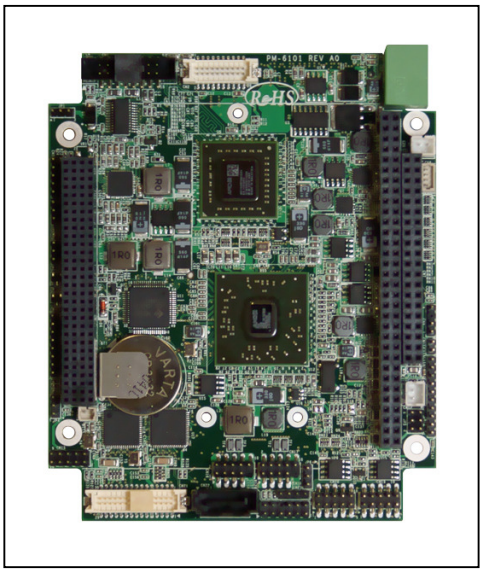
Custom Embedded Systems

User Manual

MB-73350

MB-73350 is a PC/104-Plus module with onboard AMD® G-series T16R or T40R, AMD® A55E chipset, DDR3 up to 4GB, 2x Giga LAN, Onboard VGA, LVDS, SATA, CF socket, 4x USB, 2x COM, GPIO, DC 5V input



Ver.	Release Date	Update
1.0	2012.08.07	Release
1.1	2012.08.29	Correct Pin define for LVDS, Backlight, CMOS

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Trademark

Limitation of liability

For more information on other WIN products visit our website http://www.win-entrprises.

For technical support send your inquiries to sales@win-ent.com.

Packing list

Before using this product make sure that the following materials have been shipped.

- 1 x MB-73350 PC/104-Plus board
- 1 x CPU cooling heatsink w/ fan (p/n: CB-F000047-00)
- 1 x VGA cable w/o bracket, 20 cm length (p/n: CB-IVGA01-00)
- 1 x COM port cable w/o bracket, 13 cm length (p/n: CB-ICOM25-00)
- 1 x cable for LAN module & board, 15 cm length (p/n: CB-ILAN10-00)
- 1 x LAN module (p/n: R214A)
- 1 x USB cable w/o bracket, 20 cm length (p/n: CB-IUSB03-00)
- 1 x Power input cable, 20 cm length (p/n: CB-IPOW82-01)
- 1 x CD for driver & Utility (p/n: TBD)

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

Model Name	Description
MB-7335A	PC/104-Plus with AMD T16R, onboard VGA, LVDS, 2 x Giga LAN, COM, USB, SATA, CF socket, DC 5V input.
MB-7335B	PC/104-Plus with AMD T40R, onboard VGA, LVDS, 2 x Giga LAN, COM, USB, SATA, CF socket, DC 5V input.
MB-7335C	PC/104-Plus with AMD T16R, onboard VGA, LVDS, 2 x Giga LAN, COM, USB, SATA, CF socket, DC 5V input. (Pin Down Type)
MB-7335D	PC/104-Plus with AMD T40R, onboard VGA, LVDS, 2 x Giga LAN, COM, USB, SATA, CF socket, DC 5V input. (Pin Down Type)

Optional Accessories

Audio daughter board (p/n: IP-90340)
Audio cable connect daughter board & MB-73350 (p/n: CB-IDE18-00)

Safety Information

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before moving 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 to 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.

Contents

1.1 Introduction

MB-73350 is a PC/104-Plus form factor with onboard AMD® G-series™ APU and AMD® A55E chipset. Based on AMD® Accelerated Processing Unit (APU), MB-73350 designed for specialized tasks (e.g., graphic, video), most visual applications and data processing in parallel. With Outstanding graphics performance/watt through integrated advanced graphics and hardware. It plays HD media smoothly. Suitable applications include Digital Signage, Set-Top-Box, Point of Sales, Video conferencing, Medical appliances, Casino Gaming Machines, Thin Clients, Human Machine Interfaces, and Auto Infotainment.

MB-73350 supports dual display for VGA + LVDS. The AMD® G-series processor also build-in graphic (AMD® Radeon HD 6000 series) and a video decoding engine for MPEG-2, VC-1, DivX and H.264. The Max. TDP of AMD® T16R processor is 4.5W only and good for application which need low power design but high graphic performance.

Onboard AMD® A55E chipset provide extensive IO ports support, including 1 x SATAII interface with 300MB/s transfer rate, 4 x USB 2.0, HD Audio, onboard 2 x Gigabit Ethernet provided by Intel® i211AT Gigabit Ethernet. 1 x RS232/422/485 & 1 x RS232, 8-bit GPIO and 1 x CompactFlash socket support Type-2 CompactFlash card. MB-73350 operating at single DC 5V input.

WIN offers customers 5 year (starting from release date) product longevity with the option of purchasing an extended 2-year supply (via contract) beyond the standard 5 year offering.

About WIN Enterprises:

WIN offers reliable and solid products which are produced under the Management System Standards: ISO9001-2000 Certificate. The certificate keeps us focused on our quality objectives of management and environmentally sound production. A 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's 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 projects contact us at:

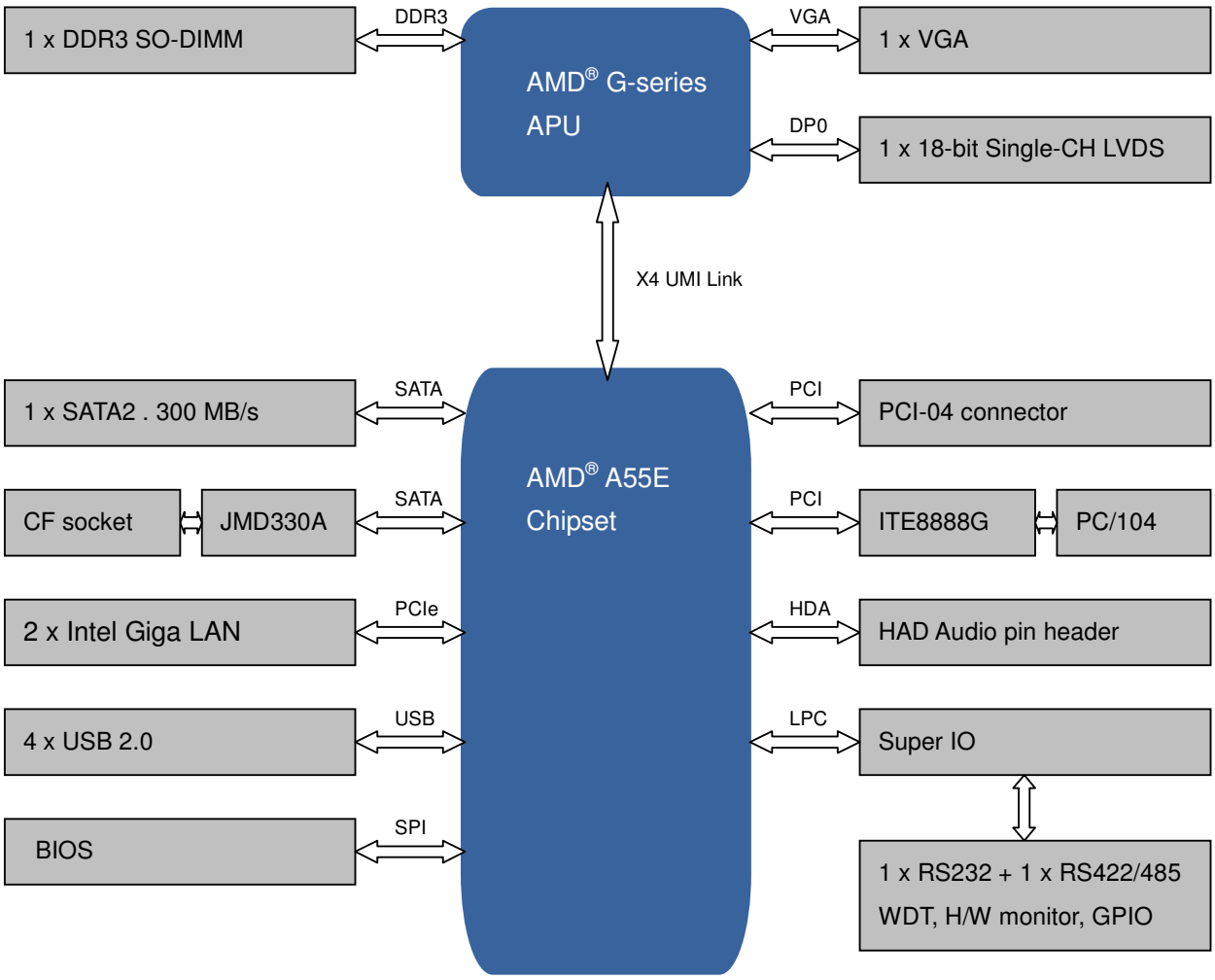
Email: sales@win-ent.com TEL: +1 (978) 688-2000

