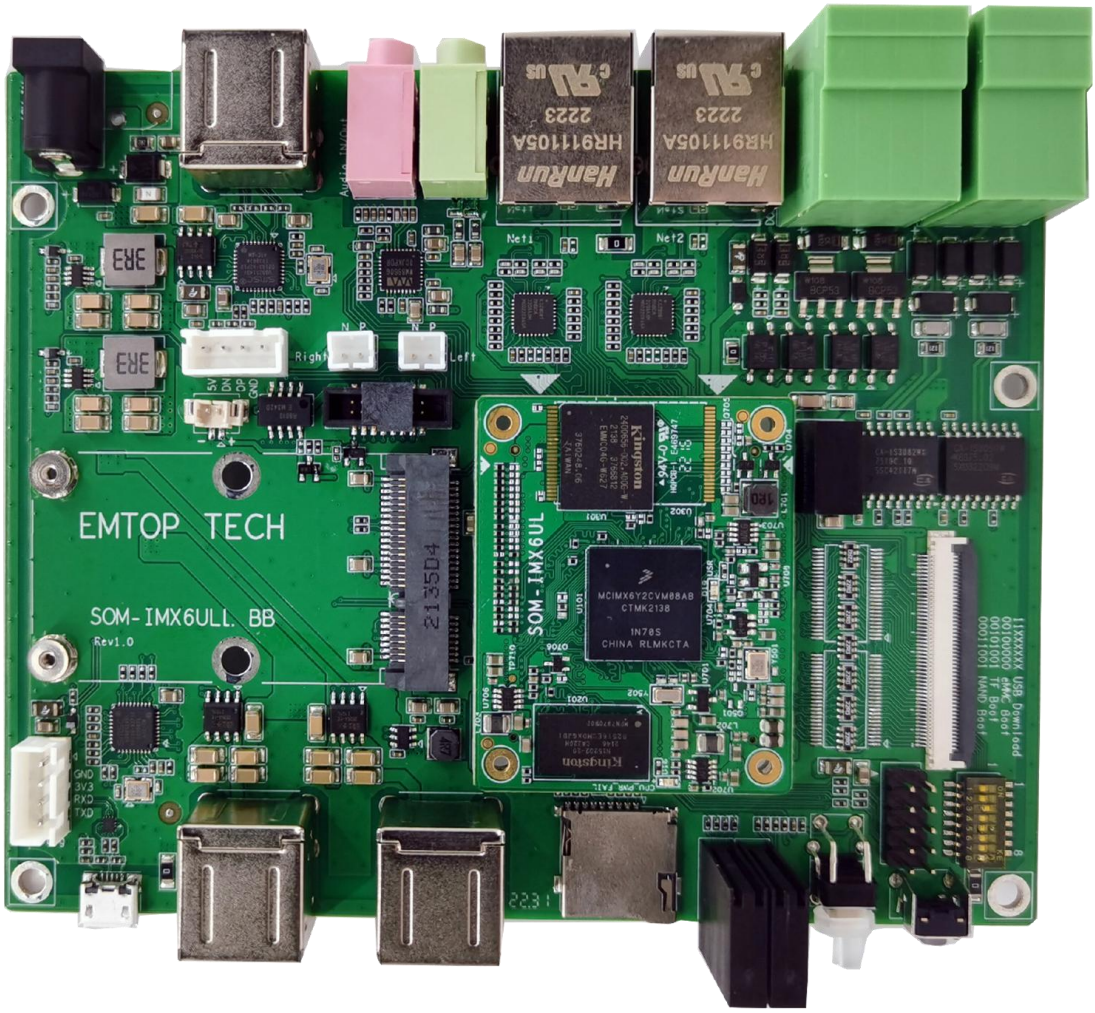
BB-ET6ULL



SOM-ET6ULL + SOM-ET6ULL-BB

User Manual

Version: 1.0

2023-01-03

Revision History：

Version	Date	Description
1.0	2023-01-03	Initial Release

Table of Contents

1. PRODUCT OVERVIEW 4

1.1 INTRODUCTION 4

1.2 HARDWARE FEATURES 4

1.2.1 *SOM-ET6ULL* *4*

1.2.2 *SOM-ET6ULL BB* *6*

1.3 MECHANICAL DIMENSION 7

1.4 INTERFACE DETAILS 8

1.4.1 *DC Power Input* *8*

1.4.2 *USB Host* *8*

1.4.3 *Audio Input/Output* *9*

1.4.4 *2x 1W Speaker Connector* *10*

1.4.5 *10/100M Ethernet* *11*

1.4.6 *DIN/DO* *12*

1.4.7 *CAN/RS485* *13*

1.4.8 *LCD* *14*

1.4.9 *Reset* *17*

1.4.10 *User Button* *18*

1.4.11 *LED Indicator Light* *19*

1.4.12 *TF Card* *20*

1.4.13 *4G* *21*

1.4.14 *2.54mm Extension Interface* *23*

1.4.15 *USB Extension Interface* *24*

1.4.16 *IO Extension* *25*

1.4.17 *Debug Port* *26*

1.4.18 *Serial Download* *27*

1. Product Overview

1.1 Introduction

The SOM-ET6ULL BB is a baseboard that design by Emtop tech for the SOM board SOM-ET6ULL. It features a lot of rich and flexible interfaces. Can be used for the customers to develop their user programs, verify their expected functions and shorten product development cycle. The optional that with a box that can be used directly by the customer, or they can be customized a box and used this Kit directly for the productions.

1.2 Hardware Features

1.2.1 SOM-ET6ULL

Electrical Parameters

- Working Temperature：0 °C~ 70°C（Commercial）
  -45°C~ 85°C（Industrial）
- Ambient Humidity：20% ~ 90%, non-condensing
- Mechanical Dimensions：60mm x 27mm
- Power Input：5V,1.8V/3.3V

Processor

Feature	Details
SOM-i.MX6ULL	
Arm Cortex-A7 MPCore platform	Single ARM Cortex-A7 MPCore, including: • 32 KB L1 Instruction Cache • 32 KB L1 Data Cache • Media Processing Engine (MPE)

	Co-processor • General Interrupt Controller(GIC) • Global Timer • Snoop Control Unit • Target frequency of 528MHz
Audio	• S/PDIF Input and Output • SAI modules supporting I2S,AC97,TDM
On-chip memory	• Boot ROM (96KB) • Secure/non-secure RAM (32KB)
Memory and storage	
DDR SDRAM	• 512MB DDR3 SDRAM (16-bit bus width) • Maximum 1GB support • 800MHz maximum DDR clock
eMMC	• 4GB eMMC flash memory default • 8-bits MMC mode • 4~32GB storage option • Nand or eMMC + SPI option • 256MB ~ 4GB storage option
Expandable flash (MicroSD)	• Meets SD/SDIO 3.0 standard Runs at 4-bits • Supports system boot from SD card • Supports high-capacity SDXC card up to 2TB
Network & Wireless	
Ethernet	• 10/100 Mbps Ethernet Controller • Up to 2 MAC (6G2, 6G3 Only)
Hardware Interface	
	• 5x UART • 2x ENET

I/O connectivity	• 1x SDIO • 1x JTAG • 10x GPIOs • 10x SNVS_TAMPER • 2x OTG
Display Interfaces	• 24bits RGB LCD
Camera	• 8Bit CSI

