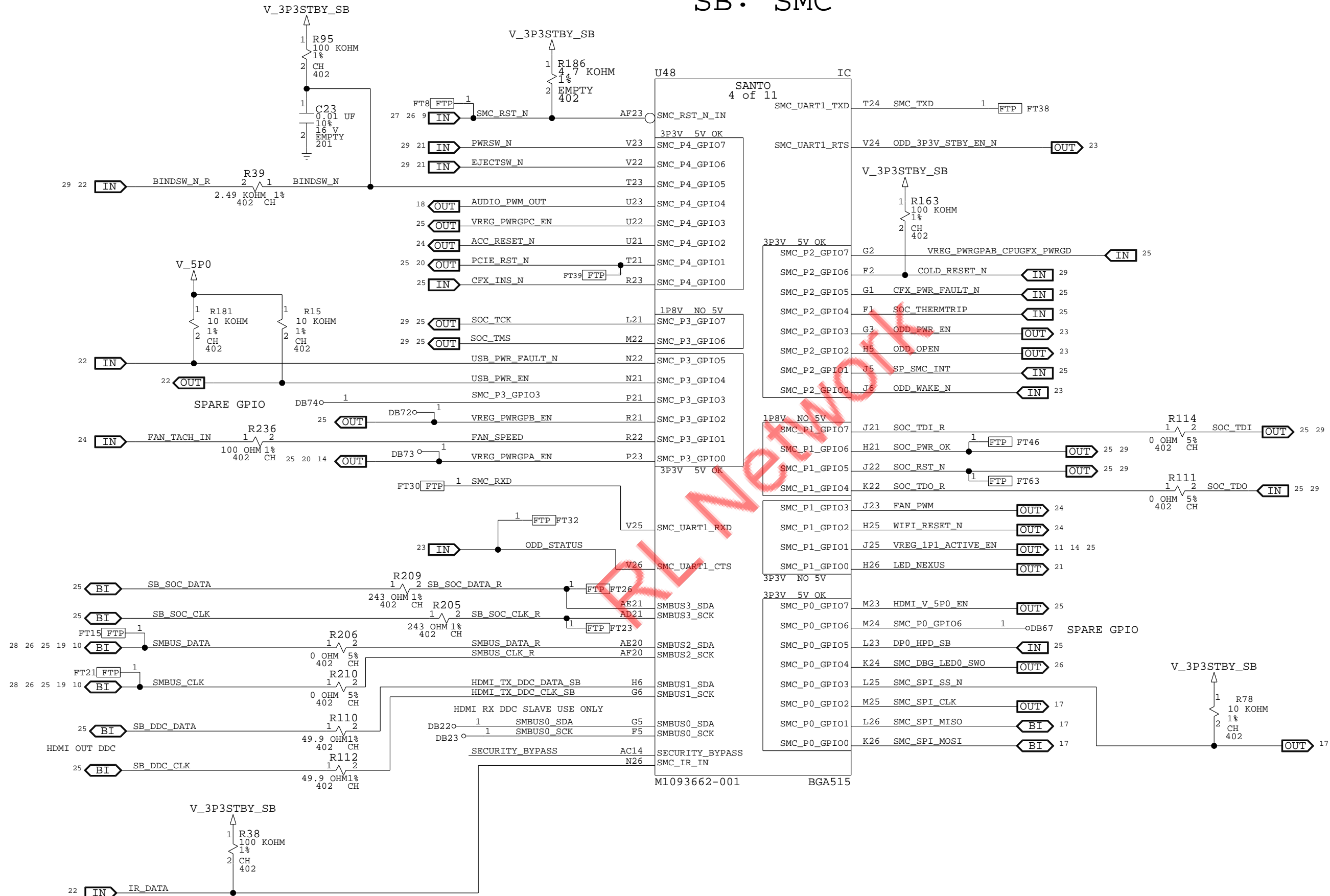




# SB: SMC



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# SB: USB

U48 IC  
SANTO 6 of 11

D

D

C

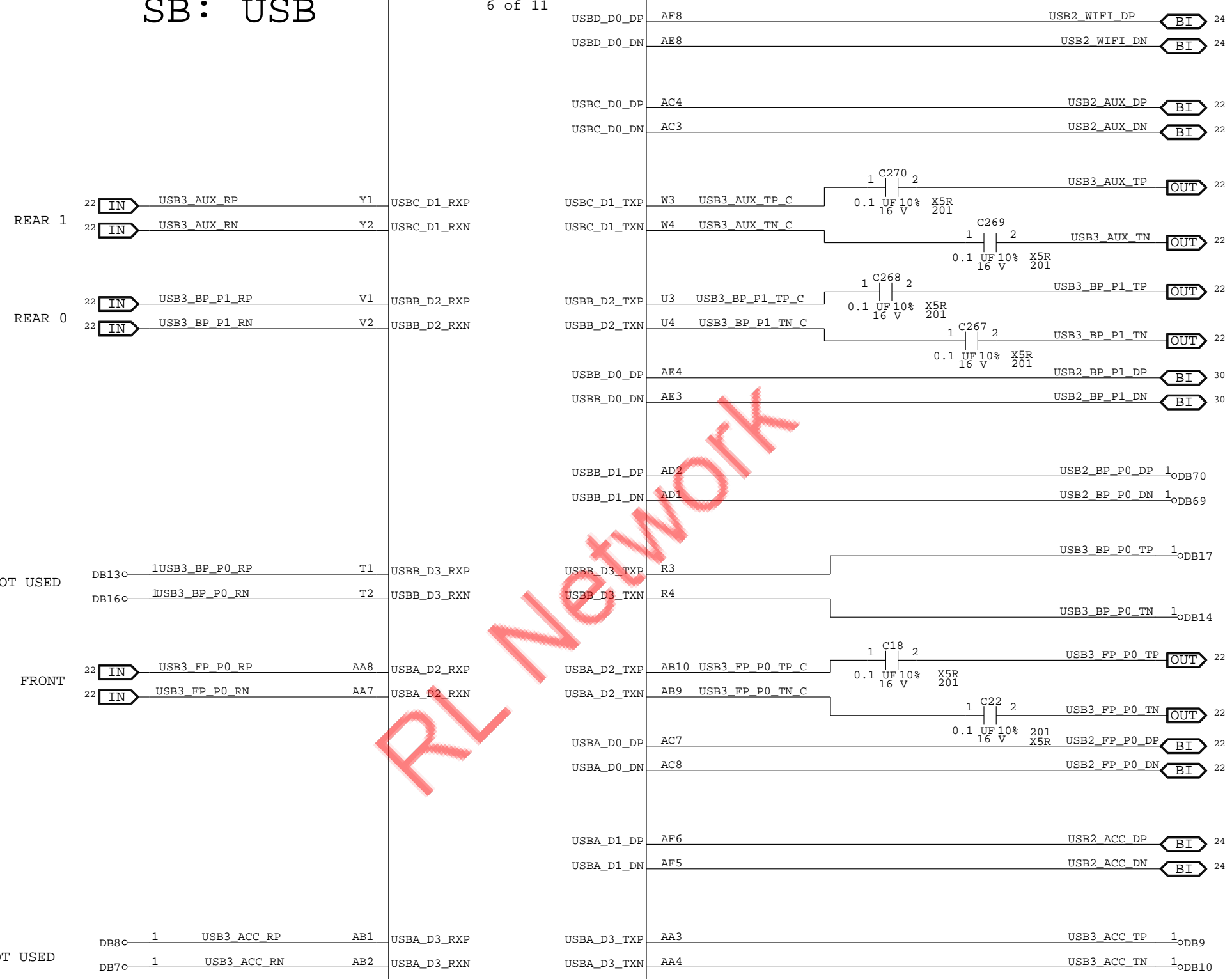
C

B

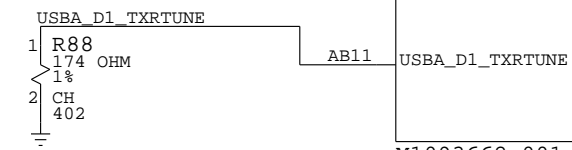
B

A

A

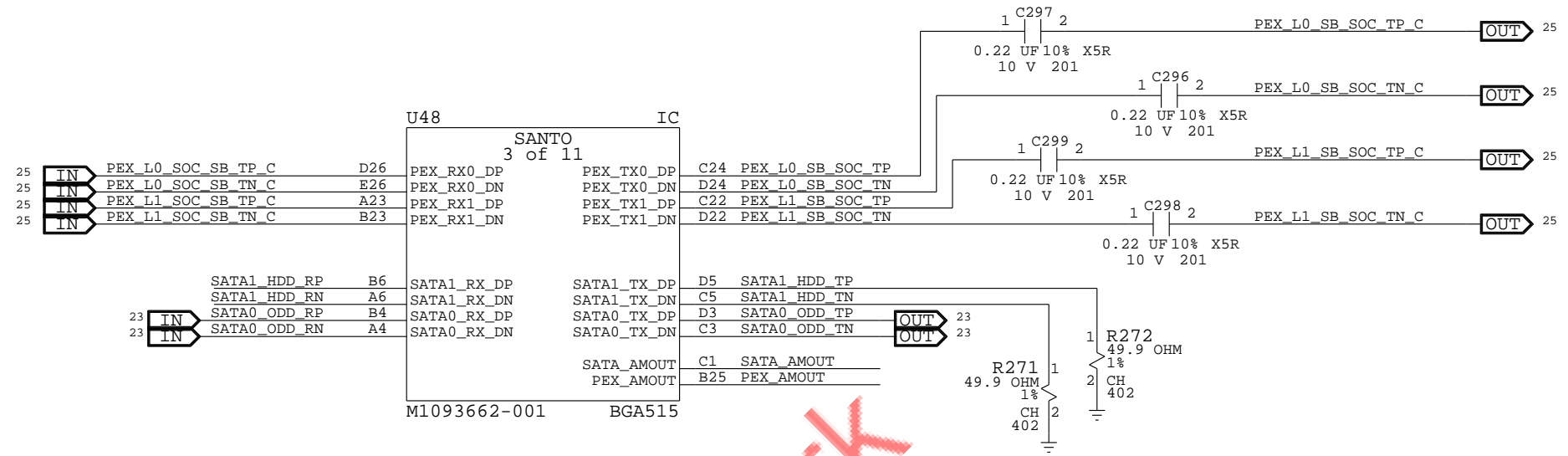


USBA_D2_AMOUT	AA5	USBA_D2_AMOUNT
USBA_D1_AMOUT	AE6	USBA_D1_AMOUNT
USBA_D0_AMOUT	AC11	USBA_D0_AMOUNT
USBB_D2_AMOUT	R5	USBB_D2_AMOUNT
USBB_D1_AMOUT	AD5	USBB_D1_AMOUNT
USBB_D0_AMOUT	AF4	USBB_D0_AMOUNT
USBC_D1_AMOUT	W5	USBC_D1_AMOUNT
USBC_D0_AMOUT	AC5	USBC_D0_AMOUNT
USBD_D0_AMOUT	AE9	USBD_D0_AMOUNT

