

# **S2R72A54**

# **Evaluation Board Manual**

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### 1. Overview

This document applies to the S2R72A54 Evaluation Board (Product code: S5U2R72A54F0100) for the S2R72A54 hub control LSI supporting USB 2.0 (Product code: S2R72A54F12Ex00).

This document explains how to use connector, control function and parts of the S2R72A54 Evaluation Board.

## 2. Connectors, LEDs, and Power Supply

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## 2. Connectors, LEDs, and Power Supply

### 2.1 Parts arrangement

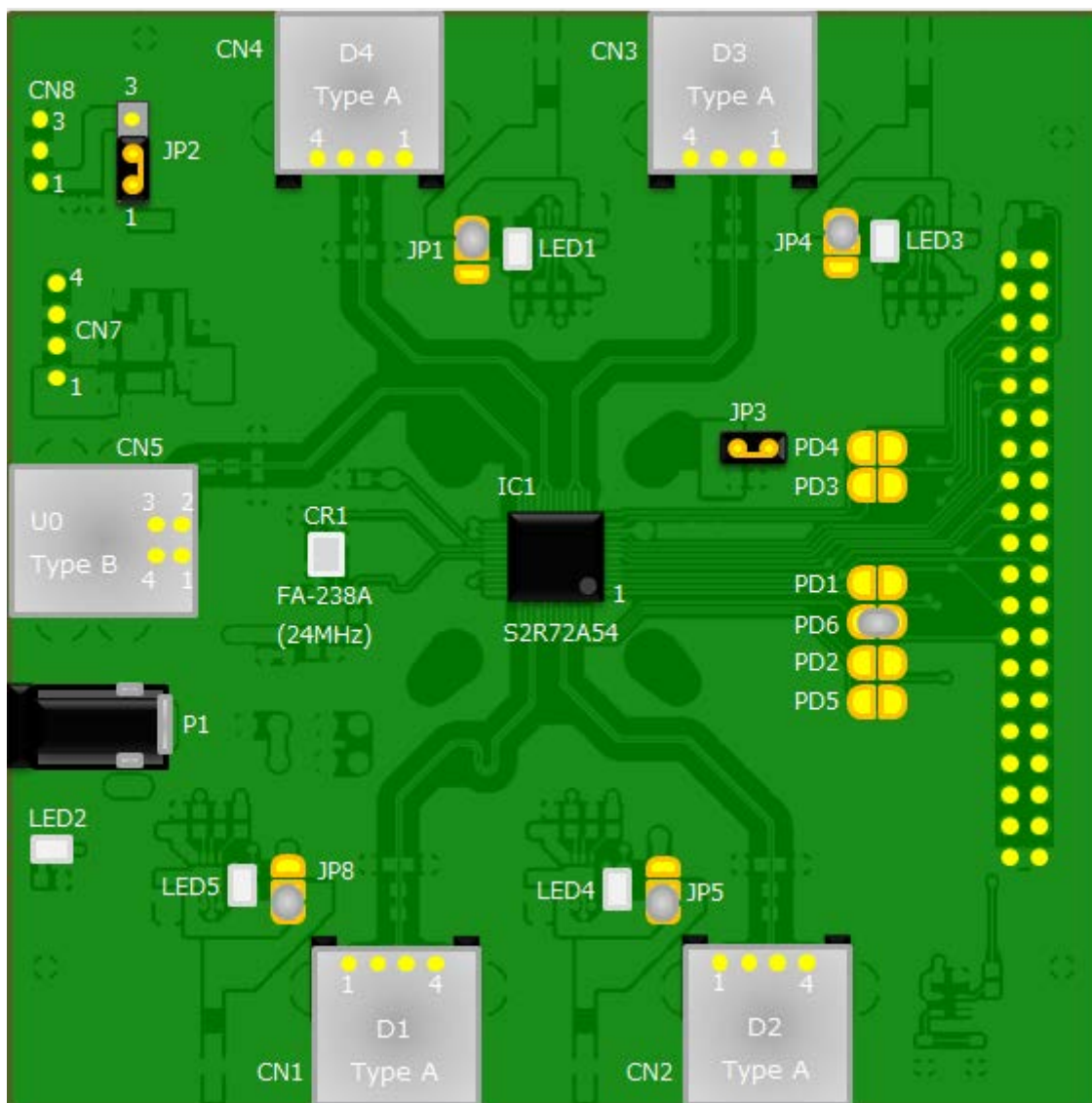


Figure 2.1 Parts arrangement of S2R72A54 Evaluation Board

### 2.2 Connectors

The connector uses are as shown below.

