '?' character is added to the end of the command.
 - The distinction between parameters uses the ',' character.
- Application of changed settings

By default, all settings are changed in the IDLE state. Changing settings during operation can cause discrepancies between the changed settings and the settings that are currently operating. The changed settings are applied after rebooting the device or resetting by ATZ command.

If you want to factory reset, use reset pins or AT command.

3.2 AT Command List

3.2.1 AT

function	Check that you can communicate with the device
command format	AT<CR>
response format	When the command is received normally, <CR><LF>OK<CR><LF> command format error <CR><LF>ERROR<CR><LF>

3.2.2 ATZ

function	Software reset on the cDA110
command	ATZ<CR>

format	
response format	When the command is received normally, the device restarts and responds <CR><LF>OK<CR><LF> just like power supply.

3.2.3 AT&F

function	Factory Initialization of the cDA110
command format	AT&F<CR>
response format	When the command is received normally, <CR><LF>OK<CR><LF> is responded just like power supply. All settings return to the default settings, and all stored connection information is also erased. Ex) AT&F<CR> <CR><LF>OK<CR><LF>

3.2.4 AT+VER?

function	Check the firmware version information
command format	AT+VER?<CR>
response format	<CR><LF>+VER,Major.Minor.Revision<CR><LF> Ex) AT+VER? <CR><LF>+VER,0.2.0<CR><LF> <CR><LF>OK<CR><LF>

3.2.5 AT+UART

function	Change the UART communication settings of the cDA110.
command format	AT+UART= <i>Baudrate, Parity, Stopbit, Flow control</i> <CR> <i>Baudrate</i> : 9600, 19200, 38400, 57600, 115200, 230400, 460800 <i>Parity</i> : 'N' → no parity, 'E' → even parity, 'O' → odd parity <i>Stopbit</i> : '1' → 1 stopbit, '2' → 2 stopbits <i>Flow control</i> : '0' → Disable flow control, '1' → Enable flow control
response format	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
Notes	Ex) If you set 115200, even parity, 1 stopbit, flow control on, AT+UART,115200,E,1,1<CR> <CR><LF>OK<CR><LF> Apply changed settings ATZ<CR>

3.2.6 AT+NAME

function	Check and Set the name of the Bluetooth Device of the cDA110
command format	Device name checking: AT+NAME?<CR> Device name setting: AT+NAME= <i>Device Local Name</i> <CR>
response format	Device name checking <CR><LF>+NAME, <i>Device Local Name</i> <CR><LF> Device Local Name: The Bluetooth device name of the cDA110 device. This name appears when searching on another device. Device Name Setting Change Bluetooth name of the cDA110. <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>

Notes	Name change is only possible in IDLE state. The factory initial setting is in the form of "cDA110-xxxxxx", xxxxx is the lower six-digit hexadecimal value of the cDA110 Bluetooth address.
-------	---

3.2.7 AT+INFO1?

function	Check the basic information of the cDA110.
command format	AT+INFO1?<CR>
response format	<CR><LF>+INFO1, <i>Bluetooth device Address, Device Name, Operation Mode, Current State</i><CR><LF> <CR><LF>OK<CR><LF> <i>Bluetooth Device Address</i>: Bluetooth device address with 12 -hexadecimal digits. <i>Device Name</i>: The name of the device that appears when searching for Bluetooth devices. <i>Operation mode</i> "0": Start with Bluetooth function stopped. "1": Undiscoverable but connectable. "2": Discoverable and connectable. "3": Bluetooth connection attempts to the last device was connected. undiscoverable and unconnectable. <i>Current State</i>: operational status of Bluetooth function "IDLE": Bluetooth function stopped working "SCANNING": Discoverable and connectable "INQUIRING": Searching for peripheral Bluetooth devices "CONNECTING": Trying to connect to Bluetooth "CONNECTED": Bluetooth(SPP) is connected to counterpart device