1.2 Specifications

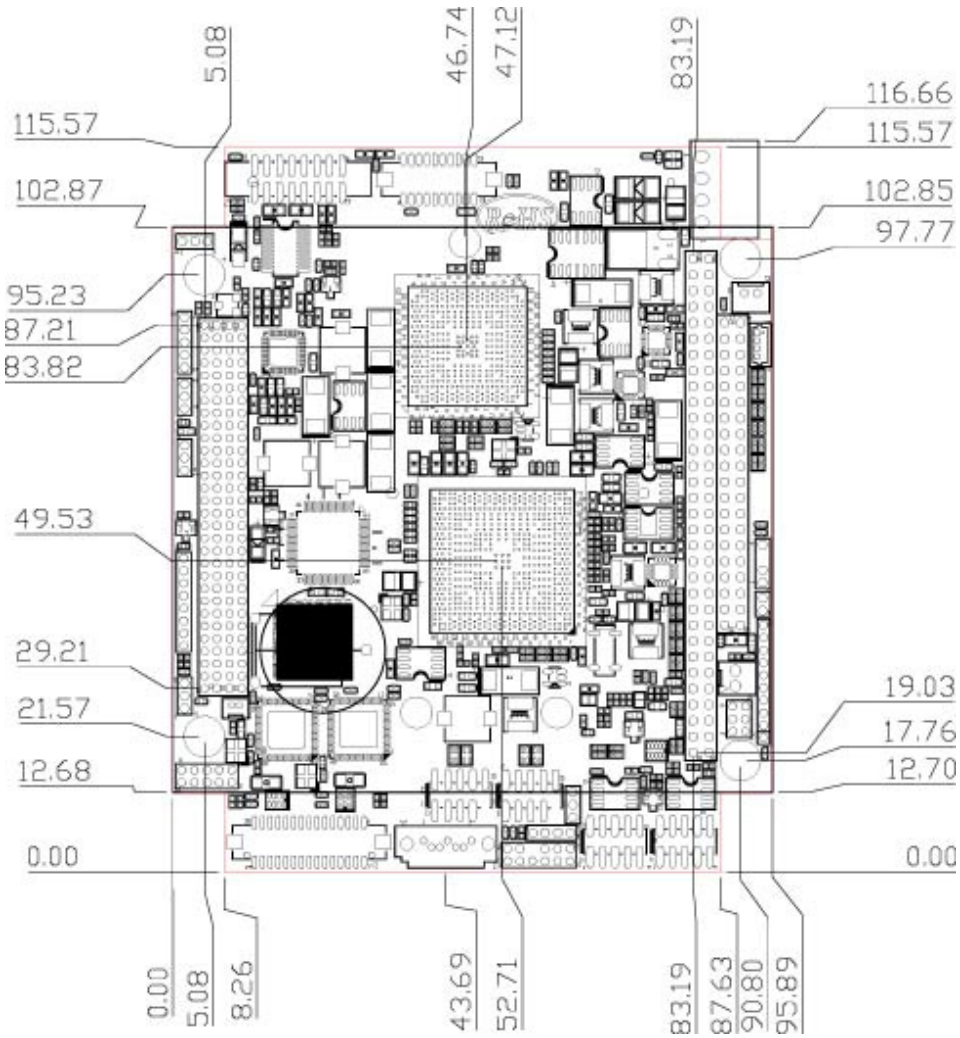
Form Factor	PC/104-Plus
CPU	Onboard AMD® G-series T16R 615 MHz (Single-Core) Onboard AMD® G-series T40R 1.0 GHz (Single-Core) Onboard AMD® G-series T52R 1.5 GHz (Single-Core)
Chipset	AMD® A55E chipset
Memory	1 x DDR3 1066/1333 MHz SO-DIMM up to 4GB * DDR3 1333 for T52R CPU only
BIOS	AMI® SPI BIOS
Watchdog Timer	255 levels timer interval, (1 ~ 255 seconds), setup by software
Integrated graphic	AMD® Radeon HD 6000 Series Graphics
VGA interface	1 x internal VGA interface
LVDS interface	1 x 18-bit single channel LVDS interface
SATA interface	1 x SATAII up to 300 MB/s
SSD interface	1 x CompactFlash socket
Ethernet	2 x Intel® i211AT or i210AT Gigabit ethernet
Expansion interface	1 x PC/104-Plus
COM	1 x RS422/485 , 1 x RS232
USB	4 x USB 2.0
Audio	1 x HDA audio pin-header (need to purchase Audio module to work with)
GPIO	8-bit programmable GPIO interface
Power Input	Single DC 5V input
Board Size	96 mm x 116 mm
Operating temperature	0℃ ~ 60℃

Note: Specifications and photos subject to change without prior notification.