Table 2.1 Connectors

Reference	Uses
CN1	USB downstream port 1
CN2	USB downstream port 2
CN3	USB downstream port 3
CN4	USB downstream port 4
CN5	USB upstream port 0
CN6	Function expansion (not use)
CN7	Power supply input (5V) (not use)
P1	Power supply input receptacle (5V)
CN8	Power supply input (3.3V) (not use)

### 2.2 LEDs

The LED illumination patterns are as shown below.

Table 2.2 LEDs

Reference	Illumination pattern
LED2	Illuminates when 5V power supply is input.
LED5	Illuminates when Port1 VBUS switch is enabled.
LED4	Illuminates when Port2 VBUS switch is enabled.
LED3	Illuminates when Port3 VBUS switch is enabled.
LED1	Illuminates when Port4 VBUS switch is enabled.

## 2. Connectors, LEDs, and Power Supply

### 2.3 Power Supply

The diagram below illustrates the power supply configuration for the evaluation board. Provide +5 V to P1. CN7 and CN8 are not used in case of P1 used. And if CN7 and CN8 are not used, then they should be opened.

Note that, if +3.3 V external power supplies are provided, +5 V should be input to P1 or CN7, and +3.3 V should be input to CN8. In this case, JP2 described later must be changed from their default settings.

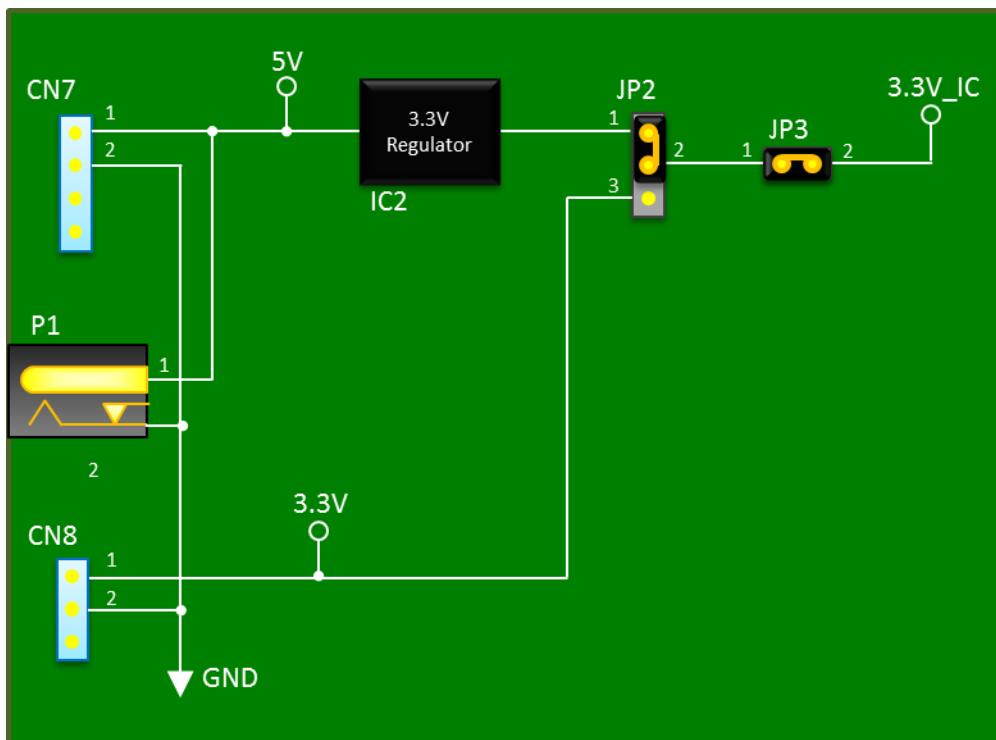


Figure 2.2 Structure of power supply

### 2.4 AC adapter

This evaluation board is structured along USB2.0 standard, it is needed power supply more than 2.5A, because USB2.0 standard says to need power supply of 500mA/1port, and this evaluation board consumes a current less than 500mA, therefore it is needed more than 2.5A of power supply. Therefore the recommendation condition of the AC adapter to connect to P1 is as follows.