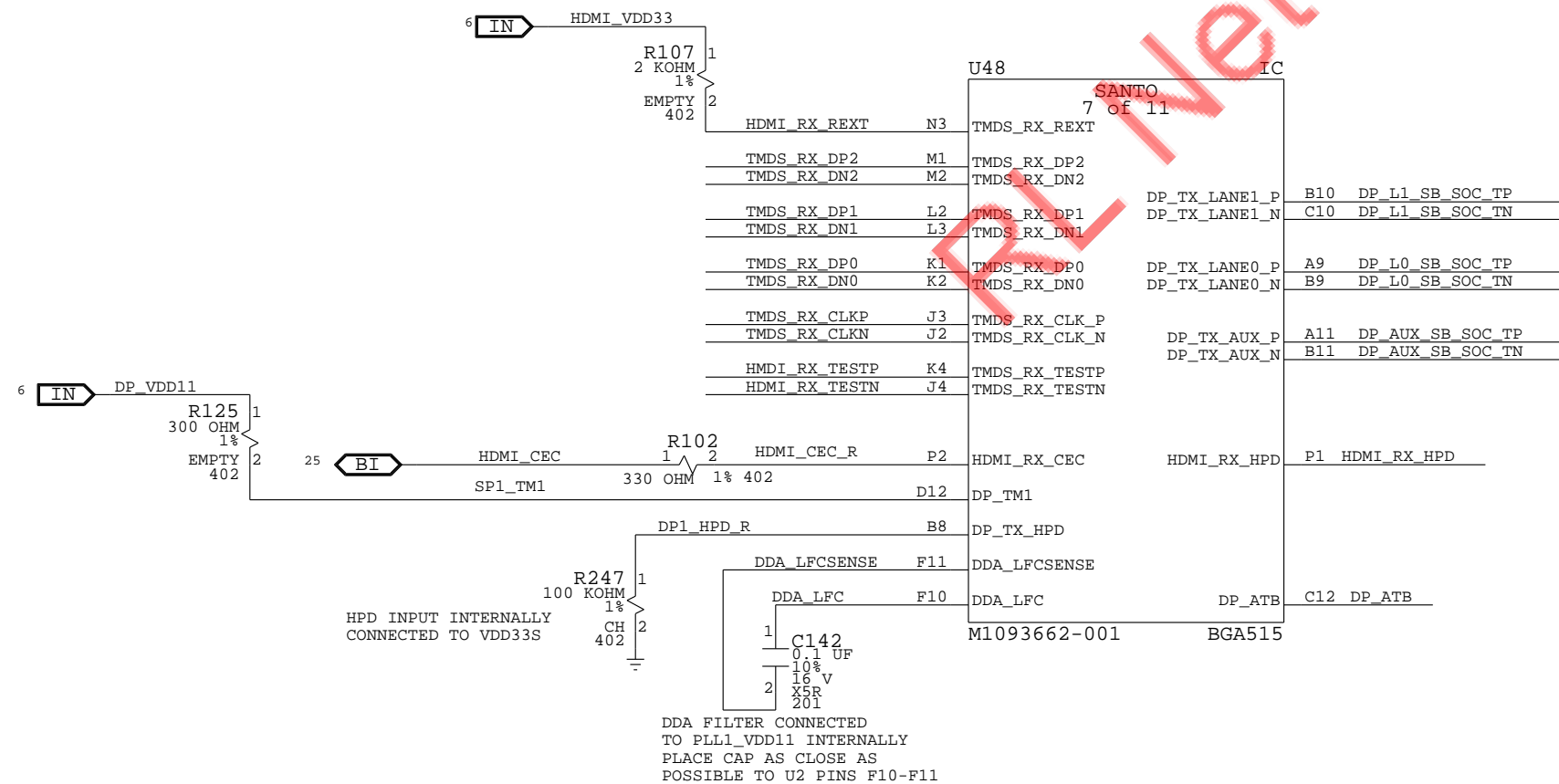


M1093662-001 BGA515

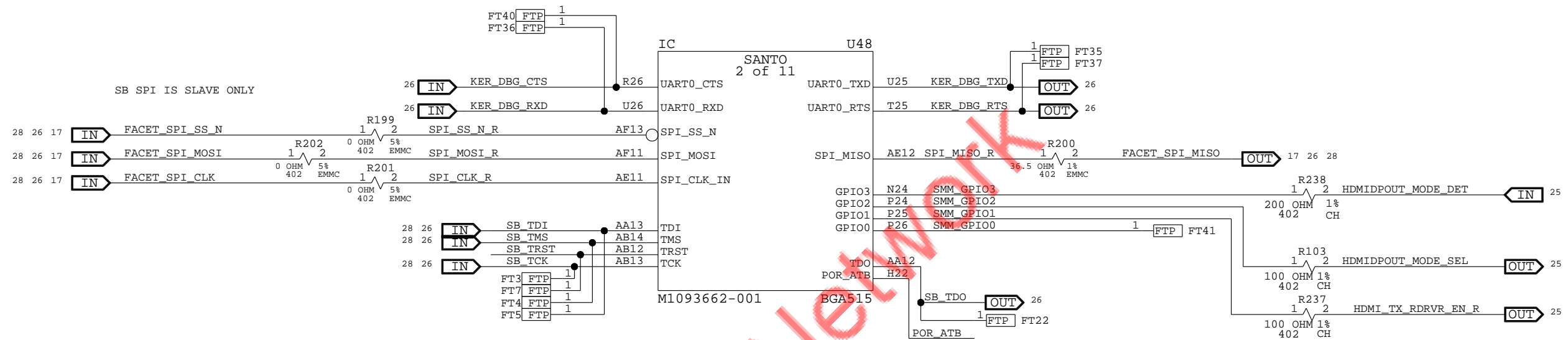
# SB: PCIE, SATA, VIDEO



**HDMI/DP NOT USED  
VIB SHOULD BE HELD IN RESET**



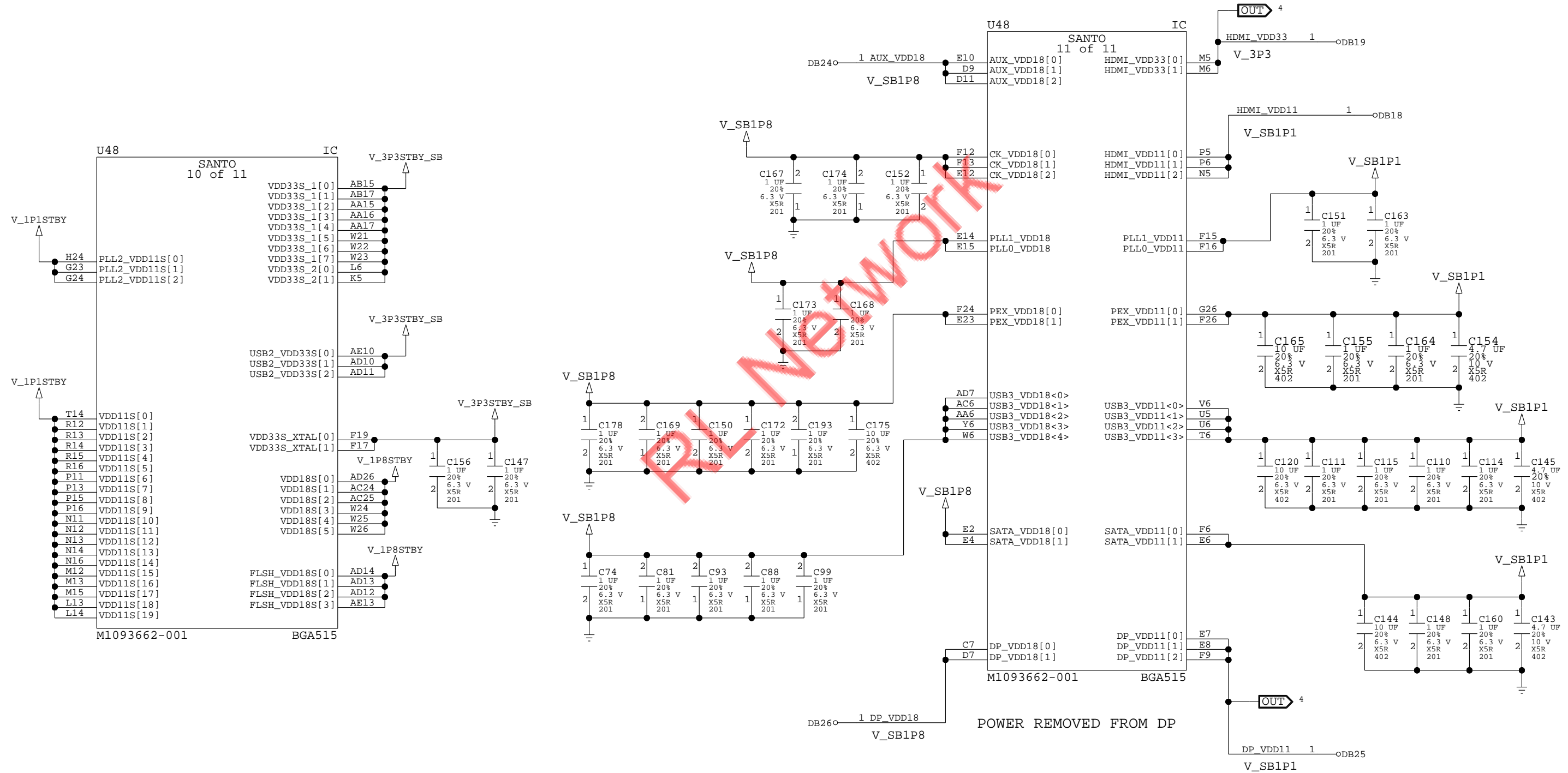
# SB: SMM UART, SPI, JTAG, GPIO



# SB: POWER

POWER REMOVED FROM AUX AND HDMI

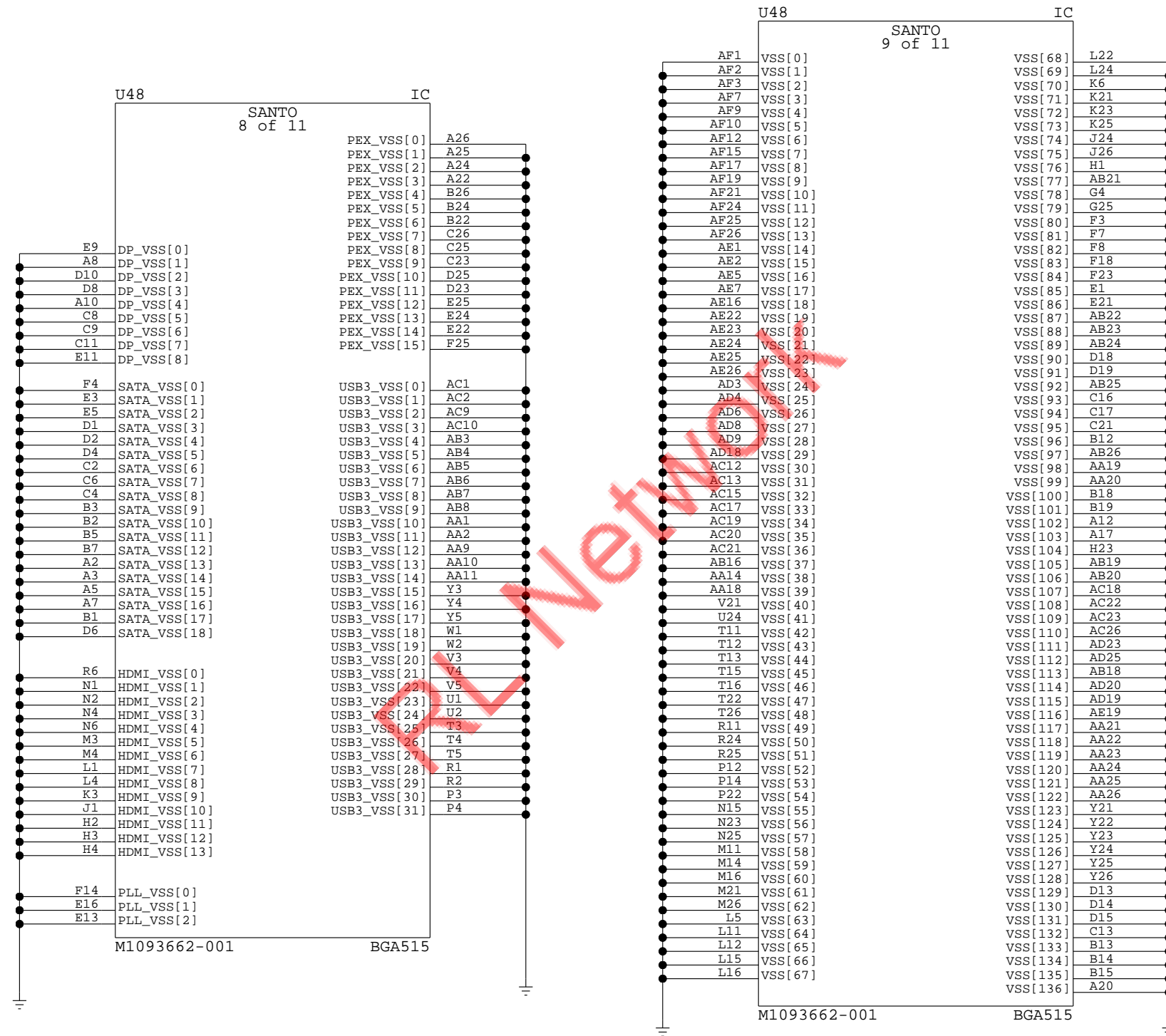
U48 IC



POWER REMOVED FROM DP

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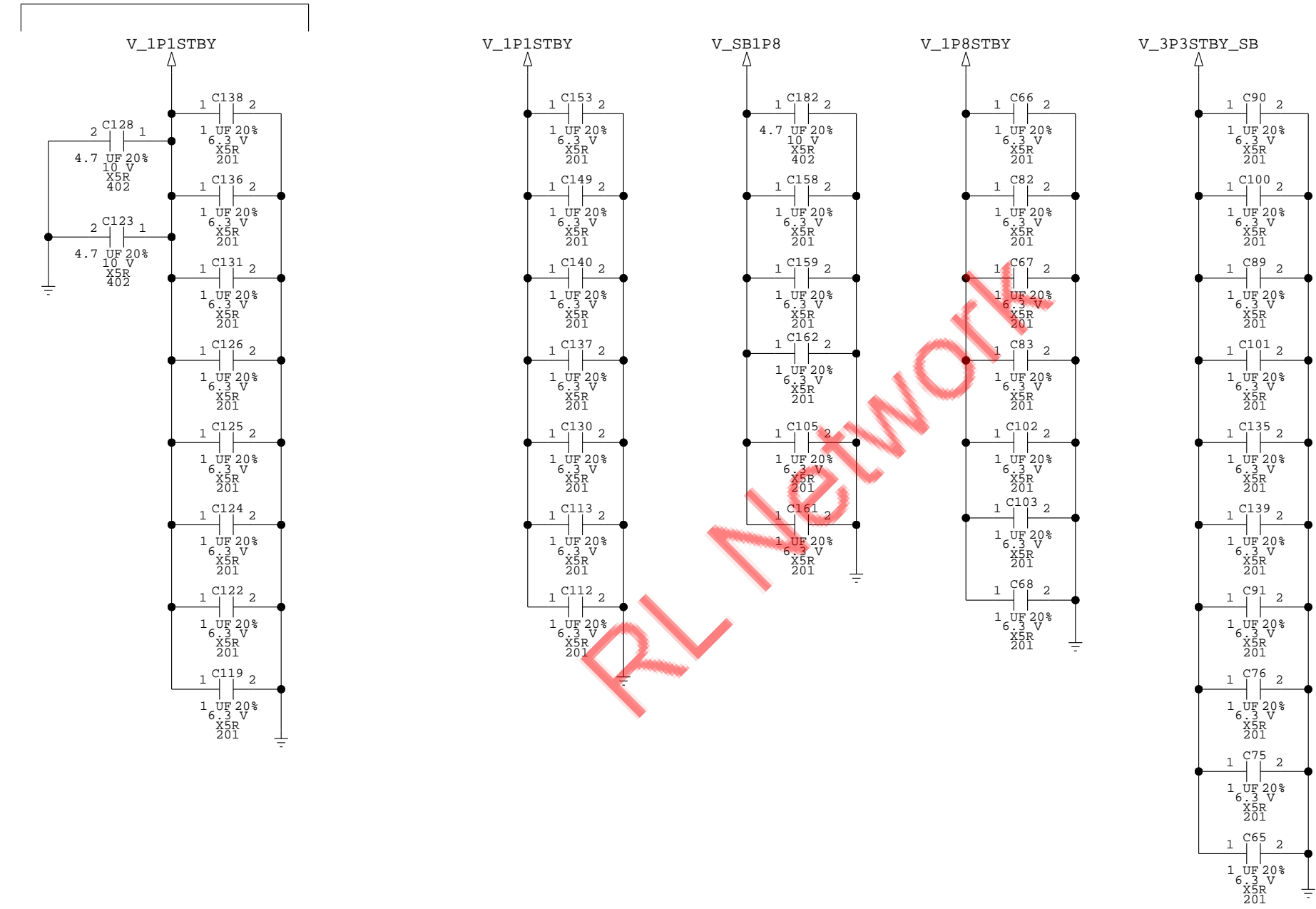
# SB: POWER VSS



NOTE: ALL V\_SB1P1 DECOUPLING IS SHOWN ON POWER PAGE 6

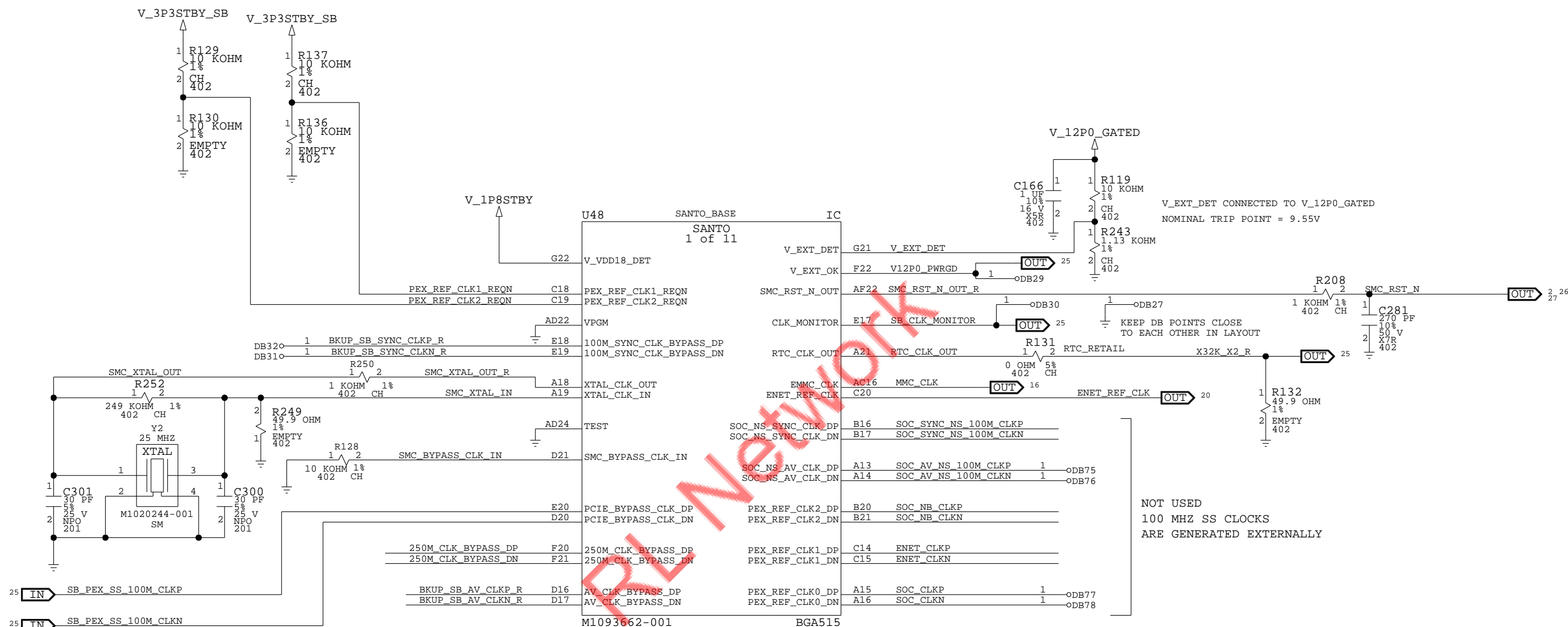
# SB: DECOUPLING

THIS GROUP OF CAPS MUST BE REMOVED TO SUPPORT SOCKET USE





# SB: CLOCKS, STRAPPING, POR



NOT USED  
100 MHZ SS CLOCKS  
ARE GENERATED EXTERNALLY

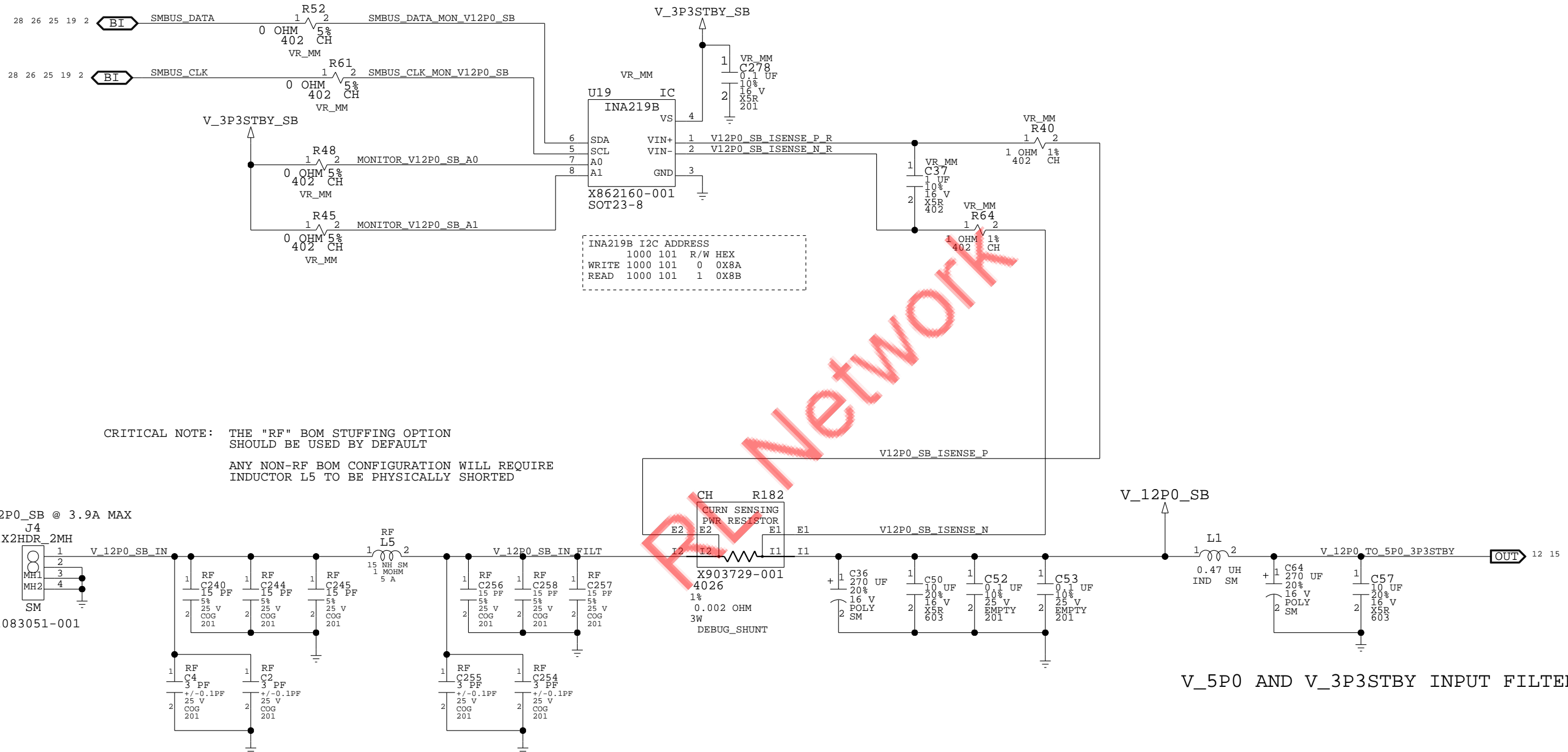
UNUSED 100 MHZ OUTPUTS  
MUST BE TURNED OFF BY SMC

NOTE: USE ALTERNATE FOOTPRINT SKT\_BGA515\_27X27X2P4\_1MM\_CO  
IN LAYOUT TO SUPPORT USE OF SOUTHBRIDGE SOCKET.

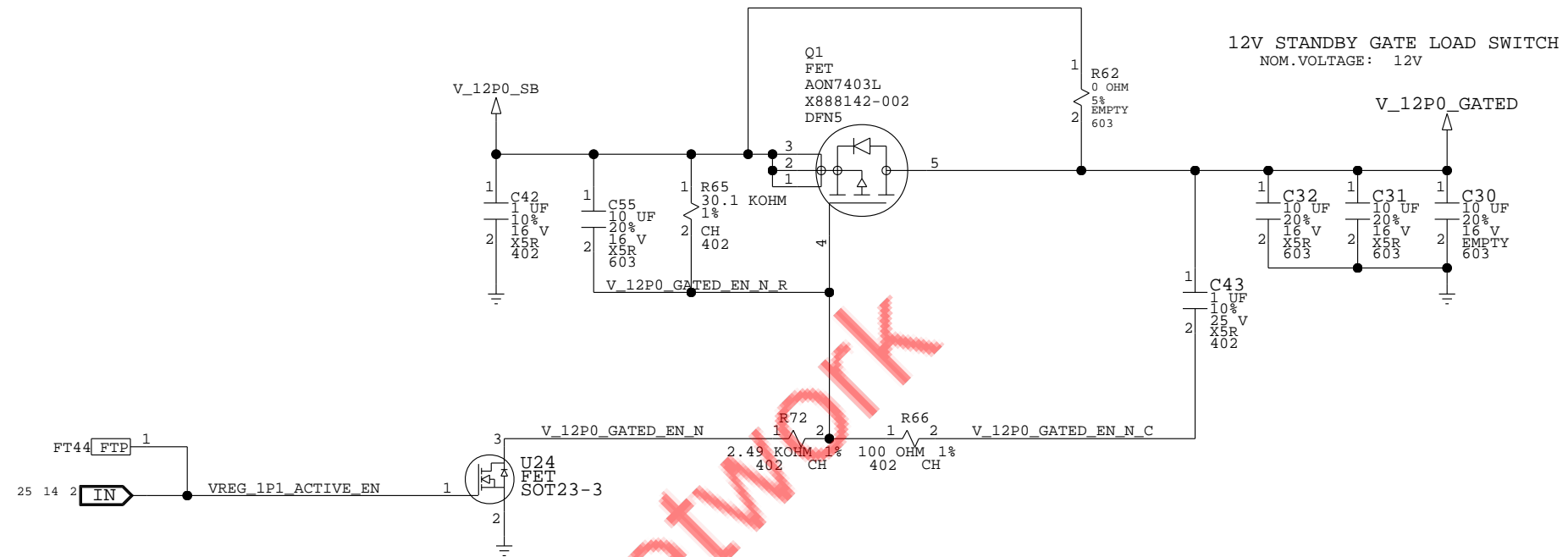
MXXXXXXX-001	MATL	REF DES	DESCR.	BOM PROPERTY
M1093668-001	IC	U48	SANTO, IC, SM, BGA-515, SB, PRODUCTION	SANTO_RETAIL
M1093662-001	IC	U48	SANTO, IC, SM, BGA-515, SB, DEV MODE, STD	SANTO_DEV
M1093668-001	EMPTY	U48	SANTO, NO STUFF	SANTO_EMPTY

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# VREG: V\_12P0\_SB INPUT & FILTER

