3.5" SBC with Intel® Atom™ N270 Processor, VGA/LVDS, Dual PCIe GbE, CF type II, SATA and Audio

WAFER-945GSE
Quick Installation Guide

Version 1.0

Mar. 11, 2009

Package Contents

WAFER-945GSE package includes the following items:

- 1 x WAFER-945GSE Single Board Computer
- 1 x 4 RS-232 Cable
- 2 x SATA cable
- 1x KB/MS Cable
- 1x Audio Cable
- 1 x Enclosure Heatsink
- 1 x Mini Jumper Pack
- 1 x Utility CD
- 1 x QIG (Quick Installation Guide)

Specifications

- CPU: On board Intel® Atom™ N270 1.6GHz/512KB L2 Cache with a 533MHz FSB
- System Chipset: Intel® 945GSE +ICH7M
- BIOS: AMI BIOS, SPI 8Mbit Flash ROM
- System memory: 1 x 200-pins 533/400MHz DDR2 SDRAM SO-DIMM (max. 2GB)
- Ethernet: Dual Realtek RTL8111CP GbE Controllers
- I/O Interface:

  2 x SATA

  6 x USB 2.0 (2 on rear side, 4 by pin-header)

  1 x CF Type II

  5 x RS-232

  1 x RS-232/422/485

  1 x KB/MS by 1x6 pins wafer-header
- Expansions:

  1 x PCIe mini card slot
- Audio: Realtek ALC655 with AC'97 Audio codec by 2x5 pin-header
- Digital I/O: 8-bit digital I/O, 4-bit input/ 4-bit output by super I/O
- Super I/O: ITE IT8718F
- Second super I/O: Fintek F81216D
- Display Interface:

  Analog CRT: Support for CRT Hot plug

  18-bit Dual-Channel LVDS from Intel® 945GSE
- Watchdog timer:

  Software programmable supports 1~255 sec. system reset
- Power Supply: AT/ATX support, +5V for CPU Board, +12V for LVDS(LCD Panel)
- Power Consumption:

  5V@2.94A (Intel® Atom™ N270 1.6GHz with 1GB DDR2 DRAM)
- Humidity: Operation: 5% ~ 95%, non-condensing
- Temperature: 0 ~ 60°C(32 ~ 140°F)
- Dimension: 146 mm x 102 mm

- Weight: GW: 700g; NW: 230g

Ordering Information

WAFER-945GSE-N270-R10:
3.5" SBC with Intel® Atom™ N270 1.6GHz, VGA/LVDS, Dual GbE, CFII, USB, SATA and Audio
32000-070301-RS: Dual port USB cable
32200-026500-RS: RS-232/422/485 cable
32100-043403-RS: ATX Power Cable
32100-088600-RS: SATA Power Cable
IO-KIT-4COM-R10: 4 COM Ports Adapter Borad

WARNING:

When running the WAFER-945GSE, do not put the WAFER-945GSE directly on a surface that can not dissipate system heat, especially the wooden or plastic desk. It is highly recommended to run the WAFER-945GSE
→ on a heat dissipation surface or
→ using copper pillars to hold the board up from the desk below

Jumpers setting

LABEL	FUNCTION
J_CMOS1	CMOS state setting
J_VLVDS1	LVDS1 Voltage Selection
JP1	COM2 Port Mode setting
JCF1	CF Card setting
ATXCTL1	AT Power Mode Setting
J_LCD_TYPE1	LVDS1 Panel Resolution Selection

J_CMOS1: Clear CMOS Setup	
J_CMOS1	**DESCRIPTION**
Short 1-2 (default)*	**Keep CMOS Setup (Normal Operation)**
Short 2-3	**Clear CMOS Setup**

JP1: configure COM2 Mode	
JP1	**DESCRIPTION**
Short 1-2 (default)	**RS - 232**
Short 3-4	**RS - 422**
Short 5-6	**RS - 485**
Short 5-6 Short 7-8	**RS-485 with RTS Control**

J_VLVDS1: LVDS Voltage Selection	
J_VLVDS1	**DESCRIPTION**
1-2	**+3.3V LVDS**
2-3	**+5V LVDS**

JCF1: Configure CF Card type	
JCF1	**DESCRIPTION**
Open (default)	**Slave**
Short 1-2	**Master**

ATXCTL1: AT Power Mode Setting	
ATXCTL1	**DESCRIPTION**
Short 2-3 (default)	**AT Power Mode**
Open	**ATX Power Mode**

J_LCD_TYPE1: LVDS1 Panel Resolution Selection				DESCRIPTION
7-8	**5-6**	**3-4**	**1-2**	
Open	**Open**	**Open**	**Open**	640X480 (18-bit)
Open	**Open**	**Open**	**Short**	800X480 (18-bit)
Open	**Open**	**Short**	**Open**	800X600 (18-bit) (Default)
Open	**Open**	**Short**	**Short**	1024X768 (18-bit)
Open	**Short**	**Open**	**Open**	1280X1024 (36-bit)
Open	**Short**	**Open**	**Short**	1400X1050 (36-bit)
Open	**Short**	**Short**	**Open**	1400X900 (36-bit)
Open	**Short**	**Short**	**Short**	1600X1200 (36-bit)

Table of Connectors

LABEL	FUNCTION
VGA1	VGA 15-pin Female Connector
USB_C45	2 Port USB Connector
LAN1 LAN2	RJ-45 LAN Connectors
KB_MS1	Keyboard & Mouse Connector
COM1	COM Port Connector (RS-232)
COM2	Internal Serial Port Connectors (RS-232/422/485)
COM	Internal Serial 4 Port Connectors (RS-232)
USB01 USB23	Internal 4 Port USB Connectors
AUDIO1	AC'97 audio Connector
SATA1 SATA2	Serial ATA Connectors
CPU_FAN1	Fan Connector
ATXCTL1	ATX Power Control Connector
ATXPWR1	Main Power Input Connector
LVDS1	LVDS Panel Connector
INVERTER1	LVDS1 Panel Backlight +12V Power Source
PWRBTN1	Power Button
RESET1	Reset Button
BAT1	Battery connector
CF1	Compact Flash Slot
DIO1	Digital I/O Connector
JSPI 1	SPI flash connector
CN4	PCIe Mini Card Slot
LED_C1	LED Indicators, PWRLED, HDDLED and +5V Power output Connector
DIMM1	DDR2 SO-DIMM slot

VGA1: 15-pin Female Connector			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	RED	2	GREEN
3	BLUE	4	NC
5	GND	6	CRT_PLUG#
7	GND	8	GND
9	VCC	10	GND
11	NC	12	DDCDAT
13	HSYNC	14	VSYNC
15	DDCCLK		

USB_C45: USB Connector			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	VCC (+5V)	5	VCC (+5V)
2	DATA4-	6	DATA5-
3	DATA4+	7	DATA5+
4	GND	8	GND

LAN1、LAN2: RJ-45 LAN Connector			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	MDIA3-	5	MDIA1+
2	MDIA3+	6	MDIA2+-
3.	MDIA2-	7	MDIA0-
4.	MDIA1-	8	MDIA0+

KB_MS1: 6-pin Keyboard/Mouse Connector	
PIN NO.	**DESCRIPTION**
1	VCC (+5V)
2	Mouse Data
3	Mouse Clock
4	Keyboard Data
5	Keyboard Clock
6	GND

COM1: Serial Port Connector (RS-232)		
PIN NO.	**DESCRIPTION**	
1	DATA CARRIER DETECT	(DCD#)
2	RECEIVE DATA	(RXD)
3	TRANSMIT DATA	(TXD)
4	DATA TERMINAL READY	(DTR#)
5	GND	(GND)
6	DATA SET READY	(DSR#)
7	REQUEST TO SEND	(RTS#)
8	CLEAR TO SEND	(CTS#)
9	RING INDICATOR	(RI#)

COM2 : Internal Serial Port Connector (RS-232/422/485)			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	DATA CARRIER DETECT (DCD#)	2	DATA SET READY (DSR#)
3	RECEIVE DATA (RXD)	4	REQUEST TO SEND (RTS#)
5	TRANSMIT DATA (TXD)	6	CLEAR TO SEND (CTS#)
7	DATA TERMINAL READY (DTR#)	8	RING INDICATOR (RI#)
9	GND	10	N/C
11	TXD485+	12	TXD485#
13	RXD485+	14	RXD485#

COM : Internal Serial Port Connector (COM3 ~ COM6) (RS-232)			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	DATA CARRIER DETECT (DCD3#)	2	DATA SET READY (DSR3#)
3	RECEIVE DATA (RXD3)	4	REQUEST TO SEND (RTS3#)
5	TRANSMIT DATA (TXD3)	6	CLEAR TO SEND (CTS3#)
7	DATA TERMINAL READY (DTR3#)	8	RING INDICATOR (RI3#)
9	GND	10	GND
11	DATA CARRIER DETECT (DCD4#)	12	DATA SET READY (DSR4#)
13	RECEIVE DATA (RXD4)	14	REQUEST TO SEND (RTS4#)
15	TRANSMIT DATA (TXD4)	16	CLEAR TO SEND (CTS4#)
17	DATA TERMINAL READY (DTR4#)	18	RING INDICATOR (RI4#)
19	GND	20	GND
21	DATA CARRIER DETECT (DCD5#)	22	DATA SET READY (DSR5#)
23	RECEIVE DATA (RXD5)	24	REQUEST TO SEND (RTS5#)
25	TRANSMIT DATA (TXD5)	26	CLEAR TO SEND (CTS5#)
27	DATA TERMINAL READY (DTR5#)	28	RING INDICATOR (RI5#)
29	GND	30	GND
31	DATA CARRIER DETECT (DCD6#)	32	DATA SET READY (DSR6#)
33	RECEIVE DATA (RXD6)	34	REQUEST TO SEND (RTS6#)
35	TRANSMIT DATA (TXD6)	36	CLEAR TO SEND (CTS6#)
37	DATA TERMINAL READY (DTR6#)	38	RING INDICATOR (RI6#)
39	GND	40	GND