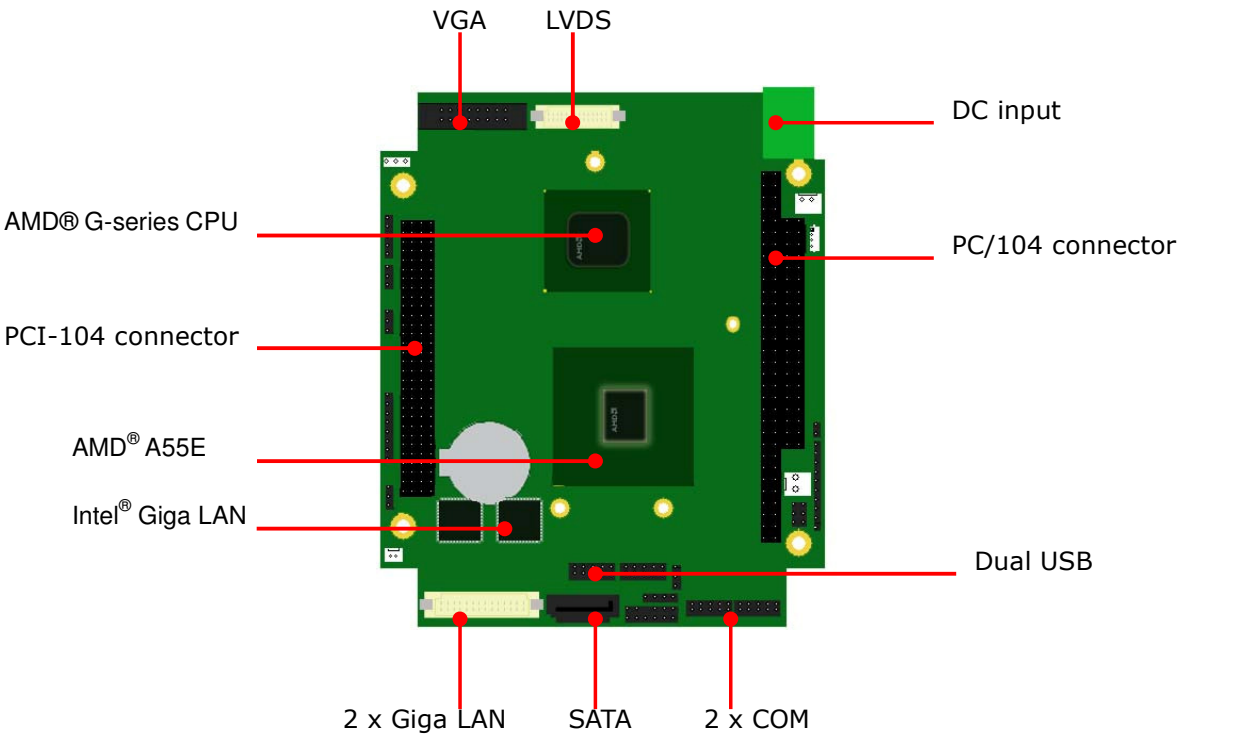
1.3 Block Diagram

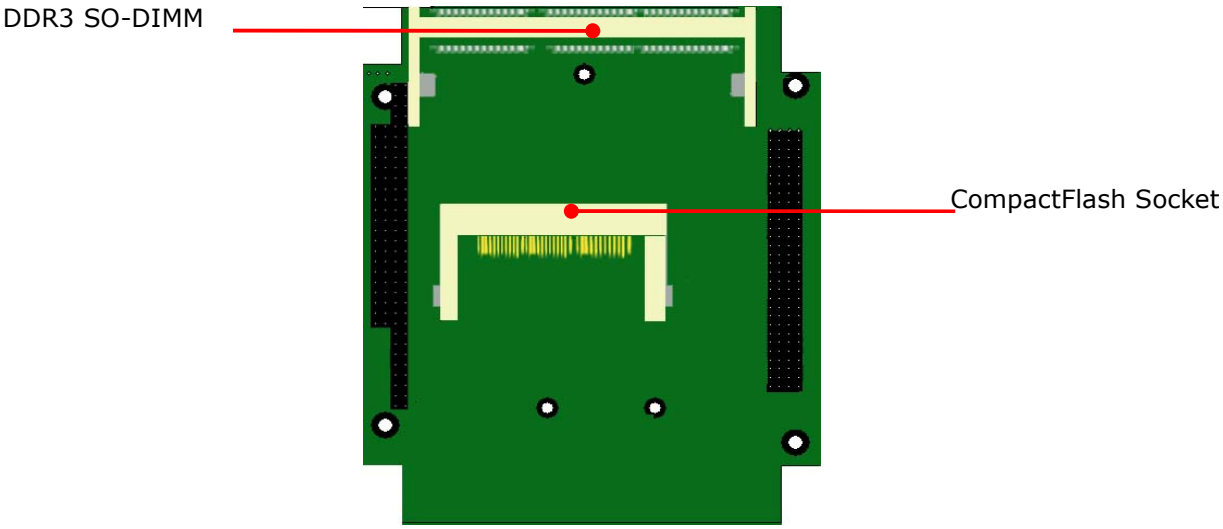


1.4 Board Layout Dimensions

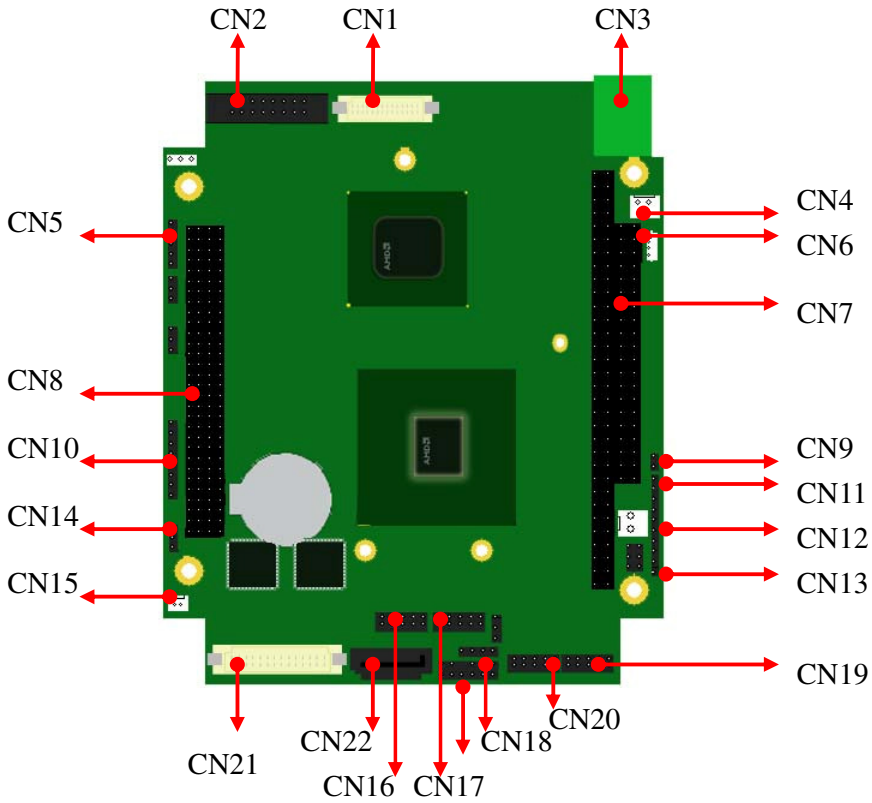


1.5 IO ports


VGA
LVDS
DC input
AMD® G-series CPU
PC/104 connector
PCI-104 connector
AMD® A55E
Intel® Giga LAN
Dual USB
2 x Giga LAN
SATA
2 x COM


DDR3 SO-DIMM
CompactFlash Socket

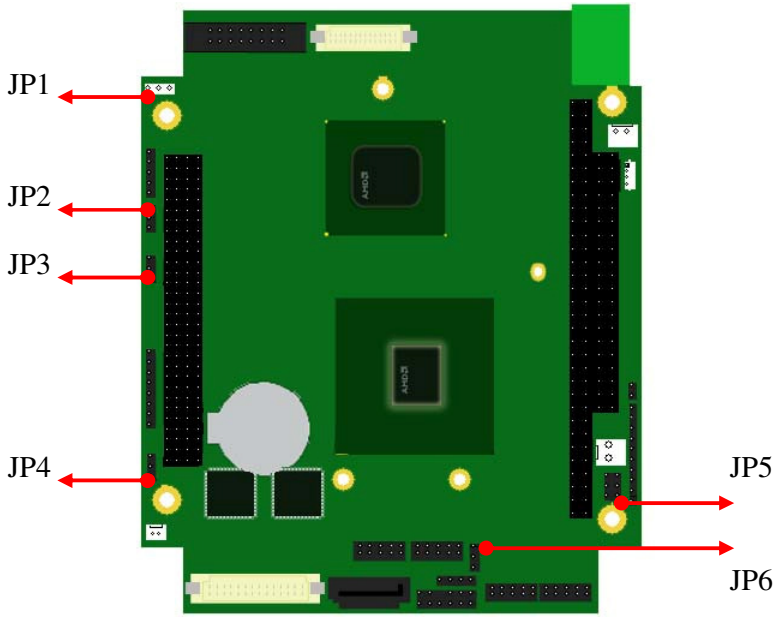
2.1 The location of onboard connectors



Label	Function
CN1	LVDS Connector (18-bit Single channel)
CN2	VGA connector
CN3	+5V DC power input connector
CN4	+12V DC power input connector
CN5	LVDS backlight control
CN6	+5V_SB DC input and PS_ON
CN7	PC/104 connector
CN8	PCI-104 connector
CN9	-12V / -5V DC input
CN10	Front Panel pin header
CN11	Power Button
CN12	FAN connector
CN13	GPIO pin header
CN14	LPC port pin header

Label	Function
CN15	External Battery connector
CN16	USB ports 0/1
CN17	USB ports 2/3
CN18	COM2 (RS422 / 485) connector
CN19	COM1 (RS232) connector
CN20	COM2 (RS232) connector
CN21	LAN1 , LAN2 connector
CN22	SATA connector
CN23	HAD connector
DIMM	1 x SO-DIMM on solder-ide
CF1	1 x CompactFlash socket on solder-side

2.2 The location of onboard jumpers



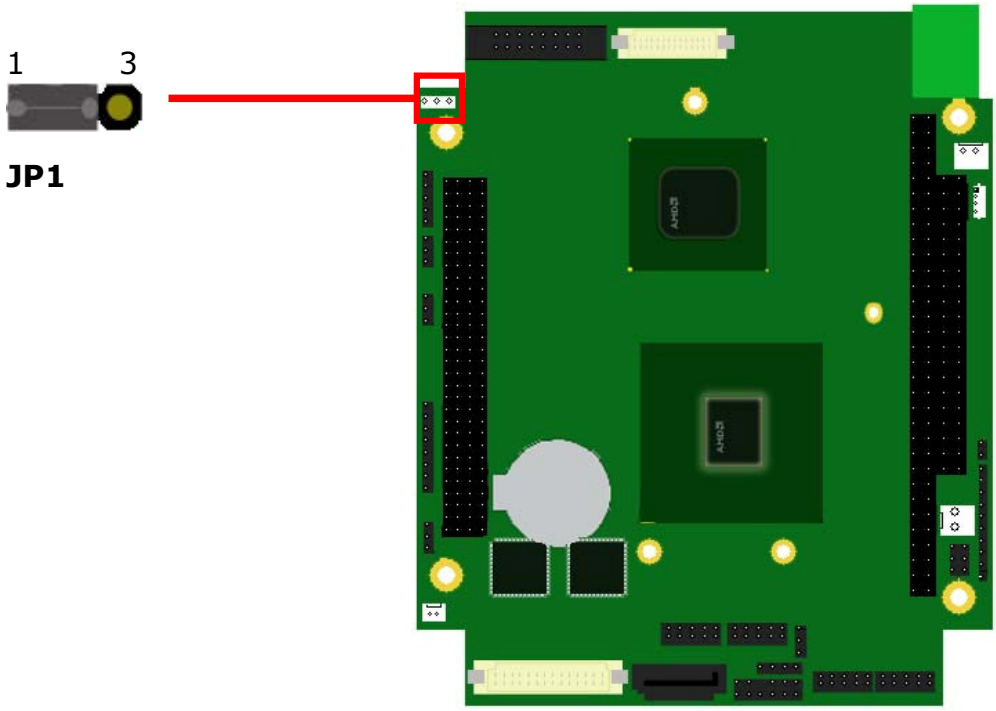
Label	Function
JP1	Panel Voltage (VCC) select
JP2	PCI-104 Vio voltage select
JP3	WDT select
JP4	AT & ATX mode select
JP5	COM2 mode select
JP6	Clear CMOS

2.3 The function list of onboard jumpers setting

- 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 PCI-104 Vio voltage select

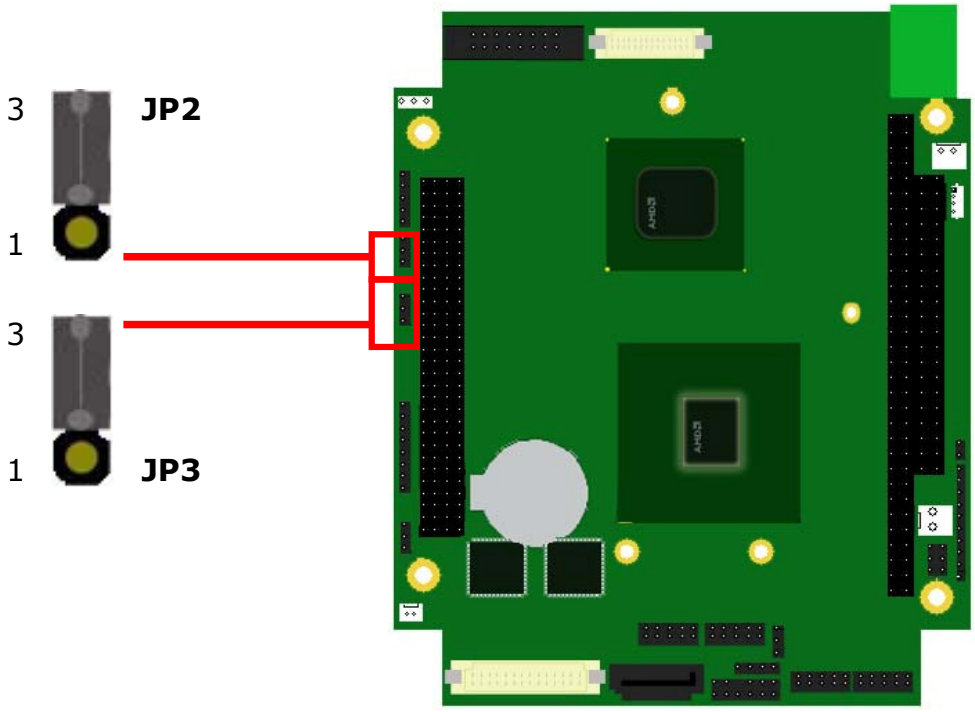
JP2	
Closed Pin	Result
1-2	+5V
2-3 *	+3.3V

