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DISCLAMIER

DEPARTMENT

PHED-SH

Intel Corporation

2200 Mission College Blvd.  
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SIZE

B

CODE

34649

DOCUMENT NUMBER

M20898

REV

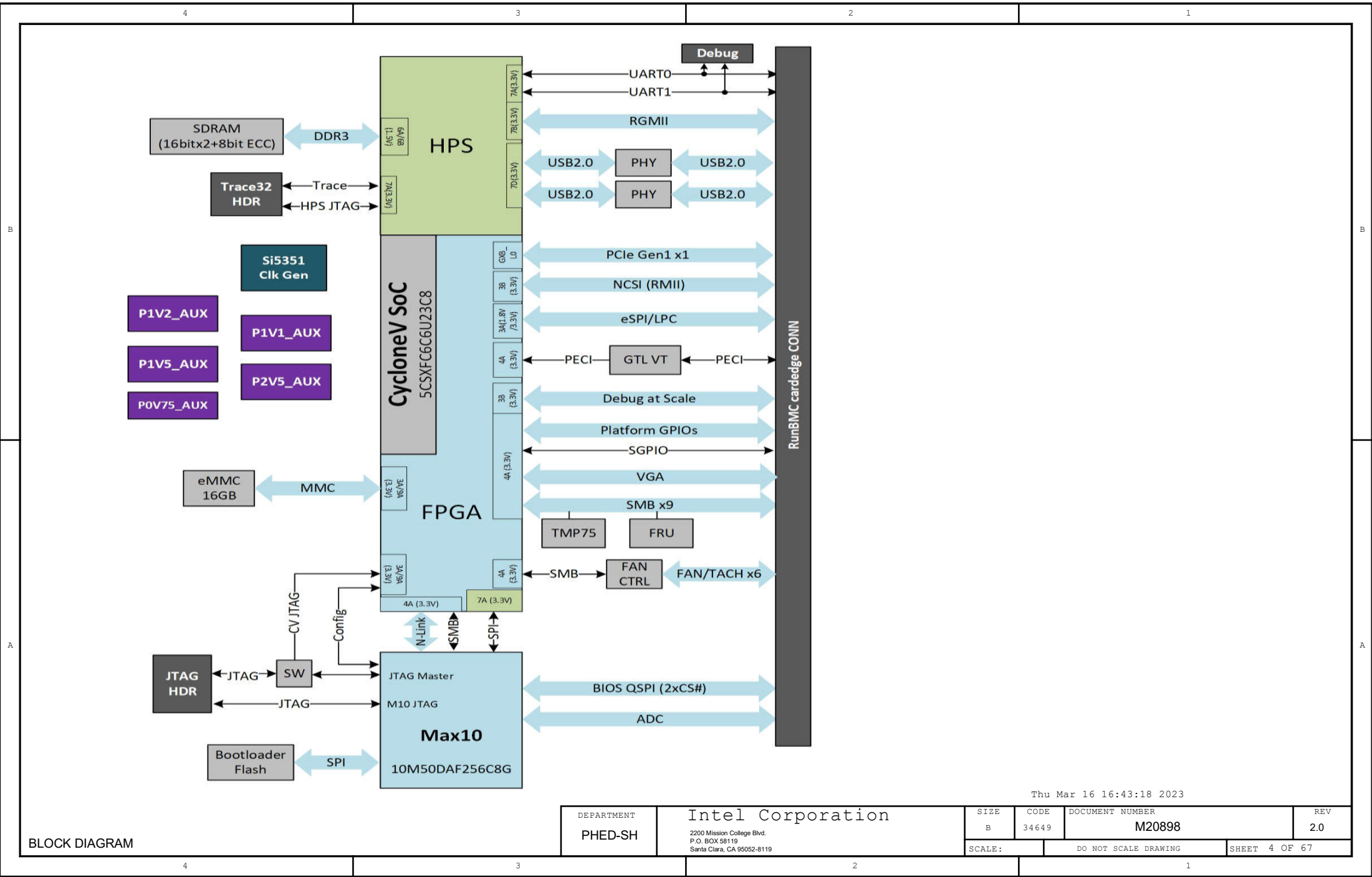
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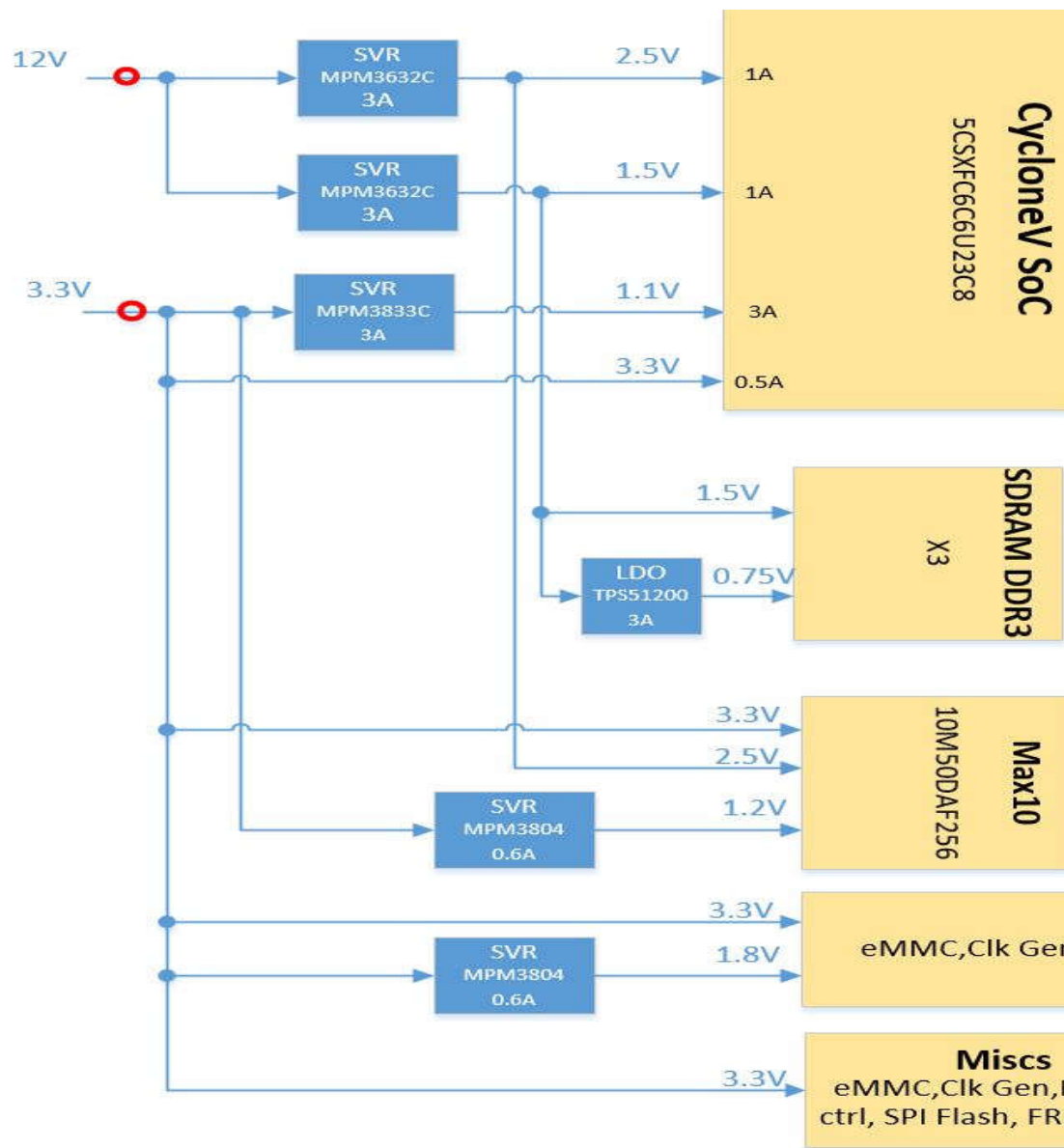
DO NOT SCALE DRAWING

SHEET 2 OF 67





Thu Mar 16 16:43:18 2023



#### Notes:

1. FPGA and HPS shared same output rail w/ one VR.
2. 3x FPGA EPE data, 2x HPS EPE data for VR design.
3. SDRAM Vtt termination type, res divider or LDO.

 Current sensing points

#### Power sequence:

Stage1: P12V\_AUX, P3V3\_AUX from the baseboard

Stage2: P1V1\_AUX, P1V2\_AUX

Stage3: gated by P1V1\_PWRGD: P2v5\_AUX, P1V5\_AUX, P1V8\_AUX from card edge (need switch), 3V3\_Aux for C5/M10 IO (need switch)

Stage4: gated by P1V5\_PWRGD: 0.75V\_AUX – PWRGD\_SMC\_VRS

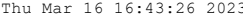
There's no need to gate the Misc 3.3V/1.8V rail since both C5 and M10 support hot socketing.

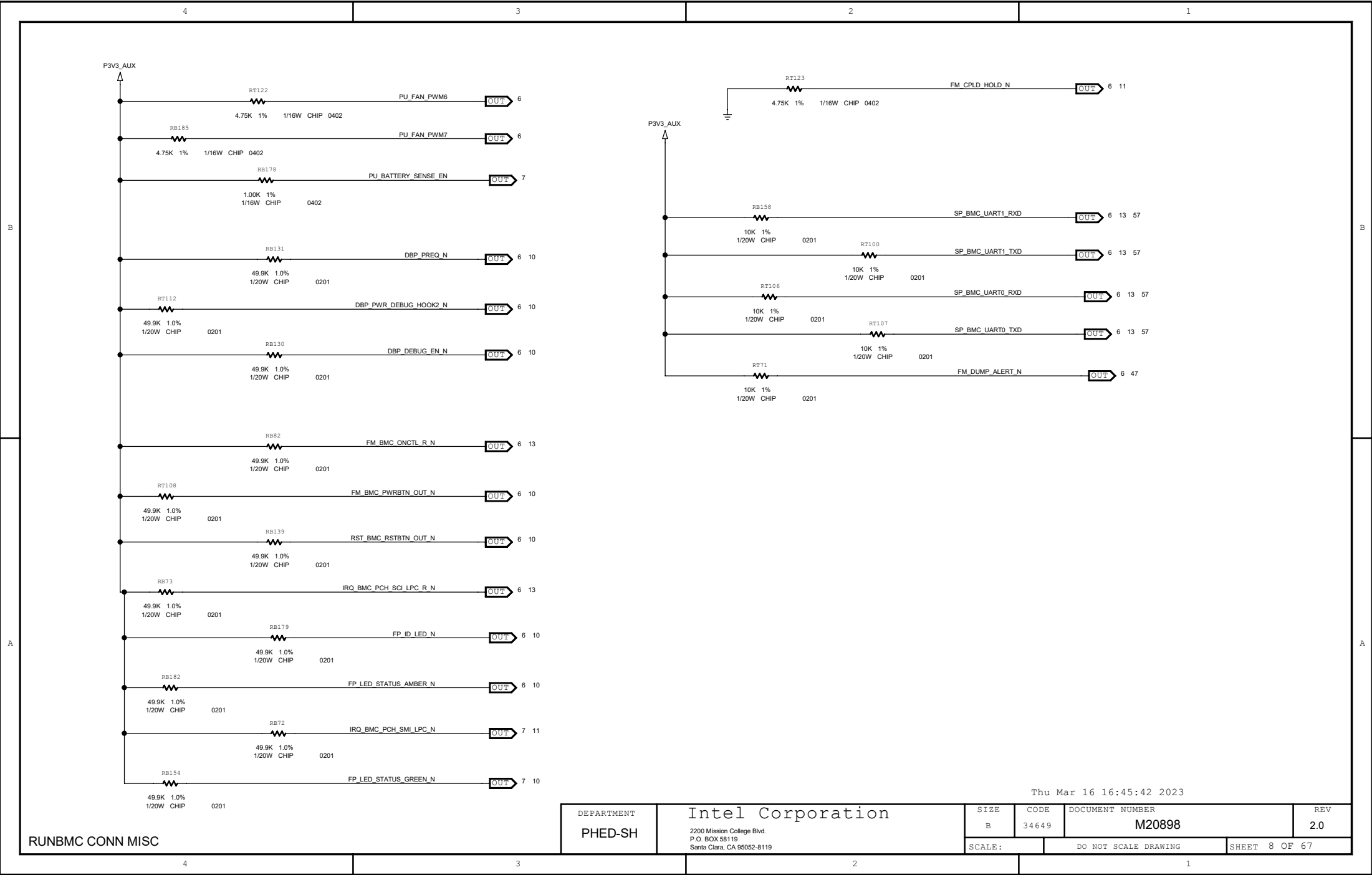
VR DIAGRAM

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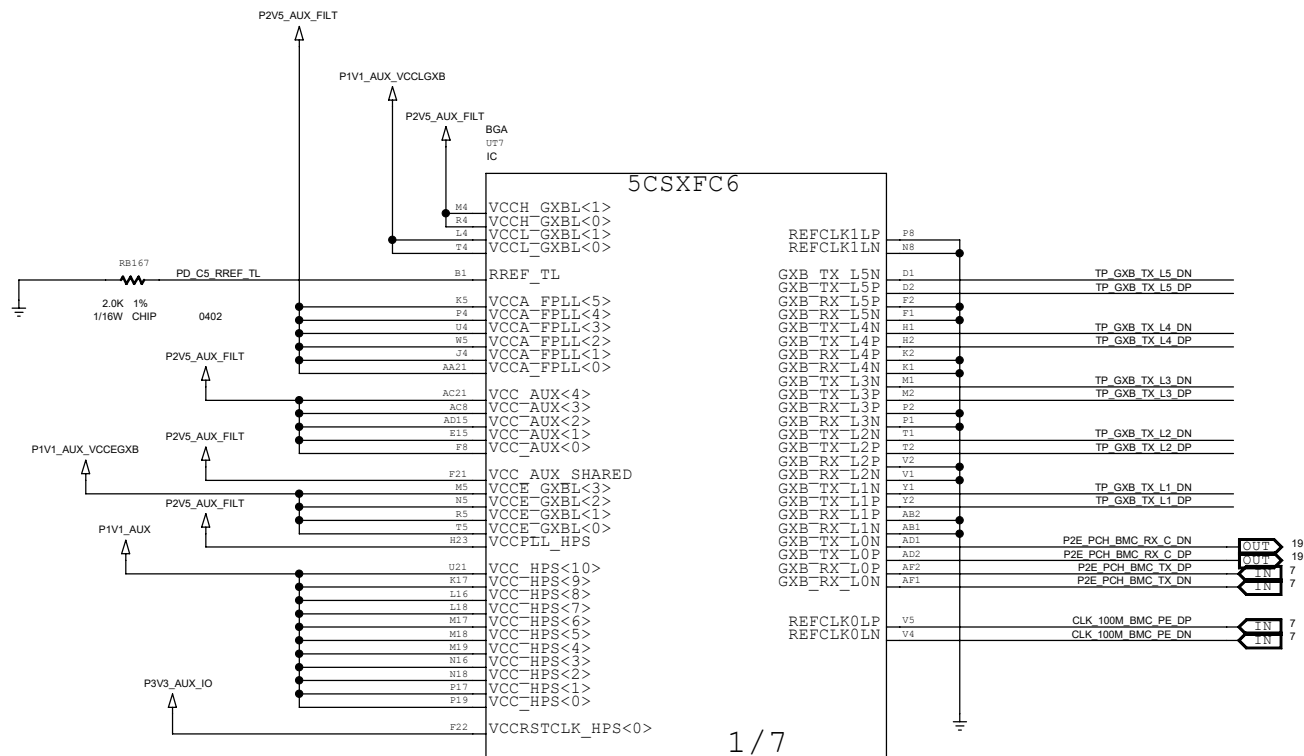




RUNBMC CONN MISC

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BOM NOTE:

PN: 5CSXFC6C6U23C8N

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UT7

5CSXFC6

2/7

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CYCLONE V SOC (2 OF 6) - BANK 3A, 3B

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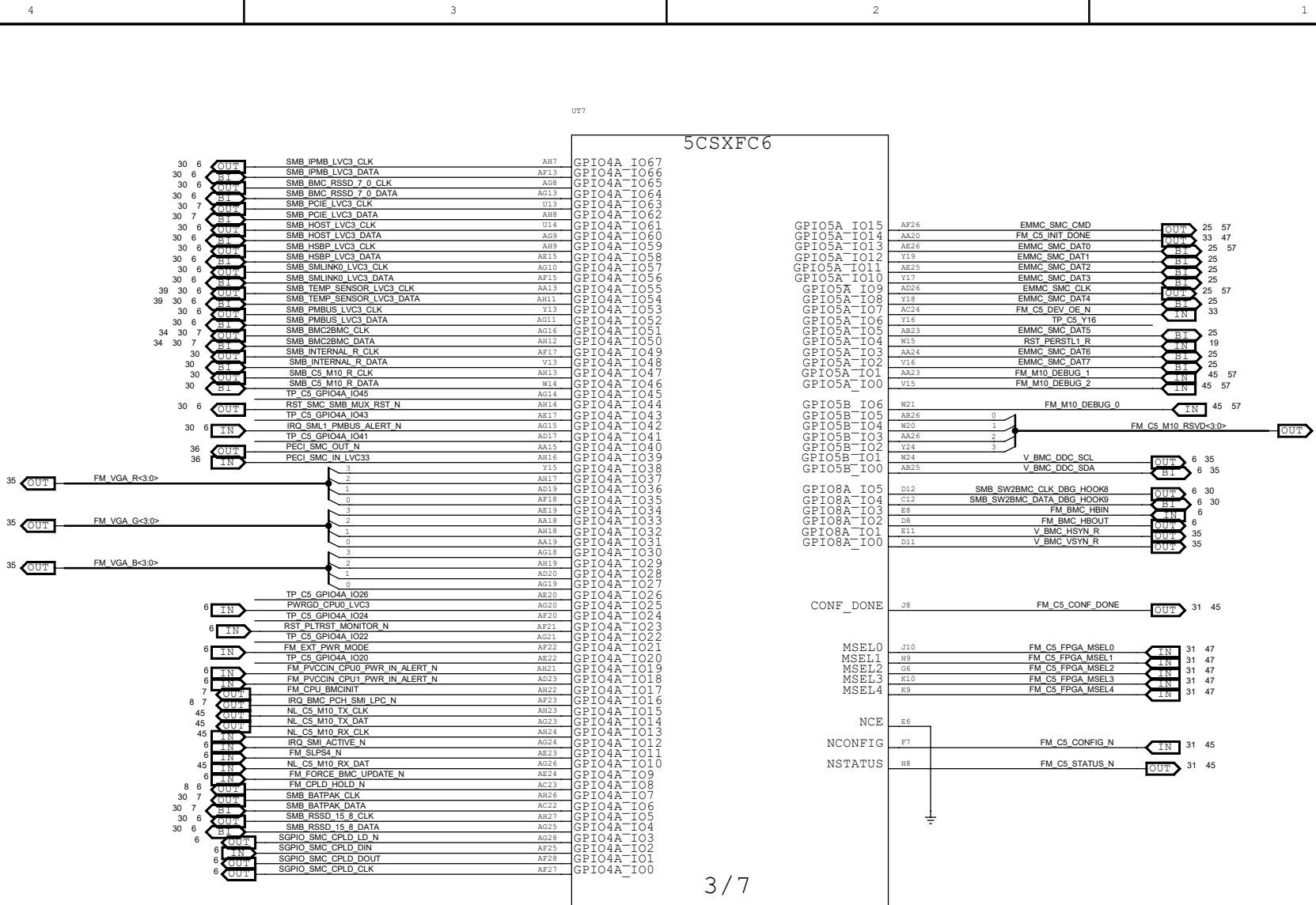
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2.0