Table 2.3 Recommendation condition of AC adapter

	Recommendation condition		Unit
	Min.	Max.	
Output voltage	4.75	5.25	V
Supply current	2.5	-	A
Plug dimension	$\phi 2.1 \times \phi 5.5 \times 9.5$		mm
Plug shape	Center : +, Outskirts : -		-

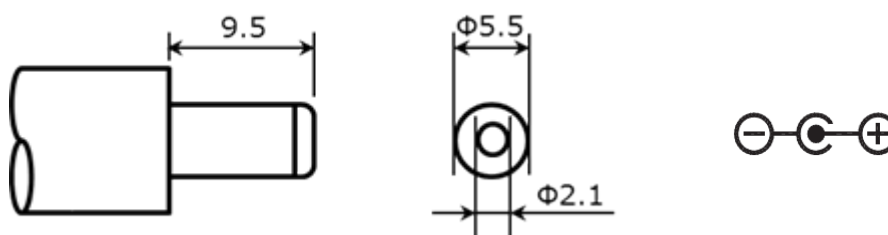


Figure 2.3 Plug dimension and shape

In our company, the following AC adapter is used for evaluation.

Manufacture:	Adapater Technology
Product code:	STD-05040U

**Note:** The output voltage of this AC adapter is 5V +- 6% and over the range of the above recommendation condition. However there is no problem in estimating when using it, the output voltage is in the range above mentioned. Conditions for use of this AC adapter is only room temperature in our evaluation, and the temperature load is not also giving in our temperature test.



### 3. Function Settings

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### 3. Function Settings

#### 3.1 Jumper pin list

The pin uses and details are as shown below. These are drawn yellow on parts of default settings.

Table 3.1 Jumper pin settings

Reference	Use	1-2 shorted	2-3 shorted
JP2	3.3V power supply selection	Onboard regulator	External input (CN8)
JP3	3.3V power consumption measurement	Always shorted	-

Table 3.2 Solder Jumper pin settings

Reference	Use	1-2 shorted	2-3 shorted
JP8	Port1 – VBUS power selection	Onboard VBUS switch	(supply from pin 3)
JP5	Port2 – VBUS power selection	Onboard VBUS switch	(supply from pin 3)
JP4	Port3 – VBUS power selection	Onboard VBUS switch	(supply from pin 3)
JP1	Port4 – VBUS power selection	Onboard VBUS switch	(supply from pin 3)
PD1	For testing	Opened	-
PD2	For testing	Opened	-
PD3	For testing	Opened	-
PD4	For testing	Opened	-
PD5	For testing	Opened	-
PD6	For testing	Shorted	-

### 3.2 Mode settings

#### VBUS supply mode settings

Set using PMODE (PD5 and R33). These are set to “Individual” with the default settings.

Table 3.3 VBUS supply mode settings

PMODE	R33	PD5	VBUS supply mode	Additional settings
H	Connect	Open	Individual mode	Short between Pin 1 and 2 of JP8, JP5, JP4 and JP1.
L	Remove	Short	Gang mode	Short between Pin 1 and 2 of JP8, and connect all Pin 2 of JP8, JP5, JP4 and JP1.

Note: IC7 (MAXIM : MAX8586ETA+T) may be detected as having overcurrent when using in Gang mode, depending on the power consumption of the USB device connected, as IC7 feeds the VBUS for all downstream ports. The initial overcurrent detection setting ( $R24 = 39 \text{ k}\Omega$ ) is 0.925 A (typ.), and so R24 should be changed appropriately if the total VBUS supply current for all downstream ports exceeds this. For more information, refer to the IC7 data sheet.