* Default setting

- 2.3.3: JP3 for WDT select

JP3	
Closed Pin	Result
1-2	IRQ11
2-3 *	Reset

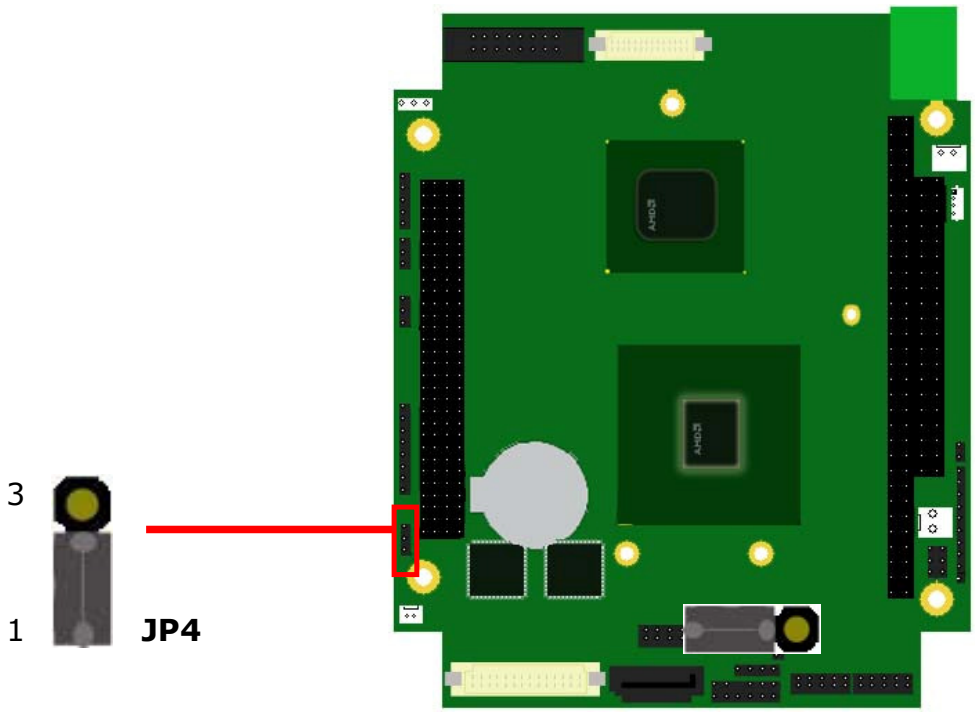
* Default setting



- 2.3.4 : JP4 for AT & ATX mode select

JP4	
Closed Pin	Result
1-2 *	AT mode
2-3	ATX mode

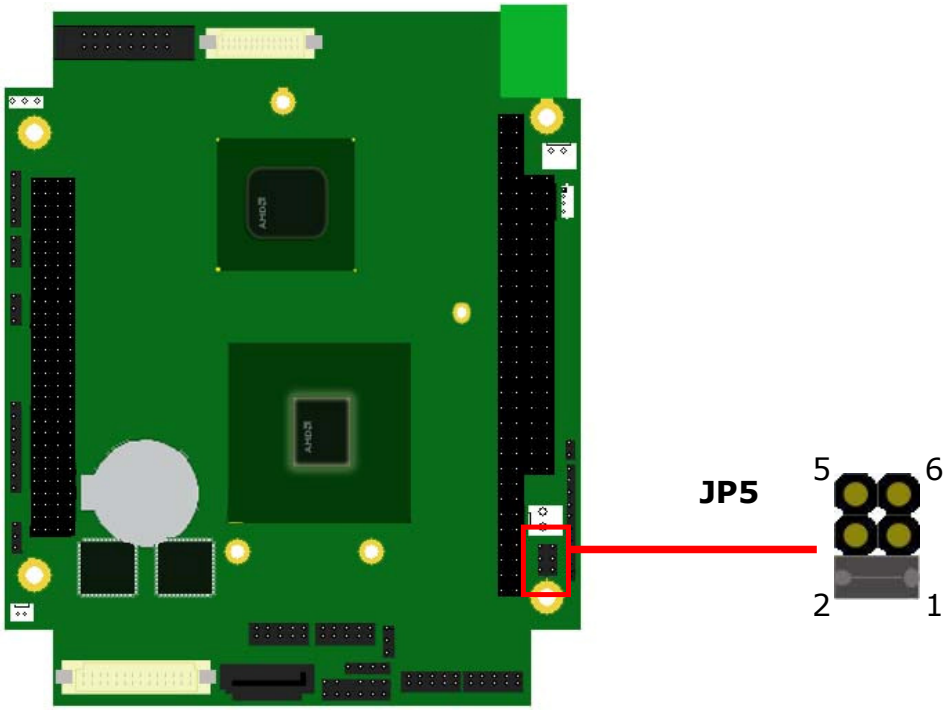
* Default setting



- 2.3.5: JP5 for COM2 select

JP5	
Closed Pin	Result
1-2 *	RS232
3-4	RS422
5-6	RS485

* Default setting

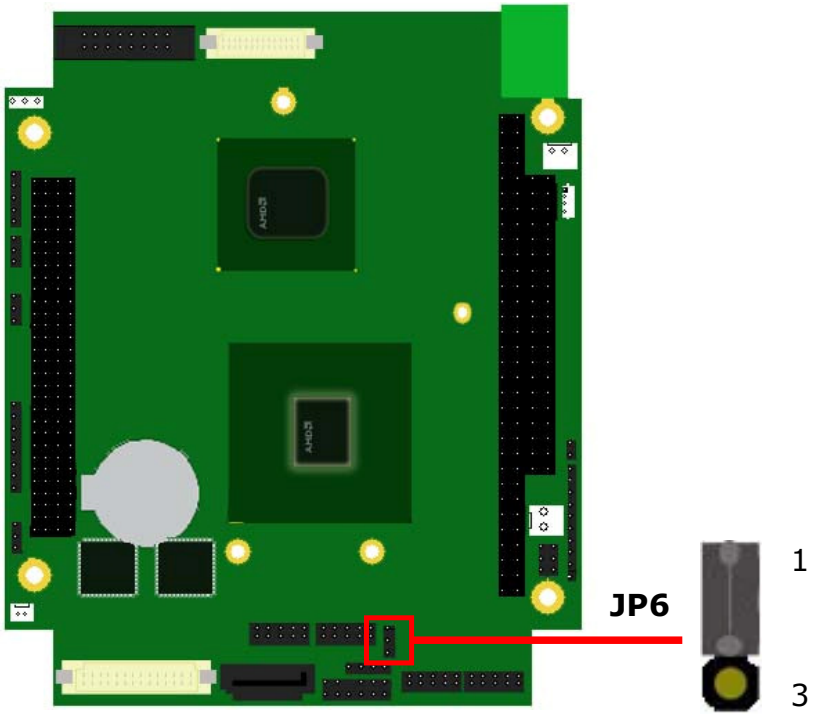


- 2.3.6: JP6 for clean CMOS

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

JP6	
Closed Pin	Result
1-2 *	Hold CMOS
2-3	Clear CMOS

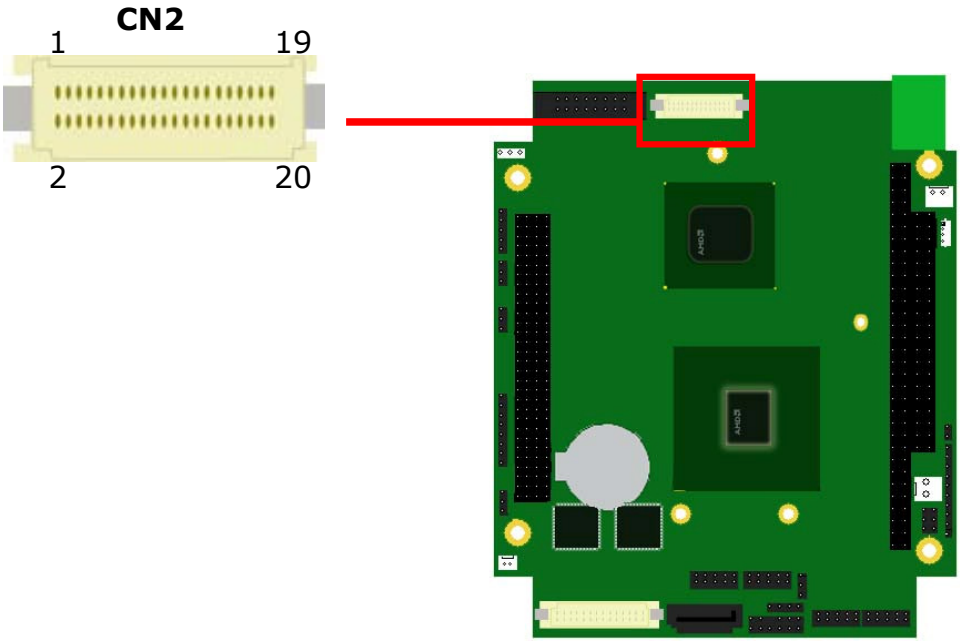
* Default setting



2.4 The pin definitions of onboard pin headers

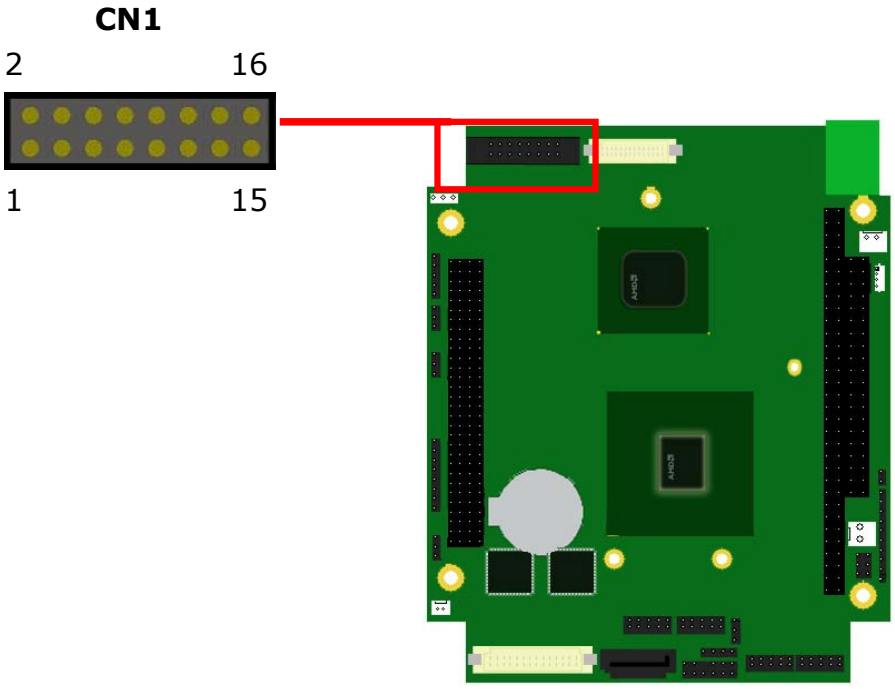
- 2.4.1: CN2 for LVDS connector

CN6 : 2 x 10 header , connector type : DF13A-20DP-1.25V			
Pin	**Signal**	**Pin**	**Signal**
1	TXP2	2	TXN2
3	GND	4	GND
5	TXP1	6	TXN1
7	GND	8	VCC_LCD
9	TXP0	10	TXN0
11	TXP3	12	TXN3
13	GND	14	GND
15	N/C	16	N/C
17	LBKLT_EN_DELAY	18	VCC_LCD
19	AUX_N	20	AUX_P



- 2.4.2: CN1 for VGA connector

