EMB-CV1 series

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Packing List

(Standard, not bulk pack)

Before you begin installing your card, please make sure that the following materials have been shipped:

- 1   Cable Set (SATA Cable, SATA Power Cable)
- 1   Metal I/O Bracket
- 1   Product CD
- 1   Industrial Motherboard

If any of these items should be missing or damaged, please contact your distributor or sales representative immediately.

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Chapter

1

**General
Information**

1.1 Features

- Onboard Intel® Atom™ D2550 Processor
- Intel® NM10
- Intel® Graphics Media Accelerator 3600 Supports DirectX 10, OpenGL 3.0
- DDR3 800/1066 SO-DIMM x 2, Max. 4GB
- VGA, 18/24-bit LVDS, DVI, Dual Independent Display
- Dual Gigabit Ethernet
- COM x 5 (RS-232 x 4, RS-232/422/485 x 1)
- USB2.0 x 6, SATA 3Gb/s x 2
- PCI-Express [x1] x 1, Full-size Mini Card + SIM slot x 1 (m-SATA option, if use m-SATA, one of SATA port and Mini Card + SIM Card will be disable)
- 5.1 CH Audio Channel

1.2 Specifications

System

- Processor   Intel® Atom™ D2550 Dual Core Processor, up to 1.86GHz

- System Memory   204-pin single channel DDR3 800/1066 DIMM x 2, Max. 4GB (When you install only one memory module, install it on DIMM A2 slot)

- Chipset   Intel® NM10

- I/O Chipset   ITE IT8783F

- Ethernet   Realtek 8111E for 10/100/1000Base-TX, RJ-45 x 2

- BIOS   AMI BIOS, 32MB ROM

- Wake On LAN   Yes

- Watchdog Timer   System reset: 1~255 steps programmable

- H/W Status Monitoring Supports Power Supply Voltage, Fan Speed, and Temperature Monitoring

- Expansion Interface   PCI-Express[x1] x 1,

  Full-size Mini Card + SIM Card slot x 1 (m-SATA option)

- Battery   Lithium battery

- Power Requirement   DC 12V

  (selectable AT/ATX mode)

- Board Size   6.7"(L) x 6.7"(W)

  (170 mm x 170 mm)

- Gross Weight   1.1 lb (0.5 Kg)

- Operating Temperature 32˚F~ 140˚F (0˚C ~ 60˚C)
- Storage Temperature -40˚F~ 185˚F (-40˚C ~ 85˚C)
- Operating Humidity 5%~95% relative humidity, non-condensing

Display
- Chipset Intel® Graphics Media Accelerator 3650
- Resolution Up to 1440x900 18/24-bit
- LCD Interface 18/24-bit LVDS
- Video Interface VGA x 1, DVI-D x 1

I/O
- Storage SATA x 2 (support AHCI mode)

  (if use m-SATA, one SATA port will be disable)
- Serial Port RS-232 x 4, RS-232/422/485 x 1 (RS-422/485 is selectable by BIOS)
- Parallel Port STD/SPP/EPP
- USB USB2.0 x 6

  (5x2 pin header for internal x 2, onboard Type A connector x 4)
- Digital I/O Supports 8-bit (Programmable)
- PS/2 Port Keyboard/ Mouse x 1
- Audio Line-in, Mic-in, Line-out

Chapter

2

Quick
Installation
Guide

2.1   Safety Precautions

Warning!

Always completely disconnect the power cord from your board whenever you are working on it. Do not make connections while the power is on, because a sudden rush of power can damage sensitive electronic components.

Caution!

Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis

2.2   Location of Connectors and Jumpers
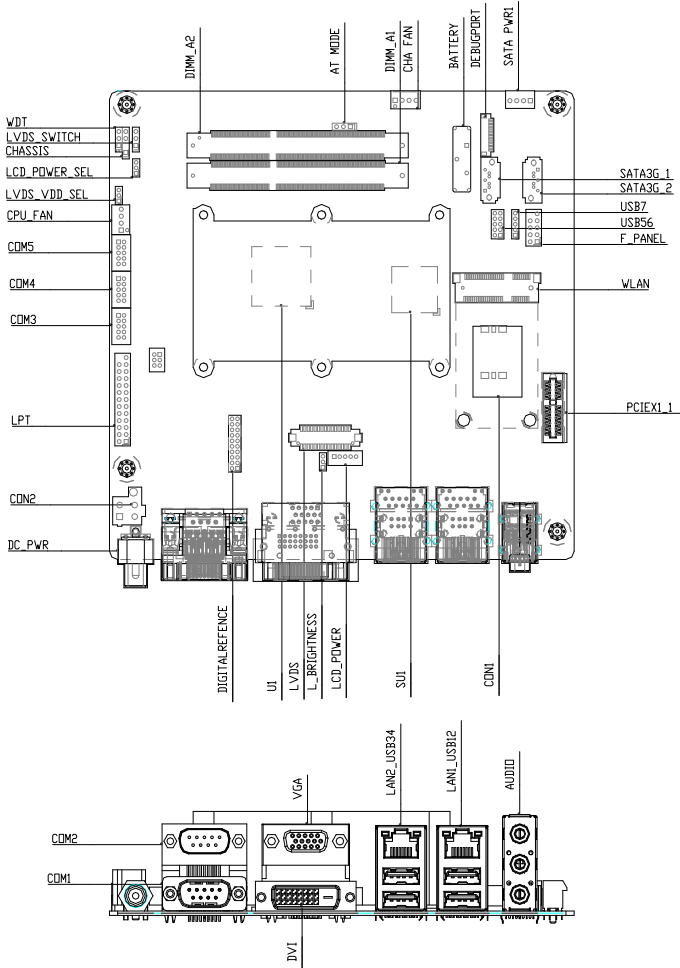
NOTE: If choose m-SATA SKU, SATA3G_2 port, mini card and SIM card slot will be disable.

2.3　Mechanical Drawing

Component Side
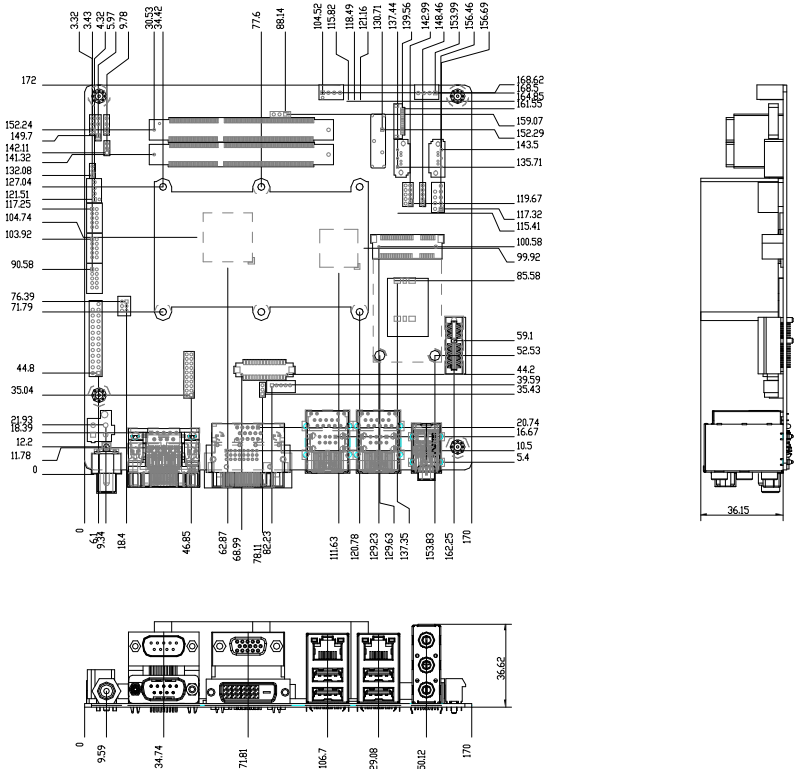
Solder Side
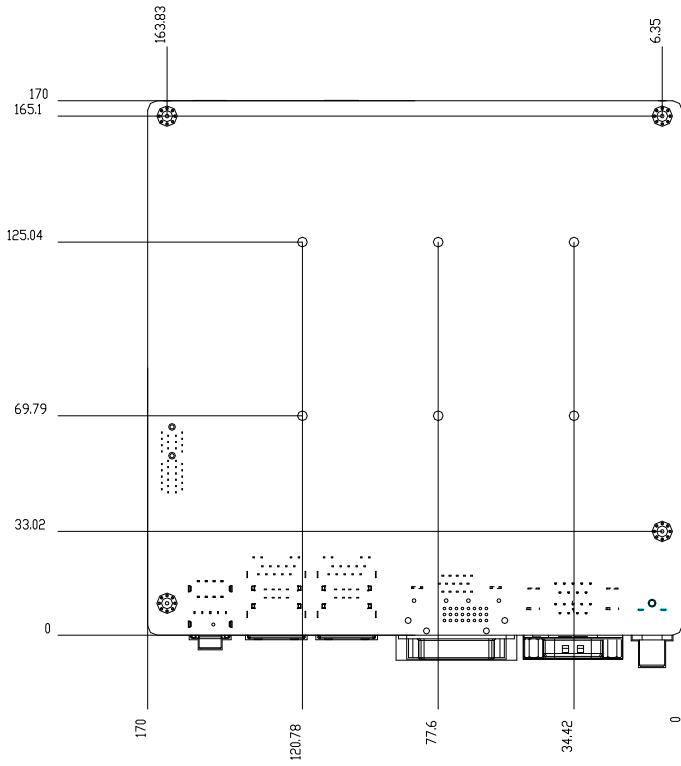
2.4   List of Jumpers

