

# AT22F

## MAIN PCB (MP0.1) / HEPC010XXXX

## MAIN SCH (MP0.1) / HESD00XXXXX

### 2022-02-10

- 01. TITLE
- 02. REVISION
- 03. INT-CONNECTOR
- 04. MAIN-POWER
- 05. SUB-POWER
- 06. QUAD\_POWER
- 07. QUAD\_CON\_MCU\_VIDEO-BUFFER
- 08. EVEL-SHIFT\_SERIAL-FLASH
- 09. DETECTOR
- 10. CAN\_ACCELERATION\_USB\_DEBUG
- 11. MCU-UPD70F3622
- 12. APU-S5P6818
- 13. EMMC\_CODEC\_EXT\_MIC
- 14. SCALER-TP6816
- 15. AUDIO\_SWITCH\_HDMI-OUT
- 16. EXT-CONNECTOR

MODEL	AT22F		DRAWING NAME	TITLE			
Section	Date	Sign & Name	PCB (REV.)/CODE	MAIN PCB (MP0.1) / HEPC010XXXX			
Designer	2022-02-10	KIM MIN-SOO	DRAWING NO.	MAIN SCH (MP0.1) / HESD00XXXXX			
Approved	2022-02-10		DATE	2021.12.01	Size	A3	1 / 16

REVISION HISTORY

REV.	DATE	DESCRIPTION	By
MP0.1	2021.12.01 2022.01.03 2022.01.06 2022.01.10 2022.01.12 2022.01.14  2022.01.17 2022.01.18  2022.01.19  2022.01.20 2022.02.04 2022.02.05  2022.02.10	1. Design Start 2. 바이어로 부터 4ch Quad Box를 외장에서 AVN 내장으로 설계 변경 요청 설계 진행. 3. 바이어로 부터 RS-232 기능 추가 요청 및 Quad Box의 Reset을 AVN MCU에서 제어할수 있도록 설계. 4. Mode Name 확정 : LM22F-TW --> AT22F로 변경. 5. CW402의 #36번 핀의 DC-DC_ON을 #14번 핀으로 이동. 6. Wire connector는 기존 DA4 기기를 향후 한화 FUSO 7" 제품으로 교체, Rear Connector & PIN 레이아웃은 동일 --> 바이어 요청 사항으로 수정 설계 진행 ( 2022-01-11 ) 7. CAN Interface 회로 Part를 Main 에서 Power로 부품 이동. 8. TPMS 및 I-DRV를 위한 신규 Connector 추가 ( MG645320 ) 9. 부품 Reference Name 재설정 10. CW316을 " TAK-V4LMDGA-BF+ " 로 HONDA Connector 선정 11. Rear Sensor Part 회로 삭제. 12. Reverse Power Switch Part 회로 삭제. 13. CW303의 #20번 핀에 CPU_MIC_P 핀 추가 및 신규 생성 MIC_IN_P으로 EXT_MIC_P와 연결. 14. CW302의 ANT_DET( #8 ) 및 AUTO_ANT_ON ( #12 ) 삭제 15. MAIN SASH HOLE 추가 ( PCB 기구도면 입수 ) 16. TVS Diode ( D323, D324 ) 추가. 17. 잘못된 부품 Reference Name 변경. ( PCB : AT22F_MAIN_MP0.1_220205.PCB ) : MOD2 --> MOD301, MOD1 --> MOD302, TC1 --> TC301 : CS1 --> CS301, CS2 --> CS302, CF1 --> CF301  18. VC332, VC333을 SEMTECH 부품명 " RCLAMP0544T " ( HEDI0400040 )로 회로도 적용. 19. IC312의 MCU를 ST사의 ST32F103CBT6에서 대만의 Pin to Pin 제품 AT32FxxxCB로 변경 적용. 20. FU401과 FU402를 60R110XPR ( HEFU0200100 )에서 60R110XMR ( HEFU0200160 )으로 변경 적용.	KMS

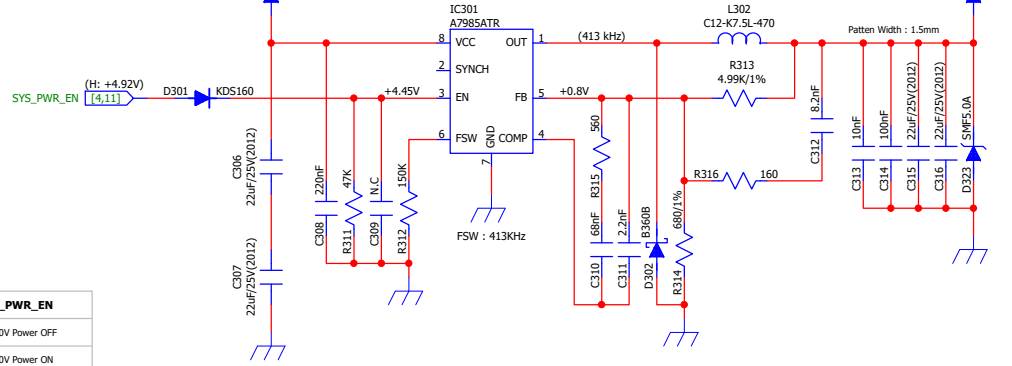
REV.	DATE	DESCRIPTION	By
			KIM MIN SOO

MODEL	AT22F		DRAWING NAME	REVISION		
Section	Date	Sign & Name	PCB (REV.)/CODE	MAIN PCB (MP0.1) / HEPC010XXXX		
Designer	2022-02-10	KIM MIN-SOO	DRAWING NO.	MAIN SCH (MP0.1) / HESD00XXXXX		
Approved	2022-02-10		DATE	2021.12.01	Size	A3
					2	/ 16



## SYSTEM POWER +5.0V

(+14.4V or +28.0V)  
(+13.3V / +27.15V)  
B+  
[3,4,6,10]

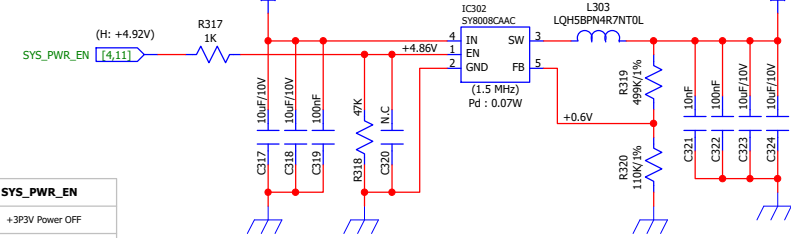


SYS\_PWR\_EN

L	+5POV Power OFF
H	+5POV Power ON

## SYSTEM POWER +3.3V

(+5.0V ± 0.2V)  
(Typ. 400 mA)  
+5POV  
[3,4,5,9,11,15]

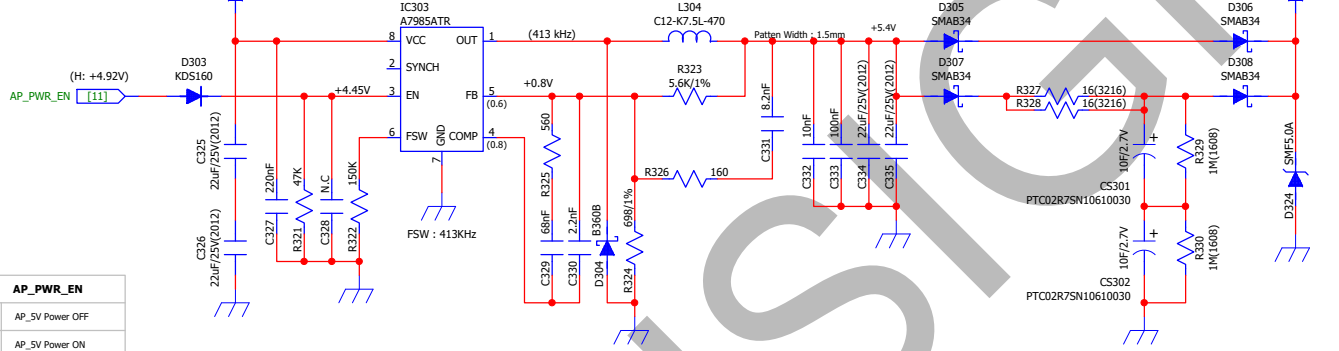


SYS\_PWR\_EN

L	+3P3V Power OFF
H	+3P3V Power ON

## CPU POWER +5.0V

(+13.3V / +27.15V)  
B+  
[3,4,6,10]

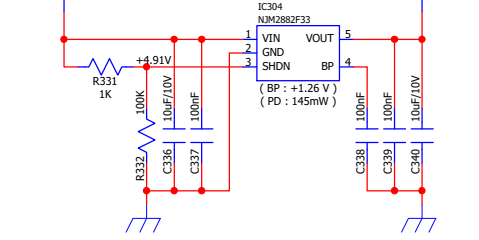


AP\_PWR\_EN

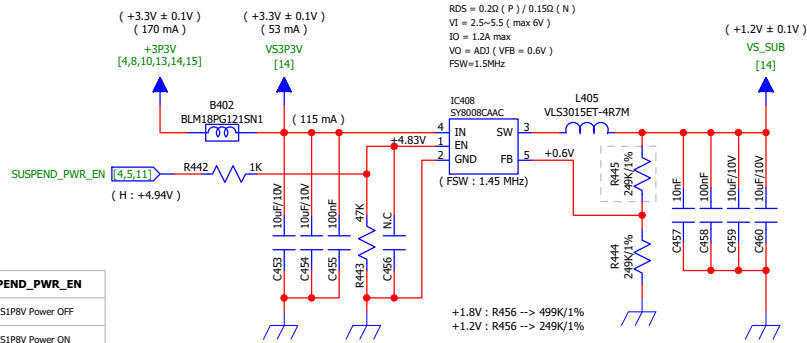
L	AP_5V Power OFF
H	AP_5V Power ON

## AP Interface 3.3V

(+5.0V ± 0.2V)  
AP\_5V [4,5,12]



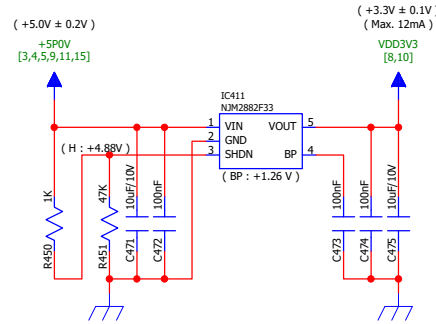
## VIDEO SCALER &amp; DECODER +3.3V &amp; +1.2V



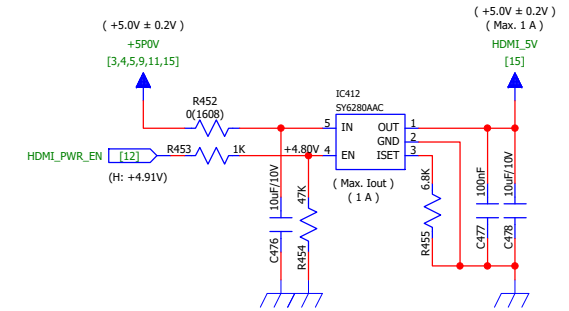
SUSPEND\_PWR\_EN

L	VS1PBV Power Off
H	VS1PBV Power ON

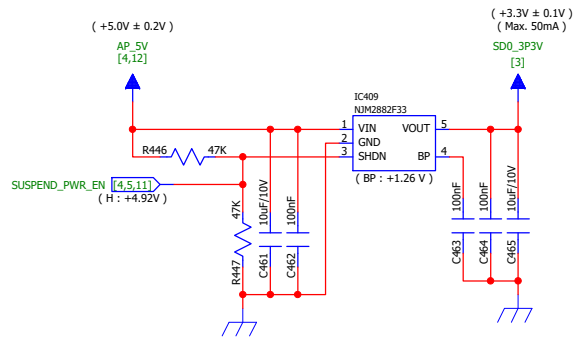
## Acceleration sensor Power +3.3V



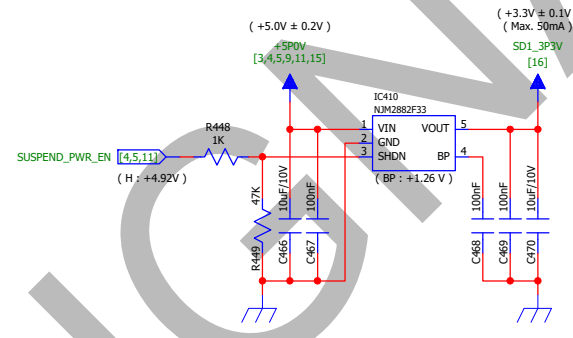
## HDMI Power Switch



## SD0 Power +3.3V

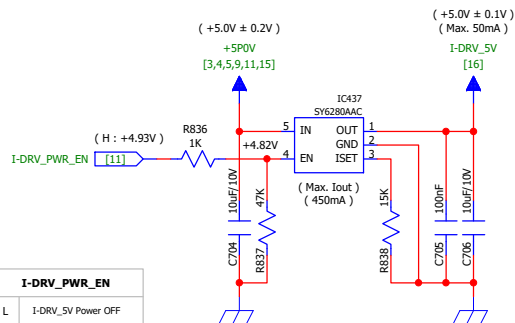


## SD1 Power +3.3V



## IR Remote Power +5.0V

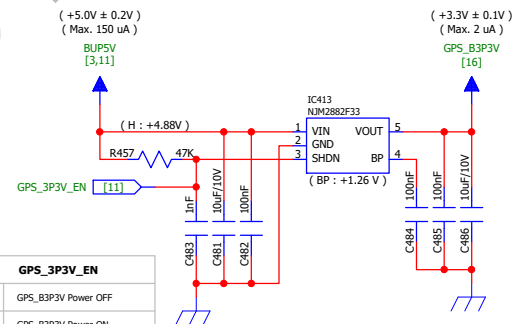
## I-DRV +5.0V Power Switch



I-DRV\_PWR\_EN

L	I-DRV_5V Power Off
H	I-DRV_5V Power ON

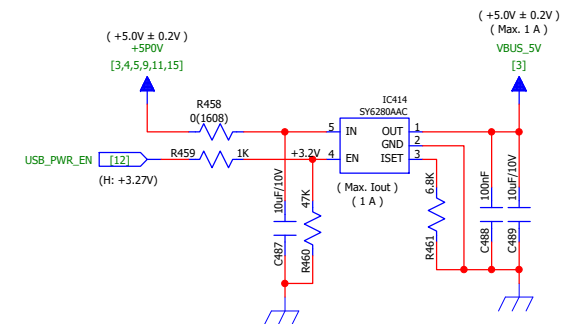
## GPS B-UP POWER +3.3V



GPS\_3P3V\_EN

L	GPS_B3P3V Power Off
H	GPS_B3P3V Power ON

## Front USB Power



MODEL

AT22F

DRAWING NAME

SUB-POWER

Section

Date

Sign &amp; Name

PCB (REV.)/CODE

MAIN PCB (MP0.1) / HEP0010XXXX

Designer

2022-02-10

KIM MIN-SOO

DRAWING NO.

