

**3.5" SBC with Intel® Atom™ N270 Processor, VGA/LVDS,
Dual GbE, CFII, USB, SATA, on board 1GB Memory and
PC/104**

WAFER-945GSE2

Quick Installation Guide

Version 2.0

Mar. 08, 2012

Package Contents

WAFER-945GSE2 package includes the following items:

- 1 x WAFER-945GSE2 Single Board Computer
- 2 x SATA cable
- 1x KB/MS Cable
- 1x Audio Cable
- 1 x Mini Jumper Pack
- 2 x Plastic Intermediate Pole for PC/104 (15mm)
- 2 x Plastic Intermediate Pole for PC/104 (20mm)
- 1 x Utility CD
- 1 X QIG (Quick Installation Guide)



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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: 8x on Board 64Mb x16 (1Gb)DDR2 SDRAM 533MHz, total 1024MB(1GB)
- Ethernet: Dual Realtek RTL8111E PCIe Interface GbE Controllers
- I/O Interface:
 - 2 x SATA
 - 6 x USB 2.0 (2 on rear side, 4 by 2x4 pin-header 2.00mm pitch)
 - 1 x CF Type II
 - 1 x RS-232 (by DB9 connector on rear side)
 - 1 x RS-232/422/485 (by 2x7 pin-header 2.00mm pitch)
 - 1 x KB/MS (by 1x6 pins wafer-header 2.00mm pitch)
- Expansions:
 - 1 x PC/104 (ISA bus, not support DMA mode)
- Audio: Realtek ALC662 with HD 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: Integrated in Intel® 945GSE, 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@3.1A (Intel® Atom™ N270 1.6GHz with on board 1GB DDR2 SDRAM)
- Humidity: Operation: 5% ~ 95%, non-condensing

- Temperature:
0°C ~ 60°C (WAFER-945GSE2-N270-R20)
-20°C ~ 70°C (WAFER-945GSE2-N270W-R20)
- Dimension: 146 mm x 102 mm
- Weight: GW: 700g; NW: 230g

Ordering Information

WAFER-945GSE2-N270-R20:

3.5" SBC with Intel® Atom™ N270 1.6GHz, VGA/LVDS, Dual GbE, CFII, USB, SATA, on board 1GB Memory and PC/104

WAFER-945GSE2-N270W-R20:

3.5" SBC with Intel® Atom™ N270 1.6GHz, VGA/LVDS, Dual GbE, CFII, USB, SATA, on board 1GB Memory and PC/104, -20°C ~ 70°C

32001-008600-100-RS: Dual ports USB cable

32205-000300-100-RS: RS-232/422/485 cable

32100-052100-RS: ATX Power Cable

32100-088600-RS: SATA Power Cable

Jumpers setting

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

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

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

ATXCTL1: AT Power Mode Setting	
AT Mode: Short 2-3 (Default) ATX Mode: Use PS_ON & 5VSB cable	
ATXCTL1	DESCRIPTION
Short 2-3 (default)	AT Power Mode
Open	ATX Power Mode

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

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

Table of Connectors

LABEL	FUNCTION
VGA1	VGA 15-pin Female Connector
USB_C45	2 Ports External USB Connector
LAN1 LAN2	RJ-45 LAN Connectors
KB_MS1	Keyboard & Mouse Connector
COM1	External Serial Port Connector (RS-232)
COM2	Internal Serial Port Connector (RS-232/422/485)
LED_C1	LED Indicators, PWRLED, HDDLED and +5V Power output
BAT1	+3V Battery Connector
DIO1	Digital I/O Connector
USB01 USB23	Internal 4 Port USB Connectors
AUDIO1	Audio Connector
SATA1, 2	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
CF1	Compact Flash Slot
JSPI1	SPI flash Connector
CN2	PC/104 Connector
CN1	PC/104 -5V and -12V Input Connector

VGA1: VGA 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: 2 ports External 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: External 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#

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

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

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

USB01, USB23: Internal USB Connectors			
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 : Audio Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LINE_OUTR	2	LINEIN_R
3	GND	4	GND
5	LINE_OUTL	6	LINEIN_L
7	GND	8	GND
9	MICIN	10	MICIN

SATA1 & SATA2 : Serial ATA Connectors			
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	
AT Mode: Short 2-3 (Default)	
ATX Mode: Use PS_ON & 5VSB cable	
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