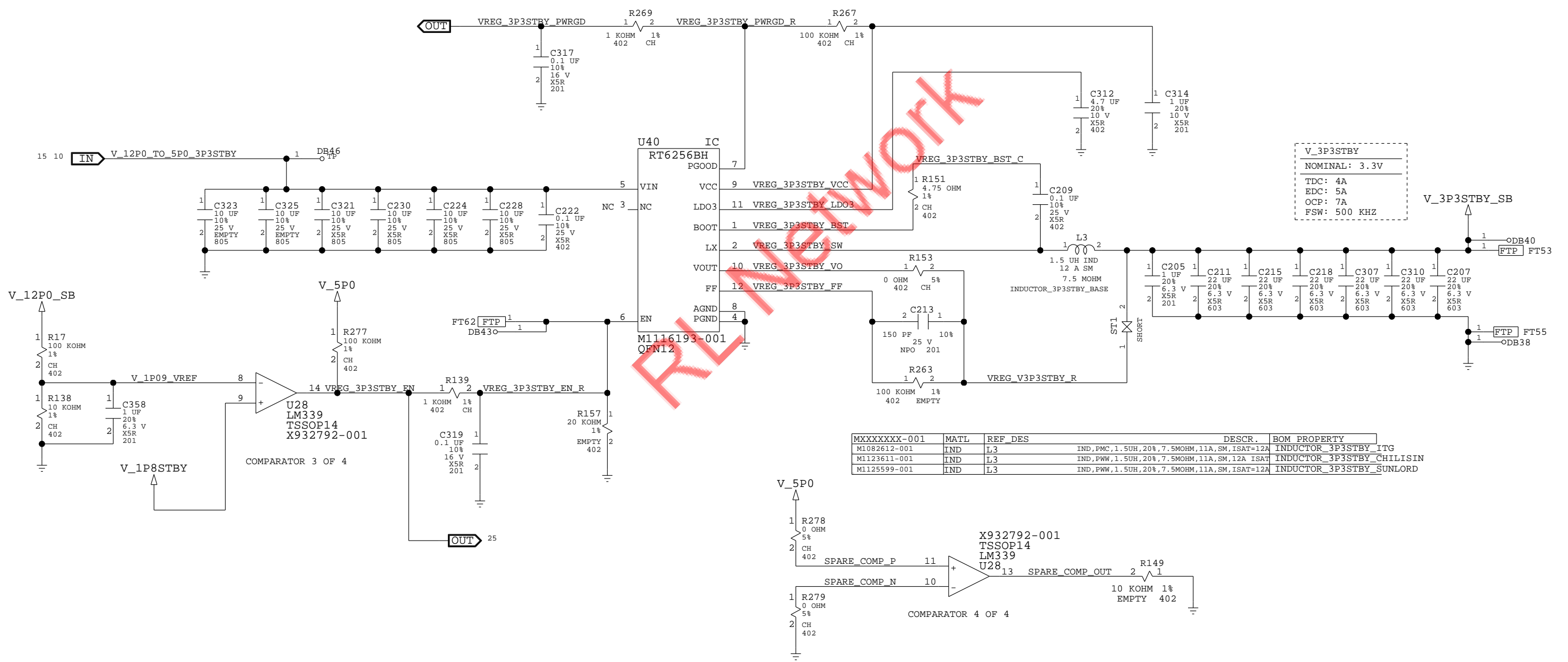


# VREG: STANDBY GATES

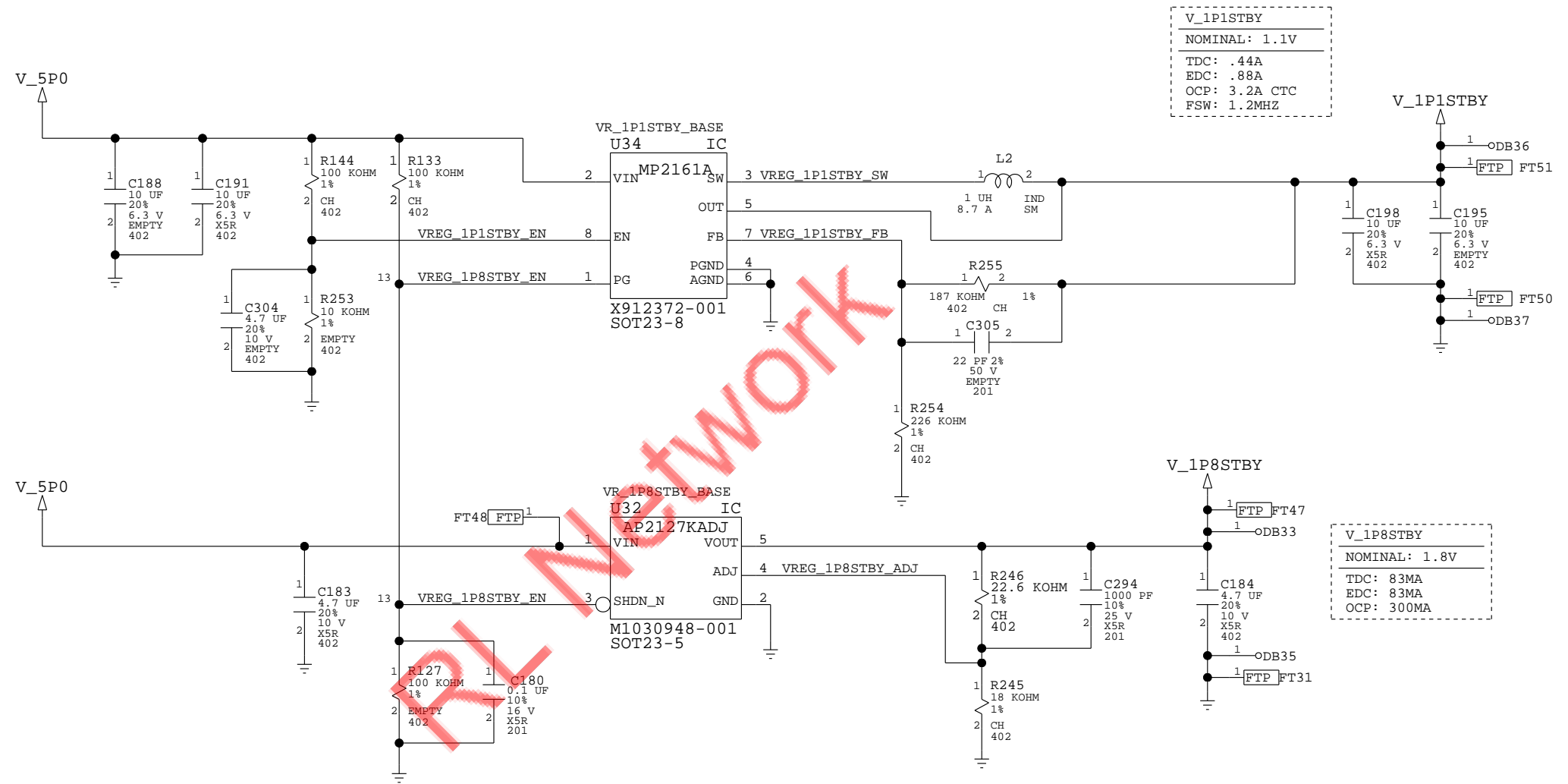


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# VREG: V\_3P3STBY\_SB



# VREG: V\_1P1STBY, V\_1P8STBY



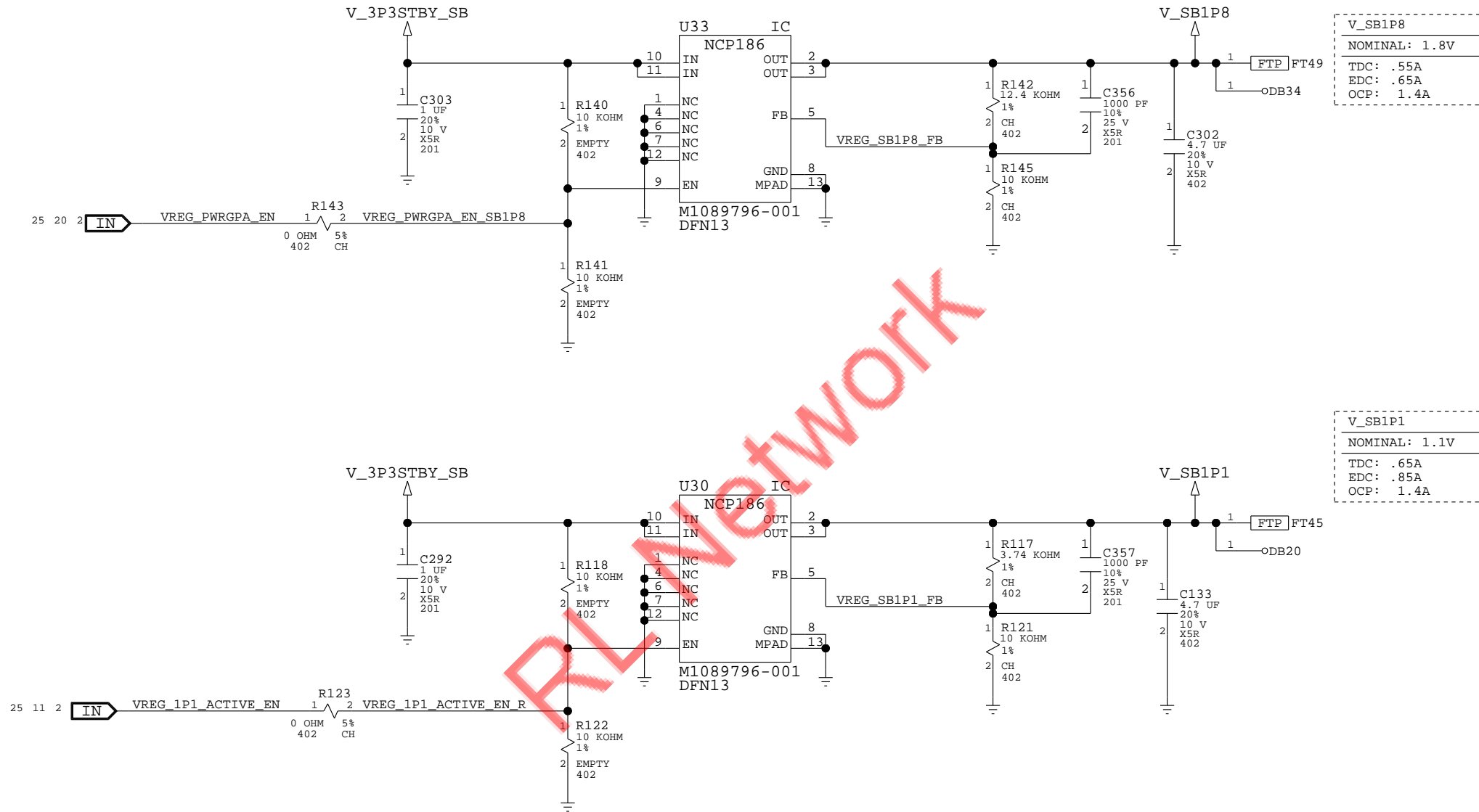
V\_1P1STBY  
 NOMINAL: 1.1V  
 TDC: .44A  
 EDC: .88A  
 OCP: 3.2A CTC  
 FSW: 1.2MHZ

V\_1P8STBY  
 NOMINAL: 1.8V  
 TDC: 83MA  
 EDC: 83MA  
 OCP: 300MA

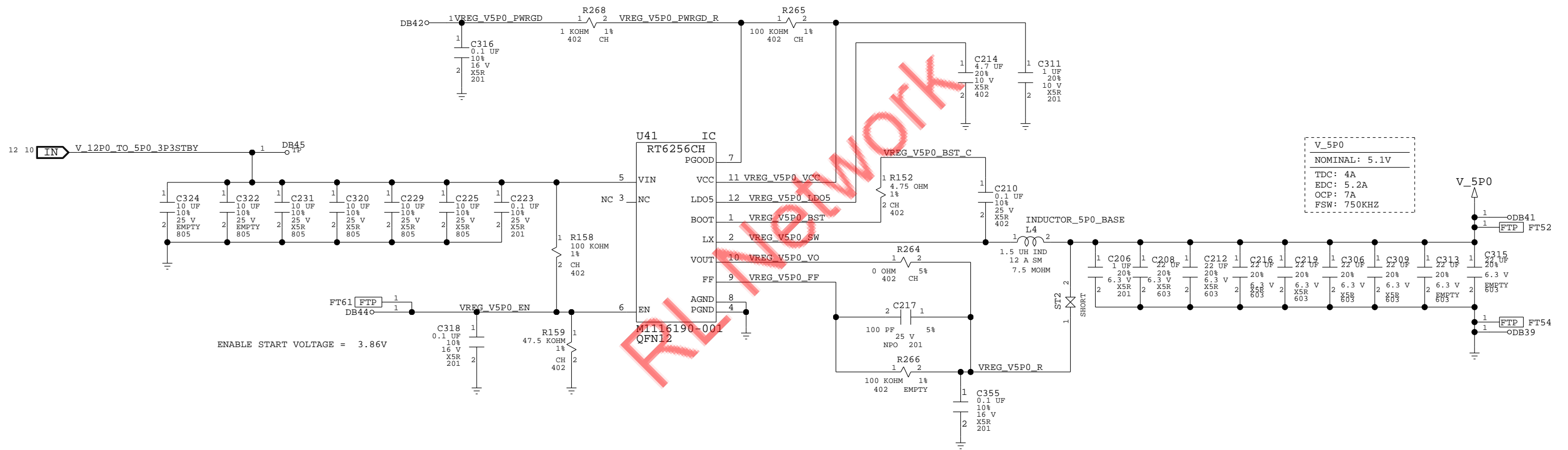
MXXXXXX-001	MATL	REF DES	DESCR.	BOM PROPERTY
X912372-001	IC	U34	IC-PWR, VREG, SM, TSOT23-8, STEP DOWN, 6V, 2A, MP2161A	VR_1P1STBY_MPS
M1018565-001	IC	U34	IC-PWR, VREG, SM, TSOT23-8, STEP DOWN, 6V, 2A, RICHTER, RT5785C QUAL	VR_1P1STBY_RICHTER

MXXXXXX-001	MATL	REF DES	DESCR.	BOM PROPERTY
M1030948-001	IC	U32	IC-PWR, LDO, 300MA, ADJ V, SM, SOT-23-5, 0.8 V	VR_1P8STBY_DIODES
M1125074-001	IC	U32	IC-PWR, LDO, SM, TSOT23-5, LDO, ADJ, 300MA, RT9078	VR_1P8STBY_RICHTER

# VREG: V\_SB1P1, V\_SB1P8



# VREG: V\_5P0

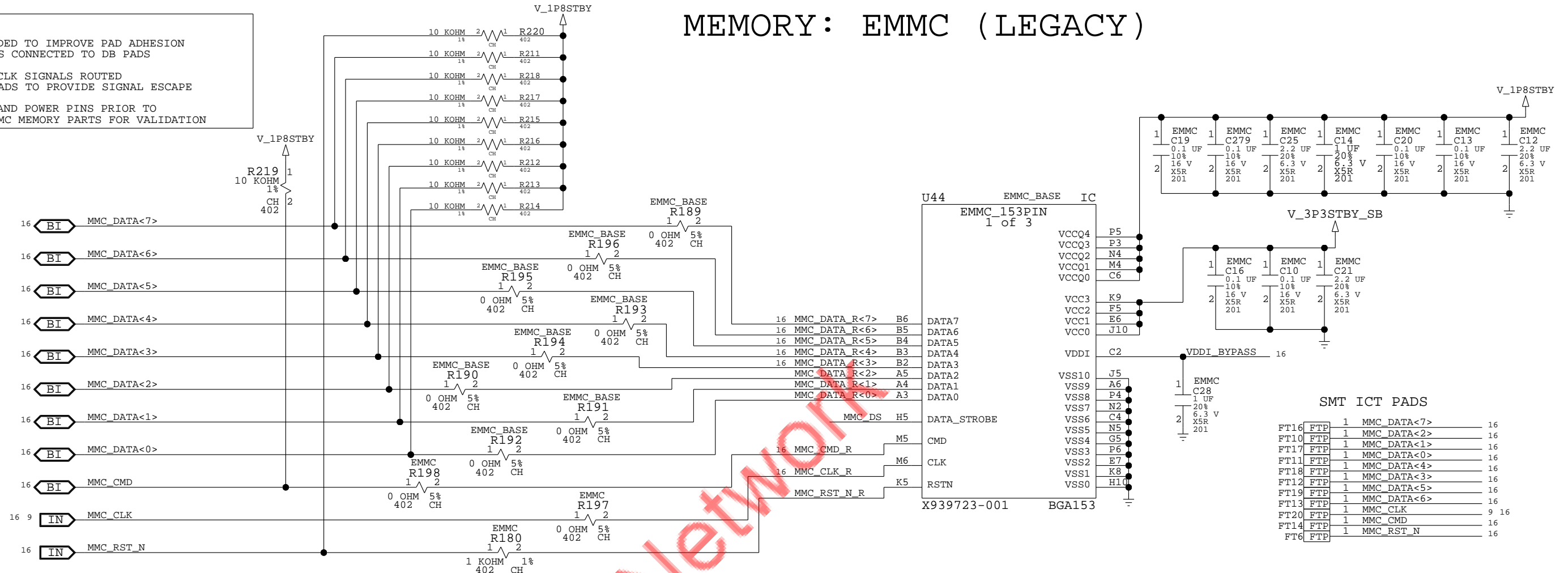


ENABLE START VOLTAGE = 3.86V

MXXXXXXXX-001	MATL	REF_DES	DESCR.	BOM PROPERTY
M1082612-001	IND	L4	IND,PMC,1.5UH,20%,7.5MOHM,11A,SM,ISAT=12A	INDUCTOR_5P0_ITG
M1123611-001	IND	L4	IND,PWW,1.5UH,20%,7.5MOHM,11A,SM,12A ISAT	INDUCTOR_5P0_CHILISIN
M1125599-001	IND	L4	IND,PWW,1.5UH,20%,7.5MOHM,11A,SM,ISAT=12A	INDUCTOR_5P0_SUNLORD