3.2.8 AT+INFO2?

function	Check the basic information of the cDA110.
command format	AT+INFO2?<CR>
response format	<CR><LF>+INFO2, <i>UART hardware flow control, Escape sequence, Bluetooth low power mode, Secure Simple Pairing, MITM protection</i><CR><LF> <CR><LF>OK<CR><LF> <i>UART hardware flow control</i>: Whether to use RTS/CST flow control on the UART interface. If it is 0, do not use it. If it is 1, flow control operates. When flow control is used, data is output to UART only when CTS input on the cDA110 is enabled. <i>Bluetooth low power mode</i> : Whether Bluetooth sniff mode is used or not. If it is 0, it is always kept active and does not use it. If it is 1, use sniff mode. <i>Secure Simple Pairing</i>: Whether to use Bluetooth Secure Simple Pairing(SSP). If it is 0, do not use SSP. If it is 1, use SSP <i>MITM protection</i>: Whether to use Man In The Middle protection. If it is 0, do not use it. If it is set to 1, the connection will not be possible if the counterpart device cannot perform MITM protection. It displays the passkey value with the +PASSKEY message and needs to decide whether to allow connection with the AT+BTUC command.

3.2.9 AT+OPMODE

function	Set and check the operation mode of the cDA110
command format	Checking operation mode AT+OPMODE?

	Setting operation Mode <code>AT+OPMODE=Operation mode<CR></code> The configurable <i>operation mode</i> is as follows below. 0: Operation mode that controls the setup and operation of the device with AT commands. 1: When the power is supplied, it is connectable but undiscoverable. 2: When the power is supplied, it is connectable and discoverable. 3: When the power is supplied, it attempts to connect to the device was connected last.
response format	Check operation mode <code><CR><LF>+OPMODE,Operation mode<CR><LF></code> <i>Operation mode</i> Depending on the operation mode setting, it is indicated as 0, 1, 2, and 3, respectively. For operation mode settings <code><CR><LF>OK<CR><LF></code> or <code><CR><LF>ERROR<CR><LF></code>
Notes	Operation mode setting is only possible in the IDLE state. Let it restart with ATZ command after changing the mode. If the target address is not set, the operation mode cannot be changed to OPMODE 3.

3.2.10 AT+PIN

function	Set the PIN code to use when making secure connections with older Bluetooth devices that do not support secure simple pairing. The AT command for checking the PIN code set in the cDA110 is not supported for security reasons.
command format	<code>AT+PIN=Pin code<CR></code> <i>Pin code</i> can be set up to 16 ASCII characters or numbers. The default setting value is 1234.
response format	<code><CR><LF>OK<CR><LF></code> or <code><CR><LF>ERROR<CR><LF></code>
Notes	The command can only be performed in the IDLE state.

3.2.11 AT+INQ

function	Search for peripheral Bluetooth classic devices. It is searchable for up to 10 devices.
command format	<code>AT+INQ=Timeout, Option<CR></code> Timeout: 3 ~ 60 sec Option: '0' → Turn off the function to take the name of the remote device, '1' → Turn on the function to take the name of the remote device.
response format	Command performs successfully <code><CR><LF>OK<CR><LF></code> or <code><CR><LF>ERROR<CR><LF></code> Search result: <code><CR><LF>+INQ,Bdaddr,CoD,RSSI,Name<CR><LF></code> <i>Bdaddr</i> : Bluetooth device address detected <i>CoD</i> : Class of Device (refer to Bluetooth Specification for details) <i>RSSI</i> : received signal strength <i>Name</i> : The name of the discovered device. It is output when the 'Option' item is set to 1 at the start of the search and is displayed as 'NONE' if the name is not obtained or 'Option' is set to 0. Response example) <code><CR><LF>001122334455,00FF00,-56,NONE<CR><LF></code>
Notes	The command can only be performed in the IDLE state.

3.2.12 AT+SCAN

function	The cDA110 device is set up to be discoverable or connectable. The executable commands differ depending on the operation mode setting. This command is not available on OPMODE 3.
command format	AT+SCAN= <i>Option</i> , <i>Timeout</i> <CR> AT+SCAN command in this format is only available on OPMODE 0 . <i>Option</i> : '1' → Discoverable but unconnectable '2' → Undiscoverable but connectable '3' → Discoverable and connectable <i>Timeout</i> : Time to attempt connection. 3~180 seconds, no time limit if it is 0. AT+SCAN<CR> Available on OPMODE 0, 1, 2 OPMODE 0 and 2 operate without a time limit in searchable and connectable state. For OPMODE 1, it only works in connectable state.
response format	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
Notes	When this command is received, if Bluetooth is connected or waiting to be connected, it responds ERROR. After going into standby by AT+SCAN<CR> command, Bluetooth is connected and when it is disconnected, it becomes standby. If you want to stop the operation during SCAN, use the AT+OPCANCEL command.

3.2.13 AT+CONN

function	Command the cDA110 to attempt to connect to a remote device. Available only on OPMODE 0 or OPMODE3.
command format	If you specify a remote device address AT+CONN= <i>Target Bluetooth address</i> , <i>Timeout</i> <CR> <i>Target Bluetooth address</i> : Address of the Bluetooth device you want to connect to. <i>Timeout</i> : Time limit for connection attempts, 3 to 180 seconds, no time limit for 0. When connecting to the last connected device without a time limit AT+CONN<CR>
response format	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF> In the case of a command format that does not specify a remote device address, a connection is attempted to the address of the last connected counterpart Bluetooth device. If this address is not set, it will be processed as an error. The device address that was last connected can be checked with the AT+TADDR? command. If the connection is not made within the Timeout, output the <CR><LF>ERROR<CR><LF> message and stop attempting to connect.
Notes	When this command is received, if other Bluetooth-related actions are in progress, it responds with ERROR. Use the AT+OPCANCEL command if you want to stop operating during a connection attempt. Immediately after the connection, it becomes an online data mode and immediately becomes a state in which data can be transmitted and received wirelessly. When you try to connect with the AT+CONN<CR> command, if you disconnect from a remote location after the connection is made, you will automatically try to reconnect after a while. If the connection is disconnected from the device that attempted to connect, no reconnection attempt is made.

	If the operating mode is OPMODE 1 or OPMODE2, this AT command is not available.
--	---

3.2.14 AT+DISC

function	Disconnect the cDA110 Bluetooth connection.
command format	AT+DISC<CR>
response format	Command received <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF> When the connection is disconnected after the command is received. <CR><LF>+DISC, <i>Bluetooth device address</i> <CR><LF> <i>Bluetooth device address</i> : address of disconnected Bluetooth device
Notes	

3.2.15 AT+OL

function	When the cDA110 is connected to the counterpart Bluetooth device and becomes an online command mode that is manageable AT commands using an escape sequence, a command to convert it back to an online data mode for transmitting data.
command format	AT+OL<CR>
response format	No response when switched from online command mode to online data mode. In other cases, respond with <CR><LF>ERROR<CR><LF>
Notes	

3.2.16 AT+OPCANCEL

function	The cDA110's ongoing Bluetooth-related shutdown.
command format	AT+OPCANCEL<CR>
response format	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
Notes	If you enter the AT+OPCANCEL command again after the command has been entered and is currently cancelling the action, it is treated as an error.

3.2.17 AT+RSSI

function	Monitor signal reception sensitivity with the cDA110 device connected
command format	AT+RSSI= <i>Enable</i> <CR> <i>Enable</i> : '0' → Stop RSSI monitoring, '1' → Start RSSI monitoring,
response format	Command received <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF> RSSI Output <CR><LF>+RSSI, <i>rsssi</i> <CR><LF> <i>rsssi</i> : Signal reception sensitivity (-128 to 127)
Notes	When this command is received, if other Bluetooth-related actions are in progress, it responds with ERROR.

3.2.18 AT+ES

function	Setting whether to enable Escape sequence detection
command format	Check Settings AT+ES?<CR> Setting up AT+ES= <i>Enable</i> <CR> <i>Enable</i> : '0' → Escape sequence detection disabled, '1'→ Escape sequence detection enabled
response format	Command received and set up complete <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF> Check Settings <CR><LF> <i>Enable</i> <CR><LF> <i>Enable</i> : '0' → Escape sequence detection disabled, '1'→ Escape sequence detection enabled
Notes	When this command is received, if other Bluetooth-related actions are in progress, it responds with ERROR.