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

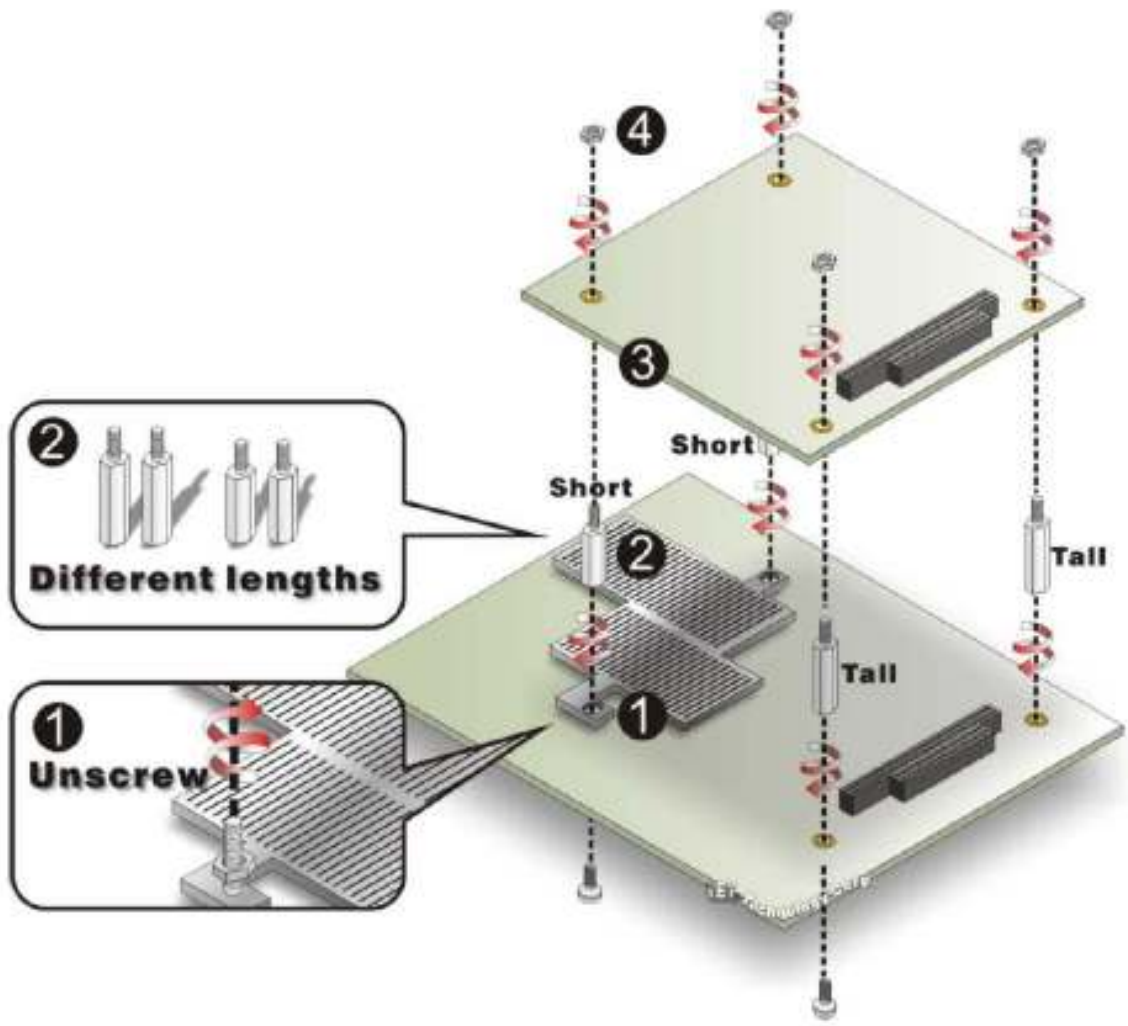
JSPI1 : SPI flash Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	SPI_VCC (+3.3V)	2	GND
3	SPI_CS#	4	SPI_CLK
5	SPI_MISO	6	SPI_MOSI
7	N/C	8	N/C

CN2: PC/104 (64 pin ISA bus) Connector							
PIN	Description	PIN	Description	PIN	Description	PIN	Description
A1	-IOCHK	A17	SA14	B1	GND	B17	-DACK1
A2	SD7	A18	SA13	B2	RSTDRV	B18	DRQ1
A3	SD6	A19	SA12	B3	VCC	B19	-REFRESH
A4	SD5	A20	SA11	B4	IRQ9	B20	BCLK
A5	SD4	A21	SA10	B5	NC	B21	IRQ7
A6	SD3	A22	SA9	B6	DRQ2	B22	IRQ6
A7	SD2	A23	SA8	B7	NC	B23	IRQ5
A8	SD1	A24	SA7	B8	-NOWS	B24	IRQ4
A9	SD0	A25	SA6	B9	+12V	B25	IRQ3
A10	IOCHRDY	A26	SA5	B10	GND	B26	-DACK2
A11	AEN	A27	SA4	B11	-SMEMW	B27	TC
A12	SA19	A28	SA3	B12	-SMEMR	B28	BALE
A13	SA18	A29	SA2	B13	-IOW	B29	VCC
A14	SA17	A30	SA1	B14	-IOR	B30	ISAOSC
A15	SA16	A31	SA0	B15	-DACK3	B31	GND
A16	SA15	A32	GND	B16	DRQ3	B32	GND

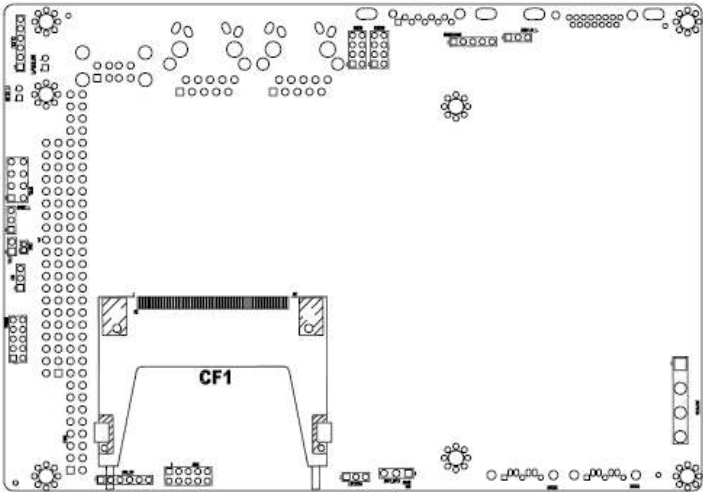
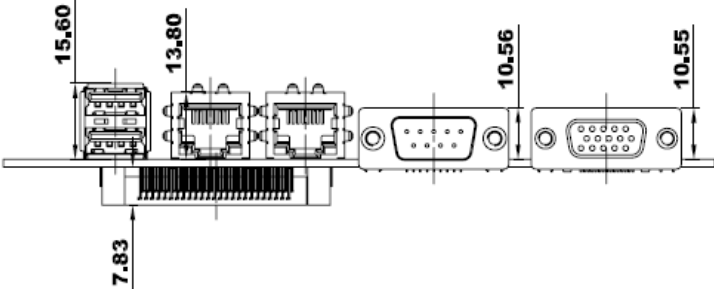
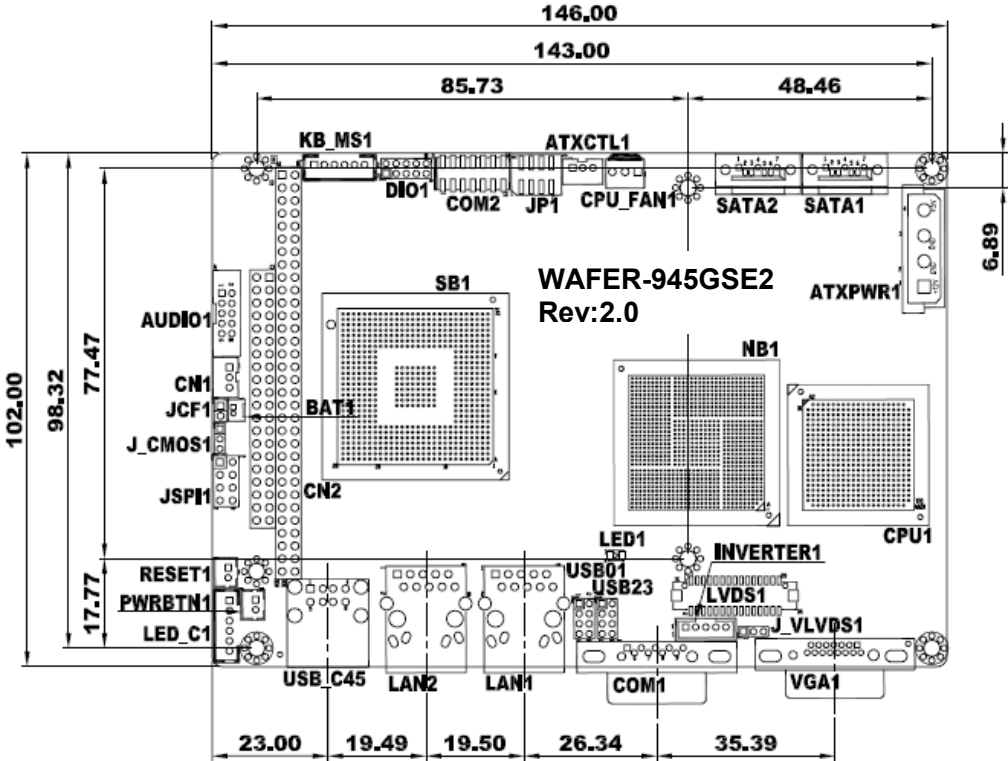
CN2: PC/104 (40 pin ISA bus) Connector							
PIN	Description	PIN	Description	PIN	Description	PIN	Description
C1	GND	C11	-MEMW	D1	GND	D11	-DACK5
C2	-SBHE	C12	SD8	D2	-MEMCS16	D12	DRQ5
C3	SA23	C13	SD9	D3	-IOCS16	D13	-DACK6
C4	SA22	C14	SD10	D4	IRQ10	D14	DRQ6
C5	SA21	C15	SD11	D5	IRQ11	D15	-DACK7
C6	SA20	C16	SD12	D6	IRQ12	D16	DRQ7
C7	SA19	C17	SD13	D7	IRQ15	D17	VCC
C8	SA18	C18	SD14	D8	IRQ14	D18	-MASTER
C9	SA17	C19	SD15	D9	-DACK0	D19	GND
C10	-MEMR	C20	NC	D10	DRQ0	D20	GND

CN1: PC/104 -5V and -12V Input Connector	
PIN NO.	DESCRIPTION
1	-5V
2	GND
3	-12V

PC/104 assembly figure:



Board Layout: Jumper and Connector Locations



Board dimensions with Heat Sink:

