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011	011_SoC Bootstrap
012	012_SoC RGMII/OSPI
013	013_SoC GPIO/MCASP/VOUT
014	014_SoC USB/OLDI/CSI & USB C
015	015_SoC JTAG & MISC
016	016_BP P1 & P2

REVISION HISTORY

VER #	DATE	DESCRIPTION OF CHANGES	AUTHOR
0.1	28 Oct. 2022	First release	qxn
0.2	1 Nov. 2022	1. Remove unused nets 2. Use WKUP_I2C0 for PMIC 3. Add pull-down to VPP 4. Move eEMMC_RSTn to GPIO0_7 5. Add USER button for boot mode seletion 6. Try to add a CSI connector 7. Using processor boall numbers for signal name on P1 and P2 8. Change SoC to AM6232, change eMMC to 4GB, change DDR to 512MB	qxn
0.3	2 Nov. 2022	1. Remove CSI 2. Add SD card, move LDO0 to VDD_SD 3. Power the VPP with VDD_1V8 through a jumper 4. Connect P2.19 to AC20 instead	qxn
0.4	23 Dec.2022	1. Replace the ideal diode with LM73100RPWR 2. Replace EEPROM and ADC with MSPM0 3. Correct the boot settings 4. Connect AD24(MDC) to P2.17 and AB22(MDIO) to P2.20 which is same as pocketbealge.	qxn

Main

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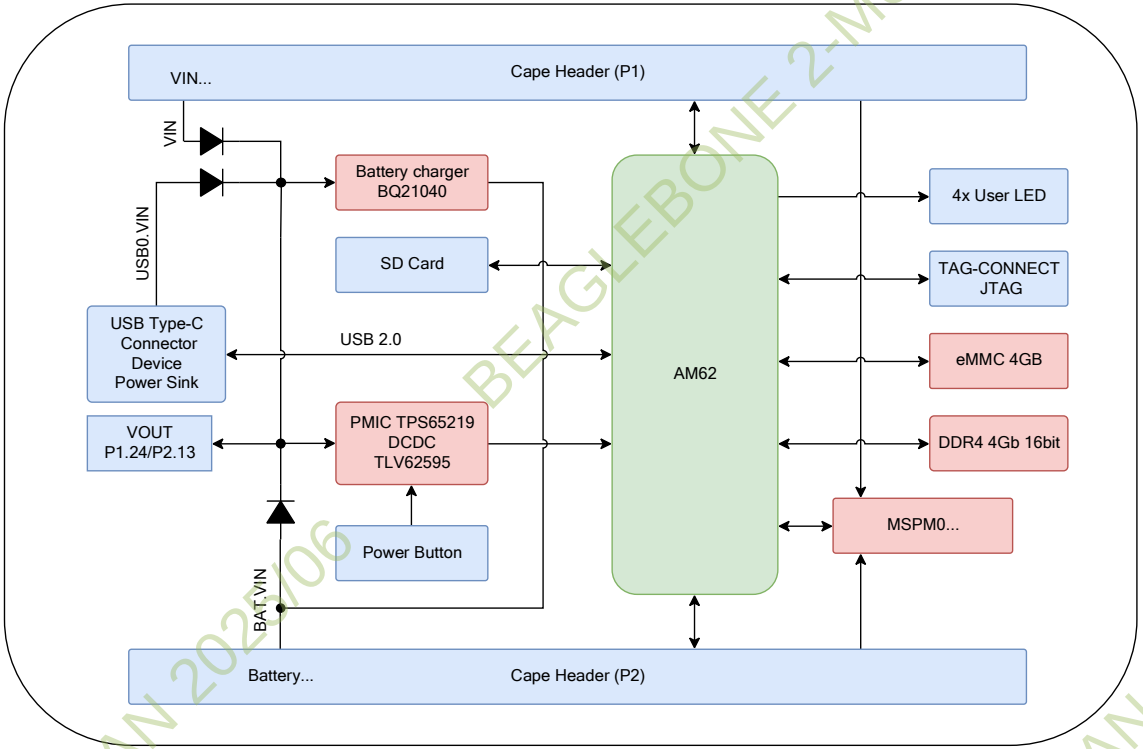
Title: PocketBeagle2

Size: A3	Document Number: 001_Revision History	Rev: v0.3
Draw By: qxn	Date: Friday, December 23, 2022	Sheet: 1 of 16

Block Diagram

BEAGLE BONE 2-MURAT IRKAN AM62xx TEXAS INSTRUMENTS

DEBIAN LINUX 12 /13-PC



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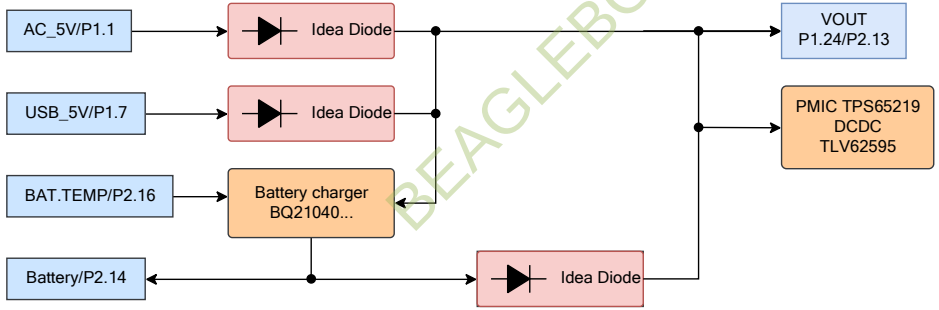
Power tree



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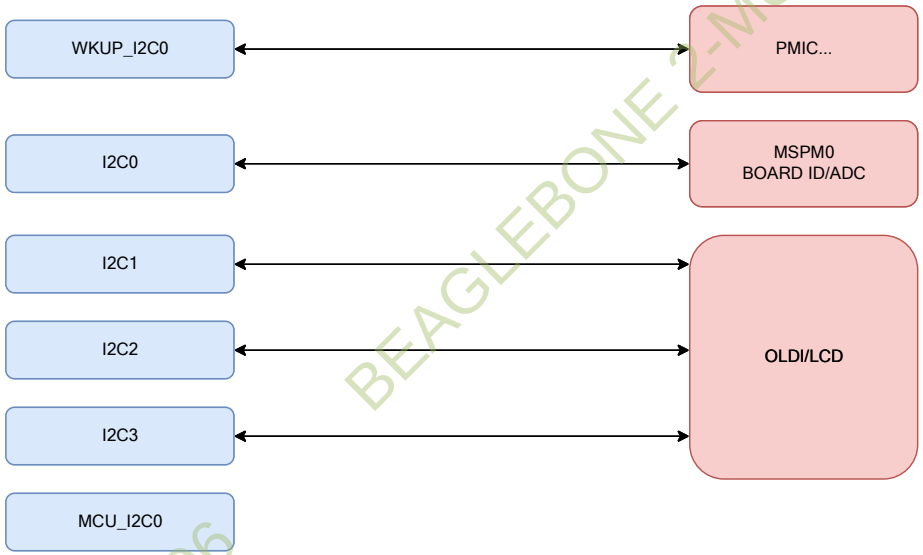
	Title: PocketBeagle2	
Size: A3	Document Number: 003_Power Tree	Rev: v0.3
Draw By: qxn	Date: Friday, December 23, 2022	Sheet: 3 of 16

I2C Usage Diagram



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	Title: PocketBeagle2	
Size: A3	Document Number: 004_I2C Usage Diagram	Rev: v0.3
Draw By: qxn	Date: Friday, December 23, 2022	Sheet: 4 of 16

Power Path

2.7 -> 23v MIN/MAX GİRİŞ VOLTAJ DEĞERİ

BATERİ VOLTAJ GİRİŞ

+5v GİRİŞ

VIN_5V

USB_5V

VBAT

VSYS

R55 470K 1% R0402

R56 68K 1% R0402

R57 150K 1% R0402

C12 10nF 6.3V C0201

U7 LM73100RPW

R37 470K 1% R0402

R39 68K 1% R0402

R40 150K 1% R0402

C13 10nF 6.3V C0201

U9 LM73100RPW

R41 432K 1% R0402

R42 78.7k 1% R0402

R43 180K 1% R0402

C14 10nF 6.3V C0201

U10 LM73100RPW

C15 22uF 25V C0805

OVLO set point: 5.5V 3%
UVLO set point: 3.8V 3%
UV_rising: 3.8V
UV_falling: 3.5V
OV_rising: 5.5V
OV_falling:5.05V

OVLO set point: 5.5V 3%
UVLO set point: 3.8V 3%
UV_rising: 3.8V
UV_falling: 3.5V
OV_rising: 5.5V
OV_falling:5.05V

OVLO set point: 4.6V 3%
UVLO set point: 3.2V 3%
UV_rising: 3.2V
UV_falling: 2.9V
OV_rising: 4.6V
OV_falling:4.2V

It is turned off if either VIN_5V or USB_5V is present.

Battery Charger

ISET = 540mA

U5 BQ21040 SOT-23-6

C6 1uF 10V C0402

R46 1K 1% R0201

R47 10K 1% R0201

C7 1uF 10V C0402

BAT_TS [16]

CHG_N [15]

DCDC 3V3

3.3v regülatör

U12 TLV62595DMQR VSON-6 vson6_0d5_1d5x1d5x1mm

VDD_3V3_EN

R137 10K 1% R0201

C133 10uF 10V C0603

L18 2520 0.47uH 5.0A 3A

R260 560K 1% R0402

R261 124K 1% R0402

C11 100pF 50V C0201

C134 22uF 25V C0805

C135 22uF 25V C0805

TP26

Vout = Vfb x (1 + R260/ R261)
= 0.6V x (1 + 560K / 124K)
= 0.6V x 5.516
= 3.309V

PMIC

U17 TPS65219 QFN-32

Buck1 Buck2 Buck3 LDO1 LDO2 LDO3 LDO4 INT LDO DIGITAL

C62 10uF 10V C0603

C63 10uF 10V C0603

C64 10uF 10V C0603

L14 2520 0.33uH 6.9A

C50 47uF 6.3V C0805

L16 2520 0.47uH 5.0A

C60 47uF 6.3V C0805

L17 2520 0.47uH 5.0A

C54 47uF 6.3V C0805

C125 C112 C113 C103 2.2uF 10V C0402

R54 R228 R161 10K 1% R0201

C53 C52 2.2uF 10V C0402

C49 C48 C47 C46 2.2uF 10V C0402

R159 R160 10K 1% R0201

ADC_REF_VOLTAGE_SELECT

[10] WKUP_I2C0_SDL
[10] WKUP_I2C0_SDA
[15,16] PWR_BTN
[9] SD_VOLT_SEL
[9,10,15] RESETSTATz
[10] PMIC_LPM_EN0

PWR_BTN

nRSTOUT
nINT

MCU_PORz [10,16]
EXTINTn [10]

VDD_3V3_EN

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	Title: PocketBeagle2	
Size: A3	Document Number: 005_PMIC & Charger	Rev: v0.3
Draw By: qxn	Date: Friday, December 23, 2022	Sheet: 5 of 16

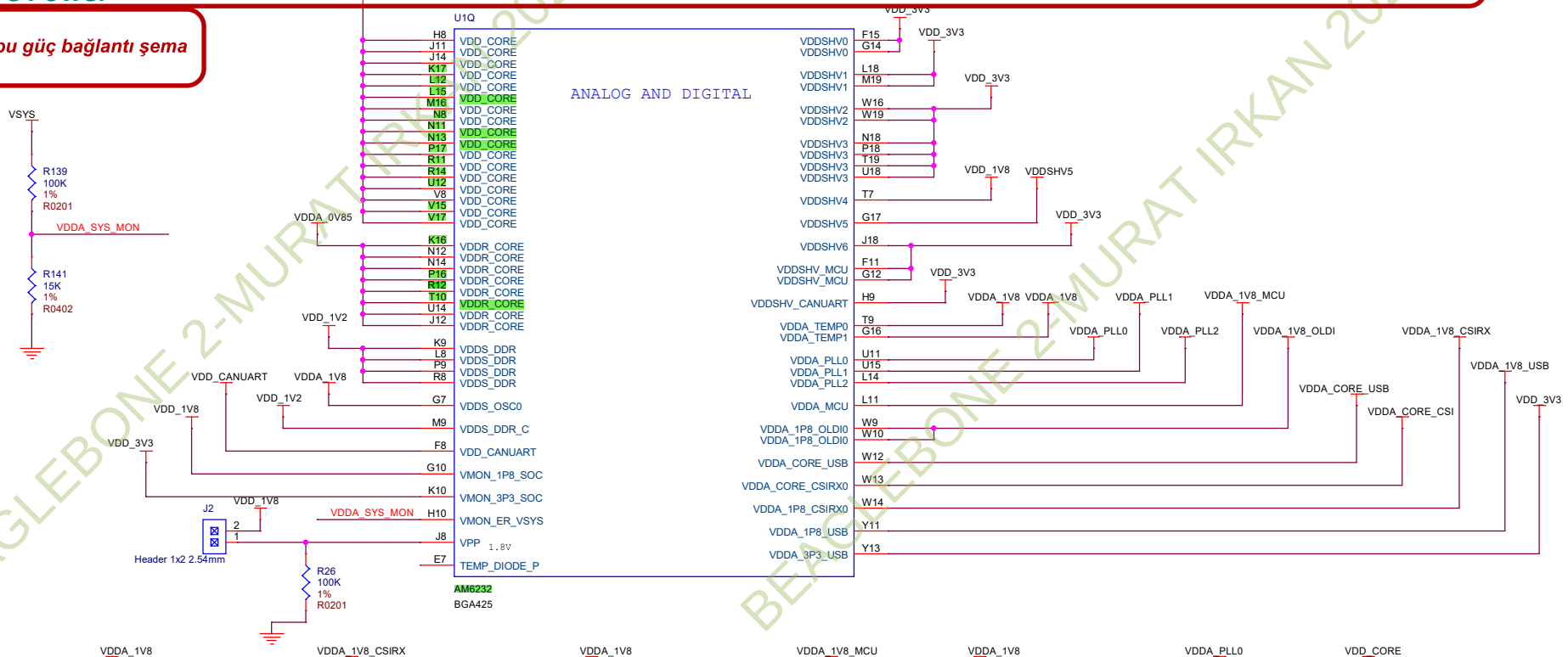
Main

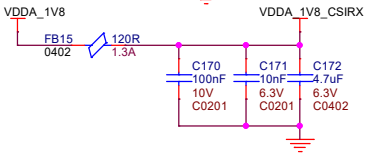
AM6232 DEBIAN/UBUNTU LINUX BİLGİSAYAR

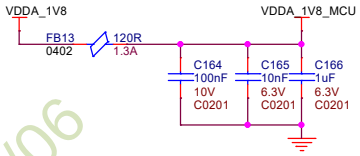
06/25/2025 10:50 AM

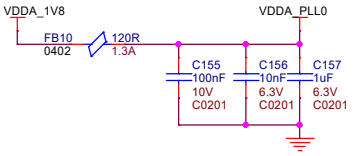
SoC Power

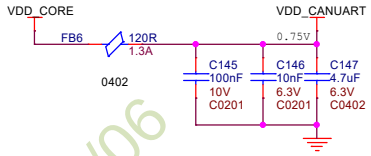
arm cpu güç bağlantı şema

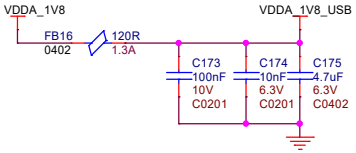


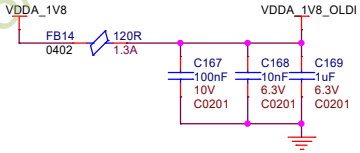


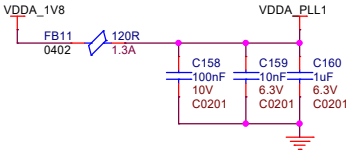


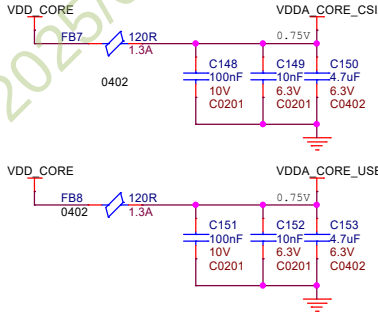


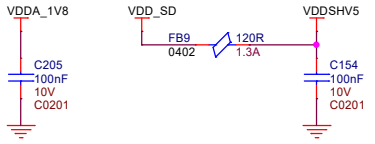


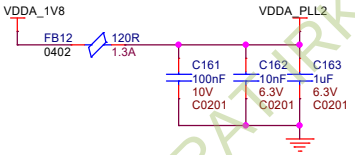








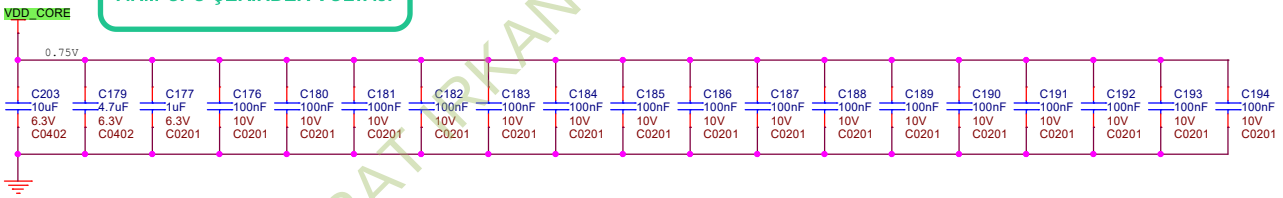


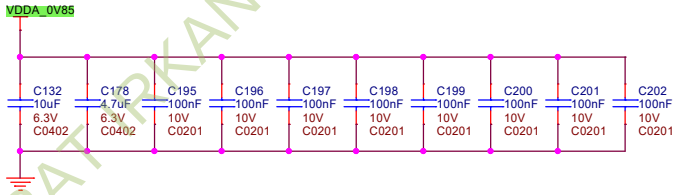


SoC DCAPs

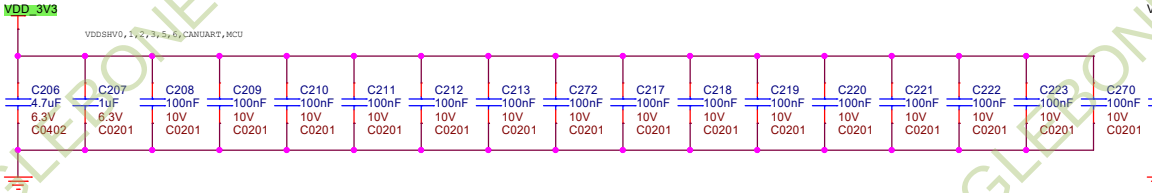
LINUX- PC DEKÜPLAJ KONDANSATÖRLERİ

ARM-CPU ÇEKİRDEK VOLTAJI

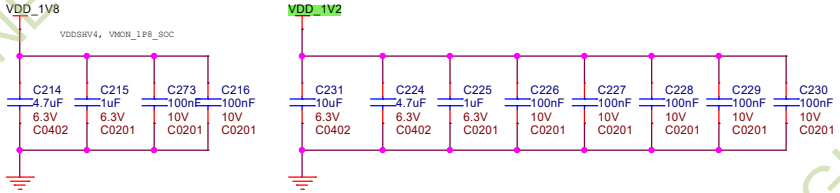




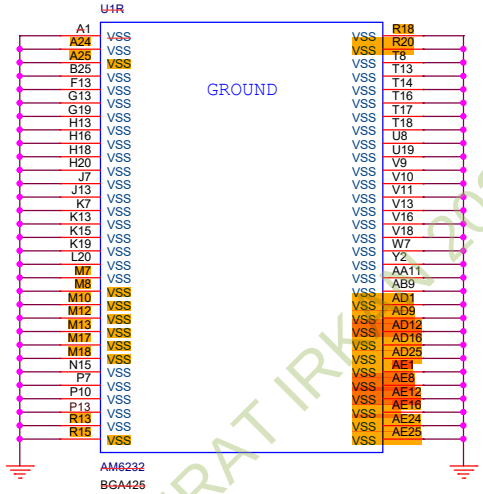
3.3VOLT

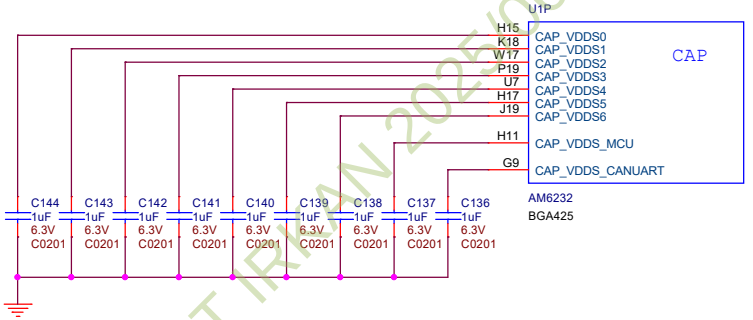


1.2v



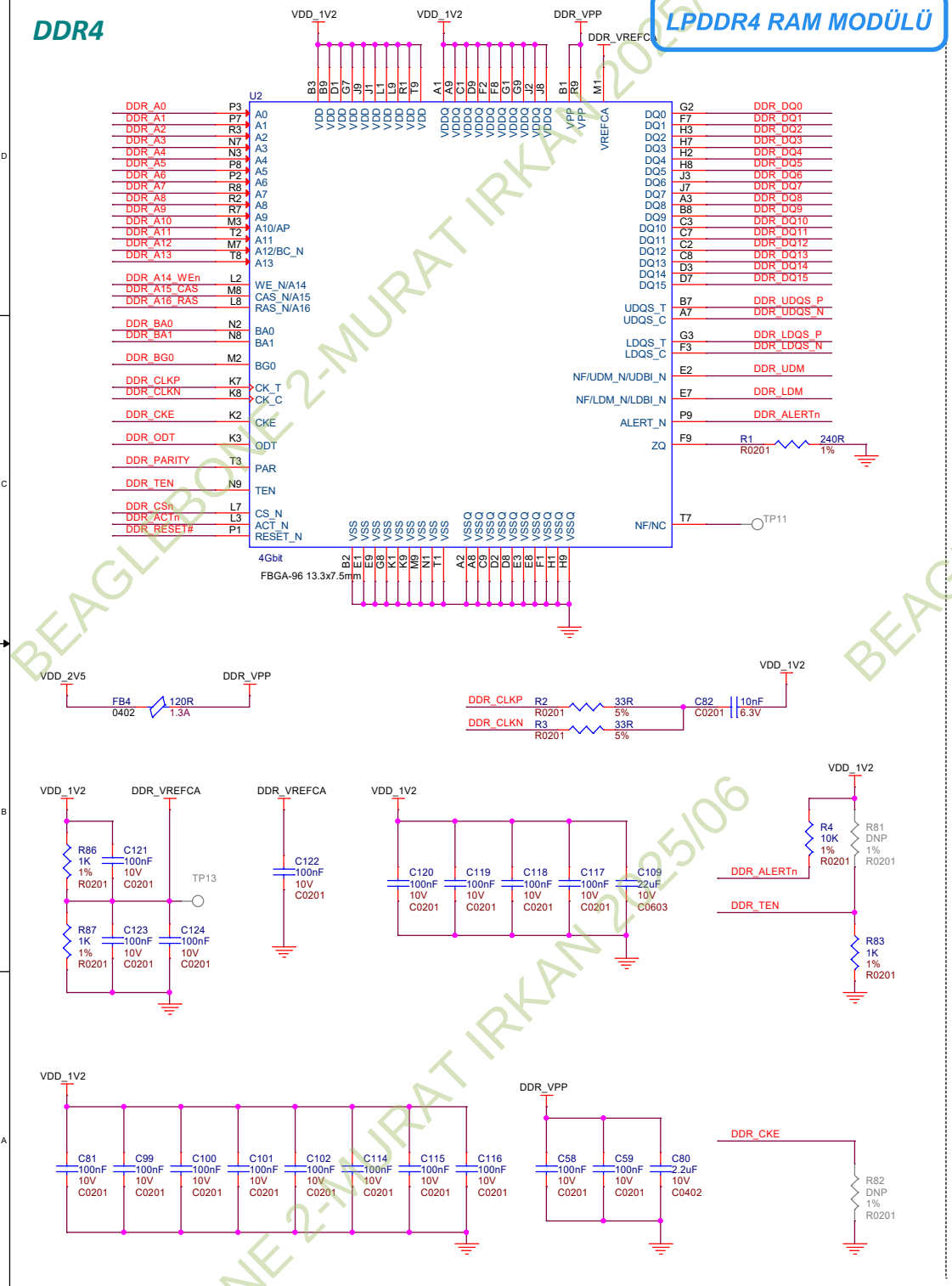
ARM-CPU TÜM ŞASELERİ (-)volt



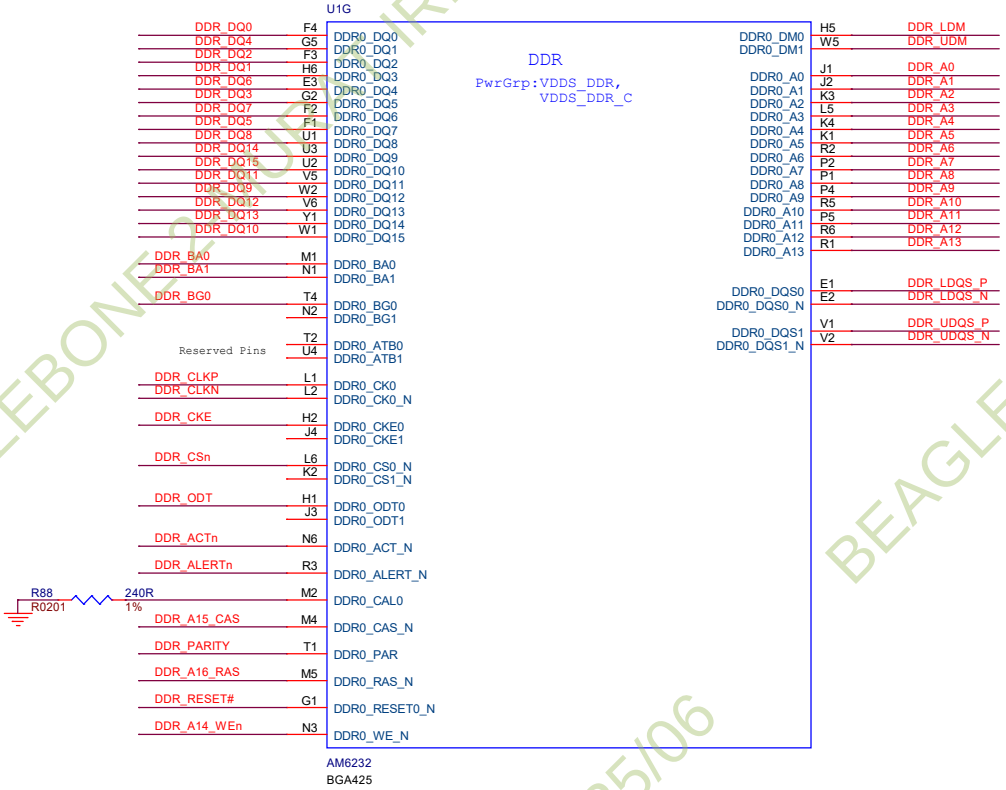


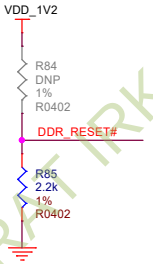
DDR4

LPDDR4 RAM MODÜLÜ



SoC DDR controller

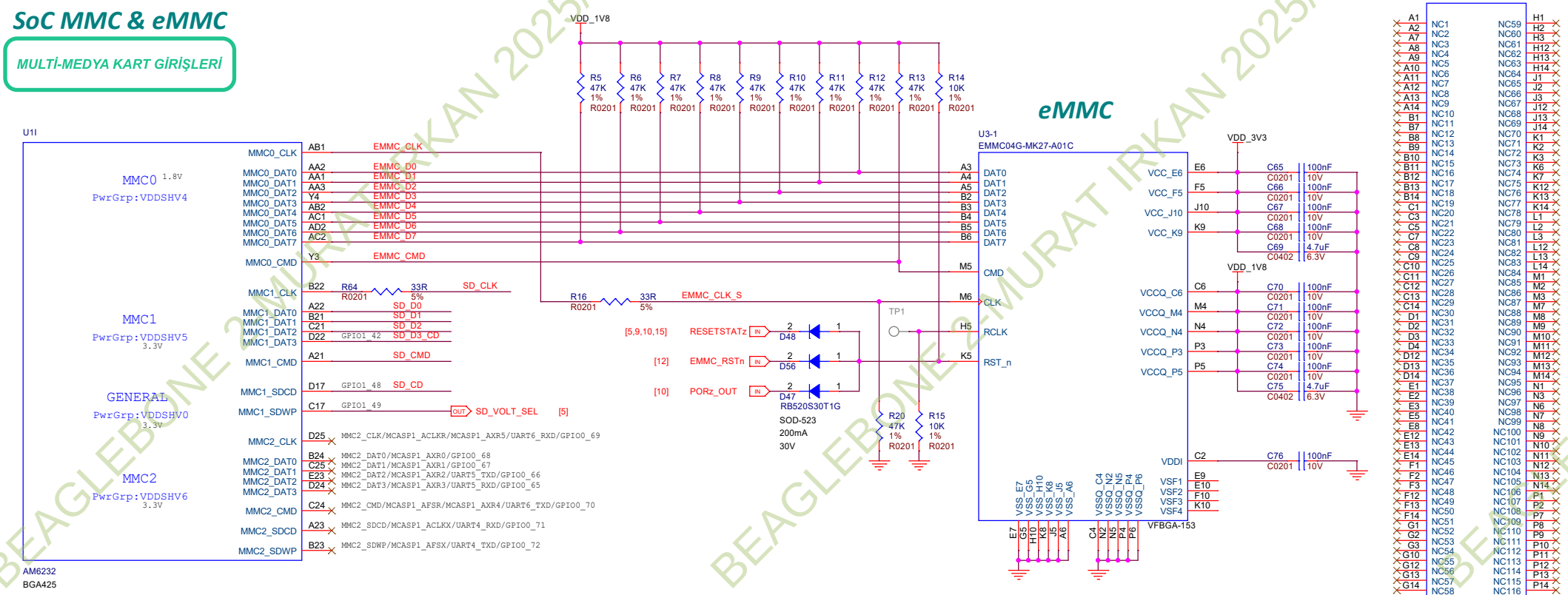




NOTE: DDR DQ Lines Swapped
Within Data Byte

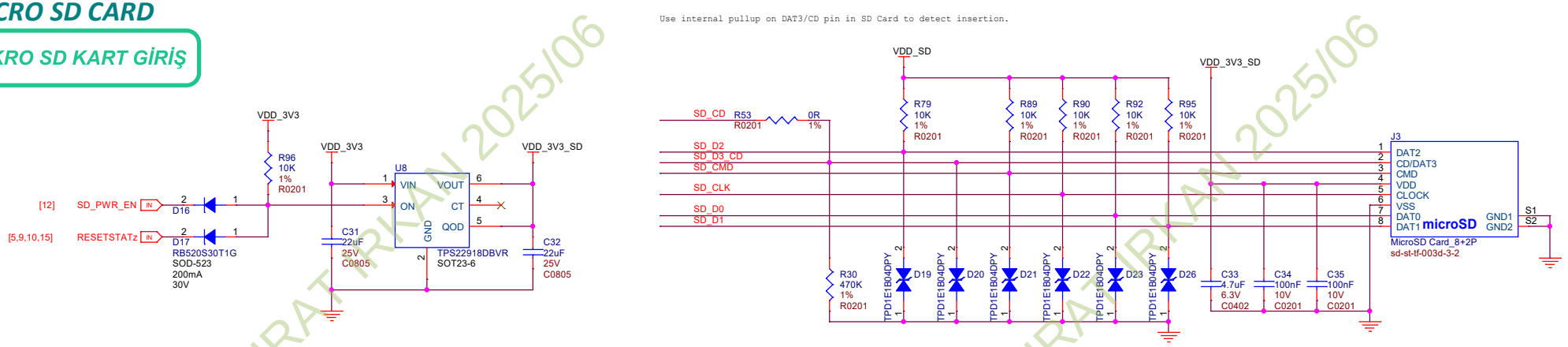
SoC MMC & eMMC

MULTİ-MEDYA KART GİRİŞLERİ

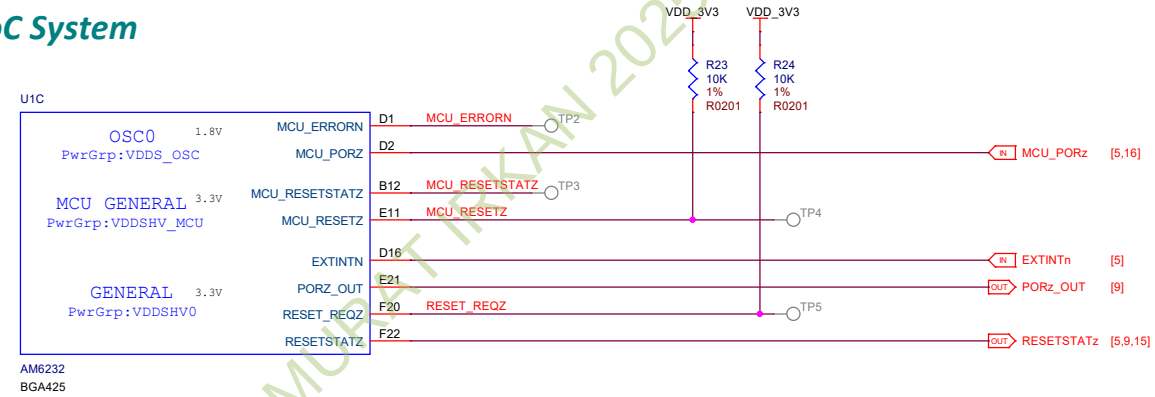


MICRO SD CARD

MİKRO SD KART GİRİŞ

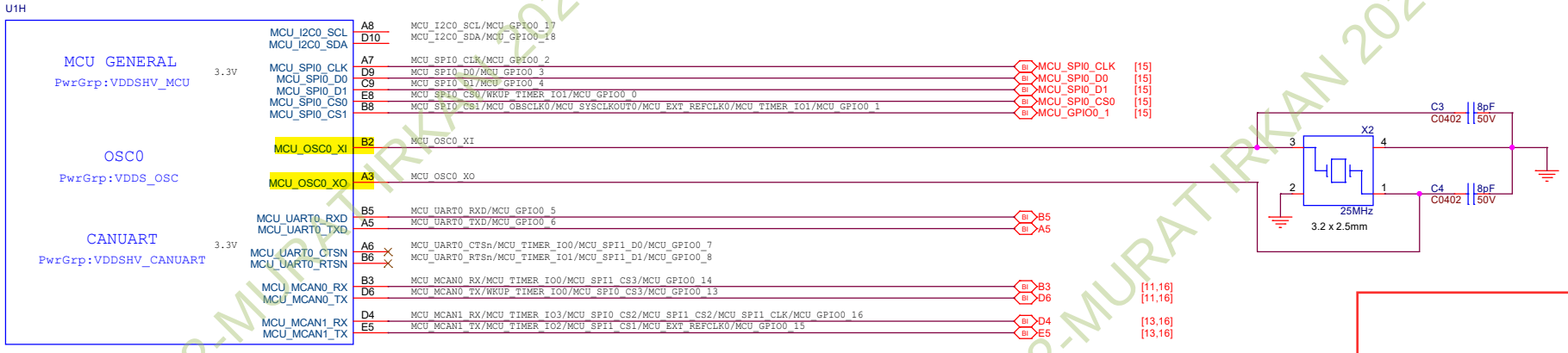


SoC System



WKUP Domain

MCU Domain



SoC GPIO 1.8V

ARM CPU GENEL GİRİŞLER VE ÇIKIŞLAR

U1F

GPMC
PwrGrp:VDDSHV3
3.3V

GPMC0_CLK	P25	GPMC0_CLK/MCASP1_AXR3/GPMC0_FCLK_MUX/PR0_PRU0_GPO8/PR0_PRU0_GPI8/TRC_DATA6/GPIO0_31		
GPMC0_AD0	M25	GPMC0_AD0/PR0_PRU1_GPO8/PR0_PRU1_GPI8/MCASP2_AXR4/PR0_PRU0_GPO0/PR0_PRU0_GPI0/TRC_CLK/GPIO0_15/BOOTMODE00	BOOTMODE0	
GPMC0_AD1	N23	GPMC0_AD1/PR0_PRU1_GPO9/PR0_PRU1_GPI9/MCASP2_AXR5/PR0_PRU0_GPO1/PR0_PRU0_GPI1/TRC_CTL/GPIO0_16/BOOTMODE01	BOOTMODE1	
GPMC0_AD2	N24	GPMC0_AD2/PR0_PRU1_GPO10/PR0_PRU1_GPI10/MCASP2_AXR6/PR0_PRU0_GPO2/PR0_PRU0_GPI2/TRC_DATA0/GPIO0_17/BOOTMODE02	BOOTMODE2	
GPMC0_AD3	N25	GPMC0_AD3/PR0_PRU1_GPO11/PR0_PRU1_GPI11/MCASP2_AXR7/PR0_PRU0_GPO3/PR0_PRU0_GPI3/TRC_DATA1/GPIO0_18/BOOTMODE03	BOOTMODE3	
GPMC0_AD4	P24	GPMC0_AD4/PR0_PRU1_GPO12/PR0_PRU1_GPI12/MCASP2_AXR8/PR0_PRU0_GPO4/PR0_PRU0_GPI4/TRC_DATA2/GPIO0_19/BOOTMODE04	BOOTMODE4	
GPMC0_AD5	P22	GPMC0_AD5/PR0_PRU1_GPO13/PR0_PRU1_GPI13/MCASP2_AXR9/PR0_PRU0_GPO5/PR0_PRU0_GPI5/TRC_DATA3/GPIO0_20/BOOTMODE05	BOOTMODE5	
GPMC0_AD6	P21	GPMC0_AD6/PR0_PRU1_GPO14/PR0_PRU1_GPI14/MCASP2_AXR10/PR0_PRU0_GPO6/PR0_PRU0_GPI6/TRC_DATA4/GPIO0_21/BOOTMODE06	BOOTMODE6	
GPMC0_AD7	R23	GPMC0_AD7/PR0_PRU1_GPO15/PR0_PRU1_GPI15/MCASP2_AXR11/PR0_PRU0_GPO7/PR0_PRU0_GPI7/TRC_DATA5/GPIO0_22/BOOTMODE0	BOOTMODE7	
GPMC0_AD8	R24	GPMC0_AD8/VOUT0_DATA16/UART2_RXD/MCASP2_AXR0/PR0_PRU1_GPO0/PR0_PRU1_GPI0/GPIO0_23/BOOTMODE08	BOOTMODE8	
GPMC0_AD9	R25	GPMC0_AD9/VOUT0_DATA17/UART2_TXD/MCASP2_AXR1/PR0_PRU1_GPO1/PR0_PRU1_GPI1/GPIO0_24/BOOTMODE09	BOOTMODE9	
GPMC0_AD10	T25	GPMC0_AD10/VOUT0_DATA18/UART3_RXD/MCASP2_AXR2/PR0_PRU1_GPO2/PR0_PRU1_GPI2/GPIO0_25/OBSCLK0/BOOTMODE10	BOOTMODE10	
GPMC0_AD11	R21	GPMC0_AD11/VOUT0_DATA19/UART3_TXD/MCASP2_AXR3/PR0_PRU1_GPO3/PR0_PRU1_GPI3/TRC_DATA23/GPIO0_26/BOOTMODE1	BOOTMODE11	
GPMC0_AD12	T22	GPMC0_AD12/VOUT0_DATA20/UART4_RXD/MCASP2_AFSX/PR0_PRU0_GPO0/PR0_PRU0_GPI0/TRC_DATA22/GPIO0_27/BOOTMODE12	BOOTMODE12	
GPMC0_AD13	T24	GPMC0_AD13/VOUT0_DATA21/UART4_TXD/MCASP2_ACLKX/PR0_PRU0_GPO1/PR0_PRU0_GPI1/TRC_DATA21/GPIO0_28/BOOTMODE13	BOOTMODE13	
GPMC0_AD14	U25	GPMC0_AD14/VOUT0_DATA22/UART5_RXD/MCASP2_AFSR/PR0_PRU0_GPO2/PR0_PRU0_GPI2/TRC_DATA20/GPIO0_29/UART2_CTSn/BOOTMODE14	BOOTMODE14	
GPMC0_AD15	U24	GPMC0_AD15/VOUT0_DATA23/UART5_TXD/MCASP2_ACLKR/PR0_PRU0_GPO3/PR0_PRU0_GPI3/TRC_DATA19/GPIO0_30/UART2_RTSn/BOOTMODE15	BOOTMODE15	
GPMC0_CSN0	M21	GPMC0_CSn0/MCASP2_AXR14/PR0_PRU0_GPO17/PR0_PRU0_GPI17/TRC_DATA15/GPIO0_41		
GPMC0_CSN1	L21	GPMC0_CSn1/PR0_PRU1_GPO16/PR0_PRU1_GPI16/MCASP2_AXR15/PR0_PRU0_GPO18/PR0_PRU0_GPI18/TRC_DATA16/GPIO0_42		
GPMC0_CSN2	K22	GPMC0_CSn2/I2C2_SCL/MCASP1_AXR4/UART4_RXD/PR0_PRU0_GPO19/PR0_PRU0_GPI19/TRC_DATA17/GPIO0_43/MCASP1_AFSR	BI K22	[10,16]
GPMC0_CSN3	K24	GPMC0_CSn3/I2C2_SDA/GPMC0_A20/UART4_TXD/MCASP1_AXR5/TRC_DATA18/GPIO0_44/MCASP1_ACLKR	BI K24	[10,16]
GPMC0_ADVN_ALE	L23	GPMC0_ADVn_ALE/MCASP1_AXR2/PR0_PRU0_GPO9/PR0_PRU0_GPI9/TRC_DATA7/GPIO0_32		
GPMC0_BE0N_CLE	M24	GPMC0_BE0n_CLE/MCASP1_ACLKX/PR0_PRU0_GPO12/PR0_PRU0_GPI12/TRC_DATA10/GPIO0_35		
GPMC0_BE1N	N20	GPMC0_BE1n/MCASP2_AXR12/PR0_PRU0_GPO13/PR0_PRU0_GPI13/TRC_DATA11/GPIO0_36	BI N20	[16]
GPMC0_DIR	M22	GPMC0_DIR/PR0_ECAP0_IN_APWM_OUT/MCASP2_AXR13/PR0_PRU0_GPO16/PR0_PRU0_GPI16/TRC_DATA14/GPIO0_40/EQEP2_S	BI M22	[13,16]
GPMC0_WAIT0	U23	GPMC0_WAIT0/MCASP1_AFSX/PR0_PRU0_GPO14/PR0_PRU0_GPI14/TRC_DATA12/GPIO0_37		
GPMC0_WAIT1	V25	GPMC0_WAIT1/VOUT0_EXTPCLKIN/GPMC0_A21/UART6_RXD/GPIO0_38/EQEP2_I		
GPMC0_WPN	K25	GPMC0_WPn/AUDIO_EXT_REFCLK1/GPMC0_A22/UART6_TXD/PR0_PRU0_GPO15/PR0_PRU0_GPI15/TRC_DATA13/GPIO0_3		
GPMC0_OEN_REN	L24	GPMC0_OEn_REn/MCASP1_AXR1/PR0_PRU0_GPO10/PR0_PRU0_GPI10/TRC_DATA8/GPIO0_33		
GPMC0_WEN	L25	GPMC0_WEn/MCASP1_AXR0/PR0_PRU0_GPO11/PR0_PRU0_GPI11/TRC_DATA9/GPIO0_34		

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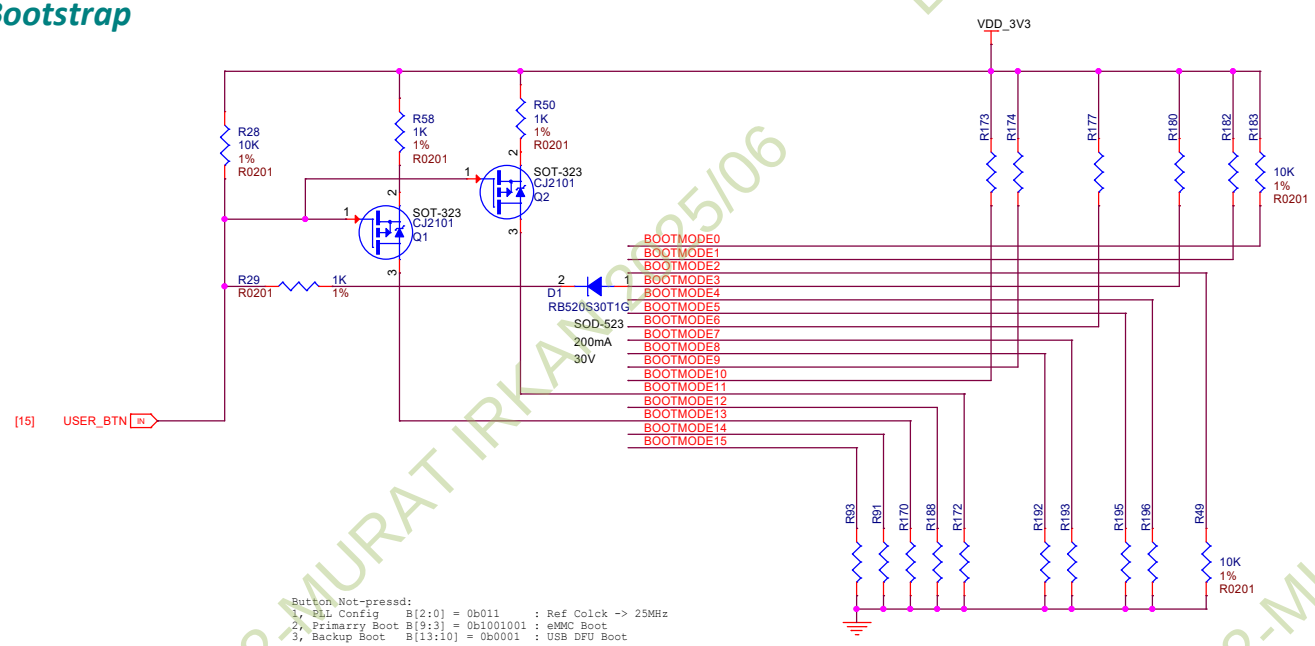
Bootstrap




```
Button Not-pressd:
1, PLL Config    B[2:0] = 0b011     : Ref Colck -> 25MHz
2, Primarry Boot B[9:3] = 0b1001001 : eMMC Boot
3, Backup Boot   B[13:10] = 0b0001  : USB DFU Boot

Button Pressd:
1, PLL Config    B[2:0] = 0b011     : Ref Colck -> 25MHz
2, Primarry Boot B[9:3] = 0b1001000 : SDCard FS Boot
3, Backup Boot   B[13:10] = 0b1011  : UART Boot
```

RGMII

U1M

RGMII1 3.3V

PwrGrp:VDDSHV2

RGMII1_RD0	AB17	RGMII1_RD0/RMII1_RXD0/GPIO0_81
RGMII1_RD1	AC17	RGMII1_RD1/RMII1_RXD1/GPIO0_82
RGMII1_RD2	AB16	RGMII1_RD2/PR0_UART0_RTSn/GPIO0_83
RGMII1_RD3	AA15	RGMII1_RD3/GPIO0_84
RGMII1_RXC	AD17	RGMII1_RXC/RMII1_REF_CLK/PR0_UART0_CTSn/GPIO0_80
RGMII1_RX_CTL	AE17	RGMII1_RX_CTL/RMII1_RX_ER/GPIO0_79
RGMII1_TD0	AE20	RGMII1_TD0/RMII1_TXD0/GPIO0_75
RGMII1_TD1	AD20	RGMII1_TD1/RMII1_TXD1/GPIO0_76
RGMII1_TD2	AE18	RGMII1_TD2/PR0_UART0_RXD/GPIO0_77
RGMII1_TD3	AD18	RGMII1_TD3/PR0_UART0_TXD/GPIO0_78
RGMII1_TXC	AE19	RGMII1_TXC/RMII1_CRS_DV/GPIO0_74
RGMII1_TX_CTL	AD19	RGMII1_TX_CTL/RMII1_TX_EN/GPIO0_73

AE18 [13,16]

AD18 [13,16]

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U1S

RGMII2 3.3V

PwrGrp:VDDSHV2

RGMII2_RD0	AE23	RGMII2_RD0/RMII2_RXD0/MCASP2_AXR2/PR0_PRU0_GPO2/PR0_PRU0_GPI2/PR0_UART0_RTSn/GPIO1_3
RGMII2_RD1	AB20	RGMII2_RD1/RMII2_RXD1/MCASP2_AFSR/PR0_PRU0_GPO3/PR0_PRU0_GPI3/MCASP2_AXR7/GPIO1_4
RGMII2_RD2	AC21	RGMII2_RD2/MCASP2_AXR0/PR0_PRU0_GPO4/PR0_PRU0_GPI4/PR0_UART0_RXD/GPIO1_5/EQEP2_A
RGMII2_RD3	AE22	RGMII2_RD3/AUDIO_EXT_REFCLK0/PR0_PRU0_GPO16/PR0_PRU0_GPI16/PR0_UART0_TXD/GPIO1_6/EQEP2_B
RGMII2_RXC	AD23	RGMII2_RXC/RMII2_REF_CLK/MCASP2_AXR1/PR0_PRU0_GPO1/PR0_PRU0_GPI1/PR0_ECAP0_SYNC_IN/GPIO1_2
RGMII2_RX_CTL	AD22	RGMII2_RX_CTL/RMII2_RX_ER/MCASP2_AXR3/PR0_PRU0_GPO0/PR0_PRU0_GPI0/GPIO1_1
RGMII2_TD0	Y18	RGMII2_TD0/RMII2_TXD0/MCASP2_AXR6/PR0_PRU1_GPO2/PR0_PRU1_GPI2/GPIO0_89
RGMII2_TD1	AA18	RGMII2_TD1/RMII2_TXD1/MCASP2_ACLKR/PR0_PRU1_GPO3/PR0_PRU1_GPI3/MCASP2_AXR8/GPIO0_90
RGMII2_TD2	AD21	RGMII2_TD2/MCASP2_AFSX/PR0_PRU1_GPO4/PR0_PRU1_GPI4/PR0_ECAP0_IN_APWM_OUT/GPIO0_91/EQEP2_I
RGMII2_TD3	AC20	RGMII2_TD3/MCASP2_ACLKX/PR0_PRU1_GPO16/PR0_PRU1_GPI16/PR0_ECAP0_SYNC_OUT/PR0_UART0_CTSn/GPIO1_0/EQEP2_S
RGMII2_TXC	AE21	RGMII2_TXC/RMII2_CRS_DV/MCASP2_AXR5/PR0_PRU1_GPO1/PR0_PRU1_GPI1/GPIO0_88
RGMII2_TX_CTL	AA19	RGMII2_TX_CTL/RMII2_TX_EN/MCASP2_AXR4/PR0_PRU1_GPO0/PR0_PRU1_GPI0/GPIO0_87

Y18 [13,16]

AA18 [13,16]

AD21 [16]

AC20 [16]

AE21 [16]

AA19 [13,15,16]

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OSPI

U1J

OSPI 3.3V

PwrGrp:VDDSHV1

OSPI0_CLK	H24	OSPI0_CLK/GPIO0_0
OSPI0_D0	E25	OSPI0_D0/GPIO0_3
OSPI0_D1	G24	OSPI0_D1/GPIO0_4
OSPI0_D2	F25	OSPI0_D2/GPIO0_5
OSPI0_D3	F24	OSPI0_D3/GPIO0_6
OSPI0_D4	J23	OSPI0_D4/SPI1_CS0/MCASP1_AXR1/UART6_RXD/GPIO0_7
OSPI0_D5	J25	OSPI0_D5/SPI1_CLK/MCASP1_AXR0/UART6_TXD/GPIO0_8
OSPI0_D6	H25	OSPI0_D6/SPI1_D0/MCASP1_ACLKX/UART6_RTSn/GPIO0_9
OSPI0_D7	J22	OSPI0_D7/SPI1_D1/MCASP1_AFSX/UART6_CTSn/GPIO0_10
OSPI0_CSN0	F23	OSPI0_CSn0/GPIO0_11
OSPI0_CSN1	G21	OSPI0_CSn1/GPIO0_12
OSPI0_CSN2	H21	OSPI0_CSn2/SPI1_CS1/OSPI0_RESET_OUT1/MCASP1_AFSR/MCASP1_AXR2/UART5_RXD/GPIO0_13
OSPI0_CSN3	E24	OSPI0_CSn3/OSPI0_RESET_OUT0/OSPI0_ECC_FAIL/MCASP1_ACLKR/MCASP1_AXR3/UART5_TXD/GPIO0_14
OSPI0_DQS	J24	OSPI0_DQS/UART5_CTSn/GPIO0_2
OSPI0_LBCLKO	G25	OSPI0_LBCLKO/UART5_RTSn/GPIO0_1

SD_PWR_EN [9]

GPIO0_3 [15]

GPIO0_4 [15]

GPIO0_5 [15]

GPIO0_6 [15]

EMMC_RSTn [9]

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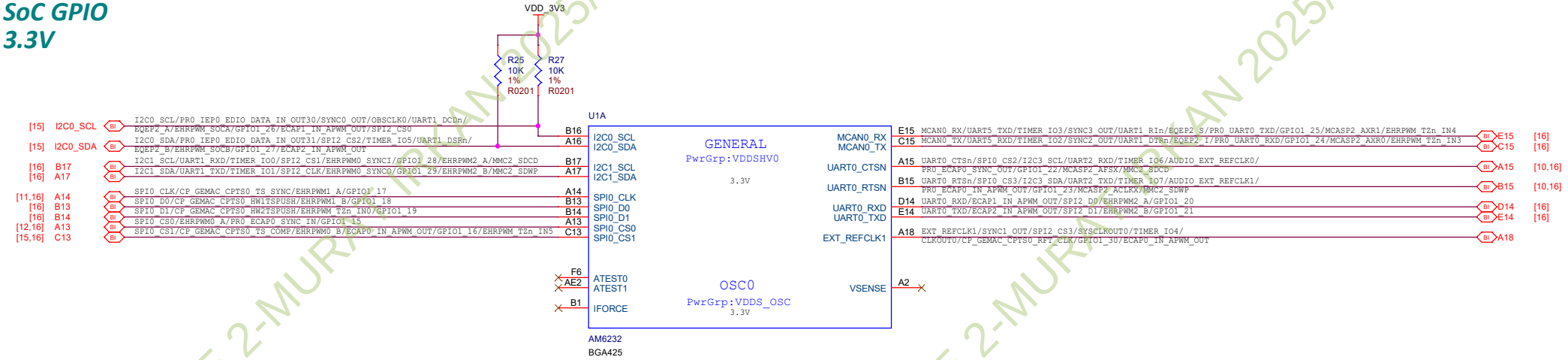
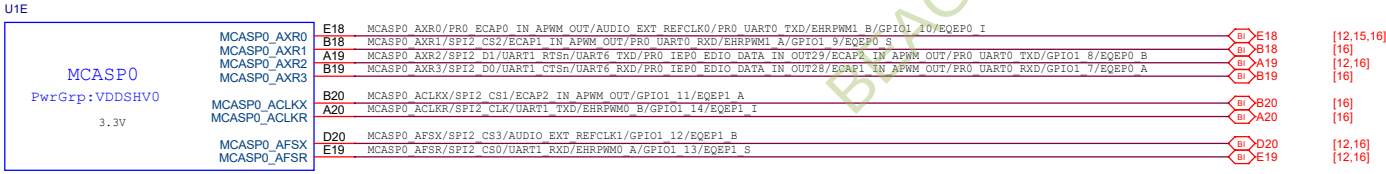
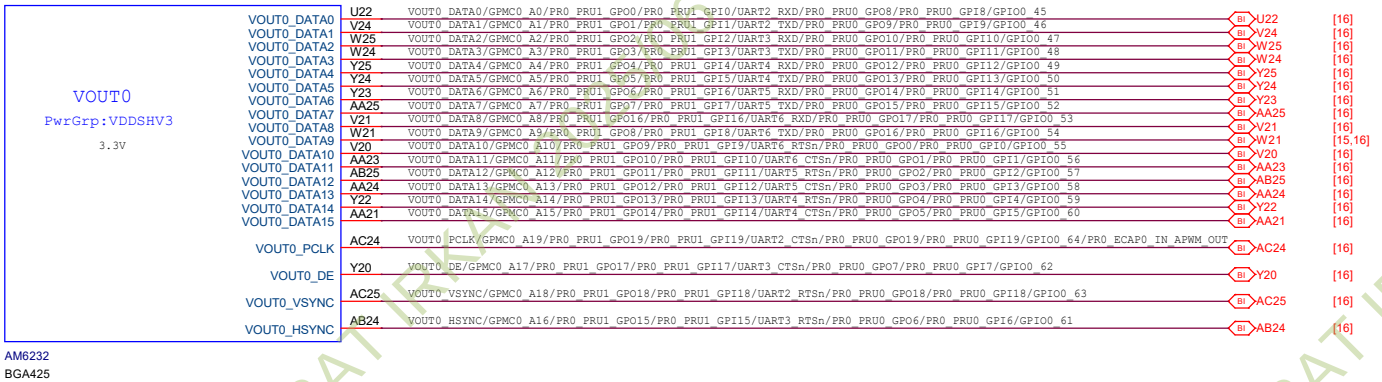
SoC GPIO 3.3V

