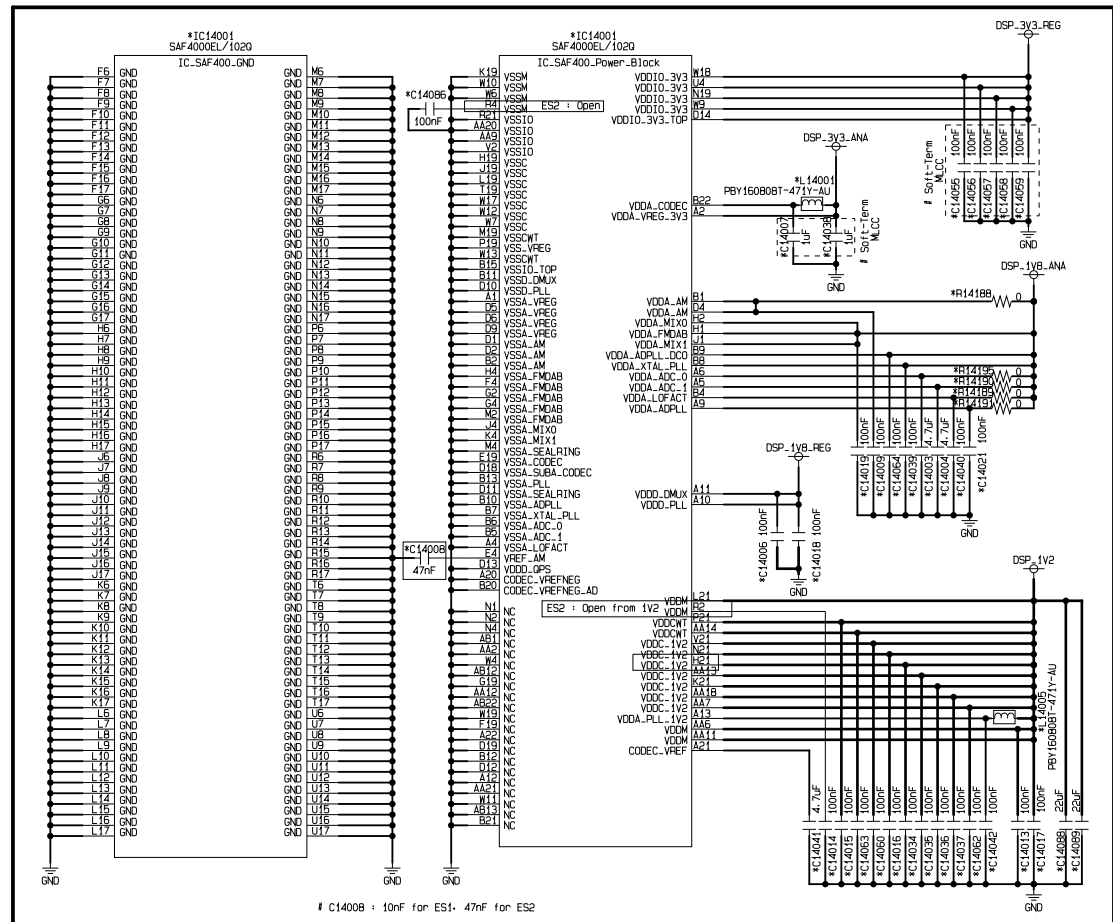
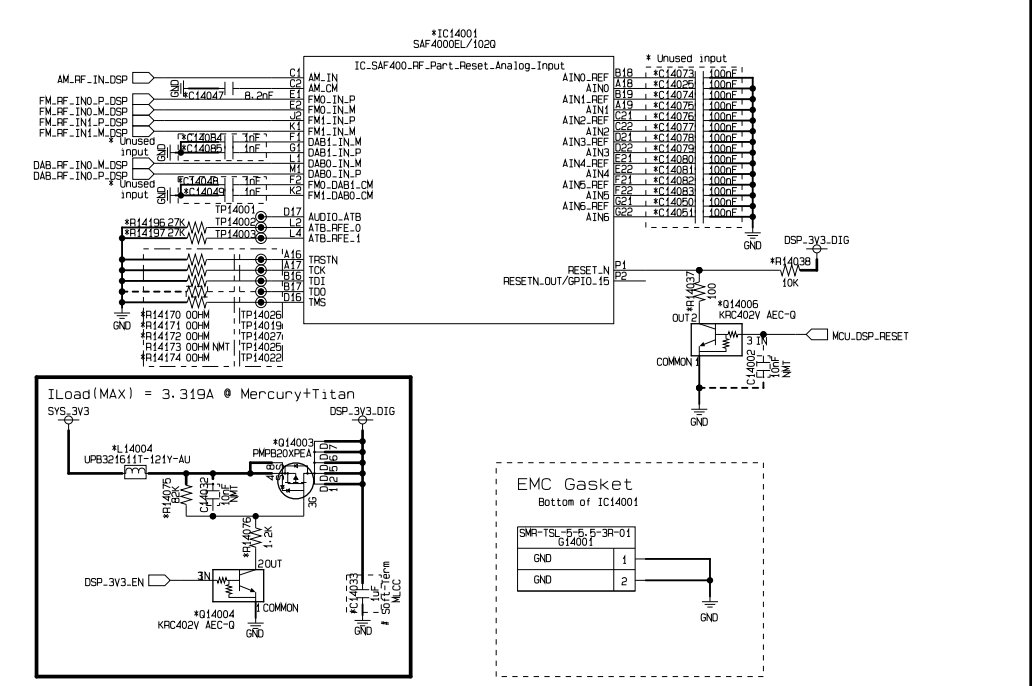
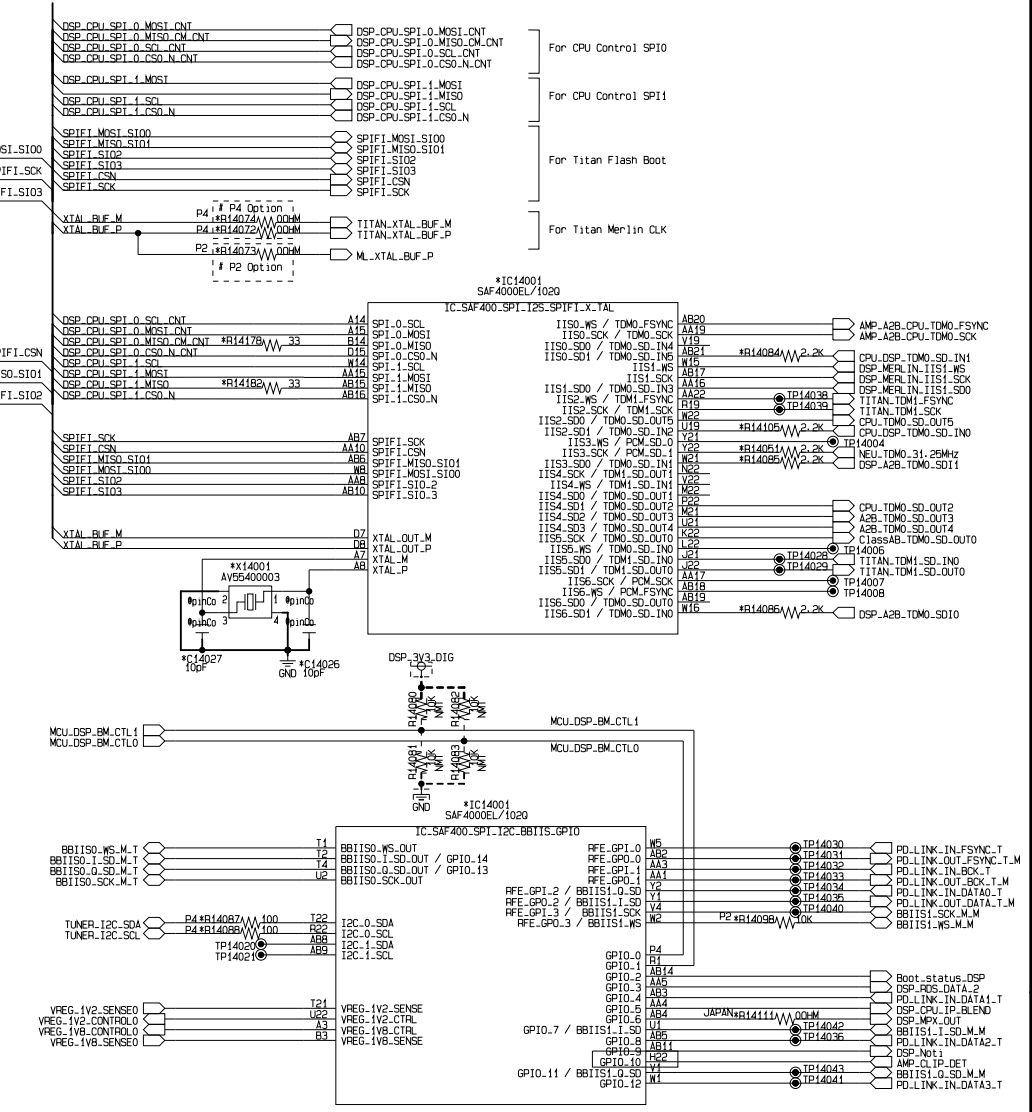
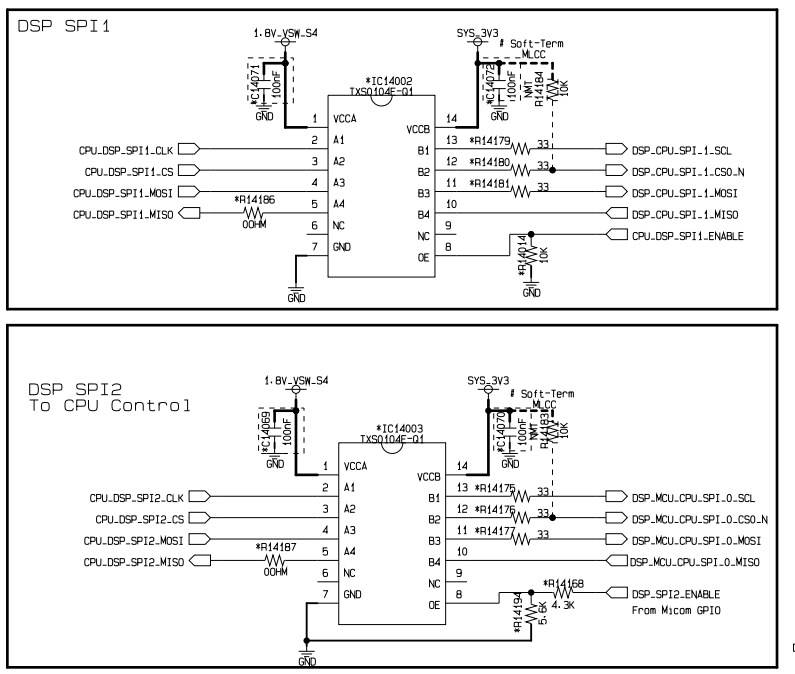
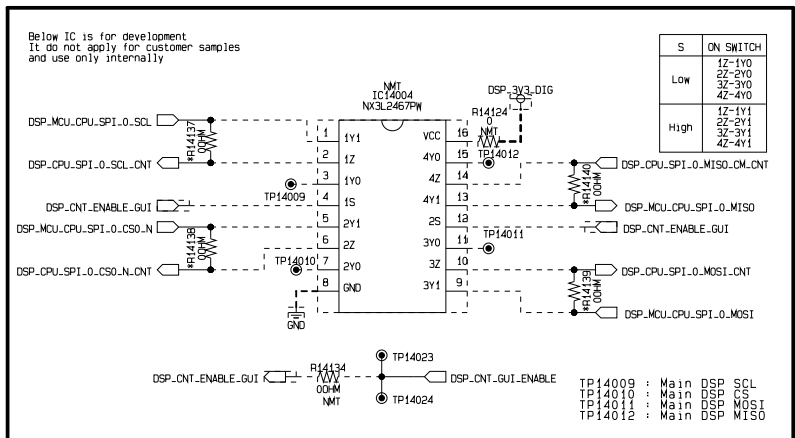
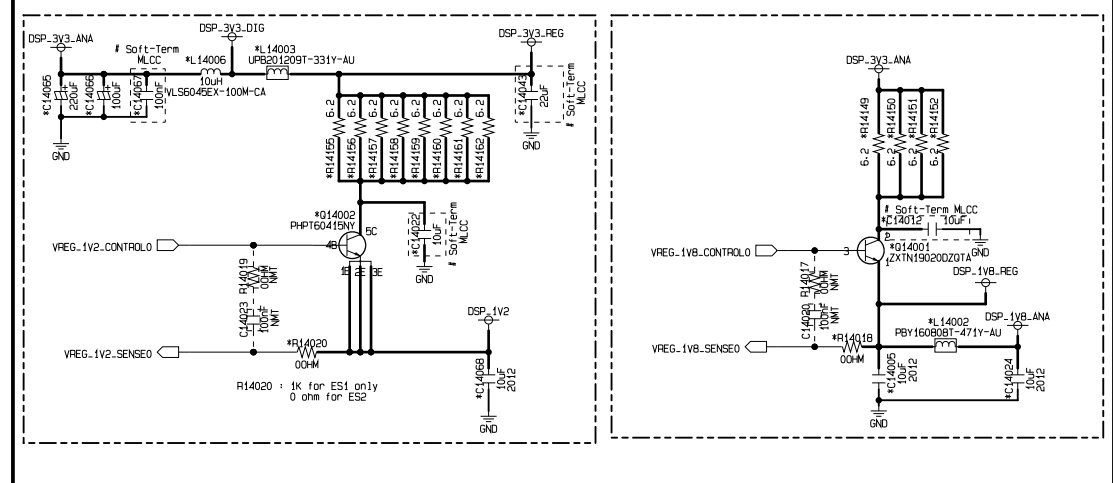
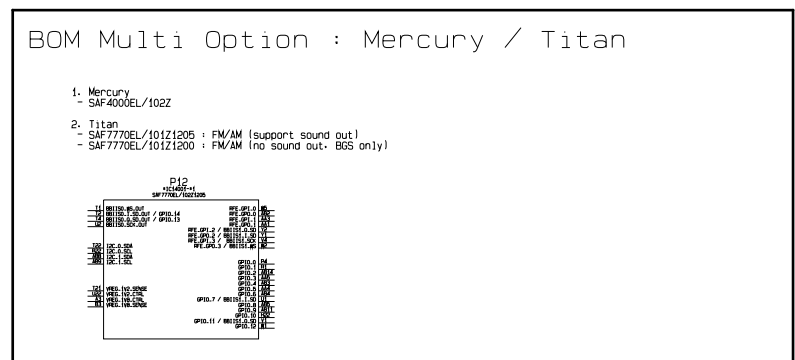
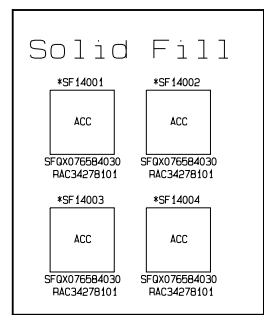