SCALE:

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SHEET 10 OF 67



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UT7

22 21 20 BI V M BMC DDR3 DQ&lt;39:0&gt;

5CSXFC6

V M BMC DDR3 MA&lt;15:0&gt; OUT 20 21 22 23

0	J25	HPS_DQ_0
1	J24	HPS_DQ_1
2	E28	HPS_DQ_2
3	D27	HPS_DQ_3
4	J26	HPS_DQ_4
5	R26	HPS_DQ_5
6	G27	HPS_DQ_6
7	F28	HPS_DQ_7
8	K25	HPS_DQ_8
9	L25	HPS_DQ_9
10	J27	HPS_DQ_10
11	J28	HPS_DQ_11
12	M27	HPS_DQ_12
13	M26	HPS_DQ_13
14	M28	HPS_DQ_14
15	N28	HPS_DQ_15
16	N24	HPS_DQ_16
17	N25	HPS_DQ_17
18	T28	HPS_DQ_18
19	U28	HPS_DQ_19
20	N26	HPS_DQ_20
21	N27	HPS_DQ_21
22	R27	HPS_DQ_22
23	V27	HPS_DQ_23
24	R26	HPS_DQ_24
25	R25	HPS_DQ_25
26	AA28	HPS_DQ_26
27	W26	HPS_DQ_27
28	R24	HPS_DQ_28
29	T24	HPS_DQ_29
30	U27	HPS_DQ_30
31	AA27	HPS_DQ_31
32	T26	HPS_DQ_32
33	U25	HPS_DQ_33
34	AC28	HPS_DQ_34
35	V25	HPS_DQ_35
36	V19	HPS_DQ_36
37	V20	HPS_DQ_37
38	AE27	HPS_DQ_38
39	AD28	HPS_DQ_39

HPS_A_0	C28	0
HPS_A_1	B28	1
HPS_A_2	E26	2
HPS_A_3	D26	3
HPS_A_4	J21	4
HPS_A_5	J20	5
HPS_A_6	C26	6
HPS_A_7	B26	7
HPS_A_8	F26	8
HPS_A_9	F25	9
HPS_A_10	A24	10
HPS_A_11	B24	11
HPS_A_12	D24	12
HPS_A_13	C24	13
HPS_A_14	G23	14
HPS_A_15	F24	15

HPS_BA_0	A27	V M BMC DDR3 BA0	OUT	20	21	22	23
HPS_BA_1	M25	V M BMC DDR3 BA1	OUT	20	21	22	23
HPS_BA_2	G25	V M BMC DDR3 BA2	OUT	20	21	22	23
HPS_CAS_N	A26	V M BMC DDR3 CAS_N	OUT	20	21	22	23
HPS_CK	N21	V M BMC DDR3 CLK_DP	OUT	20	21	22	23
HPS_CKE_0	L28	V M BMC DDR3_CKE	OUT	20	21	22	23
HPS_CKE_1	K28	TP V M BMC DDR3_CKE1	OUT	20	21	22	23
HPS_CK_N	N20	V M BMC DDR3_CLK_DN	OUT	20	21	22	23
HPS_CS_0	L21	V M BMC DDR3_CS_N	OUT	20	21	22	23
HPS_CS_1	L20	TP V M BMC DDR3_CS1_N	OUT	20	21	22	23
HPS_DM_0	G28	V M BMC DDR3_DM_0	OUT	20	21	22	23
HPS_DM_1	P28	V M BMC DDR3_DM_1	OUT	20	21	22	23
HPS_DM_2	W28	V M BMC DDR3_DM_2	OUT	20	21	22	23
HPS_DM_3	AE28	V M BMC DDR3_DM_3	OUT	20	21	22	23
HPS_DM_4	AE28	V M BMC DDR3_DM_4	OUT	20	21	22	23
HPS_DQSN_0	R16	V M BMC DDR3_DQS0_N	BI	20	21	22	23
HPS_DQSN_1	R18	V M BMC DDR3_DQS1_N	BI	20	21	22	23
HPS_DQSN_2	T18	V M BMC DDR3_DQS2_N	BI	20	21	22	23
HPS_DQSN_3	T20	V M BMC DDR3_DQS3_N	BI	20	21	22	23
HPS_DQSN_4	V17	V M BMC DDR3_DQS4_N	BI	20	21	22	23
HPS_DQSP_0	R17	V M BMC DDR3_DQS0_P	BI	20	21	22	23
HPS_DQSP_1	R19	V M BMC DDR3_DQS1_P	BI	20	21	22	23
HPS_DQSP_2	T19	V M BMC DDR3_DQS2_P	BI	20	21	22	23
HPS_DQSP_3	U19	V M BMC DDR3_DQS3_P	BI	20	21	22	23
HPS_DQSP_4	V18	V M BMC DDR3_DQS4_P	BI	20	21	22	23
HPS_ODT_1	G26	TP V M BMC DDR3_ODT1	OUT	20	21	22	23
HPS_RAS_N	A25	V M BMC DDR3_RAS_N	OUT	20	21	22	23
HPS_RESET_N	V28	V M BMC DDR3_RST_N	OUT	20	21	22	23
HPS_RZQ_0	996	PD_HPS_RZQ_0	OUT	20	21	22	23
HPS_ODT_0	D28	V M BMC DDR3_ODT	OUT	20	21	22	23
HPS_WE_N	E25	V M BMC DDR3_WE_N	OUT	20	21	22	23

RB74

240

GND

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IN

ULPI USBPHY USB2B\_CLKOUT B12

HPS\_GPI044

4/7

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CYCLONE V SOC (4 OF 6) - BANK 6A6B - HPS MEM

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M20898REV  
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SHEET 12 OF 67

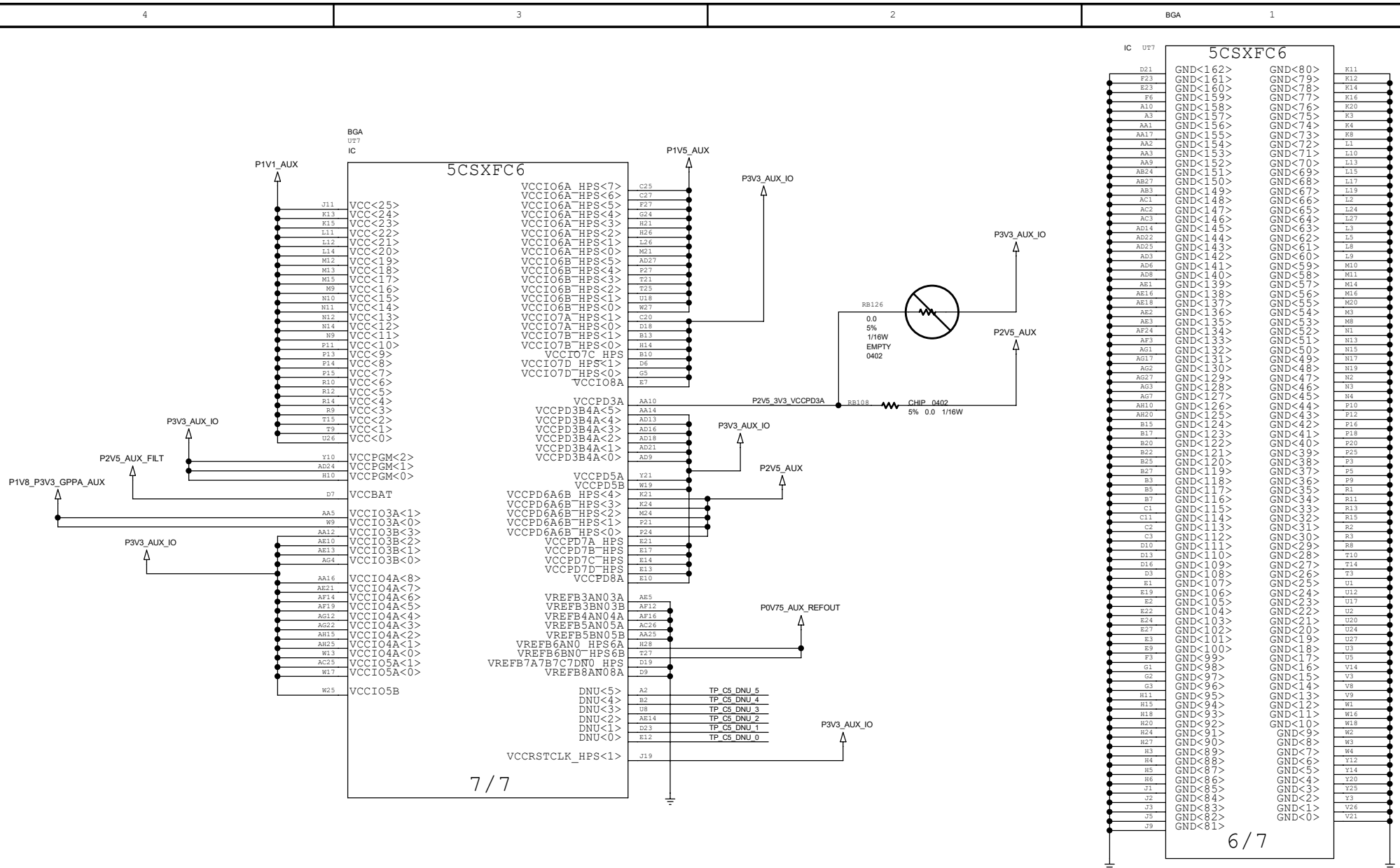
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Thu Mar 16 16:43:35 2023

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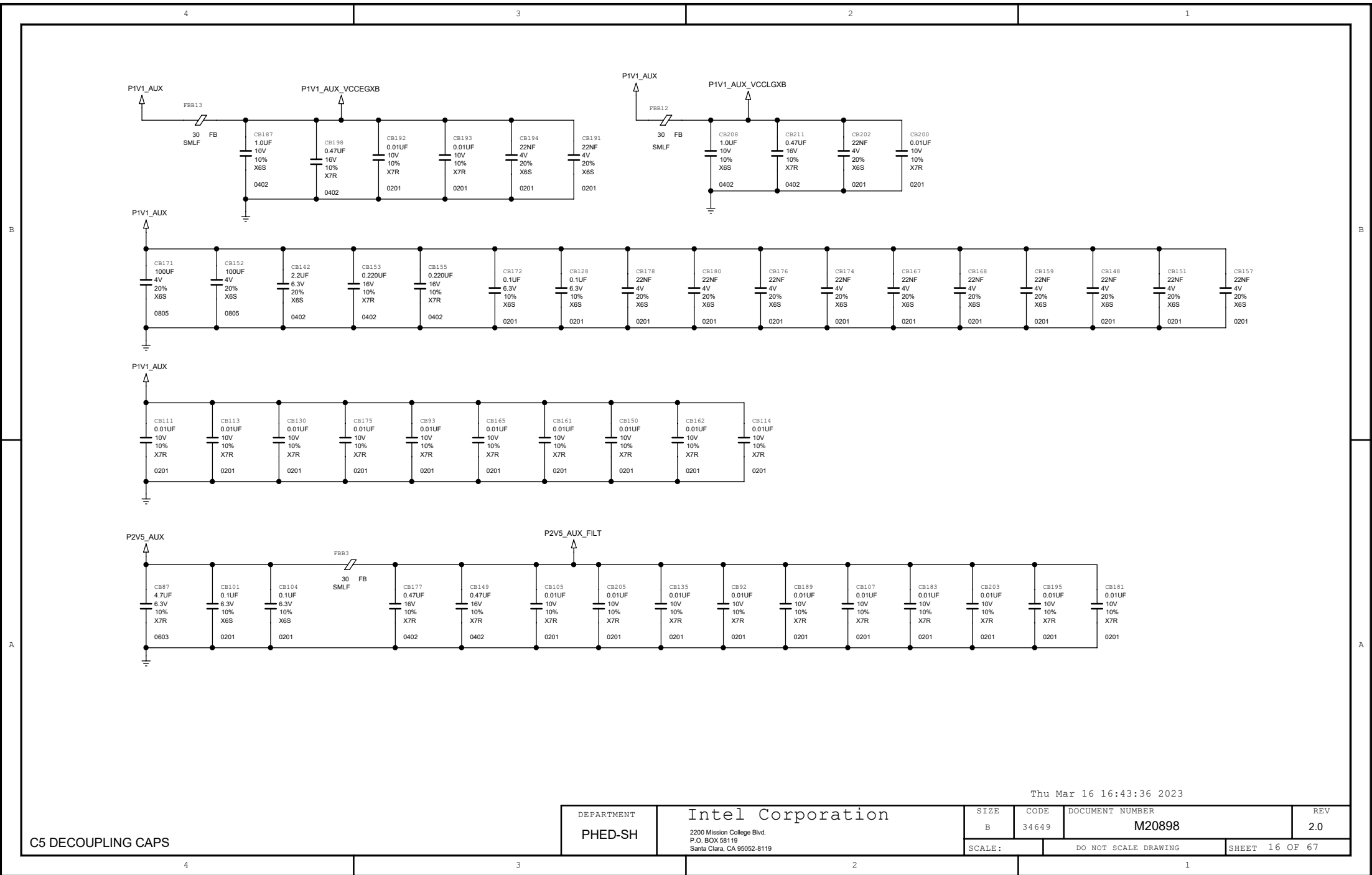
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REV  
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SHEET 15 OF 67



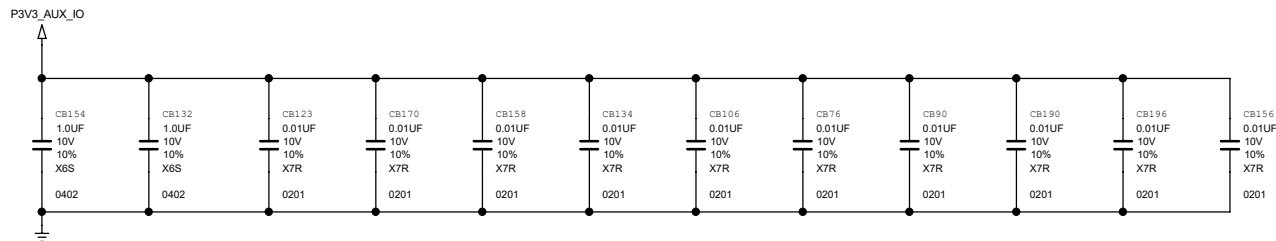
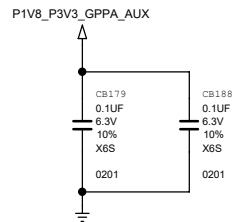
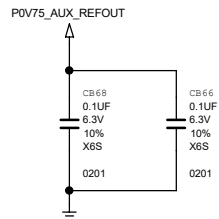
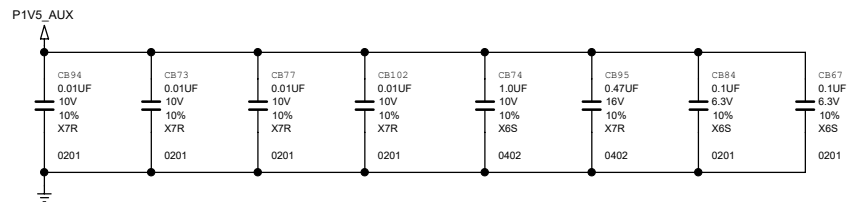


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C5 DECOUPLING CAPS

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SCALE:

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SHEET 17 OF 67

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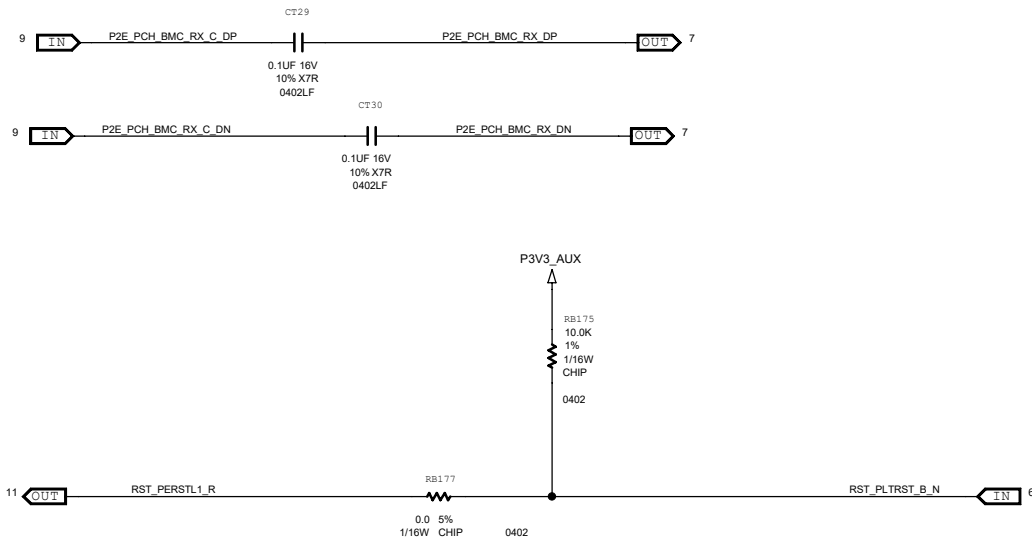
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CYCLONE 5

