Quick Setup Installation Guide

Version 1.3

Model: MB-60470

EBX Form-Factor SBC: Low-Power AMD Opteron Processor PCI Express Slot, CompactFlash Socket, ExpressCard Socket, 4x SATA, and Stackable HyperTransport Connector

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Chapter 1. General Information

1.0 Introduction

The MB-60470, featuring a PCI Express slot and a stackable HyperTransport connector, is a long-life AMD Opteron-based reference design for the embedded market. With its EBX small form factor and support for dual-core processors, MB-60470 is ideal for demanding networking, imaging, storage, and gaming applications, and other intense applications. The AMD reference design is available as a commercial, off-the-shelf (COTS) controller or as part of a complete embedded platform. It can be customized in OEM quantities.

1.1 Specifications

Core Features	
CPU	AMD Opteron Processors HE (55W) and EE (30W). Supports Dual Core CPUs.
Chipset	nVidia nForce Professional 2200
Memory	Up to 8 GB DDR RAM
I/O	
Serial Port	One Serial Port
USB	Supports Four USB Ports, 2.0 Compliant
PCI Express	Right-Angle 16-Lane PCI Express Slot
HyperTransport	Stackable HyperTransport Connector
ExpressCard	Optional: ExpressCard Socket
Networking	
Ethernet	Two 10/100/1000 Gigabit Ethernet Ports
Storage	
SATA	Four SATA II Interfaces
Flash Storage	One 50-pin CompactFlash Socket
Audio / Video	
Audio	Onboard Audio: AC-97 Codec ALC850
Video	Onboard SMI VGA Controller
Mechanical & Environmental	
Electrical	***Power Input***: ATX Power Supply
Mechanical	***Board Size***: ETX Form Factor: 5.75" x 8.00" (146 mm x 203 mm)
Environmental	***Operating Temperature***: 32 to 122° F (0 to 50° C)
Additional Support	
Software Drivers	Windows 95, 98, 2000, NT, XP, NT Embedded, XP Embedded, and 64-bit Windows XP Professional x64. Several Linux distributions are also supported, including 64-bit Debian Linux.
Customization	WIN Enterprises offers several customization options for all standard products. The core module of this design can serve as the basis for a new design to meet your specific requirements and speed your time-to-market. WIN offers full design, manufacturing,

	fulfillment, and support services to ensure the success of all product launches and product lifecycles.

Ordering Information	
MB-60470	WIN EBX Form Factor Controller: AMD Opteron processor with nVidia chipset
CO-01030-1	Heatsink and fan for CPU and Chipset cooling

Please make sure the following items have been included in the package before installation:

MB-60470 Low Power Embedded SBC
Drivers CD

If parts are missing or damaged, please contact your distributor or sales representatives immediately. Save the shipping materials and carton in the event that you want to ship or store the board in the future. After you unpack the board, inspect it to assure an intact shipment. Do not apply power to the board if it appears to have been damaged.

Leave the board in its original packing until you are ready to install

1.2 Precautions

Please make sure you properly ground yourself before handling the MB-60470 board or other system components. Electrostatic discharge can be easily damage the MB-60470 board.

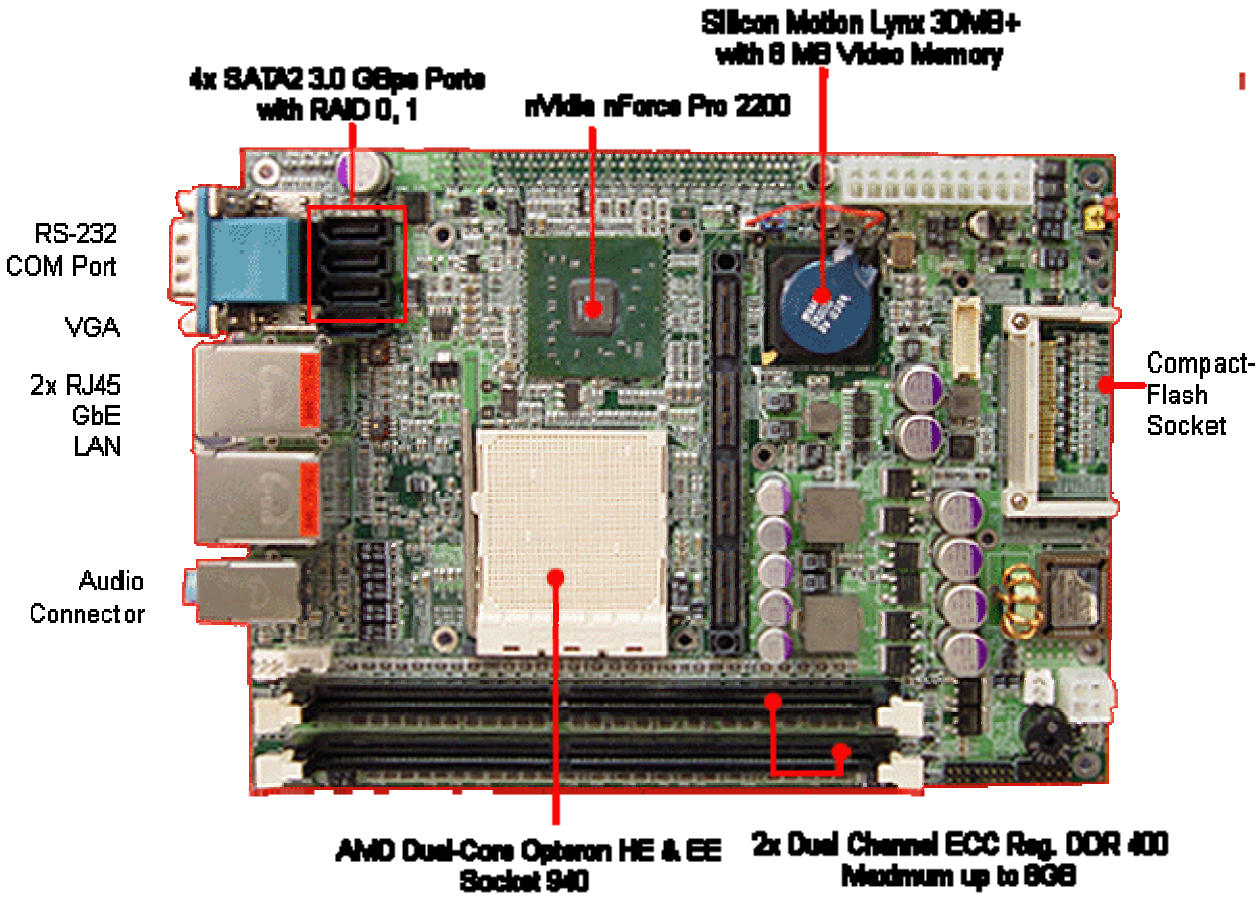
Do not remove the anti-static packing until you are ready to install the MB-60470 board. Ground yourself before removing any system component from it protective anti-static packaging. To ground yourself, grasp the expansion slot covers or other unpainted parts of the computer chassis.

Handle the MB-60470 board by its edges and avoid touching its components.

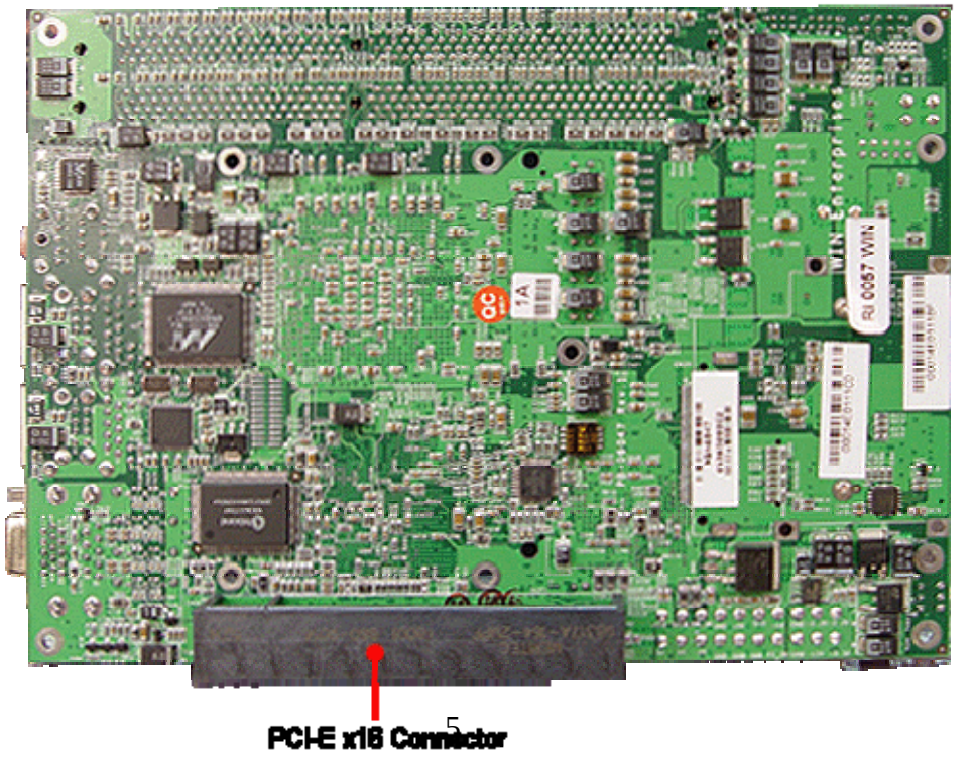
Chapter 2: Layout

2.1 Board Layout

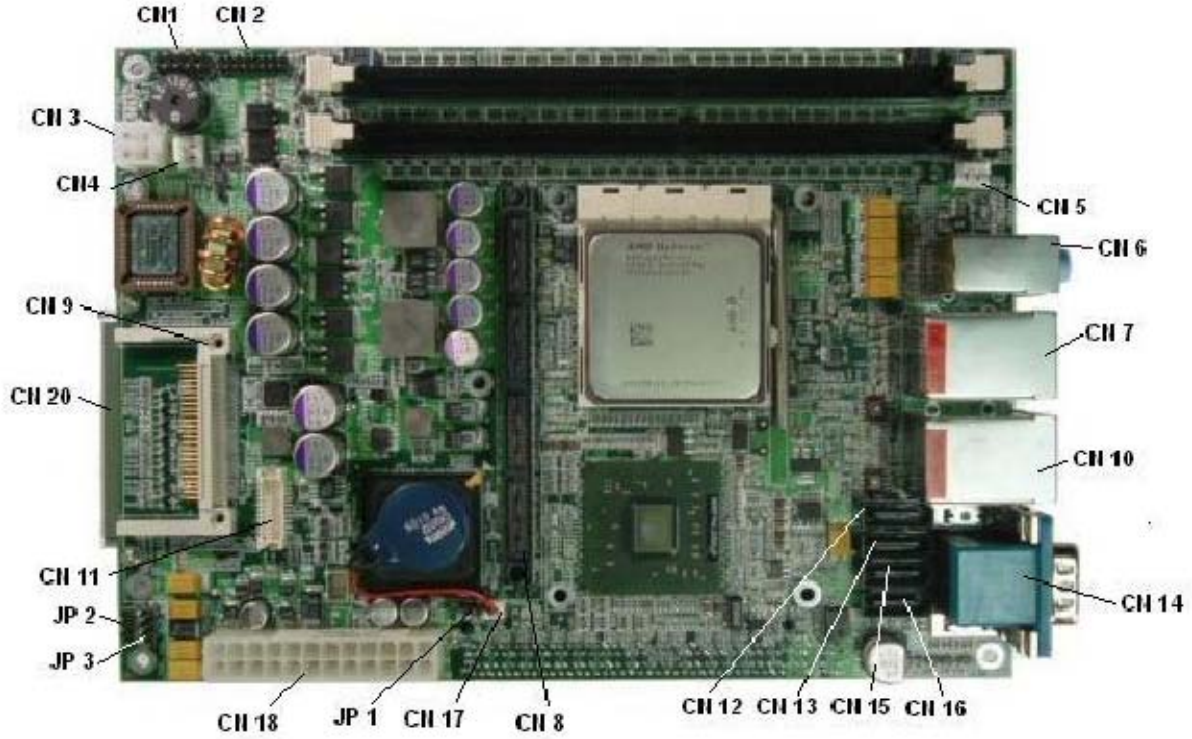
MB-60470 Front View



MB-60470 Rear View



2.2 Connectors Location



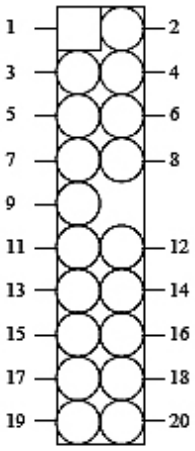
2.3 Location of Connectors / Jumpers and Definitions

Connector	Define	Connector	Define
CN1	Front Panel	CN14	Video + Comport
CN2	Post-Card Header	CN15	SATA Connector
CN3	P4 Auxiliary Power Connector	CN16	SATA Connector
CN4	Fan Connector	CN17	Battery Header
CN5	Fan Connector	CN18	ATX Power Connector
CN6	Audio	CN19	AMD Hardware bug Connector
CN7	LAN/USB	CN20	Card Express
CN8	Hypertransport Connector	CN21	SMBUS Data Connector*
CN9	CompactFlash Socket	CN22	USB Connector
CN10	LAN/USB 2	CN23	GPIO Connector
CN11	LVDS Connector	JP1	Flash Recovery
CN12	SATA Connector	JP2	LCD Voltage
CN13	SATA Connector	JP3	Clear CMOS

* SMBUS data connector has been removed from the latest revision of the board

2.4 Connector Settings

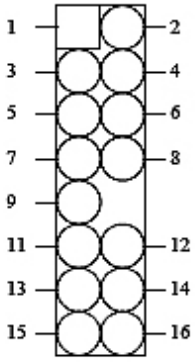
CN1: Front Panel Connector



PIN	Assignment	PIN	Assignment
1	HDD+ LED	2*	Power/Standby LED
3	HDD- LED	4*	Power/Standby LED
5	Power Button	6	Power Button
7	Reset Switch	8	Reset Switch GND
9	NC		
11	VDD_GBIT_2.5V	12	CN7_LED_TX
13	LED_ACT	14	CN10_LED_LINK
15	SIO_COM_TXD2_R (TTL ONLY)	16	SIO_COM_RXD2_R (TTL ONLY)
17	SMB_SCL_33V	18	SMB_SDA_33V
19	+3.3V	20	GND

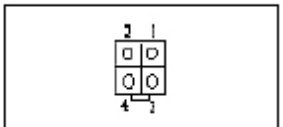
*Note: for Power LED pin 2 is high, pin 4 is low. For standby it's reversed

CN 2: Post-Card Header



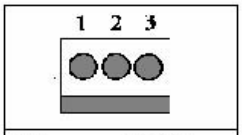
PIN	Assignment	PIN	Assignment
1	+3.3V	2	LPC AD0
3	LPC AD1	4	LPC AD2
5	LPC AD3	6	LPC FRAME*
7	LPCRST H	8	+5V
9	PCI_CLKLPC_H		
11	Ground	12	Ground
13	LPC_DRQ0*	14	Ground
15	LPC_SERIRQ	16	Ground

CN 3: A4 Auxiliary Power Connector



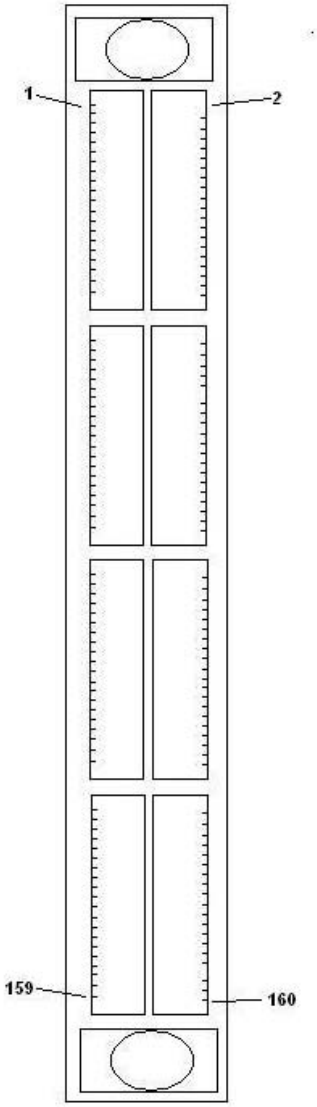
Pin	Define	Pin	Define
4	+12V	2	Ground
3	+12V	1	Ground

CN4/5: FAN Connector



Pin	Define
1	Ground
2	+12V
3	Speed Detect

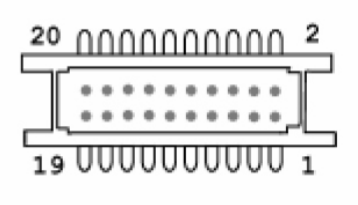
CN 8: HyperTransport Connector



	Assignment	PIN	Assignment
1	3.3V	2	3.3V
3	3.3V	4	3.3V
5	3.3V	6	3.3V
7	TDI	8	HT_REFCLK100
9	USERA0/A0’	10	TMS
11	USERB0/B0’	12	USERC/C0
13	USERD0/D0’	14	SMBCLK
15	USERE0/E0’	16	SMBDAT
17	TRST	18	GND
19	TCK	20	HT_TX_CADp0
21	GND	22	HT_TX_CADn0
23	HT_TX_CADp8	24	GND
25	HT_TX_CADn8	26	HT_TX_CADp1
27	GND	28	HT_TX_CADn1
29	HT_TX_CADp9	30	GND
31	HT_TX_CADn9	32	HT_TX_CADp2
33	GND	34	HT_TX_CADn2
35	HT_TX_CADp10	36	GND
37	HT_TX_CADn10	38	HT_TX_CADp3
39	GND	40	HT_TX_CADn3
41	HT_TX_CADp11	42	GND
43	HT_TX_CADn11	44	HT_TX_CLK0p
45	GND	46	HT_TX_CLK0n
47	HT_TX_CLK1p	48	GND
49	HT_TX_CLK1n	50	GND
51	GND	52	HT_TX_CADp4
53	HT_TX_CADp12	54	HT_TX_CADn4
55	HT_TX_CADn12	56	GND
57	GND	58	HT_TX_CADp5
59	HT_TX_CADp13	60	HT_TX_CADn5
61	HT_TX_CADn13	62	GND
63	GND	64	HT_TX_CADp6
65	HT_TX_CADp14	66	HT_TX_CADn6
67	HT_TX_CADn14	68	GND
69	GND	70	HT_TX_CADp7
71	HT_TX_CADp15	72	HT_TX_CADn7
73	HT_TX_CADn15	74	GND
75	GND	76	HT_TXCTL0p
77	USER_TCTL1p	78	HT_TXCTL0n
79	USER_TCTL1n	80	GND
81	GND	82	USER_RCTL1n
83	HT_RX_CTL0n	84	USER_RCTL1p
85	HT_RX_CTL0p	86	GND
87	GND	88	HT_RX_CADn15
89	HT_RX_CADn7	90	HT_RX_CADp15
91	HT_RX_CADp7	92	GND
93	GND	94	HT_RX_CADn14

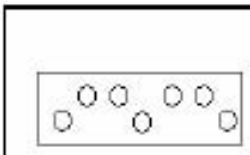
95	HT_RX_CADn6	96	HT_RX_CADp14
97	HT_RX_CADp6	98	GND
99	GND	100	HT_RX_CADn13
101	HT_RX_CADn5	102	HT_RX_CADp13
103	HT_RX_CADp5	104	GND
105	GND	106	HT_RX_CADn12
107	HT_RX_CADn4	108	HT_RX_CADp12
109	HT_RX_CADp4	110	GND
111	GND	112	HT_RX_CLK1n
113	GND	114	HT_RX_CLK1p
115	HT_RX_CLK0n	116	GND
117	HT_RX_CLK0p	118	HT_RX_CADn11
119	GND	120	HT_RX_CADp11
121	HT_RX_CADn3	122	GND
123	HT_RX_CADp3	124	HT_RX_CADn10
125	GND	126	HT_RX_CADp10
127	HT_RX_CADn2	128	GND
129	HT_RX_CADp2	130	HT_RX_CADn9
131	GND	132	HT_RX_CADp9
133	HT_RX_CADn1	134	GND
135	HT_RX_CADp1	136	HT_RX_CADn8
137	GND	138	HT_RX_CADp8
139	HT_RX_CADn0	140	GND
141	HT_RX_CADp0	142	GND
143	GND	144	LDT_STOP#
145	LDT_REQ#	146	PWROK
147	RESET#	148	USERE1/E1’
149	USERC1/C1’	150	USERD1/D1’
151	SystemReset#	152	USERB1/B1’
153	HT_REFCLK100I	154	USERA1/A1’
155	3.3V	156	TDO
157	3.3V	158	3.3V
159	3.3V	160	3.3V

CN11: LVDS Connector



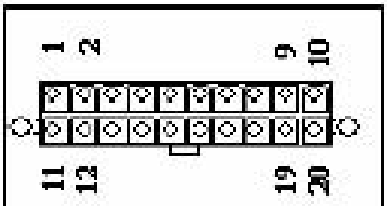
Pin	**Define**	**Pin**	**Define**
1	VDDLVDS	2	VDDLVDS
3	Ground	4	Ground
5	TxOUT0-	6	TxOUT0+
7	Ground	8	TxOUT1-
9	TxOUT1+	10	Ground
11	TxOUT2-	12	TxOUT2+
13	Ground	14	TxCLKOUT-
15	TxCLKOUT+	16	Ground
17	TxOUT3-	18	TxOUT3+
19	Ground	20	Ground

CN12/CN13/CN15/CN16: SATA Connector



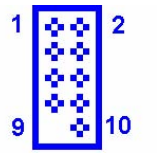
Pin	Signal
1	Ground
2	TXP
3	TXN
4	Ground
5	RXN
6	RXP
7	Ground

CN 18: ATX Power Connector



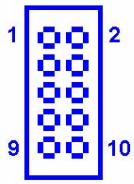
Pin	Signal	Pin	Signal
1	3.3V	11	3.3V
2	3.3V	12	-12V
3	Ground	13	Ground
4	+5V	14	PSON
5	Ground	15	Ground
6	+5V	16	Ground
7	Ground	17	Ground
8	PWROK	18	-5V
9	+5VSB	19	+5V
10	+12V	20	+5V

CN 22: USB Connector



Pin	Assignment	Pin	Assignment
1	+5V	2	+5V
3	Data-	4	Data-
5	Data+	6	Data+
7	Ground	8	Ground
		10	Ground

CN 23: GPIO Connector



Pin	Assignment	Pin	Assignment
1	+5V	2	SIO_GPI1
3	SIO_GPO1	4	SIO_GPI2
5	SIO_GPO2	6	SIO_GPI3
7	SIO_GPO3	8	SIO_GPI4
9	SIO_GPO4	10	Ground

2.5 Jumpers: Definitions & Settings

JP1: Flash recovery (Blue jumper: ON by defaults)

JP2: LCD voltage (Red jumper)

1-2: 3.3V (Default) 2-3: 5V

See Appendix B

JP3: Clear CMOS (Red jumper)

1-2: Clear CMOS 2-3: Hold Data (Default)