CN7 : 2 x 8 header , pitch 2.00 mm			
Pin	**Signal**	**Pin**	**Signal**
1	CRT_RED	2	CRT_GREEN
3	CRT_BLUE	4	+5VP0
5	GND	6	GND
7	GND	8	GND
9	+V_CRTCON	10	GND
11	V5P0	12	CRT_DDC_SDA
13	CRT_HSYNC	14	CRT_VSYNC
15	CRT_DDC_SCL	16	N/C

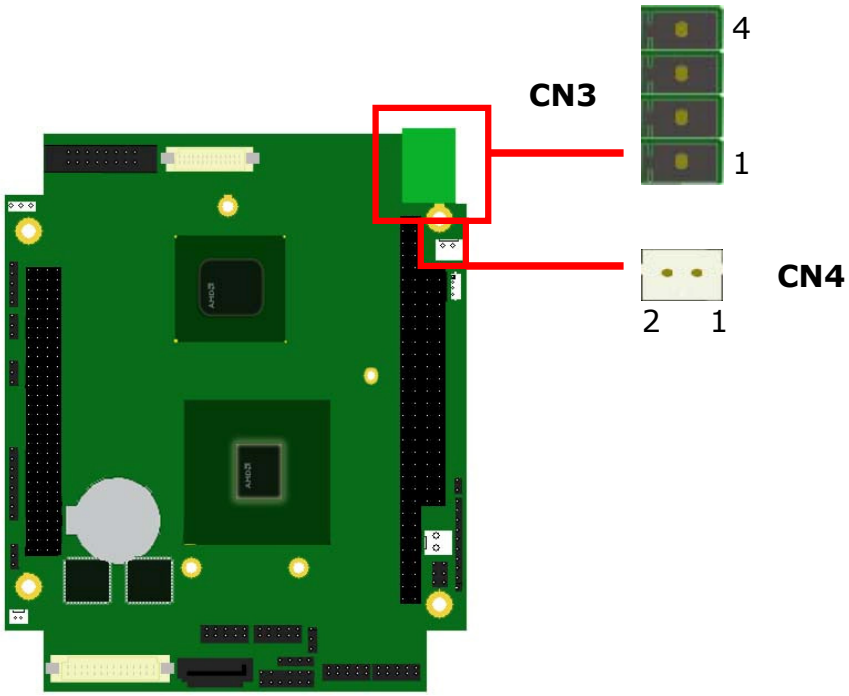


- 2.4.3: CN3 for +5V DC input

CN9 : 1 x 4 header			
Pin	**Signal**	**Pin**	**Signal**
1	+V5P0	2	+V5P0
3	GND	4	GND

- 2.4.4: CN4 for +12V DC input

CN12 : 1 x 2 header , pitch 2.00 mm			
Pin	**Signal**	**Pin**	**Signal**
1	GND	2	+V12P0

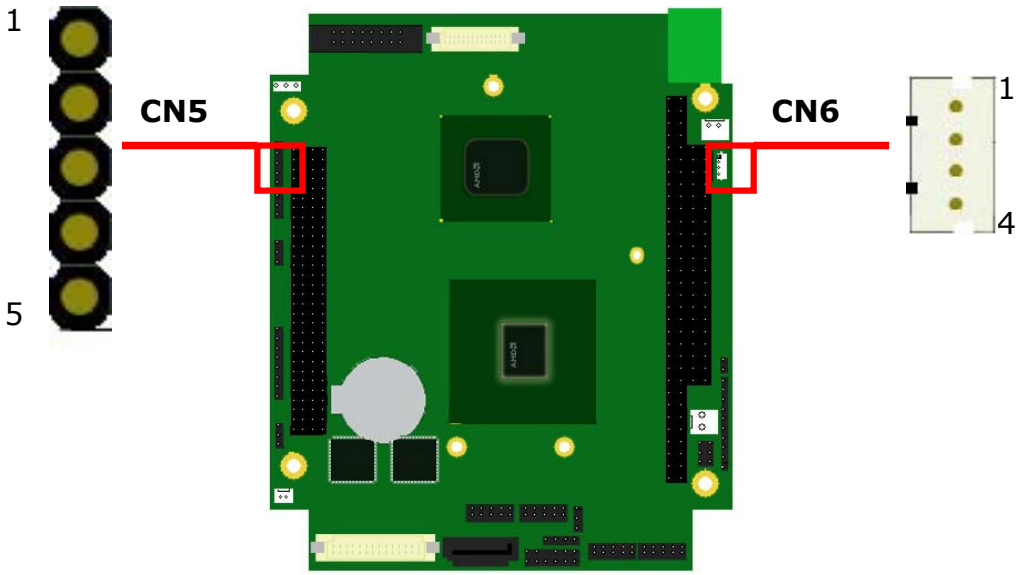


- 2.4.5: CN5 for LVDS Backlight Control

CN12 : 1 x 5 header , pitch 2.00 mm			
Pin	**Signal**	**Pin**	**Signal**
1	+12VP0	2	GND
3	LBKLT_EN_DELAY	4	LCD_BKB_CTRL

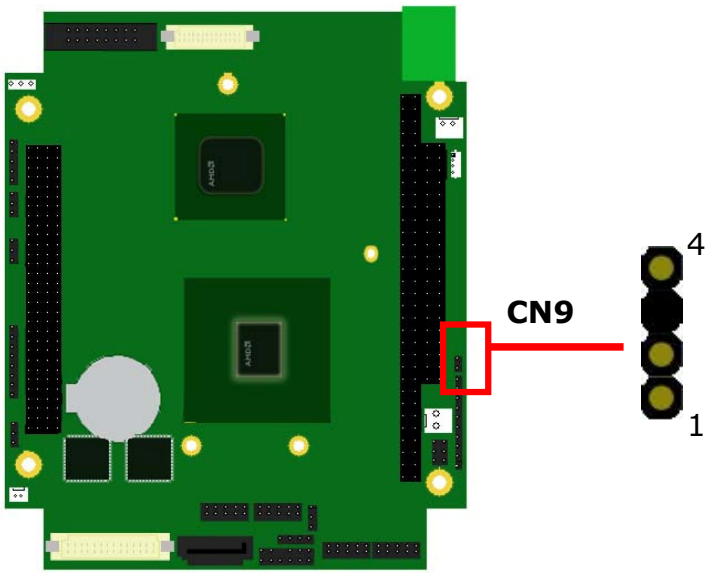
- 2.4.6: CN6 for +5V_SB DC input and PS_ON

CN13 : 1 x 4 header , pitch 2.0 mm			
Pin	**Signal**	**Pin**	**Signal**
1	+V5P0_STBY	2	+V5P0_STBY
3	GND	4	PS_ON



- 2.4.7: CN9 for -5V & -12V DC input

CN13 : 1 x 4 header , pitch 2.0 mm			
Pin	**Signal**	**Pin**	**Signal**
1	-V5P0	2	GND
3	N/C	4	-V12P0

