PG180-A02

256b GDDR6 x16

TALL DP + DP + DP + HDMI/DP + USB

TABLE OF CONTENTS

base on V372-02S change for D18 Z
1. P.23 remove SLI & BRIDGE_LED_VDD & SLI_BRG_PRST*
2. P.52 remove LED change FAN connector
3. P.53 remove LED
4. P.3&44 add FUSE
5. P.5~14 mem add <>
6. P.53 LED use V336-0D
7. P.32 remove
8. P.35~38 dual MOS
9. P.33 change dual MOS
10. P.43 remove
11. P.31 change to UP1666
12. P.21 remove colay DP

0727:

page 24: REMOVE GPIO29_IDLE_IN_SW
remove GPIO9_INPUT_DYN_BAL2

page 29: 12V_F RTD3 change to 12V_F

page 30: 12V_F RTD3 change to 12V_F

page 33: 12V_F RTD3 change to 12V_F
移除保護線路

page 39: remove INPUT SWITCH RTD3

page 40: remove INPUT SWITCH RTD3 USB

page 44: remove INA3221

page 46: remove PFM_SKIP net
remove PS_RTD3_12V_SW net

page 47: remove PS_VMON_PGOOD net
12V_F RTD3 change to 12V_F
remove 3V3_PORT
remove 3V3_RTD3 change to nv3v3

page 48: remove OC_CRIT* NET from ina3221
remove PS_VMON_PGOOD net

page 49: PCIE Voltage Monitor1

page 52: REMOVE VIN =>12V_PEX6_8_IN_OVRS

page 54: change GPU scrow holes to small size

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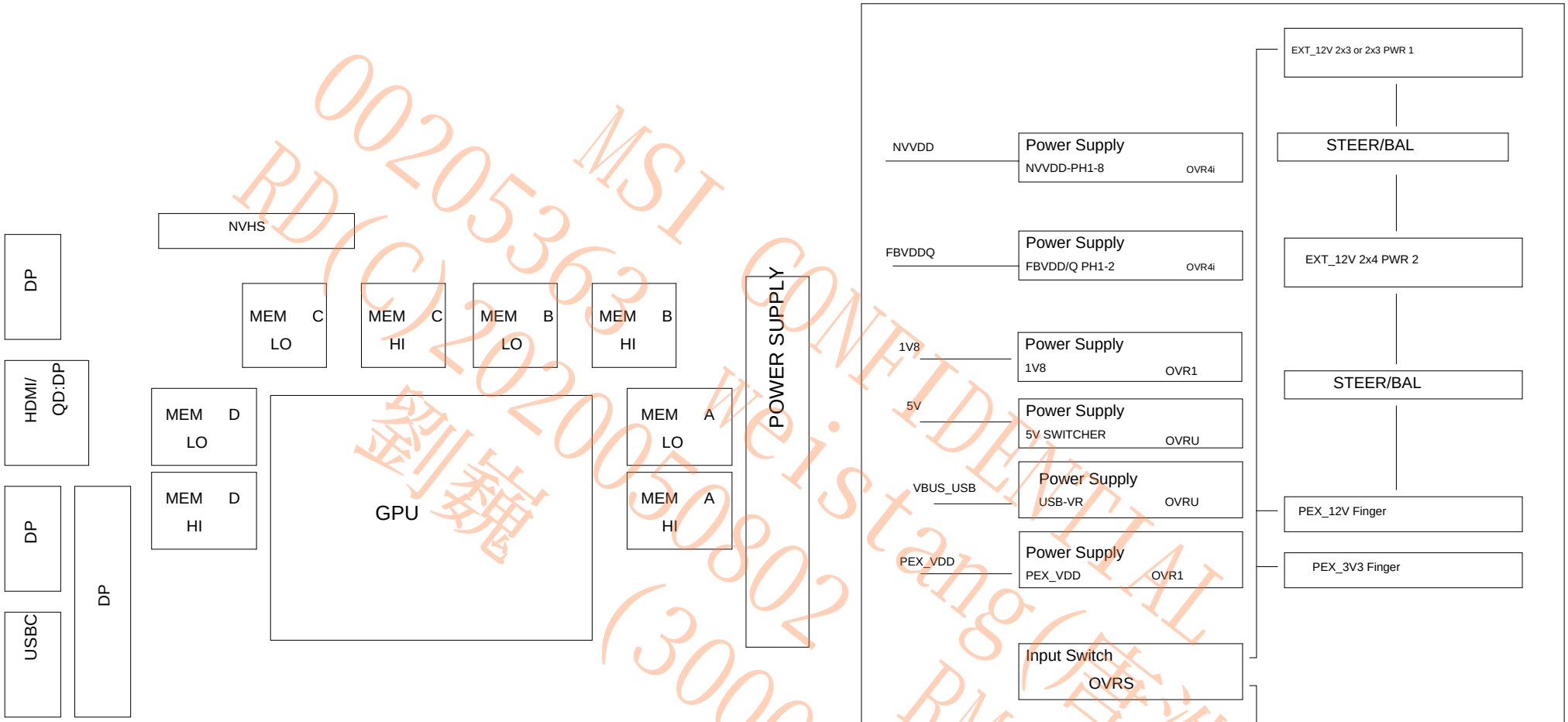
Page2: Block Diagram



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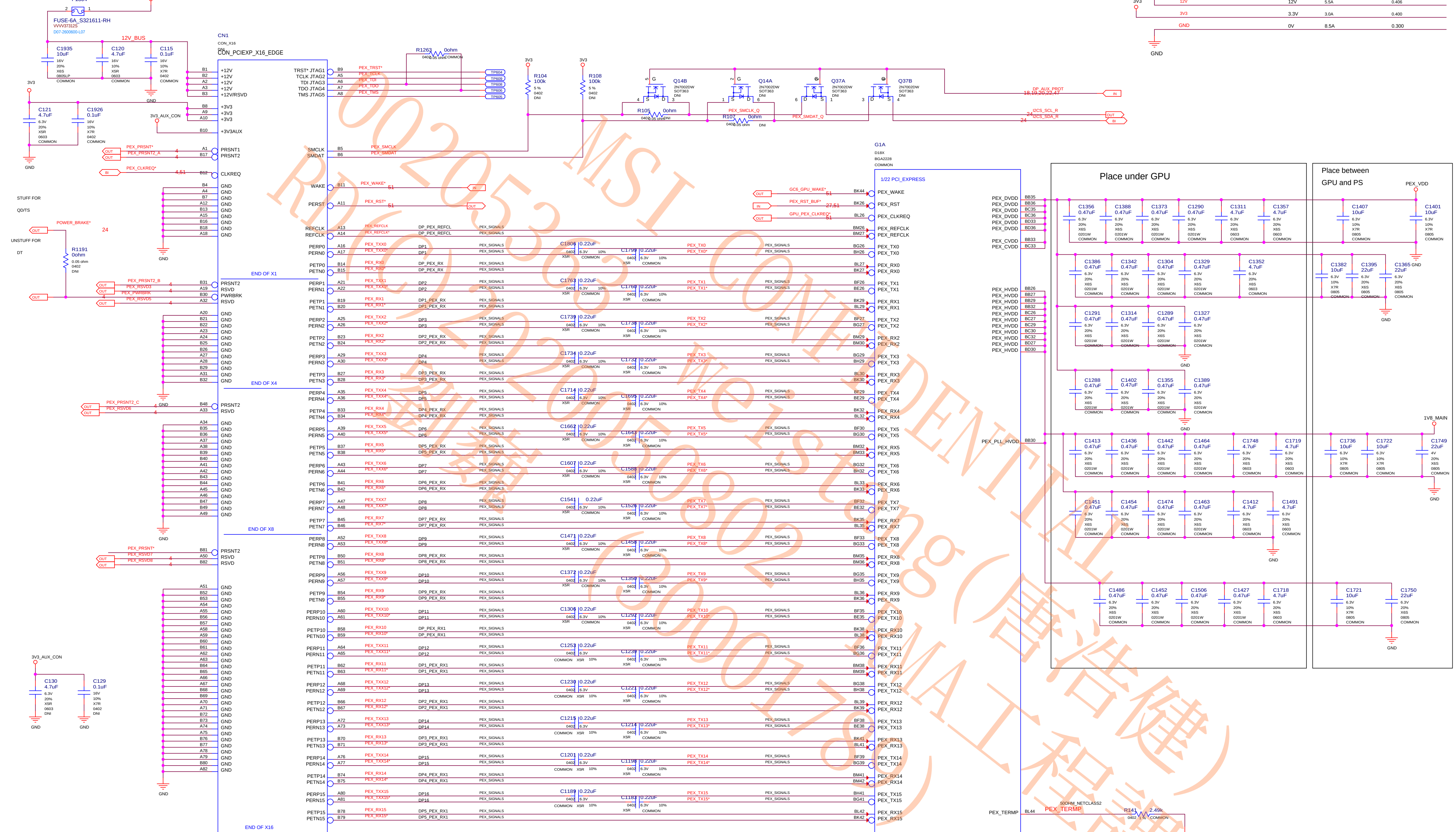
Page3: PCI Express



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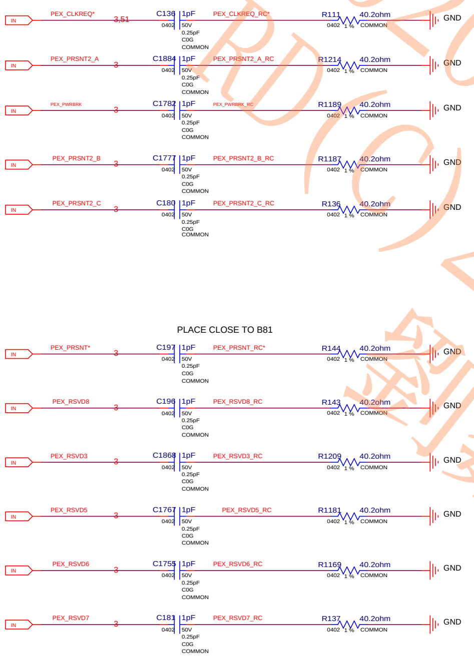
Page4: PCI Termination


PEX_CLKREQ*
C138 1pF 0402 50V 0.25pF C0G COMMON
PEX_CLKREQ_RC*
R111 40.2ohm 0402 1% COMMON
GND
PEX_PRSNT2_A
C1884 1pF
PEX_PRSNT2_A_RC
R1214 40.2ohm
GND
C1782 1pF
R1189 40.2ohm
GND
PEX_PRSNT2_B
C1777 1pF
PEX_PRSNT2_B_RC
R1187 40.2ohm
GND
PEX_PRSNT2_C
C180 1pF
PEX_PRSNT2_C_RC
R136 40.2ohm
GND
PLACE CLOSE TO B81
PEX_PRSNT*
C197 1pF
PEX_PRSNT_RC*
R144 40.2ohm
GND
PEX_RSVD8
C196 1pF
PEX_RSVD8_RC
R143 40.2ohm
GND
PEX_RSVD3
C1868 1pF
PEX_RSVD3_RC
R1209 40.2ohm
GND
PEX_RSVD5
C1767 1pF
PEX_RSVD5_RC
R1181 40.2ohm
GND
PEX_RSVD6
C1759 1pF
PEX_RSVD6_RC
R1169 40.2ohm
GND
PEX_RSVD7
C181 1pF
PEX_RSVD7_RC
R137 40.2ohm
GND

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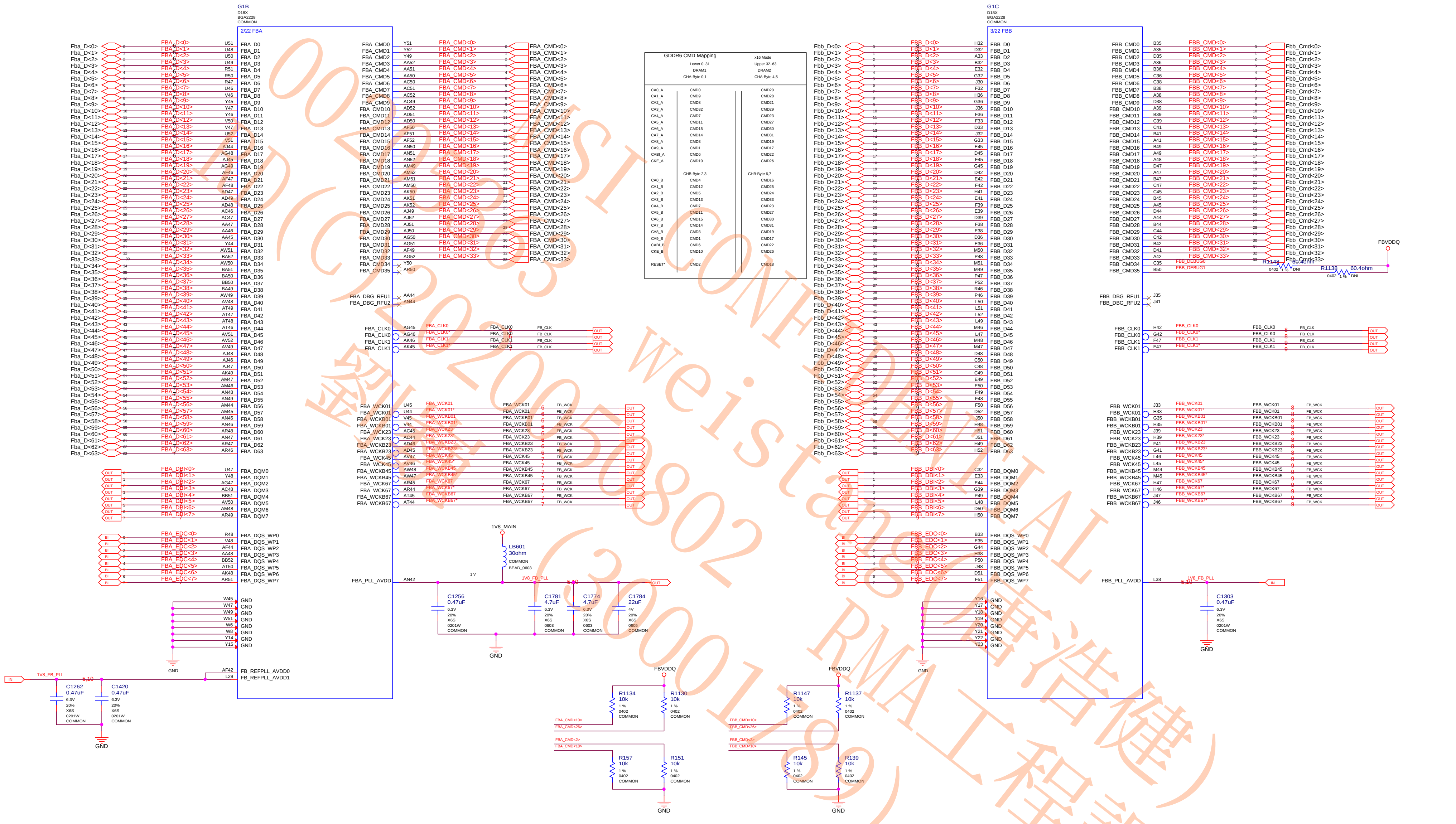
Page5: MEMORY: GPU Partition A/B



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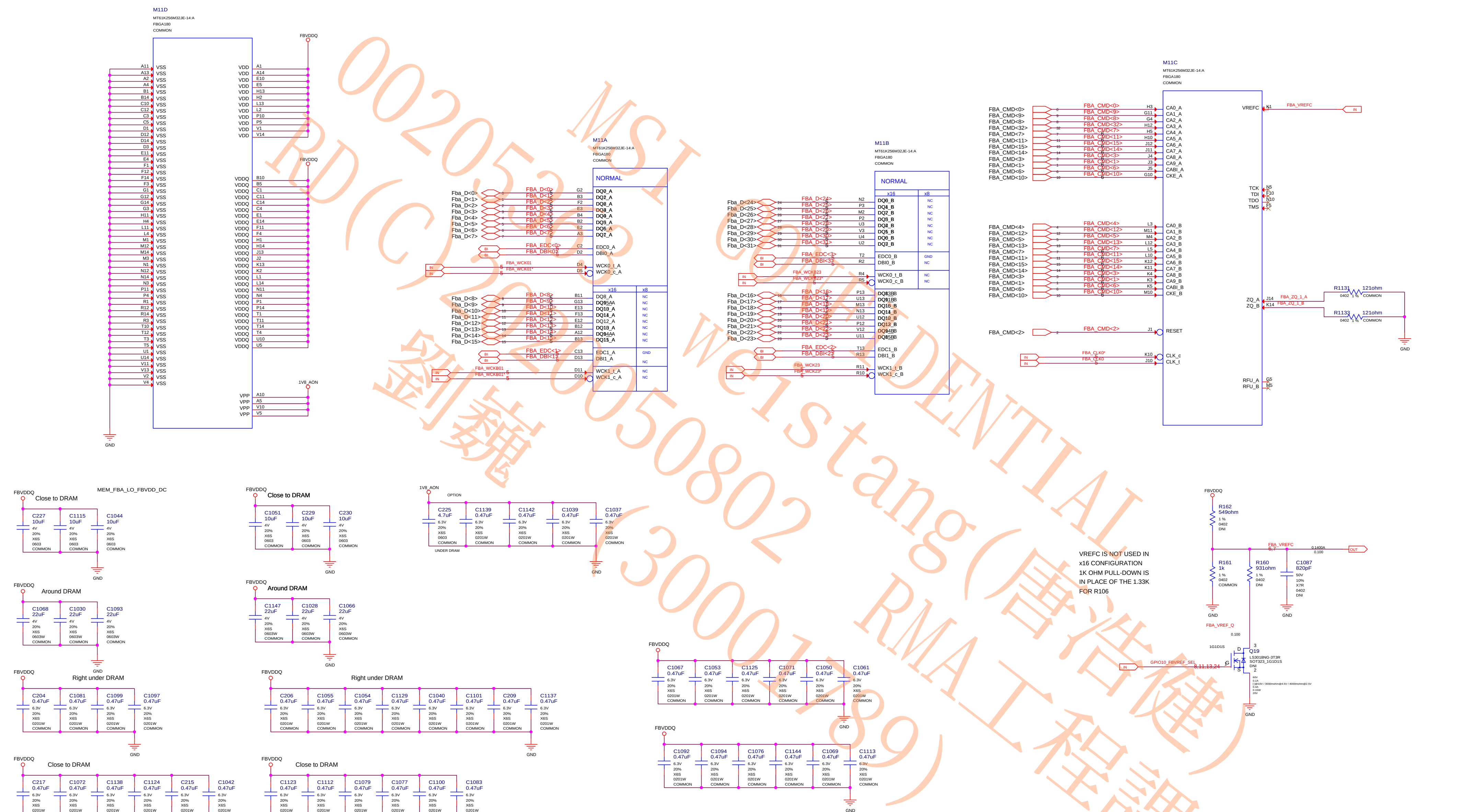
Page6: MEMORY: FBA Partition 31..0



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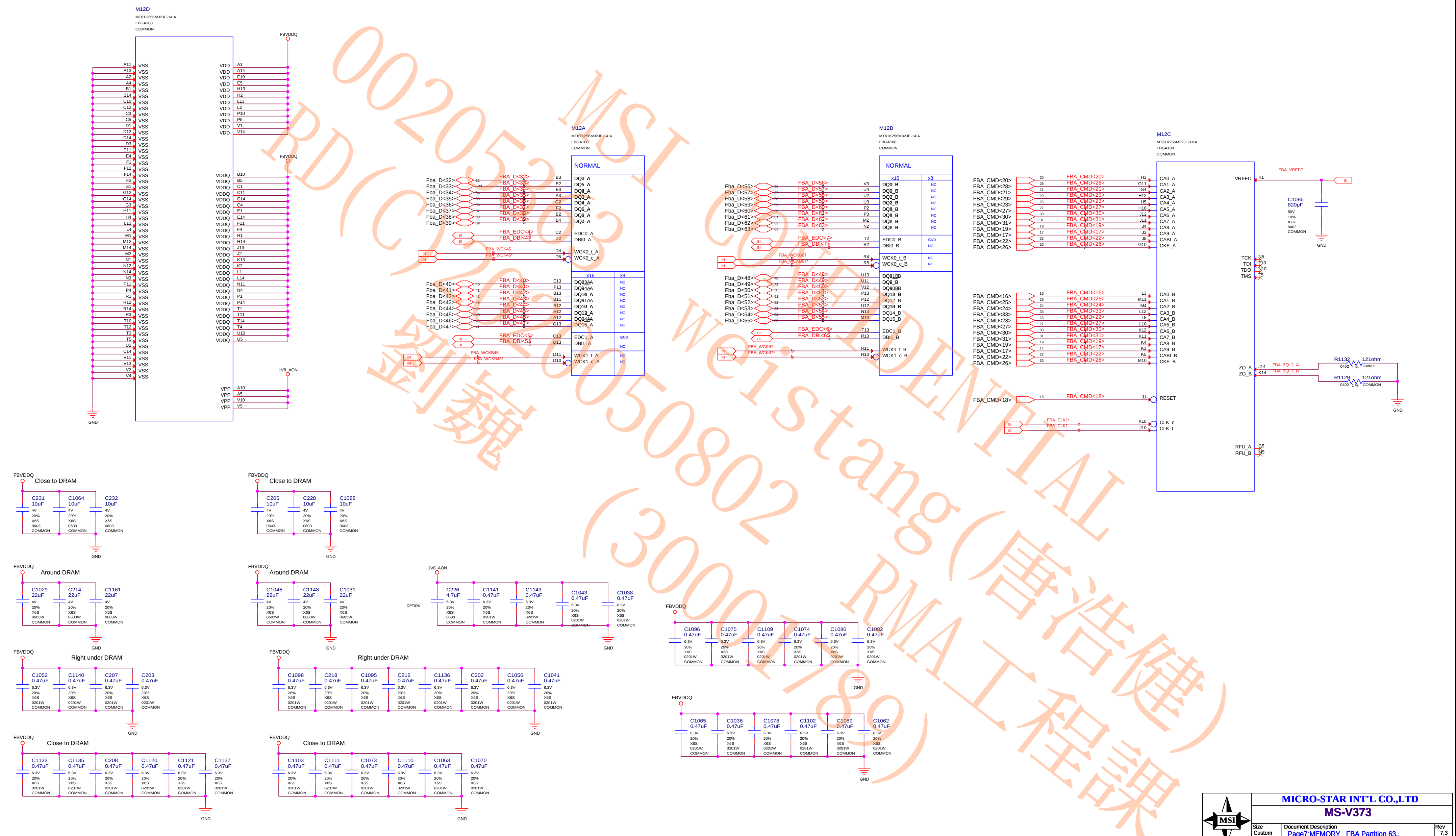
Page7: MEMORY: FBA Partition 63..32



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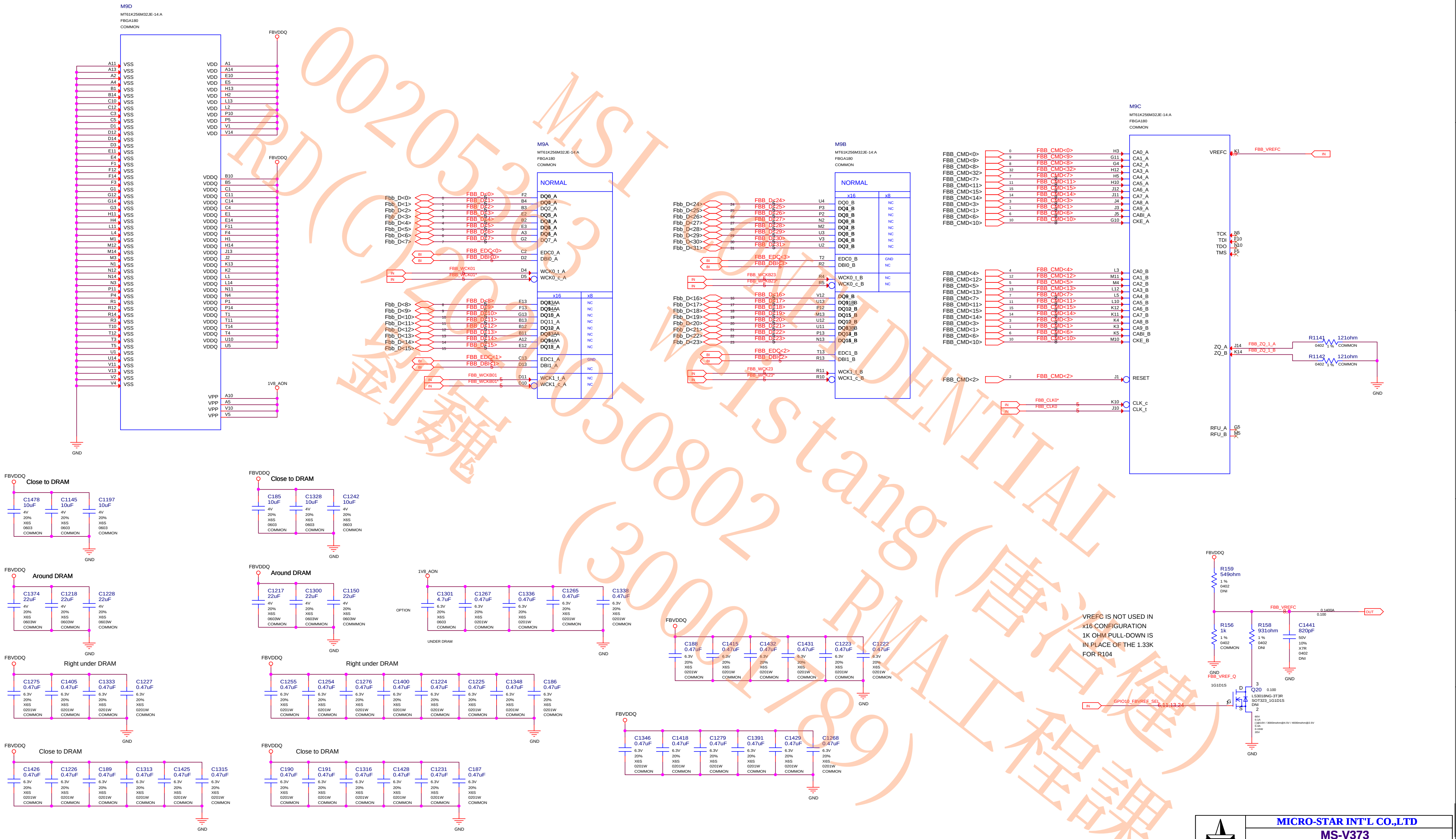
Page8: MEMORY: FBB Partition 31..0