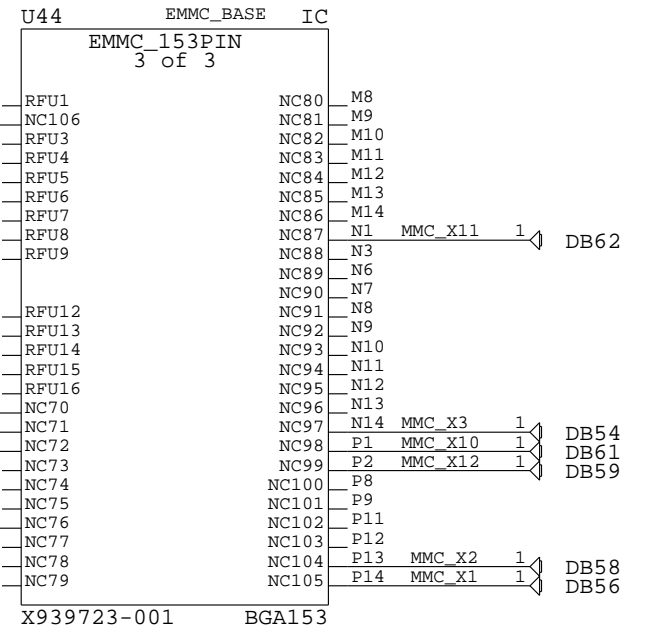
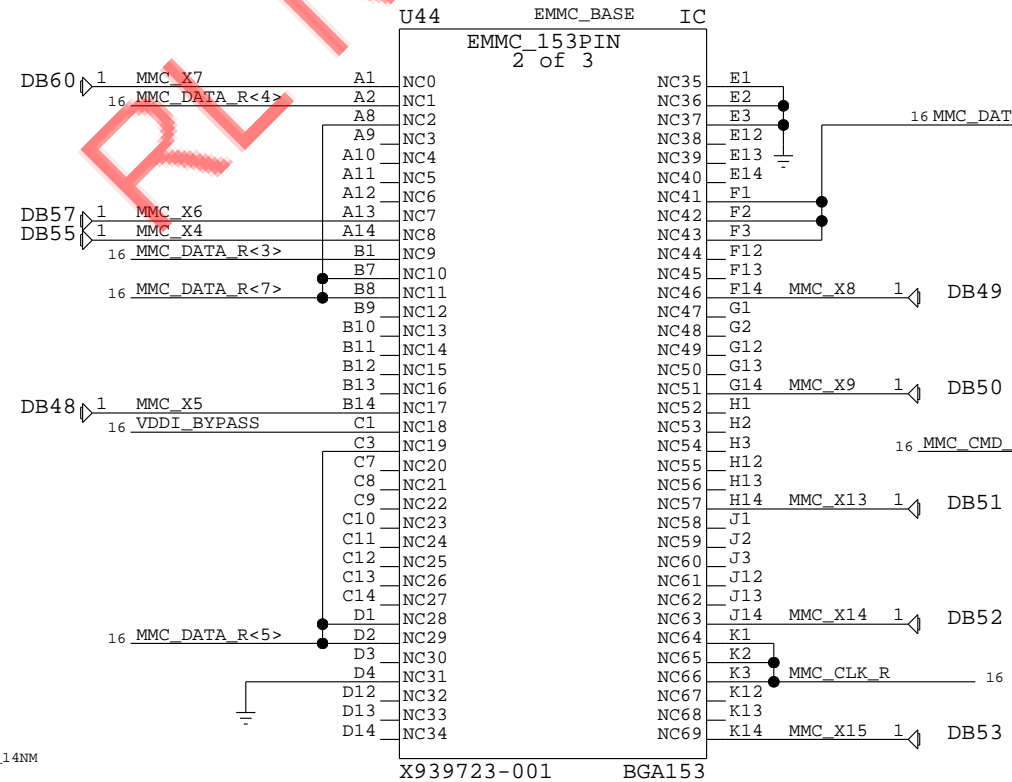
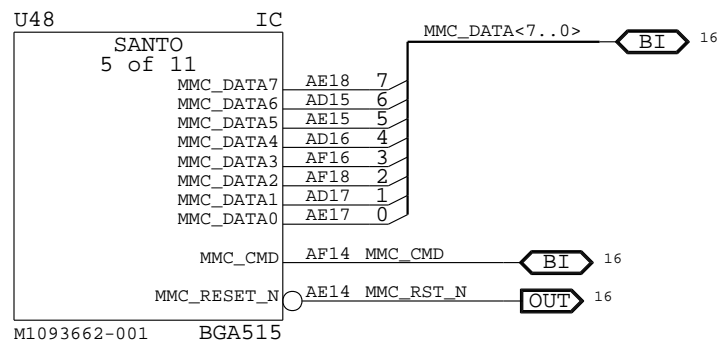
# MEMORY: EMMC (LEGACY)

- NOTES:
- MMC\_X NETS ARE NEEDED TO IMPROVE PAD ADHESION USING 13 MIL TRACES CONNECTED TO DB PADS
  - EMMC DATA, CMD AND CLK SIGNALS ROUTED THROUGH MULTIPLE PADS TO PROVIDE SIGNAL ESCAPE
  - VERIFY ALL SIGNAL AND POWER PINS PRIOR TO CONSIDERING NEW EMMC MEMORY PARTS FOR VALIDATION



SMT ICT PADS

FT16	FTP	1	MMC_DATA<7>	16
FT10	FTP	1	MMC_DATA<2>	16
FT17	FTP	1	MMC_DATA<1>	16
FT18	FTP	1	MMC_DATA<0>	16
FT11	FTP	1	MMC_DATA<4>	16
FT12	FTP	1	MMC_DATA<3>	16
FT19	FTP	1	MMC_DATA<5>	16
FT13	FTP	1	MMC_DATA<6>	16
FT20	FTP	1	MMC_CLK	9 16
FT14	FTP	1	MMC_CMD	16
FT6	FTP	1	MMC_RST_N	16

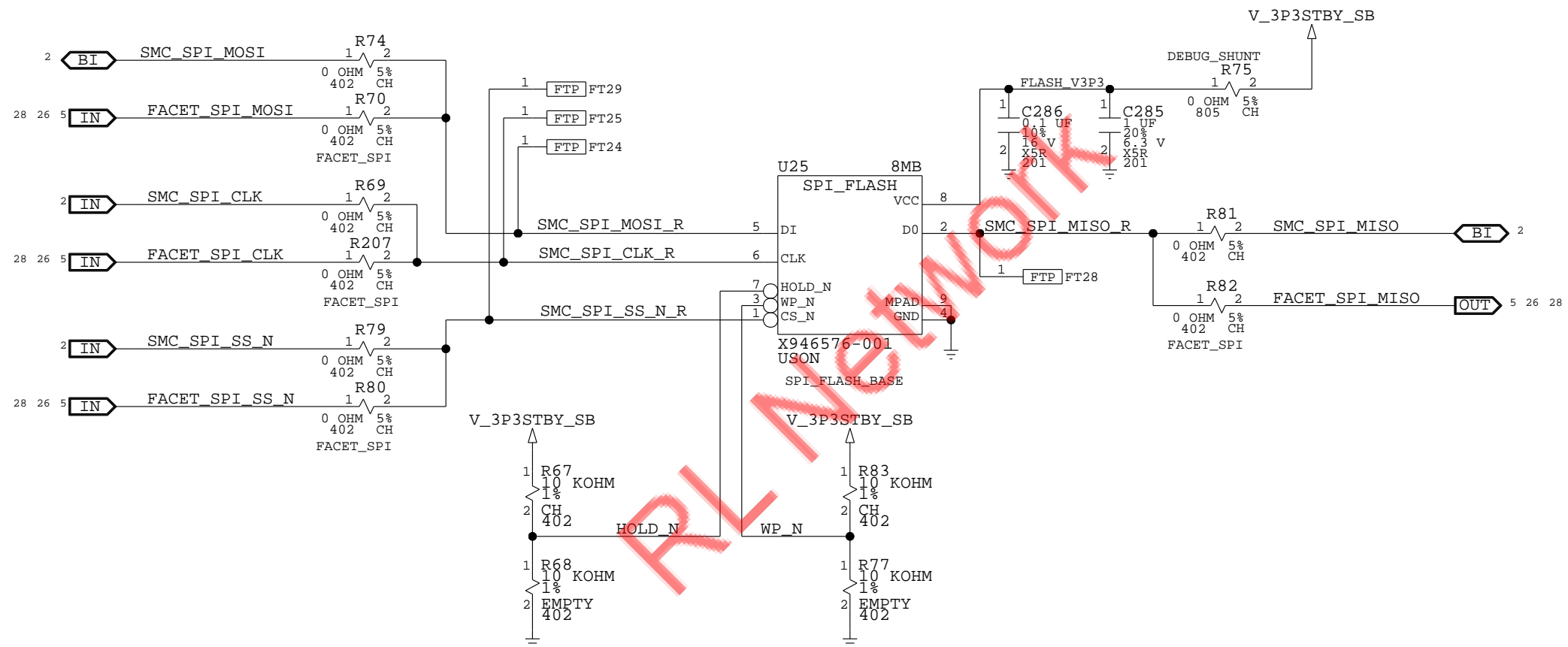


MXXXXXX-001	MATL	REF DES	DESCR.	BOM PROPERTY
X934261-001	IC	U44	MEM, 8GB, EMMC, FLASH, 15NM, BGA153, TOSHIBA	EMMC_TOSHIBA_15NM
X945540-002	IC	U44	MEM, 8GB, EMMC, FLASH, 14NM, BGA153, SAMSUNG	EMMC_SAMSUNG_14NM
X939723-001	IC	U44	MEM, 8GB, EMMC, FLASH, 16NM, BGA153, HYNIX	EMMC_HYNIX_16NM
X800617-001	RES	R189, R190, R191, R192, R193, R194, R195, R196	49.9 OHM 1%, 1/16W, 0402	EMMC_TOSHIBA_15NM, EMMC_SAMSUNG_14NM
X809936-001	RES	R189, R190, R191, R192, R193, R194, R195, R196	100 OHM 1%, 1/16W, 0402	EMMC_HYNIX_16NM



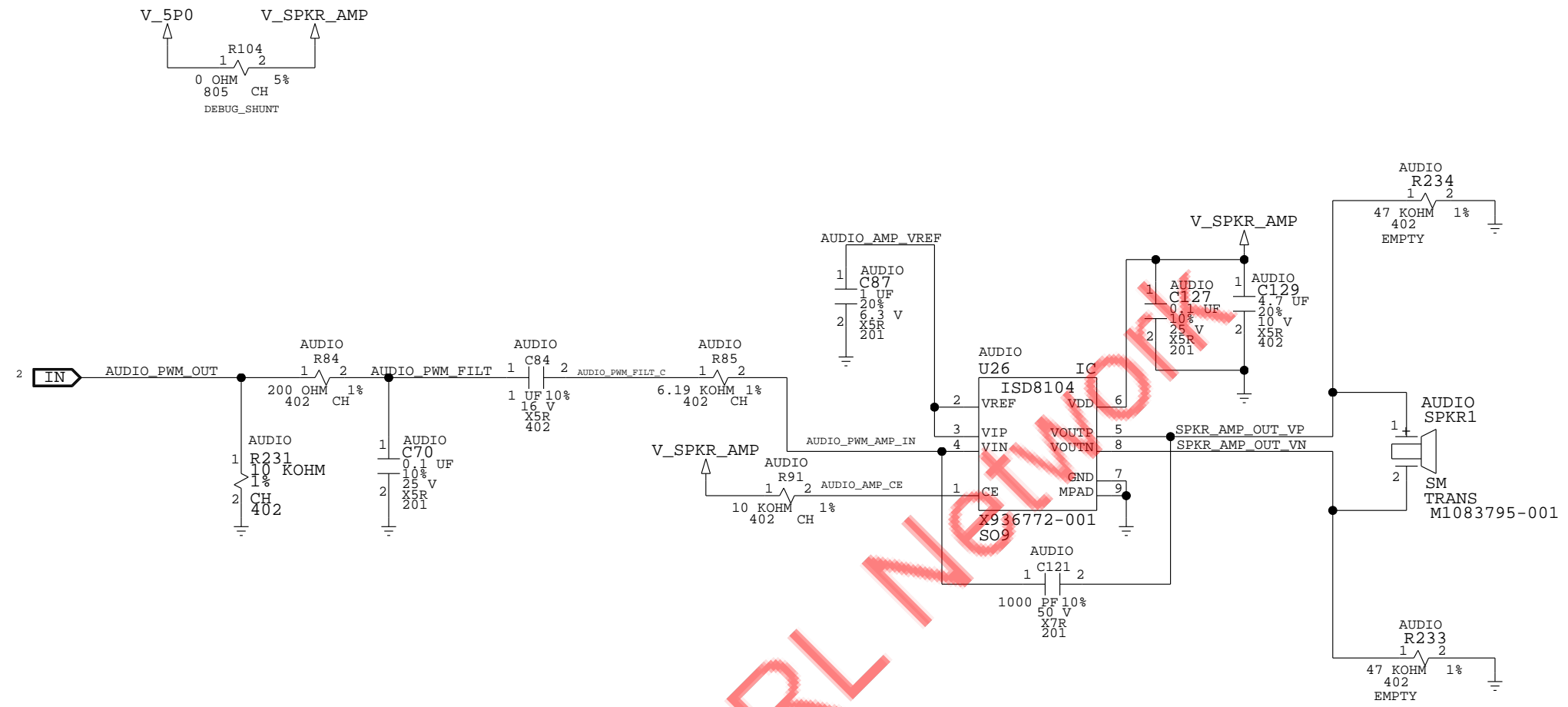
# MEMORY: SPI FLASH

NOTE: SPI FLASH IS CONNECTED TO BOTH SMC AND FACET MASTERS

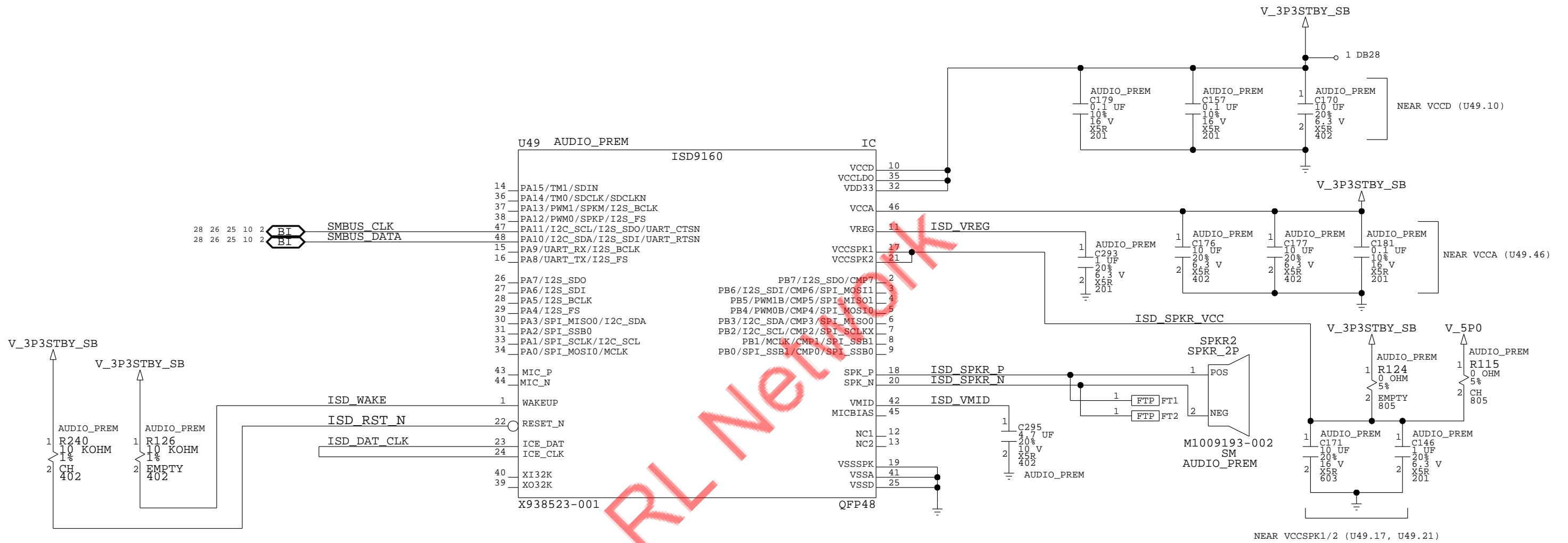


MXXXXXXXX-001	MATL	REF	DES	DESCR.	BOM PROPERTY
X946576-001	IC	U25		WINBOND, SPI_FLASH, 8GBIT, USON	SPI_FLASH_WINBOND
M1090771-001	IC	U25		MACRONIX, SPI_FLASH, 8GBIT, USON	SPI_FLASH_MACRONIX

# AUDIO: BASIC



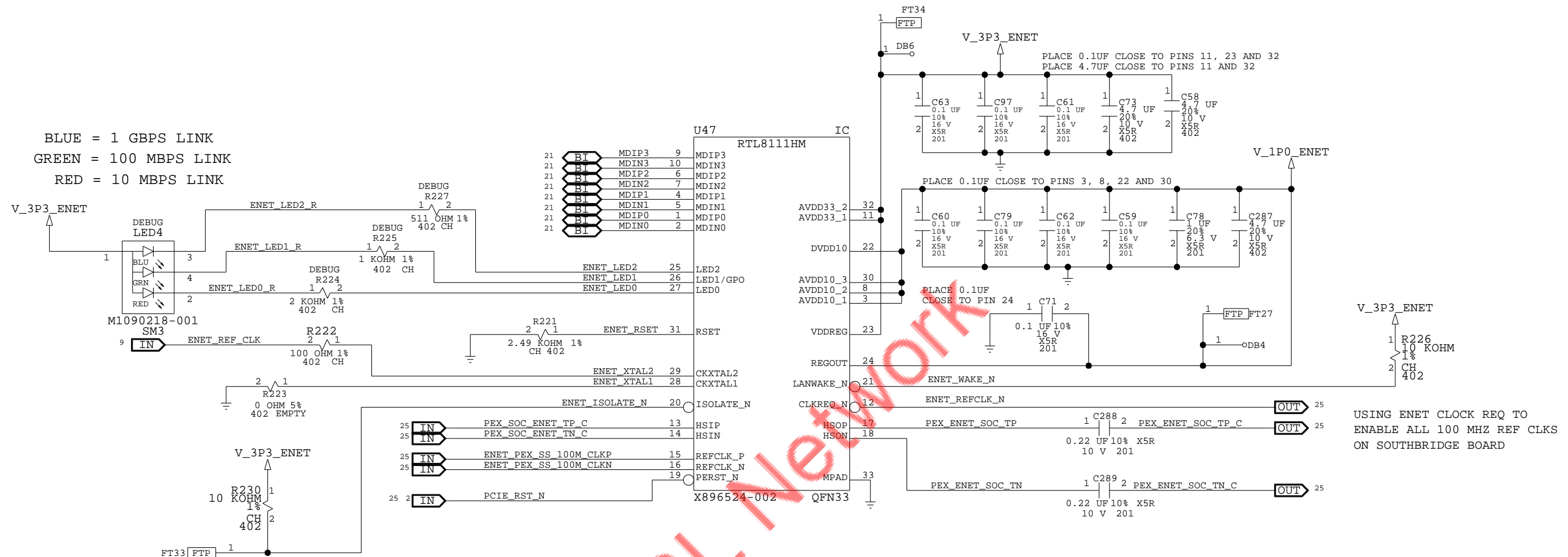
# AUDIO: PREMIUM (SE/LE)