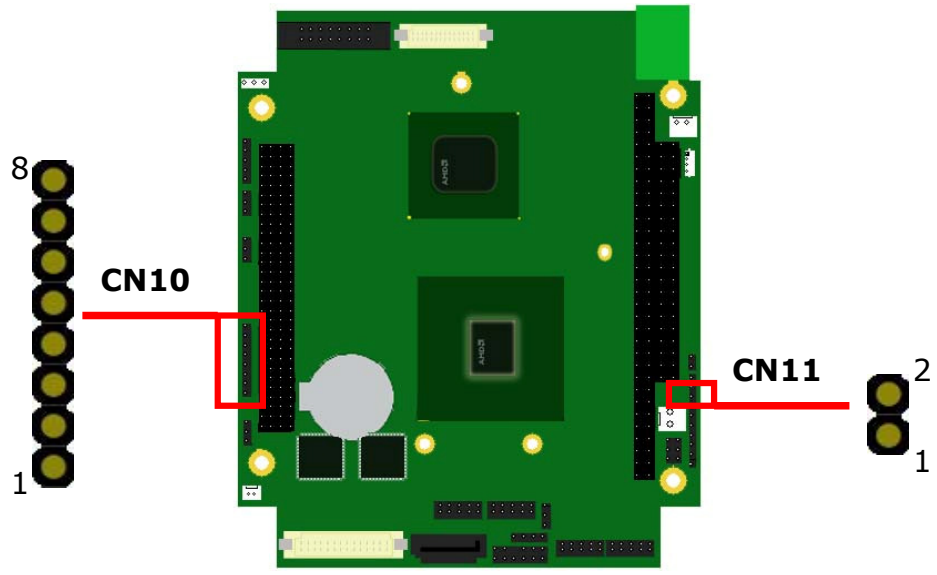


- 2.4.8: CN10 for Front Panel

CN14 : 1 x 8 header , pitch 2.0 mm			
Pin	**Signal**	**Pin**	**Signal**
1	PWR_LED_N	2	GND
3	HDD_LED_N	4	HDD_LED_N
5	SYSRST_N	6	GND
7	SPKR_PU	8	BEEP_SPKR_R_N

CN11 for Power Button

CN15 : 1 x 2 header , pitch 2.0 mm			
Pin	**Signal**	**Pin**	**Signal**
1	PWRSW	2	GND

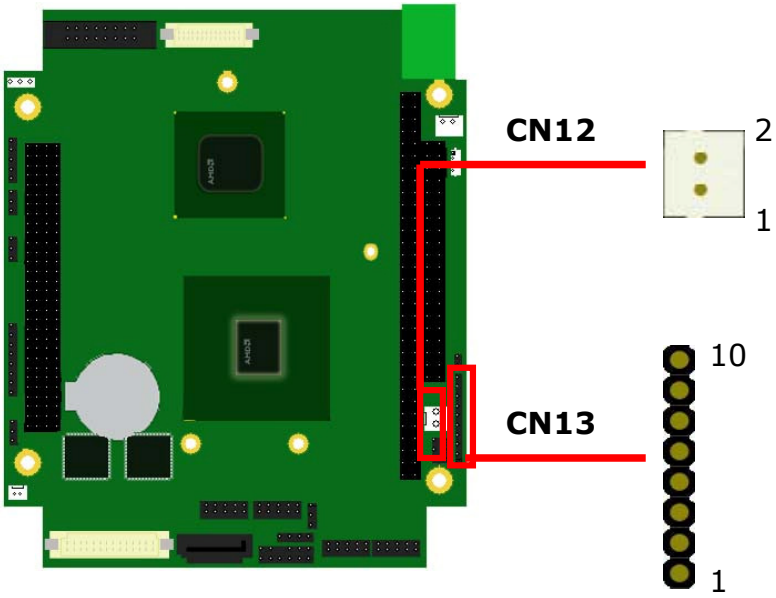


- 2.4.9 : CN12 for Fan connector

CN17 : 1 x 2 header , pitch 2.0 mm			
Pin	**Signal**	**Pin**	**Signal**
1	+V5P0	2	GND

CN13 for GPIO ports

CN15 : 1 x 10 header , pitch 2.0 mm			
Pin	**Signal**	**Pin**	**Signal**
1	+V3P3	2	GPIO10
3	GPIO11	4	GPIO12
5	GPIO13	6	GPIO14
7	GPIO15	8	GPIO16
9	GPIO17	10	GND

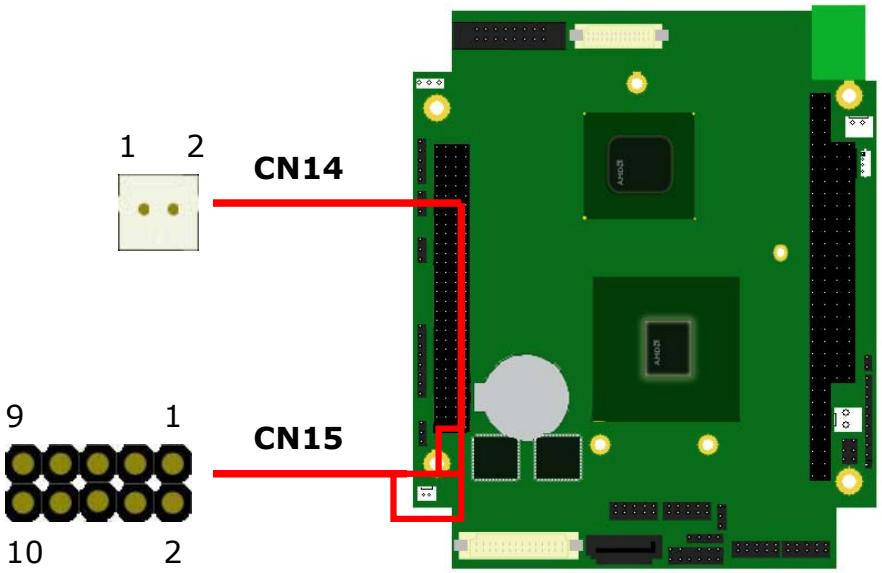


- 2.4.10: CN15 for LPC connector

CN19 : 2 x 5 header , pitch 2.0 mm			
Pin	**Signal**	**Pin**	**Signal**
1	+V3P3	2	LAD0
3	LAD1	4	LAD2
5	LAD3	6	LFRAME_N
7	RST_N	8	+5VP0
9	LPC1_33 MHz	10	GND

CN14 for Battery connector

CN19 : 1 x 2 header , pitch 2.0 mm			
Pin	**Signal**	**Pin**	**Signal**
1	BAT2_R	2	GND

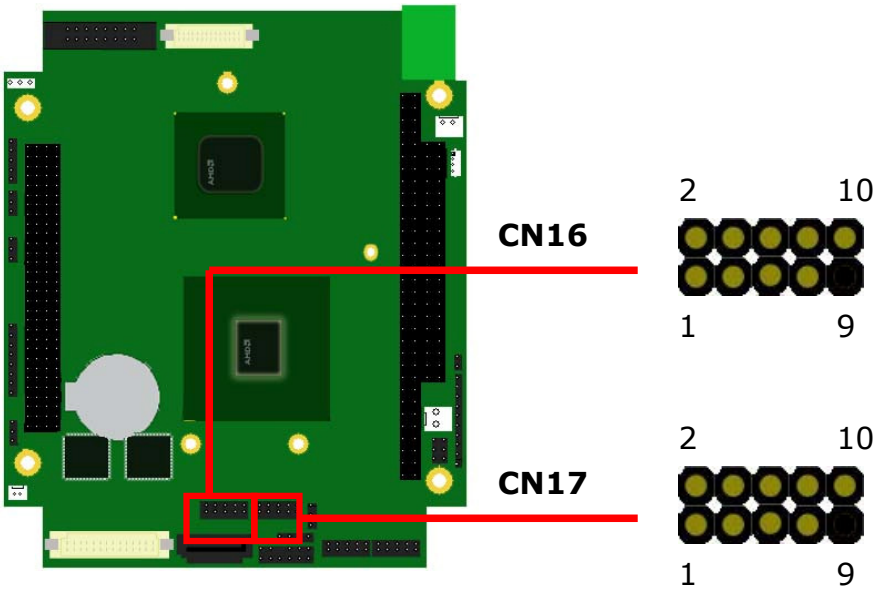


- 2.4.11: CN16 for USB0 & USB1

CN20 : 2 x 5 header , pitch 2.0 mm			
Pin	**Signal**	**Pin**	**Signal**
1	VCC	2	VCC
3	USB_PN_1	4	USB_PN_0
5	USB_PP_1	6	USB_PP_0
7	GND	8	GND
9	N/C	10	GND

CN17 for USB2 & USB3

CN20 : 2 x 5 header , pitch 2.0 mm			
Pin	**Signal**	**Pin**	**Signal**
1	VCC	2	VCC
3	USB_PN_3	4	USB_PN_2
5	USB_PP_3	6	USB_PP_2
7	GND	8	GND
9	N/C	10	GND