## 4. Appendix

### 4. Appendix

#### 4.1 Board dimensions

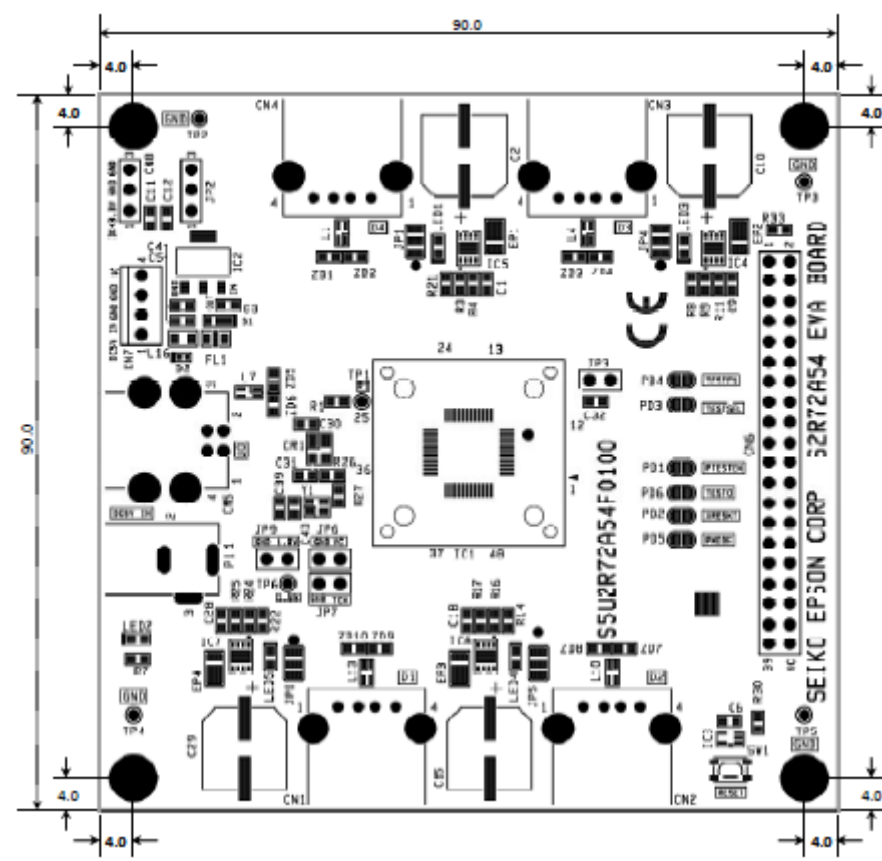


Figure 4.1 Board dimensions

#### 4.2 Circuit diagram

It's attached to the end of this document.

