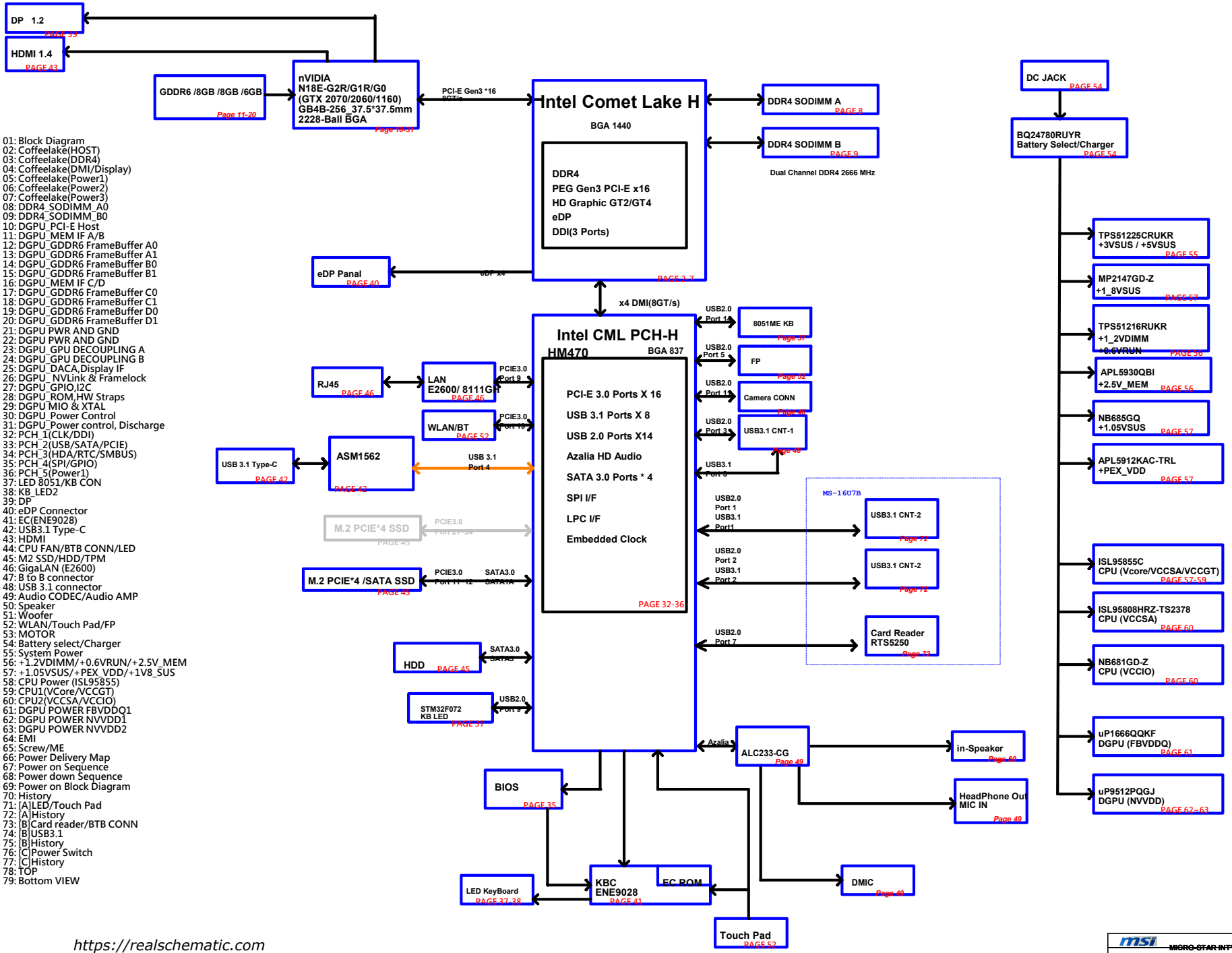
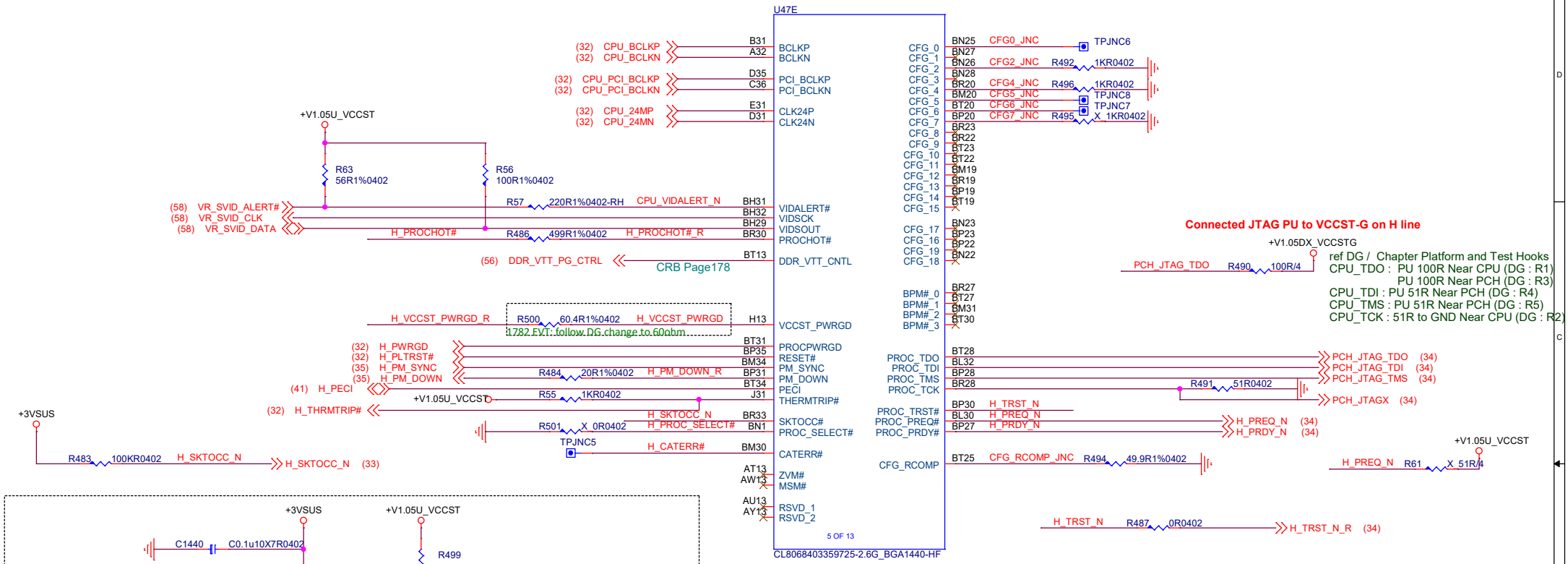
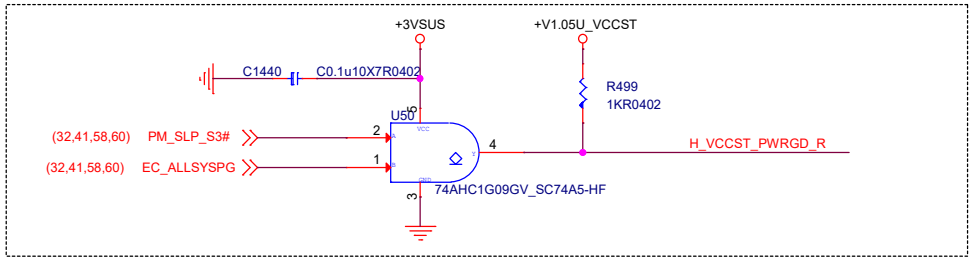
MS-16U7/17E7 Ver: 0A Intel Comet Lake platform



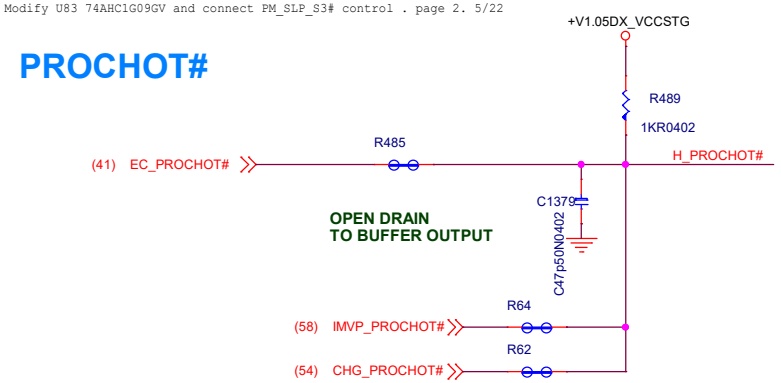
Page 01: Block Diagram
Page 02: Coffeelake(HOST)
Page 03: Coffeelake(DDR4)
Page 04: Coffeelake(DMI/Display)
Page 05: Coffeelake(Power1)
Page 06: Coffeelake(Power2)
Page 07: Coffeelake(Power3)
Page 08: DDR4_SODIMM_A0
Page 09: DDR4_SODIMM_B0
Page 10: DGPU_PCI-E Host
Page 11: DGPU_MEM IF A/B
Page 12: DGPU_GDDR6 FrameBuffer A0
Page 13: DGPU_GDDR6 FrameBuffer A1
Page 14: DGPU_GDDR6 FrameBuffer B0
Page 15: DGPU_GDDR6 FrameBuffer B1
Page 16: DGPU_MEM IF C/D
Page 17: DGPU_GDDR6 FrameBuffer C0
Page 18: DGPU_GDDR6 FrameBuffer C1
Page 19: DGPU_GDDR6 FrameBuffer D0
Page 20: DGPU_GDDR6 FrameBuffer D1
Page 21: DGPU PWR AND GND
Page 22: DGPU PWR AND GND
Page 23: DGPU_GPU DECOUPLING A
Page 24: DGPU_GPU DECOUPLING B
Page 25: DGPU_DACA,Display IF
Page 26: DGPU_ NVLink & Framelock
Page 27: DGPU_GPIO,I2C
Page 28: DGPU_ROM,HW Straps
Page 29: DGPU MIO & XTAL
Page 30: DGPU_Power Control
Page 31: DGPU_Power control, Discharge
Page 32: PCH_1(CLK/DDI)
Page 33: PCH_2(USB/SATA/PCIE)
Page 34: PCH_3(HDA/RTC/SMBUS)
Page 35: PCH_4(SPI/GPIO)
Page 36: PCH_5(Power1)
Page 37: LED 8051/KB CON
Page 38: KB_LED2
Page 39: DP
Page 40: eDP Connector
Page 41: EC(ENE9028)
Page 42: USB3.1 Type-C
Page 43: HDMI
Page 44: CPU FAN/BTB CONN/LED
Page 45: M2 SSD/HDD/TPM
Page 46: GigaLAN (E2600)
Page 47: B to B connector
Page 48: USB 3.1 connector
Page 49: Audio CODEC/Audio AMP
Page 50: Speaker
Page 51: Woofer
Page 52: WLAN/Touch Pad/FP
Page 53: MOTOR
Page 54: Battery select/Charger
Page 55: System Power
Page 56: +1.2VDIMM/+0.6VRUN/+2.5V_MEM
Page 57: +1.05VSUS/+PEX_VDD/+1V8_SUS
Page 58: CPU Power (ISL95855)
Page 59: CPU1(VCore/VCCGT)
Page 60: CPU2(VCCSA/VCCIO)
Page 61: DGPU POWER FBVDDQ1
Page 62: DGPU POWER NVVDD1
Page 63: DGPU POWER NVVDD2
Page 64: EMI
Page 65: Screw/ME
Page 66: Power Delivery Map
Page 67: Power on Sequence
Page 68: Power down Sequence
Page 69: Power on Block Diagram
Page 70: History
Page 71: [A]LED/Touch Pad
Page 72: [A]History
Page 73: [B]Card reader/BTB CONN
Page 74: [B]USB3.1
Page 75: [B]History
Page 76: [C]Power Switch
Page 77: [C]History
Page 78: TOP
Page 79: Bottom VIEW

MICRO-STAR INTL CO.,LTD.
Block Diagram
MS-16U71 / 17E7
0A





Modify U83 74AHC1G09GV and connect PM_SLP_S3# control . page 2. 5/22



MSR Privacy Bit Feature

CFG3	1 = Debug capability is determined by IA32_Debug_Interface_MSR (0xC80) bit[0] setting 0 = IA32_Debug_Interface_MSR (0xC80) bit[0] default setting overridden

PEG DEFER TRAINING	
CFG7	1: (Default) PEG Train immediately following xxRESETB de assertion 0: PEG Wait for BIOS for training

eDP Enable	
CFG4	1 = Disabled 0 = Enabled

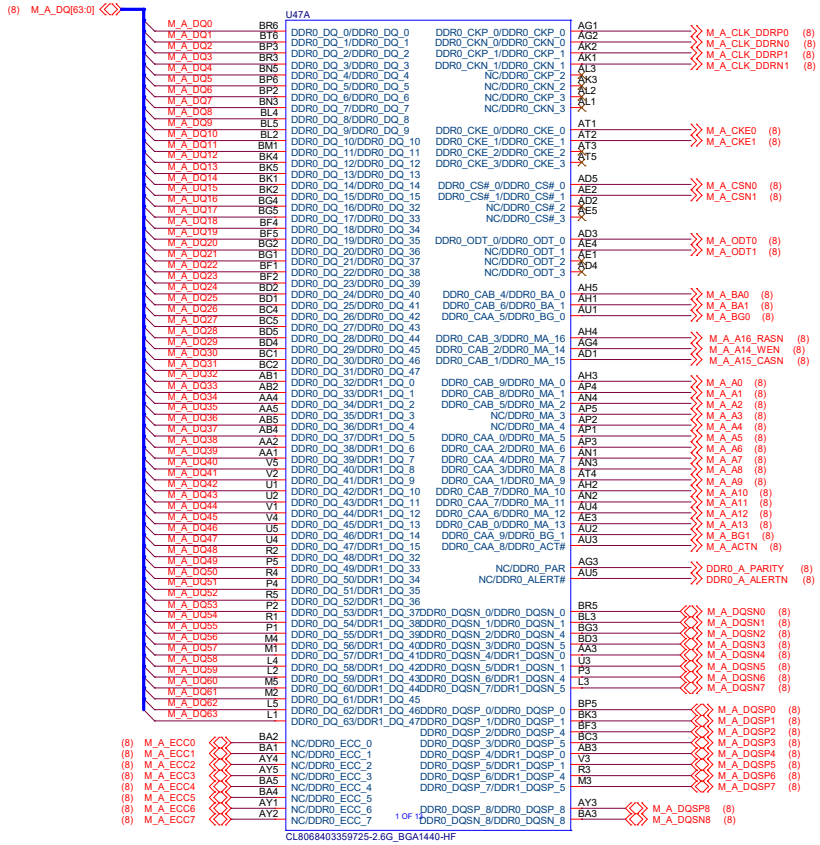
PCIE Express * Static X16 Lane Numbering Reversal	
CFG2	CFG[2]: PCI Express* Static x16 Lane Numbering Reversal. 1 = Normal operation 0 = Lane numbers reversed.

PCI Express* Bifurcation	
CFG[6:5]	00 = 1 x8, 2 x4 PCI Express* 01 = reserved 10 = 2 x8 PCI Express* 11 = 1 x16 PCI Express*

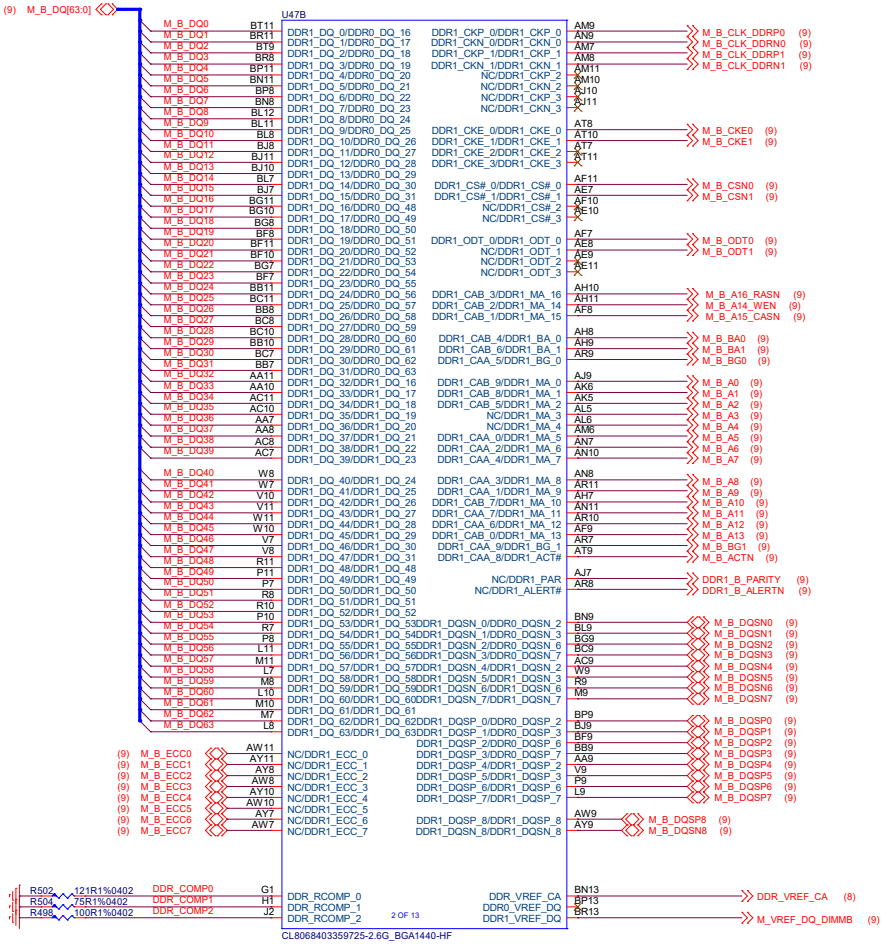
Intel 54492 Page 37,121

Title: Coffeelake(HOST)		
Size: Custom	Document Number: MS-16U71 / 17E7	Rev: 0A
Date: Friday, October 18, 2019	Sheet 2 of 79	

DDR Channel A



DDR Channel B



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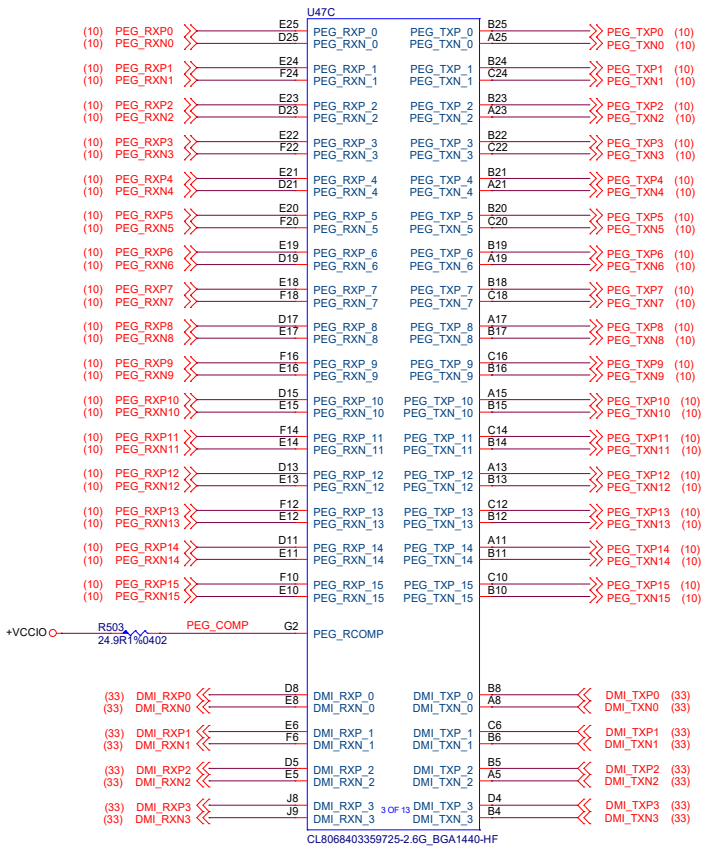
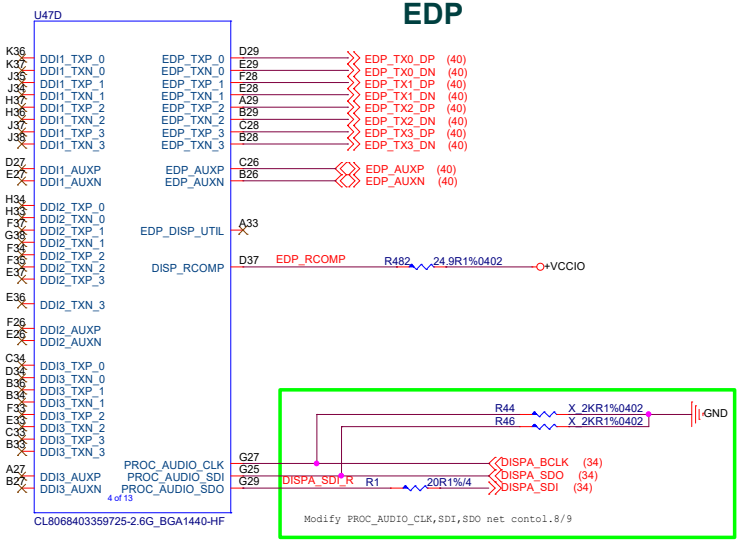
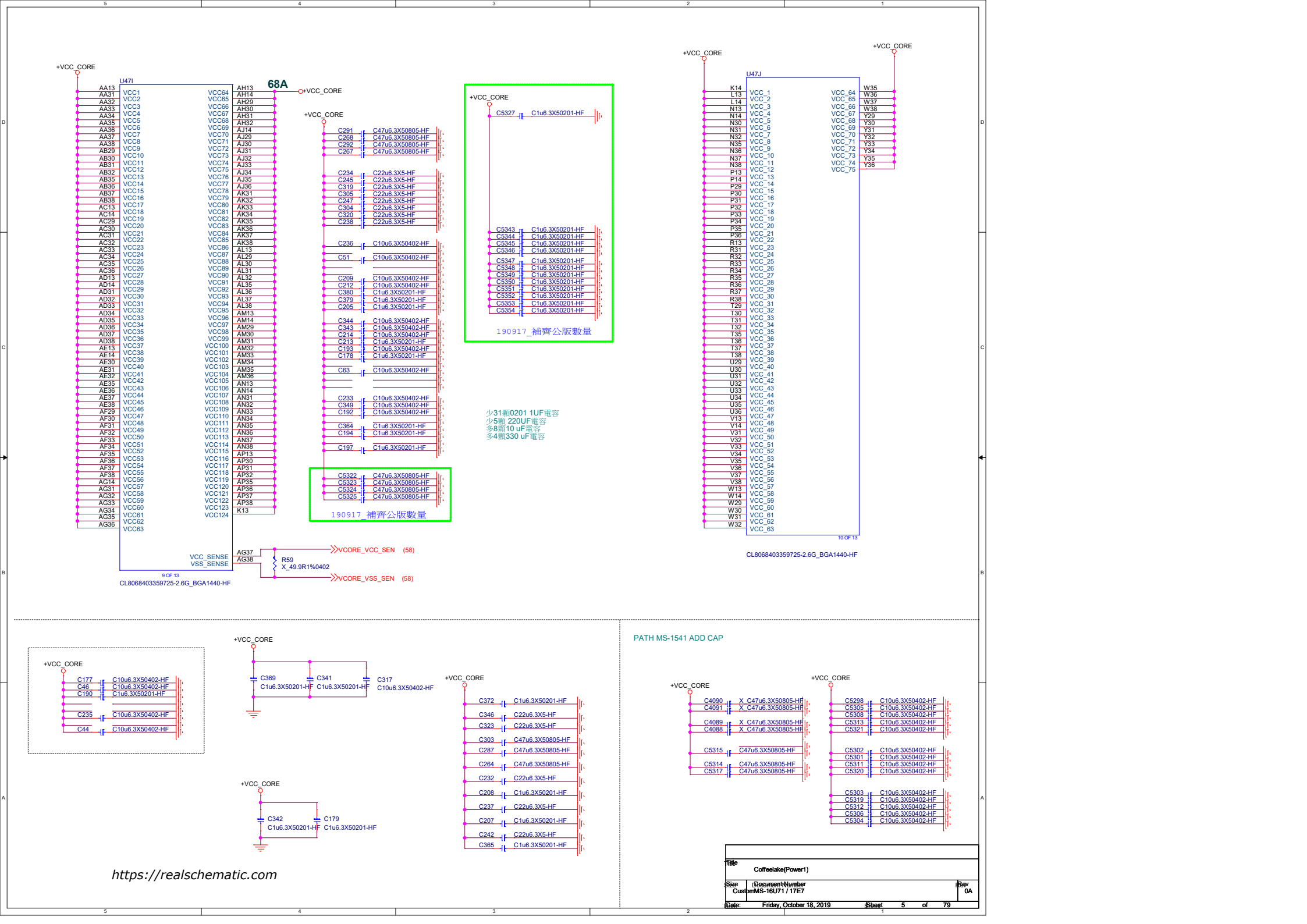
Size: Custom	Document Number: MS-16U71 / 17E7	Rev: 0A
Date: Friday, October 18, 2019	Sheet 3 of 79	



EDP



Title	Coffeelake(DMI/Display)		
Size	Document Number CustomMS-16U71 / 17E7		Rev 0A
Date: Friday, October 18, 2019		Sheet 4 of 79	


+VCC_CORE
U47I
68A
AA13 AA31 AA32 AA33 AA34 AA35 AA36 AA37 AA38 AB29 AB30 AB31 AB32 AB35 AB36 AB37 AB38 AC13 AC14 AC29 AC30 AC31 AC32 AC33 AC34 AC35 AC36 AD13 AD14 AD31 AD32 AD33 AD34 AD35 AD36 AD37 AD38 AE13 AE14 AE30 AE31 AE32 AE35 AE36 AE37 AE38 AF29 AF30 AF31 AF32 AF33 AF34 AF35 AF36 AF37 AF38 AG14 AG31 AG32 AG33 AG34 AG35 AG36
VCC1 VCC2 VCC3 VCC4 VCC5 VCC6 VCC7 VCC8 VCC9 VCC10 VCC11 VCC12 VCC13 VCC14 VCC15 VCC16 VCC17 VCC18 VCC19 VCC20 VCC21 VCC22 VCC23 VCC24 VCC25 VCC26 VCC27 VCC28 VCC29 VCC30 VCC31 VCC32 VCC33 VCC34 VCC35 VCC36 VCC37 VCC38 VCC39 VCC40 VCC41 VCC42 VCC43 VCC44 VCC45 VCC46 VCC47 VCC48 VCC49 VCC50 VCC51 VCC52 VCC53 VCC54 VCC55 VCC56 VCC57 VCC58 VCC59 VCC60 VCC61 VCC62 VCC63
VCC64 VCC65 VCC66 VCC67 VCC68 VCC69 VCC70 VCC71 VCC72 VCC73 VCC74 VCC75 VCC76 VCC77 VCC78 VCC79 VCC80 VCC81 VCC82 VCC83 VCC84 VCC85 VCC86 VCC87 VCC88 VCC89 VCC90 VCC91 VCC92 VCC93 VCC94 VCC95 VCC96 VCC97 VCC98 VCC99 VCC100 VCC101 VCC102 VCC103 VCC104 VCC105 VCC106 VCC107 VCC108 VCC109 VCC110 VCC111 VCC112 VCC113 VCC114 VCC115 VCC116 VCC117 VCC118 VCC119 VCC120 VCC121 VCC122 VCC123 VCC124
AH13 AH14 AH29 AH30 AH31 AH32 AJ14 AJ29 AJ30 AJ31 AJ32 AJ33 AJ34 AJ35 AJ36 AK31 AK32 AK33 AK34 AK35 AK36 AK37 AK38 AL13 AL29 AL30 AL31 AL32 AL35 AL36 AL37 AL38 AM13 AM14 AM29 AM30 AM31 AM32 AM33 AM34 AM35 AM36 AN13 AN14 AN31 AN32 AN33 AN34 AN35 AN36 AN37 AN38 AP13 AP30 AP31 AP32 AP35 AP36 AP37 AP38 K13
9 OF 13
CL8068403359725-2.6G_BGA1440-HF
VCC_SENSE
VSS_SENSE
AG37
AG38
R59
X_49.9R1%0402
VCORE_VCC_SEN (58)
VCORE_VSS_SEN (58)
C291 C47u6.3X50805-HF
C268 C47u6.3X50805-HF
C292 C47u6.3X50805-HF
C267 C47u6.3X50805-HF
C234 C22u6.3X5-HF
C245 C22u6.3X5-HF
C319 C22u6.3X5-HF
C305 C22u6.3X5-HF
C247 C22u6.3X5-HF
C304 C22u6.3X5-HF
C320 C22u6.3X5-HF
C238 C22u6.3X5-HF
C236 C10u6.3X50402-HF
C51 C10u6.3X50402-HF
C209 C10u6.3X50402-HF
C212 C10u6.3X50402-HF
C380 C1u6.3X50201-HF
C379 C1u6.3X50201-HF
C205 C1u6.3X50201-HF
C344 C10u6.3X50402-HF
C343 C10u6.3X50402-HF
C214 C10u6.3X50402-HF
C213 C1u6.3X50201-HF
C193 C10u6.3X50402-HF
C178 C1u6.3X50201-HF
C63 C10u6.3X50402-HF
C233 C10u6.3X50402-HF
C349 C10u6.3X50402-HF
C192 C10u6.3X50402-HF
C364 C1u6.3X50201-HF
C194 C1u6.3X50201-HF
C197 C1u6.3X50201-HF
C5322 C47u6.3X50805-HF
C5323 C47u6.3X50805-HF
C5324 C47u6.3X50805-HF
C5325 C47u6.3X50805-HF
190917_補齊公版數量
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C5343 C1u6.3X50201-HF
C5344 C1u6.3X50201-HF
C5345 C1u6.3X50201-HF
C5346 C1u6.3X50201-HF
C5347 C1u6.3X50201-HF
C5348 C1u6.3X50201-HF
C5349 C1u6.3X50201-HF
C5350 C1u6.3X50201-HF
C5351 C1u6.3X50201-HF
C5352 C1u6.3X50201-HF
C5353 C1u6.3X50201-HF
C5354 C1u6.3X50201-HF
190917_補齊公版數量
少31顆0201 1UF電容
少5顆 220UF電容
多8顆10 uF電容
多4顆330 uF電容
U47J
K14 L13 L14 N13 N14 N30 N31 N32 N35 N36 N37 N38 P13 P14 P29 P30 P31 P32 P33 P34 P35 P36 R13 R31 R32 R33 R34 R35 R36 R37 R38 T29 T30 T31 T32 T35 T36 T37 T38 U29 U30 U31 U32 U33 U34 U35 U36 V13 V14 V31 V32 V33 V34 V35 V36 V37 V38 W13 W14 W29 W30 W31 W32
VCC_1 VCC_2 VCC_3 VCC_4 VCC_5 VCC_6 VCC_7 VCC_8 VCC_9 VCC_10 VCC_11 VCC_12 VCC_13 VCC_14 VCC_15 VCC_16 VCC_17 VCC_18 VCC_19 VCC_20 VCC_21 VCC_22 VCC_23 VCC_24 VCC_25 VCC_26 VCC_27 VCC_28 VCC_29 VCC_30 VCC_31 VCC_32 VCC_33 VCC_34 VCC_35 VCC_36 VCC_37 VCC_38 VCC_39 VCC_40 VCC_41 VCC_42 VCC_43 VCC_44 VCC_45 VCC_46 VCC_47 VCC_48 VCC_49 VCC_50 VCC_51 VCC_52 VCC_53 VCC_54 VCC_55 VCC_56 VCC_57 VCC_58 VCC_59 VCC_60 VCC_61 VCC_62 VCC_63
VCC_64 VCC_65 VCC_66 VCC_67 VCC_68 VCC_69 VCC_70 VCC_71 VCC_72 VCC_73 VCC_74 VCC_75
W35 W36 W37 W38 Y29 Y30 Y31 Y32 Y33 Y34 Y35 Y36
10 OF 13
CL8068403359725-2.6G_BGA1440-HF
C177 C10u6.3X50402-HF
C46 C10u6.3X50402-HF
C190 C1u6.3X50201-HF
C235 C10u6.3X50402-HF
C44 C10u6.3X50402-HF
C369 C1u6.3X50201-HF
C341 C1u6.3X50201-HF
C317 C10u6.3X50402-HF
C342 C1u6.3X50201-HF
C179 C1u6.3X50201-HF
C372 C1u6.3X50201-HF
C346 C22u6.3X5-HF
C323 C22u6.3X5-HF
C303 C47u6.3X50805-HF
C287 C47u6.3X50805-HF
C264 C47u6.3X50805-HF
C232 C22u6.3X5-HF
C208 C1u6.3X50201-HF
C237 C22u6.3X5-HF
C207 C1u6.3X50201-HF
C242 C22u6.3X5-HF
C365 C1u6.3X50201-HF
PATH MS-1541 ADD CAP
C4090 X_C47u6.3X50805-HF
C4091 X_C47u6.3X50805-HF
C4089 X_C47u6.3X50805-HF
C4088 X_C47u6.3X50805-HF
C5315 C47u6.3X50805-HF
C5314 C47u6.3X50805-HF
C5317 C47u6.3X50805-HF
C5298 C10u6.3X50402-HF
C5305 C10u6.3X50402-HF
C5308 C10u6.3X50402-HF
C5313 C10u6.3X50402-HF
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C5301 C10u6.3X50402-HF
C5311 C10u6.3X50402-HF
C5320 C10u6.3X50402-HF
C5303 C10u6.3X50402-HF
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Size
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MS-16U71 / 17E7
Rev
0A
Date:
Friday, October 18, 2019
Sheet
5
of
79
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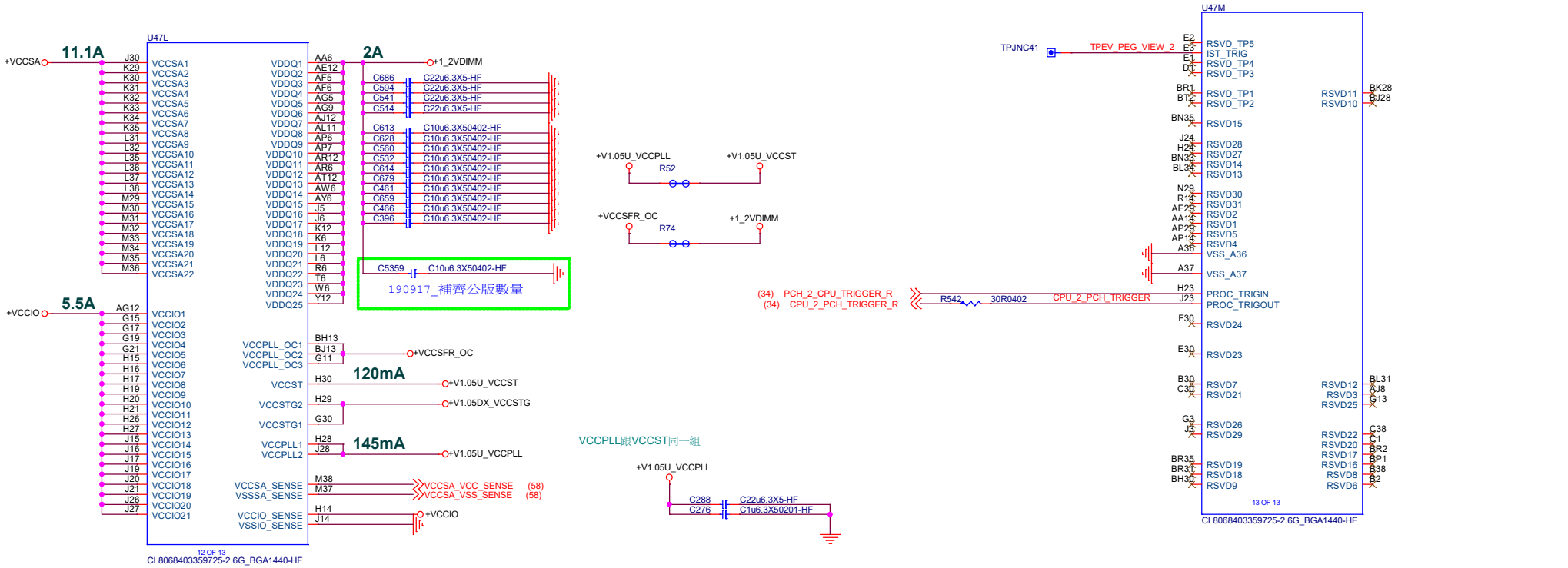

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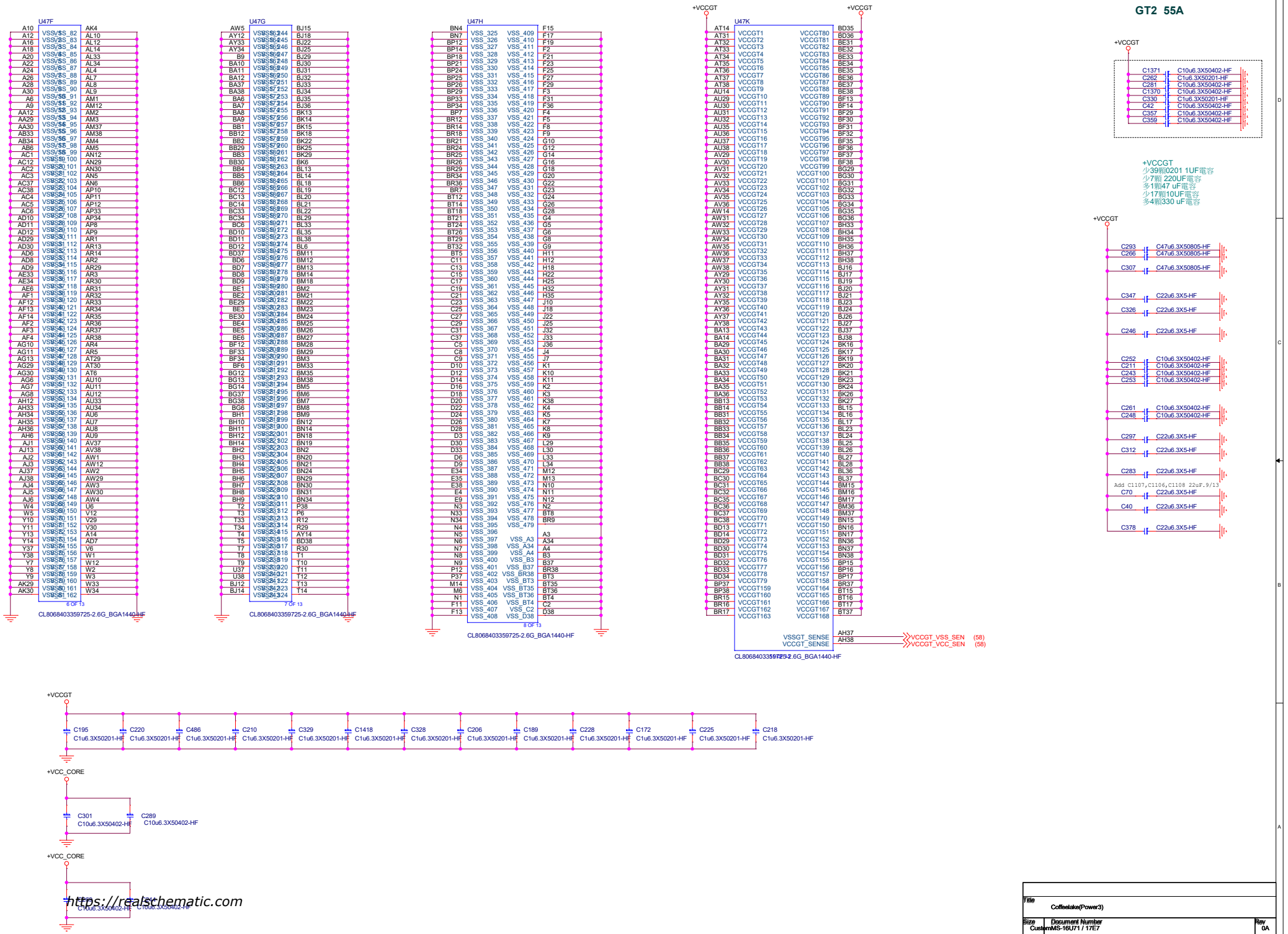
Date:	Friday, October 18, 2019	Sheet 6 of 79	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U47F
U47G
U47H
U47K
+VCCGT
+VCC_CORE
C1371 C10u6.3X50402-HF
C262 C1u6.3X50201-HF
C281 C10u6.3X50402-HF
C1370 C10u6.3X50402-HF
C330 C1u6.3X50201-HF
C42 C10u6.3X50402-HF
C357 C10u6.3X50402-HF
C359 C10u6.3X50402-HF
+VCCGT
少39顆0201 1UF電容
少7顆 220UF電容
多1顆47 uF電容
少17顆10UF電容
多4顆330 uF電容
C293 C47u6.3X50805-HF
C266 C47u6.3X50805-HF
C307 C47u6.3X50805-HF
C347 C22u6.3X5-HF
C326 C22u6.3X5-HF
C246 C22u6.3X5-HF
C252 C10u6.3X50402-HF
C211 C10u6.3X50402-HF
C243 C10u6.3X50402-HF
C253 C10u6.3X50402-HF
C261 C10u6.3X50402-HF
C248 C10u6.3X50402-HF
C297 C22u6.3X5-HF
C312 C22u6.3X5-HF
C283 C22u6.3X5-HF
Add C1107,C1106,C1108 22uF.9/13
C70 C22u6.3X5-HF
C40 C22u6.3X5-HF
C378 C22u6.3X5-HF
VSSGT_SENSE
VCCGT_SENSE
AH37
AH38
VCCGT_VSS_SEN (58)
VCCGT_VCC_SEN (58)
C195 C1u6.3X50201-HF
C220 C1u6.3X50201-HF
C486 C1u6.3X50201-HF
C210 C1u6.3X50201-HF
C329 C1u6.3X50201-HF
C1418 C1u6.3X50201-HF
C328 C1u6.3X50201-HF
C206 C1u6.3X50201-HF
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C228 C1u6.3X50201-HF
C172 C1u6.3X50201-HF
C225 C1u6.3X50201-HF
C218 C1u6.3X50201-HF
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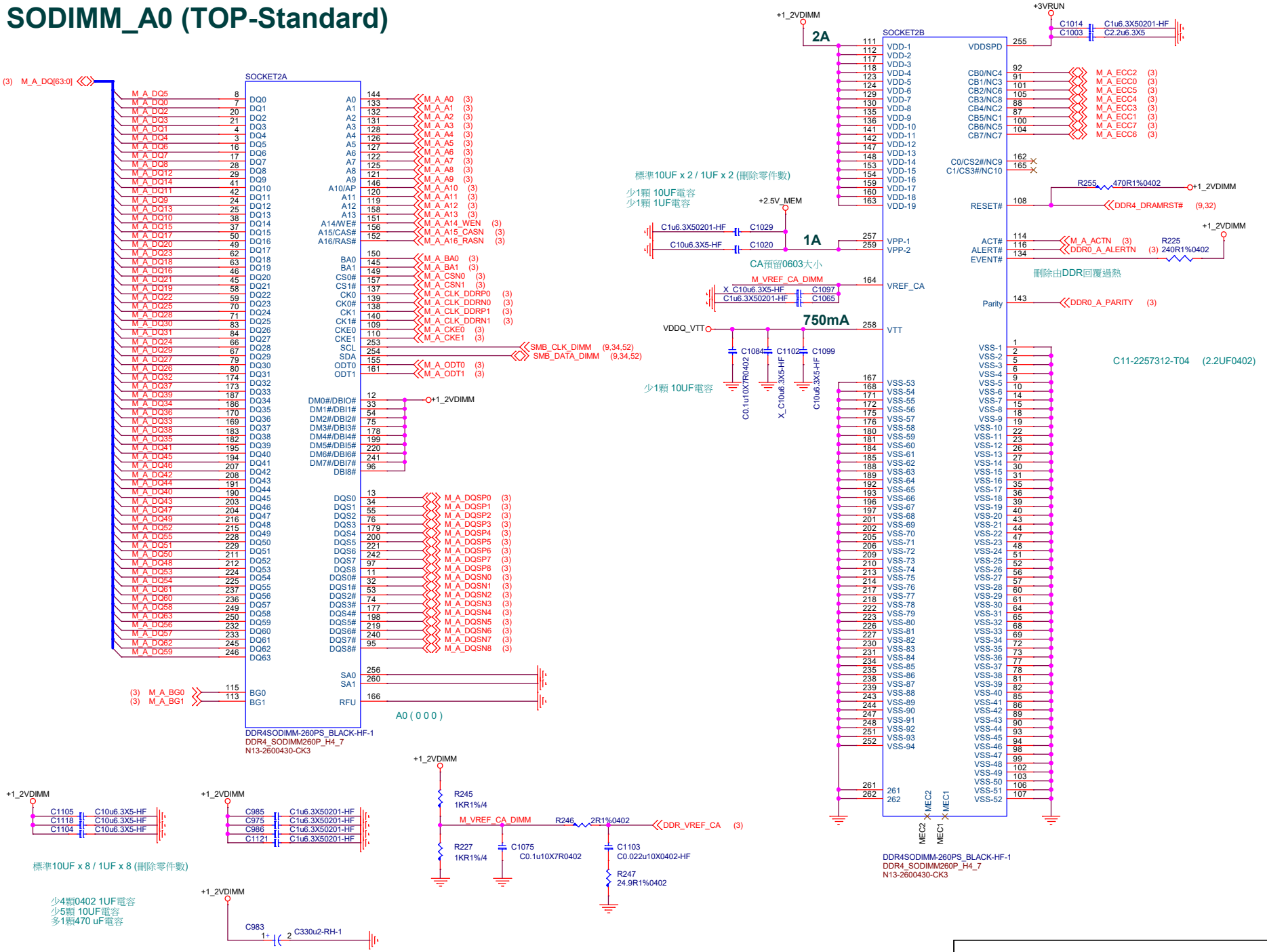
Title
Coffeelake(Power3)
Size
Custom
Document Number
MS-16U71 / 17E7
Rev
0A
Date:
Friday, October 18, 2019
Sheet
7
of
79

SODIMM_A0 (TOP-Standard)



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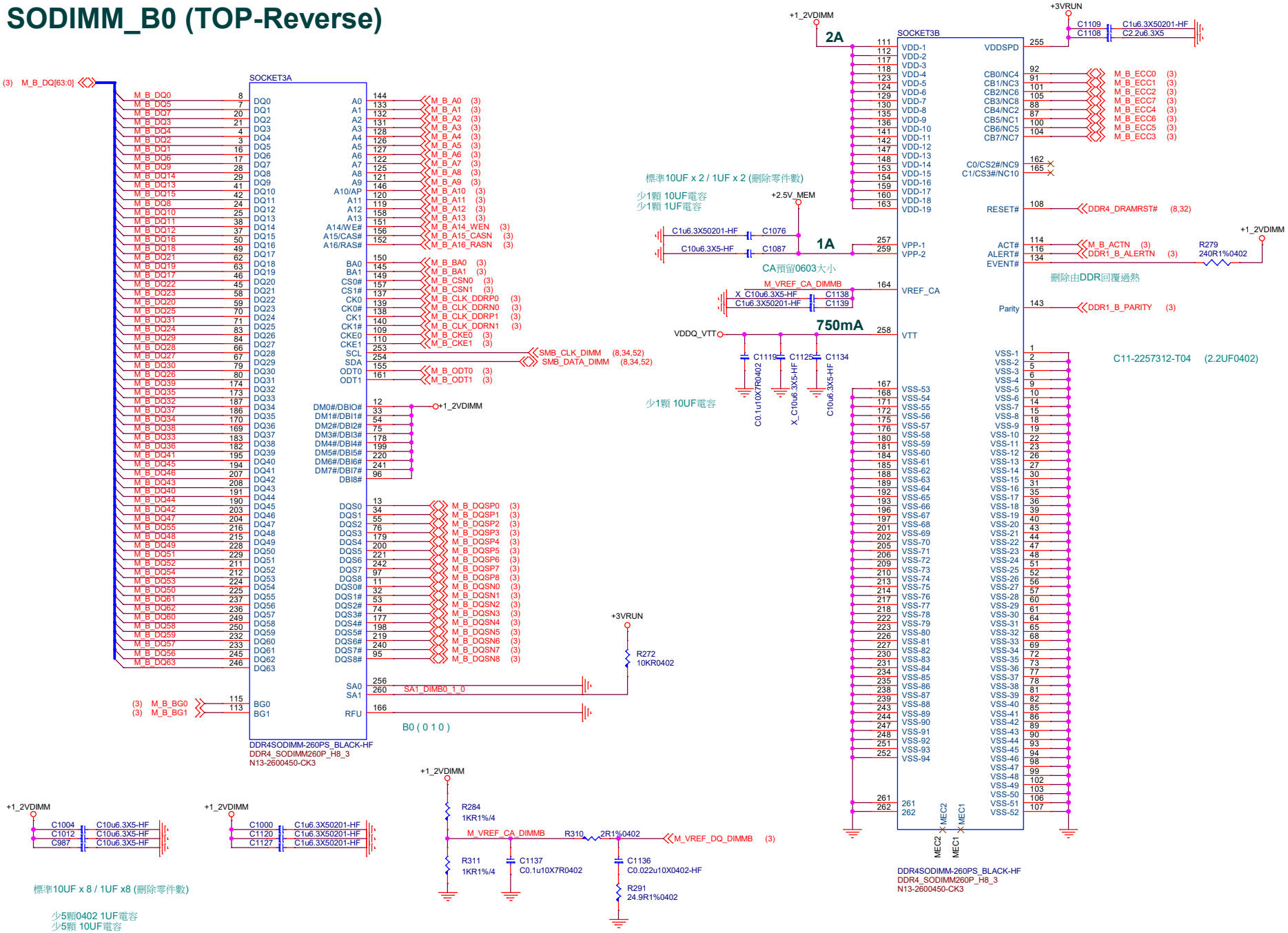
Title	DDR4_SODIMM_A0	
Size: Custom	Document Number: MS-16U71 / 17E7	Rev: 0A
Date: Friday, October 18, 2019	Sheet 8 of 79	

SODIMM_B0 (TOP-Reverse)



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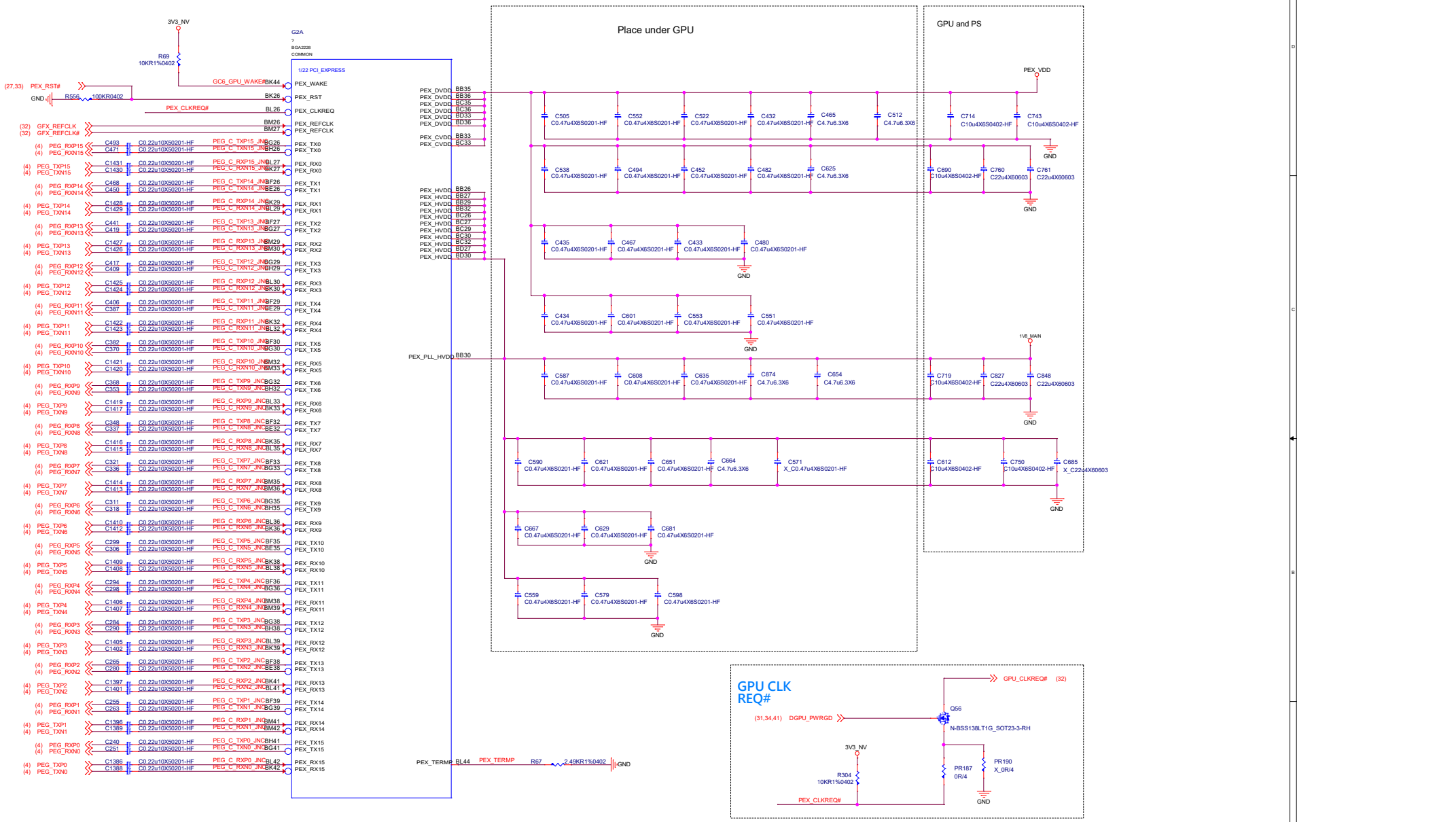
Title	DDR4_SODIMM_B0		
Size: Custom	Document Number: MS-16U71 / 17E7		Rev: 0A
Date: Friday, October 18, 2019		Sheet 9 of 79	



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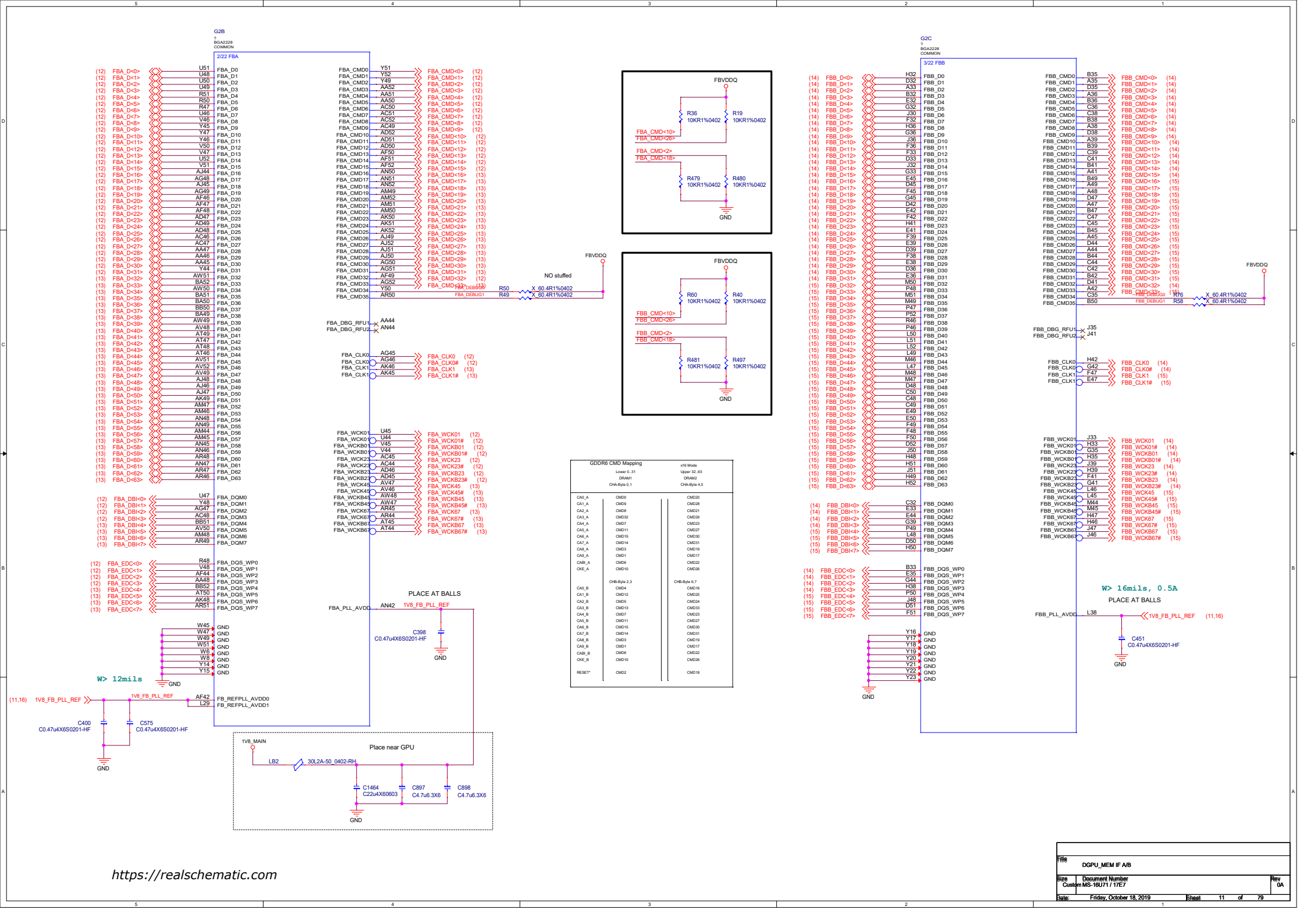
Title:	DGPU_PCI-E Host		
Size: Custom	Document Number: MS-16U71 / 17E7		Rev: 0A
Date: Friday, October 18, 2019	Sheet: 10	of 79	


G2B
BGA2228
COMMON
2/22 FBA
FBA_D0
FBA_D1
FBA_D2
FBA_D3
FBA_D4
FBA_D5
FBA_D6
FBA_D7
FBA_D8
FBA_D9
FBA_D10
FBA_D11
FBA_D12
FBA_D13
FBA_D14
FBA_D15
FBA_D16
FBA_D17
FBA_D18
FBA_D19
FBA_D20
FBA_D21
FBA_D22
FBA_D23
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FBA_D25
FBA_D26
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FBA_D40
FBA_D41
FBA_D42
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FBA_D44
FBA_D45
FBA_D46
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FBA_D48
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FBA_D56
FBA_D57
FBA_D58
FBA_D59
FBA_D60
FBA_D61
FBA_D62
FBA_D63
FBA_CMD0
FBA_CMD1
FBA_CMD2
FBA_CMD3
FBA_CMD4
FBA_CMD5
FBA_CMD6
FBA_CMD7
FBA_CMD8
FBA_CMD9
FBA_CMD10
FBA_CMD11
FBA_CMD12
FBA_CMD13
FBA_CMD14
FBA_CMD15
FBA_CMD16
FBA_CMD17
FBA_CMD18
FBA_CMD19
FBA_CMD20
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FBA_CMD22
FBA_CMD23
FBA_CMD24
FBA_CMD25
FBA_CMD26
FBA_CMD27
FBA_CMD28
FBA_CMD29
FBA_CMD30
FBA_CMD31
FBA_CMD32
FBA_CMD33
FBA_CMD34
FBA_CMD35
FBA_DEBUG0
FBA_DEBUG1
NO stuffed
FBVDDQ
R50
R49
X_60.4R1%0402
FBA_DBG_RFU1
FBA_DBG_RFU2
FBA_CLK0
FBA_CLK0#
FBA_CLK1
FBA_CLK1#
FBA_DBI0
FBA_DBI1
FBA_DBI2
FBA_DBI3
FBA_DBI4
FBA_DBI5
FBA_DBI6
FBA_DBI7
FBA_DQM0
FBA_DQM1
FBA_DQM2
FBA_DQM3
FBA_DQM4
FBA_DQM5
FBA_DQM6
FBA_DQM7
FBA_EDC0
FBA_EDC1
FBA_EDC2
FBA_EDC3
FBA_EDC4
FBA_EDC5
FBA_EDC6
FBA_EDC7
FBA_DQS_WP0
FBA_DQS_WP1
FBA_DQS_WP2
FBA_DQS_WP3
FBA_DQS_WP4
FBA_DQS_WP5
FBA_DQS_WP6
FBA_DQS_WP7
FBA_WCK01
FBA_WCK01#
FBA_WCKB01
FBA_WCKB01#
FBA_WCK23
FBA_WCK23#
FBA_WCKB23
FBA_WCKB23#
FBA_WCK45
FBA_WCK45#
FBA_WCKB45
FBA_WCKB45#
FBA_WCK67
FBA_WCK67#
FBA_WCKB67
FBA_WCKB67#
PLACE AT BALLS
FBA_PLL_AVDD
1V8_FB_PLL_REF
C398
C0.47u4X6S0201-HF
GND
W> 12mils
(11,16)
1V8_FB_PLL_REF
C400
C0.47u4X6S0201-HF
C575
C0.47u4X6S0201-HF
FB_REFPLL_AVDD0
FB_REFPLL_AVDD1
1V8_MAIN
LB2
30L2A-50_0402-RH
Place near GPU
C1464
C22u4X60603
C897
C4.7u6.3X6
C898
C4.7u6.3X6
FBVDDQ
R36
R19
R479
R480
R60
R40
R481
R497
10KR1%0402
FBA_CMD<10>
FBA_CMD<26>
FBA_CMD<2>
FBA_CMD<18>
GDDR6 CMD Mapping
x16 Mode
Lower 0..31
DRAM1
CHA-Byte 0,1
Upper 32..63
DRAM2
CHA-Byte 4,5
CHB-Byte 2,3
CHB-Byte 6,7
RESET*
G2C
BGA2228
COMMON
3/22 FBB
FBB_D0
FBB_D1
FBB_D2
FBB_D3
FBB_D4
FBB_D5
FBB_D6
FBB_D7
FBB_D8
FBB_D9
FBB_D10
FBB_D11
FBB_D12
FBB_D13
FBB_D14
FBB_D15
FBB_D16
FBB_D17
FBB_D18
FBB_D19
FBB_D20
FBB_D21
FBB_D22
FBB_D23
FBB_D24
FBB_D25
FBB_D26
FBB_D27
FBB_D28
FBB_D29
FBB_D30
FBB_D31
FBB_D32
FBB_D33
FBB_D34
FBB_D35
FBB_D36
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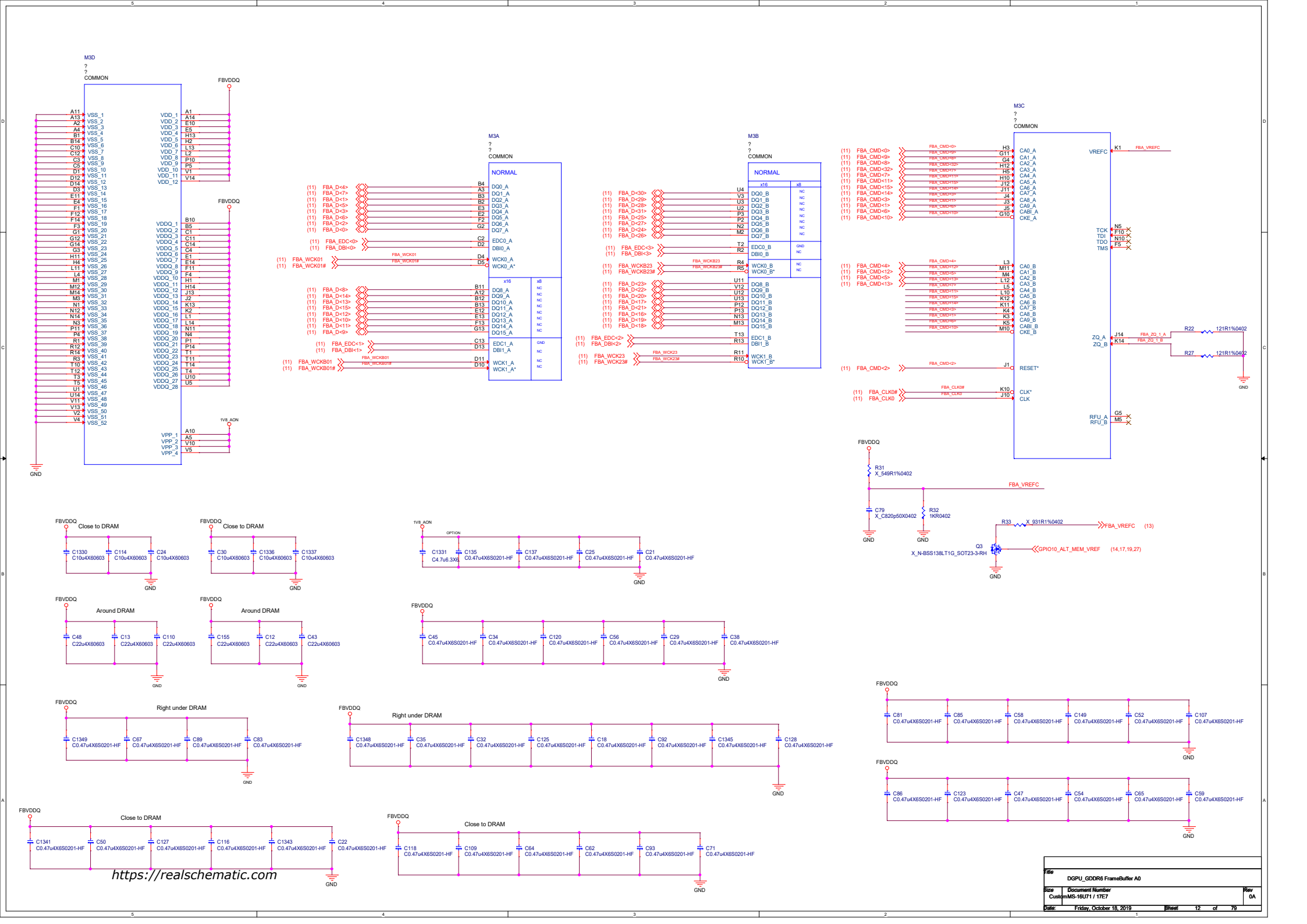
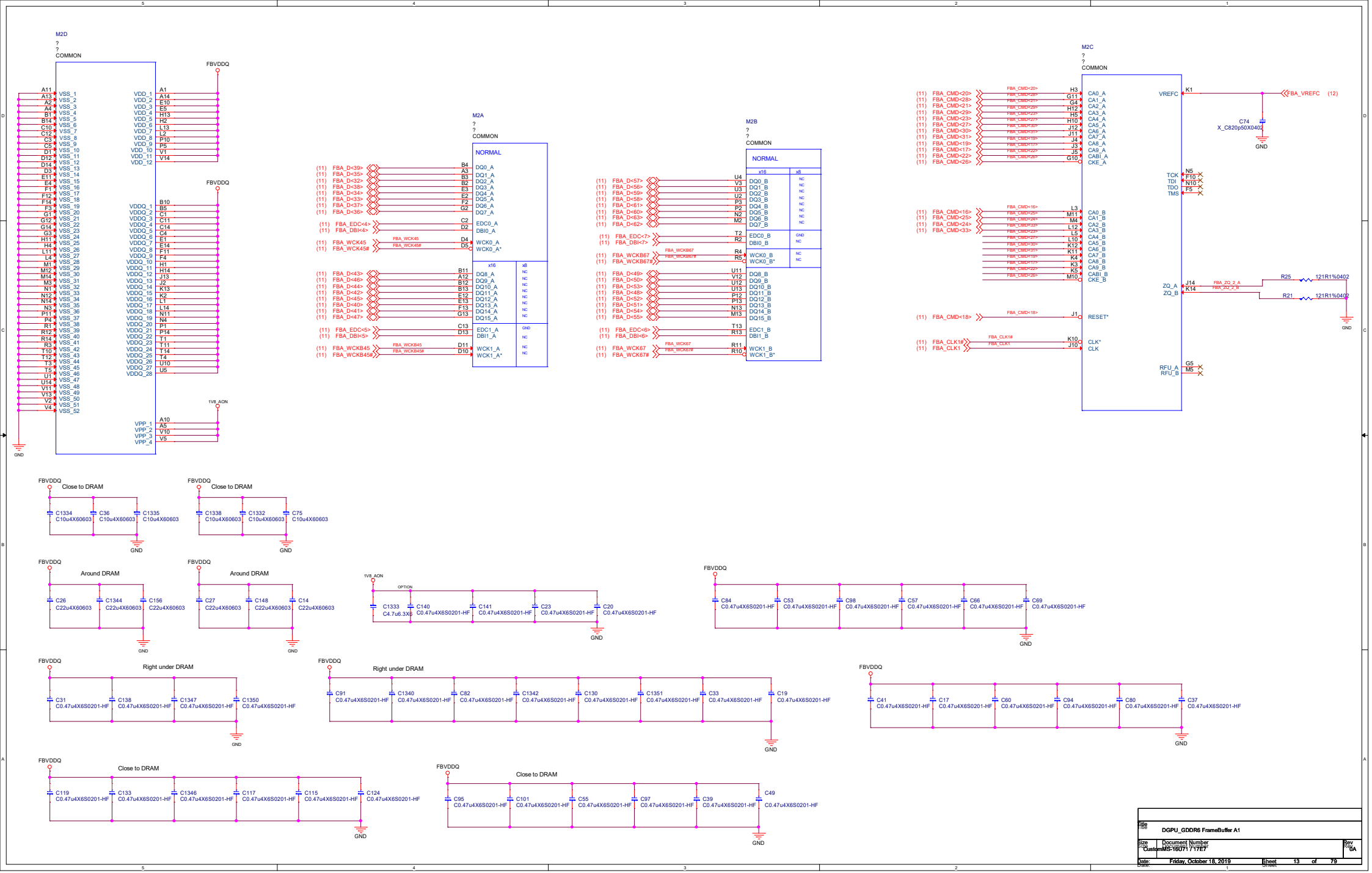
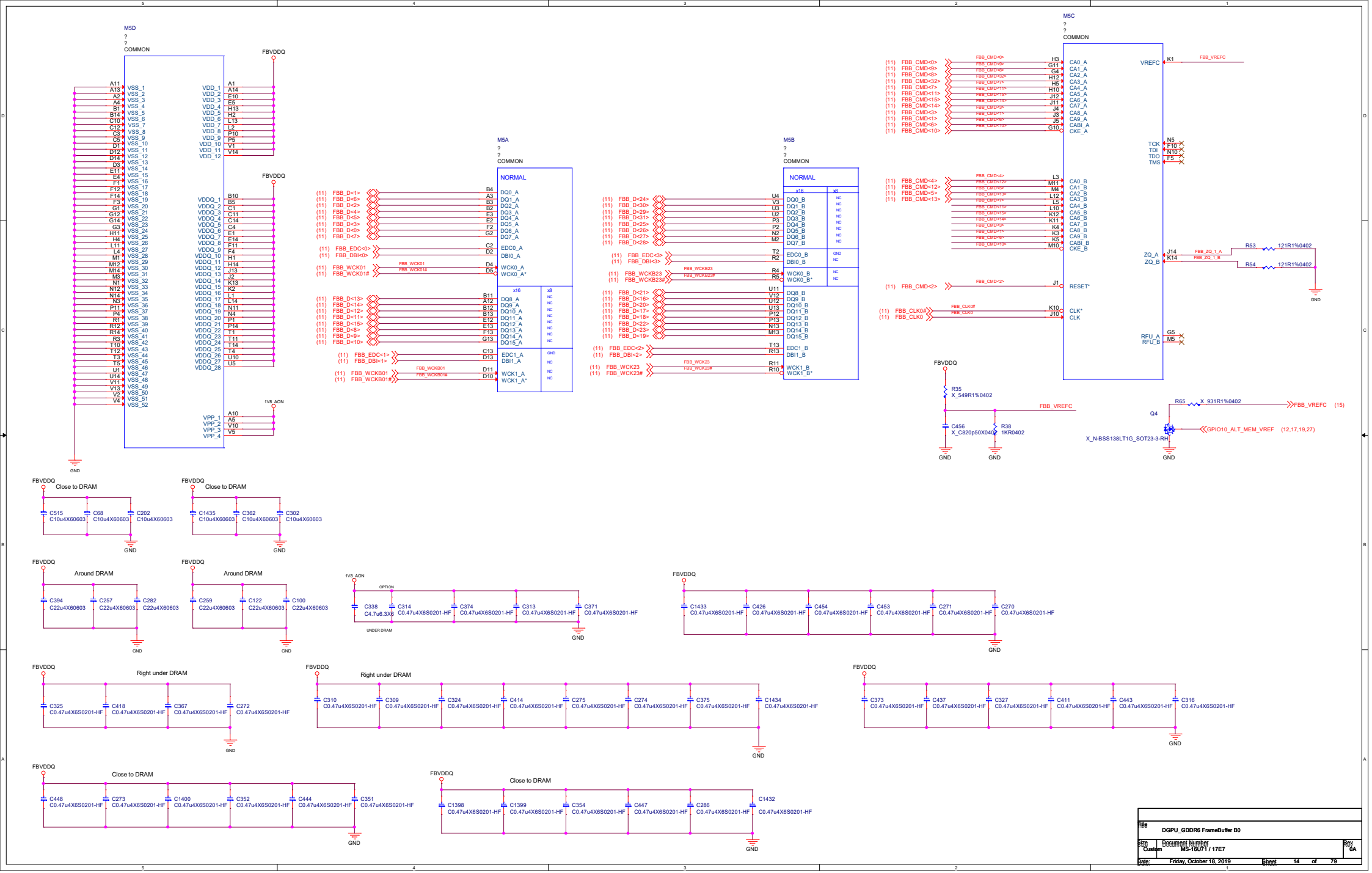
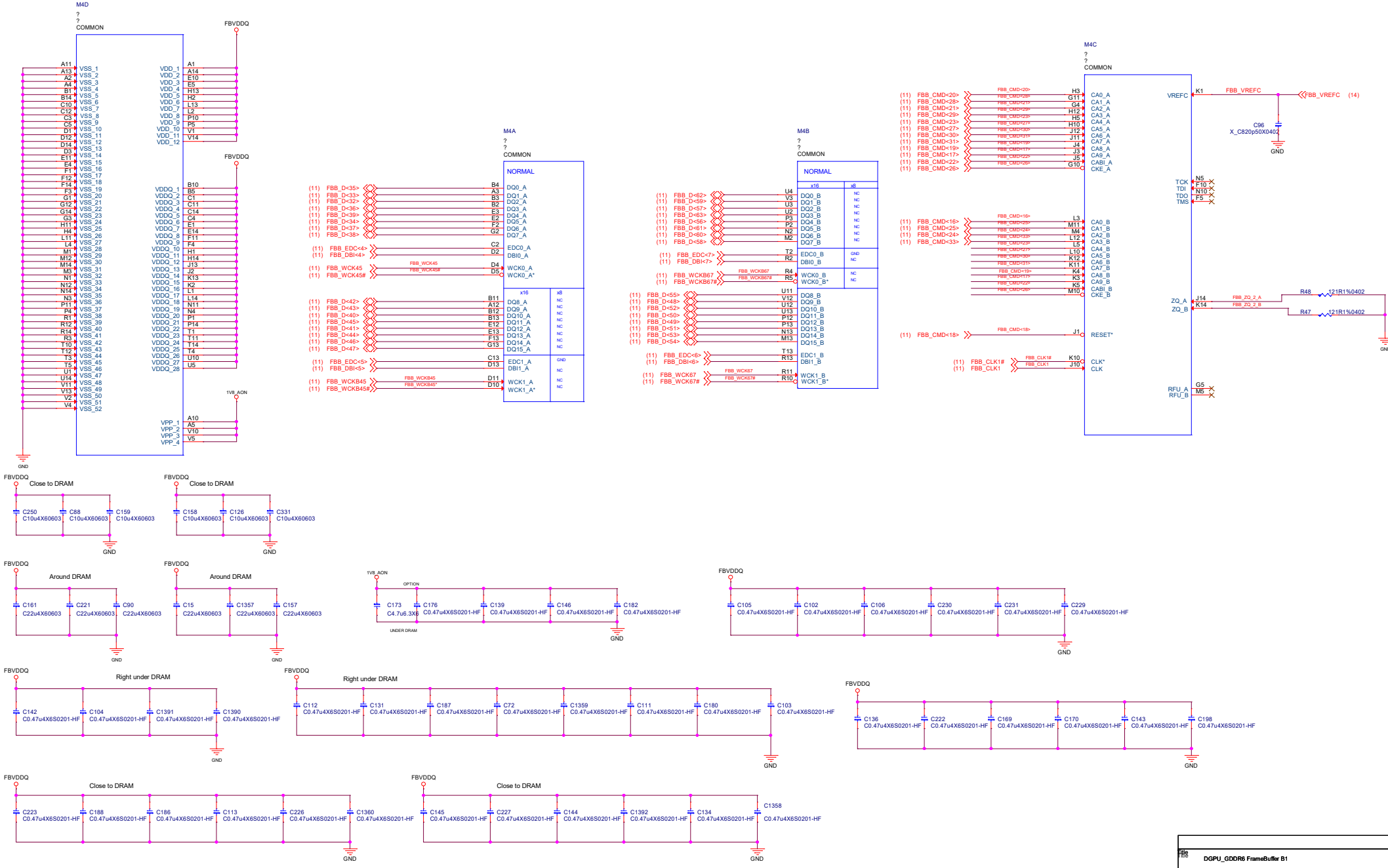
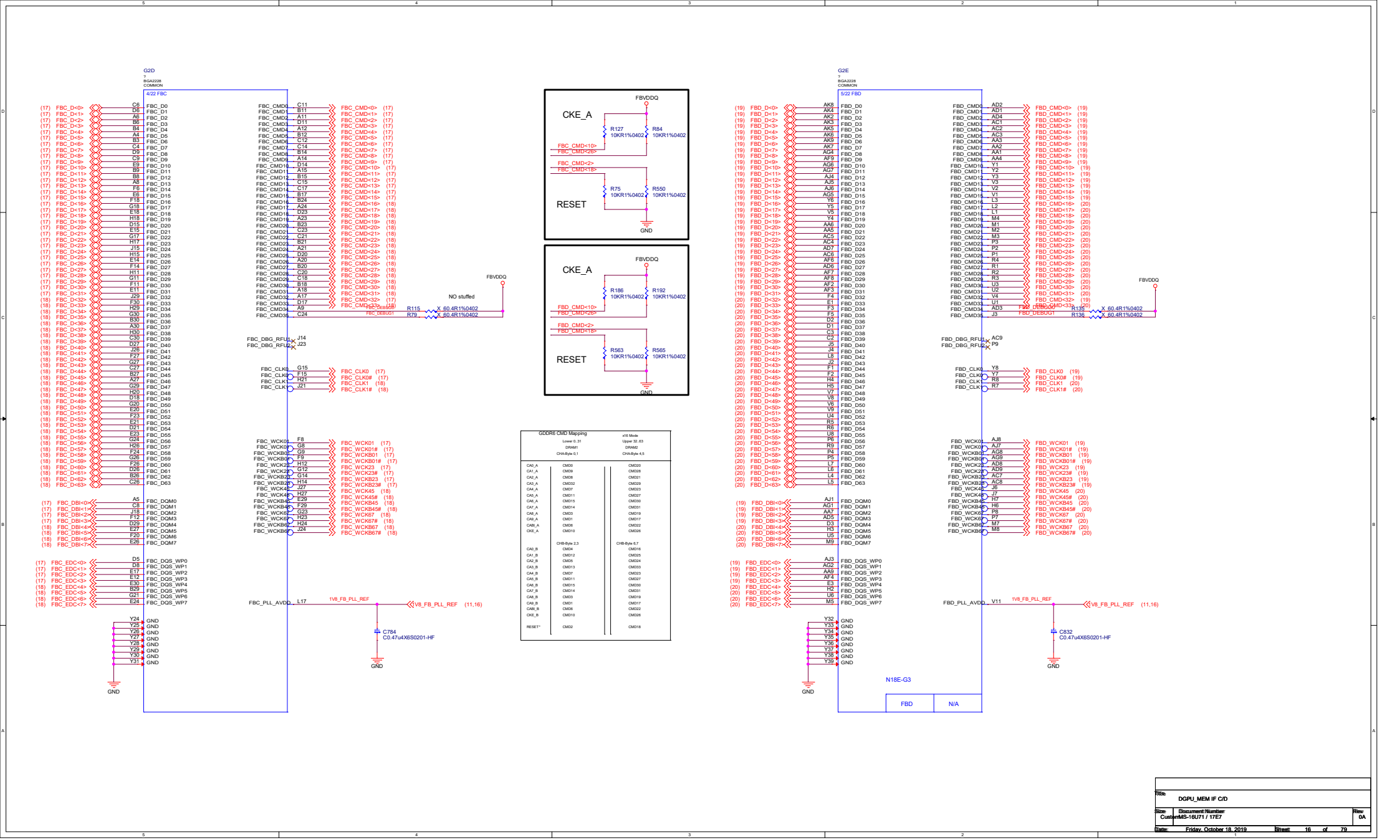
FBB_D38
FBB_D39
FBB_D40
FBB_D41
FBB_D42
FBB_D43
FBB_D44
FBB_D45
FBB_D46
FBB_D47
FBB_D48
FBB_D49
FBB_D50
FBB_D51
FBB_D52
FBB_D53
FBB_D54
FBB_D55
FBB_D56
FBB_D57
FBB_D58
FBB_D59
FBB_D60
FBB_D61
FBB_D62
FBB_D63
FBB_CMD0
FBB_CMD1
FBB_CMD2
FBB_CMD3
FBB_CMD4
FBB_CMD5
FBB_CMD6
FBB_CMD7
FBB_CMD8
FBB_CMD9
FBB_CMD10
FBB_CMD11
FBB_CMD12
FBB_CMD13
FBB_CMD14
FBB_CMD15
FBB_CMD16
FBB_CMD17
FBB_CMD18
FBB_CMD19
FBB_CMD20
FBB_CMD21
FBB_CMD22
FBB_CMD23
FBB_CMD24
FBB_CMD25
FBB_CMD26
FBB_CMD27
FBB_CMD28
FBB_CMD29
FBB_CMD30
FBB_CMD31
FBB_CMD32
FBB_CMD33
FBB_CMD34
FBB_CMD35
FBB_DEBUG0
FBB_DEBUG1
R76
R58
X_60.4R1%0402
FBB_DBG_RFU1
FBB_DBG_RFU2
FBB_CLK0
FBB_CLK0#
FBB_CLK1
FBB_CLK1#
FBB_DBI0
FBB_DBI1
FBB_DBI2
FBB_DBI3
FBB_DBI4
FBB_DBI5
FBB_DBI6
FBB_DBI7
FBB_DQM0
FBB_DQM1
FBB_DQM2
FBB_DQM3
FBB_DQM4
FBB_DQM5
FBB_DQM6
FBB_DQM7
FBB_EDC0
FBB_EDC1
FBB_EDC2
FBB_EDC3
FBB_EDC4
FBB_EDC5
FBB_EDC6
FBB_EDC7
FBB_DQS_WP0
FBB_DQS_WP1
FBB_DQS_WP2
FBB_DQS_WP3
FBB_DQS_WP4
FBB_DQS_WP5
FBB_DQS_WP6
FBB_DQS_WP7
FBB_WCK01
FBB_WCK01#
FBB_WCKB01
FBB_WCKB01#
FBB_WCK23
FBB_WCK23#
FBB_WCKB23
FBB_WCKB23#
FBB_WCK45
FBB_WCK45#
FBB_WCKB45
FBB_WCKB45#
FBB_WCK67
FBB_WCK67#
FBB_WCKB67
FBB_WCKB67#
W> 16mils, 0.5A
PLACE AT BALLS
FBB_PLL_AVDD
1V8_FB_PLL_REF
(11,16)
C451
C0.47u4X6S0201-HF
GND
https://realschematic.com
Title
DGPU_MEM IF A/B
Size
Custom
Document Number
MS-16U71 / 17E7
Rev
0A
Date:
Friday, October 18, 2019
Sheet
11
of
79

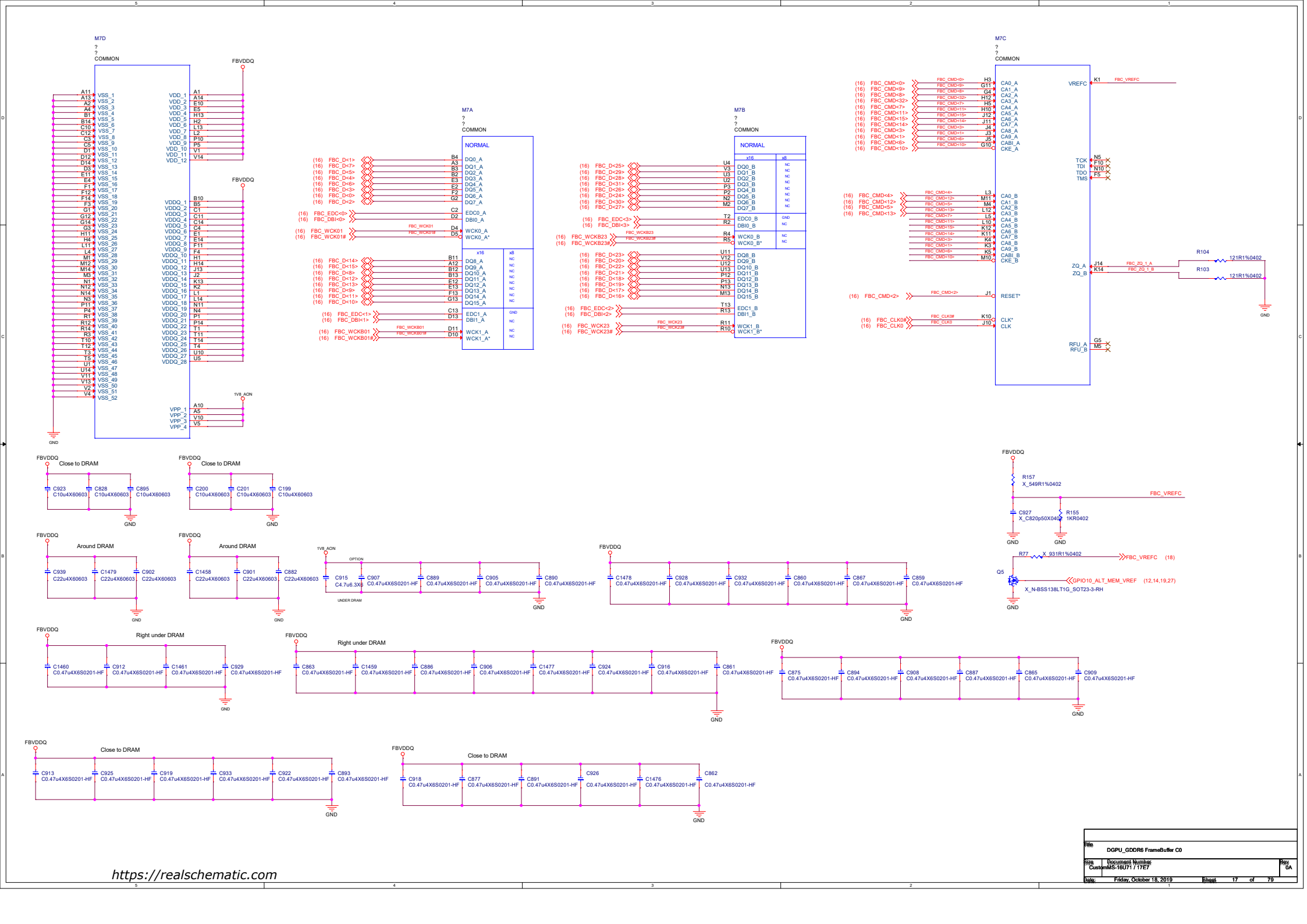

M3D
COMMON
FBVDDQ
GND
1V8_AON
M3A
NORMAL
M3B
NORMAL
M3C
COMMON
FBA_VREFC
RESET*
CLK*
FBA_ZQ_1_A
FBA_ZQ_1_B
121R1%0402
R31 X_549R1%0402
C79 X_C820p50X0402
R32 1KR0402
R33 X_931R1%0402
Q3 X_N-BSS138LT1G_SOT23-3-RH
GPIO10_ALT_MEM_VREF
Close to DRAM
Around DRAM
Right under DRAM
C0.47u4X6S0201-HF
C10u4X60603
C22u4X60603
https://realschematic.com
Title
DGPU_GDDR6 FrameBuffer A0
Size
Custom
Document Number
MS-16U71 / 17E7
Rev
0A
Date:
Friday, October 18, 2019
Sheet
12
of
79

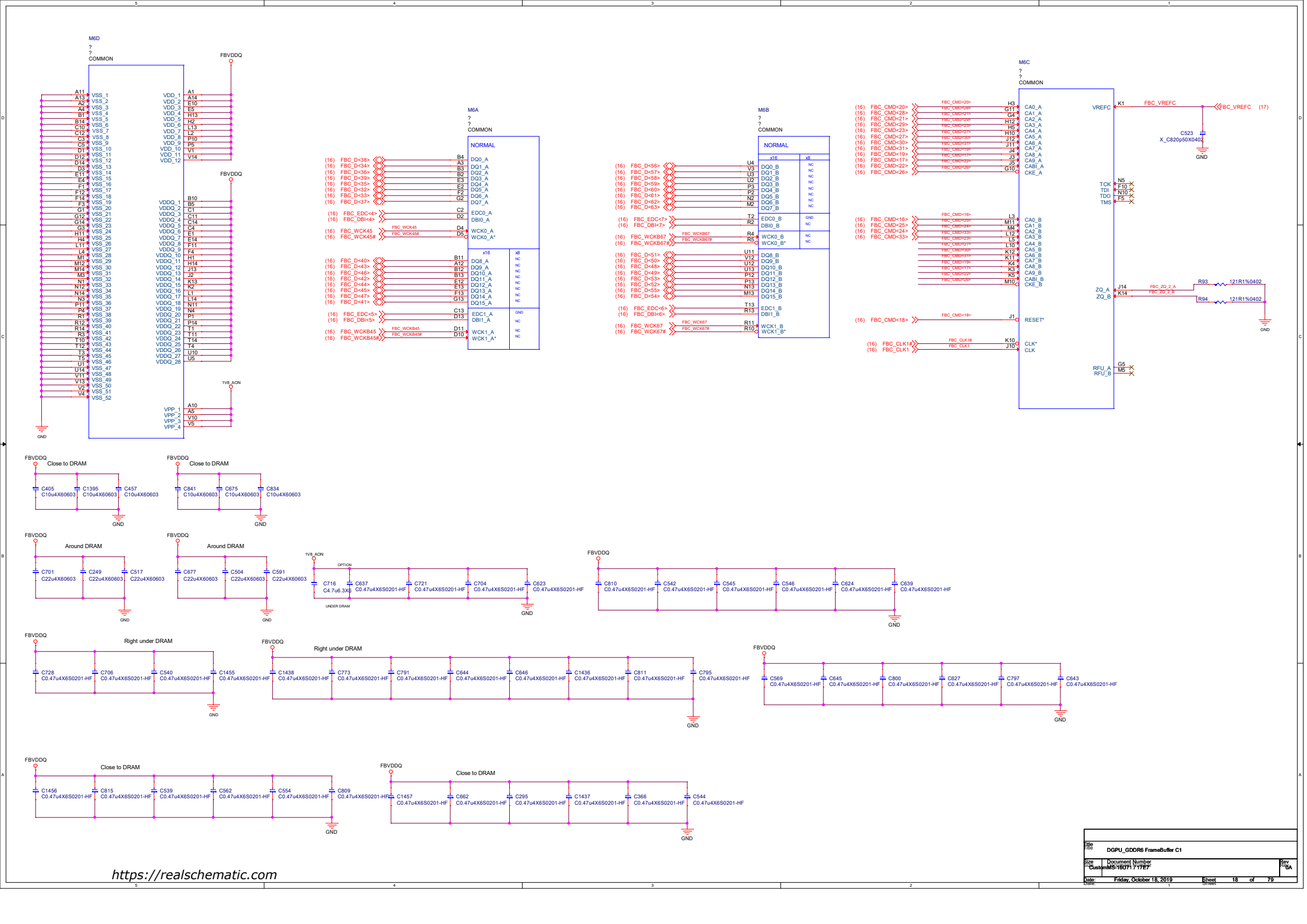


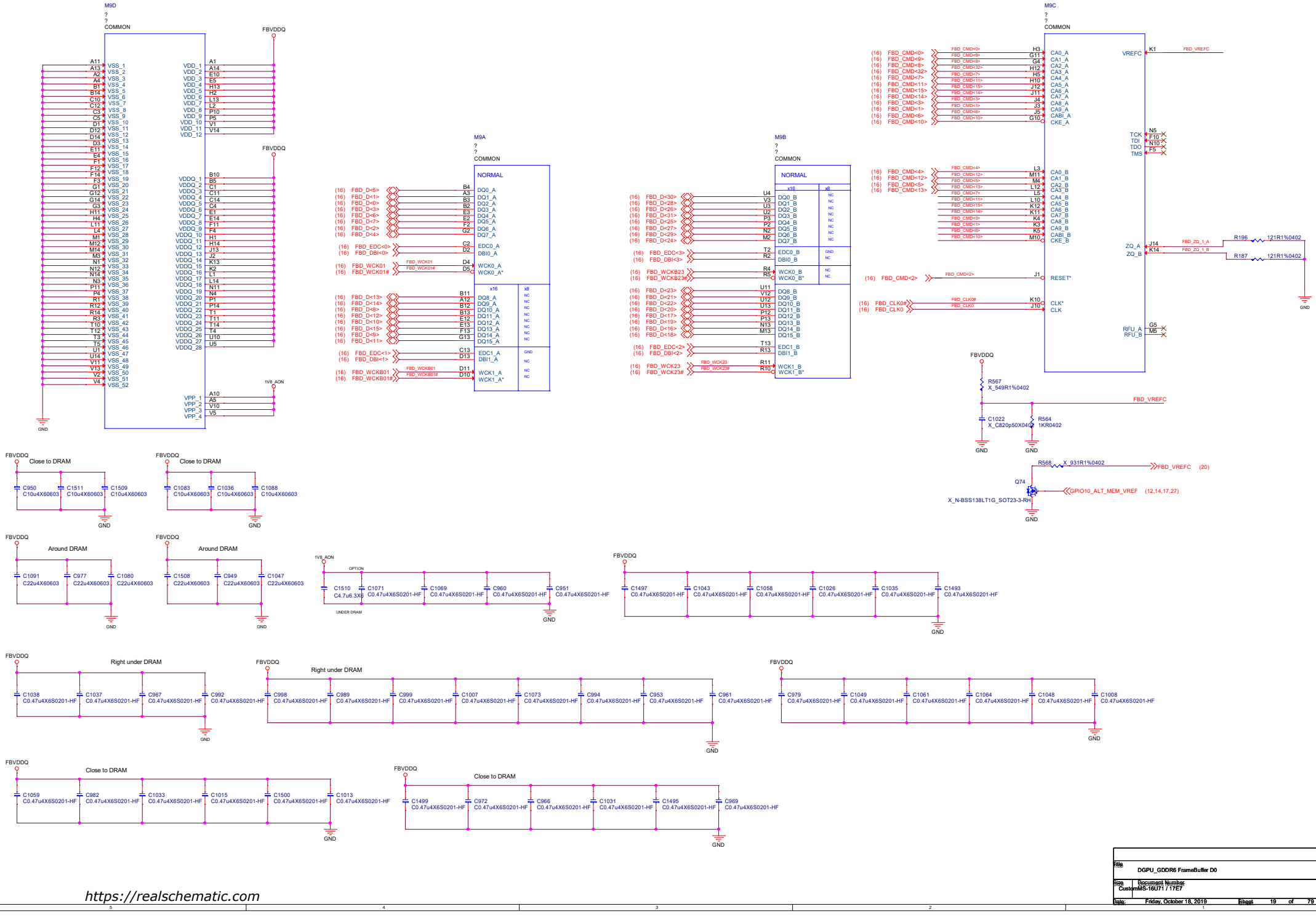


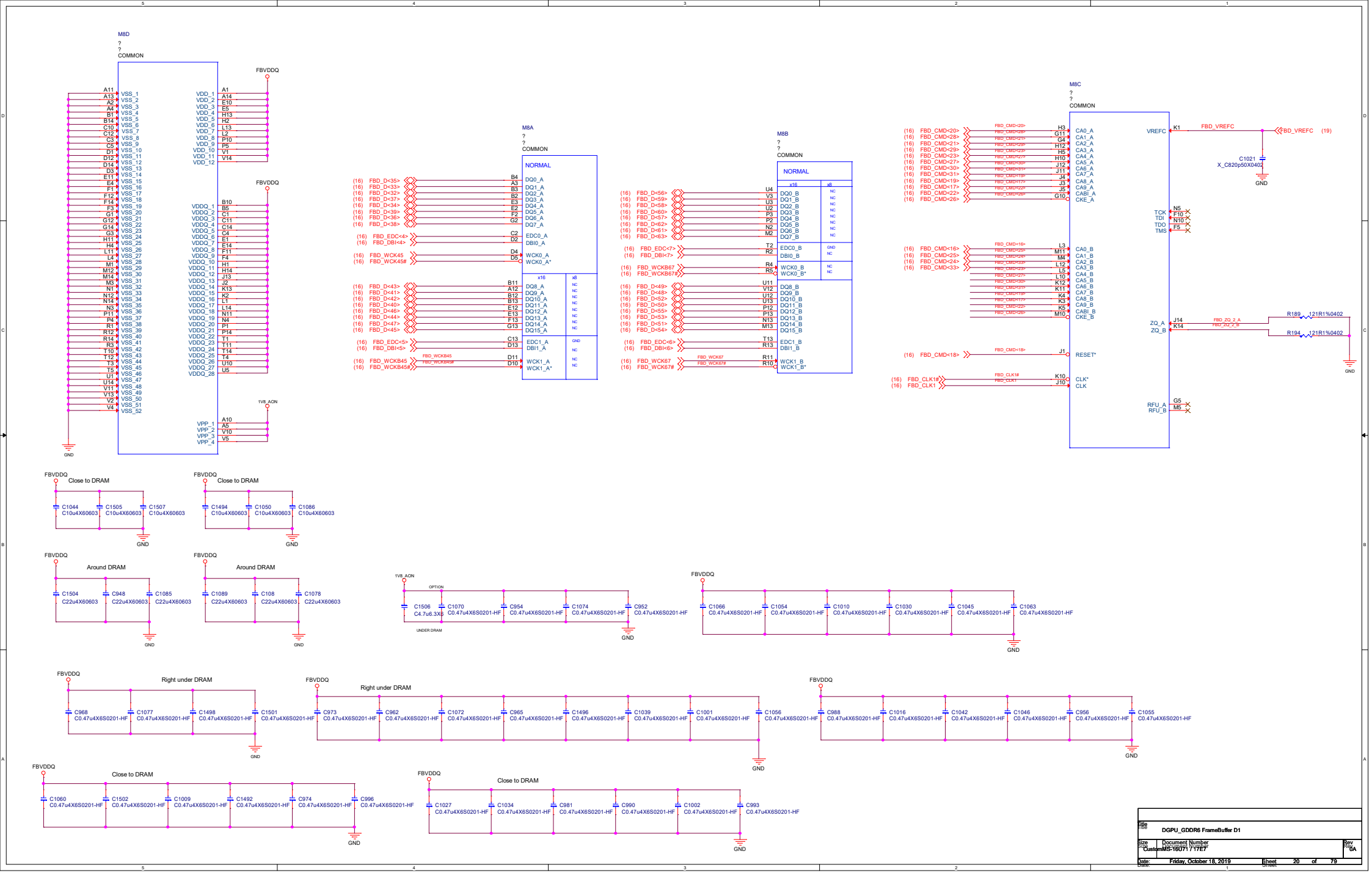


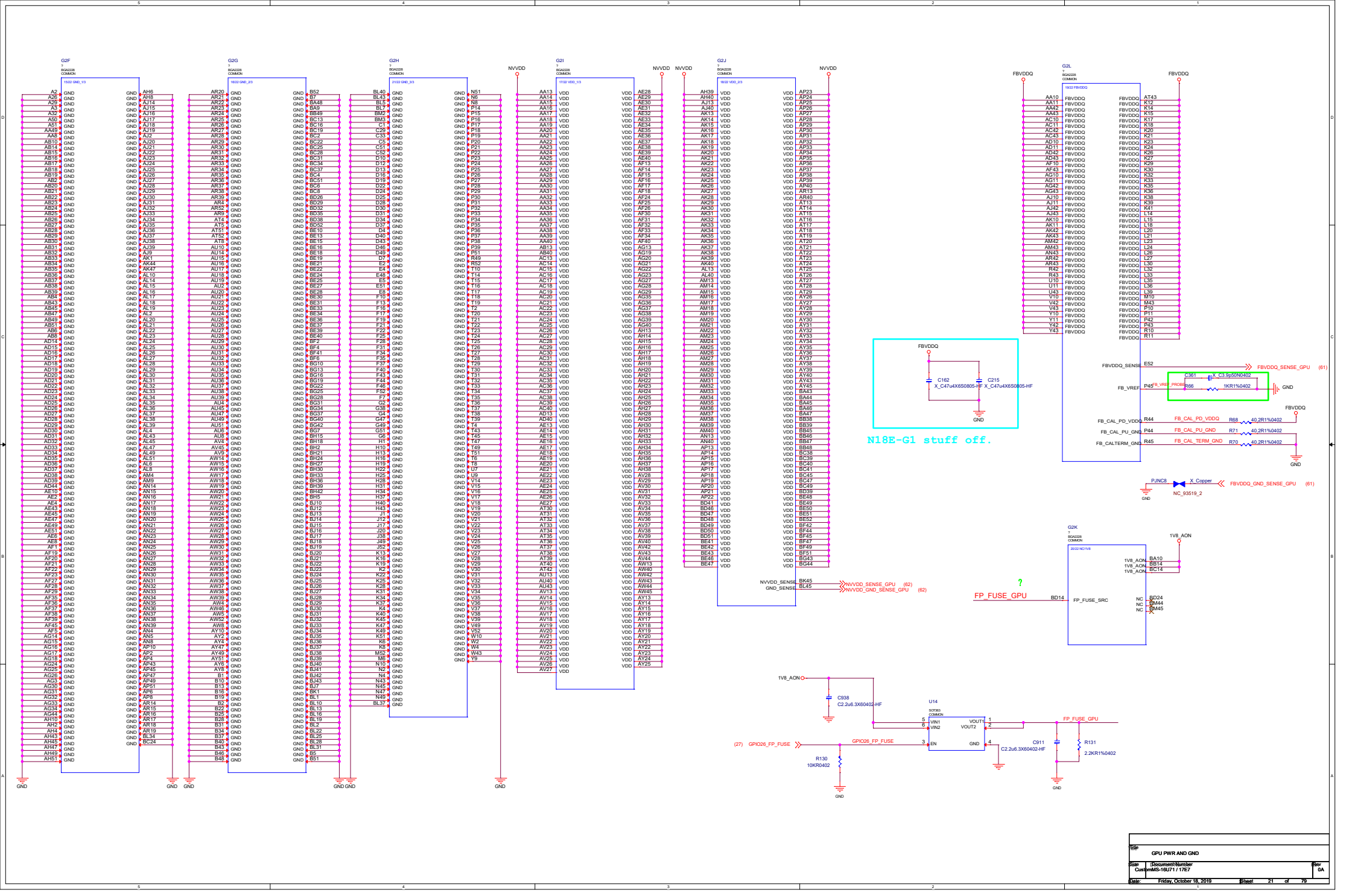



M7D
COMMON
M7A
COMMON
NORMAL
M7B
COMMON
NORMAL
M7C
COMMON
FBVDDQ
1V8_AON
GND
Close to DRAM
Around DRAM
Right under DRAM
OPTION
UNDER DRAM
C0.47u4X6S0201-HF
C10u4X60603
C22u4X60603
X_549R1%0402
X_C820p50X0402
1KR0402
X_931R1%0402
X_N-BSS138LT1G_SOT23-3-RH
121R1%0402
FBC_VREFC
FBC_CMD<0>
FBC_CMD<1>
FBC_CMD<2>
FBC_CMD<3>
FBC_CMD<4>
FBC_CMD<5>
FBC_CMD<6>
FBC_CMD<7>
FBC_CMD<8>
FBC_CMD<9>
FBC_CMD<10>
FBC_CMD<11>
FBC_CMD<12>
FBC_CMD<13>
FBC_CMD<14>
FBC_CMD<15>
FBC_CMD<32>
FBC_CLK0
FBC_CLK0#
FBC_ZQ_1_A
FBC_ZQ_1_B
FBC_WCKB23
FBC_WCKB23#
FBC_WCK23
FBC_WCK23#
FBC_WCKB01
FBC_WCKB01#
FBC_WCK01
FBC_WCK01#
GPIO10_ALT_MEM_VREF (12,14,19,27)
FBC_VREFC (18)
https://realschematic.com
Title
DGPU_GDDR6 FrameBuffer C0
Size
Custom
Document Number
MS-16U71 / 1E7
Rev
0A
Date:
Friday, October 18, 2019
Sheet
17
of
79

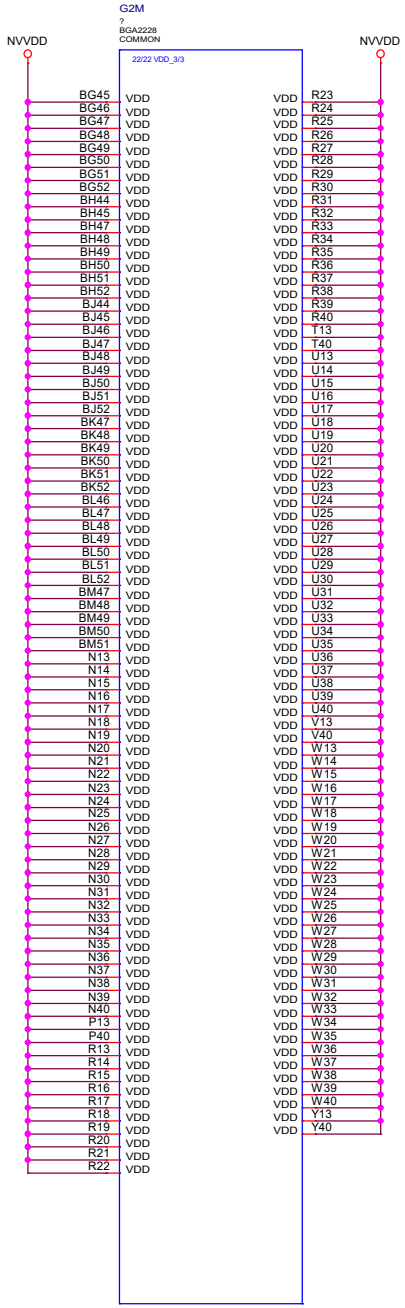

M6D
COMMON
FBVDDQ
1V8_AON
M6A
NORMAL
M6B
NORMAL
M6C
COMMON
Close to DRAM
Around DRAM
Right under DRAM
OPTION
UNDER DRAM
GND
https://realschematic.com
DGPU_GDDR6 FrameBuffer C1
Friday, October 18, 2019







GPU PWR GND NCs



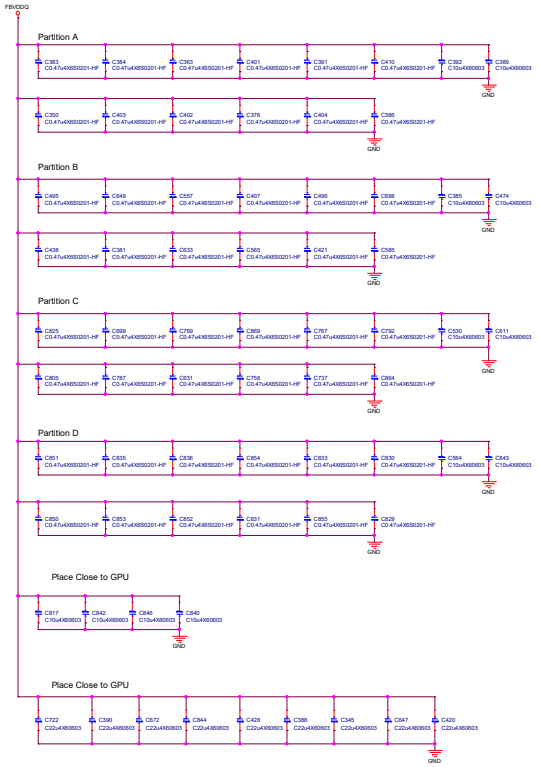
https://realschematic.com

Title: GPU PWR AND GND			
Size: Custom	Document Number: MS-16U71 / 17E7		Rev: 0A
Date: Friday, October 18, 2019		Sheet 22 of 79	

GPU Decoupling

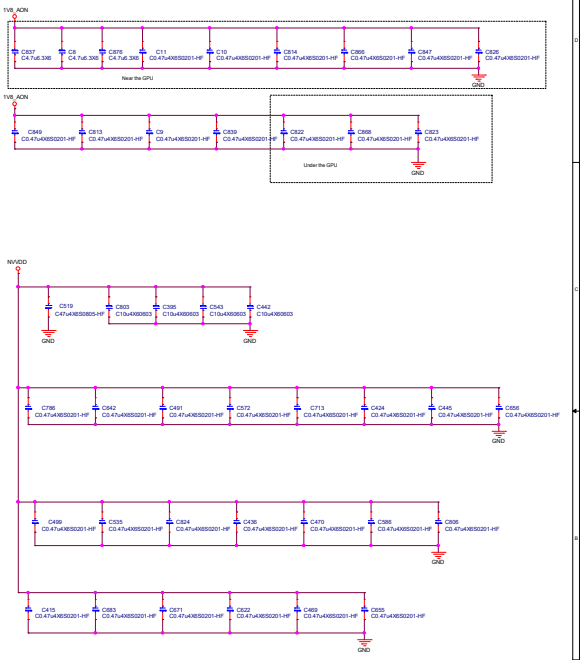
GPU DECOUPLING A

FBVDDQ_GPU



NVVDD

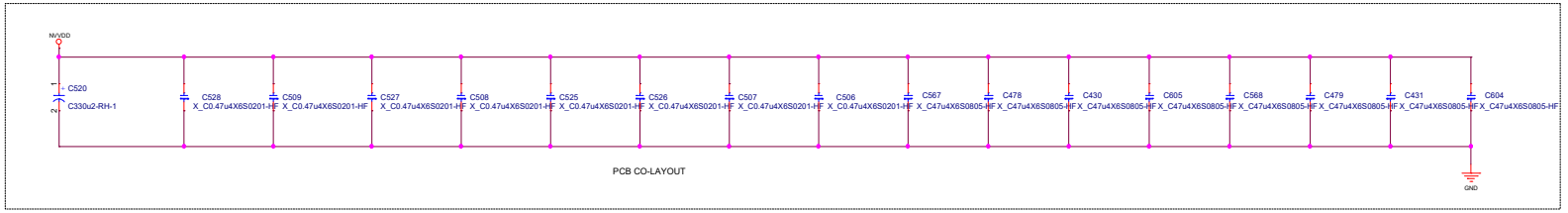
1V8_AON

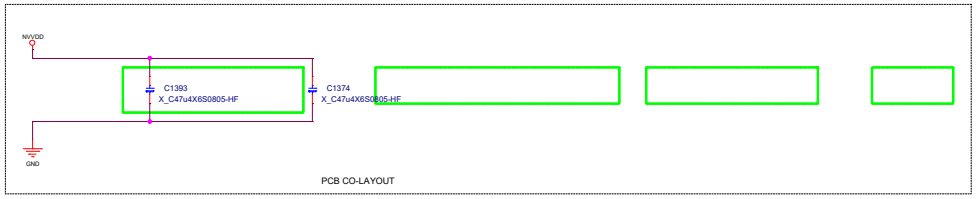


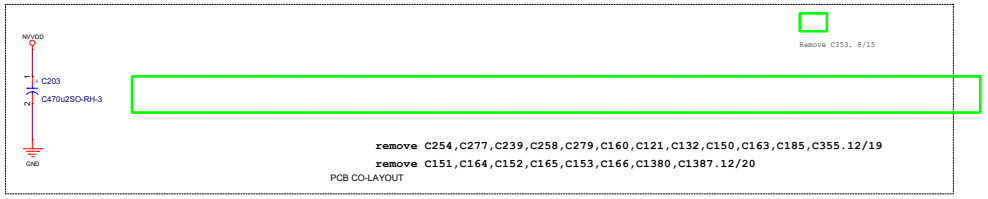
MICRO-STAR INT'L CO.,LTD.	
Title: DGPU_GPU DECOUPLING A	
Size: Custom	Document Number: MS-16U71 / 17E7
Rev: 0A	
Date: Friday, October 18, 2019	Sheet 23 of 79

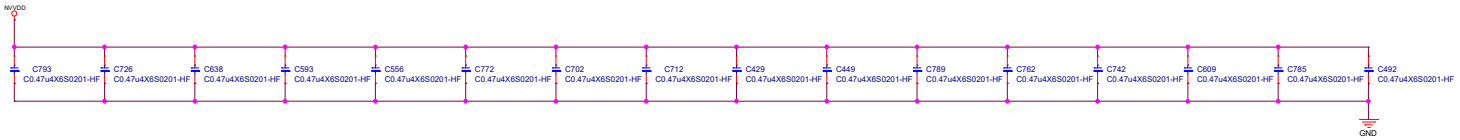
GPU DECOUPLING B

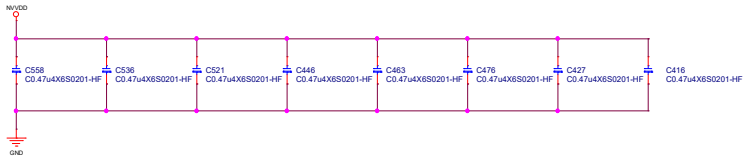
GPU Decoupling

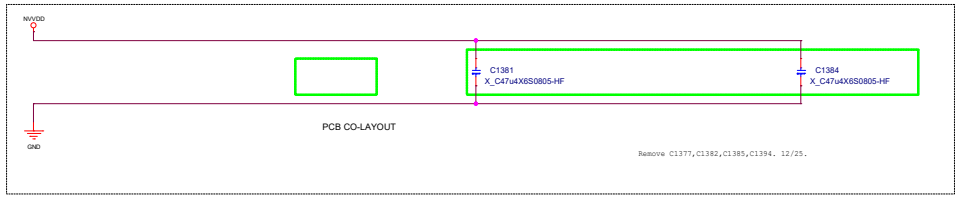


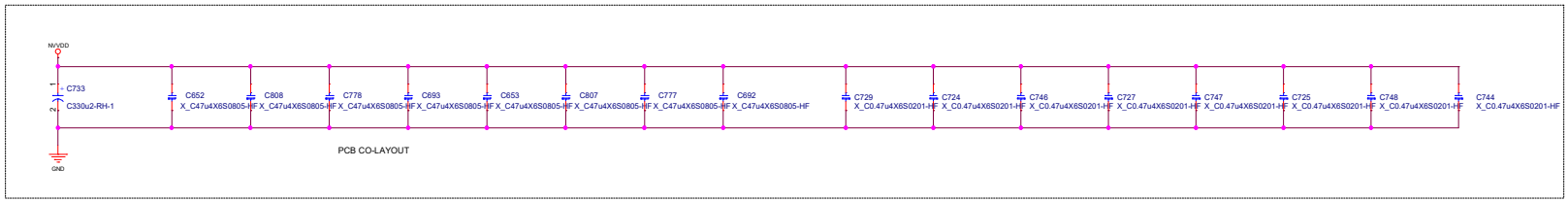












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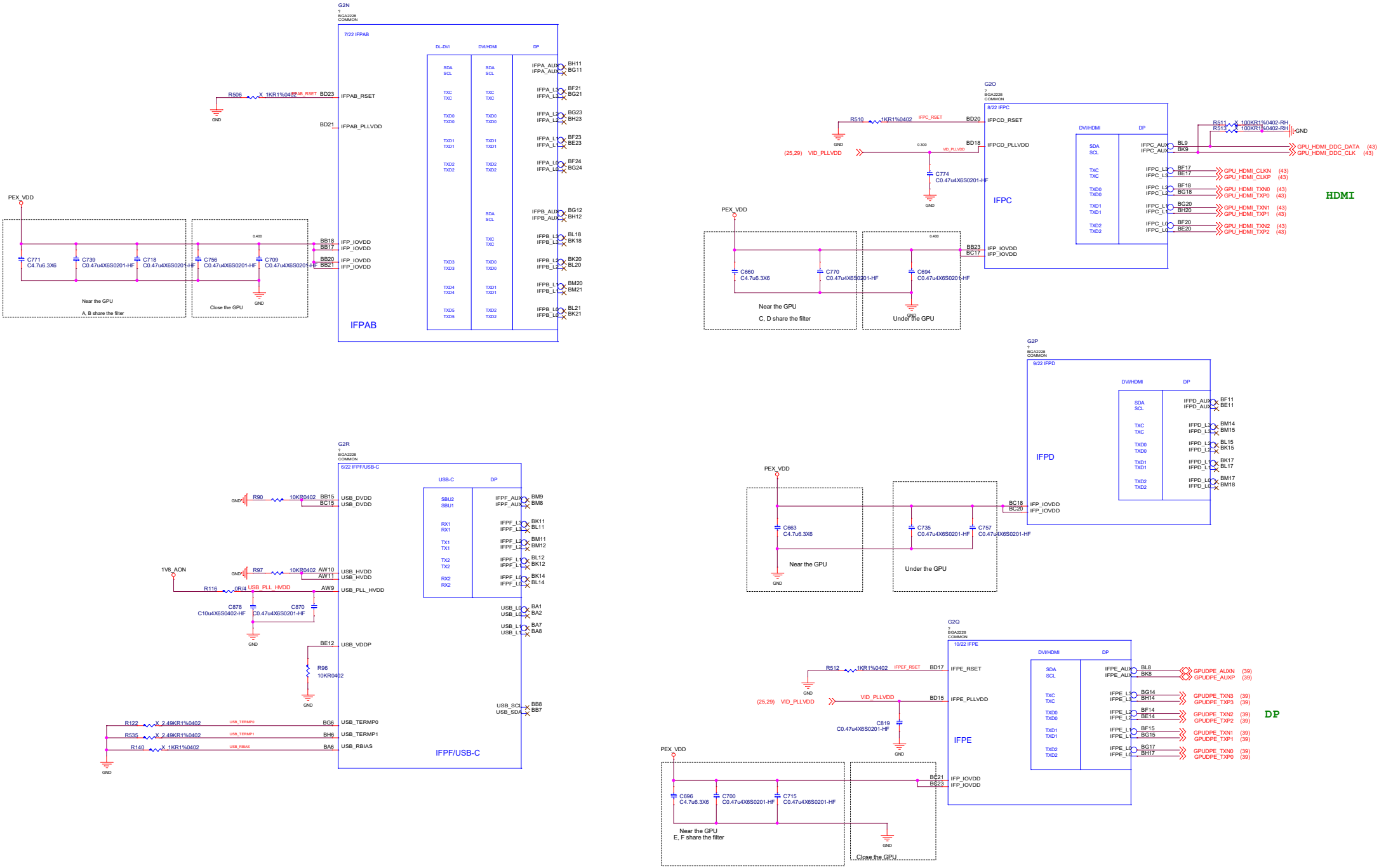
Title: DGPU_GPU DECOUPLING B

Size: Custom | Document Number: MS-16U71 / 17E7 | Rev: 0A

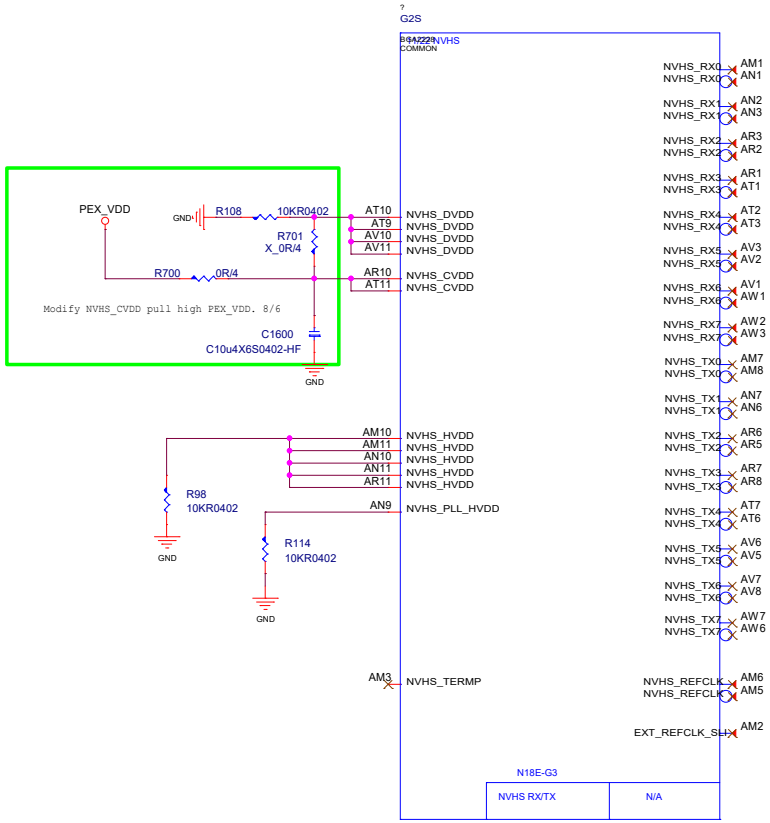
Date: Friday, October 18, 2019 | Sheet 24 of 79

DACA,Display IF

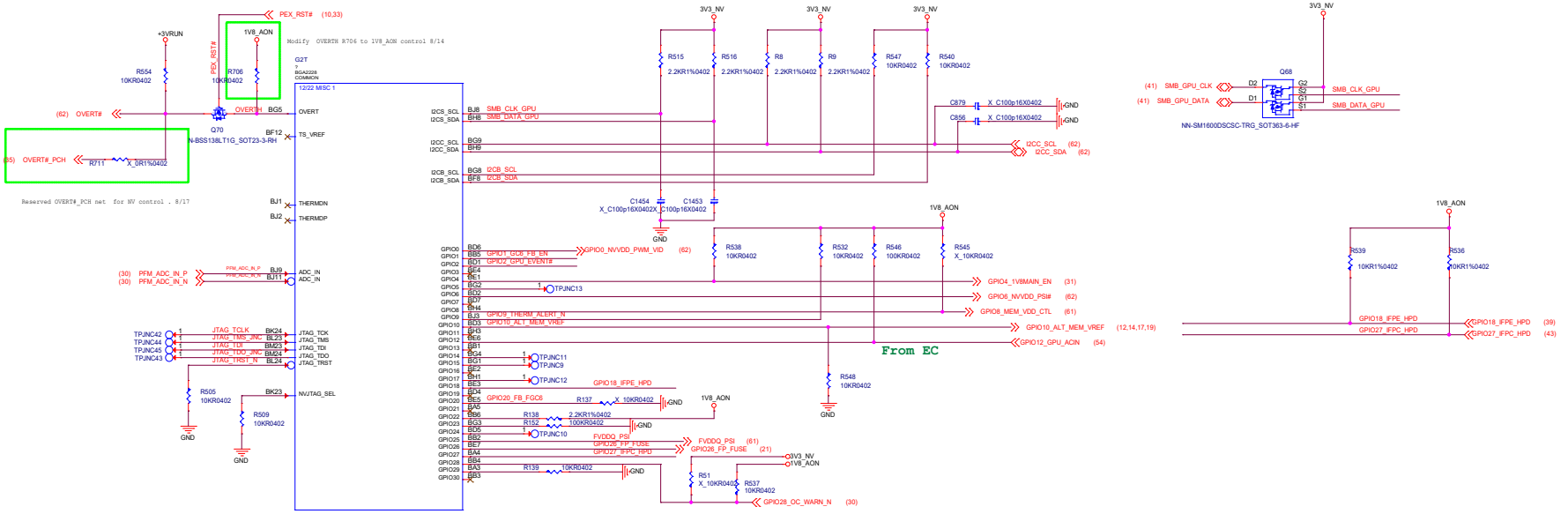


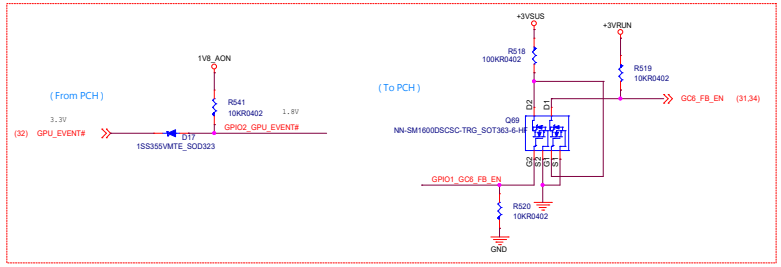
https://realschematic.com

MICRO-STAR INT'L CO.,LTD.			
Title: DGPU_DACA,Display IF			
Size: A2	Document Number: MS-16U71 / 17E7		Rev: 0A
Date: Friday, October 18, 2019	Sheet: 25 of 79		



Title	GPU_ NVLink & Framelock	
Size: Custom	Document Number: MS-16U71 / 17E7	Rev: 0A
Date: Friday, October 18, 2019	Sheet 26 of 79	





Pin Name	Normal function	I/O	Functional Description	Recommended Default Pull-up or Pull-down
GPIO0	**NVDD_PWM_VID**	O	PWM Output to control NVVDD	0 to 1V8 PWM output (No Pull Up or Down)
GPIO1	GC6_FB_EN	O	FB Enable for GC6 2.1	10K pull-down
GPIO2	GPU_EVENT#	I	GPU wake signal for GC6 2.1	10K pull-up to 1V8 _AON
GPIO3	**UNUSED**	O		
GPIO4	**1V8_MAIN_EN**	O	GPU POWER Sequencing for GC6 2.1	10K pull-up to 1V8 _AON
GPIO5	**FRAME_LOCK**	I	Active low Frame Lock	10K pull-up to 1V8 _AON
GPIO6	**NVDD_PSI**	O	Phase shedding	10K pull-up to 1V8 _AON
GPIO7	LCD_BL_PWM	O	LCD Panel Backlight PWM	100K pull-down
GPIO8	**MEM_VDD_CTL**	O	Memory Voltage Control	pull-up/pull-down to set the FBVDD/Q power-on voltage
GPIO9	THERM_ALERT	I/O	Active Low Thermal Alert	10K pull-up to 1V8_AON
GPIO10	MEM_VREF_CTL	O	Memory VREF Control	10K pull-down
GPIO11	LCD_VCC	O	Panel Power Enable	10K pull-down
GPIO12	PWR_LEVEL	I	AC power detect or power supply overdraw input	10K pull-up to 1V8_AON
GPIO13	**UNUSED**	O		
GPIO14	**HPD_IFPA**	I	Hot Plug Detect for IFPA	10K pull-up to 1V8_AON
GPIO15	**HPD_IFPB**	I	Hot Plug Detect for IFPB	10K pull-up to 1V8_AON
GPIO16	**UNUSED**	O		
GPIO17	**HPD_IFPD**	I	Hot Plug Detect for IFPD	10K pull-up to 1V8_AON
GPIO18	**HPD_IFPF**	I	Hot Plug Detect for IFPE	10K pull-up to 1V8_AON
GPIO19	**Reserved**	O		
GPIO20	**NB_FGC6**			10K pull-down
GPIO21	**LCD_BLEN**		**LCD Panel Backlight Enable**	100K pull-down
GPIO22	**SWAPRDY_IN**			2.2K pull-up to 1V8_AON
GPIO23	**RASTER_SYNC1**			100K pull-down
GPIO24	**HPD_IFPF/USBC_HPD or DONGLE_DET**	I	**Hot Plug Detect for IFPF or USBC**	10K pull-up to 1V8_AON
GPIO25	**FBVDD_PSI**	O		
GPIO26	**FP_FUSE**			10K pull-down
GPIO27	**HPD_IFPC**	I	Hot Plug Detect for IFPC	10K pull-up to 1V8_AON
GPIO28	**INA_HT/ADC_MUX_SEL**			10K pull-up
GPIO29	**IDLE_INDICATOR**			10K pull-down
GPIO30	**UNUSED**			

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Title: DGPU_GPIO,I2C

Size: Custom | Document Number: MS-16U71 / 17E7 | Rev: 0A

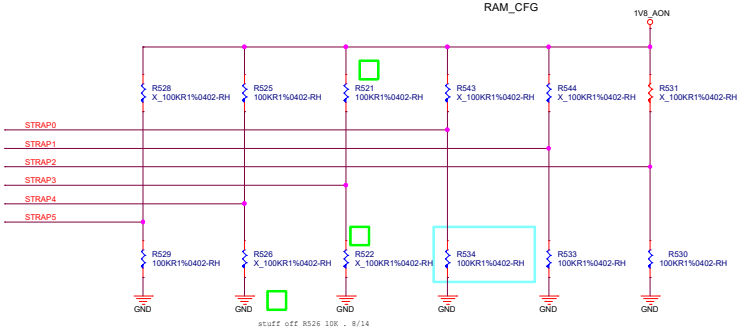
Date: Friday, October 18, 2019 | Sheet 27 of 79

H=High :Tied to 1.8V
M=Middle:Tied to 0.9V
L=Low :Tied to 0V

STRAP2	STRAP1	STRAP0	RAMCFG[4:0]		
L	L	L	00000	RAMCFG TBD	
L	L	H	00001	RAMCFG TBD	DEFAULT
L	H	L	00010	RAMCFG TBD	
L	H	H	00011	RAMCFG TBD	
H	H	L	00110	RAMCFG TBD	
H	H	H	00111	RAMCFG TBD	

RAMCFG[4:0]	DENSITY	WIDTH	VENDOR
00000	8Gb	256-bit	Samsung
00001	8Gb	256-bit	Micron
00010	8Gb	256-bit	Hynix
00110	16Gb	256-bit	Hynix
00111	16Gb	256-bit	Samsung
01000	16Gb	256-bit	Micron

RAM_CFG



ROM_SO	ROM_SI	ROM_SCLK	DUMMY[2:0],FS_OVERT	1:ENABLE 0:DISABLE	
L	L	L	XXX1	FS_OVERT ENABLE	DEFAULT
L	L	M	XXX0	FS_OVERT DISABLE	

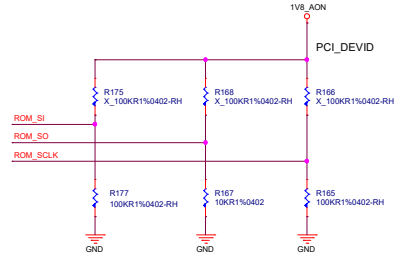
STRAP5	STRAP4	STRAP3	SMB_ALT_ADDR	DEVID_SEL	PCIE_CFG	VGA_DEVICE	
M	H	H	1	1	1	1	
M	H	L	1	1	1	0	
M	L	H	1	1	0	1	
M	L	L	1	1	0	0	
L	H	M	1	0	1	1	
L	M	H	1	0	1	0	
L	M	L	1	0	0	1	
L	L	M	1	0	0	0	
H	H	H	0	1	1	1	
H	H	L	0	1	1	0	
H	L	H	0	1	0	1	
H	L	L	0	1	0	0	
L	H	H	0	0	1	1	
L	H	L	0	0	1	0	
L	L	H	0	0	0	1	Default
L	L	L	0	0	0	0	

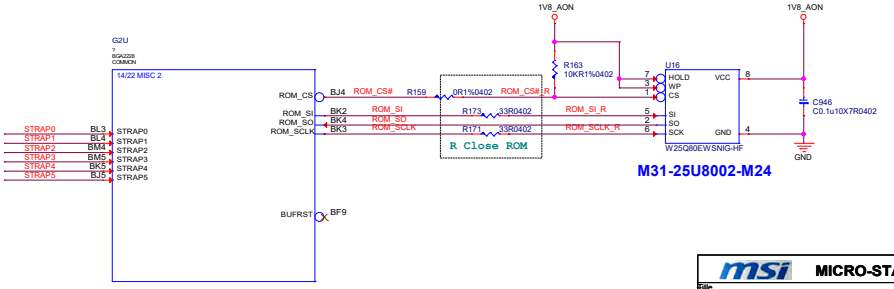
1:SMB_ALT_ADDR ENABLE
0:SMB_ALT_ADDR DISABLE

1:DEVID_SEL REBRAND
0:DEVID_SEL ORIGNAL

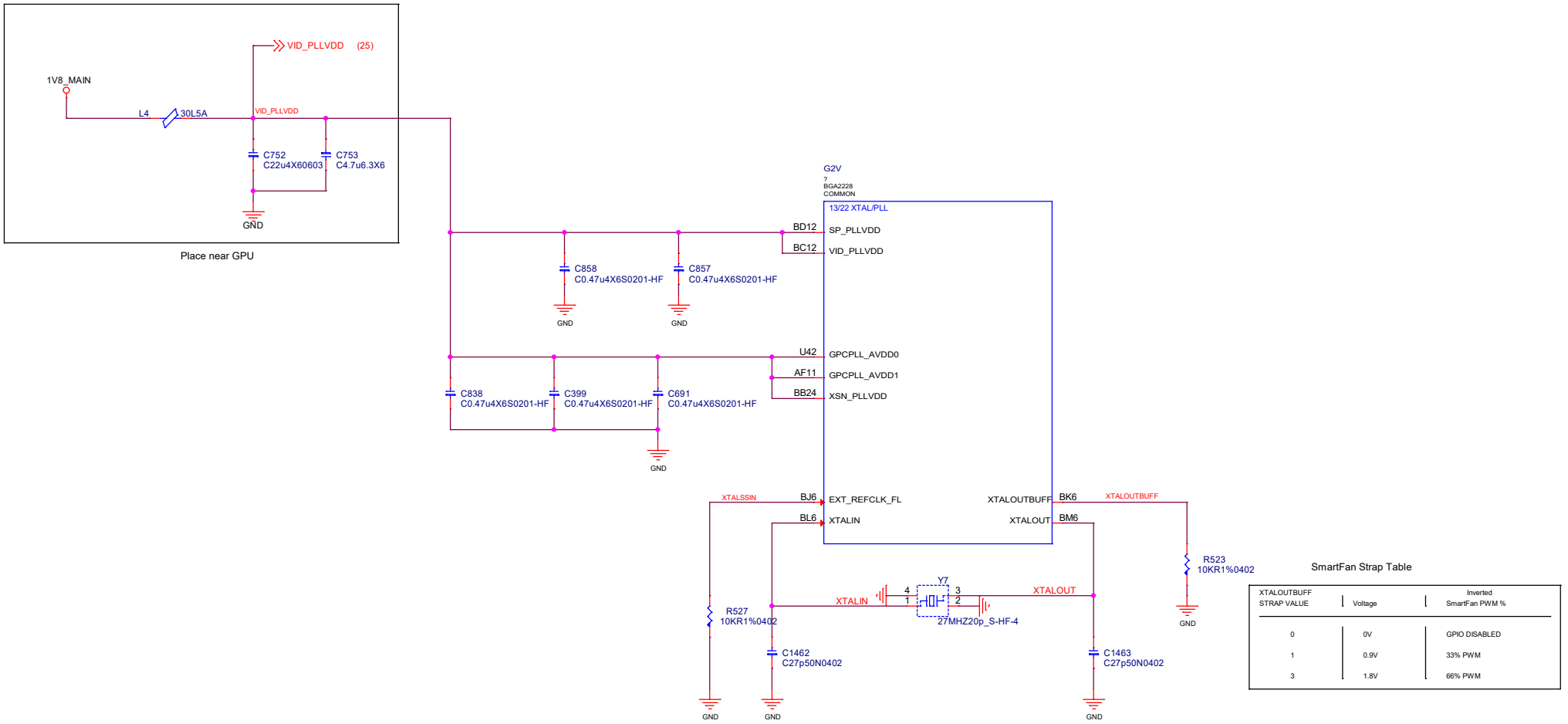
1:PCIE_CFG LOW POWER
0:PCIE_CFG HIGH POWER

1:VGA_DEVICE ENABLE
0:VGA_DEVICE DISABLE





msi	MICRO-STAR INT'L CO.,LTD.	
Title: DGPU_ROM,HW Straps		
Size: Custom	Document Number: MS-16U71 / 17E7	Rev: 0A
Date: Friday, October 18, 2019	Sheet 28 of 79	



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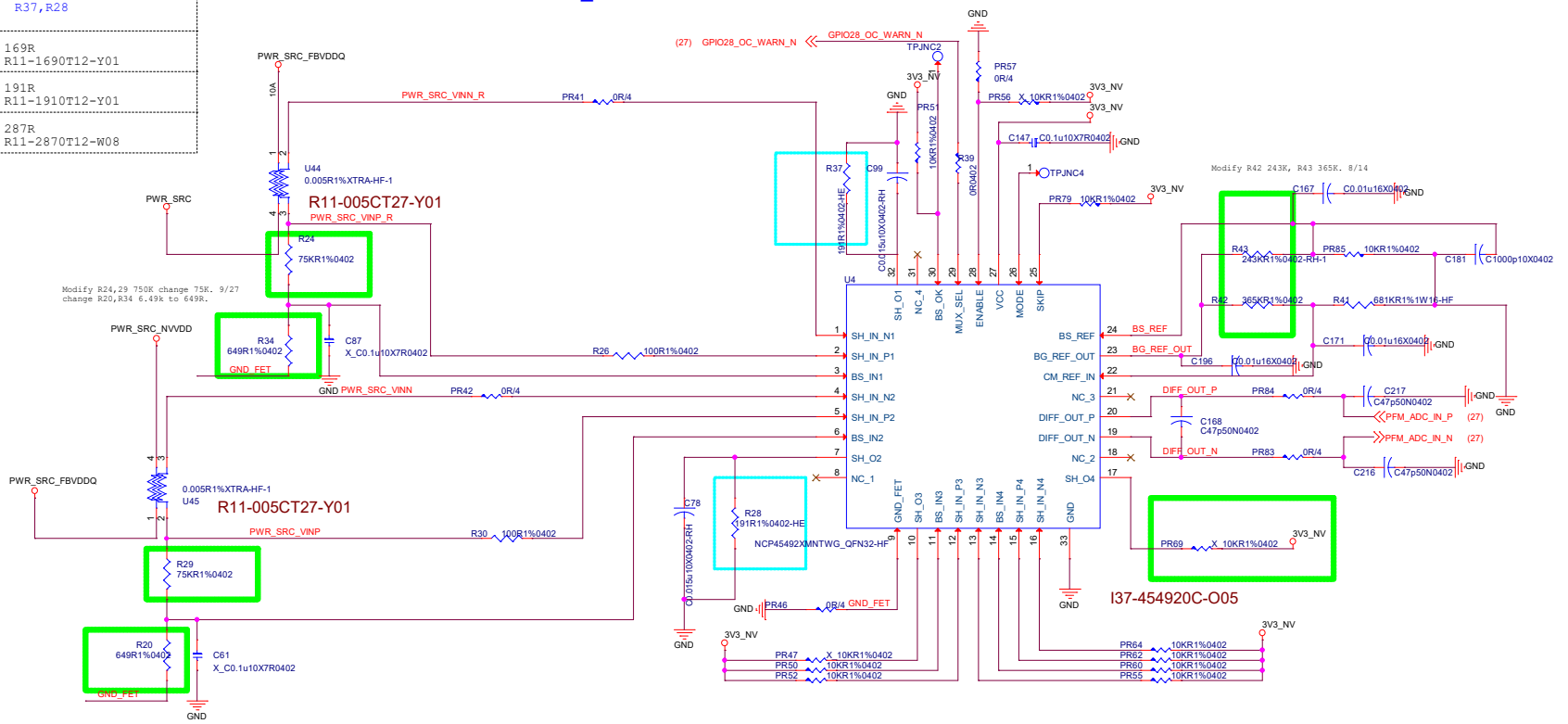
Title: DGPU MIO & XTAL

Size: A3 | Document Number: MS-16U71 / 17E7 | Rev: 0A

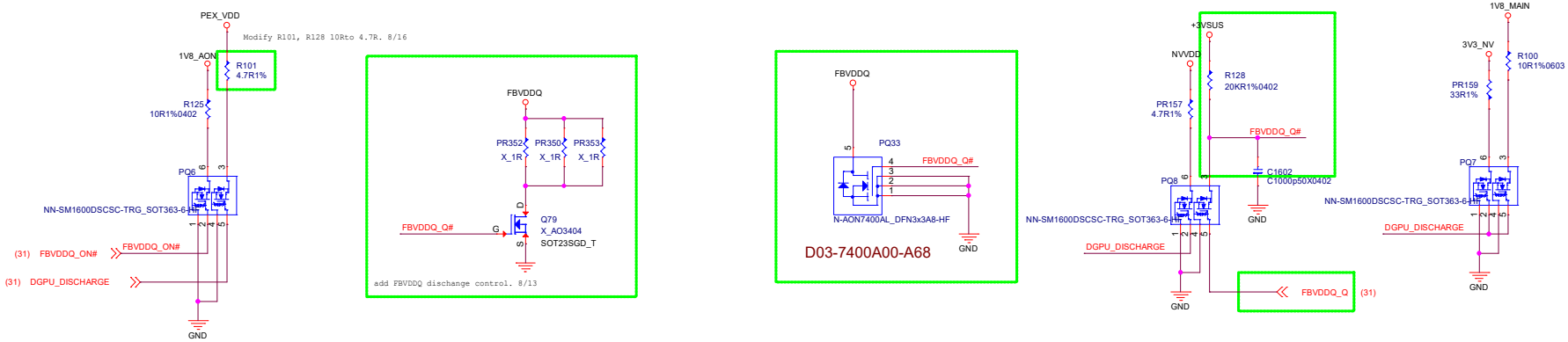
Date: Friday, October 18, 2019 | Sheet 29 of 79

DGPU_Power Control

TGP	SKU	R24,R29	R34,R20	C87,C61 先不上件	R37,R28
150W	G3	75K	649R	1nF	169R R11-1690T12-Y01
115W	G2	75K	649R	1nF	191R R11-1910T12-Y01
80W	G1/G0	75K	649R	1nF	287R R11-2870T12-W08



Discharge



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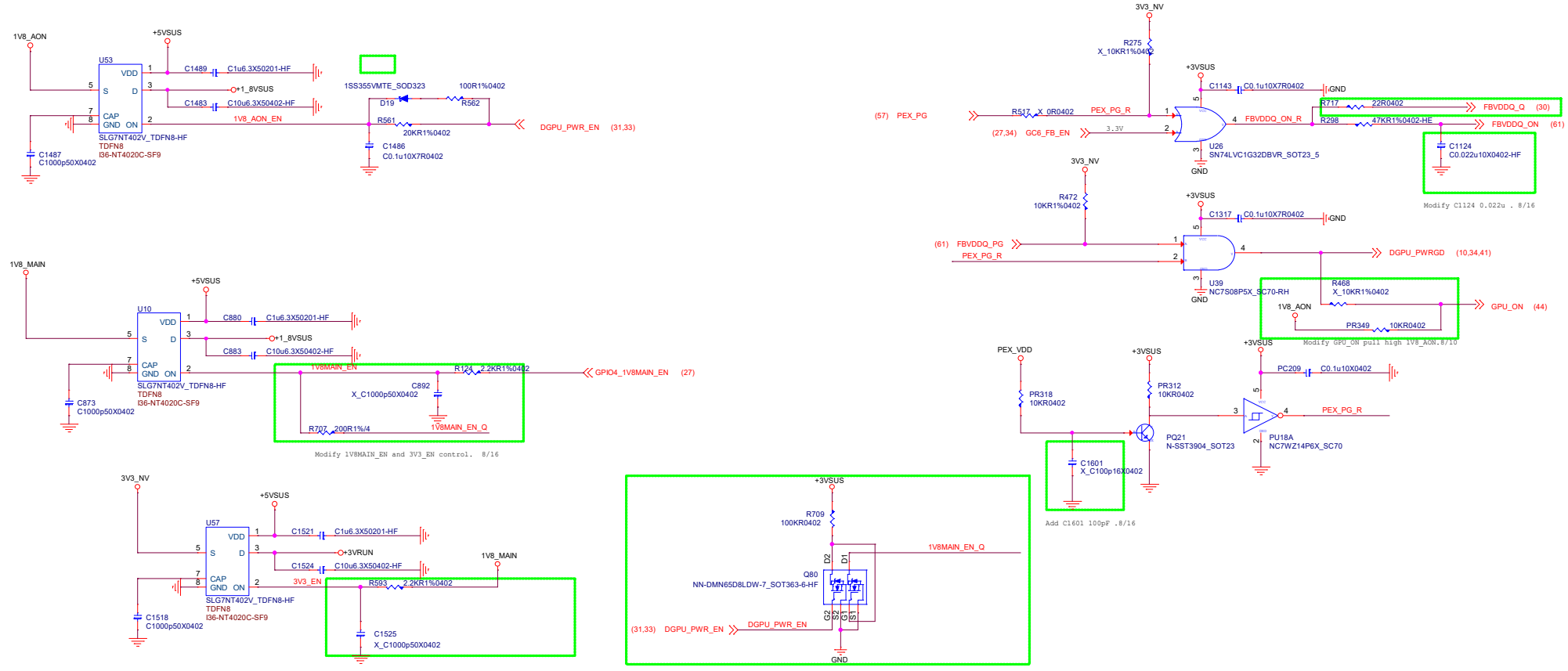
Title	DGPU_Power Control	
Size: Custom	Document Number: MS-16U71 / 17E7	Rev: 0A
Date: Friday, October 18, 2019	Sheet 30 of 79	

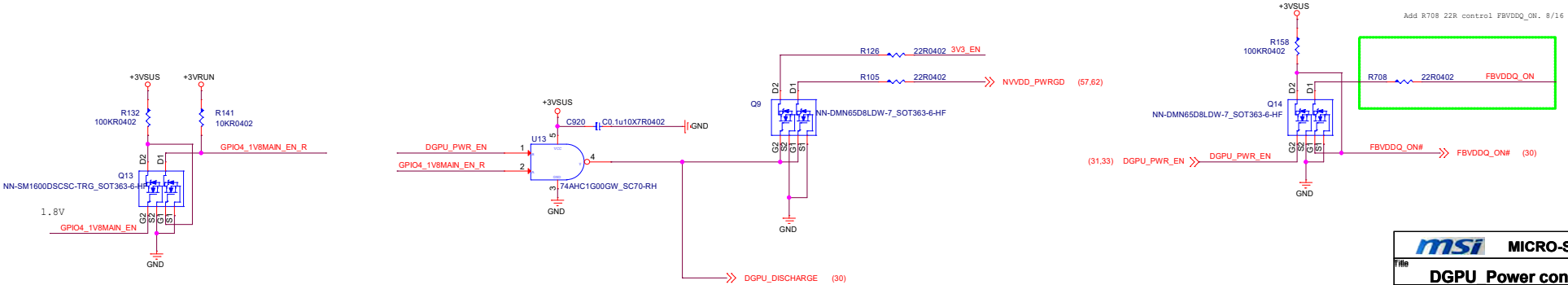
nVIDIA Power Sequence Power UP

Power on = 1V8_AON -> 1V8_MAIN -> 3V3_NV -> NVVDD -> NVDDS/PEX_VDD -> FBVDDQ -> DGPUPWRGD



nVIDIA Power Sequence Power Down

Power down = FBVDDQ -> NVDDS/PEX_VDD -> 3V3_NV -> 1V8_AON -> 1V8_MAIN

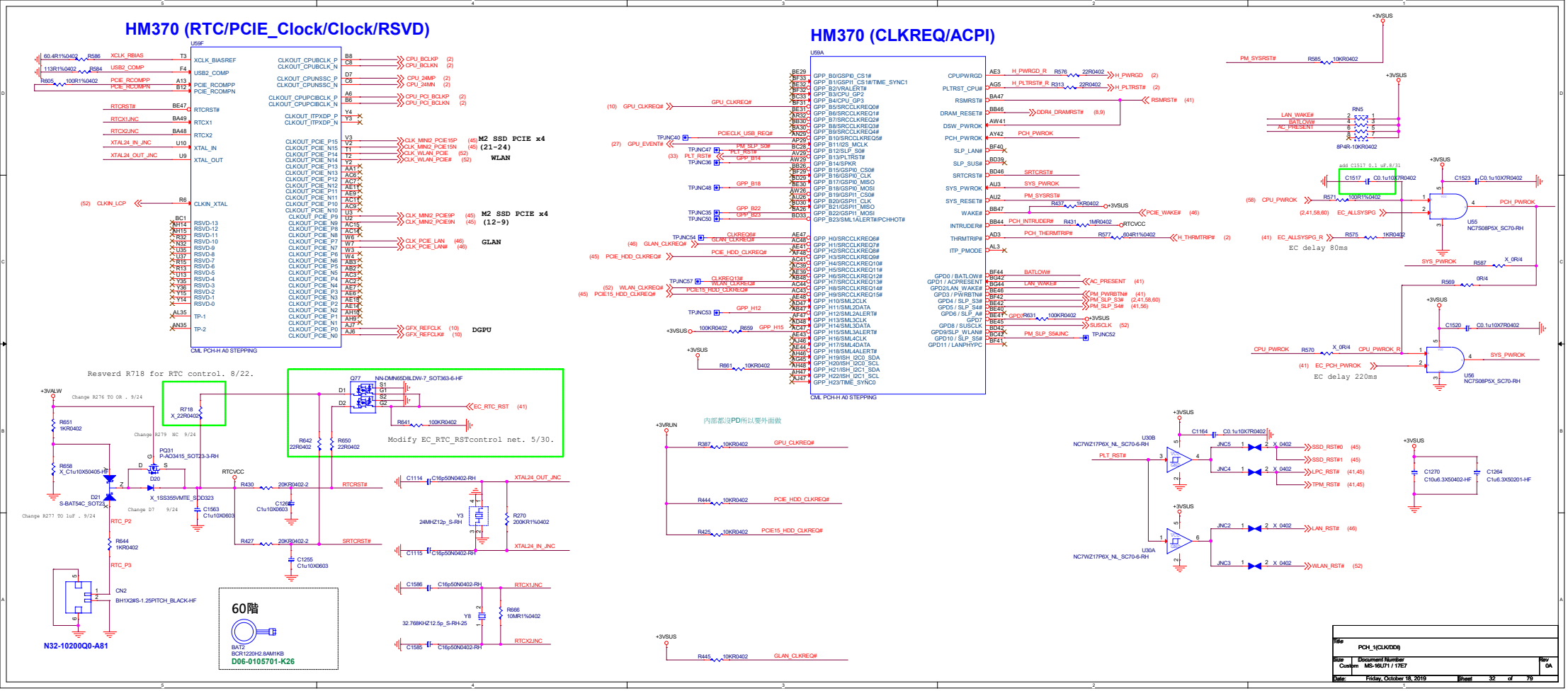


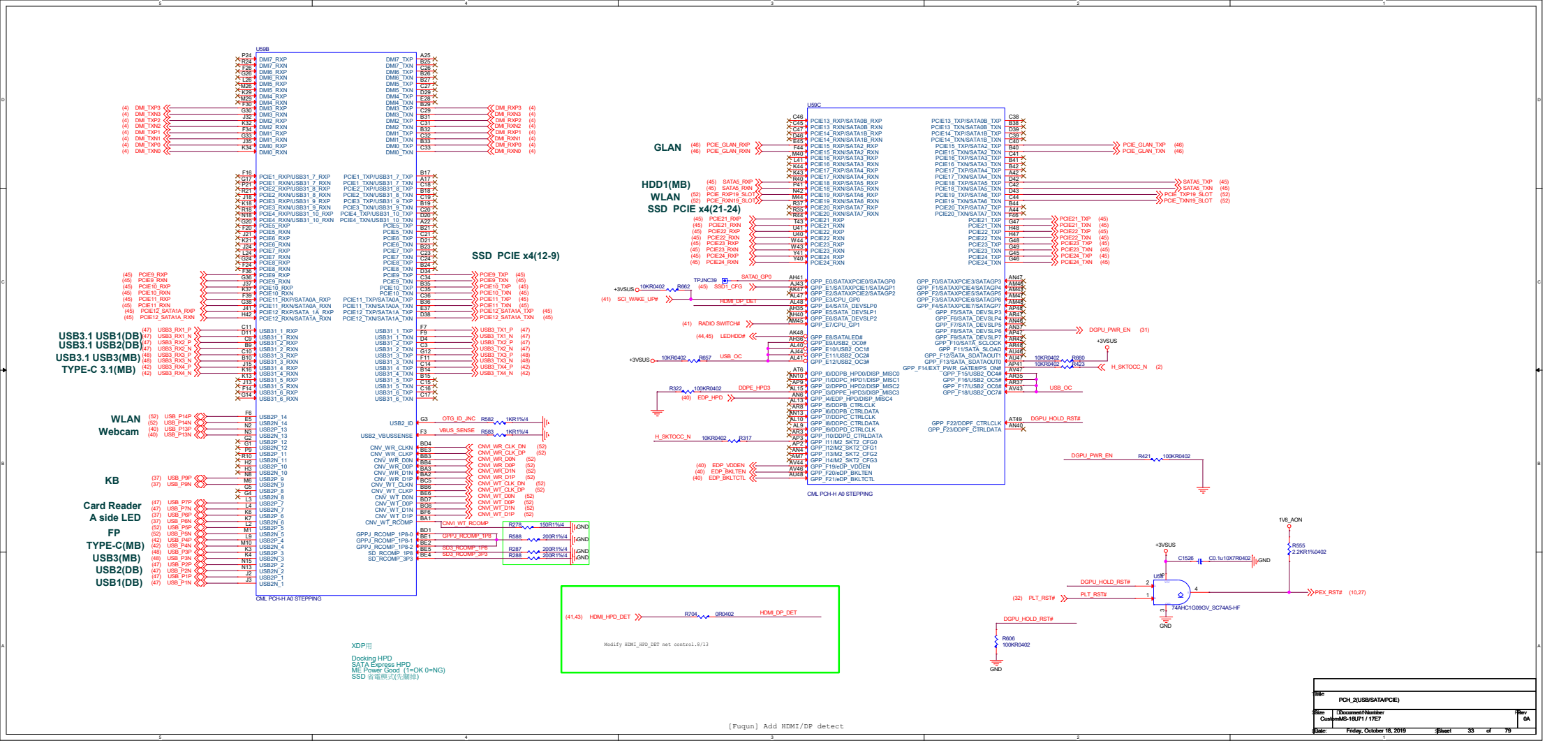
MICRO-STAR INT'L CO.,LTD.

Title: DGPU_Power control, Discharge

Size | Document Number: MS-16U71 / 17E7 | Rev: 0A

Date: | Sheet 31 of 79

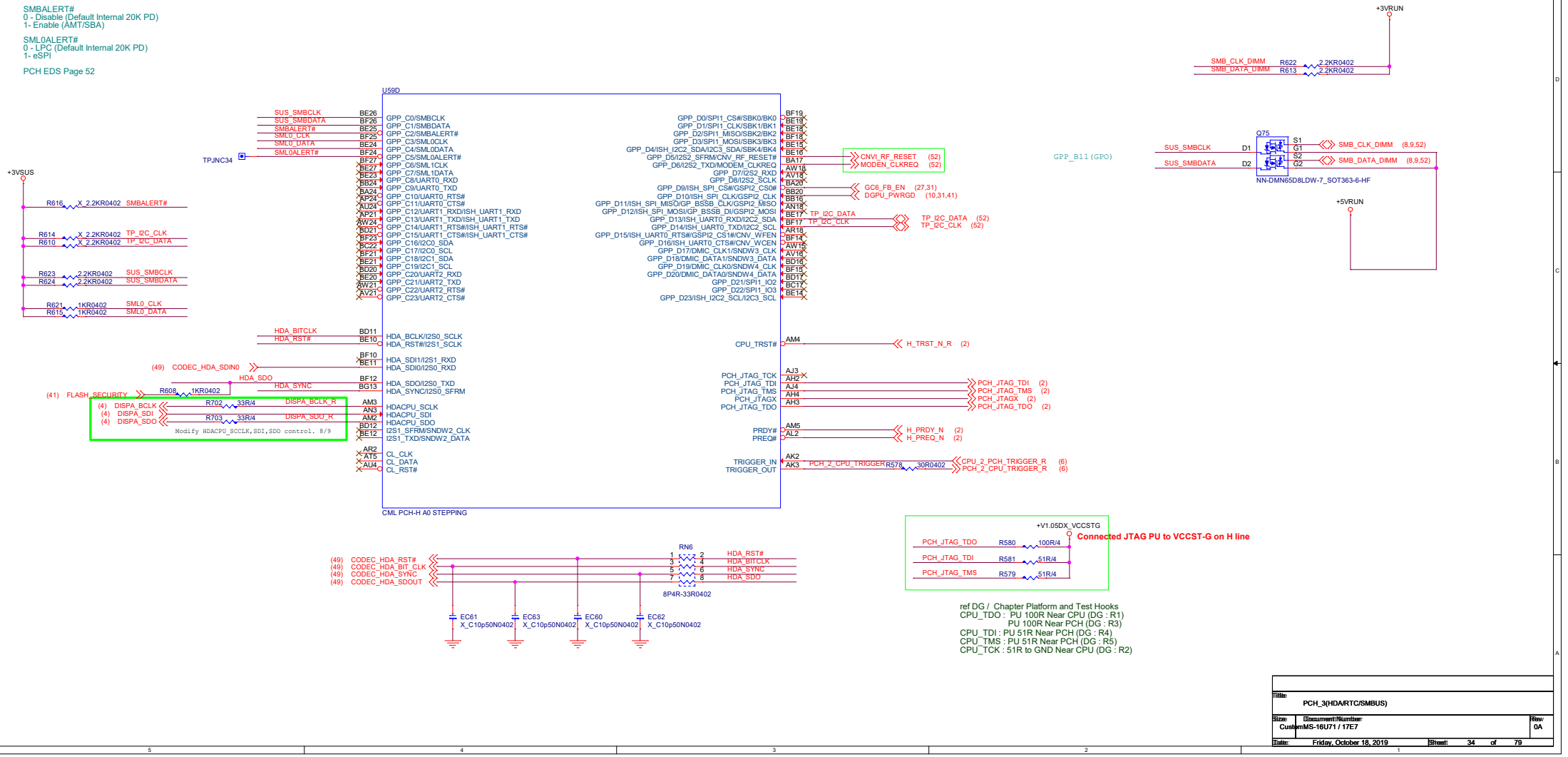




SMBALERT#
0 - Disable (Default Internal 20K PD)
1- Enable (AMT/SBA)

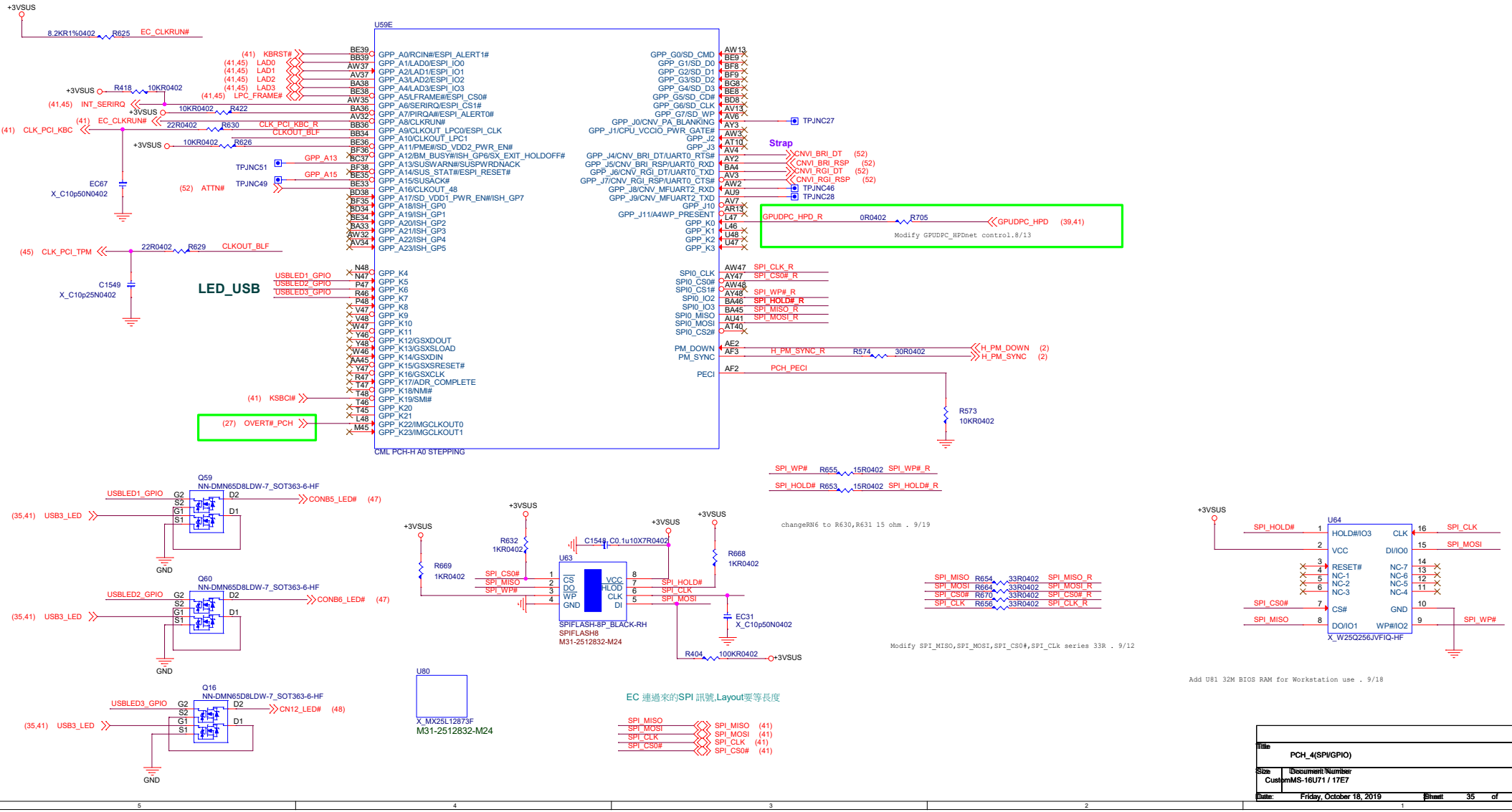
SML0ALERT#
0 - LPC (Default Internal 20K PD)
1- eSPI

PCH EDS Page 52



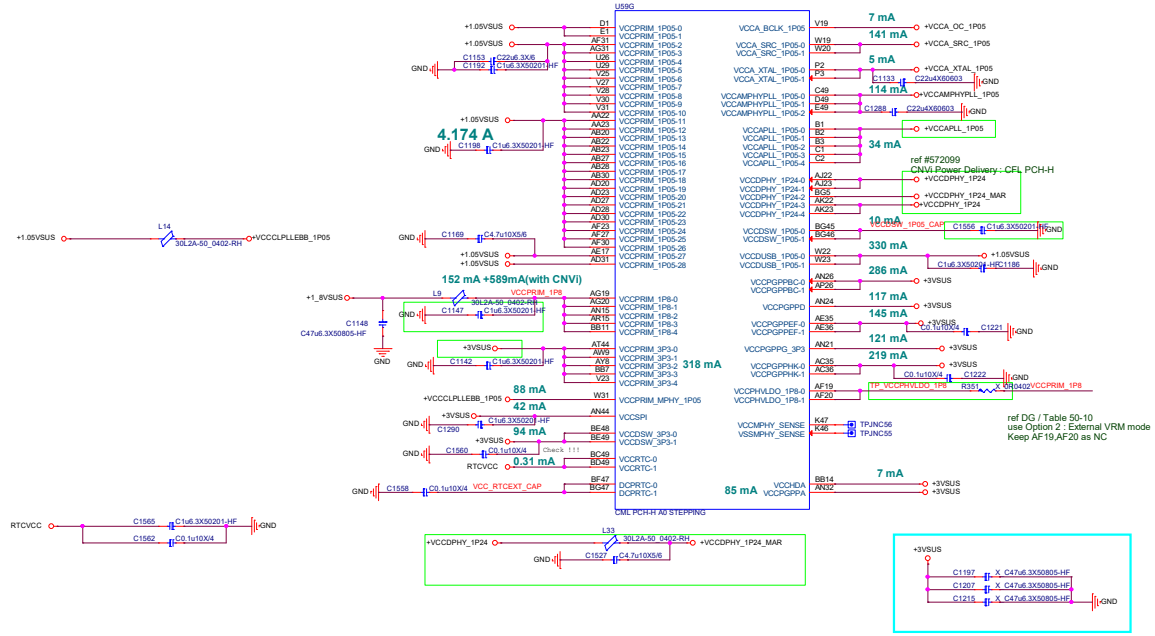
ref DG / Chapter Platform and Test Hooks
CPU_TDO : PU 100R Near CPU (DG : R1)
PU 100R Near PCH (DG : R3)
CPU_TDI : PU 51R Near PCH (DG : R4)
CPU_TMS : PU 51R Near PCH (DG : R5)
CPU_TCK : 51R to GND Near CPU (DG : R2)

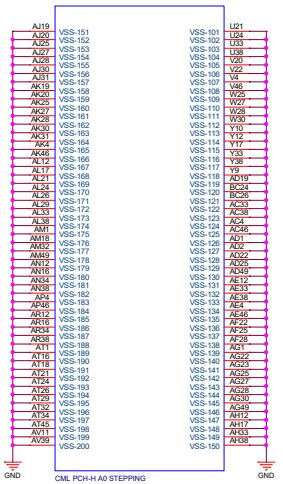
Title: PCH_3(HDA/RTC/SMBUS)		
Size: Custom	Document Number: MS-16U71 / 17E7	Rev: 0A
Date: Friday, October 18, 2019	Sheet: 34 of 79	

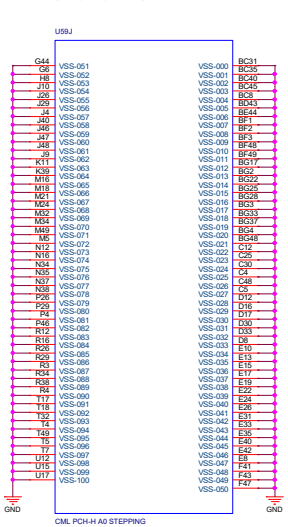


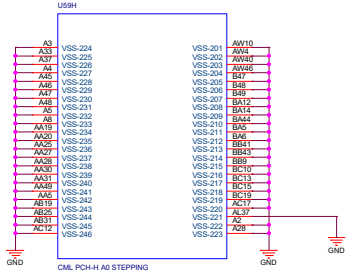
HM370 (Power)

ref DG / Table 50-6 Decoupling Requirements









GPIO Group Summary

GPIO Group	Power Pins	Voltage
Primary Well Group A (GPP_A)	VCCPGPPA	1.8V or 3.3V
Primary Well Group B (GPP_B) Primary Well Group C (GPP_C)	VCCPGPPBC	1.8V or 3.3V
Primary Well Group D (GPP_D)	VCCPGPPD	1.8V or 3.3V
Primary Well Group E (GPP_E) Primary Well Group F (GPP_F)	VCCPGPPEF	1.8V or 3.3V
Primary Well Group G (GPP_G)	VCCPGPPG_3P3 or VCCPRIM_1P8	1.8V or 3.3V
Primary Well Group H (GPP_H) Primary Well Group K (GPP_K)	VCCPGPPHK	1.8V or 3.3V
Primary Well Group I (GPP_I)	VCCPRIM_3P3	3.3V Only
Primary Well Group J (GPP_J)	VCCPRIM_1P8	1.8V Only
Deep Sleep Well Group (GPD)	VCCDSW_3P3	3.3V Only

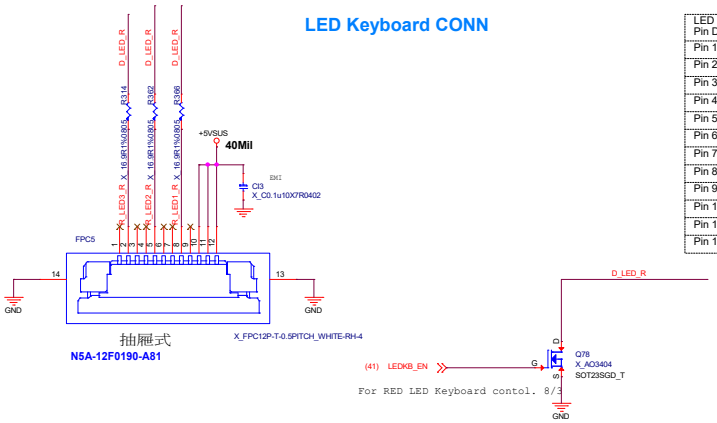
Note: Except for GPP_G group, the operating voltage of a GPIO group having voltage configurability (1.3V or 1.8V) is selected by both connecting the corresponding power pin and setting the group voltage selection soft strap to the desired voltage. GPP_G group voltage is selected by setting the corresponding soft strap only.

Power Descriptions for PCH in CNL-H

Name	Description
VCCA_BCLK_1P05	**Analog supply for BCLK circuitries:** 1.05V
VCCA_SRC_1P05	**Analog supply for PCIe clock circuitries:** 1.05V
VCCA_XTAL_1P05	**Analog supply for XTAL circuitries:** 1.05V
VCCDUSB_1P05	**Supply for USB digital logic:** 1.05V
VCCAPLL_1P05	**Analog supply for BCLK/DMI/Audio PLLs:** 1.05V. This rail can be derived from the VCCPRIM_1P05 rail with the proper isolation. Refer to the Platform Design Guide for implementation detail.
VCCPRIM_1P05	**Primary Well:** 1.05V. For PCIe//USB3/SATA MPHY logic, I/O blocks, SRAM, JTAG, CNVI.
VCCDSW_1P05	**Deep Sx Well:** 1.05V. This rail is generated by on die DSW low dropout (LDO) linear regulator to supply DSW core logic. Board needs to connect a 1uF capacitor to this rail and power should NOT be driven from the board.
VCCPRIM_MPHY_1P05	**Mod PHY Primary**: 1.05V. Primary supply for PCIe/USB3/SATA MPHY logic and PCIe/USB PLL dividers
VCCAMPHYPLL_1P05	**Analog supply for USB3, PCIe Gen 2/Gen 3, and SATA3 PLLs:** 1.05V. Refer to the Platform Design Guide for filtering and decoupling recommendations.
VCCPRIM_1P8	**1.8V Primary Well.**
VCCPRIM_3P3	**3.3V Primary Well.**
VCCSPI	**SPI Primary Well 3.3V or 1.8V,** for SPI interface.
VCCHDA	**HDA Audio Power 3.3V, 1.8V, or 1.5V,** for Intel's High Definition Audio.
VCCDSW_3P3	**3.3V Deep Sx Well.**
VCCRTC	**RTC Well Supply.** This rail can drop to 2.0V if all other planes are off. This power is not expected to be shut off unless the RTC battery is removed or drained. ***Note:*** VCCRTC nominal voltage is 3.0V. This rail is intended to always come up first and always stay on. It should NOT be power cycled regularly on non-coin battery designs. Refer to the Platform Design Guide, RTC Design Guidelines chapter for latest design recommendations. ***Note:*** Implementation should not attempt to clear CMOS by using a jumper to pull VCCRTC low. Clearing CMOS can be done by using a jumper on RTCRST# or GPI.
DCPRTC	RTC decoupling capacitor only. This rail should NOT be driven.
VCCDPHY_1P24	**1.24V for CNVi logic.** This rail is generated internally with a LDO and needs to be routed to the motherboard so that the rail can be supplied back to the SoC. Refer to the Platform Design Guide for implementation details.
VCCDPHY_EC_1P24	For decoupling capacitor only. This rail should NOT be driven from the motherboard. This rail can optionally be connected to VCCDPHY_1P24 on the motherboard.
VCCPHVLDO_1P8	**1.8V Primary Well.** On the motherboard, this power pin must be connected to VCCPRIM_1P8 rail in Internal 1.8 V VRM Mode and left as no-connect in External 1.8V VRM Mode.
VCCPGPPA	**1.8V or 3.3V for GPP_A group.**
VCCPGPPBC	**1.8V or 3.3V for GPP_B and GPP_C groups.**
VCCPGPPD	**1.8V or 3.3V for GPP_D group.**
VCCPGPPEF	**1.8V or 3.3V for GPP_E and GPP_F groups.**
VCCPGPPG_3P3	**3.3V for GPP_G group.**
VCCPGPPHK	**1.8V or 3.3V for GPP_H and GPP_K groups.**
VCCMPHY_SENSE	**1.05V Sense Line.**
VSSMPHY_SENSE	**0V (Ground) Sense Line.**
VSS	**Ground.**

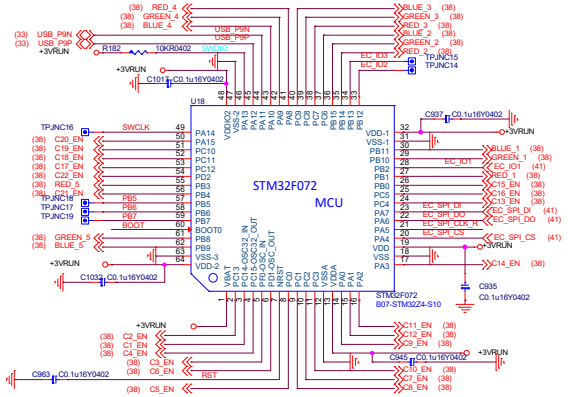
Title	PCH_5(Power1)		
Size	Document Number		Rev
Custom	MS-16071 / 17E7		0A
Date:	Friday, October 18, 2019	Sheet 36 of 79	

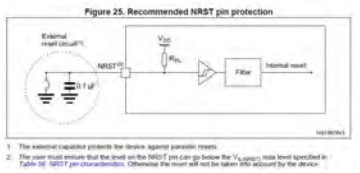
LED Keyboard CONN



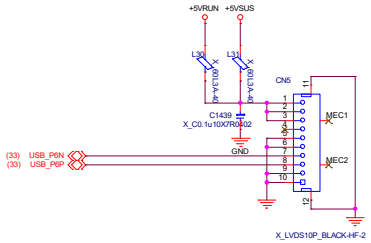
LED Keyboard Pin Define		RED LED Keyboard Pin Define
Pin 1	VCC_G	
Pin 2	VCC_R	VCC
Pin 3	VCC_B	
Pin 4	LED1_B	
Pin 5	LED1_R	LED1_R
Pin 6	LED1_G	
Pin 7	LED2_B	
Pin 8	LED2_R	LED2_R
Pin 9	LED2_G	
Pin 10	LED3_B	
Pin 11	LED3_R	LED3_R
Pin 12	LED3_G	

LED STM32F072 Controller





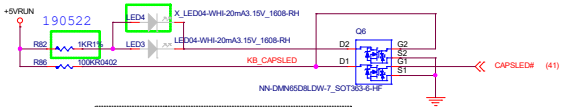
A side LED



GE	CN5 use
GP/GL/WE	CN5 no use

CAPSLED

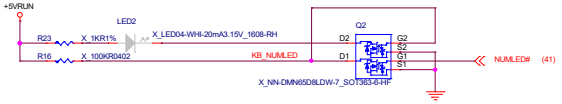
Add LED4 for17"



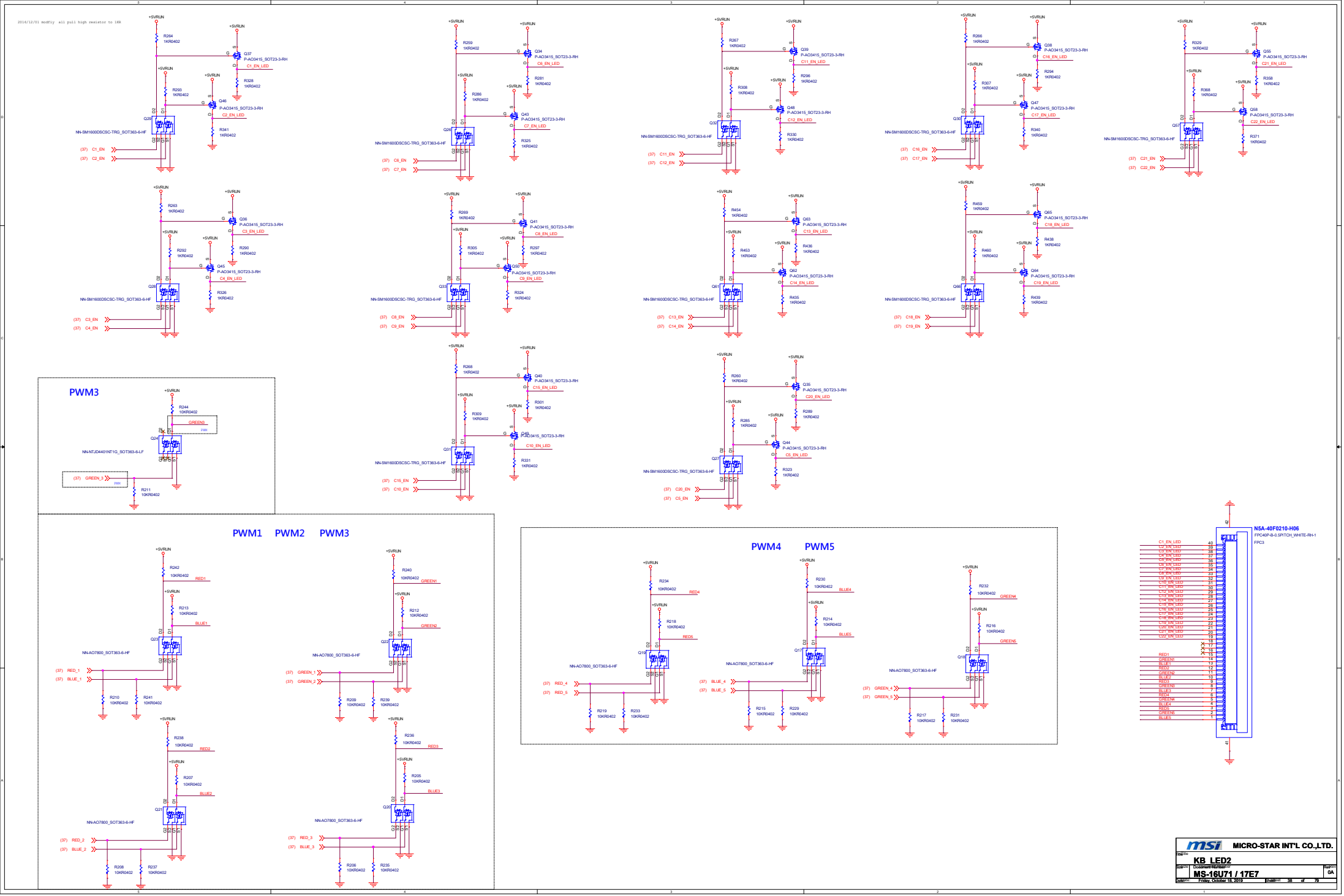
	LED3,LED4
GE	D0C-040C300-L05
GP	D0C-0402010-L05

	LED3
17E1/17E2	D0C-040C300-L05

NUMLED

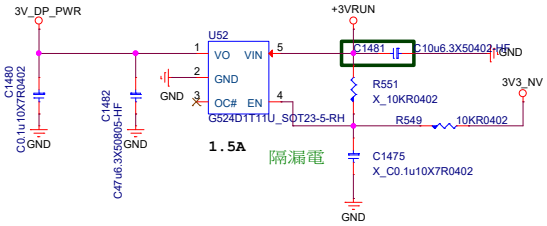


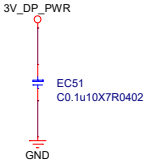
Title	LED 8051/KB CON
Size	Document Number: CustomMS-16U71 / 1757
Rev	0A
Date:	Friday, October 18, 2019
Sheet	37 of 79



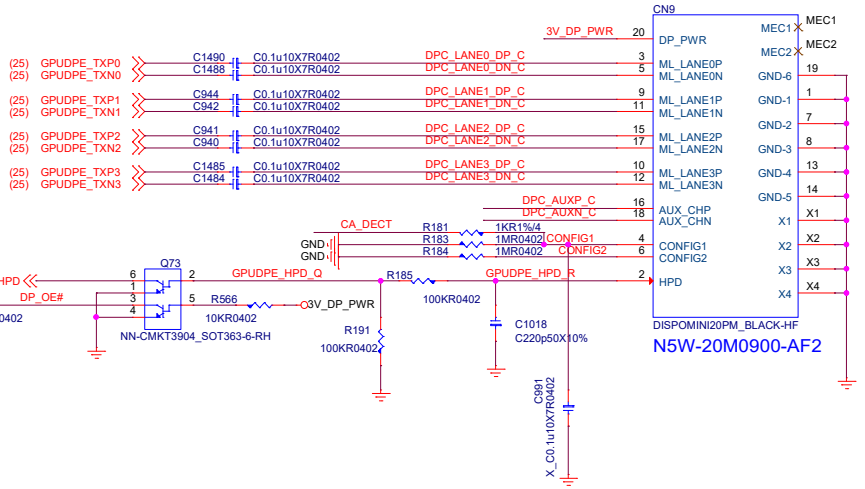
Display Port

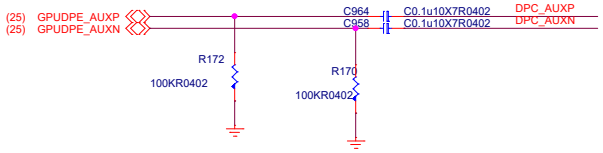
The preset trip limit must not exceed 3A at the Upstream device connector DP_PWR pin and 1.5A at the Downstream device connector DP_PWR pin.



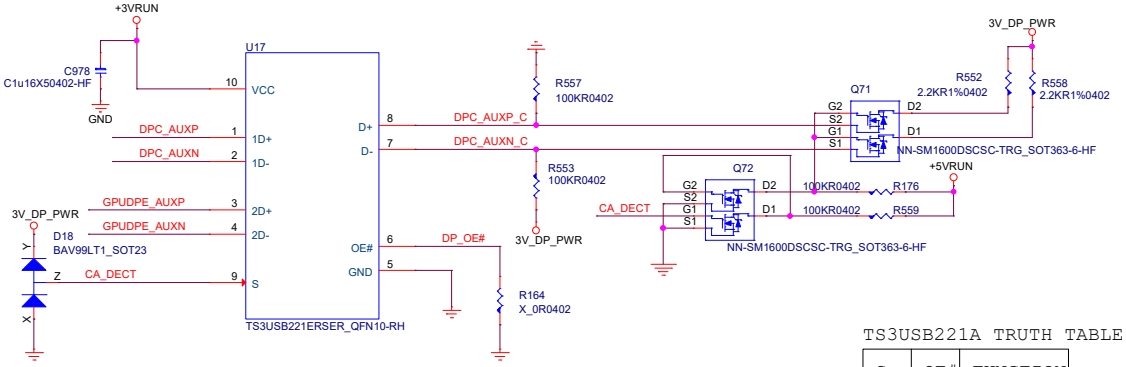


Display Port



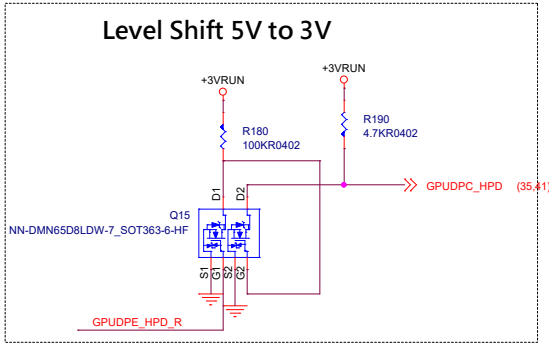


DP/TMDS mode select



TS3USB221A TRUTH TABLE

S	OE#	FUNCTION
X	H	Disconnect
L	L	D = 1D
H	L	D = 2D



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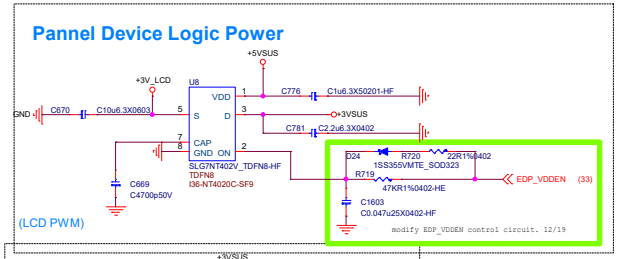
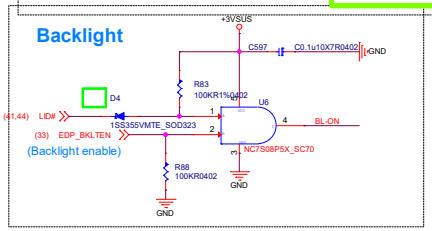
Title: DP

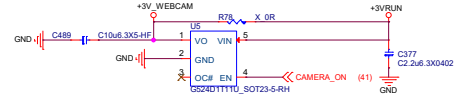
Size: Custom | Document Number: MS-16U71 / 17E7 | Rev: 0A

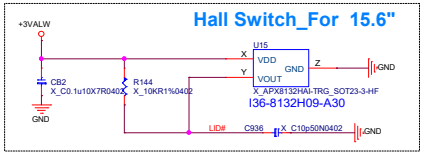
Date: Friday, October 18, 2019 | Sheet 39 of 79

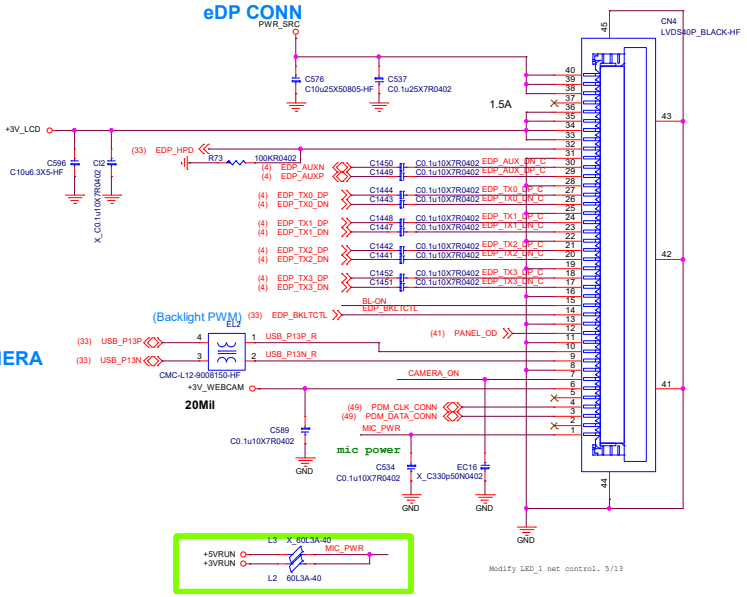
eDP/Camera



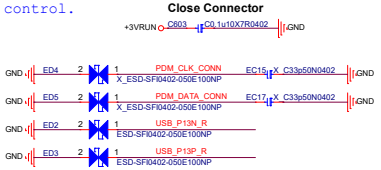








5/30 Modify MIC_PWR select control.



LCD Module Pin Define FOR FULL HD PANEL

Pin No	Symbol	Description
1	Vcom SDA	Vcom IIC SDA
2	H_GND	High Speed Ground
3	LAN1_N	Complement Signal-Lane 1
4	LAN1_P	True Signal-Main Lane 1
5	H_GND	High Speed Ground
6	LAN0_N	Complement Signal-Lane 0
7	LAN0_P	True Signal-Main Lane 0
8	H_GND	High Speed Ground
9	AUX+	True Signal-Auxiliary Channel
10	AUX-	Complement Signal-Auxiliary Channel
11	H_GND	High Speed Ground
12	LCD_VCC	Power Supply +3.3 V (typical)
13	LCD_VCC	Power Supply +3.3 V (typical)
14	NC	No Connection (Reserved for CMI test)
15	H_GND	Ground
16	H_GND	Ground
17	HPD	Hot Plug Detect
18	BL_GND	BL Ground
19	BL_GND	BL Ground
20	BL_GND	BL Ground
21	BL_GND	BL Ground
22	BL_EN	BL_Enable Signal of LED Converter
23	BL_PWM	PWM Dimming Control Signal of LED Converter
24	Vcom SCL	Vcom IIC SCL
25	NC	No Connection (Reserved)
26	LED_VCCS	BL Power
27	LED_VCCS	BL Power
28	LED_VCCS	BL Power
29	LED_VCCS	BL Power
30	**OD_EN**	**OD_Enable Signal of TCON**

LCD Module Pin Define FOR WQHD PANEL

Pin No	Symbol	Description
1	NC	Reserved for LCD manufactureer's use
2	H_GND	High Speed Ground
3	Lane3_N	Complement Signal Link Lane 3
4	Lane3_P	True Signal Link Lane 3
5	H_GND	High Speed Ground
6	Lane2_N	Complement Signal Link Lane 2
7	Lane2_P	True Signal Link Lane 2
8	H_GND	High Speed Ground
9	Lane1_N	Complement Signal Link Lane 1
10	Lane1_P	True Signal Link Lane 1
11	H_GND	High Speed Ground
12	Lane0_N	Complement Signal Link Lane 0
13	Lane0_P	True Signal Link Lane 0
14	H_GND	High Speed Ground
15	AUX_CH_P	True Signal Auxiliary Channel
16	AUX_CH_N	Complement Signal Auxiliary Channel
17	H_GND	High Speed Ground
18	VDD	LCD logic and driver power(3.3V)
19	VDD	LCD logic and driver power(3.3V)
20	VDD	LCD logic and driver power(3.3V)
21	VDD	LCD logic and driver power(3.3V)
22	BIST	BIST patterns selection L : Disable [default] , H : Enable
23	LCD_GND	LCD logic and driver ground
24	LCD_GND	LCD logic and driver ground
25	LCD_GND	LCD logic and driver ground
26	LCD_GND	LCD logic and driver ground
27	HPD	HPD signal pin
28	BL_GND	Backlight ground
29	BL_GND	Backlight ground
30	BL_GND	Backlight ground
31	BL_GND	Backlight ground
32	BL_ENABLE	Backlight On/0ff
33	BL_PWM_DIM	System PWM
34	NC	Reserved for LCD manufacturer's use
35	NC	Reserved for LCD manufacturer's use
36	VBL	Backlight power
37	VBL	Backlight power
38	VBL	Backlight power
39	VBL	Backlight power
40	**OD_EN**	**OD_Enable Signal of TCON**

MICRO-STAR INT'L CO.,LTD.

Title: eDP /Camera

Size: Custom | Document Number: MS-16U71 / 17E7 | Rev: 0A

Date: Friday, October 18, 2019 | Sheet 40 of 79

RSMRST# follow DG modify to 10K

KBC/EC/uP (ENE9028)

PU/PD

R620 47KR0402 RSMRST#
R617 100KR0402 KBRST#

KB pull Hi 10k

+3VALW
RN4
1 2 KBIN3
3 4 KBIN2
5 6 KBIN1
7 8 KBIN0
8P4R-10KR0402
RN3
1 2 KBIN7
3 4 KBIN6
5 6 KBIN5
7 8 KBIN4
8P4R-10KR0402

LID pull hi 10K

+3VALW
R646 10KR0402 LID#

+3VALW
R420 4.7KR0402 BATCLK_M
R419 4.7KR0402 BATDATA_M

Hardware Reset

SW2 SW-TACT81S-HF
RST_SW# R647 100R1%0402 ECRST#
C1568 C0.1u10X7R0402
D23 ESD-MLVS0402L04-HF
N71-0101630-D02

03/21 1.0 ADD EC_IO1

U62

LPC I/F
(35,45) INT_SERIRQ → SERIRQ
(35,45) LPC_FRAME# → LFRAME#
(35) CLK_PCI_KBC → PCICLK
(35) EC_CLKRUN# → CLKRUN#/GPIO1D
(35,45) LAD0 → LAD0
(35,45) LAD1 → LAD1
(35,45) LAD2 → LAD2
(35,45) LAD3 → LAD3
Move EC_IO1 net control. 8/3

ECRST#
(35) KBRST# → KBRST#/GPIO01
(35) KBSCI# → SCI#/GPIO0E
(37) EC_IO1 → GA20/GPIO00
(32,45) LPC_RST# → PCIRST#/GPIO05

FAN&PWM
(37) LEDKB_EN → PWM0/GPIO0F
(35) USB3_LED → PWM1/GPIO10
(54) AC_CTL → PWM2/GPIO11
(34) FLASH_SECURITY → PWM3/GPIO19
(44) CPU_PWM0 → FANPWM0/GPIO12
(44) DGPU_PWM1 → FANPWM1/GPIO13
(44) CPUFAN_FB → FANFB0/GPIO14
(44) GPUFAN_FB → FANFB1/GPIO15
Add LEDKB_EN control. 8/3

IKB
KBOUT0 → KSO0/GPIO20
KBOUT1 → KSO1/GPIO21
KBOUT2 → KSO2/GPIO22
KBOUT3 → KSO3/GPIO23
KBOUT4 → KSO4/GPIO24
KBOUT5 → KSO5/GPIO25/UART_SOUT
KBOUT6 → KSO6/GPIO26
KBOUT7 → KSO7/GPIO27/SERIRQ(LPC_Bypass)UART_RTS
KBOUT16 → KSO8/GPIO28
KBOUT17 → KSO9/GPIO29
(44) FAN_SW# → KSO10/GPIO2A
(44) KB_LED_SW → KSO11/GPIO2B/LAD3(LPC_Bypass)
(54) BATT_EN → KSO12/GPIO2C/LAD2(LPC_Bypass)UART_DTR
(54) BAT_IN# → KSO13/GPIO2D/LAD1(LPC_Bypass)
(40,44) LID# → KSO14/GPIO2E/LAD0(LPC_Bypass)
(57) SUSPWROK → KSO15/GPIO2F
EC_SDA → KSO16/GPIO48/UART_SOUT2
EC_SCL → KSO17/GPIO49
TPJNC37
TPJNC38
KBOUT8 → KSI0/GPIO30/E51TXD
KBOUT9 → KSI1/GPIO31
KBOUT10 → KSI2/GPIO32
KBOUT11 → KSI3/GPIO33
KBOUT12 → KSI4/GPIO34
KBOUT13 → KSI5/GPIO35
KBOUT14 → KSI6/GPIO36
KBOUT15 → KSI7/GPIO37/EDI_DO

ESB
(49) EAPD → GPIO0B/ESB_CLK
(49) EC_MUTE# → GPIO0C/ESB_DAT_O

CIR
KBIN6 → GPIO40/AD6
KBIN7 → GPIO41/CIR_RLC_TX/AD7
(56) DIMM_ON_2V5 → GPIO0A/OWM
(32) EC_RTC_RST → GPIO0D/RLC_TX2

SPI FLASH
(35) SPI_MISO → MISO/GPIO5B
(35) SPI_MOSI → MOSI/GPIO5C
(35) SPI_CLK → SPICLK/GPIO58
(35) SPI_CS0# → SPICS#/GPIO5A

PS2 I/F
(52) TP_CLK → PSCLK3/GPIO4E
(52) TP_DATA → PSDAT3/GPIO4F
(42) SCL3 → PSCLK2/GPIO4C/SCL3
(42) SDA3 → PSDAT2/GPIO4D/SDA3
(54) BATCLK_M → PSCLK1/GPIO4A/SCL2/SMBD_CLK
(54) BATDATA_M → PSDAT1/GPIO4B/SDA2/SMBD_DAT

UART
E51TXD/GPIO16
E51CLK/GPIO17

MB_ID → GPIO5D
(32) EC_ALLSYSPG_R → GPIO5E

KB9028Q-C-RH

POWER/GROUND
VCC_LPC, VCC, VCC-1, VCC-2, VCC-3, VCC0, VCC_IO2
AVCC, AGND
GND, GND-1, GND-2, GND-3, GND-4
+3VALW
C1569 C0.1u10X7R0402
C1203 C0.1u10X7R0402
C1554 C0.1u10X7R0402
C1545 C0.1u10X7R0402
C1567 C0.1u10X7R0402

SMBUS
SDA0/GPIO45 → SMB_GPU_DATA (27)
SCL0/GPIO44 → SMB_GPU_CLK (27)
IEDI_SDA/SDA1/GPIO47 → EC_SDA (43)
IEDI_SCL/SCL1/GPIO46 → EC_SCL (43)

AD/DA
DA0/GPO3C → BT_PWR_ON (52)
DA1/GPO3D → CAMERA_ON (40)
DA2/GPO3E → DGPU_PWRGD (10,31,34)
DA3/GPO3F → PANEL_OD (40)
AD0/GPI38 → KBIN0
AD1/GPI39 → KBIN1
AD2/GPI3A → KBIN2
AD3/GPI3B → KBIN3
AD4/GPI42 → KBIN4
AD5/GPI43 → KBIN5

SDI
GPXIOA00/GPIO60/SHICS# → EC_SPI_CS (37)
GPXIOA01/GPIO61/SHICLK → EC_SPI_CLK (37)
GPXIOA02/GPIO62/SHIDO → EC_SPI_DO (37)

POWER_FAIL0/GPIO63/GPXIOA03 → SUS_ON (55)
GPIO64/GPXIOA04 → WLAN_PWRON (52)
GPIO65/GPXIOA05 → ADP_ICC (54)
VCOUT1/GPIO66/GPXIOA06 → DIMM_ON_1V2 (6,56)
VCOUT0/GPIO67/GPXIOA07 → EC_PROCHOT# (2)
GPIO68/GPXIOA08 → GPIO_LID (52)
GPIO69/GPXIOA09 → LED_CHARGE (44)
GPIO6A/GPXIOA10 → LED_BATLOW (44)
GWG/GPIO6B/GPXIOA11 → AC_PRESENT (32)
SDIDO/GPIO78/GPXIOD00 → EC_SPI_DI (37)
GPIO79/GPXIOD01 → AC_OK (54)
EC_EN#/GPIO7A/GPXIOD02 → GPU_ACIN1 (54)
GPIO7B/GPXIOD03 → PWR_SW# (44)
GPIO7C/GPXIOD04 → EC_ALLSYSPG
GPIO7D/GPXIOD05 → RUN_ON (6,55)
GPIO7E/GPXIOD06 → PM_PWRBTN# (32)
GPIO7F/PECI → H_PECI (2)
H_PECI_R R602 33R0402

GPIO04 → RADIO SWITCH# (33)
i_clk_8051/GPIO07 → GPUDPC_HPD (35,39)
PROCHOT#/i_clk_peri/GPIO08 → SCI_WAKE_UP# (33)
POWER_FAIL1/GPIO18 → EC_PCH_PWROK (32)
GPIO50 → WLAN_LED (44)
GPIO52 → USB_ENABLE (42,47,48)
WDT_LED#/GPIO54 → PWR_LED# (44)
GPIO56 → RSMRST# (32)
XCLK32K/GPIO57 → PM_SLP_S3# (2,32,58,60)
GPIO59 → PM_SLP_S4# (32,56)

LED
GPIO1A/NUMLED# → NUMLED# (37)
GPIO53/CAPSLED# → CAPSLED# (37)
GPIO55/SCROLED# → HDMI_HPD_DET (33,43)

+3VRUN
R572 2.2KR0402
EC_ALLSYSPG (2,32,58,60)
C1534 X_C2200p50X0402

SMB_GPU_CLK R378 2.2KR0402
SMB_GPU_DATA R377 2.2KR0402

PWR_SW#
D10 ESD-MLVS0402L04-HF
Add D22 for EMI. 12/18.

FPC4 FPC28P-1T-1PITCH_WHITE-RH-1
KBOUT17 1
KBOUT16 2
KBIN0 3
KBIN1 4
KBIN2 5
KBIN3 6
KBIN4 7
KBIN5 8
KBIN6 9
KBIN7 10
KBOUT15 11
KBOUT14 12
KBOUT13 13
KBOUT12 14
KBOUT11 15
KBOUT10 16
KBOUT9 17
KBOUT8 18
KBOUT7 19
KBOUT6 20
KBOUT5 21
KBOUT4 22
KBOUT3 23
KBOUT2 24
KBOUT1 25
KBOUT0 26
N5A-26F0270-A81

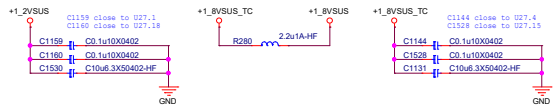
MotherBoard ID
+3VALW
R603 10KR0402
MB_ID
R604 X_10KR0402

For EMI
EC29 ESD-AOZ8829DI-03-HF
KBOUT7 KBOUT6 KBOUT5 KBOUT4
EC30 ESD-AOZ8829DI-03-HF
KBOUT3 KBOUT2 KBOUT1 KBOUT0
EC27 ESD-AOZ8829DI-03-HF
KBOUT11 KBOUT10 KBOUT9 KBOUT8
EC28 ESD-AOZ8829DI-03-HF
KBOUT15 KBOUT14 KBOUT13 KBOUT12
D22 ESD-AOZ8831DT-05-HF
KBOUT16
D12 ESD-AOZ8831DT-05-HF
KBOUT17

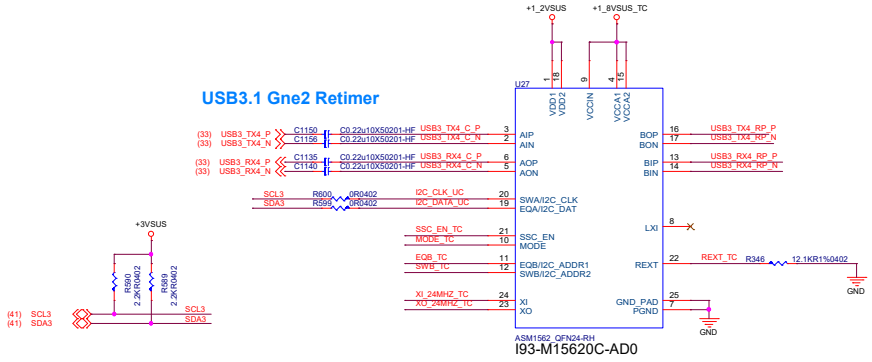
MICRO-STAR INT'L CO.,LTD.
Title: EC(ENE9028)
Size: Custom
Document Number: MS-16U71 / 17E7
Rev: 0A
Date: Friday, October 18, 2019
Sheet 41 of 79

USB3.1 TYPE C

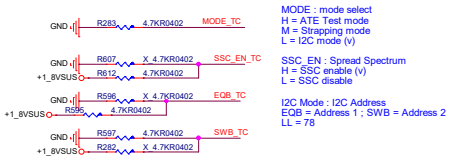
ASM1562 Re-timer



USB3.1 Gne2 Retimer



Strap

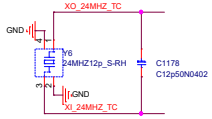


MODE : mode select
H = ATE Test mode
M = Strapping mode
L = I2C mode (v)

SSC_EN : Spread Spectrum
H = SSC enable (v)
L = SSC disable

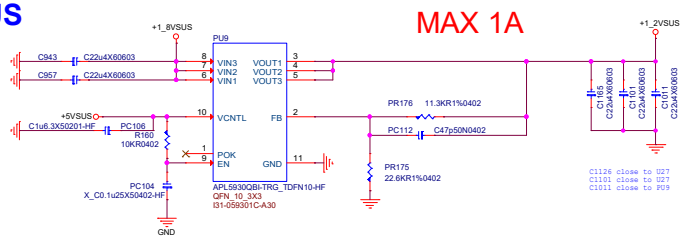
I2C Mode : I2C Address
EQB = Address 1 ; SWB = Address 2
LL = 78

24MHz Clock

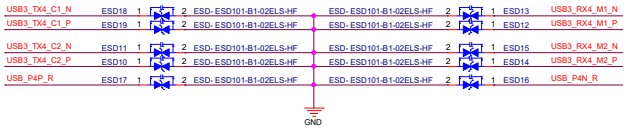


+1_2VSUS

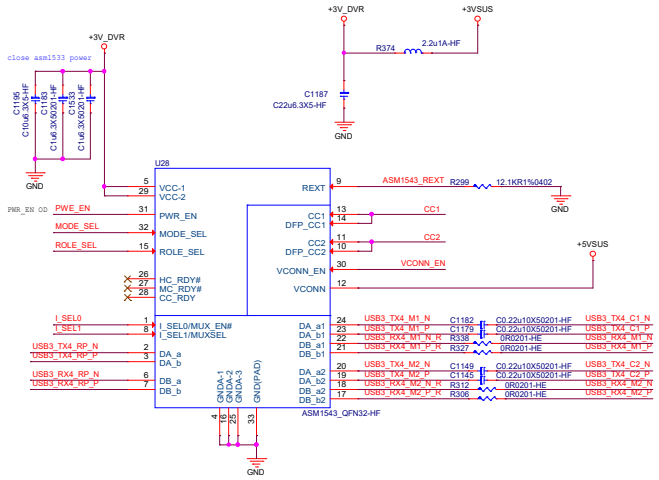
MAX 1A



ESD

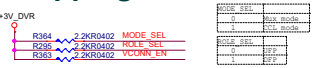


ASM1543 Mux with CCL

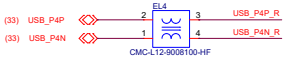


Function Table

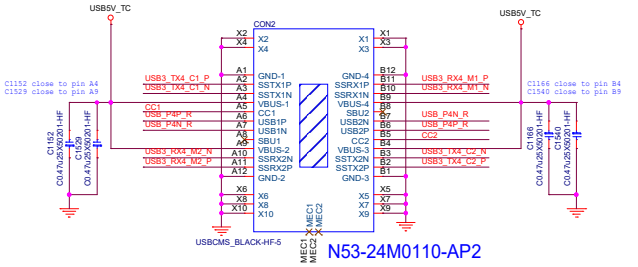
Strapping Table



USB20 CMC

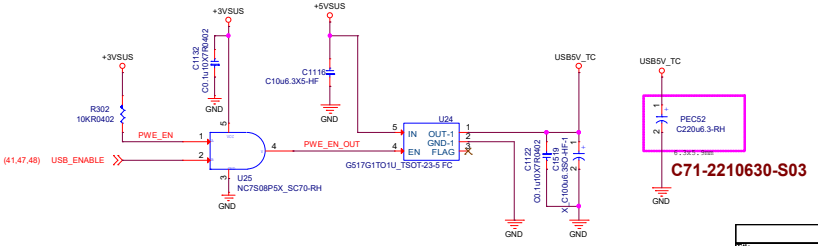


Type-C Connector

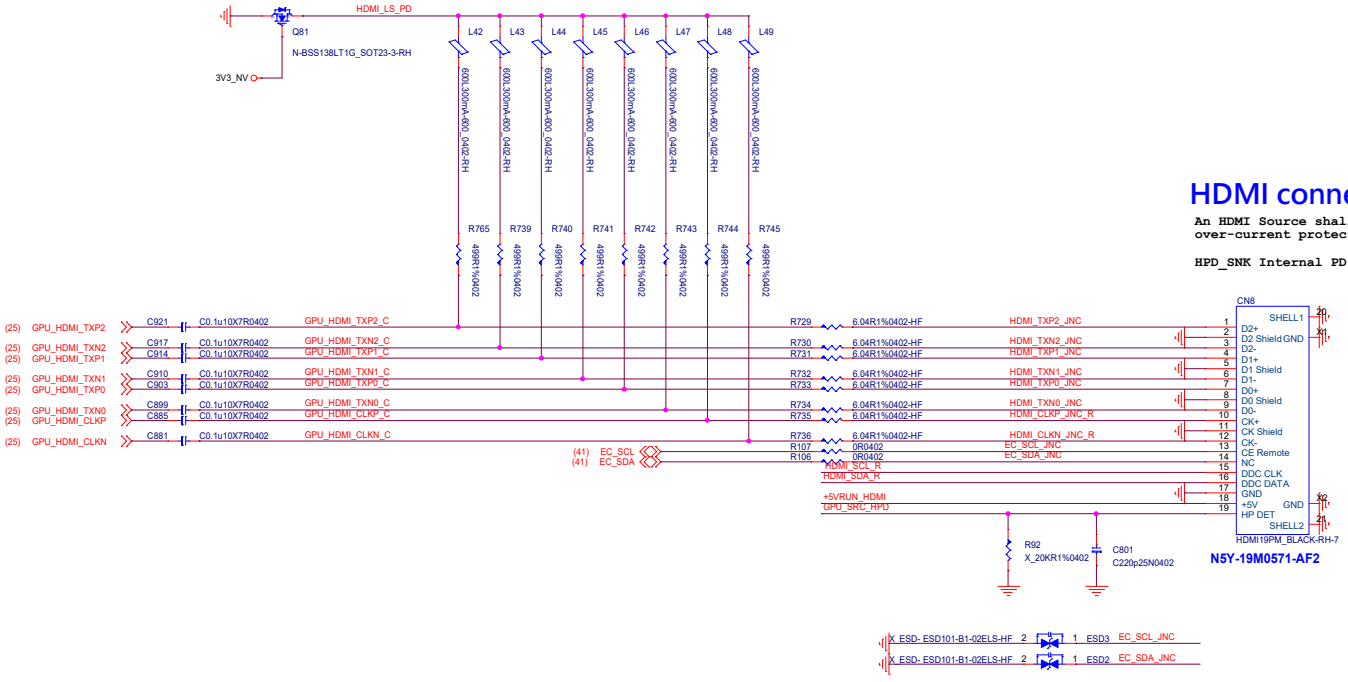


N53-24M0110-AP2

PWR Switch



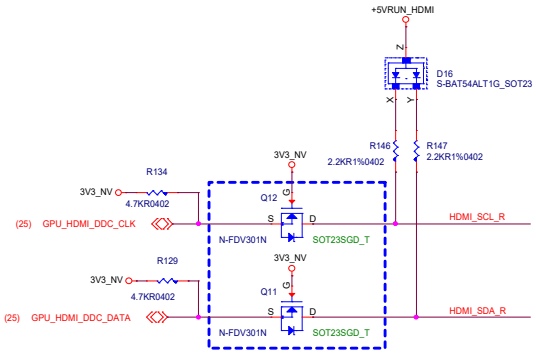
Title	USB3.1 Type-C		
Size	Document Number		Rev
Custom	MS-16U71 / 17E7		0A
Date:	Friday, October 18, 2019	Sheet 42 of 79	



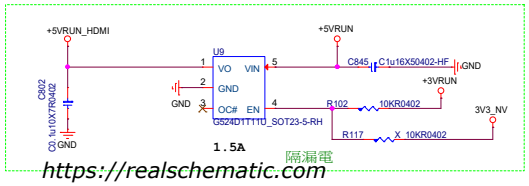
HDMI connector

An HDMI Source shall have +5V Power signal over-current protection of no more than 0.5A.

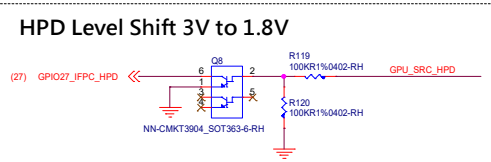
HPD_SNK Internal PD 150kohm



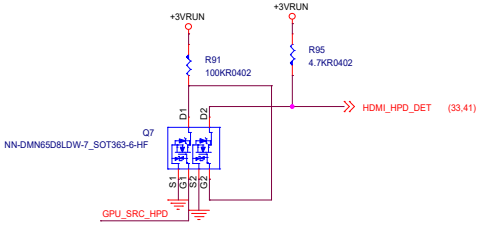
SDA/SCL Capacitance need <50pF
MOSFET (Main & AVL) requires attention



HPD Level Shift 3V to 1.8V



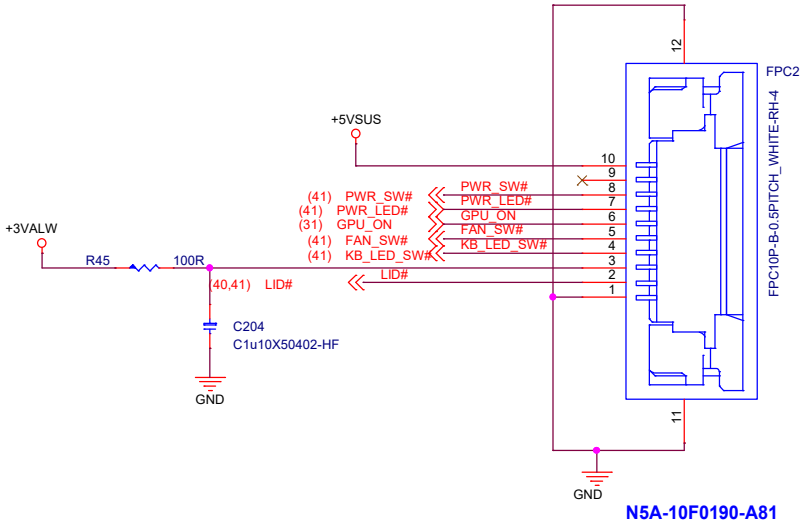
HPD Level Shift 5V to 3V FOR PCH & EC



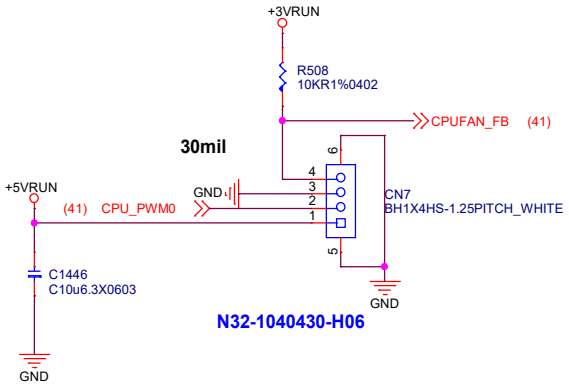
MICRO-STAR INT'L CO.,LTD.		
Title: HDMI		
Size: C	Document Number: MS-16U71 / 17E7	Rev: 0A
Date: Friday, October 18, 2019	Sheet 43 of 79	

CPU FAN/CPU FAN/POWER CONN/ LED CONN

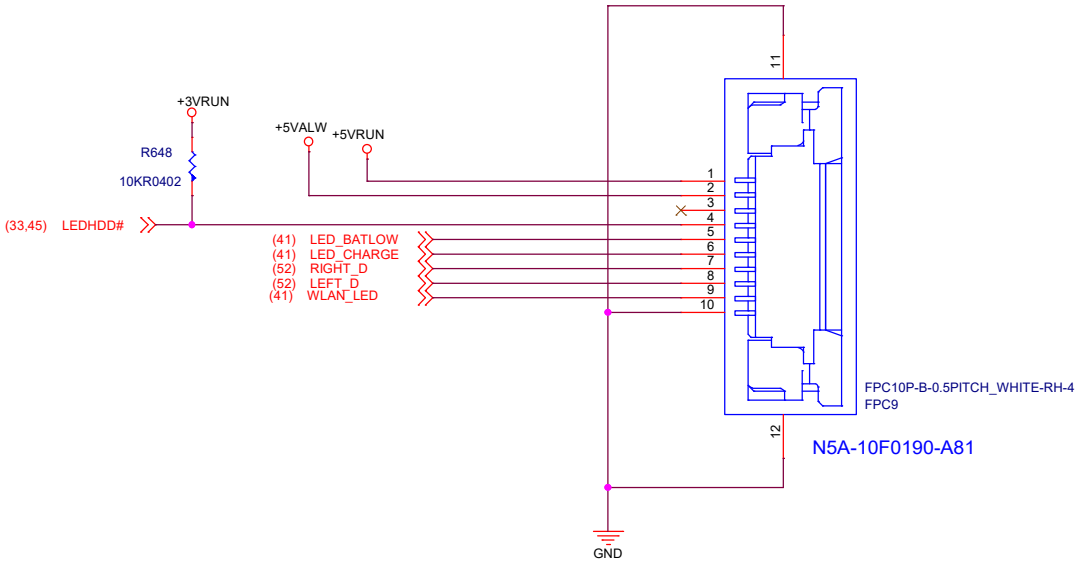
Power Switch Connector



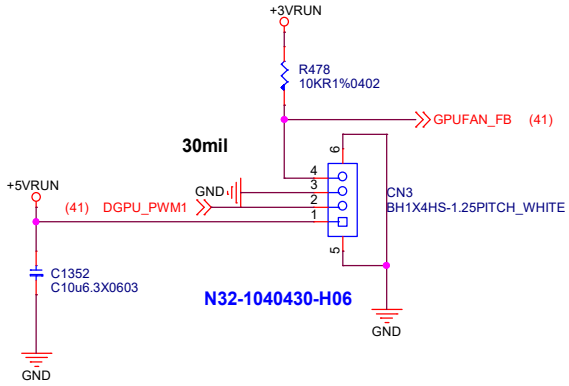
CPU FAN



Switch connector



DGPU FAN

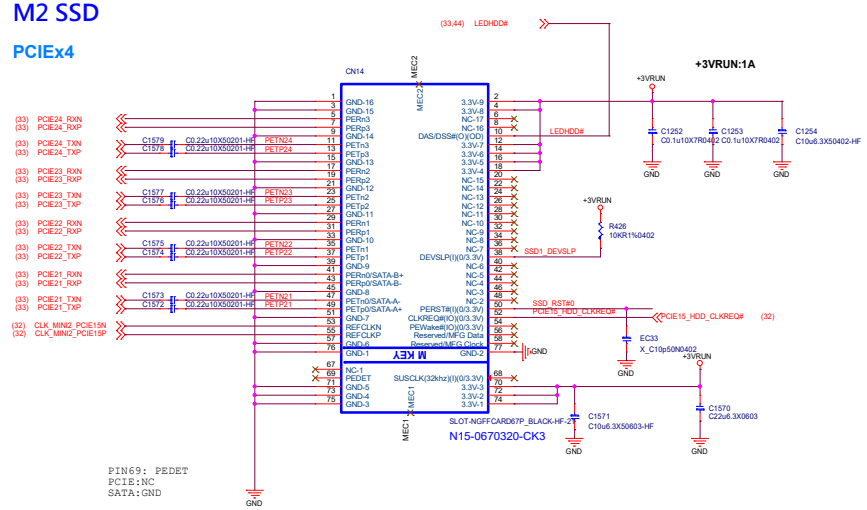


MICRO-STAR INT'L CO.,LTD.

Title	CPU FAN/BTB CONN/LED	
Size: Custom	Document Number: MS-16U71 / 17E7	Rev: 0A
Date: Friday, October 18, 2019	Sheet 44 of 79	

M2 SSD

PCIEx4



(32) SSD_RST#0 — SSD_RST#0

(32) SSD_RST#1 — SSD_RST#1

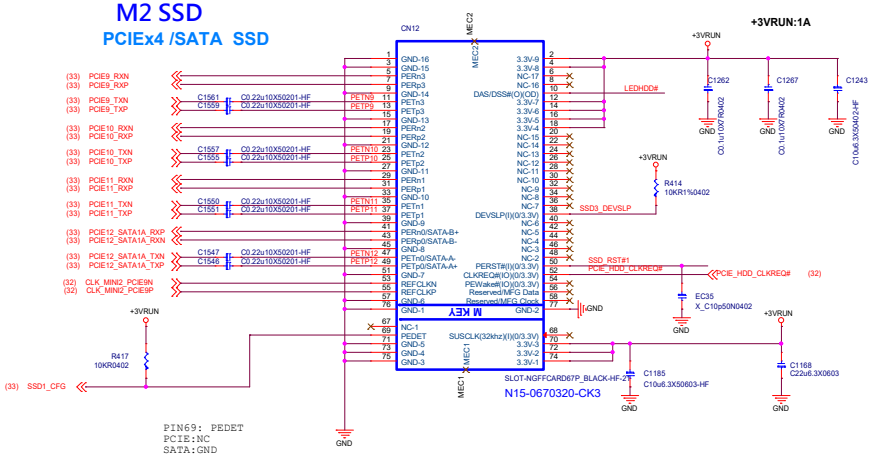
40	NC	No Connect
41	SATA-B+/PERn0	Host receiver differential signal pair
42	NC	No Connect
43	SATA-B-/PERp0	Host receiver differential signal pair
44	NC	No Connect
45	GND	Ground
46	NC	No Connect
47	SATA-A-/PETn0	Host Transmitter differential signal pair
48	NC	No Connect
49	SATA-A+/PETp0	Host transmitter differential signal pair

E3 Spacer Support — E2B-16J1010-A89 — GND

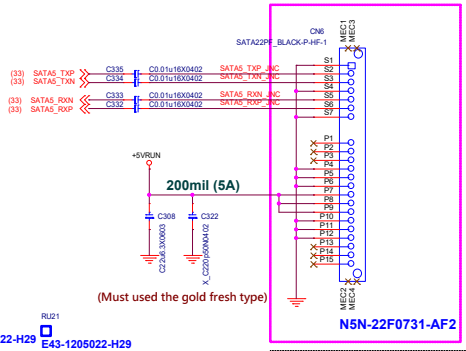
E4 Spacer Support — E2B-16J1010-A89 — GND

M2 SSD

PCIEx4 /SATA SSD



HDD



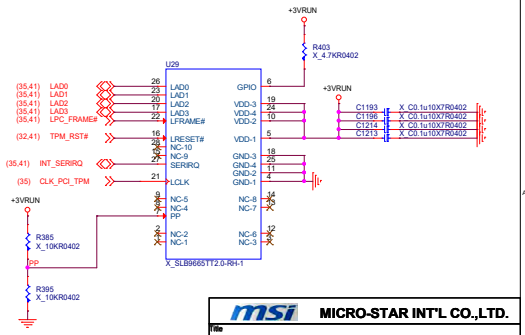
RU20 E43-1205022-H29 RUBBER

RU21 E43-1205022-H29 RUBBER

16U	N5N-22F0401-AF2	5020	SATA_D22_3 SATA_D22_14P
16U X	N5N-22F0731-AF2	5020	

03/21 1.0 Add E43-1205022-H29 螺絲

TPM



MICRO-STAR INT'L CO.,LTD.

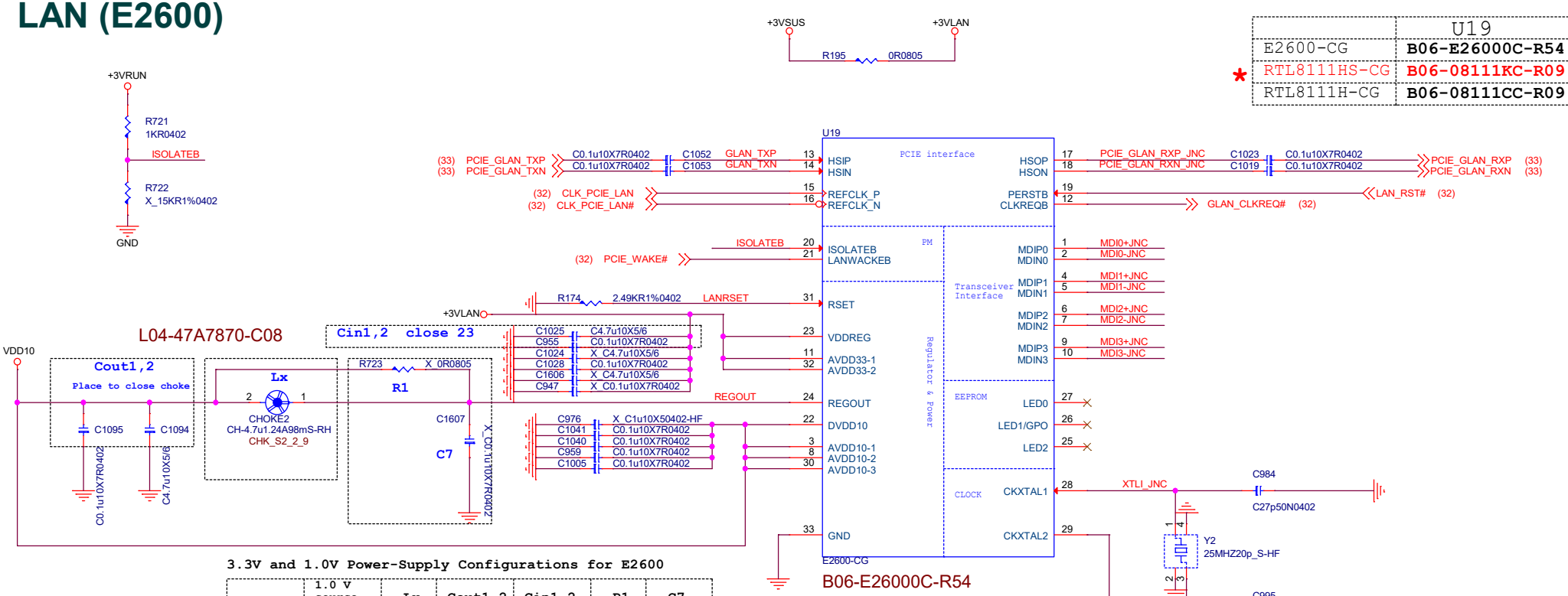
Title: M2 SSD/HDD/TPM

Size: Custom | Document Number: MS-16U71 / 17E7 | Rev: 0A

Date: Friday, October 18, 2019 | Sheet 45 of 79

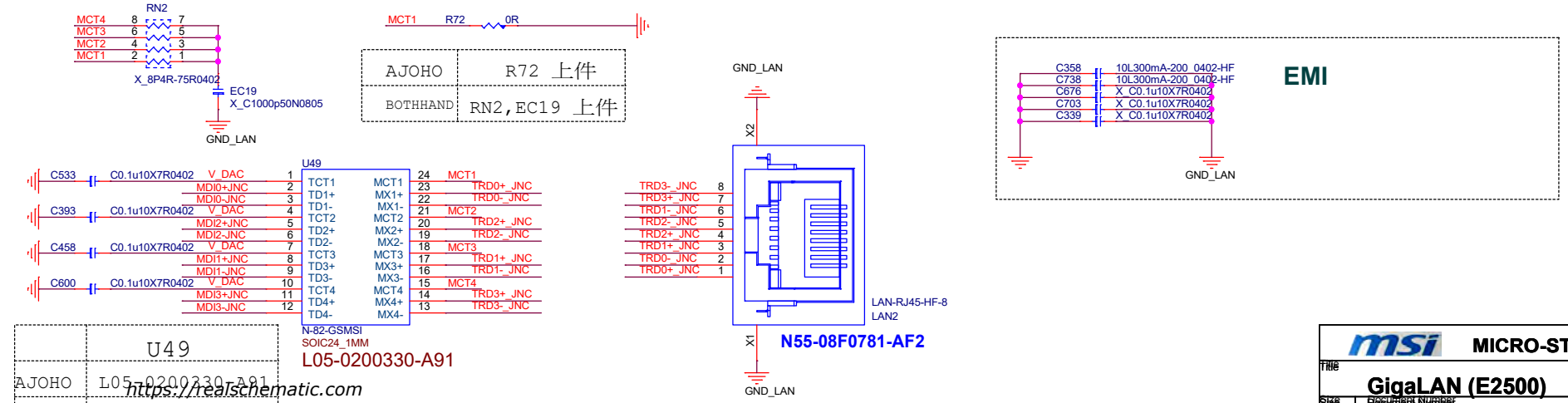
LAN (E2600)

	U19
E2600-CG	B06-E26000C-R54
* RTL8111HS-CG	B06-08111KC-R09
RTL8111H-CG	B06-08111CC-R09



3.3V and 1.0V Power-Supply Configurations for E2600

	1.0 V source	Lx	Cout1,2	Cin1,2	R1	C7
E2600	SWR	O	O	O	X	X
* RTL-8111HS	SWR	O	O	O	X	X
RTL-8111H	Regout	X	X	X	O	O



	R72
AJOHO	上件
BOTHHAND	RN2,EC19 上件

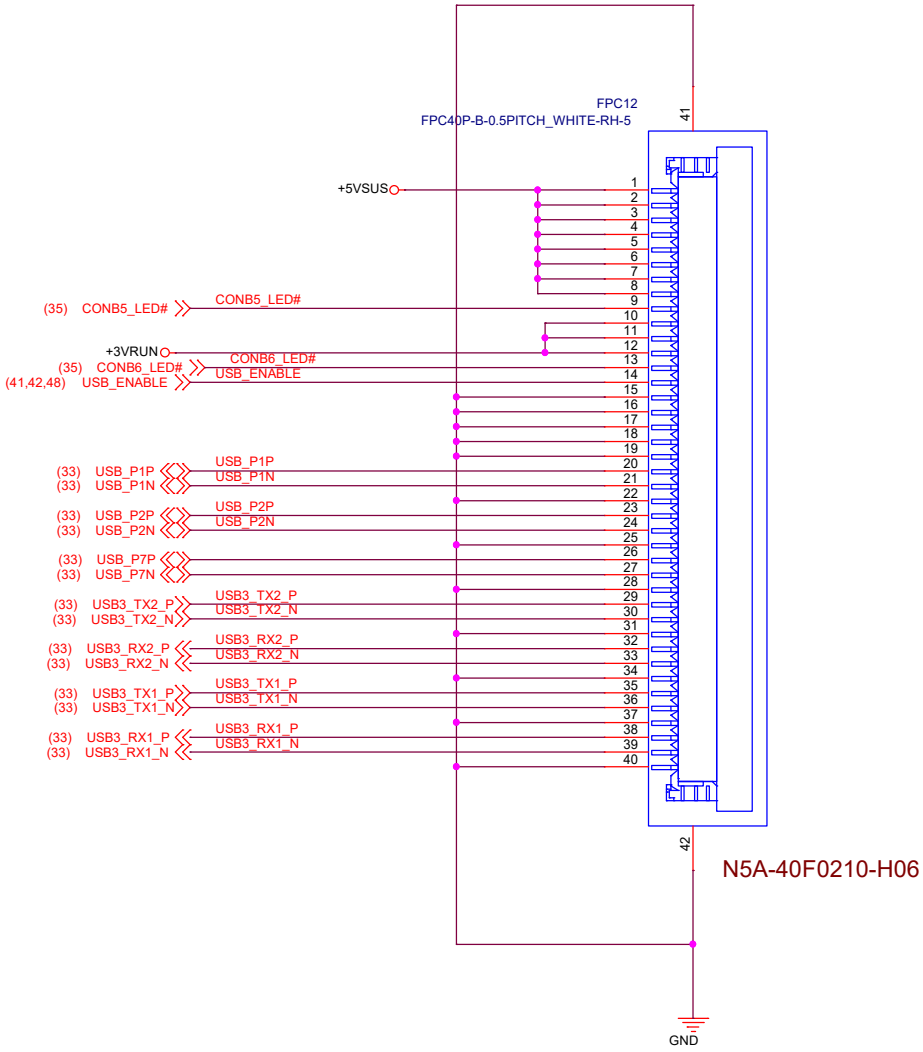
	U49
AJOHO	L05-0200230-A91
BOTHHAND	L05-0200070-B09

MICRO-STAR INT'L CO.,LTD.

Title: GigaLAN (E2500)

Size: Custom | Document Number: MS-16U71 / 17E7 | Rev: 0A

Date: Friday, October 18, 2019 | Sheet 46 of 79

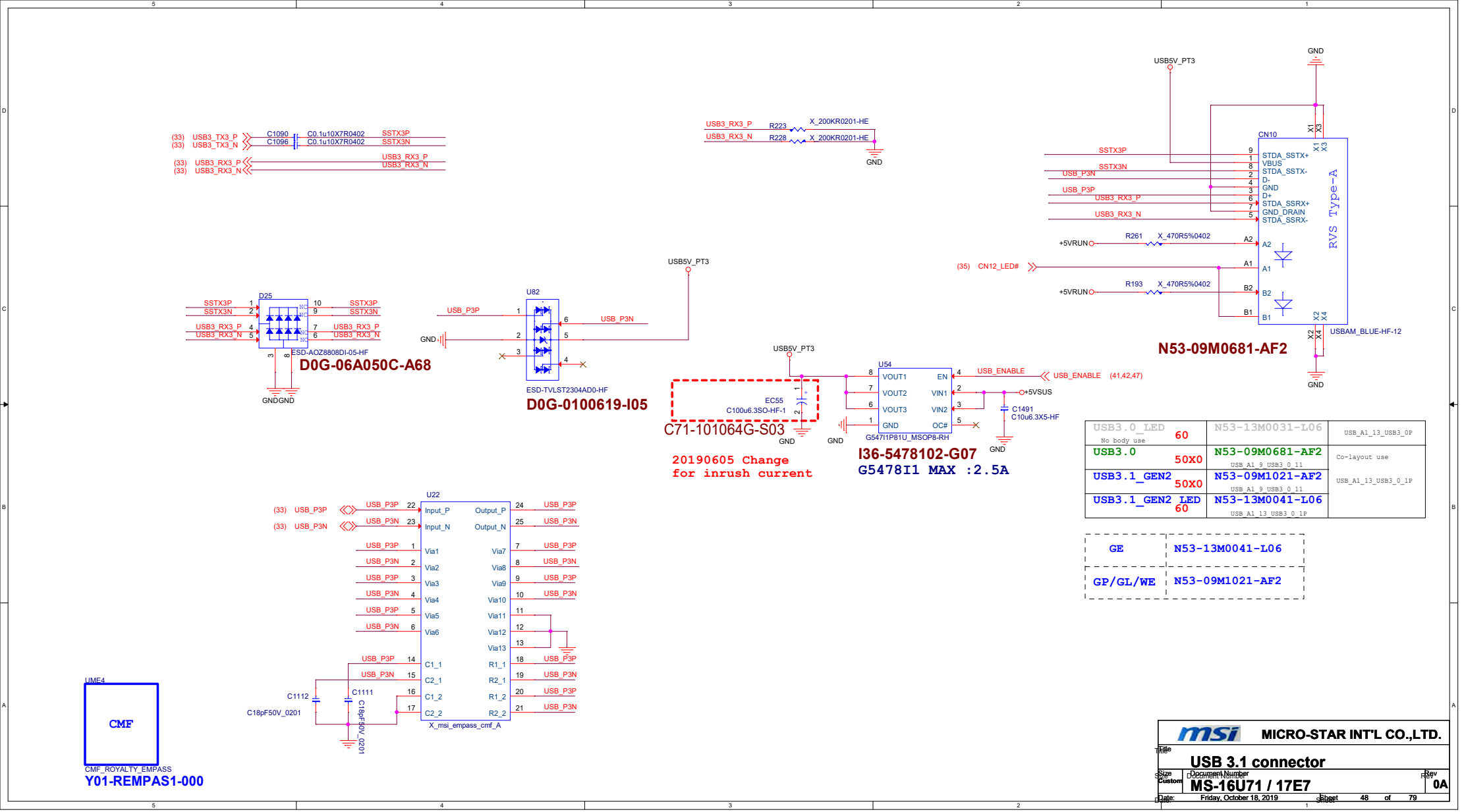


MICRO-STAR INT'L CO.,LTD.

Title: B to B connector

Size: Custom | Document Number: MS-16U71 / 17E7 | Rev: 0A

Date: Friday, October 18, 2019 | Sheet 47 of 79



USB3.0_LED No body use	60	N53-13M0031-L06
USB3.0	50X0	N53-09M0681-AF2 USB_A1_9_USB3_0_11
USB3.1_GEN2	50X0	N53-09M1021-AF2 USB_A1_9_USB3_0_11
USB3.1_GEN2_LED	60	N53-13M0041-L06 USB_A1_13_USB3_0_1P

USB_A1_13_USB3_0P	
Co-layout use	
USB_A1_13_USB3_0_1P	

GE	N53-13M0041-L06
GP/GL/WE	N53-09M1021-AF2

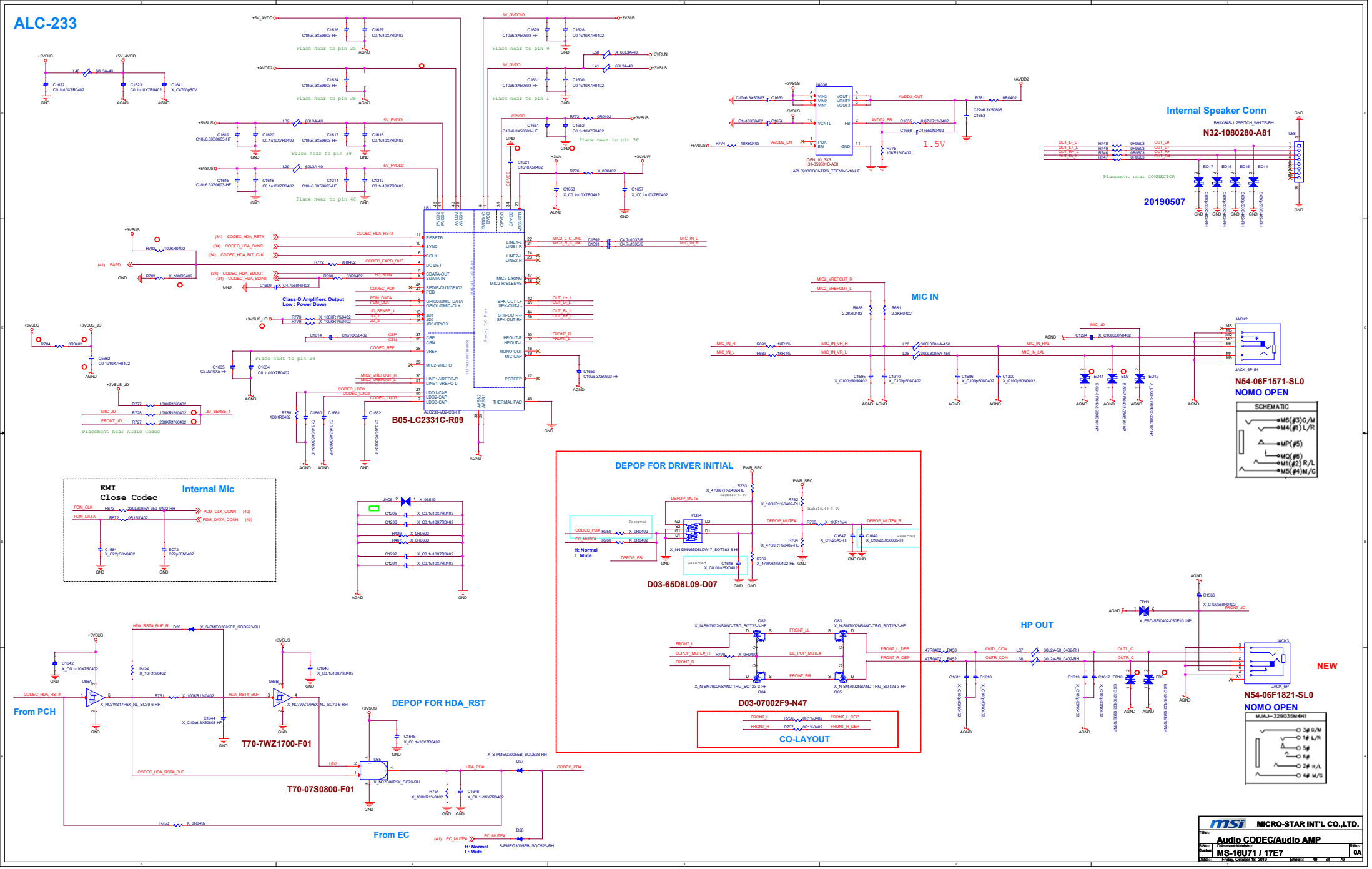
MICRO-STAR INT'L CO.,LTD.

Title: USB 3.1 connector

Size: Custom | Document Number: MS-16U71 / 17E7 | Rev: 0A

Date: Friday, October 18, 2019 | Sheet 48 of 79

ALC-233



MSI	MICRO-STAR INT'L CO.,LTD.
Title	Audio CODEC/Audio AMP
Size / Custom	Document Number: MS-16U71 / 17E7 — Rev: 0A
Date:	Friday, October 18, 2019 — Sheet 40 of 79

MICRO-STAR INT'L CO.,LTD.

Title: Speaker

Size: C | Document Number: MS-16U71 / 17E7 | Rev: 0A

Date: Friday, October 18, 2019 | Sheet 50 of 79

MICRO-STAR INT'L CO.,LTD.

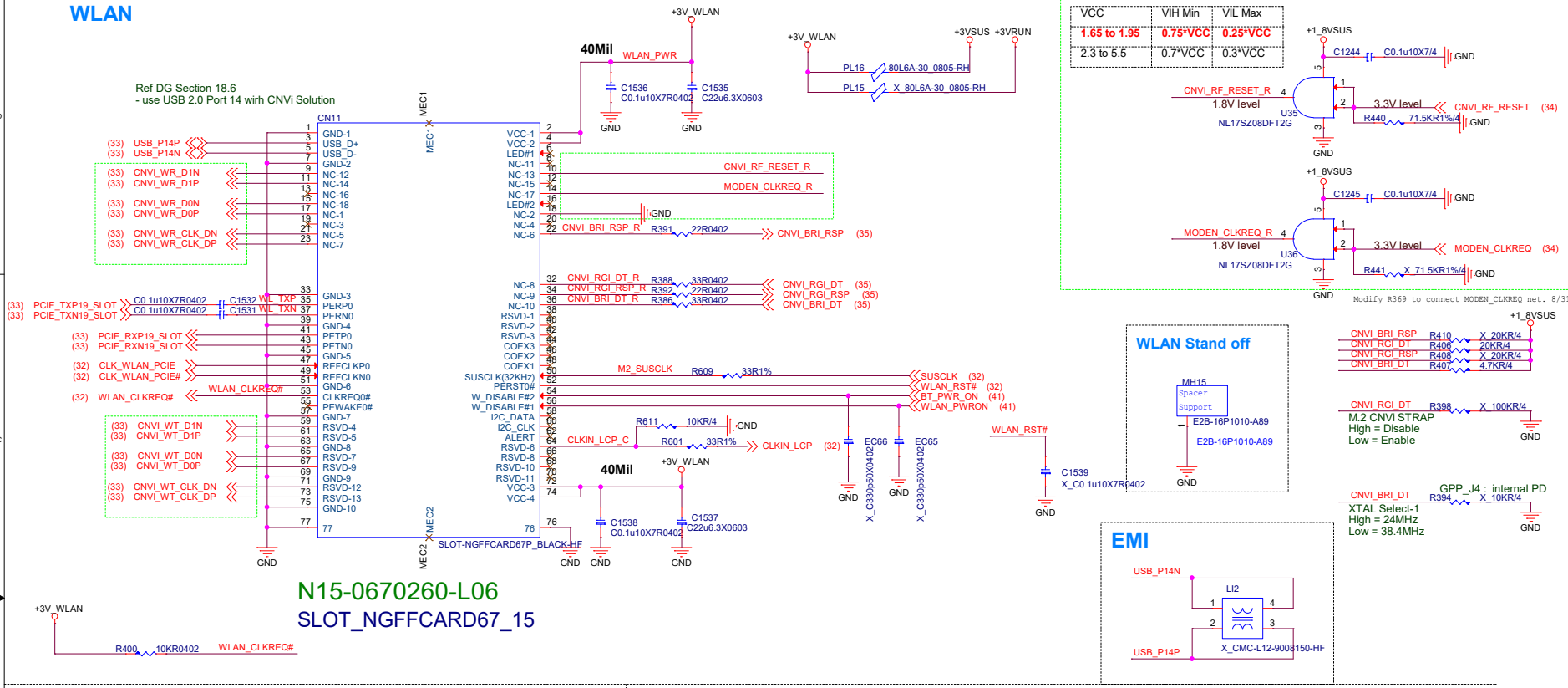
Title: Woofer

Size: C | Document Number: MS-16U71 / 17E7 | Rev: 0A

Date: Friday, October 18, 2019 | Sheet 51 of 79

WLAN /Touch Pad

WLAN



N15-0670260-L06

SLOT_NGFFCARD67_15

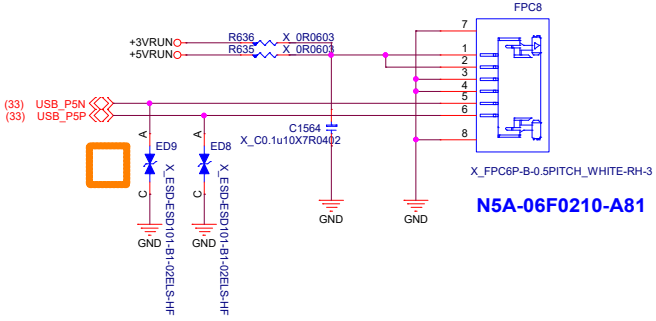
PN : T70-7SZ0870-O05
AND Gate/ NL17SZ08DFT2G

VCC	VIH Min	VIL Max
1.65 to 1.95	0.75*VCC	0.25*VCC
2.3 to 5.5	0.7*VCC	0.3*VCC

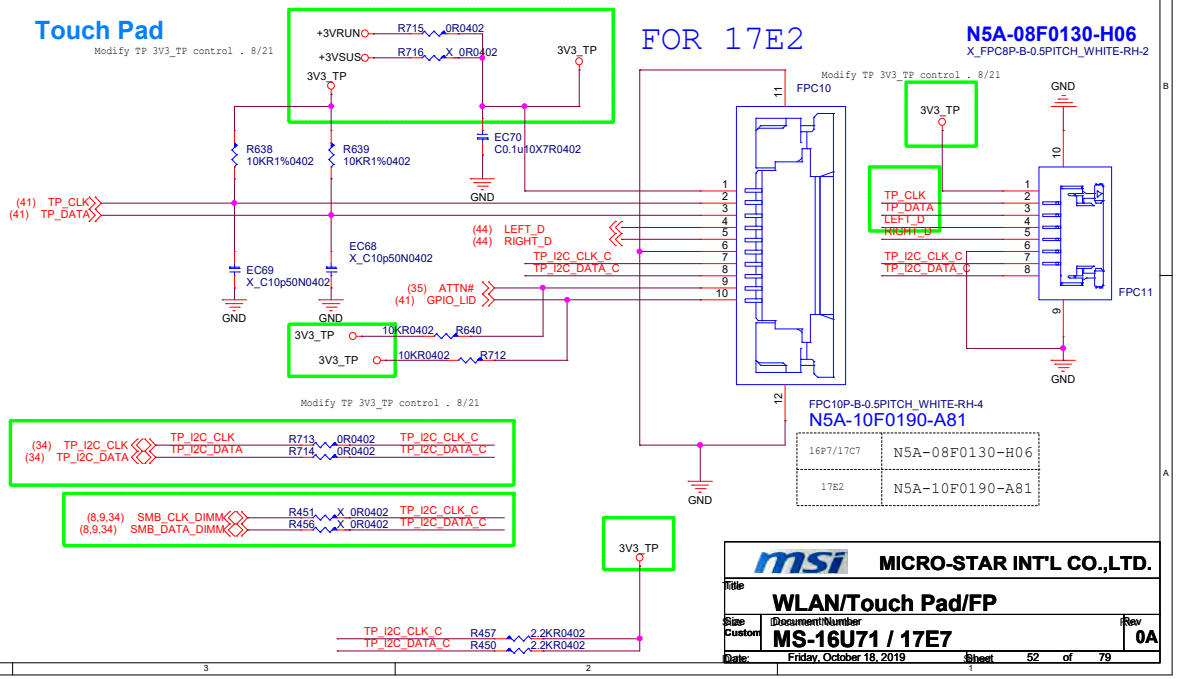
WLAN Stand off

EMI

FP



Touch Pad



16P7/17C7	N5A-08F0130-H06
17E2	N5A-10F0190-A81

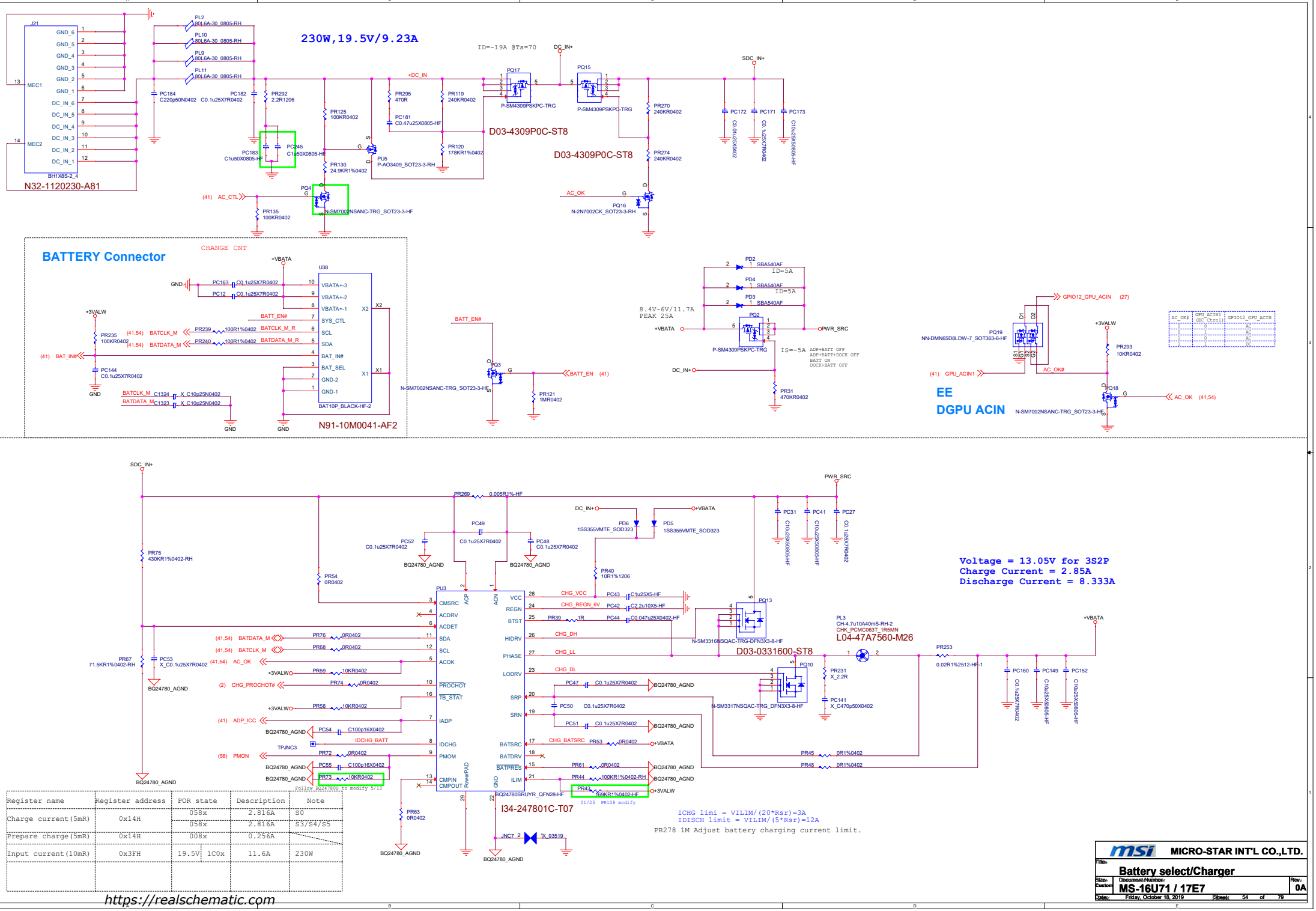
MICRO-STAR INT'L CO.,LTD.

Title: WLAN/Touch Pad/FP

Size: Custom | Document Number: MS-16U71 / 17E7 | Rev: 0A

Date: Friday, October 18, 2019 | Sheet 52 of 79

Title: MOTOR		
Size: Custom	Document Number: MS-16U71 / 17E7	Rev: 0A
Date: Friday, October 18, 2019	Sheet 53 of 79	



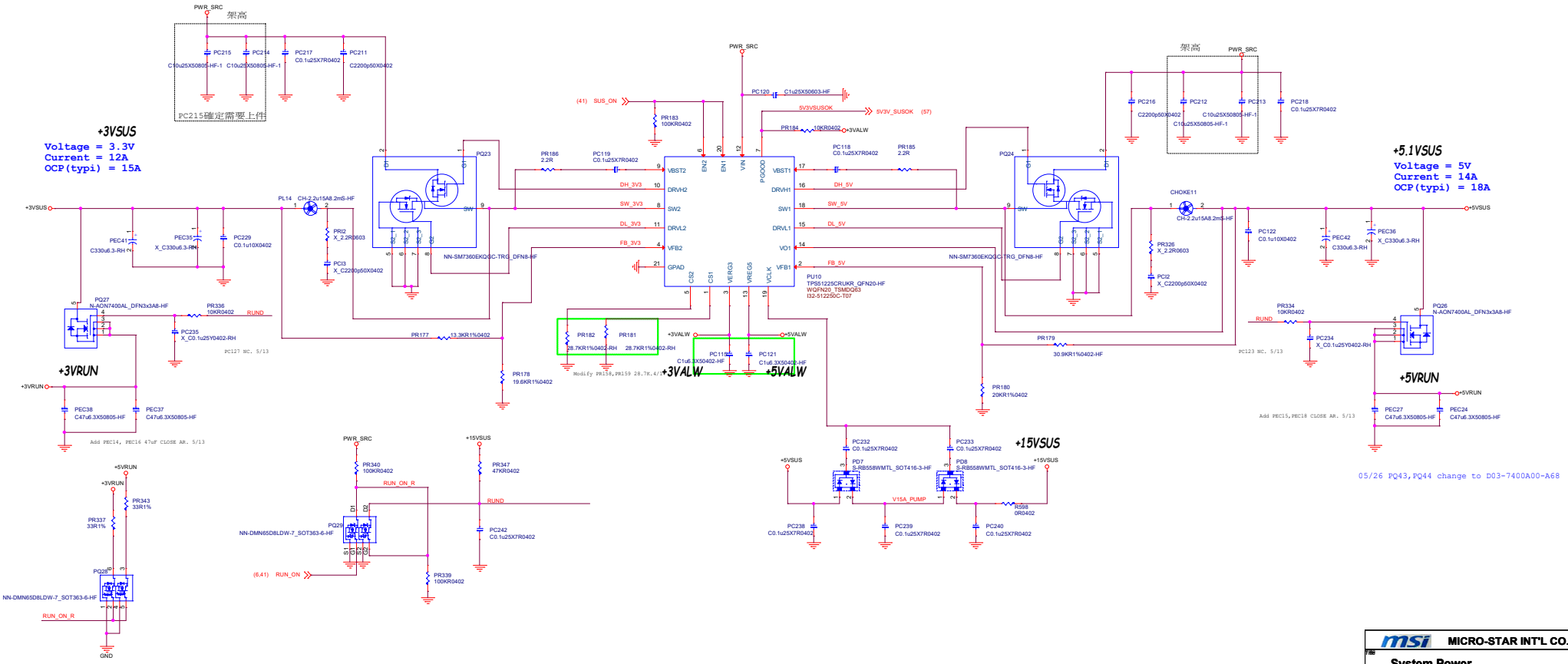
Register name	Register address	POR state	Description	Note
Charge current(5mR)	0x14H	058x	2.816A	S0
		058x	2.816A	S3/S4/S5
Prepare charge(5mR)	0x14H	008x	0.256A	
Input current(10mR)	0x3FH	19.5V 1C0x	11.6A	230W

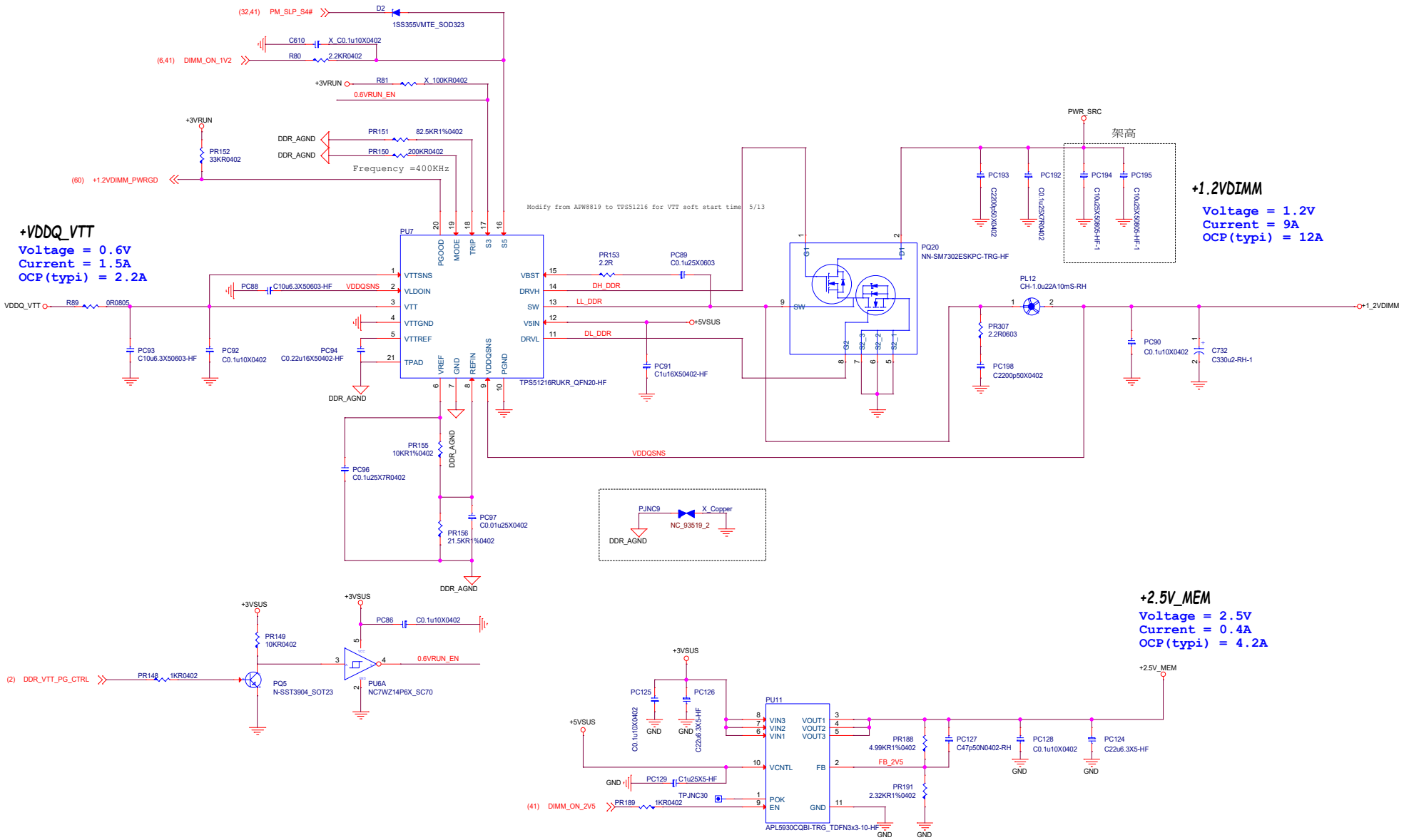
MICRO-STAR INT'L CO.,LTD.

Title: Battery select/Charger

Size: Custom | Document Number: MS-16U71 / 17E7 | Rev: 0A

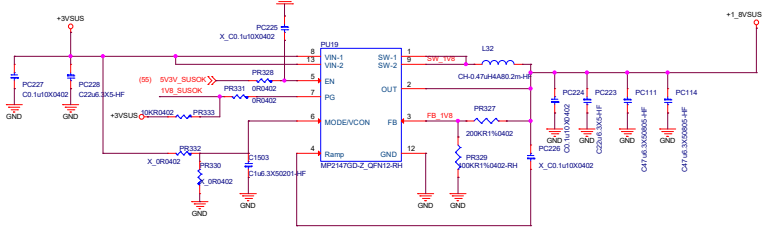
Date: Friday, October 18, 2019 | Sheet: 54 of 79





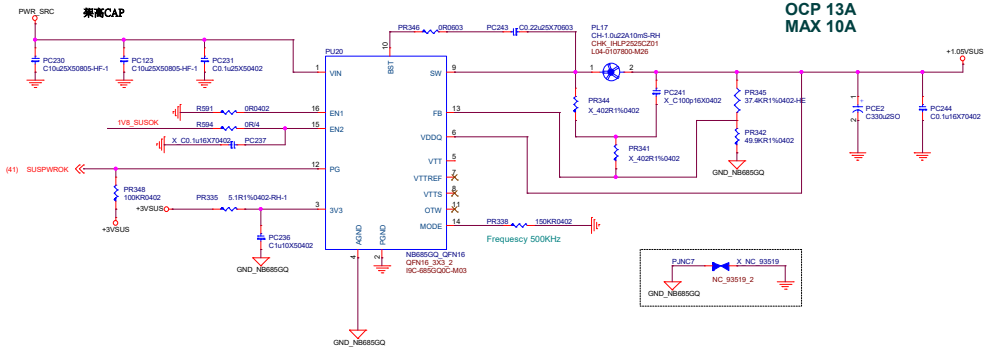
+1_8VSUS

Voltage = 1.8V
Current = 4A
OCP(Min) = 7A



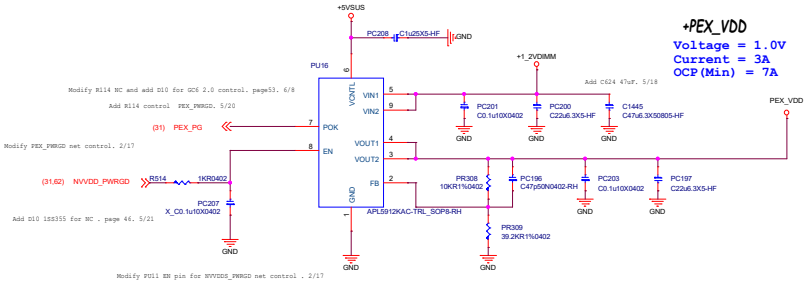
+1.05VSUS

OCP 13A
MAX 10A



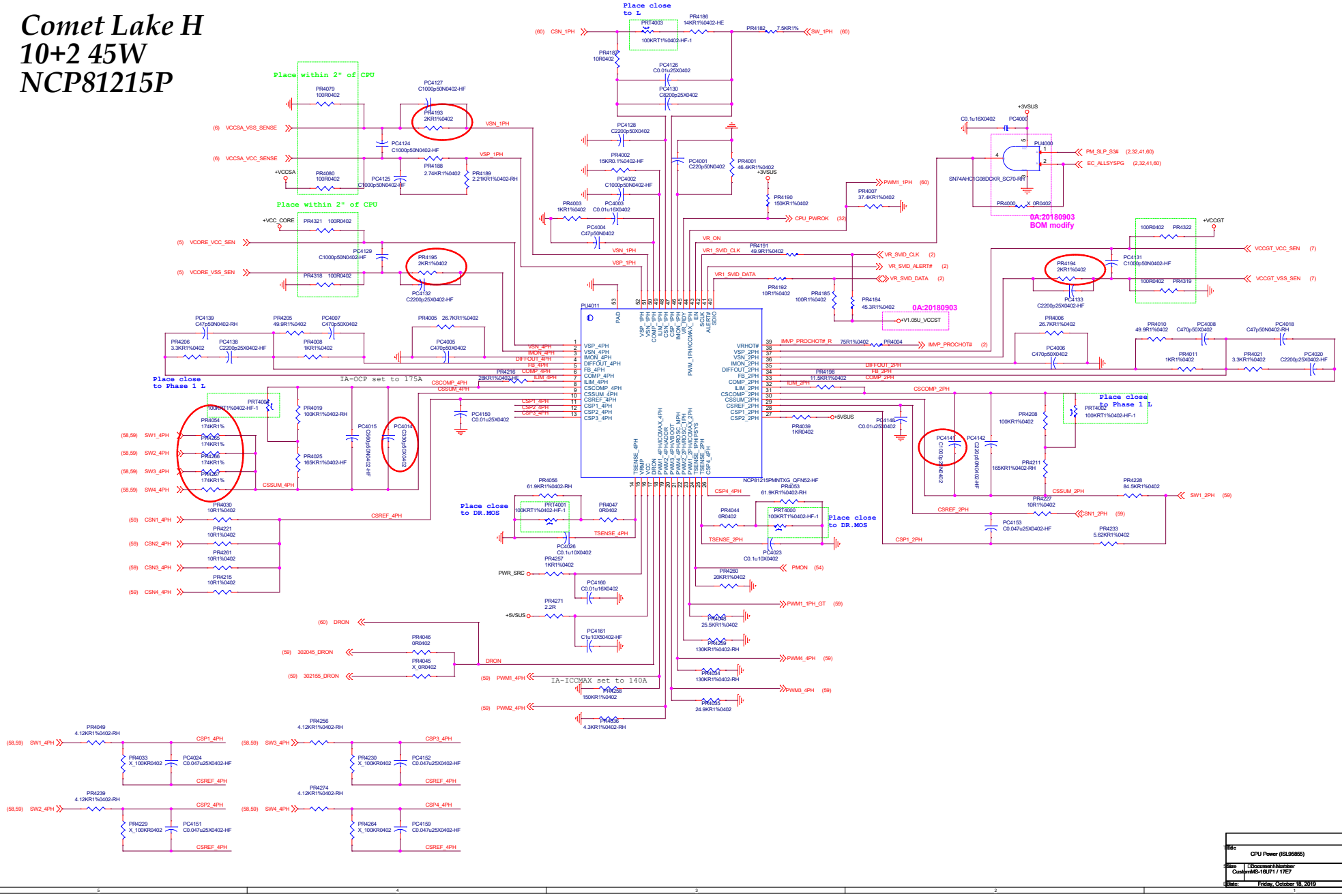
+PEX_VDD

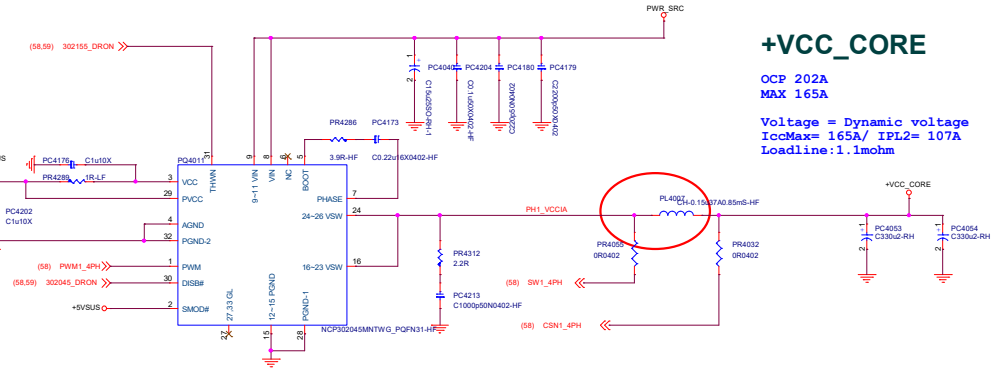
Voltage = 1.0V
Current = 3A
OCP(Min) = 7A



msi	MICRO-STAR INT'L CO.,LTD.	
Title	+1.05VSUS/+PEX_VDD/+1_8VSUS	
Size	Document Number	Rev
Custom	MS-16U71 / 17E7	0A
Date:	Friday, October 18, 2019	Sheet 57 of 79

Comet Lake H
10+2 45W
NCP81215P

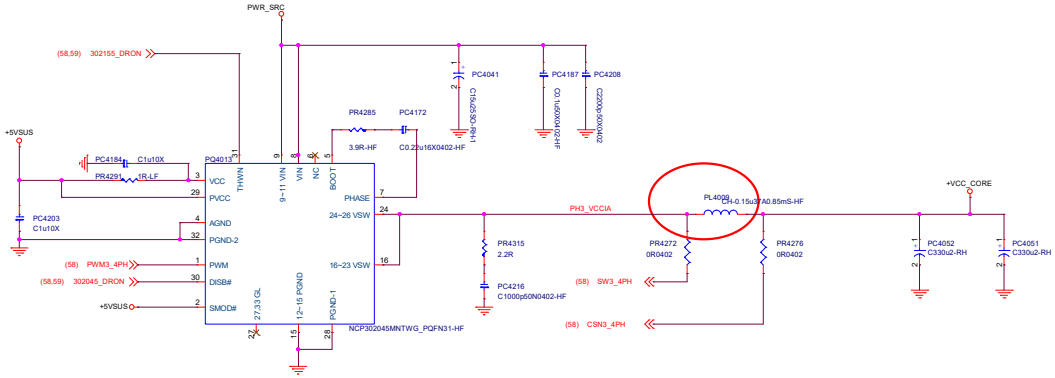


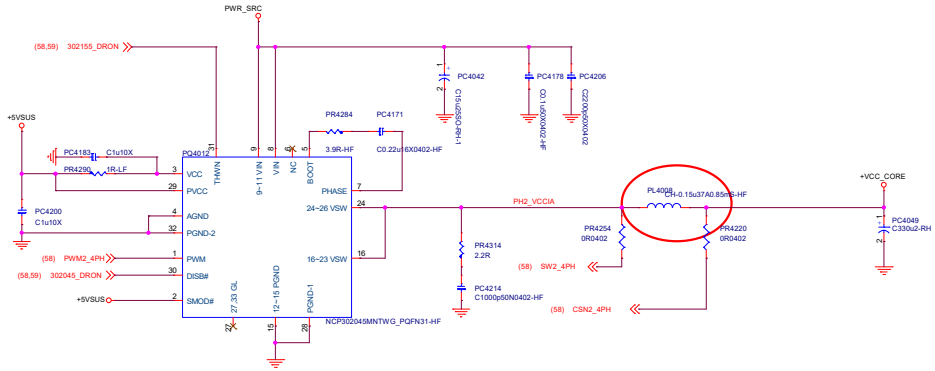


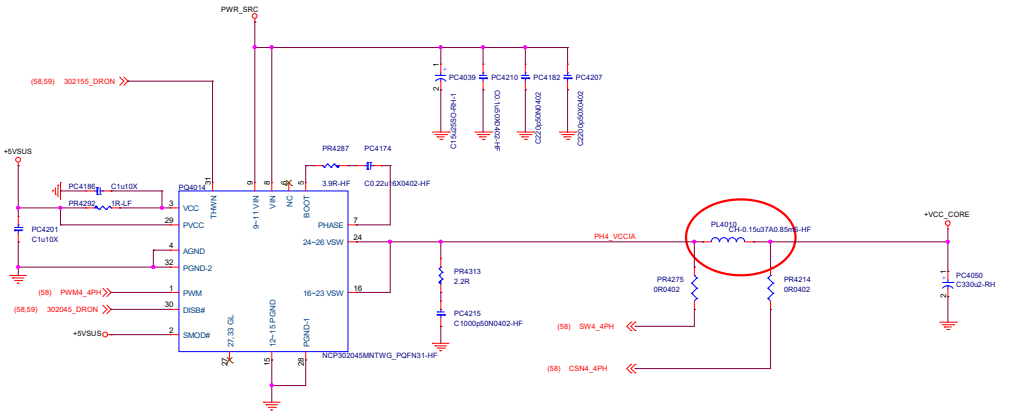
+VCC_CORE

OCP 202A
MAX 165A

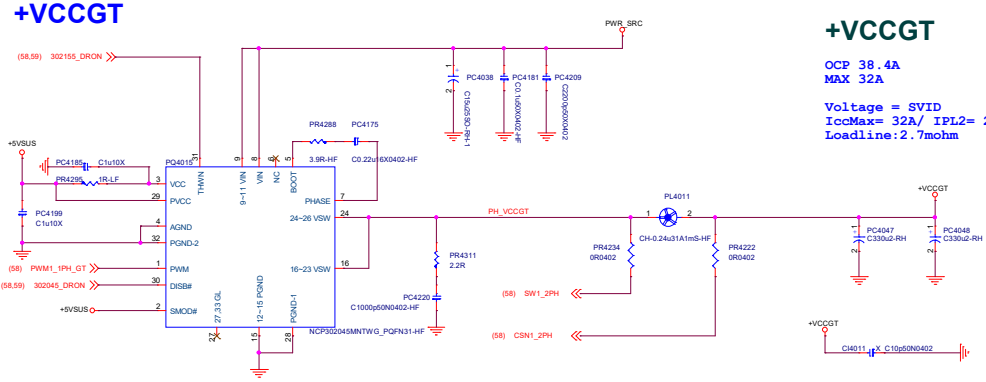
Voltage = Dynamic voltage
IccMax= 165A/ IPL2= 107A
Loadline:1.1mohm







+VCCGT



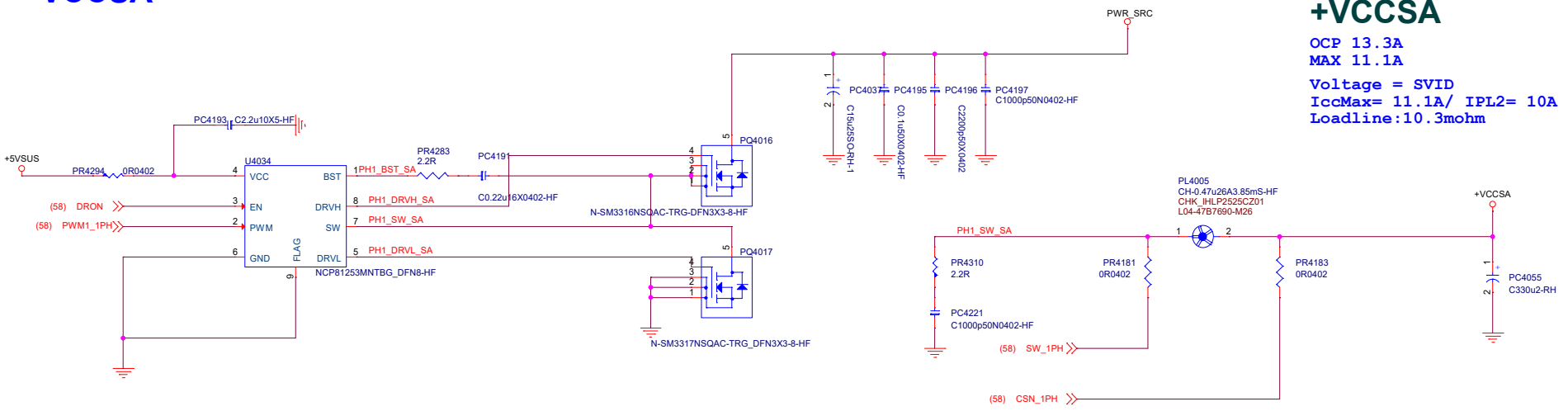
+VCCGT

OCP 38.4A
MAX 32A

Voltage = SVID
IccMax= 32A/ IPL2= 25A
Loadline:2.7mohm

Title	CPU1(VCore/VCCGT)	
Size	Document Number	Rev
Custom	MS-16U71 / 17E7	0A
Date:	Friday, October 18, 2019	Sheet 59 of 79

+VCCSA

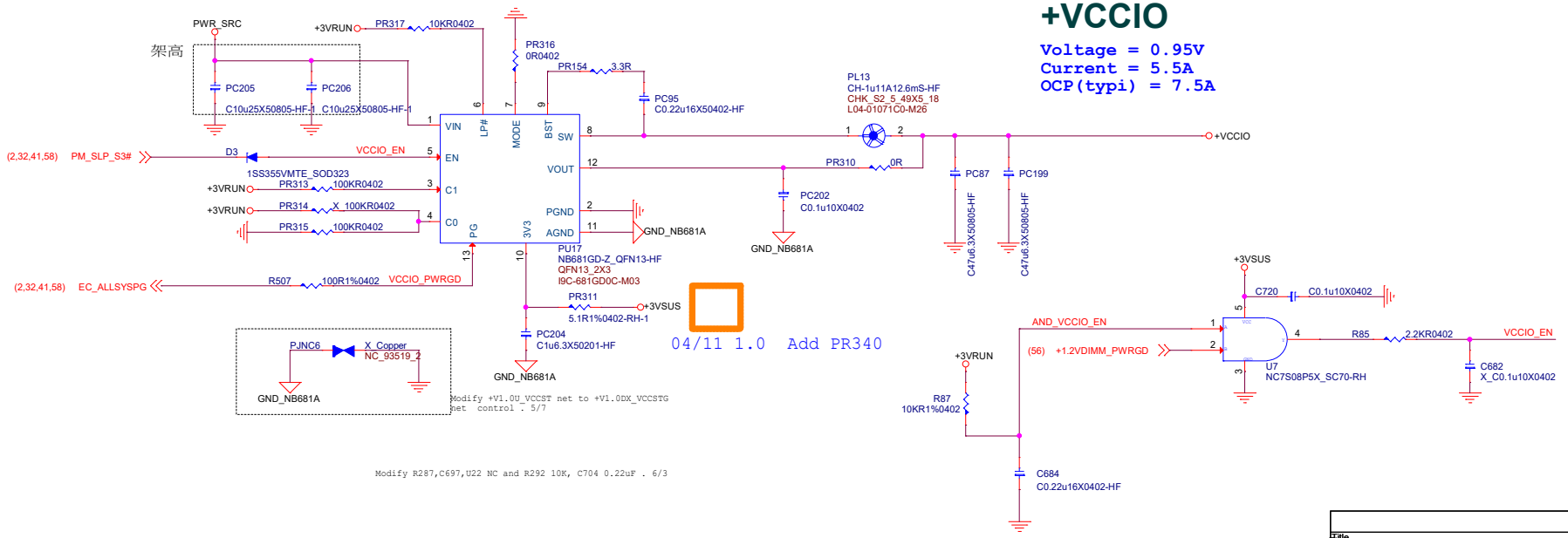


+VCCSA

OCP 13.3A
MAX 11.1A

Voltage = SVID
IccMax= 11.1A/ IPL2= 10A
Loadline:10.3mohm

+VCCIO



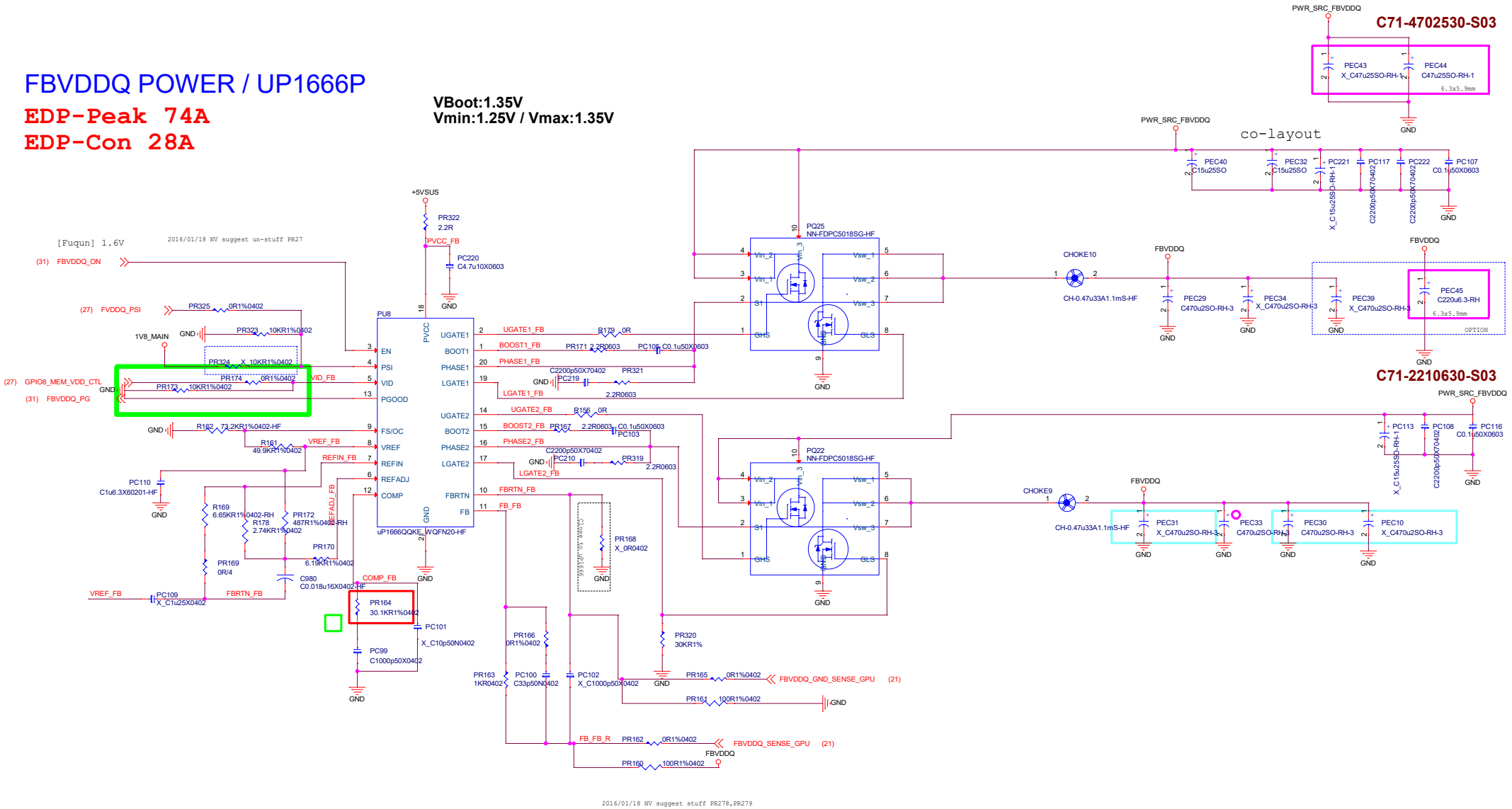
Title	CPU2(VCCSA/VCCIO)	
Size: CustomMS-16U71 / 17E7	Document Number	Rev: 0A
Date: Friday, October 18, 2019	Sheet 60 of 79	

FBVDDQ POWER / UP1666P

EDP-Peak 74A

EDP-Con 28A

VBoot:1.35V
Vmin:1.25V / Vmax:1.35V



MICRO-STAR INT'L CO.,LTD.

Title: DGPU POWER FBVDDQ1

Size: Document Number: MS-16U71 / 17E7 Rev: 0A

Date: Sheet 61 of 79

DGPU POWER / UP9512P

EDP-Peak 300A

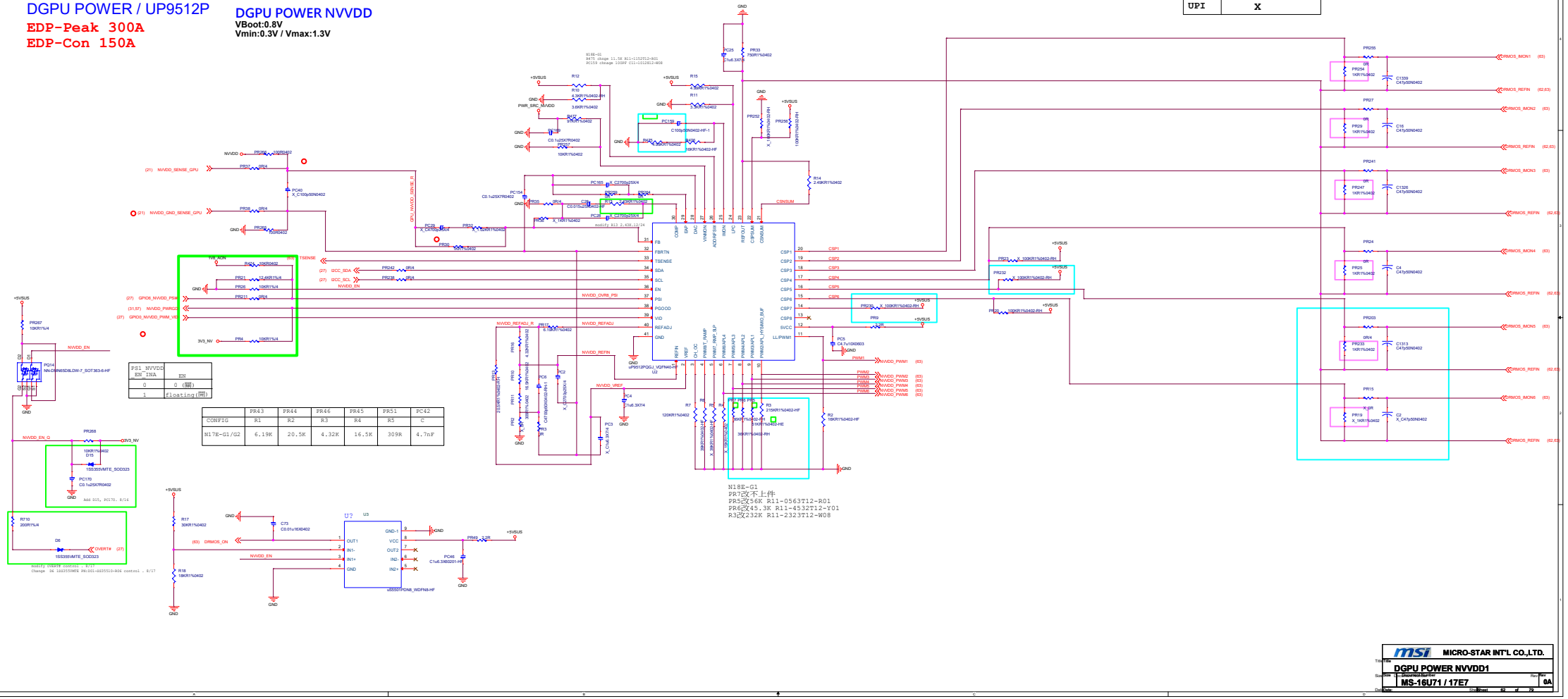
EDP-Con 150A

DGPU POWER NVVDD

VBoot:0.8V

Vmin:0.3V / Vmax:1.3V

	99254,9929,99247,9925,99233,9919
ON Semi	1K R11-0102T12-W08
UPI	X



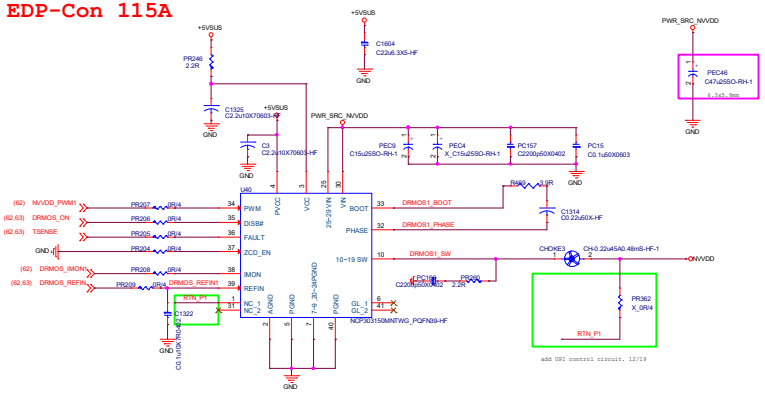
MICRO-STAR INT'L CO.,LTD.	
Title	DGPU POWER NVVDD1
Size	Document Number: MS-16U71 / 17E7
Rev	0A
Date	Sheet 62 of 79

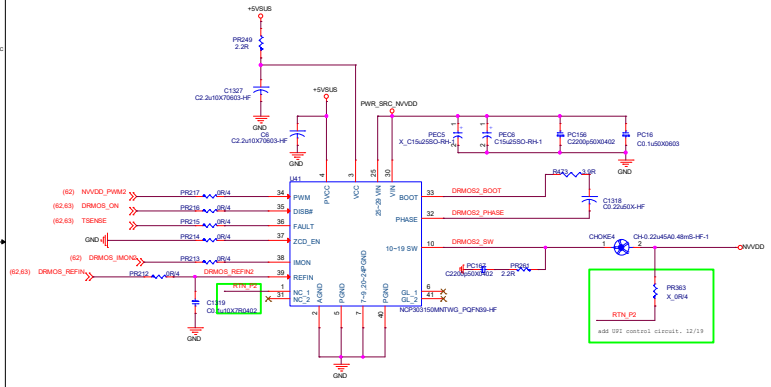
DGPU POWER

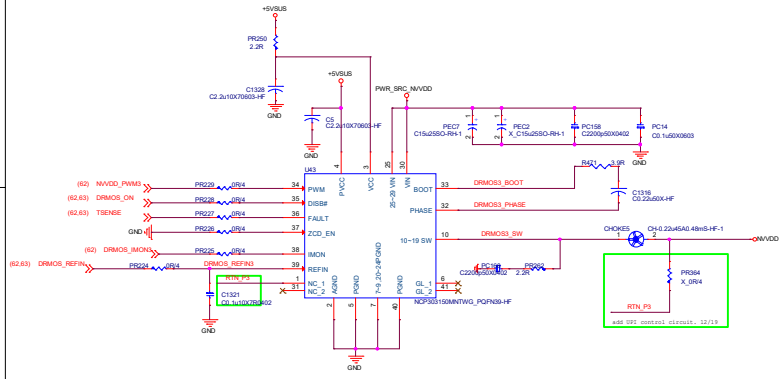
ON Semi	I33-303150C-O05
UPI	I33-9619A0C-U47

	R469,R473,R488,R471,R493,R470	R9359,R9360,R9361,R9362,R9363,R9364
ON Semi	3.9R R11-039A033-W08	X
UPI	2.2R R11-022A013-W08	0R R11-0000012-W08

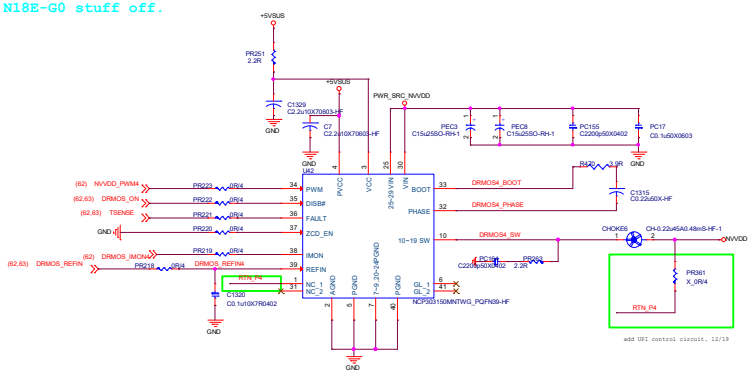
EDP-Peak 300A
EDP-Con 115A

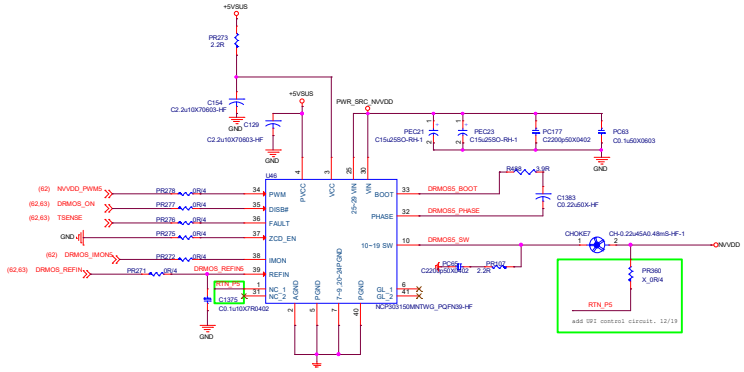




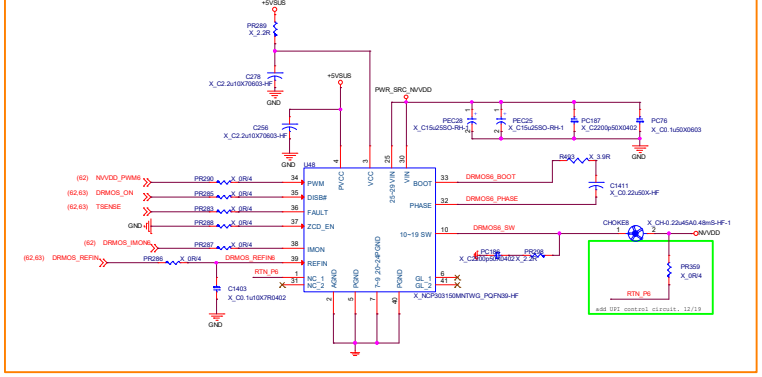


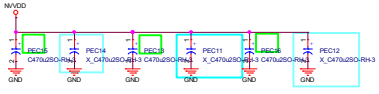
N18E-G0 stuff off.

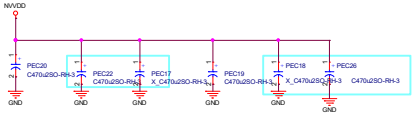




N18E-G1R/G2R stuff off.

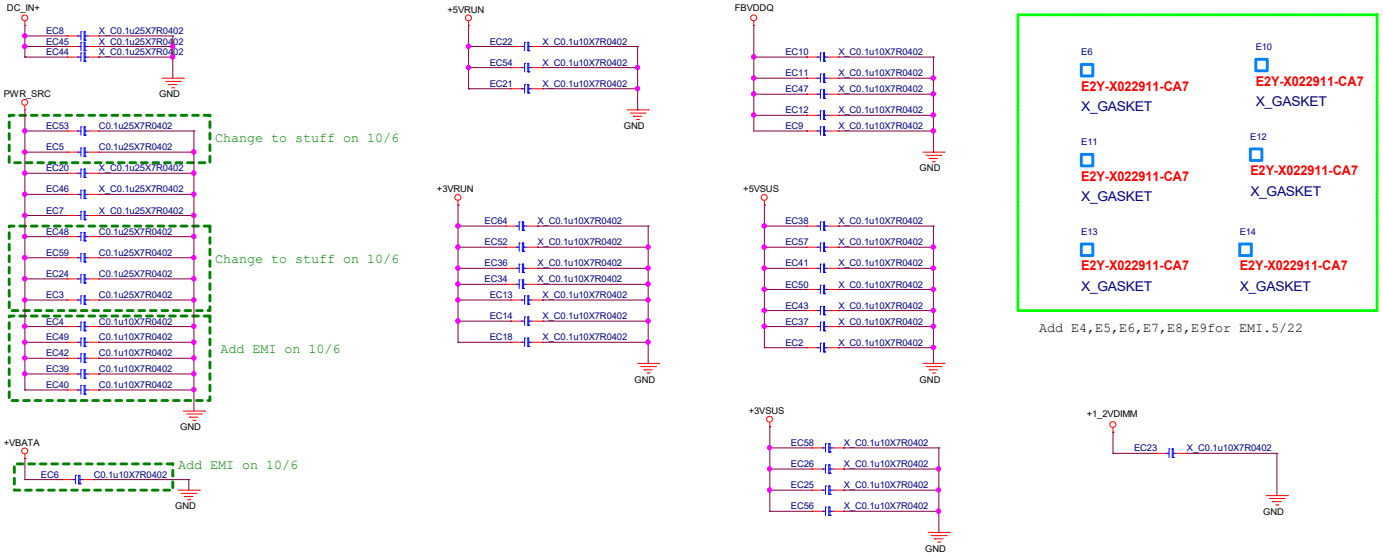




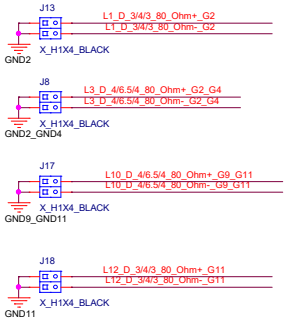


https://realschematic.com

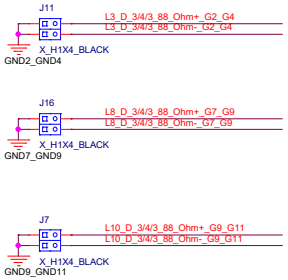
Title	DGPU POWER NVVDD2		
Size	Document Number		Rev
SUB	CustomM8-16U71 / 17E7		0A
Date:	Friday, October 18, 2019	Sheet	63 of 79



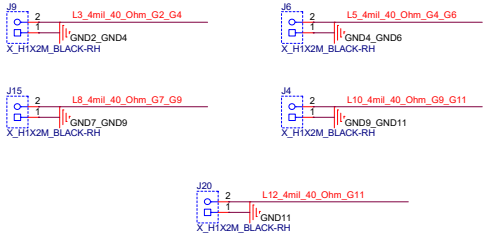
80 OHM / CLK/WCK/USB3.1



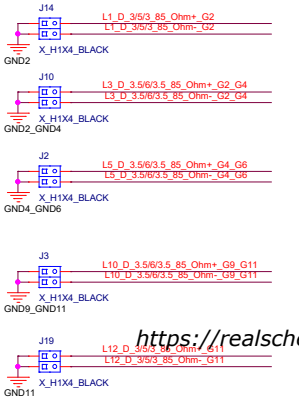
88 OHM /DDR4 CLK



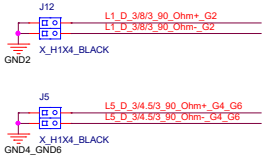
40 OHM / DDR4 CTRL



85 OHM /SATA /PCH PCIE/ EDP USB /HDMI/DP/DMI/CLK/PEG



90 OHM LAN/USB 3.1 MUX



MICRO-STAR INT'L CO.,LTD.		
Title: EMI		
Size: Custom	Document Number: MS-16U71 / 17E7	Rev: 0A
Date: Friday, October 18, 2019	Sheet 64 of 79	

CPU Holes

MCPU2 H_R142D126BR197_MB_N
MCPU3 H_R142D126BR197_MB_N
MCPU6 H_R142D126BR197_MB_N
GND

DGPU Holes

MCPU5 H_R142D126BR197_MB_N
MCPU7 H_R142D126BR197_MB_N
MCPU8 H_R142D126BR197_MB_N
MCPU4 H_R142D126BR197_MB_N
GND

PCB INSIDE Holes

MH7 H_R197D91_N
MH13 H_R197D91_N
MH8 H_R197D91_N
MH10 H_R197D91_N
MH3 H_R197D91_N
MH2 H_R197D91_N
MH14 H_R197D91_N
MH12 H_R197D91_N
MH4 H_R197D91_N
MH9 H_R236D157_V3_N
MH11 H_R197D118_V3_N
npth_80 MH5
npth_80 MH6
GND

PCB OUTSIDE Holes

npth_80 XX7 X_npth_80
npth_80 XX6 X_npth_80
npth_80 XX5 X_npth_80
NPTH118 XX4 X_NPTH118
NPTH118 XX2 X_NPTH118
NPTH118 XX11 X_NPTH118
NPTH118 XX12 X_NPTH118
npth_80 XX10 X_npth_80
npth_80 XX9 X_npth_80
npth_80 XX13 X_npth_80

UME5 CPU BKT
CPU BKT
307-6P10111-HG0

UME6 GPU BKT
GPU BKT
307-6P10211-HG0

UME32 MB MYLAR
GASKET
E2Y-6U11111-G40

FM27 FM28 FM30 FM16
FM19 FM2 FM5 FM14
FM32 FM11 FM3 FM10
FM12 FM24 FM23 FM26
FM7 FM20 FM34 FM17
FM13 FM8 FM33 FM22
FM15 FM6 FM31 FM18
FM29 FM25 FM9 FM21 FM4

GASKET

UME26 MB MYLAR
HDMI GASKET
E2Y-X058811-CA7

UME27 MB MYLAR
DP GASKET
E2Y-X066811-CA7

UME33 MB MYLAR
GASKET
E2Y-X036611-CA7

UME34 MB MYLAR
GASKET
E2M-3570611-G40

Option BOM 5020

GPU

GPU2080R1 GPU
X_N18E-G3R-A1
OB3-16V1001-N08
N18E-G3R

GPU2070R1 GPU
X_N18E-G2R-A1
OB3-16V1002-N08
N18E-G2R

GPU2060R1 GPU
X_N18E-G1R-A1
OB3-16V1003-N08
N18E-G1R

GPU1160 GPU
X_N18E-G0-A1
B03-TU11605-N08
GTX 1660 Ti

CPU

CPU0001 GPU
X_CL8070104398908
OAD-17G3003-I06
COMET LAKE,6 CORE(QTJ2)

MB_mylar

UME22 MB MYLAR
MB_mylar
E2P-6P11311-Y42

UME23 MB MYLAR
MB_mylar
E2P-6P11311-Y42

UME24 MB MYLAR
MB_mylar
E2P-6P11311-Y42

UME25 MB MYLAR
MB_mylar
E2P-6P11311-Y42

MB_RUBBER

UME35 MB MYLAR
GASKET
E2Y-7750211-Y40

UME21 MB Key board RUBBER
MB_RUBBER_5*5*2.7mm
E2Y-4613211-Y40

UME39 MB MYLAR
RUBBER
E2Y-3D11111-Y40

UME40 MB MYLAR
RUBBER
E2Y-6H21312-Y40

UME36 MB MYLAR
GASKET
E2Y-6H21312-Y40

MH16 E2B-1032010-RH
GND
E2B-16P1020-A89

1160	E2B-16P1020-A89
1170	E2B-1032010-A89
1180	E2B-16P1020-A89

PCB1
PD0-16U710A-H73
PD0-16U710A-H73

Hannstar:PD0-16U710A-H73
TRIPOD: PD0-16U710A-T53

E2 X_HS-MS1011-RH
GND

UME1 HDMI Lable
HDMI ROYALTY
Y01-RHDMI03-000

UME2 BIOS Lable
BIOS_LABEL
G51-N1CO041-A09

For MP

MICRO-STAR INT'L CO.,LTD.
Title: **Screw/ME**
Size: C
Document Number: **MS-16U71 / 17E7**
Rev: **0A**
Date: Friday, October 18, 2019
Sheet 65 of 79

MS-16P1 Power Delivery Chart

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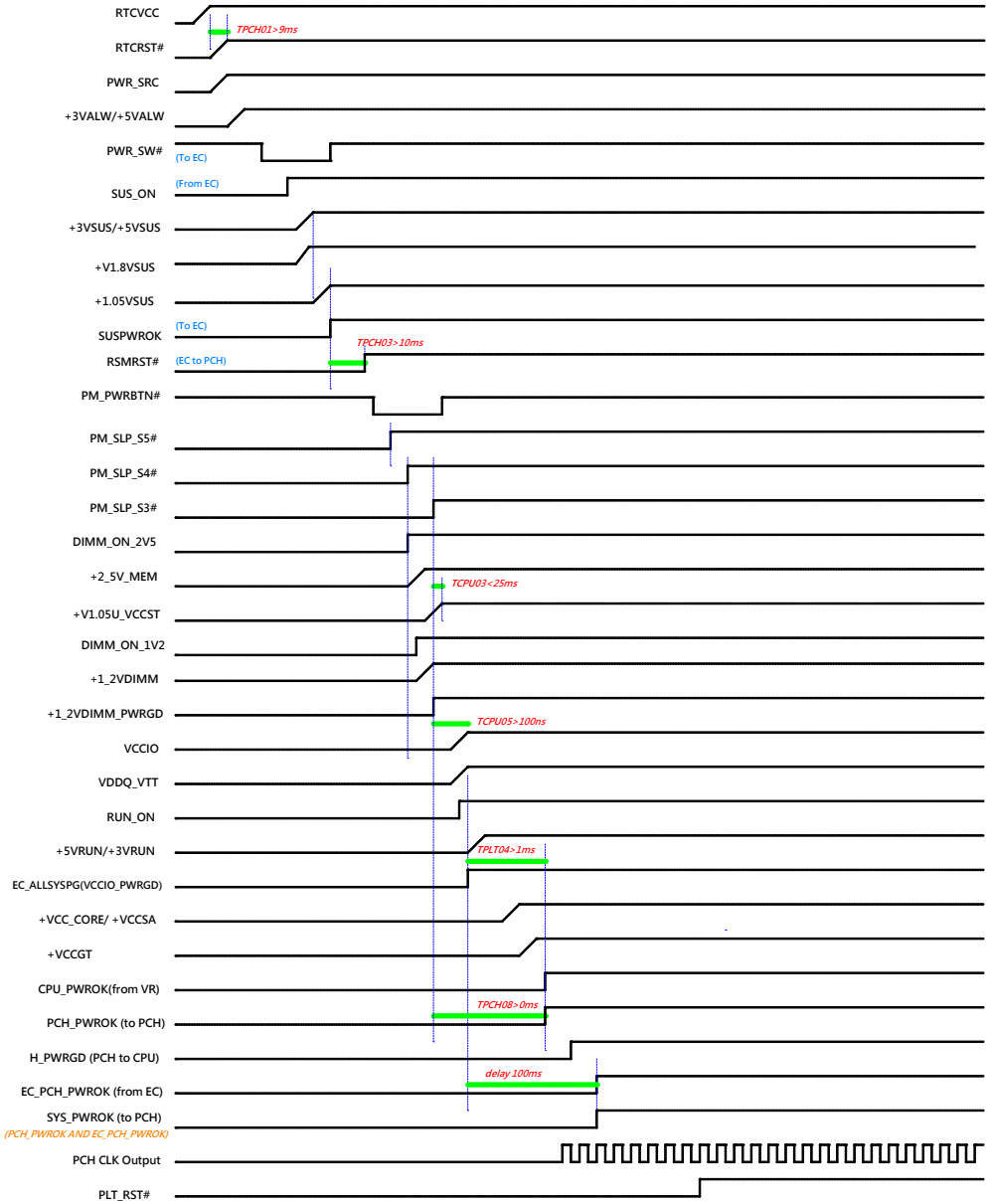
Power Delivery Map

MS-16U71 / 17E7

Power on Sequence

G3 -> S0



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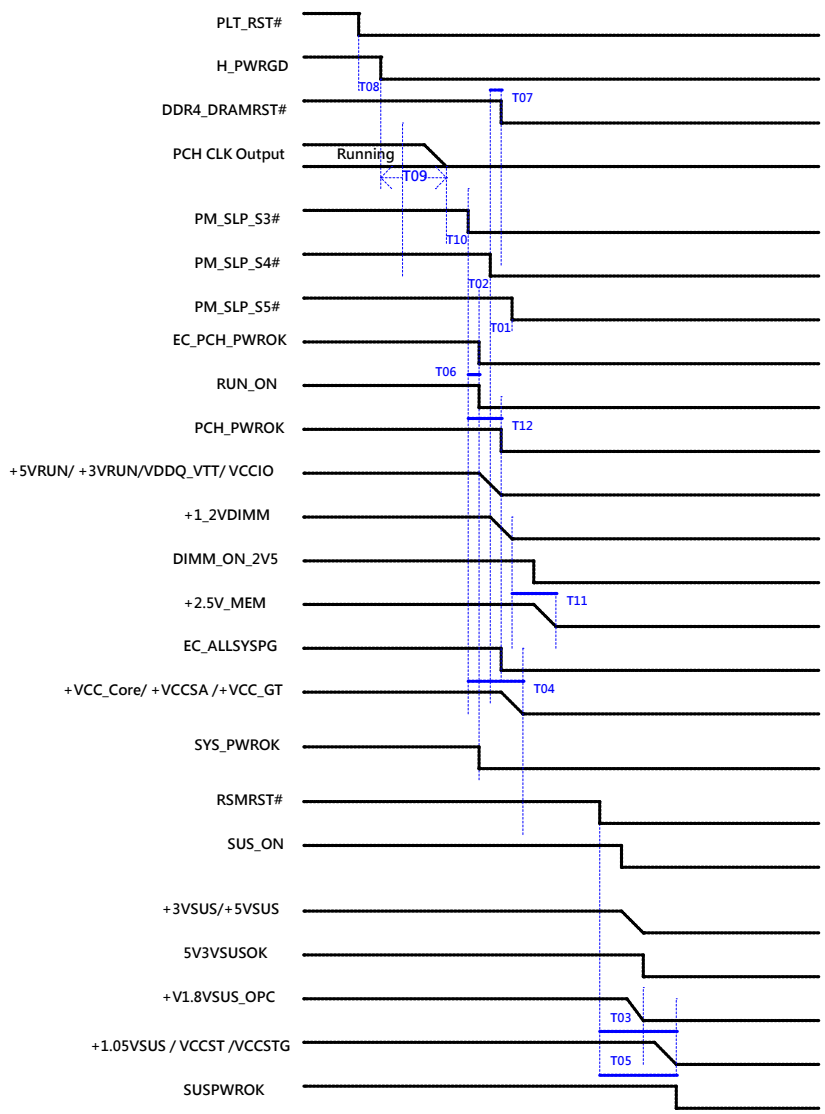
Title: Power on Sequence		
Size: Custom	Document Number: MS-16U71 / 17E7	Rev: 0A
Date: Friday, October 18, 2019	Sheet 67 of 79	

Power down Sequence

S0 -> G3



	MIN	MAX	Units	Description
T01	30		us	SLP_S5# assertion to SLP_S4#
T02	30		us	SLP_S4# assertion to SLP_S3#
T03	1		us	RSMRST# asserting to VccPRIM dropping 5% of nominal value
T04		500	ms	SLP_S3# assertion to VCC, VCCGT, VCCIO and VCCSA rails completely off.
T05	1		us	RSMRST# asserting to VccPRIM dropping 5% of nominal value
T06		1	us	SLP_S3# assertion to VCCIO VR disabled
T07	-100		ns	DDR_RESET# assertion to SLP_S4# assertion
T08	30		us	PLTRST# assertion to PROCPWRGD deassertion
T09	10		us	PROCPWRGD de-assertion to CLKOUT_BCLK turning OFF.
T10	1		us	CLKOUT_BCLK turning OFF to SLP_S3# assertion
T11	30		ms	VDDQ ramped down to VPP ramp down
T12	0		ms	SLP_S3# assertion to PCH_PWROK deassertion

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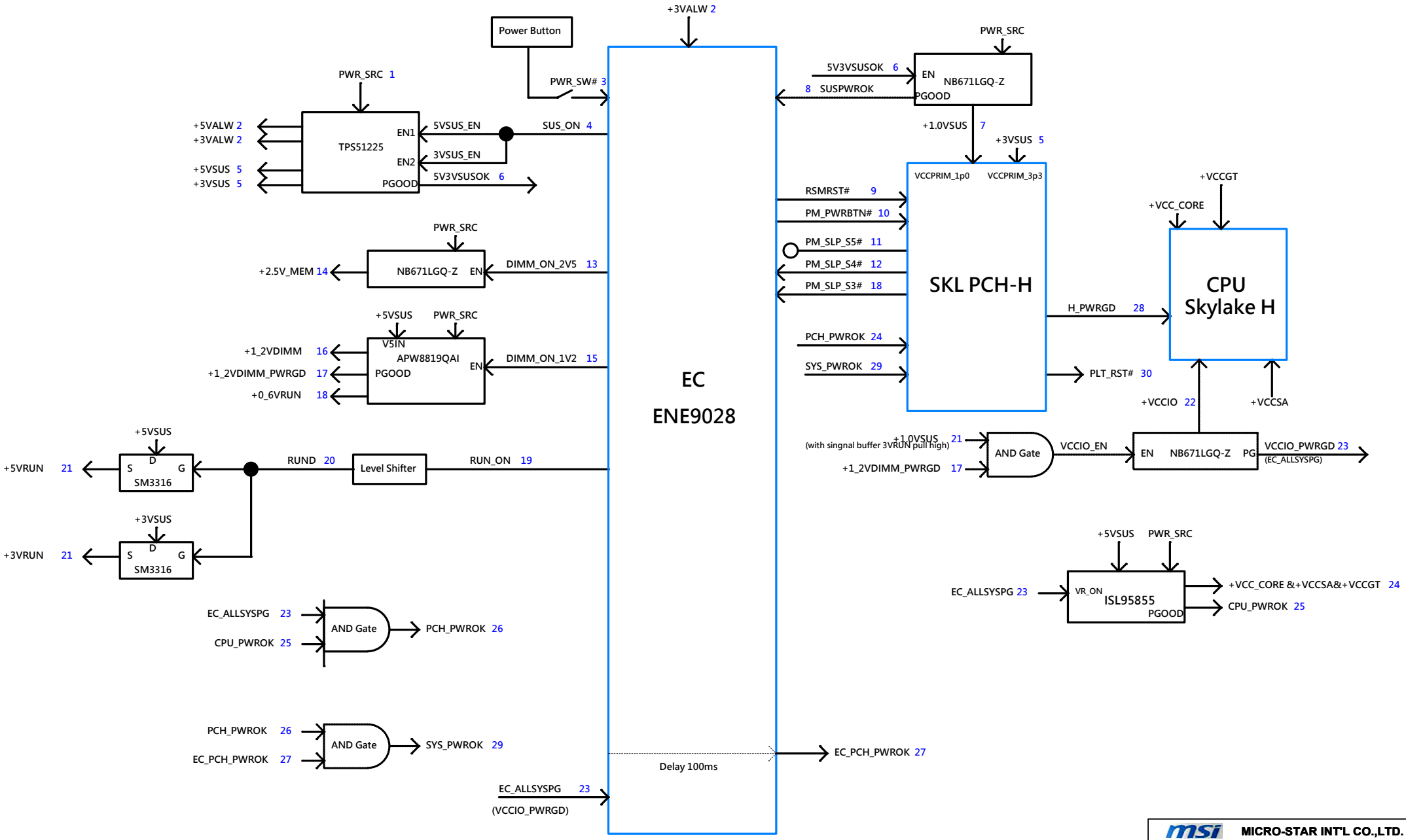
Title: Power down Sequence

Size: Custom | Document Number: MS-16U71 / 17E7 | Rev: 0A

Date: Friday, October 18, 2019 | Sheet 68 of 79

MS-16P7 Power on Block Diagram



https://realschematic.com

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Title	Power on Block Diagram	
Size: Custom	Document Number: MS-16U71 / 17E7	Rev: 0A
Date: Friday, October 18, 2019	Sheet 69 of 79	

MS-16U7 Revision History List

2019/09/26 VER 0A MS-16U7_10_2070_SAMSUNG_i7-9750H_190925_1230_16_FINAL SENT TO LAYOUT.DSN

(Copy From MS-16U11)

Page XX (BOM) :Modify BOM FOLOW 607-16U11-05S (014)

2019/09/26 VER 0A MS-16U7_10_2070_SAMSUNG_i7-9750H_190926A.DSN

Page 5,6,7,58,59,60 (SCH) :Change CPU POWER Form 17E9

2019/09/26 VER 0A MS-16U7_10_2070_SAMSUNG_i7-9750H_190926B.DSN

Page 43 (LAYOUT) :Reduce HDMI2.0 Re-timer change to HDMI 1.4
Page 24 (BOM) :Reduce GPU Backside cap Form 47u*16 to 330u*2
Page 48 (LAYOUT) :Reduce USB 3.1 type A Re-timer
Page 42 (LAYOUT & BOM) :Add PEC52 For Costdown
Page 61 (LAYOUT & BOM) :Add PEC43 , PEC44 , PEC45 For Costdown
Page 63 (LAYOUT & BOM) :Add PEC46 For Costdown
Page 48,74 (LAYOUT) : Change EC55, ECB15, ECB11 form C11-4767314-M09 100uF 0805
to C71-101064G-S03 100uF TYPE B for USB ODD inrush current

2019/09/26 VER 0A MS-16U7_10_2070_SAMSUNG_i7-9750H_190926D.DSN

Page 50 (LAYOUT) : Delete Speaker
Page 51 (LAYOUT) : Delete WOOFER
Page 53 (LAYOUT) : Delete MOTO
Page 49 (LAYOUT) : CHANGE ALC1220 to ALC233

2019/10/03 VER 0A MS-16U7_10_2070_SAMSUNG_i7-9750H_191003A.DSN

Page 49 (LAYOUT) : Modify Audio Circuit for FAE request

Page 58 (BOM) : CHANGE PR4054 PR4265 PR4266 PR4267
Form R11-1743T22-Y01 to R11-1743T13-W08 for power request

Page 30 (BOM) : CHANGE U4
Form I37-454910C-O05 to I37-454920C-O05 for power request

2019/10/03 VER 0A MS-16U7_0A_2070_SAMSUNG_i7-9750H_19116C.DSN

Page 42 (BOM) : STUFF R160 and CHANGE PU9 PU11 U4036
Form I31-059300C-A30 to I31-059301C-A30 for design

Page 5 (BOM) : UnStuff C4089 , C4088 ,C4091 ,C4090 For Cost down