MAIN SCH (MP0.1) / HESD00XXXXX

Approved

2022-02-10

DATE

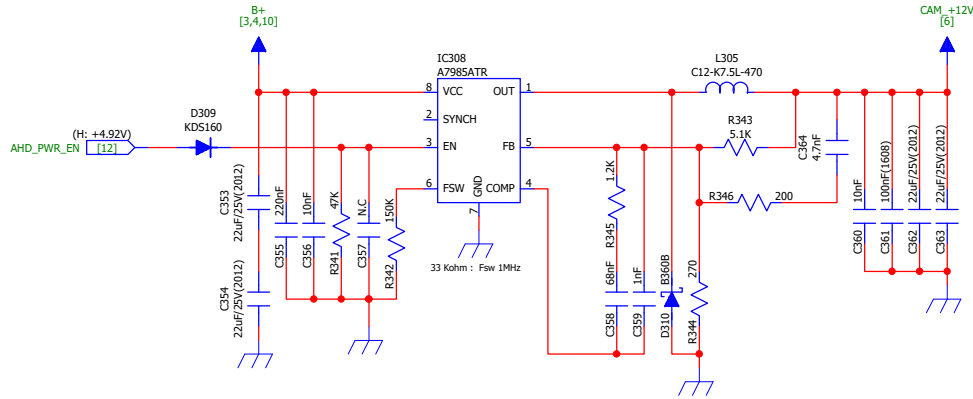
2021.12.01

Size

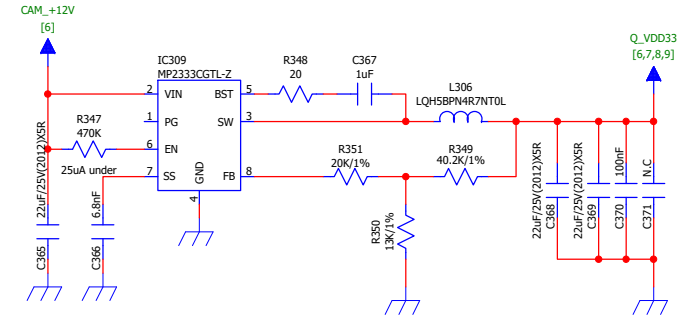
A3

5 / 16

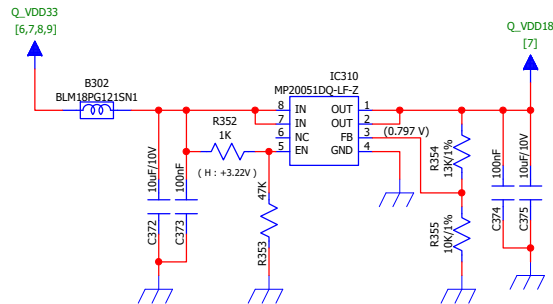
## QUAD 12V



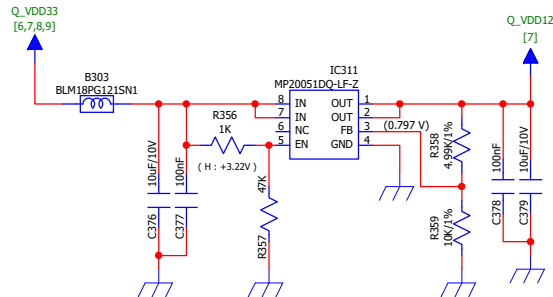
## QUAD +3.3V



## QUAD +1.8V



## QUAD +1.2V



6

5

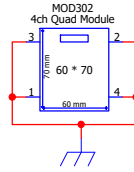
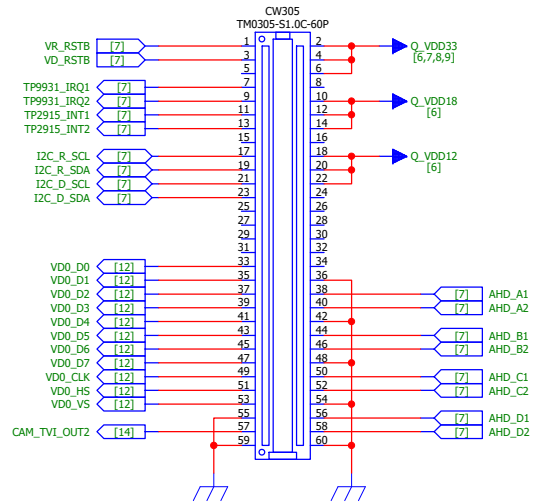
4

3

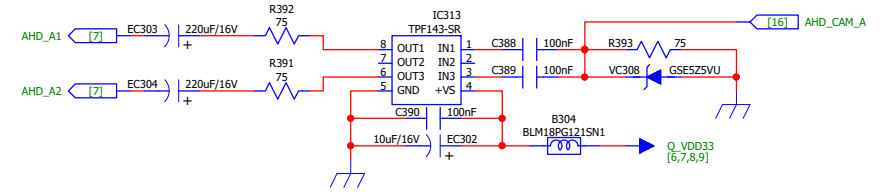
2

1

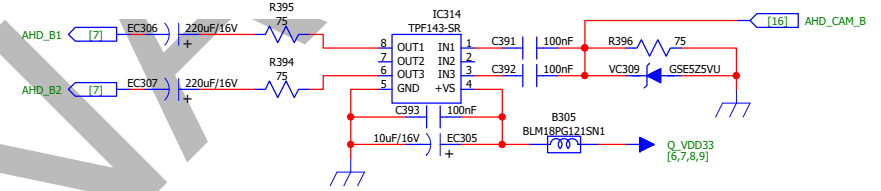
## Quad Main B to B Connector.



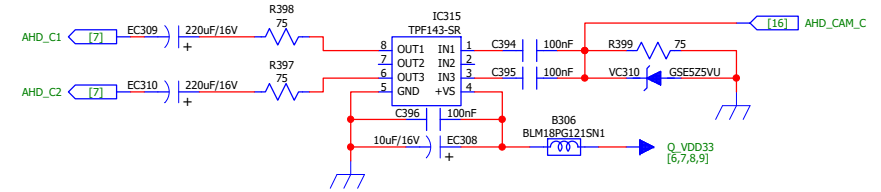
## Camera A Video Buffer



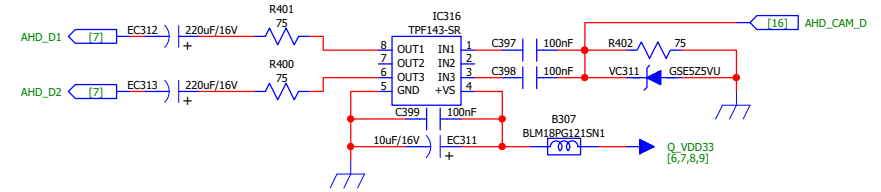
## Camera B Video Buffer



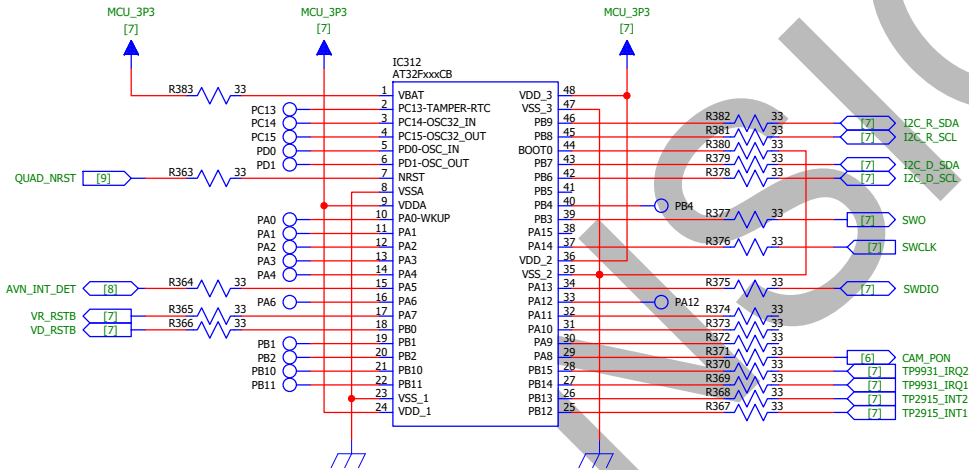
## Camera C Video Buffer



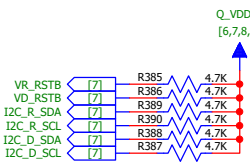
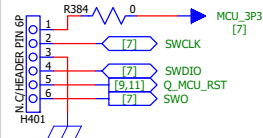
## Camera D Video Buffer



## MCU

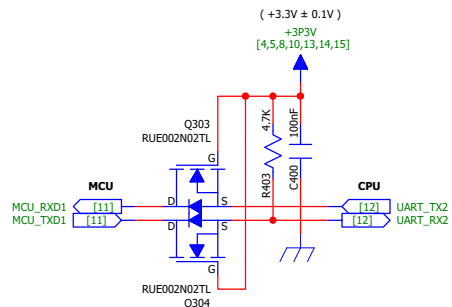


## JTAG debug

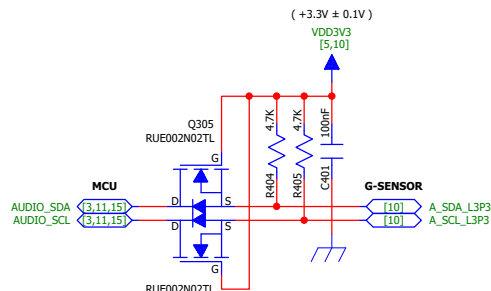


MODEL	AT22F		DRAWING NAME		QUAD_CON_MCU_VIDEO-BUFFER	
Section	Date	Sign & Name	PCB (REV.)/CODE		MAIN PCB (MP0.1) / HEP0010XXXX	
Designer	2022-02-10	KIM MIN-SOO	DRAWING NO.		MAIN SCH (MP0.1) / HESD00XXXXX	
Approved	2022-02-10		DATE	2021.12.01	Size	A3 7 / 16

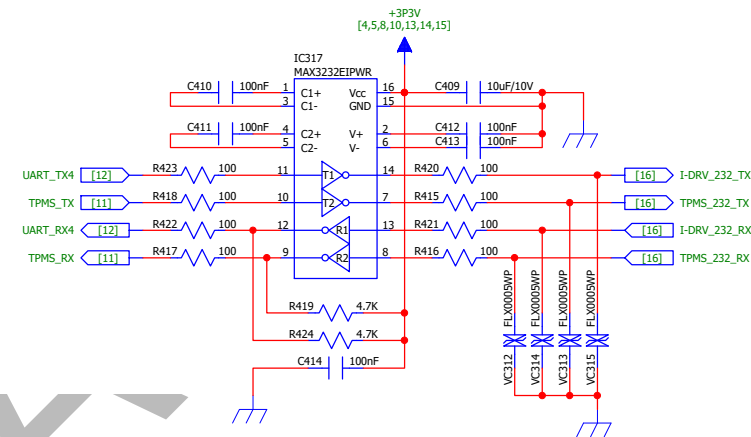
## MCU & CPU UART Level Shift



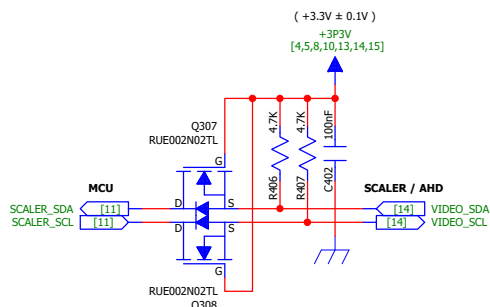
## MCU & Sensor Level Shift



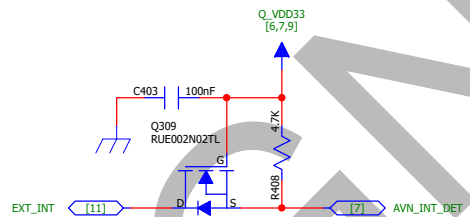
## RS-232 Interface



## MCU & Video Level Shift

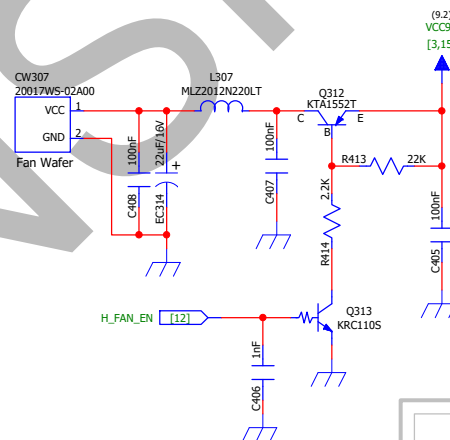


## Quad Box Detector - level shift



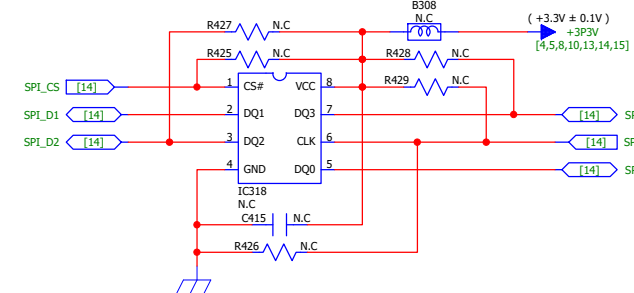
## Reverse Power

## DC Fan



DC FAN (DFL4010B12)  
: +9.6V ( 38mA )

## 32M Serial Flash



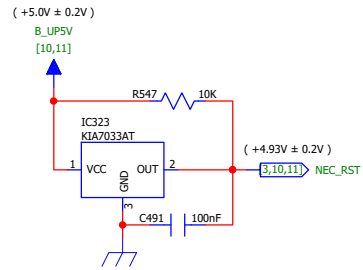
MODEL	AT22F		DRAWING NAME	
Section	Date	Sign & Name	PCB (REV.)/CODE	LEVEL-SHIFT_SERIAL-FLASH
Designer	2022-02-10	KIM MIN-SOO	DRAWING NO.	MAIN PCB (MP0.1) / HEP010XXXX
Approved	2022-02-10		DATE	2021.12.01
		Size	A3	8 / 16



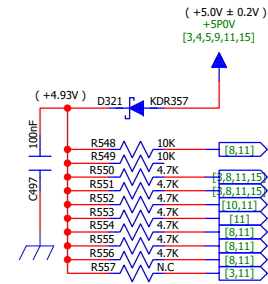




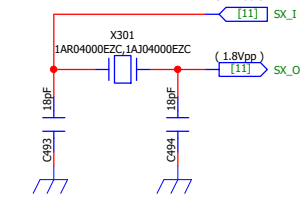
## Voltage Detector



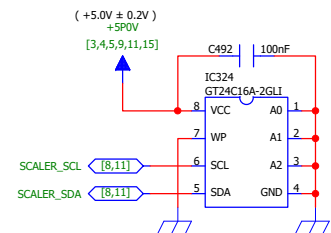
## Pull-Up RES



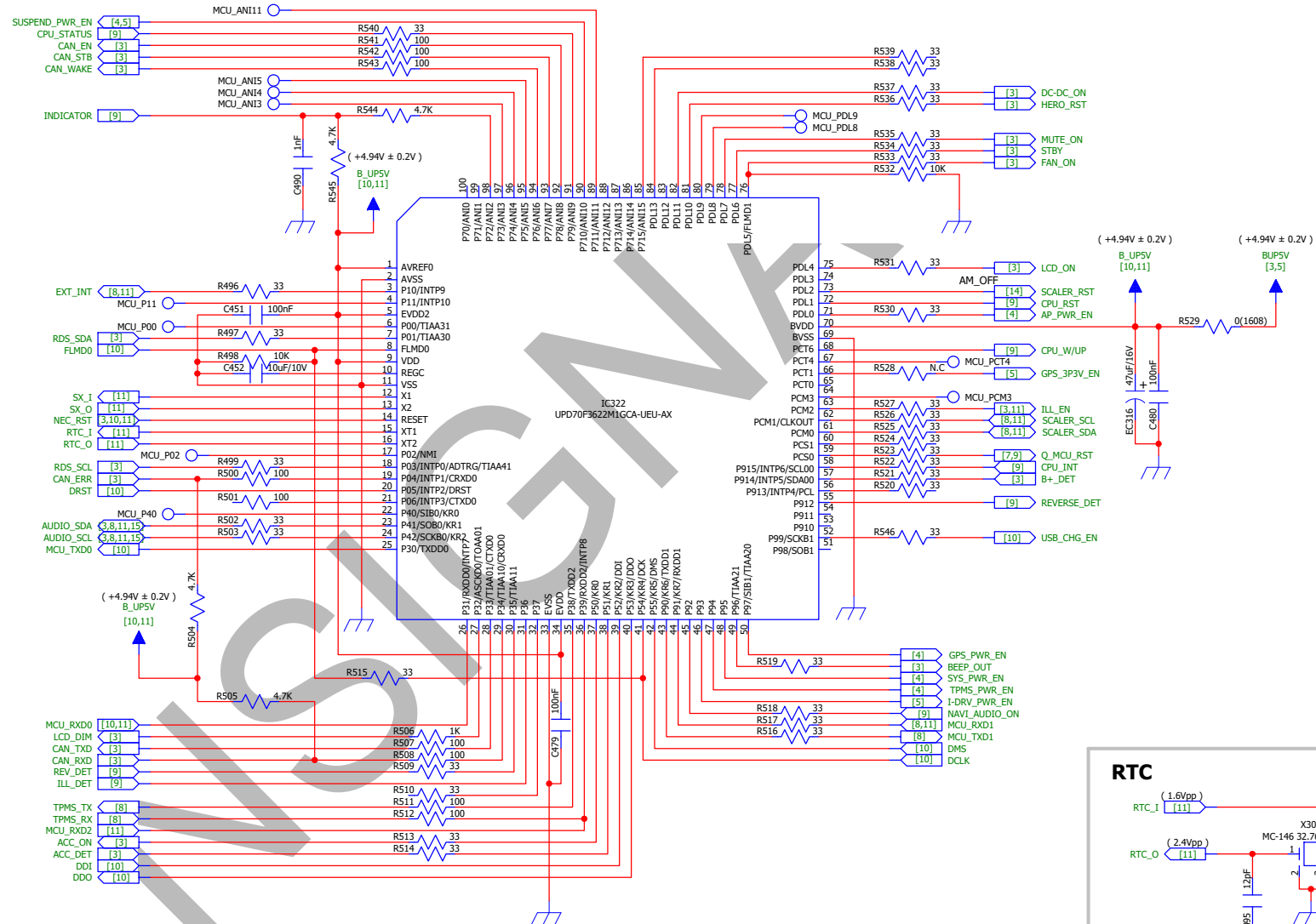
## System Clock



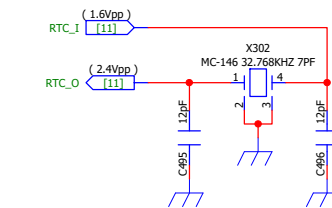
## EEPROM



	a. point	b. point
Indicator	+4.97V	+4.96V
L sig in	+3.39V	+3.39V
R sig in	+2.49V	+2.49V
L/R sig in	+2.02V	+2.02V



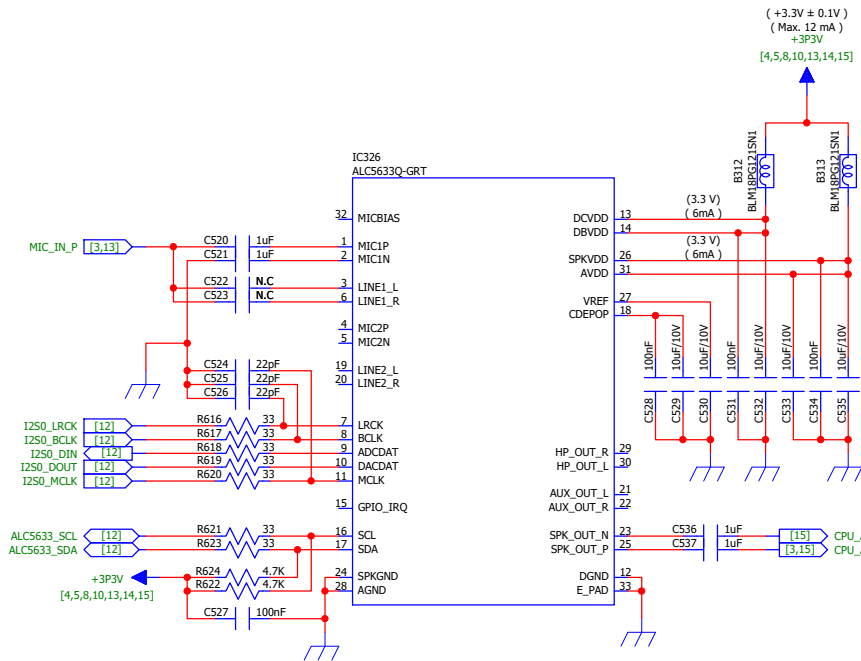
## RTC



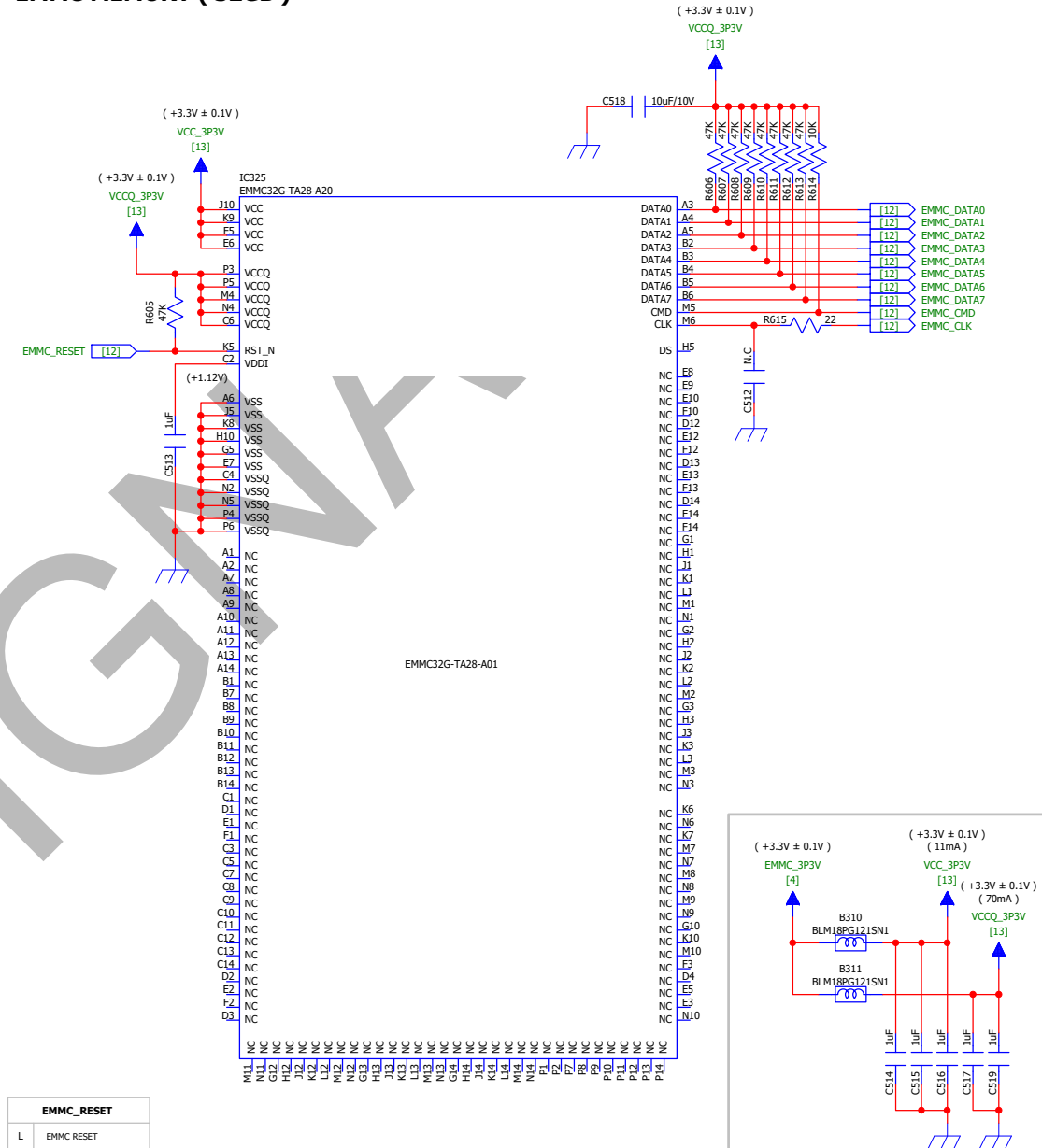
MODEL	AT22F		DRAWING NAME		MCU-UPD70F3622		
Section	Date	Sign & Name	PCB (REV.)/CODE		MAIN PCB (MP0.1) / HEP010XXXX		
Designer	2022-02-10	KIM MIN-SOO	DRAWING NO.		MAIN SCH (MP0.1) / HESD00XXXXX		
Approved	2022-02-10		DATE	2021.12.01	Size	A3	11 / 16



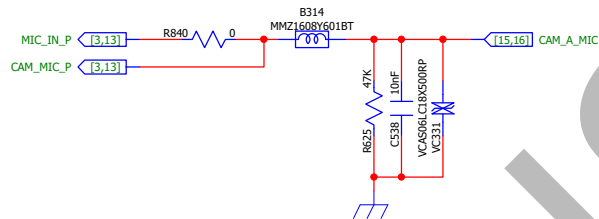
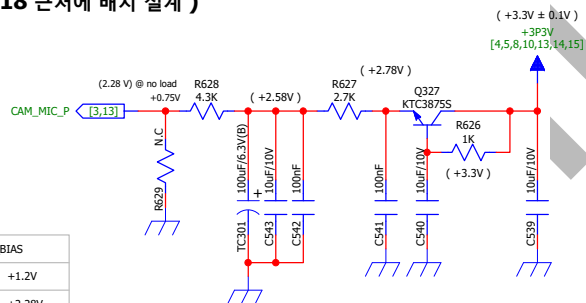
## ALC5633Q AUDIO CODEC



## EMMC MEMORY ( 32GB )



## GSM Noise Filter ( Connector 근처에 가깝게 배치 )

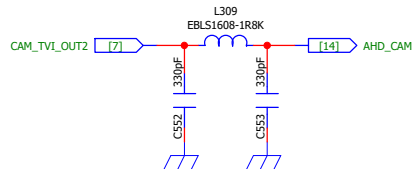
Bias For External MicroPhone  
( CW418 근처에 배치 설계 )

\* 설정에서 MIC Option을 External로 설정

EMMC_RESET	
L	EMMC RESET
H	EMMC ON ( or Open )

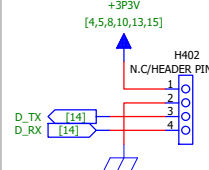
MODEL	AT22F		DRAWING NAME		EMMC_CODEC_EXT_MIC	
Section	Date	Sign & Name	PCB (REV.)/CODE		MAIN PCB (MP0.1) / HEP0010XXXX	
Designer	2022-02-10	KIM MIN-SOO	DRAWING NO.		MAIN SCH (MP0.1) / HESD00XXXXXX	
Approved	2022-02-10		DATE	2021.12.01	Size	A3 13 / 16

## DISPLAY DIGITAL CAMERA



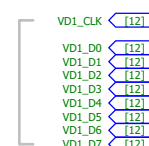
## ANALOG CAMERA

## AUX VIDEO

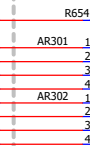
TP6816-CB1  
UART Debug

4개의 TP는 PCB 외각 면에 나란히 배치

## CPU &lt;--



## Close to TP6816



## AVDTSC [14]

## VDDO [14]

## VDDO\_IP2 [14]

## TP6816 : I2C Mode Slave Address (88h)

## R653 33

## R652 33

## R651 33

## VIDEO\_SCL [8]

## VIDEO\_SDA [8]

## RSTB [14]

## FPQ23 [14]

## FPQ22 [14]

## FPQ21 [14]

## FPQ20 [14]

## FPQ19 [14]

## FPQ18 [14]

## FPQ17 [14]

## FPQ16 [14]

## EEPROM Code Start Address Selection [3:0]

## UART1 to configure (L=Enable, H=Disable)

## EEPROM SID, L=0x40h H=0x40h

## TP6816 SID, L=0x80h H=0x80h

## Boot Select [1:0], 0/3= normal boot mode,

## 1= I2C boot mode, 2= normal uC mode

## FPQ23 [14]

## FPQ22 [14]

## FPQ21 [14]

## FPQ20 [14]

## FPQ19 [14]

## FPQ18 [14]

## FPQ17 [14]

## FPQ16 [14]

## FPQ15 [14]

## FPQ14 [14]

## FPQ13 [14]

## FPQ12 [14]

## FPQ11 [14]

## FPQ10 [14]

## FPQ9 [14]

## FPQ8 [14]

## FPQ7 [14]

## FPQ6 [14]

## FPQ5 [14]

## FPQ4 [14]

## FPQ3 [14]

## FPQ2 [14]

## FPQ1 [14]

## FPQ0 [14]

## FPQ-1 [14]

## FPQ-2 [14]

## FPQ-3 [14]

## FPQ-4 [14]

## FPQ-5 [14]

## FPQ-6 [14]

## FPQ-7 [14]

## FPQ-8 [14]

## FPQ-9 [14]

## FPQ-10 [14]

## FPQ-11 [14]

## FPQ-12 [14]

## FPQ-13 [14]

## FPQ-14 [14]

## FPQ-15 [14]

## FPQ-16 [14]

## FPQ-17 [14]

## FPQ-18 [14]

## FPQ-19 [14]

## FPQ-20 [14]

## FPQ-21 [14]

## FPQ-22 [14]

## FPQ-23 [14]

## FPQ-24 [14]

## FPQ-25 [14]

## FPQ-26 [14]

## FPQ-27 [14]

## FPQ-28 [14]

## FPQ-29 [14]

## FPQ-30 [14]

## FPQ-31 [14]

## FPQ-32 [14]

## FPQ-33 [14]

## FPQ-34 [14]

## FPQ-35 [14]

## FPQ-36 [14]

## FPQ-37 [14]

## FPQ-38 [14]

## FPQ-39 [14]

## FPQ-40 [14]

## FPQ-41 [14]

## FPQ-42 [14]

## FPQ-43 [14]

## FPQ-44 [14]

## FPQ-45 [14]

## FPQ-46 [14]

## FPQ-47 [14]

## FPQ-48 [14]

## FPQ-49 [14]

## FPQ-50 [14]

## FPQ-51 [14]

## FPQ-52 [14]

## FPQ-53 [14]

## FPQ-54 [14]

## FPQ-55 [14]

## FPQ-56 [14]

## FPQ-57 [14]

## FPQ-58 [14]

## FPQ-59 [14]

## FPQ-60 [14]

## FPQ-61 [14]

## FPQ-62 [14]

## FPQ-63 [14]

## FPQ-64 [14]

## FPQ-65 [14]

## FPQ-66 [14]

## FPQ-67 [14]

## FPQ-68 [14]

## FPQ-69 [14]

## FPQ-70 [14]

## FPQ-71 [14]

## FPQ-72 [14]

## FPQ-73 [14]

## FPQ-74 [14]

## FPQ-75 [14]

## FPQ-76 [14]

## FPQ-77 [14]

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## FPQ-79 [14]

## FPQ-80 [14]

## FPQ-81 [14]

## FPQ-82 [14]

## FPQ-83 [14]

## FPQ-84 [14]

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## FPQ-87 [14]

## FPQ-88 [14]

## FPQ-89 [14]

## FPQ-90 [14]

## FPQ-91 [14]

## FPQ-92 [14]

## FPQ-93 [14]

## FPQ-94 [14]

## FPQ-95 [14]

## FPQ-96 [14]

## FPQ-97 [14]

## FPQ-98 [14]

## FPQ-99 [14]

## FPQ-100 [14]

## FPQ-101 [14]

## FPQ-102 [14]

## FPQ-103 [14]

## FPQ-104 [14]

## FPQ-105 [14]

## FPQ-106 [14]

## FPQ-107 [14]

## FPQ-108 [14]

## FPQ-109 [14]

## FPQ-110 [14]

## FPQ-111 [14]

## FPQ-112 [14]

## FPQ-113 [14]

## FPQ-114 [14]

## FPQ-115 [14]

## FPQ-116 [14]

## FPQ-117 [14]

## FPQ-118 [14]

## FPQ-119 [14]

## FPQ-120 [14]

## FPQ-121 [14]

## FPQ-122 [14]

## FPQ-123 [14]

## FPQ-124 [14]

## FPQ-125 [14]

## FPQ-126 [14]

## FPQ-127 [14]

## FPQ-128 [14]

## FPQ-129 [14]

## FPQ-130 [14]

## FPQ-131 [14]

## FPQ-132 [14]

## FPQ-133 [14]

## FPQ-134 [14]

## FPQ-135 [14]

## FPQ-136 [14]

## FPQ-137 [14]

## FPQ-138 [14]

## FPQ-139 [14]

## FPQ-140 [14]

## FPQ-141 [14]

## FPQ-142 [14]

## FPQ-143 [14]

## FPQ-144 [14]

## FPQ-145 [14]

## FPQ-146 [14]

## FPQ-147 [14]

## FPQ-148 [14]

## FPQ-149 [14]

## FPQ-150 [14]

## FPQ-151 [14]

## FPQ-152 [14]

## FPQ-153 [14]

## FPQ-154 [14]

## FPQ-155 [14]

## FPQ-156 [14]

## FPQ-157 [14]

## FPQ-158 [14]

## FPQ-159 [14]

## FPQ-160 [14]

## FPQ-161 [14]

## FPQ-162 [14]

## FPQ-163 [14]

## FPQ-164 [14]

## FPQ-165 [14]

## FPQ-166 [14]

## FPQ-167 [14]

## FPQ-168 [14]

## FPQ-169 [14]

## FPQ-170 [14]

## FPQ-171 [14]

## FPQ-172 [14]

## FPQ-173 [14]

## FPQ-174 [14]

## FPQ-175 [14]

## FPQ-176 [14]

## FPQ-177 [14]

## FPQ-178 [14]

## FPQ-179 [14]

## FPQ-180 [14]

## FPQ-181 [14]

## FPQ-182 [14]

## FPQ-183 [14]

## FPQ-184 [14]

## FPQ-185 [14]

## FPQ-186 [14]

## FPQ-187 [14]

## FPQ-188 [14]

## FPQ-189 [14]

## FPQ-190 [14]

## FPQ-191 [14]

## FPQ-192 [14]

## FPQ-193 [14]

## FPQ-194 [14]

## FPQ-195 [14]

## FPQ-196 [14]

## FPQ-197 [14]

## FPQ-198 [14]

## FPQ-199 [14]

## FPQ-200 [14]

## FPQ-201 [14]

## FPQ-202 [14]

## FPQ-203 [14]

## FPQ-204 [14]

## FPQ-205 [14]

## FPQ-206 [14]

## FPQ-207 [14]

## FPQ-208 [14]

## FPQ-209 [14]

## FPQ-210 [14]

## FPQ-211 [14]

## FPQ-212 [14]

## FPQ-213 [14]

## FPQ-214 [14]

## FPQ-215 [14]

## FPQ-216 [14]

## FPQ-217 [14]

## FPQ-218 [14]

## FPQ-219 [14]

## FPQ-220 [14]

## FPQ-221 [14]

## FPQ-222 [14]

## FPQ-223 [14]

## FPQ-224 [14]

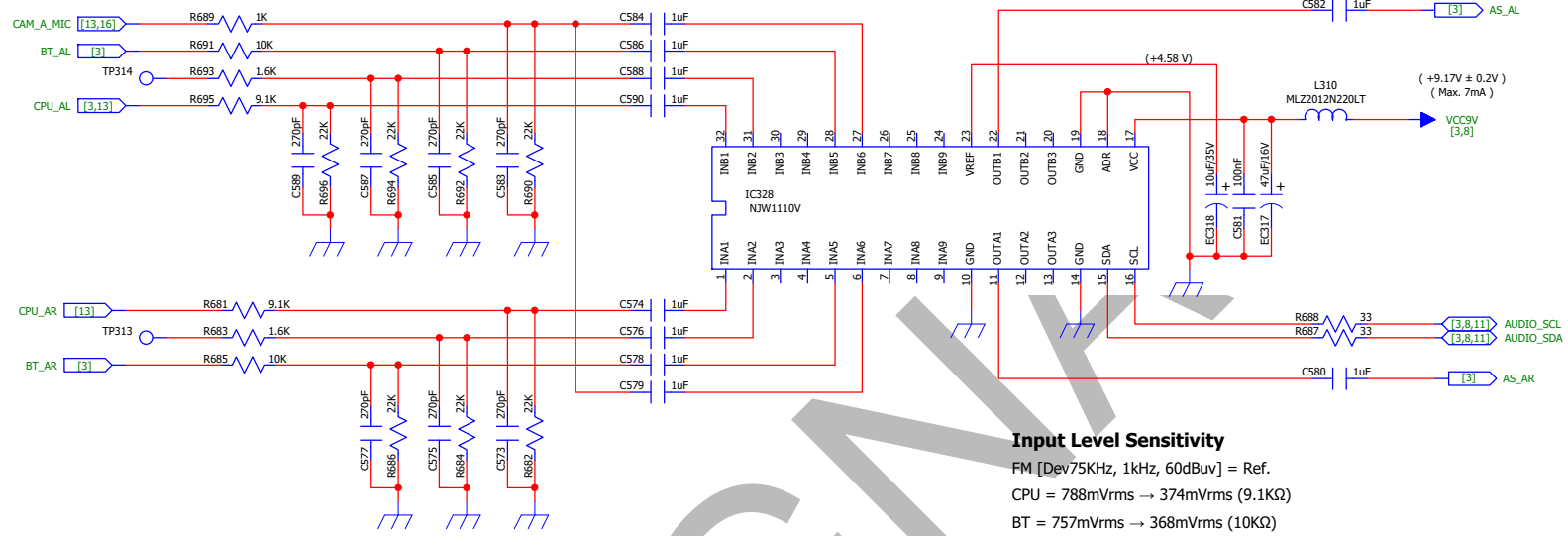
## FPQ-225 [14]