CARD EDGE



CAD NOTE:

PUT ALL THE COMPONENTS IN THIS PAGE CLOSE TO CARD EDGE CONNECTOR

C5 PCIE AC CAP

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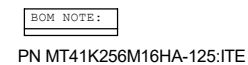
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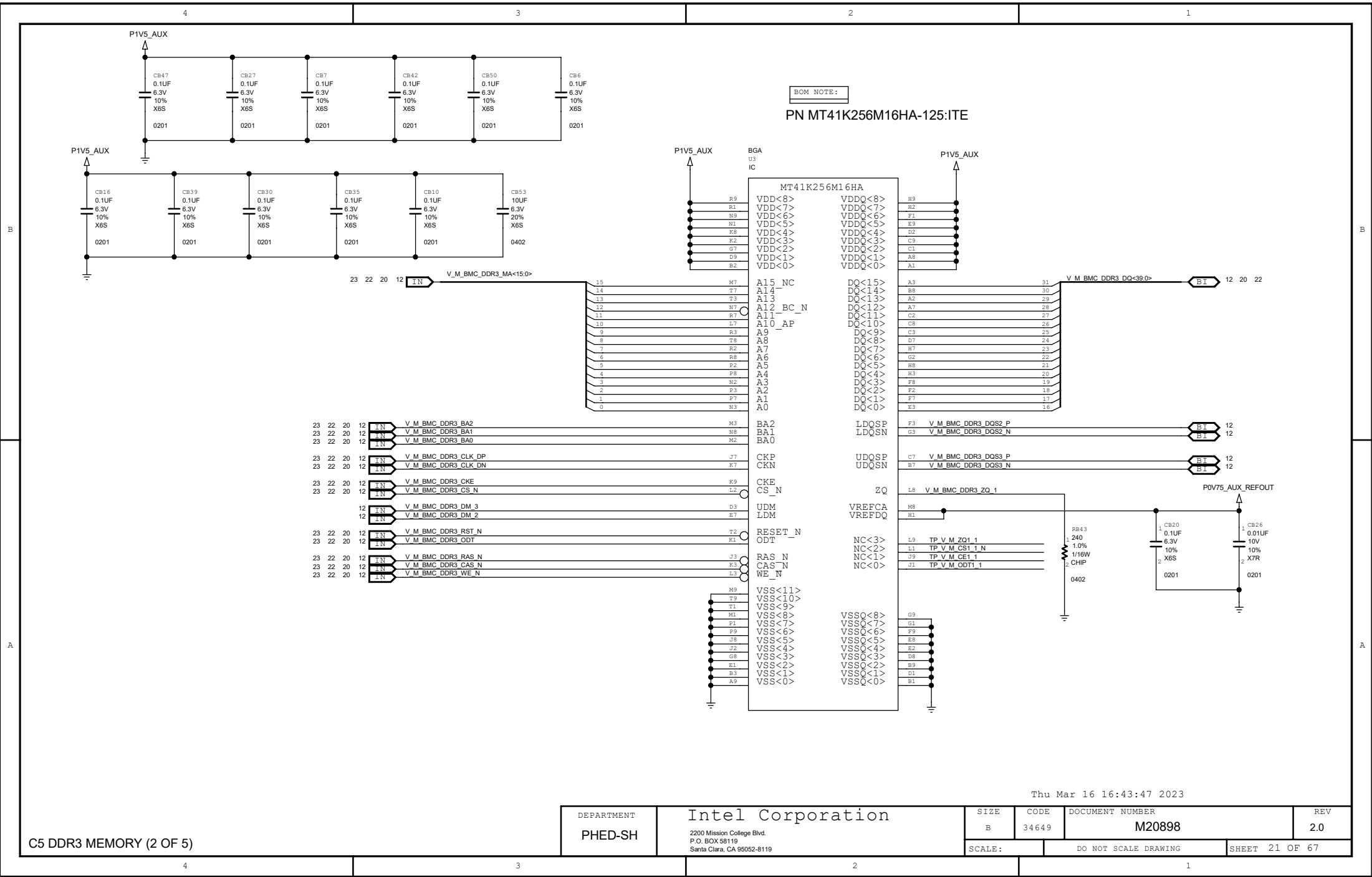
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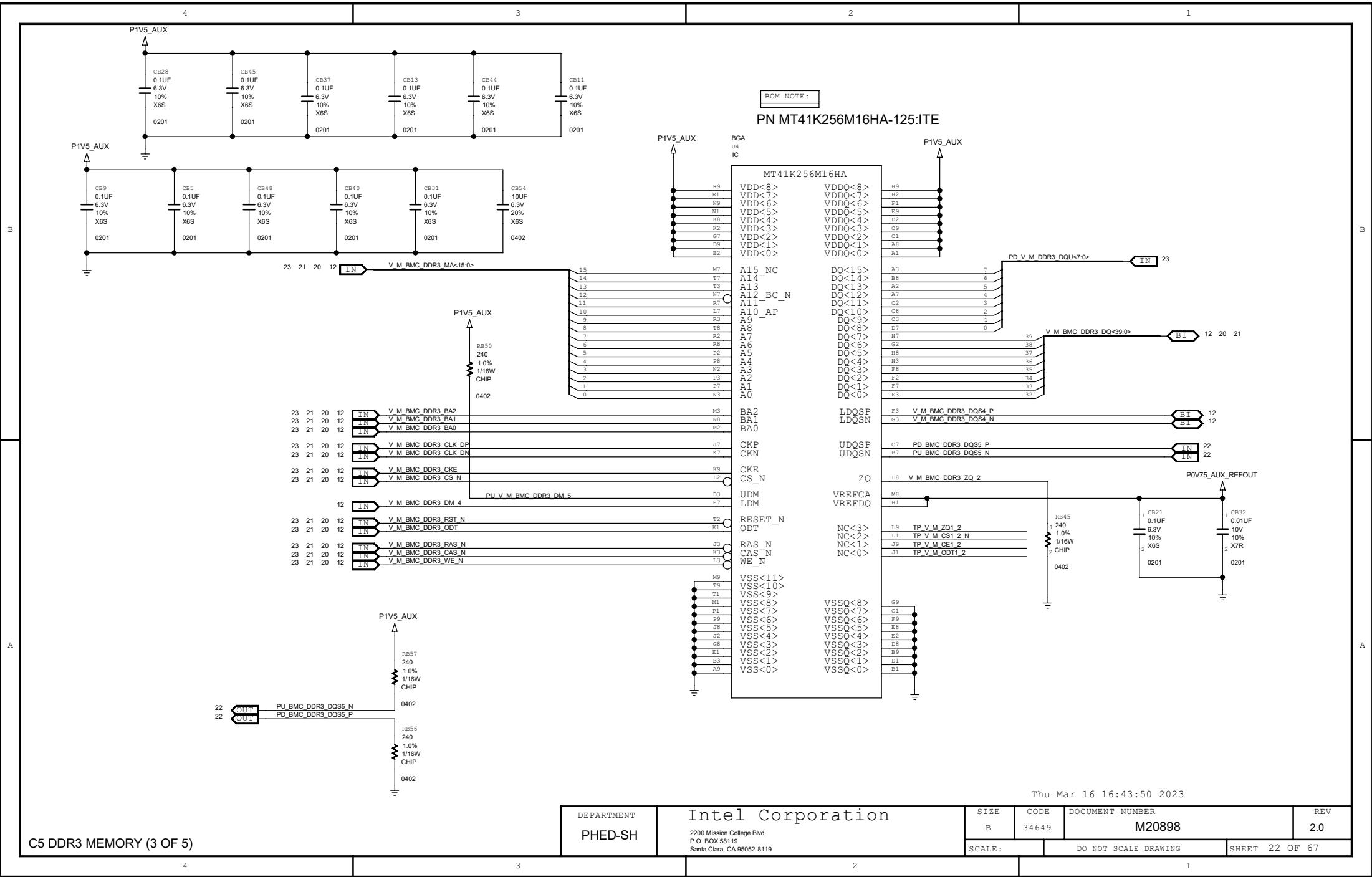
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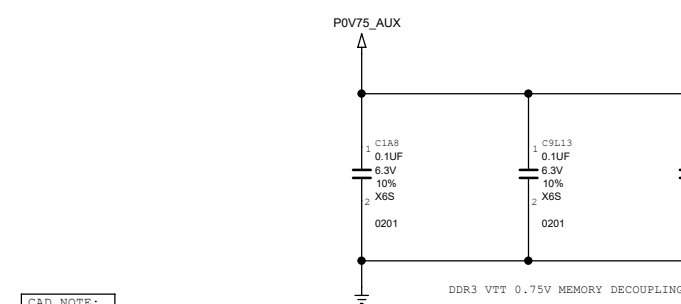
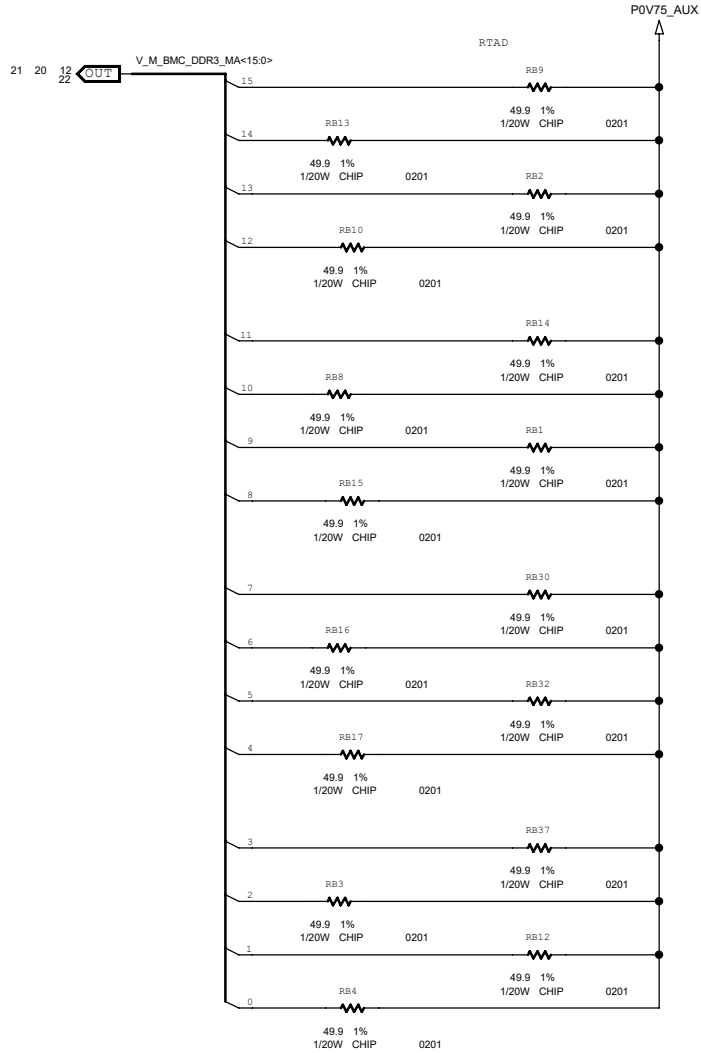
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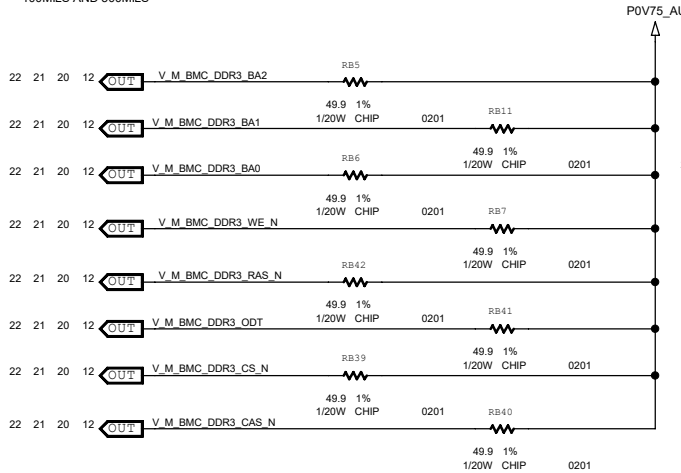
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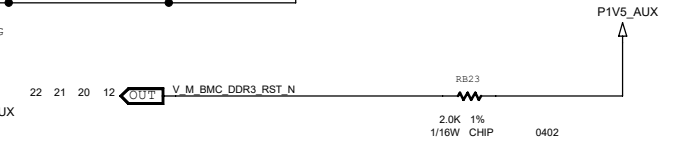
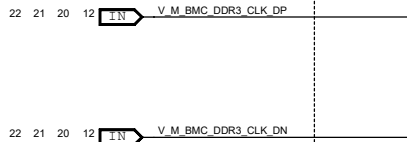




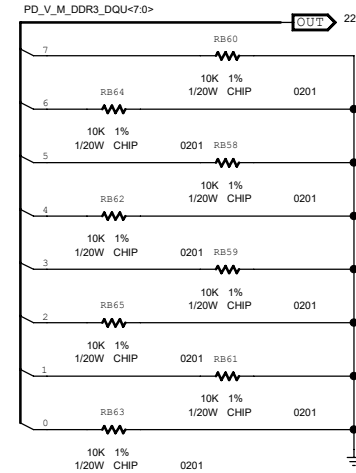
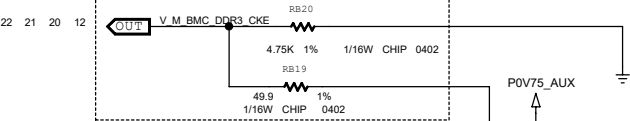
CAD NOTE:  
PLACE RTAD RESISTORS CLOSE  
TO DDR3 MEMORY, BETWEEN:  
100MILS AND 500MILS



CAD NOTE:  
PLACE AT 3RD DDR CHIP, SIGNAL TERMINATION



CAD NOTE:  
PLACE CLOSE TO EACH OTHER TO MINIMIZE STUB



C5 DDR3 MEMORY (4 OF 5)

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SHEET 23 OF 67

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SCALE:

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SHEET 24 OF 67

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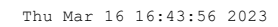
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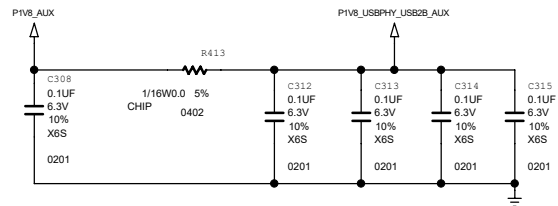
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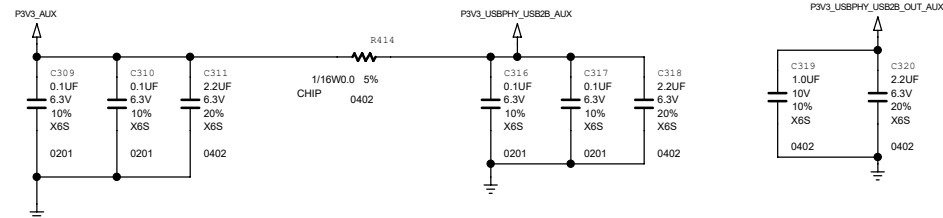






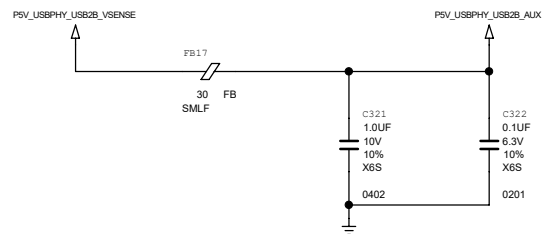
CAD NOTE:

PLACE NEAR USB3320



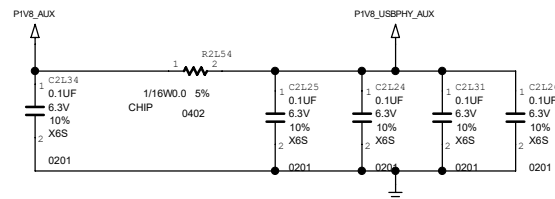
CAD NOTE:

PLACE NEAR VDD33 PIN



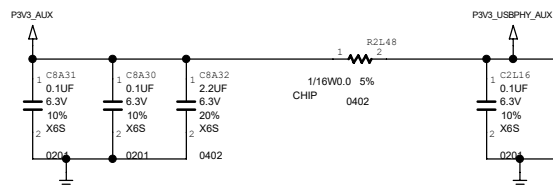
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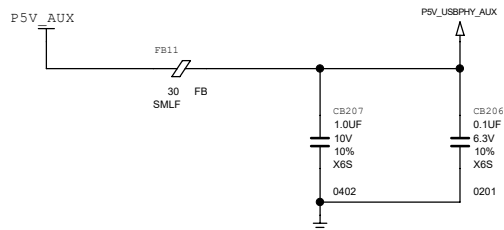
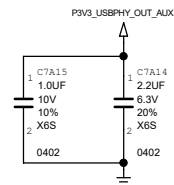
CAD NOTE:

PLACE NEAR USB3320



CAD NOTE:

PLACE NEAR VDD33 PIN



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C5 USB PHY (2 OF 2)