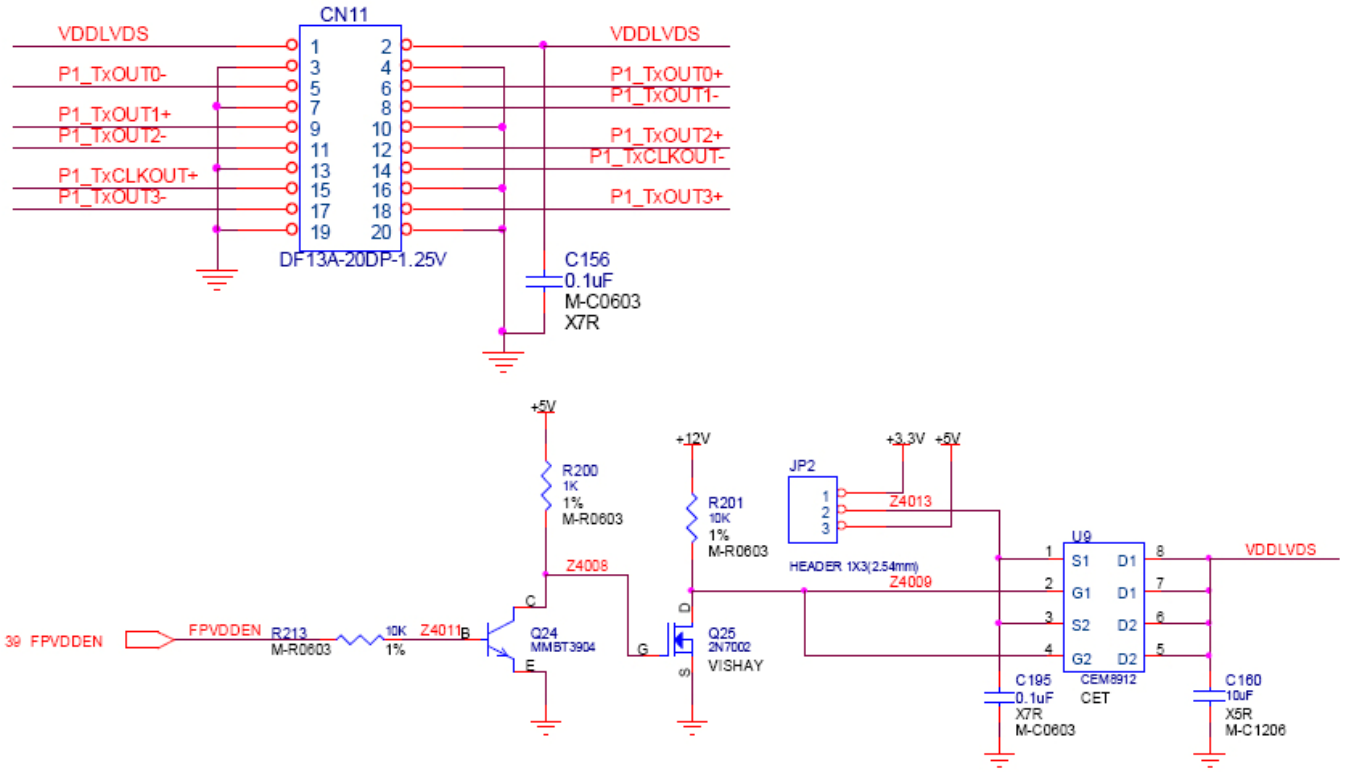
Appendix A Switches and Jumpers

SW1

1	**2**	**3**	**4**	
ON	ON			640x480
OFF	ON			800x600
ON	OFF			1024x768
OFF	OFF			1280x1024
		OFF	ON	12bit TFT
		ON	OFF	18bit TFT
		OFF	OFF	24bit TFT

Appendix B

LVDS LCD Voltage



JP2 adjust the voltage to the LCD. There is no backlight controller on this board. Please, connect your backlight to the appropriate voltage rail on the power supply.

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