![pibiger]

USB To CANFD Series Products
User Mannual

SavvyCAN-FD-X2 USB To Dual Channel CANFD	SavvyCAN-FD-C USB To CANFD Cable	SavvyCAN-FD-mPCI USB To Dual Channel CANFD with mini pcie interface (usb2.0 bus)

Date	Revision	Description
2023/01/01	V1.0	First Released
2025/7/19	V1.0	ADD Chapter4, Chapter5

www.pibiger-tech.com	docs.pibiger-tech.com
sales@pibiger-tech.com	support@pibiger-tech.com

Document Catalogue

www.pibiger-tech.com	docs.pibiger-tech.com
sales@pibiger-tech.com	support@pibiger-tech.com

1Introduction

1.1   Product Series

Product Name	CAN Version	Bitrate	Isolation	Max Rate	Interface	Time Stamp
SavvyCAN-FD-X2	CAN2.0A/B CANFD 1.0	12Mbit/s	2500V	15000fps/s	USB 2*DSUB 9PIN	1us
SavvyCAN-FD-mPCI	CAN2.0A/B CANFD 1.0	12Mbit/s	2500V	15000fps/s	MINIPCIE (USB Bus)	1us
SavvyCAN-FD-C	CAN2.0A/B CANFD 1.0	12Mbit/s	2500V	15000fps/s	1.5M USB Cable 1*D-Sub 9PIN	1us

The new CAN FD standard (CAN with Flexible Data rate) is primarily characterized by higher bandwidth for data transfer.

The maximum of 64 data bytes per CAN FD frame (instead of 8 so far) can be transmitted with bit rates up to 12 Mbit/s.

1.2   Product Features

1   True High-speed USB 2.0 Compatible with CAN specifications 2.0A/2.0B/FD;
2   CAN FD support for ISO and Non-ISO standard support software switch;
3   CAN FD bit rates data field (64 bytes max.) from 25 kbit/s up to 12Mbit/s;
4   Class CAN bit rates data field from 25 kbit/s up to 1 Mbit/s;
5   Time stamp Resolution Up to 1 μs;
6   Each CAN FD Signal &Power Separately Isolated Up to 2500 Volts against USB;
7   Bus load measurements including error frames and overload frames on physical bus;
8   Induced error generation for incoming and outgoing CAN messages;

2Hardware Description

2.1 SavvyCAN-FD-X2

The SavvyCAN-FD-X2 is a plug and play high speed USB2.0 to CANFD adapter enables the connection of dual channel CANFD networks to a computer via USB. Each CAN FD channel is separately isolated against USB with a maximum of 2500V.
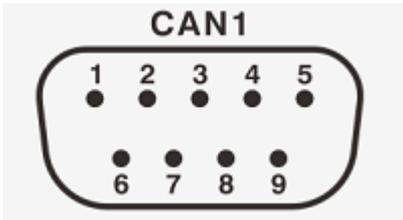

Specification

Connector	
CANFD	Dual Channel 9PIN D-SUB Connectors
USB	USB plug type A（Computer）
	USB plug type B（Devcie）

CAN Features	
Protocols	CAN 2.0A (standard format)
	CAN 2.0B (extended format)
	CAN FD ISO 11898-1:2015
	CAN FD non-ISO
CAN bit rates	25 kbit/s up to 1 Mbit/s
CANFD bit rates	25 kbit/s up to 12Mbit/s
USB ESD	IEC 61000-4-2 Level 4
	+25 kV (contact discharge)
	+30 kV (air-gap discharge)
Galvanic isolation	Signal &Power Separately Isolated by 2500 Volts against USB
	IEC 61000-4-2 Contact
	IEC 61000-4-2 Air
	ISO 10605 150 pF / 2 k2 Contact
	ISO 10605 330 pF 1 2 k2 Contact
Micro controller	180MHZ Cortex-M4 MCU
Timestamp resolution	1 µs
Built In 120Ω Termination Resistor	Enable/Disable Through Software
Others	
Temperature	-40°~ 85°
PCBA Size (L * W * H)	84x80x28 mm
Weight	190 g

Pins Out Description

CAN1	PIN OUT Description	
	1	NC
	2	CANL bus line (dominant low)
	3	CAN_GND
	4	NC
	5	NC
	6	NC
	7	CANH bus line (dominant high)
	8	NC
	9	NC

CAN0（Normal）	PIN OUT Description	
CAN0 1 2 3 4 5 6 7 8 9	1	NC
	2	CANL bus line (dominant low)
	3	CAN_GND
	4	NC
	5	NC
	6	NC
	7	CANH bus line (dominant high)
	8	NC
	9	NC

Note1: Not connect GND do not affect normal communication, if cable with shielding suggest connect to GND;

LED Indication
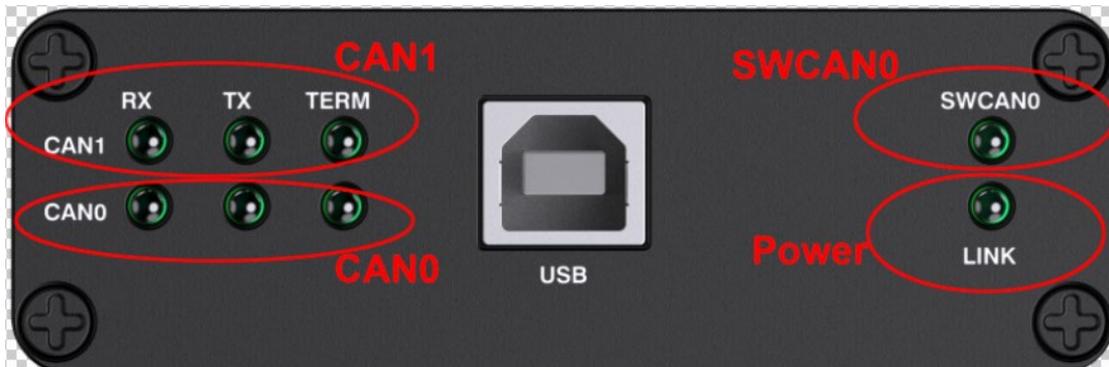
When plug SavvyCAN-FD-X2 device to Computer All lights are flashing for one second. Then TERM LED And LINK LED turns to be green.

Led Name	Description
Power LED Indicator	Power Up And Driver Installted LINK LED turns to be blinking.
CAN1 LED Indicator	TX LED Blinking, Sending Data; RX LED Blinking, Receiving Data; TERM LED Green,120Ω Activated;
CAN0 LED Indicator	TX LED Blinking, Sending Data; RX LED Blinking, Receiving Data; TERM LED Green,120Ω Activated;

2.2 SAVVYCAN-FD-C

The SAVVYCAN-FD-C is a plug and play high speed USB2.0 to CANFD converter comes with 1.2m high quality Cable enables the connection of one channel CANFD networks to a computer via USB. CANFD is isolated protection against USB 2500V.
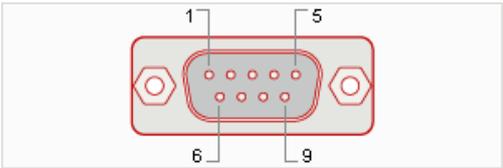

Specification

Connector	
CANFD	9PIN D-SUB Connectors
USB Cable	1.2M High Quality USB Cable with type A
CAN Features	

Protocols	CAN 2.0A (standard format)
	CAN 2.0B (extended format)
	CAN FD ISO 11898-1:2015
	CAN FD non-ISO
CAN bit rates	25 kbit/s up to 1 Mbit/s
CANFD bit rates	25 kbit/s up to 12Mbit/s
USB ESD	IEC 61000-4-2 Level 4
	+25 kV (contact discharge)
	+30 kV (air-gap discharge)
Galvanic isolation	Signal &Power Separately Isolated by 2500 Volts against USB
	IEC 61000-4-2 Contact
	IEC 61000-4-2 Air
	ISO 10605 150 pF / 2 k2 Contact
	ISO 10605 330 pF 1 2 k2 Contact
Micro controller	180MHZ Cortex-M4 MCU
Timestamp resolution	1 µs
Built In 120Ω Termination Resistor	Disable/Enable Through Software
Others	
Temperature	-40°~ 85°

Pins Out Description

1	NC
2	CAN-L
3	GND
4	NC
5	NC
6	NC
7	CAN-H
8	NC
9	NC

www.pibiger-tech.com	docs.pibiger-tech.com
sales@pibiger-tech.com	support@pibiger-tech.com

LED Indication
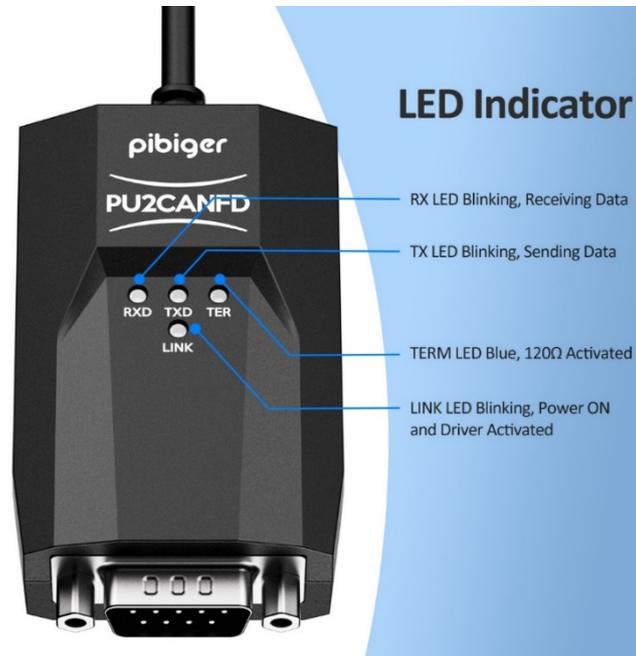
Led Name	LED Status	Description
RXD	Blinking	Receiving Data
TXD	Blinking	Sending Data
TER	Blue Led On	Build In 120Ω Term Resistor Enable;
LINK	Blinking	Power Up and Driver Installed.
	Blue Led On	Power Up Driver Not Installed.

2.3 SavvyCAN-FD-mPCI

The SavvyCAN-FD-mPCI is a plug and play high speed USB2.0 to CANFD CAN Card.
CAN FD each channel is separately isolated against USB with a maximum of 2500V.

www.pibiger-tech.com	docs.pibiger-tech.com
sales@pibiger-tech.com	support@pibiger-tech.com

pibiger

Specification

Connector	
Dual Channel CANFD	2X3PIN 1mm Connector
Mini PCIE USB	USB BUS
CAN Features	
Protocols	CAN 2.0A (standard format)
	CAN 2.0B (extended format)
	CAN FD ISO 11898-1:2015
	CAN FD non-ISO
CAN bit rates	25 kbit/s up to 1 Mbit/s
CANFD bit rates	25 kbit/s up to 12Mbit/s
USB ESD	IEC 61000-4-2 Level 4
	+25 kV (contact discharge)
	+30 kV (air-gap discharge)
Galvanic isolation	Signal &Power Separately Isolated by 2500 Volts against USB
	IEC 61000-4-2 Contact
	IEC 61000-4-2 Air
	ISO 10605 150 pF / 2 k2 Contact
	ISO 10605 330 pF 1 2 k2 Contact
Micro controller	180MHZ Cortex-M4 MCU
Timestamp resolution	1 µs
Built In 120Ω Termination Resistor	Activated/Deactivated Through Software

Others	
Temperature	-40°~ 85°
PCBA Size (L * W * H)	84x80x28 mm
Weight	191 g

Pins Out Description
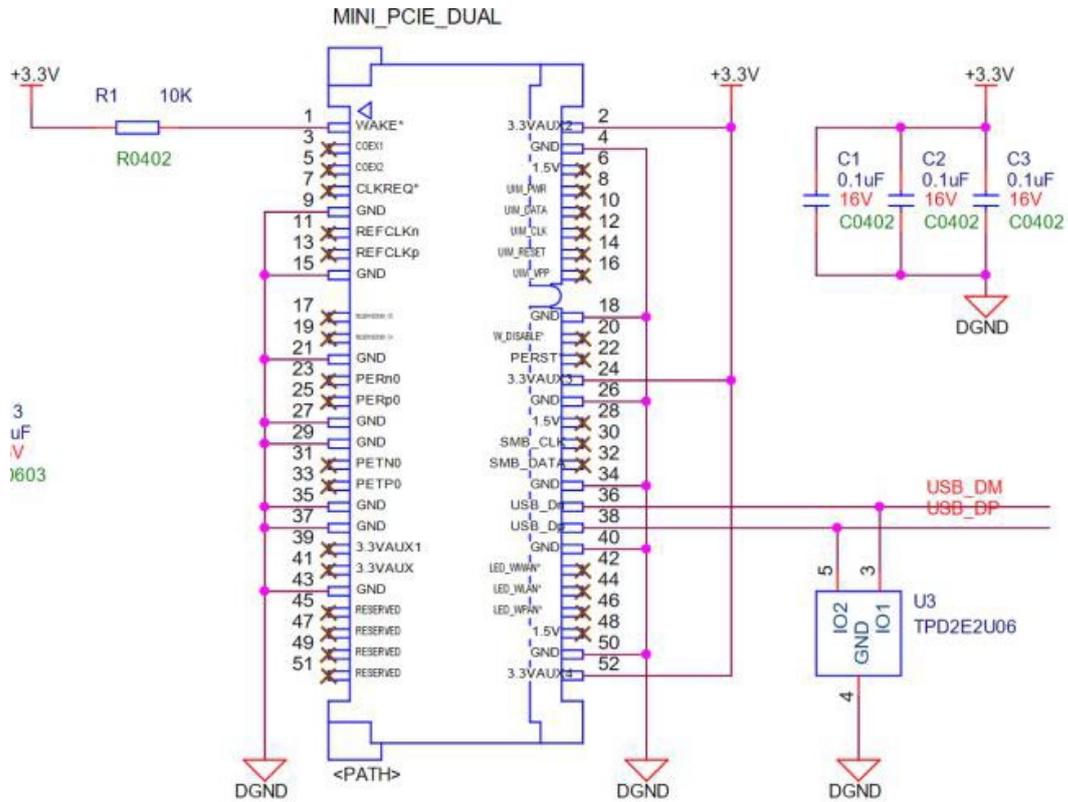
LED Indication

	Description	Indication
A	Power&Driver LED	Blinking, Driver install and Power Up
B	CAN0 120Ω Term	On, CAN0 Term Enable; Off, CAN0 Term Disable
C	CAN1 120Ω Term	On, CAN1 Term Enable; Off, CAN1 Term Disable
D	CAN0 Receive	Blinking，CAN0 Receiving Data;
E	CAN0 Send	Blinking，CAN0 Sending Data;
F	CAN1 Receive	Blinking，CAN1 Receiving Data;
G	CAN1 Send	Blinking，CAN0 Receiving Data;

Design Reference

3PIN Connector Board End

Vendor: HDGC1002WR-S-3P

3D View

PIN数	A±0.1	B±0.1	C±0.1	D±0.1
2P	4.35	2.65	1.00	3.25
3P	5.35	3.65	2.00	4.25
4P	6.35	4.65	3.00	5.25
5P	7.35	5.65	4.00	6.25
6P	8.35	6.65	5.00	7.25
7P	9.35	7.65	6.00	8.25
8P	10.35	8.65	7.00	9.25
9P	11.35	9.65	8.00	10.25
10P	12.35	10.65	9.00	11.25

RECOMMENDER P.C.B.LAYOUT TOP VIEW
(COMPONENT SIDE TOLERANCE±0.1)

Specifications:
1.Rated Voltage : 50V AC/DC
2.Rated Current : 1A AC,DC
3.Withstand Voltage : 200V AC/minute
4.Contact Resistance : 50mΩ(MAX.)
5.Insulation Resistance : 100MΩ(MIN.)
6.Storage Temperature Range:−40°C~+85°C;
7.Operation Temperature Range:−25°C~+70°C;

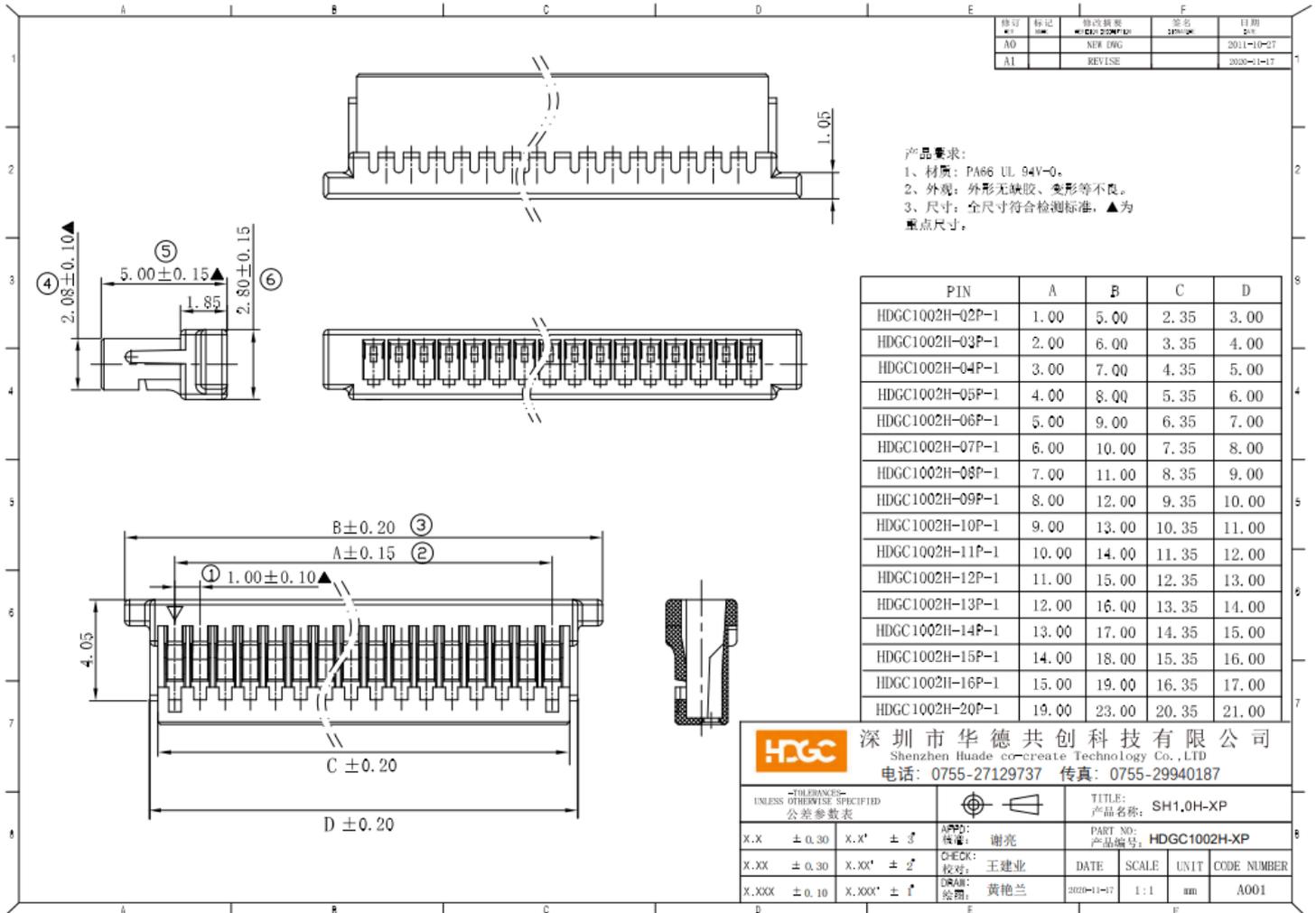| 3 | 插片 | 黄铜H65 | 镀镍锡 | |
2	插针	黄铜H65	镀镍锡	
1	基座	LCP	本色	
序号	品 名	材 质	电镀/颜色	备 注
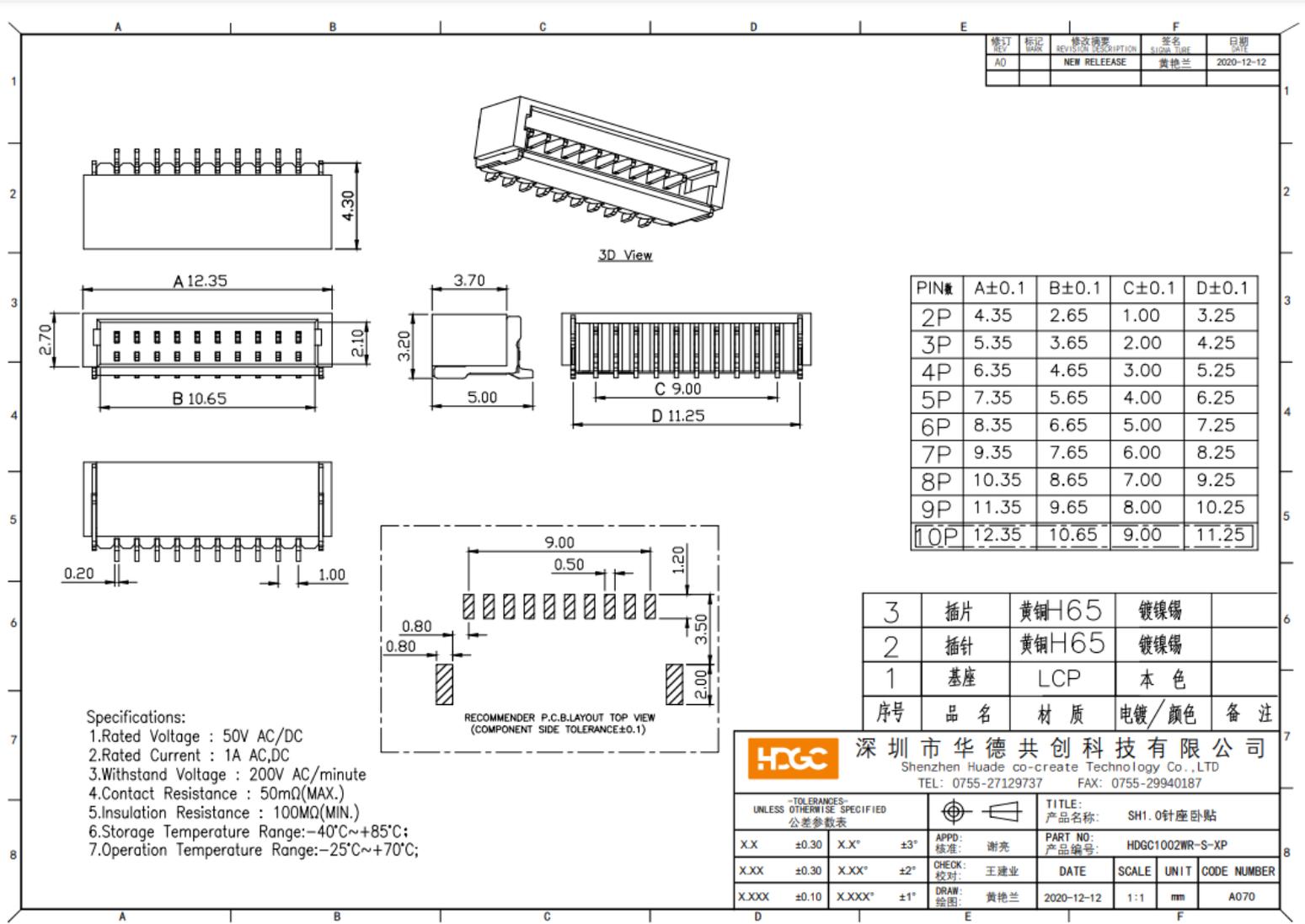
深圳市华德共创科技有限公司
Shenzhen Huade co-create Technology Co.,LTD
TEL: 0755-27129737   FAX: 0755-29940187

−TOLERANCES− UNLESS OTHERWISE SPECIFIED 公差参数表				TITLE: 产品名称:	SH1.0针座卧贴	
X.X	±0.30	X.X°	±3°	APPD: 核准: 谢亮	PART NO: 产品编号:	HDGC1002WR-S-XP
X.XX	±0.30	X.XX°	±2°	CHECK: 校对: 王建业	DATE	
X.XXX	±0.10	X.XXX°	±1°	DRAW: 绘图: 黄艳兰	2020-12-12	SCALE 1:1	UNIT mm	CODE NUMBER A070

修订 REV	标记 MARK	修改摘要 REVISION DESCRIPTION	签名 SIGNA TURE	日期 DATE
A0		NEW RELEEASE	黄艳兰	2020-12-12

Design End

Vendor: HDGC1002H-5P

PIN	A	B	C	D
HDGC1002H-02P-1	1.00	5.00	2.35	3.00
HDGC1002H-03P-1	2.00	6.00	3.35	4.00
HDGC1002H-04P-1	3.00	7.00	4.35	5.00
HDGC1002H-05P-1	4.00	8.00	5.35	6.00
HDGC1002H-06P-1	5.00	9.00	6.35	7.00
HDGC1002H-07P-1	6.00	10.00	7.35	8.00
HDGC1002H-08P-1	7.00	11.00	8.35	9.00
HDGC1002H-09P-1	8.00	12.00	9.35	10.00
HDGC1002H-10P-1	9.00	13.00	10.35	11.00
HDGC1002H-11P-1	10.00	14.00	11.35	12.00
HDGC1002H-12P-1	11.00	15.00	12.35	13.00
HDGC1002H-13P-1	12.00	16.00	13.35	14.00
HDGC1002H-14P-1	13.00	17.00	14.35	15.00
HDGC1002H-15P-1	14.00	18.00	15.35	16.00
HDGC1002H-16P-1	15.00	19.00	16.35	17.00
HDGC1002H-20P-1	19.00	23.00	20.35	21.00

产品要求：
1、材质：PA66 UL 94V-0。
2、外观：外形无缺胶、变形等不良。
3、尺寸：全尺寸符合检测标准，▲为重点尺寸。

深圳市华德共创科技有限公司
Shenzhen Huade co-create Technology Co.,LTD
电话：0755-27129737 传真：0755-29940187

TITLE: 产品名称：SH1.0H-XP
PART NO: 产品编号：HDGC1002H-XP

MINIPCIE Connector

Vendor：Lotes，AAA-PCI-049-K01
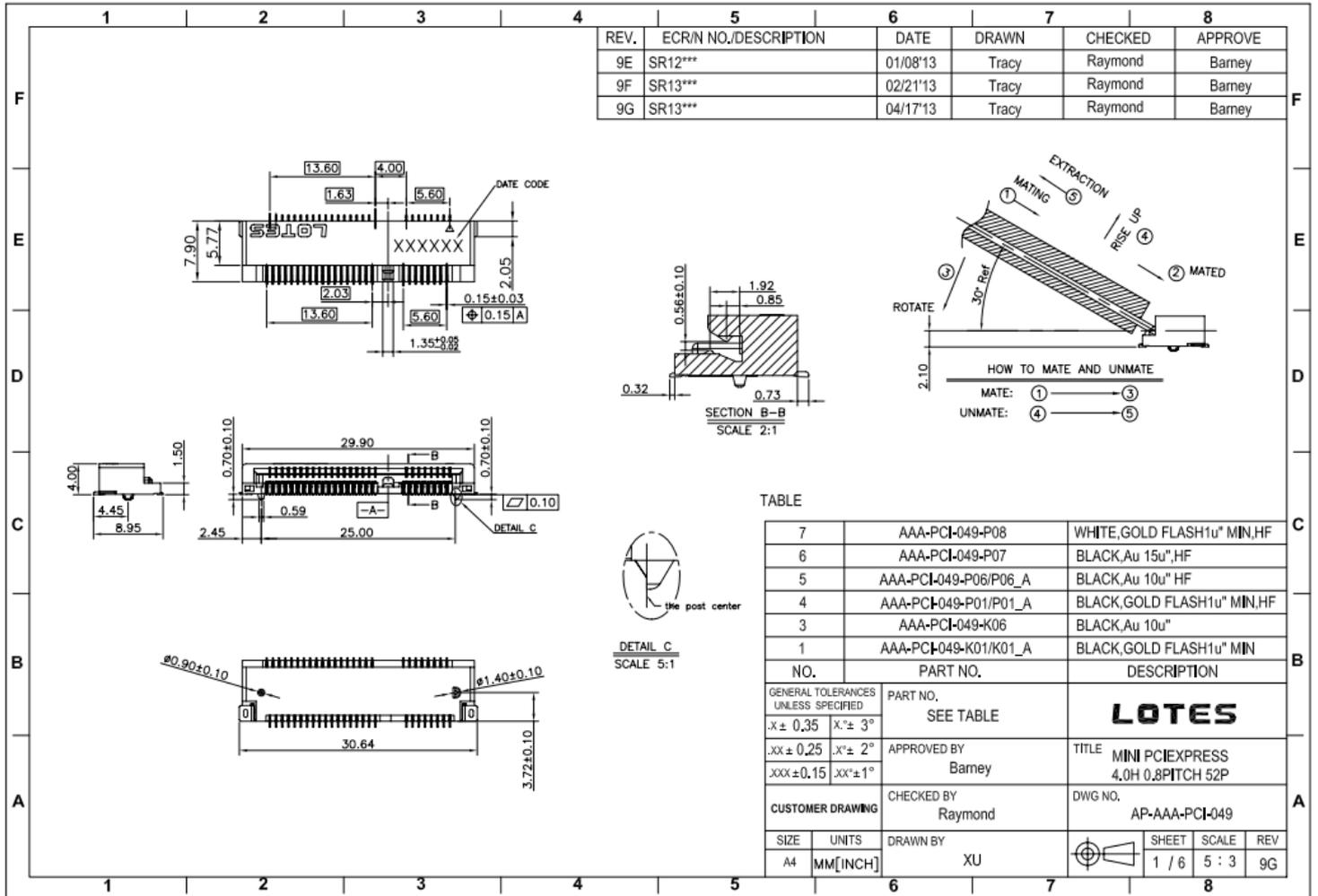
3 Connection
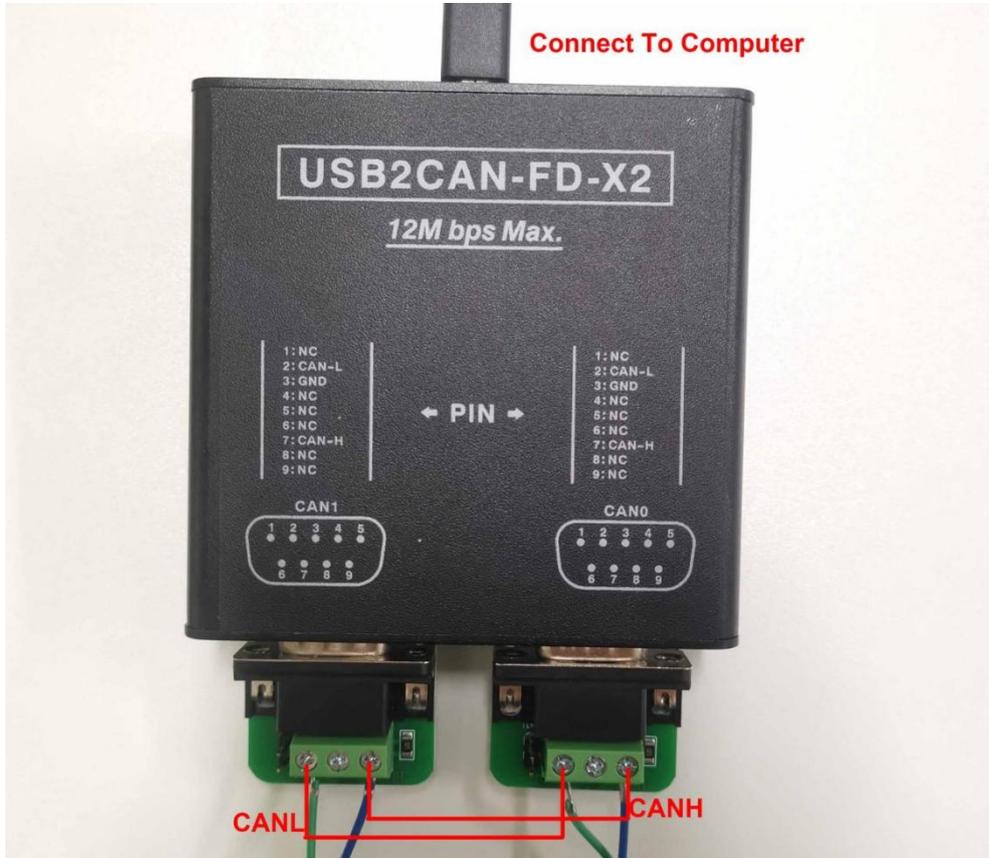
3.1 Enable/Disable Build In 120Ω Term Resistor

Products **comes enable build in 120Ω term resistor in default**.

If you need external connection of 120Ω termination resistor please refer to below method:
https://docs.pibiger-tech.com/home/usb-to-can-fd-series/savvycanfd/quick-start-guide#id-1-5-internal-120o-termination-resistor

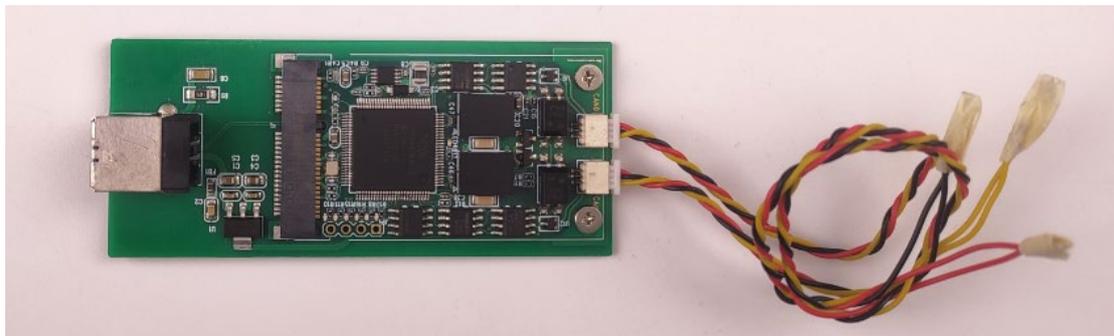| www.pibiger-tech.com	docs.pibiger-tech.com
sales@pibiger-tech.com	support@pibiger-tech.com

3.2 SavvyCAN-FD-X2/SAVVYCAN-FD-C Connection

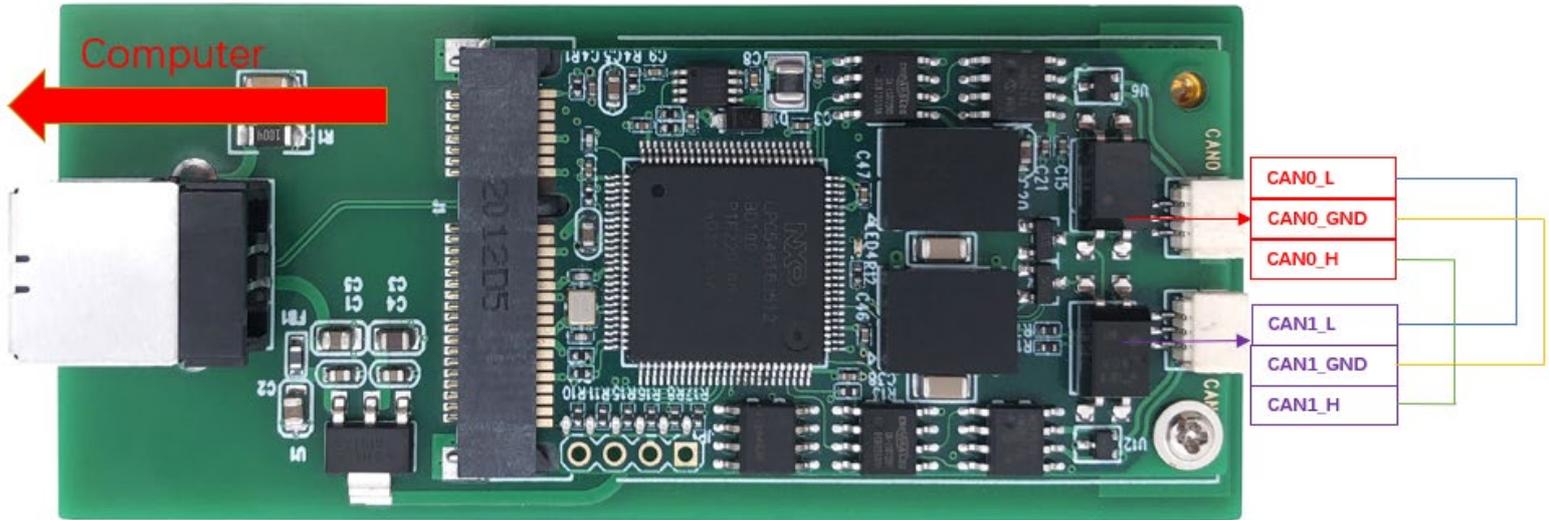**Notes:**

Note: Remove jumper When build in 120Ω termination resistor Enable.	Note: Add jumper When build in 120Ω termination resistor Disable.

www.pibiger-tech.com	docs.pibiger-tech.com
sales@pibiger-tech.com	support@pibiger-tech.com

3.3 SavvyCAN-FD-mPCI Connection Figure

4 Software

4.1 Description:

This device works on Windws,Linux,Mac Os.

4.1.1 Windows:

- **SavvyCAN-FD-Version**

Pibiger Release FD version SavvyCAN Software,you can download from below link:

www.pibiger-tech.com	docs.pibiger-tech.com
sales@pibiger-tech.com	support@pibiger-tech.com

1

https://docs.pibiger-tech.com/home/usb-to-can-fd-series/savvycanfd

4.1.2 Linux:
- CAN-UTILS/C/Python On Linux
- Open Source SavvyCAN Compiler Method

4.1.3 MacOs
- Open Source SavvyCAN Compiler Method

4.2 Software Guide

https://docs.pibiger-tech.com/home/usb-to-can-fd-series/savvycanfd/hardware-manual

4.2.1 How to Use On Windows

https://docs.pibiger-tech.com/home/usb-to-can-fd-series/savvycanfd/quick-start-guide#id-1-2-how-to-use-on-windows

4.2.2 How to Use On Linux

https://docs.pibiger-tech.com/home/usb-to-can-fd-series/savvycanfd/quick-start-guide#id-1-3-how-to-use-on-linux

4.2.3 How to Use On Mac Os

https://docs.pibiger-tech.com/home/usb-to-can-fd-series/savvycanfd/quick-start-guide#id-1-4-how-to-use-on-mac-os

4.2.4 Internal 120Ω Termination Resistor

https://docs.pibiger-tech.com/home/usb-to-can-fd-series/savvycanfd/quick-start-guide#id-1-5-internal-120o-termination-resistor

www.pibiger-tech.com	docs.pibiger-tech.com
sales@pibiger-tech.com	support@pibiger-tech.com

4.2.5 CUSTOM Nominal/Data Bit Rate

https://docs.pibiger-tech.com/home/usb-to-can-fd-series/savvycanfd/quick-start-guide#id-1-6-custom-nominal-data-bit-rate

4.2.6 CAN FD Protocol

https://docs.pibiger-tech.com/home/usb-to-can-fd-series/savvycanfd/can-fd-protocol

4.2.7 Third Party Software

https://docs.pibiger-tech.com/home/usb-to-can-fd-series/savvycanfd/third-party-software-support

5 Technic Support

sales@pibiger-tech.com; support@pibiger-tech.com;	