The board has a number of jumpers that allow you to configure your system to suit your application.

The table below shows the function of each of the board's jumpers:

Label	Function
ATMODE	AT/ATX Mode Selection
CLRTC	Clear COMS
DIGITALREFENCE	COM2 External Power Selection
LVDS_VDD_SEL	LVDS Panel Power Selection
L_BRIGHTNESS	LVDS Brightness Control Type Selection
LVDS_SWITCH	LVDS Function Enable
LCD_POWER_SEL	LVDS Panel Backlight Power Selection
WDT	Watchdog Timer Function Switch

2.5   List of Connectors

The board has a number of connectors that allow you to configure your system to suit your application.

The table below shows the function of each of the board's connectors:

Label	Function
DC_PWR	+12V Power connector
CON2	+12V AUX Power Connector
CHA_FAN	System FAN Connector
COM3	COM 3 Connector
COM4	COM 4 Connector
COM5	COM 5 Connector
CON1	SIM Card Socket
CPU_FAN	CPU FAN Connector
DIGITALREFENCE	GPIO/SM BUS/COM2/ COM2 External Power Selection
F_PANEL	Front Panel Pin Header
KB/Ms	PS/2 Keyboard / Mouse Connector
LCD_POWER	LVDS Panel Power Connector
LPT	Parallel Port Connector
LVDS	LVDS Panel Connector
PCIEX1_1	PCI-E [x1] Slot
SATA_PWR1	Serial ATA Power Connector
SATA3G_1	SATA 0 Connector
SATA3G_2	SATA 1 Connector

USB56	USB 5 & 6 Pin Header
USB7	USB 7 Pin Header
WLAN	Mini PCI-E Slot

NOTE: The +12V Power connector (Label: DC_PWR) is lockable Jack

type with screw. Please refer the inner and outer diameter

dimension of connector as below to choose suitable adaptor.
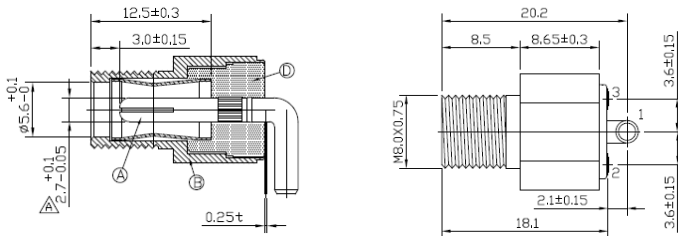
2.6   Setting Jumpers

You configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To "close" a jumper you connect the pins with the clip.

To "open" a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2 or 2 and 3.

Open   **Closed**   **Closed 2-3**
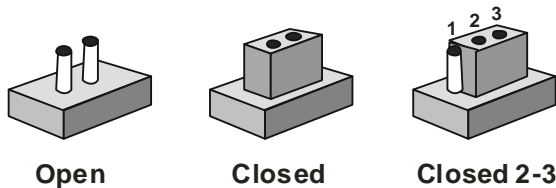
A pair of needle-nose pliers may be helpful when working with jumpers.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any change.

