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HDMI to LVDS converter.	
Part Number:	MDIB-1416 iss3
Version:	4
Date:	22/01/2022
Revision History	
Date	**Description of change**
05/09/2016	First draft
15/10/2018	Upgraded LED driver chip Changed pinout on CN2 Adjusted voltages for 7”TFT
20/01/2022	Updated electrical characteristics
08/11/2023	Updated to MDIB-1416 iss3 BL current default now 40mA Voltage / current set resistors now 1206

RoHS 2011/65/EU

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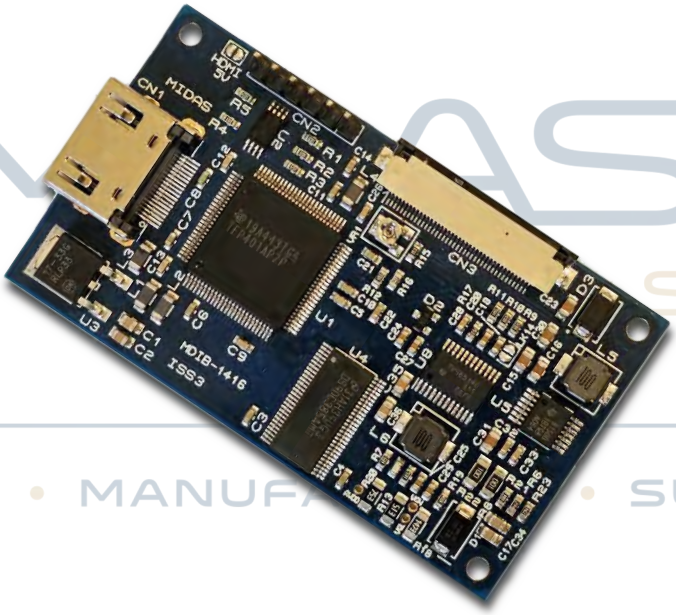
MDIB-1416 iss3 HDMI to LVDS

Overview & Features

The MDIB-1416 iss3 is an HDMI to LVDS converter. Ideal for connecting a range of Midas TFT displays to a Single Board Computer such as the Raspberry Pi.



Features

- Standard High Definition Multimedia Interface (HDMI) connector
- 40 way 0.5mm pitch FFC TFT display connector
- Connections for 5V power and EDID programming
- Single 5V power supply requirement
- Voltage generation from -7.5V to 21V (Digital/Analogue/VCOM/VGL/VGH)
- EEprom (24C02) for Extended Display Identification Data (EDID) storage
- Mechanical dimensions 70 x 40 x 12 mm.
- Compatible with many LVDS interface TFTs including the following:

  MCT070LA12W1024600LML

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Connections

CN1 19PIN HDMI AMP 1747981-1	Symbol	Description
1	D2+	TDMS Data 2+
2	D2S	TDMS Data 2 Shield
3	D2-	TDMS Data 2-
4	D1+	TDMS Data 1+
5	D1S	TDMS Data 1 Shield
6	D1-	TDMS Data 1-
7	D0+	TDMS Data 0+
8	D0S	TDMS Data 0 Shield
9	D0+	TDMS Data 0-
10	DC+	TDMS Clock+
11	DCS	TDMS Clock Shield
12	DC-	TDMS Clock-
13	CEC	Consumer Electronic Control
14	NC	Not Connected
15	SCL	Display Data Channel Clock
16	SDA	Display Data Channel Data
17	GND	Ground
18	+5V	+5V power From HDMI
19	HPD	Hot Plug Detect

CN2 6 PIN 0.1" pitch header	Symbol	Description
1	+5V	+5V power From HDMI (EEprom only if LK13 open)
2	SCK	EDID I2C clock
3	SDA	EDID I2C data
4	GND	Ground
5	VIN	+5V Supply to Board
6	PWM	Backlight PWM IN (5V)

CN3 40Pin 0.5mm pitch Display Connector	Symbol	Description
1	VCOM	Common Voltage
2	VDD	Display supply (3.3V)
3	VDD	Display supply (3.3V)
4	NC	No connection
5	# Reset	Global reset pin
6	STBYB	Stand
7	GND	Ground
8	RXIN0-	-LVDS differential data input
9	RXIN0+	+LVDS differential data input
10	GND	Ground
11	RXIN1-	-LVDS differential data input
12	RXIN1+	+LVDS differential data input
13	GND	Ground
14	RXIN2-	-LVDS differential data input
15	RXIN2+	+LVDS differential data input
16	GND	Ground
17	RXCLKIN-	-LVDS differential clock input
18	RXCLKIN+	+LVDS differential clock input
19	GND	Ground
20	RXIN3-	-LVDS differential data input
21	RXIN3+	+LVDS differential data input
22	GND	Ground
23	NC	No connection
24	NC	No connection
25	GND	Ground
26	NC	No connection
27	NC	No connection
28	SELB	6bit/8bit mode select (see LK 6/8)
29	AVDD	Power for Analog circuit
30	GND	Ground
31	VLED-	LED Cathode
32	VLED-	LED Cathode
33	SHLR	Horizontal inversion (see LK LR)
34	UPDN	Vertical inversion (see LK VD)
35	VGL	Gate OFF Voltage
36	NC	No connection
37	NC	No connection
38	VGH	Gate ON Voltage
39	VLED+	LED Anode
40	VLED+	LED Anode

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Electrical Specifications

Absolute Maximum Ratings		
Operating temperature	0 to +70	°C
Storage temperature	-40 to +125	°C
ViN	6.0	V
CN2 inputs and outputs w.r.t VSS	–0.3 to VIN+0.3	V

Typical Electrical Characteristics				
Parameter	**Min**	**Typ**	**Max**	**Unit**
Supply Voltage ViN (Supply Voltage to Board)	4.75	5.0	5.5	V
Supply Current IiN (Board only no HDMI signal)	-	40	-	mA
Supply Voltage VDD (Supply Voltage to Display)	-	3.3	-	V

Item	Symbol	Min	Unit	Remarks
Power supply for LCD	AVDD	9.7	V	R7=10k, R20=75k
	VGH	19.1	V	R18=147k, R19=10k
	VGL	-6.2	V	R13=51k, R14=10k
	VCOM	VR1	V	Adjustable
LED Backlight Current	Forward Current	40	mA	R21=10Ω // R22=10Ω

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Calculations

Analogue Supply Voltage (AVDD)

The Analog Supply Voltage can be set for various voltages using **R7** and **R20.**
R20 is 1206 size for easy adjustment.

$$AVDD = \frac{1.146v}{R7}\ x\ (R7 + R20)$$

E.g.

$$\left(\frac{1.146}{10x10^3}\right)\left(10x10^3 + 75x10^3\right) = 9.7V$$

Gate On Voltage (VGH)

The Gate On Voltage can be set for various voltages using **R18** and **R19.**
R18 is 1206 size for easy adjustment.

$$VGH = \frac{1.214v}{R19}\ x\ (R18 + R19)$$

E.g.

$$\left(\frac{1.214}{10x10^3}\right)\left(147x10^3 + 10x10^3\right) = 19.1V$$

Gate Off Voltage (VGL)

The Gate Off Voltage can be set for various voltages using **R13** and **R14.**
R13 is 1206 size for easy adjustment.

$$VGL = \frac{\text{-}1.213v}{R14}\ x\ R13$$

E.g.

$$\left(\frac{\text{-}1.213}{10x10^3}\right)\left(51x10^3\right) = \text{-}6.19V$$

Common Voltage (VCOM)

The Common Voltage can be set for various voltages using a potentiometer **VR1**.

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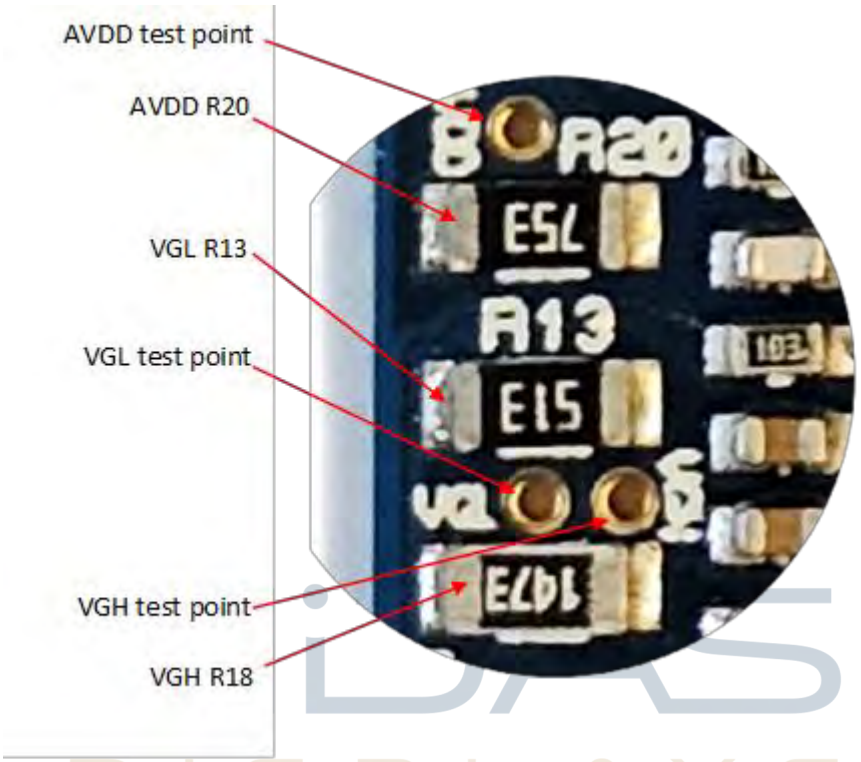


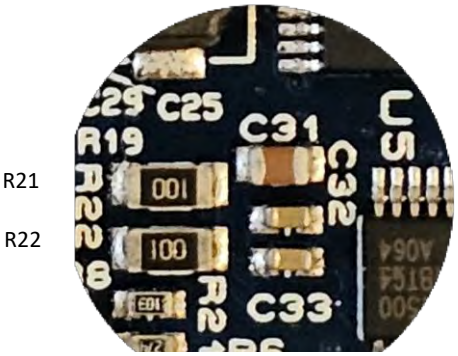
LED Backlight Current

The LED Backlight is driven by a constant current circuit which can be set for various currents using **R21** and **R22** (please, see circuit diagram).
R13 is 1206 size for easy adjustment.

$$LED\ Current = \frac{0.2v}{R21//R22}$$

E.g.

$$\frac{0.2}{10//10} = \frac{0.2}{5} = 40mA$$



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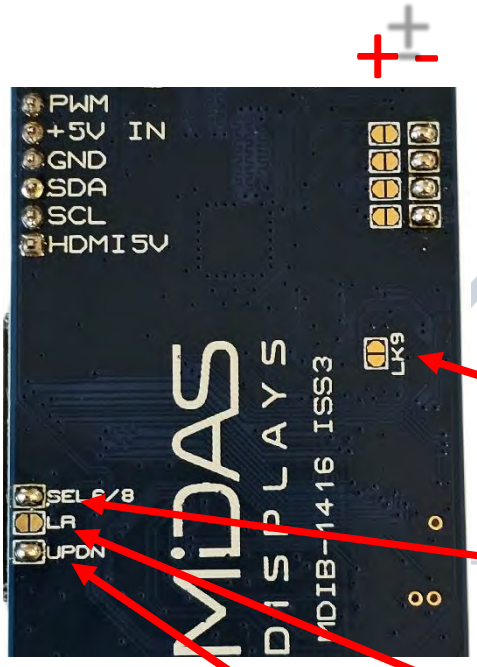
Solder Links on back of PCB

There are 9 solder links on the board 1 on the front and 8 on the back of the PCB to set various options for the IC.

(HDMI to RGB IC)

Link	+	- (Default)
Pixel Clock	RGB Data clocked on +Ve edge	RGB Data clocked on -Ve edge
ST	High RGB Data drive strength	Low RGB Data drive strength
PIX	Two pixels per clock	One pixel per clock
$\overline{\text{STAG}}$	Simultanious pixel output	Staggered pixel output



Links

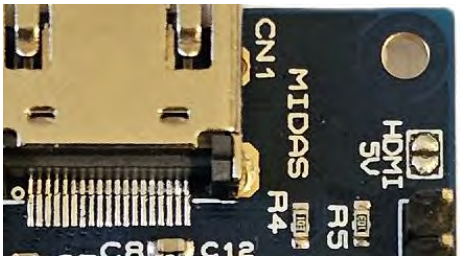
Pixel Clock
ST
PIX
STAG

R-FB (RGBS to LVDS IC)
OPEN= Falling edge clock (default).
CLOSED= Rising edge Clock.

6/8 (Default CLOSED)
OPEN= 6-Bit.
CLOSED= 8-Bit.

LR (Default OPEN)
OPEN= LR.
CLOSED= RL.

UD (Default closed)
OPEN= UD.
CLOSED= DU.



HDMI 5V (Default open)
OPEN= 5V via CN2.
CLOSED= 5V via HDMI.

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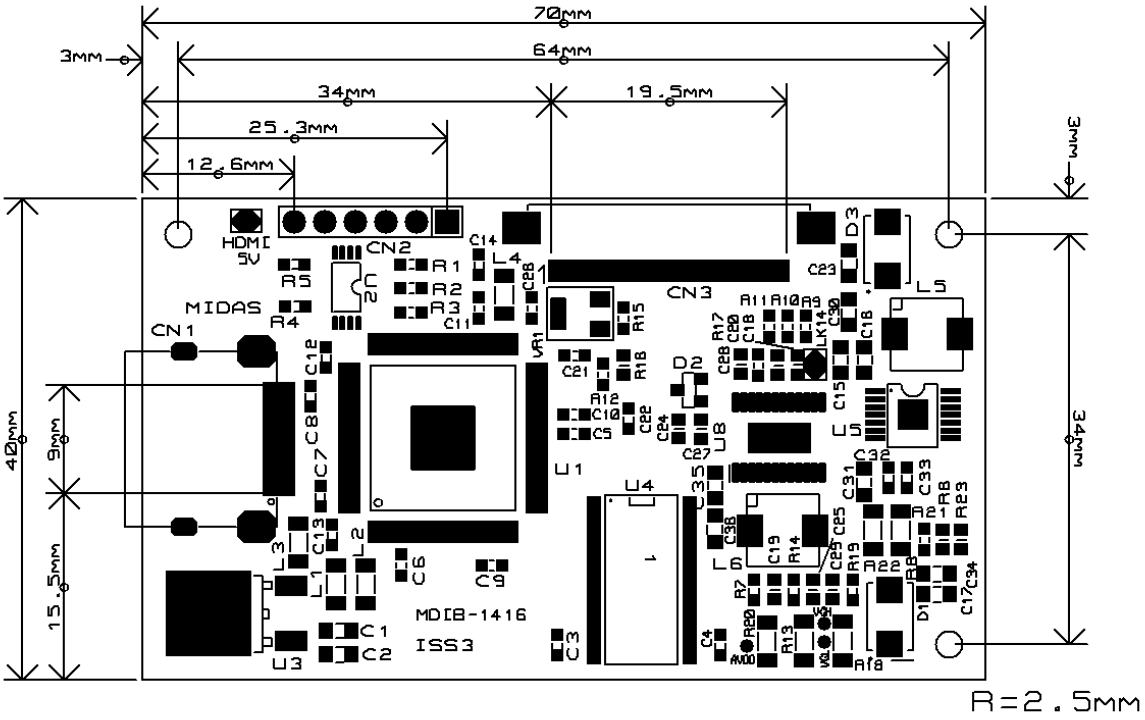
Mechanical Drawing



*Note all measurements are in mm unless stated otherwise.