USB01, USB23: Internal USB Connector			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	VCC (+5V)	2	GND
3	DATA-	4	DATA+
5	DATA+	6	DATA-
7	GND	8	VCC (+5V)

AUDIO1 : AC'97 audio Connector			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	LINE_OUTR	2	LINEIN_R
3	GND_AUDIO	4	GND_AUDIO
5	LINE_OUTL	6	LINEIN_L
7	GND_AUDIO	8	GND_AUDIO
9	MICIN	10	MICIN

SATA1 & SATA2 : Serial ATA Connector			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	GND	5	RX-
2	TX+	6	RX+
3	TX-	7	GND
4	GND	8	N/C

CPU_FAN1 : CPU Fan Connector	
PIN NO.	**DESCRIPTION**
1	GND
2	+12V (PWM)
3	FANIO1

ATXCTL1 : ATX Power Control Connector	
PIN NO.	**DESCRIPTION**
1	5VSB
2	GND
3	PS_ON#

ATXPWR1 : Main Power Input Connector	
PIN NO.	**DESCRIPTION**
1	+12V
2	GND
3	GND
4	VCC (+5V)

LVDS1: LVDS Connector			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	GND1	2	GND2
3	A_Y0	4	A_Y0#
5	A_Y1	6	A_Y1#
7	A_Y2	8	A_Y2#
9	A_CK	10	A_CK#
11	NC	12	NC
13	GND3	14	GND4
15	B_Y0	16	B_Y0#
17	B_Y1	18	B_Y1#
19	B_Y2	20	B_Y2#
21	B_CK	22	B_CK#
23	NC	24	NC
25	GND5	26	GND6
27	VCC_LCD	28	VCC_LCD
29	VCC_LCD	30	VCC_LCD

INVERTER1: 5-pin Header Inverter Connector	
PIN NO.	**DESCRIPTION**
1	LCD_BKLTCTL
2	GND
3	+12V
4	GND
5	BACKLIGHT ENABLE

PWRBTN1: Power Button	
PIN NO.	**DESCRIPTION**
1	PWRBTSW-
2	GND

RESET1: Reset Button	
PIN NO.	**DESCRIPTION**
1	PM_RESET-
2	GND

BAT1 : +3V Battery Connector			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	BAT (+3V)	2	GND

Note: Duo to the space limitation, the motherboard is shipped with the battery connected but not attached on a surface. Attaching the battery to the Super I/O chip will cause the interruption of the CF card. To prevent this happen, please attach the battery onto the motherboard after completing the system installation. The suggested places for attaching battery are:

1. Super I/O chip
2. CF card
3. Others

CF1 : CF Card Interface Slot			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	GND	26	CD1#
2	D3	27	D11
3	D4	28	D12
4	D5	29	D13
5	D6	30	D14
6	D7	31	D15
7	CE#	32	CE2#
8	A10	33	VS1#
9	OE#	34	IOR#
10	A9	35	IOW#
11	A8	36	WE#
12	A7	37	IRQ
13	VCC	38	VCC
14	A6	39	CSEL#
15	A5	40	VS2#
16	A4	41	RESET#
17	A3	42	WAIT#
18	A2	43	INPACK#
19	A1	44	REG#
20	A0	45	BVD2
21	D0	46	BVD1
22	D1	47	D8
23	D2	48	D9
24	IOCS16#	49	D10
25	CD2#	50	GND2