Generally, you simply need a standard cable to make most connections.

2.7 AT/ATX Mode Selection (ATMODE)

ATOMODE	Function
Close 1-2	AT
Close 2-3	ATX Mode (Default)

2.8 Clear COMS (CLRTC)

CLRTC	Function
Close 1-2	Protected (Default)
Close 2-3	Clear

2.9 COM2 External Power Selection (DIGITALREFENCE)

DIGITALREFENCE	Function
Close 15-16	+12V
Close 17-18	RI# (Default)
Close 19-20	+5V

2.10 LVDS Panel Power Selection (LVDS_VDD_SEL)

LVDS_VDD_SEL	Function
Close 1-2	+3.3V (Default)
Close 2-3	+5V

2.11 LVDS Brightness Control Type Selection (L_BRIGHTNESS)

L_BRIGHTNESS	Function
Close 1-2	Voltage Control (Default)
Close 2-3	PWM Control

2.12 LVDS function Enable (LVDS_SWITCH)

LVDS_SWITCH	Function
Close 1-2	Disable
Close 2-3	Enable (Default)

2.13 LVDS Panel Backlight Power Selection (LCD_POWER_SEL)

LCD_POWER_SEL	Function
Close 1-2	+12V
Close 2-3	+5V (Default)

2.14 Watchdog Timer Function Switch (WDT)

WDT	Function
Close 1-2	Disable (Default)
Close 2-3	Enable

2.15 +12V AUX Power Connector (CON2)

Pin	Signal	Pin	Signal
1	GND	2	GND
3	+12V	4	+12V

2.16 CPU/SYSTEM FAN Connector (CPU_FAN/CHA_FAN)

Pin	Signal	Pin	Signal
1	FAN Control	2	FAN Sense
3	+12V	4	GND

2.17 COM3/COM4/COM5 RS-232 Serial Port PIN HEADER (COM3/COM4/COM5)

Pin	Signal	Pin	Signal
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	NC

2.18 GPIO/SM BUS/COM2/ COM2 External Power Selection (DIGTALREFENCE)

Pin	Signal	Pin	Signal
1	GP50	2	GP51
3	GP52	4	GP53
5	GP54	6	GP55
7	GP56	8	GP57
9	+5V	10	GND
11	SMB_CLOCK	12	SMB_DATA
13	+5V	14	GND
15	COM2_RI#	16	+12V
17	COM2_RI#	18	RI#
19	COM2_RI#	20	+5V

2.19 COM2 RS-232/422/485 connector

Pin	Signal	Pin	Signal
1	DCD (422TXD-/485DATA-)	2	RXD (422RXD+)
3	TXD (422TXD+/485DATA+)	4	DTR (422RXD-)
5	GND	6	DSR
7	RTS	8	CTS
9	RI/+12V/+5V	10	N.C.

2.20 Front Panel Pin Header (F_PANEL)

Pin	Signal	Pin	Signal
1	HDDLED+	2	POWERLED+
3	HDDLED-	4	POWERLED-
5	RESET-	6	PWRBTN+
7	RESET+	8	PWRBTN-
9	N/C		

2.21 PS/2 Keyboard/Mouse Connector (KB/MS)

Pin	Signal	Pin	Signal
1	KB_DATA	2	KB_CLK
3	GND	4	+5V
5	MS_DATA	6	MS_CLK

2.22 LVDS Panel Power Connector (LCD_POWER)

Pin	Signal	Pin	Signal
1	Panel Power	2	Panel brightness control
3	GND	4	GND
5	Panel backlight control		

2.23 Parallel Port Connector (LPT)

Pin	Signal	Pin	Signal
1	STB#	2	AFD#
3	DATA 0	4	ERROR#
5	DATA 1	6	INIT#
7	DATA 2	8	SLIN#
9	DATA 3	10	GND
11	DATA 4	12	GND
13	DATA 5	14	GND
15	DATA 6	16	GND
17	DATA 7	18	GND
19	ACK#	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT		

2.24 LVDS Panel Connector (LVDS)

Pin	Signal	Pin	Signal
1	NC	2	NC
3	Panel power	4	GND
5	NC	6	NC
7	NC	8	NC
9	NC	10	NC
11	NC	12	NC
13	DDC_DATA	14	DDC_CLOCK
15	DATA3-	16	DATA3+
17	DATA2-	18	DATA2+
19	DATA1-	20	DATA1+
21	DATA0-	22	DATA0+
23	Panel power	24	GND
25	LVDS_CLOCK-	26	LVDS_CLOCK+
27	Panel power	28	GND
29	Backlight enable	30	Brightness control

NOTE: LVDS connector Vendor:

PINREX; Model: 712-76-30GWR8. Please refer the drawing

below, notice the location of PIN1, PIN2, PIN29 and PIN30.
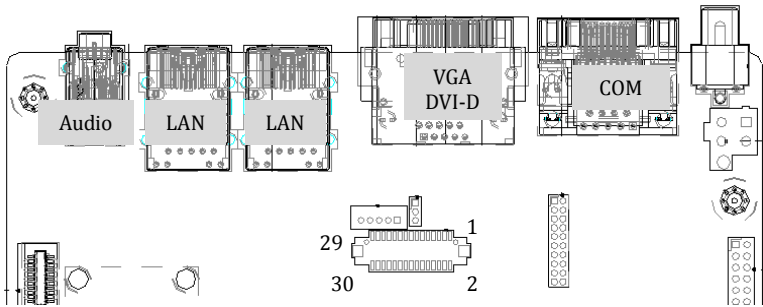
2.25 Serial ATA Power Connector (SATA_PWR1)

Pin	Signal	Pin	Signal
1	+5	2	GND
3	GND	4	+12V

2.26 USB 5 & 6 PIN HEADER (USB56)

Pin	Signal	Pin	Signal
1	+5V	2	GND
3	USBD-	4	GND
5	USBD+	6	USBD+
7	GND	8	USBD-
9	GND	10	+5V

2.27 USB 7 PIN HEADER (USB7)

Pin	Signal
1	+5V
2	USBD-
3	USBD+
4	GND
5	NC

Chapter

3

AMI BIOS Setup

3.1   System Test and Initialization

These routines test and initialize board hardware. If the routines encounter an error during the tests, you will either hear a few short beeps or see an error message on the screen. There are two kinds of errors: fatal and non-fatal. The system can usually continue the boot up sequence with non-fatal errors.

System configuration verification

These routines check the current system configuration against the values stored in the CMOS memory. If they do not match, the program outputs an error message. You will then need to run the BIOS setup program to set the configuration information in memory.

There are three situations in which you will need to change the CMOS settings:

1.   You are starting your system for the first time

2.   You have changed the hardware attached to your system

3.   The CMOS memory has lost power and the configuration information has been erased.

The EMB-CV1 CMOS memory has an integral lithium battery backup for data retention. However, you will need to replace the complete unit when it runs down.

3.2   AMI BIOS Setup

AMI BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed CMOS RAM so that it retains the Setup information when the power is turned off.

Entering Setup

Power on the computer and press <Del> or <F2> immediately. This will allow you to enter Setup.

Main

Set the date, use tab to switch between date elements.

Advanced

Advanced BIOS Features Setup including TPM, ACPI, etc.

Chipset

Host bridge parameters.

Boot

Enabled / disabled quiet boot option.

Security

Set setup administrator password.

Save & Exit

Exit system setup after saving the changes.

Chapter

4

Driver
Installation

The EMB-CV1 comes with an Autorun CD-ROM that contains all drivers and utilities that can help you to install the driver automatically.

Insert the driver CD, the driver CD-title will automatically start and show the installation guide. If not, please follow the sequence below to install the drivers.

Follow the sequence below to install the drivers:

      Step 1 – Install Chipset Driver

      Step 2 – Install VGA Driver

      Step 3 – Install LAN Device

      Step 4 – Install Audio Driver

      Step 5 – Install AHCI Driver

Please read instructions below for further detailed installations.

4.1　Installation:

Insert the EMB-CV1 CD-ROM into the CD-ROM drive. And install the drivers from Step 1 to Step 5 in order.

