3.5" SBC with Intel® Atom™ N270 1.6GHz Processor, VGA/LVDS/TTL, PCIe GbE, CFII, USB, SATA, 4 COM and PC/104

WAFER-945GSE3
Quick Installation Guide

Version 1.0

Jul. 22, 2010

Package Contents

WAFER-945GSE3 package includes the following items:

- 1 x WAFER-945GSE3 Single Board Computer
- 2 x SATA Cable
- 1 x PS/2 KB/MS Y Cable
- 1 x Audio Cable
- 1 x Dual Ports USB Cable
- 2 x RS-232 Cable
- 1 x Mini Jumper Pack
- 1 x Utility CD
- 1 x QIG (Quick Installation Guide)

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Specifications

- CPU: Intel®Atom™ Processor 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: One Realtek RTL8111CP (PCIe x1 Interface) GbE Controller
- I/O Interface:

  2 x SATA

  4 x USB 2.0 (by 2x4 pin 2.00mm pitch pin-header)

  1 x CF Type II

  3 x RS-232 (1 on rear side, 2 by 2x5 pin 2.00mm pitch pin-header)

  1 x RS-232/422/485 (by 2x7 pin 2.00mm pitch pin-header)

  1 x PS/2 KB/MS (PS/2 KB/MS on rear side)
- Infrared Interface: 1 x Infrared interface by pin-header (Share with COM2)
- Expansions: 1 x PC/104 slot (ISA Bus, not support ISA DMA Mode)
- Audio: Realtek ALC655 with AC'97 Audio codec by 2x5 pin pin-header
- Digital I/O: 8-bit digital I/O, 4-bit input/ 4-bit output by super I/O: Fintek F81865
- Super I/O: Fintek F81865
- Display Interface:

  Analog CRT: Integrated in Intel® 945GSE, Support for CRT Hot plug

  18-bit dual-channel LVDS from Intel®945GSE

  24-bit TTL (LVDS to TTL bridge)

  Support Dual display for VGA+LVDS or VGA+TTL
- Watchdog timer:

  Software programmable supports 1~255 sec. system reset by super I/O: Fintek F81865
- Power Supply:

  AT/ATX support, +5V for CPU Board, +12V for LVDS Inverter/FAN/COM/PC104 (ISA)

- Power Consumption:
  5V@2.54A (Intel®Atom™ N270 1.6GHz processor with on board 2GB DDR2 SDRAM)
- Operation Humidity: 5% ~ 95%, non-condensing
- Operating Temperature: 0 ~ 60°C(32 ~ 140°F)
- Dimension: 146 mm x 102 mm
- Weight: GW: 650g; NW: 250g

Ordering Information

WAFER-945GSE3-N270-R10:
3.5" SBC with Intel®Atom™ N270 1.6GHz Processor, VGA/LVDS/TTL, PCIe GbE, CFII, USB, SATA, 4 COM and PC/104
32200-015100-RS: LPT cable
32200-026500-RS: RS-232/422/485 cable
32100-052100-RS: ATX Power Cable
32100-088600-RS/32102-00100-100-RS/32102-000100-200-RS: SATA Power Cable

Jumpers setting

LABEL	FUNCTION
J_CMOS1	CMOS state setting
J_VLVDS1	LVDS1 Voltage Selection setting
JP3	COM2 Port Mode setting
JCF1	CF Card setting
ATXCTL1	AT Power Mode Setting
JP1	LVDS & TTL Jumper Setting
JP2	Audio Power Input
J_COM_F1 J_COM_F2	Setting the function of pin9 (COM1) and pin8 (COM2) as signal or voltage in COM1 or COM2 Connector
J_COM_V1 J_COM_V2	Setting the voltage level of Pin9 (COM1) and Pin8 (COM2) in COM1 or COM2 Connector

J_CMOS1: Clear CMOS Setup

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

JP3: 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 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: LVDS & TTL Jumper Setting	
JP1	**DESCRIPTION**
1-2(default)	**LVDS only**
2-3	TTL only

JP2: Audio Power Input	
JP2	**DESCRIPTION**
1-2(default)	**+5V**
2-3	+12V

J_COM_F1 & J_COM_F2: Setting the function of pin9 (COM1) and pin8 (COM2) as signal or voltage in COM1 or COM2 Connector.	
	DESCRIPTION
1 – 2	Set COM1 and COM2 as voltage
2 – 3 (default)	**Set COM1 and COM2 as signal "RING"**

J_COM_V1 & J_COM_V2: Setting the voltage level of Pin9 (COM1) and Pin8 (COM2) in COM1 or COM2 Connector	
	DESCRIPTION
1 – 2 (default)	**+5V**
2 – 3	+12V

Table of Connectors

LABEL	FUNCTION
LAN1	RJ-45 LAN Connector
KB_MS1	Keyboard & Mouse Connector
COM1	External Serial Port Connector (RS-232)
BAT1	+3V Battery Connector
COM2	Internal Serial Port Connector (RS-232/422/485)
LED_C1	LED Indicators, PWRLED, HDDLED and +5V Power output
DIO1	Digital I/O Connector
COM3, COM4	Internal Serial Port Connectors (RS-232)
USB01 USB23	Internal 4 Ports USB Connectors
AUDIO1	Audio Connector
SATA1, 2	Serial ATA Connectors
ATXCTL1	ATX Power Control Connector
ATXPWR1	Main Power Input Connector
LVDS1	LVDS Panel Connector
INVERTER1	LVDS Panel Backlight +12V Power Source
PWRBTN1	Power Button
RESET1	Reset Button
CF1	Compact Flash Slot
JSPI1	SPI flash Connector
IR1	Infrared interface connector
TTL1	TTL LCD Connector
FAN1	FAN Connector
CN2	PC/104 (64 pin + 40 pin ISA bus) Connector
CN1	PC/104 -5V and -12V Input Connector
SDVO1	SDVO Connector (Optional)
DBG_PORT1	Firmware Hub Debug Port Connector (Optional)
LPT1	LPT Port Connector
VGA1	VGA 15-pin Female Connector
DIMM1	DDR2 SO-DIMM slot

LAN1: 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	KBDATA
2	MSDATA
3	GND
4	VCC (+5V)
5	KBCLK
6	MSCLK

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#)

BAT1 : +3V Battery Connector	
PIN NO.	**DESCRIPTION**
1	BAT (+3.3V)
2	GND

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	GND
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

COM3, COM4 : Internal Serial Port Connectors (RS-232)			
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	GND

USB01, USB23: Internal USB Connectors			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	VCC (+5V)	2	VCC (+5V)
3	DATA-	4	DATA-
5	DATA+	6	DATA+
7	GND	8	GND
9	GND	10	N/A (KEY)

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

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	GND	2	GND
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	GND	14	GND
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	GND	26	GND
27	VCC_LCD	28	VCC_LCD
29	VCC_LCD	30	VCC_LCD

INVERTER1: LVDS Panel Backlight +12V Power Source	
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	GND
2	PM_RESET
3	GND
4	PM_RESET

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

IR1: Infrared interface connector	
PIN NO.	**DESCRIPTION**
1	VCC (+5V)
2	NC
3	IR-RX
4	GND
5	IR-TX

TTL1: TTL LCD Connector			
Pin	**Description**	**Pin**	**Description**
2	LCD_VCC	1	LCD_VCC
4	GND	3	GND
6	LCD_VCC	5	LCD_VCC
8	GND	7	SDA
10	NC	9	NC
12	B1	11	B0
14	B3	13	B2
16	B5	15	B4
18	NC	17	NC
20	G1	19	G0
22	G3	21	G2
24	G5	23	G4
26	NC	25	NC
28	R1	27	R0
30	R3	29	R2
32	R5	31	R4
34	GND	33	GND
36	VSYNC	35	CLK
38	HSYNC	37	LCD_EN
40	NC	39	NC

FAN1: FAN Connector	
PIN NO.	**DESCRIPTION**
1	FANIO1
2	+12V
3	GND

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

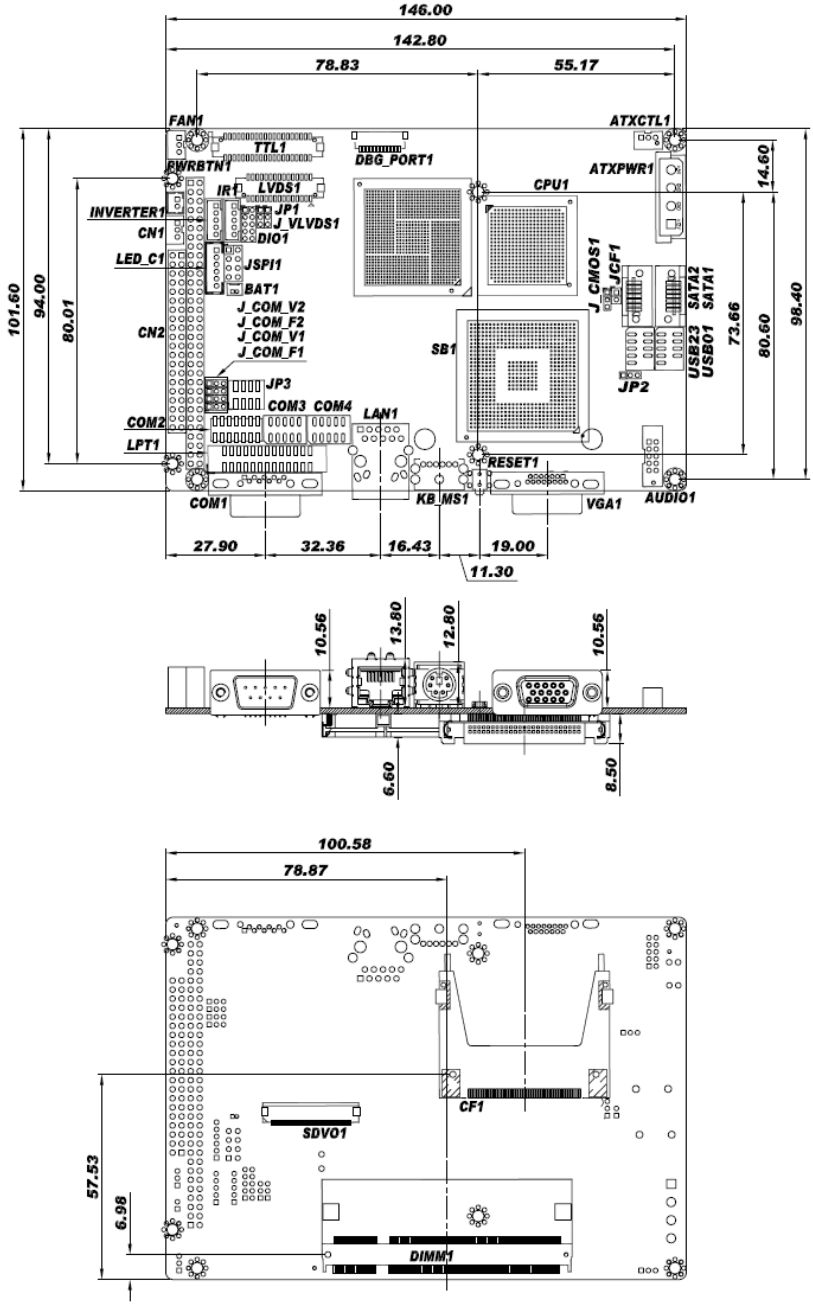
SDVO1 : SDVO Connector (Optional)			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	GND	25	GND
2	NC	26	SDVOB_BLUE-
3	NC	27	SDVOB_BLUE+
4	GND	28	GND
5	NC	29	SDVOB_RED-
6	NC	30	SDVOB_RED+
7	GND	31	GND
8	SDVOB_CLK -	32	SDVO_STALL-
9	SDVOB_CLK+	33	SDVO_STALL+
10	GND	34	GND
11	SDVOB_GREEN-	35	SDVO_TVCLKIN-
12	SDVOB_GREEN+	36	SDVO_TVCLKIN+
13	GND	37	GND
14	NC	38	SDVO_CLK
15	NC	39	SDVO_DATA
16	GND	40	PCIRST-
17	SDVOB_INT-	41	VCC
18	SDVOB_INT+	42	VCC
19	GND	43	VCC
20	NC	44	NC
21	NC	45	NC
22	GND		
23	NC		
24	NC		

DBG_PORT1 : FirmWare Hub Debug Port Connector (Optional)			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	GND	7	LAD2
2	FWHPCLK	8	LAD3
3	PCIRST#	9	INT_SERIRQ
4	LFRAME	10	GND
5	LAD0	11	+3.3V
6	LAD1	12	+5V

LPT1: LPT port connector			
PIN	**Description**	**PIN**	**Description**
1	STB#	2	AFD#
3	PD0	4	ERR#
5	PD1	6	INIT#
7	PD2	8	SLIN#
9	PD3	10	GND
11	PD4	12	GND
13	PD5	14	GND
15	PD6	16	GND
17	PD7	18	GND
19	ACK#	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SCLT	26	NC

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 (+5V)	10	GND
11	NC	12	DDCDAT
13	HSYNC	14	VSYNC
15	DDCCLK		

Board Layout: Jumper and Connector Locations



Board dimensions with Heat Sink: