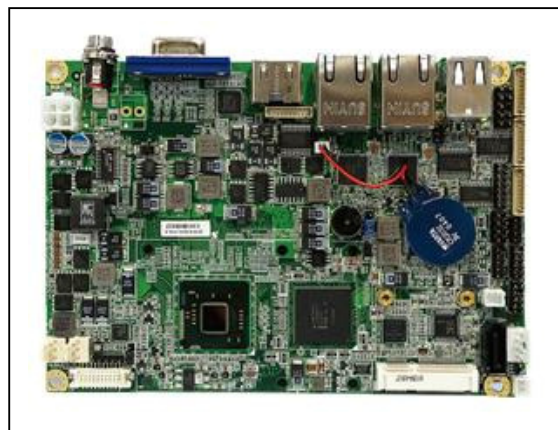


# User Manual

## **MB-80510 (SCB for PL-80510 Platform)**

3.5" SBC with onboard Intel® Atom™ processor D2550 or N2600, Intel® NM10 chipset, DDR3 up to 4GB, 2 x Intel® Giga LAN, Onboard VGA, LVDS, HDMI, SATA, 6 x USB, 4 x COM, GPIO, 2 x Mini-PCIe sockets, DC 8V ~ 32V input



Ver.	Release Date	Update
1.0	2013.01.31	Release



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For more information or other WIN products, please visit our website <http://www.win-enterprises.com>.

For technical support send your inquiries to [sales@win-ent.com](mailto:sales@win-ent.com).

## Packing list

Before use this product, please make sure that the following materials have been shipped.

- ▶ 1 x MB-80510 3.5" SBC
- ▶ 1 x CPU cooling Fan ( p/n: CB-F0056-00 )
- ▶ 1 x SATA cable, L/ 200mm ( p/n: CB-SATA11-00 )
- ▶ 1 x 12V/5V SATA power cable , L/ 150mm ( p/n: CB-IPOW41-00 )
- ▶ 1 x COM port, DB9 type, L/ 180mm, without bracket ( p/n: CB-ICOM34-01 )
- ▶ 1 x CD Utilit

p/n: CB-F0056-00	p/n: CB-SATA11-00	p/n: CB-IPOW41-00	p/n: CB-ICOM34-01
			

Model Name	Description
MB-8051A	3.5" SBC w/ Intel® Atom™ N2600, 2 GLAN, DDR3 up to 2GB, VGA, LVDS, HDMI, SATA, COM, Mini-PCle, DC 8V~32V input.
MB-8051B	3.5" SBC w/ Intel® Atom™ D2550, 2 GLAN, DDR3 up to 4GB, VGA, LVDS, HDMI, SATA, COM, Mini-PCle, DC 8V~32V input.

\* If any of those items are missing or damaged, please contact with sales representative or distributor

Optional Accessory

Photo	Model Name	
	P//N:	CB-ICOM34-01
	Single COM port, DB9 type, L/ 180mm, without bracket	
	P//N:	CB-IUSB03-00
	Dual USB cable, L/ 245mm, without bracket	
	P//N:	TBD
	DC 5V output cable for SATA SSD	
	P//N:	CB-IPS200-00
	PS/2 Keyboard & Mouse cable, L/ 150mm, without bracket	
	P//N:	CB-IAUD15-01
	Line-out , Line-In , Mic-In audio cable, L/ 180mm, without bracket	



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### **Safety Information**

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Make sure that your power supply is set to the correct voltage in your area.
- If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

### **Operation Safety**

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter technical problems with the product, contact a qualified service technician or your retailer.



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## **Custom Embedded Solutions**

### **1.1 Introduction**

MB-80510 is a 3.5" SBC with onboard Intel® Atom™ processor N2600 or D2550 dual core processor and Intel® NM10 express chipset. Integrated graphics for three display options include HDMI , VGA and 18/24-bit LVDS. One DDR3 SO-DIMM supports a maximum of 4GB DDR3 800/1066 of system memory.

There're two flexible Mini-PCIe sockets for expansion, one is Full-size type and the other one is half-size type. Both of them are support standard Mini-PCIe card for PCIe & USB signal-base, such as WIFI. Besides that, A SIM card holder that could install SIM card when install a Full-size Mini-PCIe 3G module for wireless connection. For the Half-size Mini-PCIe socket, it's also support mSATA SSD as storage device.

Regarding I/O ports , MB-80510 provides plenty of connectivity , such as 2 x Intel® gigabit Ethernet provided by Intel® i211AT controller, 1 x RS232/422/485 & 3 x RS232, 6 x USB2.0, HD Audio, PS/2 Keyboard/Mouse, 1 x SATA 6Gb/s, 1 x LPC pin-header that could support WIN's TPM module if customer need to protect information.

MB-80510 that could accept wide range DC 8V ~ 32V input, a external DC locking power jack and a 4-pin internal power connector for easier power integration

MB-80510 is a small form-factor embedded platform equip with Intel® Atom low power processor and also rich IO ports, make MB-80510 suitable for a wide range of applications in digital signage, POS, kiosks, and factory automation. Fanless design are allowed for high temperature and dusty environments

WIN offers reliable and solid products which are produced under Management System Standards: ISO9001-2000 Certificate. The certificate keeps us focused on our quality objectives of management and environmental production. Its willingness to customize standard products for meet unique customer needs makes WIN different. All ODM projects are welcome. Years of experiences enables WIN to fulfill the customer's vision, by delivering products to exact specifications. WIN R&D team is proud of its strong engineering background. R&D professionals account for 25% of the WIN workforce. We focus on developing new products for both emerging and established markets

For more information about OEM/ODM, please contact us :

Email: [sales@win-ent.com](mailto:sales@win-ent.com)

TEL: +1 (978) 688-2000



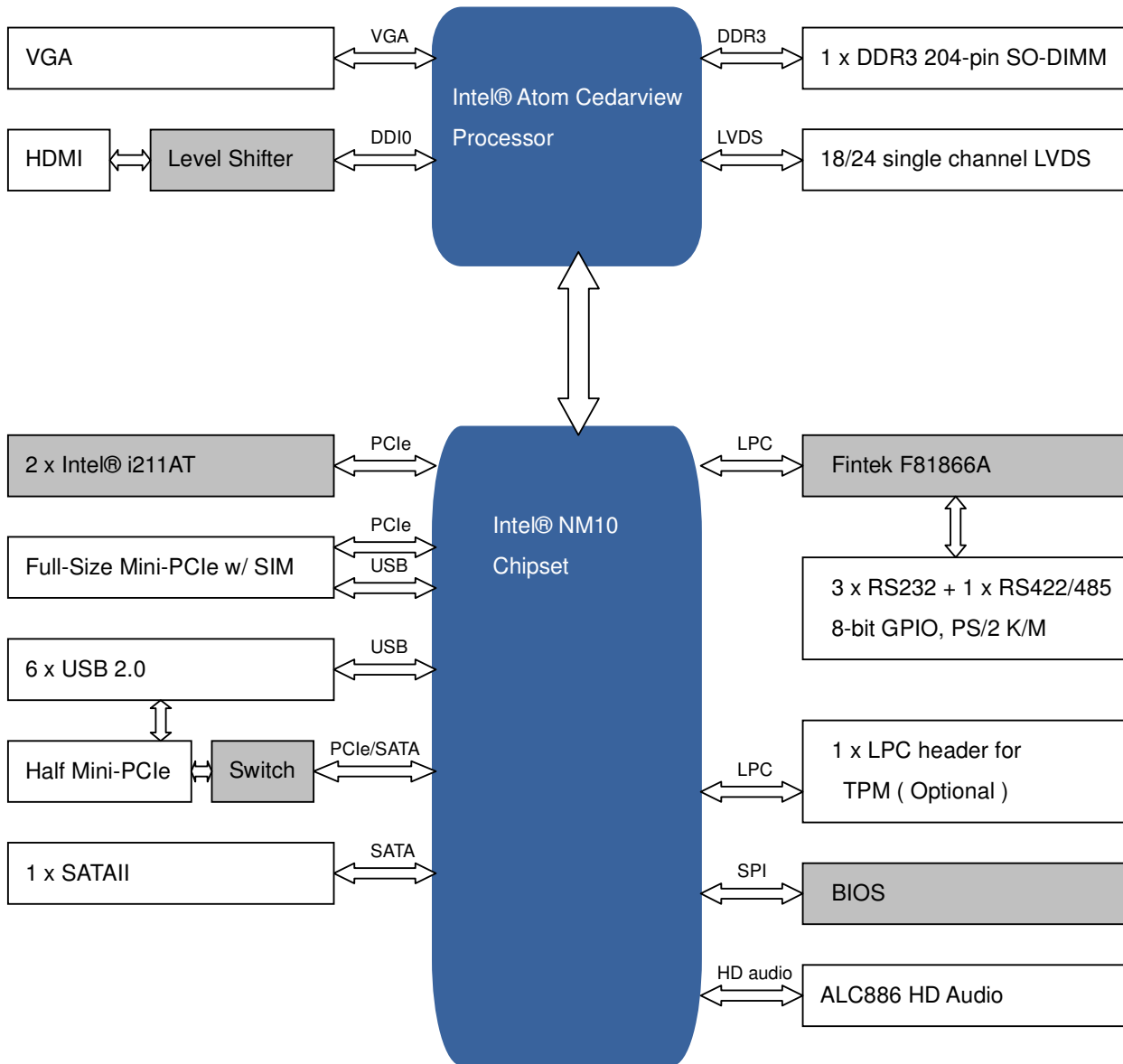


**Custom Embedded Solutions**

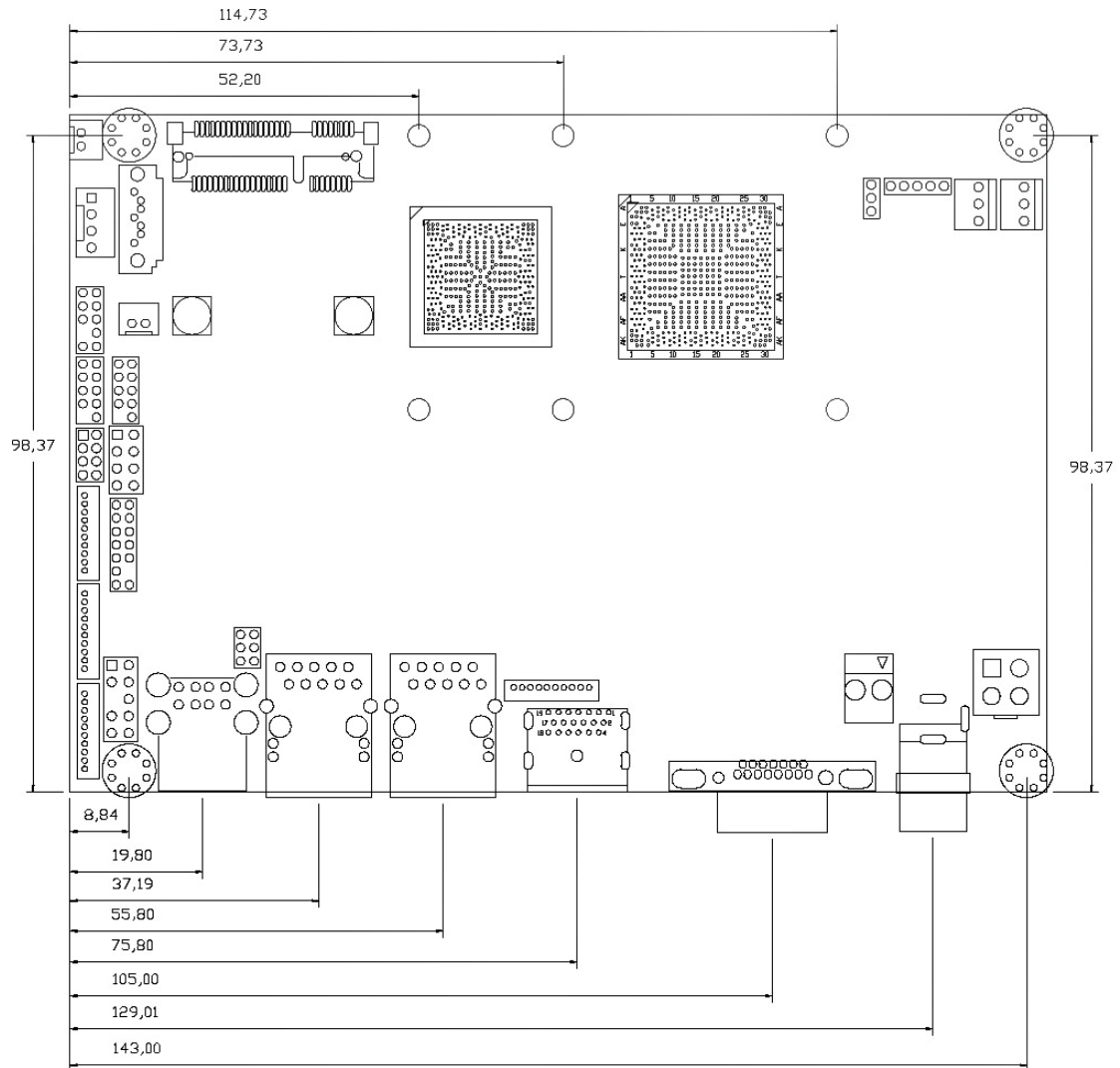
1.2 Specifications of board

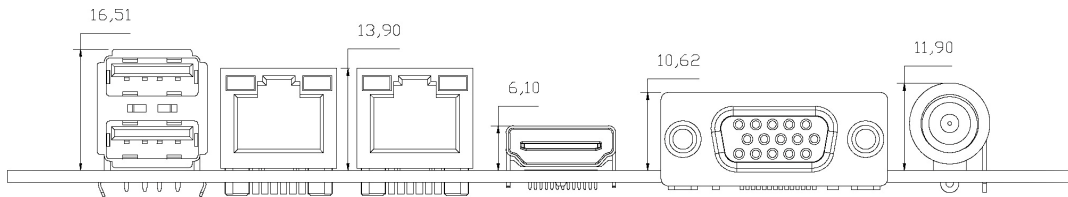
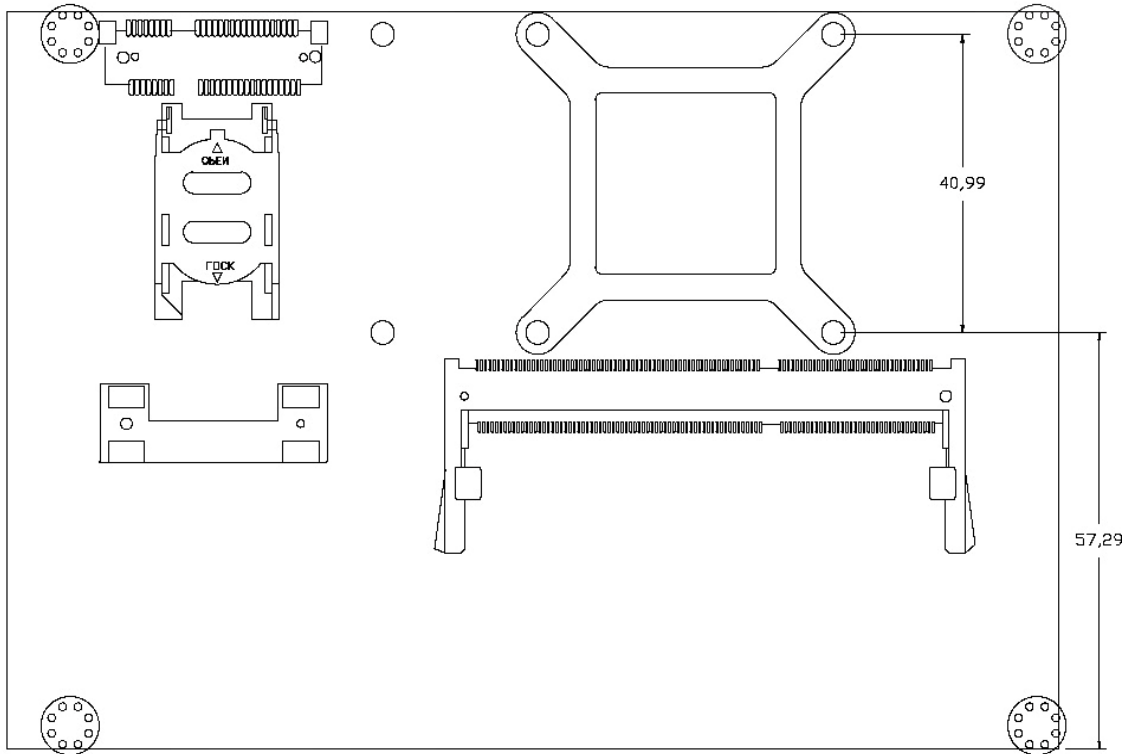
Form Factor	3.5" SBC
CPU	Onboard Intel® Atom N2600 / D2550 processor
Chipset	Intel® NM10 chipset
Memory	1 x DDR3 204-pin SO-DIMM socket up to 4GB ( D2550 ) 1 x DDR3 204-pin SO-DIMM socket up to 2GB ( N2600 )
BIOS	AMI® SPI BIOS
Watchdog Timer	255 levels timer interval, (1 ~ 255 seconds), setup by software
Integrated graphic	Build-in Intel® Atom graphic
VGA interface	1 x DB15 external VGA connector
LVDS interface	18/24-bit Single-channel LVDS interface (D2550) 18-bit Single-channel LVDS interface (N2600)
HDMI interface	1 x external HDMI 1.3a spec. interface
SATA interface	1 x SATAII
SSD interface	1 x Half-size Mini-PCIe socket support mSATA .
Ethernet	2 x Intel® i211AT
Audio interface	1 x Realtek ALC886 codec
Expansion interface	1 x Full-size Mini-PCIe socket w/ SIM socket ( PCIe X1 + USB2.0 signal ) 1 x Half-size Mini-PCIe socket ( PCIe X1 / SATA2.0 + USB2.0 signal )
COM	Internal: 3 x RS232, 1 x RS422/485 ( COM2 )
USB	Internal: 4 x USB 2.0 External: 2 x USB 2.0
GPIO	8-bit programmable GPIO interface
Low Pin Count	1 x Low Pin Count ( Support AEWIN's TPM module )
Power Input	Wide range DC 8V ~ 32V input
Other Internal IO	1 x 12V/5V & 1 x 5V DC output header 1 x LVDS Voltage select, 1 x LVDS inverter, 1 x PS/2 K/M Reset, HDD/Power LED header
Operating temperature	0°C ~ 60°C

### 1.3 Block Diagram

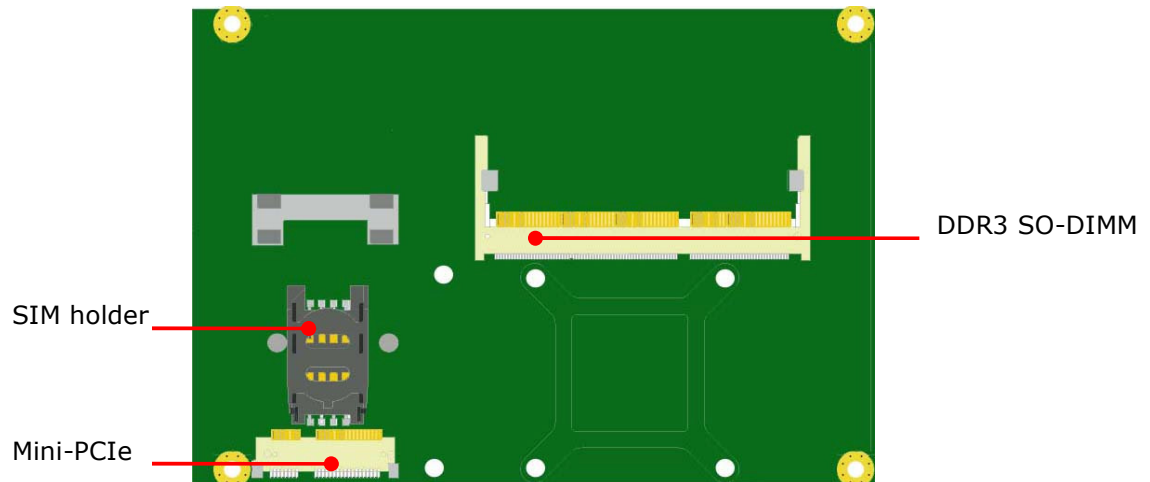
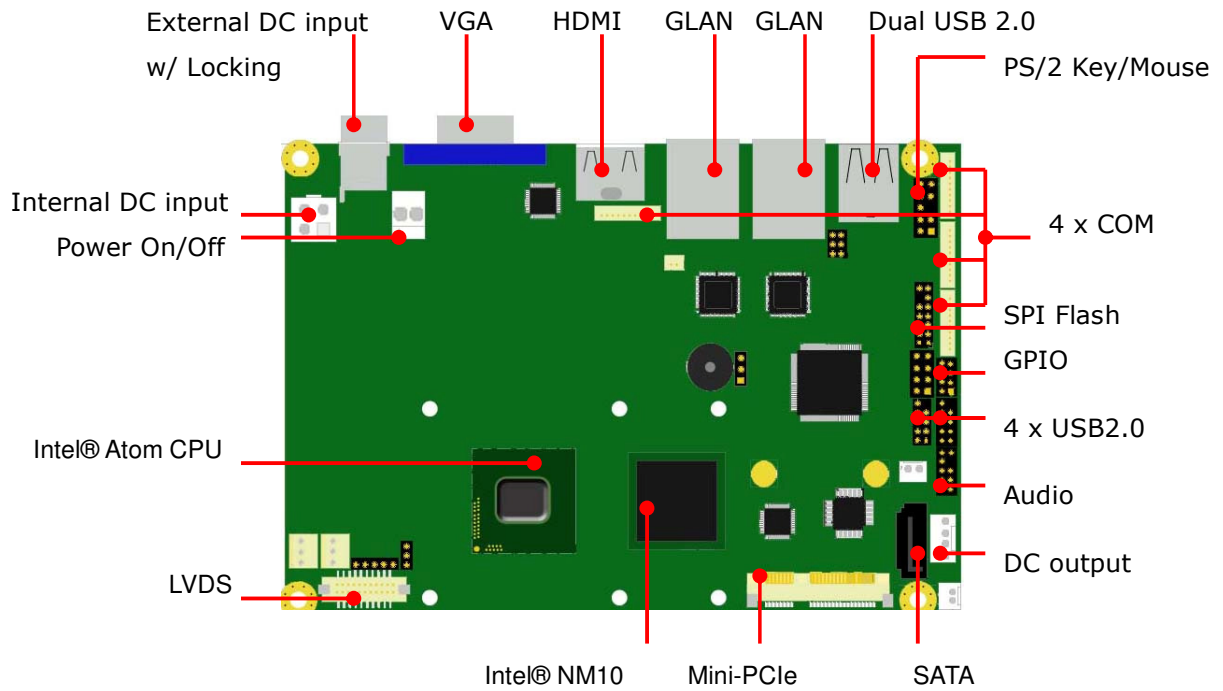


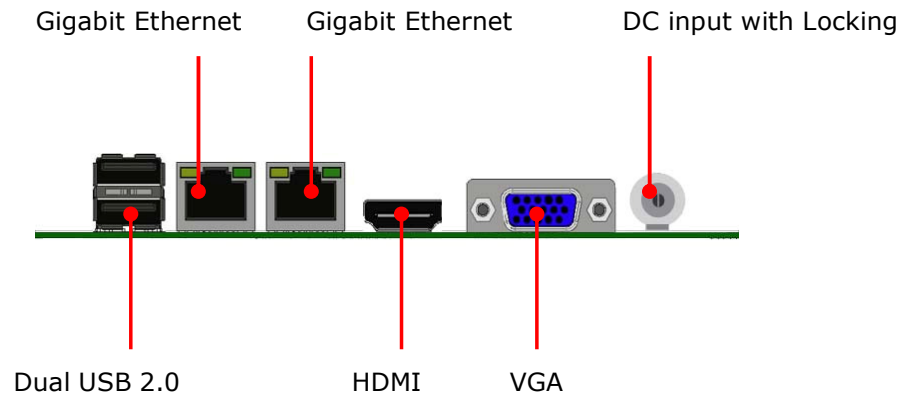
### 1.4 Board Layout Dimensions



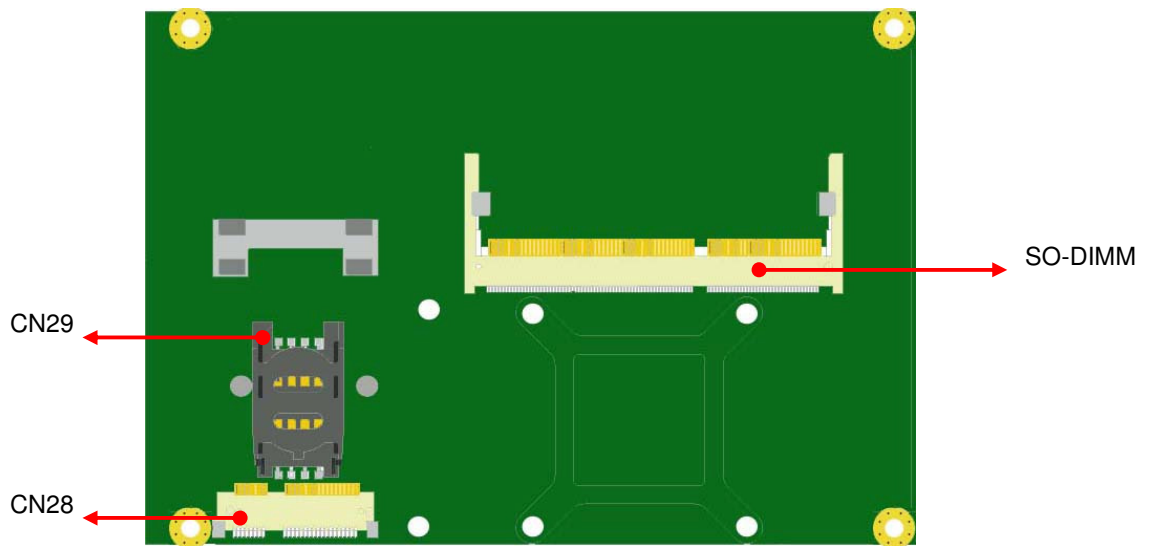
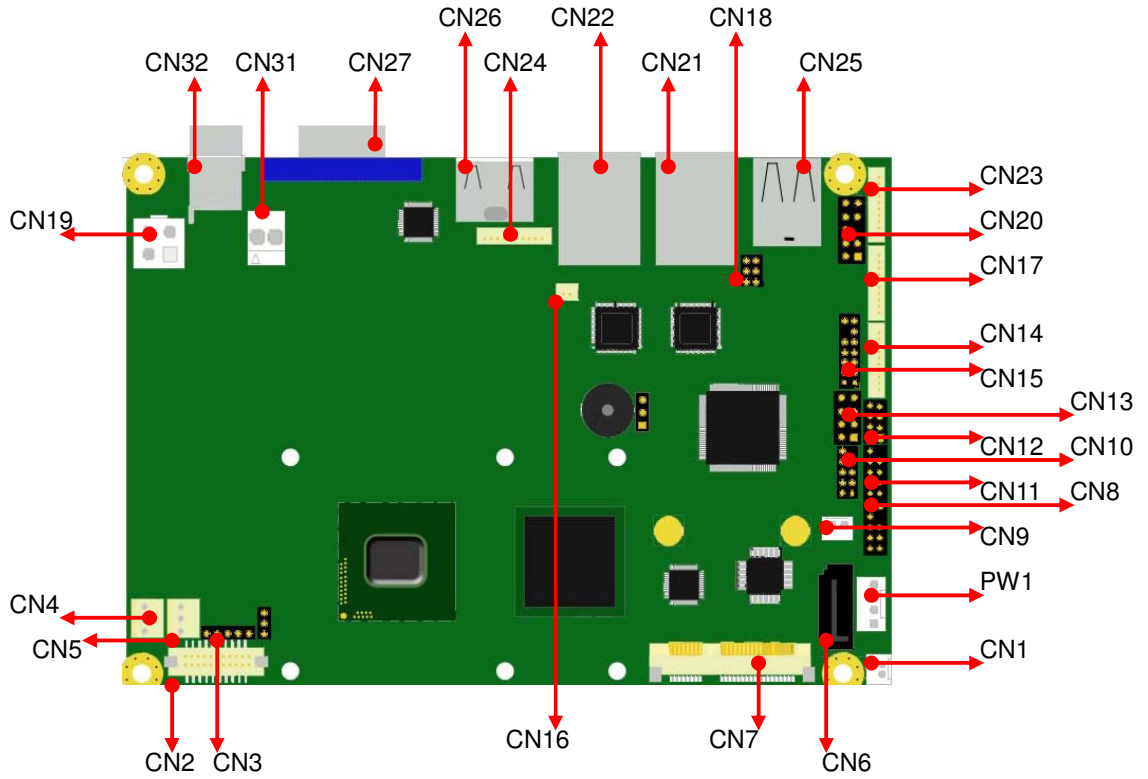


### 1.5 IO ports





## 2.1 The location of onboard connectors





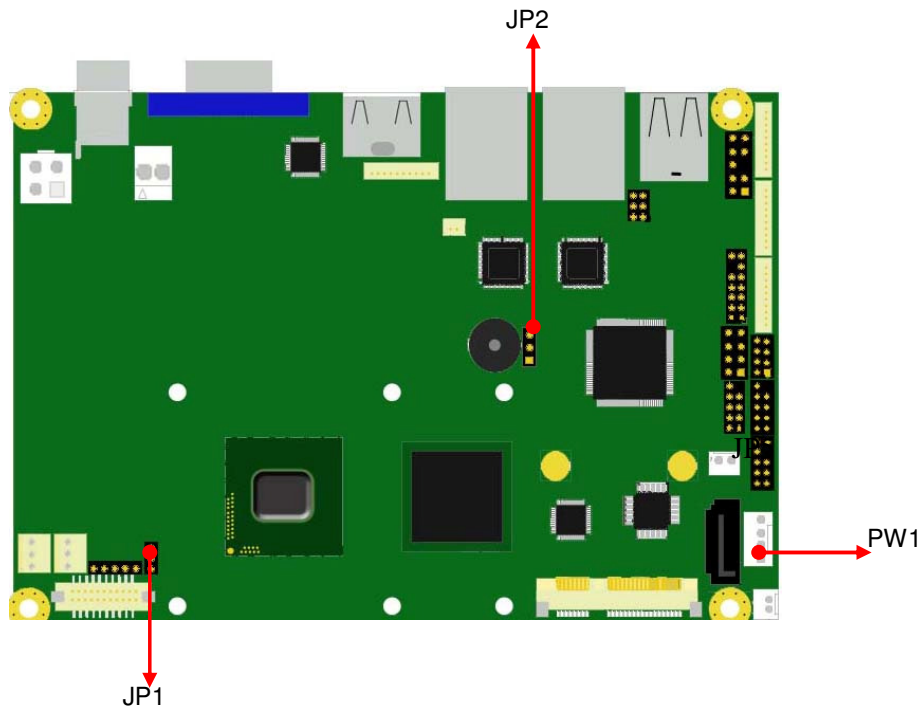
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Label	Function
CN1	WLAN/WWAN LED Pin header
CN2	LVDS Pin header
CN3	Backlight Pin header
CN4	System Fan header
CN5	CPU Fan header
CN6	SATA 2.0 connector
CN7	Half-size Mini-PCIe socket
CN8	Audio Pin header
CN9	DC 5V output for SSD Pin header
CN10	USB 2.0 Pin header
CN11	USB 2.0 Pin header
CN12	8-bit GPIO Pin header
CN13	SPI Flash Pin header
CN14	COM2 / RS232/422/485 Pin header
CN15	Low Pin Count Pin header
CN16	CMOS Battery header

Label	Function
CN17	COM3 / RS232 Pin header
CN18	Reset, HDD/Power LED Pin header
CN19	4-pin internal DC input connector
CN20	PS/2 Keyboard & Mouse Pin header
CN21	Gigabit Ethernet connector
CN22	Gigabit Ethernet connector
CN23	COM4 / RS232 Pin header
CN24	COM1 / RS232 Pin header
CN25	Dual USB 2.0 connector
CN26	HDMI connector
CN27	DB15 VGA connector connector
CN28	Full-size Mini-PCIe socket
CN29	SIM holder
CN30	N/A
CN31	Power On/Off switch ( N/C )
CN32	External DC input power connector



## 2.2 The location of onboard jumpers



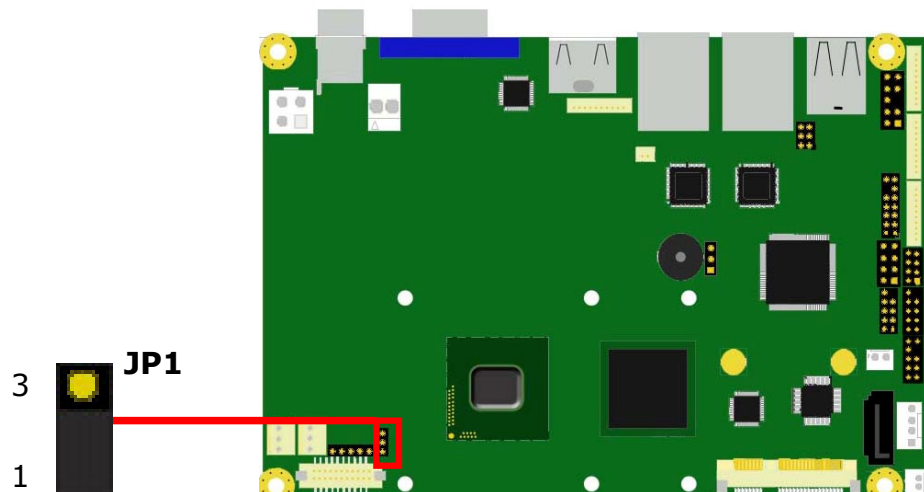
Label	Function
JP1	Panel Voltage ( VCC ) select
JP2	CMOS Clear jumper
PW1	12V/5V DC output

## 2.3 The function list of onboard jumper settings

### - 2.3.1 : JP1 for LVDS Panel Vcc select

JP1	
Closed Pin	Result
1-2 *	+3.3V
2-3	+5V

\* Default setting

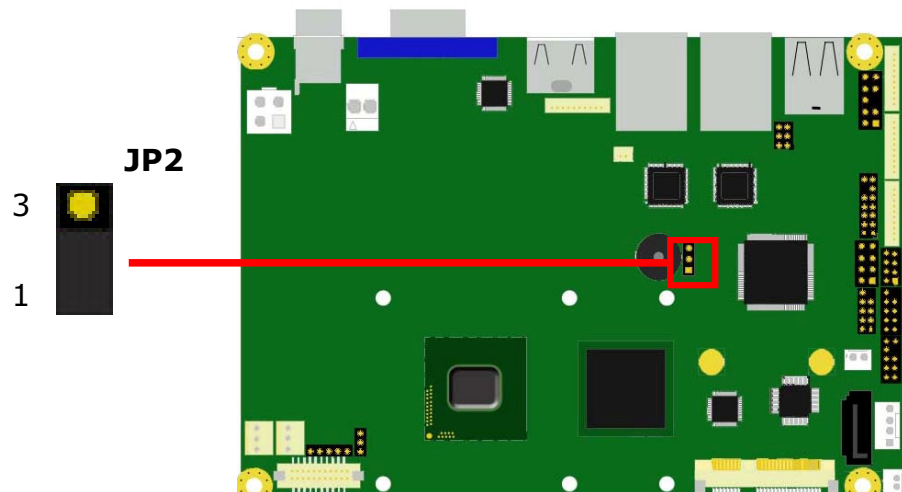


### - 2.3.2 : JP2 for Clear CMOS

If you want to clean the CMOS data, set jumper to 2-3 just for few seconds, Then,  
Move the jumper back to 1-2 pin

JP2	
Closed Pin	Result
1-2 *	Normal
2-3	Clear CMOS

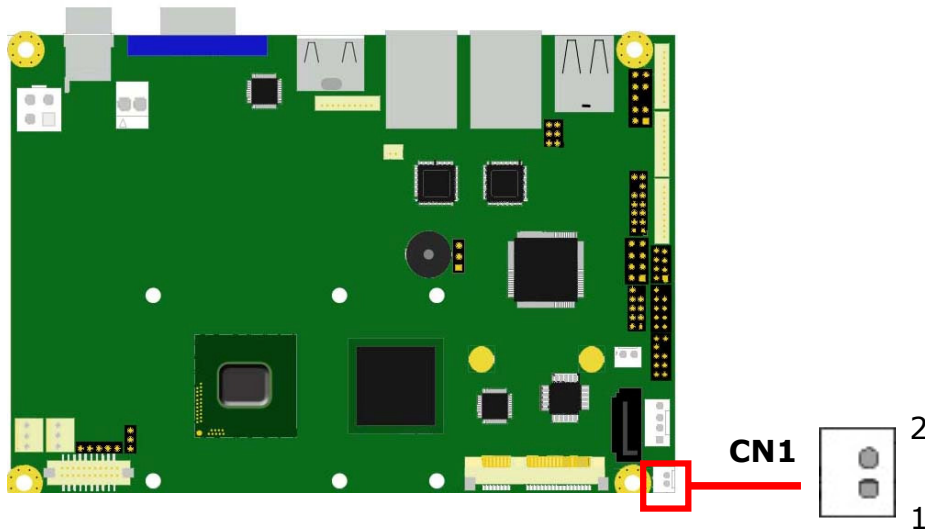
\* Default setting



## 2.4 The pin definitions of onboard pin header

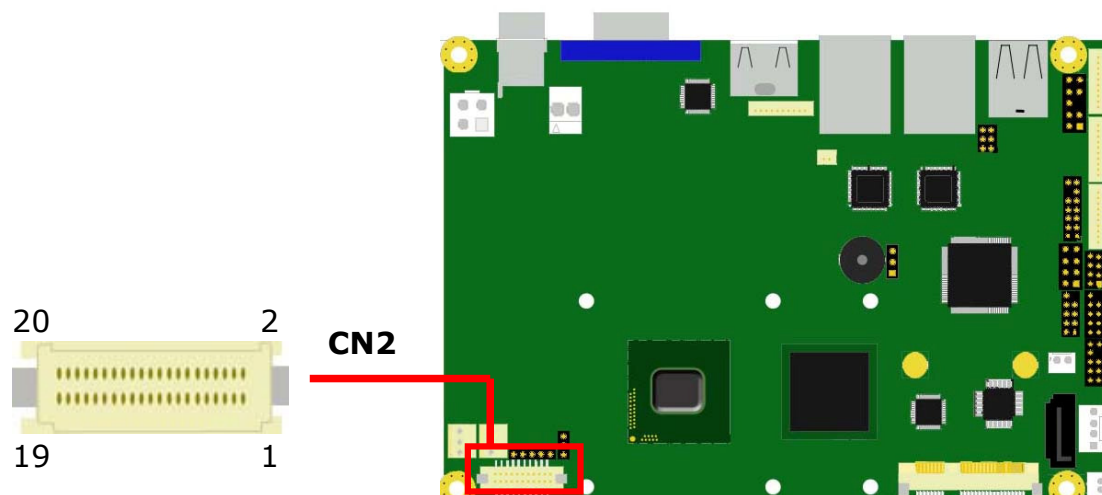
### - 2.4.1 : CN1 for Mini-PCIe WLAN/WWAN LED indicator