3.2.19 AT+BTMITM

function	Enable or disable passkey to prevent MITM(Man-In-The-Middle) in Secure Simple Pairing
command format	Check whether MITM is used or not AT+BTMITM?<CR> MITM Enable Settings AT+BTMITM= <i>Enable</i> <CR> <i>Enable</i> : 0 does not use MITM. If it's 1, use MITM.
response format	For checking whether MITM is used or not <CR><LF>+BTMITM, <i>Enable</i> <CR><LF><CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF> For MITM Enable Settings <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF> Passkey notification with MITM enabled <CR><LF>+PASSKEY, <i>Bluetooth device address</i> , <i>Passkey</i> <CR><LF> <i>Bluetooth device address</i> : Bluetooth address of the counterpart device to be paired <i>Passkey</i> : a six-digit number that the user must verify
Notes	If MITM is enabled, the IO capability of the device is set to 'Display Yes/No'. When Secure simple pairing starts, the generated passkey is output in the form of +PASSKEY, <i>Bluetooth device address</i> , <i>passkey</i> . User can choose whether to allow access with the AT+BTUC =Accept command. Pairing is automatically denied if only a method that does not require user input (e.g., just work) is available when pairing with a remote device while MITM is enabled.

3.2.20 AT+BTUC

function	User input to decide whether to allow pairing when using (MITM)Man-In-The-Middle in Secure Simple Pairing. When +PASSKEY, <i>Bluetooth device address</i> , and <i>passkey</i> indicate that MITM pairing has started, this command determines whether to allow the pairing.
command format	Pairing Acceptance Response AT+BTUC=Accept<CR> Accept: reject pairing if it is 0, allow pairing if it is 1.
response format	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>

Notes	The <CR><LF>+CONN, <i>Bluetooth device address</i> <CR><LF> message is output only when pairing is completed, and a connection is made.
-------	---

3.2.21 AT+BTLP

function	Set whether to enable Bluetooth low power mode (sniff mode). When the Sniff mode is enabled, if there is no data transmission and reception in the connected state, the Sniff mode is activated and current consumption is reduced. When the Data transmission resumes in Sniff mode, the state is switched to the active mode, and Bluetooth data transmission is not performed while the mode is switched. Thus, a delay may occur in data transmission.
command format	Checking whether to use Bluetooth low power mode AT+BTLP?<CR> Setting whether to use Bluetooth low power mode AT+BTLP= <i>Enable</i> <CR> <i>Enable</i> : 0 is not used. If it's 1, use it.
response format	For checking whether to use Bluetooth low power mode <CR><LF>+BTLP, <i>Enable</i> <CR><LF> <i>Enable</i> : 0 is not used. If it's 1, use it. For setting whether to use Bluetooth low power mode <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
Notes	This command is only available in the IDLE state. Bluetooth low power mode can only be entered when both connected devices are enabled.

3.2.22 AT+TADDR

function	Command to read or write the Bluetooth address of the device to be connected
command format	Check the Bluetooth address of the stored device to be connected AT+TADDR? Save the Bluetooth address of the device to be connected AT+TADDR= <i>Bluetooth address</i> <CR> <i>Bluetooth address</i> : <i>Bluetooth address of the device to be connected</i>
response format	Check the Bluetooth address of the stored device to be connected <CR><LF>+TADDR, <i>Bluetooth address</i> <CR><LF> <i>Bluetooth address</i> : Bluetooth address of the destination to be connected For storing Bluetooth addresses of device to be connected <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
Notes	This command is only available in the IDLE state.

3.2.23 AT+QM

function	Function to enable or disable the cDA110 to respond OK, ERROR to AT commands or to notify events such as +CONN, +DISC, etc.
command format	Check settings AT+QM?<CR> Command settings AT+QM= <i>enable</i> <CR> <i>enable</i> : If it is 0, it outputs a response message such as OK, ERROR, etc. If it is 1, no output.
response format	For checking settings <CR><LF>+QM, <i>enable</i> <CR><LF> <i>enable</i> : If it is 0, it outputs a response message such as OK, ERROR, etc. If 1 does not print.

	For command settings <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
Notes	

3.2.24 AT+SSP

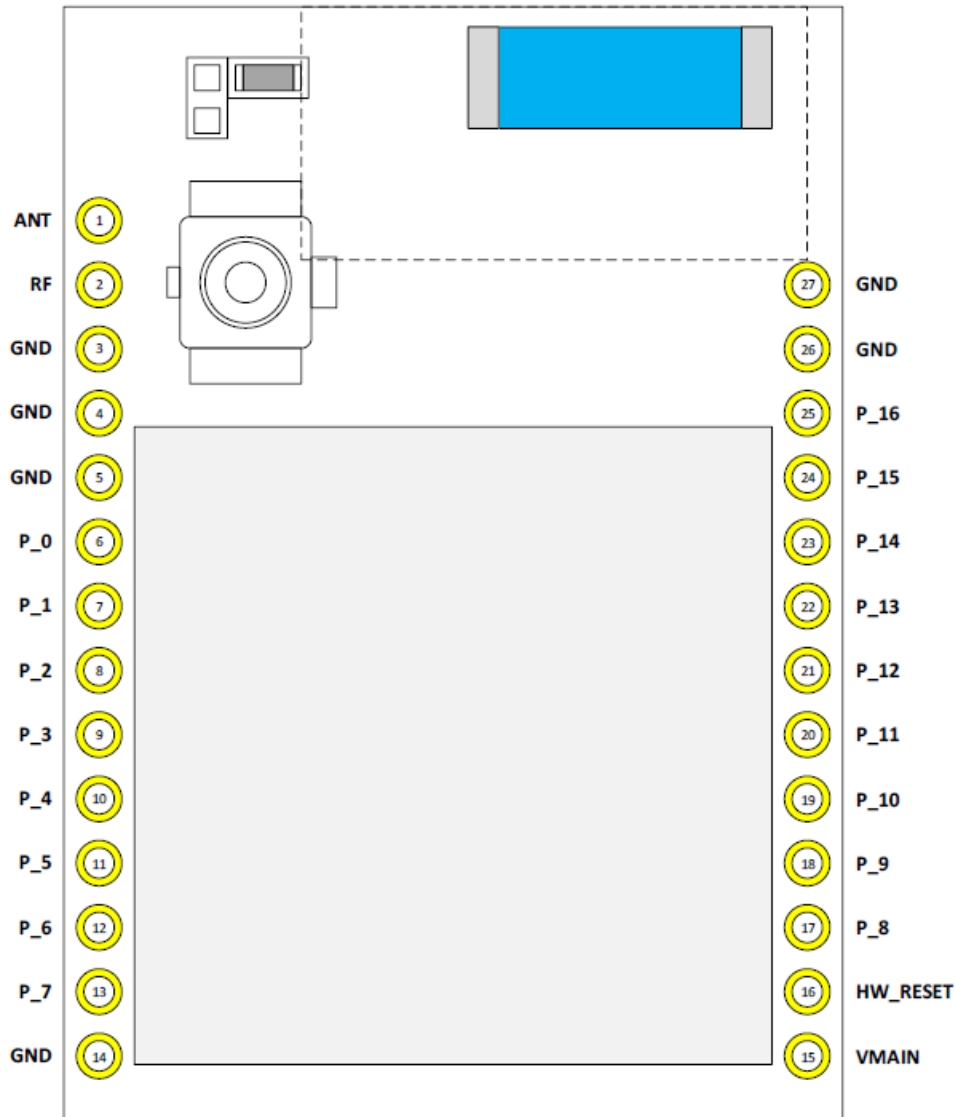
function	The cDA110's secure simple pairing method can be turned on or off. If you turn off the Secure simple pairing, you will use the method of creating a secret key using pin code. If you turn on the Secure simple pairing, you can connect without the password or use the MITM protection.
command format	Check settings AT+SSP?<CR> Command settings AT+SSP= <i>enable</i> <CR> <i>enable</i> : If it is 1, use secure simple pairing If it is 0, do not use secure simple pairing (operates by pin code method)
response format	For checking settings <CR><LF>+SSP, <i>enable</i> <CR><LF> <i>enable</i> : 1 is set to use secure simple pairing method. If it is 0, do not use secure simple pairing. For command settings <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
Notes	If you change the settings, the changed settings are applied only when the device is restarted. Because the secure simple pairing and pin code method have different ways of creating secret keys, it is recommended to change this setting after factory reset if necessary.

