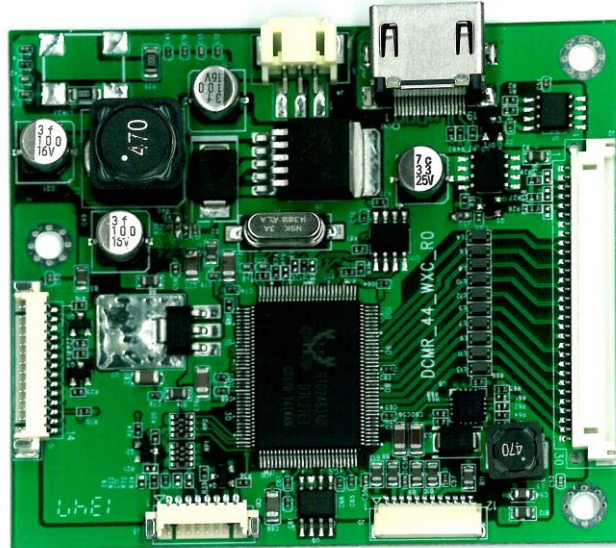


SPECIFICATION FOR APPROVAL

(HDMI INTERFACE CONTROLLER FOR TFT-LCD INTERFACE)

MODEL : DCMR-44 WXC R

APPROVE	REFERENCE



(PLEASE RETURN ONE OF THESE TO US IMMEDIATELY WITH YOUR SIGNATURE FOR APPROVAL)

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1. Revision History

Version	Date	Section	Description
1.0	31 Jan. 2014	All	DCMR-44_WXC_R_Specification

2. Product Overview

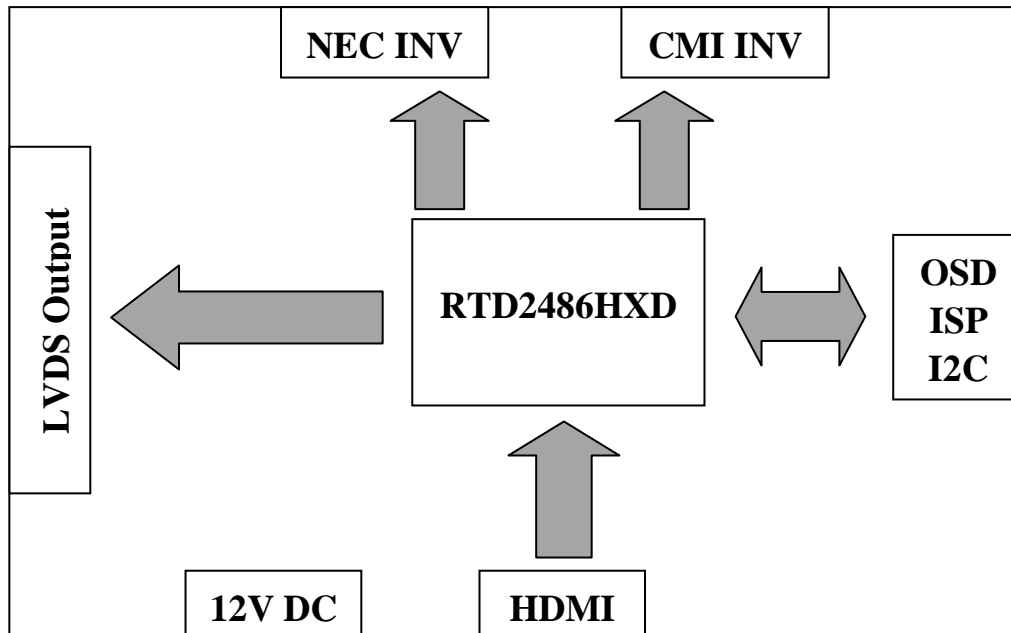
This DVI on LVDS Converter Board accepts standard single DVI (HDMI connector) signals. It generates control signals and the panel data to drive TFT-LCDs; suitable for the displays with VCC level 3,3V. This board supports to FullHD resolution at vertical refresh rate 60Hz. The user interface includes brightness, contrast adjustment, etc. via on-screen programming. Some OSD functions can be managed via I2C interface.

3. Features

- Support up to FullHD resolution 60Hz;
- Input format detection;
- Compatibility with standard VESA Mode;
- Smart engine for color calibration;
- Independent horizontal/vertical scaling;
- Integrated 8-bit triple channel 165MHz ADC/PLL;
- LVDS 24 bit output interface;
- Support displays with LVDS VCC 3,3V
- User friendly On Screen Display menu to control image
 - Color adjust (contrast, brightness, etc.),
 - OSD setting,
 - Reset;
- Power management support (DPMS - VESA compliant);
- Control contrast and brightness by I2C interface;
- DDC Support.

4. System Configuration

- Figure 1. System Block Diagram



5. Electrical Specifications

Item	Condition	MIN.	TYP.	MAX.	Unit
Supply Voltage	-----	7	12.0	24	Vdc
Absolute Max. Rating	-----	7	12.0	24	Vdc
Current Consumption ¹	Board Only (active mode)		0,12 @ 12V		A
	Board Only (sleep mode)		0,27 @12V		A
	With NEC Display	0,36	0,58 @ 12V	0,84	A
	With CMI Display	0,31	0,65 @ 12V	1,06	A
In rush current			~		
Fuse			0		A

¹ Test was performed with the CMI G12111-L01 and NEC NL12880BC20-05 display models; minimal value was measured by 0% PWM duty, maximal – by 100% PWM duty.

6. Operational Setup

The OSD provides certain functions to have clear image and others.

There are 5 buttons to control the OSD, PCB board and 1 LED for show status of board.

Functions of each OSD key are shown in the following table.

No.	Button	Switch Function
1	Menu	1. Open the OSD Main Menu / Close the OSD Main Menu
2	Select	1. Select a Item
3	Down	1. Move to downside on menu list 2. decrease the value of selected item
4	Up	1. Move to upside on menu list 2. Increase the value of selected item
5	Power	1. Turn on power / Turn off power

7. OSD (On-Screen-Display)

7.1. Main Menu



Color:	Adjust and correct the color
Image Setting:	no function
Position:	no function
OSD Menu:	Adjust the On-Screen-Display
Language:	Select a language of OSD
Misc.:	All other settings
Exit:	Close the main menu

7.2. Sub-Menu: Color



Contrast:	Adjust the contrast of the image
Brightness:	Adjust the brightness of the image
Color Adjust:	Adjust the value of red, green and blue
Color Temp:	Adjust the color temperature
Back:	Back to main menu

7.3. Sub-Menu: OSD Menu



- OSD H. Pos.: Adjust the H. position of the OSD
OSD V. Pos.: Adjust the H. position of the OSD
OSD Timer: Adjust the OSD off timer
Back: Back to main menu

7.4. Sub-Menu: Language

English:	Select English
Française:	Select French
Deutsch:	Select German
Español:	Select Spanish
Korean:	Select Korean

7.5. Sub-Menu: Misc.



Signal Source:	Select the input source
Reset:	Factory reset
Factory Mode:	Select some default settings
Back:	Back to main menu

9. DDC EDID data

This DDC (Display Data Channel) provides a basic one-way communication route from the display to the controller. The DCMR-44 controller board supports the Extended Display Identification Data (EDID) standard.

The special DDC-file with the EDID information contains the following table in the HEX code (example):

00	FF	FF	FF	FF	FF	FF	00	08	6B	00	05	0F	41	01	00
2D	14	01	03	A0	31	1D	78	28	96	05	3E	50	2A	29	95
8B	2F	49	BD	CE	00	81	00	00	04	61	4F	00	84	61	4A
61	4C	00	84	00	84	EA	1A	00	80	50	20	10	30	15	20
44	00	1E	B3	10	00	00	18	00	00	00	FC	00	44	49	47
49	54	41	4C	5F	42	45	43	4B	0A	00	00	00	FD	00	2B
55	14	5C	0F	00	0A	20	20	20	20	20	20	00	00	00	FE
00	34	30	57	58	0A	20	20	20	20	20	20	20	20	00	B3

10. Input Connectors

10.1. Power Input connector (J4)

Power supply

JST S3B-PH-SM4-TB

3 pins (use Pin 1 as marked on connector)

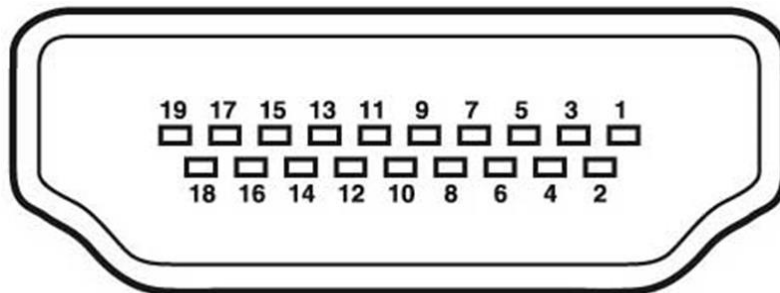


Pin	Signal
1	12V
2	GND
3	GND

10.2. HDMI Input connector (CN1)

Pin specifications for the HDMI connector (use Pin 1 as marked on connector)

Pin	Input signal	Pin	Input signal
1	TMDS data 2+	11	TMDS clock shield
2	TMDS data 2 shield	12	TMDS clock -
3	TMDS data 2-	13	CEC
4	TMDS data 1+	14	In use (not connected on device)
5	TMDS data 1 shield	15	SCL
6	TMDS data 1-	16	SDA
7	TMDS data 0+	17	DDC/CED ground
8	TMDS data 0 shield	18	+5V voltage
9	TMDS clock 0-	19	Hot-plug detect
10	TMDS clock+		

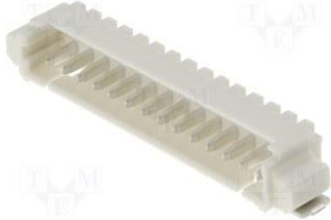


10.3. OSD, I2C, ISP Interface Connector (J1)

OSD + I2C + Firmware update

MOLEX, 53261-1471

14 pins (use Pin 1 as marked on connector)



Pin	Signal
1	Power On
2	n.c.
3	GND OSD/ISP
4	Power Key
5	3.3V
6	Menu Key
7	Down Key
8	ISP DATA
9	ISP CLK
10	Up Key
11	Sel Key
12	n.c.
13	I2C SDA
14	I2C SCL

11. Output Connectors for LCD Interface

11.1. LVDS Interface (J2)

Yeonho, 12507WR-30A (1.25mm Pitch / 30 Pin)

Pin	Signal
1	VDD
2	VDD
3	DSP (0 ohms resist. To VDD and GND, resist. to VDD is mounted)
4	FRC (0 ohms resist. to VDD and GND, resist. to VDD is mounted)
5	MSL (0 ohms resist. to VDD and GND, resist. to VDD is mounted)
6	GND
7	GND
8	GND
9	TXO0-
10	TXO0+
11	TXO1-
12	TXO1+
13	TXO2-
14	TXO2+
15	TXOCLK-
16	TXOCLK+
17	TXO3-
18	TXO3+
19	GND
20	TXE0-
21	TXE0+
22	TXE1-
23	TXE1+
24	TXE2-
25	TXE2+
26	TXECLK-
27	TXECLK+
28	TXE3-
29	TXE3+
30	GND

11.2. Backlight Power Connector Display (J3)

Molex 53261-0871

8 pins (use Pin 1 as marked on connector)

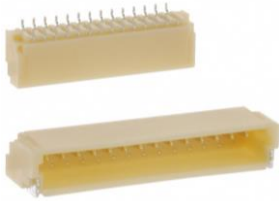


Pin	Signal
1	12V
2	12V
3	n.c.
4	(0 ohms resist. to 12V and GND)
5	Enable
6	Backlight Adjust
7	GND
8	GND

11.3. Backlight Power Connector Display (J5)

JST SM12B-SRSS-TB

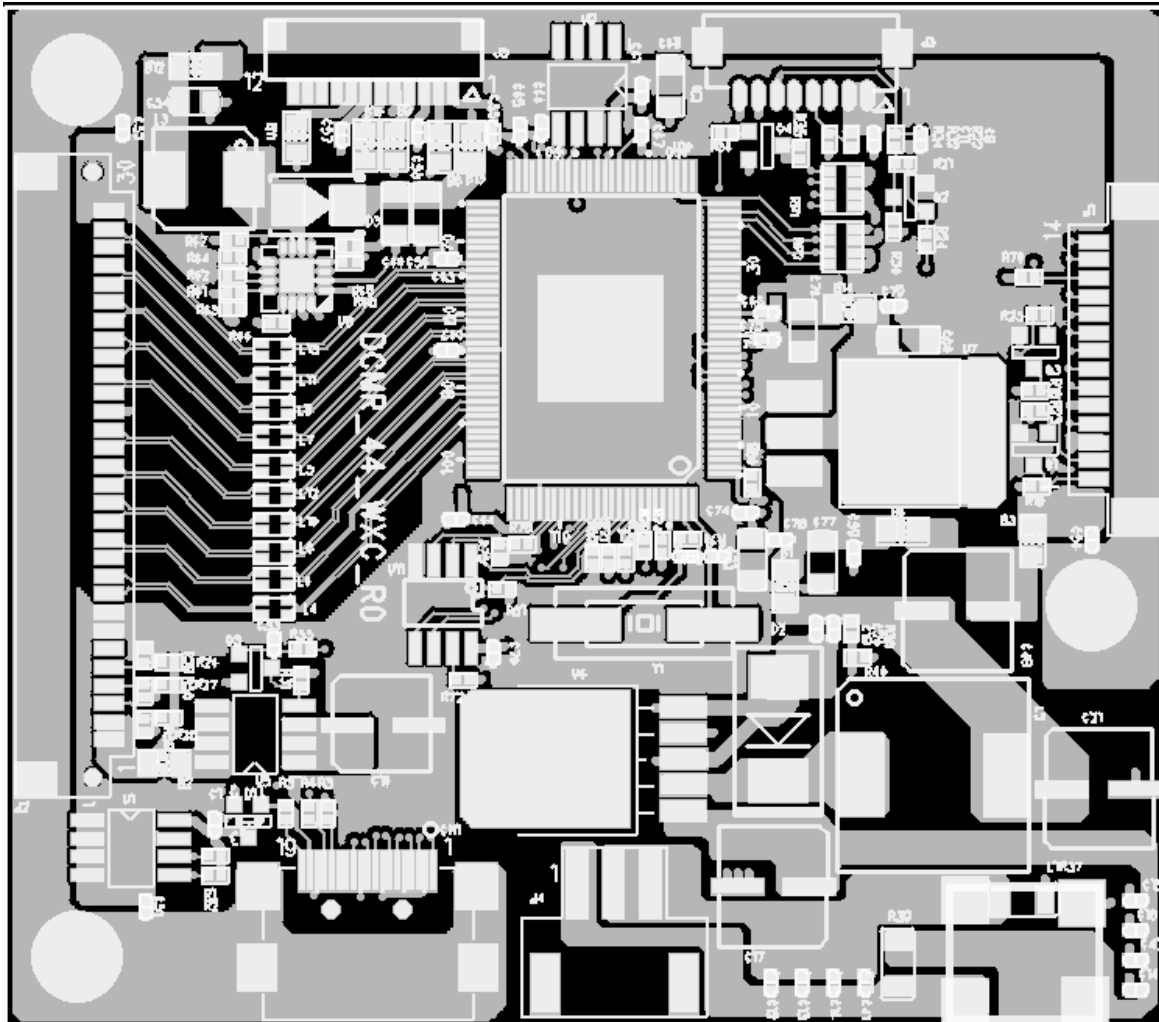
12 pins (use Pin 1 as marked on connector)



Pin	Signal
1	Anode 1
2	Cathode 1
3	Anode 2
4	Cathode 2
5	Anode 3
6	Cathode 3
7	Anode 4
8	Cathode 4
9	n.c.
10	n.c.
11	n.c.
12	n.c.

12. Mechanical Dimension

Dimensions:	70x80mm
Contour:	rectangular
Production technology:	SMD
Total height:	1mm PCB + max. 7,5mm part height



13. Reliability

Test item	Condition
High temperature storage test	+65°
Low temperature storage test	-34°
High temperature operation test	+50°
Low temperature operation test	0°
Vibration test	
Shock test	
Altitude test	
Humidity test	

14. Absolute maximum ratings

Test item	Condition
High temperature storage	+65°
Low temperature storage	-34°
High temperature operation	+50°
Low temperature operation	0°

15. Mounting rules

- You must mount a module using holes.
- Avoid any bend force during mounting

16. Operating Precautions

- The spike noise causes the mis-operation of circuits. It should be lower than following voltage : $V = \pm 200\text{mV}$ (over and under shoot voltage)
- Be careful for condensation at sudden temperature change. Condensation makes damage to electrical contacted parts.
- Module has high frequency circuits. Sufficient suppression to the electromagnetic interference shall be done by system manufacturers. Grounding and shielding methods may be important to minimize the interference.

17. Packing / Labels

Serial number looks in general in following way:

"ABC-NN-YYMMDD-XXXX"

ABC	Acronym for the SMT producer;
NN	Firmware version VN.N
YYMMDD	Manufactured year/month/date (YY/MM/DD);
XXXX	Manufacturing sequence of product.

18. General Cautions

- When preparing a cable for a specific flat panel, always refer to appropriate cable pin-out and flat panel specification. Always check the flat panel signals before connecting the cable. Any incorrect pin connection may damage the flat panel permanently.

19. Errata