EPIC SBC with Intel® Atom™ N270 1.6GHz Processor, VGA/LVDS, PCIe GbE, CAN bus, CF Type II, USB, SATA, and 2 COM

NANO-945GSE3
Quick Installation Guide

Version 1.0

Mar. 30, 2010

Package Contents

NANO-945GSE3 package includes the following items:

- 1 x NANO-945GSE3 Single Board Computer
- 1 x PS/2 KB/MS Y cable
- 1 x SATA Signal + SATA +5V power Output Cable kit
- 1 x Power cable
- 2 x CAN-bus cable
- 1 x Mini Jumper Pack
- 1 x Utility CD
- 1 x QIG (Quick Installation Guide)

Specifications

- CPU: Intel® Atom™ N270 1.6GHz/512KB L2 Cache processor with a FSB 533MHz
- System Chipset: Intel® 945GSE +ICH7M
- BIOS: AMI BIOS
- System memory: 1 x 200-pins 533/400MHz DDR2 SDRAM SO-DIMM Supported (max. 2GB)
- Ethernet: 1 x Realtek RTL8111CP PCIe GbE Controller (PCIe x1 Interface)
- I/O Interface:

  2 x SATA (1 x SATA +5V Power Output by 1x2-pin wafer-header)

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

  1 x CF Type II

  1 x RS-232

  1 x RS-232/422/485

  1 x PS/2 KB/MS Connector on rear site, 1 x KB/MS by 1x6 pins wafer-header (Co-layout)

  1 x IDE

  1 x LPT

- CAN-bus interface :

  2 x CAN-bus interface
  PCI to CAN-bus CPLD: Xilinx XC95288XL-10TQG144C
  CAN-bus controller: Philips (NXP) SJA1000T
  CAN-bus transceiver: Philips (NXP) PCA82C251
  Signal Support: CAN_H, CAN_L
  Isolated Protection: 2500Vrms on CAN side
  Programmable transfer rate: up to 1Mbps
  Driver support: Windows® XP, Windows® XP Embedded

- Audio: Support by Audio Kit (AC'97 & HD)

  5.1 channel AC'97 Audio Kit with Realtek ALC655 codec

  7.1 channel HD Audio Kit with Realtek ALC883 codec support dual audio streams

- Digital I/O: 8-bit digital I/O, 4-bit input/ 4-bit output by super I/O ITE IT8718F
- Infrared Interface: 1x Infrared Interface by super I/O ITE IT8718F
- Super I/O: ITE IT8718F

- Display Interface:

  VGA Integrated in Intel® 945GSE

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

  HDTV-out

  1 x SDVO FPC Connector (Optional)

- Watchdog timer:

  Software programmable supports 1~255 sec. system reset by super I/O ITE IT8718F

- Power Supply:

  Main Power Input: +9V ~ +28V Wide Rang Voltage Input

  AT/ATX Power Supply

  AT/ATX Mode Support

- Power Consumption:

  12V@1.49A (Intel® Atom™ N270 1.6GHz Processor with 2GB DDR2 667MHz SO-DIMM DRAM)

- Operating Humidity: 5% ~ 95%, non-condensing
- Operating Temperature: 0 ~ 60°C(32 ~ 140°F)
- Dimension: 165 mm x 115 mm
- Weight: GW: 700g; NW: 320g

Ordering Information

NANO-945GSE3-N270-R10:
EPIC SBC with Intel® Atom™ N270 1.6GHz Processor, VGA/LVDS, PCIe GbE, CAN bus, CF Type II, USB, SATA, and 2 COM
AC-KIT08R-R10: 5.1 channel AC'97 Audio Kit with Realtek ALC655 codec
AC-KIT883HD-R10: 7.1 channel HD Audio Kit with Realtek ALC883 codec support dual audio streams
32000-044300-RS: Dual ports USB cable
32200-015100-RS: LPT cable
32200-026500-RS/32205-000300-100-RS: RS-232/422/485 cable
32000-062800-RS: SATA Cable
32000-083701-RS : HDTV out cable
32200-000009-RS: 44-pin to 44-pin 2.5" IDE HDD cable
32100-192900-RS: One 4-pin (2x2pin) to one 4-pin (1x4pin) DC power input cable
32100-088600-RS/32102-00100-100-RS/32102-000100-200-RS: SATA Power Cable

Jumpers setting

LABEL	FUNCTION
J_CMOS1	CMOS state setting
JP1	COM2 Port Mode setting
J_VLVDS1	LVDS1 Voltage Selection
JCF1	CF Card Master/Slave Setting
ATXCTL1	AT/ATX Power Mode Setting
JP2、JP3	CAN BUS 120Ω Terminal Resistor Setting (Between CAN_H and CAN_L)
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

J_VLVDS1: LVDS1 Voltage Selection

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

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

ATXCTL1	DESCRIPTION
1-2	ATX Power Mode
2-3 (default)	**AT 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: CF Card Master/Slave Setting

JCF1	DESCRIPTION
Open (default)	**Slave**
Short 1-2	Master

JP2、JP3: CAN BUS 120Ω Terminal Resistor Setting (Between CAN_H and CAN_L)

JP2、JP3	DESCRIPTION
1-2 (default)	**ON (**120Ω)
Open	OFF (Open)

J_LCD_TYPE1: LVDS Panel Resolution type select				Panel Resolution
7-8	**5-6**	**3-4**	**1-2**	
Open	**Open**	**Open**	**Open**	**800X600 18-bit (Default)**
Open	Open	Open	Short	1024X768 18-bit
Open	Open	Short	Open	1280x1024 36-bit
Open	Open	Short	Short	1400x1050 36-bit

Table of Connectors

LABEL	FUNCTION
VGA1	VGA 15-pin Female Connector
USB_C23 USB_C45	External USB Connectors
LAN1	RJ45 LAN Connector
KB_MS1	6-pin Mini-DIN Keyboard/Mouse Connector
KB1	Keyboard/Mouse 6-pin Wafer Connector
COM1	External Serial Port D-sub Connector (RS-232)
COM2	Internal Serial Port Connector (RS-232/422/485)
LPT1	Parallel Port Connector
USB01	Internal USB Connector
J_AUDIO1	External Audio Module Connector
SATA1 SATA2	Serial ATA Connectors
IR1	Infrared Interface Connector
CPU_FAN1	Fan Connector
IDE1	IDE Connector
DIO1	Digital I/O Connector
TV1	HDTV-out Connector
LVDS1	LVDS Panel Connector
INVERTER1	LVDS1 Panel Backlight +12V Power Source
F_PANEL1	PWR & RST Buttons and Indicators
ATXCTL1	ATX Power Control Connector
CN1 CN2	+12V Main Power Input Connectors
CN3	+5V Power Output Connector (for 2.5” SATA HDD)
JSPI 1	Flash BIOS SPI ROM Connector
BAT1	Battery connector
CAN1 CAN2	CAN BUS Connectors
CN4	Programming XC95288XL Connector
CF1	Compact Flash Slot
SDVO1	SDVO Connector (Optional)
DIMM1	DDR2 SO-DIMM slot

VGA1: 15-pin D-sub 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_C23 & USB_C45: External USB Connectors			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	VCC (+5V)	5	VCC (+5V)
2	DATA4-	6	DATA5-
3	DATA4+	7	DATA5+
4	GROUND	8	GROUND

LAN1: RJ45 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 Mini-DIN Keyboard/Mouse Connector	
PIN NO.	**DESCRIPTION**
1	Keyboard Data
2	Mouse Data
3	GND
4	VCC (+5V)
5	Keyboard Clock
6	Mouse Clock

KB1: Keyboard/Mouse 6-pin Wafer 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 D-sub 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#

LPT1 : Parallel Port Connector			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	STROBE#	2	AUTO FORM FEED #
3	DATA0	4	ERROR#
5	DATA1	6	INITIALIZE#
7	DATA2	8	PRINTER SELECT LN#
9	DATA3	10	GND
11	DATA4	12	GND
13	DATA5	14	GND
15	DATA6	16	GND
17	DATA7	18	GND
19	ACKNOWLEDGE#	20	GND
21	BUSY	22	GND
23	PAPER EMPTY	24	GND
25	PRINTER SELECT	26	N/C

USB01: 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)

J_AUDIO1 : External Audio Module Connector			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	AC97_SYNC	2	AC97_BITCLK
3	AC97_SDOUT	4	AC97_PCBEEP
5	AC97_SDIN	6	AC97_RST#
7	AC97_VCC	8	AC97_GND
9	AC97_12V	10	AC97_GND

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

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

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

IDE1 : IDE Interface Connector			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	RESET#	2	GND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GND	20	N/C
21	IDE DRQ	22	GND
23	IOW#	24	GND
25	IOR#	26	GND
27	IDE CHRDY	28	BALE – DEFAULT
29	IDE DACK	30	GND
31	INTERRUPT	32	N/C
33	SA1	34	PDIAG#
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GND
41	VCC	42	VCC
43	GND	44	N/C

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

TV1: HDTV-out Connector			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	GND	2	AGREEN_Y
3	GND	4	ARED_C
5	GND	6	ABLUE_CVBS

LVDS1: LVDS Connector (18-bit)			
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

F_PANEL1: PWR & RST Buttons and Indicators panel					
	PIN	**DESCRIPTION**	**PIN**	**DESCRIPTION**	
PWRBTN	1	PWRBTSW-	2	VCC (+5V)	Power LED
	3	GND	4	GND	
HDD LED	5	VCC (+5V)	6	SYSRST-	RESET
	7	-HDLED	8	GND	

ATXCTL1 : ATX Power Control Connector AT Mode: Short 2-3 (Default) ATX Mode: Use PS_ON# & 5VSB cable	
PIN NO.	**DESCRIPTION**
1	5VSB
2	PS_ON#
3	GND

CN1、CN2: +9V~28V Main Power Input Connector			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	GND	2	GND
3	+12V	4	+12V

CN3 : +5V Power Output Connector (for 2.5” SATA HDD)			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	VCC (+5V)	2	GND

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

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

CAN1、CAN2 : CAN BUS Connectors	
PIN NO.	**DESCRIPTION**
1	CAN H
2	Isolated GND
3	CAN L

CN4 : Programming XC95288XL Connector	
PIN NO.	**DESCRIPTION**
1	VCC (+3.3V)
2	TDO
3	TDI
4	N/C
5	N/C
6	TMS
7	GND
8	TCK

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

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		

Board Layout: Jumper and Connector Locations