ISD9160FIMS05 - REMOVED CAP TOUCH FUNCTIONALITY

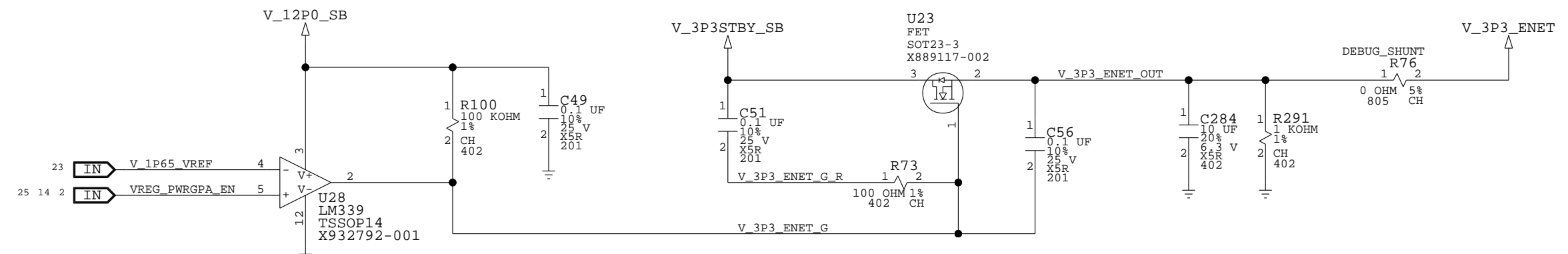
# ETHERNET NIC

BLUE = 1 GBPS LINK  
 GREEN = 100 MBPS LINK  
 RED = 10 MBPS LINK



USING ENET CLOCK REQ TO  
 ENABLE ALL 100 MHZ REF CLKS  
 ON SOUTHBRIDGE BOARD

NOM. VOLTAGE: 3.3V  
 MAX POWER: 590MW



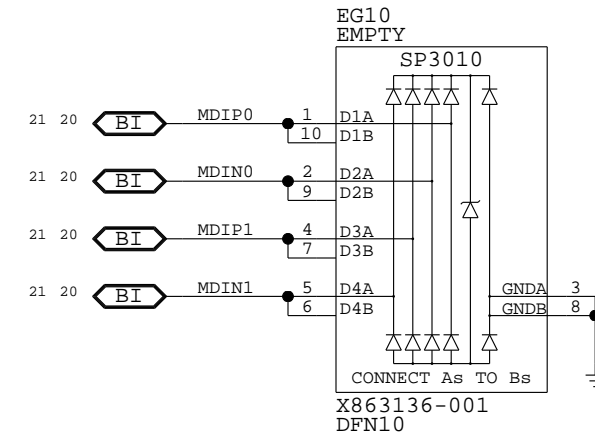
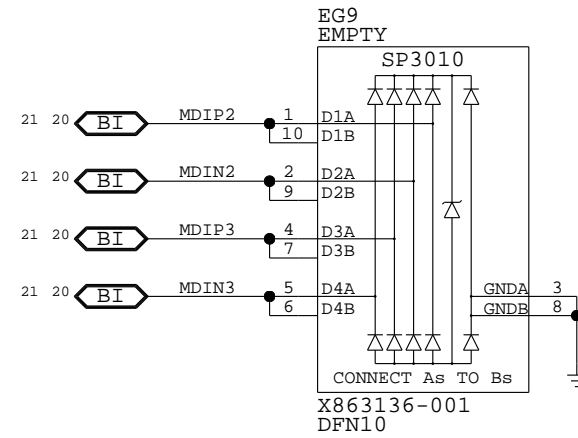
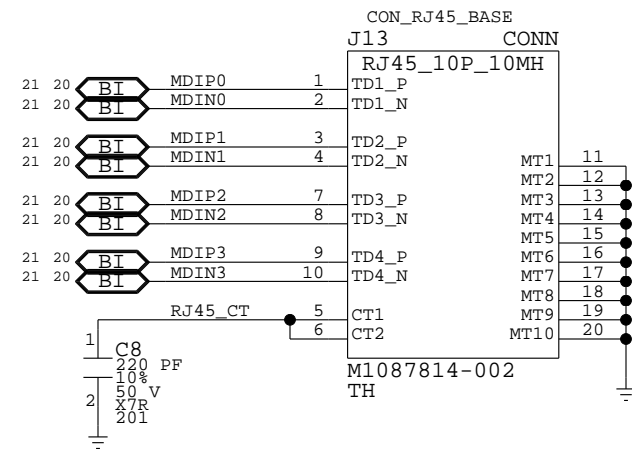
COMPARATOR 1 OF 4:  
 V\_3P3\_ENET GATE DRIVE

ETHERNET POWER ENABLE CIRCUIT MUST  
 MEET THE FOLLOWING TIMING REQUIREMENTS  
 RISE TIME: > 0.5 MS AND < 100 MS  
 POWER OFF/ON CYCLE TIME: > 50 MS

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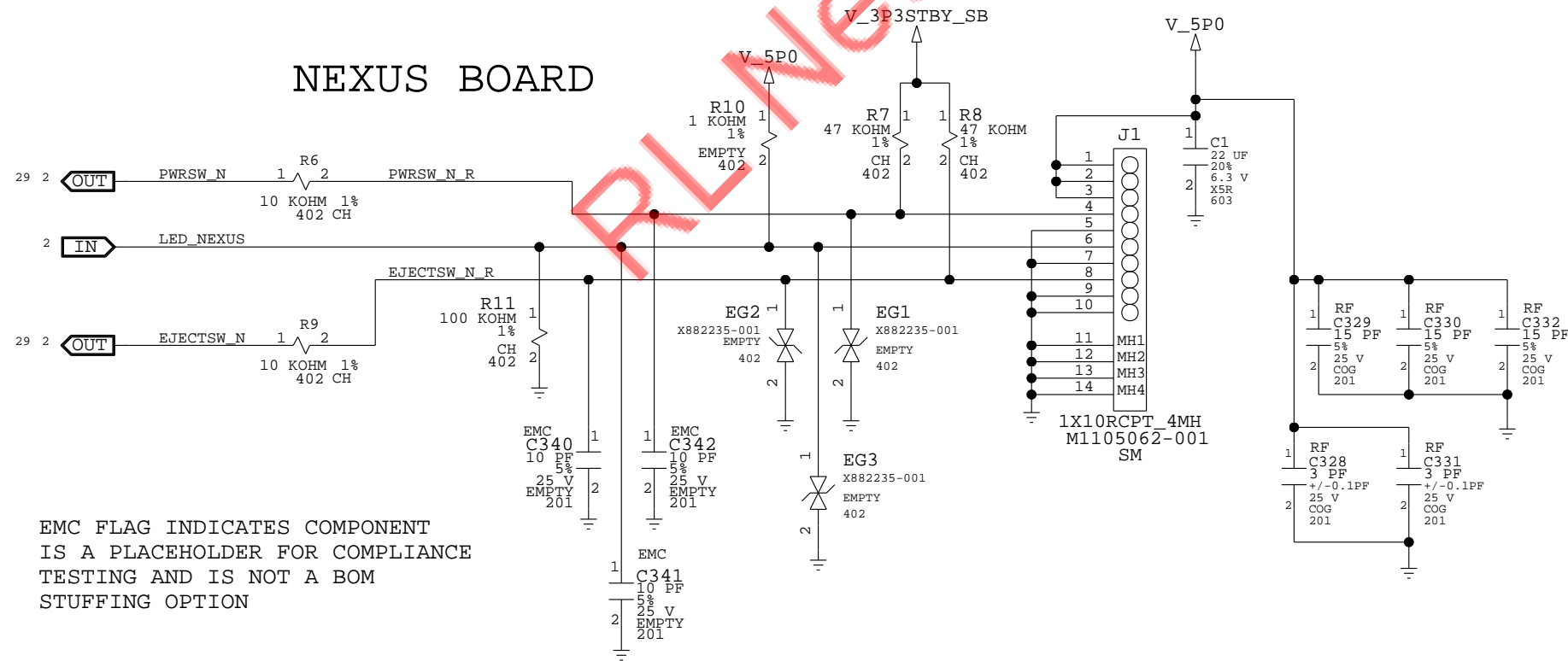
# CONN: RJ45, NEXUS BOARD

## ETHERNET RJ45



MXXXXXX-001	MATL	REF DES	DESCR.	BOM PROPERTY
M1087814-002	CONN	J13	FOXCONN RJ45 CONNECTOR	CON_RJ45_FOXC
MXXXXXX-001	CONN	J13	AMPHENOL QUAL RJ45 CONNECTOR	CON_RJ45_AMP

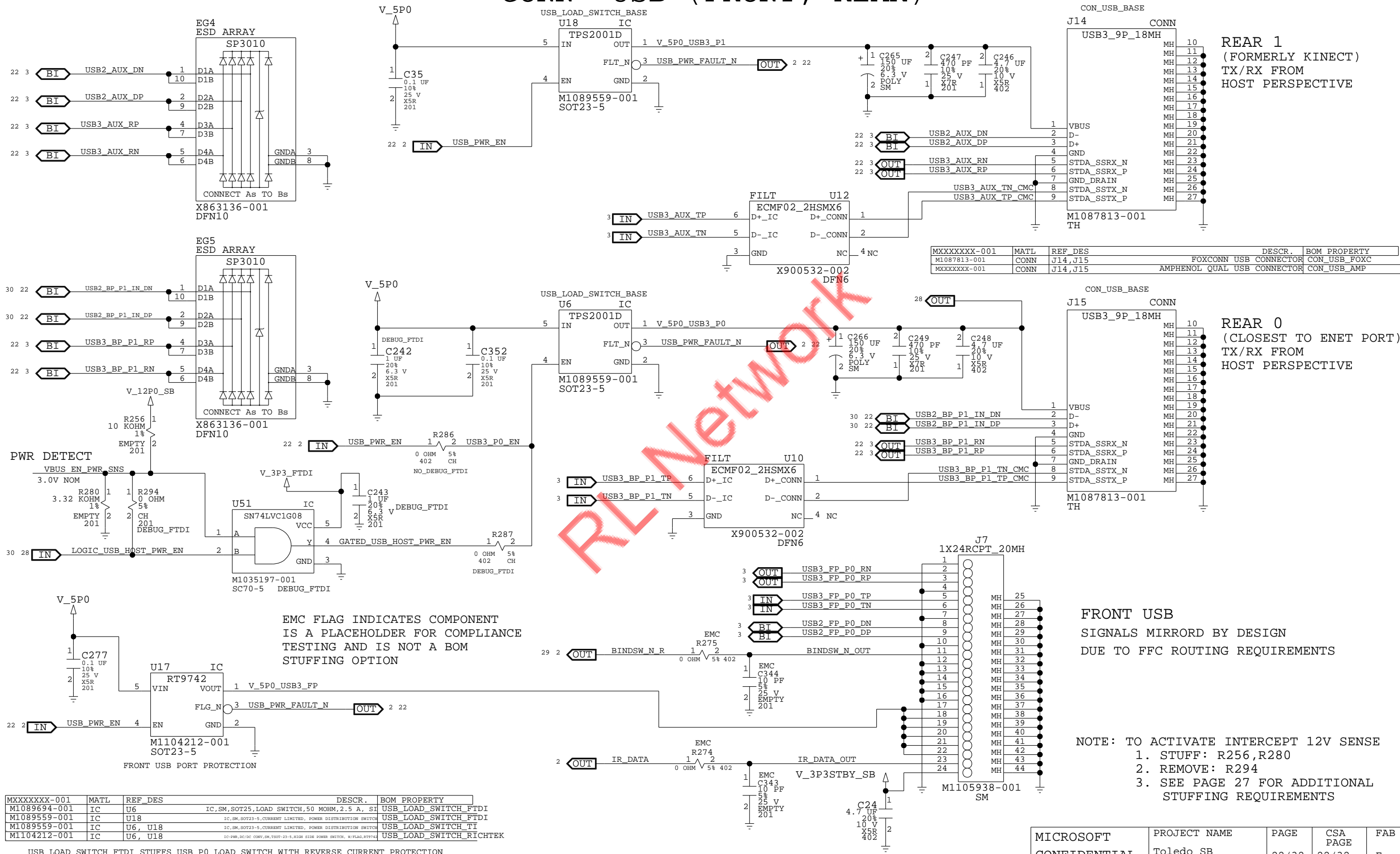
## NEXUS BOARD



EMC FLAG INDICATES COMPONENT IS A PLACEHOLDER FOR COMPLIANCE TESTING AND IS NOT A BOM STUFFING OPTION

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# CONN: USB (FRONT, REAR)



REAR 1  
(FORMERLY KINECT)  
TX/RX FROM  
HOST PERSPECTIVE

REAR 0  
(CLOSEST TO ENET PORT)  
TX/RX FROM  
HOST PERSPECTIVE

FRONT USB  
SIGNALS MIRROR D BY DESIGN  
DUE TO FFC ROUTING REQUIREMENTS

NOTE: TO ACTIVATE INTERCEPT 12V SENSE  
1. STUFF: R256,R280  
2. REMOVE: R294  
3. SEE PAGE 27 FOR ADDITIONAL  
STUFFING REQUIREMENTS

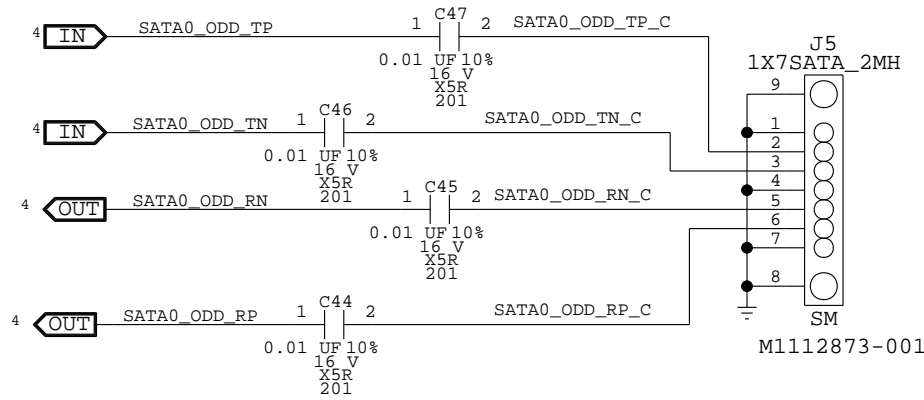
MXXXXXXXX-001	MATL	REF_DES	DESCR.	BOM PROPERTY
M1089694-001	IC	U6	IC,SM,SOT25,LOAD SWITCH,50 MOHM,2.5 A, SI	USB_LOAD_SWITCH_FTDCI
M1089559-001	IC	U18	IC,SM,SOT23-5,CURRENT LIMITED, POWER DISTRIBUTION SWITCH	USB_LOAD_SWITCH_FTDCI
M1089559-001	IC	U6, U18	IC,SM,SOT23-5,CURRENT LIMITED, POWER DISTRIBUTION SWITCH	USB_LOAD_SWITCH_TTI
M1104212-001	IC	U6, U18	IC-PWR,DC/DC CONV,SM,T207-23-5,HIGH SIDE POWER SWITCH, W/FLAG,RT9742	USB_LOAD_SWITCH_RICHTXK

USB\_LOAD\_SWITCH\_FTDCI STUFFS USB P0 LOAD SWITCH WITH REVERSE CURRENT PROTECTION

MXXXXXXXX-001	MATL	REF_DES	DESCR.	BOM PROPERTY
M1087813-001	CONN	J14, J15	FOXCONN USB CONNECTOR	CON_USB_FOXC
MXXXXXXXX-001	CONN	J14, J15	AMPHENOL QUAL USB CONNECTOR	CON_USB_AMP

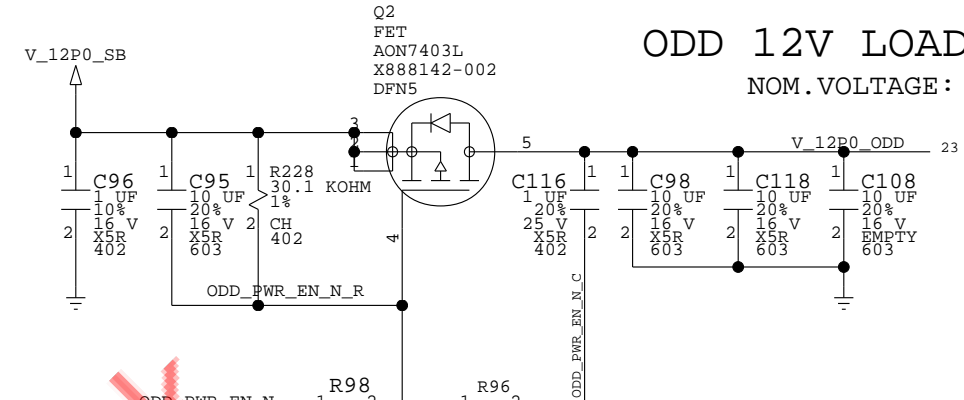
# CONN: ODD SATA & PWR

## ODD SATA



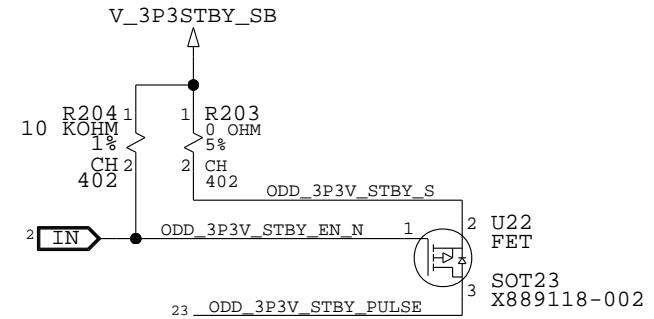
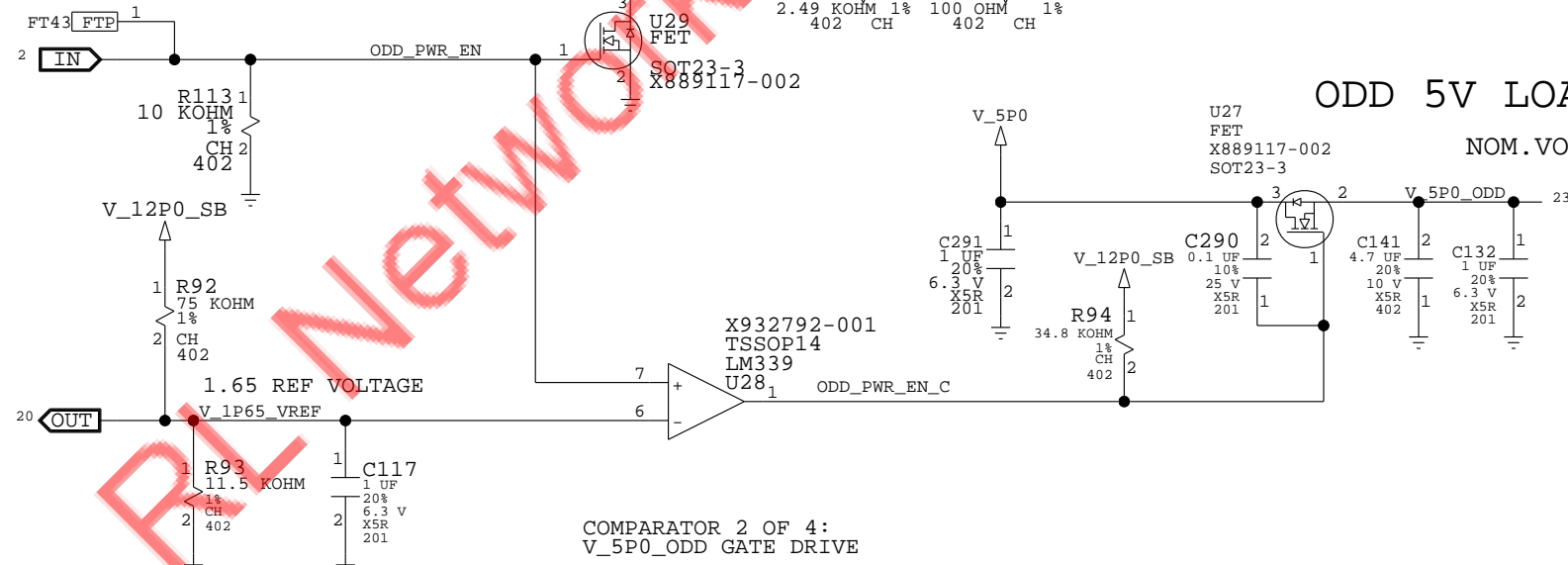
## ODD 12V LOAD SWITCH

NOM. VOLTAGE: 12V



## ODD 5V LOAD SWITCH

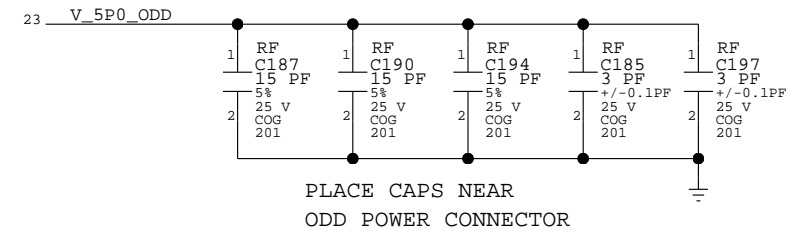
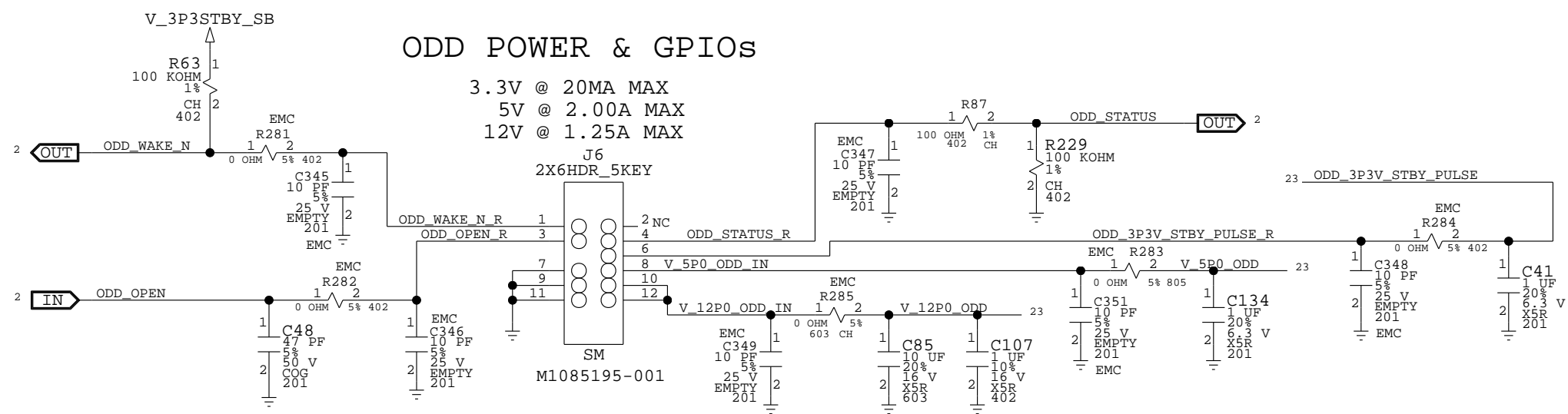
NOM. VOLTAGE: 5.0V



EMC FLAG INDICATES COMPONENT IS A PLACEHOLDER FOR COMPLIANCE TESTING AND IS NOT A BOM STUFFING OPTION

## ODD POWER & GPIOs

3.3V @ 20MA MAX  
5V @ 2.00A MAX  
12V @ 1.25A MAX

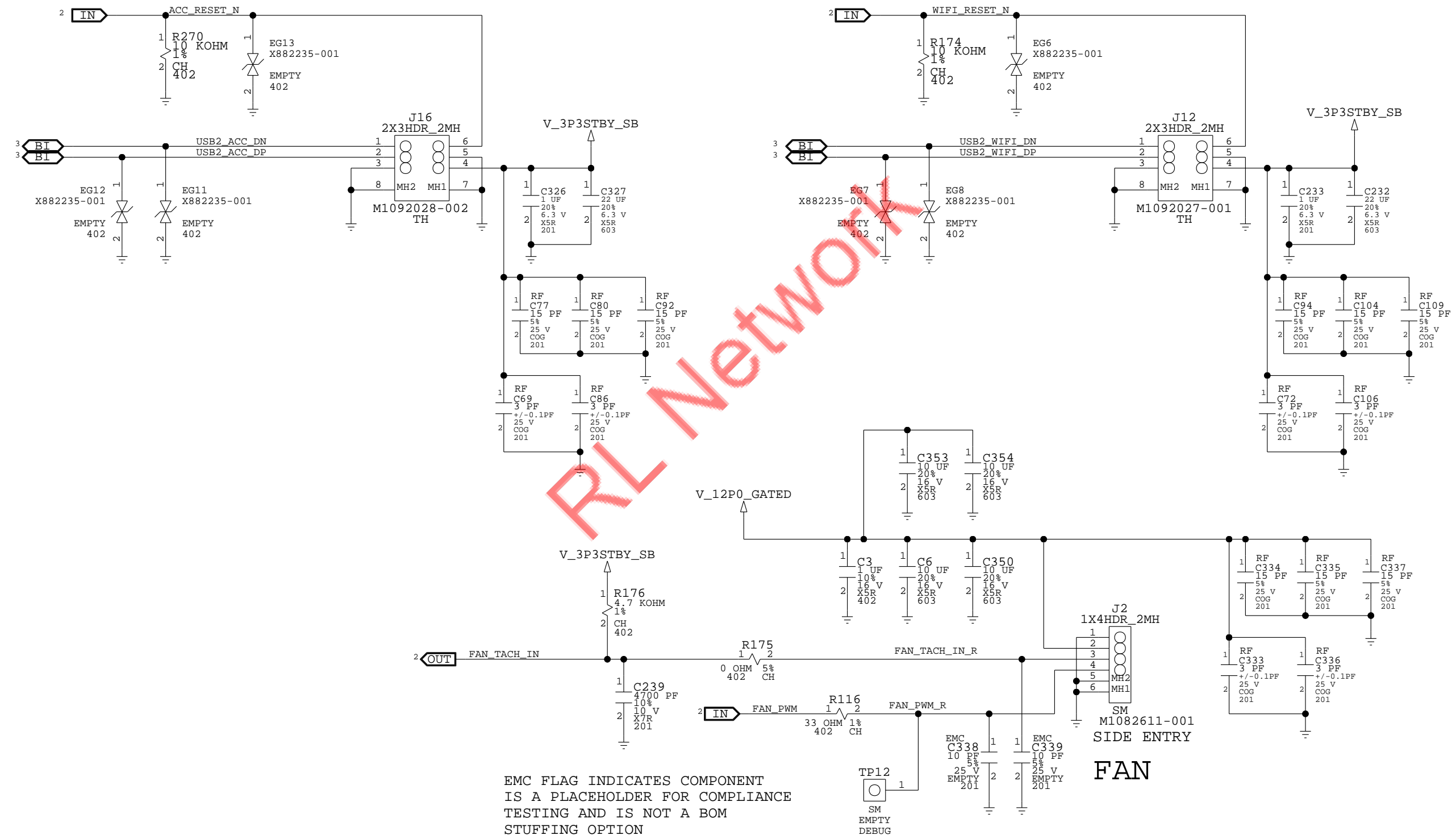


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# CONN: FAN, ACCY & NTKW RADIOS

## ACCY RADIO

## NETWORK RADIO



EMC FLAG INDICATES COMPONENT IS A PLACEHOLDER FOR COMPLIANCE TESTING AND IS NOT A BOM STUFFING OPTION

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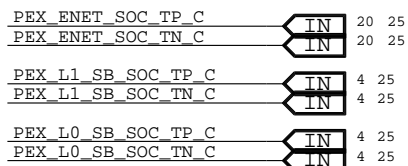


NOTE: EMPTY RESISTORS ARE POPULATED ON SOC BOARD

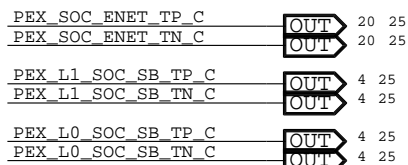
# CONN: B2B SB/SOC

25MHZ CLOCK TO SOC

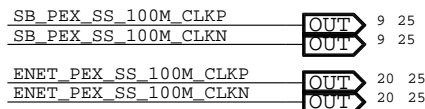
## PCIE SOC RX



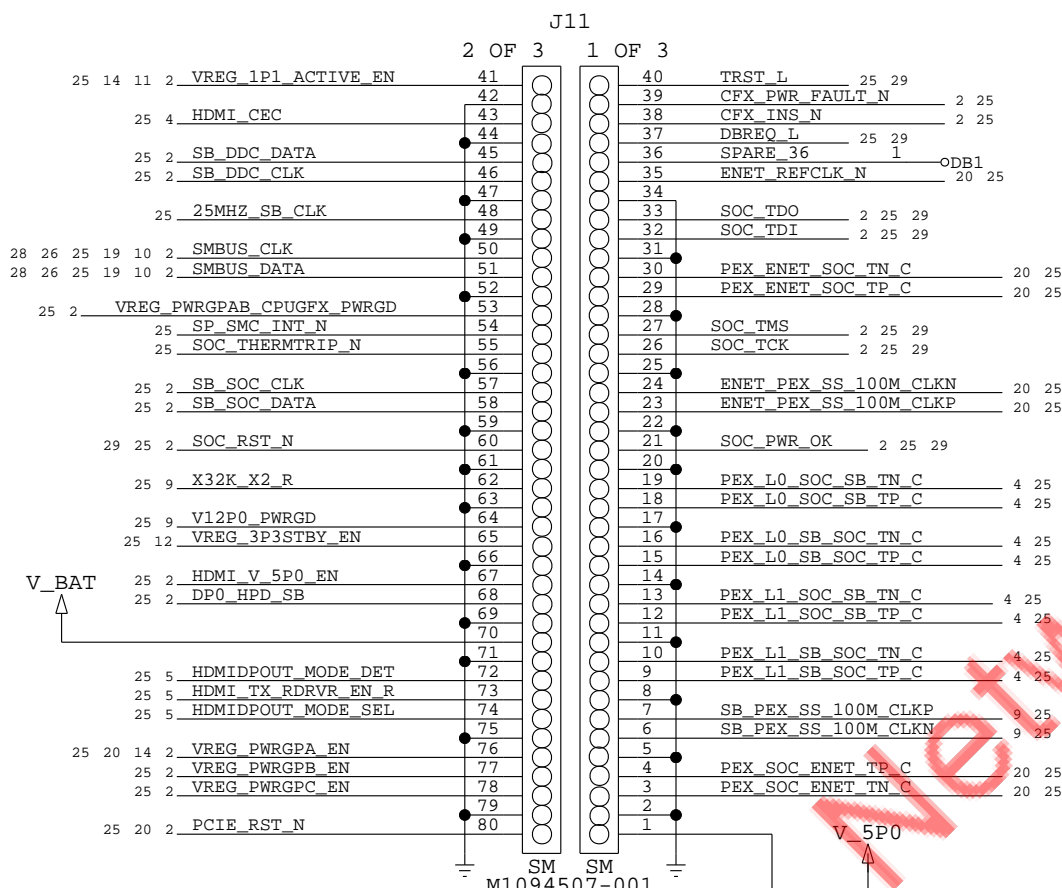
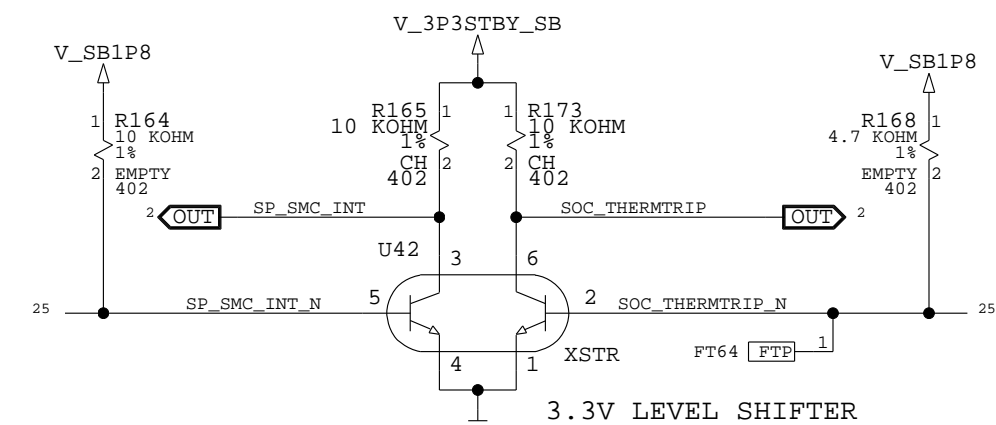
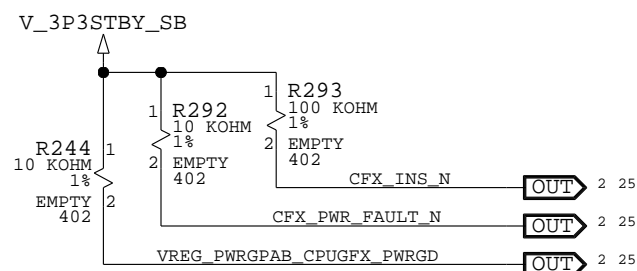
## PCIE SOC TX



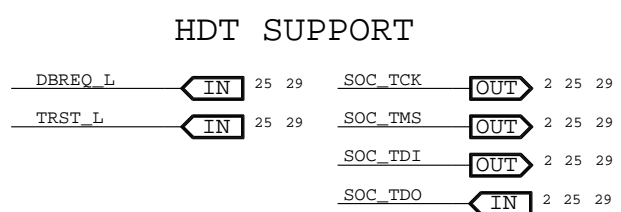
## 100 MHZ REF CLOCKS FROM SOC



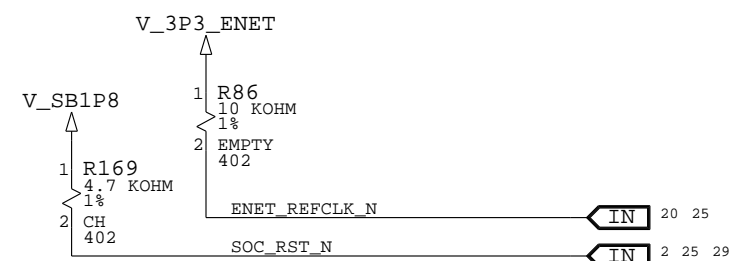
## SB SIGNALS FROM SOC



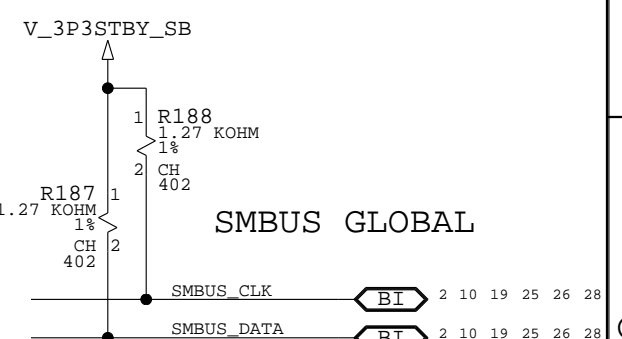
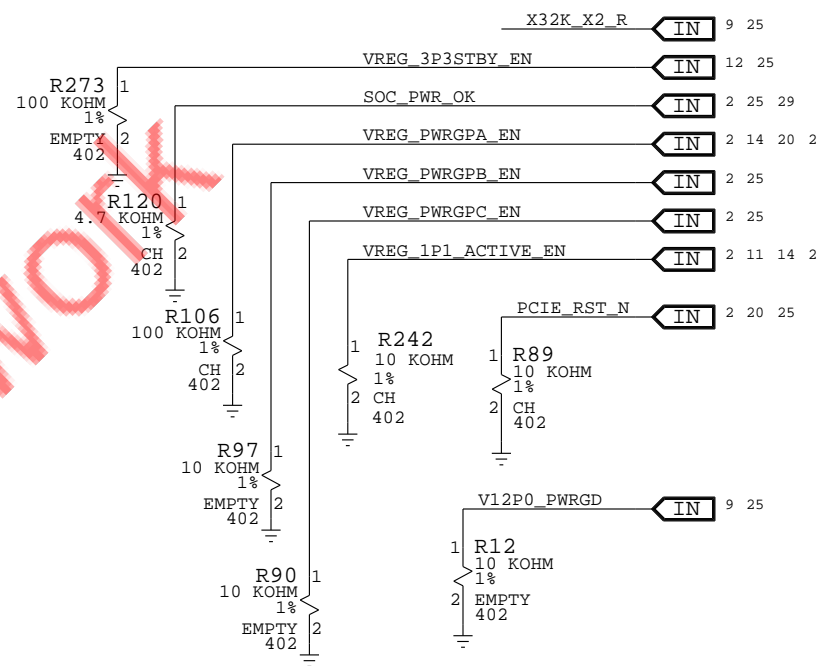
V\_5P0 @ 55MA MAX  
V\_BAT @ 1MA MAX



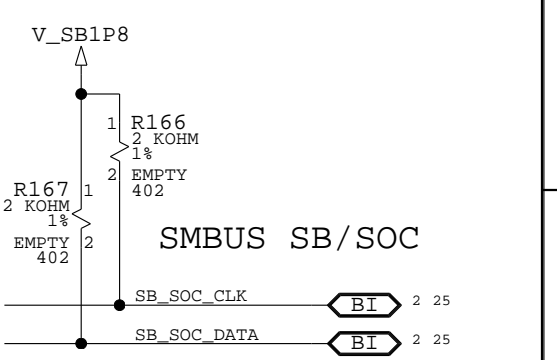
SEE P30 FOR SIGNAL DETAILS



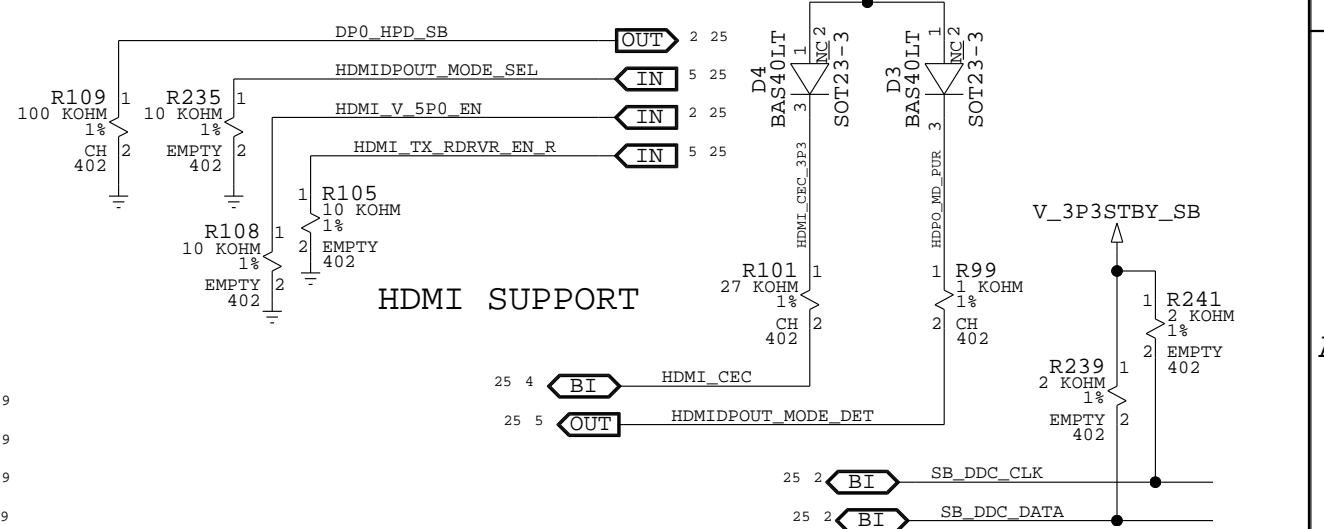
## SB SIGNALS TO SOC



## SMBUS GLOBAL

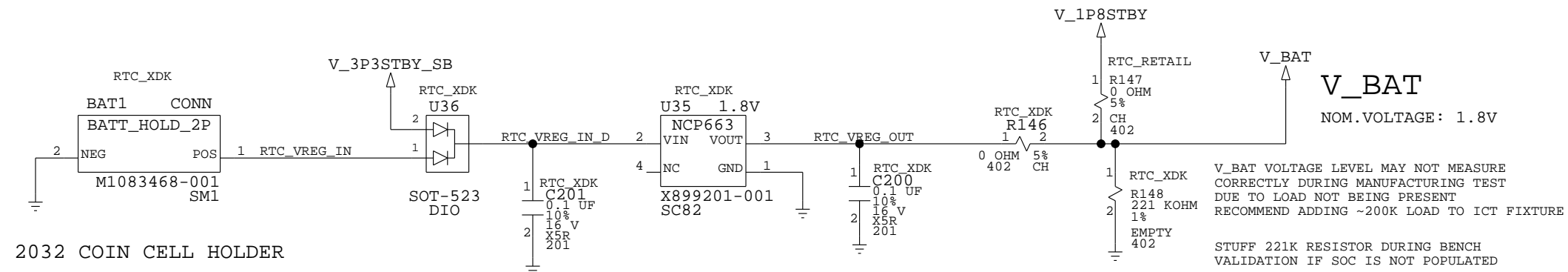
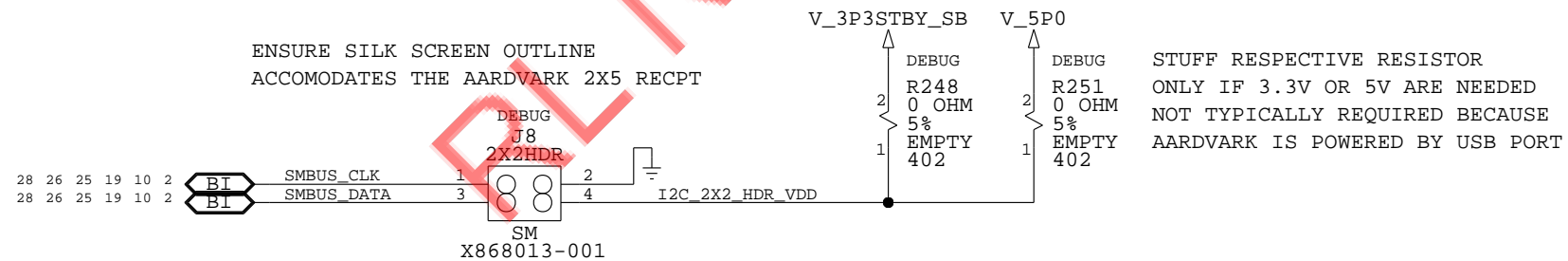
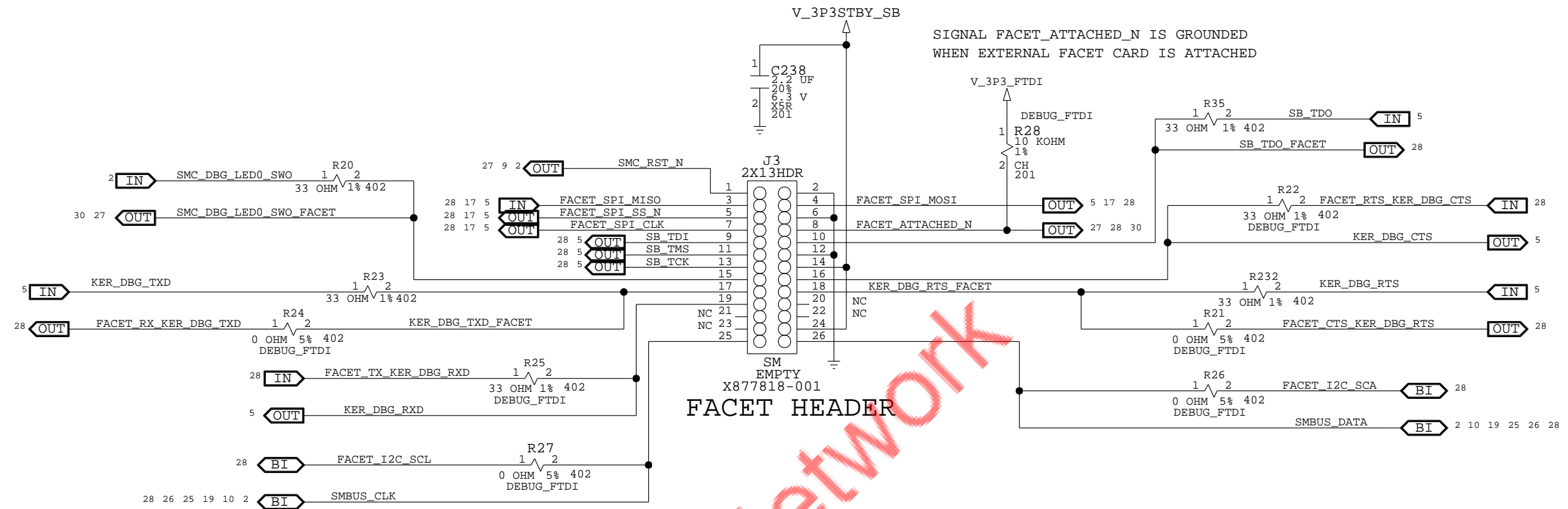


## SMBUS SB/SOC



## HDMI SUPPORT

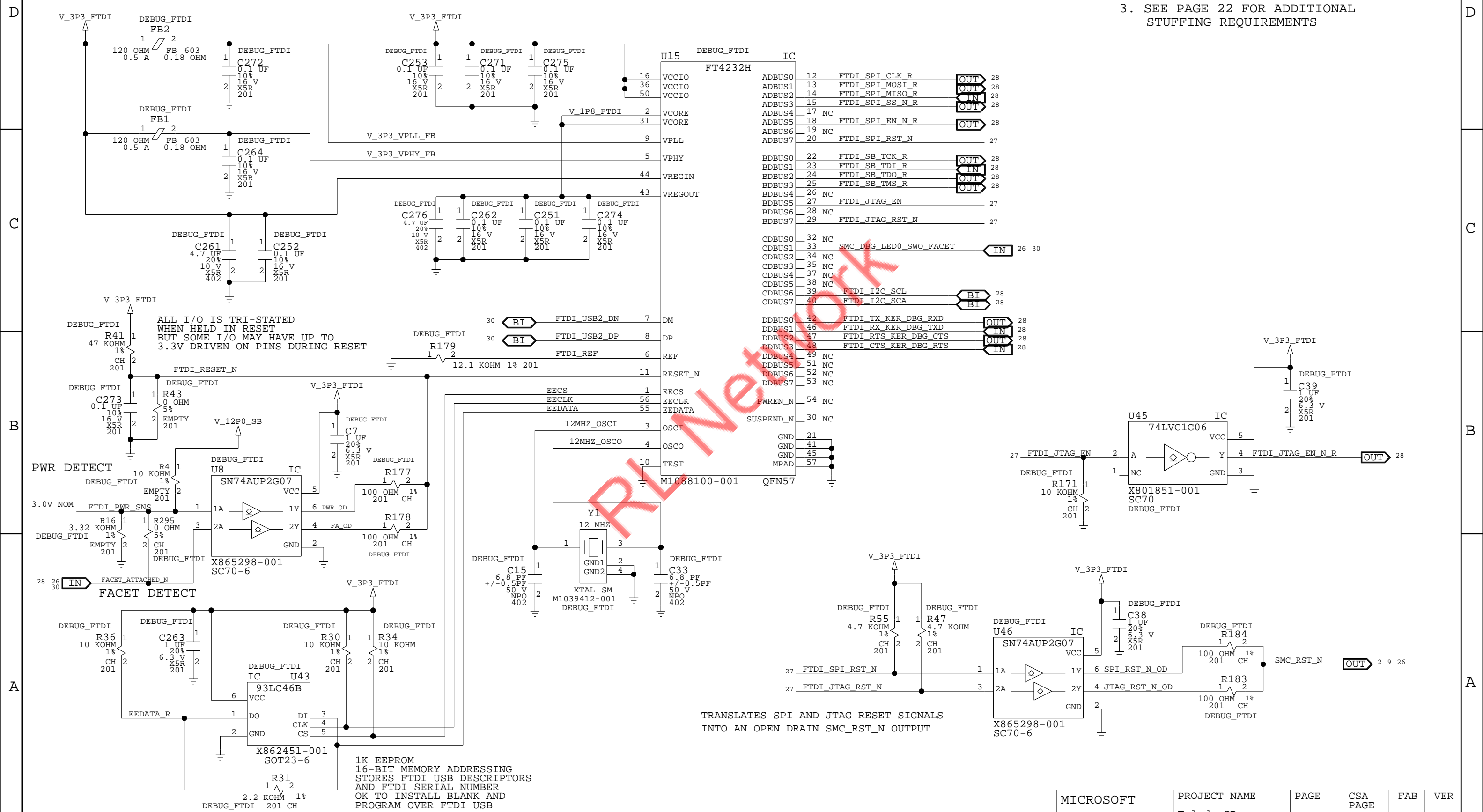
# DEBUG: FACET, I2C, V\_BAT



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# DEBUG: FTDI BRIDGE

NOTE: TO ACTIVATE INTERCEPT 12V SENSE  
 1. STUFF: R4,R16  
 2. REMOVE: R295  
 3. SEE PAGE 22 FOR ADDITIONAL STUFFING REQUIREMENTS

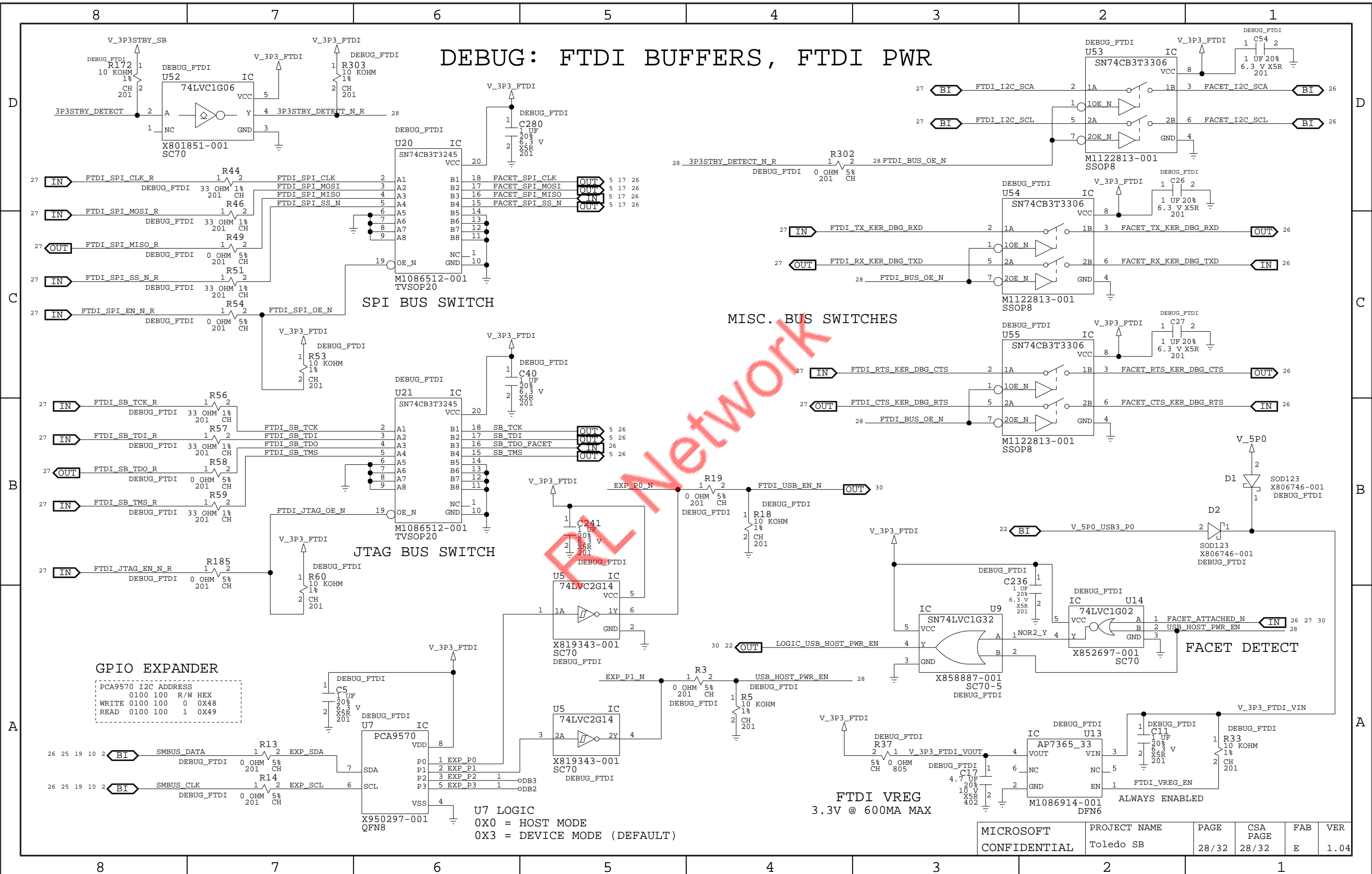


TRANSLATES SPI AND JTAG RESET SIGNALS INTO AN OPEN DRAIN SMC\_RST\_N OUTPUT

1K EEPROM  
 16-BIT MEMORY ADDRESSING  
 STORES FTDI USB DESCRIPTORS  
 AND FTDI SERIAL NUMBER  
 OK TO INSTALL BLANK AND  
 PROGRAM OVER FTDI USB

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# DEBUG: FTDI BUFFERS, FTDI PWR

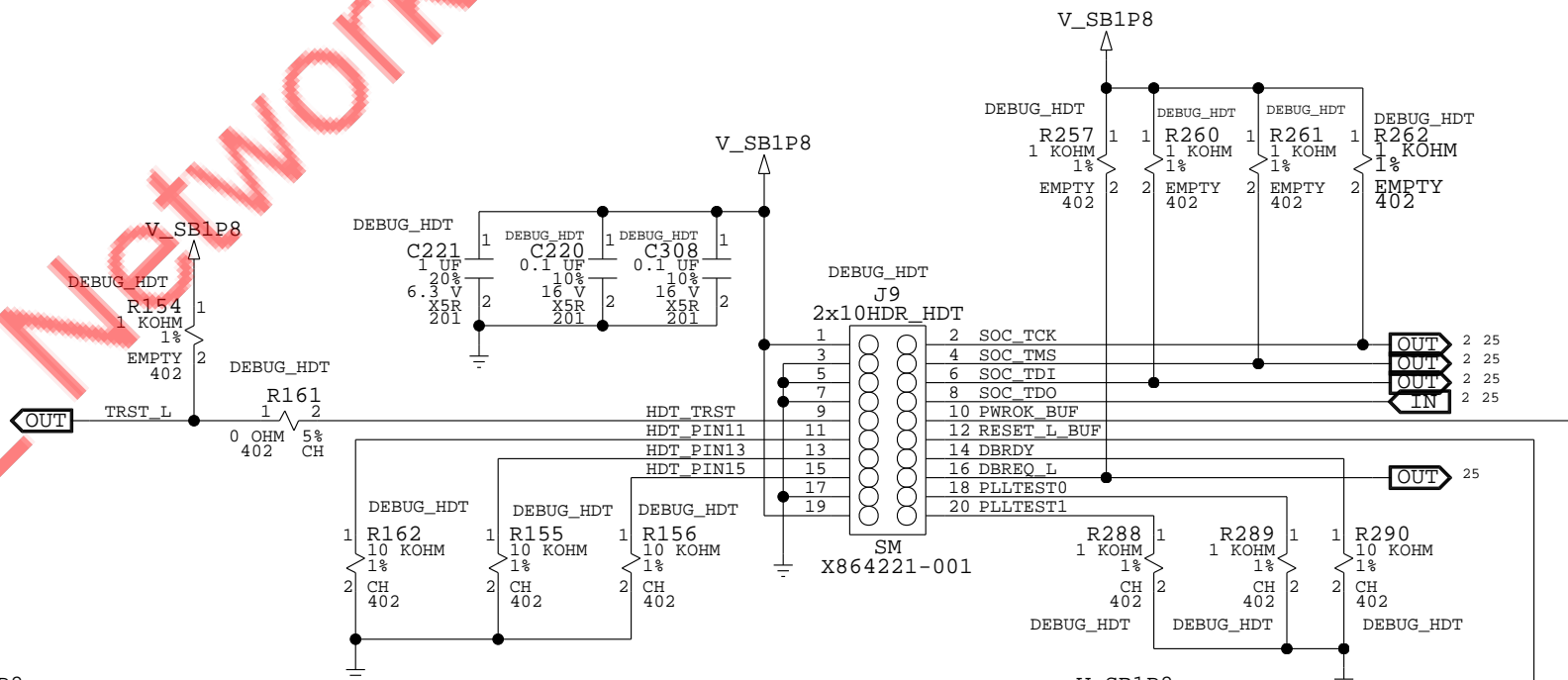
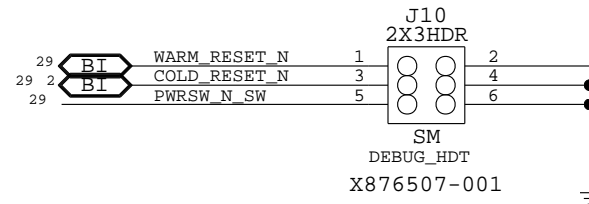
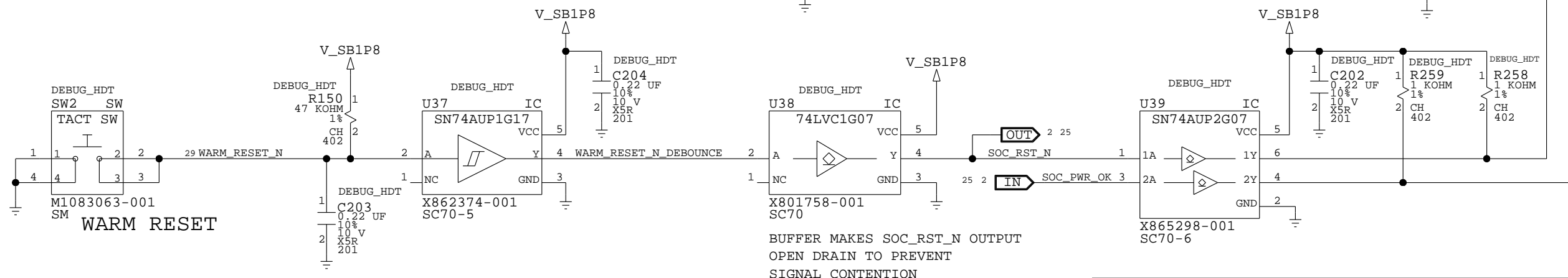
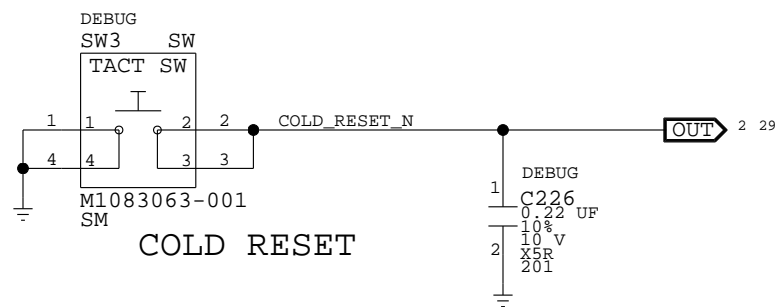
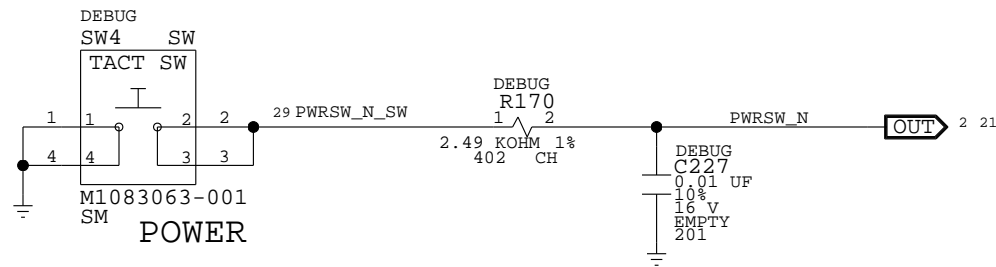
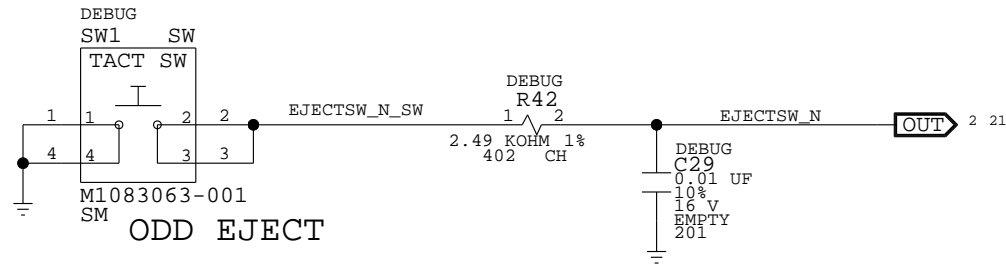
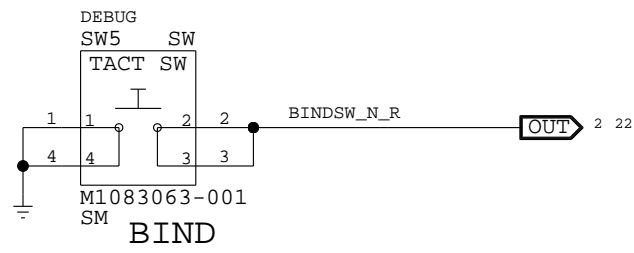