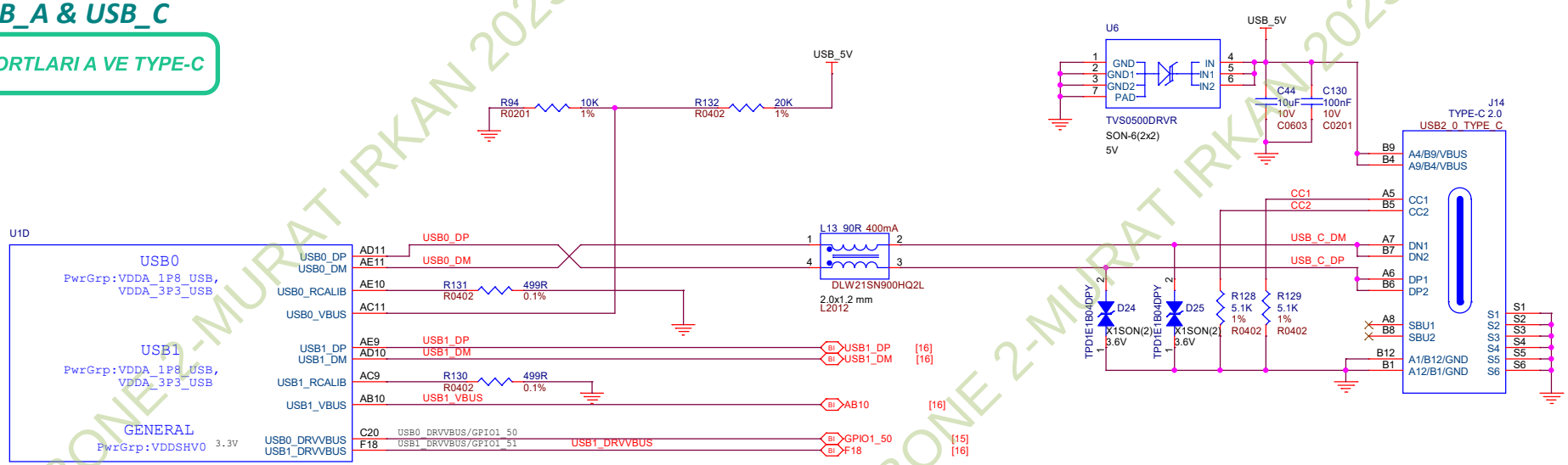




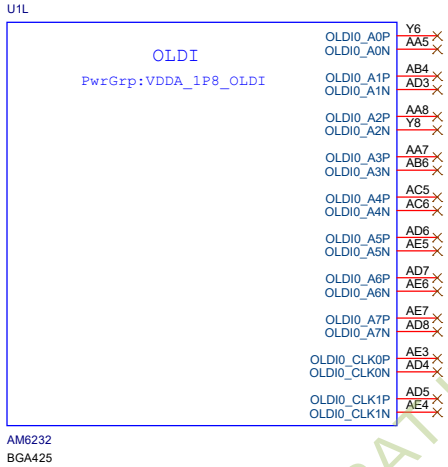


USB_A & USB_C

USB PORTLARI A VE TYPE-C

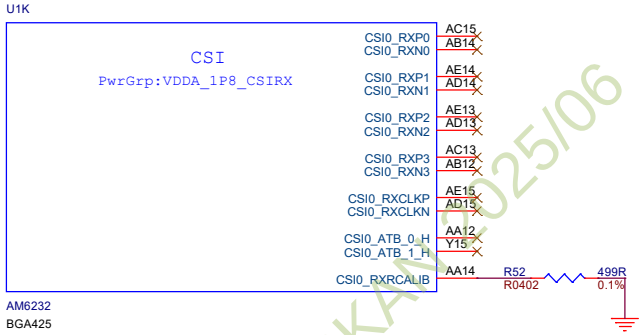


OLDI

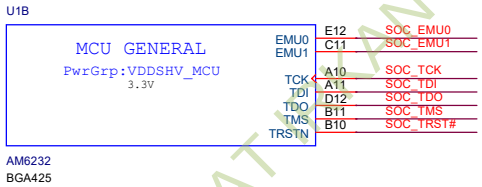


KAMERA BAĞLANTISI

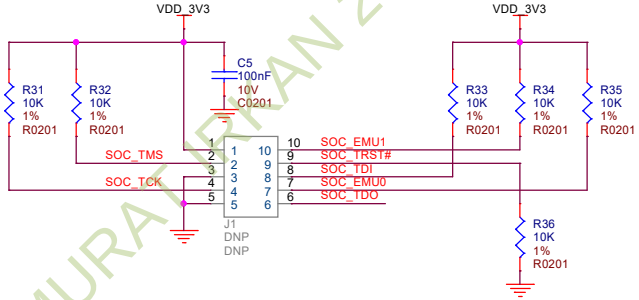
CSI



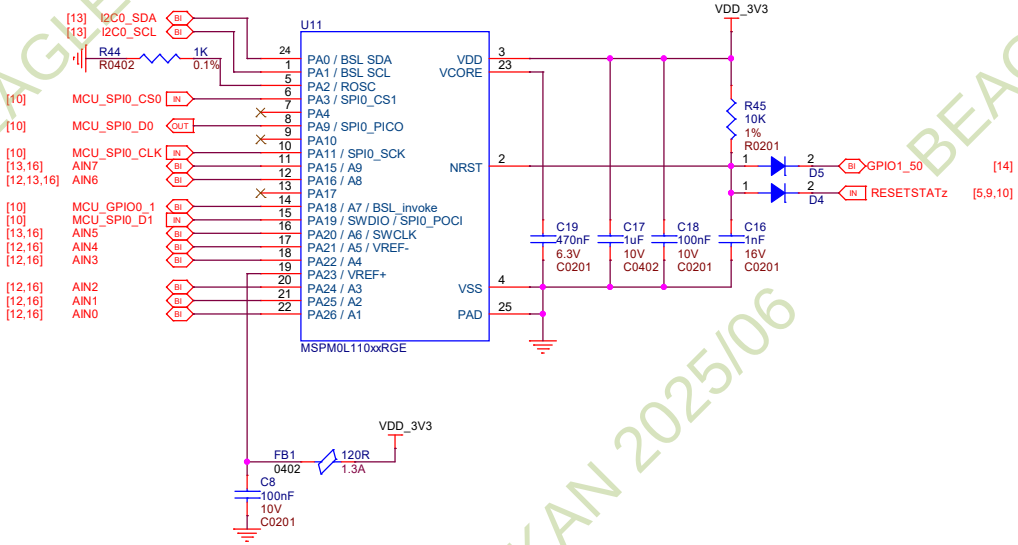
JTAG



Tag-Connect

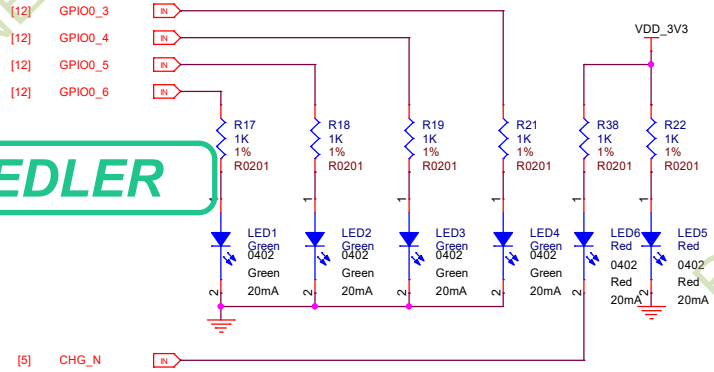


MCU



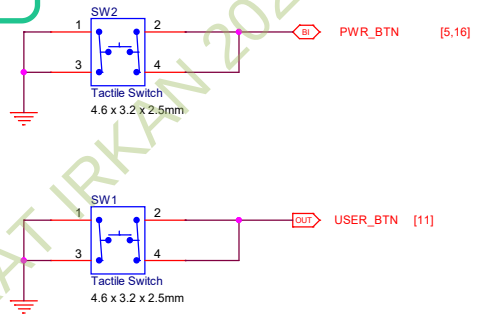
LEDs

LEDLER

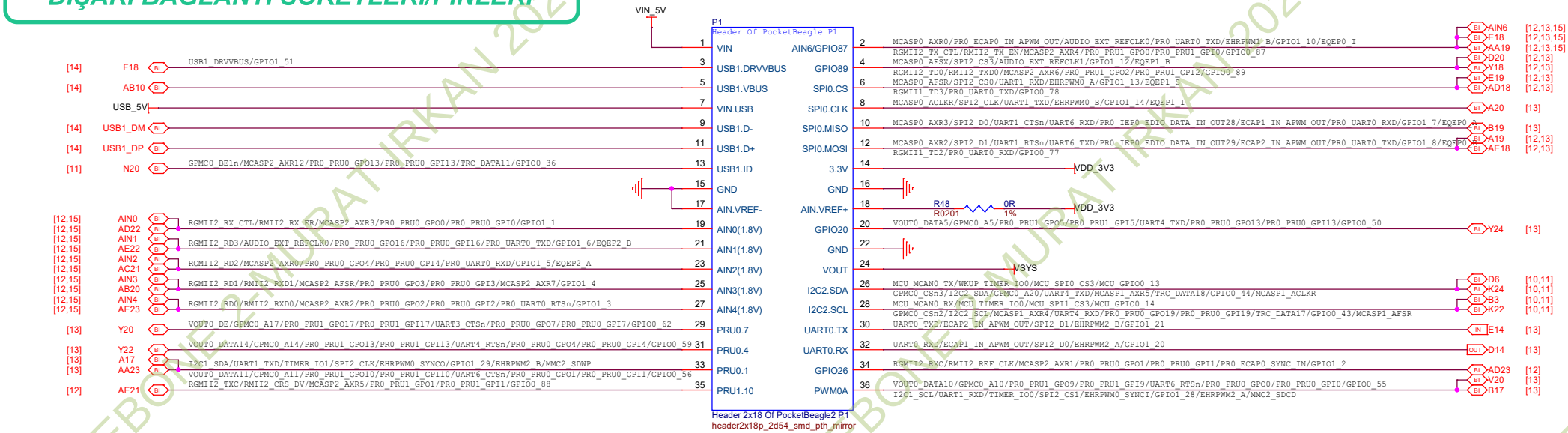


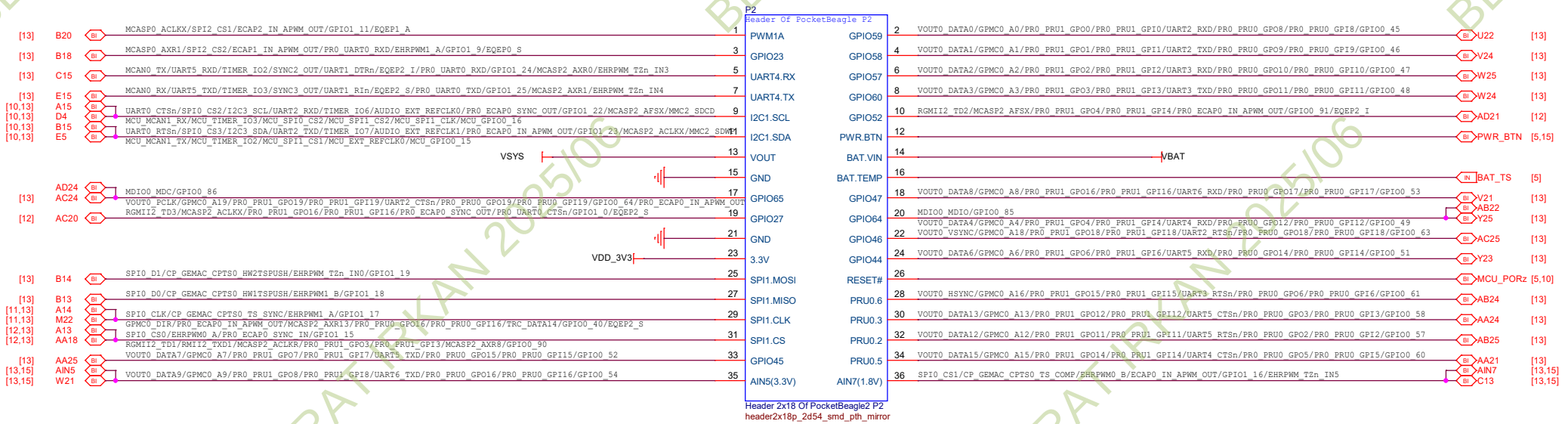
Power Button

GÜÇ TUŞU



DIŞARI BAĞLANTI SOKETLERİ/PİNLERİ





TBD:Where to put these signals?