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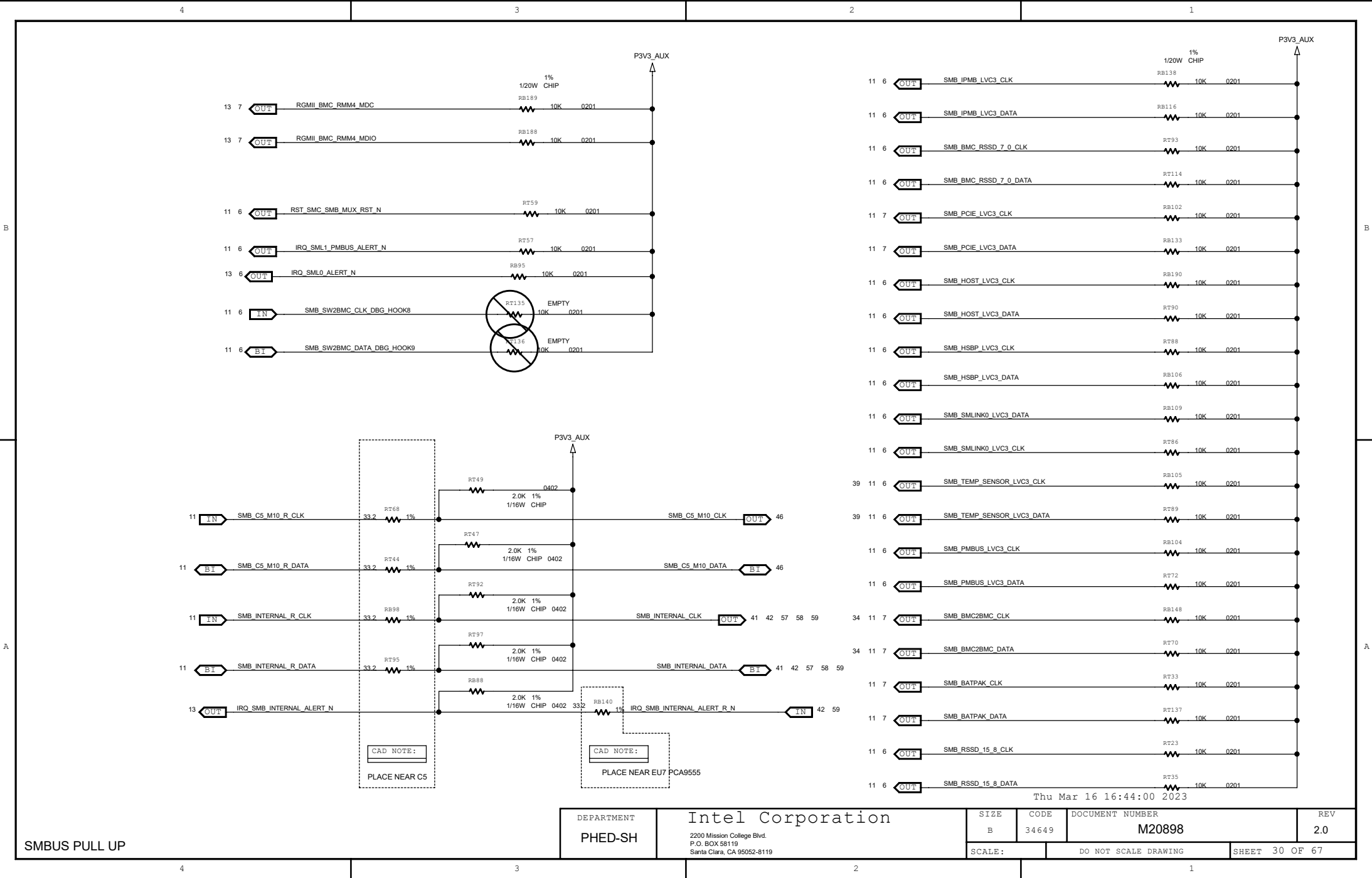
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SCALE:

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SHEET 29 OF 67



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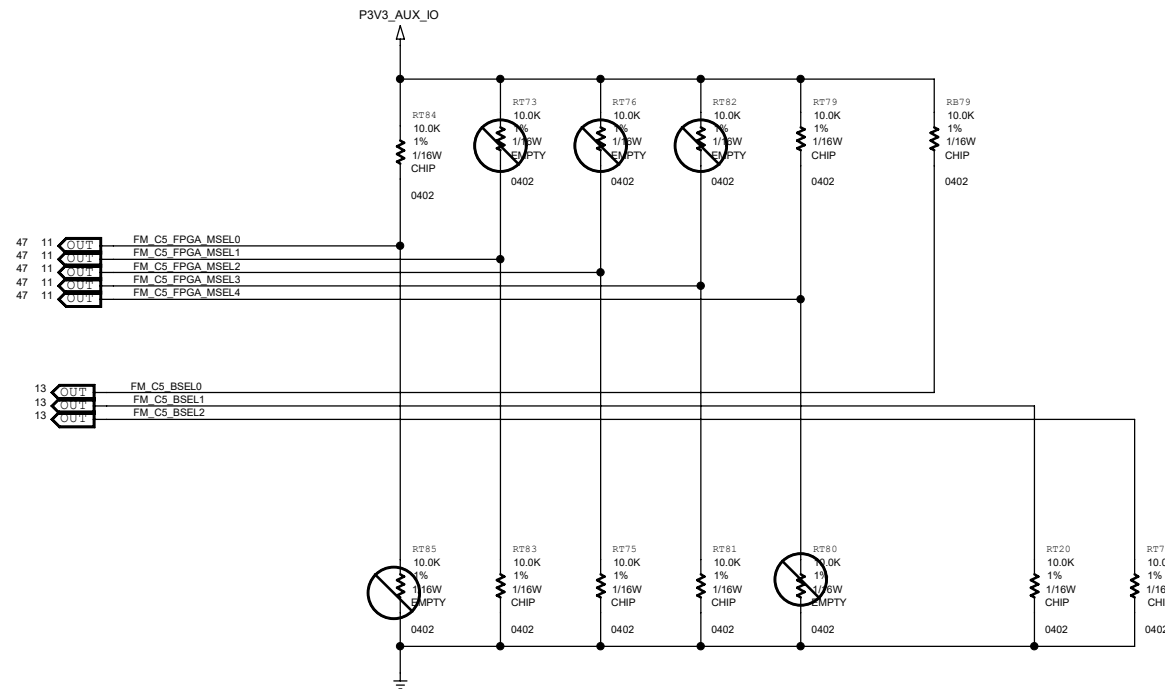
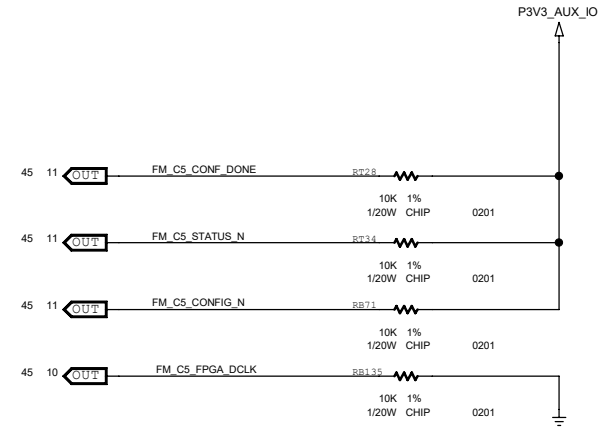
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DESIGN NOTE:

MODE	AES	CDR RATIO	MSEL [4:0]
PS	X	X	10001(DEFAULT)
FPP-16	DISABLE	1	00100
	ENABLE	4	00101
FPP-32	DISABLE	1	01100
	ENABLE	4	01101

DESIGN NOTE:

DEVICE	BSEL [2:0]
FPGA	001 (DEFAULT)



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C5 CONFIG

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SCALE:

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SHEET 31 OF 67

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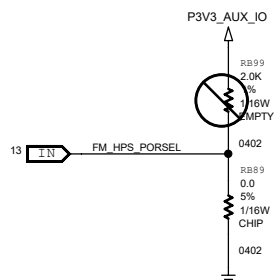


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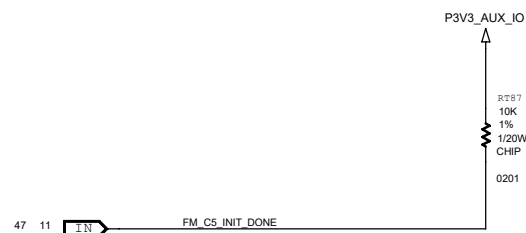
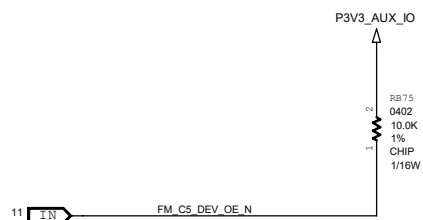
2

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DESIGN NOTE:

PU	FAST POR DELAY (4MS-12MS)
PD(DEFAULT)	STANDARD POR DELAY (100MS-300MS)



C5 MISC

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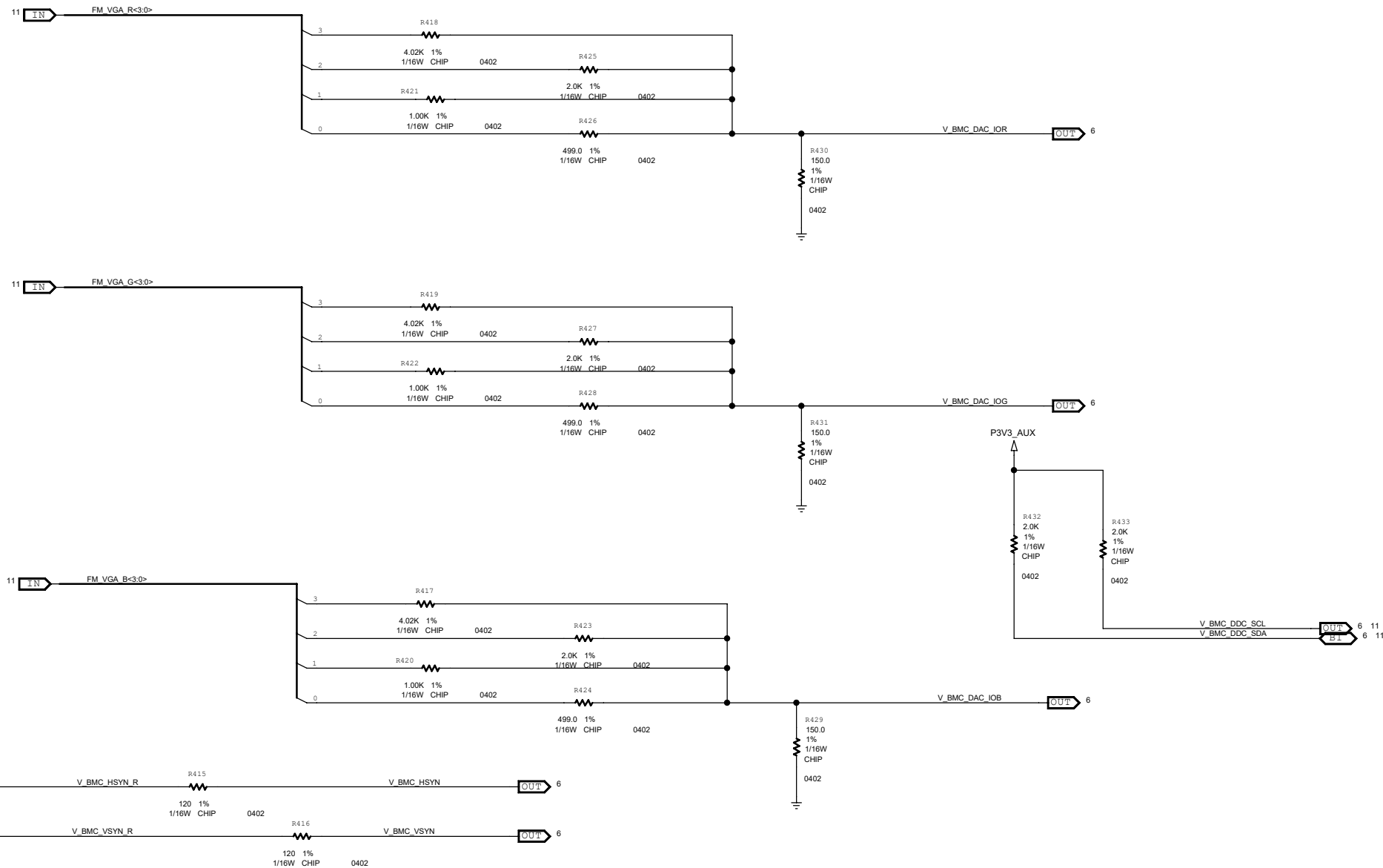
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SCALE:

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SHEET 33 OF 67





VGA

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CODE  
34649

DOCUMENT NUMBER  
M20898

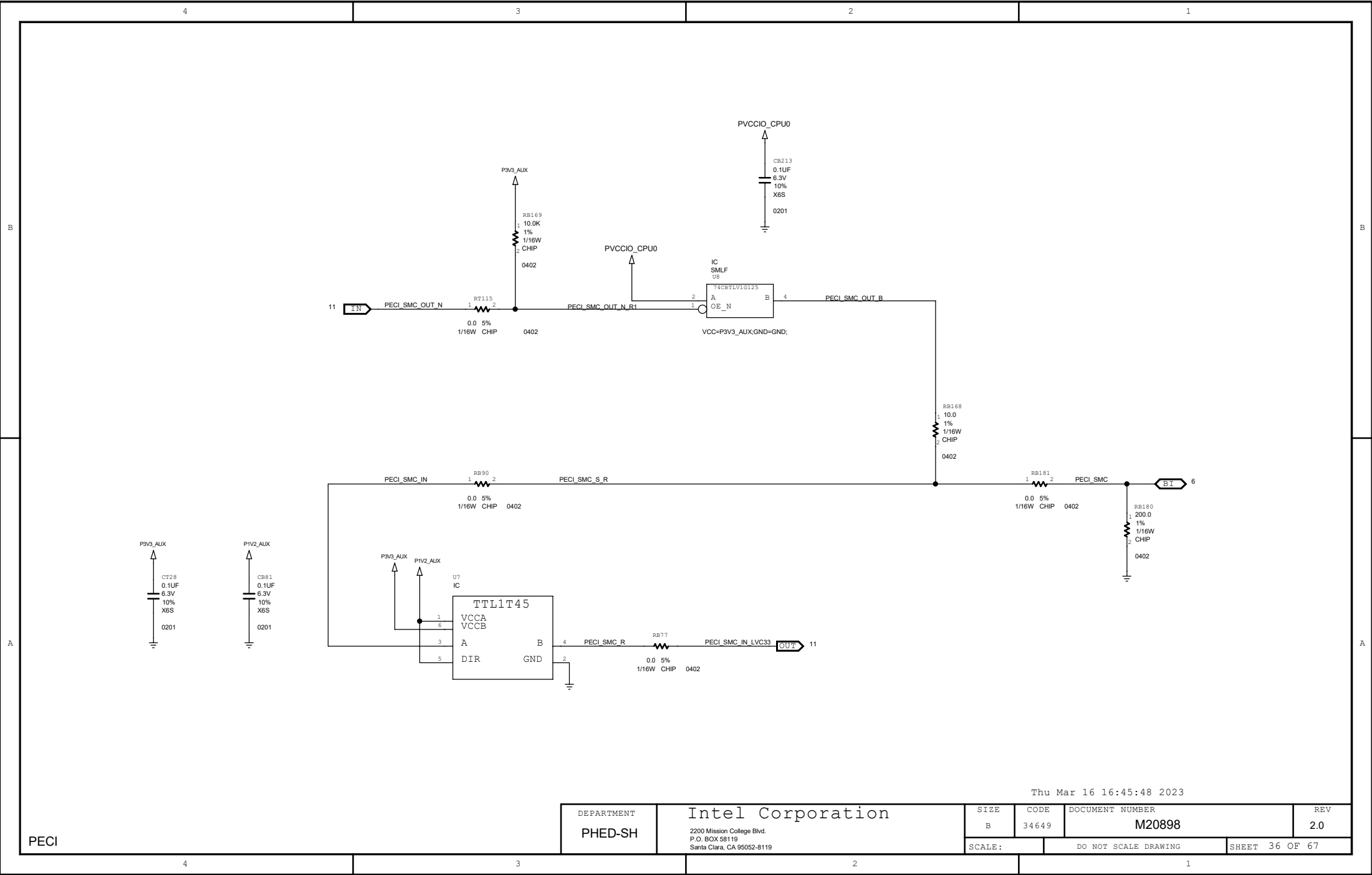
REV  
2.0

SCALE:

DO NOT SCALE DRAWING

SHEET 35 OF 67

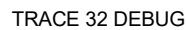
Thu Mar 16 16:46:10 2023



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DEPARTMENT PHED-SH	Intel Corporation 2200 Mission College Blvd. P.O. BOX 58119 Santa Clara, CA 95052-8119		SIZE B	CODE 34649	DOCUMENT NUMBER M20898	REV 2.0
			SCALE:		DO NOT SCALE DRAWING	SHEET 36 OF 67

Thu Mar 16 16:45:48 2023







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Thu Mar 16 16:44:14 2023

DEPARTMENT	Intel Corporation	SIZE	CODE	DOCUMENT NUMBER	REV
PHED-SH	2200 Mission College Blvd. P.O. BOX 58119 Santa Clara, CA 95052-8119	B	34649	M20898	2.0
SCALE:		DO NOT SCALE DRAWING			SHEET 40 OF 67