		MATERIAL	COLOR/FINISH
A			

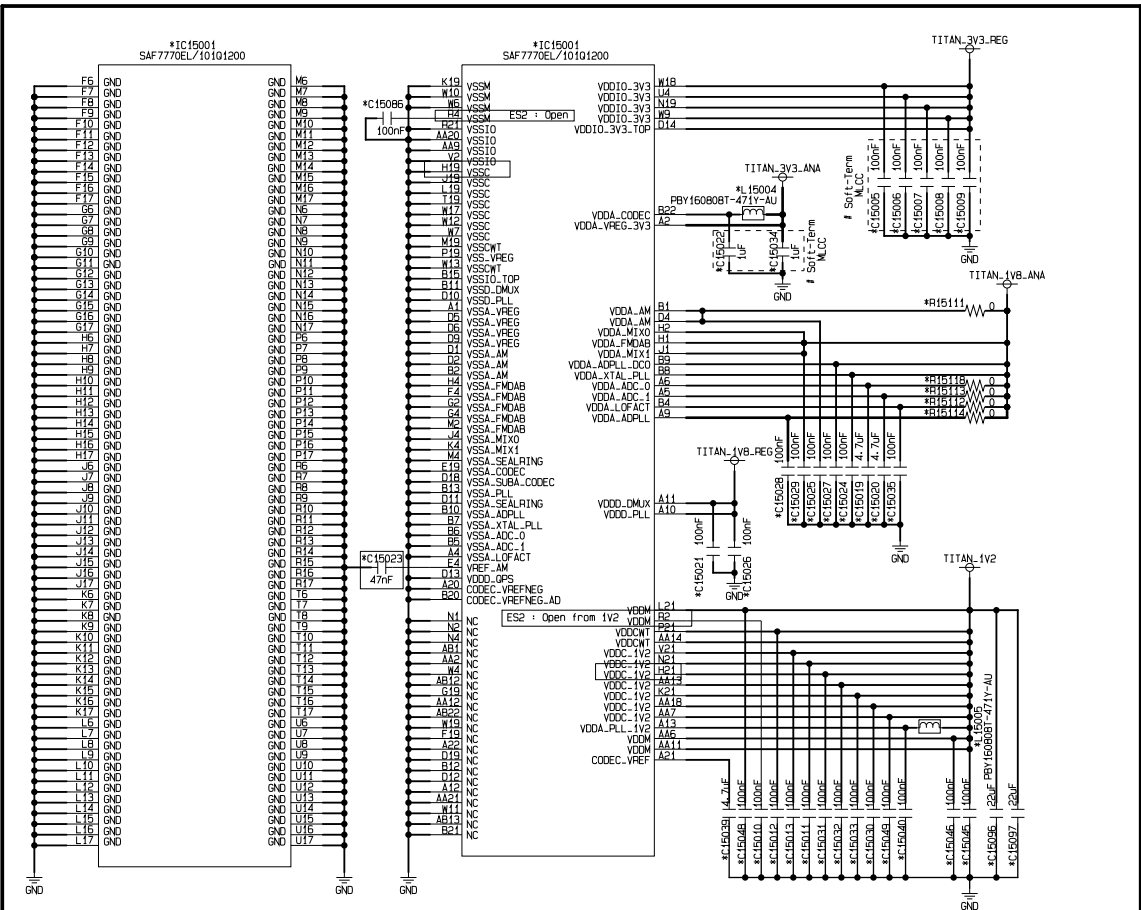


Version	H19	H21	H22
ES1	GPIO.P10	N.C	N.C
ES2	VSSC	VDDC	GPIO.P10



QUANTITY	SCALE	UNIT	DRAWN	CHECKED	APPROVED	DATE	DESCRIPTION	MATERIAL	COLOR/FINISH	NOTE
THIRD ANGLE PRO	mm	mm	JS Jeong	Siyun Yoo		2019. 10. 10	EAX67685006 (ICAS-3)			
LG Electronics Inc.							Analog/Digital Tuner (Mercury). 14/18			