1.2.2 SOM-ET6ULL BB

Electrical Parameters

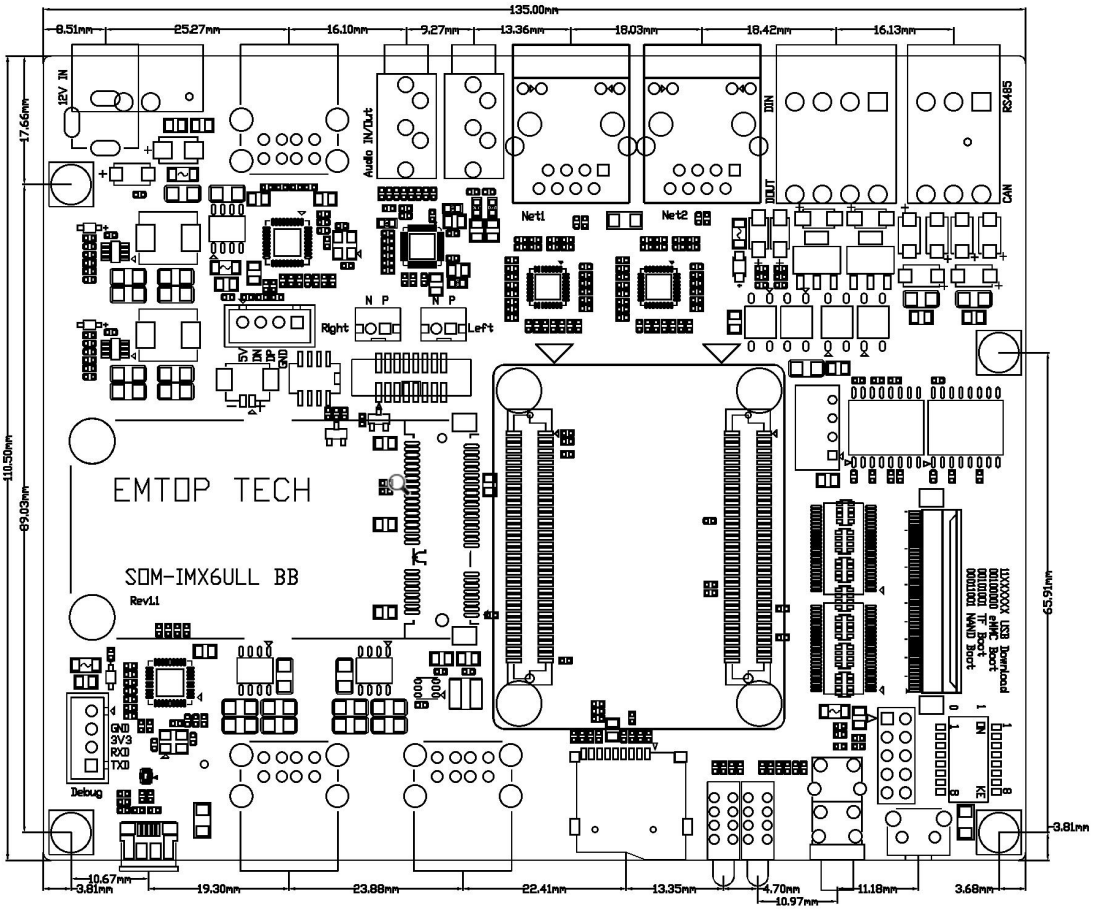
- Working Temperature：0 °C~ 70°C（Commercial）
  -45°C~ 85°C（Industrial）
- Ambient Humidity：20% ~ 90%, non-condensing
- Mechanical Dimensions：135mm x 110mm
- Power Input：12V/2A Maximum

Connectivity

- 2x 80Pin BTB Connector
- 12V Power Input;
- 6x USB 2.0 Host
- Audio Input/Output
- 2x 1W Audio Output
- 2x 10/100Mbps Ethernet
- 1x RS385
- 1x CAN
- 2x DI
- 2x DO
- 1x 24Bits RGB LCD
- 1x TF Card Connector

- 1x MINI PCIe (For 4G module only)
- 1x SIM Card
- 1x MicroUSB Connector (For updated only)
- 1x 16Pin Extension Interface Include SPI, I2C and UART
- 1x 2.54mm Pin header for UART
- 1x 2.50mm Box header for Debug

1.3 Mechanical Dimension

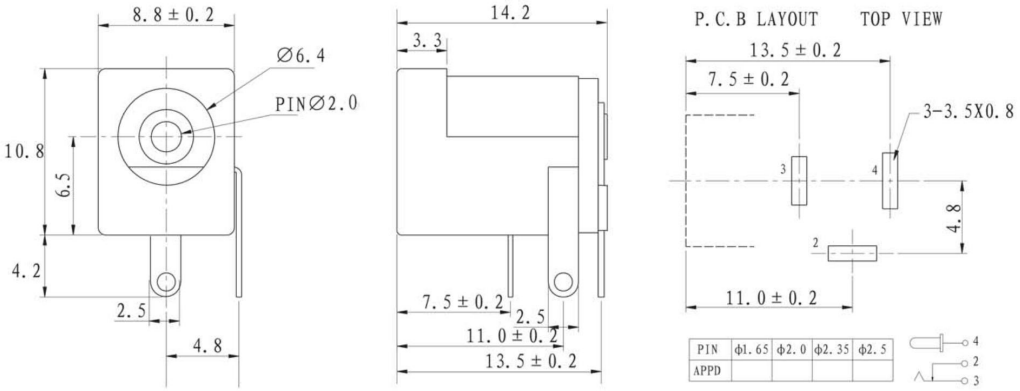


1.4 Interface Details

1.4.1 DC Power Input

The SOM-ET6ULL BB places a DC Jack to feature a 12V power supply input. The recommended power supply is 12V/2A. If some customized features are requested, please contact the sales.

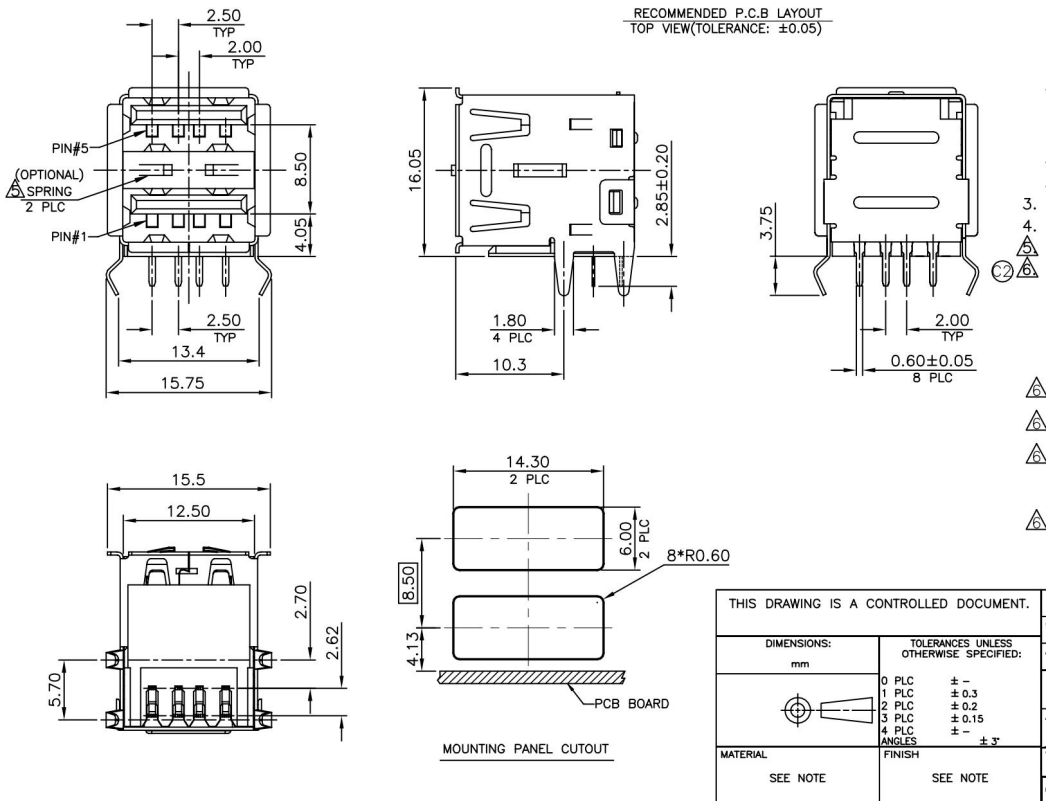
1) Part Reference：J4
2) Not special Pin1 is defined. The center is positive power input, and the negative pole around.
3) Specification for the DC Jack as below:



1.4.2 USB Host

The SOM-ET6ULL BB order three double-deck USB type A connector to feature six USB 2.0 host port for users.