U7 LOGIC  
 0X0 = HOST MODE  
 0X3 = DEVICE MODE (DEFAULT)

FTDI VREG  
 3.3V @ 600MA MAX

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# DEBUG: BUTTONS, HDT

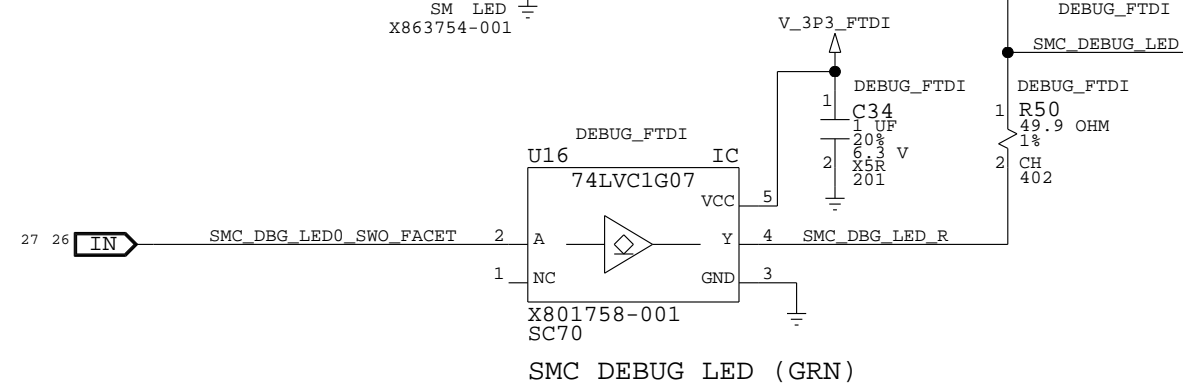
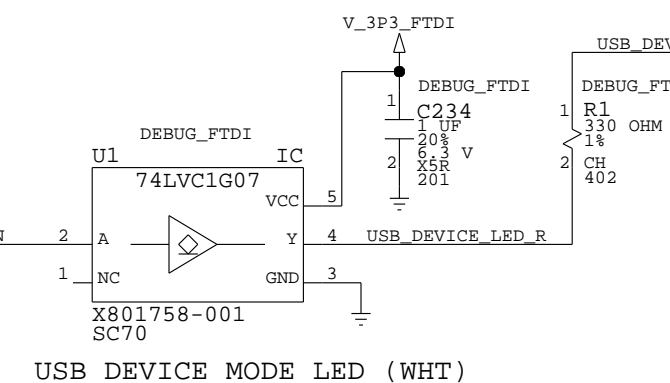
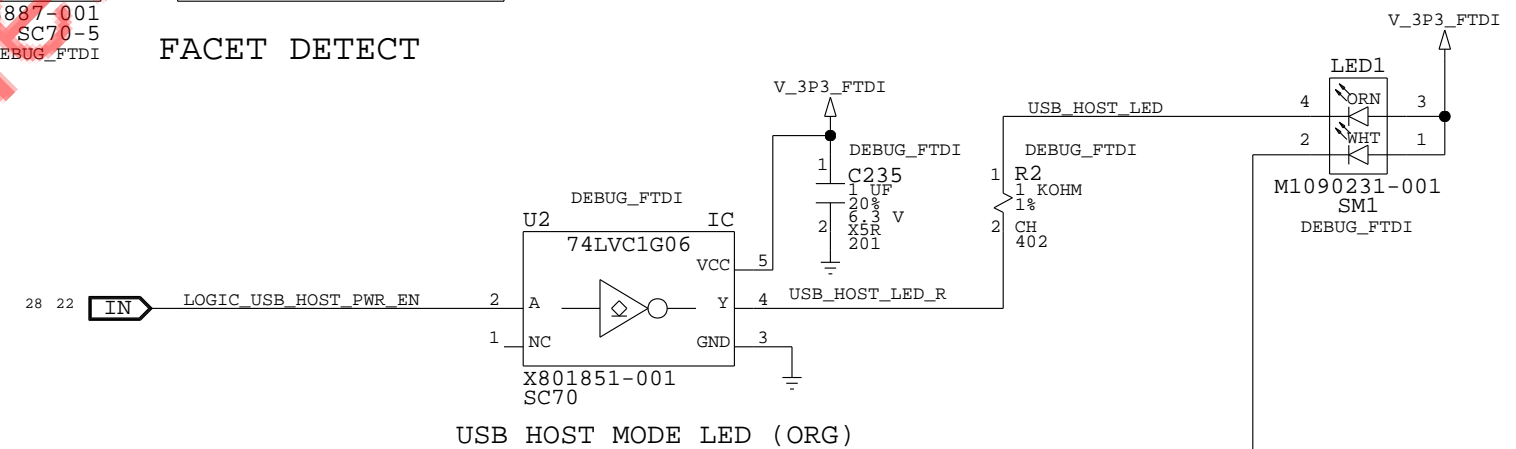
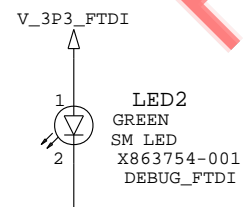
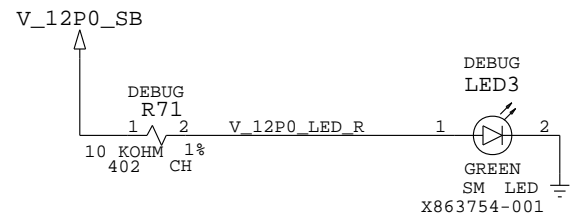
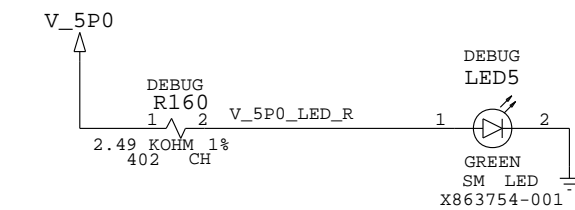
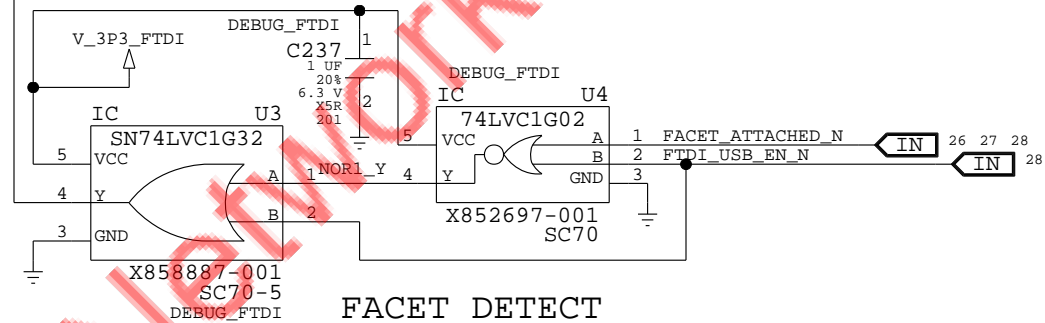
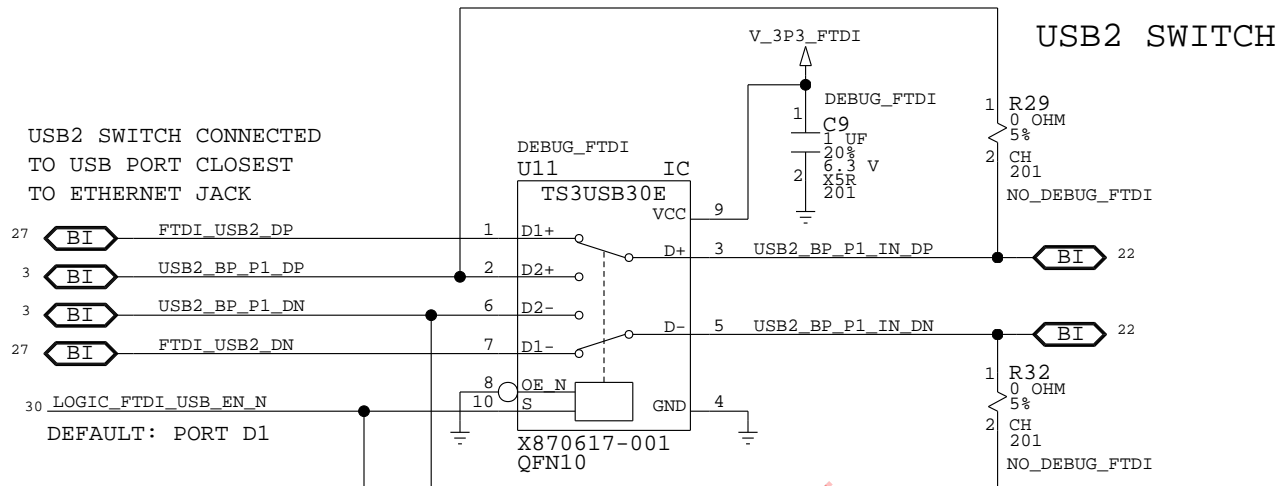
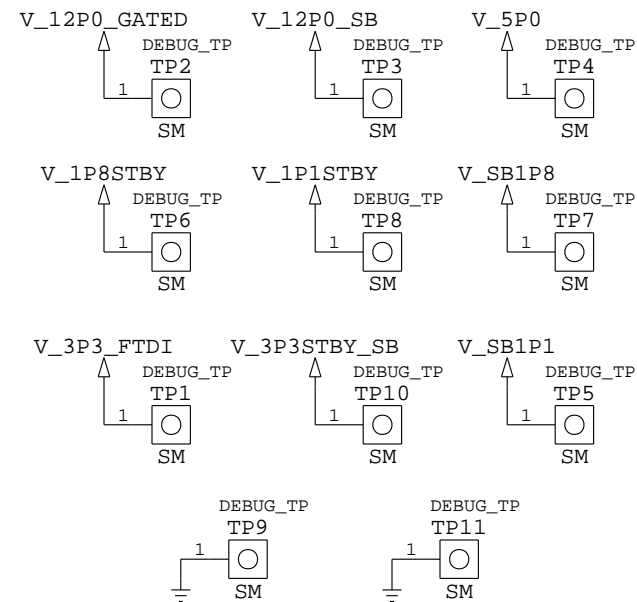


BUFFER MAKES SOC\_RST\_N OUTPUT OPEN DRAIN TO PREVENT SIGNAL CONTENTION

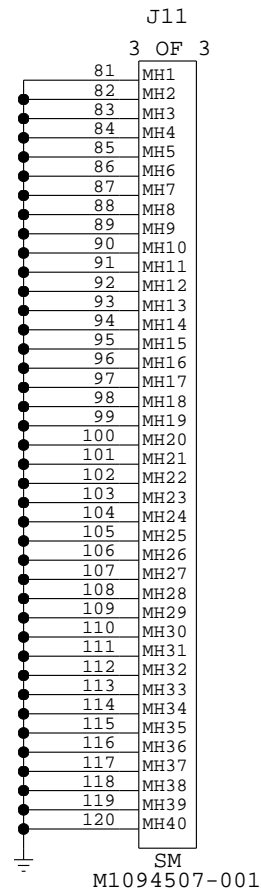
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# DEBUG: TEST POINTS, LEDS, USB2 SWITCH

NOTE: THESE TEST POINTS ARE NOT TO BE USED FOR VOLTAGE REGULATOR QUALIFICATION TEST POINTS



# LABELS AND MOUNTING



## INTELLIGENT SERIAL NUMBER TARGET

LBL1  
LABEL  
M1023566-331  
25P55X6P5\_TARGET

XXXXXXXX-001	MATL	REF DES	DESCR.	BOM PROPERTY
XXXXXXXX-00X	FR4	PCB1	PCB, TOLEDO, 6LAYERS, GI, FR4, SB, FAB	PCB_GI
M1127054-001	FR4	PCB1	PCB, TOLEDO, 6LAYERS, OSP, FR4, SB, DEBUG, RF, FAB	PCB_OSP_DEBUG
M1126891-002	FR4	PCB1	PCB, TOLEDO, 6LAYERS, OSP, FR4, SB, RF, FABE, RETAIL	PCB_OSP_RETAIL_RF
M1128162-002	FR4	PCB1	PCB, TOLEDO, 6LAYERS, OSP, FR4, SB, NON-RF, FABE, RETAIL	PCB_OSP_RETAIL_NO_RF

USES DEBUG NETLIST  
 USES RETAIL NETLIST  
 USES RETAIL NETLIST W/RF INDUCTOR SHORTED

NOTE: MUST ADD ELECTRICAL SHORT ACROSS L5 IN BOARD FILE  
TO PHYSICALLY CREATE PCB\_OSP\_RETAIL\_NO\_RF CONFIG

# BOM DEFINITIONS

BOM	DEFINITION
AUDIO	INCLUDES COMPONENTS FOR THE STANDARD AUDIO SOLUTION
AUDIO_PREM	INCLUDES COMPONENTS FOR THE PREMIUM SE/LE SPEAKER SOLUTION
COMMON	ALL COMPONENTS WITH NO BOM PROPERTY
DEBUG	COMPONENTS REQUIRED FOR BRING UP & DEBUG
NO_DEBUG_FTDI	DO NOT USE WITH DEBUG_FTDI OPTION. BYPASSES DEBUG_FTDI FOOTPRINTS AND CONNECTS USB R0 ENABLE TO SMC
DEBUG_FTDI	DO NOT USE WITH NO_DEBUG_FTDI OPTION. ADDS COMPONENTS TO SUPPORT DEBUGGING OVER USB. USE WITH USB_LOAD_SWITCH_DEBUG
DEBUG_HDT	HDT-RELATED DEBUG COMPONENTS
DEBUG_SHUNT	COMPONENTS WHICH ARE ON DEBUG BOARDS, BUT ARE REMOVED/SHORTED ON RETAIL
EMMC	POPULATE TO SUPPORT EMMC INTERFACE
EMMC_BASE	DUMMY PLACE HOLDER FOR EMMC DEVICE & RESISTORS. NEVER USE THIS IN THE RECIPE FILE. SELECT ONE OF THESE INSTEAD: EMMC_HYNIX_16NM, EMMC TOSHIBA_15NM, EMMC SAMSUNG_14NM
EMMC_HYNIX_16NM	HYNIX EMMC DEVICE
EMMC_SAMSUNG_14NM	SAMSUNG EMMC DEVICE
EMMC_TOSHIBA_15NM	TOSHIBA EMMC DEVICE
CON_USB_BASE	DUMMY PLACE HOLDER FOR USB CONNECTORS. NEVER USE IN RECIPE FILE
CON_USB_FOXC	FOXCONN USB CONNECTORS
CON_USB_AMP	AMPHENOL USB CONNECTORS
CON_RJ45_BASE	DUMMY PLACE HOLDER FOR RJ45 CONNECTOR. NEVER USE IN RECIPE FILE
CON_RJ45_FOXC	FOXCONN RJ45 CONNECTOR
CON_RJ45_AMP	FOXCONN RJ45 CONNECTOR
PCB_GI	FAB TYPE: GOLD
PCB_OSP	FAB TYPE: ORGANIC SOLDERABILITY PRESERVATIVE GREEN SOLDERMASK
PCB_RF	FAB TYPE: GOLD. PCB ROUTED TO POPULATE RF FILTER INDUCTOR
RTC_RETAIL	RTC CIRCUIT IMPLEMENTATION FOR RETAIL BOARDS
RTC_XDK	RTC CIRCUIT IMPLEMENTATION FOR XDK BOARDS
RF	STUFFS HIGH FREQUENCY RF FILTERS
SANTO_BASE	DUMMY PLACE HOLDER FOR SANTO SB. NEVER USE THIS IN THE RECIPE FILE. USE ONE OF THESE INSTEAD: SANTO_DEV OR SANTO_RETAIL
SANTO_DEV	DEBUG VERSION OF SANTO SB
SANTO_RETAIL	RETAIL VERSION OF SANTO SB
SPI_FLASH_WINBOND	WINBOND SPI FLASH
SPI_FLASH_MACRONIX	MACRONIX SPI FLASH
USB_LOAD_SWITCH_BASE	BASE PROPERTY FOR REAR USB LOAD SWITCHES. NEVER USE IN RECIPE FILE
USB_LOAD_SWITCH_FTDI	STUFFS RETAIL LOAD SWITCH FOR USB REAR0 AND TI LOAD SWITCH FOR REAR1. USE WITH DEBUG_FTDI
USB_LOAD_SWITCH_RICHTEK	STUFFS RICHTEK LOAD SWITCH FOR USB REAR0 AND REAR1. USE WITH NO_DEBUG_FTDI
USB_LOAD_SWITCH_TI	STUFFS TI LOAD SWITCH FOR USB REAR0 AND REAR1. USE WITH NO_DEBUG_FTDI
VR_1P1STBY_BASE	BASE PROPERTY FOR 1P1STBY REGULATOR SOURCE. NEVER USE IN RECIPE FILE
VR_1P1STBY_MPS	STUFFS MPS 1P1STBY REGULATOR
VR_1P1STBY_RICHTEK	STUFFS RICHTEK 1P1STBY REGULATOR
VR_FIXED	SET ALL VRS TO FIXED VOLTAGES (NON-MARGINED). EXCLUDES V_MEMIO. MUST BE USED IN CONJUNCTION WITH NOT VR_MM
VR_MM	ALLOWS MOST VRS TO BE MARGINED FOR M&M BOARDS. EXCLUDES V_MEMIO. MUST BE USED IN CONJUNCTION WITH NOT VR_FIXED