## 4.3 Parts list

Table 4.1 Parts list

Reference	Model	Manufacture	Qty.	Other Comment	no mount
CN1,CN2,CN3,CN4	UBA-4R-D14-4D	JST	4	USB Type-A Connector	
CN5	UBB-4R-D14T-4D	JST	1	USB Type-B Connector	
CN6	WLW-8-20PW	MAC8	1	2 line - 40 pin	✓
CN7	171825-4	AMP	1	1 line - 4 pin	✓
CN8	WL-1-3	MAC8	1	1 line - 3 pin	✓
CR1	FA-238A (24MHz)	EPSON	1	CL : 7pF	
C1,C9,C18,C28	LMK107B7105KA-T	Taiyo Yuden	4	1uF/10V/1608/10%	
C2,C10,C15,C29	EEEHD1C221AP	Panasonic	4	220uF/16V	
C3,C5,C11,C32,C22,C23,C24	GRM188R61C106KAALD	MURATA	7	10uF/16V/1608/10%	
C4,C6,C12,C20,C21,C25,C33,C34,C35,C36	CL10B104KB8NNNC	Samsung	10	0.1uF/50V/1608/10%	
C7,C8,C13,C14,C16,C17,C26,C27,C31,C37,C38	C1608C0G1H070D080AA	TDK	11	7pF/50V/1608/0.5p	
C30	GRM1885C1H6R0DZ01D	MURATA	1	6pF/50V/1608/0.5p	
C19	GRM188R61C225KE15D	MURATA	1	2.2uF/16V/1608/10%	
C39	GRM188B11H103KA01D	MURATA	1	0.01uF/50V/1608/10%	✓
C40	C1608X7R1H104K080AA	TDK	1	0.1uF/50V/1608/10%	✓
D1	RSX051VA-30TR	ROHM	1		
D2	DF2S5.6FS,L3M	TOSHIBA	1		
EP1,EP2,EP3,EP4	-		4		✓
IC4,IC5,IC6,IC7	MAX8586ETA+T	MAXIM	4		
IC2	LT1117CST-3.3	LINEAR TECHNOLOGY	1		
IC3	TPS3800G27DCK	TI	1		
IC1	S2R72A54	EPSON	1	USB-Hub HS 4 ports	
JP1,JP4,JP5,JP8	-		4		✓
JP2	WL-1-3	MAC8	1	1 line - 3 pin	
JP3	WL-1-2	MAC8	1	1 line - 2 pin	
JP6,JP7	WL-1-2	MAC8	2	1 line - 2 pin	✓
JP9	WL-1-2	MAC8	1	1 line - 2 pin	✓
LED1,LED2,LED3,LED4,LED5	SML-510MWT86	ROHM	5	Green	
L1,L4,L7,L10,L13	DLW21SN900SQ2L	MURATA	5		✓
L2,L3,L5,L6,L8,L9,L11,L12,L14,L15	BLM21PG600SN1D	MURATA	10		
P1	MJ-179PH	MARUSHIN ELECTRIC	1		
R21,R2,R4,R6,R8,R10,R11,R13,R14,R15,R17,R20,R22,R23,R25,R26,R29,R30	ERJ-3GEY0R00V	Panasonic	18	0/1608	
R3,R9,R16,R24,R32	ERJ-3EKF3902V	Panasonic	5	39K/0.1W/1608/1%	
R5,R7,R12,R19,R28	ERJ-3EKF8200V	Panasonic	5	820/0.1W/1608/1%	
R18	ERJ-3EKF10R0V	Panasonic	1	10/0.1W/1608/1%	
R1	ERJ-3EKF6041V	Panasonic	1	6.04K/0.1W/1608/1%	
R27	ERJ-3GEY0R00V	Panasonic	1	0/1608	✓
SH1,SH2	MJ1B-BGB-L	Amtek Technology	2		
SW1	SKRPABE010	ALPS	1		
TP1,TP6	-		2		✓
TP2,TP3,TP4,TP5	SLC-33-G-K		4		
Y1	SG-211SEE 24MHz	EPSON	1		✓
ZD1,ZD2,ZD3,ZD4,ZD5,ZD6,ZD7,ZD8,ZD9,ZD10	AVRL161A6R8GBA	TDK	10		✓
FL1	NFM21PC105B1C3D	MURATA	1		
L16	BLM21PG220SN1	MURATA	1		
R31	ERJ-3EKF2202V	Panasonic	1	22K/0.1W/1608/1%	
R33	ERJ-3EKF1002V	Panasonic	1	10K/0.1W/1608/1%	

## 4. Appendix

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Note:

- Equivalent products may be mounted.
- Includes components not mounted. Check the “No\_Mount” indication in this parts list and the circuit diagram.

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## Revision History

Rev. No.	Date	Page	Type	Revision details (including previous details) and reason
Rev. 0.79	Apr. 1, 2016	All	New	Newly established
Rev. 0.90	Jul. 20, 2016	P.1	Added	Added parts code (S5U2R72A54F0100) as this eva board.
		P.2	Revised	Changed parts arrangement of Figure 2.1.
		P.4	Revised	Changed structure of power supply of Figure 2.2.
		P.5	Added	Added section 2.4 AC adapter.
		P.7	Added	Added "MAXIM: MAX8586ETA+T" as explanation of IC7.
		P.8	Added	Added board dimensions of Figure 4.1.
		P.9	Added	Added parts list of Table 4.1.
		EOD	Added	Added circuit diagram
Rev. 1.00	Oct. 28, 2016	All	Established	Established with qualified mass production of S2R72A54

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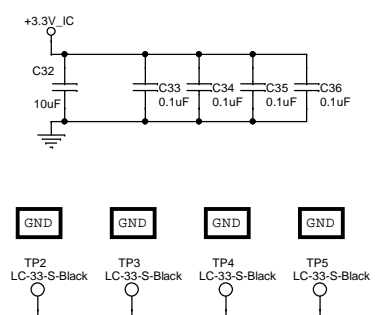
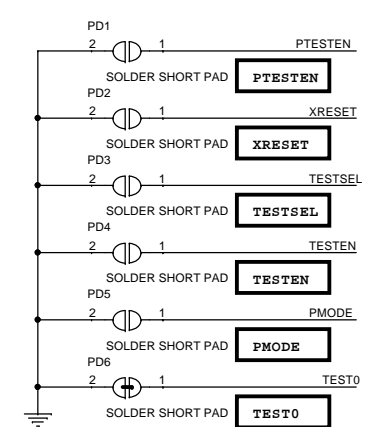
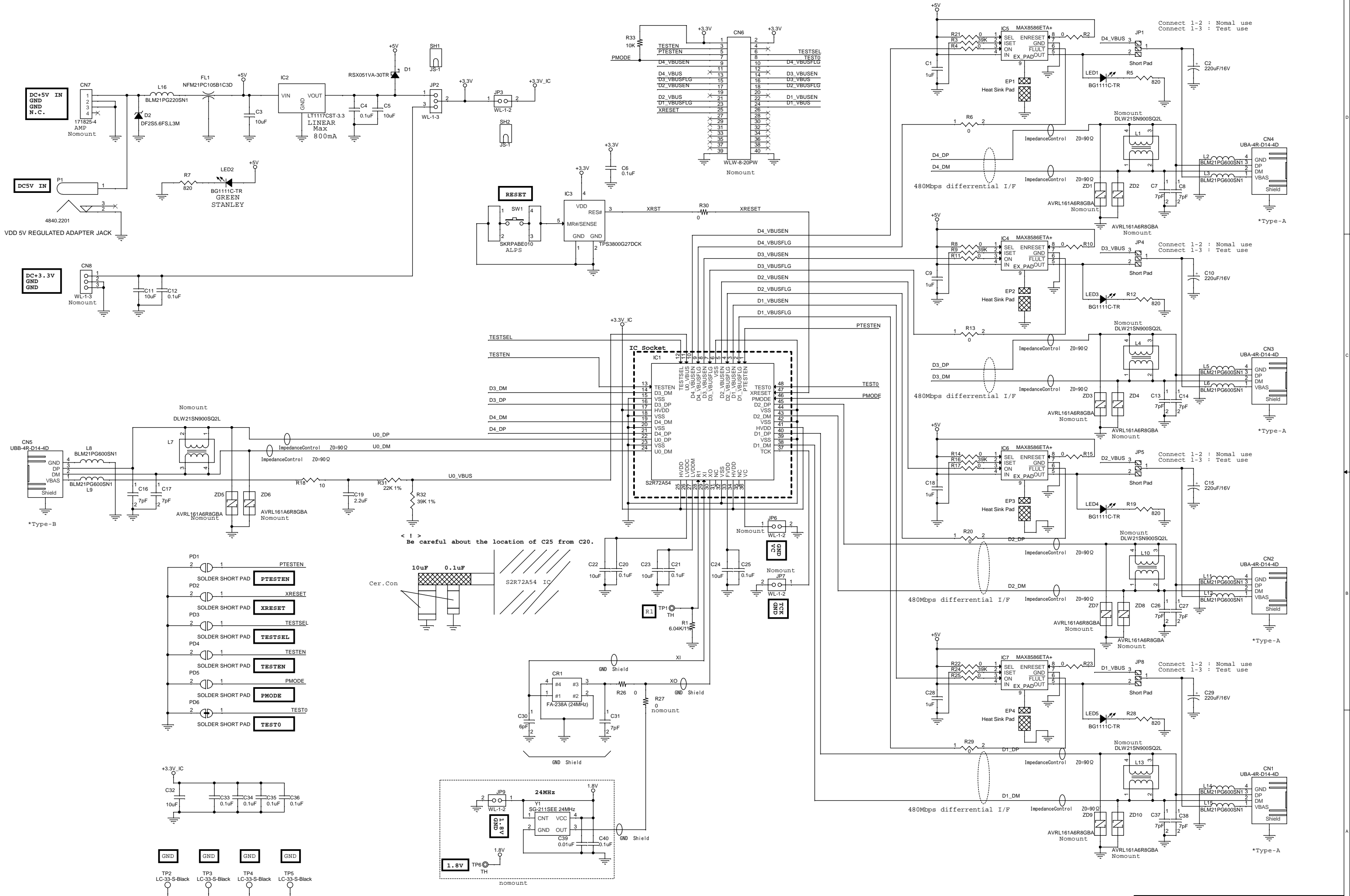
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