BACKLIGHT DRIVING SCHEMATIC

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FOR RIVERDI HB IPS 3.5" TFT SERIES

Rev.1.0
2022-09-05

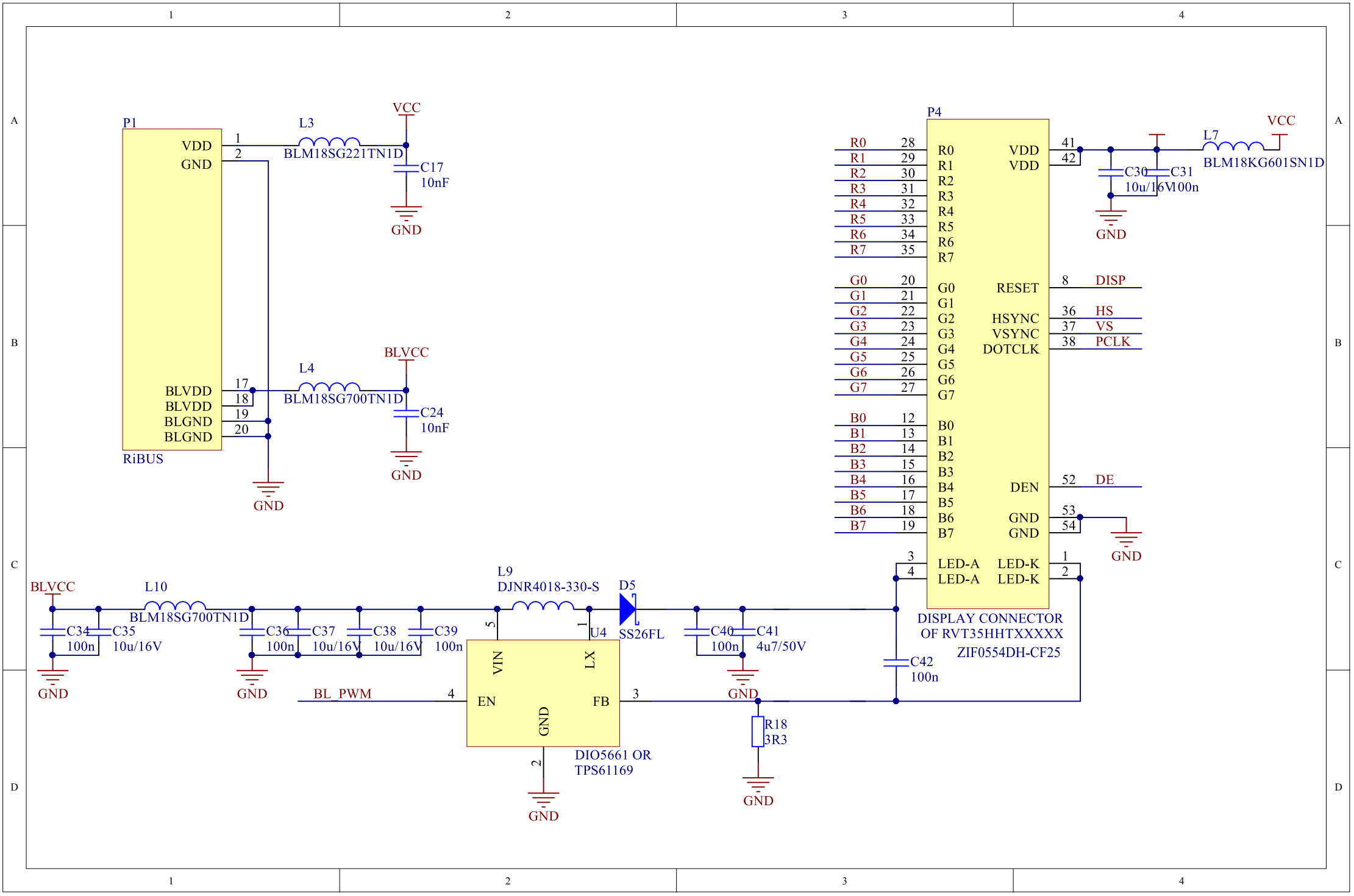
An example of the backlight driving circuit for the below product:

PRODUCT NAME	DESCRIPTION
RVT35HHTNWN00	HB, IPS, 3.5”, 320x240, 1000cd/m², RGB, No touch panel,
RVT35HHTFWN00	HB, IPS, 3.5”, 320x240, 1000cd/m², RGB, No touch panel, Metal frame
RVT35HHTNWC00-B	HB, IPS, 3.5”, 320x240, 850cd/m², RGB, uxTouch, Optical bonding
RVT35HHTNWC00	HB, IPS, 3.5”, 320x240, 800cd/m², RGB, uxTouch, Air bonding
RVT35HHTNWCA0	HB, IPS, 3.5”, 320x240, 800cd/m², RGB, aTouch, Air bonding
RVT35HHTFWCA0	HB, IPS, 3.5”, 320x240, 800cd/m², RGB, aTouch, Air bonding, Metal frame

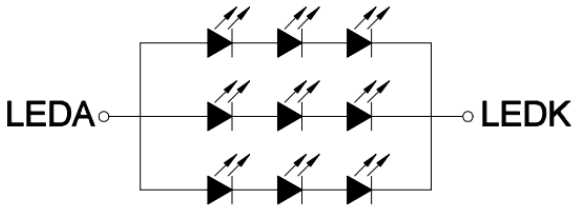
1. REVISION RECORD

REV NO.	REV DATE	CONTENTS	REMARKS
1.0	2022-09-05	Initial Release	

2. CONTENTS


P1
VDD
GND
BLVDD
BLVDD
BLGND
BLGND
RiBUS
L3
BLM18SG221TN1D
C17
10nF
L4
BLM18SG700TN1D
C24
10nF
VCC
BLVCC
GND
P4
R0
R1
R2
R3
R4
R5
R6
R7
G0
G1
G2
G3
G4
G5
G6
G7
B0
B1
B2
B3
B4
B5
B6
B7
VDD
RESET
HSYNC
VSYNC
DOTCLK
DEN
LED-A
LED-K
DISP
HS
VS
PCLK
DE
L7
BLM18KG601SN1D
C30
10u/16V
C31
100n
L9
DJNR4018-330-S
D5
SS26FL
U4
VIN
LX
EN
FB
DIO5661 OR
TPS61169
L10
BLM18SG700TN1D
C34
100n
C35
10u/16V
C36
100n
C37
10u/16V
C38
10u/16V
C39
100n
C40
100n
C41
4u7/50V
C42
100n
BL_PWM
R18
3R3
DISPLAY CONNECTOR
OF RVT35HHTXXXXX
ZIF0554DH-CF25

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,

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 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