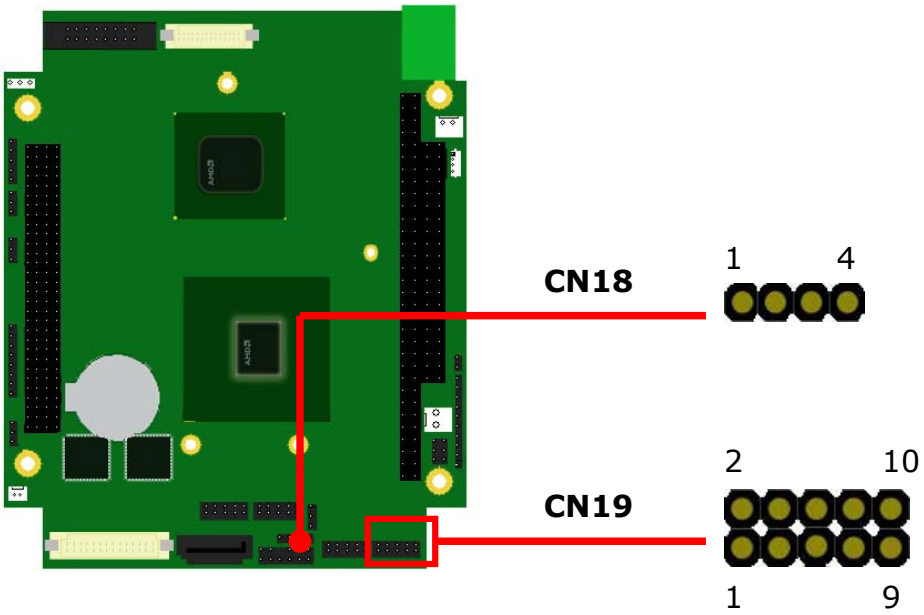


- 2.4.12: CN18 for COM2 (RS422/485) Connector

CN21 : 1 x 4 header , pitch 2.00 mm			
Pin	**Signal**	**Pin**	**Signal**
1	485_RXD-	2	485_RXD+
3	485_TXD+	4	485_TXD-

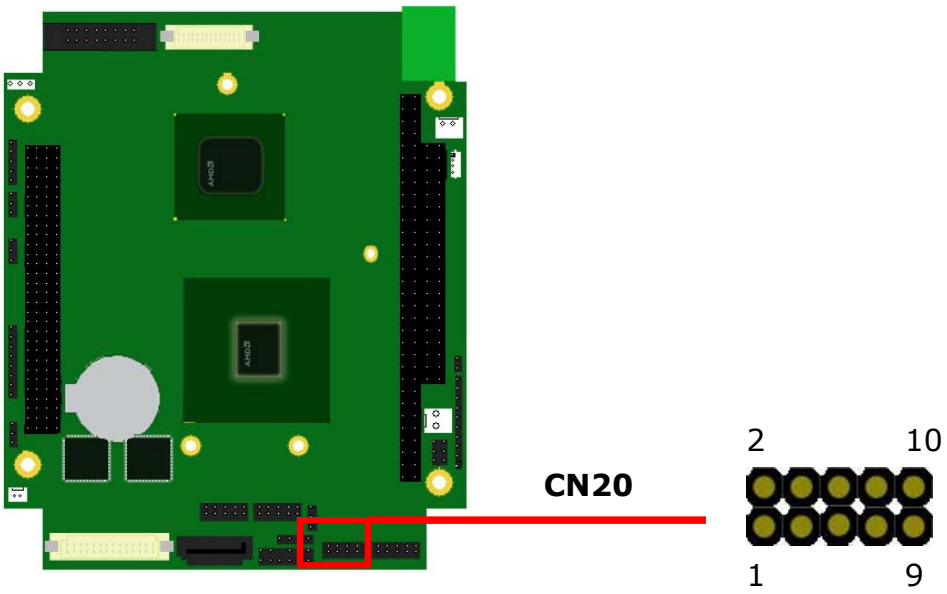
CN19 for COM1 (RS232) Connector

CN21 : 2 x 5 header , pitch 2.00 mm			
Pin	**Signal**	**Pin**	**Signal**
1	DCD_N_CON	2	DSR_N_CON
3	SIN_CON	4	RTS_N_CON
5	SOUT_CON	6	CTS_N_CON
7	DTR_N_CON	8	RI_N_CON
9	GND	10	N.C



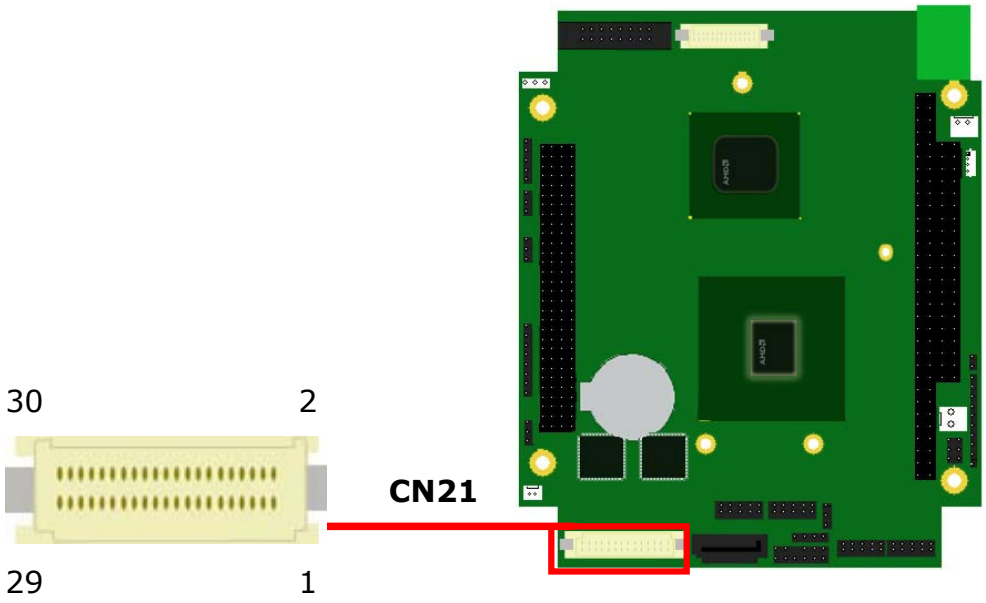
- 2.4.13: CN20 for COM2 (RS232) Connector

CN20 : 2 x 5 header , pitch 2.00 mm			
Pin	**Signal**	**Pin**	**Signal**
1	DCD_N_CON	2	DSR_N_CON
3	SIN_CON	4	RTS_N_CON
5	SOUT_CON	6	CTS_N_CON
7	DTR_N_CON	8	RI_N_CON
9	GND	10	N/C



- 2.4.14: CN21 for LAN1, LAN2 Connector

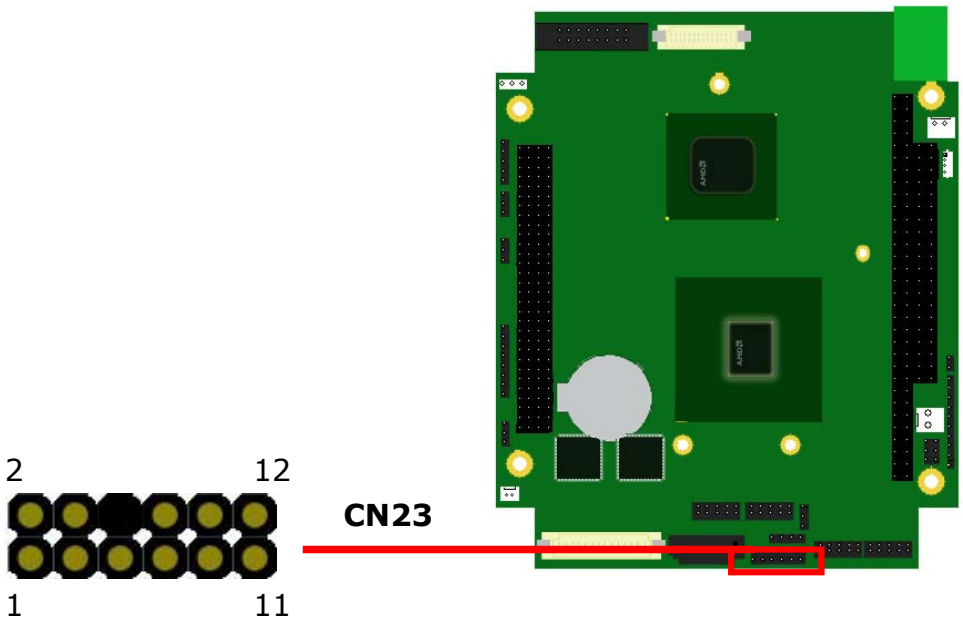
CN20 : 2 x 15 header , connector type : DF13A-30DP-1.25V			
Pin	**Signal**	**Pin**	**Signal**
1	LAN1_L_MDIP2	2	LAN1_L_MDIP0
3	LAN1_L_MDIN2	4	LAN1_L_MDIN0
5	LAN1_L_MDIP3	6	LAN1_L_MDIP1
7	LAN1_L_MDIN3	8	LAN1_L_MDIN1
9	+V3P3	10	GND
11	LAN1_ACT_N_R	12	LAN1_LINK_N
13	LAN1_LINK100_N_R	14	LAN1_LINK1000_N
15	GND	16	GND
17	LAN2_L_MDIP0	18	LAN2_L_MDIP2
19	LAN2_L_MDIN0	20	LAN2_L_MDIN2
21	LAN2_L_MDIP1	22	LAN2_L_MDIP3



- 2.4.15: CN23 for HDA Connector

Note: You will need to purchase WIN's audio module & cabling to support audio function

CN20 : 2 x 6 header , pitch 2.00 mm			
Pin	**Signal**	**Pin**	**Signal**
1	+V5P0	2	GND
3	GND	4	HDA_BIT_CLK_Coded
5	+V3P3	6	N/C
7	HDA_SDIN0	8	HDA_SYNC_Codec
9	GND	10	HDA_RST_N_Codec
11	HDA_SDOUT	12	HDA_SDATA_IN1



3.1 GPIO Sample Program for DOS environment

```
#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
#define GPIO_port 0x378
#define GPIO_read_portGPIO_port + 3

void Enter_sio_config();
void Exit_sio_config();
void ENABLE_GPIO();
```

```
void Input_mode();
void Output_mode();
void help();

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

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

	ENABLE_GPIO();

		if(strcmp(argv[1], "-i") == 0){
		Input_mode();
		data_rw8 = inportb(GPIO_read_port);
		if ((data_rw8&0x01) == 0x00)
			printf("GPI0 -> Low\n");
		else
			printf("GPI0 -> High\n");

		if ((data_rw8&0x02) == 0x00)
			printf("GPI1 -> Low\n");
		else
			printf("GPI1 -> High\n");

		if ((data_rw8&0x04) == 0x00)
			printf("GPI2 -> Low\n");
		else
			printf("GPI2 -> High\n");

		if ((data_rw8&0x08) == 0x00)
			printf("GPI3 -> Low\n");
		else
			printf("GPI3 -> High\n");
```

```
        if ((data_rw8&0x10) == 0x00)
                printf("GPI4 -> Low\n");
        else
                printf("GPI4 -> High\n");

        if ((data_rw8&0x20) == 0x00)
                printf("GPI5 -> Low\n");
        else
                printf("GPI5 -> High\n");

        if ((data_rw8&0x40) == 0x00)
                printf("GPI6 -> Low\n");
        else
                printf("GPI6 -> High\n");

        if ((data_rw8&0x80) == 0x00)
                printf("GPI7 -> Low\n");
        else
                printf("GPI7 -> High\n");

        }

else if(strcmp(argv[1], "-h0") == 0){
        printf("GPO0 -> High\n");
        Output_mode();
        data_rw8 = inportb(GPIO_port)&0xFE;
        data_rw8 |= 0x01;
        outportb(GPIO_port, data_rw8);
}
else if(strcmp(argv[1], "-l0") == 0){
        printf("GPO0 -> Low\n");
        Output_mode();
        data_rw8 = inportb(GPIO_port)&0xFE;
        outportb(GPIO_port, data_rw8);
}

else if(strcmp(argv[1], "-h1") == 0){
        printf("GPO1 -> High\n");
```

```
        Output_mode();
        data_rw8 = inportb(GPIO_port)&0xFD;
        data_rw8 |= 0x02;
        outportb(GPIO_port, data_rw8);
    }
    else if(strcmp(argv[1], "-l1") == 0){
        printf("GPO1 -> Low\n");
        Output_mode();
        data_rw8 = inportb(GPIO_port)&0xFD;
        outportb(GPIO_port, data_rw8);
    }

    else if(strcmp(argv[1], "-h2") == 0){
        printf("GPO2 -> High\n");
        Output_mode();
        data_rw8 = inportb(GPIO_port)&0xFB;
        data_rw8 |= 0x04;
        outportb(GPIO_port, data_rw8);
    }
    else if(strcmp(argv[1], "-l2") == 0){
        printf("GPO2 -> Low\n");
        Output_mode();
        data_rw8 = inportb(GPIO_port)&0xFB;
        outportb(GPIO_port, data_rw8);
    }

    else if(strcmp(argv[1], "-h3") == 0){
        printf("GPO3 -> High\n");
        Output_mode();
        data_rw8 = inportb(GPIO_port)&0xF7;
        data_rw8 |= 0x08;
        outportb(GPIO_port, data_rw8);
    }
    else if(strcmp(argv[1], "-l3") == 0){
        printf("GPO3 -> Low\n");
        Output_mode();
        data_rw8 = inportb(GPIO_port)&0xF7;
        outportb(GPIO_port, data_rw8);
```

```
}

else if(strcmp(argv[1], "-h4") == 0){
        printf("GPO4 -> High\n");
        Output_mode();
        data_rw8 = inportb(GPIO_port)&0xEF;
        data_rw8 |= 0x10;
        outportb(GPIO_port, data_rw8);
}
else if(strcmp(argv[1], "-l4") == 0){
        printf("GPO4 -> Low\n");
        Output_mode();
        data_rw8 = inportb(GPIO_port)&0xEF;
        outportb(GPIO_port, data_rw8);
}

else if(strcmp(argv[1], "-h5") == 0){
        printf("GPO5 -> High\n");
        Output_mode();
        data_rw8 = inportb(GPIO_port)&0xDF;
        data_rw8 |= 0x20;
        outportb(GPIO_port, data_rw8);
}
else if(strcmp(argv[1], "-l5") == 0){
        printf("GPO5 -> Low\n");
        Output_mode();
        data_rw8 = inportb(GPIO_port)&0xDF;
        outportb(GPIO_port, data_rw8);
}

else if(strcmp(argv[1], "-h6") == 0){
        printf("GPO6 -> High\n");
        Output_mode();
        data_rw8 = inportb(GPIO_port)&0xBF;
        data_rw8 |= 0x40;
        outportb(GPIO_port, data_rw8);
}
else if(strcmp(argv[1], "-l6") == 0){
```

```
            printf("GPO6 -> Low\n");
            Output_mode();
            data_rw8 = inportb(GPIO_port)&0xBF;
            outportb(GPIO_port, data_rw8);
      }

      else if(strcmp(argv[1], "-h7") == 0){
            printf("GPO7 -> High\n");
            Output_mode();
            data_rw8 = inportb(GPIO_port)&0x7F;
            data_rw8 |= 0x80;
            outportb(GPIO_port, data_rw8);
      }
      else if(strcmp(argv[1], "-l7") == 0){
            printf("GPO7 -> Low\n");
            Output_mode();
            data_rw8 = inportb(GPIO_port)&0x7F;
            outportb(GPIO_port, data_rw8);
      }

      else{
            help();
            return;
      }

      return;
}

void Enter_sio_config()                     //Enter F81865 Configuration
{
      outportb(index_port, 0x87);
      delay(1);                       //Delay some time
      outportb(index_port, 0x87);
      outportb(index_port, 0x07);               //Super IO Selct Bank Register Number
      outportb(data_port , 0x03);               //Select logical device 7
      outportb(index_port, 0x30);
      outportb(data_port , 0x01);
}
```

```
void Exit_sio_config()                          //Exit F81865 Configuration
{
      outportb(index_port, 0xAA);
}

void ENABLE_GPIO()
{
      int BusNum    = 0x00;    //bus0
      int DevFunc = 0xA3;      //device20, function3
      int RegNum    = 0x44;    //reg44
      long int data_rw32;

      data_rw32 = (BusNum << 8) + (DevFunc << 8);
      data_rw32 += (RegNum & 0xFC);
      data_rw32 |= 0x80000000;
      outportl(0xCF8, data_rw32);
      outportb(0xCFC, 0xC1);
}

void Input_mode()
{
      Enter_sio_config();
      outportb(index_port, 0xF0);
      outportb(data_port,    0x41);
      Exit_sio_config();
}

void Output_mode()
{
      Enter_sio_config();
      outportb(index_port, 0xF0);
      outportb(data_port,    0x40);
      Exit_sio_config();
}

void help()
{
```

```
        printf("WIN GPIO Program\n");
        printf("Usage: GPIO -i    (Show GPI Settings)\n");
        printf("Usage: GPIO -hx (Set GPO Value to high)\n");
        printf("                        x = 0 ~ 7\n");
        printf("Usage: GPIO -lx (Set GPO Value to low)\n");
        printf("                        x = 0 ~ 7\n");
}
```

3.2 Watchdog timer Sample Program for DOS environment

```
#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;

                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);
        }
        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, 0xFA);
                data_rw8 = inportb(data_port)|0x01;
                outportb(data_port, data_rw8);

                outportb(index_port, 0xF5);
                data_rw8 = inportb(data_port)&0xF7|0x31;
                outportb(data_port, data_rw8);
                        sscanf(argv[2], "%d", &data_rw8);
                outportb(index_port, 0xF6);
                outportb(data_port,    data_rw8);
                        printf("Watchdog Timer will count down for %d second(s)\n", data_rw8);
```

```
            }
        }
        else if(strcmp(argv[1], "-m") ==0 ){
            //Set Time-out Value
            if(argv[2] == NULL){
                help();
                return;
            }
            else{
                Enter_sio_config();
                outportb(index_port, 0xFA);
                data_rw8 = inportb(data_port)|0x01;
                outportb(data_port, data_rw8);

                outportb(index_port, 0xF5);
                data_rw8 = inportb(data_port)&0xF7|0x31;
                data_rw8 |= 0x08;
                outportb(data_port, data_rw8);
                    sscanf(argv[2], "%d", &data_rw8);
                outportb(index_port, 0xF6);
                outportb(data_port,    data_rw8);
                    printf("Watchdog Timer will count down for %d minute(s)\n", data_rw8);
            }
        }
        Exit_sio_config();
        return;
}

void Enter_sio_config()                         //Enter F81865 Configuration
{
        outportb(index_port, 0x87);
        delay(1);                               //Delay some time
        outportb(index_port, 0x87);
        outportb(index_port, 0x07);                     //Super IO Selct Bank Register Number
        outportb(data_port , 0x07);                     //Select logical device 7
        outportb(index_port, 0x30);
        outportb(data_port , 0x01);
}
```

```
void Exit_sio_config()                          //Exit F81865 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");
}
```