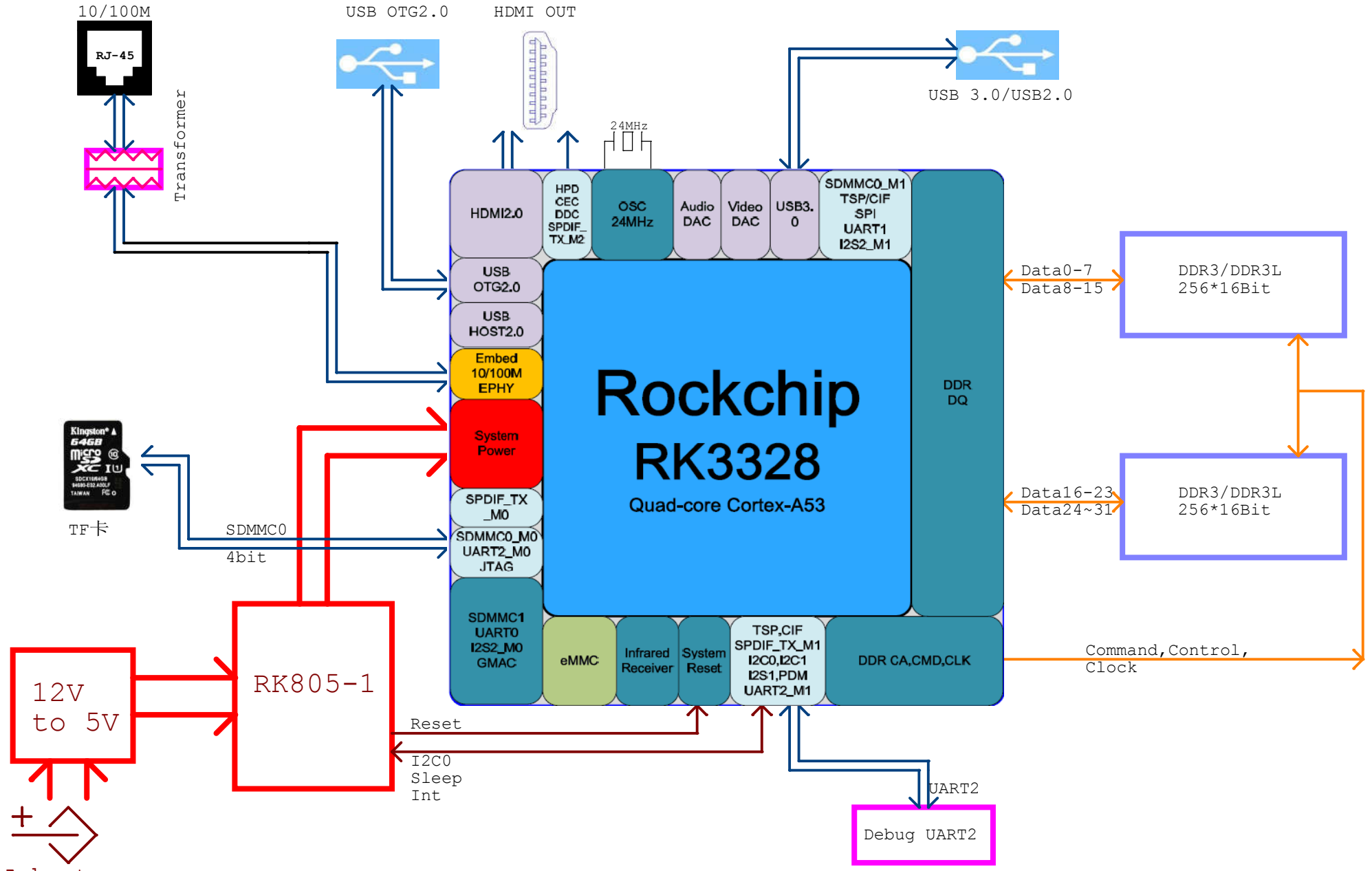
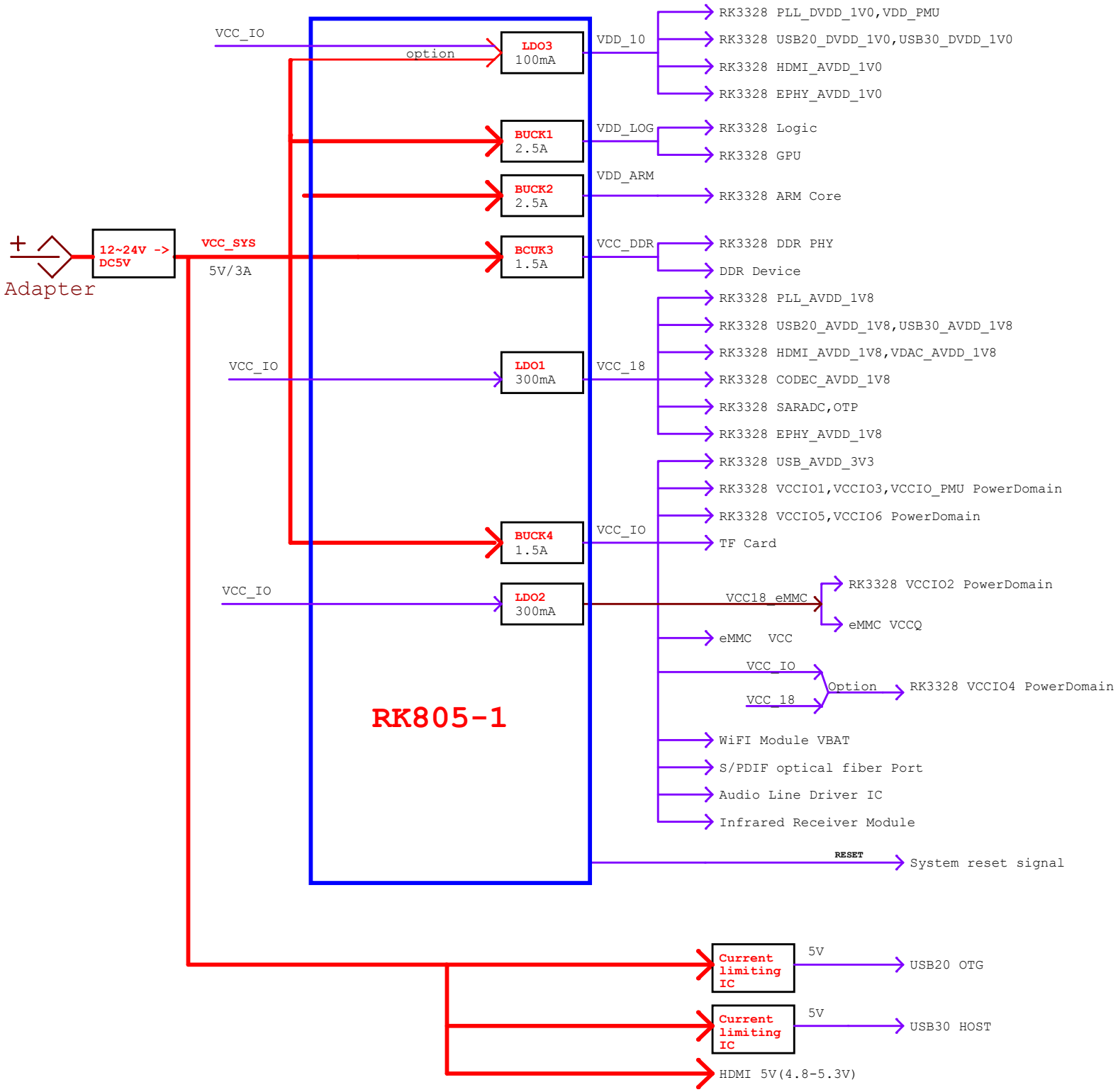


Title	MKS PI	Makerbase FaceBook : https://www.facebook.com/Makerbase.mks/ Github : https://github.com/makerbase-mks	
Size A3	Document Number 01_Block Diagram	Makerbase	Rev V1.1_001
Date: Monday, June 27, 2022	Sheet 1 of 18		



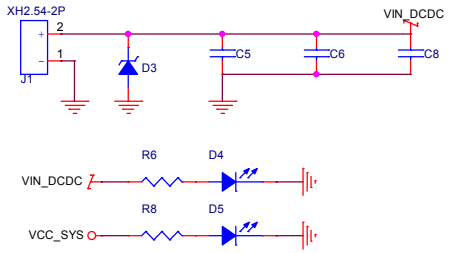
Power Timing

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

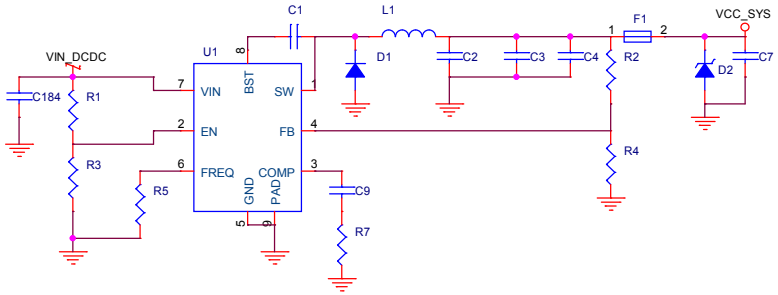
IO Domain Voltage	IO Voltage=3.3V	IO Voltage=1.8V
VCCIO_PMU	3.3V	Not Support
VCCIO1	3.3V	Not Support
VCCIO2		1.8V (Default) eMMC
VCCIO3	3.3V (Default)	
VCCIO4	3.3V (Default) WIFI:RTL8723BS	
VCCIO5	3.3V (Default)	
VCCIO6	3.3V (Default)	

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 V1.1.001
Date:	Monday, June 27, 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

RK805-1

QFN32-4X4mm

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

At the end of the feedback

RK3328 Power pin

At the end of the feedback

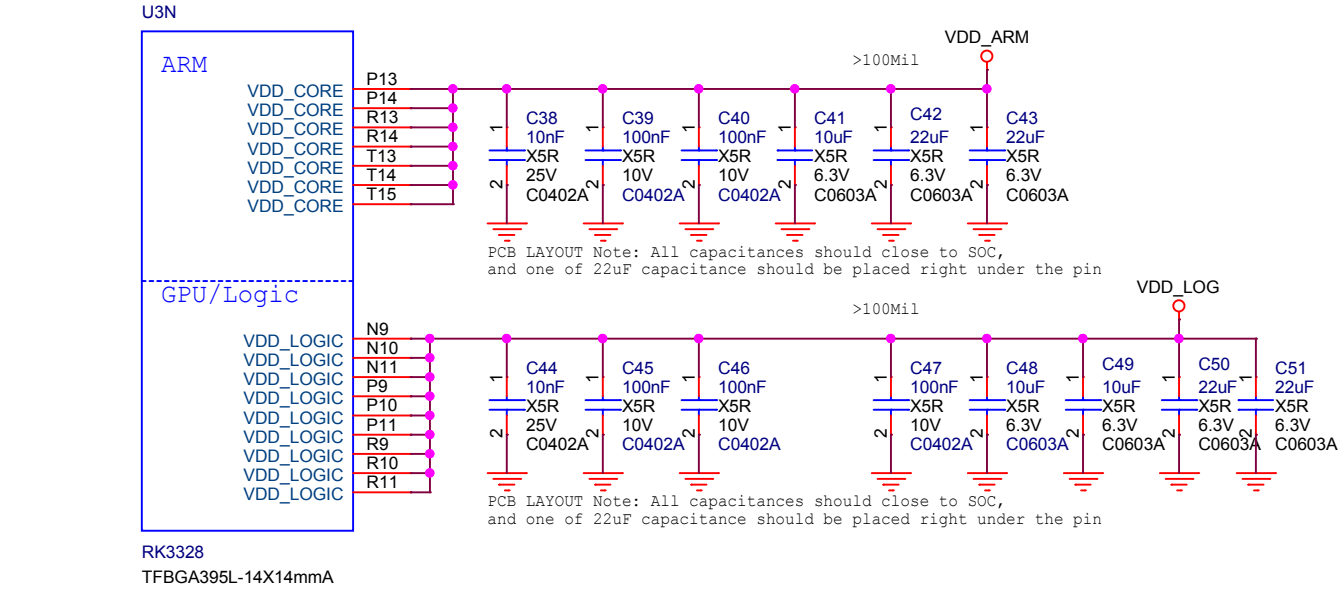
RK3328 Power pin

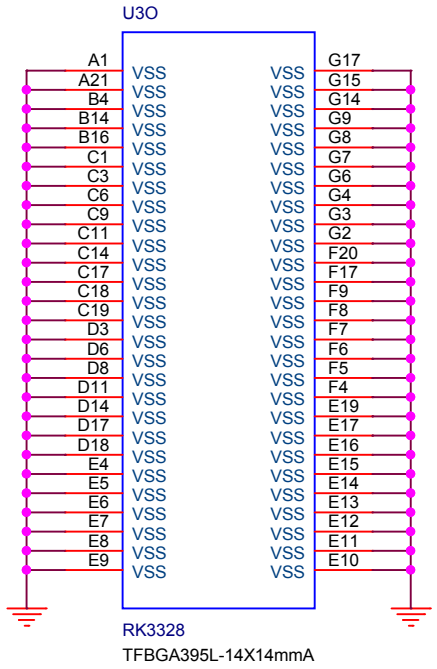
LED DISPLAY

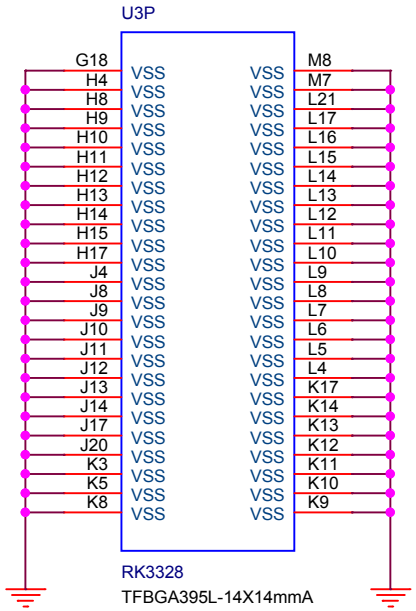
Note:
Default:green light on in working
red light on in standby

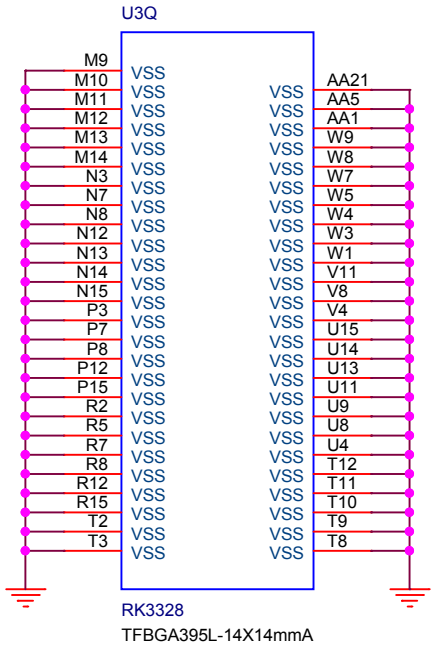
Rev	Date	Author	Description
V1.1_001	2022-06-27	MKS PI	Makerbase

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	Makerbase	Rev V1.1_001
Date: Monday, June 27, 2022	Sheet 3 of 18		

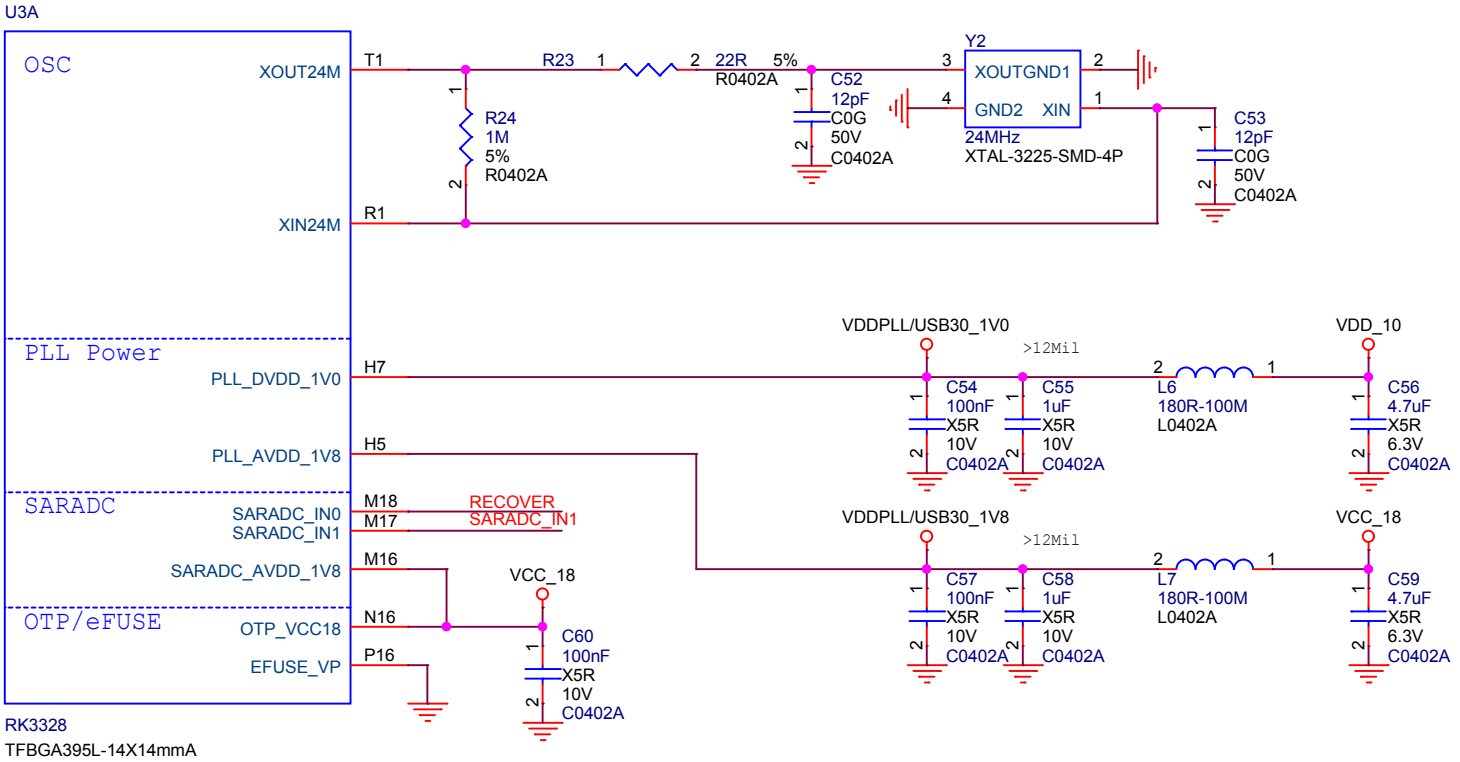


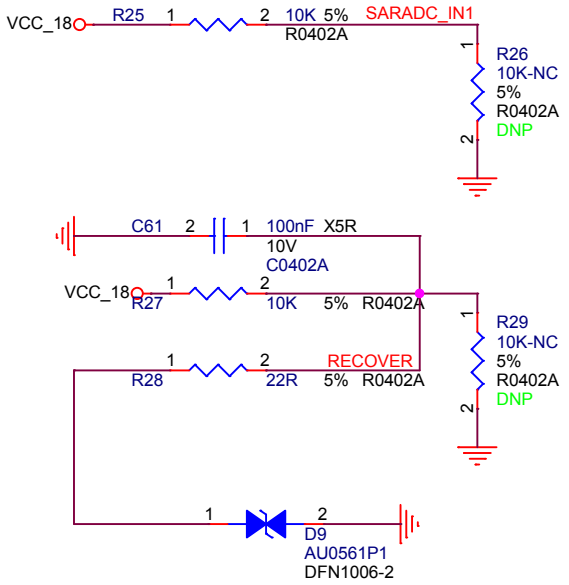






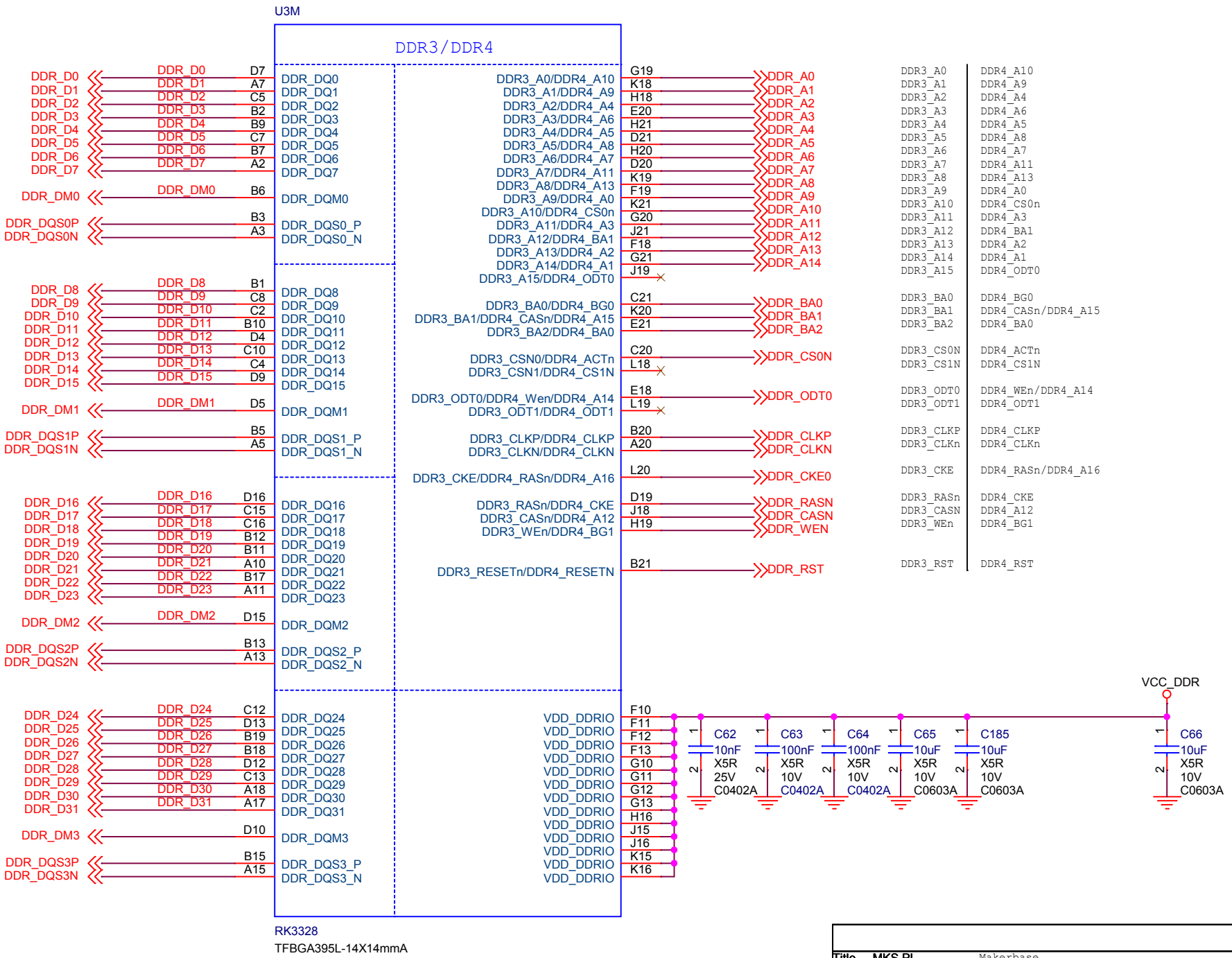
Title	MKS PI	Makerbase FaceBooK : https://www.facebook.com/Makerbase.mks/ Github : https://github.com/makerbase-mks	
Size A4	Document Number 04_RK3328 Power	Makerbase	Rev V1.1_001
Date:	Monday, June 27, 2022	Sheet 4 of 18	



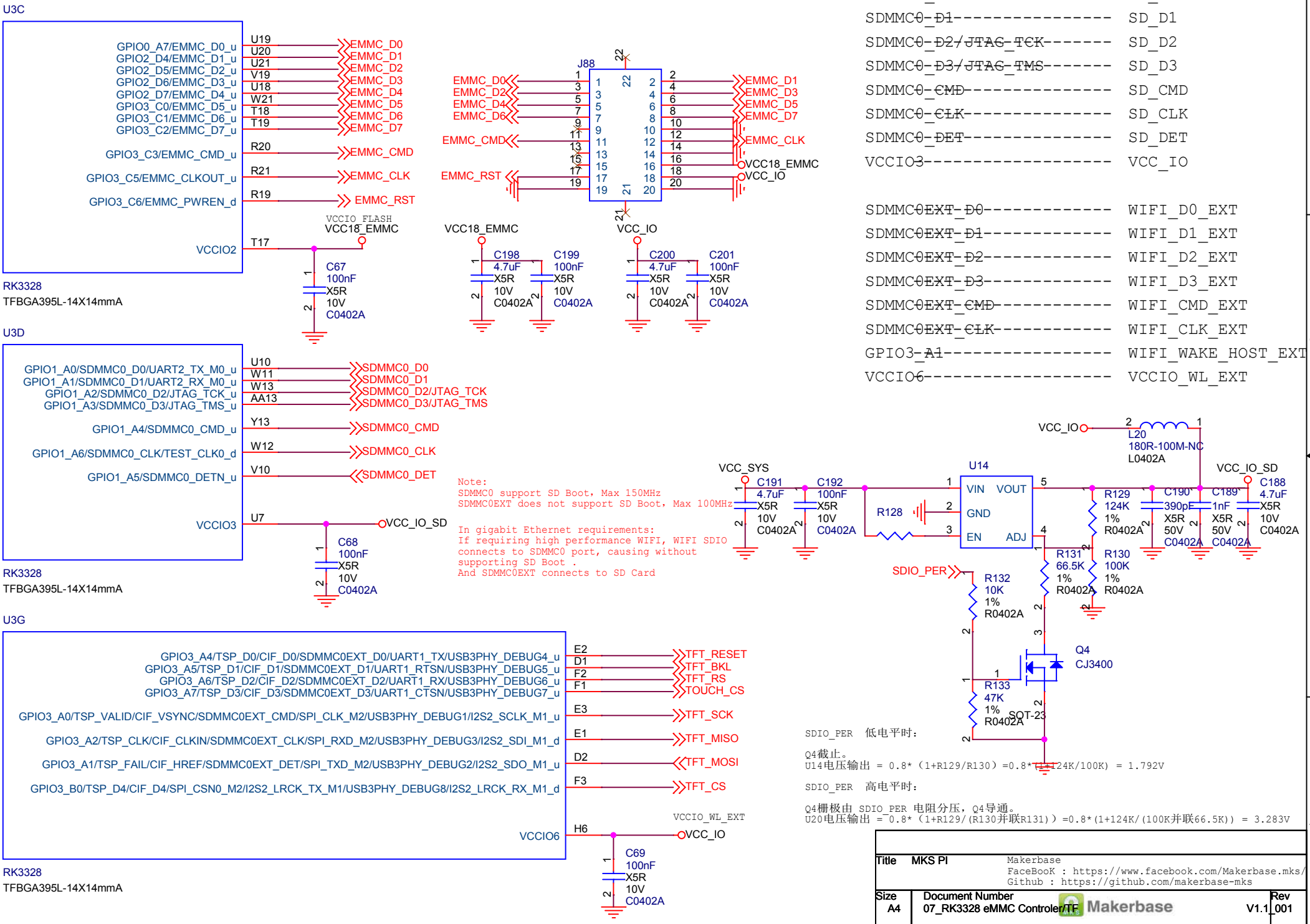


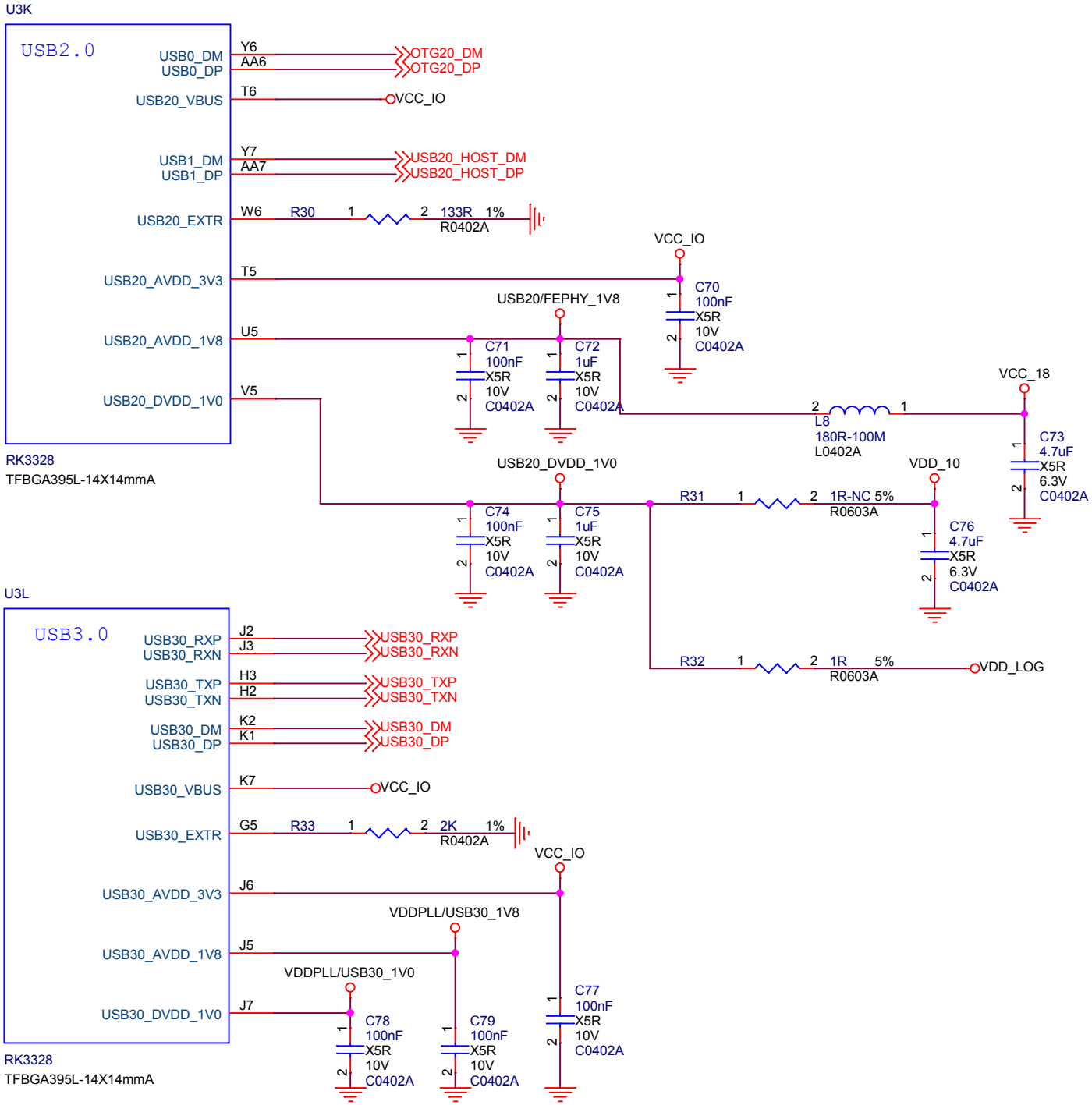
SARADC_IN0	SARADC_IN1	Up Resistance	Down Resistance	
Recover		DNP	10K	
BOM1		110K	10K	
BOM2		100K	20K	
BOM3		100K	33K	
BOM4		36K	18K	
BOM5		51K	36K	
BOM6		51K	51K	
BOM7		36K	51K	
BOM8		18K	36K	
BOM9		33K	100K	
BOM10		20K	100K	
BOM11		10K	110K	
BOM12		10K	DNP	

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	Makerbase	Rev V1.1_001
Date:	Monday, June 27, 2022	Sheet 5 of 18	

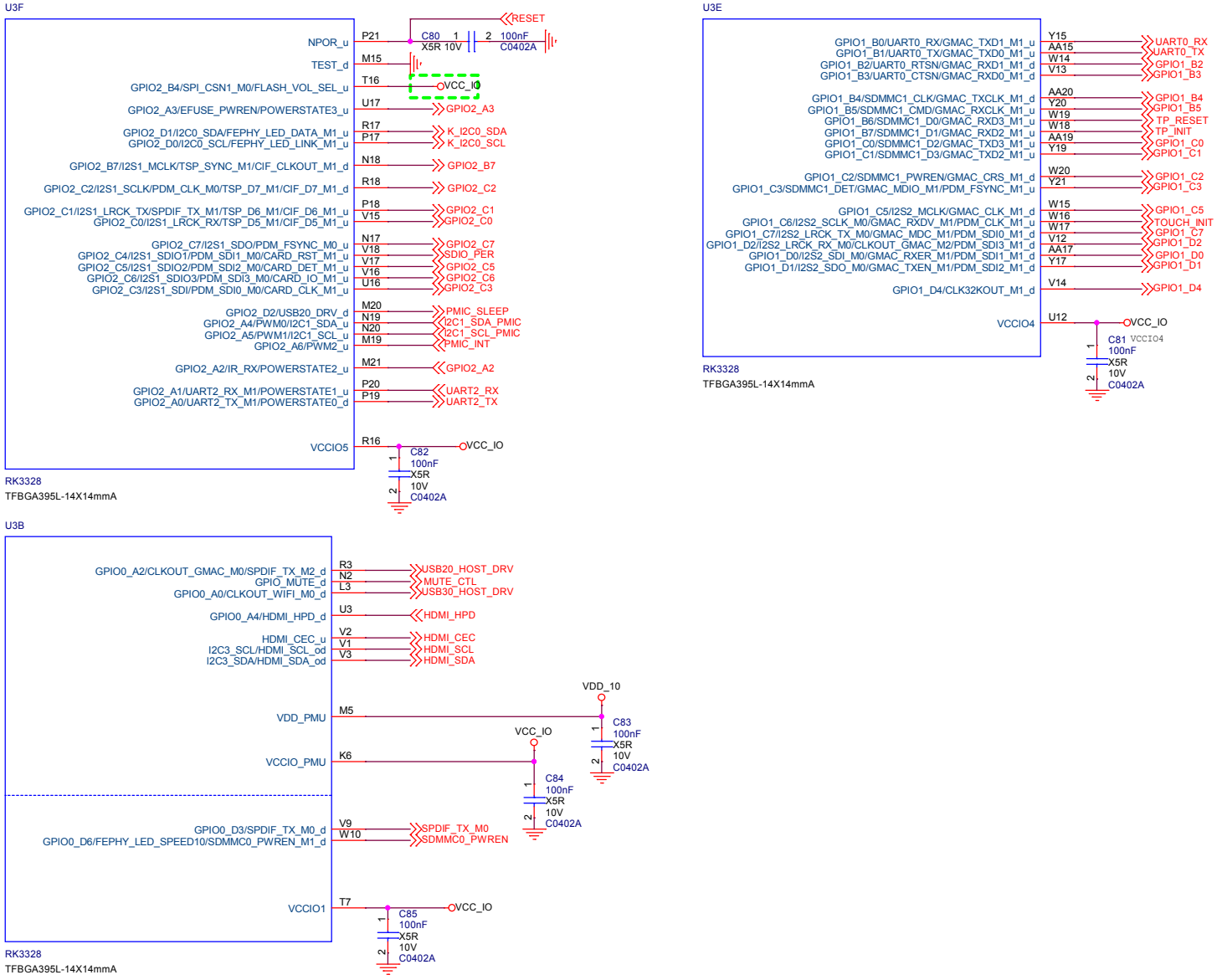


Title	MKS PI	Makerbase FaceBooK : https://www.facebook.com/Makerbase.mks/ Github : https://github.com/makerbase-mks
Size A4	Document Number 06_RK3328 DDR Controler	Rev V1.1_001
Date: Monday, June 27, 2022	Sheet 6 of 18	


U3C
GPIO0_A7/EMMC_D0_u
GPIO2_D4/EMMC_D1_u
GPIO2_D5/EMMC_D2_u
GPIO2_D6/EMMC_D3_u
GPIO2_D7/EMMC_D4_u
GPIO3_C0/EMMC_D5_u
GPIO3_C1/EMMC_D6_u
GPIO3_C2/EMMC_D7_u
GPIO3_C3/EMMC_CMD_u
GPIO3_C5/EMMC_CLKOUT_u
GPIO3_C6/EMMC_PWREN_d
VCCIO2
U19
U20
U21
V19
U18
W21
T18
T19
R20
R21
R19
T17
EMMC_D0
EMMC_D1
EMMC_D2
EMMC_D3
EMMC_D4
EMMC_D5
EMMC_D6
EMMC_D7
EMMC_CMD
EMMC_CLK
EMMC_RST
VCCIO_FLASH
VCC18_EMMC
C67
100nF
X5R
10V
C0402A
RK3328
TFBGA395L-14X14mmA
J88
EMMC_D0
EMMC_D2
EMMC_D4
EMMC_D6
EMMC_CMD
EMMC_RST
EMMC_D1
EMMC_D3
EMMC_D5
EMMC_D7
EMMC_CLK
VCC18_EMMC
VCC_IO
VCC18_EMMC
C198
4.7uF
X5R
10V
C0402A
C199
100nF
X5R
10V
C0402A
VCC_IO
C200
4.7uF
X5R
10V
C0402A
C201
100nF
X5R
10V
C0402A
U3D
GPIO1_A0/SDMMC0_D0/UART2_TX_M0_u
GPIO1_A1/SDMMC0_D1/UART2_RX_M0_u
GPIO1_A2/SDMMC0_D2/JTAG_TCK_u
GPIO1_A3/SDMMC0_D3/JTAG_TMS_u
GPIO1_A4/SDMMC0_CMD_u
GPIO1_A6/SDMMC0_CLK/TEST_CLK0_d
GPIO1_A5/SDMMC0_DETN_u
VCCIO3
U10
W11
W13
AA13
Y13
W12
V10
U7
SDMMC0_D0
SDMMC0_D1
SDMMC0_D2/JTAG_TCK
SDMMC0_D3/JTAG_TMS
SDMMC0_CMD
SDMMC0_CLK
SDMMC0_DET
VCC_IO_SD
C68
100nF
X5R
10V
C0402A
RK3328
TFBGA395L-14X14mmA
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
U3G
GPIO3_A4/TSP_D0/CIF_D0/SDMMC0EXT_D0/UART1_TX/USB3PHY_DEBUG4_u
GPIO3_A5/TSP_D1/CIF_D1/SDMMC0EXT_D1/UART1_RTSN/USB3PHY_DEBUG5_u
GPIO3_A6/TSP_D2/CIF_D2/SDMMC0EXT_D2/UART1_RX/USB3PHY_DEBUG6_u
GPIO3_A7/TSP_D3/CIF_D3/SDMMC0EXT_D3/UART1_CTSN/USB3PHY_DEBUG7_u
GPIO3_A0/TSP_VALID/CIF_VSYNC/SDMMC0EXT_CMD/SPI_CLK_M2/USB3PHY_DEBUG1/I2S2_SCLK_M1_u
GPIO3_A2/TSP_CLK/CIF_CLKIN/SDMMC0EXT_CLK/SPI_RXD_M2/USB3PHY_DEBUG3/I2S2_SDI_M1_d
GPIO3_A1/TSP_FAIL/CIF_HREF/SDMMC0EXT_DET/SPI_TXD_M2/USB3PHY_DEBUG2/I2S2_SDO_M1_u
GPIO3_B0/TSP_D4/CIF_D4/SPI_CSN0_M2/I2S2_LRCK_TX_M1/USB3PHY_DEBUG8/I2S2_LRCK_RX_M1_d
VCCIO6
E2
D1
F2
F1
E3
E1
D2
F3
H6
TFT_RESET
TFT_BKL
TFT_RS
TOUCH_CS
TFT_SCK
TFT_MISO
TFT_MOSI
TFT_CS
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
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 V1.1_001
Date: Monday, June 27, 2022
Sheet 7 of 18

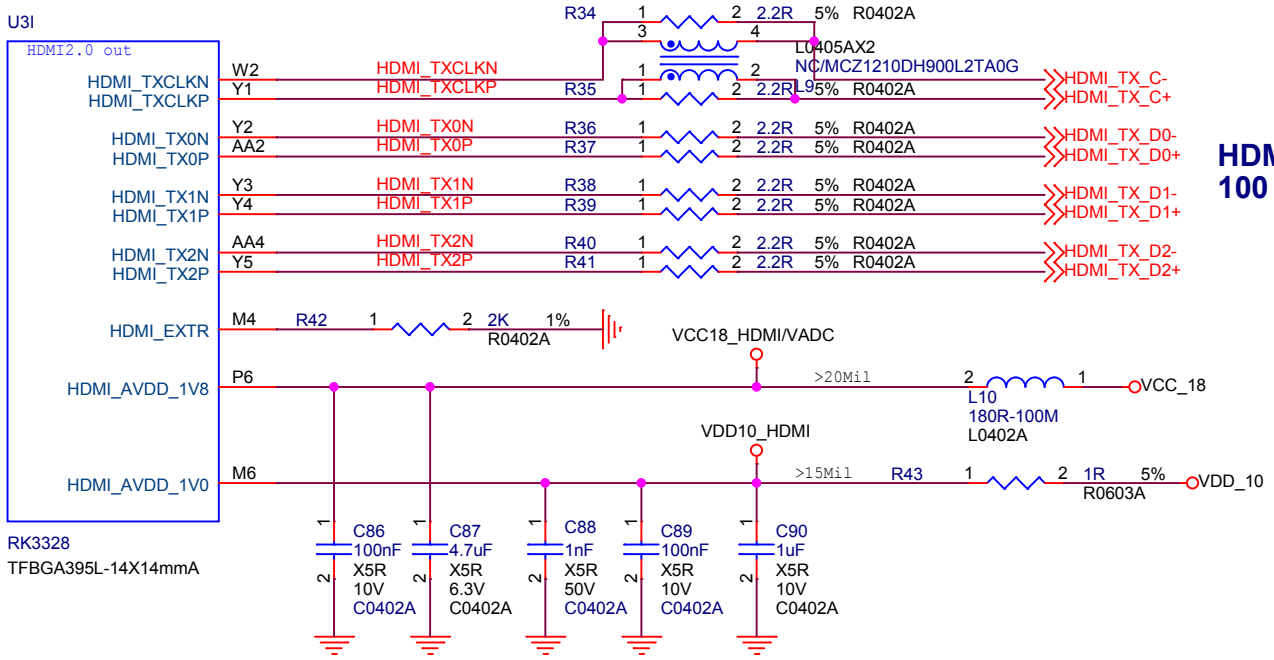


Title	MKS PI	Makerbase FaceBooK : https://www.facebook.com/Makerbase.mks/ Github : https://github.com/makerbase-mks	
Size A4	Document Number 08_RK3328 USB2 PHY/USB3 PHY		Rev V1.1_001
Date:	Monday, June 27, 2022	Sheet 8 of 18	



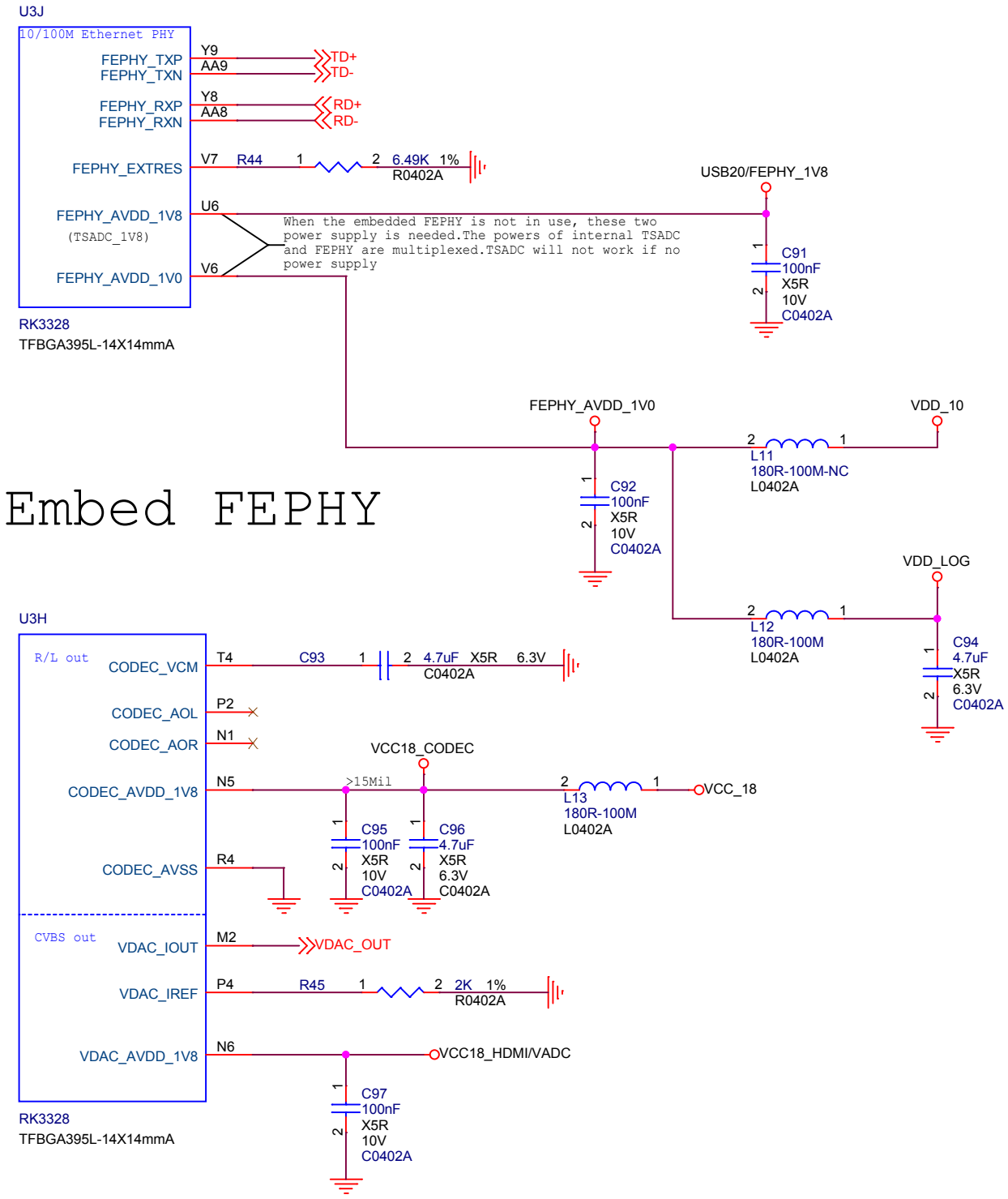
Title	MKS PI	Makerbase FaceBook : https://www.facebook.com/Makerbase.mks/ Github : https://github.com/makerbase-mks	
Size A3	Document Number 09_RK3328 SDIO/UART/I2C/I2S/IR	Makerbase	Rev V1.1_001
Date: Wednesday, June 29, 2022	Sheet 9 of 18		

Close to RK3328

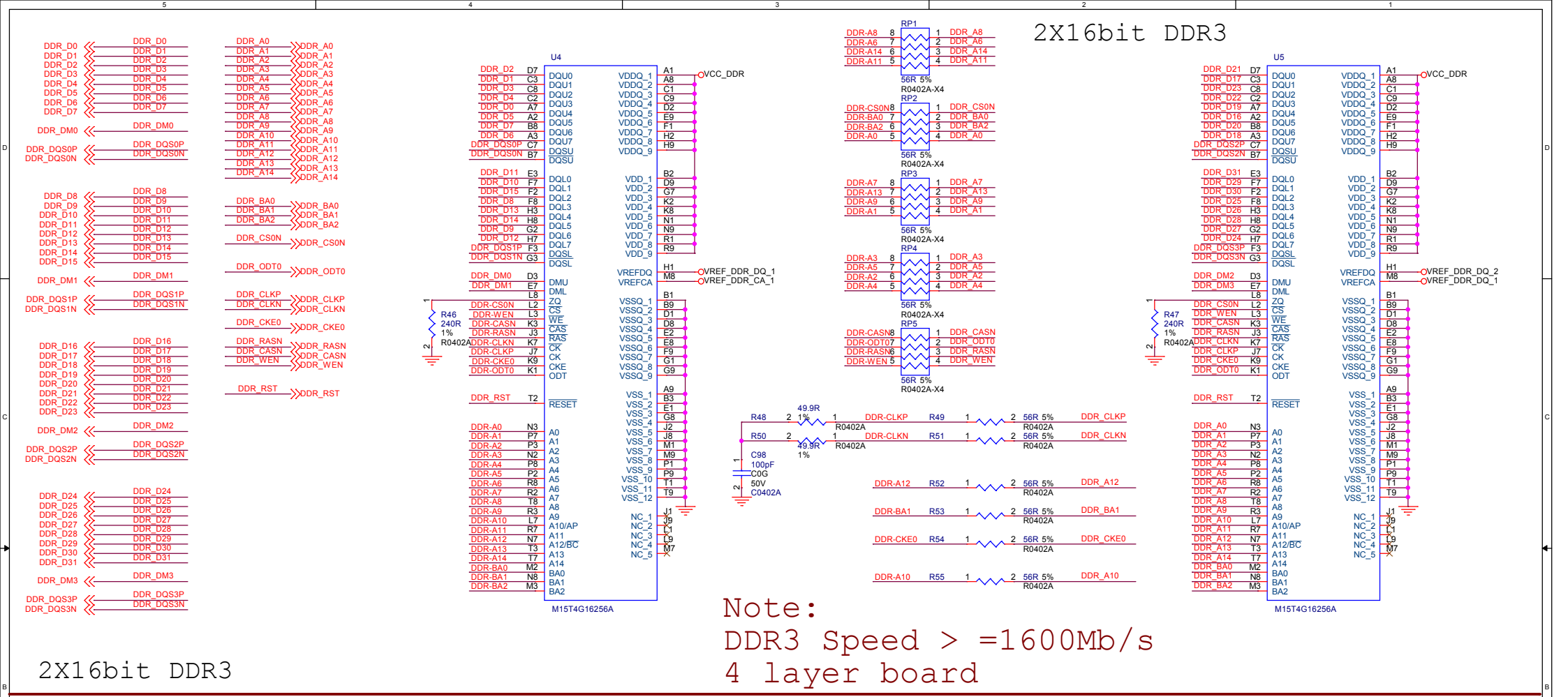


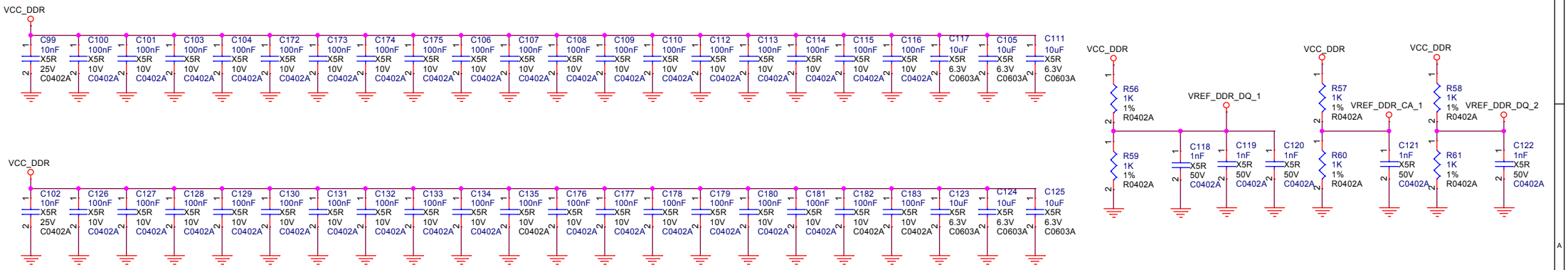
HDMI TMDS trace
100 Ohm +-10%

Title	MKS PI	Makerbase FaceBooK : https://www.facebook.com/Makerbase.mks/ Github : https://github.com/makerbase-mks	
Size	Document Number		Rev
A4	10_RK3328 HDMI PHY	Makerbase	V1.1_001
Date:	Monday, June 27, 2022	Sheet 10 of 18	

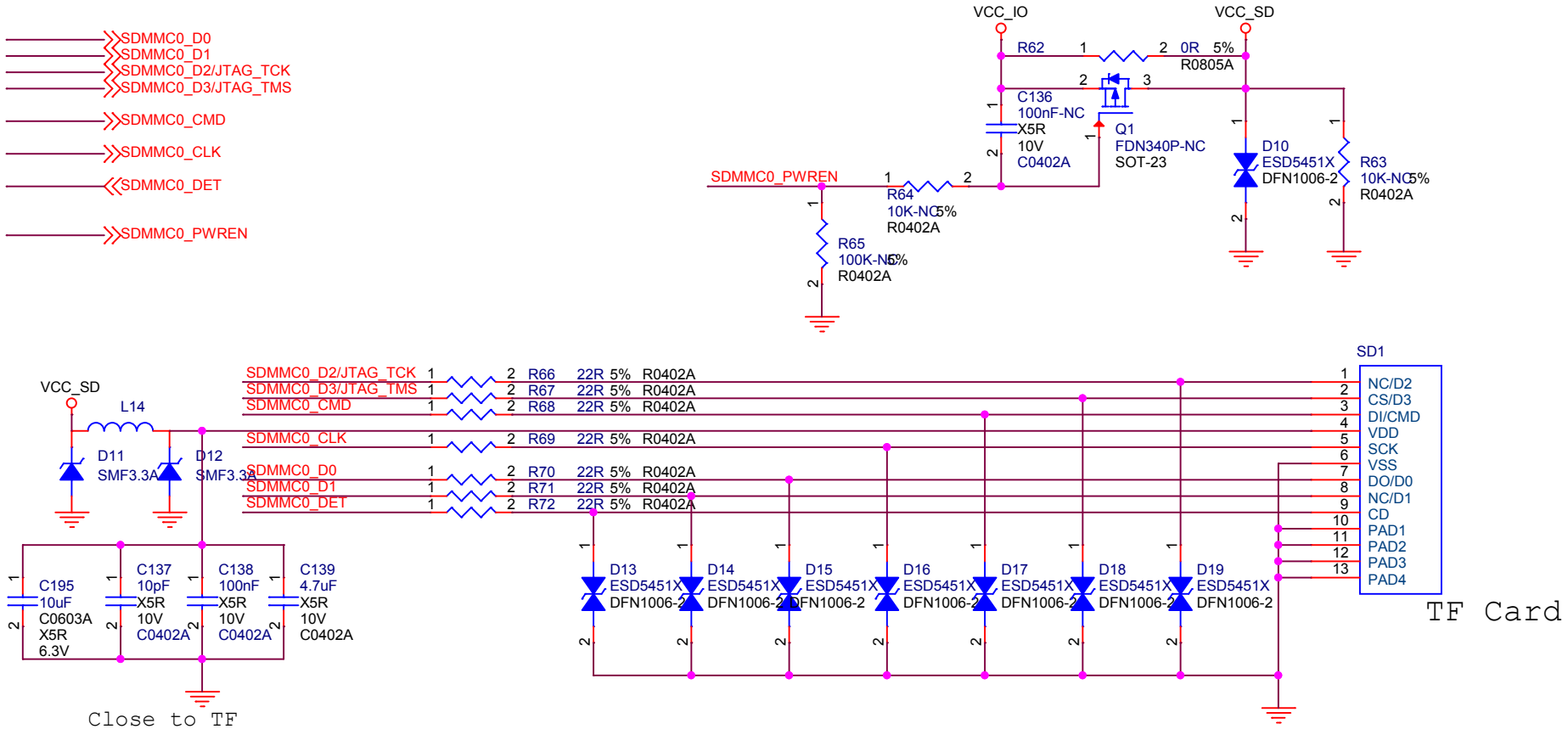


Title	MKS PI	Makerbase FaceBooK : https://www.facebook.com/Makerbase.mks/ Github : https://github.com/makerbase-mks	
Size A4	Document Number 11_RK3328 FEPHY/AV	Makerbase	Rev V1.1_001
Date: Monday, June 27, 2022		Sheet 11 of 18	

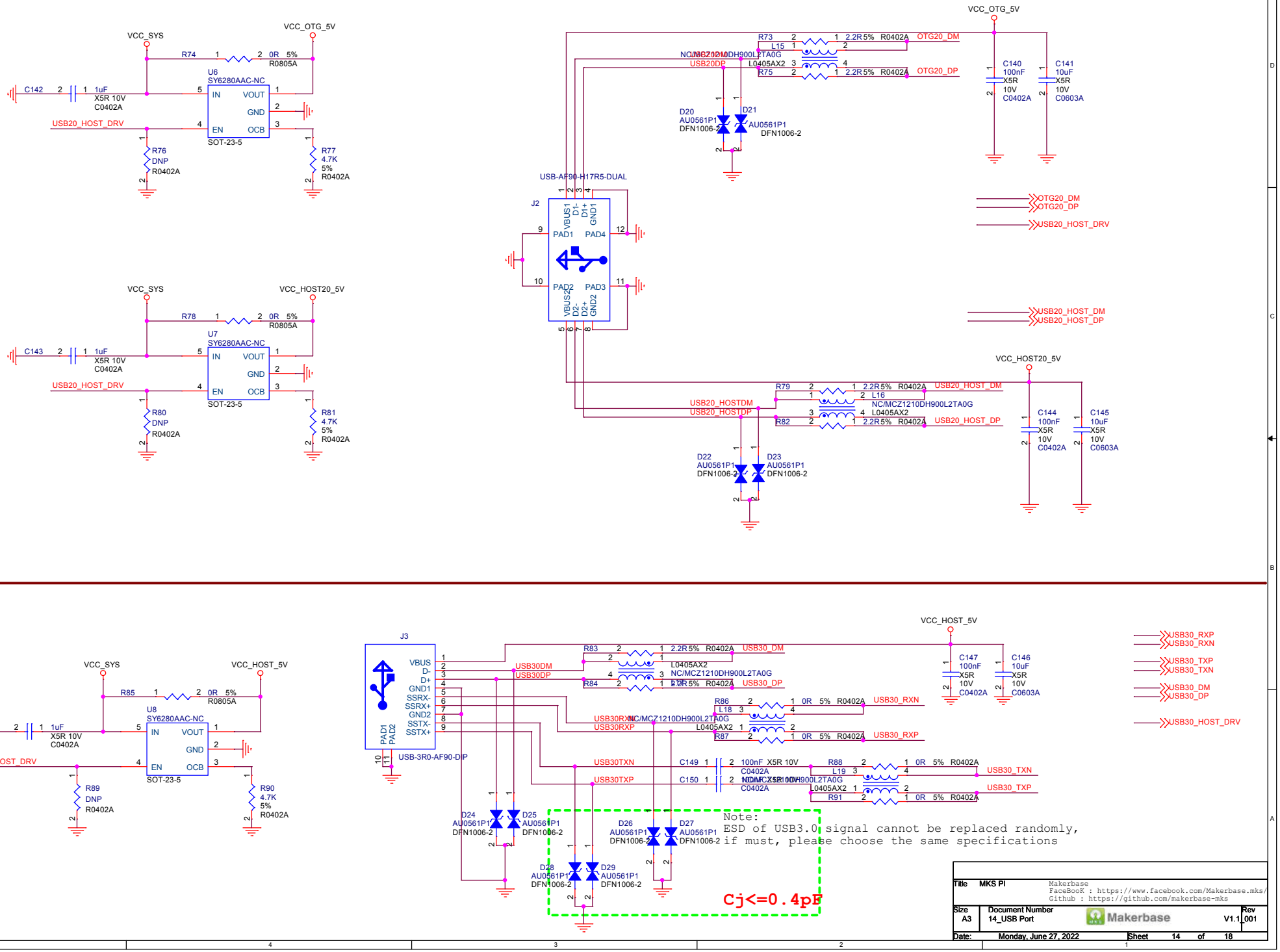


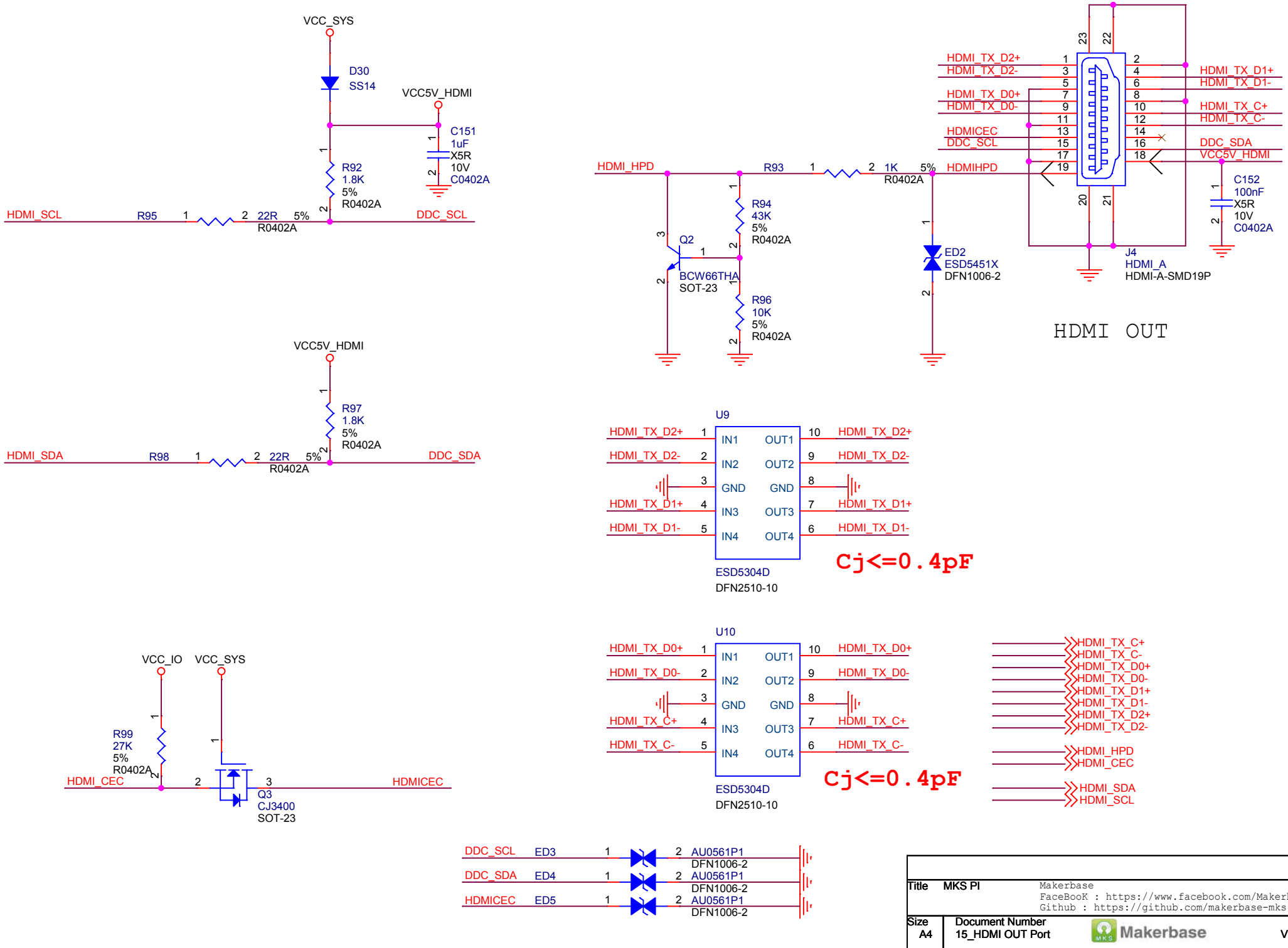


Title	MKS PI	Makerbase FaceBook : https://www.facebook.com/Makerbase.mks/ Github : https://github.com/makerbase-mks	
Size A3	Document Number 12_RAM DDR3 2x16bit	Makerbase	Rev V1.1_001
Date: Monday, June 27, 2022	Sheet 12 of 18		

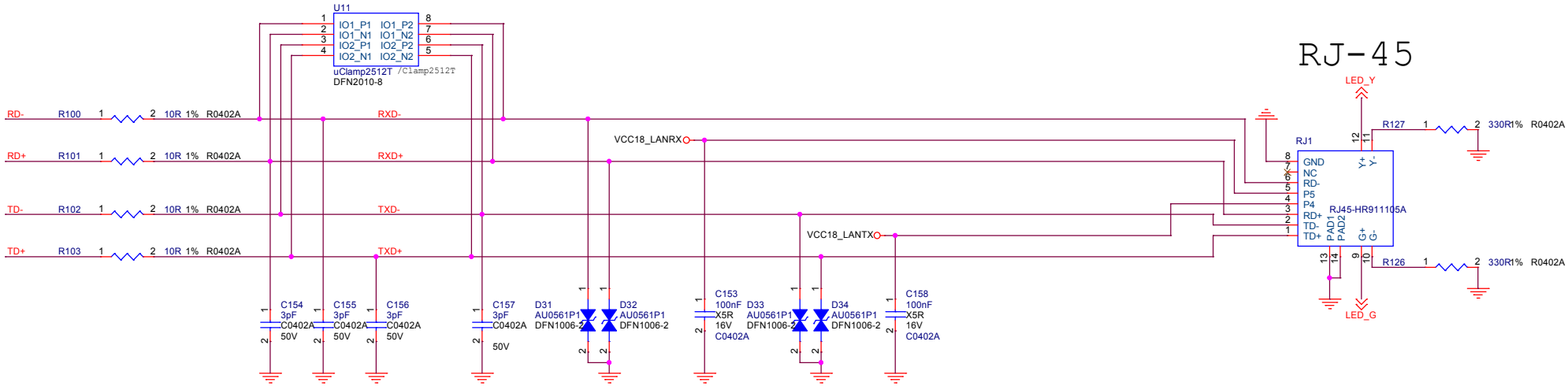


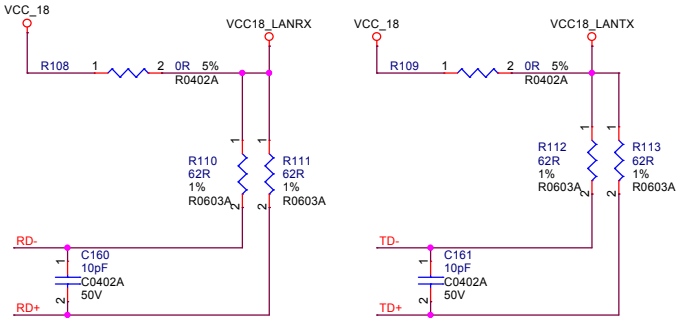
Title	MKS PI	Makerbase FaceBooK : https://www.facebook.com/Makerbase.mks/ Github : https://github.com/makerbase-mks	
Size A4	Document Number 13_TF/SD Card	Makerbase	Rev V1.1_001
Date: Monday, June 27, 2022		Sheet 13 of 18	

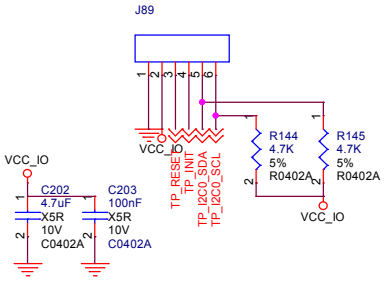

VCC_SYS
VCC_OTG_5V
R74 0R 5% R0805A
U6
SY6280AAC-NC
IN VOUT GND EN OCB
SOT-23-5
C142 1uF X5R 10V C0402A
USB20_HOST_DRV
R76 DNP R0402A
R77 4.7K 5% R0402A
VCC_SYS
VCC_HOST20_5V
R78 0R 5% R0805A
U7
SY6280AAC-NC
C143 1uF X5R 10V C0402A
USB20_HOST_DRV
R80 DNP R0402A
R81 4.7K 5% R0402A
VCC_OTG_5V
R73 2.2R 5% R0402A OTG20_DM
L15 NC/MCZ1210DH900L2TA0G
USB20DP
L0405AX2
R75 2.2R 5% R0402A OTG20_DP
C140 100nF X5R 10V C0402A
C141 10uF X5R 10V C0603A
D20 AU0561P1 DFN1006-2
D21 AU0561P1 DFN1006-2
USB-AF90-H17R5-DUAL
J2
VBUS1 D1- D1+ GND1
PAD1 PAD4 PAD2 PAD3
VBUS2 D2- D2+ GND2
OTG20_DM
OTG20_DP
USB20_HOST_DRV
USB20_HOST_DM
USB20_HOST_DP
VCC_HOST20_5V
R79 2.2R 5% R0402A USB20_HOST_DM
L16 NC/MCZ1210DH900L2TA0G
USB20_HOSTDM
USB20_HOSTDP
L0405AX2
R82 2.2R 5% R0402A USB20_HOST_DP
C144 100nF X5R 10V C0402A
C145 10uF X5R 10V C0603A
D22 AU0561P1 DFN1006-2
D23 AU0561P1 DFN1006-2
VCC_SYS
VCC_HOST_5V
R85 0R 5% R0805A
U8
SY6280AAC-NC
C148 1uF X5R 10V C0402A
USB30_HOST_DRV
R89 DNP R0402A
R90 4.7K 5% R0402A
J3
VBUS D- D+ GND1 SSRX- SSRX+ GND2 SSTX- SSTX+
PAD1 PAD2
USB-3R0-AF90-D-P
USB30DM
USB30DP
USB30RXN
USB30RXP
USB30TXN
USB30TXP
R83 2.2R 5% R0402A USB30_DM
L0405AX2
NC/MCZ1210DH900L2TA0G
R84 2.2R 5% R0402A USB30_DP
R86 0R 5% R0402A USB30_RXN
L18
R87 0R 5% R0402A USB30_RXP
C149 100nF X5R 10V C0402A
C150 NC/MCZ1210DH900L2TA0G C0402A
R88 0R 5% R0402A USB30_TXN
L19
L0405AX2
R91 0R 5% R0402A USB30_TXP
VCC_HOST_5V
C147 100nF X5R 10V C0402A
C146 10uF X5R 10V C0603A
USB30_RXP
USB30_RXN
USB30_TXP
USB30_TXN
USB30_DM
USB30_DP
USB30_HOST_DRV
D24 AU0561P1 DFN1006-2
D25 AU0561P1 DFN1006-2
D26 AU0561P1 DFN1006-2
D27 AU0561P1 DFN1006-2
D28 AU0561P1 DFN1006-2
D29 AU0561P1 DFN1006-2
Note:
ESD of USB3.0 signal cannot be replaced randomly,
if must, please choose the same specifications
Cj<=0.4pF
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 V1.1_001
Date: Monday, June 27, 2022
Sheet 14 of 18

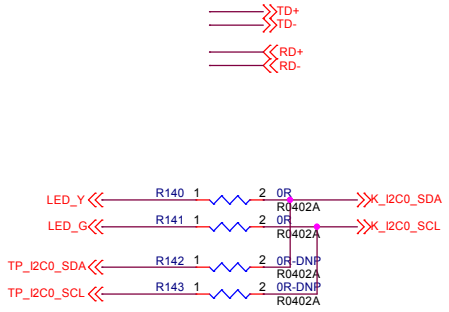


Title	MKS PI	Makerbase FaceBooK : https://www.facebook.com/Makerbase.mks/ Github : https://github.com/makerbase-mks	
Size A4	Document Number 15_HDMI OUT Port	Makerbase	Rev V1.1_001
Date:	Monday, June 27, 2022	Sheet 15 of 18	

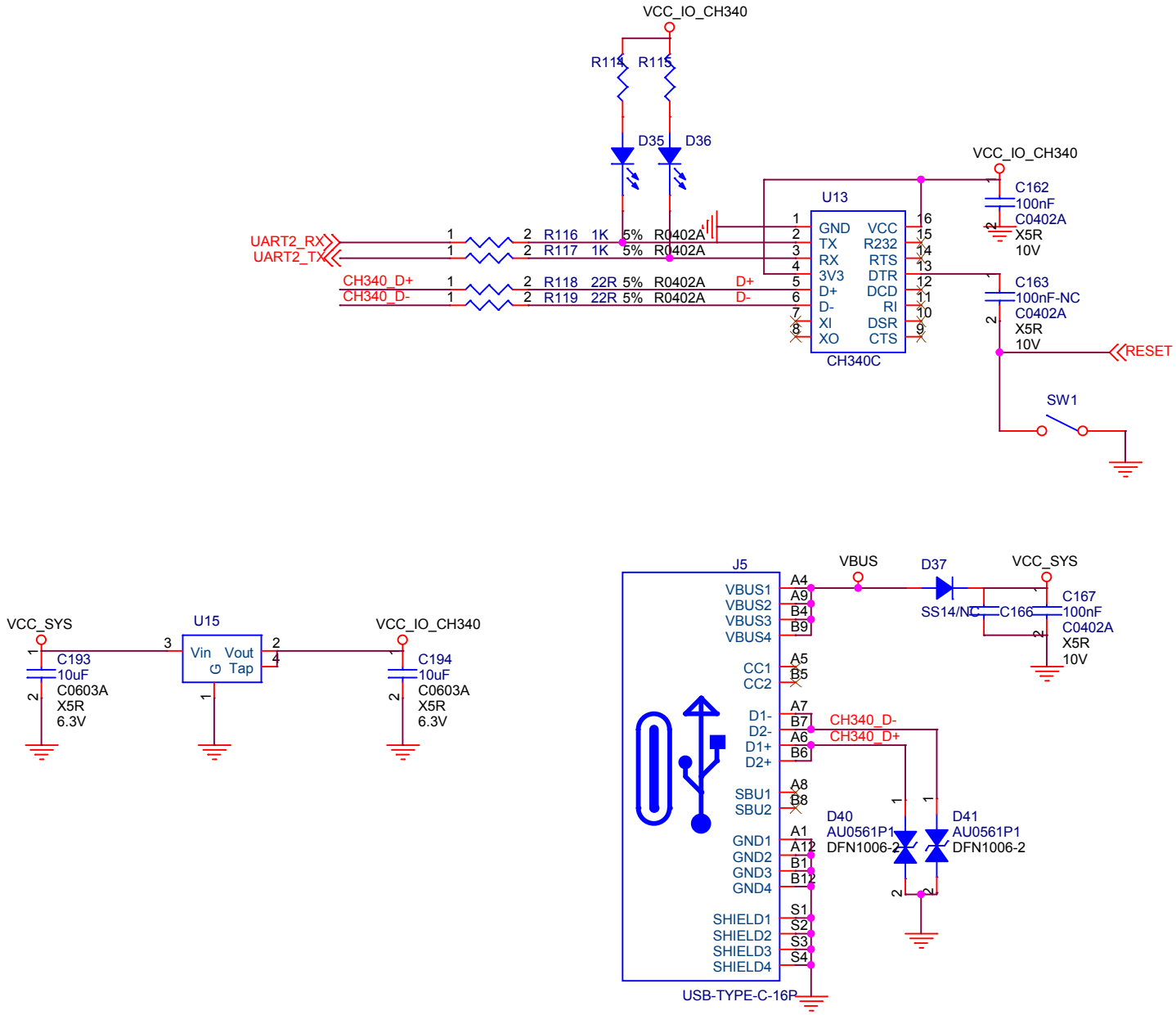




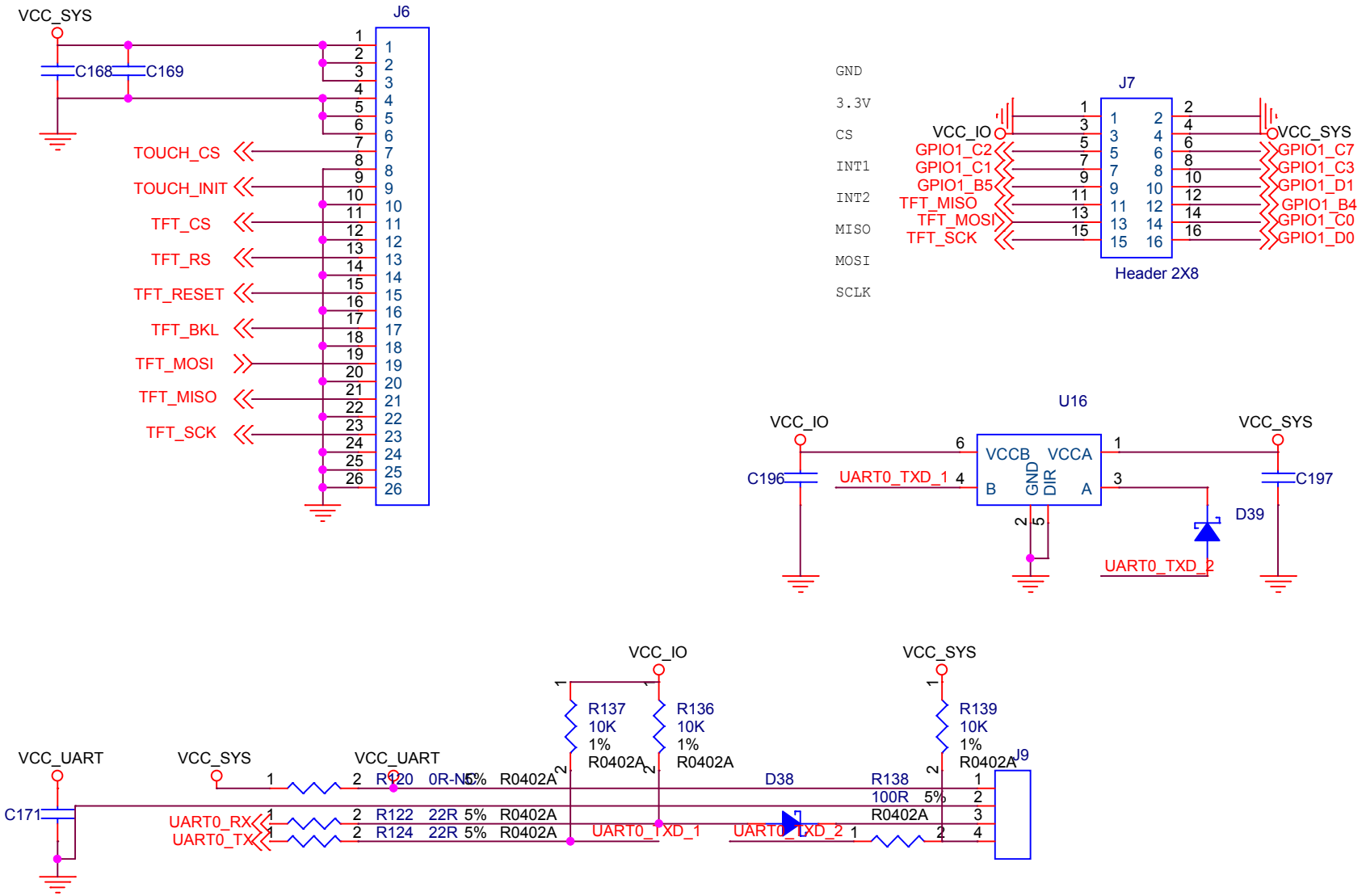




Title	MKS PI	Makerbase FaceBook : https://www.facebook.com/Makerbase.mks/ Github : https://github.com/makerbase-mks	
Size A3	Document Number 16_10/100M-Embed PHY	Makerbase	Rev V1.1_001
Date: Monday, June 27, 2022	Sheet 16 of 18		



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	Makerbase	Rev V1.1_001
Date:	Monday, June 27, 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 V1.1_001
Date:	Monday, June 27, 2022	Sheet 18 of 18	