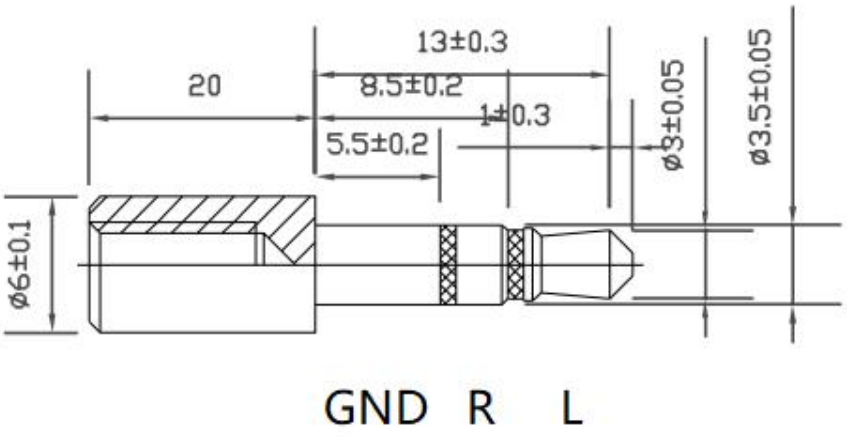
1) Part Reference：J7, J9, J10.
2) Not special Pin1 is defined.
3) Specification for the double-deck USB Host as below:



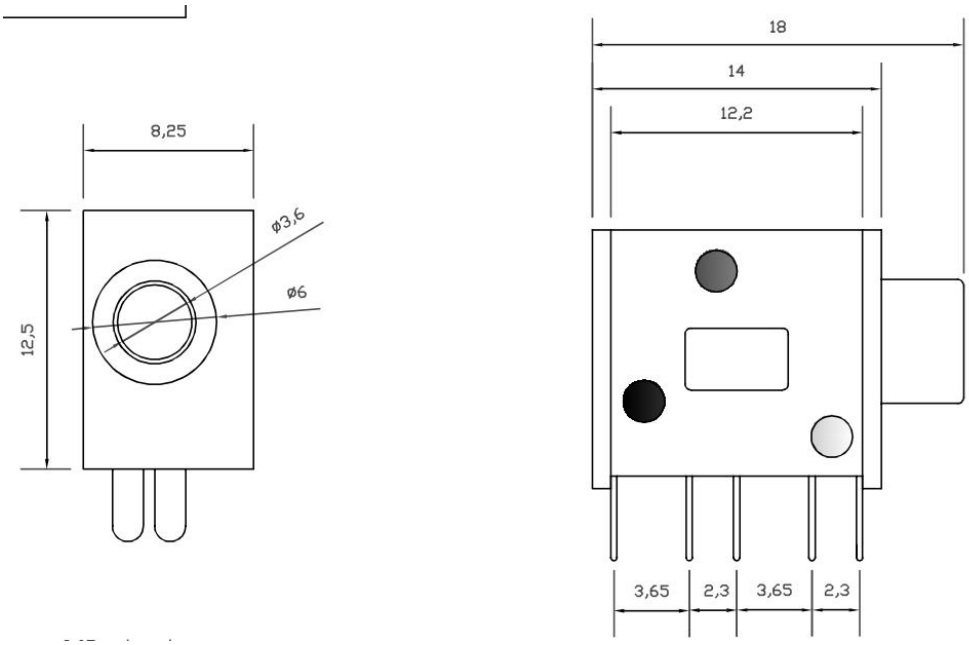
1.4.3 Audio Input/Output

The SOM-ET6ULL BB order two 3.5mm audio connector to feature audio input and audio output function. The audio output can drive a headphone directly and the audio input can receive audio signal from microphone.

1) Part Reference：J16 for audio in, J13 for audio out.
2) Not special Pin1 is defined. The specification for the audio plug show as below:



3) Specification for the double-deck USB Host as below:



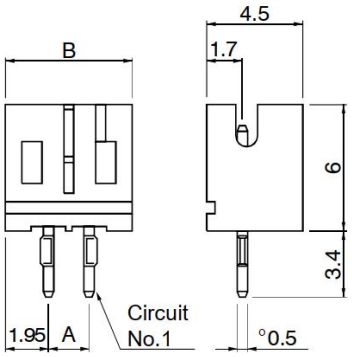
1.4.4 2x 1W Speaker Connector

The SOM-ET6ULL BB has two 2.00mm pin pitch 1x2pin WTB connectors that are used for 1W stereo speaker internal. These interfaces can drive 1W per channel into 8Ω BTL speaker.

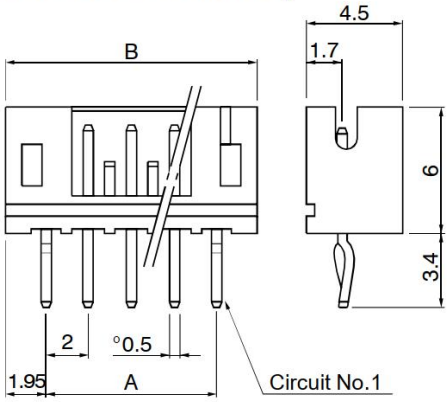
1) Part Reference: J14, J15.
2) Not special Pin1 is defined.
3) Specification for the double-deck USB Host as below:

Top entry type

(2 circuits)



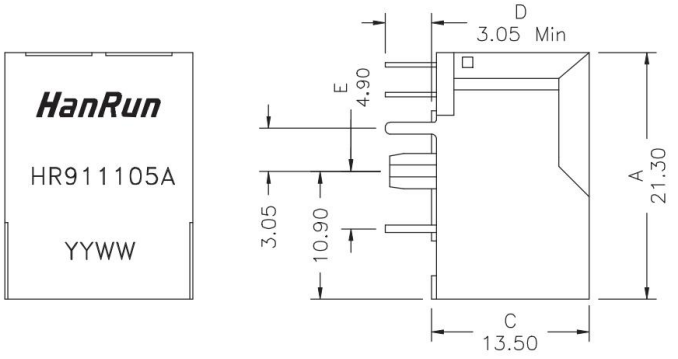
(3 circuits or more)



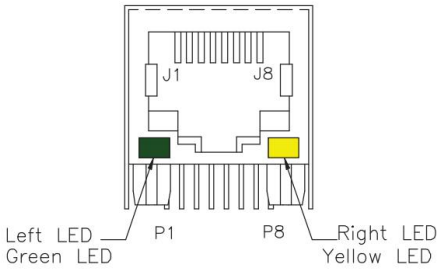
1.4.5 10/100M Ethernet

The SOM-ET6ULL BB feature two 10/100M ethernet. These network ports are 10/100M adaptive.

1) Part Reference：J5, J6.
2) Not special Pin1 is defined.
3) Specification for the double-deck USB Host as below:



(Top View) (Side View) (Bottom View)



(Front View)

Standard LED	Wavelength	Forward V (Min/Max)	Forward A	Type
Green	568nm	1.8V/2.8V	20mA	squareness
Yellow	585nm	1.8V/2.8V	20mA	squareness

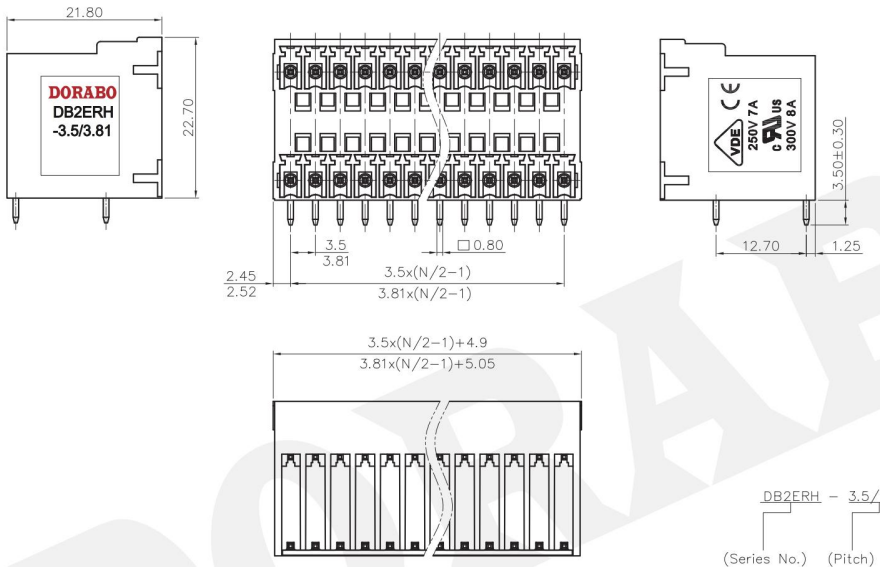
1.4.6 DIN/DO

The SOM-ET6ULL BB order a 3.81mm double-deck Terminal Block Header to feature two digital input and digital output. Upper layer features the digital output and the bottom layer features the digital input.