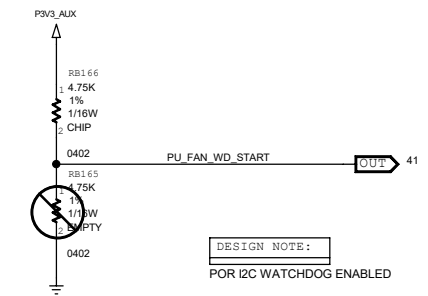
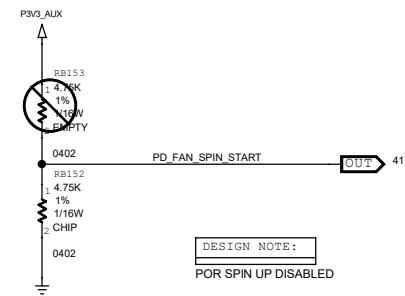
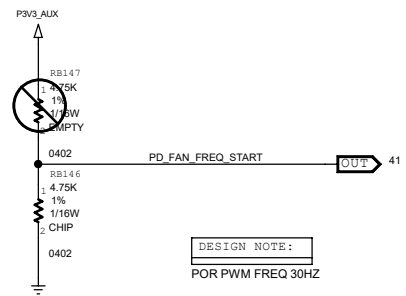
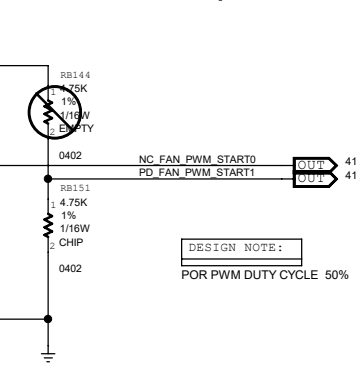
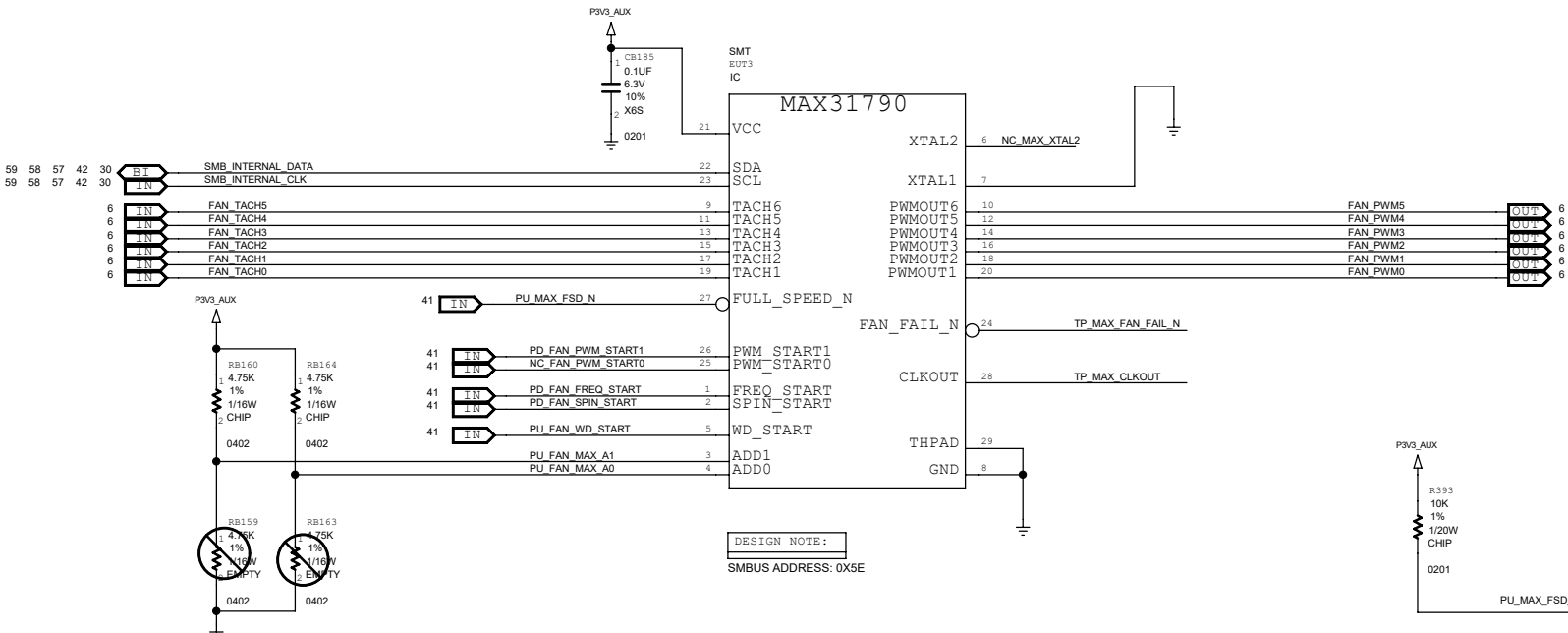
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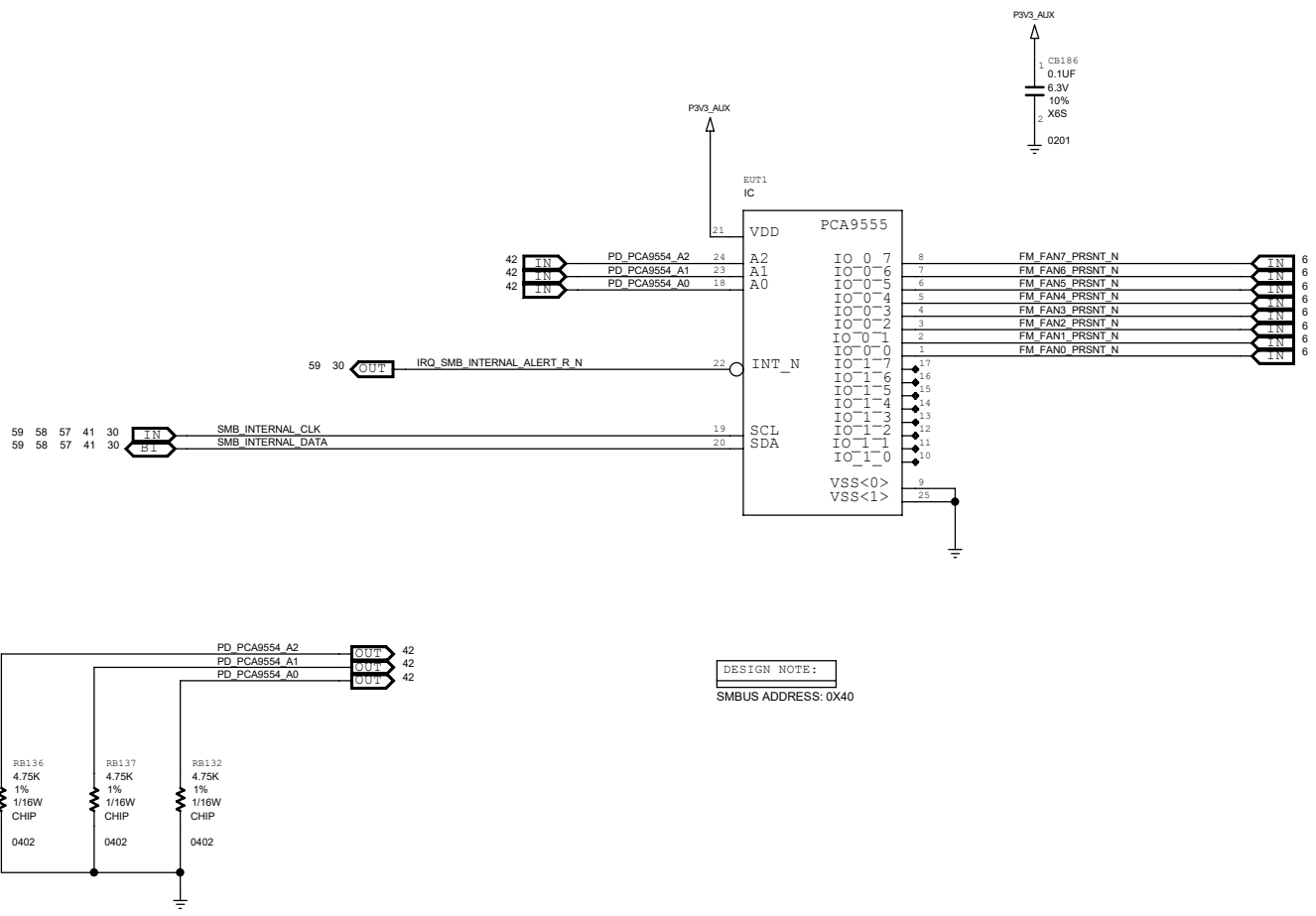




FAN CONTROL

DEPARTMENT	Intel Corporation	SIZE	CODE	DOCUMENT NUMBER	REV
PHED-SH	2200 Mission College Blvd. P.O. BOX 58119 Santa Clara, CA 95052-8119	B	34649	M20898	2.0
SCALE:		DO NOT SCALE DRAWING			SHEET 41 OF 67

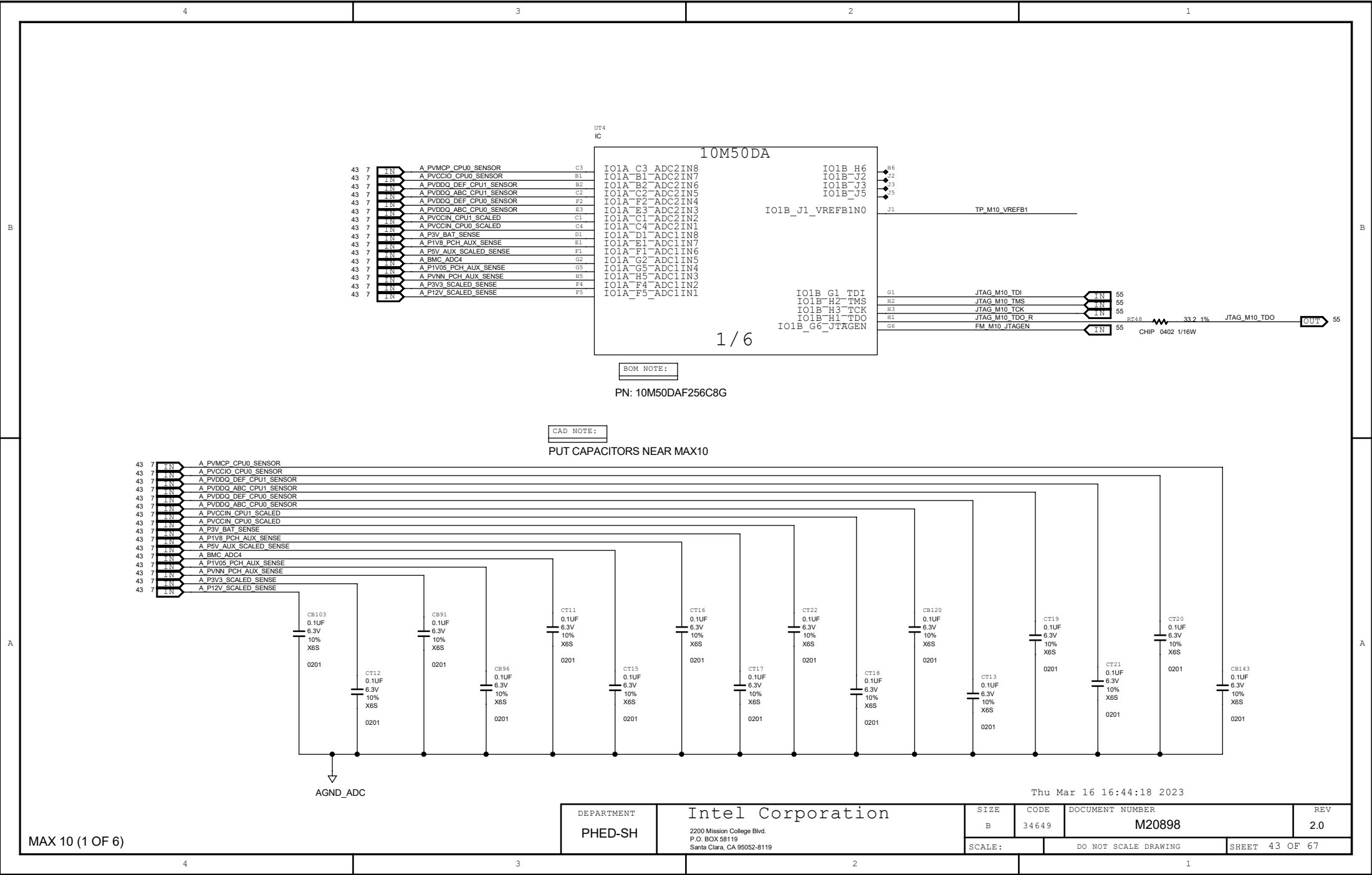
Thu Mar 16 16:44:16 2023

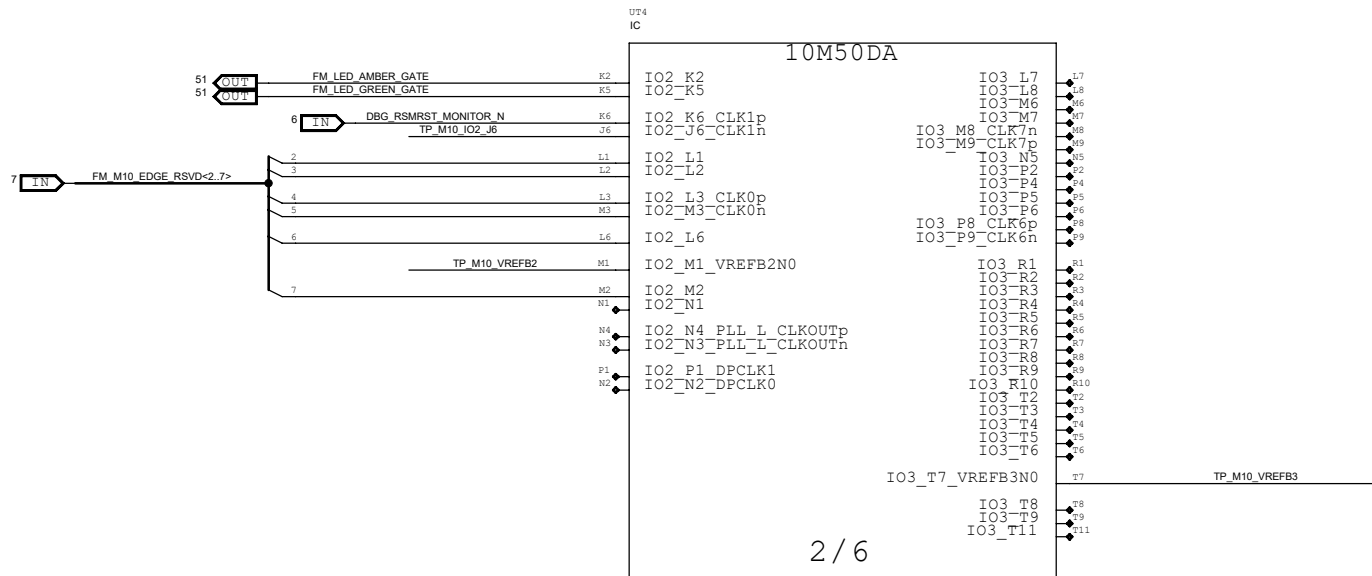


FAN PRESENT & FAULT

Thu Mar 16 16:44:17 2023

DEPARTMENT	Intel Corporation	SIZE	CODE	DOCUMENT NUMBER	REV
PHED-SH	2200 Mission College Blvd. P.O. BOX 58119 Santa Clara, CA 95052-8119	B	34649	M20898	2.0
SCALE:		DO NOT SCALE DRAWING			SHEET 42 OF 67





Thu Mar 16 16:44:19 2023

MAX 10 (2 OF 6)

DEPARTMENT

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Intel Corporation

2200 Mission College Blvd.  
P.O. BOX 58119  
Santa Clara, CA 95052-8119

SIZE

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CODE

34649

DOCUMENT NUMBER

M20898

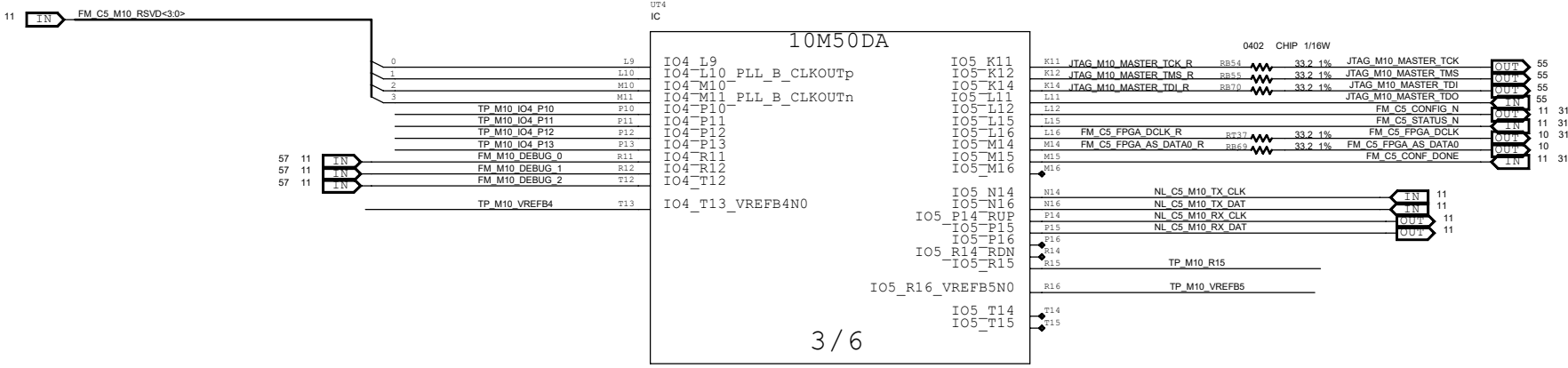
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SCALE:

DO NOT SCALE DRAWING

SHEET 44 OF 67



Thu Mar 16 16:44:20 2023

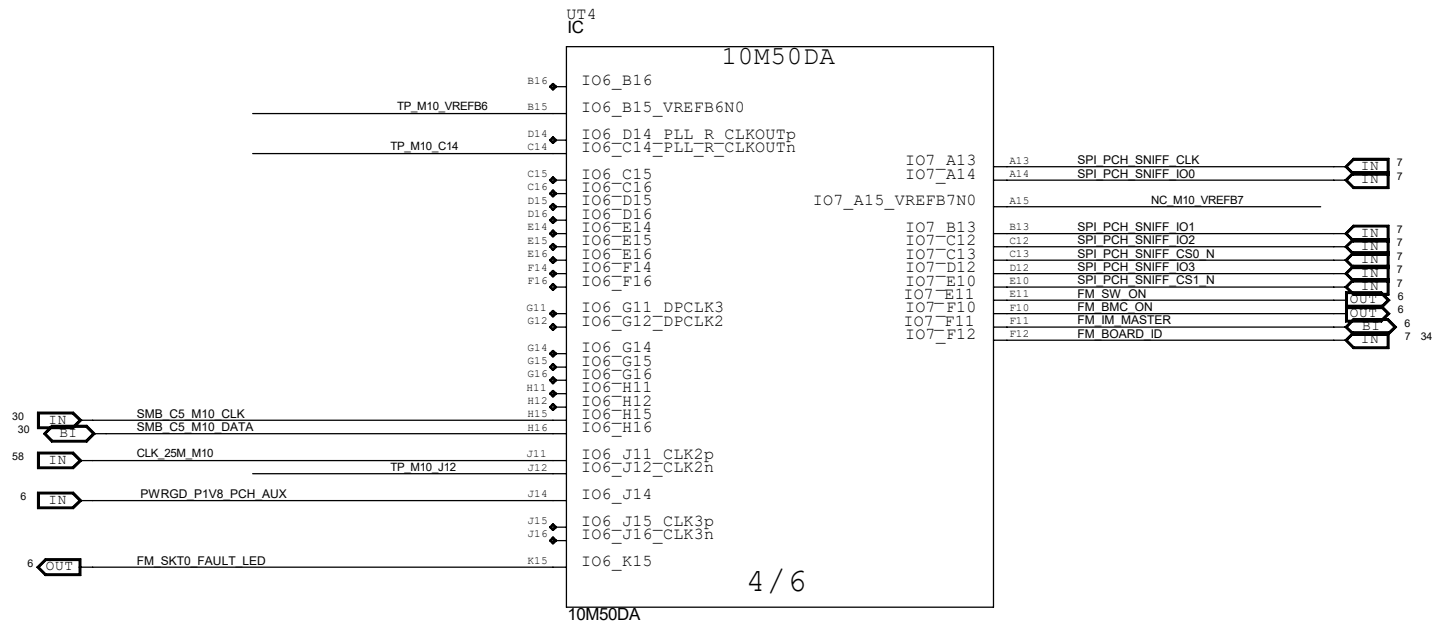
DEPARTMENT	Intel Corporation	SIZE	CODE	DOCUMENT NUMBER	REV
PHED-SH	2200 Mission College Blvd. P.O. BOX 58119 Santa Clara, CA 95052-8119	B	34649	M20898	2.0
SCALE:		DO NOT SCALE DRAWING			SHEET 45 OF 67

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Thu Mar 16 16:44:20 2023

MAX 10 (4 OF 6)

DEPARTMENT  
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Intel Corporation

2200 Mission College Blvd.  
P.O. BOX 58119  
Santa Clara, CA 95052-8119SIZE  
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DOCUMENT NUMBER

M20898

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SCALE:

DO NOT SCALE DRAWING

SHEET 46 OF 67

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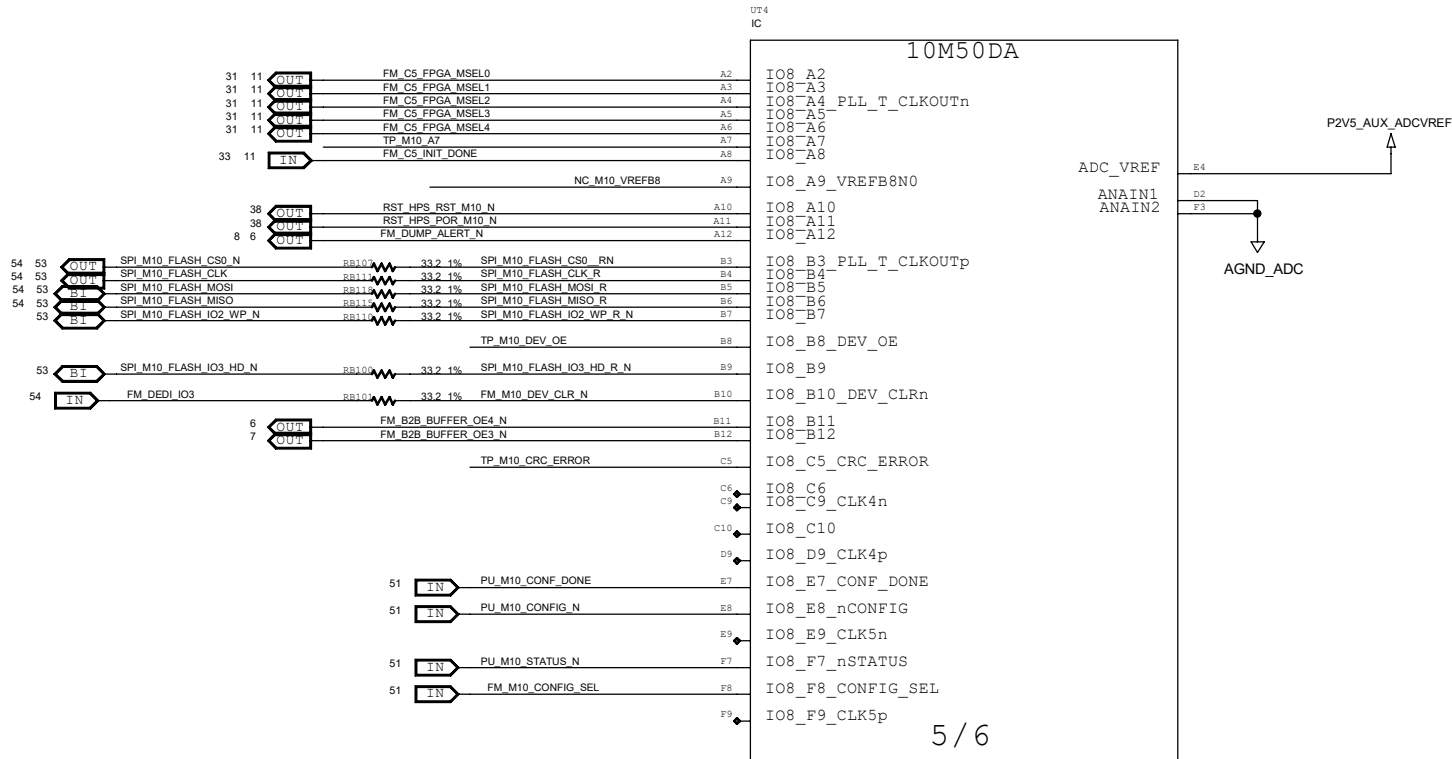
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Thu Mar 16 16:44:21 2023

MAX 10 (5 OF 6)

DEPARTMENT  
PHED-SH

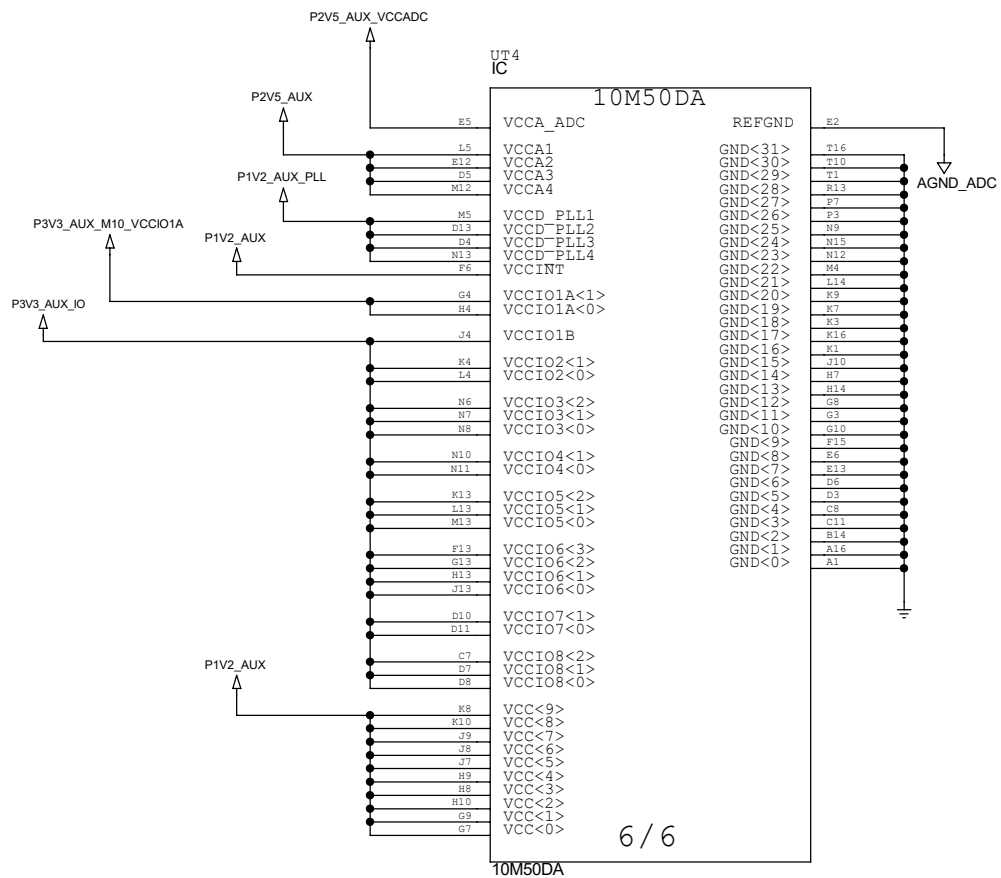
Intel Corporation

2200 Mission College Blvd.  
P.O. BOX 58119  
Santa Clara, CA 95052-8119SIZE  
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M20898REV  
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SCALE:

DO NOT SCALE DRAWING

SHEET 47 OF 67



MAX 10 (6 OF 6)

DEPARTMENT PHED-SH	Intel Corporation 2200 Mission College Blvd. P.O. BOX 58119 Santa Clara, CA 95052-8119	SIZE B	CODE 34649	DOCUMENT NUMBER M20898		REV 2.0
		SCALE:		DO NOT SCALE DRAWING		SHEET 48 OF 67

Thu Mar 16 16:44:22 2023



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Thu Mar 16 16:44:23 2023

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DEPARTMENT

PHED-SH

Intel Corporation

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Santa Clara, CA 95052-8119

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DOCUMENT NUMBER

M20898

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SCALE:

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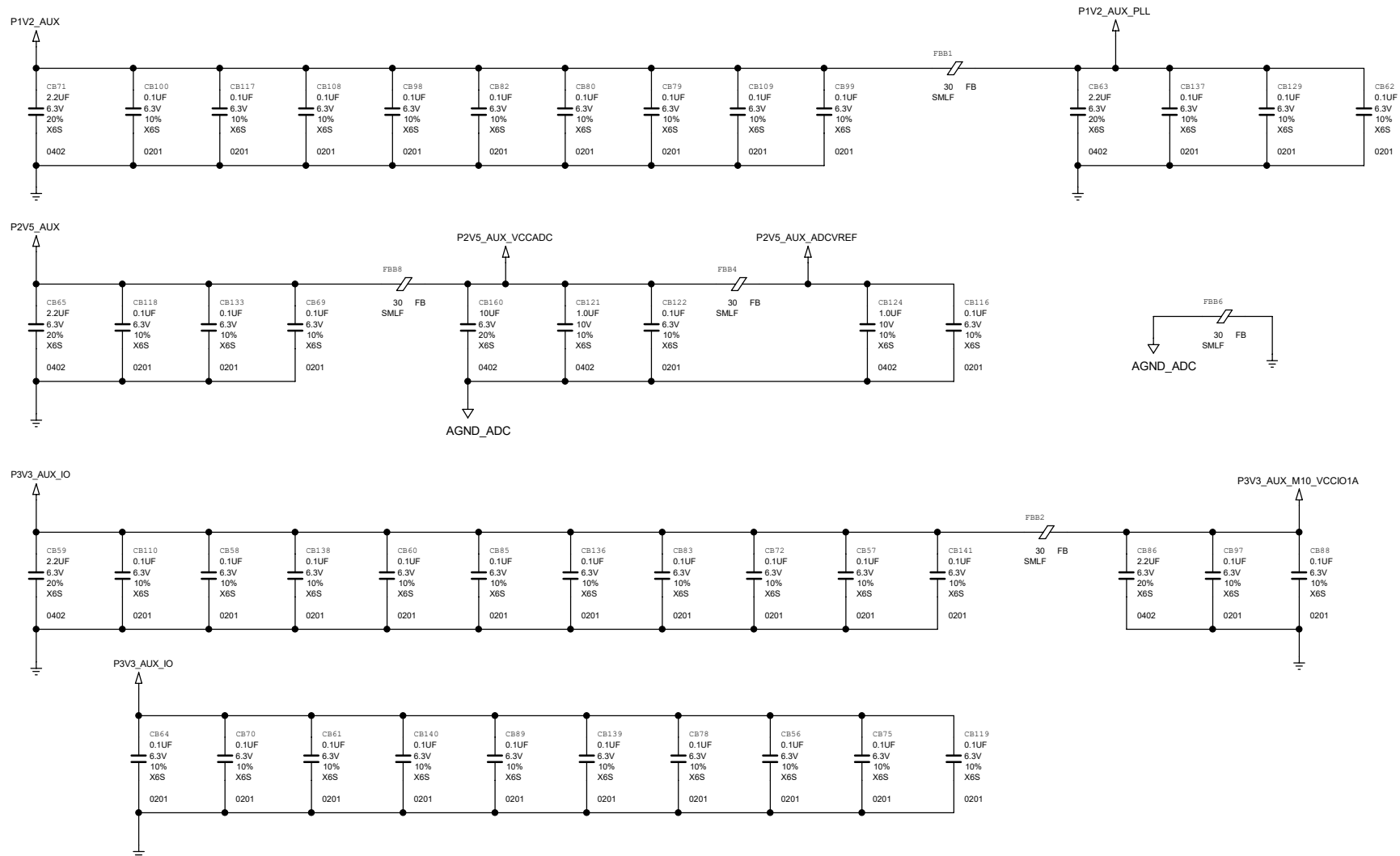
SHEET 49 OF 67

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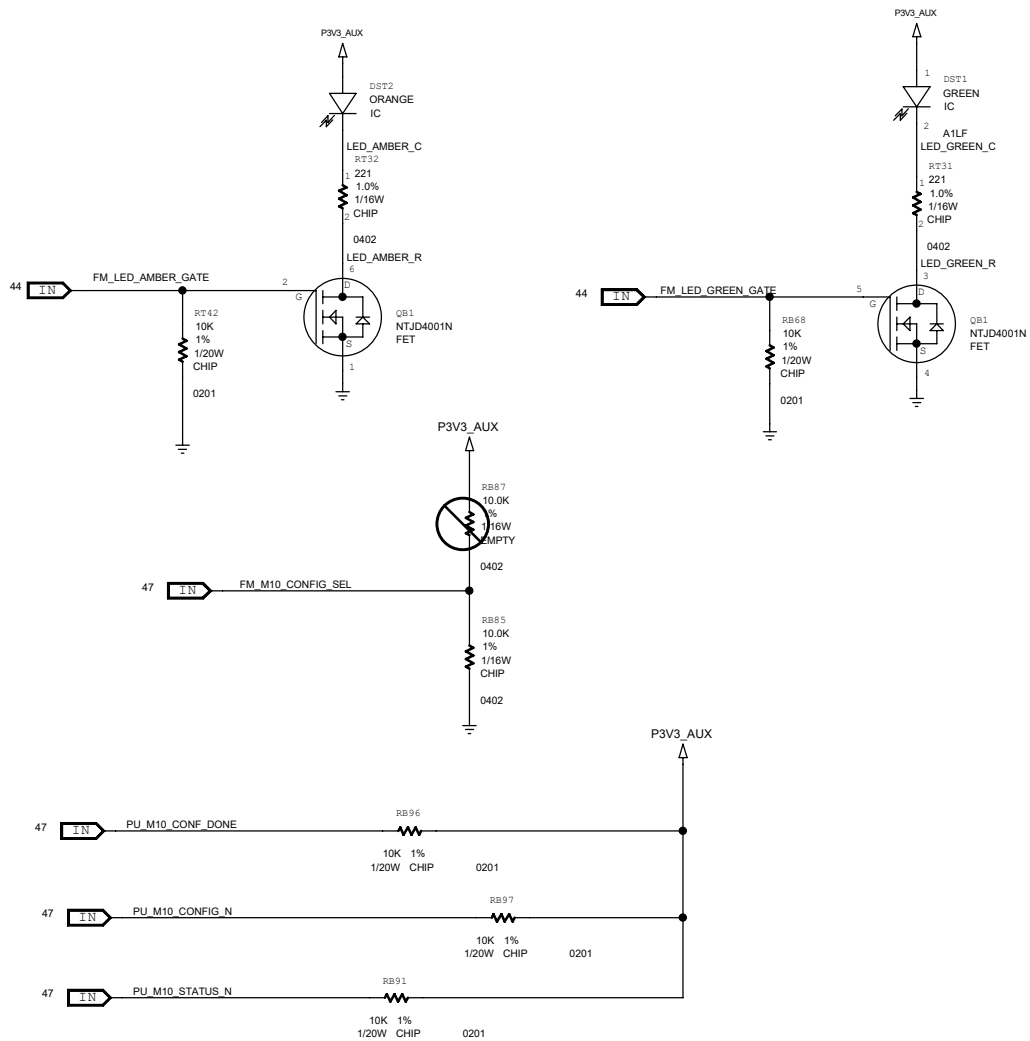
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M10 DECOUPLING CAP

Thu Mar 16 17:22:14 2023

DEPARTMENT	Intel Corporation	SIZE	CODE	DOCUMENT NUMBER	REV
PHED-SH	2200 Mission College Blvd. P.O. BOX 58119 Santa Clara, CA 95052-8119	B	34649	M20898	2.0
SCALE:		DO NOT SCALE DRAWING			SHEET 50 OF 67



M10 MISC

DEPARTMENT  
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Intel Corporation

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P.O. BOX 58119  
Santa Clara, CA 95052-8119

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SCALE:

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SHEET 51 OF 67

Thu Mar 16 17:22:16 2023

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Thu Mar 16 17:22:17 2023

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DEPARTMENT

PHED-SH

Intel Corporation

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P.O. BOX 58119  
Santa Clara, CA 95052-8119

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SCALE:

DO NOT SCALE DRAWING

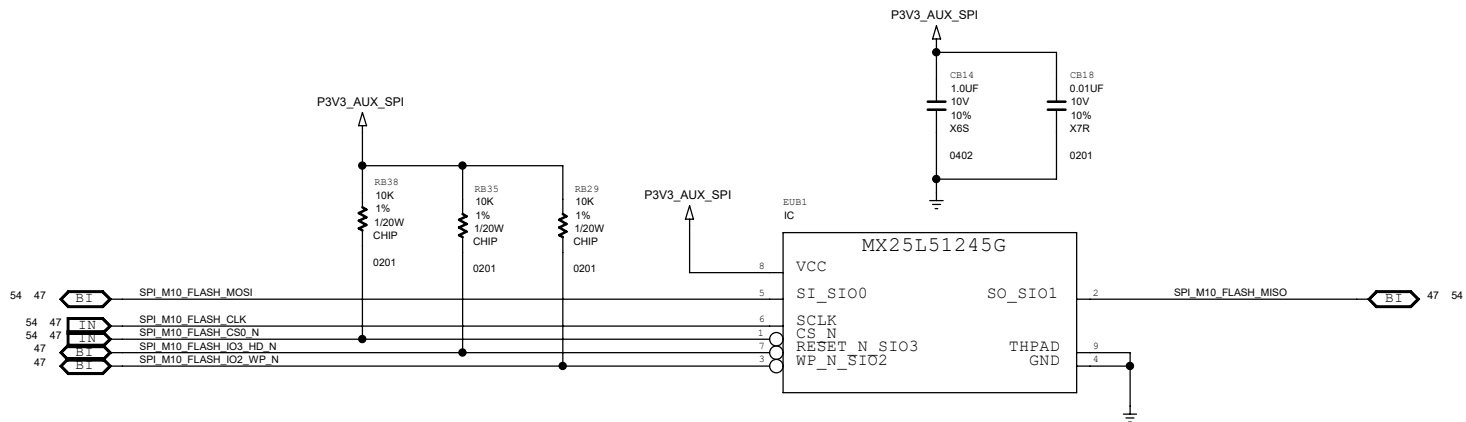
SHEET 52 OF 67

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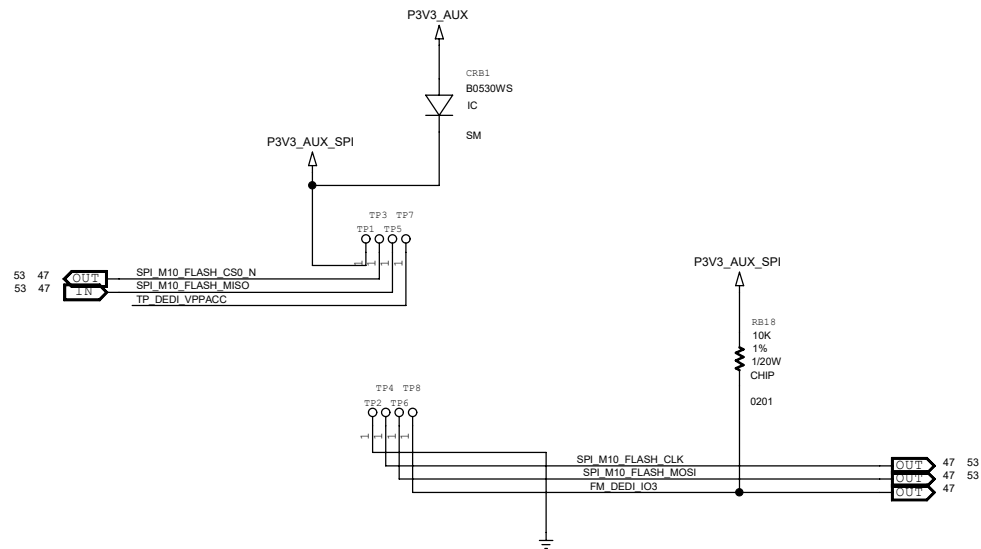
BOM NOTE:

REPLACE WITH MT25QL512ABB1EW9-0SIT

M10 SPI FLASH

Thu Mar 16 17:22:19 2023

DEPARTMENT	Intel Corporation	SIZE	CODE	DOCUMENT NUMBER	REV
PHED-SH	2200 Mission College Blvd. P.O. BOX 58119 Santa Clara, CA 95052-8119	B	34649	M20898	2.0
SCALE:		DO NOT SCALE DRAWING			SHEET 53 OF 67



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DEPARTMENT  
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Intel Corporation

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P.O. BOX 58119  
Santa Clara, CA 95052-8119

SIZE  
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DOCUMENT NUMBER  
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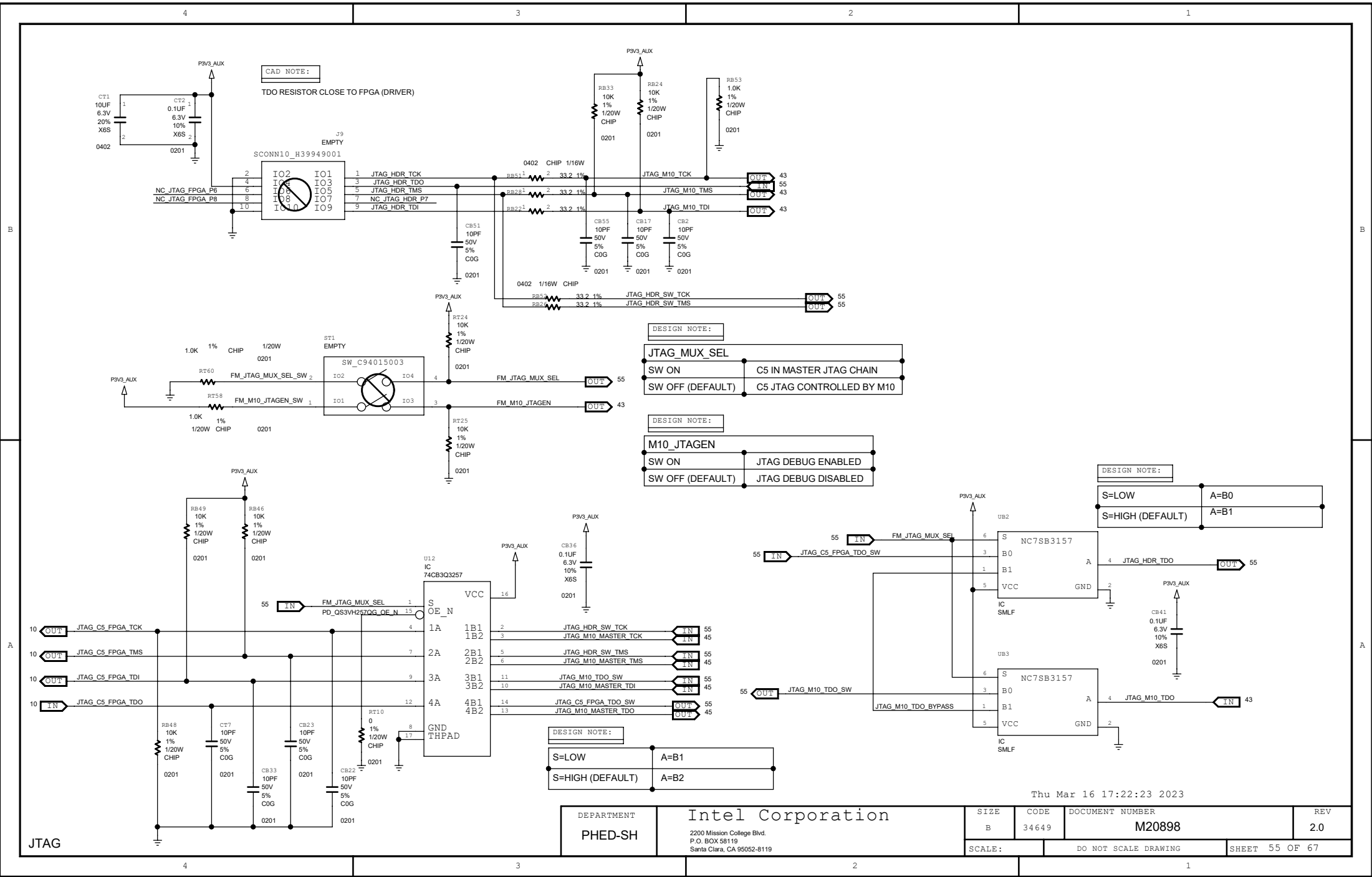
REV  
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SCALE:

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SHEET 54 OF 67

Thu Mar 16 17:22:21 2023



Thu Mar 16 17:22:23 2023

DEPARTMENT PHED-SH	Intel Corporation 2200 Mission College Blvd. P.O. BOX 58119 Santa Clara, CA 95052-8119	SIZE B	CODE 34649	DOCUMENT NUMBER M20898		REV 2.0
		SCALE:		DO NOT SCALE DRAWING		SHEET 55 OF 67

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Thu Mar 16 17:22:23 2023

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DEPARTMENT

PHED-SH

Intel Corporation

2200 Mission College Blvd.  
P.O. BOX 58119  
Santa Clara, CA 95052-8119

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M20898

REV

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SCALE:

DO NOT SCALE DRAWING

SHEET 56 OF 67

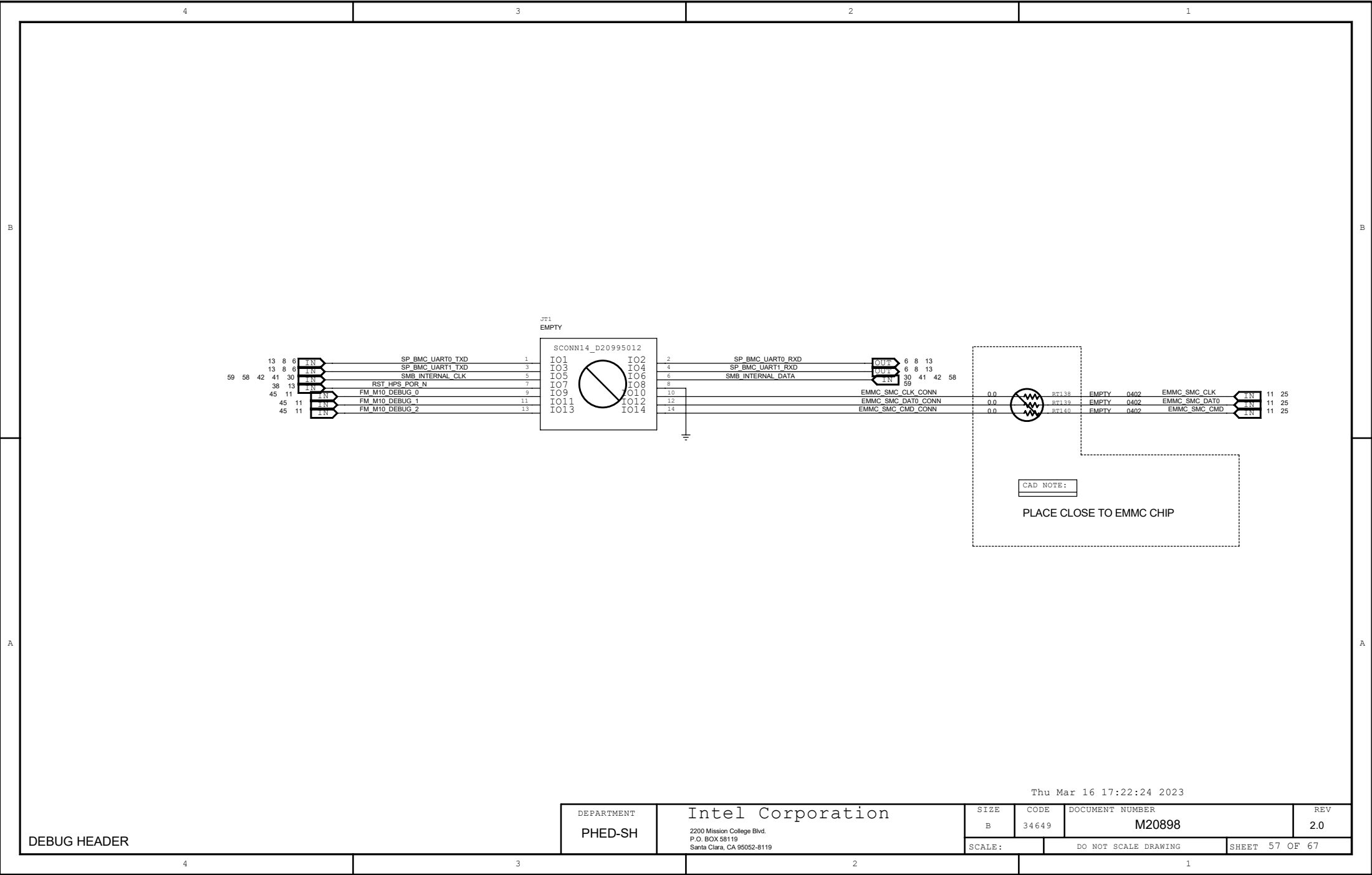
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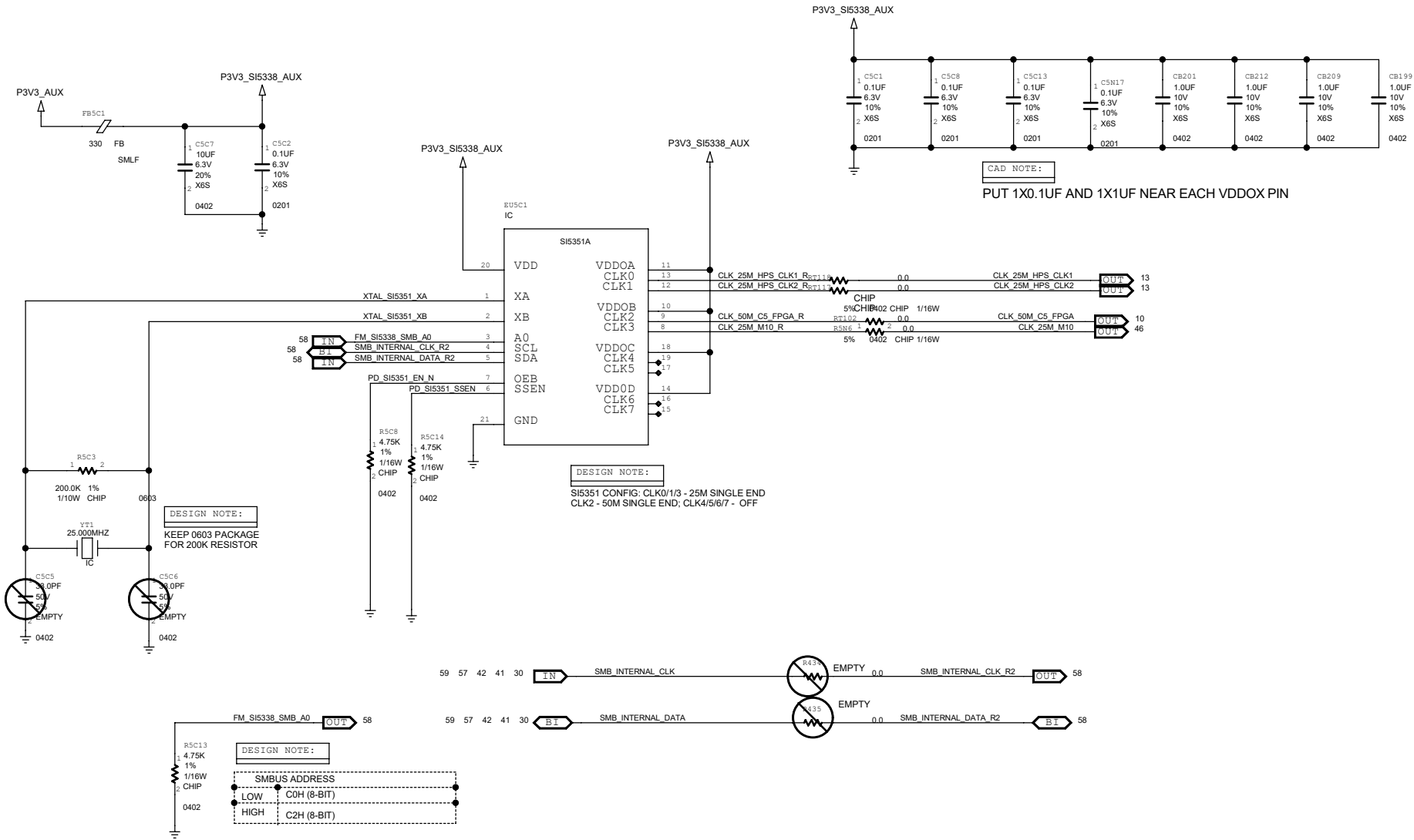




DEBUG HEADER

DEPARTMENT	Intel Corporation	SIZE	CODE	DOCUMENT NUMBER	REV
PHED-SH	2200 Mission College Blvd. P.O. BOX 58119 Santa Clara, CA 95052-8119	B	34649	M20898	2.0
SCALE:		DO NOT SCALE DRAWING			SHEET 57 OF 67

Thu Mar 16 17:22:24 2023



Thu Mar 16 17:22:24 2023

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DEPARTMENT  
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Intel Corporation

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Santa Clara, CA 95052-8119

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SCALE:

DO NOT SCALE DRAWING

SHEET 58 OF 67

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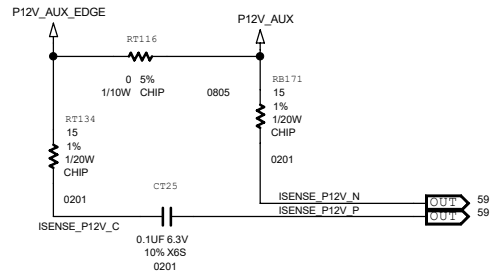
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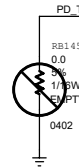
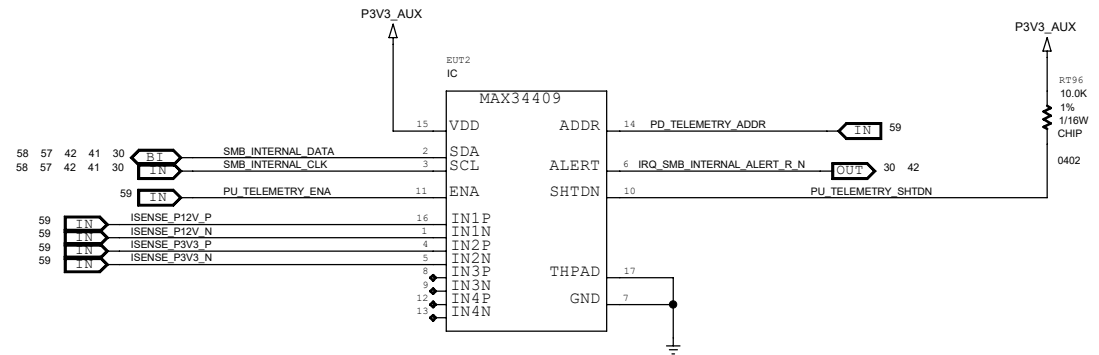
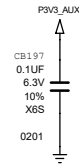
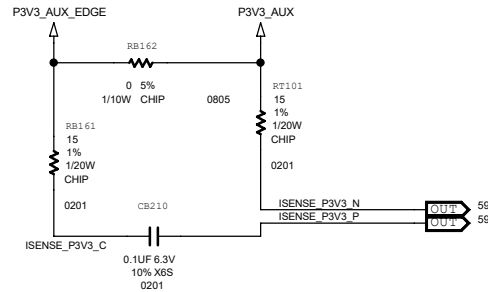
BOM NOTE:

REPLACE RT116 WITH 0805 5MOHM SENSE RESISTOR  
WALSIN WW08RR005FTL



BOM NOTE:

REPLACE RB162 WITH 0805 5MOHM SENSE RESISTOR  
WALSIN WW08RR005FTL



DESIGN NOTE:

SMBUS ADDRESS

OPEN 0X3C (8-BIT)

GND 0X20 (8-BIT)

MORE ADDRESS OPTION REFER TO DATASHEET

TELEMETRY

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M20898

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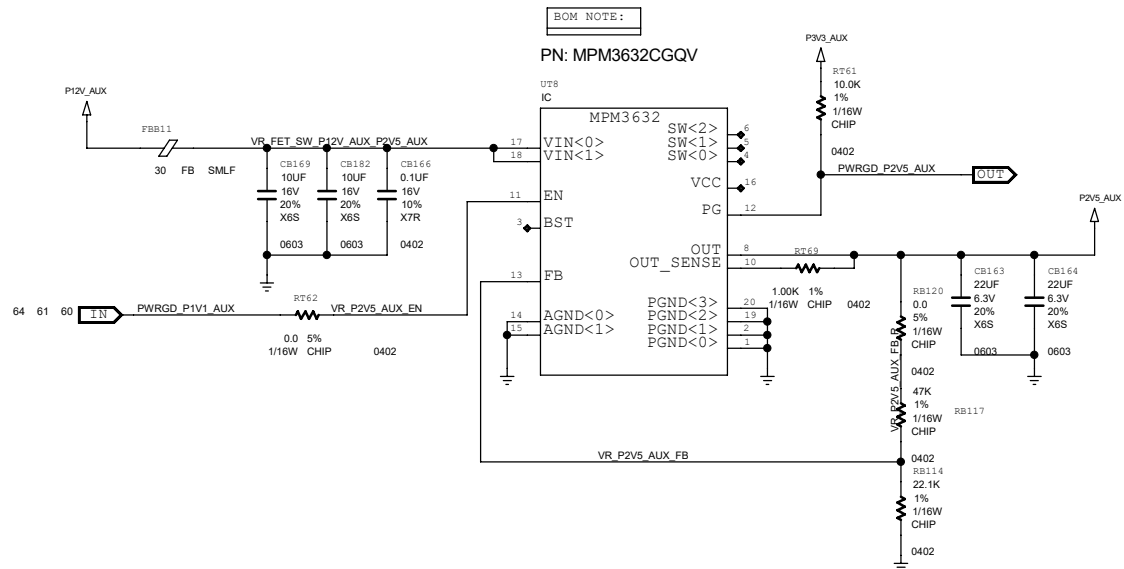
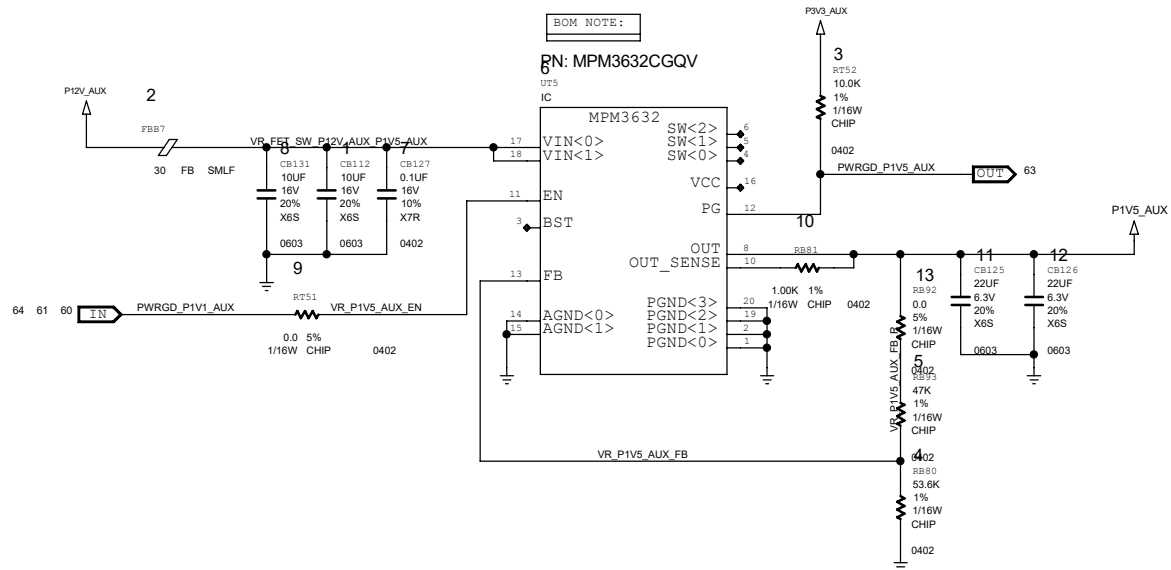
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SCALE:

DO NOT SCALE DRAWING

SHEET 59 OF 67

Thu Mar 16 17:22:26 2023



Thu Mar 16 17:22:27 2023

P1V5\_AUX & P2V5\_AUX

DEPARTMENT  
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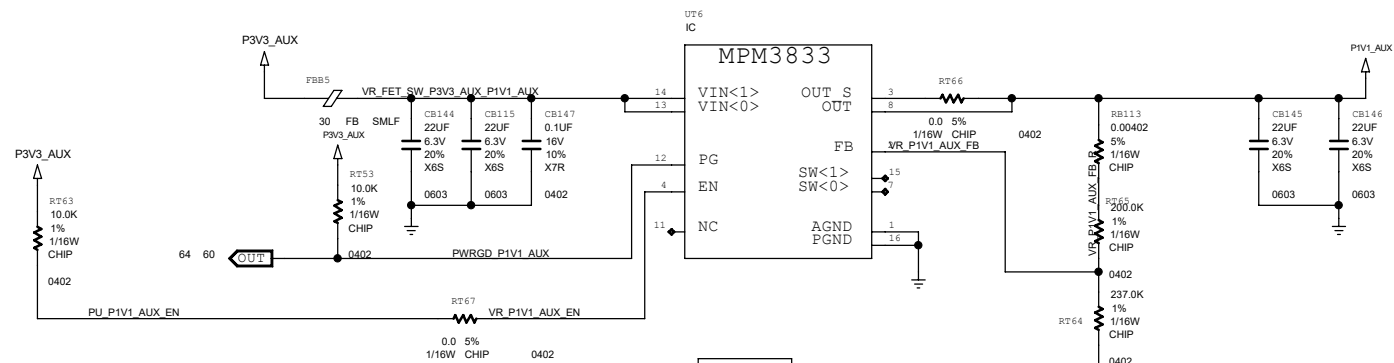
SCALE:

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SHEET 60 OF 67

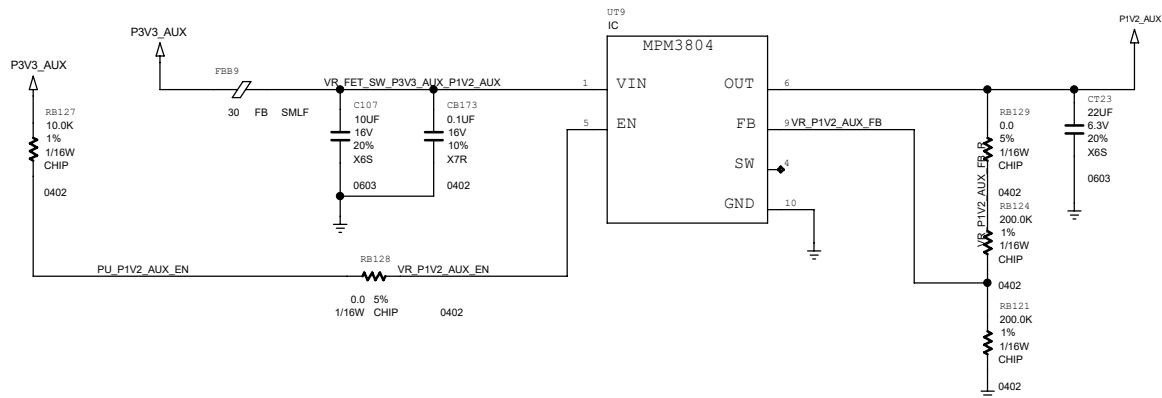
BOM NOTE:

PN: MPM3833GQV



BOM NOTE:

PN: MPM3804GG



Thu Mar 16 17:22:28 2023

P1V1\_AUX &amp; P1V2\_AUX

DEPARTMENT  
PHED-SH

Intel Corporation

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P.O. BOX 58119  
Santa Clara, CA 95052-8119SIZE  
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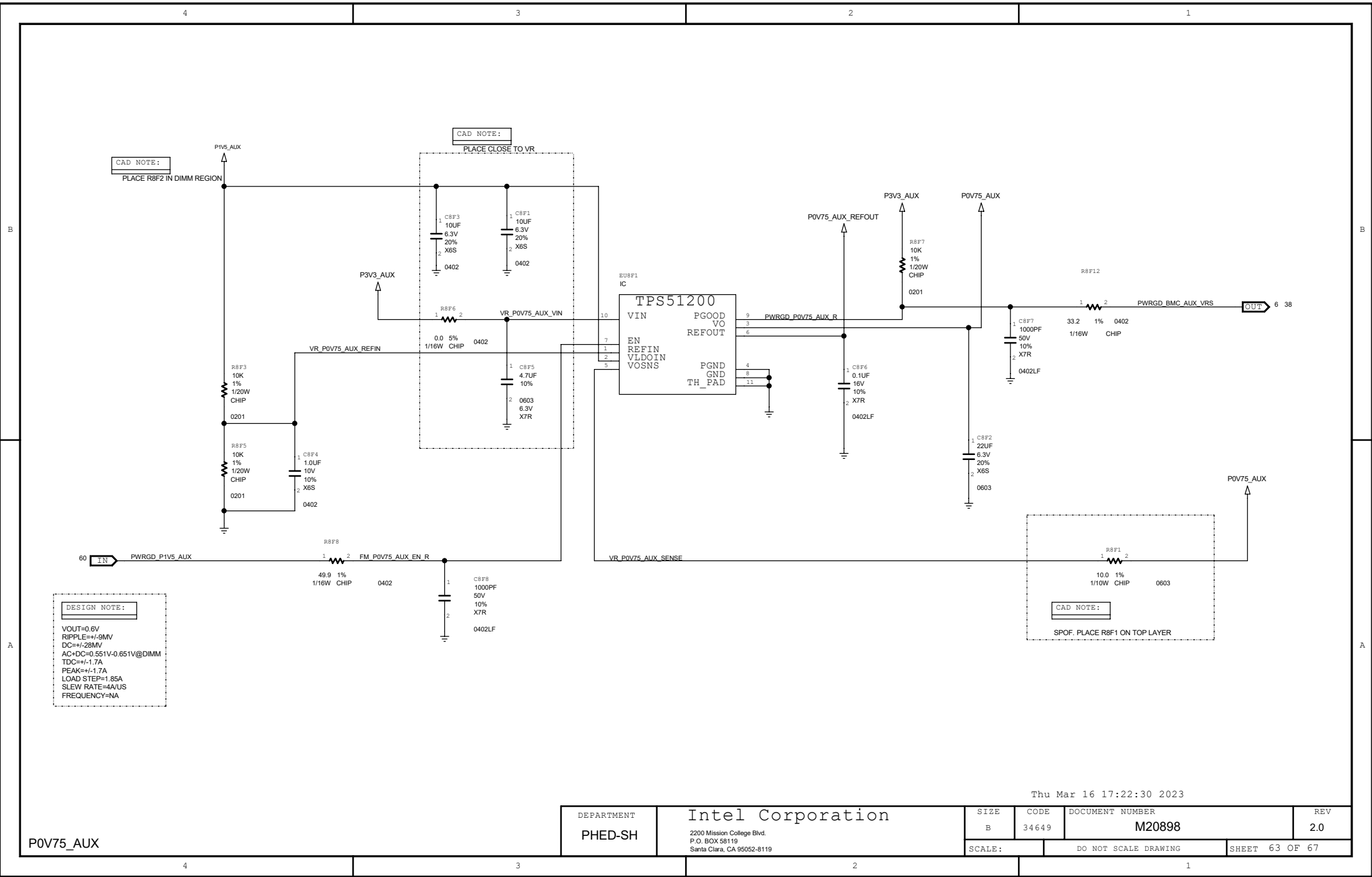
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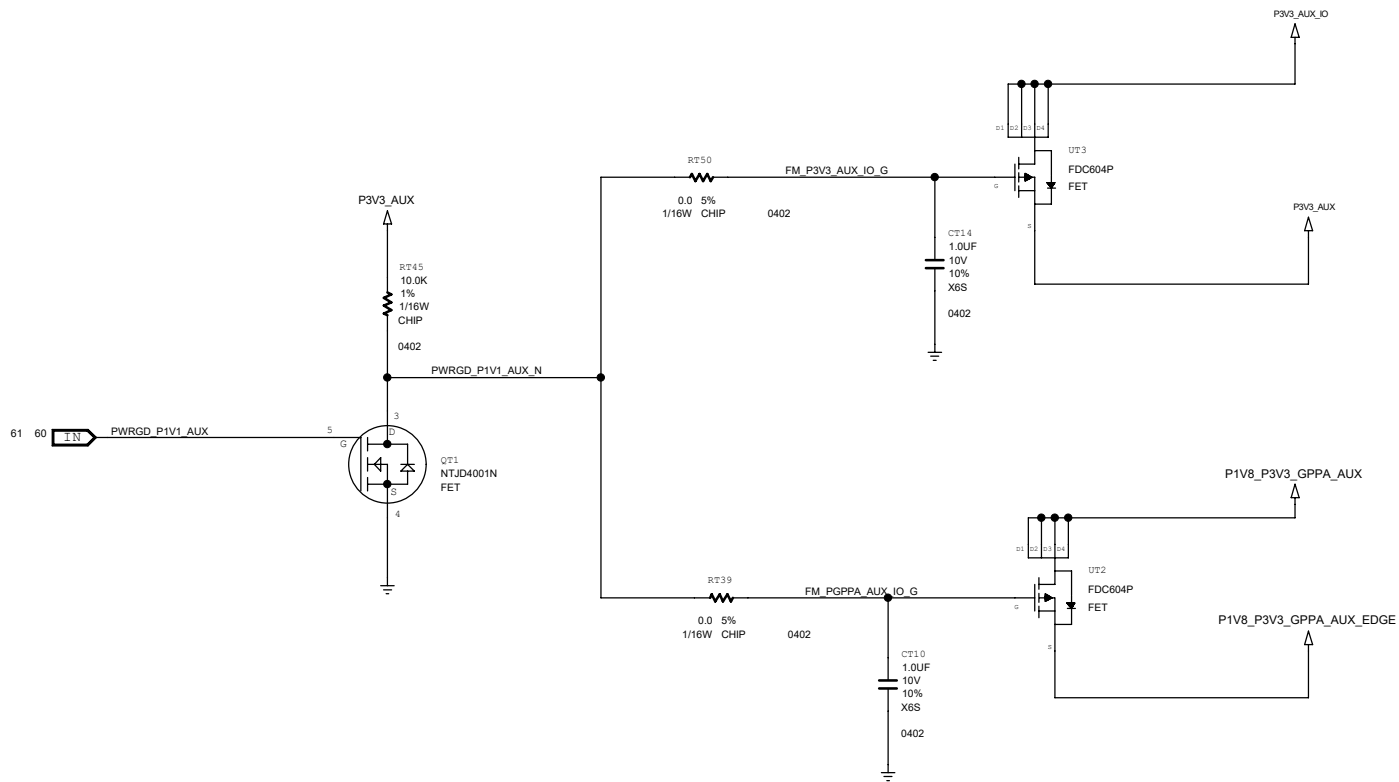
SHEET 61 OF 67



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P3V3 AND P1V8 IO SWITCH

Thu Mar 16 17:22:31 2023

DEPARTMENT  
PHED-SH

Intel Corporation

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SCALE:

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SHEET 64 OF 67



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Thu Mar 16 17:22:32 2023

UNTITLED

DEPARTMENT

PHED-SH

Intel Corporation

2200 Mission College Blvd.  
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DOCUMENT NUMBER

M20898

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SCALE:

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SHEET 65 OF 67

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Thu Mar 16 17:22:33 2023

UNTITLED

DEPARTMENT

PHED-SH

Intel Corporation

2200 Mission College Blvd.  
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DOCUMENT NUMBER

M20898

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SCALE:

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SHEET 66 OF 67

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Thu Mar 16 17:22:34 2023

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PHED-SH

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M20898

REV

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SCALE:

DO NOT SCALE DRAWING

SHEET 67 OF 67

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