3.2.25 +++ (Escape sequence)

function	It is a command for the cDA110 to switch to an online command mode manageable AT commands while connected to the counterpart Bluetooth device. I usually use it when I want to disconnect my Bluetooth connection. This command is processed only when the UART receiving buffer of the cDA110 is empty, it should allow sufficient place before transmitting the escape sequence so that all UART buffers can be emptied. Escape sequence shall be transmitted to the cDA110 without delay between each byte.
command format	+++ (3 consecutive bytes of data consisting of '+' characters)
response format	If processed successfully, output <CR><LF>OK<CR><LF> response. If Quiet mode is set, it is switched to online command mode without any response.
Notes	The default setting value for the cDA110 is to inspect the escape sequence. When a user enters an escape sequence in a terminal program, it is recommended to use the 'Paste' function of the terminal program to prevent delays between escape sequence characters.

4 Pin and LED

4.1 Pin Map



Picture : BoT-cDA110DC, BoT-cDA110DU Pin Configuration

4.2 LED

The P_14 pin operates as a status LED indicating the operation and connection state of the cDA110.

The LED ON/OFF pattern is as follows.

- Attempt to connect or inquiry

150 msec on (on) → Repeat 1 second off

- Waiting for Connection/Search

150 msec on (on) → 150 msec off → 150 msec on (on) → Repeat 1 second off

- Connected Status

Stay on

- Factory reset

10 msec on (on) → reset after repeating 90 msec off three times.

4.3 Factory Reset

P_7 is the input for factory reset of the cDA110. If you change the pin from low to high and hold it for more than 1 second, all settings on the cDA110 are initialized to the factory state.

4.4 Bluetooth Disconnect

P_4 can be used to disconnect the cDA110 from Bluetooth. When P_4 is switched from low state to high state while Bluetooth is connected, disconnect it.

If Escape sequence is disabled, you can use this pin to disconnect Bluetooth.

5 Appendix 1. Limitation of Liability and Legal Notices

★ This product may cause radio confusion during use and may receive harmful interference from counterpart devices. Therefore, there may be data transfer delays or losses, and users are advised to take this into consideration and use it after sufficient testing. Due to the nature of the radio, there is no guarantee of accuracy, reliability or completeness, nor is there any responsibility. In no event shall CHIPSEN INC. or Seller's liability limit exceed the paid selling price of the product.

★ This product is not a "customized" product, but operates on the form, behavior, and software specified by CHIPSEN INC. In other words, be aware that the product is not designed for your specific environment and use it. We recommend that you refer to the functions and commands provided in the manual. It is recommended that you use it after sufficient testing if you use it in a specific environment, and the use and application of this product is entirely with the user (customer) and CHIPSEN INC. has no warranty and no liability.

★ The technical information provided in this document describes the representative characteristics of the product and examples of the application circuit. This does not mean allowing industrial property rights, intellectual property rights, or other rights.

★ This product and related everything are subject to change without prior notice to improve performance.

★ This publication, including photographs, drawings and software, is protected by international copyright law and has all rights. Nothing contained in this manual, as well as this manual, may be reproduced, modified or stolen without the author's written consent.

★CHIPSEN INC. and CHIPSEN logo is a trademark of CHIPSEN INC. All other brands and product names mentioned in this User's Guide are trademarks of their respective owners.