Step 1 – Install Chipset Driver

1. Click on the *Step1-INF* folder and double click on the *Setup.exe*
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 2 – Install VGA Driver

1. Click on the *Step2-VGA* folder and double click on the *Setup.exe*
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 3 –Install LAN Driver

1. Click on the *Step3-LAN* folder and double click on the *setup.exe*
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 4 –Install Audio Driver

1. Click on the *Step4-Audio* folder and double click on the *SETUP.exe*

2. Follow the instructions that the window shows

3. The system will help you install the driver automatically

Step 5 –Install AHCI Driver

1. Click on the *Step5-AHCI* folder and select the folder of *AP*

2. Double click on the *setup.exe*

3. Follow the instructions that the window shows

4. The system will help you install the driver automatically

Appendix

A

Programming the Watchdog Timer

A.1 Programming

EMB-CV1 utilizes ITE 8783 chipset as its watchdog timer controller. Below are the procedures to complete its configuration and this initial watchdog timer program is also attached based on which you can develop customized program to fit your application.

Configuring Sequence Description

After the hardware reset or power-on reset, the ITE 8783 enters the

normal mode with all logical devices disabled except KBC. The initial state (enable bit) of this logical device (KBC) is determined by the state of pin 121 (DTR1#) at the falling edge of the system reset during power-on reset.
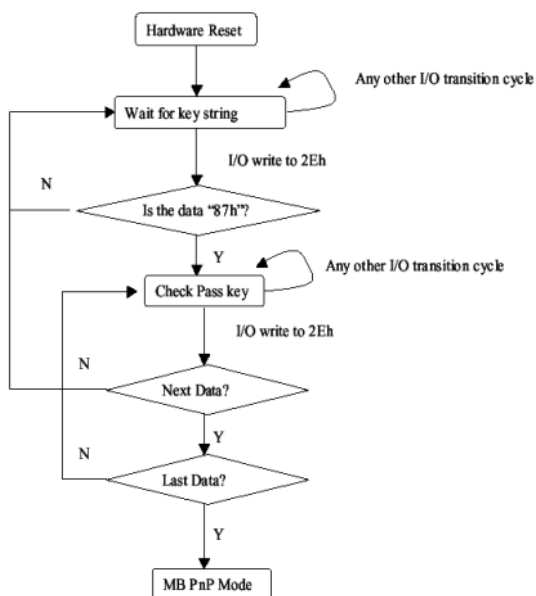
There are three steps to complete the configuration setup: (1) Enter the MB PnP Mode; (2) Modify the data of configuration registers; (3) Exit the MB PnP Mode. Undesired result may occur if the MB PnP Mode is not exited normally.

(1) Enter the MB PnP Mode

To enter the MB PnP Mode, four special I/O write operations are to be performed during Wait for Key state. To ensure the initial state of the key-check logic, it is necessary to perform four write opera-tions to the Special Address port (2EH). Two different enter keys are provided to select configuration ports (2Eh/2Fh) of the next step.

	Address Port	Data Port
87h, 01h, 55h, 55h:	2Eh	2Fh

(2) Modify the Data of the Registers

All configuration registers can be accessed after entering the MB PnP Mode. Before accessing a selected register, the content of Index 07h must be changed to the LDN to which the register belongs, except some Global registers.

(3) Exit the MB PnP Mode

Set bit 1 of the configure control register (Index=02h) to 1 to exit the MB PnP Mode.

WatchDog Timer Configuration Registers

LDN	Index	R/W	Reset	Configuration Register or Action
All	02h	W	NA	Configure Control

07h	71h	R/W	00h	Watch Dog Timer Control Register
07h	72h	R/W	001s0000b	Watch Dog Timer Configuration Register
07h	73h	R/W	38h	Watch Dog Timer Time-out Value (LSB) Register
07h	74h	R/W	00h	Watch Dog Timer Time-out Value (MSB) Register

Configure Control (Index=02h)

This register is write only. Its values are not sticky; that is to say, a hardware reset will automatically clear the bits, and does not require the software to clear them.

Bit	Description
7-2	Reserved
1	Returns to the "Wait for Key" state. This bit is used when the configuration sequence is completed.
0	Resets all logical devices and restores configuration registers to their power-on states.