## FPQ-226 [14]

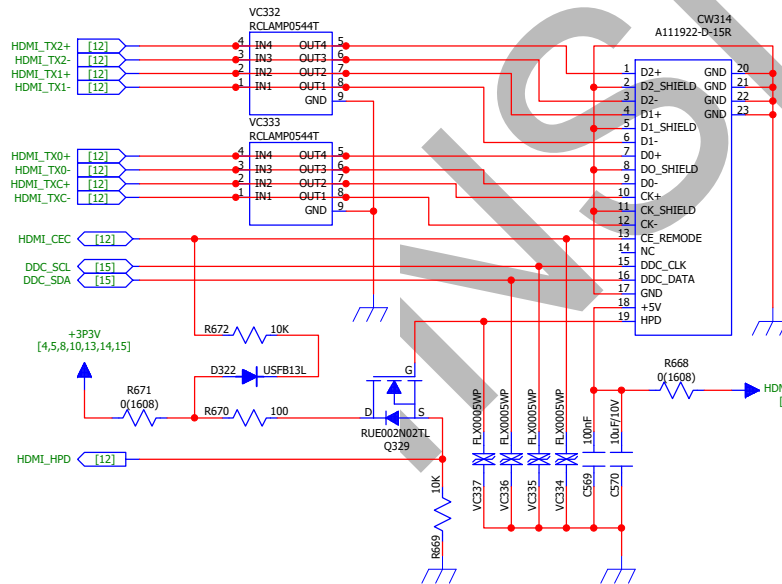
## FPQ-227 [14]

## FPQ-228 [14]

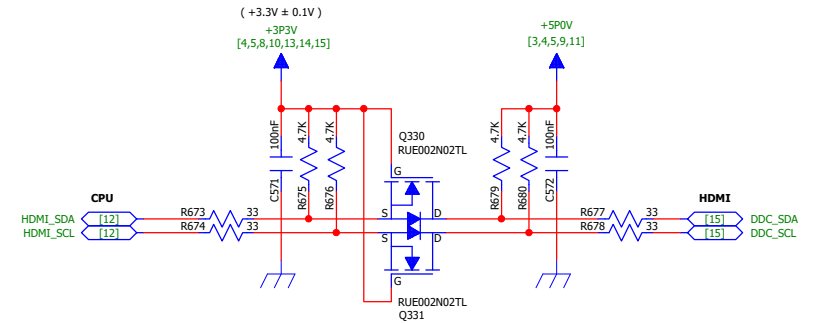
## AUDIO SWITCH



## HDMI OUT Layout: HDMI 100 ohm differential pairs



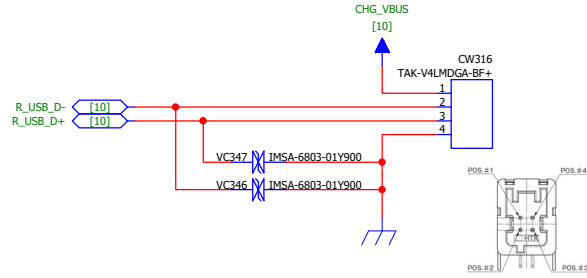
## HDMI I2C LEVEL



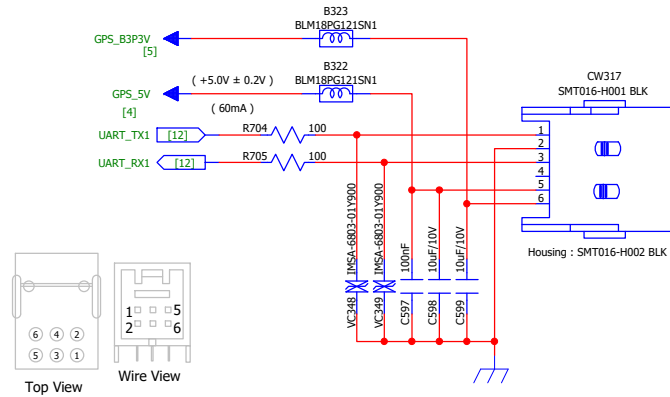
MODEL	AT22F		DRAWING NAME	
Section	Date	Sign & Name	PCB (REV.)/CODE	
Designer	2022-02-10	KIM MIN-SOO	DRAWING NO.	
Approved	2022-02-10		DATE	2021.12.01
		Size	A3	15 / 16



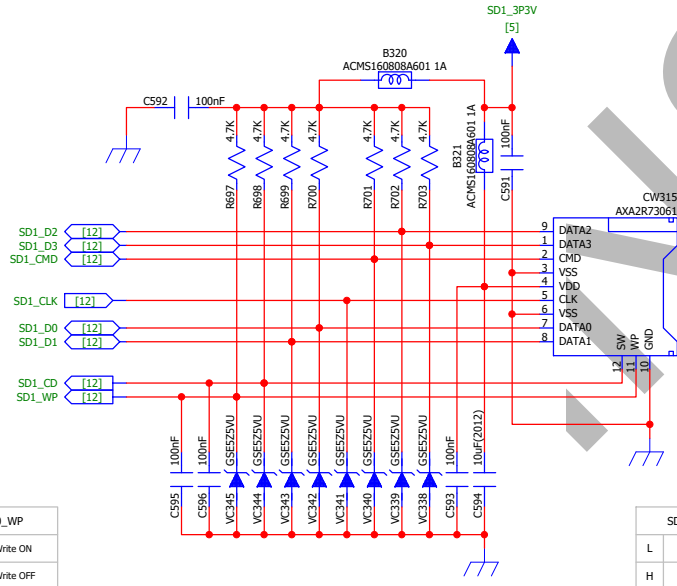
## USB CHARGER CONNECTOR



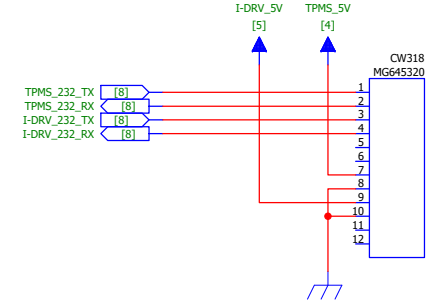
## GPS ( UBLOX )



## Rear SD Card Socket



## TPMS & I-DRV CONNECTOR

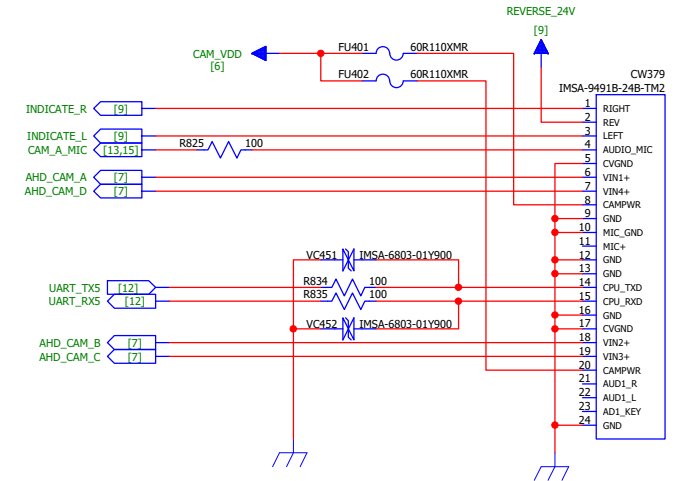


MG645320 Pin View

1	2	3	4	5	6
7	8	9	10	11	12

## 24PIN CONNECTOR

IMSA-9491B-24B-TM2 부품 ERP 신규 등록 진행해야함.



MODEL	AT22F		DRAWING NAME		EXT-CONNECTOR	
Section	Date	Sign & Name	PCB (REV.)/CODE		MAIN PCB (MP.0.1) / HEP0010XXXX	
Designer	2022-02-10	KIM MIN-SOO	DRAWING NO.		MAIN SCH (MP.0.1) / HESD00XXXX	
Approved	2022-02-10		DATE	2021.12.01	Size	A3 16 / 16