BACKLIGHT DRIVING SCHEMATIC

DRIVING CIRCUIT DESIGN GUIDE

FOR RIVERDI HB, IPS 7.0" MIPI TFT

Rev.1.0
2022-12-19

This document is applied for the Riverdi HB, IPS, 7.0" MIPI series:

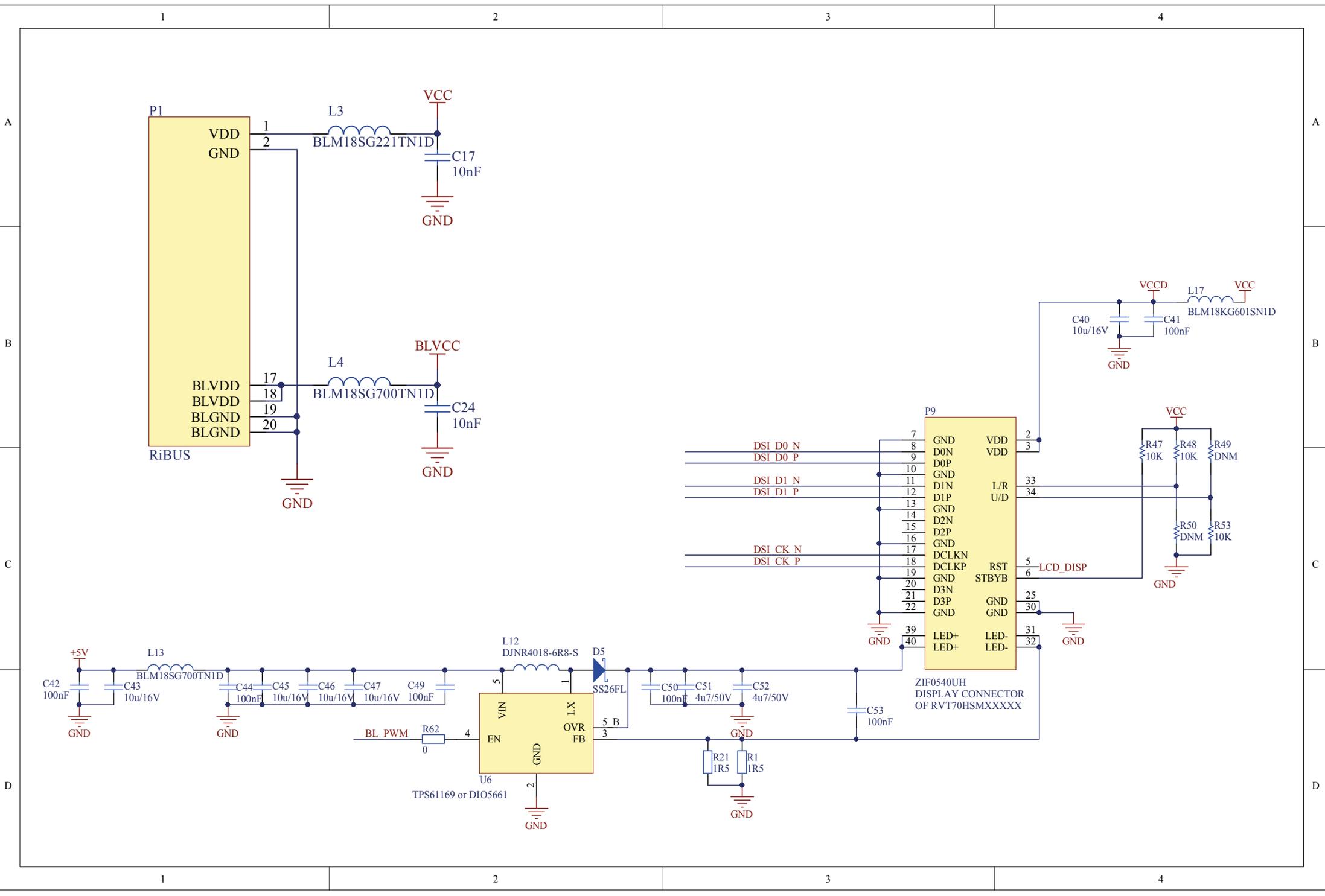| PRODUCT NAME	DESCRIPTION
RVT70HSMNWN00	HB, IPS, 7.0", 1024x600, 1000cd/m^2, MIPI, No touch panel,
RVT70HSMFWN00	HB, IPS, 7.0", 1024x600, 1000cd/m^2, MIPI, No touch panel, Metal frame
RVT70HSMNWC00-B	HB, IPS, 7.0", 1024x600, 850cd/m^2, MIPI, uxTouch, Optical bonding
RVT70HSMNWC00	HB, IPS, 7.0", 1024x600, 800cd/m^2, MIPI, uxTouch, Air bonding
RVT70HSMNWCA0	HB, IPS, 7.0", 1024x600, 800cd/m^2, MIPI, aTouch, Air bonding
RVT70HSMFWCA0	HB, IPS, 7.0", 1024x600, 800cd/m^2, MIPI, aTouch, Air bonding, Metal frame

1. REVISION RECORD

REV NO.	REV DATE	CONTENTS	REMARKS
1.0	2022-12-19	Initial Release	

2. CONTENTS

3. BACKLIGHT DRIVING CIRCUIT

Internal backlight circuit of Riverdi HB, IPS 7.0" MIPI series is built with 9x3 (3LEDs in a row) LED matrix.
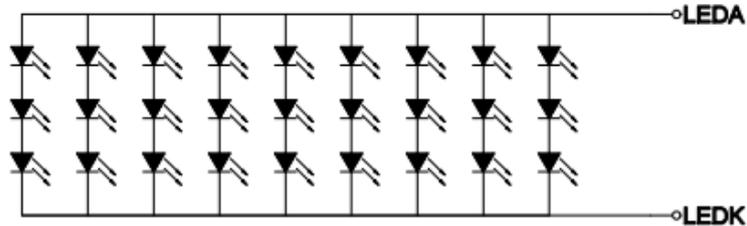
LED Diagram Circuit

Backlight parameters of Riverdi 7.0" MIPI HB, IPS series:

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT	NOTE
Backlight Driving Voltage	V_F	9.0	9.6	10.2	V	
Backlight Driving Current	I_F	-	270	-	mA	
Backlight Power Consumption	W_{BL}	-	2592	-	mW	
LED Lifetime	-	-	50,000	-	hours	Note 1

To get the full brightness, the driving current (I_F) needs to reach 270 mA.

The recommended LED driver is TPS61169 or DIO566,

For example, the feedback voltage of TPS61169: V_{FB} (max)=204mV

In our design, R21, R1 connected in parallel as a feedback resistor (R_{FB}) is set to 0.75R to achieve the full brightness.

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

I_F (max)=204mV/0.75R= 272 mA.

Both TPS61169 and DIO5661 have PWM dimming control input to drive the LED current. TPS61169 and DIO5661 have built-in low-pass filter which changes internal feedback voltage. By that, inverter is not switched on-off with PMW 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 PMW frequency is 5kHz – 100kHz for TPS61169 or 200Hz - 200kHz for DIO5661.

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