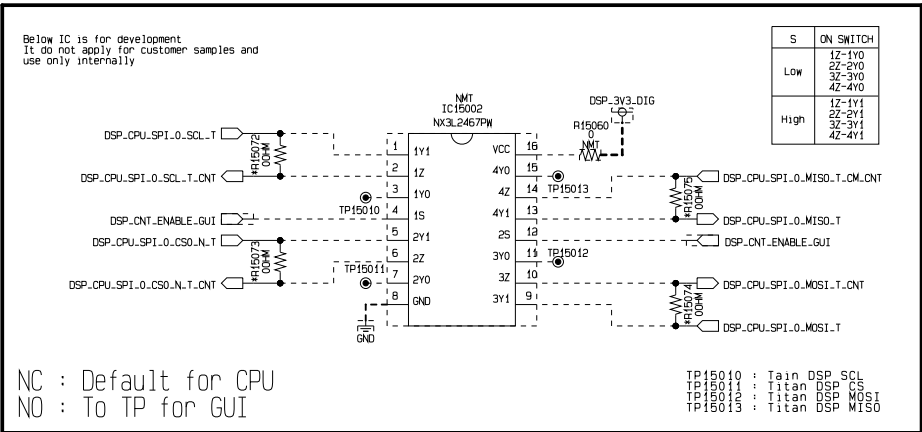
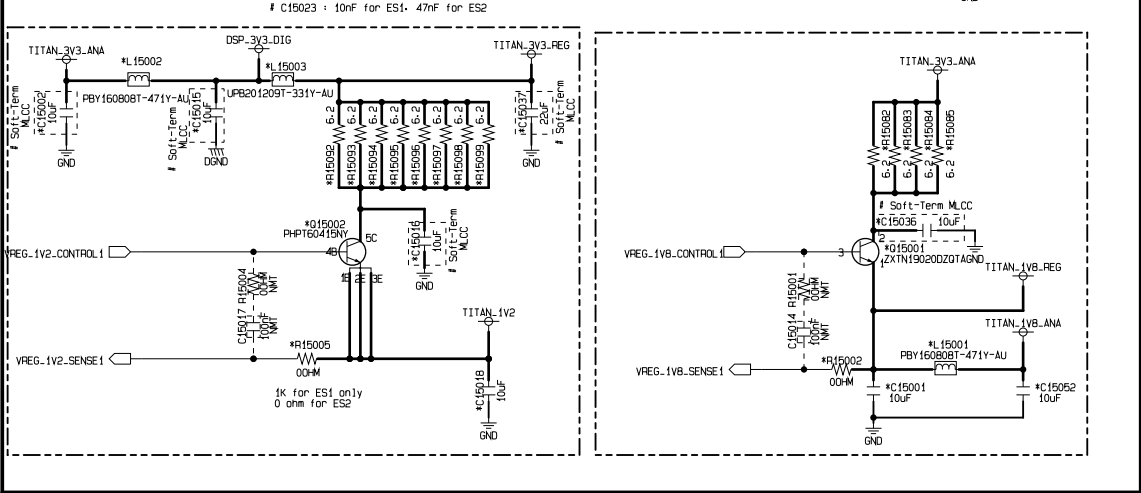
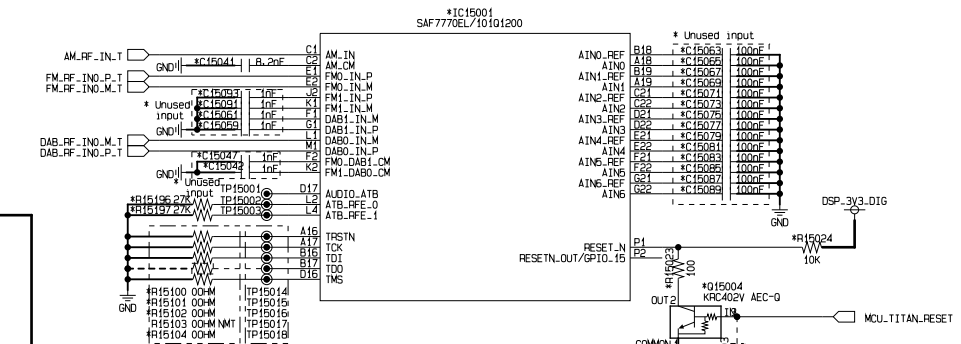
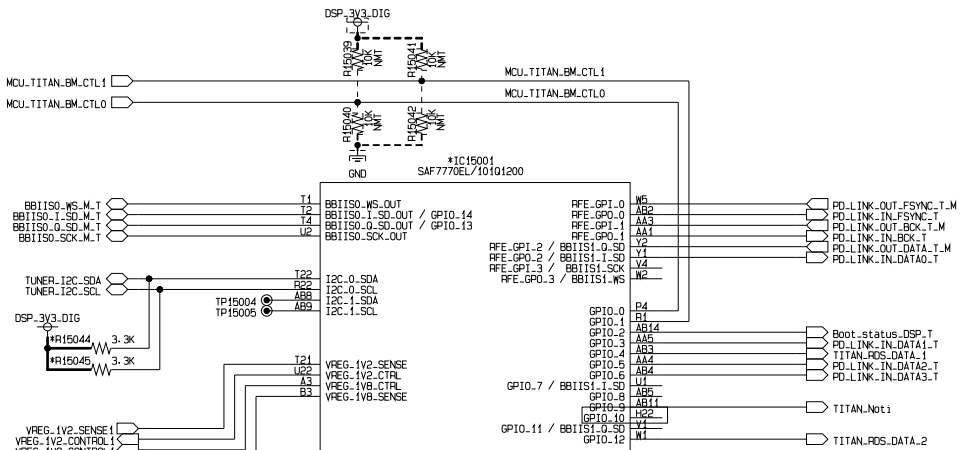
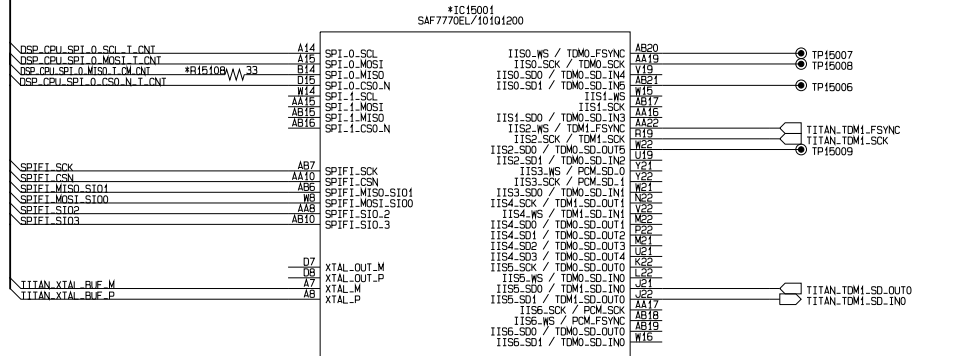
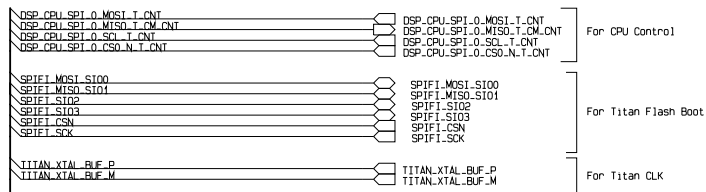
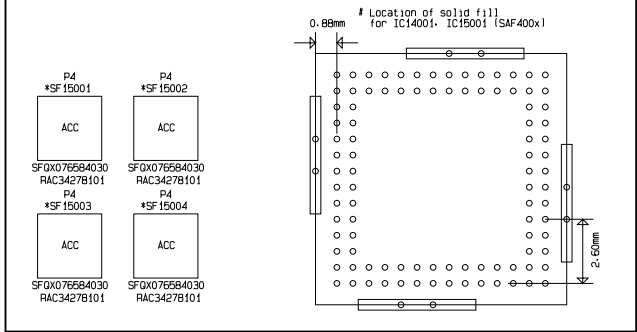
		MATERIAL	COLOR/FINISH
A			