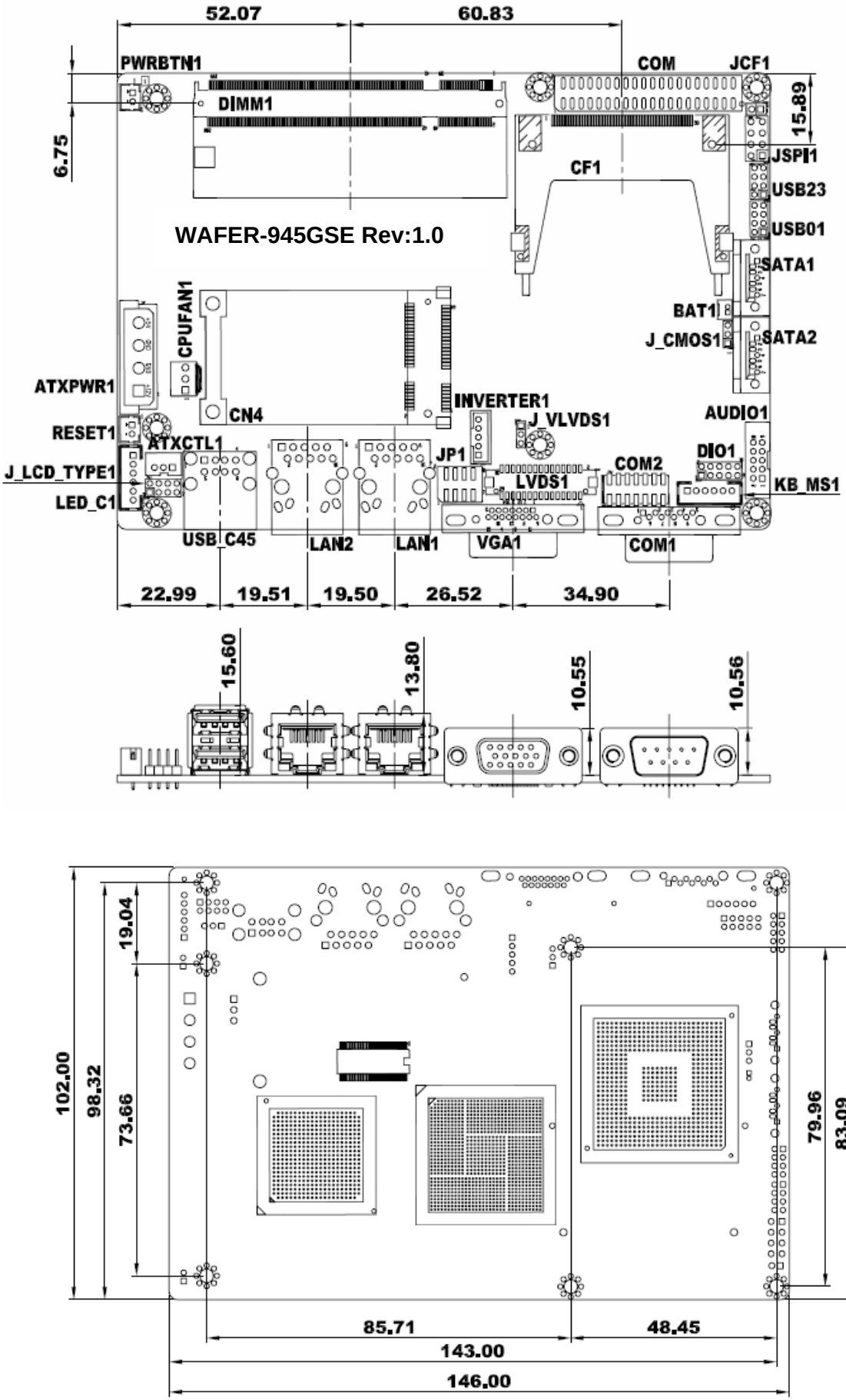
DIO1 : Digital Input / Output Connector			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	GND	2	VCC (+5V)
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2
9	Input 1	10	Input 0

JSPI1 : SPI flash Connector			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	SPI_VCC (+3.3V)	2	GND
3	SPI_CS#	4	SPI_CLK
5	SPI_MISO	6	SPI_MOSI
7	N/C	8	N/C

CN4: PCIe Mini Card Slot			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	PCIE_WAKE#	2	VCC3
3	N/C	4	GND
5	N/C	6	1.5V
7	CLKREQ#	8	LFRAME#
9	GND	10	LAD3
11	CLK-	12	LAD2
13	CLK+	14	LAD1
15	GND	16	LAD0
17	PCIRST#	18	GND
19	LPC	20	VCC3
21	GND	22	PCIRST#
23	PERN2	24	3VDual
25	PERP2	26	GND
27	GND	28	1.5V
29	GND	30	SMBCLK
31	PETN2	32	SMBDATA
33	PETP2	34	GND
35	GND	36	USBD-
37	N/C	38	USBD+
39	N/C	40	GND
41	N/C	42	N/C
43	N/C	44	RF_LINK#
45	N/C	46	BLUELED#
47	N/C	48	1.5V
49	N/C	50	GND
51	N/C	52	VCC3

LED_C1: 6-pin LED Indicators and +5V Output connector		
	PIN NO.	**DESCRIPTION**
+5V Power Output	1	VCC (+5V)
	2	GND
PWRLED	3	VCC (+5V)
	4	GND
HDDLED	5	VCC (+5V)
	6	-HDLED

Board Layout: Jumper and Connector Locations



Board dimensions with Heat Sink