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Page9: MEMORY: FBB Partition 63..32

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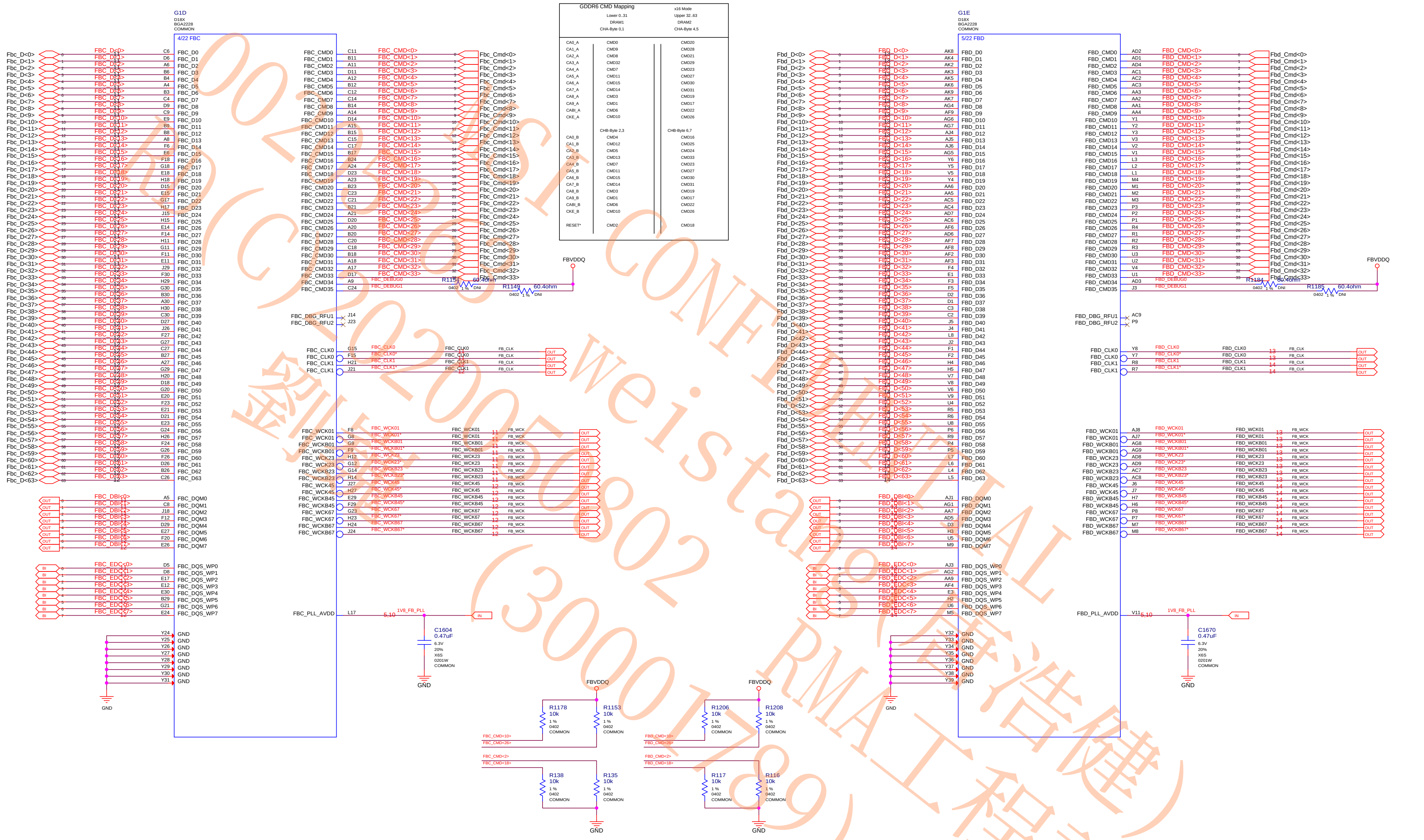
Page10: MEMORY: GPU Partition C/D



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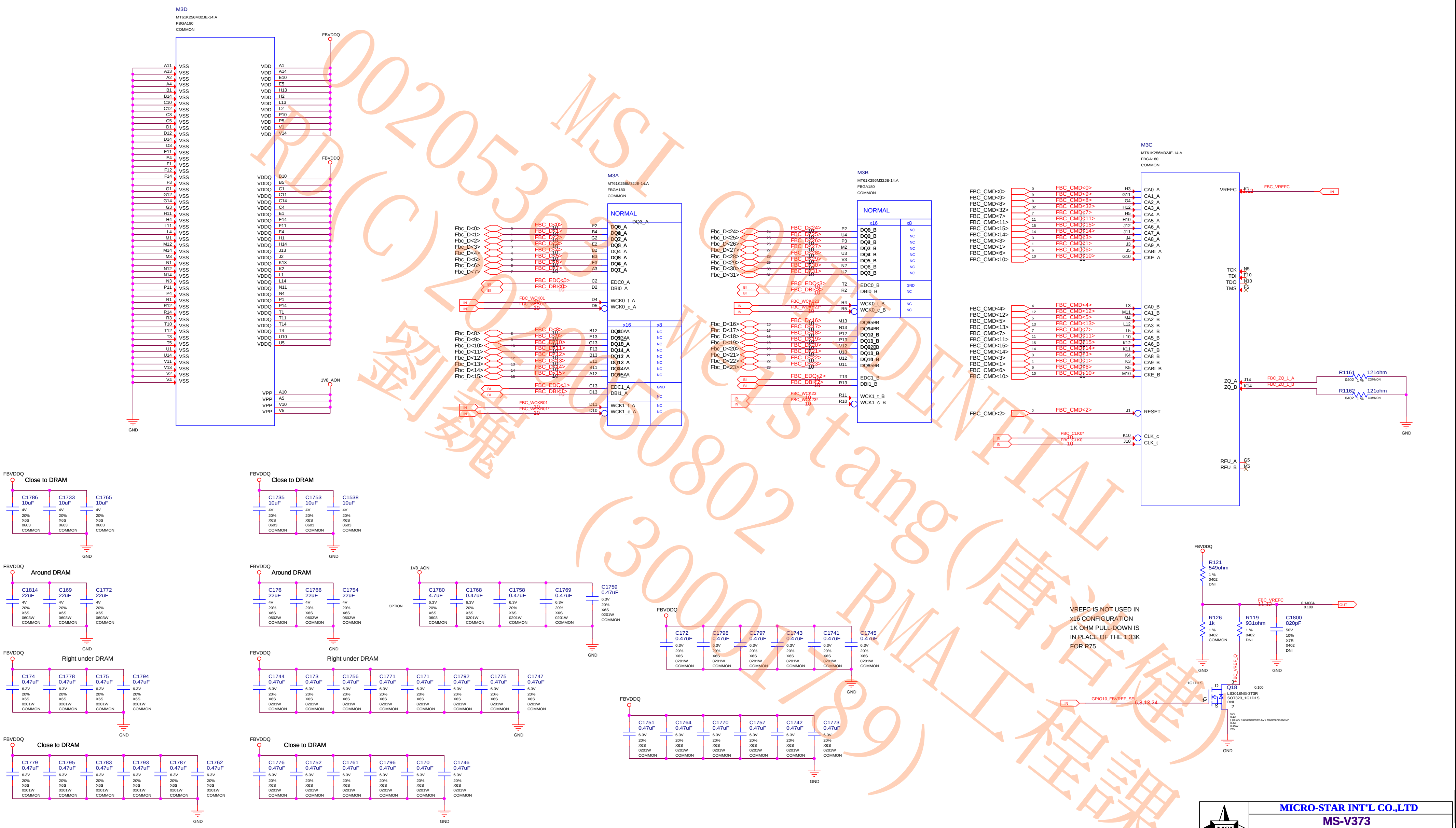
Page11: MEMORY: FBC Partition 31..0



M3D
MT61K256M32JE-14:A
FBGA180
COMMON
FBVDDQ
VSS
VDD
VDDQ
VPP
1V8_AON
GND
M3A
NORMAL
x16
x8
EDC0_A
DBI0_A
WCK0_t_A
WCK0_c_A
EDC1_A
DBI1_A
WCK1_t_A
WCK1_c_A
M3B
EDC0_B
DBI0_B
WCK0_t_B
WCK0_c_B
EDC1_B
DBI1_B
WCK1_t_B
WCK1_c_B
M3C
VREFC
FBC_VREFC
TCK
TDI
TDO
TMS
ZQ_A
ZQ_B
FBC_ZQ_1_A
FBC_ZQ_1_B
R1161
R1162
121ohm
RESET
CLK_c
CLK_t
RFU_A
RFU_B
FBC_CMD<2>
Close to DRAM
Around DRAM
Right under DRAM
OPTION
VREFC IS NOT USED IN
x16 CONFIGURATION
1K OHM PULL-DOWN IS
IN PLACE OF THE 1.33K
FOR R75
R121
549ohm
R126
1k
R119
931ohm
C1800
820pF
Q18
LS3018NG-3T3R
SOT323_1G1D1S
GPIO10_FBVREF_SEL

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Page12: MEMORY: FBC Partition 63..32

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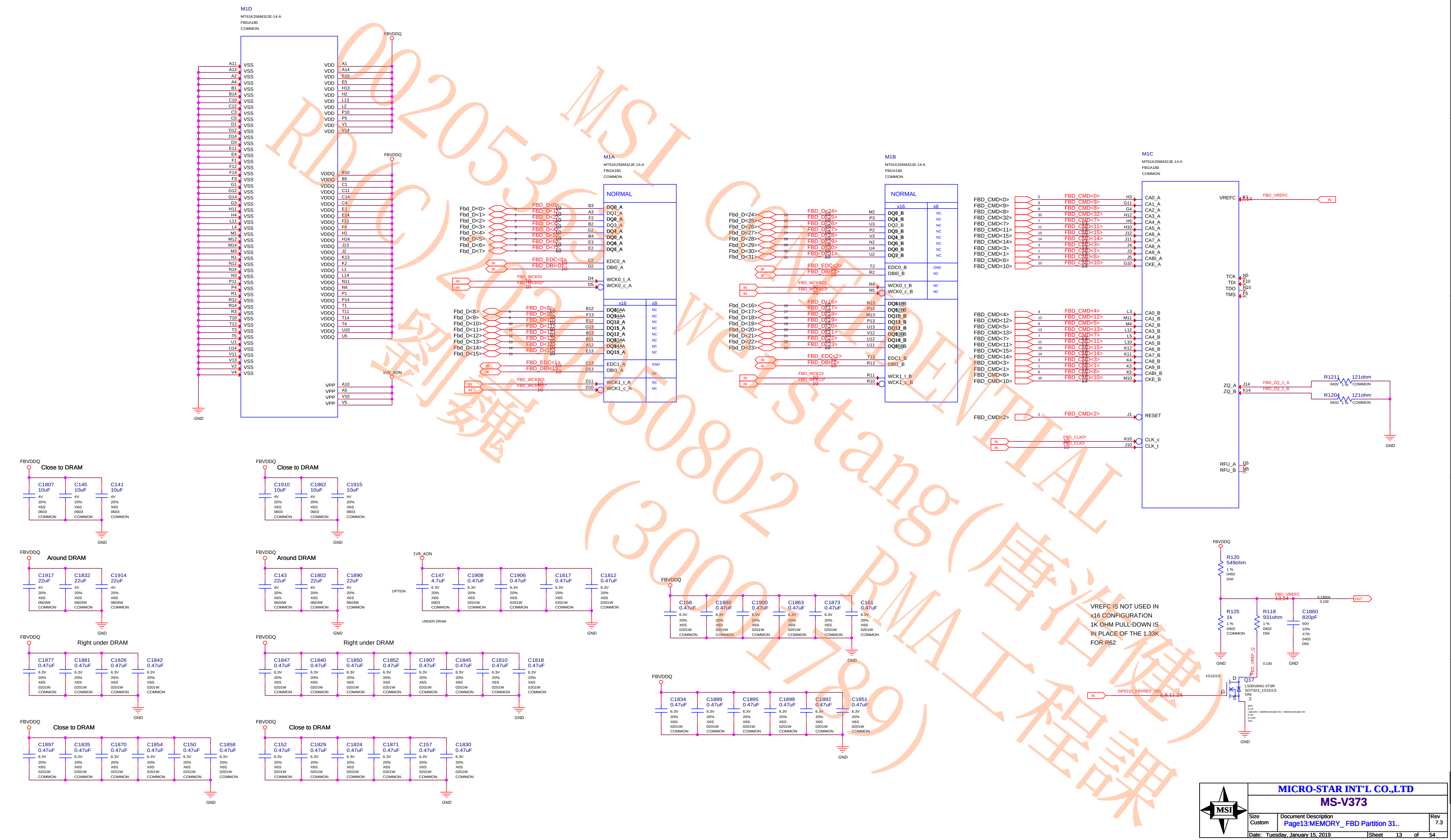
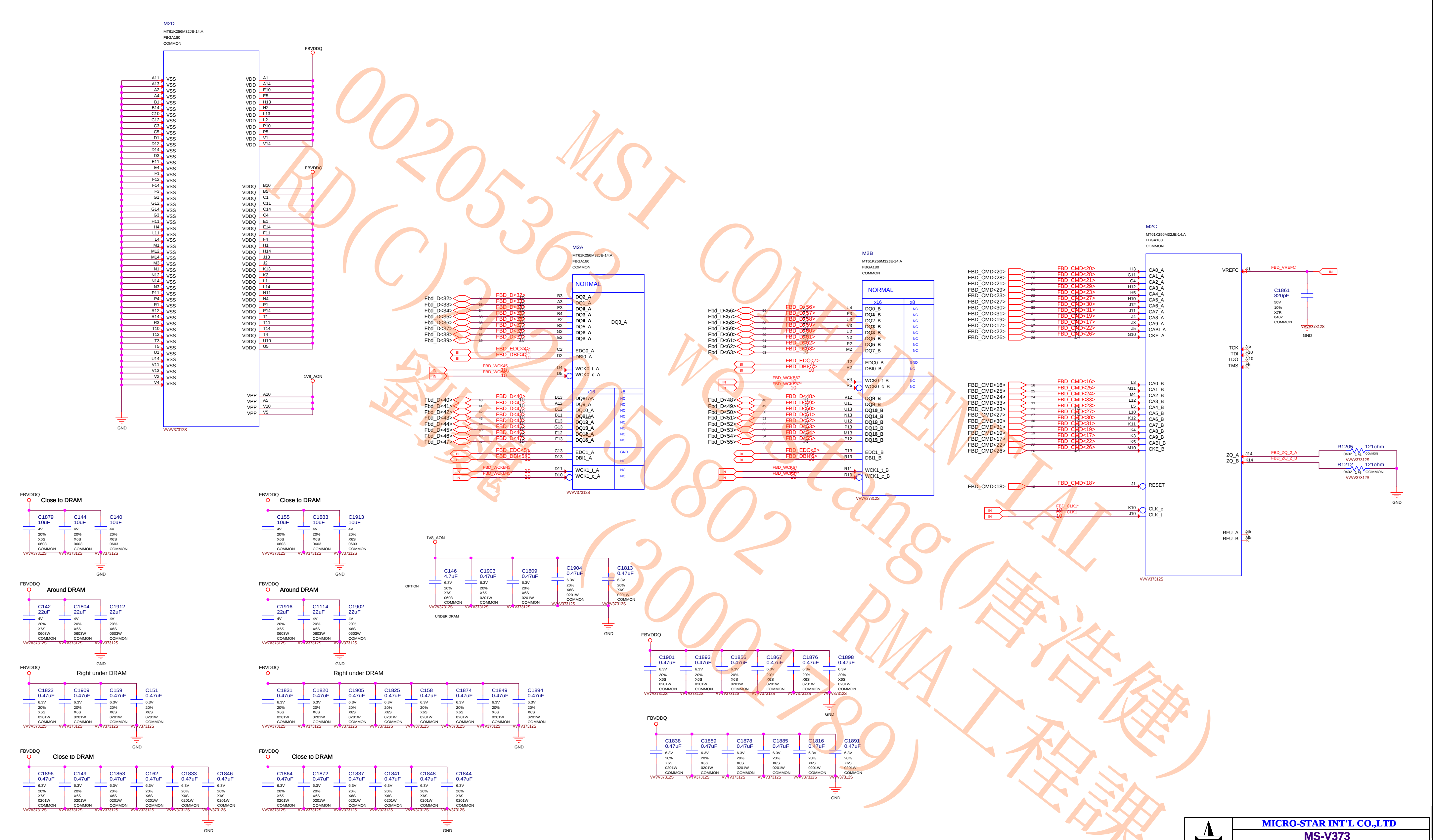
Page13: MEMORY: FBD Partition 31..0



Page14: MEMORY: FBD Partition 63..32



M2D
MT61K256M32JE-14:A
FBGA180
COMMON
M2A
M2B
M2C
NORMAL
FBVDDQ
1V8_AON
GND
VSS
VDD
VDDQ
VPP
Fbd_D<32>
Fbd_D<33>
Fbd_D<34>
Fbd_D<35>
Fbd_D<36>
Fbd_D<37>
Fbd_D<38>
Fbd_D<39>
Fbd_D<40>
Fbd_D<41>
Fbd_D<42>
Fbd_D<43>
Fbd_D<44>
Fbd_D<45>
Fbd_D<46>
Fbd_D<47>
Fbd_D<48>
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Fbd_D<50>
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Fbd_D<57>
Fbd_D<58>
Fbd_D<59>
Fbd_D<60>
Fbd_D<61>
Fbd_D<62>
Fbd_D<63>
FBD_CMD<16>
FBD_CMD<17>
FBD_CMD<18>
FBD_CMD<19>
FBD_CMD<20>
FBD_CMD<21>
FBD_CMD<22>
FBD_CMD<23>
FBD_CMD<24>
FBD_CMD<25>
FBD_CMD<26>
FBD_CMD<27>
FBD_CMD<28>
FBD_CMD<29>
FBD_CMD<30>
FBD_CMD<31>
FBD_CMD<33>
FBD_VREFC
FBD_ZQ_2_A
FBD_ZQ_2_B
FBD_CLK1*
FBD_CLK1
R1205 121ohm
R1213 121ohm
C1861 820pF
Close to DRAM
Around DRAM
Right under DRAM
UNDER DRAM
OPTION
VREFC
RESET
CLK_c
CLK_t
ZQ_A
ZQ_B
RFU_A
RFU_B
TCK
TDI
TDO
TMS

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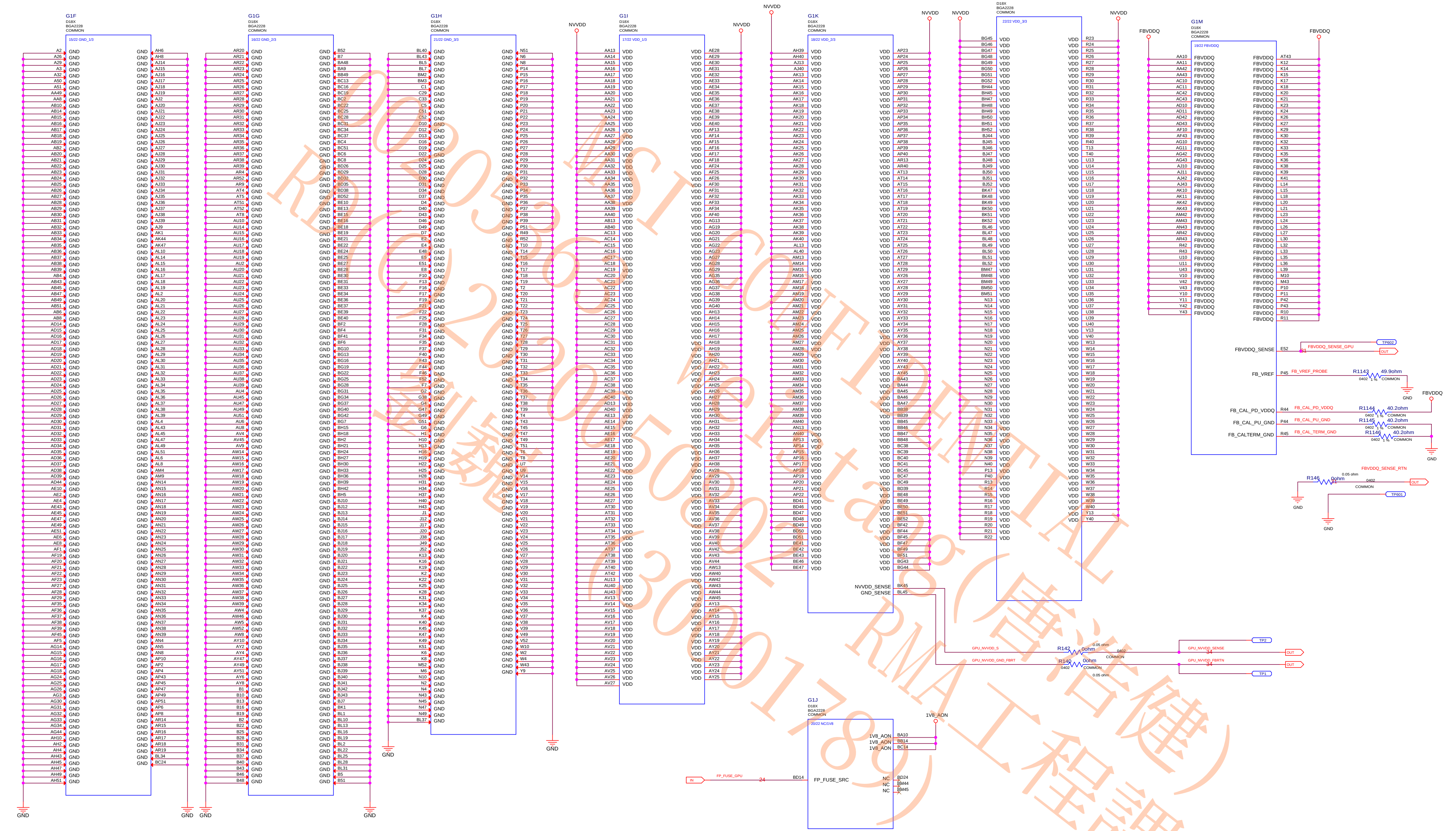
Page15: GPU PWR and GND



G1F D18X BGA2228 COMMON
15/22 GND_1/3
G1G D18X BGA2228 COMMON
16/22 GND_2/3
G1H D18X BGA2228 COMMON
21/22 GND_3/3
G1I D18X BGA2228 COMMON
17/22 VDD_1/3
G1K D18X BGA2228 COMMON
18/22 VDD_2/3
G1L D18X BGA2228 COMMON
22/22 VDD_3/3
G1M D18X BGA2228 COMMON
19/22 FBVDDQ
G1J D18X BGA2228 COMMON
20/22 NC/1V8
NVVDD
FBVDDQ
GND
1V8_AON
NVVDD_SENSE
GND_SENSE
GPU_NVVDD_S
GPU_NVVDD_GND_FBRT
GPU_NVVDD_SENSE
GPU_NVVDD_FBRTN
R142 0ohm
R140 0ohm
FBVDDQ_SENSE
FBVDDQ_SENSE_GPU
FB_VREF
FB_VREF_PROBE
R1143 49.9ohm
FB_CAL_PD_VDDQ
R1144 40.2ohm
FB_CAL_PU_GND
R1145 40.2ohm
FB_CALTERM_GND
FB_CAL_TERM_GND
R1146 40.2ohm
R146 0ohm
FBVDDQ_SENSE_RTN
FP_FUSE_SRC
FP_FUSE_GPU
TP2
TP1
TP602
TP603

