

# BACKLIGHT DRIVING SCHEMATIC



## BACKLIGHT DRIVING SCHEMATIC FOR RIVERDI HB IPS 3.5" TFT SERIES

Rev.1.1  
2024-03-08

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

PRODUCT NAME	DESCRIPTION
<a href="#">RVT35HHTNWN00</a>	HB, IPS, 3.5", 320x240, 1000cd/m <sup>2</sup> , RGB, No touch panel,
<a href="#">RVT35HHTFWN00</a>	HB, IPS, 3.5", 320x240, 1000cd/m <sup>2</sup> , RGB, No touch panel, Metal frame
<a href="#">RVT35HHTNWC00-B</a>	HB, IPS, 3.5", 320x240, 850cd/m <sup>2</sup> , RGB, uxTouch, Optical bonding
<a href="#">RVT35HHTNWC00</a>	HB, IPS, 3.5", 320x240, 800cd/m <sup>2</sup> , RGB, uxTouch, Air bonding
<a href="#">RVT35HHTNWCA0</a>	HB, IPS, 3.5", 320x240, 800cd/m <sup>2</sup> , RGB, aTouch, Air bonding
<a href="#">RVT35HHTFWCA0</a>	HB, IPS, 3.5", 320x240, 800cd/m <sup>2</sup> , RGB, aTouch, Air bonding, Metal frame



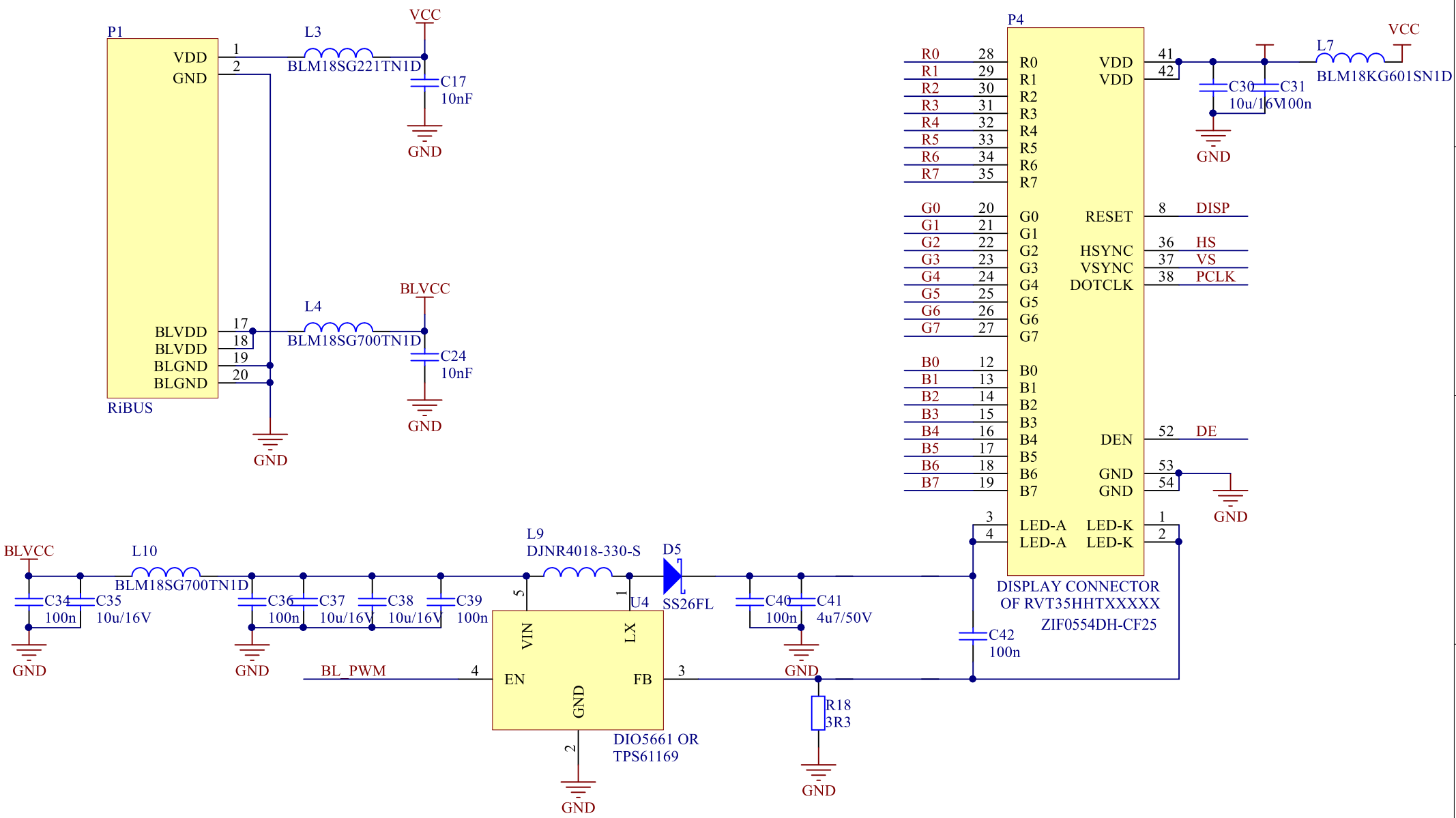
## 1. REVISION RECORD

REV NO.	REV DATE	CONTENTS	REMARKS
1.0	2022-09-05	Initial Release	
1.1	2024-03-08	Added information about input voltage for BLVCC.	



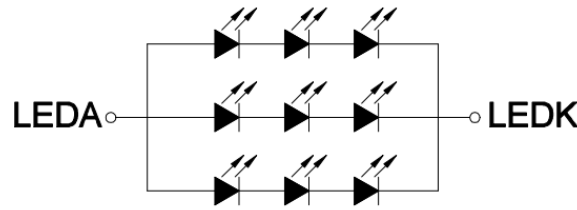
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Internal backlight circuit of Riverdi HB, IPS 3.5" Series is built with 3x3 (3LEDs in a row) LED matrix.



**LED Diagram Circuit**

Backlight parameters of Riverdi 3.5" HB, IPS series.

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Backlight Driving Voltage	$V_F$	9.0	9.6	10.2	V
Backlight Driving Current	$I_F$	-	60	-	mA
Backlight Power Consumption	$W_{BL}$	-	576	-	mW
Backlight Lifetime	-	-	50,000	-	hours

To get the full brightness, the driving current ( $I_F$ ) needs to reach 60mA.

The recommended LED driver is TPS61169 or DIO566,

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

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

In our design, R18, as a feedback resistor, is set to 3.3R to achieve the full brightness.

$$I_F (max)=V_{FB} (max)/R18$$

$$I_F (max)=204mV/3.3R=61.8 \text{ mA.}$$

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:  
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