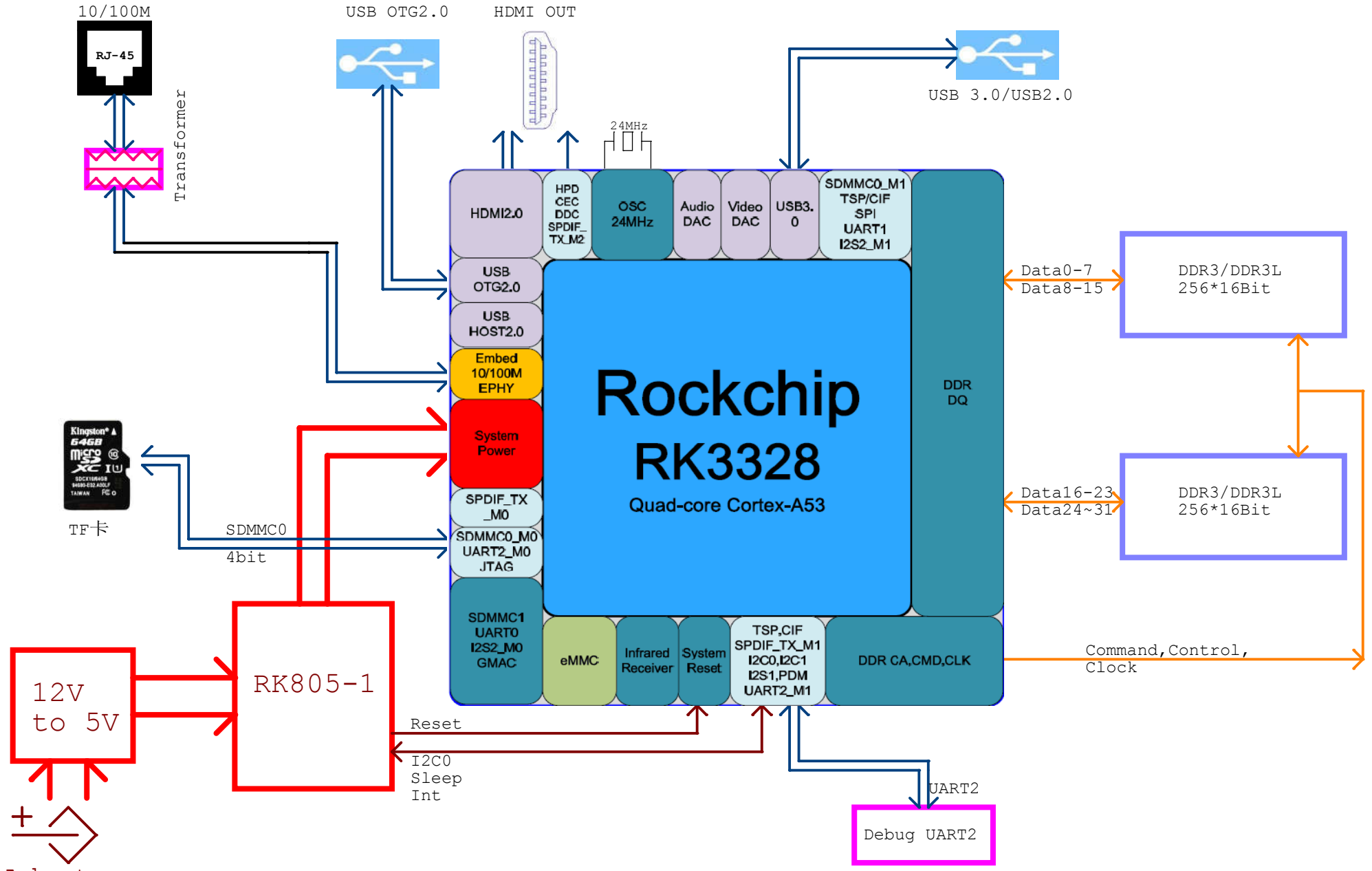
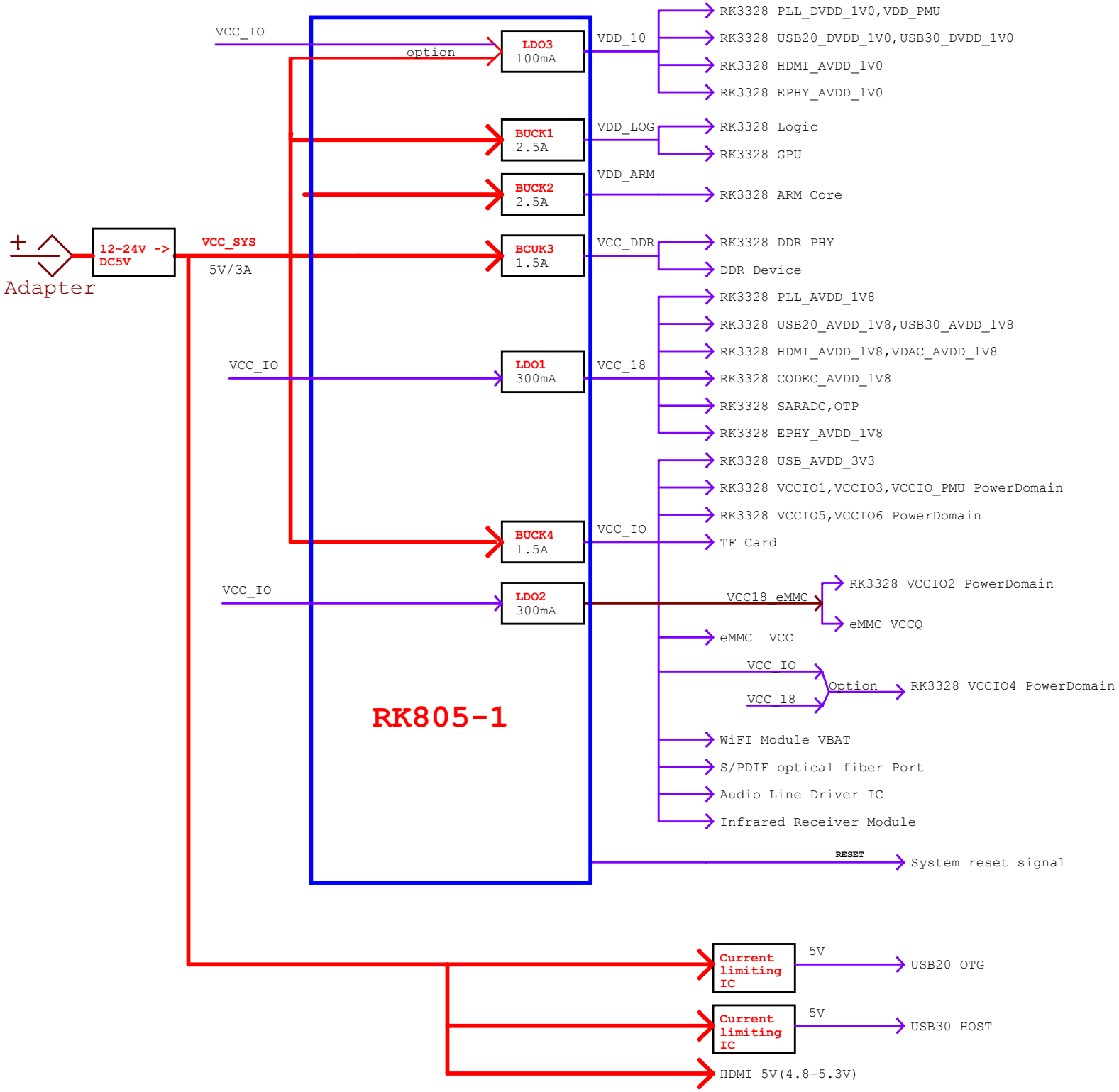


Title	MKS PI	Makerbase FaceBooK : https://www.facebook.com/Makerbase.mks/ Github : https://github.com/makerbase-mks	
Size A3	Document Number 01_Block Diagram	Makerbase	Rev V1.0_002
Date:	Friday, April 01, 2022	Sheet 1 of 18	



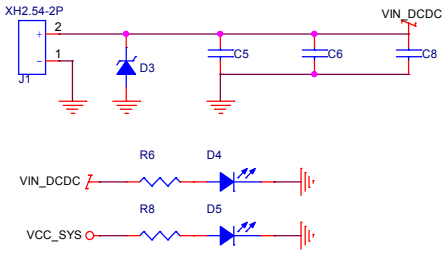
Power Timing

TYPE	VOLT	STEP	PowerName
BUCK1	1.1V		VDD_LOG
BUCK2	1.1V		VDD_ARM
BUCK3	FB=0.8V		VCC_DDR
BUCK4	3.3V		VCC_IO
LDO1	1.8V		VCC_18
LDO2	1.8V		VCC18_eMMC
LDO3	1.0V		VDD_10

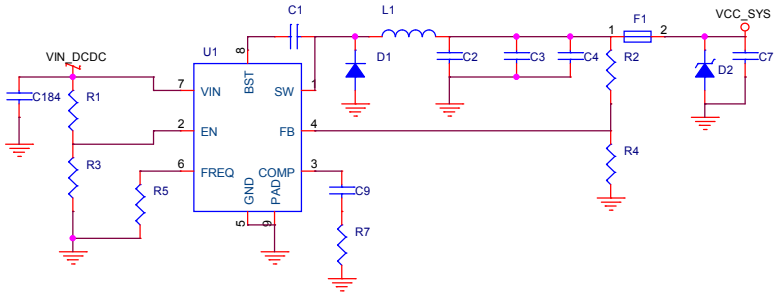
IO Domain Voltage	IO Voltage=3.3V	IO Voltage=1.8V
VCCIO_PMU	3.3V	Not Support
VCCIO1	3.3V	Not Support
VCCIO2		1.8V (Default) eMMC
VCCIO3	3.3V (Default)	
VCCIO4	3.3V (Default) WIFI:RTL8723BS	
VCCIO5	3.3V (Default)	
VCCIO6	3.3V (Default)	

Title	MKS PI	Makerbase FaceBook : https://www.facebook.com/Makerbase.mks/ Github : https://github.com/makerbase-mks	
Size A2	Document Number 02_Power tree-RK805-1	Makerbase	Rev V1.0.002
Date:	Friday, April 01, 2022	Sheet 2 of 18	

DC12~24V



VCC_SYS



不得删除！
不得随意更换型号！

IF TVS UNMOUNTED, ESD OR SURGE SHOULD BE DAMAGE THE PMIC!!!

If using 5V adapter, this device must be mounted.Replacing TVS mode is not recommended, if must, please choose the same specifications

Operating Supply Vltage : 5.5V(5.25-6V)
PeakPulse Current: >10A (tp=8/20uS)
Surge Clamping Voltage: <6.5V

DO NOT DELETE IT!

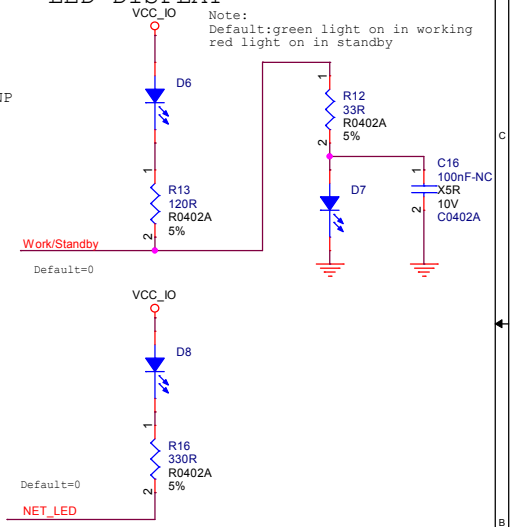
1: If WIFI/BT needs 32.768KHz clock, CPU provide 32.768KHz clock by default, and crystal DNP

2: If PLL frequency division was modified, causing 32.768KHz clock cannot be output, while WIFI/BT needs 32.768KHz clock, this part of circuit needs be mounted

3: If WIFI/BT needs not 32.768KHz clock, this part can DNP The module needs 32.768KHz nor not, please refer to each WIFI/BT module paging notes

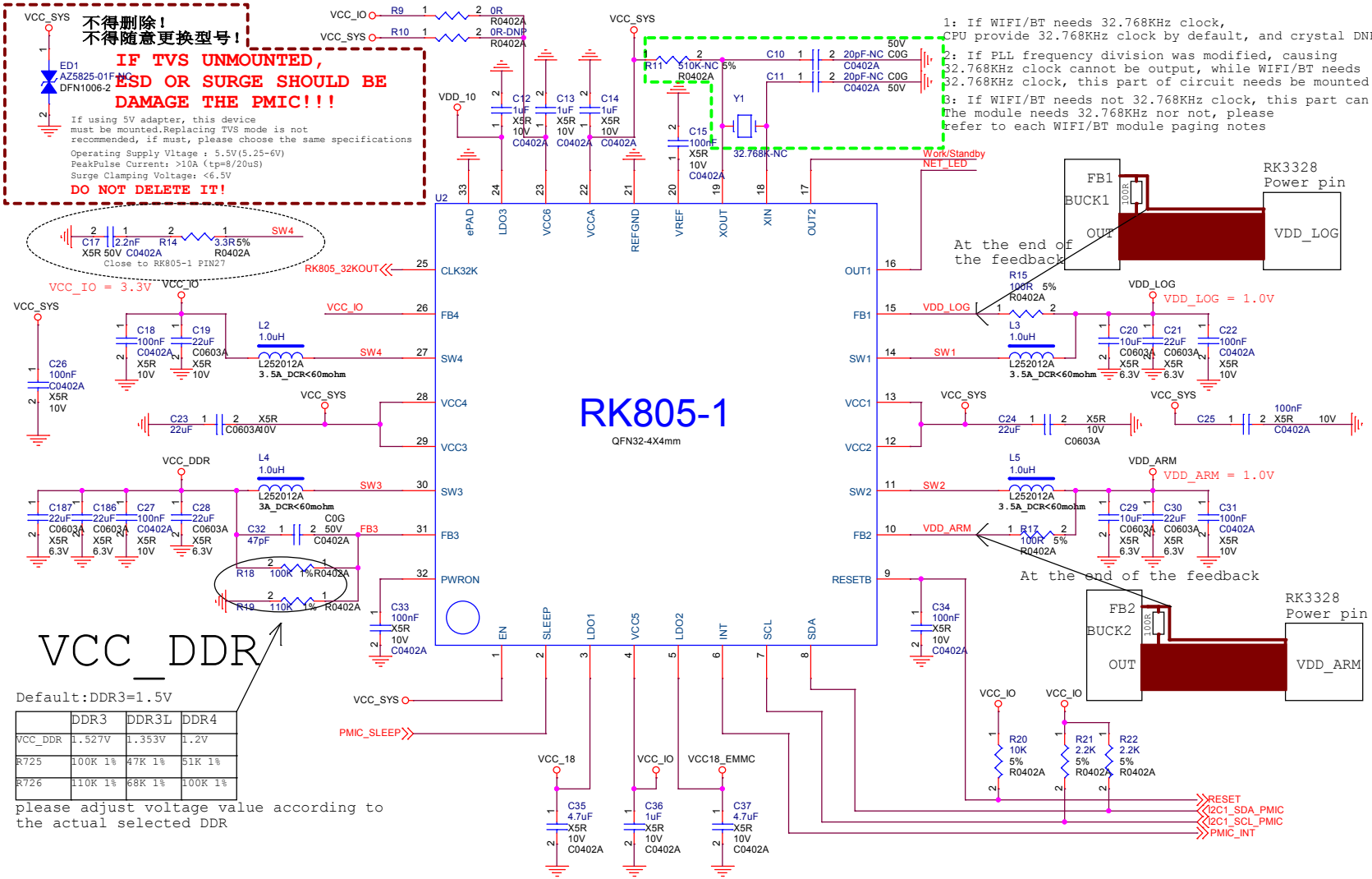
LED DISPLAY

Note:
Default:green light on in working
red light on in standby



RK805-1

QFN32-4X4mm



At the end of the feedback

VDD_LOG = 1.0V

At the end of the feedback

VDD_ARM = 1.0V

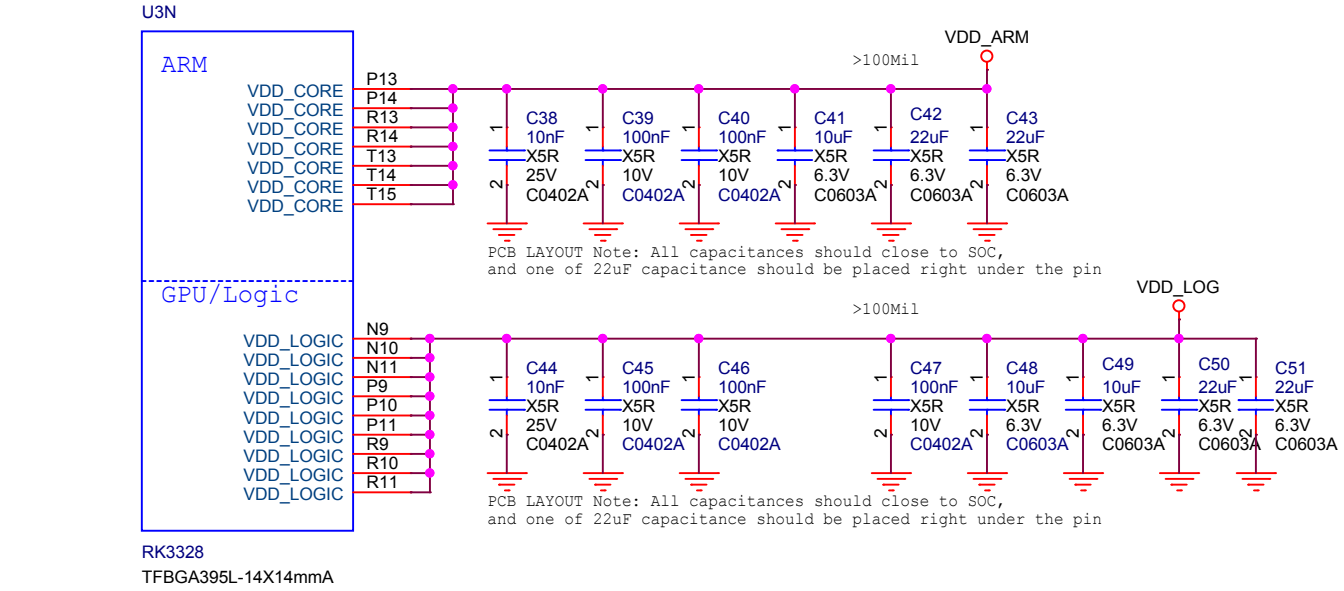
VCC_DDR

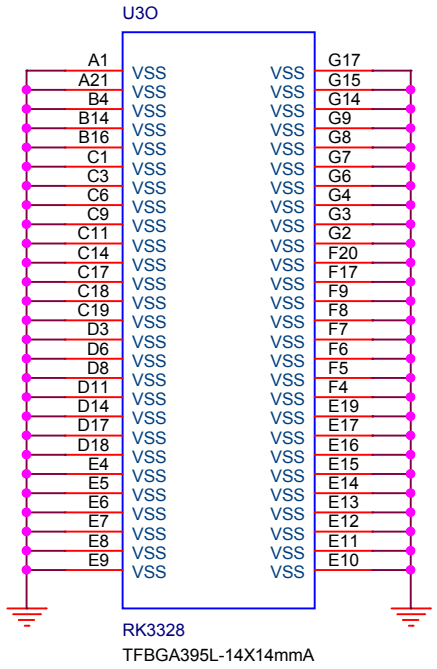
Default:DDR3=1.5V

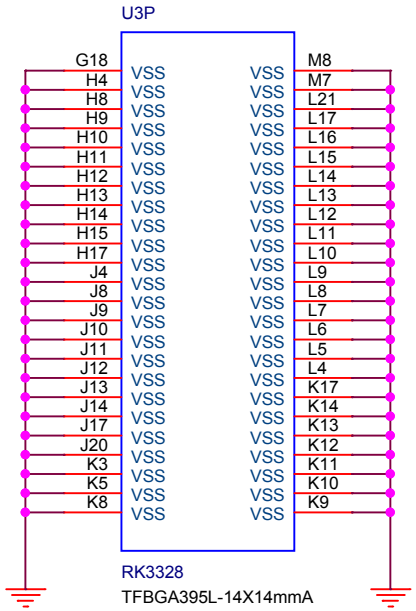
	DDR3	DDR3L	DDR4
VCC_DDR	1.527V	1.353V	1.2V
R725	100K 1%	47K 1%	51K 1%
R726	110K 1%	68K 1%	100K 1%

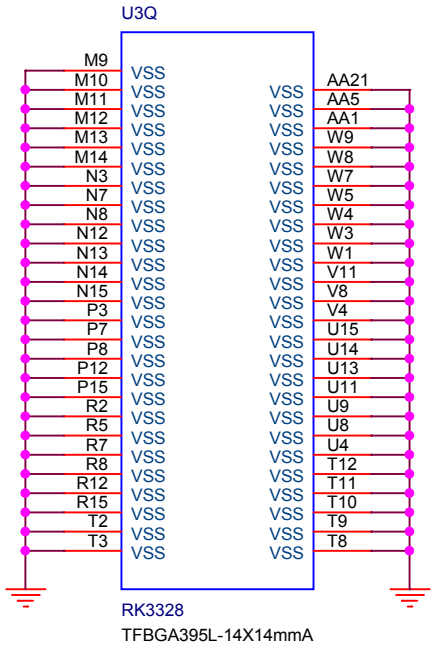
please adjust voltage value according to the actual selected DDR

Title	MKS PI	Makerbase FaceBook : https://www.facebook.com/Makerbase.mks/ Github : https://github.com/makerbase-mks	
Size A3	Document Number 03_System Power-PMIC RK805-1		Rev V1.0_002
Date: Tuesday, May 24, 2022	Sheet 3 of 18		

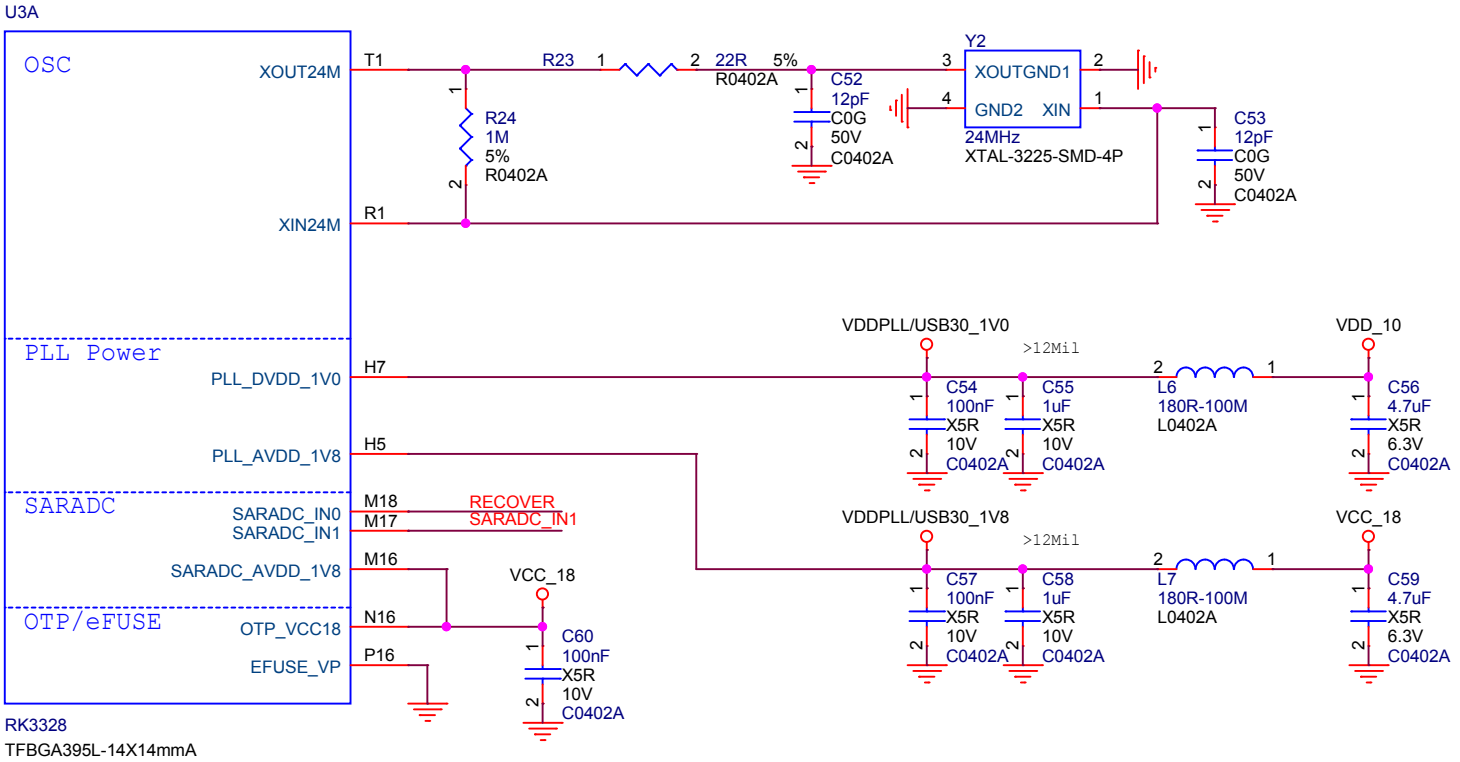


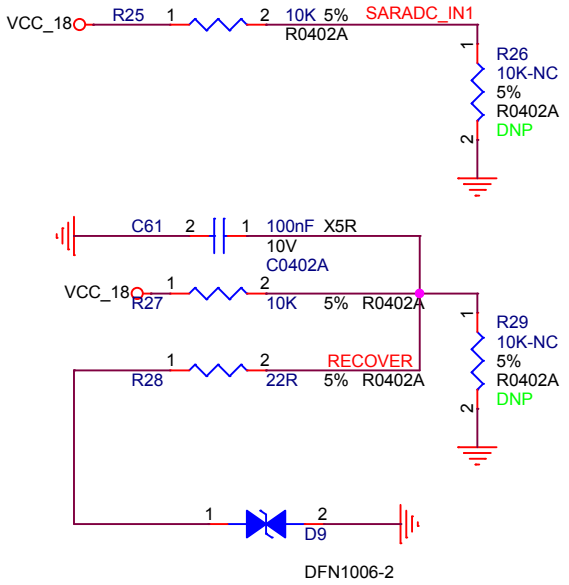






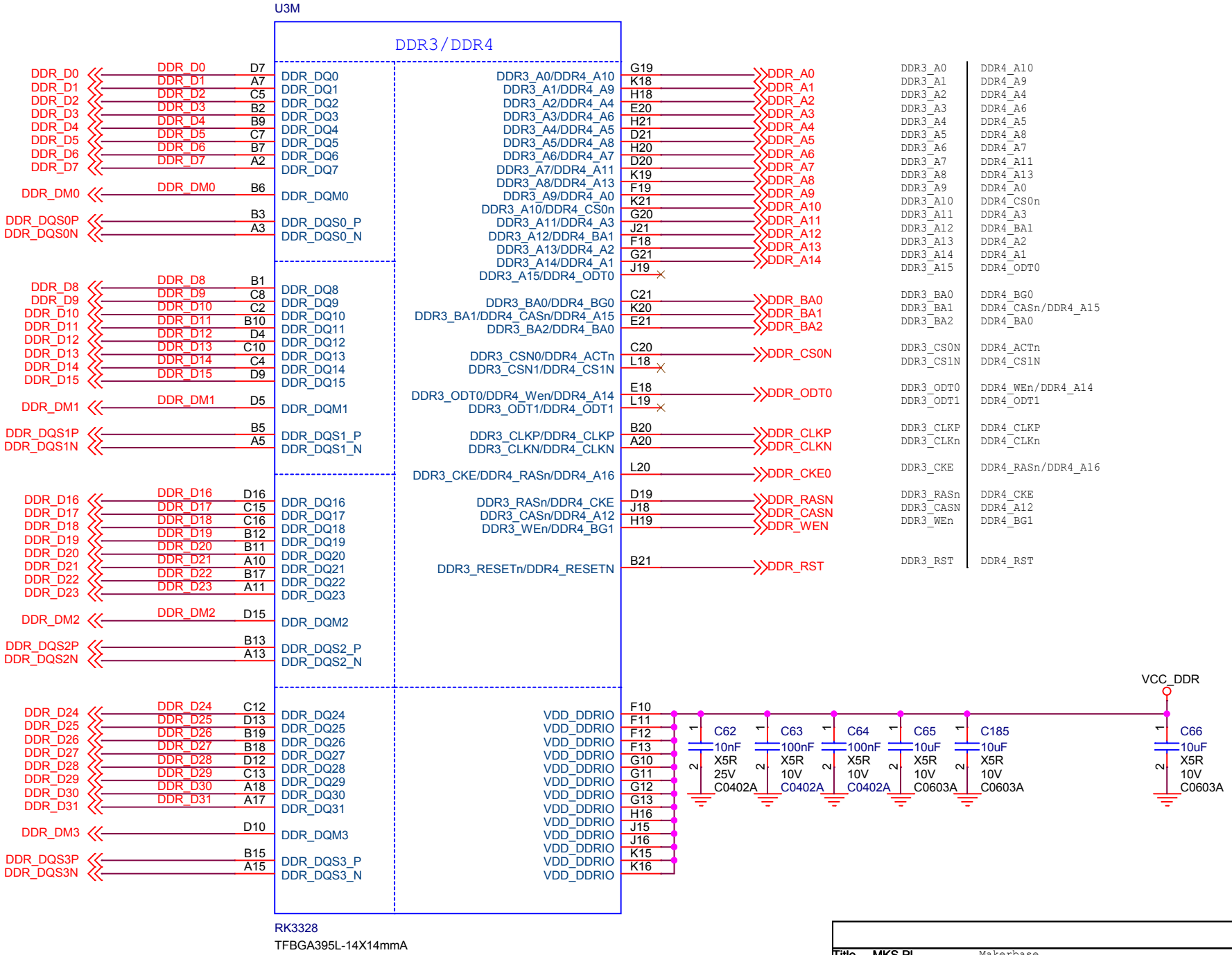
Title	MKS PI	Makerbase FaceBooK : https://www.facebook.com/Makerbase.mks/ Github : https://github.com/makerbase-mks	
Size A4	Document Number 04_RK3328 Power	Makerbase	Rev V1.0_002
Date:	Friday, April 01, 2022	Sheet 4 of 18	





SARADC_IN0	SARADC_IN1	Up Resistance	Down Resistance	
Recover		DNP	10K	
BOM1		110K	10K	
BOM2		100K	20K	
BOM3		100K	33K	
BOM4		36K	18K	
BOM5		51K	36K	
BOM6		51K	51K	
BOM7		36K	51K	
BOM8		18K	36K	
BOM9		33K	100K	
BOM10		20K	100K	
BOM11		10K	110K	
BOM12		10K	DNP	

Title	MKS PI	Makerbase FaceBooK : https://www.facebook.com/Makerbase.mks/ Github : https://github.com/makerbase-mks	
Size A4	Document Number 05_RK3328 OSC/PLL/OTP/SARADC		Rev V1.0_002
Date:	Saturday, April 02, 2022	Sheet 5 of 18	


U3M
DDR3/DDR4
DDR_D0
DDR_D1
DDR_D2
DDR_D3
DDR_D4
DDR_D5
DDR_D6
DDR_D7
DDR_DM0
DDR_DQS0P
DDR_DQS0N
DDR_D8
DDR_D9
DDR_D10
DDR_D11
DDR_D12
DDR_D13
DDR_D14
DDR_D15
DDR_DM1
DDR_DQS1P
DDR_DQS1N
DDR_D16
DDR_D17
DDR_D18
DDR_D19
DDR_D20
DDR_D21
DDR_D22
DDR_D23
DDR_DM2
DDR_DQS2P
DDR_DQS2N
DDR_D24
DDR_D25
DDR_D26
DDR_D27
DDR_D28
DDR_D29
DDR_D30
DDR_D31
DDR_DM3
DDR_DQS3P
DDR_DQS3N
DDR_DQ0
DDR_DQ1
DDR_DQ2
DDR_DQ3
DDR_DQ4
DDR_DQ5
DDR_DQ6
DDR_DQ7
DDR_DQM0
DDR_DQS0_P
DDR_DQS0_N
DDR_DQ8
DDR_DQ9
DDR_DQ10
DDR_DQ11
DDR_DQ12
DDR_DQ13
DDR_DQ14
DDR_DQ15
DDR_DQM1
DDR_DQS1_P
DDR_DQS1_N
DDR_DQ16
DDR_DQ17
DDR_DQ18
DDR_DQ19
DDR_DQ20
DDR_DQ21
DDR_DQ22
DDR_DQ23
DDR_DQM2
DDR_DQS2_P
DDR_DQS2_N
DDR_DQ24
DDR_DQ25
DDR_DQ26
DDR_DQ27
DDR_DQ28
DDR_DQ29
DDR_DQ30
DDR_DQ31
DDR_DQM3
DDR_DQS3_P
DDR_DQS3_N
DDR3_A0/DDR4_A10
DDR3_A1/DDR4_A9
DDR3_A2/DDR4_A4
DDR3_A3/DDR4_A6
DDR3_A4/DDR4_A5
DDR3_A5/DDR4_A8
DDR3_A6/DDR4_A7
DDR3_A7/DDR4_A11
DDR3_A8/DDR4_A13
DDR3_A9/DDR4_A0
DDR3_A10/DDR4_CS0n
DDR3_A11/DDR4_A3
DDR3_A12/DDR4_BA1
DDR3_A13/DDR4_A2
DDR3_A14/DDR4_A1
DDR3_A15/DDR4_ODT0
DDR3_BA0/DDR4_BG0
DDR3_BA1/DDR4_CASn/DDR4_A15
DDR3_BA2/DDR4_BA0
DDR3_CSN0/DDR4_ACTn
DDR3_CSN1/DDR4_CS1N
DDR3_ODT0/DDR4_Wen/DDR4_A14
DDR3_ODT1/DDR4_ODT1
DDR3_CLKP/DDR4_CLKP
DDR3_CLKN/DDR4_CLKN
DDR3_CKE/DDR4_RASn/DDR4_A16
DDR3_RASn/DDR4_CKE
DDR3_CASn/DDR4_A12
DDR3_WEn/DDR4_BG1
DDR3_RESETn/DDR4_RESETN
VDD_DDRIO
DDR_A0
DDR_A1
DDR_A2
DDR_A3
DDR_A4
DDR_A5
DDR_A6
DDR_A7
DDR_A8
DDR_A9
DDR_A10
DDR_A11
DDR_A12
DDR_A13
DDR_A14
DDR_BA0
DDR_BA1
DDR_BA2
DDR_CS0N
DDR_ODT0
DDR_CLKP
DDR_CLKN
DDR_CKE0
DDR_RASN
DDR_CASN
DDR_WEN
DDR_RST
DDR3_A0 DDR4_A10
DDR3_A1 DDR4_A9
DDR3_A2 DDR4_A4
DDR3_A3 DDR4_A6
DDR3_A4 DDR4_A5
DDR3_A5 DDR4_A8
DDR3_A6 DDR4_A7
DDR3_A7 DDR4_A11
DDR3_A8 DDR4_A13
DDR3_A9 DDR4_A0
DDR3_A10 DDR4_CS0n
DDR3_A11 DDR4_A3
DDR3_A12 DDR4_BA1
DDR3_A13 DDR4_A2
DDR3_A14 DDR4_A1
DDR3_A15 DDR4_ODT0
DDR3_BA0 DDR4_BG0
DDR3_BA1 DDR4_CASn/DDR4_A15
DDR3_BA2 DDR4_BA0
DDR3_CS0N DDR4_ACTn
DDR3_CS1N DDR4_CS1N
DDR3_ODT0 DDR4_WEn/DDR4_A14
DDR3_ODT1 DDR4_ODT1
DDR3_CLKP DDR4_CLKP
DDR3_CLKn DDR4_CLKn
DDR3_CKE DDR4_RASn/DDR4_A16
DDR3_RASn DDR4_CKE
DDR3_CASN DDR4_A12
DDR3_WEn DDR4_BG1
DDR3_RST DDR4_RST
VCC_DDR
C62 10nF X5R 25V C0402A
C63 100nF X5R 10V C0402A
C64 100nF X5R 10V C0402A
C65 10uF X5R 10V C0603A
C185 10uF X5R 10V C0603A
C66 10uF X5R 10V C0603A
RK3328
TFBGA395L-14X14mmA
Title MKS PI
Makerbase
FaceBooK : https://www.facebook.com/Makerbase.mks/
Github : https://github.com/makerbase-mks
Size A4
Document Number 06_RK3328 DDR Controler
Makerbase
Rev V1.0_002
Date: Friday, April 01, 2022
Sheet 6 of 18

U3C

GPIO0_A7/EMMC_D0_u U19
GPIO2_D4/EMMC_D1_u U20
GPIO2_D5/EMMC_D2_u U21
GPIO2_D6/EMMC_D3_u V19
GPIO2_D7/EMMC_D4_u U18
GPIO3_C0/EMMC_D5_u W21
GPIO3_C1/EMMC_D6_u T18
GPIO3_C2/EMMC_D7_u T19
GPIO3_C3/EMMC_CMD_u R20
GPIO3_C5/EMMC_CLKOUT_u R21
GPIO3_C6/EMMC_PWREN_d R19
VCCIO2 T17

VCCIO_FLASH
VCC18_EMMC

C67 100nF X5R 10V C0402A

RK3328
TFBGA395L-14X14mmA

U3D

GPIO1_A0/SDMMC0_D0/UART2_TX_M0_u U10 SDMMC0_D0
GPIO1_A1/SDMMC0_D1/UART2_RX_M0_u W11 SDMMC0_D1
GPIO1_A2/SDMMC0_D2/JTAG_TCK_u W13 SDMMC0_D2/JTAG_TCK
GPIO1_A3/SDMMC0_D3/JTAG_TMS_u AA13 SDMMC0_D3/JTAG_TMS
GPIO1_A4/SDMMC0_CMD_u Y13 SDMMC0_CMD
GPIO1_A6/SDMMC0_CLK/TEST_CLK0_d W12 SDMMC0_CLK
GPIO1_A5/SDMMC0_DETN_u V10 SDMMC0_DET
VCCIO3 U7 VCC_IO_SD

C68 100nF X5R 10V C0402A

RK3328
TFBGA395L-14X14mmA

U3G

GPIO3_A4/TSP_D0/CIF_D0/SDMMC0EXT_D0/UART1_TX/USB3PHY_DEBUG4_u E2 TFT_RESET
GPIO3_A5/TSP_D1/CIF_D1/SDMMC0EXT_D1/UART1_RTSN/USB3PHY_DEBUG5_u D1 TFT_BKL
GPIO3_A6/TSP_D2/CIF_D2/SDMMC0EXT_D2/UART1_RX/USB3PHY_DEBUG6_u F2 TFT_RS
GPIO3_A7/TSP_D3/CIF_D3/SDMMC0EXT_D3/UART1_CTSN/USB3PHY_DEBUG7_u F1 TOUCH_CS
GPIO3_A0/TSP_VALID/CIF_VSYNC/SDMMC0EXT_CMD/SPI_CLK_M2/USB3PHY_DEBUG1/I2S2_SCLK_M1_u E3 TFT_SCK
GPIO3_A2/TSP_CLK/CIF_CLKIN/SDMMC0EXT_CLK/SPI_RXD_M2/USB3PHY_DEBUG3/I2S2_SDI_M1_d E1 TFT_MISO
GPIO3_A1/TSP_FAIL/CIF_HREF/SDMMC0EXT_DET/SPI_TXD_M2/USB3PHY_DEBUG2/I2S2_SDO_M1_u D2 TFT_MOSI
GPIO3_B0/TSP_D4/CIF_D4/SPI_CSN0_M2/I2S2_LRCK_TX_M1/USB3PHY_DEBUG8/I2S2_LRCK_RX_M1_d F3 TFT_CS
VCCIO6 H6 VCCIO_WL_EXT

VCCIO_WL_EXT
VCC_IO

C69 100nF X5R 10V C0402A

RK3328
TFBGA395L-14X14mmA

SDMMC0_D0	----------	SD_D0
SDMMC0_D1	----------	SD_D1
SDMMC0_D2/JTAG_TCK	----------	SD_D2
SDMMC0_D3/JTAG_TMS	----------	SD_D3
SDMMC0_CMD	----------	SD_CMD
SDMMC0_CLK	----------	SD_CLK
SDMMC0_DET	----------	SD_DET
VCCIO3	----------	VCC_IO
SDMMC0EXT_D0	----------	WIFI_D0_EXT
SDMMC0EXT_D1	----------	WIFI_D1_EXT
SDMMC0EXT_D2	----------	WIFI_D2_EXT
SDMMC0EXT_D3	----------	WIFI_D3_EXT
SDMMC0EXT_CMD	----------	WIFI_CMD_EXT
SDMMC0EXT_CLK	----------	WIFI_CLK_EXT
GPIO3_A1	----------	WIFI_WAKE_HOST_EXT
VCCIO6	----------	VCCIO_WL_EXT

Note:
SDMMC0 support SD Boot, Max 150MHz
SDMMC0EXT does not support SD Boot, Max 100MHz

In gigabit Ethernet requirements:
If requiring high performance WIFI, WIFI SDIO connects to SDMMC0 port, causing without supporting SD Boot .
And SDMMC0EXT connects to SD Card

VCC_IO
L20 180R-100M-NC L0402A
VCC_IO_SD
C188 4.7uF X5R 10V C0402A

VCC_SYS
C191 4.7uF X5R 10V C0402A
C192 100nF X5R 10V C0402A
R128
U14 VIN VOUT GND EN ADJ
R129 124K 1% R0402A
C190 390pF X5R 50V C0402A
C189 1nF X5R 50V C0402A
R131 66.5K 1% R0402A
R130 100K 1% R0402A

SDIO_PER
R132 10K 1% R0402A
Q4 CJ3400 SOT-23
R133 47K 1% R0402A

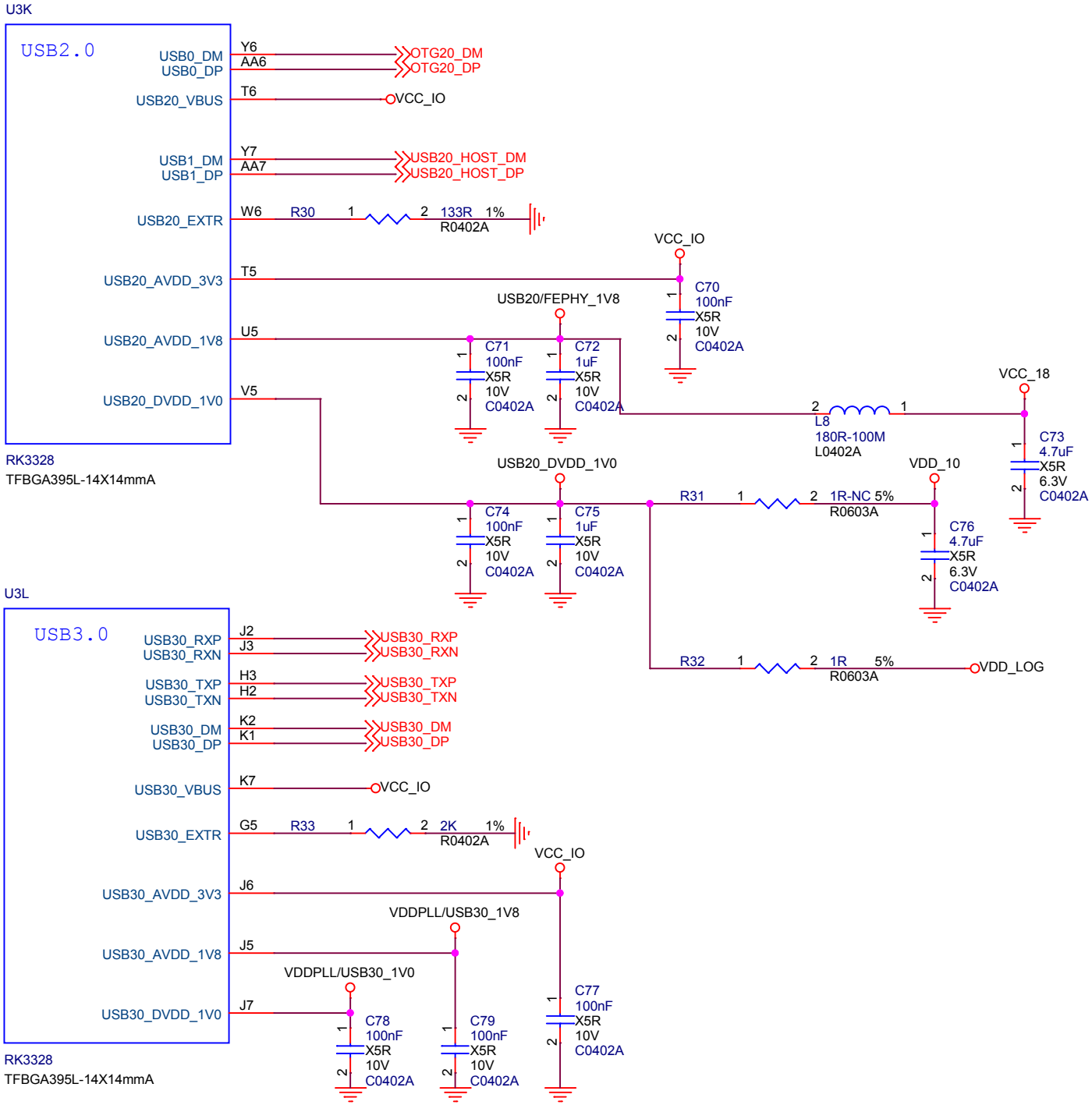
SDIO_PER 低电平时：

Q4截止。
U14电压输出 = 0.8*（1+R129/R130）=0.8*(1+124K/100K) = 1.792V

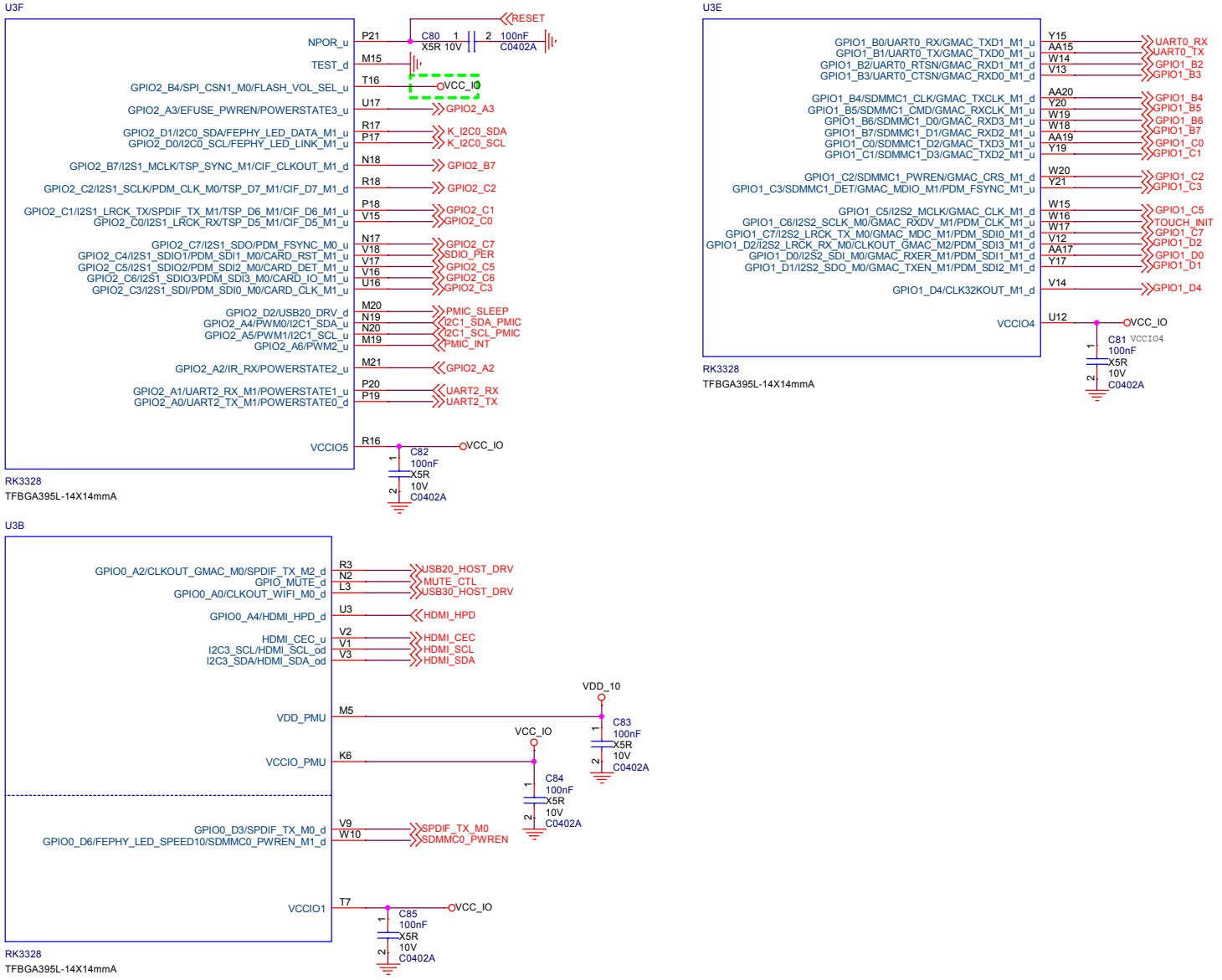
SDIO_PER 高电平时：

Q4栅极由 SDIO_PER 电阻分压，Q4导通。
U20电压输出 =0.8*（1+R129/(R130并联R131)）=0.8*(1+124K/(100K并联66.5K)) = 3.283V

Title	MKS PI	Makerbase FaceBooK : https://www.facebook.com/Makerbase.mks/ Github : https://github.com/makerbase-mks	
Size A4	Document Number 07_RK3328 eMMC Controler/TF	Makerbase	Rev V1.0_002
Date: Tuesday, May 24, 2022	Sheet 7 of 18		

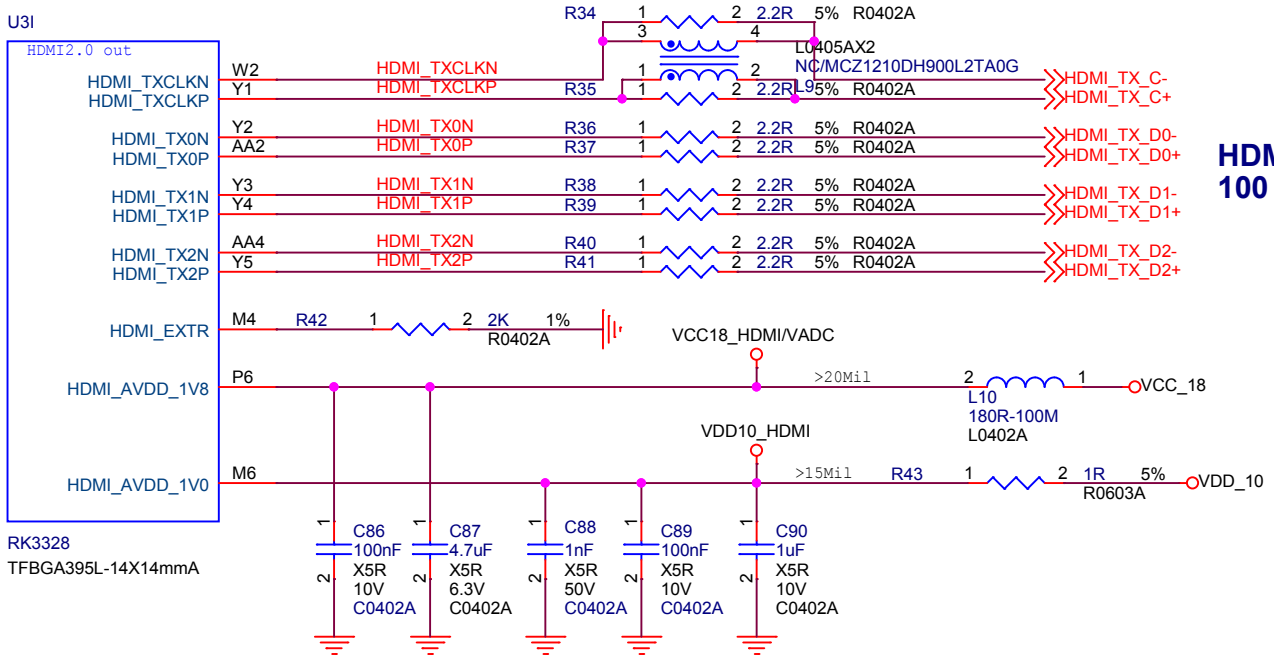


Title	MKS PI	Makerbase FaceBooK : https://www.facebook.com/Makerbase.mks/ Github : https://github.com/makerbase-mks	
Size A4	Document Number 08_RK3328 USB2 PHY/USB3 PHY	Makerbase	Rev V1.0_002
Date:	Friday, April 01, 2022	Sheet 8 of 18	



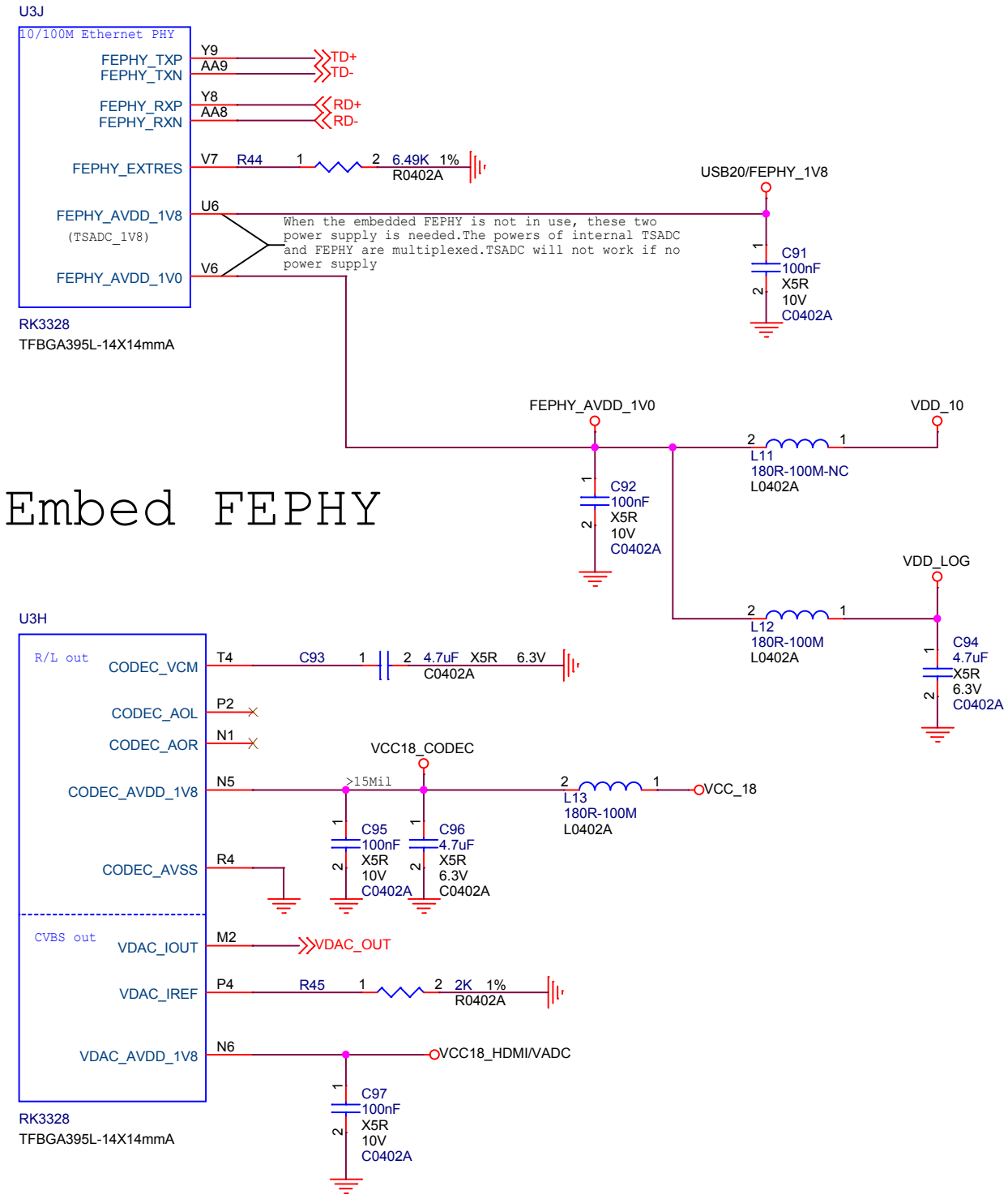
Title	MKS PI	Makerbase FaceBook : https://www.facebook.com/Makerbase.mks/ Github : https://github.com/makerbase-mks	
Size A3	Document Number 09_RK3328 SDIO/UART/I2C/I2S/IR	Makerbase	Rev V1.0_002
Date: Thursday, April 07, 2022	Sheet 9 of 18		

Close to RK3328

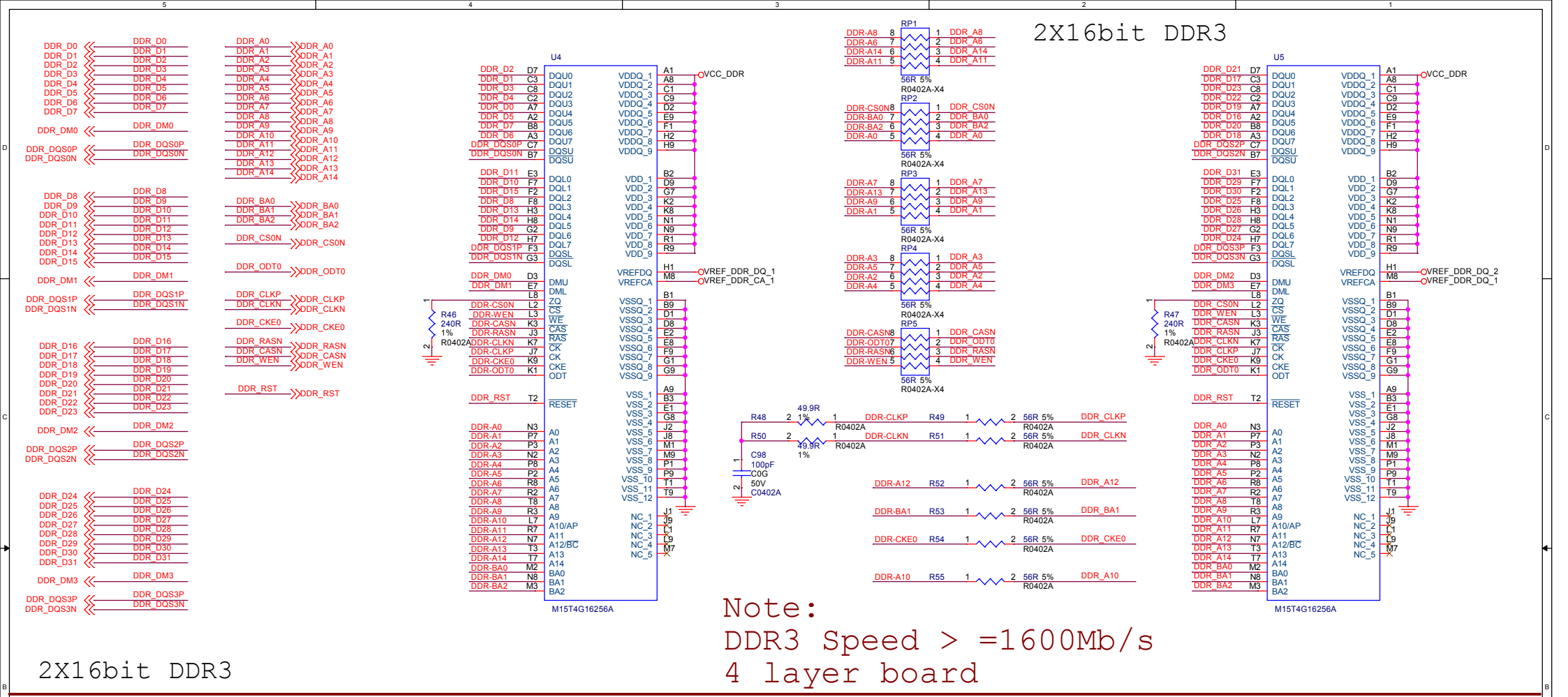


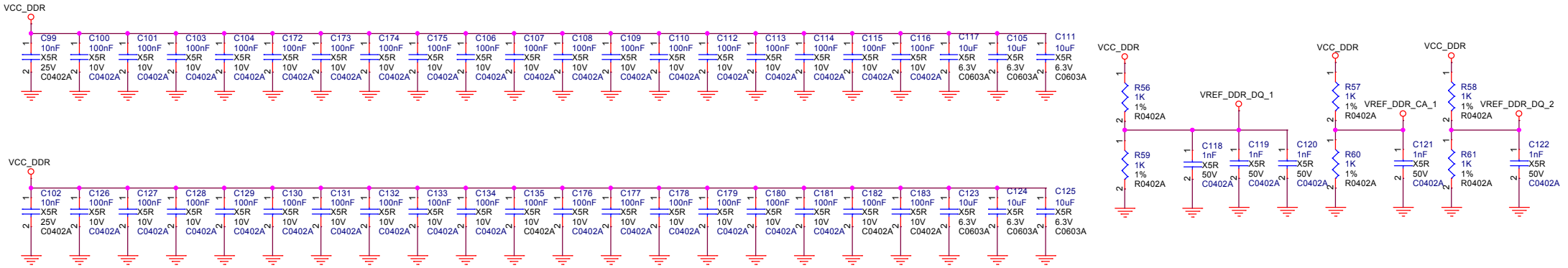
HDMI TMDS trace
100 Ohm +-10%

Title	MKS PI	Makerbase FaceBooK : https://www.facebook.com/Makerbase.mks/ Github : https://github.com/makerbase-mks	
Size A4	Document Number 10_RK3328 HDMI PHY	Makerbase	Rev V1.0_002
Date: Friday, April 01, 2022		Sheet 10 of 18	

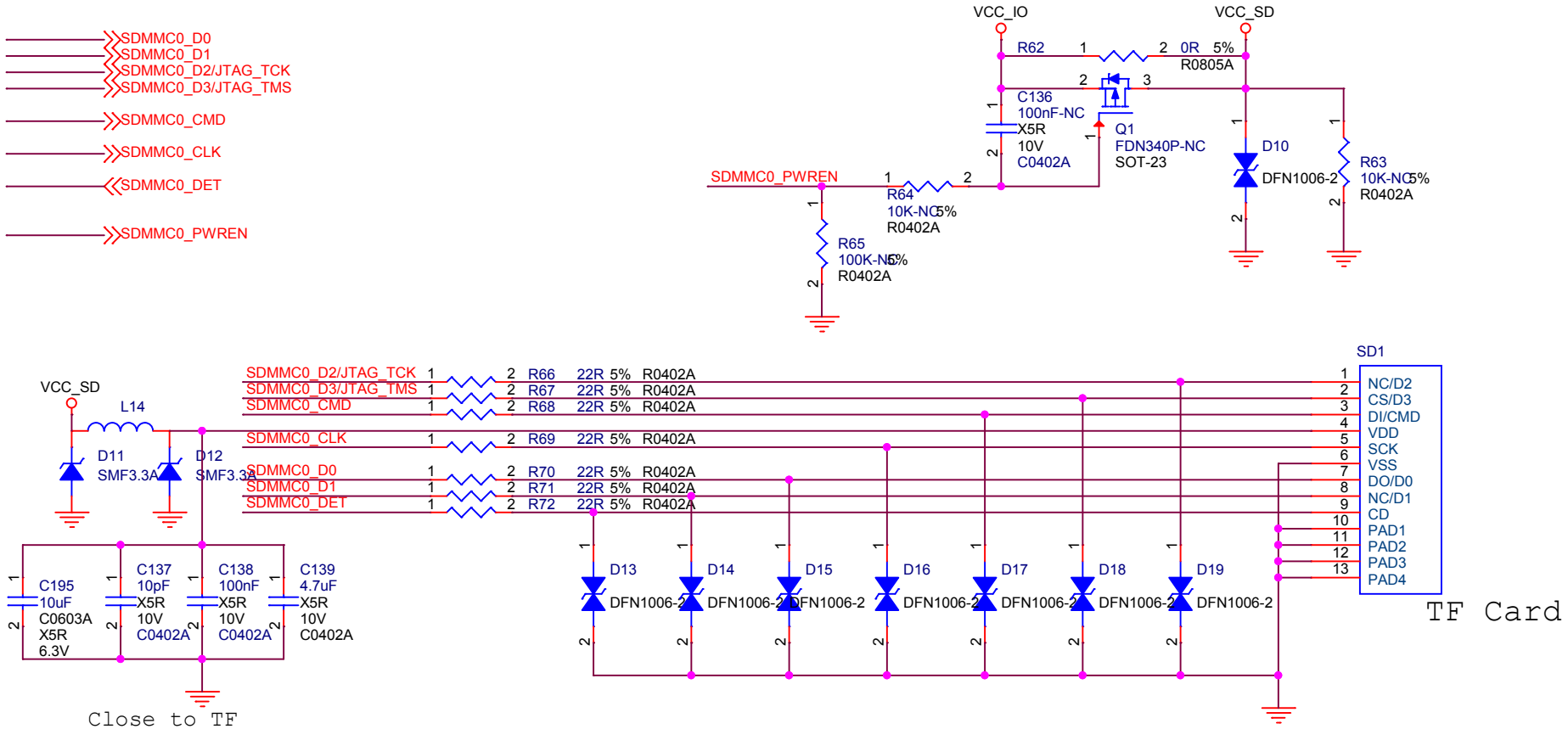


Title	MKS PI	Makerbase FaceBooK : https://www.facebook.com/Makerbase.mks/ Github : https://github.com/makerbase-mks	
Size A4	Document Number 11_RK3328 FEPHY/AV	Makerbase	Rev V1.0_002
Date:	Friday, April 01, 2022	Sheet 11 of 18	

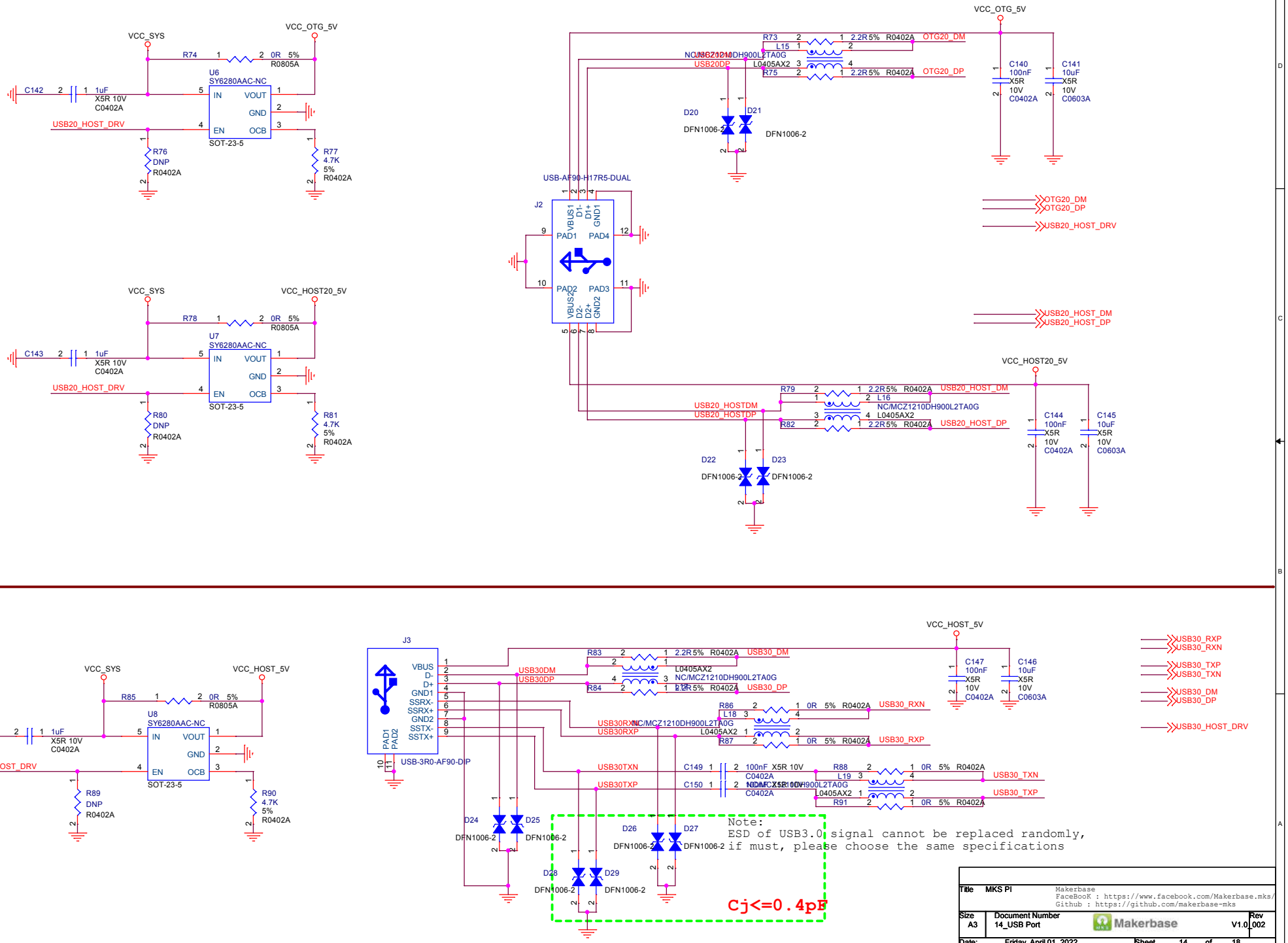


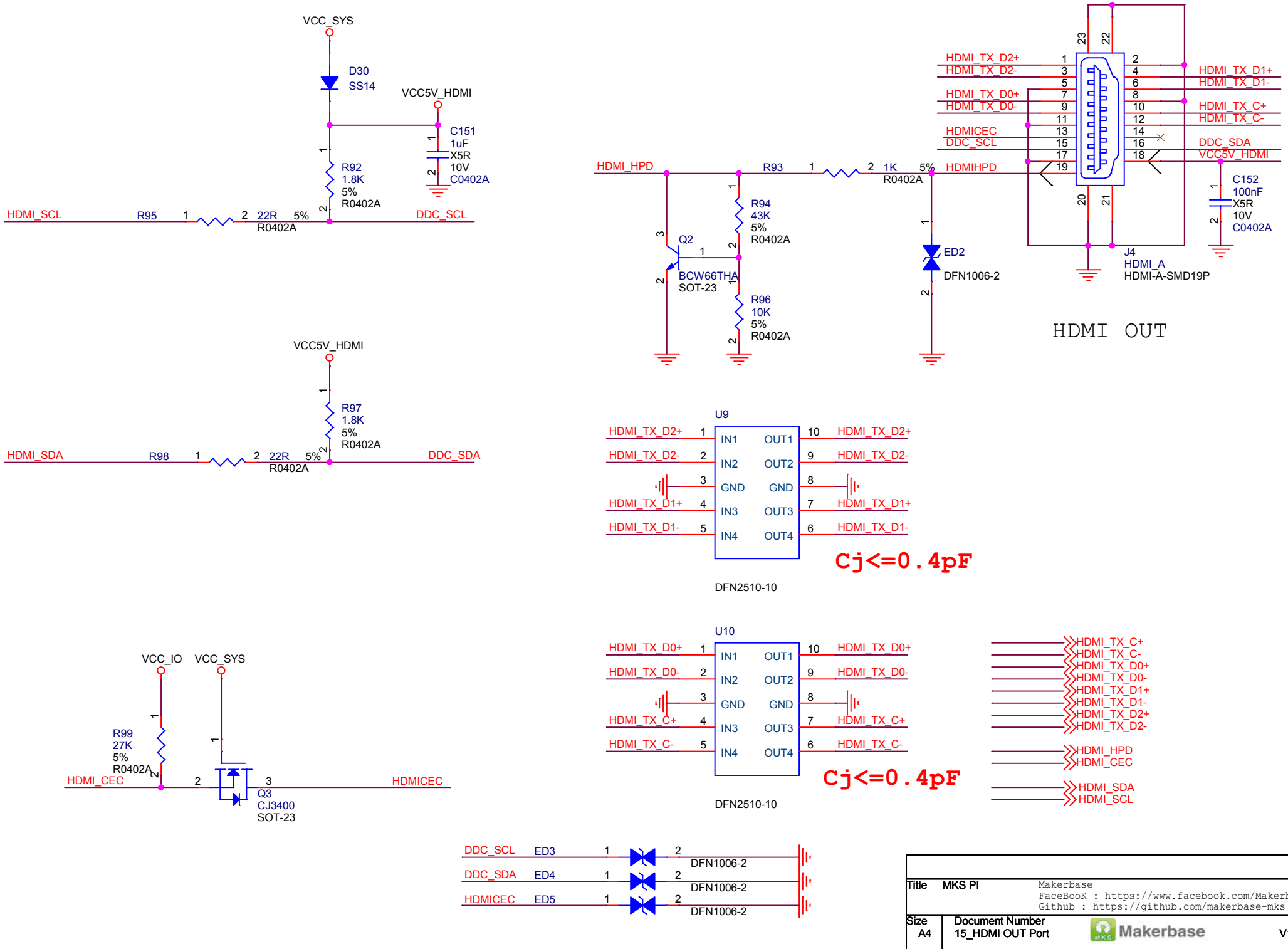


Title	MKS PI	Makerbase FaceBook : https://www.facebook.com/Makerbase.mks/ Github : https://github.com/makerbase-mks	
Size A3	Document Number 12_RAM DDR3 2x16bit	Makerbase	Rev V1.0_002
Date:	Friday, April 01, 2022	Sheet 12 of 18	

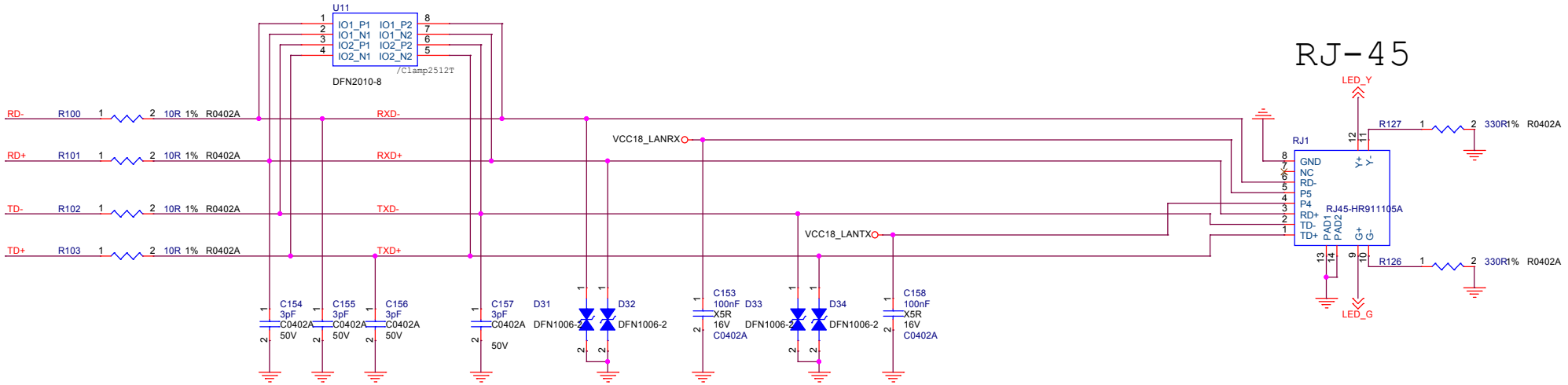


Title	MKS PI	Makerbase FaceBooK : https://www.facebook.com/Makerbase.mks/ Github : https://github.com/makerbase-mks	
Size A4	Document Number 13_TF/SD Card	Makerbase	Rev V1.0_002
Date:	Saturday, April 02, 2022	Sheet 13 of 18	

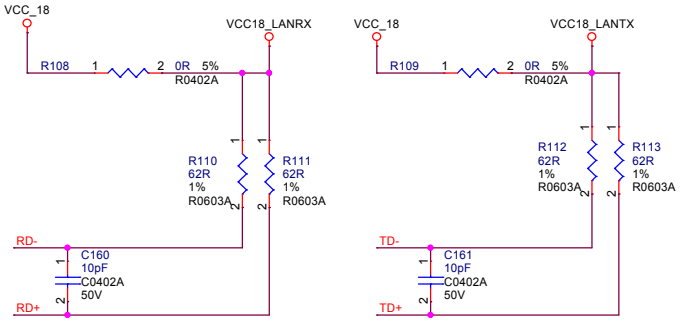

VCC_SYS
VCC_OTG_5V
U6
SY6280AAC-NC
IN
VOUT
GND
EN
OCB
SOT-23-5
C142
1uF
X5R 10V
C0402A
R74
0R 5%
R0805A
USB20_HOST_DRV
R76
DNP
R0402A
R77
4.7K
5%
R0402A
VCC_HOST20_5V
U7
R78
C143
R80
R81
R73
R75
L15
NC/MCZ1210DH900L2TA0G
L0405AX2
USB20DP
USB20DM
OTG20_DM
OTG20_DP
2.2R 5% R0402A
D20
D21
DFN1006-2
C140
100nF
C141
10uF
C0603A
USB-AF90-H17R5-DUAL
J2
VBUS1
D1-
D1+
GND1
PAD1
PAD4
PAD2
PAD3
VBUS2
D2-
D2+
GND2
USB20_HOST_DM
USB20_HOST_DP
R79
R82
L16
USB20_HOSTDM
USB20_HOSTDP
D22
D23
C144
C145
VCC_HOST_5V
U8
R85
C148
R89
R90
J3
USB-3R0-AF90-D-P
USB30DM
USB30DP
USB30RXN
USB30RXP
USB30TXN
USB30TXP
R83
R84
R86
R87
R88
R91
L18
L19
C149
C150
C147
C146
D24
D25
D26
D27
D28
D29
Note:
ESD of USB3.0 signal cannot be replaced randomly,
if must, please choose the same specifications
Cj<=0.4pF
USB30_RXP
USB30_RXN
USB30_TXP
USB30_TXN
USB30_DM
USB30_DP
USB30_HOST_DRV
Title MKS PI
Makerbase
FaceBook : https://www.facebook.com/Makerbase.mks/
Github : https://github.com/makerbase-mks
Size A3
Document Number 14_USB Port
Rev V1.0_002
Date: Friday, April 01, 2022
Sheet 14 of 18

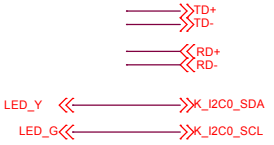


Title	MKS PI	Makerbase FaceBooK : https://www.facebook.com/Makerbase.mks/ Github : https://github.com/makerbase-mks
Size A4	Document Number 15_HDMI OUT Port	Rev V1.0_002
Date: Friday, April 01, 2022	Sheet 15 of 18	

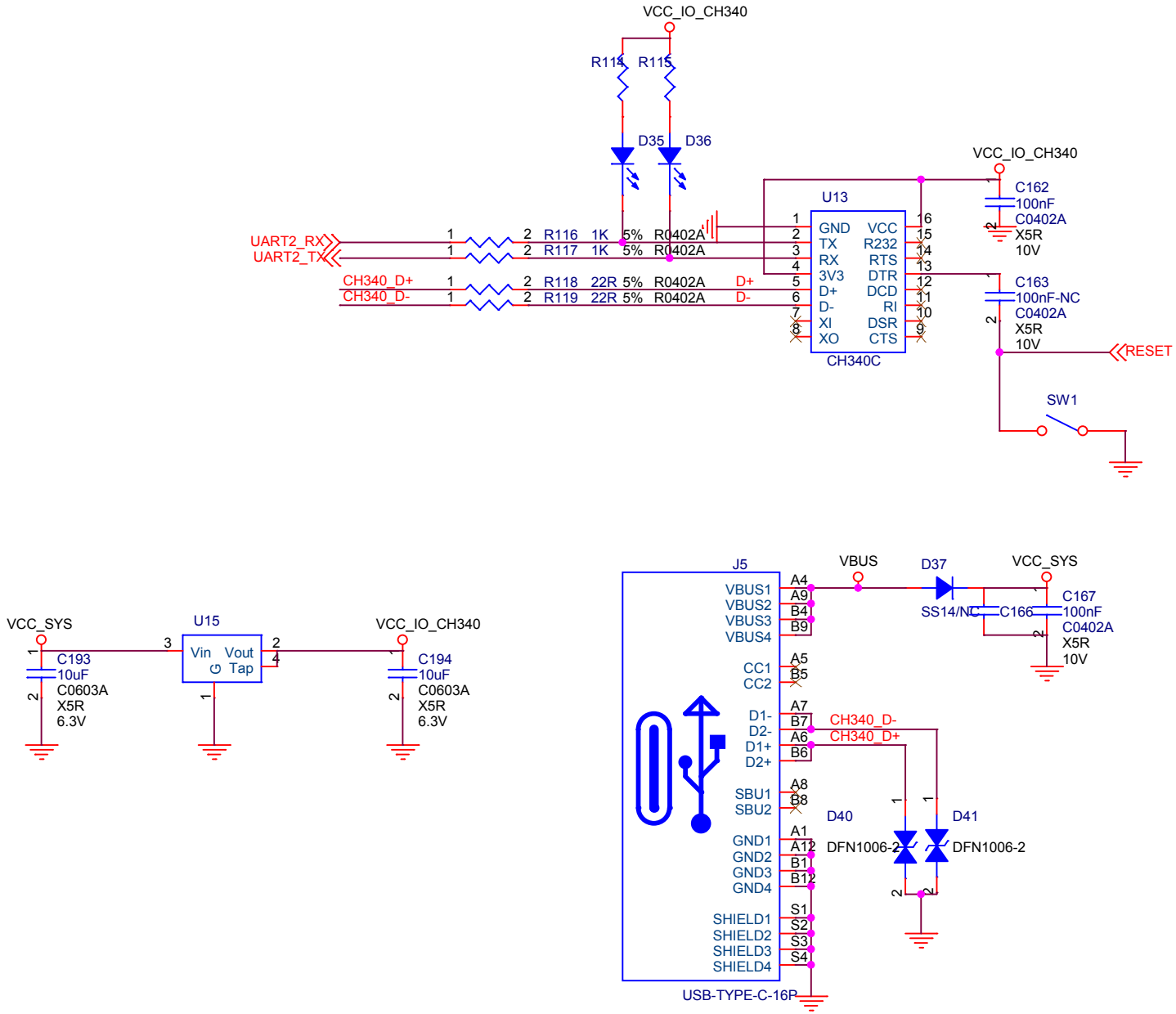


RJ-45

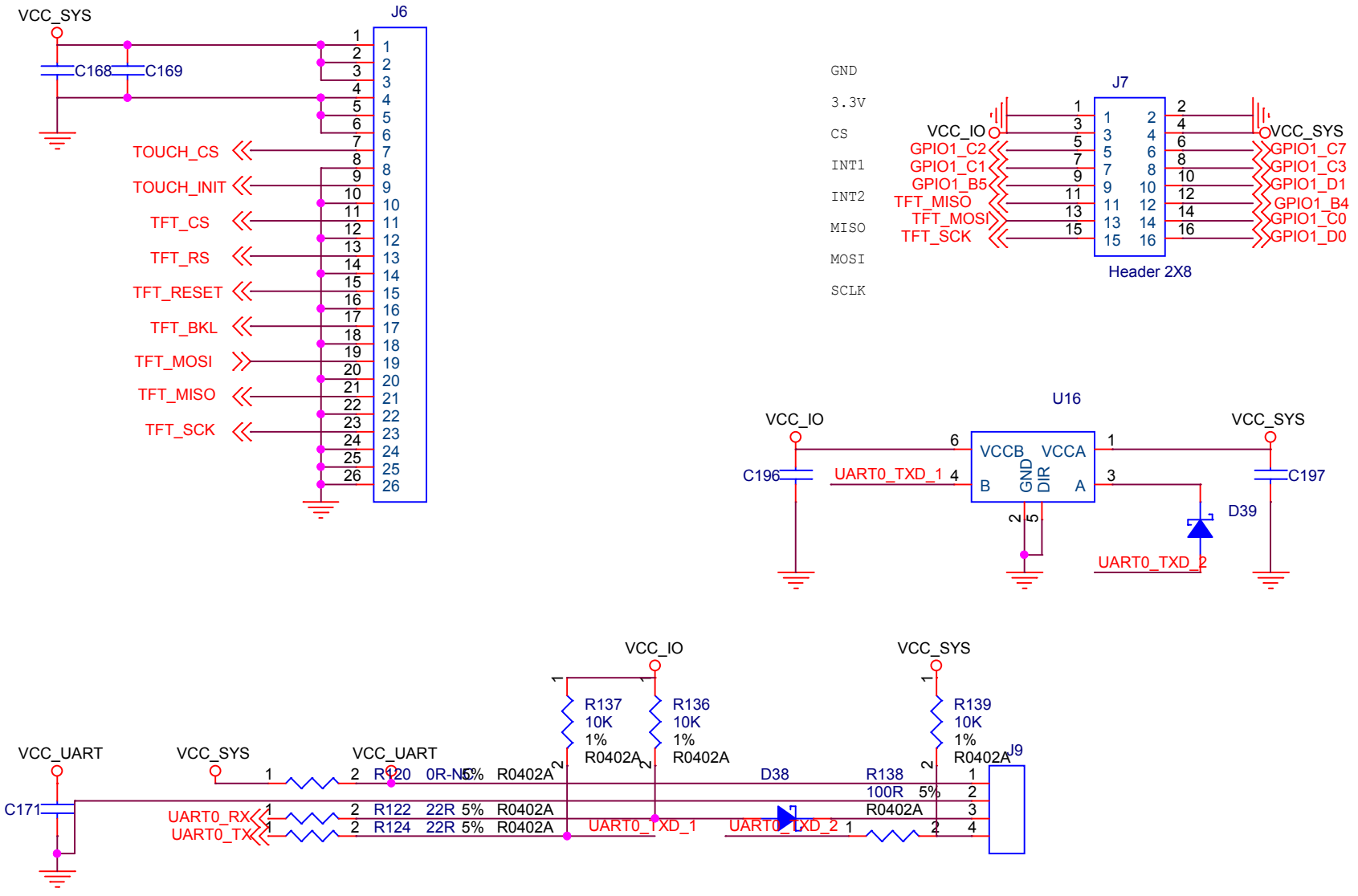




Title	MKS PI	Makerbase FaceBook : https://www.facebook.com/Makerbase.mks/ Github : https://github.com/makerbase-mks	
Size	Document Number		Rev
A3	16_10/100M-Embed PHY	Makerbase	V1.0_002
Date:	Wednesday, April 06, 2022	Sheet 16 of 18	



Title	MKS PI	Makerbase FaceBooK : https://www.facebook.com/Makerbase.mks/ Github : https://github.com/makerbase-mks
Size A4	Document Number 17_Debug UART2 CH340	Rev V1.0_002
Date: Tuesday, May 24, 2022	Sheet 17 of 18	



Title	MKS PI	Makerbase FaceBooK : https://www.facebook.com/Makerbase.mks/ Github : https://github.com/makerbase-mks	
Size A	Document Number 18_TS35/I2C/UART/IO	Makerbase	Rev V1.0_002
Date:	Tuesday, April 12, 2022	Sheet 18 of 18	