CN1: 1 x 2 header , Picth 2.0mm			
Pin	Signal	Pin	Signal
1	LED1_WLAN	2	LED_WLAN

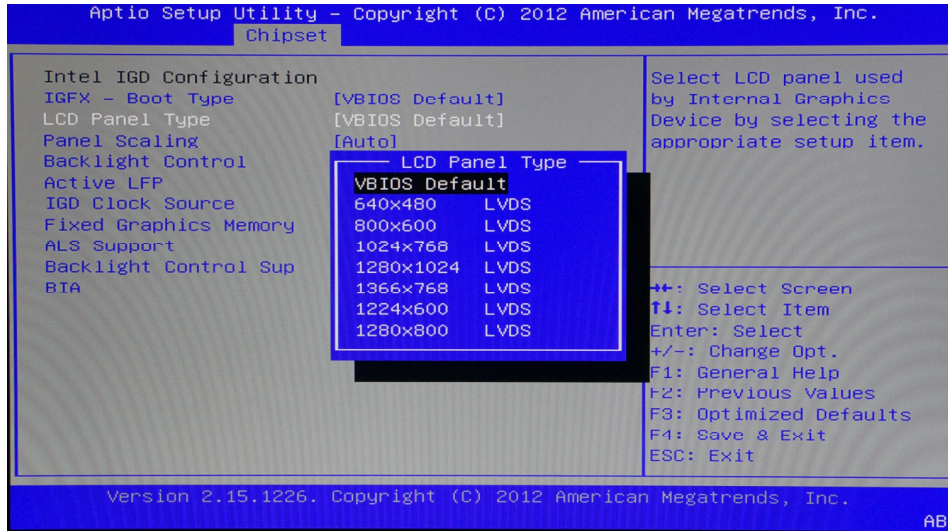


- 2.4.2 : CN2 for LVDS connector

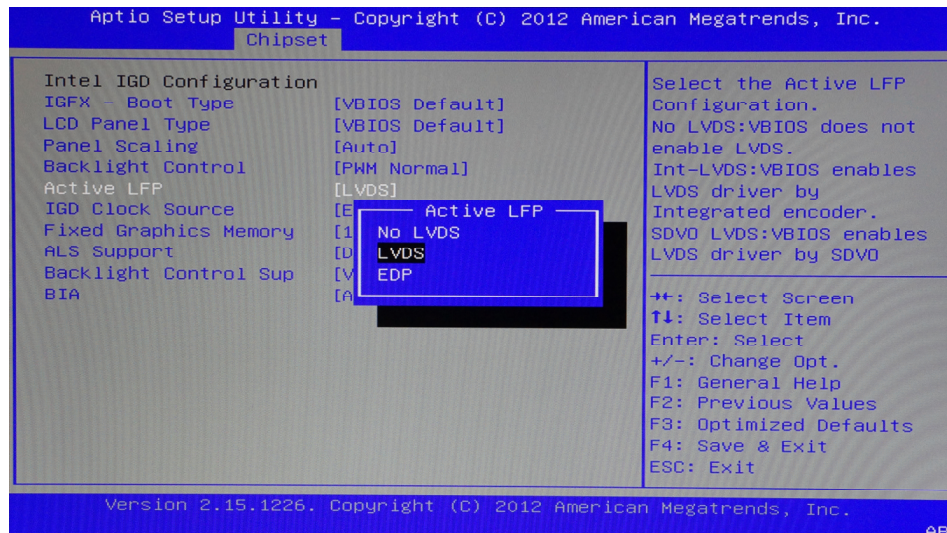
CN2 : 2 x 10 header , connector type : DF13A-20DP-1.25V			
Pin	Signal	Pin	Signal
1	LVDS_TXP0	2	LVDS_TXN0
3	GND	4	GND
5	LVDS_TXP1	6	LVDS_TXN1
7	GND	8	VCC_LCD
9	LVDS_TXP2	10	LVDS_TXN2
11	LVDS_CLKP	12	LVDS_CLKN
13	GND	14	GND
15	LVDS_TXP3	16	LVDS_TXN3
17	LBKLT_EN_DELAY	18	VCC_LCD
19	LVDS_DDC_DATA	20	LVDS_DDC_CLK



BIOS setting for LVDS Resolution:

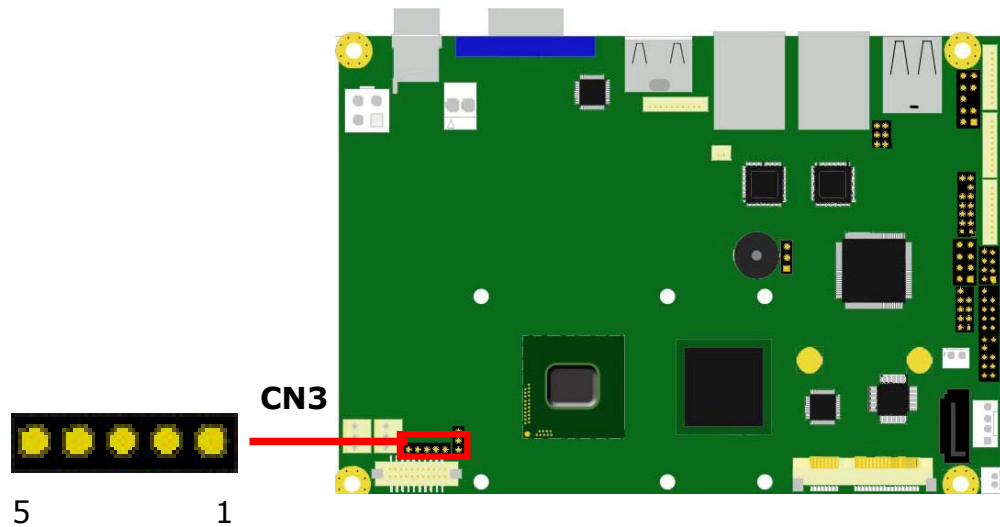


BIOS setting for LVDS Enable:



- 2.4.3 : CN3 for LVDS backlight

CN3: 1 x 5 header , Pitch : Pitch 2.0 mm			
Pin	Signal	Pin	Signal
1	+12V	2	GND
3	LBKLT_EN_DELAY	4	LCD_BKB_CTRL
5	VCC5		

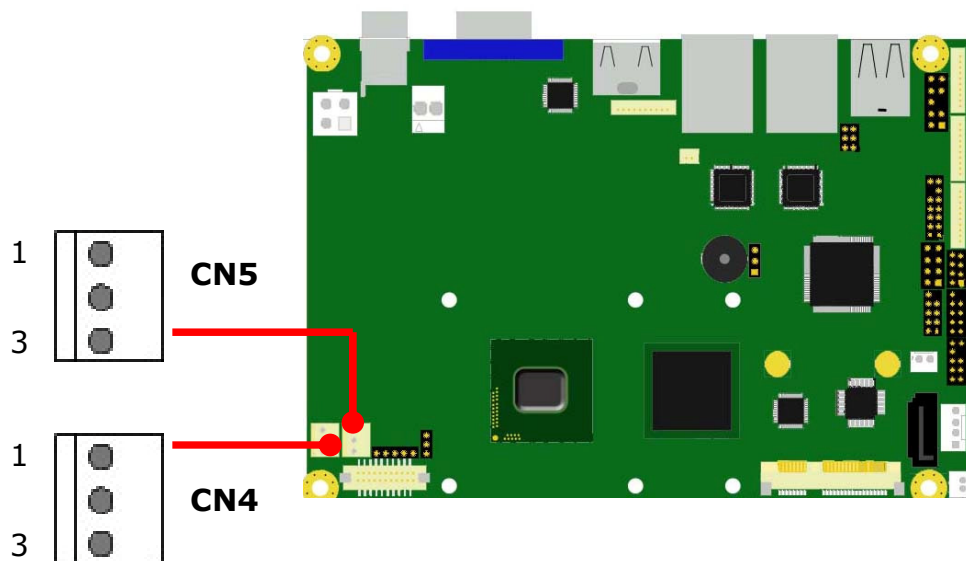


- 2.4.4 : CN4 for system Fan connector

CN4 : 1 x 3 wafer			
Pin	Signal	Pin	Signal
1	GND	2	SYSFAN_VIN
3	SYSFAN_SEN		

- 2.4.5 : CN5 for CPU Fan connector

CN5: 1 x 3 wafer			
Pin	Signal	Pin	Signal
1	GND	2	CPUFAN_VIN
3	CPUFAN_SEN		



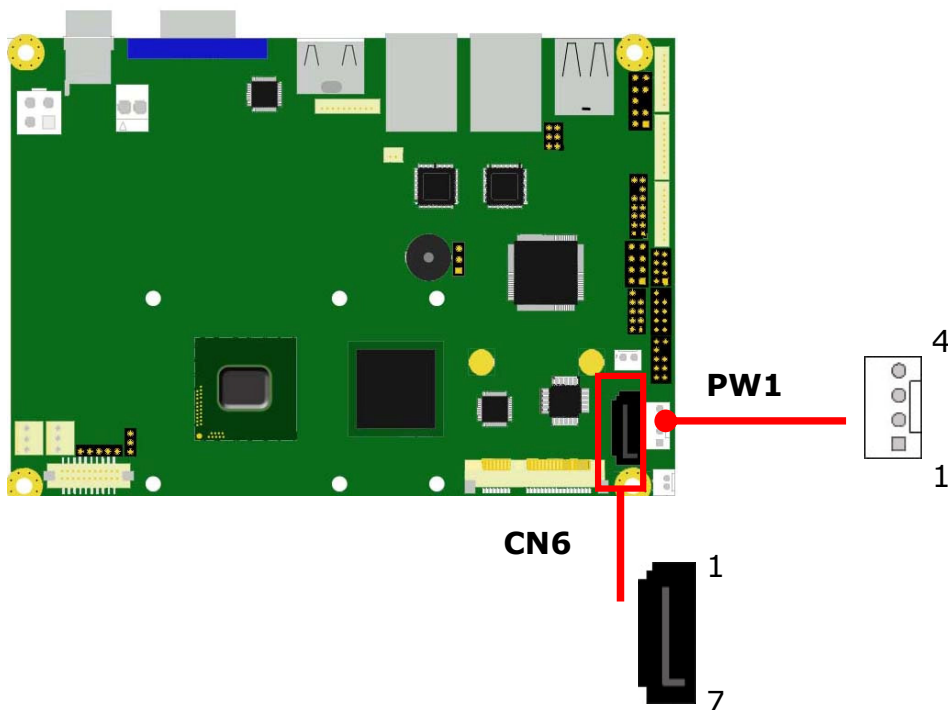


- 2.4.6 : CN6 for SATA 2.0 connector and SATA power connector

CN6 : SATA 2.0 connector			
Pin	Signal	Pin	Signal
1	GND	2	SATA_TX_P0
3	SATA_TX_N0	4	GND
5	SATA_RX_N0	6	SATA_RX_P0
7	GND		