1) Part Reference: J24
2) Not special Pin1 is defined. The pin define for the digital input/output as below:

Upper	OUT1+	OUT1-	OUT1+	OUT2-
Bottom	12V Out	DIN1	DIN2	DIN GND

3) Specification for the connector for the digital input/output as below:



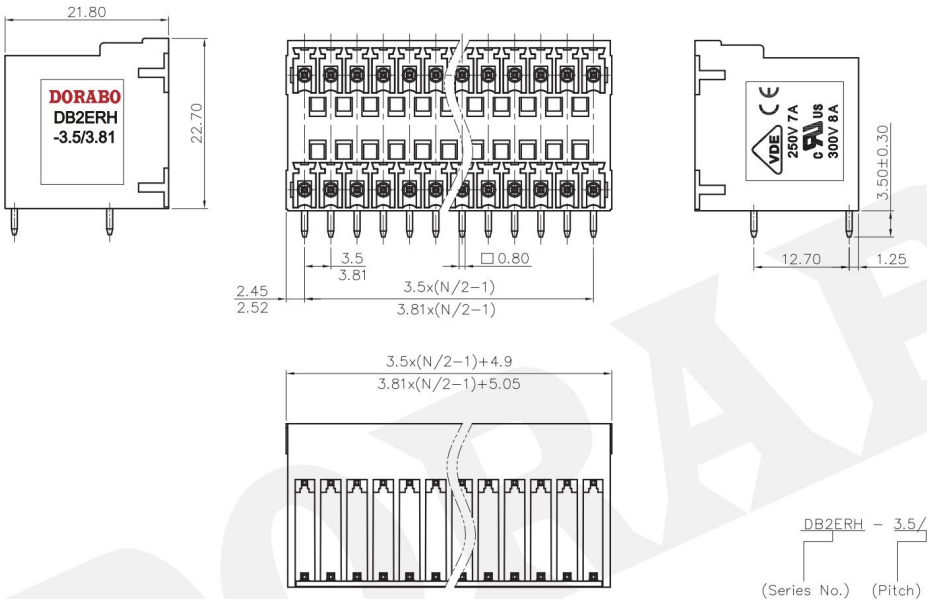
1.4.7 CAN/RS485

The SOM-ET6ULL BB order a 3.81mm double-deck Terminal Block Header to feature CAN and RS485 function. Upper layer features the CAN interface and the bottom layer features the RS485 interface.

1) Part Reference：J19
2) Not special Pin1 is defined. The pin define for the CAN/RS485 as below:

Upper	CAN_H	CAN_L	CAN_GND
Bottom	RS485_B	RS485_A	RS485_GND

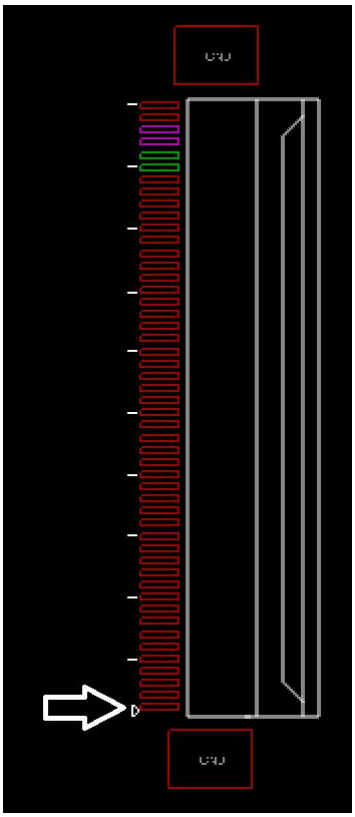
3) Specification for the connector for the digital input/output as below:



1.4.8 LCD

The SOM-ET6ULL BB order a 0.5mm pitch FPC connector to feature the LCD interface for display. It has a 24bits parallel display interface and include a resistance touch interface or capacitance touch interface with I2C bus.

1) Part Reference：J17
2) The 0.5mm pitch FPC connector has an special Pin1 defined that shows below.

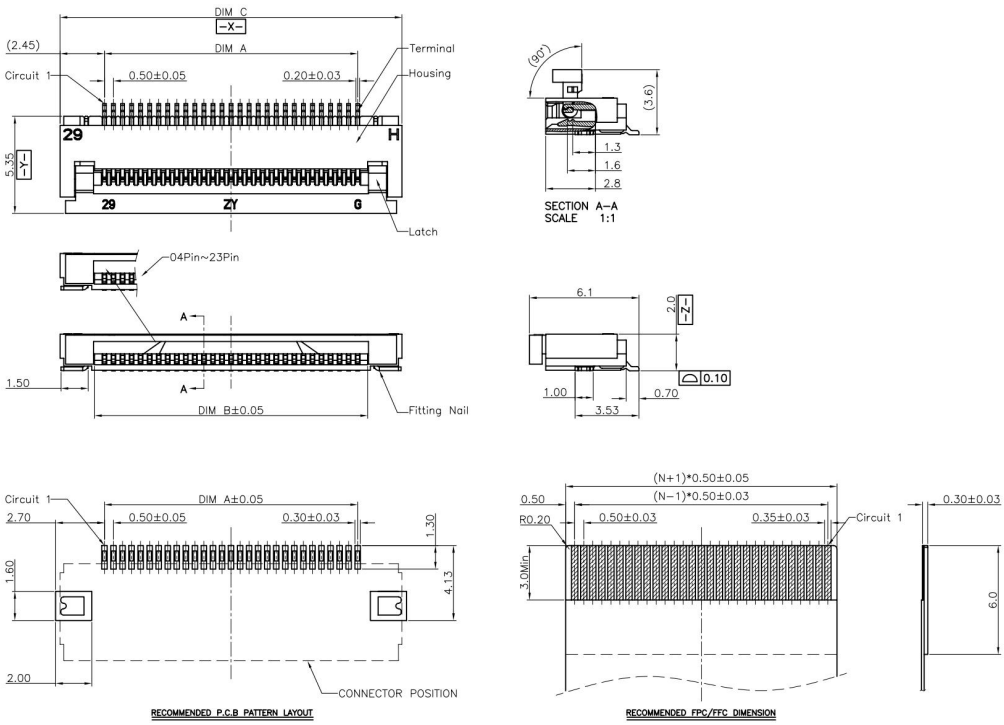


3) The pin defines for the FPC Connector as below:

Pin Num.	Pin Name	Level	Description
1	DSS_DATA0	3.3V	Display color blue Bit0
2	DSS_DATA1	3.3V	Display color blue Bit1
3	DSS_DATA2	3.3V	Display color blue Bit2
4	DSS_DATA3	3.3V	Display color blue Bit3
5	DSS_DATA4	3.3V	Display color blue Bit4
6	DSS_DATA5	3.3V	Display color blue Bit5
7	DSS_DATA6	3.3V	Display color blue Bit6
8	DSS_DATA7	3.3V	Display color blue Bit7
9	GND	0V	
10	DSS_DATA8	3.3V	Display color green bit0
11	DSS_DATA9	3.3V	Display color green bit1
12	DSS_DATA10	3.3V	Display color green bit2
13	DSS_DATA11	3.3V	Display color green bit3
14	DSS_DATA12	3.3V	Display color green bit4
15	DSS_DATA13	3.3V	Display color green bit5
16	DSS_DATA14	3.3V	Display color green bit6
17	DSS_DATA15	3.3V	Display color green bit7