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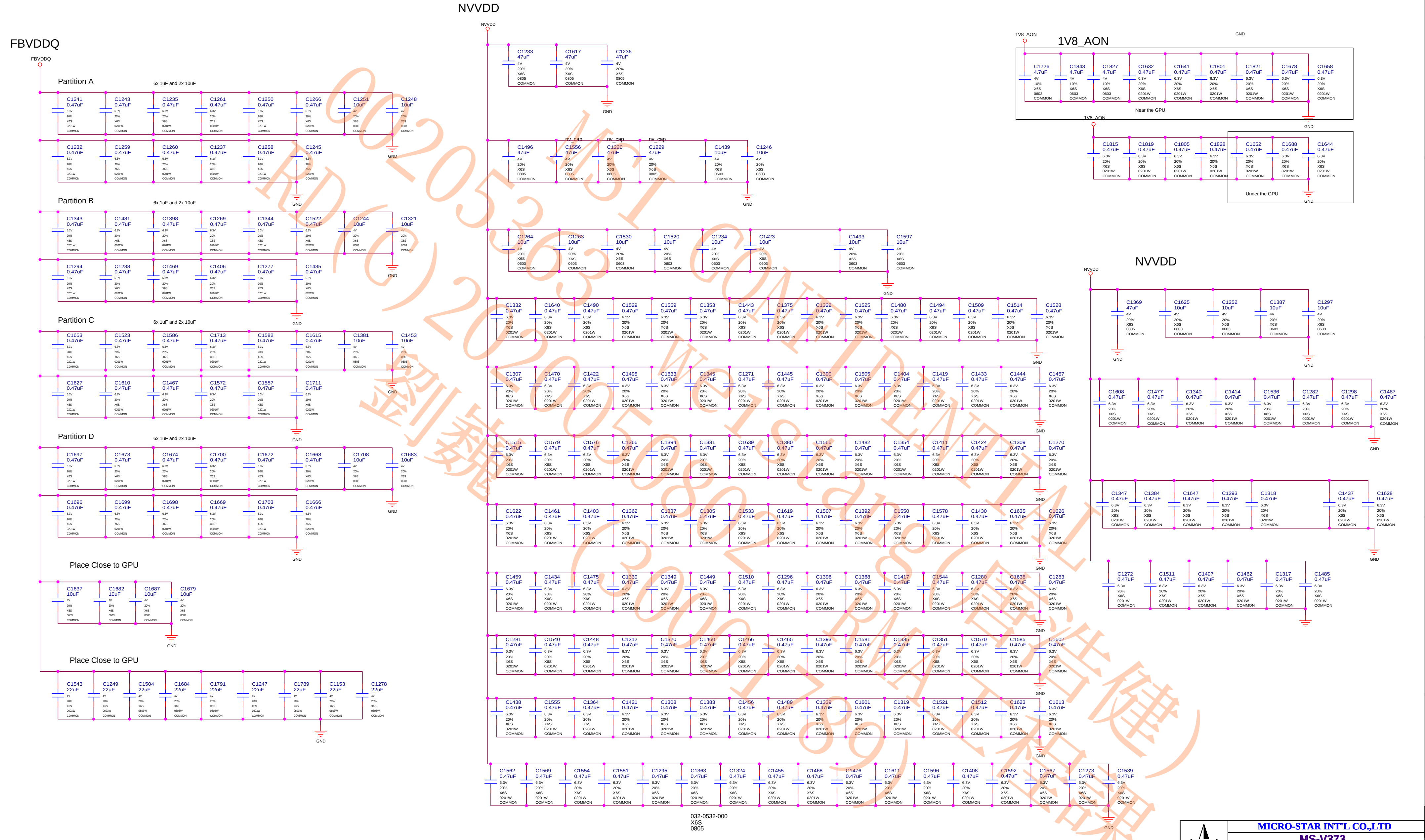
Page16: GPU Decoupling



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Page17: GPU Decoupling


NVVDD
C1370 330uF DNI 20% 2V@105degC AL-Polymer 3.5A@105degC,100KHz 0.006ohm SMD_7343
C1376 0.47uF
C1358 0.47uF
C1377 0.47uF
C1359 0.47uF
C1379 0.47uF
C1378 0.47uF
C1360 0.47uF
C1361 0.47uF
6.3V 20% X6S 0201W COMMON
C1410 47uF
C1326 47uF
C1287 47uF
C1446 47uF
C1409 47uF
C1325 47uF
C1286 47uF
C1447 47uF
4V 20% X6S 0805 COMMON
PCB CO-LAYOUT
GND
NVVDD
C1196 330uF
C1202 47uF
C1194 47uF
C1213 47uF
C1195 47uF
C1179 47uF
C1212 47uF
C1185 47uF
C1178 47uF
C1203 47uF
C1186 47uF
PCB CO-LAYOUT
GND
NVVDD
C1132 330uF
C1108 47uF
C1119 47uF
C1134 47uF
C1152 47uF
C1165 47uF
C1107 47uF
C1118 47uF
C1133 47uF
C1151 47uF
C1164 47uF
PCB CO-LAYOUT
GND
NVVDD
C1616 0.47uF
C1547 0.47uF
C1473 0.47uF
C1440 0.47uF
C1397 0.47uF
C1589 0.47uF
C1524 0.47uF
C1535 0.47uF
C1285 0.47uF
C1302 0.47uF
C1612 0.47uF
C1573 0.47uF
C1560 0.47uF
C1450 0.47uF
C1605 0.47uF
C1341 0.47uF
GND
NVVDD
C1399 0.47uF
C1385 0.47uF
C1371 0.47uF
C1299 0.47uF
C1310 0.47uF
C1323 0.47uF
C1284 0.47uF
C1274 0.47uF
GND
NVVDD
C1104 330uF
C1106 47uF
C1117 47uF
C1131 47uF
C1084 47uF
C1090 47uF
C1105 47uF
C1116 47uF
C1130 47uF
C1085 47uF
C1091 47uF
PCB CO-LAYOUT
GND
NVVDD
C1553 330uF
C1484 47uF
C1630 47uF
C1594 47uF
C1517 47uF
C1483 47uF
C1631 47uF
C1595 47uF
C1518 47uF
C1549 0.47uF
C1546 0.47uF
C1565 0.47uF
C1548 0.47uF
C1564 0.47uF
C1545 0.47uF
C1563 0.47uF
C1561 0.47uF
PCB CO-LAYOUT
GND

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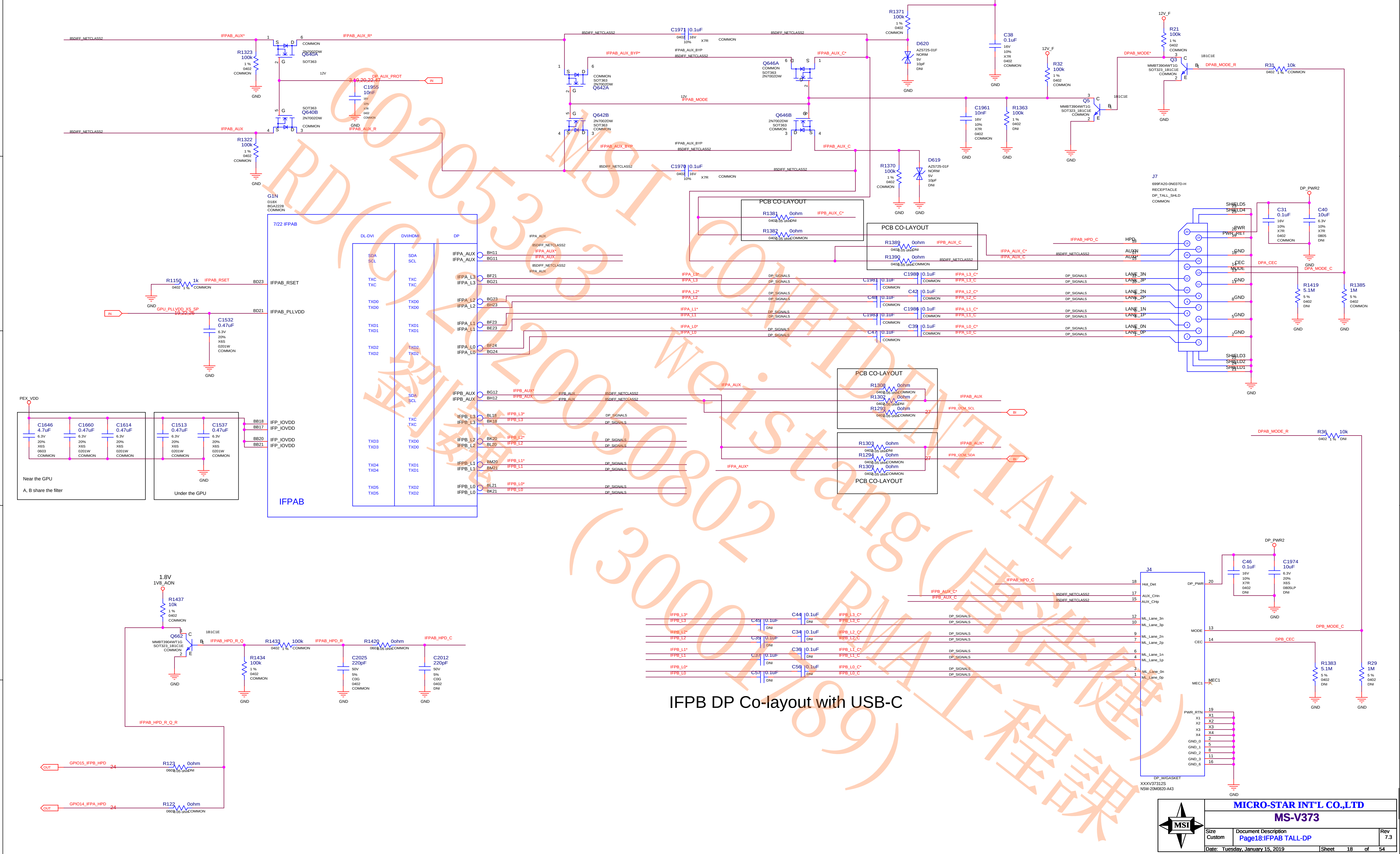
PAGE 18: IFPAB Tall-DP



G1N
D18X
BGA2228
COMMON
7/22 IFPAB
DL-DVI
DVI/HDMI
DP
IFPAB_RSET
IFPAB_PLLVDD
IFP_IOVDD
IFPA_AUX
IFPA_L3
IFPA_L2
IFPA_L1
IFPA_L0
IFPB_AUX
IFPB_L3
IFPB_L2
IFPB_L1
IFPB_L0
IFPAB
Near the GPU
A, B share the filter
Under the GPU
PEX_VDD
1.8V
1V8_AON
PCB CO-LAYOUT
J7
699FA20-0N037D-H
RECEPTACLE
DP_TALL_SHLD
COMMON
J4
DP_W/GASKET
XXXV37312S
NSW-20M0820-A43
IFPB DP Co-layout with USB-C
DP_PWR2
GPU_PLLVDD_XS_SP
GPIO15_IFPB_HPD
GPIO14_IFPA_HPD
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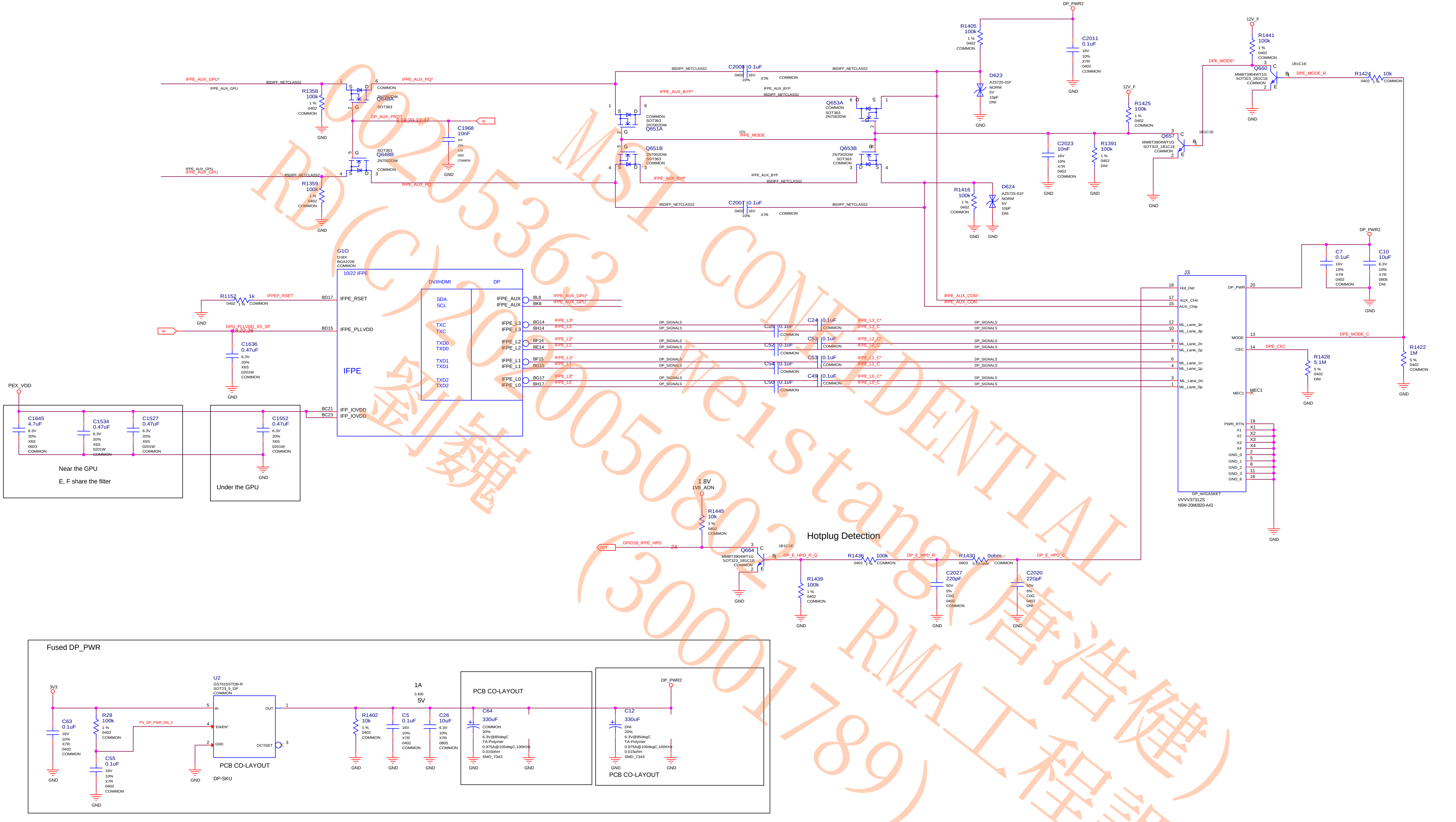
PAGE 19: IFPE DP



IFPE_AUX_GPU*
IFPE_AUX_GPU
IFPE_AUX_RQ*
IFPE_AUX_RQ
IFPE_AUX_BYP*
IFPE_AUX_BYP
IFPE_MODE
DP_AUX_PROT
DP_PWR2
R1358 100k
R1359 100k
R1405 100k
R1441 100k
R1424 10k
R1425 100k
R1391 100k
R1416 100k
R1152 1k
R1428 5.1M
R1422 1M
R1445 10k
R1436 100k
R1430 0ohm
R1439 100k
R1402 10k
R28 100k
C1968 10nF
C2008 0.1uF
C2007 0.1uF
C2011 0.1uF
C2023 10nF
C7 0.1uF
C10 10uF
C1636 0.47uF
C1645 4.7uF
C1534 0.47uF
C1527 0.47uF
C1552 0.47uF
C2027 220pF
C2020 220pF
C63 0.1uF
C55 0.1uF
C5 0.1uF
C26 10uF
C64 330uF
C12 330uF
Q648A
Q648B
Q651A
Q651B
Q653A
Q653B
Q657
Q660
Q664
D623
D624
G10
IFPE
IFPE_RSET
IFPE_PLLVDD
IFP_IOVDD
DVI/HDMI
DP
SDA
SCL
TXC
TXD0
TXD1
TXD2
IFPE_L3
IFPE_L2
IFPE_L1
IFPE_L0
J3
Hot_Det
AUX_CHn
AUX_CHp
ML_Lane_3n
ML_Lane_3p
ML_Lane_2n
ML_Lane_2p
ML_Lane_1n
ML_Lane_1p
ML_Lane_0n
ML_Lane_0p
DP_PWR
MODE
CEC
MEC1
PWR_RTN
DPE_MODE_C
DPE_MODE_R
DPE_CEC
GPU_PLLVDD_XS_SP
PEX_VDD
Near the GPU
E, F share the filter
Under the GPU
1.8V
1V8_AON
GPIO18_IFPE_HPD
Hotplug Detection
DP_E_HPD_R_Q
DP_E_HPD_R
DP_E_HPD_C
Fused DP_PWR
3V3
U2
G5761SSTDB-R
PS_DP_PWR_EN_2
1A
5V
PCB CO-LAYOUT
DP-SKU
GND
12V_F

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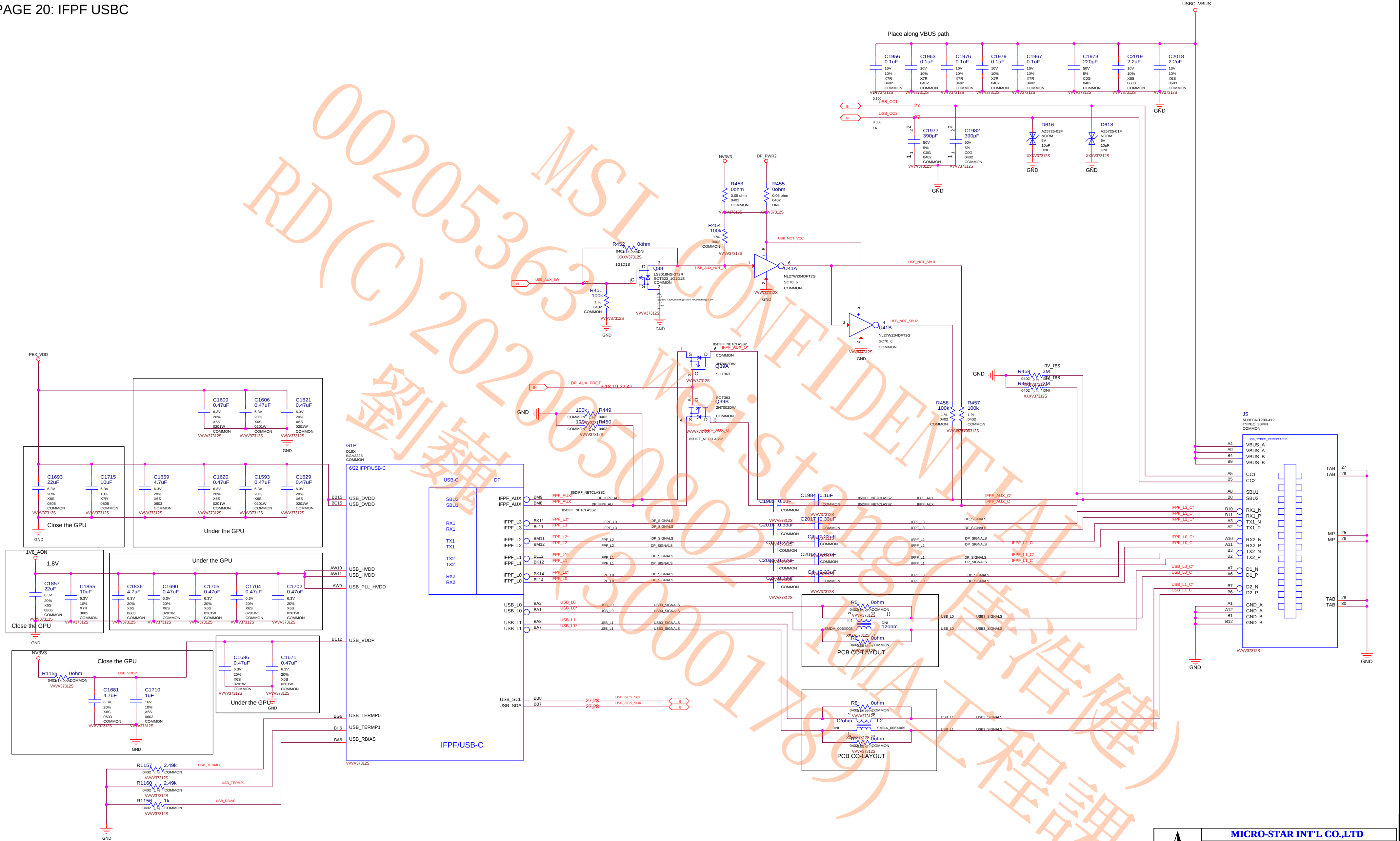
PAGE 20: IFPF USBC



USBC_VBUS
Place along VBUS path
C1956 0.1uF
C1963 0.1uF
C1976 0.1uF
C1979 0.1uF
C1967 0.1uF
C1973 220pF
C2019 2.2uF
C2018 2.2uF
USB_CC1
USB_CC2
C1977 390pF
C1982 390pF
D616 AZ5725-01F
D618 AZ5725-01F
NV3V3
DP_PWR2
R453 0ohm
R455 0ohm
R454 100k
R452 0ohm
Q38
R451 100k
USB_AUX_SW
USB_NOT_VCC
U41A
NL27WZ04DFT2G
USB_NOT_SBU1
U41B
USB_NOT_SBU2
Q39A
Q39B
2N7002DW
DP_AUX_PROT
R449 100k
R450 100k
R458 2M
R460 2M
nv_res
R456 100k
R457 100k
PEX_VDD
C1609 0.47uF
C1606 0.47uF
C1621 0.47uF
C1693 22uF
C1715 10uF
C1659 4.7uF
C1620 0.47uF
C1593 0.47uF
C1629 0.47uF
Close the GPU
Under the GPU
1V8_AON
1.8V
C1857 22uF
C1855 10uF
C1836 4.7uF
C1690 0.47uF
C1705 0.47uF
C1704 0.47uF
C1702 0.47uF
NV3V3
R1155 0ohm
USB_VDDP
C1681 4.7uF
C1710 1uF
C1686 0.47uF
C1671 0.47uF
R1157 2.49k
R1160 2.49k
R1156 1k
USB_TERMP0
USB_TERMP1
USB_RBIAS
G1P
6/22 IFPF/USB-C
USB_DVDD
USB_HVDD
USB_PLL_HVDD
USB_VDDP
USB_TERMP0
USB_TERMP1
USB_RBIAS
IFPF_AUX
IFPF_L3
IFPF_L2
IFPF_L1
IFPF_L0
USB_L0
USB_L1
USB_SCL
USB_SDA
IFPF/USB-C
C1984 0.1uF
C1985 0.1uF
C2017 0.33uF
C2016 0.33uF
R5 0ohm
L1
R6 0ohm
PCB CO-LAYOUT
R8 0ohm
L2
R7 0ohm
PCB CO-LAYOUT
J5
MJ8E0A-T280-412
TYPEC_30PIN
VBUS_A
VBUS_B
CC1
CC2
SBU1
SBU2
RX1_N
RX1_P
TX1_N
TX1_P
RX2_N
RX2_P
TX2_N
TX2_P
D1_N
D1_P
D2_N
D2_P
GND_A
GND_B
TAB
MP
GND

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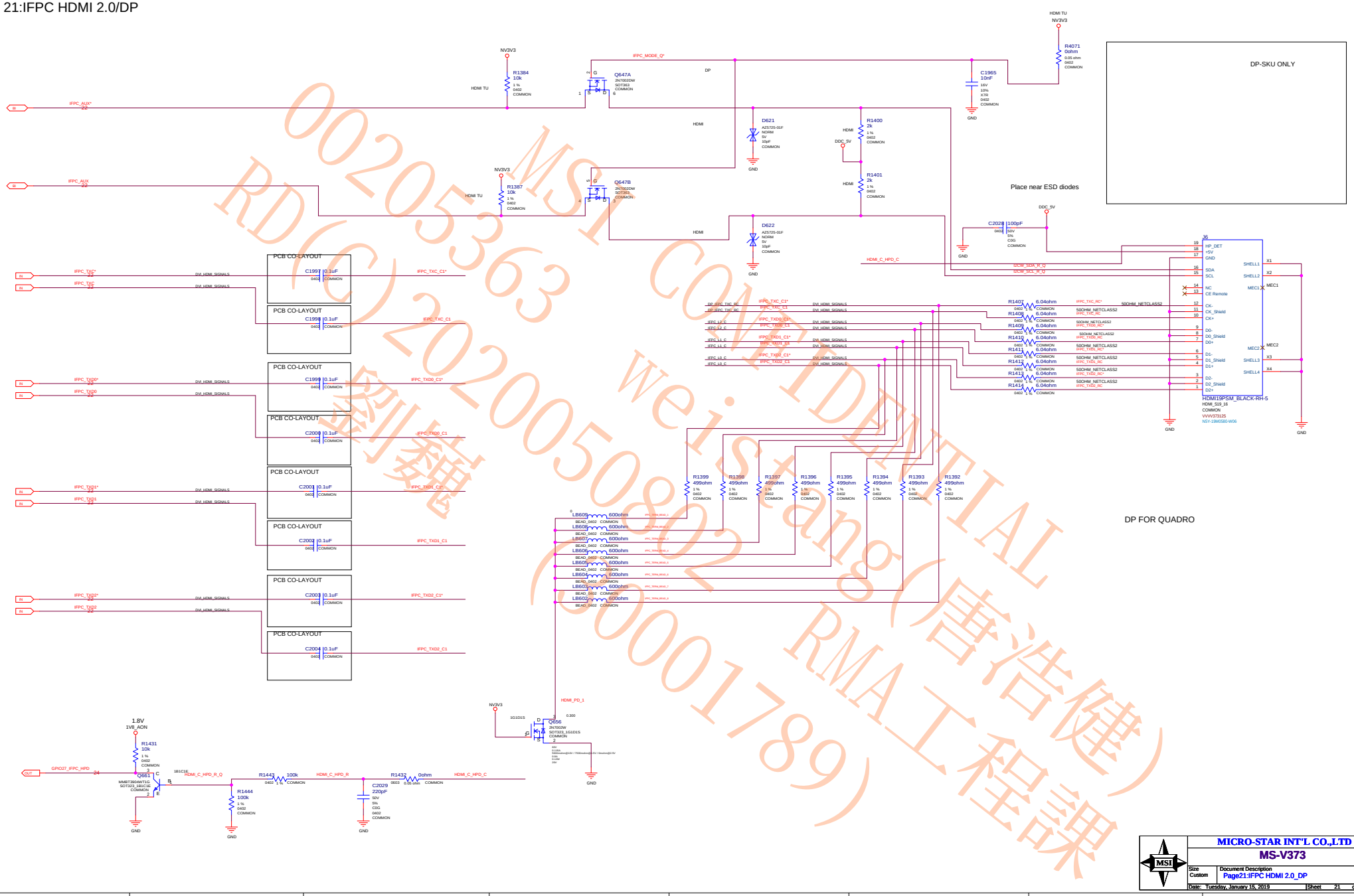
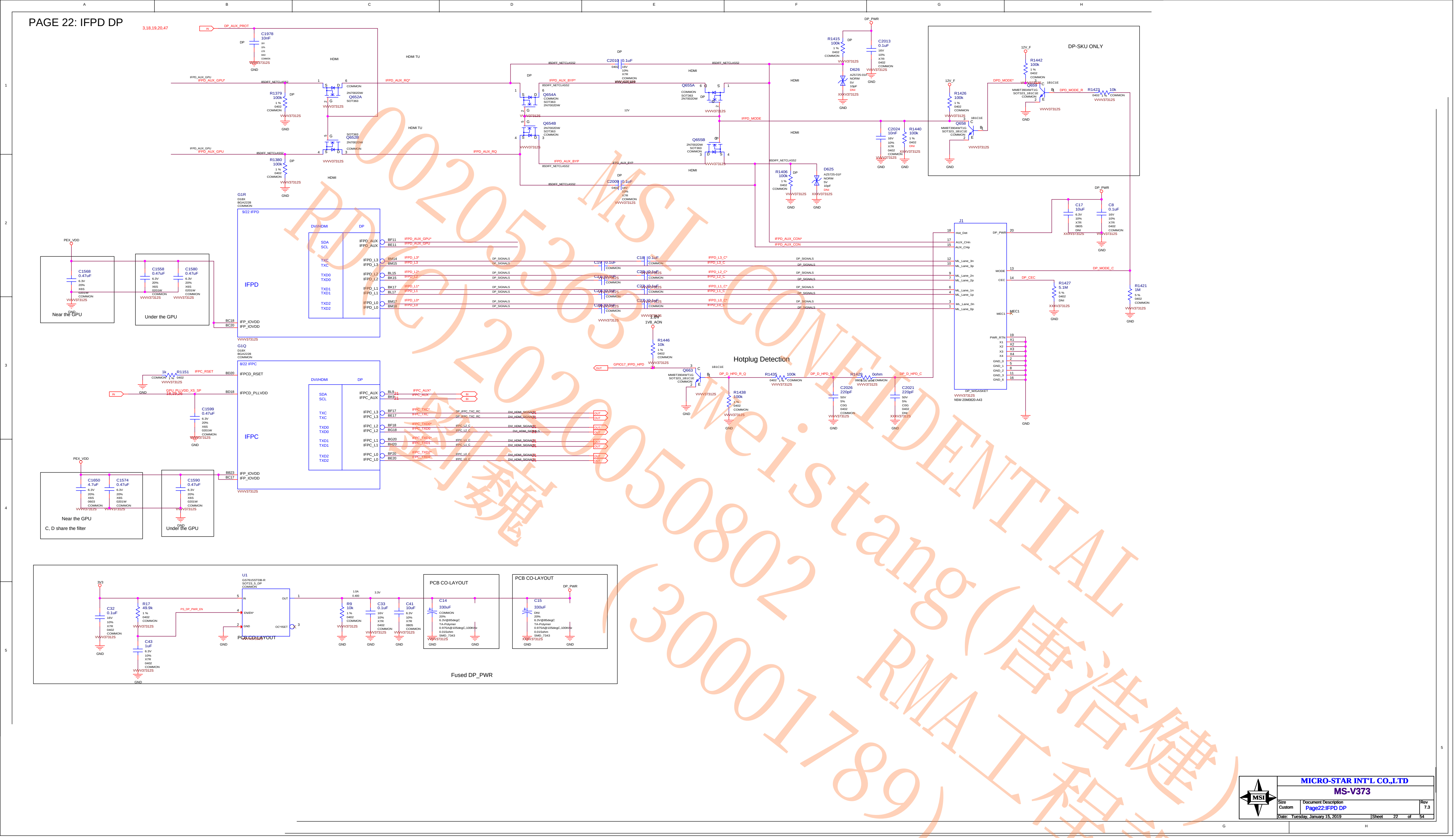
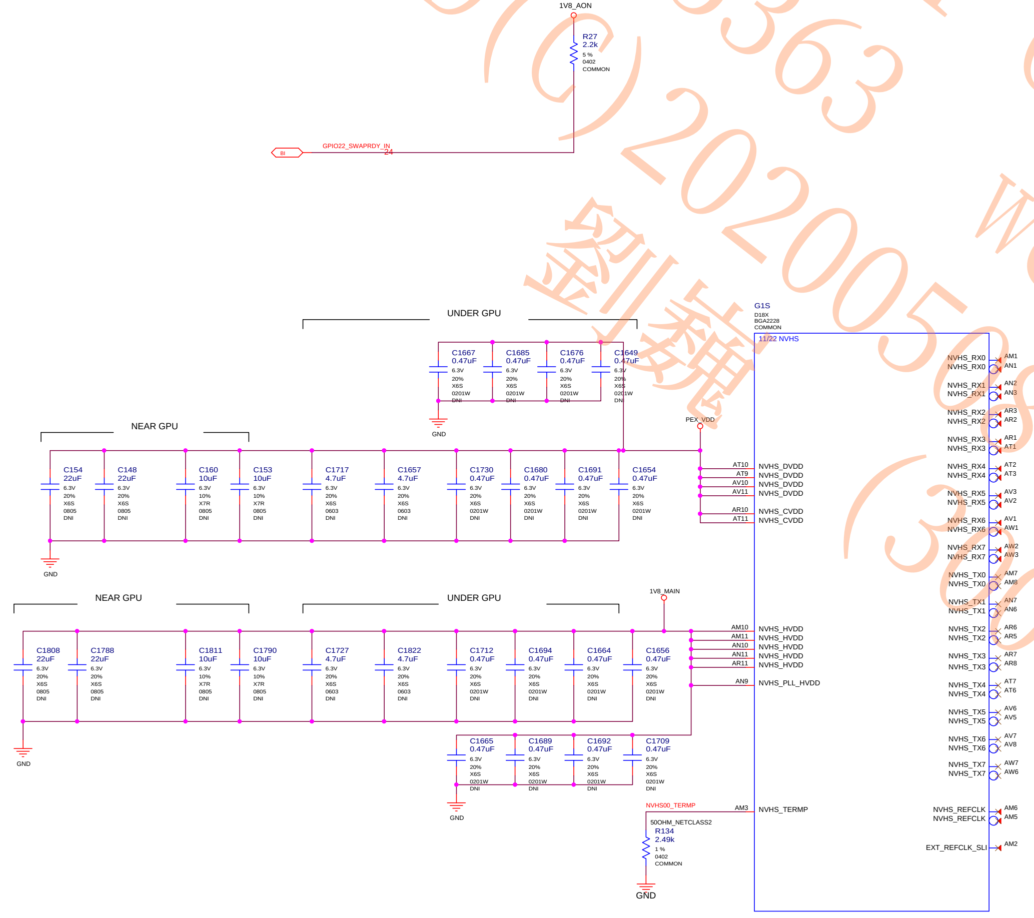
PAGE 21:IFPC HDMI 2.0/DP



PAGE 22: IFPD DP



PAGE 23: NVHS Interface



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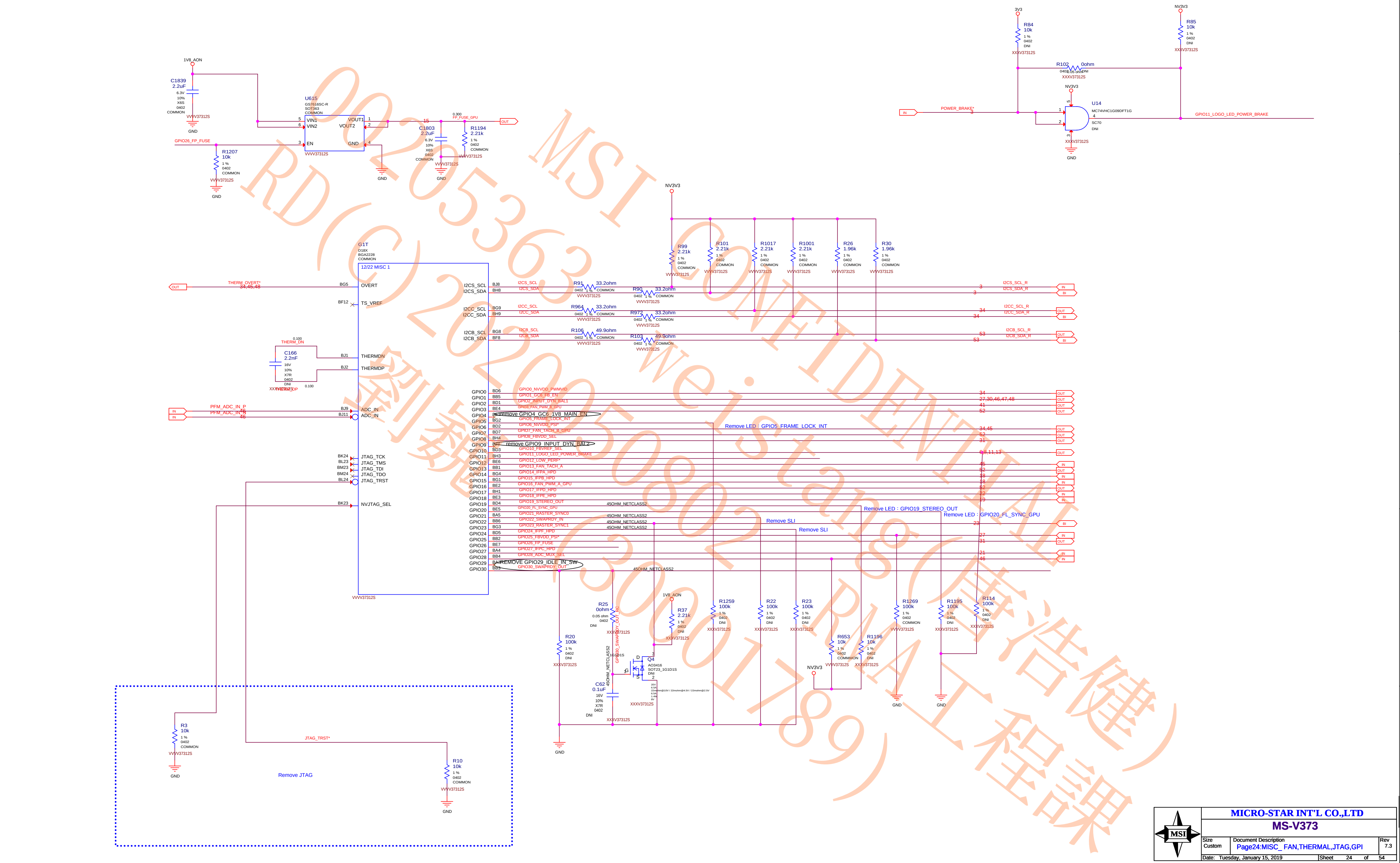
PAGE 24: MISC: Fan, Thermal, JTAG, GPIO, STEREO



1V8_AON
C1839
2.2uF
U615
VIN1
VIN2
EN
VOUT1
VOUT2
GND
GPIO26_FP_FUSE
R1207
10k
C1803
2.2uF
R1194
2.21k
FP_FUSE_GPU
R84
10k
R85
10k
R102
0ohm
U14
MC74VHC1G09DFT1G
POWER_BRAKE*
GPIO11_LOGO_LED_POWER_BRAKE
NV3V3
3V3
G1T
12/22 MISC 1
OVERT
TS_VREF
THERMDN
THERMDP
ADC_IN
JTAG_TCK
JTAG_TMS
JTAG_TDI
JTAG_TDO
JTAG_TRST
NVJTAG_SEL
I2CS_SCL
I2CS_SDA
I2CC_SCL
I2CC_SDA
I2CB_SCL
I2CB_SDA
THERM_OVERT*
THERM_DN
C166
2.2nF
PFM_ADC_IN_P
PFM_ADC_IN_N
R99
2.21k
R101
2.21k
R1017
2.21k
R1001
2.21k
R26
1.96k
R30
1.96k
R91
33.2ohm
R90
33.2ohm
R964
33.2ohm
R972
33.2ohm
R106
49.9ohm
R103
49.9ohm
GPIO0
GPIO1
GPIO2
GPIO3
GPIO4
GPIO5
GPIO6
GPIO7
GPIO8
GPIO9
GPIO10
GPIO11
GPIO12
GPIO13
GPIO14
GPIO15
GPIO16
GPIO17
GPIO18
GPIO19
GPIO20
GPIO21
GPIO22
GPIO23
GPIO24
GPIO25
GPIO26
GPIO27
GPIO28
GPIO29
GPIO30
remove GPIO4_GC6_1V8_MAIN_EN
remove GPIO9_INPUT_DYN_BAL2
REMOVE GPIO29_IDLE_IN_SW
Remove LED : GPIO5_FRAME_LOCK_INT
Remove LED : GPIO19_STEREO_OUT
Remove LED : GPIO20_FL_SYNC_GPU
Remove SLI
45OHM_NETCLASS2
R25
0ohm
R37
2.21k
R20
100k
C62
0.1uF
Q4
AO3416
R1259
100k
R22
100k
R23
100k
R653
10k
R1196
10k
R1269
100k
R1195
100k
R114
100k
R3
10k
R10
10k
JTAG_TRST*
Remove JTAG
GND

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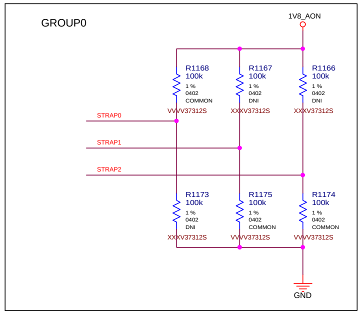
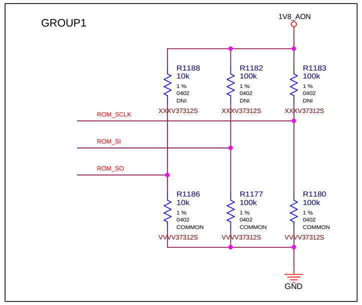
PAGE 25: MISC: ROM, Straps

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

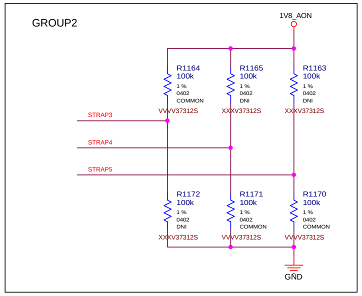
STRAP2	STRAP1	STRAP0	RAMCFG[4:0]		
L	L	L	00000	RAMCFG TBD	
L	L	H	00001	RAMCFG TBD	DEFAULT
L	H	L	00010	RAMCFG TBD	
L	H	H	00011	RAMCFG TBD	
H	H	L	00110	RAMCFG TBD	
H	H	H	00111	RAMCFG TBD	

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	Samsung
00111	16Gb	256-bit	Samsung





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	



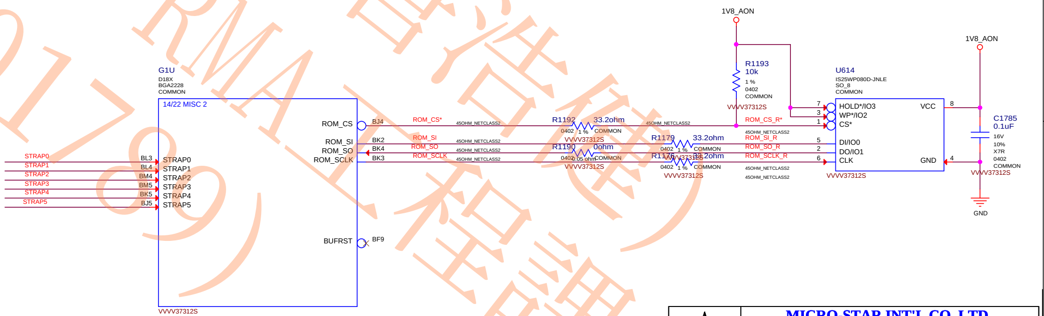
STRAP5	STRAP4	STRAP3	SMB_ALT_ADDR	DEVID_SEL	PCIE_CFG	VGA_DEVICE	
M	H	H	1	1	1	1	
M	H	L	1	1	1	0	
M	L	H	1	1	0	1	
M	L	L	1	1	0	0	
L	H	M	1	0	1	1	
L	M	H	1	0	1	0	
L	M	L	1	0	0	1	
L	L	M	1	0	0	0	
H	H	H	0	1	1	1	
H	H	L	0	1	1	0	
H	L	H	0	1	0	1	
H	L	L	0	1	0	0	
L	H	H	0	0	1	1	
L	H	L	0	0	1	0	
L	L	H	0	0	0	1	Default
L	L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



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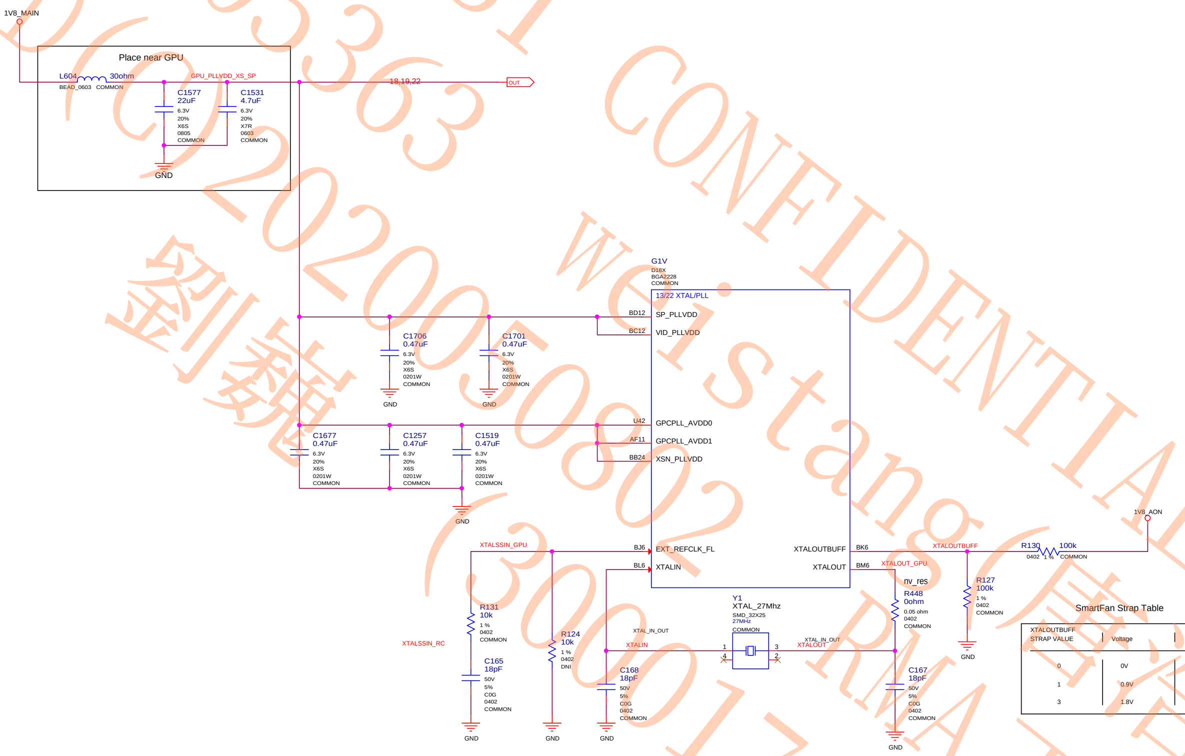
PAGE 26: MISC: XTAL. PLL



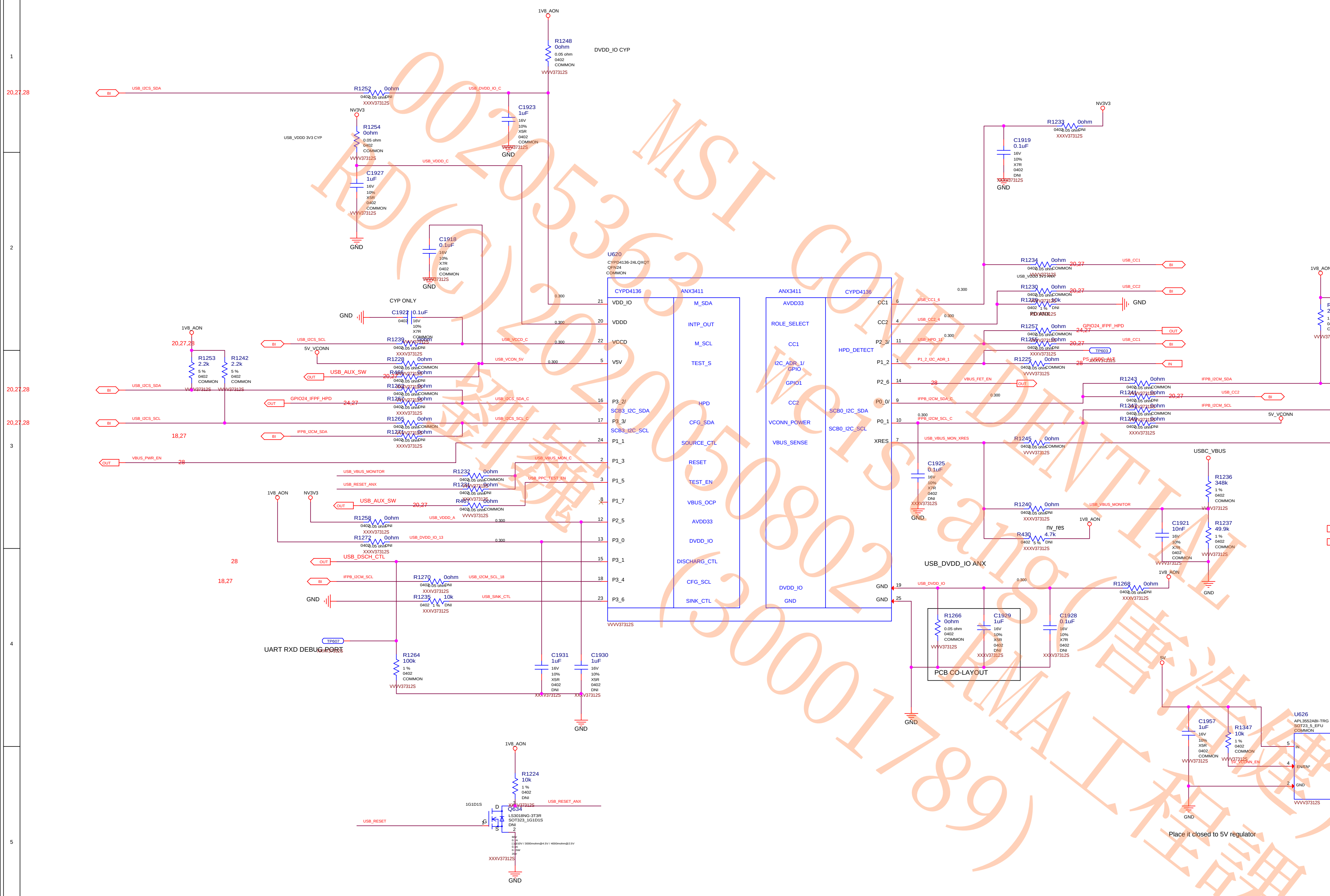
1V8_MAIN
Place near GPU
L604 30ohm
BEAD_0603 COMMON
GPU_PLLVDD_XS_SP
18,19,22
OUT
C1577 22uF 6.3V 20% X6S 0805 COMMON
C1531 4.7uF 6.3V 20% X7R 0603 COMMON
GND
G1V
D16X
BGA2228
COMMON
13/22 XTAL/PLL
BD12 SP_PLLVDD
BC12 VID_PLLVDD
C1706 0.47uF 6.3V 20% X6S 0201W COMMON
C1701 0.47uF 6.3V 20% X6S 0201W COMMON
U42 GPCPLL_AVDD0
AF11 GPCPLL_AVDD1
BB24 XSN_PLLVDD
C1677 0.47uF 6.3V 20% X6S 0201W COMMON
C1257 0.47uF 6.3V 20% X6S 0201W COMMON
C1519 0.47uF 6.3V 20% X6S 0201W COMMON
XTALSSIN_GPU
BJ6 EXT_REFCLK_FL
BL6 XTALIN
XTALOUTBUFF BK6
XTALOUT BM6
XTALOUTBUFF
XTALOUT_GPU
1V8_AON
R130 100k 0402 1 % COMMON
R127 100k 1 % 0402 COMMON
nv_res
R448 0ohm 0.05 ohm 0402 COMMON
R131 10k 1 % 0402 COMMON
R124 10k 1 % 0402 DNI
XTALSSIN_RC
C165 18pF 50V 5% C0G 0402 COMMON
Y1 XTAL_27Mhz SMD_32X25 27MHz COMMON
XTAL_IN_OUT
XTALIN
XTALOUT
C168 18pF 50V 5% C0G 0402 COMMON
C167 18pF 50V 5% C0G 0402 COMMON
GND

SmartFan Strap Table

XTALOUTBUFF STRAP VALUE	Voltage	Inverted SmartFan PWM %
0	0V	GPIO DISABLED
1	0.9V	33% PWM
3	1.8V	66% PWM

PAGE 27: MISC: USB PPC

PIN	ANX	CYP
1	TP	TP
2	RESET	VBUS_MON
3	NC	NC
4	ROLE_SEL (PD)	CC2
5	NC	VCON_5V
6	VDDD (3.3V)	CC1
7	VBUS_MON	RESET
8	NC	NC
9	CC2	I2CM_SDA
10	VCON_5V	I2CM_SCL
11	CC1	HPD
12	VDDD (3.3V)	NC
13	DVDD_IO (1.8V)	NC
14	VBUS_FET_EN	VBUS_FET_EN
15	DSCH_CTL	DSCH_CTL
16	HPD	I2CS_SDA
17	I2CM_SDA	I2CS_SCL
18	I2CM_SCL	NC
19	DVDD_IO (1.8V)	GND
20	NC	VDDD (3.3V)
21	I2CS_SDA	DVDD_IO (1.8V)
22	I2CS_SCL	VCCD (100nF)
23	SINK_CLT (PD)	NC
24	PWR_EN	PWR_EN



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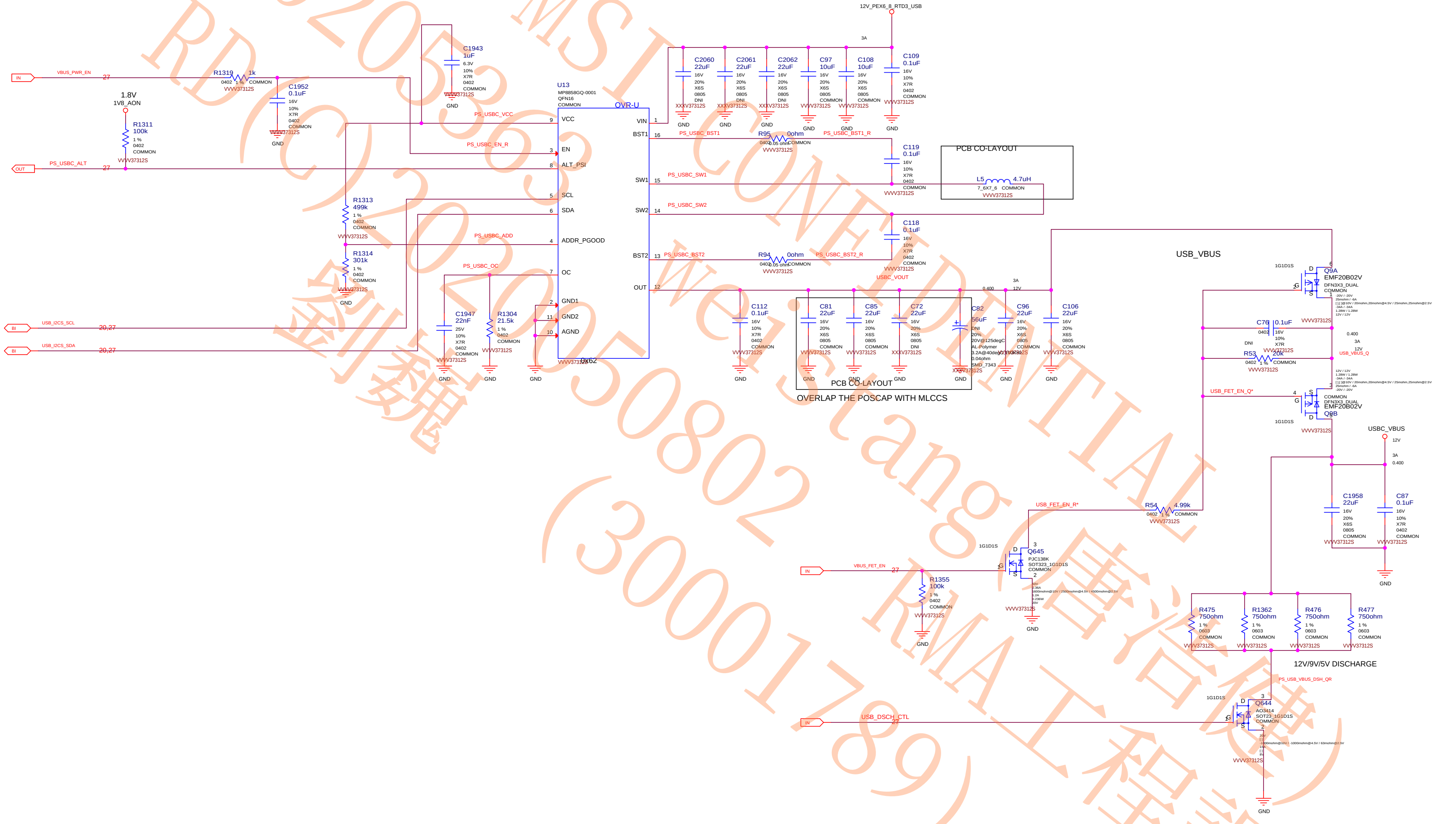
PAGE 28: PS: USB VR



12V_PEX6_8_RTD3_USB
VBUS_PWR_EN
R1319 1k
C1943 1uF
C1952 0.1uF
1.8V
1V8_AON
R1311 100k
PS_USBC_ALT
U13
MP8858GQ-0001
QFN16
OVR-U
VCC
EN
ALT_PSI
SCL
SDA
ADDR_PGOOD
OC
GND1
GND2
AGND
VIN
BST1
SW1
SW2
BST2
OUT
PS_USBC_VCC
PS_USBC_EN_R
PS_USBC_ADD
PS_USBC_OC
PS_USBC_BST1
PS_USBC_SW1
PS_USBC_SW2
PS_USBC_BST2
PS_USBC_BST1_R
PS_USBC_BST2_R
USBC_VOUT
R1313 499k
R1314 301k
C1947 22nF
R1304 21.5k
USB_I2CS_SCL
USB_I2CS_SDA
C2060 22uF
C2061 22uF
C2062 22uF
C97 10uF
C108 10uF
C109 0.1uF
R95 0ohm
C119 0.1uF
PCB CO-LAYOUT
L5 4.7uH
C118 0.1uF
R94 0ohm
C112 0.1uF
C81 22uF
C85 22uF
C72 22uF
C82 56uF
C96 22uF
C106 22uF
PCB CO-LAYOUT
OVERLAP THE POSCAP WITH MLCCS
USB_VBUS
Q9A
EMF20B02V
C76 0.1uF
R53 20K
USB_VBUS_Q
USB_FET_EN_Q*
Q9B
USBC_VBUS
C1958 22uF
C87 0.1uF
USB_FET_EN_R*
R54 4.99k
VBUS_FET_EN
R1355 100k
Q645
PJC138K
R475 750ohm
R1362 750ohm
R476 750ohm
R477 750ohm
12V/9V/5V DISCHARGE
PS_USB_VBUS_DSH_QR
USB_DSCH_CTL
Q644
AO3414
GND

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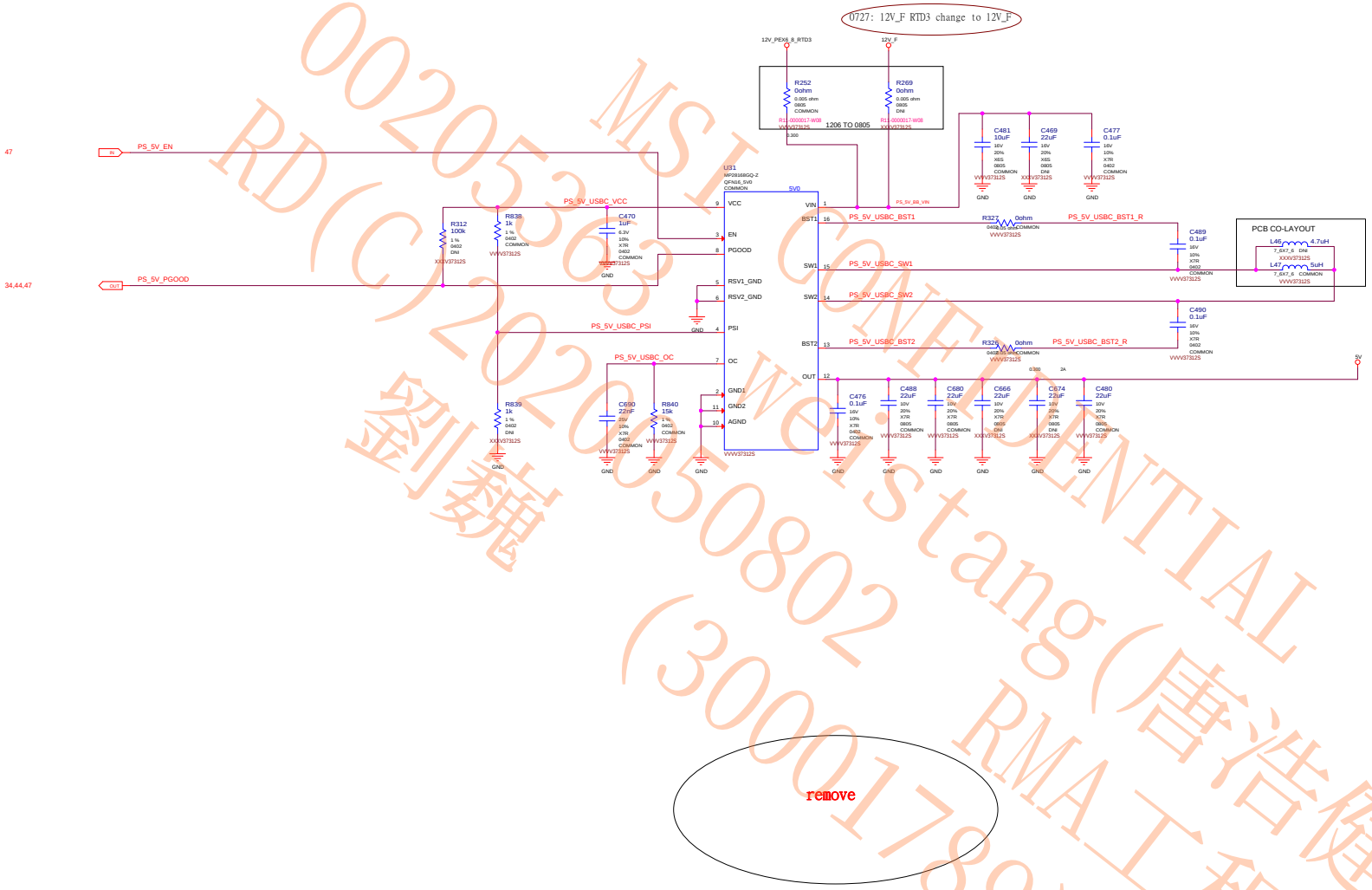
PAGE 29: PS: 5V, 5V_BACKUP



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Size: Custom	Document Description: Page29:PS_ 5V, 5V BACKUP	Rev: 7.3
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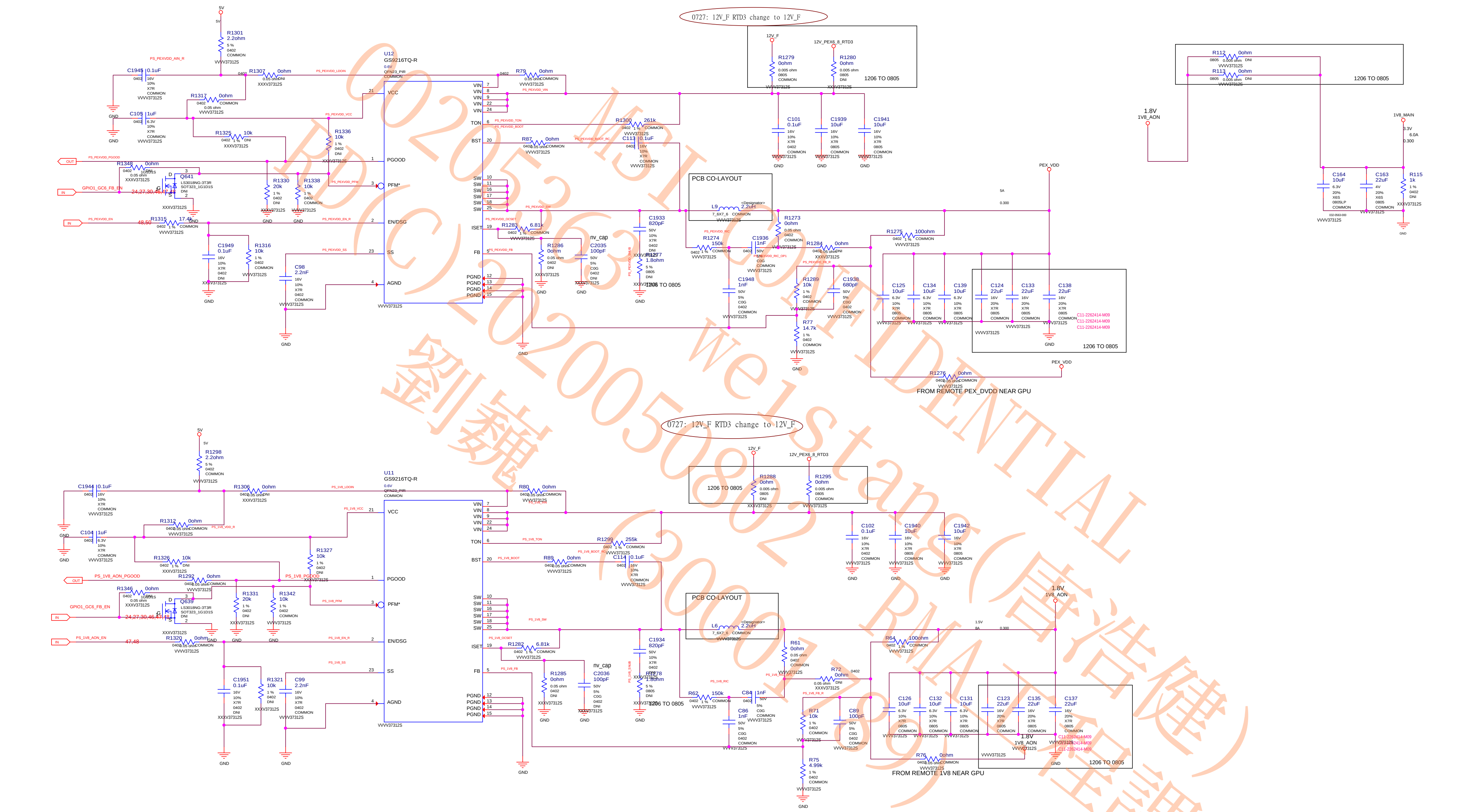
PAGE 30: PS: PEXVDD, 1V8



0727: 12V_F RTD3 change to 12V_F
U12
GS9216TQ-R
QFN23_PIR
VCC
PGOOD
PFM*
EN/DSG
SS
AGND
VIN
TON
BST
SW
ISET
FB
PGND
PCB CO-LAYOUT
L9
2.2uH
R1301
2.2ohm
5V
R1307
0ohm
R79
0ohm
R1317
0ohm
R1325
10k
R1336
10k
R1348
0ohm
Q641
LS3018NG-3T3R
SOT323_1G1D1S
R1330
20k
R1338
10k
R1315
17.4k
C1949
0.1uF
R1316
10k
C98
2.2nF
C1945
0.1uF
C105
1uF
R1300
261k
R87
0ohm
C113
0.1uF
R1283
6.81k
R1286
0ohm
C2035
100pF
nv_cap
C1933
820pF
R1277
1.8ohm
1206 TO 0805
12V_F
12V_PEX6_8_RTD3
R1279
0ohm
R1280
0ohm
C101
0.1uF
C1939
10uF
C1941
10uF
R1273
0ohm
R1274
150k
C1936
1nF
R1284
0ohm
R1275
100ohm
C1948
1nF
R1289
10k
C1938
680pF
R77
14.7k
C125
10uF
C134
10uF
C139
10uF
C124
22uF
C133
22uF
C138
22uF
PEX_VDD
R1276
0ohm
FROM REMOTE PEX_DVDD NEAR GPU
1.8V
1V8_AON
1V8_MAIN
R112
0ohm
R113
0ohm
C164
10uF
C163
22uF
R115
1k
GPIO1_GC6_FB_EN
0727: 12V_F RTD3 change to 12V_F
U11
GS9216TQ-R
R1298
2.2ohm
C1944
0.1uF
C104
1uF
R1306
0ohm
R80
0ohm
R1312
0ohm
R1326
10k
R1327
10k
R1292
0ohm
PS_1V8_AON_PGOOD
R1346
0ohm
Q639
R1331
20k
R1342
10k
R1320
0ohm
PS_1V8_AON_EN
C1951
0.1uF
R1321
10k
C99
2.2nF
R1299
255k
R89
0ohm
C114
0.1uF
R1282
6.81k
R1285
0ohm
C2036
100pF
C1934
820pF
R1278
1.8ohm
L6
2.2uH
R1288
0ohm
R1295
0ohm
C102
0.1uF
C1940
10uF
C1942
10uF
R61
0ohm
R64
100ohm
R72
0ohm
R62
150k
C84
1nF
C86
1nF
R71
10k
C89
100pF
R75
4.99k
C126
10uF
C132
10uF
C131
10uF
C123
22uF
C135
22uF
C137
22uF
R76
0ohm
FROM REMOTE 1V8 NEAR GPU

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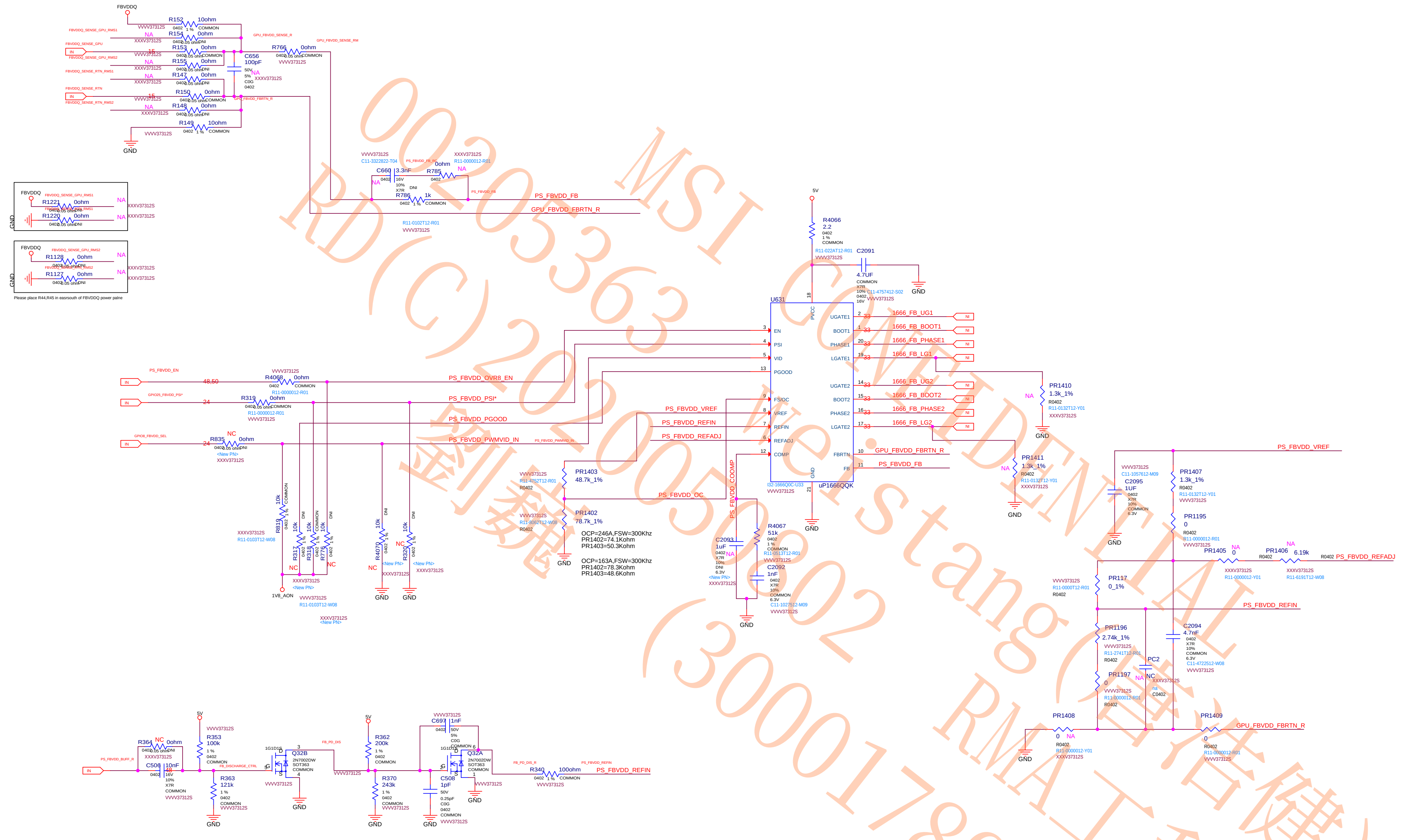
PAGE 31: PS: FBVDD Controller



FBVDDQ
GND
5V
Please place R44,R45 in east/south of FBVDDQ power paine
U631
uP1666QQK
EN
PSI
VID
PGOOD
FS/OC
VREF
REFIN
REFADJ
COMP
PVCC
UGATE1
BOOT1
PHASE1
LGATE1
UGATE2
BOOT2
PHASE2
LGATE2
FBRTN
FB
PS_FBVDD_FB
GPU_FBVDD_FBRTN_R
PS_FBVDD_OVR8_EN
PS_FBVDD_PSI*
PS_FBVDD_PGOOD
PS_FBVDD_PWMVID_IN
PS_FBVDD_VREF
PS_FBVDD_REFIN
PS_FBVDD_REFADJ
PS_FBVDD_OC
PS_FBVDD_COOMP
1666_FB_UG1
1666_FB_BOOT1
1666_FB_PHASE1
1666_FB_LG1
1666_FB_UG2
1666_FB_BOOT2
1666_FB_PHASE2
1666_FB_LG2
OCP=246A,FSW=300Khz
PR1402=74.1Kohm
PR1403=50.3Kohm
OCP=163A,FSW=300Khz
PR1402=78.3Kohm
PR1403=48.6Kohm
Q32B
Q32A
2N7002DW
SOT363
1V8_AON

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PAGE 32: PS: FBVDD Controller OVR3

MSI	MICRO-STAR INT'L CO.,LTD
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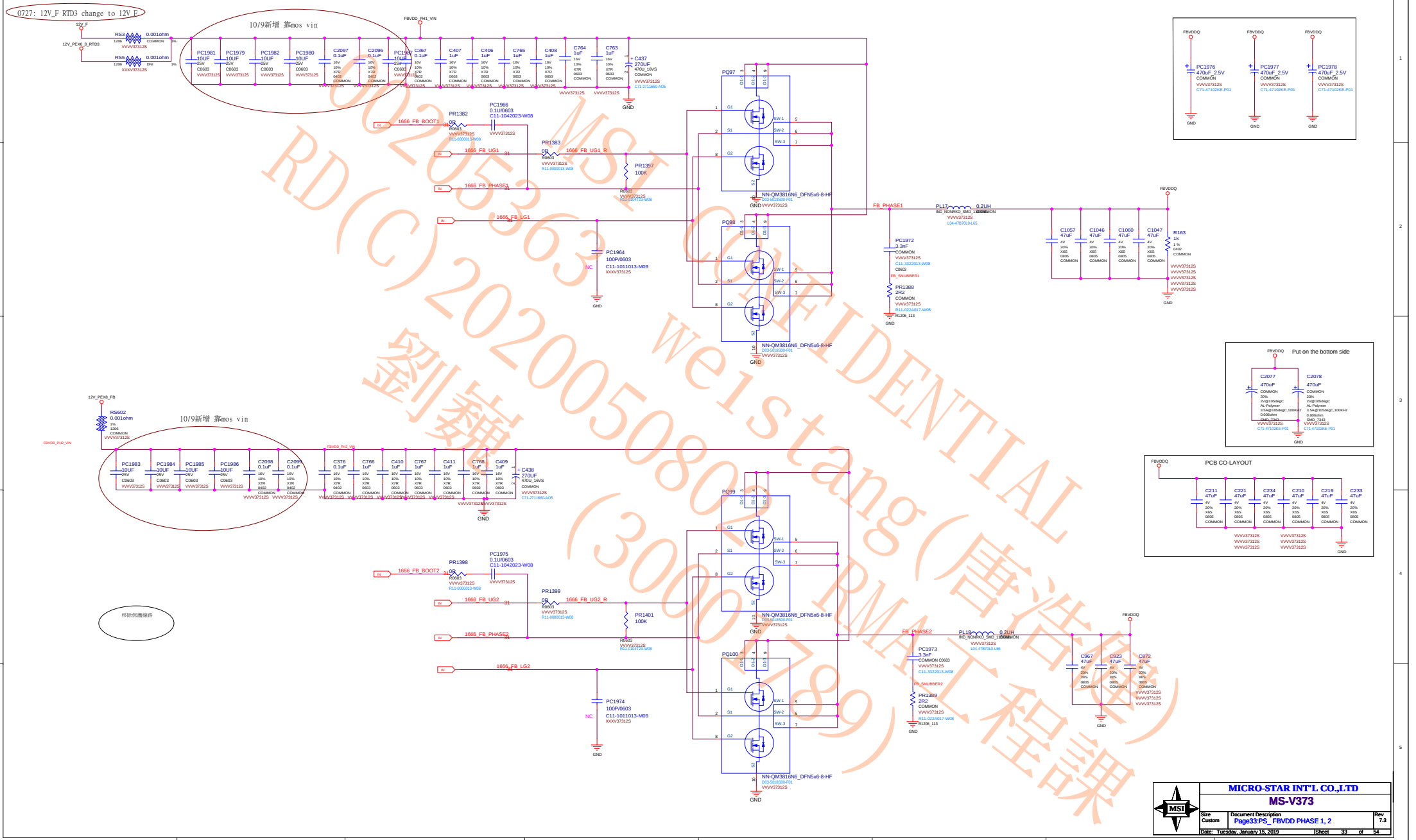
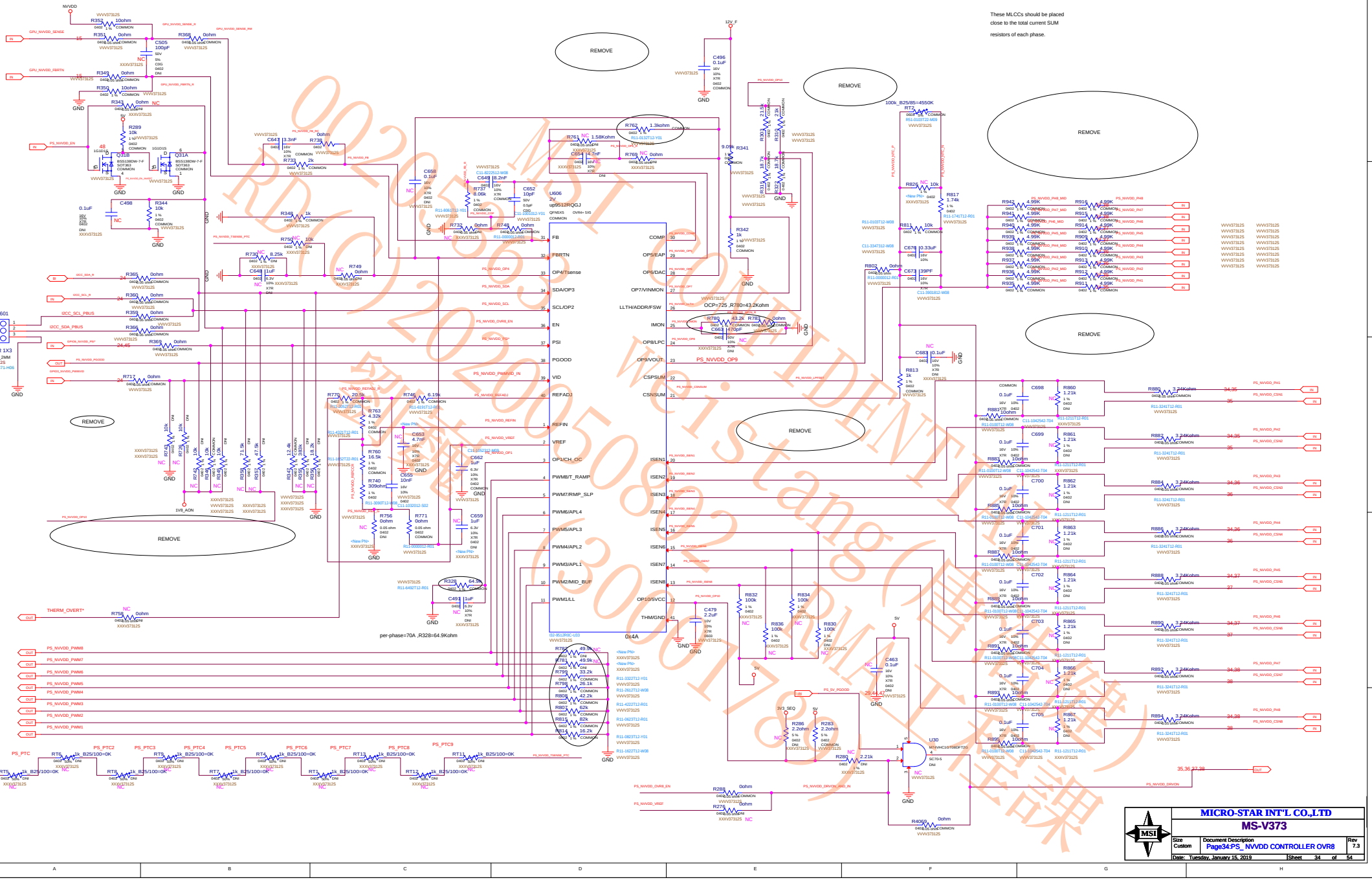
PAGE 33: PS: FBVDD Phase 1, 2




These MLCCs should be placed close to the total current SUM
resistors of each phase.
REMOVE
U606
uP9512RQGJ
FB
FBRTN
OP4/Tsense
SDA/OP3
SCL/OP2
EN
PSI
PGOOD
VID
REFADJ
REFIN
VREF
OP1/CH_OC
PWM8/T_RAMP
PWM7/RMP_SLP
PWM6/APL4
PWM5/APL3
PWM4/APL2
PWM3/APL1
PWM2/MID_BUF
PWM1/LL
COMP
OP5/EAP
OP6/DAC
OP7/VINMON
LLTH/ADDR/FSW
IMON
OP8/LPC
OP9/VOUT
CSPSUM
CSNSUM
ISEN1
ISEN2
ISEN3
ISEN4
ISEN5
ISEN6
ISEN7
ISEN8
OP10/5VCC
THM/GND
0x4A
per-phase=70A _R328=64.9Kohm
OCP=725_R780=43.2Kohm
HEADER 1X3
J601
PS_NVVDD_PWM1
PS_NVVDD_PWM2
PS_NVVDD_PWM3
PS_NVVDD_PWM4
PS_NVVDD_PWM5
PS_NVVDD_PWM6
PS_NVVDD_PWM7
PS_NVVDD_PWM8
PS_PTC
PS_PTC2
PS_PTC3
PS_PTC4
PS_PTC5
PS_PTC6
PS_PTC7
PS_PTC8
PS_PTC9
THERM_OVERT*
PS_NVVDD_DRVON
MICRO-STAR INT'L CO.,LTD
MS-V373
Size Custom
Document Description
Page34:PS_NVVDD CONTROLLER OVR8
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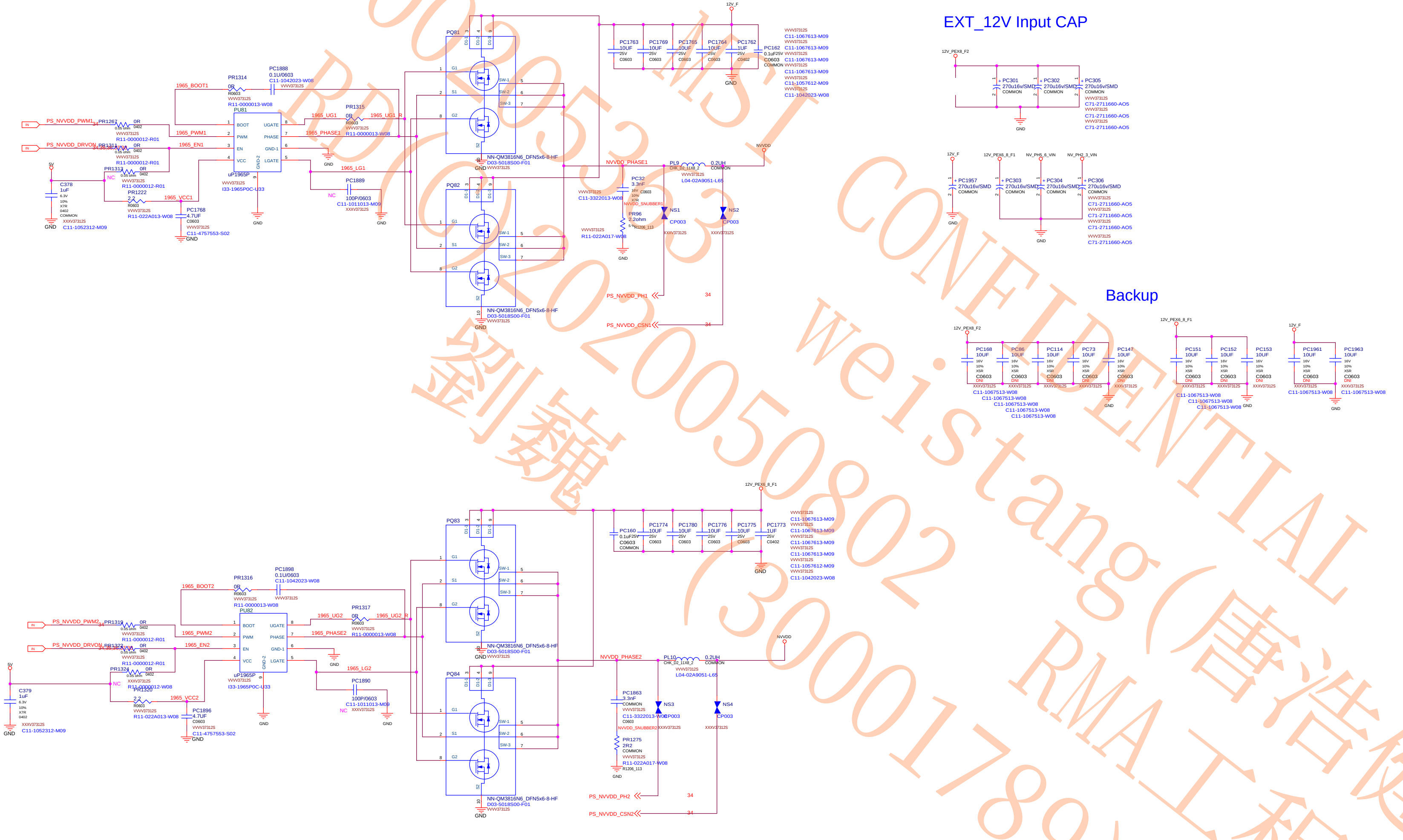
PAGE 35: PS: NVVDD Phase 1, 2



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Size: D

Document Description: Page35:PS_ NVVDD Phase 1, 2

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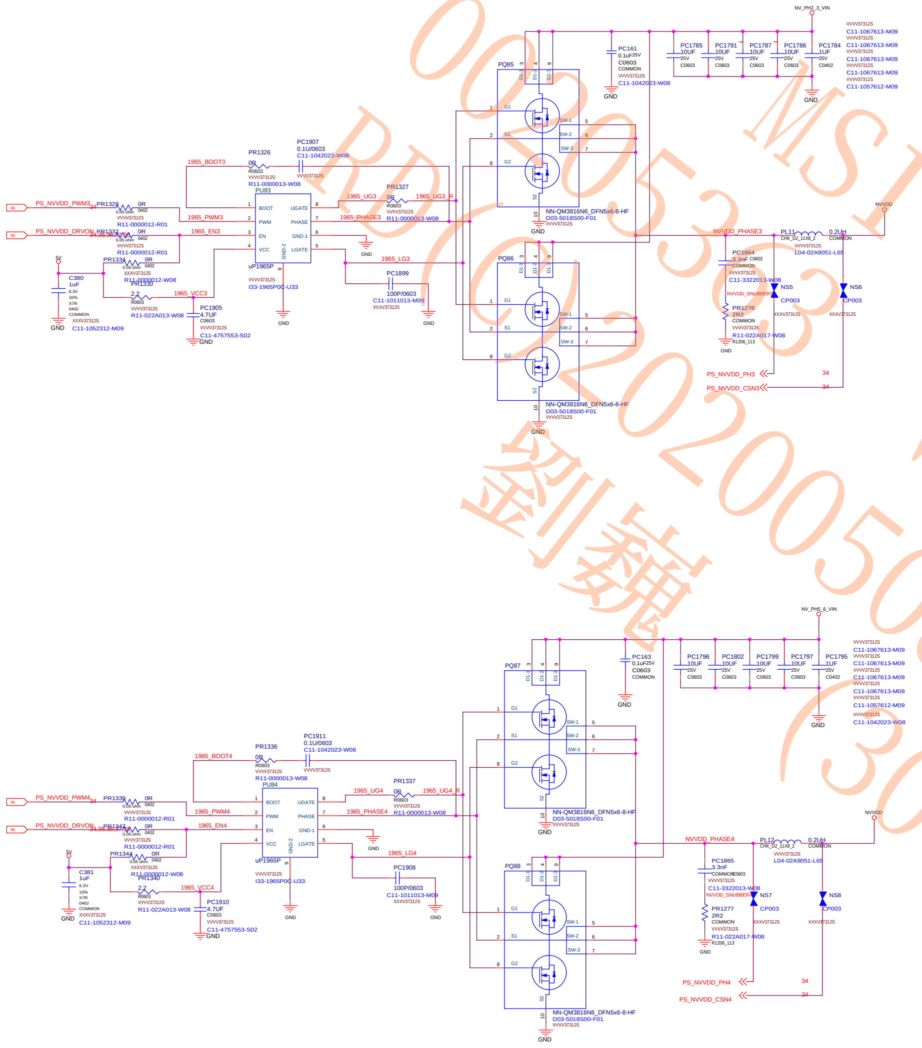
PAGE 36: PS: NVVDD Phase 3, 4



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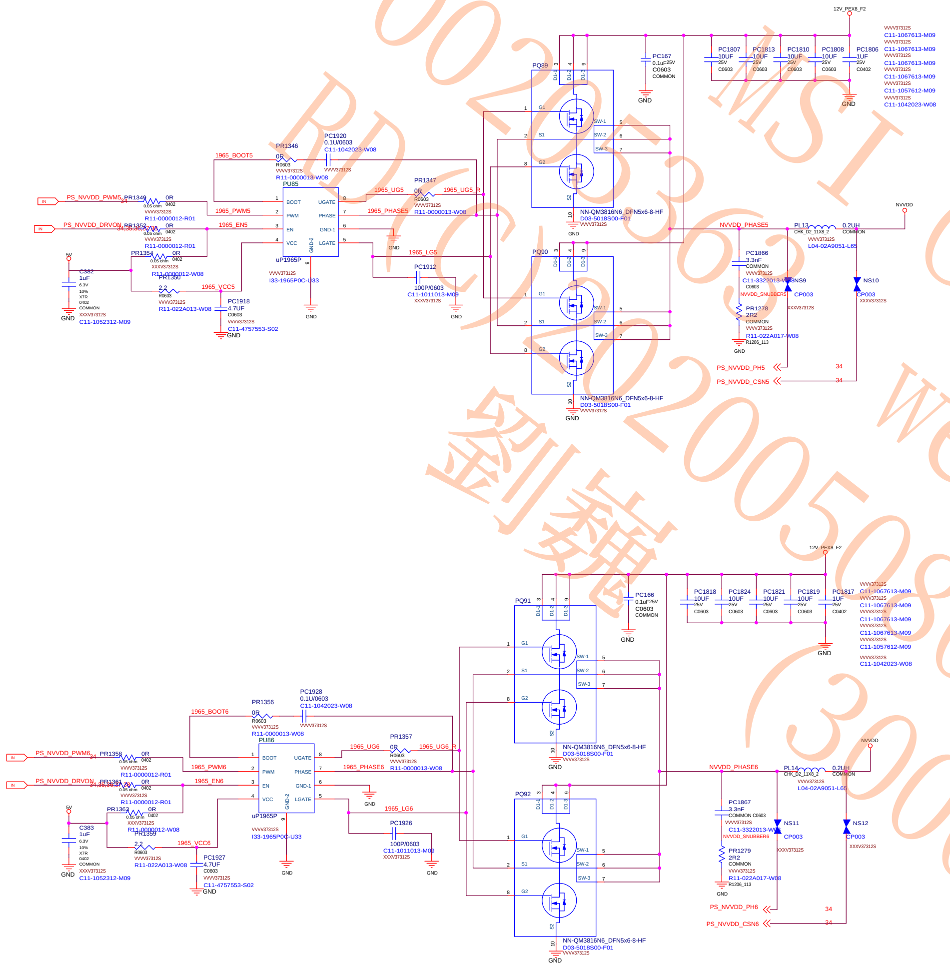
PAGE 37: PS: NVVDD Phase 5, 6



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Size: D	Document Description: Page37:PS_ NVVDD Phase 5, 6	Rev: 7.3
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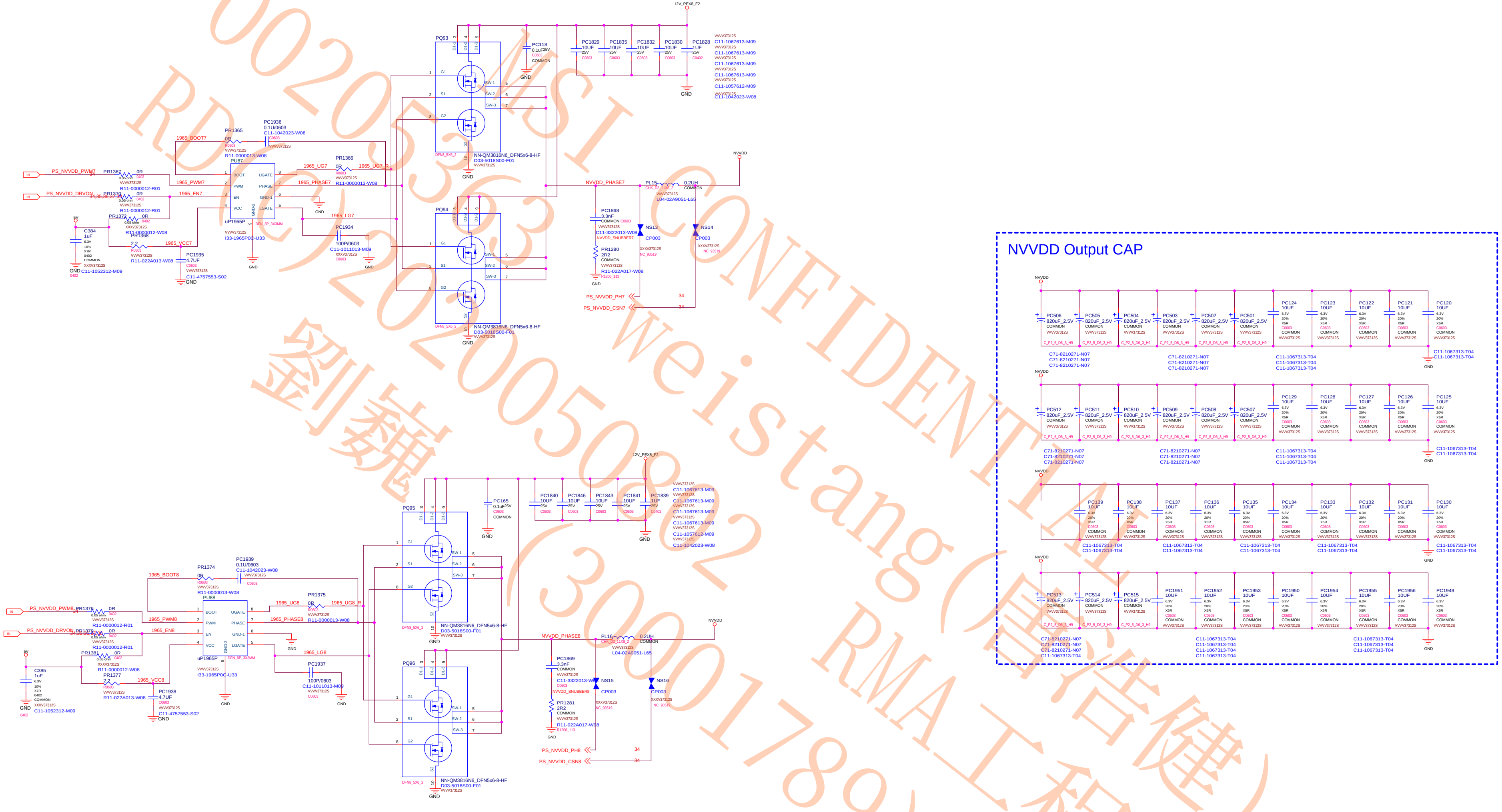

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D	Page38:PS_ NVVDD Phase 7, 8	7.3

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PAGE 39: PS: INPUT SWITCH RTD3

AND GATE LOGIC FOR P-BOARD

GPIO1	GPIO29	SWITCH	VOUT
0	0	0	12V_F
0	1	0	12V_F
1	0	0	12V_F
1	1	1	3V3A

AND GATE LOGIC FOR P-BOARD

GPIO1	GPIO29	SWITCH	VOUT
0	0	0	3V3
0	1	0	3V3
1	0	0	3V3
1	1	1	3V3A

0727: remove

MSI	MICRO-STAR INT'L CO.,LTD MS-V373	
Size: Custom	Document Description: Page39:PS_ INPUT SWITCH RTD3	Rev: 7.3
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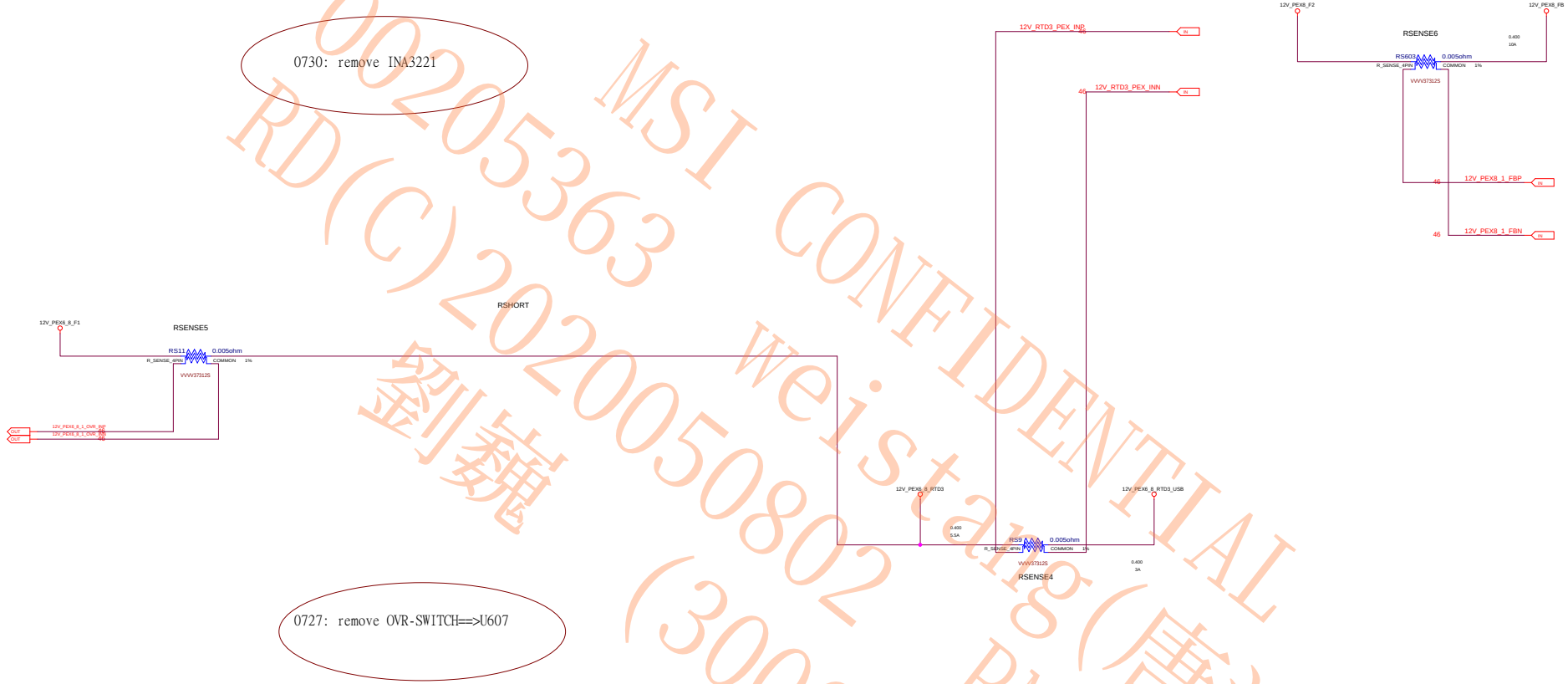
PAGE 40: PS: INPUT SWITCH RTD3 USB

0730: remove INA3221

0727: remove OVR-SWITCH==>U607



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Size	Document Description	Rev
Custom	Page40:PS_ INPUT SWITCH RTD3 USB	7.3

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PAGE 41: PS: INPUT SWITCH Rail Balance

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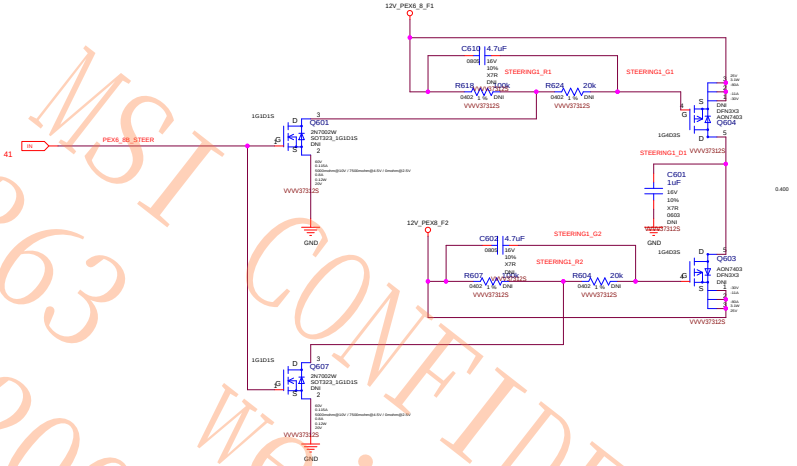
PAGE 42: PS: 12V CURRENT STEERING

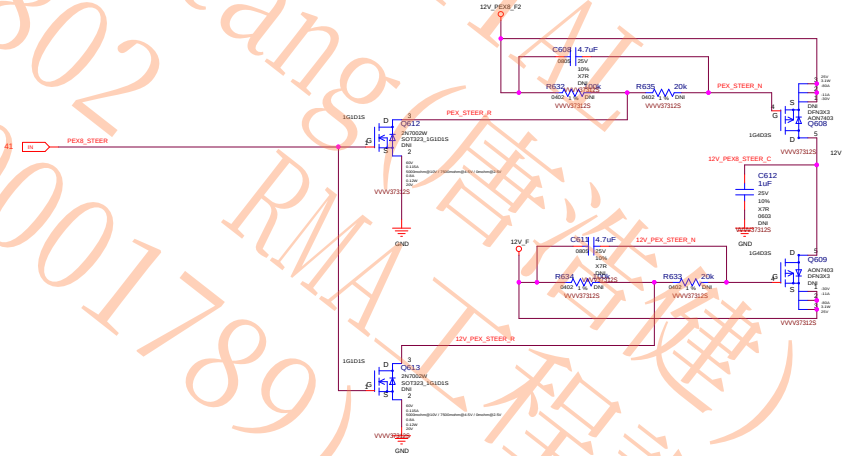
12V CURRENT STEERING (UNDER POWER BOOT):

GUIDES CURRENT FROM PEX EDGE TO PEX 6/8 PIN INPUT AREA



12V CURRENT STEERING (UNDER POWER BOOT):

GUIDES CURRENT FROM PEX EDGE TO PEX 8 PIN INPUT AREA



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Size: Custom	Document Description: Page42:PS_12V CURRENT STEERING		Rev: 7.3
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PAGE 43: PS: VR THERMAL PROTECTION

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Size: Custom	Document Description: Page43:PS_ VR THERMAL PROTECTION	Rev: 7.3
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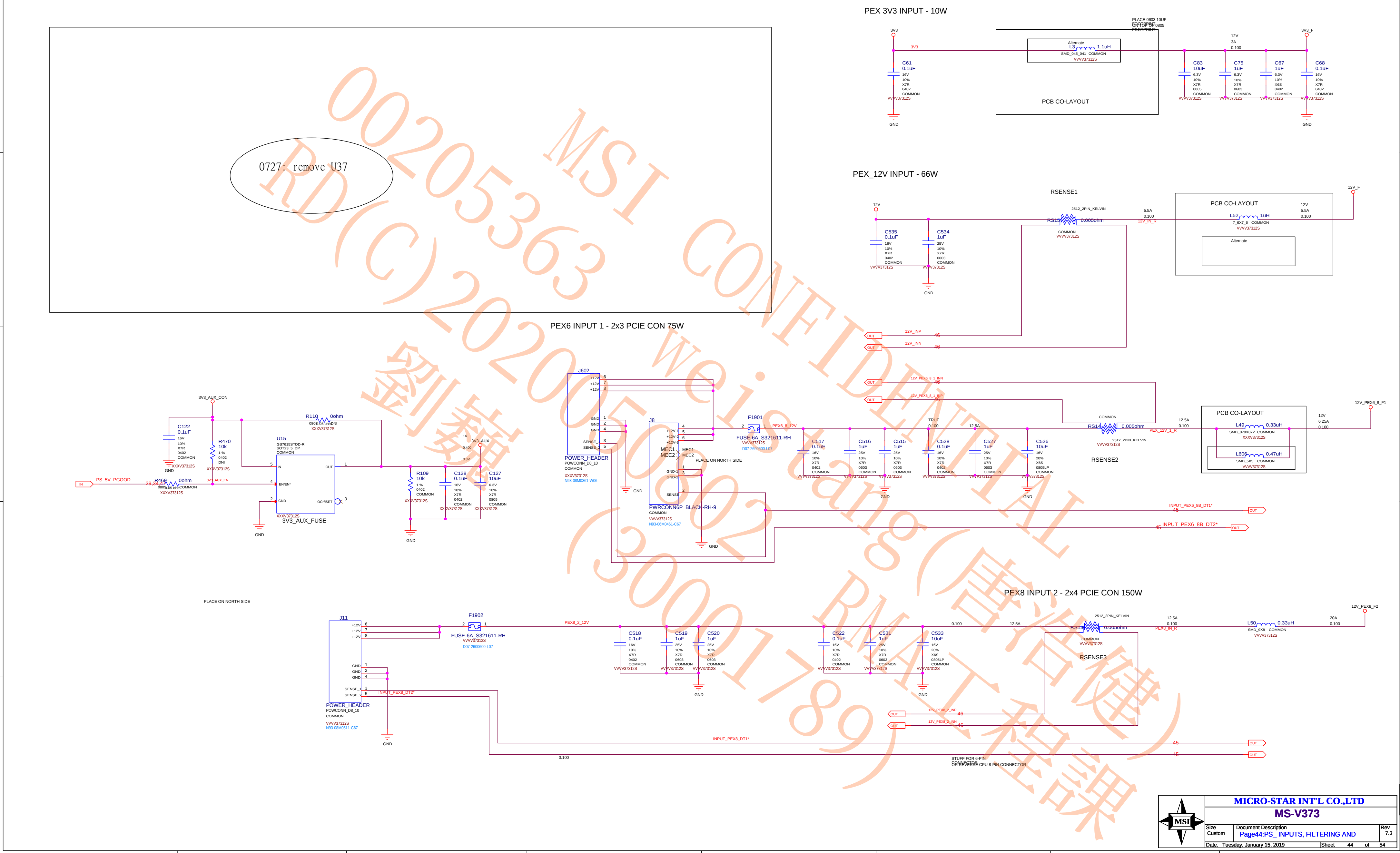
PAGE 44: PS: Inputs, Filtering, and Monitoring



PEX 3V3 INPUT - 10W
PCB CO-LAYOUT
PEX_12V INPUT - 66W
RSENSE1
0727: remove U37
PEX6 INPUT 1 - 2x3 PCIE CON 75W
POWER_HEADER
PWRCONN6P_BLACK-RH-9
PLACE ON NORTH SIDE
FUSE-6A_S321611-RH
RSENSE2
3V3_AUX_FUSE
PS_5V_PGOOD
PEX8 INPUT 2 - 2x4 PCIE CON 150W
RSENSE3
INPUT_PEX6_8B_DT1*
INPUT_PEX6_8B_DT2*
INPUT_PEX8_DT1*
INPUT_PEX8_DT2*
STUFF FOR 6-PIN CONNECTOR
OR REVERSE CPU 8-PIN CONNECTOR
MICRO-STAR INT'L CO.,LTD
MS-V373
Size Custom
Document Description Page44:PS_ INPUTS, FILTERING AND
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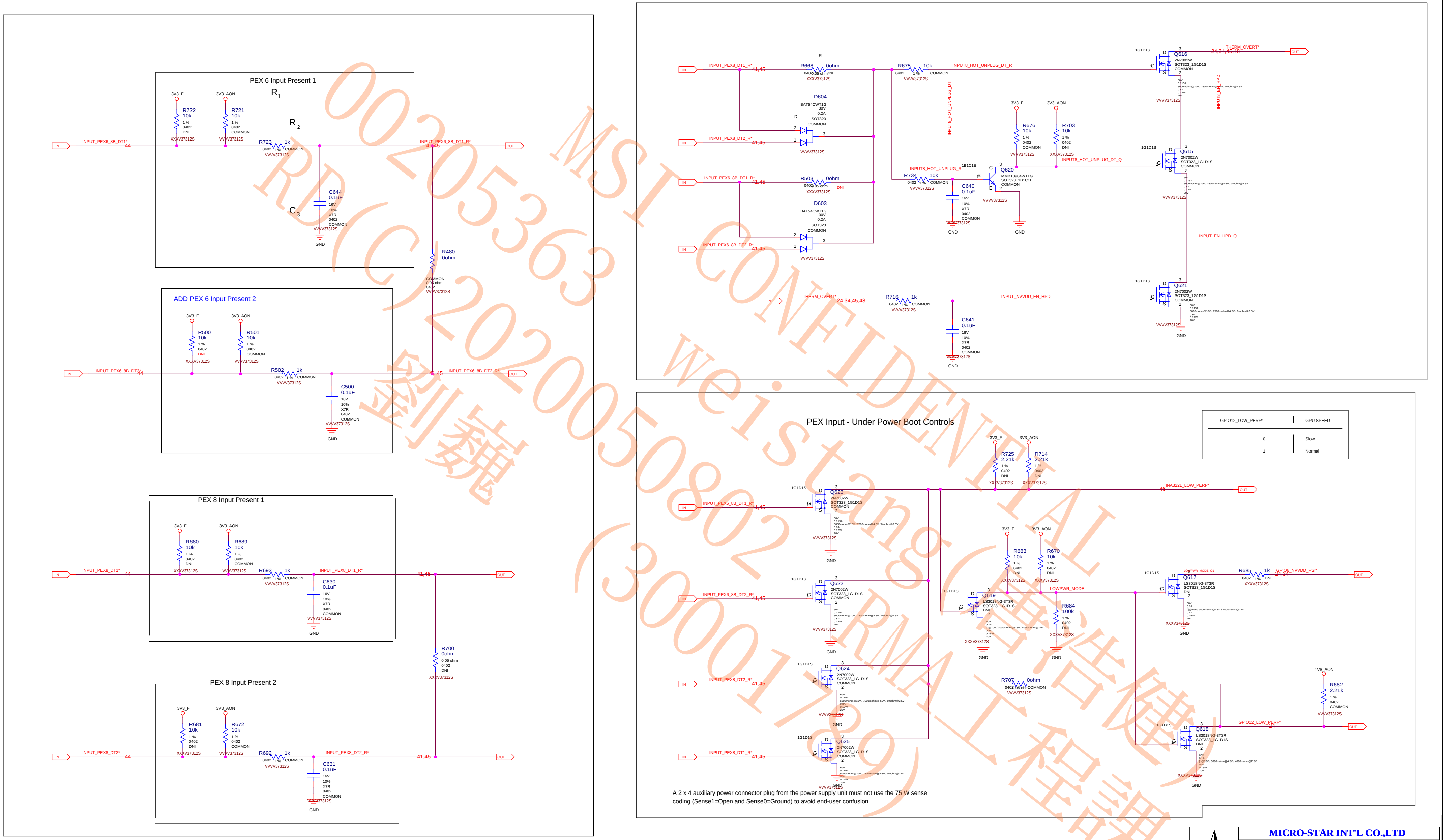
PAGE 45: PS: Current Steering, Hot Unplug Detect



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Size: Custom	Document Description: Page45:PS_ CURRENT STEERING,HOT U — Rev 7.3
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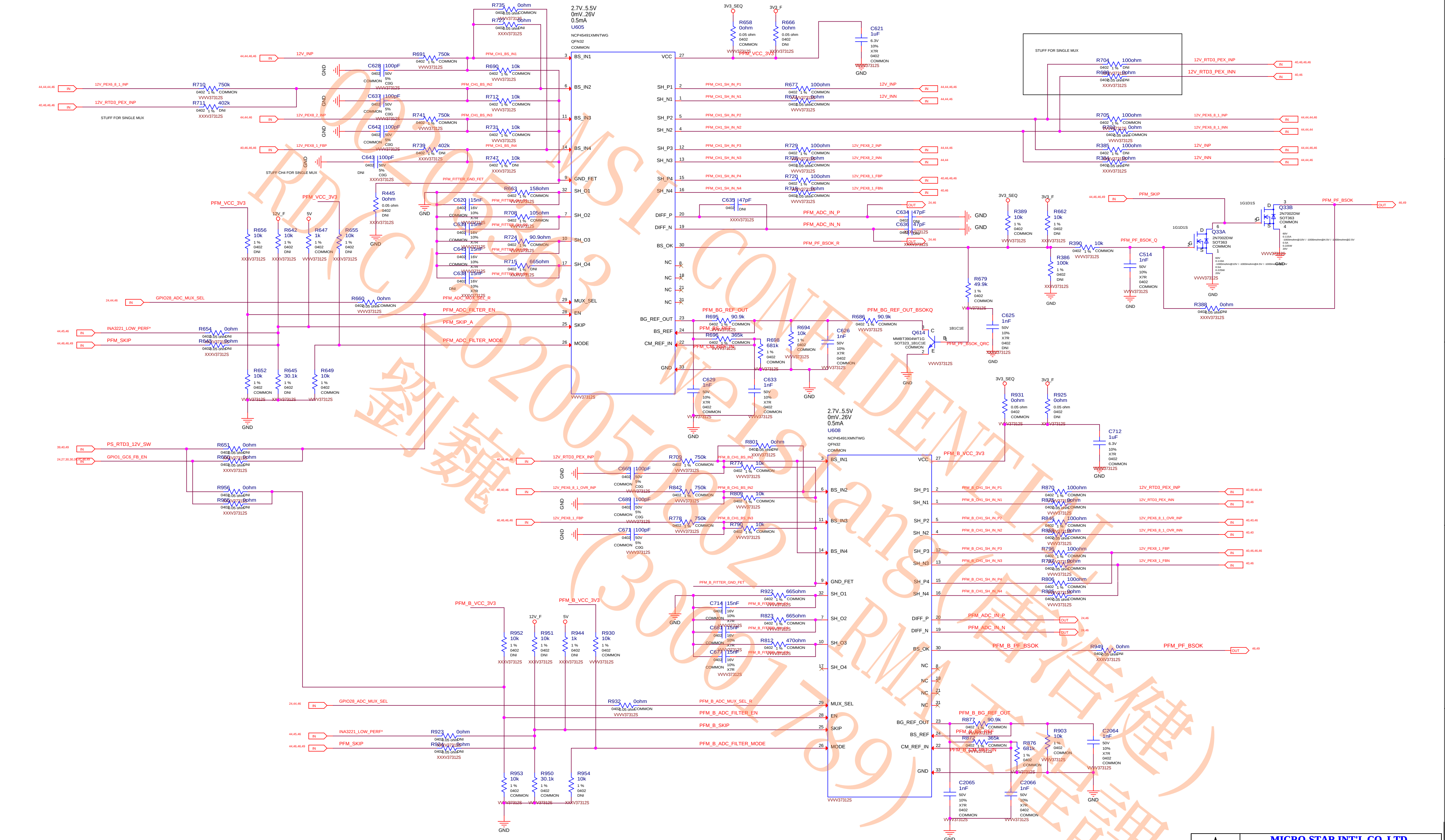
STUFF IF USING 2XMUX
U605
NCP45491XMNTWG
QFN32
2.7V..5.5V
0mV..26V
0.5mA
BS_IN1
BS_IN2
BS_IN3
BS_IN4
GND_FET
SH_O1
SH_O2
SH_O3
SH_O4
MUX_SEL
EN
SKIP
MODE
VCC
SH_P1
SH_N1
SH_P2
SH_N2
SH_P3
SH_N3
SH_P4
SH_N4
DIFF_P
DIFF_N
BS_OK
NC
BG_REF_OUT
BS_REF
CM_REF_IN
GND
U608
STUFF FOR SINGLE MUX
STUFF CH4 FOR SINGLE MUX
PFM_VCC_3V3
PFM_B_VCC_3V3
12V_INP
12V_INN
12V_PEX8_1_INP
12V_PEX8_1_INN
12V_PEX8_2_INP
12V_PEX8_2_INN
12V_RTD3_PEX_INP
12V_RTD3_PEX_INN
GPIO28_ADC_MUX_SEL
INA3221_LOW_PERF*
PFM_SKIP
PS_RTD3_12V_SW
GPIO1_GC6_FB_EN
PFM_ADC_IN_P
PFM_ADC_IN_N
PFM_PF_BSOK
PFM_PF_BSOK_Q
PFM_BG_REF_OUT
PFM_BG_REF_OUT_BSOKQ
PFM_ADC_FILTER_EN
PFM_SKIP_A
PFM_ADC_FILTER_MODE
PFM_B_ADC_IN_P
PFM_B_ADC_IN_N
PFM_B_PF_BSOK
PFM_B_ADC_FILTER_EN
PFM_B_SKIP
PFM_B_ADC_FILTER_MODE
PFM_B_BG_REF_OUT
Q614
MMBT3904WT1G
SOT323_1B1C1E
Q33A
Q33B
2N7002DW
SOT363
3V3_SEQ
3V3_F
12V_F
5V
GND
MSI CONFIDENTIAL

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Size: Custom	Document Description: Page46:PS_ PRE-FILTER
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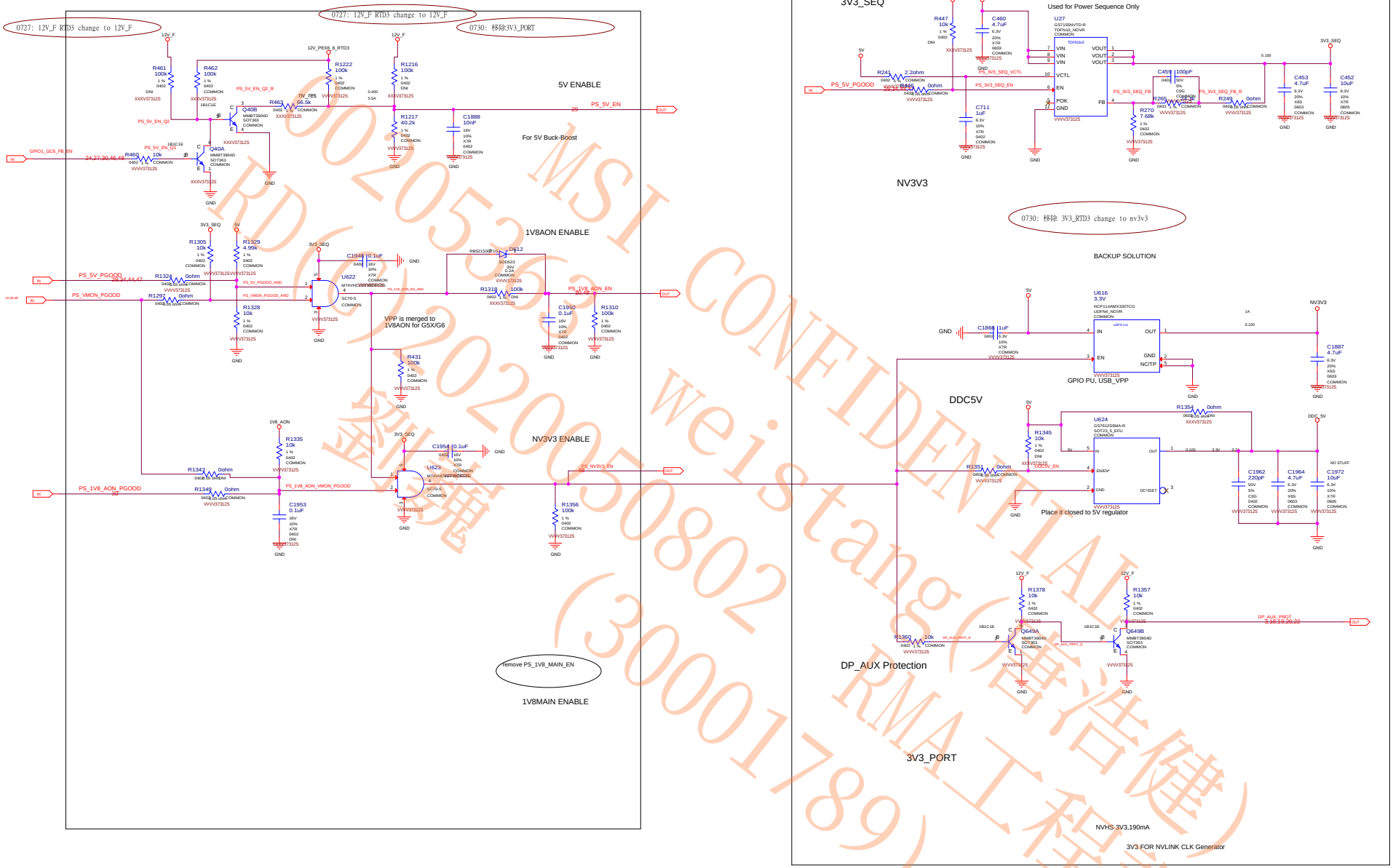
PAGE 47: SEQUENCE:5V,1V8,NV3V3 ENABLE



MICRO-STAR INT'L CO.,LTD		
MS-V373		
Size: Custom	Document Description: Page47:SEQUENCE_ 5V, 1V8, NV3V3 E	Rev: 7.3
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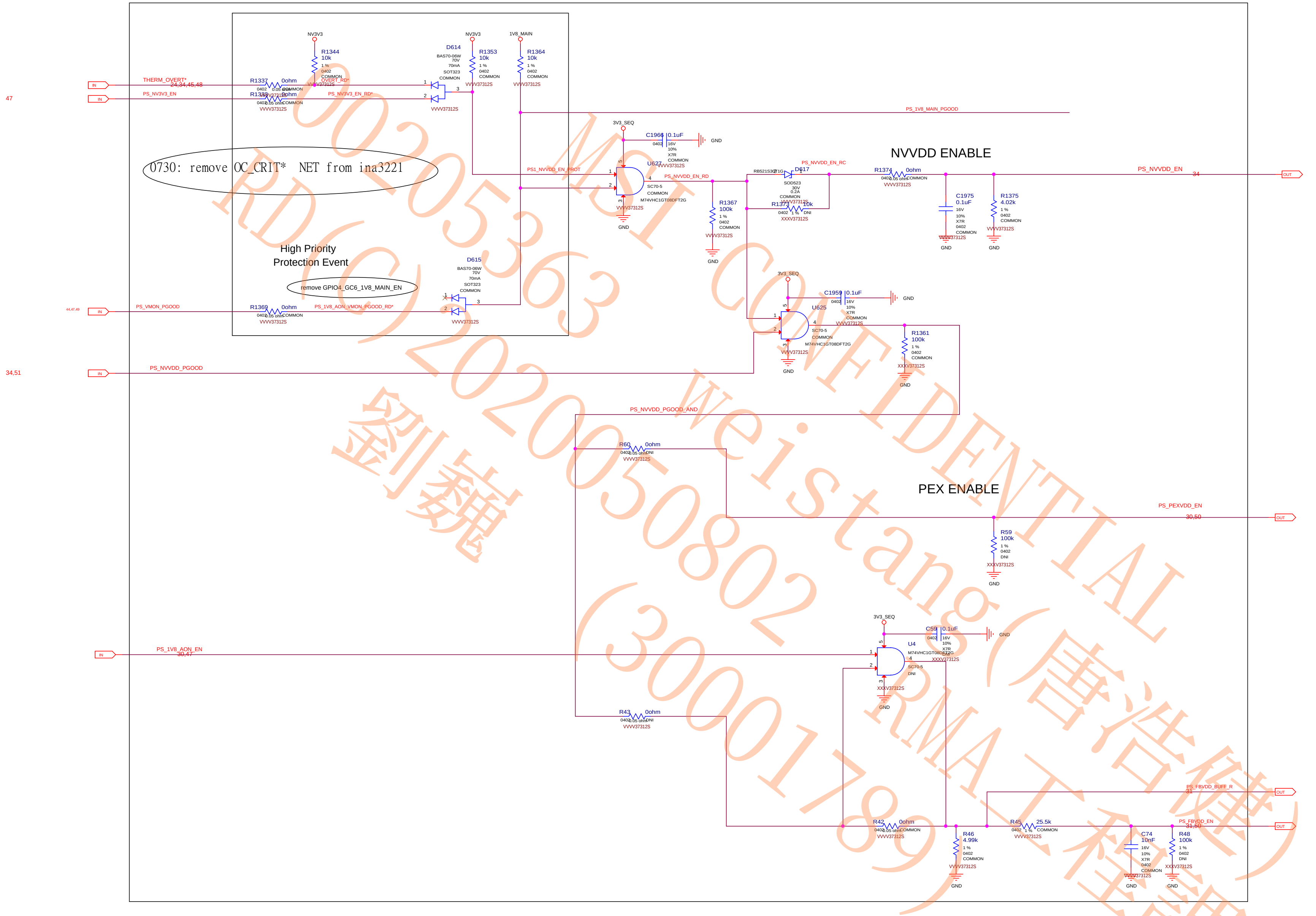
PAGE 48: SEQUENCE:NV,PEX,FB ENABLE



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MS-V373		
Size: Custom	Document Description: Page48:SEQUENCE_ NV, PEX, FB ENAB	Rev 7.3
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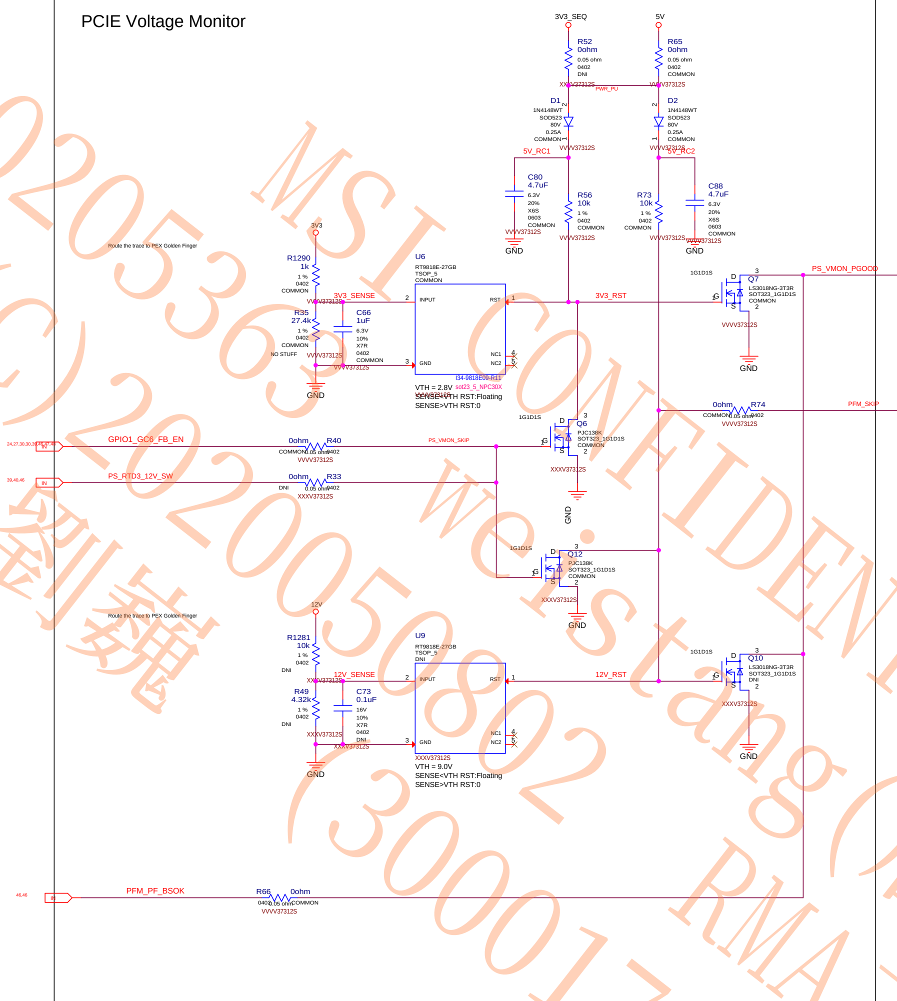
PCIE Voltage Monitor


3V3_SEQ
5V
R52 0ohm
R65 0ohm
D1 1N4148WT
D2 1N4148WT
5V_RC1
5V_RC2
C80 4.7uF
R56 10k
R73 10k
C88 4.7uF
3V3
Route the trace to PEX Golden Finger
R1290 1k
U6 RT9818E-27GB
3V3_SENSE
R35 27.4k
C66 1uF
3V3_RST
Q7
PS_VMON_PGOOD
VTH = 2.8V
SENSE<VTH RST:Floating
SENSE>VTH RST:0
Q6
R74 0ohm
PFM_SKIP
GPIO1_GC6_FB_EN
R40 0ohm
PS_VMON_SKIP
PS_RTD3_12V_SW
R33 0ohm
Q12
12V
R1281 10k
U9 RT9818E-27GB
12V_SENSE
R49 4.32k
C73 0.1uF
12V_RST
Q10
VTH = 9.0V
SENSE<VTH RST:Floating
SENSE>VTH RST:0
PFM_PF_BSOK
R66 0ohm
GND

Signal	Direction	Function
3V3	INPUT	Sense the 3V3 Voltage from PCIE golden finger
12V	INPUT	Sense the 12V Voltage from PCIE golden finger
PS_VMON_PGOOD	OPEN-DRAIN	Floating(H) once both 3V3 and 12V reach Vth
GC6_FB_EN	INPUT	Indicator for RTD3/GC6 residence,Use to Mask the VMON_PGOOD
PS_PF_SKIP	INPUT	From INA3221(VPU) or Pre-filter(SKIP)
PS_PF_BSOK	INPUT	From INA3221(PV) or Pre-filter(BS_OK)
PS_RTD3_12V_SW	INPUT	GC6_FB_EN && IDLE_IN_SW

BOM Configuration

OPTIONS	PEX3V3_SENSE	PEX12V_SENSE	OTHER_12V_SENSE
Use Pre-Filter	Pre-Filter NO STUFF U12 NO STUFF Q3,Q5 NO STUFF D15	Pre-Filter NO STUFF U13 NO STUFF Q4	Pre-Filter
Use INA3221	Voltage_Monitor	INA3221 NO STUFF U12 NO STUFF Q4	INA3221
NO INA3221 NO Pre-Filter	Voltage_Monitor	Voltage_Monitor	N/A

Power Supply

INA3221:3V3_SEQ

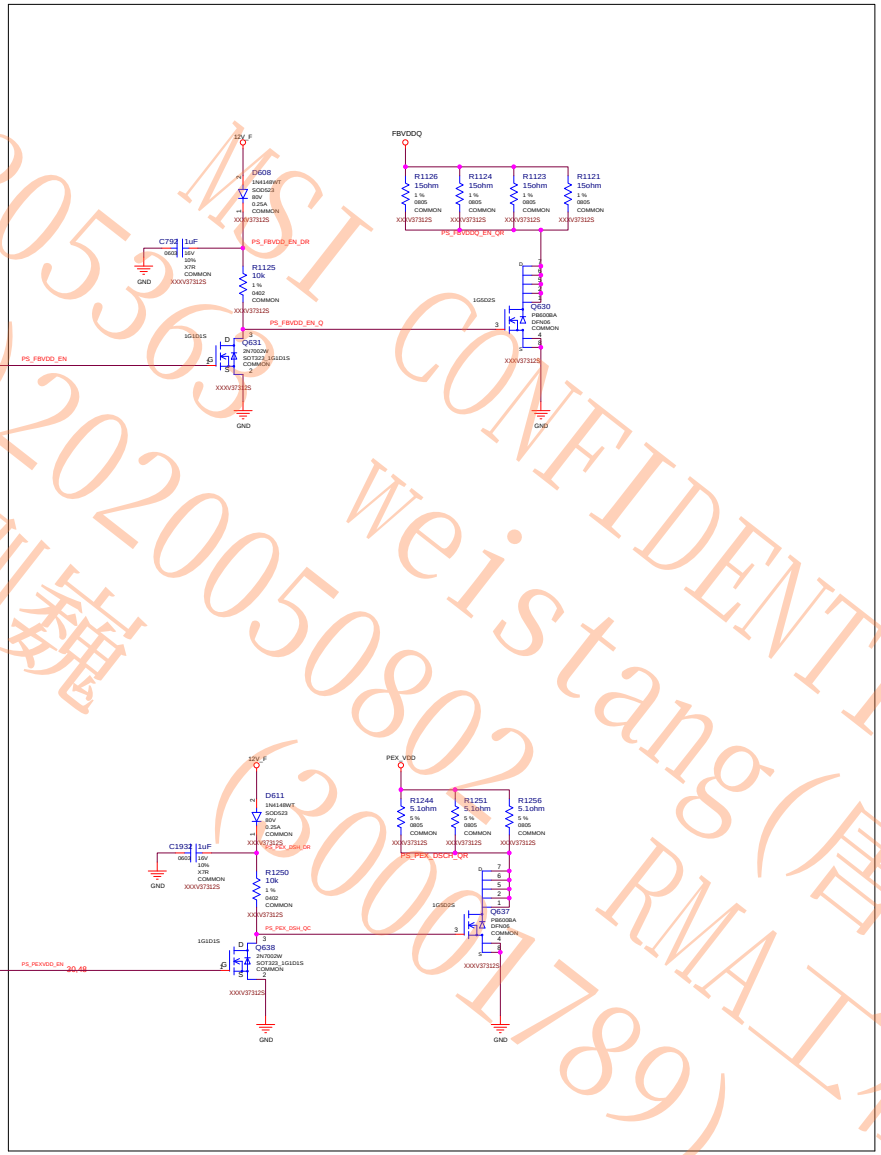
Pre_Filter(ADC_MUX):3V3(PEX)

Dual Pre-Filter case:

Only use the Primary Pre-Filter to sense 3V3PEX

and All Input 12Vs

PAGE 50: SEQUENCE:DISCHARGE



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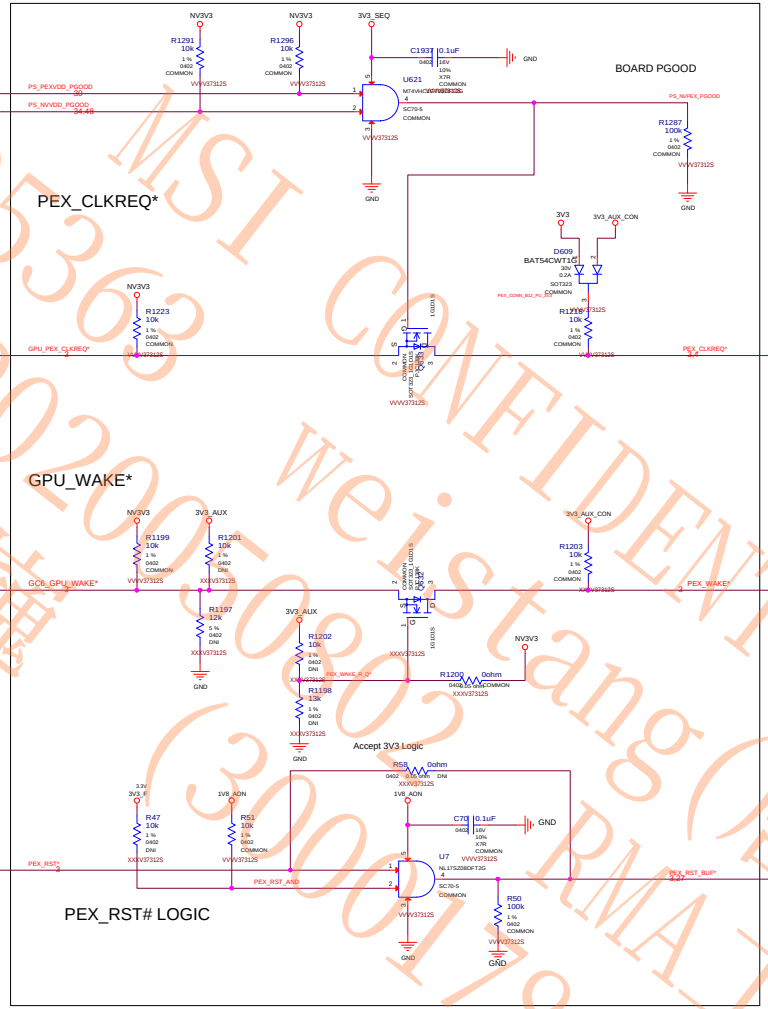
PAGE 51: SEQUENCE:MISC



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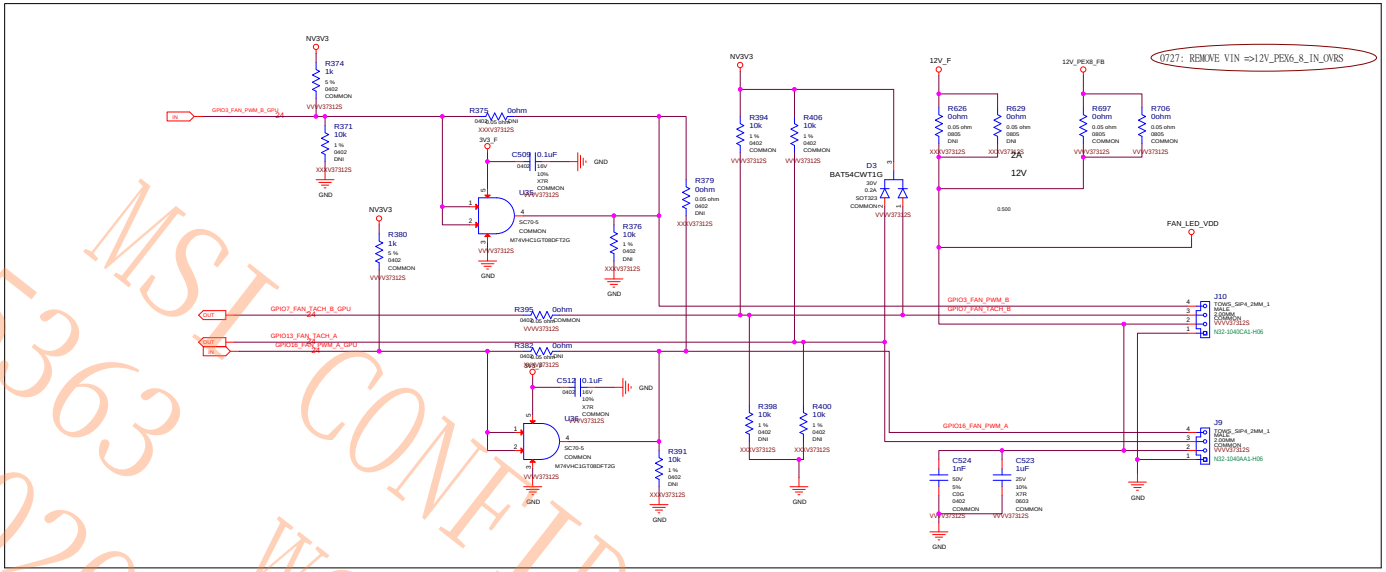
PAGE 52: LED & FAN HEADERS



LED BOOST

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Size: Custom	Document Description: Page52:LED & FAN HEADERS		Rev: 7.3
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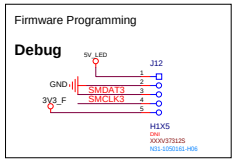
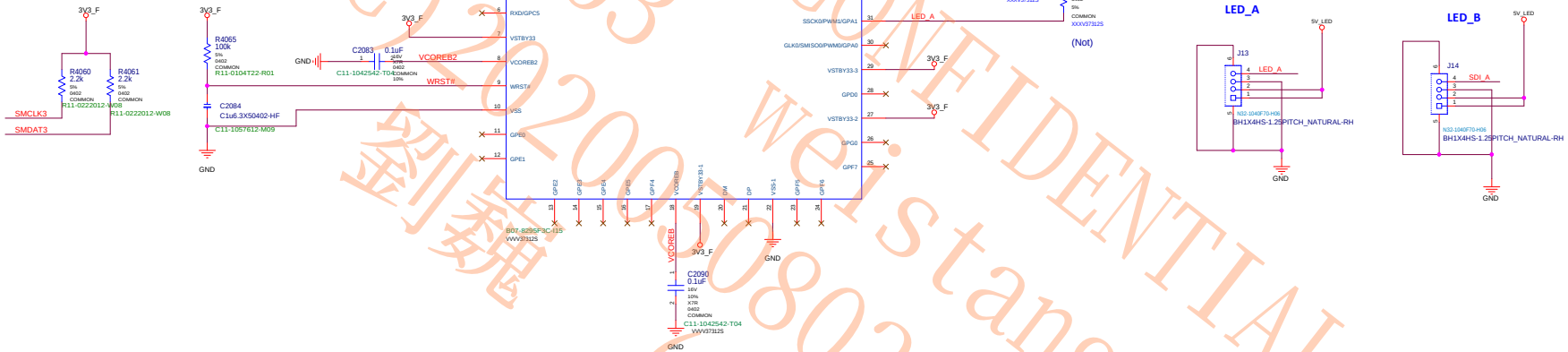
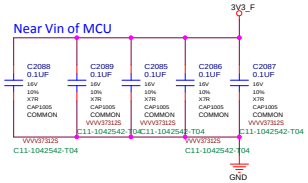
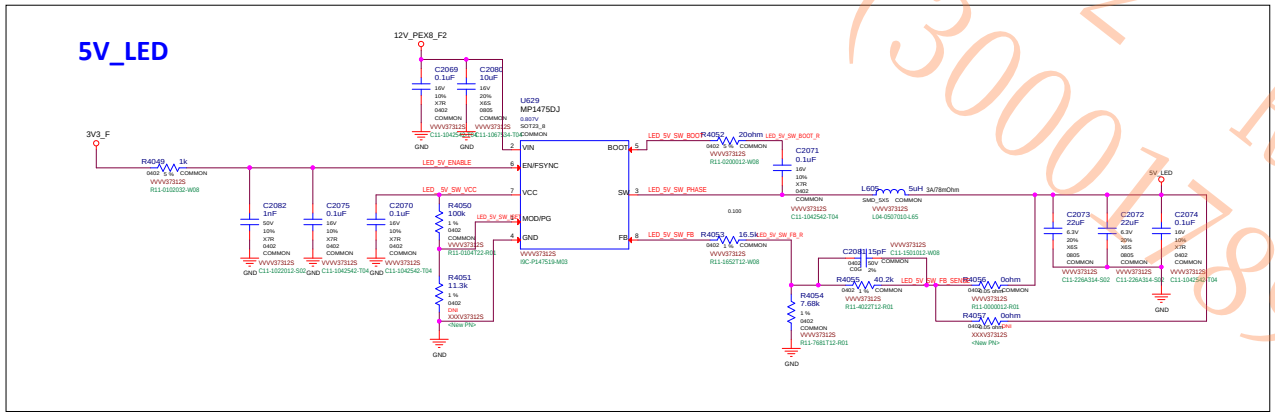
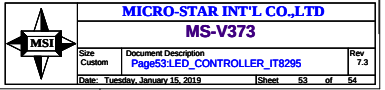
PAGE 53: LED_CONTROLLER_IT8295



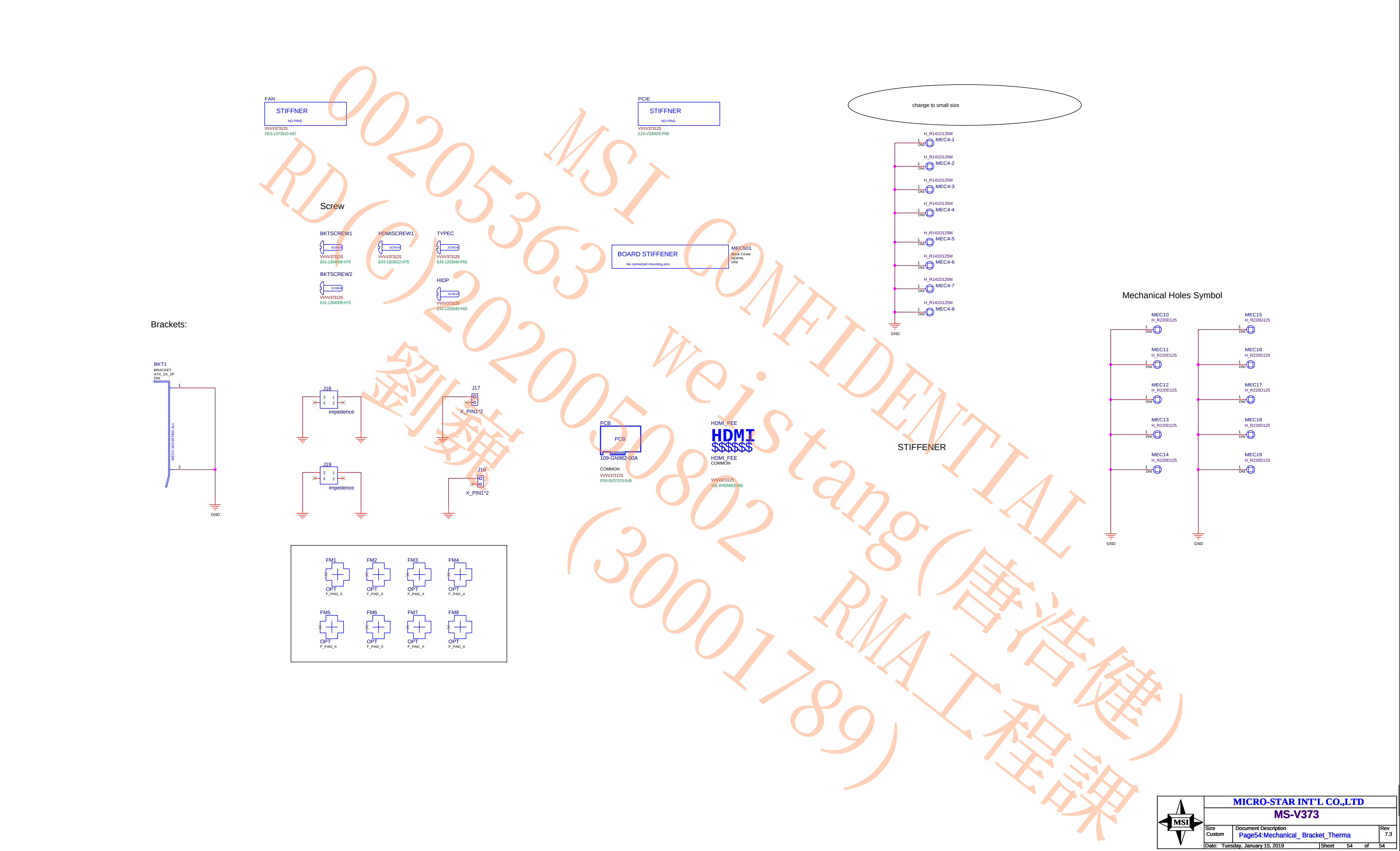








PAGE 54:MECHANICAL;BRACKET/THERMAL SOLUTION



FAN
STIFFNER
NO PINS
VVVV37312S
OE3-V373010-A87
PCIE
STIFFNER
NO PINS
VVVV37312S
E24-V330020-P09
change to small size
Screw
BKTSCREW1
VVVV37312S
E41-1304009-H75
HDMISCREW1
VVVV37312S
E43-1303012-H75
TYPEC
VVVV37312S
E43-1203040-P65
BKTSCREW2
VVVV37312S
E41-1304009-H75
HIDP
VVVV37312S
E43-1203040-P65
BOARD STIFFENER
No connected mounting pins
MEC501
Back Cover
NOPIN
DNI
H_R141D125M
MEC4-1
MEC4-2
MEC4-3
MEC4-4
MEC4-5
MEC4-6
MEC4-7
MEC4-8
GND
Mechanical Holes Symbol
MEC10
MEC11
MEC12
MEC13
MEC14
MEC15
MEC16
MEC17
MEC18
MEC19
H_R220D125
Brackets:
BKT1
BRACKET
ATX_2X_2P
DNI
J18
impedence
J17
X_PIN1*2
J19
impedence
J16
X_PIN1*2
PCB
109-GN982-00A
COMMON
VVVV37312S
PD0-0V37370-E48
HDMI_FEE
HDMI
$$$$$$
HDMI_FEE
COMMON
VVVV37312S
Y01-RHDMI603-000
STIFFENER
FM1
FM2
FM3
FM4
FM5
FM6
FM7
FM8
OPT
F_PAD_X
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Custom
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