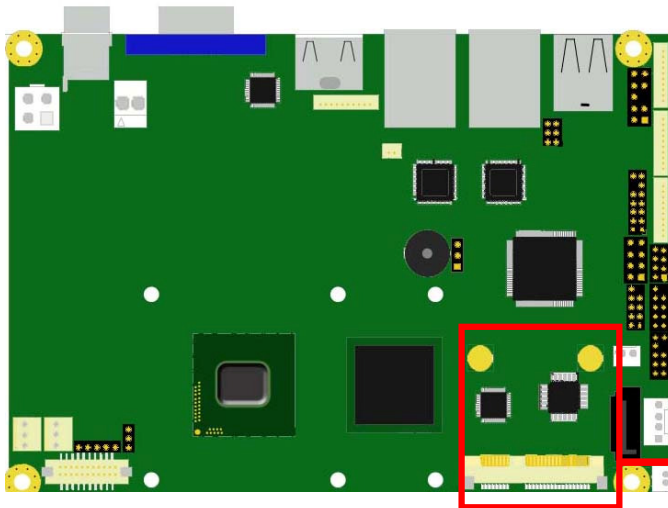
PW1 : 4-pin wafer for SATA power connector			
Pin	Signal	Pin	Signal
1	+12V	2	GND
3	GND	4	+5V

**Note:** Maximum output current 12V/2A, 5V/2A

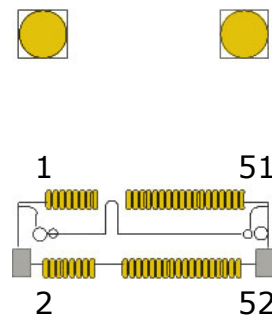


- 2.4.7 : CN7 for half-size Mini-PCIe socket

CN7 : Half-size Mini-PCIe socket					
Pin	Signal	Pin	Signal	Pin	Signal
1	MSATA_WAKE	19	N/C	37	N/A
2	+3.3V	20	N/C	38	USB_D+
3	N/C	21	GND	39	V3P3_MSATA
4	GND	22	PLTRST_BUF1_N	40	GND
5	N/C	23	MSATA_RXN4	41	V3P3_MSATA
6	+1.5V	24	MSATA_AUX33	42	LED_WWAN
7	MCLKREQ	25	MSATA_RXP4	43	N/A
8	N/C	26	GND	44	LED_WLAN
9	GND	27	GND	45	N/A
10	N/C	28	+1.5V	46	LED_WPAN
11	MSATA_PE_CLKN	29	GND	47	N/A
12	N/C	30	ICH_SMBCLK	48	+1.5V
13	MSATA_PE_CLKP	31	MSATA_TXN4	49	N/A
14	N/C	32	ICH_SMBDATA	50	GND
15	GND	33	MSATA_TXP4	51	N/A
16	N/C	34	GND	52	+3.3V
17	N/C	35		-	
18	N/C	36	USB_D-	-	



CN7

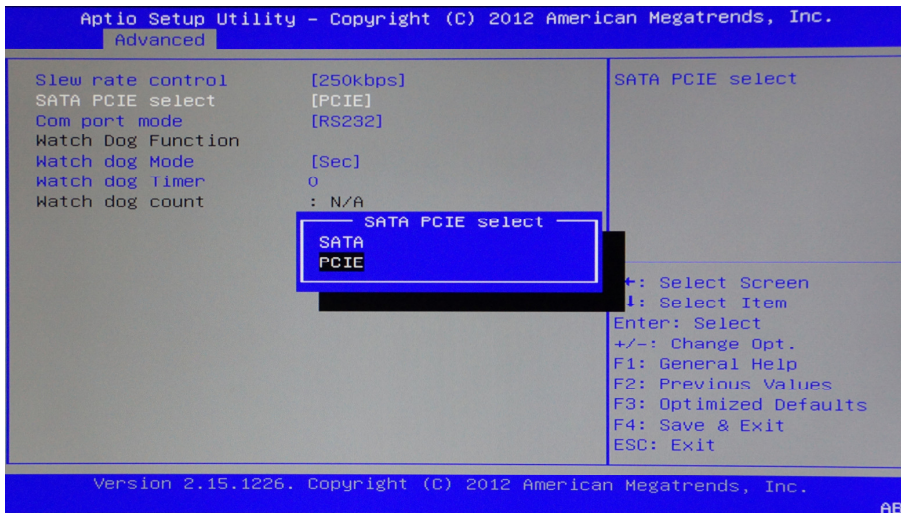




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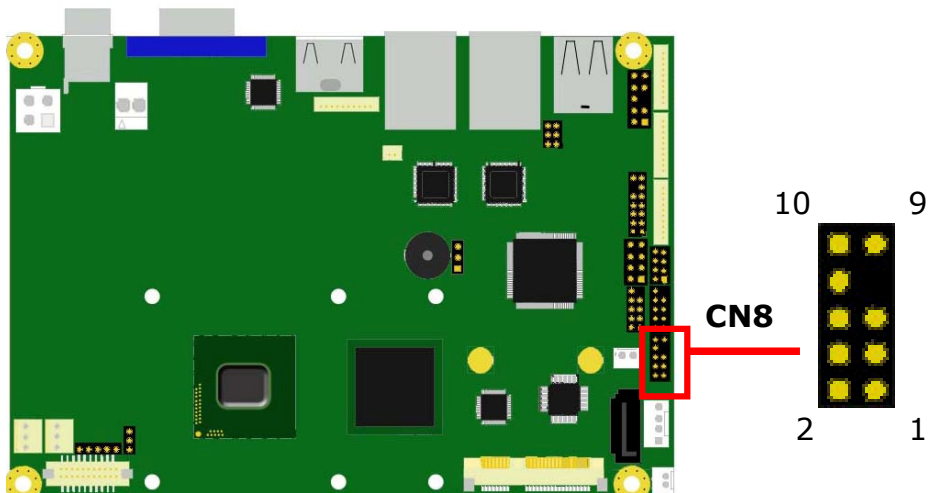
Half-size Mini-PCIe socket could support standard Mini-PCIe card or mSATA SSD.

Please into BIOS and select SATA or PCIe signal to match your card as below .



- 2.4.8 : CN8 for Audio

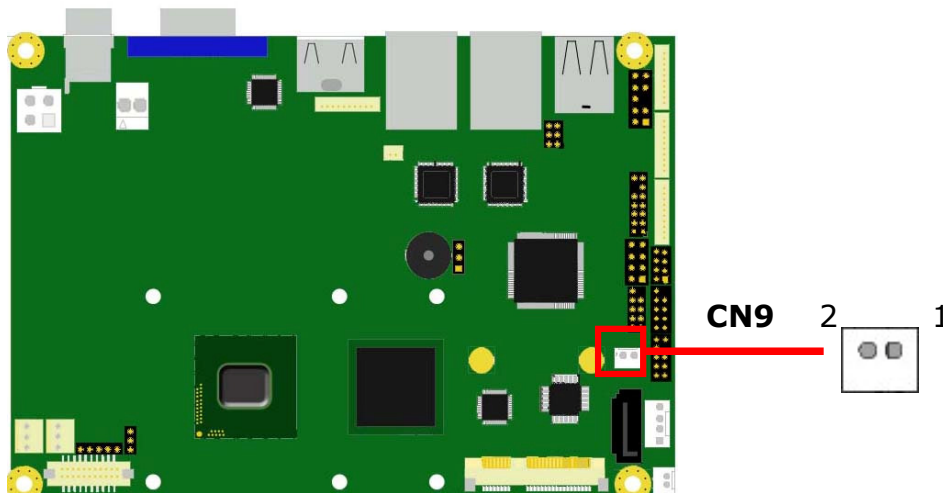
CN8: 2 x 5 header , Pitch 2.0mm			
Pin	Signal	Pin	Signal
1	LINE1-LL	2	LINE1-RR
3	GND	4	GND
5	N/C	6	MIC1_R_L
7	-	8	GND
9	SPKR_OUT_L	10	SPKR_OUT_R



- 2.4.9 : CN9 for DC output for HDD power

CN1: 1 x 2 header , Pitch 2.0mm			
Pin	Signal	Pin	Signal
1	GND	2	+5V

**Note:** Maximum output current 5V/1A. And it's share with PW1 4-pin / 5V power connector

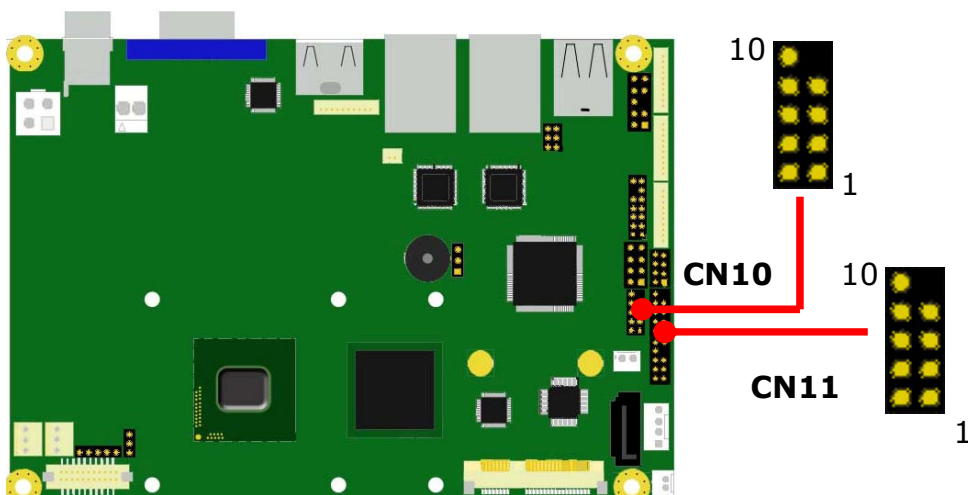


### 2.4.10 : CN10 for USB 2/3

CN10: 2 x 5 header , pitch 2.0 mm			
Pin	Signal	Pin	Signal
1	+5V	2	+5V
3	USB_PN_2	4	USB_PN_3
5	USB_PP_2	6	USB_PP_3
7	GND	8	GND
9	-	10	GND

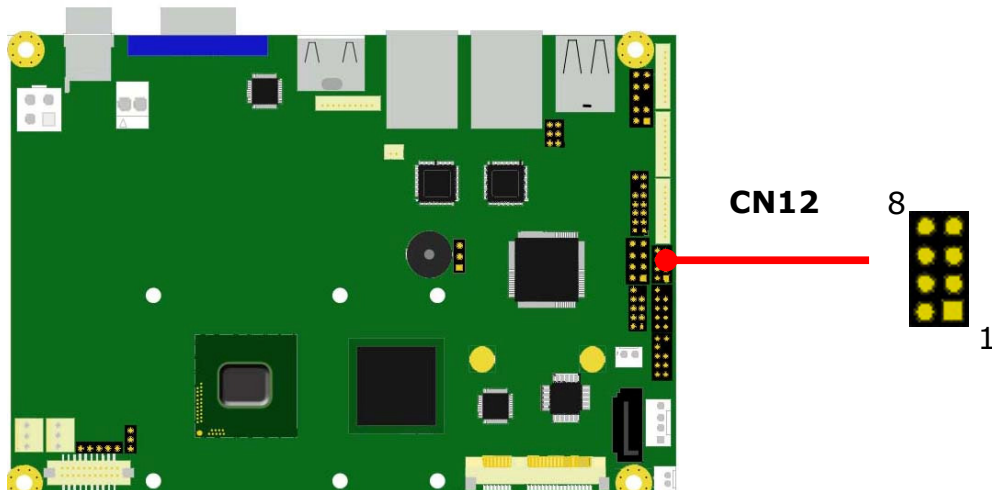
### CN11 for USB 4/5

CN10: 2 x 5 header , pitch 2.0 mm			
Pin	Signal	Pin	Signal
1	+5V	2	+5V
3	USB_PN_4	4	USB_PN_5
5	USB_PP_4	6	USB_PP_5
7	GND	8	GND
9	-	10	GND



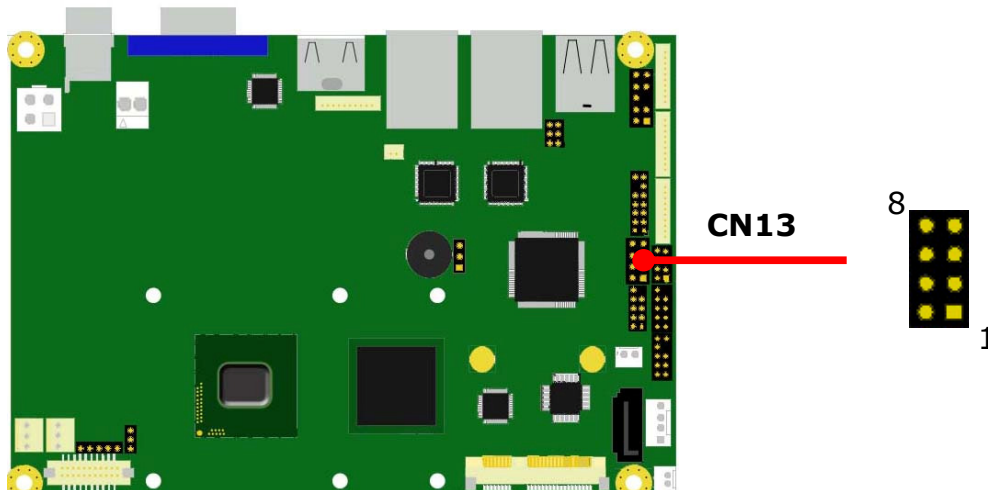
- 2.4.11 : CN12 for GPIO pin header

CN12 : 2 x 4 header , pitch 2.0 mm			
Pin	Signal	Pin	Signal
1	GPIO0	2	GPIO4
3	GPIO1	4	GPIO5
5	GPIO2	6	GPIO6
7	GPIO3	8	GPIO7



- 2.4.12 : CN13 for SPI programmer

CN13 : 2 x 4 header , pitch 2.54 mm			
Pin	Signal	Pin	Signal
1	VCC3	2	GND
3	SF_SPI_CS0_N	4	SF_SPI_CLK
5	SF_SPI_MISO	6	SF_SPI_MOSI
7	N/C	8	FLASH_IO

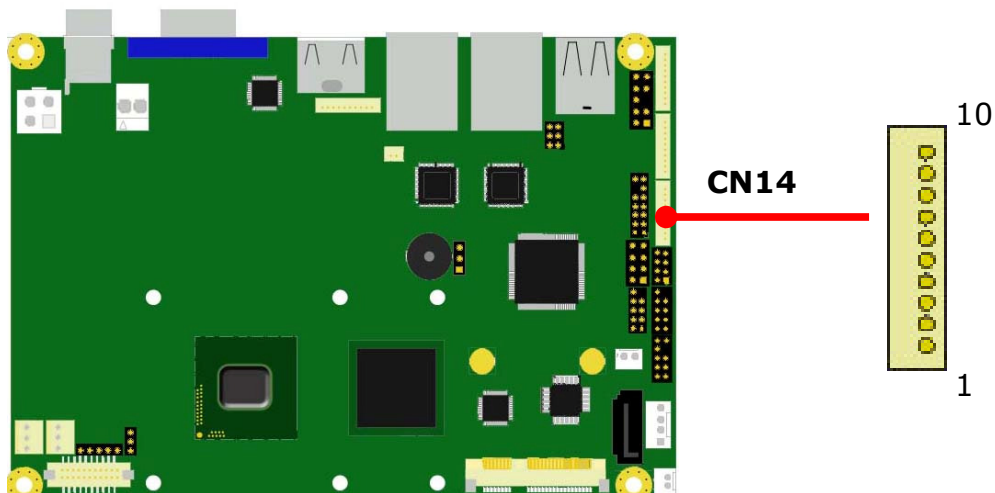




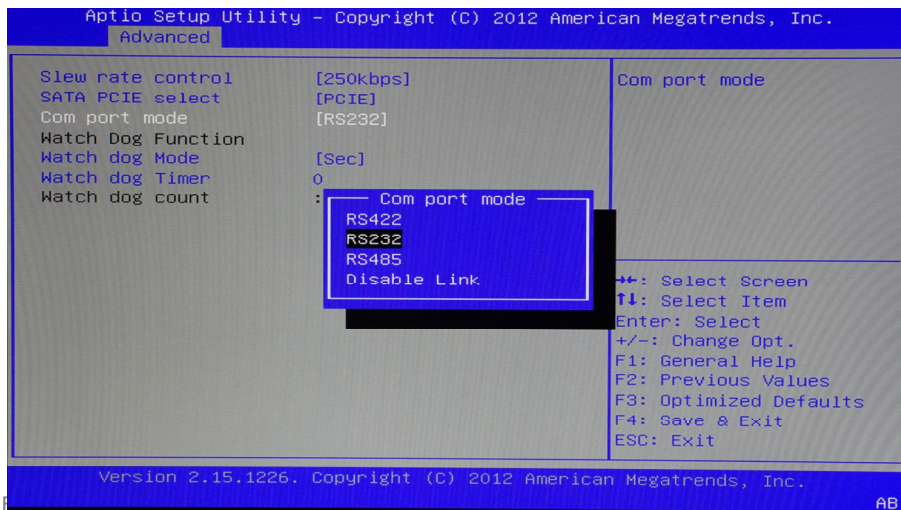
- 2.4.13 : CN14 for COM 2 , RS232/422/485

**Note:** COM2 RS-232/422/485 can be set by BIOS setting. Default is RS-232.

CN14 : Wafer 1 x 10 header, pitch 1.25 mm, connector type : YIMTEX 501MW1*10STR			
Pin	Signal	Pin	Signal
1	DCD, Data carrier detect	2	DSR, Data set ready
3	RXD, Receive data	4	RTS, Request to send
5	TXD, Transmit data	6	CTS, Clear to se
7	DTR, Data terminal ready	8	RI, Ring indicator
9	GND, Ground	10	VCC5, +5V

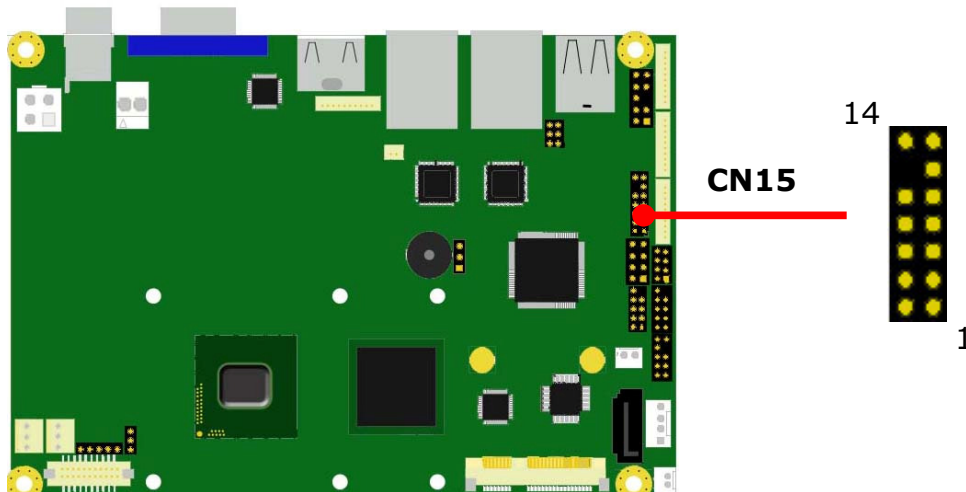


**BIOS setting manual :**



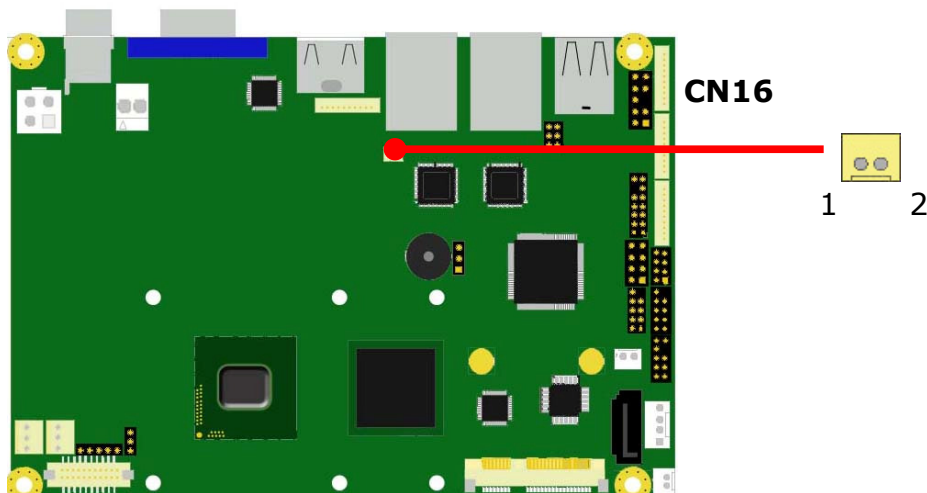
- 2.4.14 : CN15 for LPC connector

CN15 : 2 x 7 header , pitch 2.0 mm			
Pin	Signal	Pin	Signal
1	+V3P3	2	LAD0
3	LAD1	4	LAD2
5	LAD3	6	LFRAME_N
7	PLTRST_N	8	+5VP0
9	PORT80_PCLK	10	GND
11	GND		
13	ICH_SERIRQ	14	LDRQ0_N



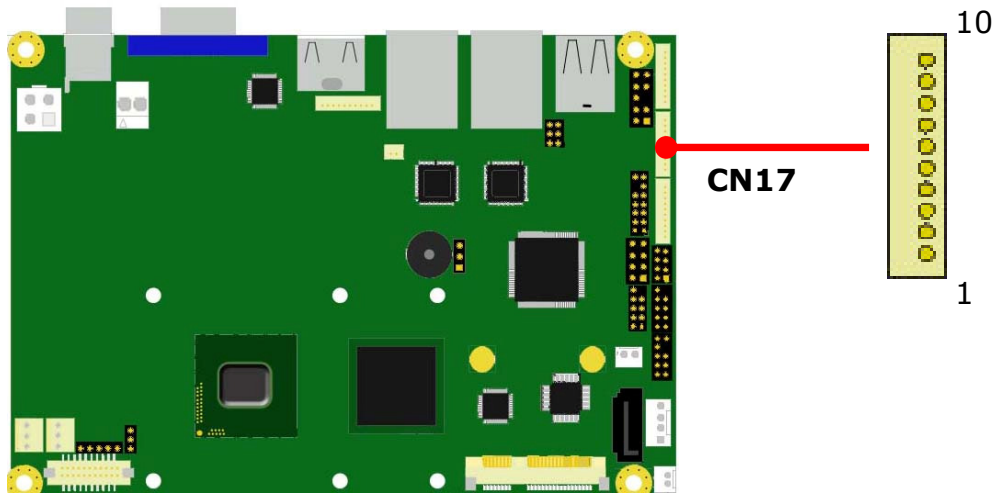
- 2.4.15 : CN16 for Battery connector

CN16 : 1 x 2 header , pitch 2.0 mm			
Pin	Signal	Pin	Signal
1	BAT1_R	2	GND



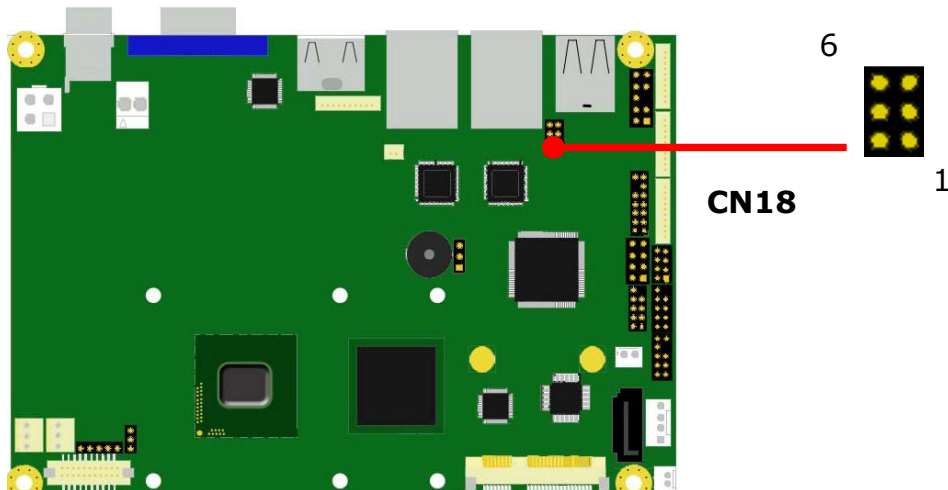
- 2.4.16 : CN17 for COM 3 , RS232

CN17 : Wafer 1 x 10 header, pitch 1.25 mm, connector type : YIMTEX 501MW1*10STR			
Pin	Signal	Pin	Signal
1	DCD, Data carrier detect	2	DSR, Data set ready
3	RXD, Receive data	4	RTS, Request to send
5	TXD, Transmit data	6	CTS, Clear to se
7	DTR, Data terminal ready	8	RI, Ring indicator
9	GND, Ground	10	VCC5, +5V



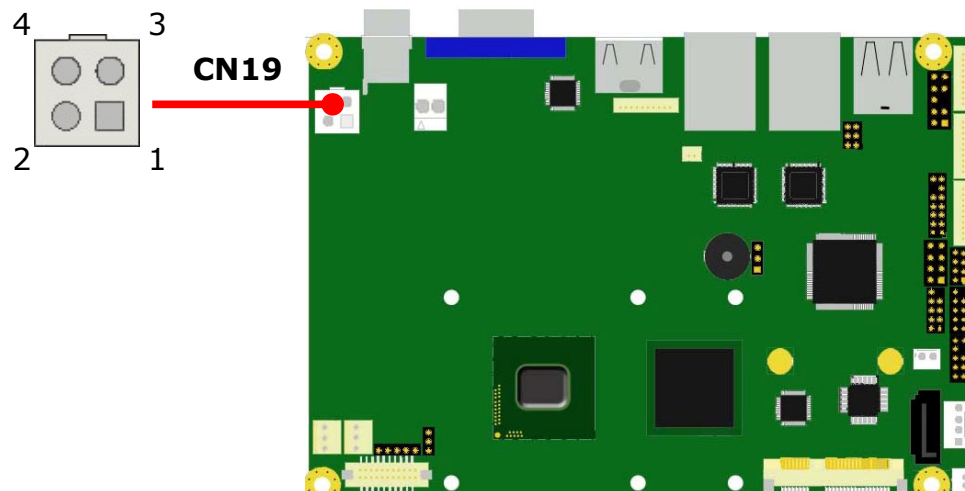
- 2.4.17 : CN18 for front Panel pin header

CN18 : 2 x 3 header , pitch 2.00 mm			
Pin	Signal	Pin	Signal
1	HDD_LED_N	2	ICH_SATA_LED_N
3	LED1_R	4	GND
5	RESET_L	6	GND



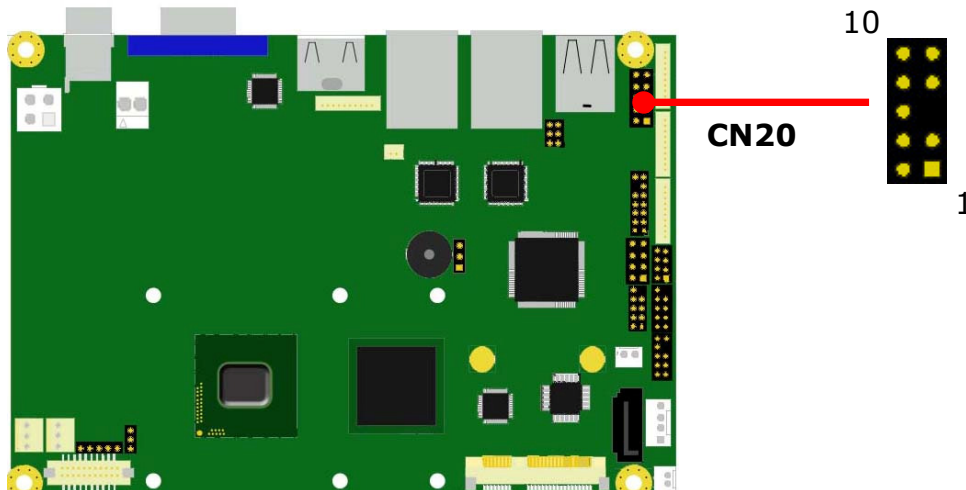
- 2.4.18 : CN19 for internal 4-pin power input

CN19 : ATX 2 x 2			
Pin	Signal	Pin	Signal
1	GND	2	GND
3	Power Input	4	Power Input



- 2.4.19 : CN20 for keyboard & mouse

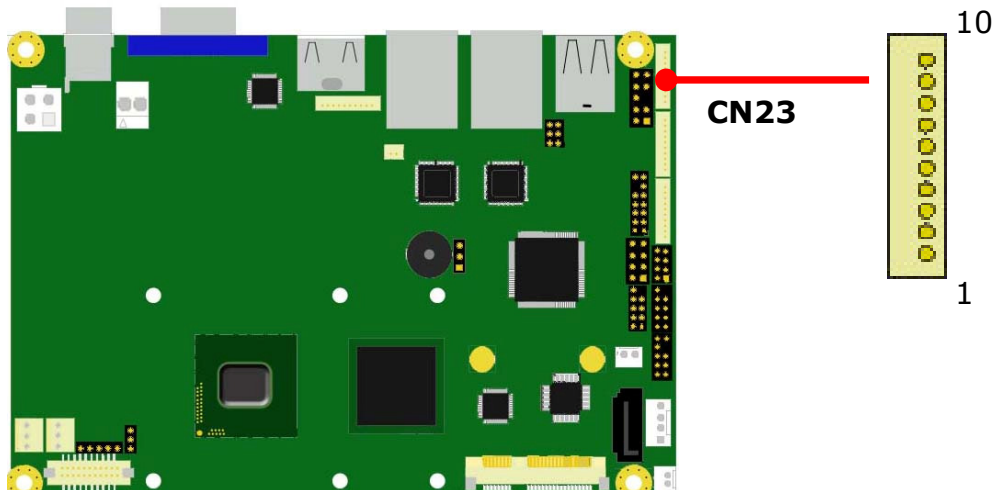
CN20 : 2 x 5 header , pitch 2.54 mm			
Pin	Signal	Pin	Signal
1	Keyboard clock	2	Mouse clock
3	Keyboard data	4	Mouse data
	Key	6	N/C
7	GND	8	GND
9	VCC5	10	VCC5



- 2.4.20 : CN23 for COM 4 , RS232

CN23 : Wafer 1 x 10 header, pitch 1.25 mm, connector type : YIMTEX 501MW1\*10STR

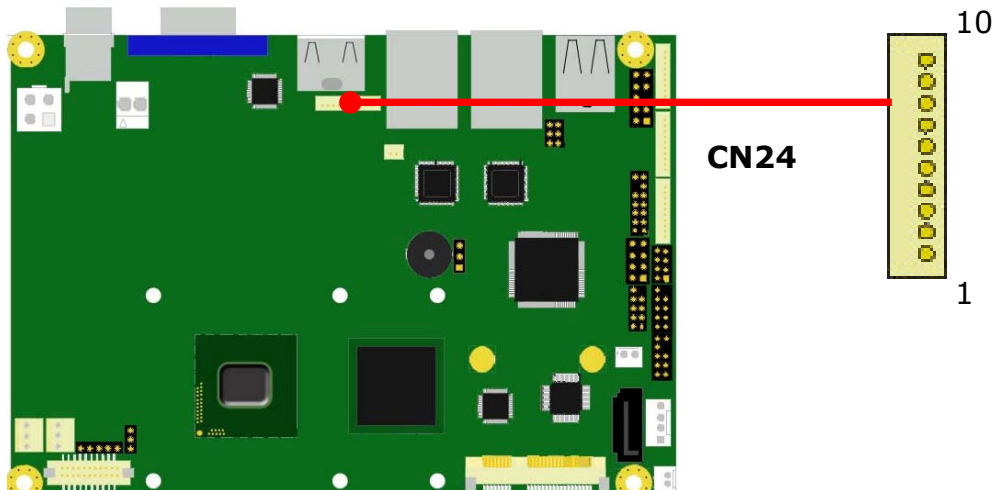
Pin	Signal	Pin	Signal
1	DCD, Data carrier detect	2	DSR, Data set ready
3	RXD, Receive data	4	RTS, Request to send
5	TXD, Transmit data	6	CTS, Clear to se
7	DTR, Data terminal ready	8	RI, Ring indicator
9	GND, Ground	10	VCC5, +5V





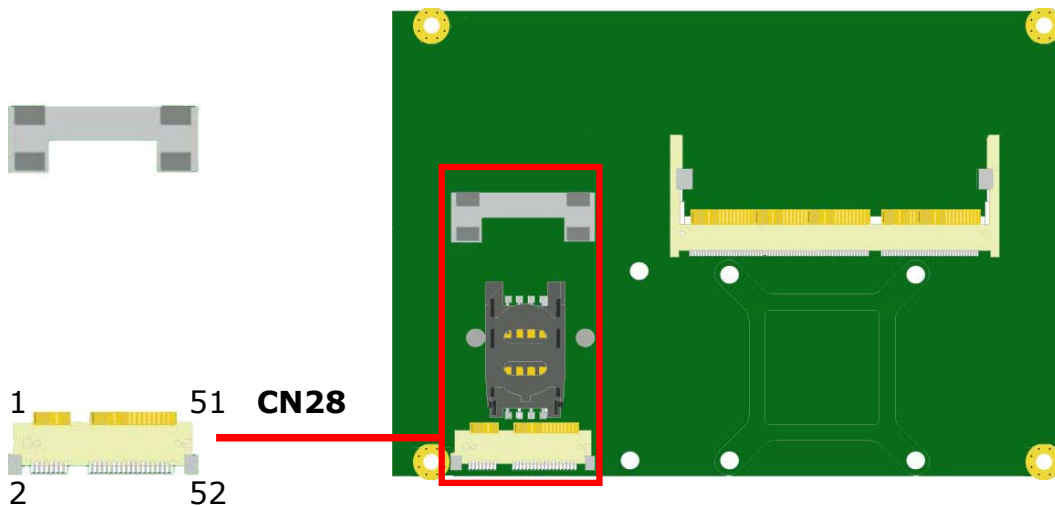
- 2.4.21 : CN24 for COM 1 , RS232

CN24 : Wafer 1 x 10 header, pitch 1.25 mm, connector type : YIMTEX 501MW1*10STR			
Pin	Signal	Pin	Signal
1	DCD, Data carrier detect	2	DSR, Data set ready
3	RXD, Receive data	4	RTS, Request to send
5	TXD, Transmit data	6	CTS, Clear to se
7	DTR, Data terminal ready	8	RI, Ring indicator
9	GND, Ground	10	VCC5, +5V



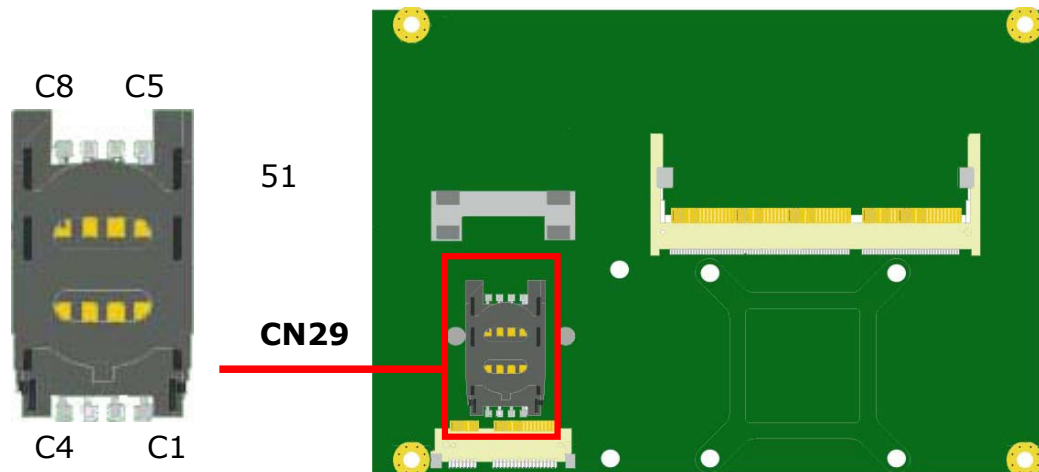
- 2.4.22 : CN28 for full-size Mini-PCIe socket

CN28 : Full-size Mini-PCIe socket					
Pin	Signal	Pin	Signal	Pin	Signal
1	MSATA_WAKE	19	N/C	37	N/A
2	+3.3V	20	N/C	38	USB_D+
3	N/C	21	GND	39	V3P3_MSATA
4	GND	22	PLTRST_BUF1_N	40	GND
5	N/C	23	MSATA_RXN4	41	V3P3_MSATA
6	+1.5V	24	MSATA_AUX33	42	LED_WWAN
7	MCLKREQ	25	MSATA_RXP4	43	N/A
8	N/C	26	GND	44	LED_WLAN
9	GND	27	GND	45	N/A
10	N/C	28	+1.5V	46	LED_WPAN
11	MSATA_PE_CLKN	29	GND	47	N/A
12	N/C	30	ICH_SMBCLK	48	+1.5V
13	MSATA_PE_CLKP	31	MSATA_TXN4	49	N/A
14	N/C	32	ICH_SMBDATA	50	GND
15	GND	33	MSATA_TXP4	51	N/A
16	N/C	34	GND	52	+3.3V
17	N/C	35		-	
18	N/C	36	USB_D-	-	



- 2.4.23 : CN29 for SIM holder

CN29 : SIM card holder			
Pin	Signal	Pin	Signal
C1	SIM_PWR	C2	SIM_RESET
C3	SIM_CLK	C4	Reserved
C5	GND	C6	SIM_VPP
C7	SIM_DATA	C8	Reserved





**Custom Embedded Solutions**

### 3.1 GPIO Sample Program for DOS environment

```
//WIN GPIO Program for EM-6333(DOS Version)
#include <stdio.h>
#include <string.h>
#include <dos.h>
#include <stdlib.h>
#include <inlines/pc.h>

#define index_port 0x2E
#define data_port 0x2F

void help();
void Enter_SIO();
void Exit_SIO();

int main(int argc, char *argv[])
{
    int data_rw8, val;

    if (argc!=2){
        help();
        return;
    }

    Enter_SIO();
    if(strcmp(argv[1], "-80h") == 0){
        val = 0x01;
        outportb(index_port, 0x89);
        data_rw8 = inportb(data_port)&(~val);
        data_rw8 |= val;
        outportb(data_port, data_rw8);
        printf("(Set GP80 to high)\n");
    }
    else if(strcmp(argv[1], "-80l") == 0){
```



### **Custom Embedded Solutions**

```
    val = 0x01;
    outportb(index_port, 0x89);
    data_rw8 = inportb(data_port)&(~val);
    outportb(data_port, data_rw8);
    printf("(Set GP80 to low)\n");
}
else if(strcmp(argv[1], "-81h") == 0){
    val = 0x02;
    outportb(index_port, 0x89);
    data_rw8 = inportb(data_port)&(~val);
    data_rw8 |= val;
    outportb(data_port, data_rw8);
    printf("(Set GP81 to high)\n");
}
else if(strcmp(argv[1], "-81l") == 0){
    val = 0x02;
    outportb(index_port, 0x89);
    data_rw8 = inportb(data_port)&(~val);
    outportb(data_port, data_rw8);
    printf("(Set GP81 to low)\n");
}
else if(strcmp(argv[1], "-82h") == 0){
    val = 0x04;
    outportb(index_port, 0x89);
    data_rw8 = inportb(data_port)&(~val);
    data_rw8 |= val;
    outportb(data_port, data_rw8);
    printf("(Set GP82 to high)\n");
}
else if(strcmp(argv[1], "-82l") == 0){
    val = 0x04;
    outportb(index_port, 0x89);
    data_rw8 = inportb(data_port)&(~val);
    outportb(data_port, data_rw8);
    printf("(Set GP82 to low)\n");
}
else if(strcmp(argv[1], "-83h") == 0){
```



### **Custom Embedded Solutions**

```
    val = 0x08;
    outportb(index_port, 0x89);
    data_rw8 = inportb(data_port)&(~val);
    data_rw8 |= val;
    outportb(data_port, data_rw8);
    printf("(Set GP83 to high)\n");
}
else if(strcmp(argv[1], "-83l") == 0){
    val = 0x08;
    outportb(index_port, 0x89);
    data_rw8 = inportb(data_port)&(~val);
    outportb(data_port, data_rw8);
    printf("(Set GP83 to low)\n");
}
else if(strcmp(argv[1], "-84h") == 0){
    val = 0x10;
    outportb(index_port, 0x89);
    data_rw8 = inportb(data_port)&(~val);
    data_rw8 |= val;
    outportb(data_port, data_rw8);
    printf("(Set GP84 to high)\n");
}
else if(strcmp(argv[1], "-84l") == 0){
    val = 0x10;
    outportb(index_port, 0x89);
    data_rw8 = inportb(data_port)&(~val);
    outportb(data_port, data_rw8);
    printf("(Set GP84 to low)\n");
}
else if(strcmp(argv[1], "-85h") == 0){
    val = 0x20;
    outportb(index_port, 0x89);
    data_rw8 = inportb(data_port)&(~val);
    data_rw8 |= val;
    outportb(data_port, data_rw8);
    printf("(Set GP85 to high)\n");
}
```



### **Custom Embedded Solutions**

```
else if(strcmp(argv[1], "-85l") == 0){
    val = 0x20;
    outportb(index_port, 0x89);
    data_rw8 = inportb(data_port)&(~val);
    outportb(data_port, data_rw8);
    printf("(Set GP85 to low)\n");
}
else if(strcmp(argv[1], "-86h") == 0){
    val = 0x40;
    outportb(index_port, 0x89);
    data_rw8 = inportb(data_port)&(~val);
    data_rw8 |= val;
    outportb(data_port, data_rw8);
    printf("(Set GP86 to high)\n");
}
else if(strcmp(argv[1], "-86l") == 0){
    val = 0x40;
    outportb(index_port, 0x89);
    data_rw8 = inportb(data_port)&(~val);
    outportb(data_port, data_rw8);
    printf("(Set GP86 to low)\n");
}
else if(strcmp(argv[1], "-87h") == 0){
    val = 0x80;
    outportb(index_port, 0x89);
    data_rw8 = inportb(data_port)&(~val);
    data_rw8 |= val;
    outportb(data_port, data_rw8);
    printf("(Set GP87 to high)\n");
}
else if(strcmp(argv[1], "-87l") == 0){
    val = 0x80;
    outportb(index_port, 0x89);
    data_rw8 = inportb(data_port)&(~val);
    outportb(data_port, data_rw8);
    printf("(Set GP87 to low)\n");
}
```



### **Custom Embedded Solutions**

```
else if(strcmp(argv[1], "-hhh") == 0){
    val = 0xFF;
    outportb(index_port, 0x89);
    data_rw8 = inportb(data_port);
    data_rw8 |= val;
    outportb(data_port, data_rw8);
    printf("(Set GP80~87 to high)\n");
}
else if(strcmp(argv[1], "-lll") == 0){
    val = 0x00;
    outportb(index_port, 0x89);
    data_rw8 = inportb(data_port);
    data_rw8 &= val;
    outportb(data_port, data_rw8);
    printf("(Set GP80~87 to low)\n");
}
else if(strcmp(argv[1], "-lte") == 0){
    val = 0x0F;
    outportb(index_port, 0x89);
    data_rw8 = inportb(data_port)&0x00;
    data_rw8 |= val;
    outportb(data_port, data_rw8);
    printf("(Set GP80~83 to high, GP84~87 to low)\n");
}
else if(strcmp(argv[1], "-ltd") == 0){
    val = 0xF0;
    outportb(index_port, 0x89);
    data_rw8 = inportb(data_port)&0x00;
    data_rw8 |= val;
    outportb(data_port, data_rw8);
    printf("(Set GP80~83 to low, GP84~87 to high)\n");
}
else if(strcmp(argv[1], "-gpr") == 0){
    outportb(index_port, 0x8A);

    val = 0x01;
    data_rw8 = inportb(data_port)&(val);
```





### **Custom Embedded Solutions**

```
if(data_rw8==val)printf("(GP80 is high)\n");  
else printf("(GP80 is low)\n");
```

```
val = 0x02;  
data_rw8 = inportb(data_port)&(val);  
if(data_rw8==val)printf("(GP81 is high)\n");  
else printf("(GP81 is low)\n");
```

```
val = 0x04;  
data_rw8 = inportb(data_port)&(val);  
if(data_rw8==val)printf("(GP82 is high)\n");  
else printf("(GP82 is low)\n");
```

```
val = 0x08;  
data_rw8 = inportb(data_port)&(val);  
if(data_rw8==val)printf("(GP83 is high)\n");  
else printf("(GP83 is low)\n");
```

```
val = 0x10;  
data_rw8 = inportb(data_port)&(val);  
if(data_rw8==val)printf("(GP84 is high)\n");  
else printf("(GP84 is low)\n");
```

```
val = 0x20;  
data_rw8 = inportb(data_port)&(val);  
if(data_rw8==val)printf("(GP85 is high)\n");  
else printf("(GP85 is low)\n");
```

```
val = 0x40;  
data_rw8 = inportb(data_port)&(val);  
if(data_rw8==val)printf("(GP86 is high)\n");  
else printf("(GP86 is low)\n");
```

```
val = 0x80;  
data_rw8 = inportb(data_port)&(val);  
if(data_rw8==val)printf("(GP87 is high)\n");  
else printf("(GP87 is low)\n");
```



**Custom Embedded Solutions**

```
    }
    else{
        help();
    }

    Exit_SIO();
    return;
}

void Enter_SIO()
{
    outportb(index_port, 0x87);
    delay(1);
    outportb(index_port, 0x87);
    outportb(index_port, 0x07);
    outportb(data_port, 0x06);
}

void Exit_SIO()
{
    outportb(index_port, 0xAA);
}

void help()
{
    printf("WIN GPIO test program\n");
    printf("=====\n");
    printf("gpio -hhh (Set GP80~87 to high)\n");
    printf("gpio -lll (Set GP80~87 to low )\n");
    printf("gpio -lte (Set GP80~83 to high, GP84~87 to low)\n");
    printf("gpio -ltd (Set GP80~83 to low, GP84~87 to high)\n");
    printf("gpio -gpr (Read GPIO status)\n");
    printf("gpio -xxh (Set xx to high)\n");
    printf("gpio -xxl (Set xx to low)\n");
    printf("    (xx=80~87)\n");
    printf("=====\n");
}
}
```



**Custom Embedded Solutions**

### 3.2 Watchdog timer Sample Program for DOS environment

```
//WIN Watch dog program for EM-6333(Dos Version)
#include <stdio.h>
#include <string.h>
#include <dos.h>
#include <stdlib.h>
#include <inlines/pc.h>

#define index_port 0x2E           //Super IO Index port address
#define data_port 0x2F          //Super IO Data port address

void Enter_sio_config();
void Exit_sio_config();
void help();

int main(int argc, char *argv[])
{
    int data_rw8, time;

    if (argc<2){
        help();
        return;
    }

    if(strcmp(argv[1], "-s") == 0){
        //Show Watchdog Register Settings
        Enter_sio_config();
        outportb(index_port, 0xF5);
        data_rw8 = inportb(data_port)&0x08;
        if(data_rw8 == 0x00){
            //second mode
            outportb(index_port, 0xF6);
            data_rw8 = inportb(data_port);
            printf("Second mode: %d second\n", data_rw8);
        }
    }
}
```



### **Custom Embedded Solutions**

```
else{
    //minute mode
    outportb(index_port, 0xF6);
    data_rw8 = inportb(data_port);
    printf("Minute mode: %d minute\n", data_rw8);
}
}
else if(strcmp(argv[1], "-t") ==0 ){
    //Set Time-out Value
    if(argv[2] == NULL){
        help();
        return;
    }
    else{
        Enter_sio_config();
        outportb(index_port, 0xF6);
        outportb(data_port , 0x00);           //Clear Status
        outportb(index_port, 0xF5);
        data_rw8 = 0x32;
        outportb(data_port, data_rw8);
        sscanf(argv[2], "%d", &time);
        outportb(index_port, 0xF6);
        outportb(data_port, time);
        if(time==0){
            //Disable count
            outportb(index_port, 0xF5);
            data_rw8 = inportb(data_port)&0xCF;
            outportb(data_port , data_rw8);
        }
        else{
            outportb(index_port, 0xFA);
            outportb(data_port , 0x01);           //Enable reset function
        }
        printf("Watchdog Timer will count down for %d second(s)\n", time);
    }
}
}
else if(strcmp(argv[1], "-m") ==0 ){
```



### **Custom Embedded Solutions**

```
//Set Time-out Value
if(argv[2] == NULL){
    help();
    return;
}
else{
    Enter_sio_config();
    outportb(index_port, 0xF6);
    outportb(data_port , 0x00);           //Clear Status
    outportb(index_port, 0xF5);
    data_rw8 = 0x32;
    data_rw8 |= 0x08;
    outportb(data_port, data_rw8);
    sscanf(argv[2], "%d", &time);
    outportb(index_port, 0xF6);
    outportb(data_port, time);
    if(time==0){
        //Disable count
        outportb(index_port, 0xF5);
        data_rw8 = inportb(data_port)&0xCF;
        outportb(data_port , data_rw8);
    }
    else{
        outportb(index_port, 0xFA);
        outportb(data_port , 0x01);       //Enable reset function
    }
    printf("Watchdog Timer will count down for %d minute(s)\n", time);
}
}
Exit_sio_config();
return;
}

void Enter_sio_config()           //Enter W83627EHF Configuration
{
    outportb(index_port, 0x87);
    delay(1);                     //Delay some time
```



### **Custom Embedded Solutions**

```
outportb(index_port, 0x87);
outportb(index_port, 0x07);           //Super IO Selct Bank Register Number
outportb(data_port , 0x07);         //Select logical device 7
}

void Exit_sio_config()                //Exit W83627EHF Configuration
{
    outportb(index_port, 0xAA);
}

void help()
{
    printf("WIN Watchdog Timer Program\n");
    printf("Usage: WDT -s      (Show Watchdog Register Settings)\n");
    printf("Usage: WDT -t xxx (Set Time-out Value)\n");
    printf("          xxx = 1 ~ 255 seconds\n");
    printf("          xxx = 0 : Time-out Disable \n");
    printf("Usage: WDT -m xxx (Set Time-out Value)\n");
    printf("          xxx = 1 ~ 255 minutes\n");
    printf("          xxx = 0 : Time-out Disable \n");
}
```