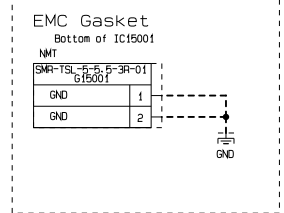
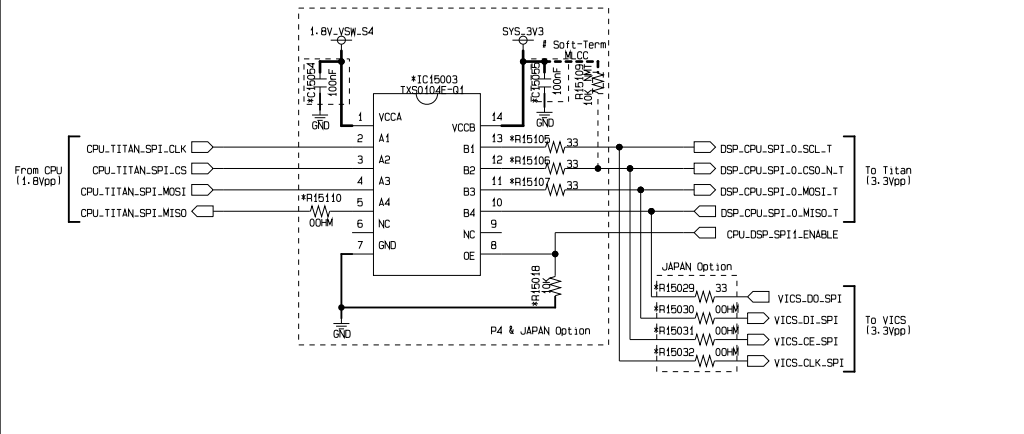
Pin changes between ES1 and ES2

Version	H19	H21	H22
ES1	GPIO.P10	N.C	N.C
ES2	VSSC	VDDC	GPIO.P10

Solid Fill



TITAN SPI To CPU Control



DIMENSIONAL TOLERANCE	
ANGULAR	0
UNLESS OTHERWISE SPECIFIED	

NMT = Not mounted
DBG = For HW debugging
NIF = Not in final design

QUANTITY	SCALE	UNIT	DRAWN	CHECKED	APPROVED	ISSUE	NO	PART NO	DESCRIPTION	MATERIAL	COLOR/FINISH	NOTE
THIRD ANGLE PRO	MM	mm	JS Jeong	Siyun Yoo			2019. 10. 10	EAX67685006 (ICAS-3)	Analog Tuner (Titan).15/18			

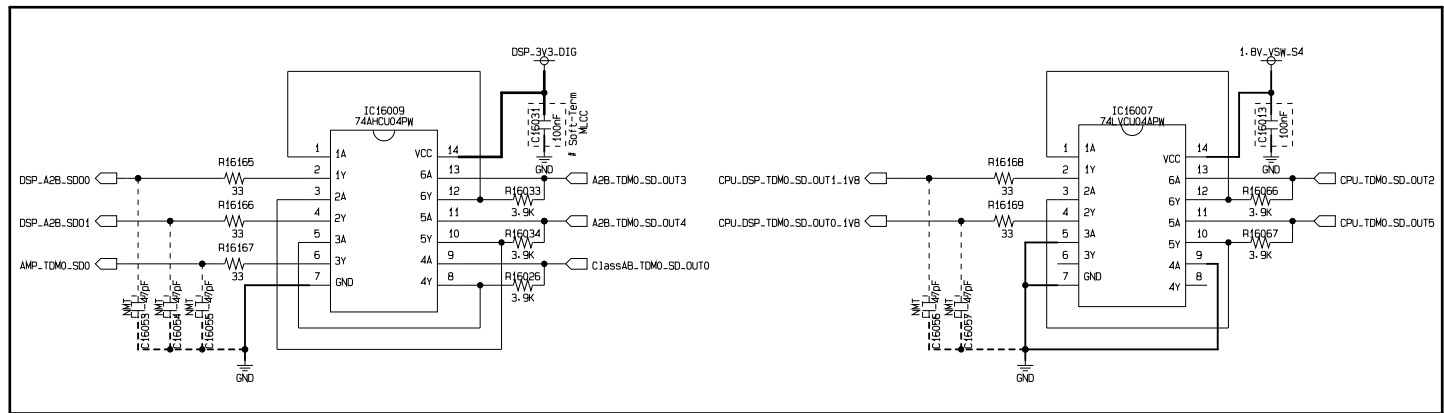
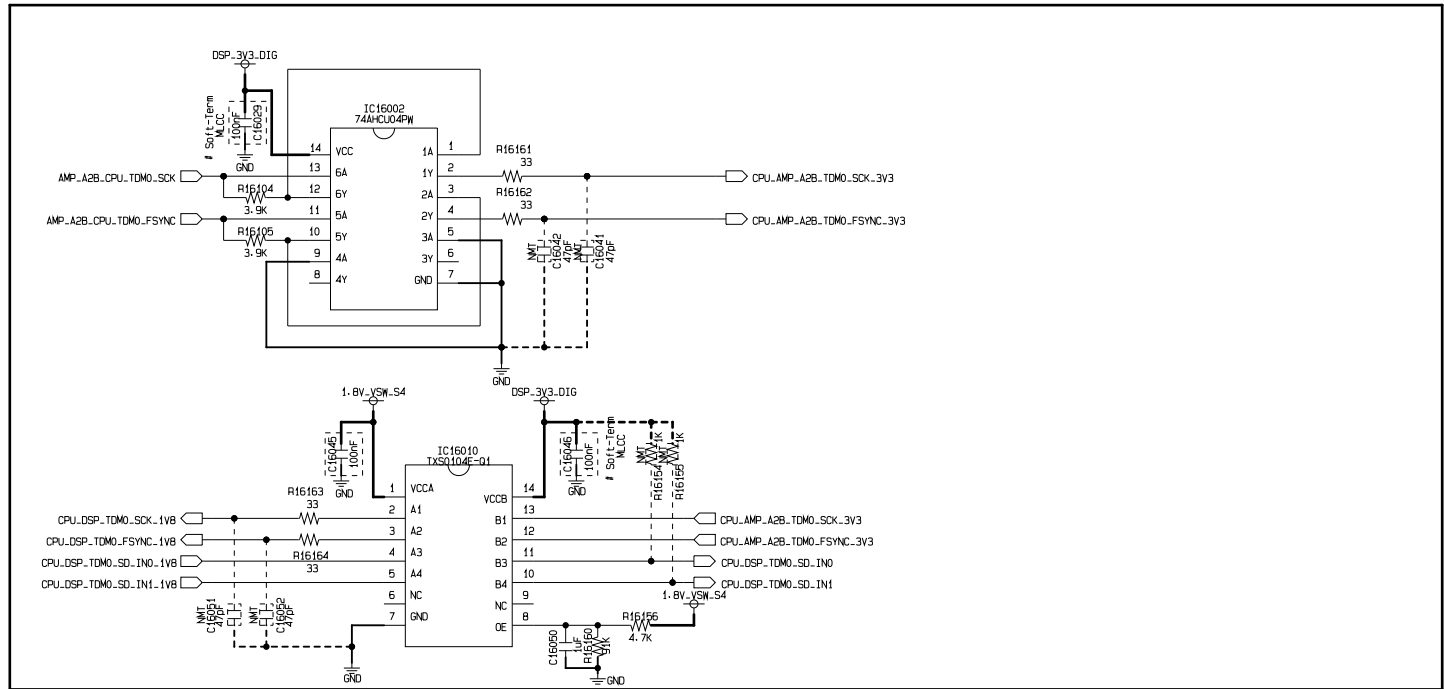
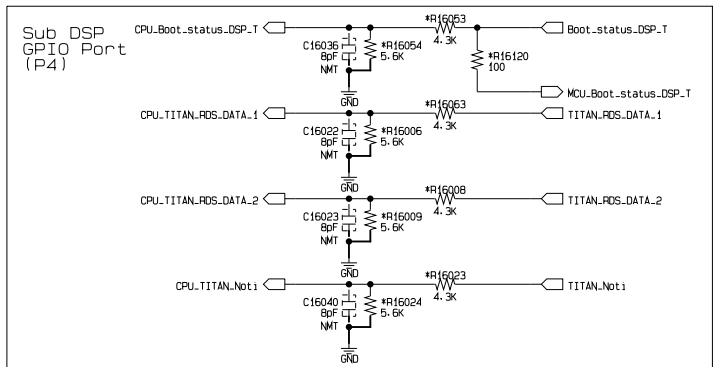
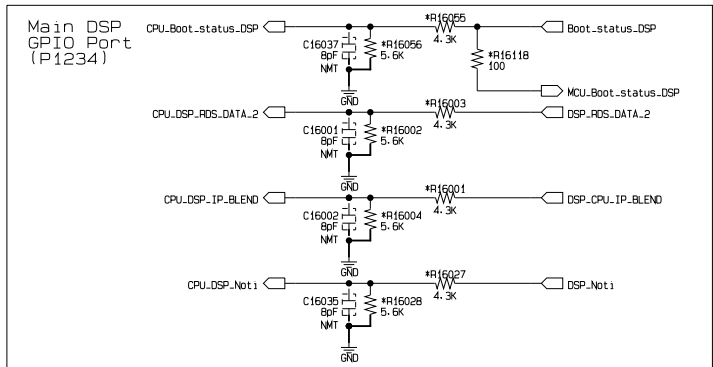
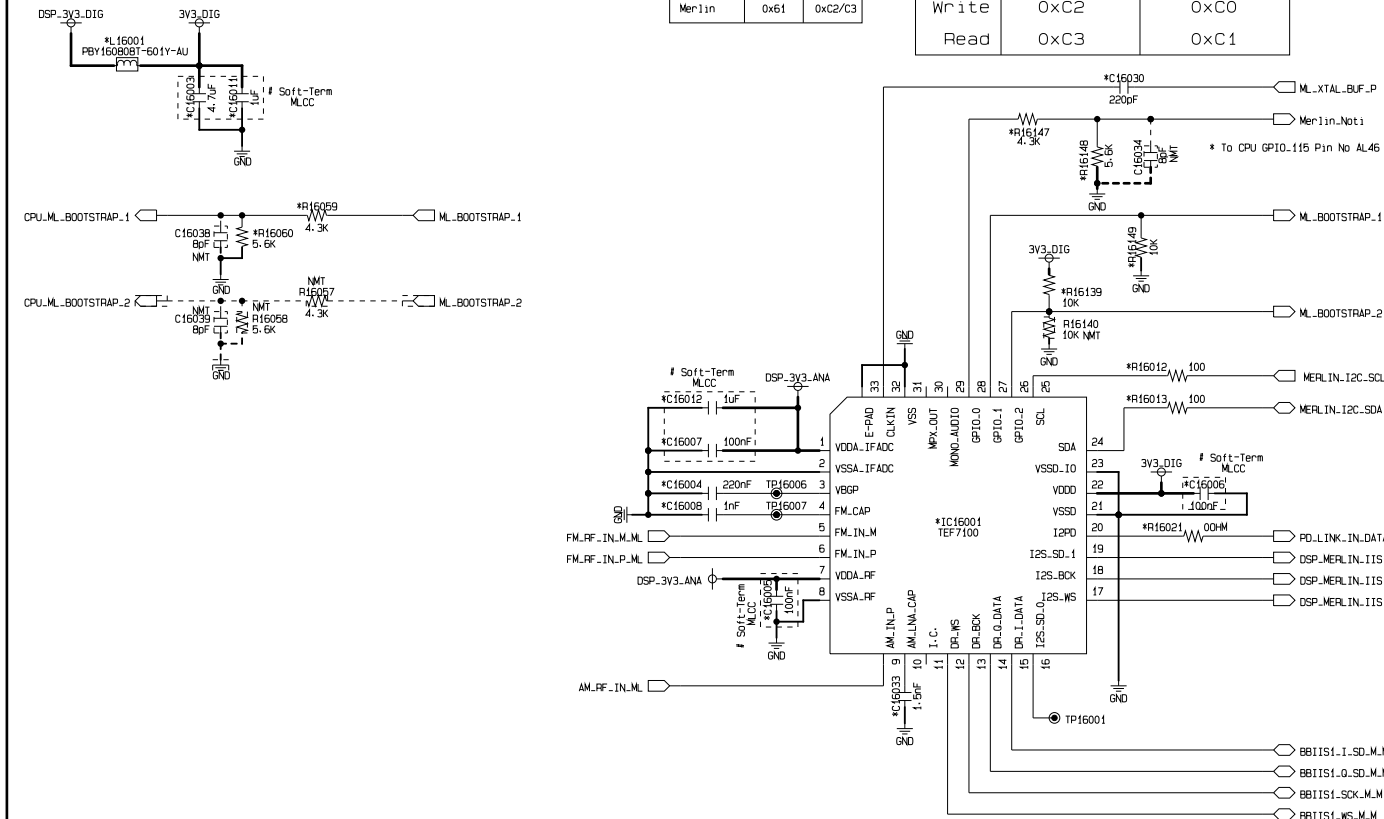
A B C D E F G H I J K L

	MATERIAL	COLOR/FINISH
A		

AM/FM/HD 3TUNER : MERLIN (Option : P2)

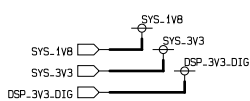
# MERLIN I2C device address		
Device	7bit	8bit
Merlin	0x61	0xC2/C3

# MERLIN I2C setting (8bit)		
GPIO_2	pulled up	pulled down
Write	0xC2	0xC0
Read	0xC3	0xC1



DIMENSIONAL TOLERANCE	
ANGULAR	0
UNLESS OTHERWISE SPECIFIED	

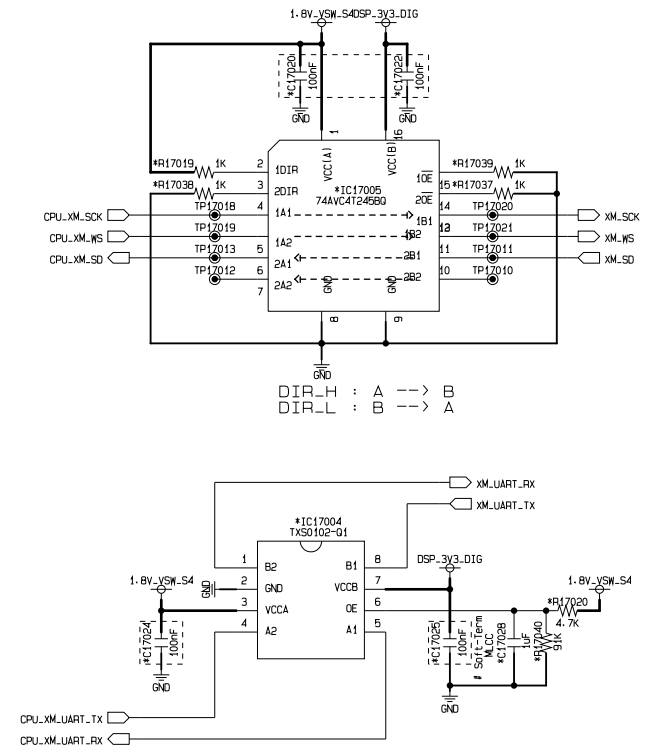
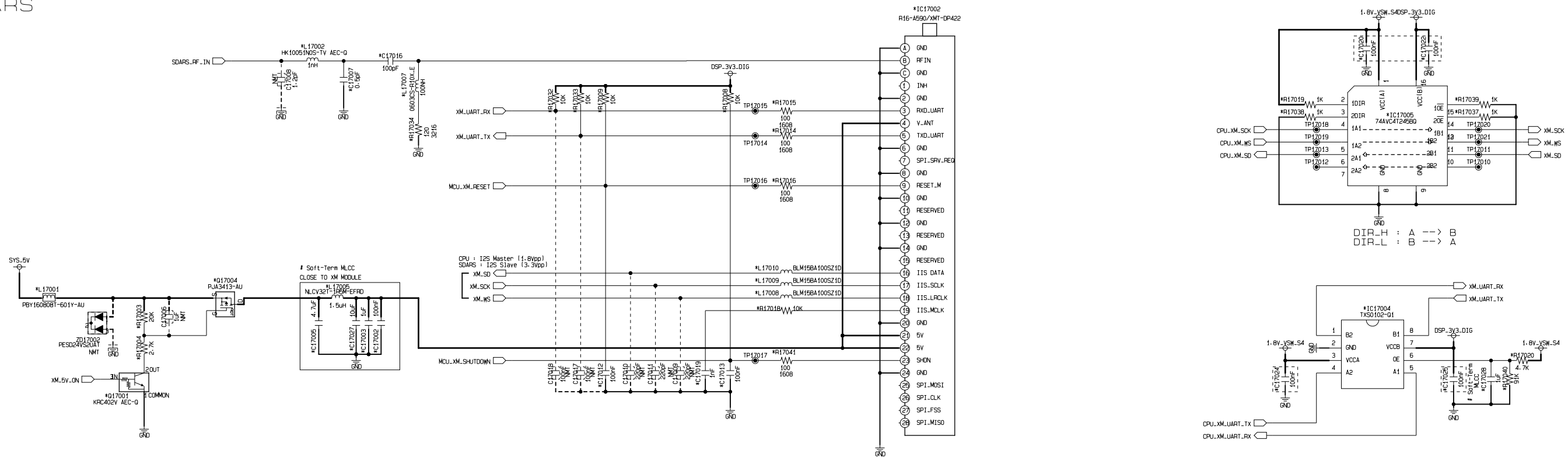
UNIT: mm
NMT = Not mounted
DBG = For HW debugging
NIF = Not in final design



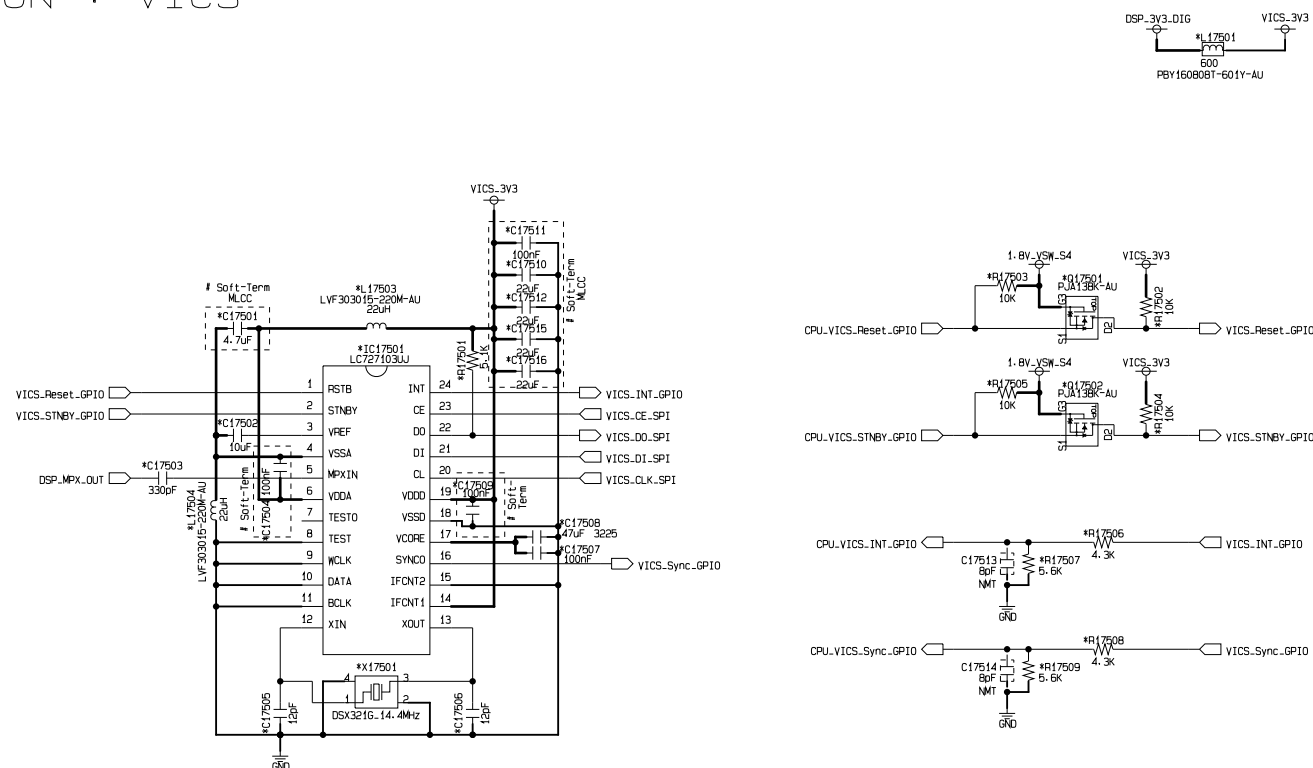
C	B	A	NO	PART NO	DESCRIPTION	MATERIAL	COLOR/FINISH	NOTE
QUANTITY								
THIRD ANGLE PRO			SCALE	UNIT	DRAWN	2019. 10. 10		
				mm	CHECKED	EAX67685006 (ICAS-3)		
					APPROVED	AM/FM Receiver (Merlin). 16/18		
					ISSUE			

		MATERIAL	COLOR/FINISH
A			

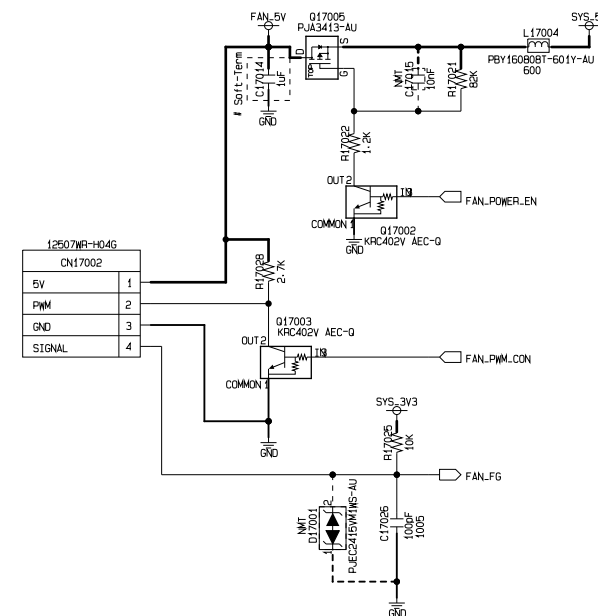
SDARS



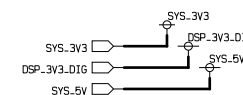
OPTION : VICS



FAN Connector

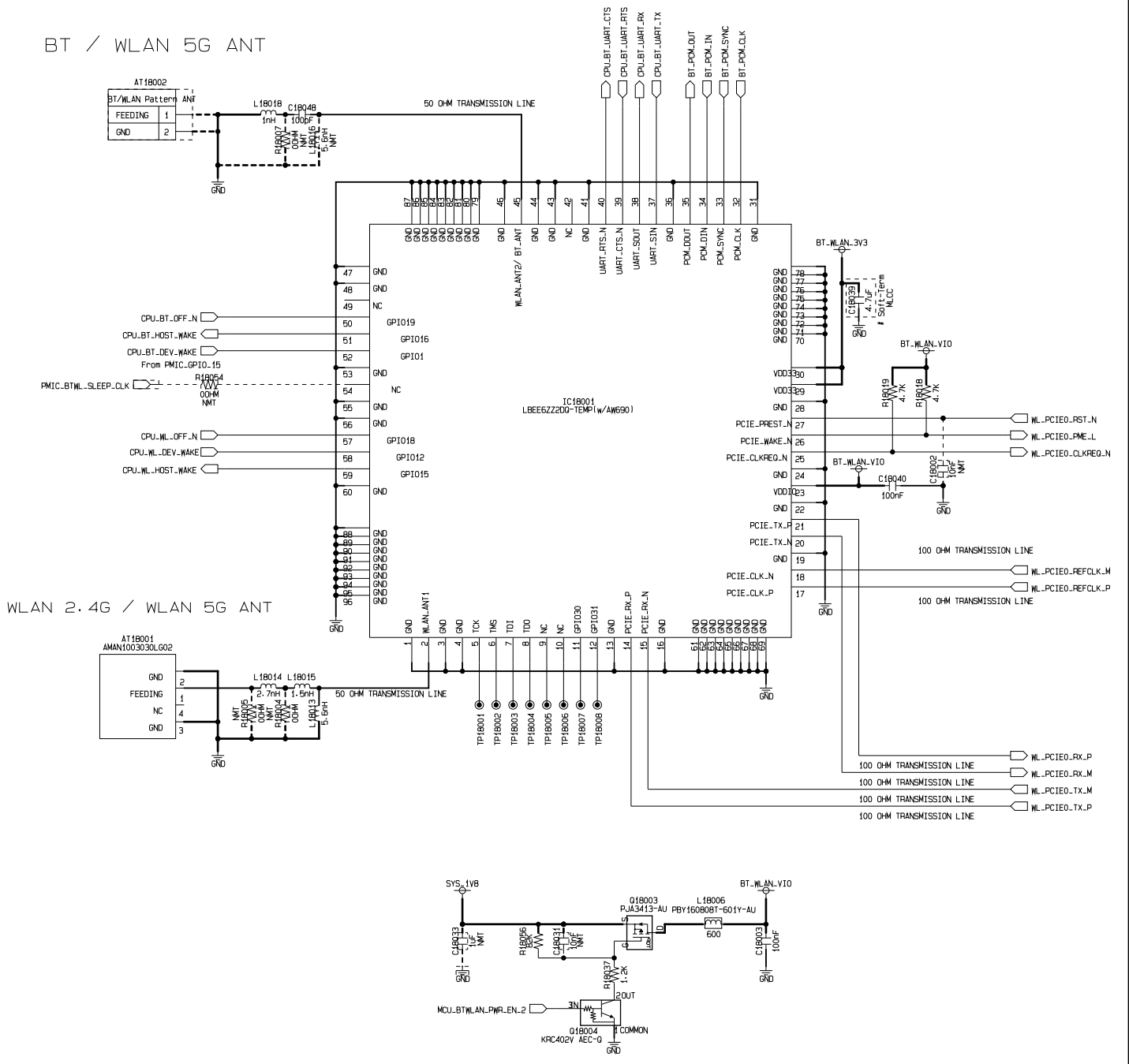


DIMENSIONAL TOLERANCE		C I A Z Z I N G	NMT = Not mounted DBG = For HW debugging NIF = Not in final design
ANGULAR	0		
UNLESS OTHERWISE SPECIFIED			

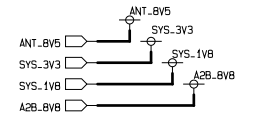
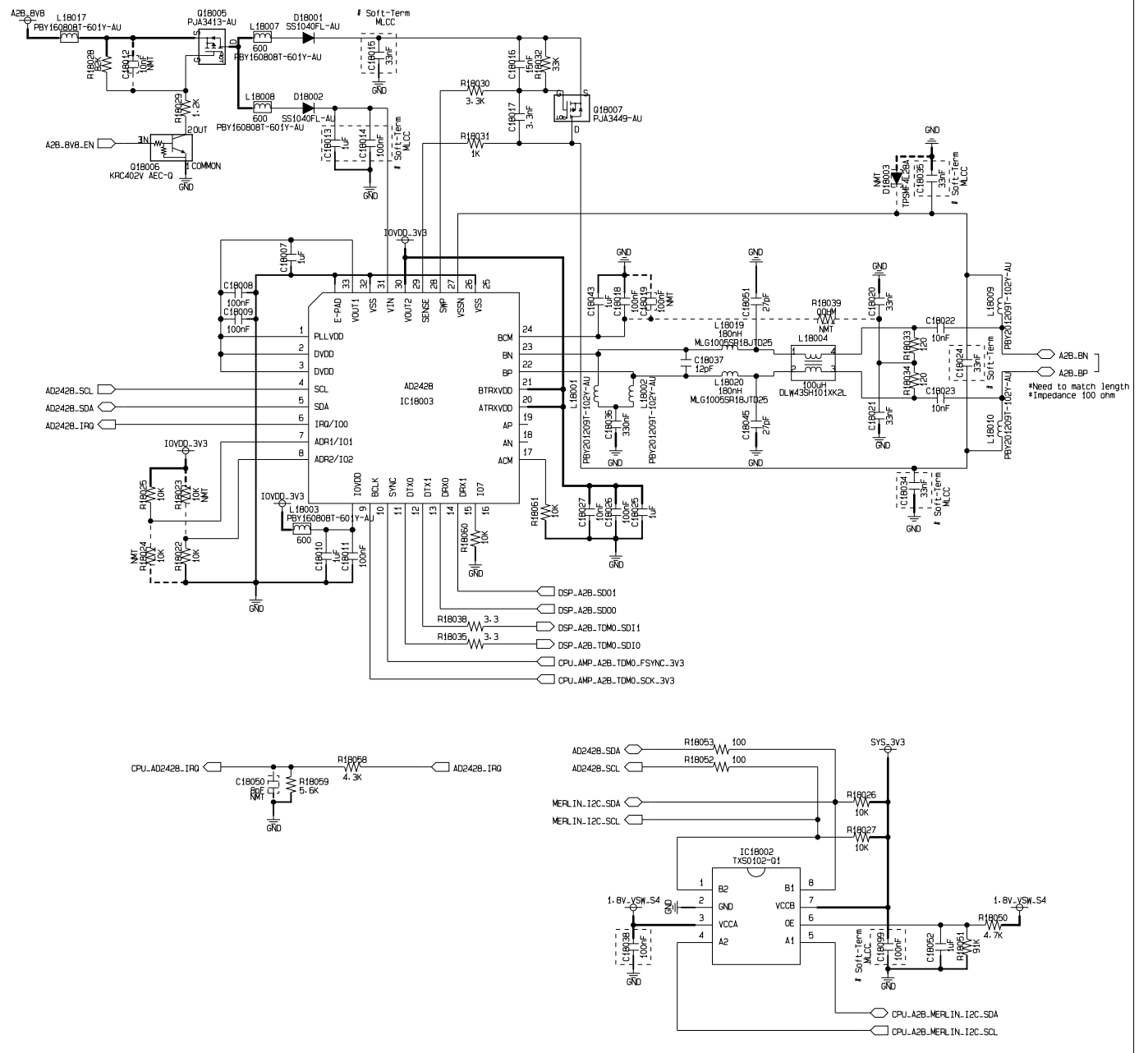
[illegible]

	MATERIAL	COLOR/FINISH
A		

BT/WIFI Module



A2B



DIMENSIONAL TOLERANCE	UNIT/NOTATION	NOTES
		NMT = Not mounted DBG = For HW debugging NIF = Not in final design
ANGULAR	0	
UNLESS OTHERWISE SPECIFIED		

QUANTITY	SCALE	UNIT	DRAWN	CHECKED	APPROVED	ISSUE	DATE	DESCRIPTION	MATERIAL	COLOR/FINISH	NOTE
			JS Jeong	Siyun Yoo			2019. 10. 10	EAX67685006 (ICAS-3)			
								WiFi/BT & A2B (18/18)			

1
2
3
4
5
6

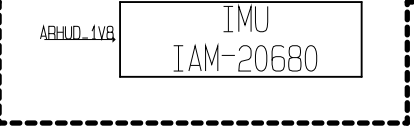
No		MATERIAL	COLOR/FINISH
A			

Date	Revision Contents	Date	Revision Contents
2017.05.08	Initial creation of circuit diagram, for ICAS-3 (EAX67685001 REV1.0)	2018.06.12	1. Major changes of schematic (EAX67685002 REV1.2 -> REV1.3) 1)sht 001 : LM25119-Q1 -> LMR14030 + LMR14050 for EMC improvement Optimize resistance values for ECALL mute and kopplebox L1021, C1174, C1043 are added for EMC improvement 2)sht 001, 014 : PMV27UPEA -> PMPB20XPEA to gurantee high power dissipation (Q1201, Q1203, Q1205, Q14003) 3)sht 002 : Pin11 (SPLIT) of TJA1043T/1 are disconnected from 4.7kohm resistor 4)sht 008 : VDDIOEI, VDDIOEO power supply is changed (VDD-Eth-3V3 -> VDD-Eth-1V8) to reduce RGMII radiated noise 5)sht 009 : VDDO supply input of 88Q2110 is changed (DVDD-3V3 -> PHY-AVDD-1.8V) for EMC improvement 6)sht 011 : Ferrite beads (L11001, L11002) are added to separate DGND of power AMP 10nF capacitors are added on analog audio outputs for EMC improvement 7)sht 014, 015 : "R2", "R4" pin treatments of IC14001&IC15001 are changed acc.to updated application note. 8)sht 016 : TDM lines are simplified comparing with REV1.2, and RC filters are added. TDM option blocks (IC16005, IC16006, IC16008) are deleted 9)All shts : Location of gaskets are prepared (NMT) for EMC test 10)sht 003, 008, 009, 014 : Load capacitors for crystals are optimized, based on crystal matching test result 11)sht 003, 015 : SPI interface between MCU and Titan are deleted (Unused)
2017.09.08	1. Major changes of schematic (EAX67685001 REV1.0 -> EAX67685002 REV1.0) 1)sht 001 : Updated quadlock pinmap acc. to ICAS-Entwurf_Quadlock-V0_4_SS-170412 PWR blocks were changed 2)sht 006 : Capacity of LPDDR4 was changed from 3GB x 2EA to 4GB x 2EA 2)sht 007 : Added FPD-LINKIII serializer DS90UH941A and HSD connector for AR-HUD 3)sht 007 : Moved IMU sensor block from sht 007 to sht 012 4)sht 009 : Added 1000BASE-T1 ethernet connector(PE335410-CDE01, DELPHI AMEC GEN2) 5)sht 010 : Changed USB protection ICs for USB1 and USB2 - USB1 : MAX16982 -> NIV1161 - USB2 : MAX16970GEEB/V -> MAX20042 - USB3 block (for JAPAN) was moved to sub PCB 6)sht 011 : Changed SB-1 power amplifier from TDA7803-8ZX to TDA7803-ZST (different package shape) 7)sht 012 : Add 30P B to B connector for sub PCB connection 8)sht 018 : Changed the BT/WiFi Chip Antenna of ANT_0 - AMAN1003015L602(AMOTECH) -> Pattern ANT 9)Applied AEC-Q components 10)Add Solid fills for BGA ICs 2. Deleted items from schematic 1)sht 002 : Deleted LIN (TJA1021T) block 2)sht 010 : USB3 (MAX3420EECJ/V+) block + HSD were moved to sub PCB 3)sht 012 : GNSS block (UBX-M8030-KA -> CSR0531) was moved to sub PCB (Changed to CSR solution)	2018.10.18	1. Major changes of schematic (EAX67685002 REV1.3 -> REV1.4) 1)sht 001 : 5V_DET -> 4V5_DET, adding SYS_5V_FAIL detect 2)sht 001 : SYS_1V1 is moved from LMR14030(IC1201) to PMIC(IC5001) Add LDO(IC1010) for SYS_1V1_ETH, remove power switching FETs for 1.1V supply Fsw of IC1004, IC1007, IC1200 are changed from 1.057MHz to 2.18MHz (ECO applied for REV1.3) 3)sht 002 : I-CAN termination resistors are changed from 4.7k to 61.9ohm (ECO applied for REV1.3) 4)sht 003 : Swap MCU_CPU_CLU_UART & MCU_CPU_IVI_UART to use DMA for safety partition 5)sht 004 : MCU_CPU_SPI level translating block is moved from PMIC GPIO to TXS0104E(IC4005) Apple CP chip is changed from 34S2313(2.0B) to MF1337S3961(2.0C) R4105 : 33nm -> 22ohm / R4033 : 0ohm -> 22ohm for eMMC S1 optimization 6)sht 009 : CM termination filter for 88Q2110 is changed acc. to Marvell's recommend. 7)sht 007 : HSD color & code are changed according to customer's request
2017.10.24	1. Major changes of schematic (EAX67685002 REV1.0 -> REV1.1) 1)sht 001 : Delete MCU_UART2_TX & RX from Q_lock connector 2)sht 003 : MCU_CPU_UART -> MCU_CPU_IVI_UART, MCU_UART2 -> MCU_CPU_CLU_UART Add EEPROM_3V3 switching block 3)sht 004 : Add Level translator(IC4005) for MCU_CPU_CLU_UART level transition Add BLSPP9_I2C and changed all I2C connections Changed CPU_UART channel connection 4)sht 009 : Changed FL9001 (DLW43SH101XK2L, Murata -> AE5002, Pulse) 5)sht 014 : Changed X14001 (FA-238A -> DSX321G, 55.46667MHz) Changed applications of Mercury for ES1 -> ES2 version up 6)sht 015 : Change applications of Titan for ES1 -> ES2 version up 7)sht 016 : IC16010 & IC16008 were changed from NLVSX4014 to TXS0104E-Q1	2018.11.29	1. Major changes of schematic (EAX67685002 REV1.4 -> REV1.5) 1)sht 001 : 2.2uF 100V 3225 soft-term MLCC -> 4.7uF 50V 3216 MLCC x 2EA (Orthogonal) on VCC line 2)sht 016 : 3V3_ANA -> DSP_3V3_ANA for MERLIN VDDA supply input, to improve S/N curve 3)sht 013 : ANT toggle switching block is moved from PMIC GPIO to level transltor IC (IC13003) 4)sht 005 : MLCCs are added to improve CPU PDN characteristics 5)sht 011 : L11001 (BLM18KG221SZ1D) -> R11001 (0ohm, 1608) L11002 (BLM15AG221SH1D) -> L11002 (BLM15AG221SH1D, NMT) to solve no sound output issue 6)sht 009 : 88Q2110 REV "A0" -> "A1" 7)ETC : Modified PCB based on 1st VW HW OPL list
2018.02.06	1. Major changes of schematic (EAX67685002 REV1.1 -> REV1.2) 1)sht 001 : ESD capacitors on Q_lock were changed to 10nF, 250V, 2012 TVSS (PESD1LIN) were added on ULA_STATUS and ZR_RESET Connect MED_DEB_UART lines to quadlock (Q_lock -> MCU pin46&47) Compnents of 5V_DET were optimized (R1044, R1045, R1046, C1066) 2)sht 003 : IC3001 P/N was changed from SPC5748C to SC667604CKU2 (Same IC but changed the P/N only) C3057, C3059, C3060, C3061 were changed, NMT -> 100nF R3051 (10k) was added on PB16 for unused input (W0_GNSS) 3)sht 004, 005 : Pin termination for unused inputs were added 4)sht 008 : C8001, C8026, C8019 were changed, 2.2uF/6.3V -> 4.7uF/16V 5)sht 009 : L9003(600ohm Bead) and C9038 (10uF) were added to separate AVDD_3V3 The generation of AMEC connector was changed, GEN2 -> GEN4 6)sht 014, 015 : Pin termination for unused inputs were added, especially for RF & Analog audio inputs 7)sht 018 : R18061(10k) was added on pin17(ACM) of IC18003 R18001(0ohm, NMT), C18004(100nF, NMT) were added for X18001 8)sht 003, 004, 005 : Swap the pin property, MCU_CPU_RESERVED_2(CPU_MCU_RESERVED_2)(<-)MCU_CPU_ERR_MONITOR(CPU_MCU_ERR_MONITOR) 9)sht 017 : R17025 was changed from 1kohm, 1005 to 10kohm, 1005 10)sht 004, 007 : CPU_IMU_INT, CPU_IMU_READY, CPU_IMU_RESERVED GPIOs were added between IC4001(CPU) and IC7301 (FPD-LINKIII serializer for AR-HUD) 11)sht 003 : R13082 was changed from 100ohm, 1005 to 0ohm, 1005 sht 017 : L17002 was changed from HK10051N2S-TV (1.2nH) to HK10052N2S-TV (2.2nH) 12)sht 014 : The option PD_LINK Resistors were changed - R14192, R14193 : P2 -> NMT - R14006, R14007 : P24 -> P4 13)sht 014 : C14026, C14027 were changed from 7pF, 1608 to 10pF, 1608 (Crystal matching) 14)sht 013 : Optimized ANT DTC circuit of ANT1 ~ ANT3 15)sht 001 : Optimized FB filters of IC1004, IC1200, IC1201 R1031, R1032 (47k) were added on "EN" pin of IC1200, IC1201 16)sht 010 : Optimized USB LC(RC) filters for Eye-pattern 17)sht 001 : IC1009 was changed, MPQ8847AGD-AEC1-Z -> MPQ8847AGQB-AEC1-Z 18)sht 009 : GND (Ethernet Shield GND) of CN9001 was separated from ICAS-3 GND, by using MLCCs C9051, C9052 (10pF, NMT) were added on RGMII_TXCLK & RXCLK 19)sht 006 : IC6001 was changed from MTF64GAJAEDN-AIT (169P, eMMC5.0) to MTF64GAPALBH-AIT (153P, eMMC5.1)	2019.01.11	1. Major changes of schematic (EAX67685002 REV1.5 -> EAX67685003 REV1.0) 1)sht 009 : R9051, R9052 are changed (1kohm, 1/BW, 2012 -> 1kohm, 1/2W, 3216) acc.to 1000BASE-T1 review. 2)sht 001 : Add R1010 (0ohm) on 12V_VW_CAN_VCC based on 2nd VW HW OPL list 3)sht 002 : Delete R2005, R2006, R2007, R2018, R2019, R2020 (100ohm, 1005) from CAN & CAN-FD, acc. to CAN review. 4)sht 001 : R1044 is changed from 22k, 1percent to 47, 1percent because BATT_UNDER_DET level is changed from 4.5V to 5.8V (Power state machine is changed) 5)sht 001 : Depopulate SYS_5V_FAIL detect block, because of power state machine change (MMI_DCI_Undervoltage @ 4.5V<Vbat<6V concept is cancelled) 6)sht 009 : 88Q2110 REV "A1" -> "A2" LPF are changed to improve 1000BASE-T1 network characteristics
		2019.10.10	1. Major changes of schematic for HW D20 (Agreed by VW) 1)sht 009 : Depopulate C9011, C9012, C9013, C9014, R9025, R9026, R9027, R9028, R9031, R9032 Change L9011, L9012, L9013, L9014, R9021, R9022, R9023, R9024 to 0ohm Depopulate D9001, D9002

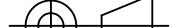
DIMENSIONAL TOLERANCE		CHANGES																					C		B	A			NO	PART NO	DESCRIPTION	MATERIAL	COLOR FINISH	NOTE
															QUANTITY																			
																	SCALE		UNIT	DRAWN	JS. Jeong		2019. 10. 10											
															THIRD ANGLE PRO				mm	CHECKED	Siyun. Yoo		EAX67685006											
ANGULAR	0																			APPROVED				Revision List										
UNLESS OTHERWISE SPECIFIED																																		

A I B I C I D I E I F I G I H I

No		MATERIAL	COLOR/FINISH
A			



CHANGES	ICON
	 Test Point  0 ohm NMT  Level Shifter  Inverter

	C	B	A	NO	PART NO	DESCRIPTION	MATERIAL	COLOR FINISH	NOTE
QUANTITY									
				SCALE	UNIT	DRAWN	2019. 10. 10		
THIRD ANGLE PRO					mm	CHECKED	EAX67685006		
 LG Electronics Inc.					APPROVED		Block Diagram		
						ISSUE			