Watch Dog Timer 1, 2, 3 Control Register (Index=71h,81h,91h Default=00h)

Bit	Description
7	**WDT Timeout Enable(WTE)** 1: Disable. 0: Enable.
6	**WDT Reset upon Mouse Interrupt(WRKMI)** 0: Disable. 1: Enable.
5	**WDT Reset upon Keyboard Interrupt(WRKBI)** 0: Disable. 1: Enable.
4	**Reserved**
3-2	**Reserved**
1	**Force Time-out(FTO)** This bit is self-clearing.
0	**WDT Status(WS)** 1: WDT value reaches 0. 0: WDT value is not 0.

Watch Dog Timer 1, 2, 3 Configuration Register (Index=72h, 82h, 92h Default=001s0000b)

Bit	Description
7	**WDT Time-out Value Select 1 (WTVS)** 1: Second 0: Minute
6	**WDT Output through KRST (Pulse) Enable(WOKE)** 1: Enable 0: Disable
5	**WDT Time-out value Extra select(WTVES)** 1: 64ms x WDT Timer-out value (default = 4s) 0: Determined by WDT Time-out value select 1 (bit 7 of this register)
4	**WDT Output through PWROK (Pulse) Enable(WOPE)** 1: Enable 0: Disable During LRESET#, this bit is selected by JP7 power-on strapping option
3-0	**Select interrupt level** [Note1] **for WDT(SIL)**

Watch Dog Timer 1,2,3 Time-Out Value (LSB) Register (Index=73h,83h,93h, Default=38h)

Bit	Description
7-0	**WDT Time-out Value 7-0(WTV)**

Watch Dog Timer 1,2,3 Time-Out Value (MSB) Register (Index=74h,84h,94h Default=00h)

Bit	Description
7-0	**WDT Time-out Value 15-8(WTV)**

A.2 ITE8783 Watchdog Timer Initial Program

```
.MODEL SMALL
.CODE
Main:
CALL Enter_Configuration_mode
CALL Check_Chip
mov cl, 7
call Set_Logic_Device
;time setting
mov cl, 10 ; 10 Sec
dec al
Watch_Dog_Setting:
;Timer setting
mov al, cl
mov cl, 73h
call Superio_Set_Reg
;Clear by keyboard or mouse interrupt
mov al, 0f0h
mov cl, 71h
call Superio_Set_Reg
;unit is second.
mov al, 0C0H
mov cl, 72h
```

```
call Superio_Set_Reg
; game port enable
mov cl, 9
call Set_Logic_Device


Initial_OK:
CALL Exit_Configuration_mode
MOV AH,4Ch
INT 21h


Enter_Configuration_Mode PROC NEAR
MOV SI,WORD PTR CS:[Offset Cfg_Port]


MOV DX,02Eh
MOV CX,04h
Init_1:
MOV AL,BYTE PTR CS:[SI]
OUT DX,AL
INC SI
LOOP Init_1
RET
Enter_Configuration_Mode ENDP


Exit_Configuration_Mode PROC NEAR
MOV AX,0202h
```

```
CALL Write_Configuration_Data
RET
Exit_Configuration_Mode ENDP


Check_Chip PROC NEAR


MOV AL,20h
CALL Read_Configuration_Data
CMP AL,87h
JNE Not_Initial


MOV AL,21h
CALL Read_Configuration_Data
CMP AL,81h
JNE Not_Initial


Need_Initial:
STC
RET
Not_Initial:
CLC
RET
Check_Chip ENDP
Read_Configuration_Data PROC NEAR
MOV DX,WORD PTR CS:[Cfg_Port+04h]
```

```
OUT DX,AL
MOV DX,WORD PTR CS:[Cfg_Port+06h]
IN AL,DX
RET
Read_Configuration_Data ENDP


Write_Configuration_Data PROC NEAR
MOV DX,WORD PTR CS:[Cfg_Port+04h]
OUT DX,AL
XCHG AL,AH
MOV DX,WORD PTR CS:[Cfg_Port+06h]
OUT DX,AL
RET
Write_Configuration_Data ENDP


Superio_Set_Reg proc near
push ax
MOV DX,WORD PTR CS:[Cfg_Port+04h]
mov al,cl
out dx,al
pop ax
inc dx
out dx,al
ret
Superio_Set_Reg endp.Set_Logic_Device proc near
```

```
Set_Logic_Device    proc    near
push ax
push cx
xchg al,cl
mov cl,07h
call Superio_Set_Reg
pop cx
pop ax
ret
Set_Logic_Device endp
```

```
;Select 02Eh->Index Port, 02Fh->Data Port
Cfg_Port DB 087h,001h,055h,055h
DW 02Eh,02Fh
```

END Main

Note: Interrupt level mapping

0Fh-Dh: not valid

0Ch: IRQ12

.

.

03h: IRQ3

02h: not valid

01h: IRQ1

00h: no interrupt selected

.

Appendix A Programming the Watchdog Timer   A-10

Appendix

B

Mating
Connector

B.1 List of Mating Connectors and Cables

The table notes mating connectors and available cables.

Connector Label	Function	Mating Connector		Available Cable	Cable P/N
		Vendor	Model No.		
CON2	+12V AUX power connector	PINREX	POWER CON 4P S/T,ATX,W/PG2 PINREX/740-41-04TWC0.DIP		
CHA_FAN	System FAN connector	PINREX	WAFER HD 4P S/T 2.54MM L-GRAY PINREX/744-81-04TG20 [EL].DIP		
COM3	COM 3 connector	CATCH	(TF)BOX HEADER.5*2P.180D.(M).2.0mm.DIP.WO PIN10.CATCH.1147-000-10SA		
COM4	COM 4 connector	CATCH	(TF)BOX HEADER.5*2P.180D.(M).2.0mm.DIP.WO PIN10.CATCH.1147-000-10SA		
COM5	COM 5 connector	CATCH	(TF)BOX HEADER.5*2P.180D.(M).2.0mm.DIP.WO PIN10.CATCH.1147-000-10SA		
CON1	SIM card socket	HAMBURG	SIM CON 6P 2.54 PITCH SMT HAMBURG/ICA-509.SMD		

CPU_FAN	CPU FAN connector	PINREX	WAFER HD 4P S/T 2.54MM L-GRAY PINREX/744-81-04TG20 [EL].DIP		
DIGITALREFENCE	GPIO/SMBUS/COM2/ COM2 external power select	JVE	HEADER 2X10P,S/T,2.0mm,STACK JVE/21N22050-20S22B01G4/9.2/2.DIP		
F_PANEL	Front panel pin header	PINREX	HEADER 2X5P 2.54mm S/T.K10 G/F PINREX/210-92-05GB02		
KB/MS	PS/2 Keyboard / Mouse connector	Ho-Base	(TF)WAFER BOX.6P.180D(M).2.0mm.W/LOCK DIP.何迪.2005-2WS-6		
LCD_POWE	LVDS panel power connector	CATCH	(TF)WAFER BOX.5P.180D.(M).2.0mm.W/LOCK DIP.CATCH.1192-700-05S		
LPT	Parallel port connector	PINREX	HEADER 2X13P,S/T,2.54mm,K26 PINREX/210-92-13GB11 [EL].DIP		
LVDS	LVDS panel connector	E-call	(TF)Board-Wire Connector.30P.180D(M).SMD.Pitch=1.25mm.W/Reinforcem.E-call.0110-01-553-300		
PCIEX1_1	PCI-E X1 slot	E-MOVE	SLOT 36P G/F PCIE X1,DARK		

			BLUE E-MOVE/EE0360 -1GGZ-00H [GA].DIP		
SATA_PWR1	Serial ATA power Connector	CATCH	(TF)WAFER.4P.1 80D.(M).2.5mm. W/LOCK POWER DIP.CATCH.1198- 700-04S.		
SATA3G_1	SATA 0 Connector	LOTES	SATA CON 7P S/T G/F,DIP,CHARL LOTES/ABA-SAT- 046-K13.DIP		
SATA3G_2	SATA 1 Connector	LOTES	SATA CON 7P S/T G/F,DIP,CHARL LOTES/ABA-SAT- 046-K13.DIP		
USB56	USB 5 & 6 pin header	JVE	(TF)PIN HEADER.5*2P.18 0D.(M).2.0mm.DI P		
WLAN	Mini PCI-E SLOT	LOTES	MINI PCI-E 52P,0.8MM,9.0H SMT LOTES/AAA-PCI- 047-P01 [HF].SMD		

Note: The Cable P/N with " * " sign is for WiTAS series products.