18	GND	0V	
19	DSS_DATA16	3.3V	Display color red bit0
20	DSS_DATA17	3.3V	Display color red bit1
21	DSS_DATA18	3.3V	Display color red bit2
22	DSS_DATA19	3.3V	Display color red bit3
23	DSS_DATA20	3.3V	Display color red bit4
24	DSS_DATA21	3.3V	Display color red bit5
25	DSS_DATA22	3.3V	Display color red bit6
26	DSS_DATA23	3.3V	Display color red bit7
27	GND	0V	
28	DSS_DE	3.3V	Display AC bias enable
29	DSS_HSYNC	3.3V	Display Horizontal Sync
30	DSS_VSYNC	3.3V	Display Vertical Sync
31	GND	0V	
32	DSS_PCLK	3.3V	Display pixel clock
33	GND	0V	
34	GPIO4	3.3V	X+
35	GPIO3	3.3V	X-
36	GPIO2	3.3V	Y+
37	GPIO1	3.3V	Y-
38	NC		
39	NC		
40	TP_INT	3.3V	Touch interrupt
41	ACC_INT	3.3V	Touch reset
42	I2C1_SCL	3.3V	I2C bus 1 clock
43	I2C1_SDA	3.3V	I2C bus 1 data
44	GND	0V	
45	VDD3V3	3.3V	3.3V for logic
46	VDD3V3	3.3V	3.3V for logic
47	VDD5V	5V	5V for backlight
48	VDD5V	5V	5V for backlight
49	LCD_RST	3.3V	LCD Reset
50	BKLGHT_PWM	3.3V	Backlight PWM output

4) Specification for the 50 Pin FPC connector as below:

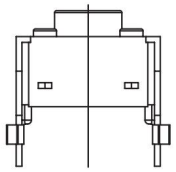


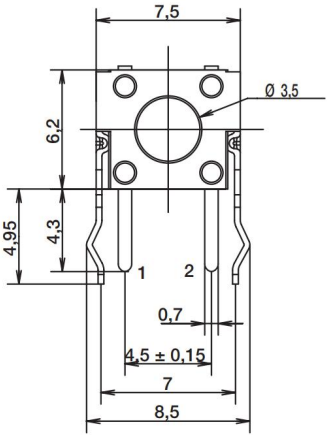
1.4.9 Reset

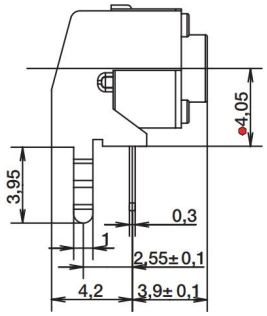
The SOM-ET6ULL BB has a reset key to cause a cold reset for the board.

1) Part Reference：S1
2) Not special Pin1 is defined. Press the button will reset the board directly.
3) Specification for the reset button as below:

V VERTICAL



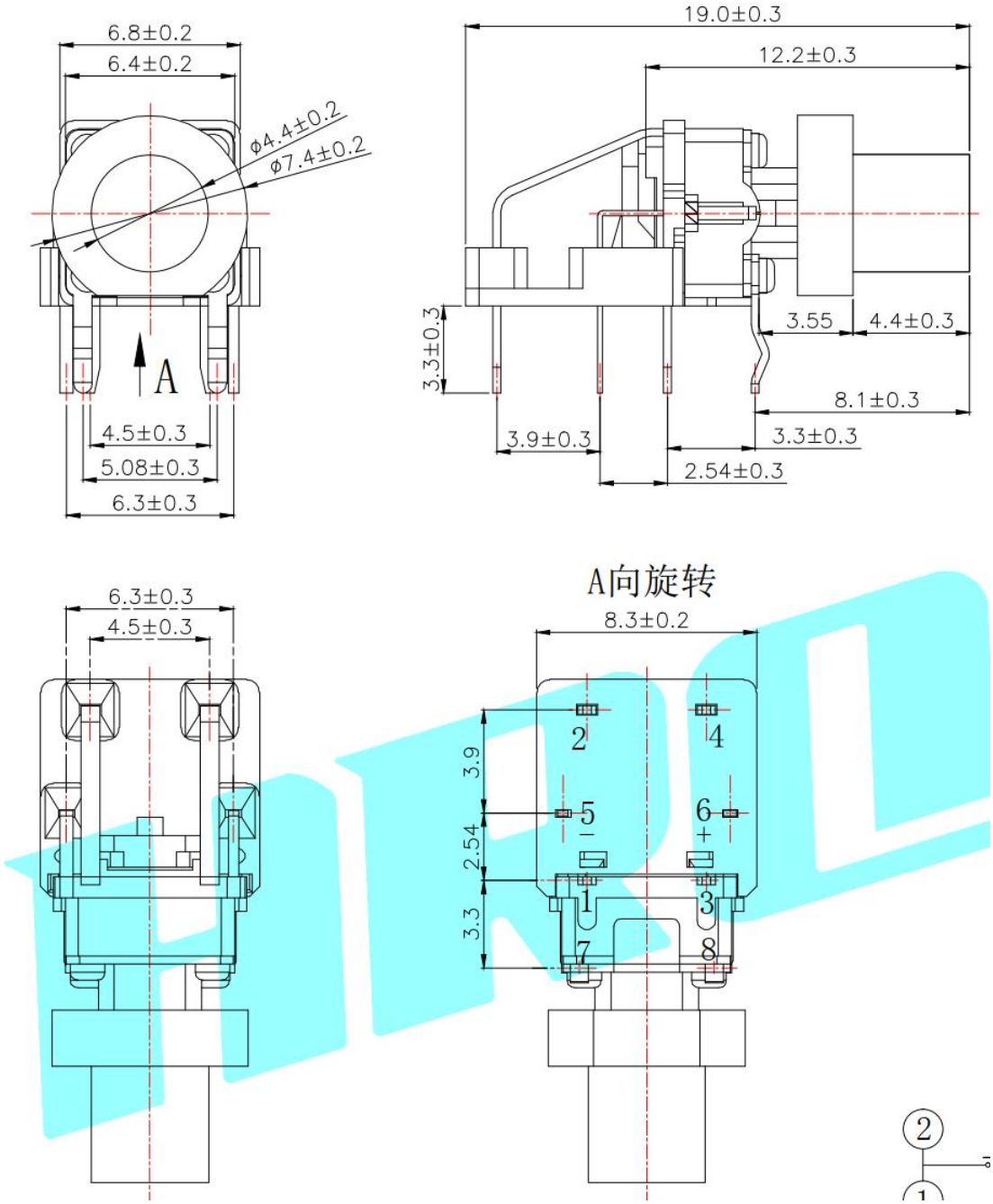




1.4.10 User Button

The SOM-ET6ULL BB has a user button key to for interrupt input. Short press the user button will generate an interrupt and long press the user button will turn down the system.

1) Part Reference：SW1
2) Not special Pin1 is defined.
3) Specification for the user button as below:



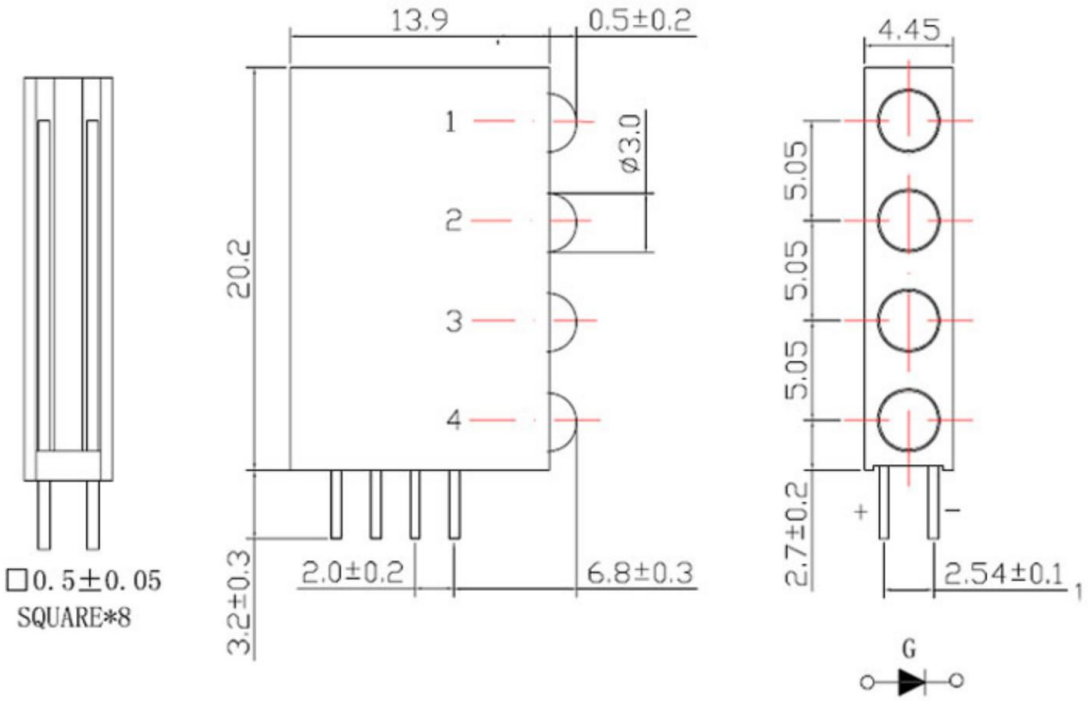
1.4.11 LED Indicator Light

The SOM-ET6ULL BB has a 2x4 LED array indicator light to indicate the state of the board. These LED will indicate the power, system running, 4G running and the internet connecting.

1) Part Reference：LED1, LED2.
2) Not special Pin1 is defined. The defines for the LED as below table.

LED	LED2	LED1
1	System/User LED	Power
2	User LED	4G 1PPS
3	ETH1 ACT	ETH1 Link
4	ETH0 ACT	ETH0 Link

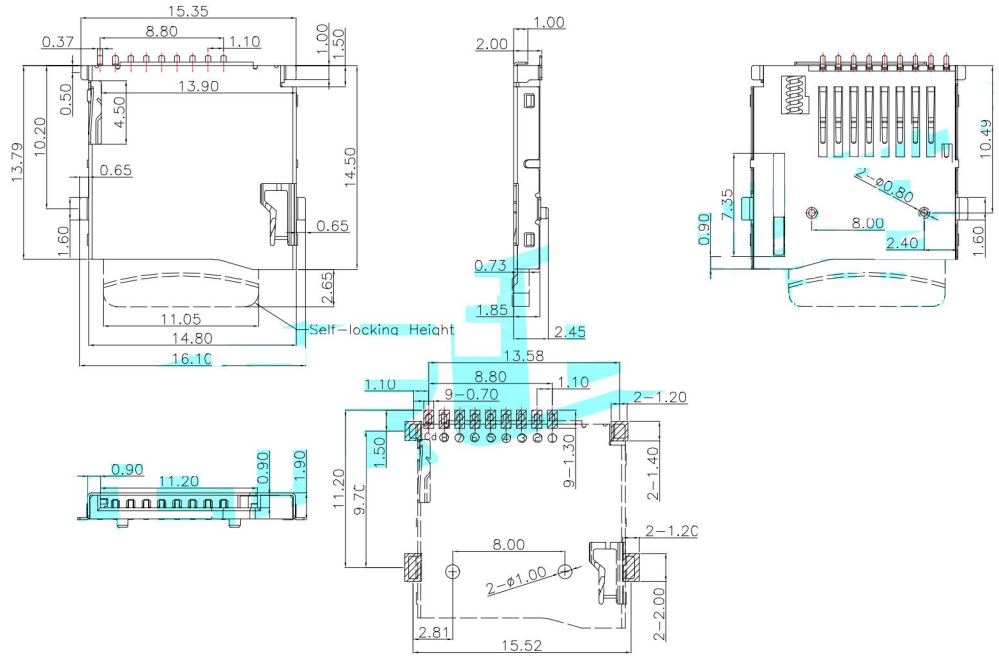
3) Specification for the user button as below:



1.4.12 TF Card

The SOM-ET6ULL BB has a TF Card connector to install a media card. This media card can be used for data storage or for firmware.

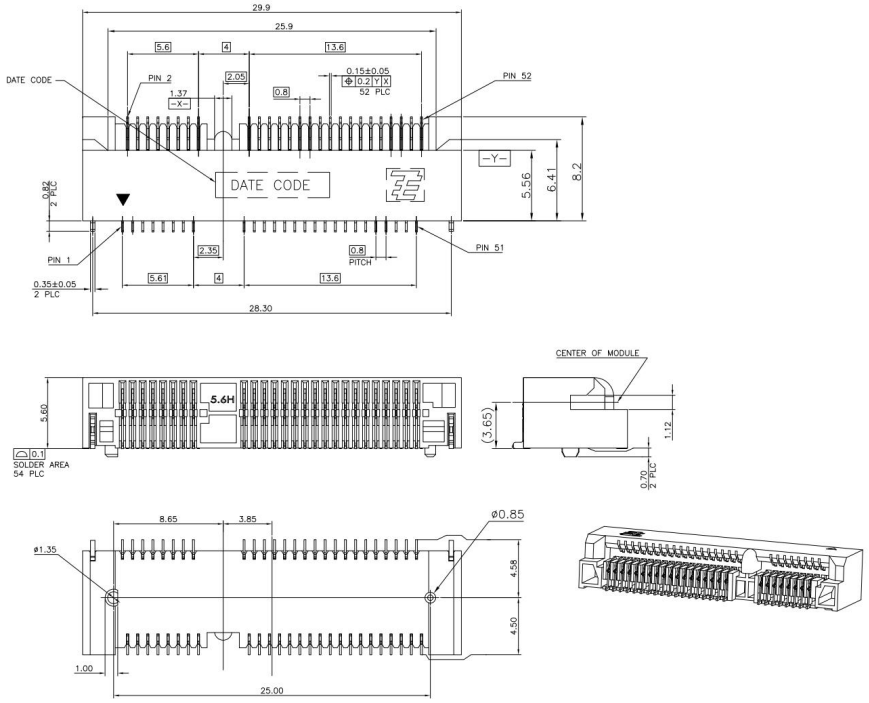
1) Part Reference：J18.
2) Not special Pin1 is defined.
3) Specification for the user button as below:



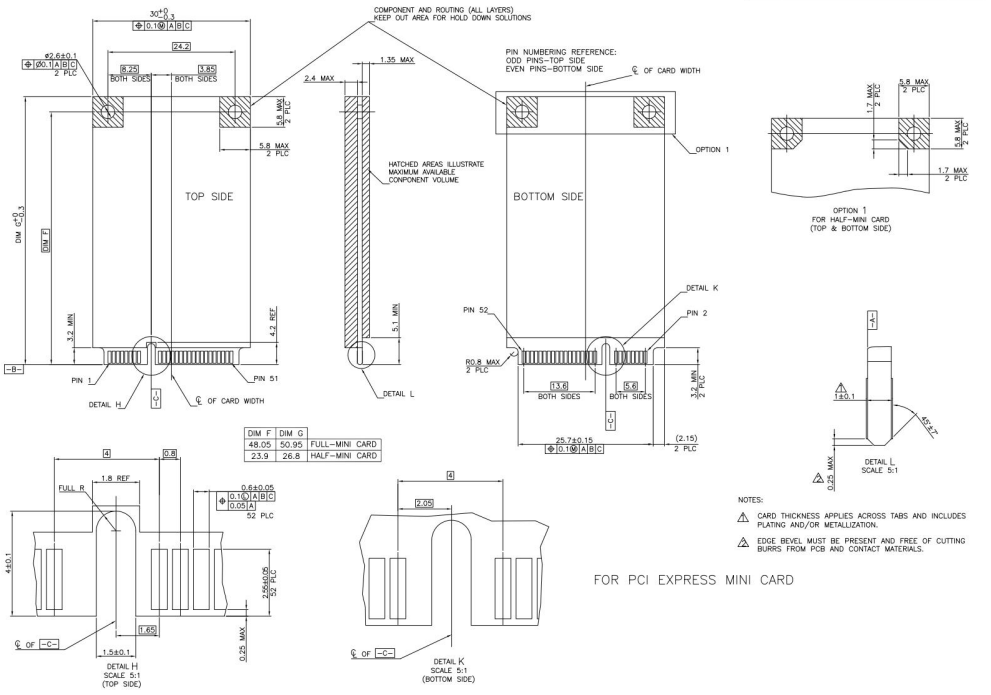
1.4.13 4G

The SOM-ET6ULL BB has a MiniPCIe and a SIM card connector used for 4G module. The 4G running state is indicated by the second LED of the LED1.

