

BACKLIGHT DRIVING SCHEMATIC



BACKLIGHT DRIVING SCHEMATIC FOR RIVERDI HB IPS 12.1" TFT SERIES

Rev.1.0
2024-03-08

An example of the backlight driving circuit for the below product:

PRODUCT NAME	DESCRIPTION
RVT121HVLNWN00	HB, IPS, 12.1", 1280x800, 1000cd/m ² , LVDS, No touch panel,
RVT121HVLFWN00	HB, IPS, 12.1", 1280x800, 1000cd/m ² , LVDS, No touch panel, Metal frame
RVT121HVLNWC00-B	HB, IPS, 12.1", 1280x800, 850cd/m ² , LVDS, uxTouch, Optical bonding
RVT121HVLNWC00-B	HB, IPS, 12.1", 1280x800, 850cd/m ² , LVDS, aTouch, Optical bonding
RVT121HVLFWCA0-B	HB, IPS, 12.1", 1280x800, 850cd/m ² , LVDS, aTouch, Optical bonding, Metal frame



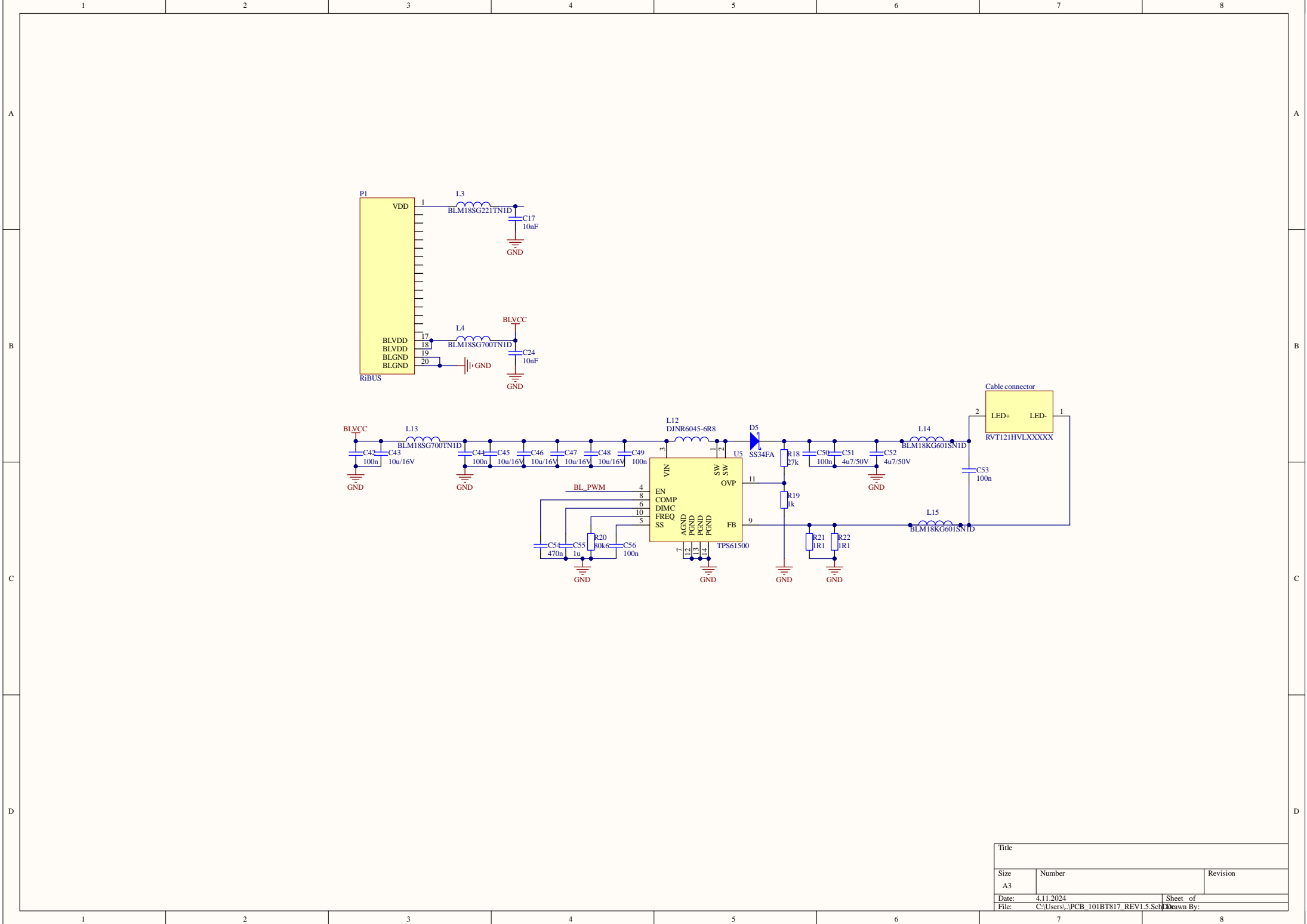
1. REVISION RECORD

REV NO.	REV DATE	CONTENTS	REMARKS
1.0	2024-03-08	Initial Release	



2. CONTENTS

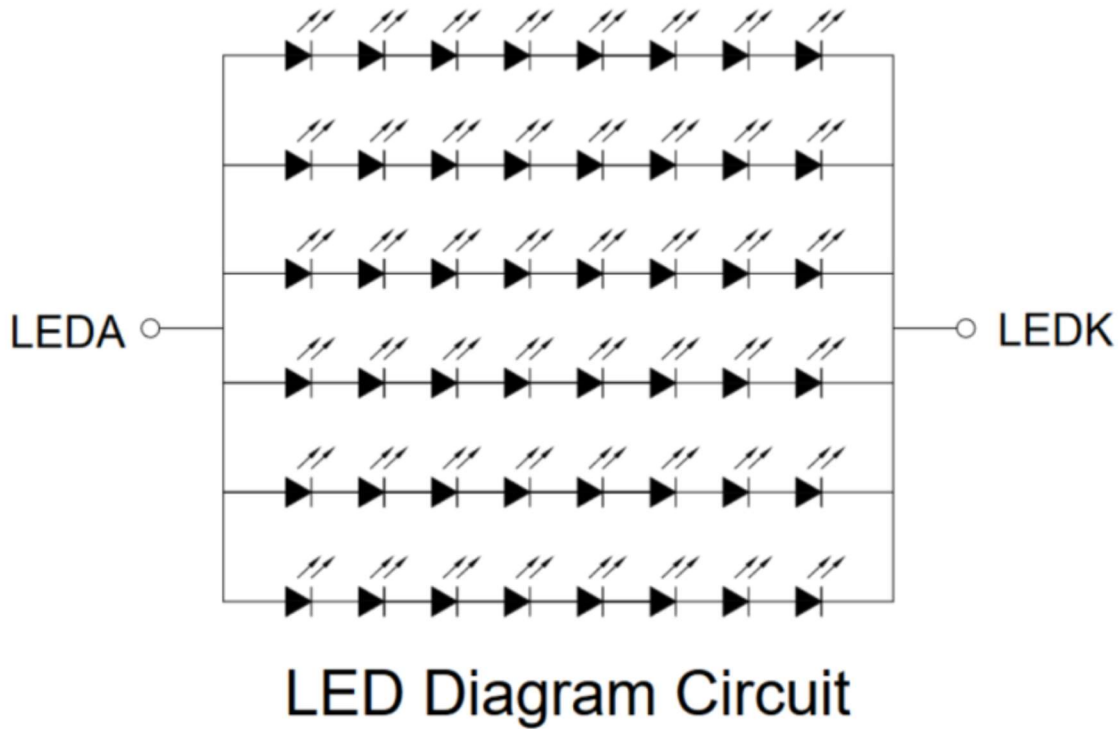
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Internal backlight circuit of Riverdi HB, IPS 12.1" Series is built with 6x8 (8 LEDs in a row) LED matrix.



Backlight parameters of Riverdi 12.1" HB, IPS series.

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Backlight Driving Voltage	V_F	23.0	25.6	26.5	V
Backlight Driving Current	I_F	-	360	-	mA
Backlight Power Consumption	W_{BL}	8.28	9.22	9.54	W
LED Lifetime	-	-	50,000	-	hours

To get the full brightness, the driving current (I_F) needs to reach 360mA.

The recommended LED driver is TPS61500.

The input voltage for BLVCC is in range 2.7V to 5.5V.

For example, the feedback voltage of TPS61500: $V_{FB} (max)=200mV$

In our design, R21, R22 connected in parallel as a feedback resistor R_{FB} , is set to $0.55R$ to achieve the full brightness.

$$I_F (max)=V_{FB} (max)/R_{FB}$$

$$I_F (max)=200mV/0.55R=363 \text{ mA.}$$

TPS61500 have PWM dimming control input to drive the LED current. TPS61500 have built-in low-pass filter which changes internal feedback voltage. By that,



inverter is not switched on-off with PWM signal but change LEDs current effectively in continuous way which cause low EMI emissions.

Please note that all Riverdi displays are designed to have low emission, that's why many LC components like beads and capacitors are on the schematic. They are not necessary but strongly recommended.

Recommended PWM frequency is 200Hz – 1kHz for TPS61500.

Hi, I am here to help you!
If you have any additional
questions, please contact
our support via email:
contact@riverdi.com