1) Part Reference：CN1 for 4G module and J12 for SIM Card.
2) Not special Pin1 is defined.
3) Specification for the MiniPCIe as below:

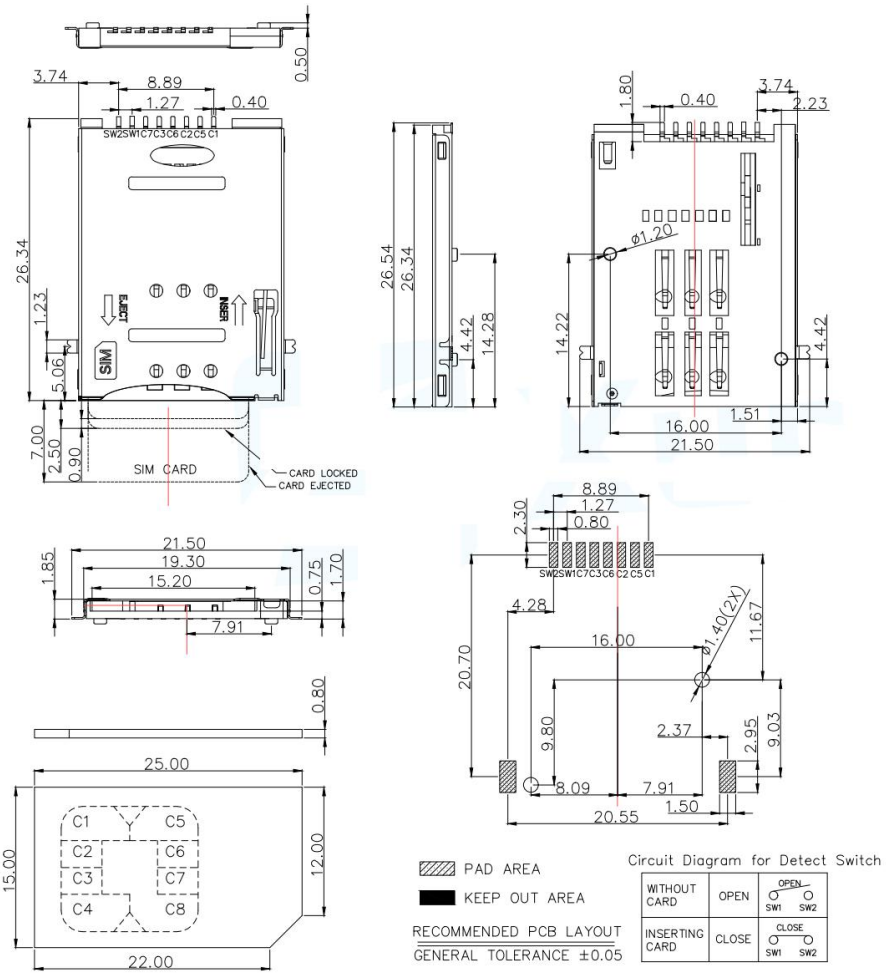


4) Specification for the 4G module as below



DIM F	DIM G	
48.05	50.95	FULL-MINI CARD
23.9	26.8	HALF-MINI CARD

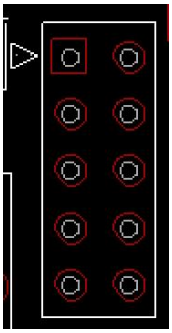
5) Specification for the 4G SIM card as below:



1.4.14 2.54mm Extension Interface

The SOM-ET6ULL BB has a 2x5pin 2.54mm pitch pin header for IO extension. A four wire UART and four GPIOs through this pin header. Please note that the four GPIOs are the same signal with Digital Input/output.

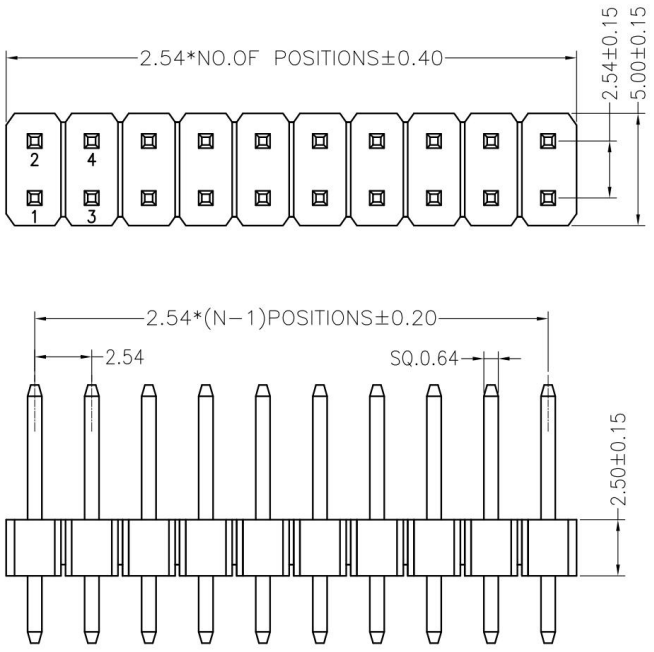
1) Part Reference：J23.
2) Pin1 position shows as below.



3) The defines for the pin header as below table.

Pin Num	Signal Name	Signal Name	Pin Num
1	3.3V/500mA Output	GND	2
3	UART5_TXD	DI0	4
5	UART5_RXD	DI1	6
7	UART5_CTS	DO0	8
9	UART5_RTS	DO1	10

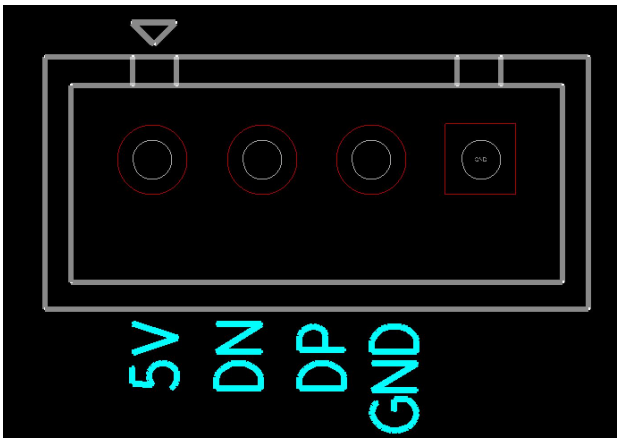
4) Specification for the user button as below:



1.4.15 USB Extension Interface

The SOM-ET6ULL BB has a 1x4pin 2.5mm pitch pin header with box for USB expansion. This connector is routed to a 4 ports USB HUB USB2514 to provide standard USB2. 0 signal.

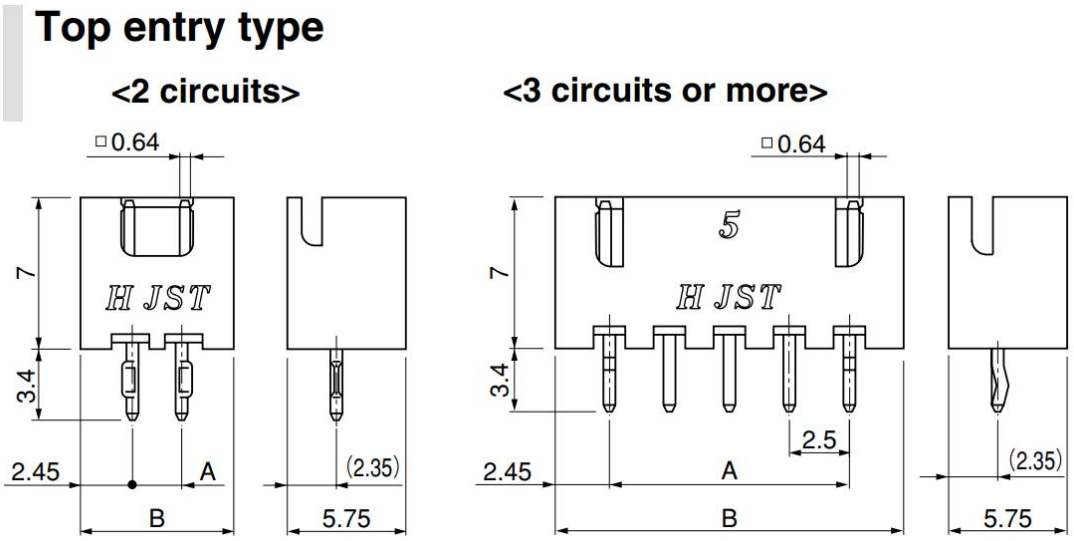
1) Part Reference：CON1.
2) Pin1 position shows as below.



3) The defines for the pin header as below table.

Pin Num	Signal Name
1	5V/500mA Output
2	DN
3	DP
4	GND

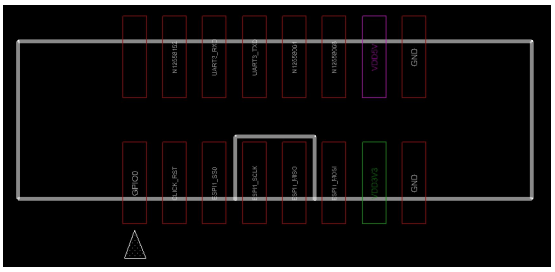
4) Specification for the user button as below:



1.4.16 IO Extension

The SOM-ET6ULL BB has a 2x8pin 1.27mm pitch pin header with box for IO expansion. This connector provides SPI, UART3, I2C2 and AIN function.

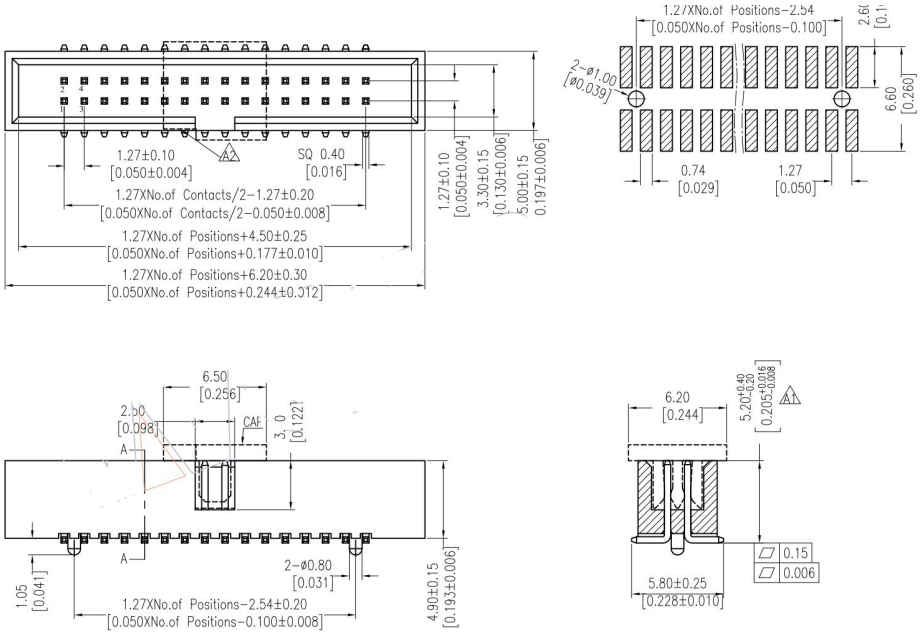
1) Part Reference: J22.
2) Pin1 position shows as below.



3) The defines for the pin header as below table.

Pin Num	Signal Name	Signal Name	Pin Num
1	GPIO0(AIN)	NC	16
2	Reset Output	EXT_INT	15
3	ESPI1_SS0	UART3_RXD	14
4	ESPI1_SCLK	UART3_TXD	13
5	ESPI1_MISO	I2C2_SCL	12
6	ESPI1_MOSI	I2C2_SDA	11
7	VDD3V3	VDD5V	10
8	GND	GND	9

4) Specification for the user button as below:

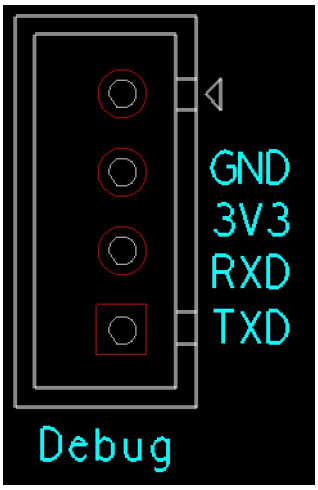


1.4.17 Debug Port

The SOM-ET6ULL BB has a 1x4pin 2.5mm pitch pin header with box for debugging. The voltage level is 3.3V.

1) Part Reference：CON2.

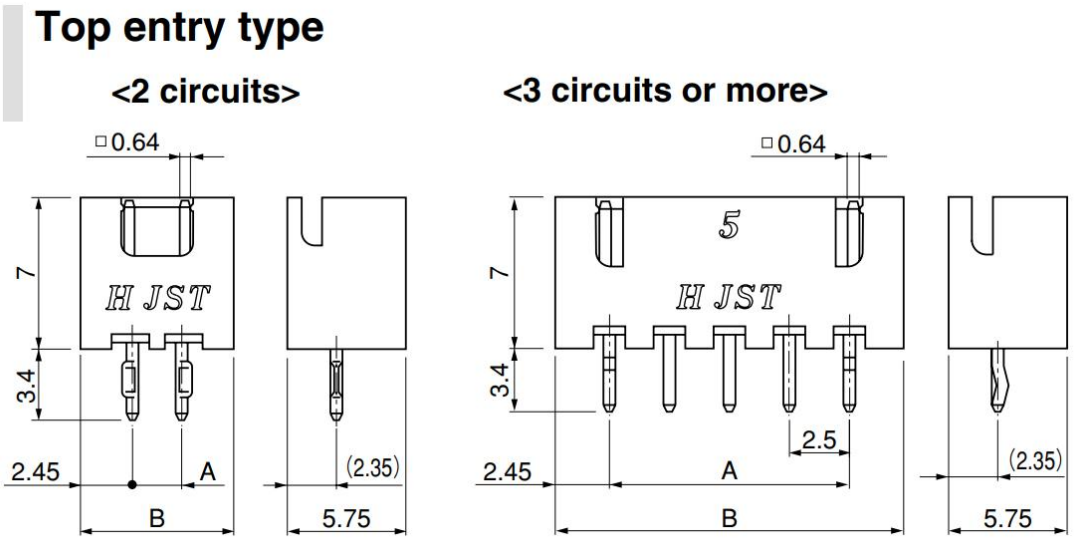
2) Pin1 position shows as below.



3) The defines for the pin header as below table.

Pin Num	Signal Name
1	GND
2	3.3V/500mA Output
3	RXD
4	TXD

4) Specification for the user button as below:



1.4.18 Serial Download

The SOM-ET6ULL BB has micro USB connector for Serial Download function.

This port only for Serial Download purpose and when is connected to a host, the

USB host on front panel near to the microUSB will be disable. This ports will still invalid until the cable is removed from the Serial Download port.

1) Part Reference：J8.
2) Not special Pin1 is defined..
3) Specification for the user button as below: