PG132-A02

370W, FH Std PCB, 384b, GDDR6x 2CH X16
DP + DP + DP + HDMI/DP

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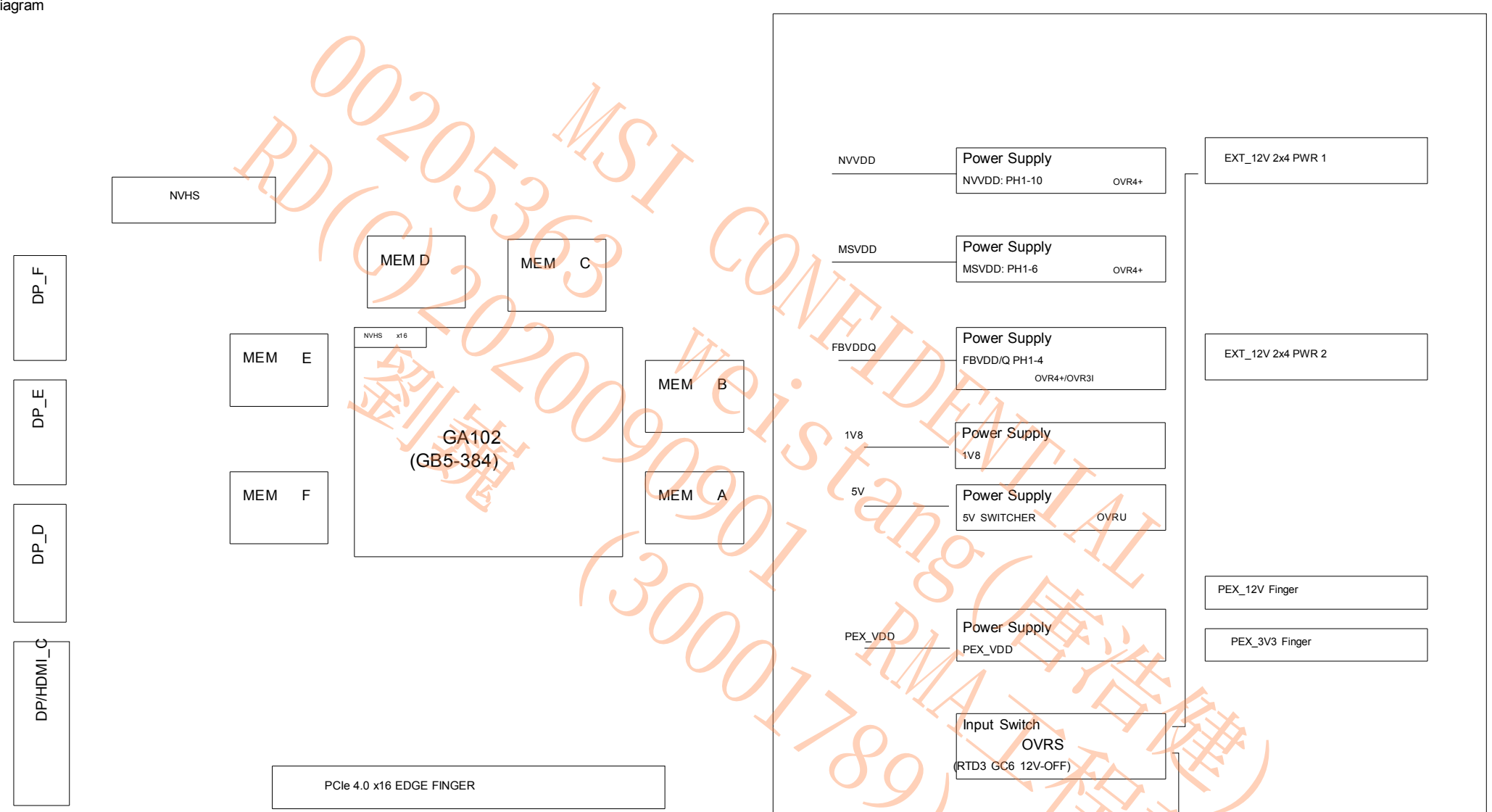
Block Diagram



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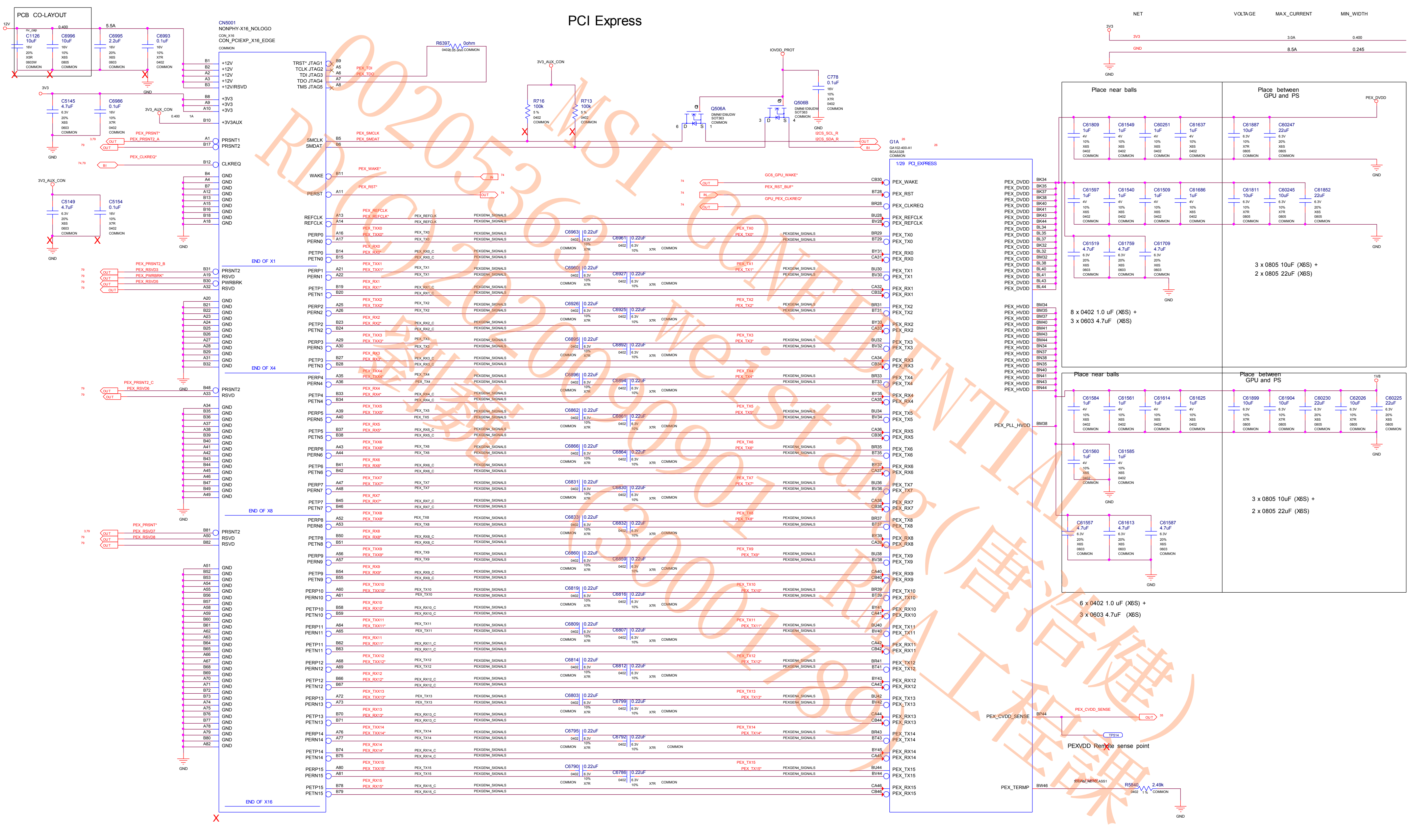
PCI Express


PCB CO-LAYOUT
CN5001
NONPHY-X16_NOLOGO
CON_PCIEXP_X16_EDGE
+12V
+12V/RSVD
+3V3
+3V3AUX
PRSNT1
PRSNT2
CLKREQ
GND
WAKE
PERST
REFCLK
SMCLK
SMDAT
TRST* JTAG1
TCLK JTAG2
TDI JTAG3
TDO JTAG4
TMS JTAG5
PWRBRK
RSVD
END OF X1
END OF X4
END OF X8
END OF X16
Q506A
Q506B
G1A
1/29 PCI_EXPRESS
PEX_WAKE
PEX_RST
PEX_CLKREQ
PEX_REFCLK
PEX_DVDD
PEX_HVDD
PEX_PLL_HVDD
PEX_CVDD_SENSE
PEX_TERMP
PEXVDD Remote sense point
NET
VOLTAGE
MAX_CURRENT
MIN_WIDTH
Place near balls
Place between GPU and PS
8 x 0402 1.0 uF (X6S) +
3 x 0603 4.7uF (X6S)
3 x 0805 10uF (X6S) +
2 x 0805 22uF (X6S)
6 x 0402 1.0 uF (X6S) +
3 x 0603 4.7uF (X6S)

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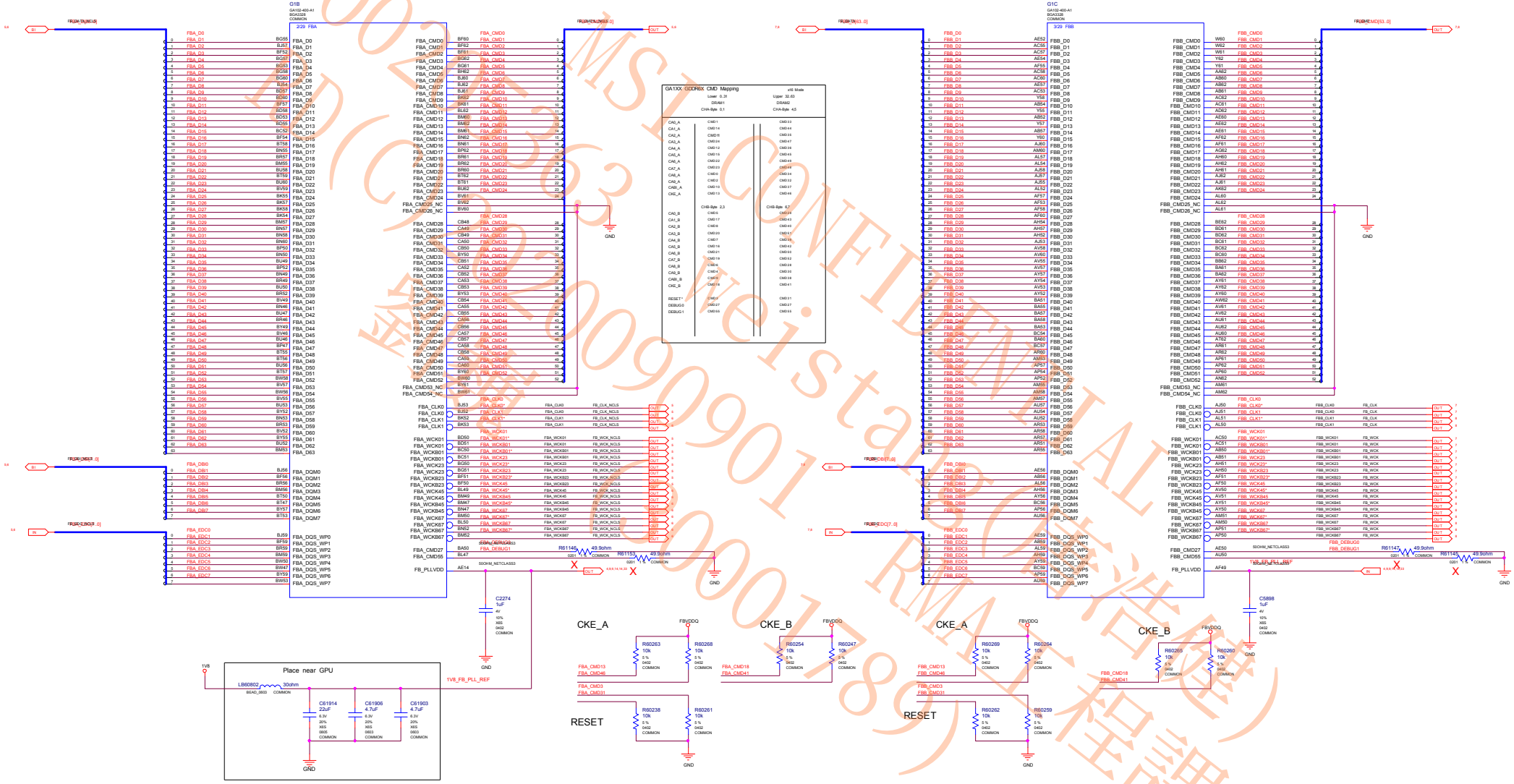
MEMORY: GPU Partition A/B



MEMORY: FBA Partition 31..0

10.5GHz
M12D
MT61K256M32JE-21T
FBGA180
COMMON
FBVDDQ
1V8
GND
10.5GHz
M12A
NORMAL
FBA_D[63..0]
FBA_EDC1
FBA_DBI1
FBA_WCKB01
FBA_WCKB01*
EDC0_A
DQX0_A
WCK0_t_A
WCK0_c_A
EDC1_A
DQX1_A
WCK1_t_A/VSS0
WCK1_c_A/VDDQ_SENSE
16Gb
8Gb
10.5GHz
M12B
NORMAL
EDC0_B
DQX0_B
WCK0_t_B/VSS1_S
WCK0_c_B/VDD_SENSE
EDC1_B
DQX1_B
WCK1_t_B
WCK1_c_B
FBA_CMD[53..0]
10.5GHz
M12C
VREFC
FBA_VREFC_L
R60306
1k
TCK
TDI
TDO
TMS
RESET
CLK_c
CLK_t
NC
ZQ_A
ZQ_B
FBA_ZQ_1_A_M11
R60288
R60282
360ohm
FBA_CLK0*
FBA_CLK0
FBA_DBI[3..0]
FBA_EDC[3..0]
CLOSE TO DRAM: 4x 0603 10uF, 18x 0402 1uF
EXTRA 3x 0402 ON TOP
AROUND DRAM: 6x 0603 22uF, 2x 0603 10uF
CLOSE TO DRAM: 4x 0402 1uF

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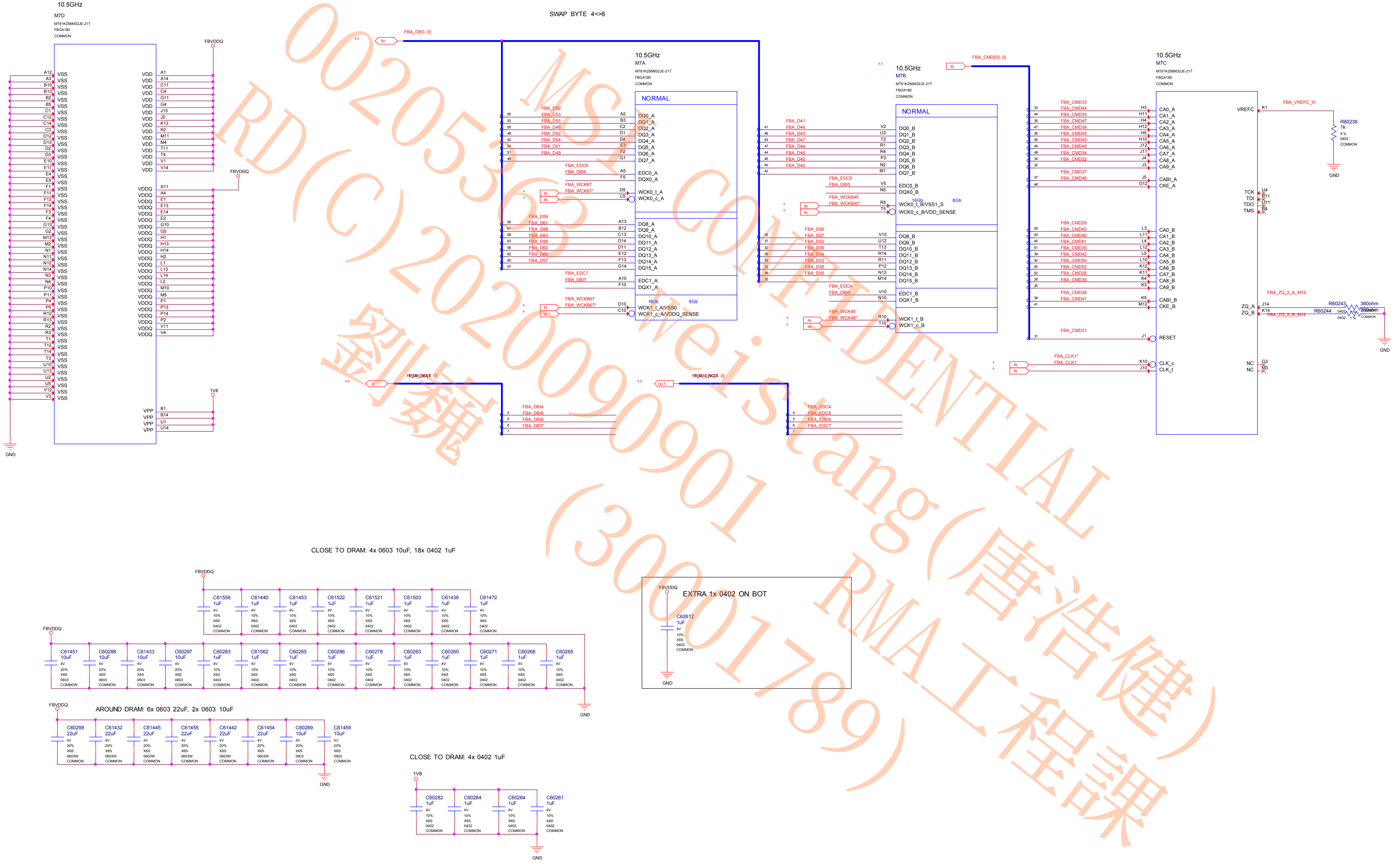
MEMORY: FBA Partition 63..32



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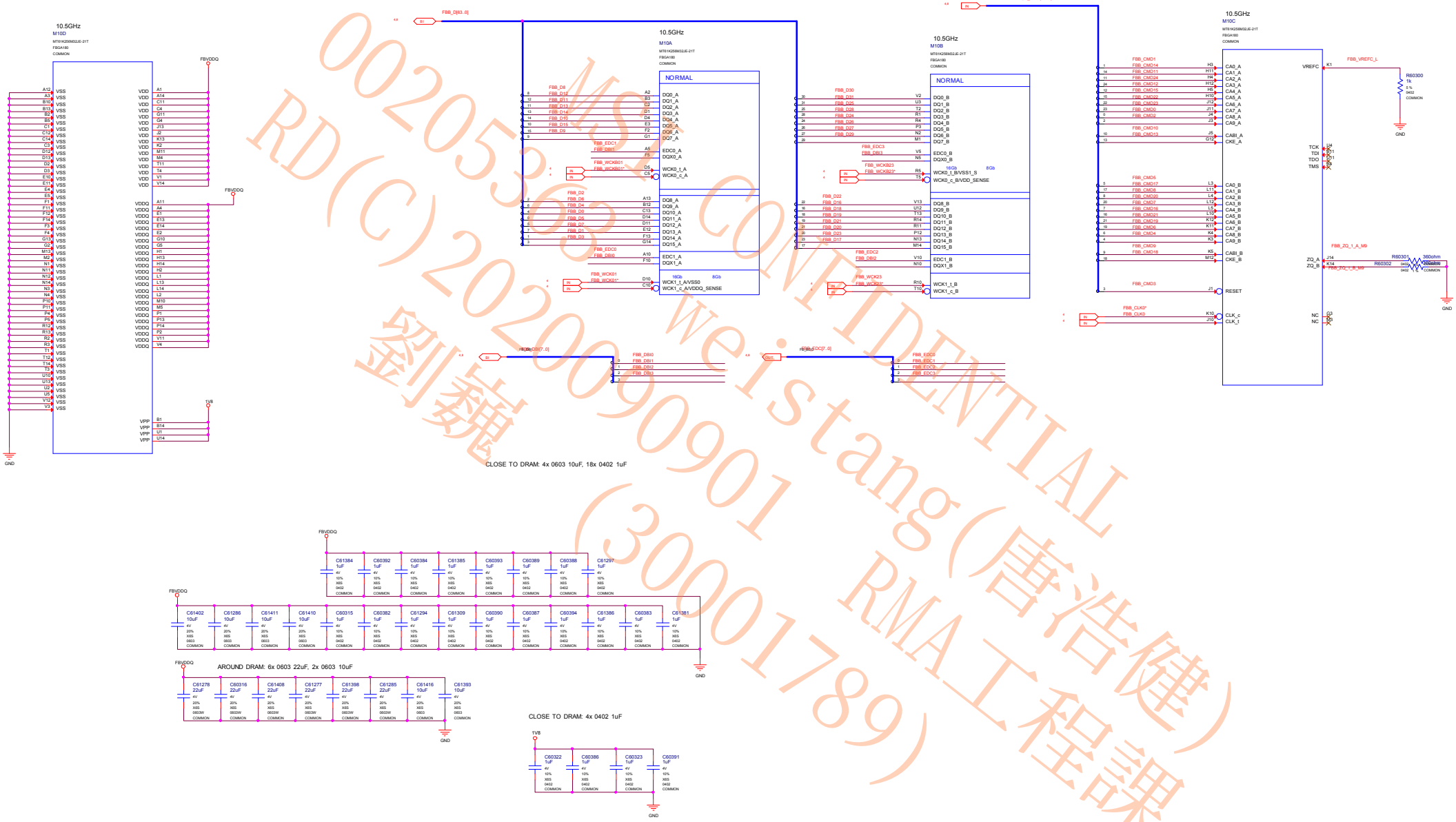
MEMORY: FBB Partition 31..0



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MEMORY: FBB Partition 63..32

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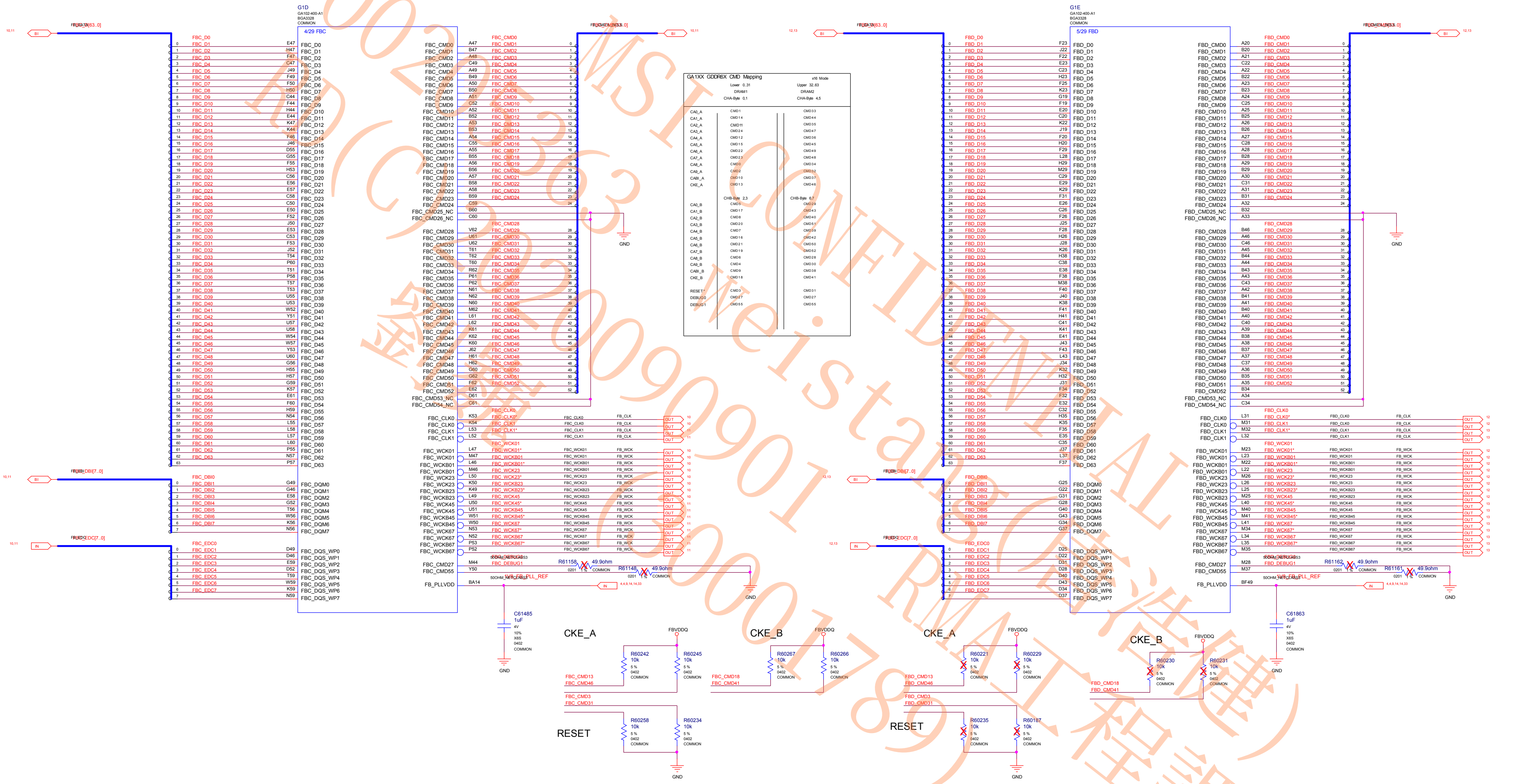
MEMORY: GPU Partition C/D



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MEMORY: FBC Partition 31..0

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MEMORY: FBC Partition 63..32

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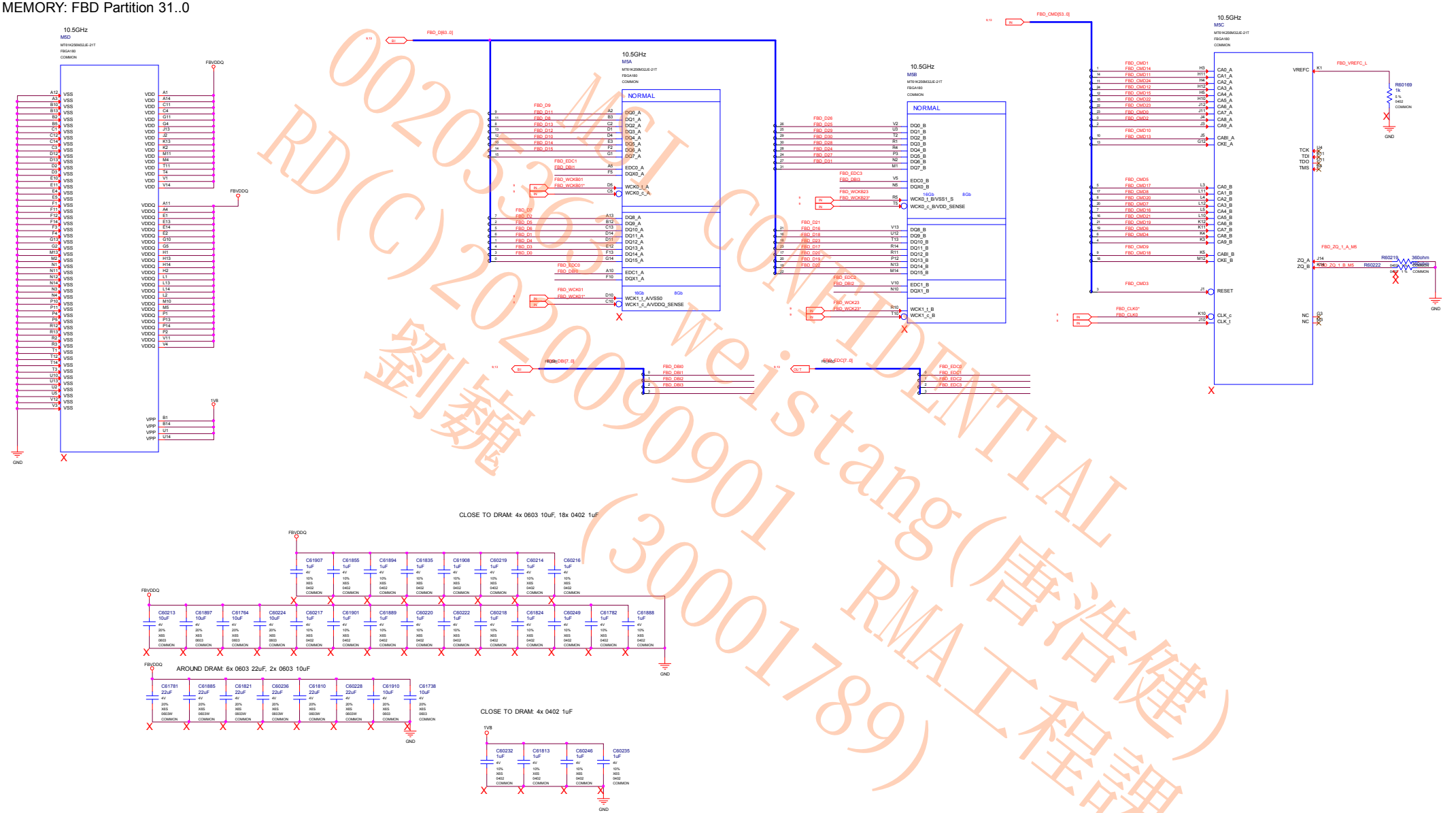
MEMORY: FBD Partition 31..0



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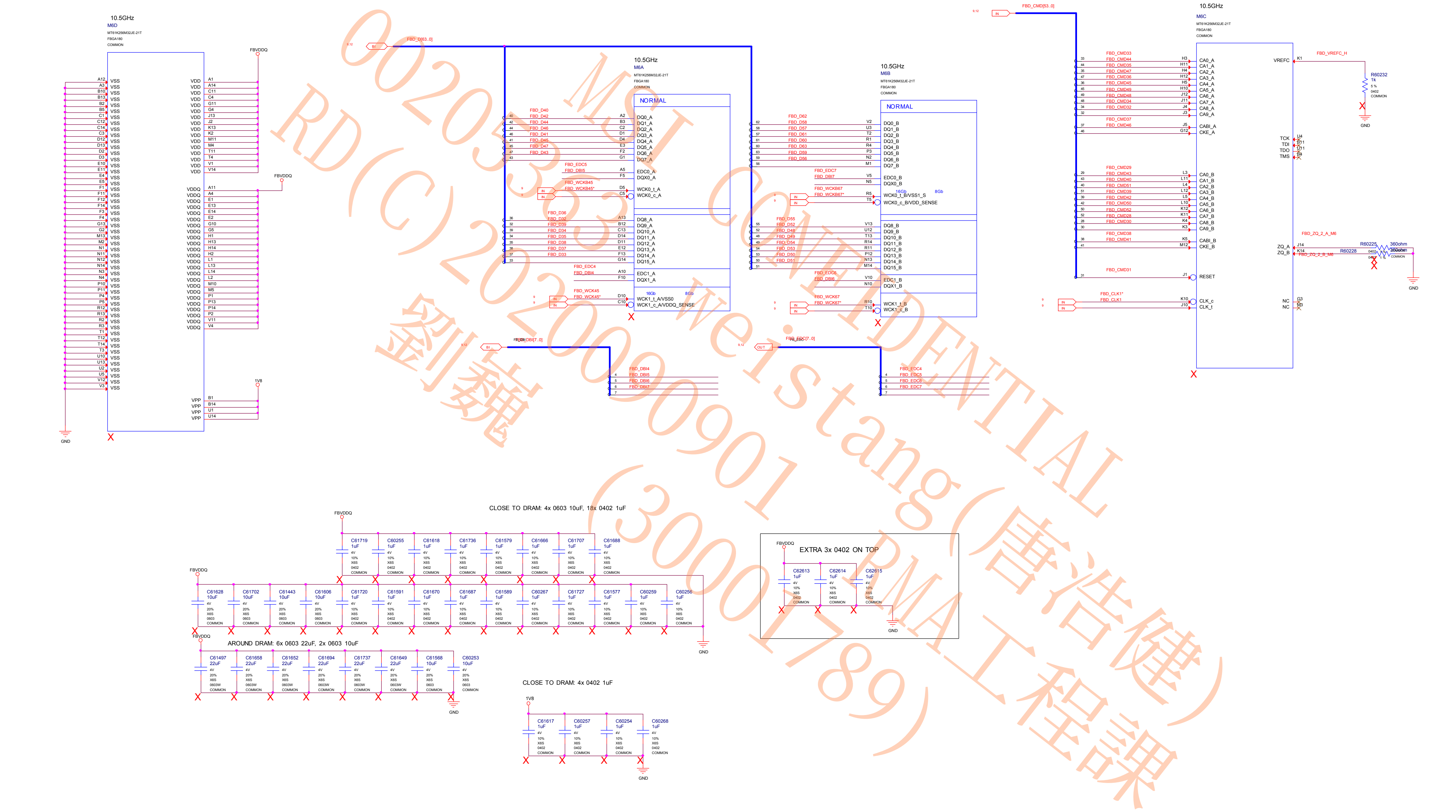
MEMORY: FBD Partition 63..32



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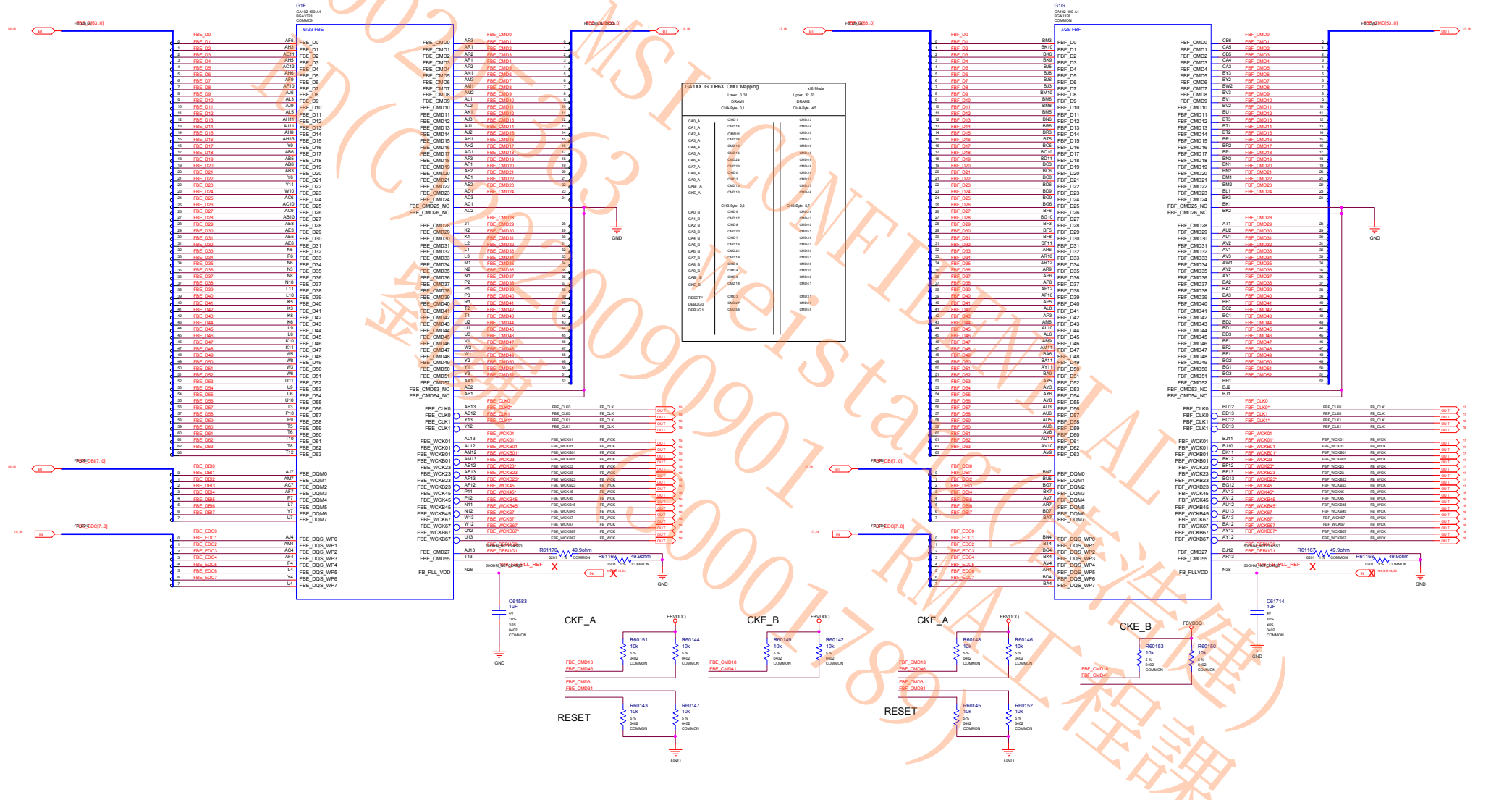
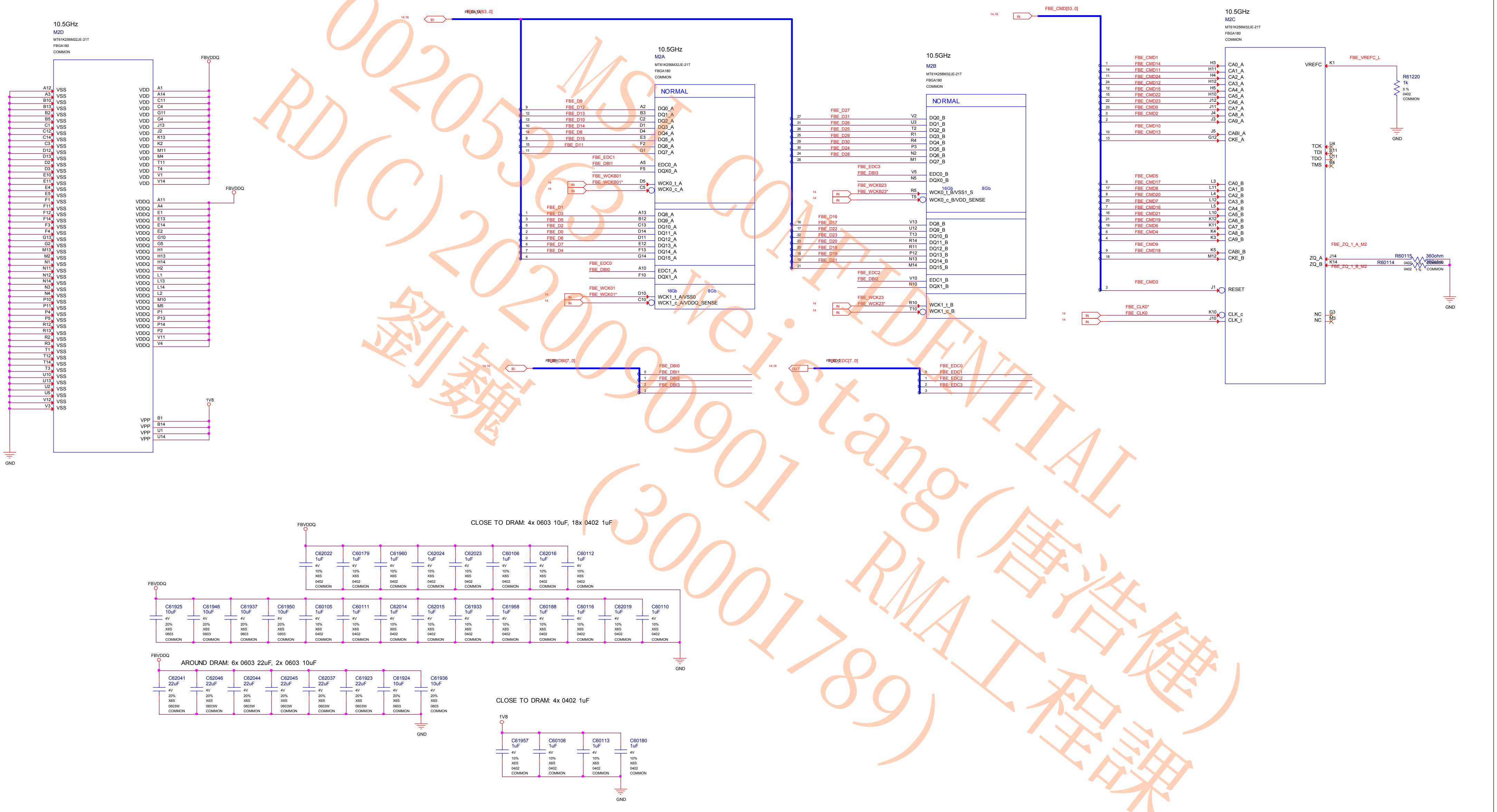
MEMORY: GPU Partition E/F



MEMORY: FBE Partition 31..0



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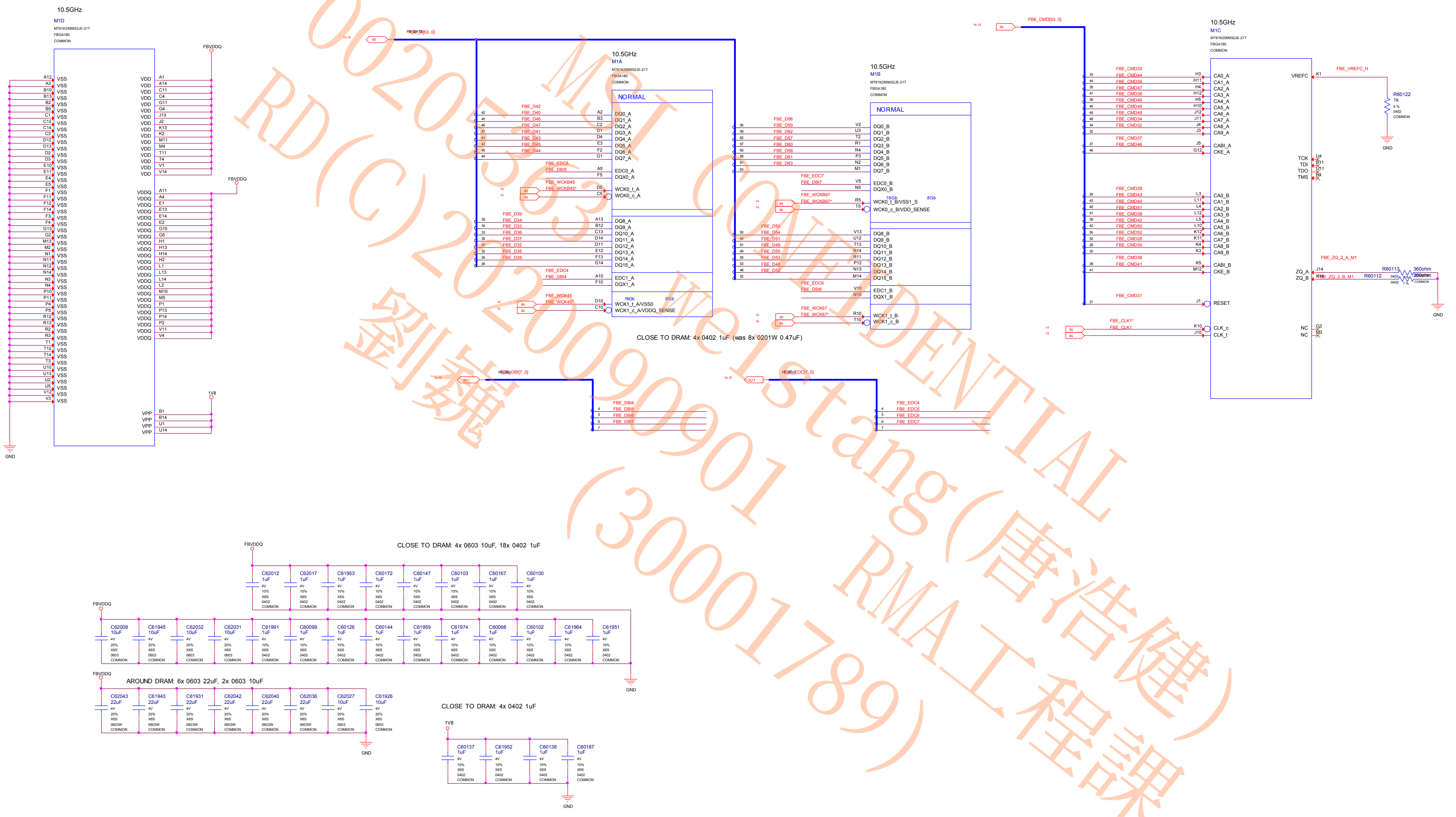
MEMORY: FBE Partition 63..32



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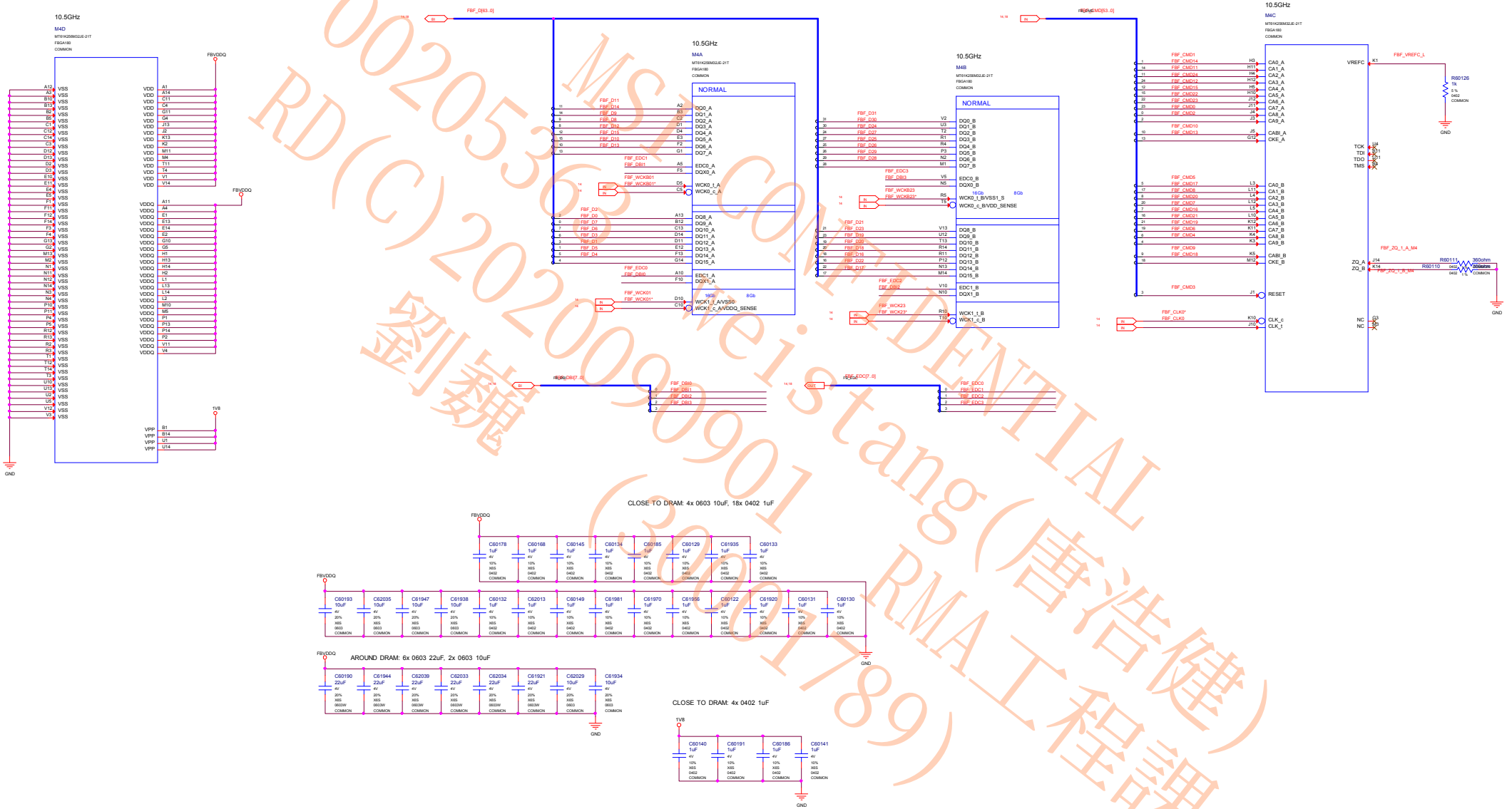
MEMORY: FBF Partition 31..0



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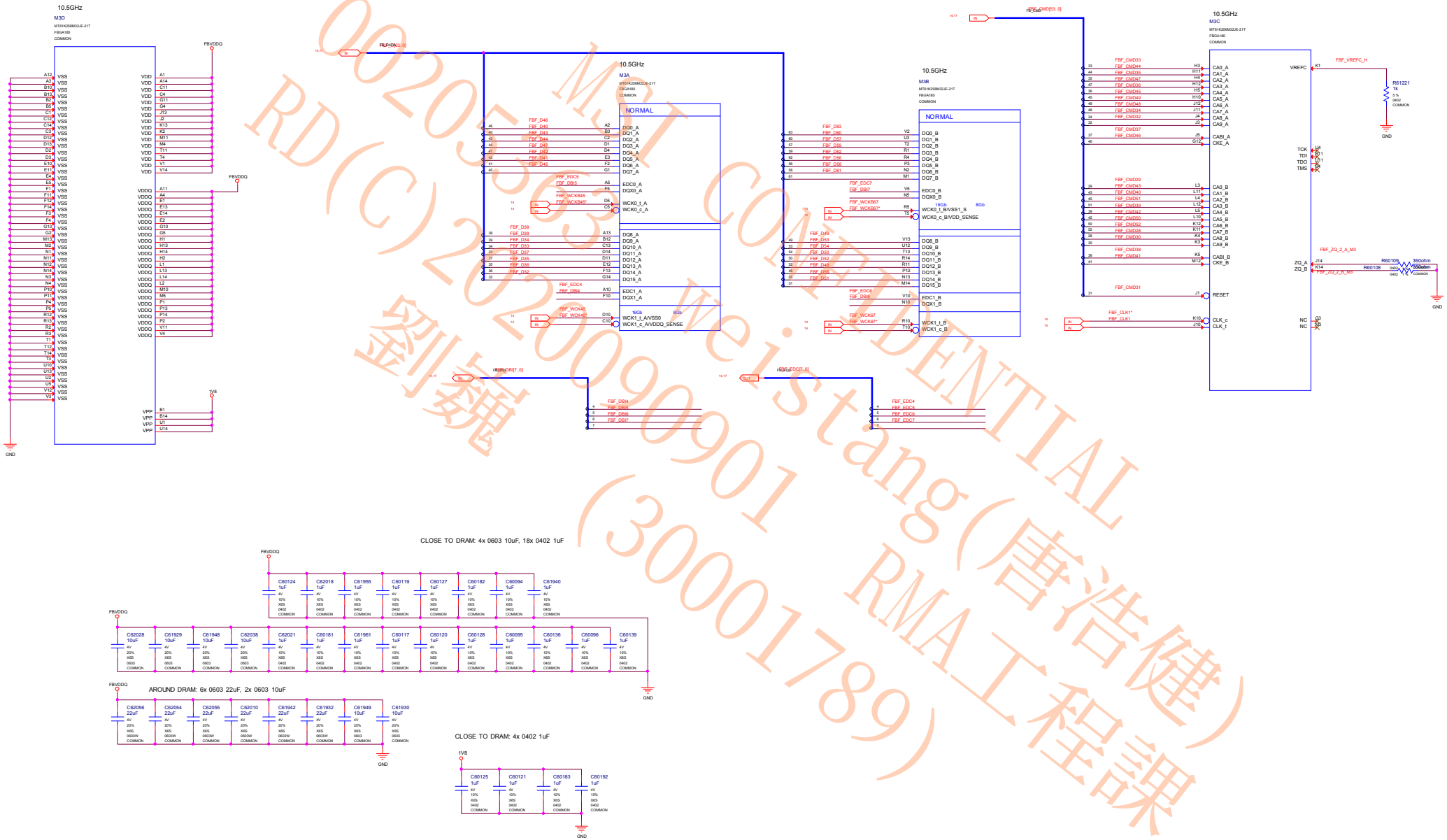
MEMORY: FBF Partition 63..32



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GPU GND, RFUs & RSVD

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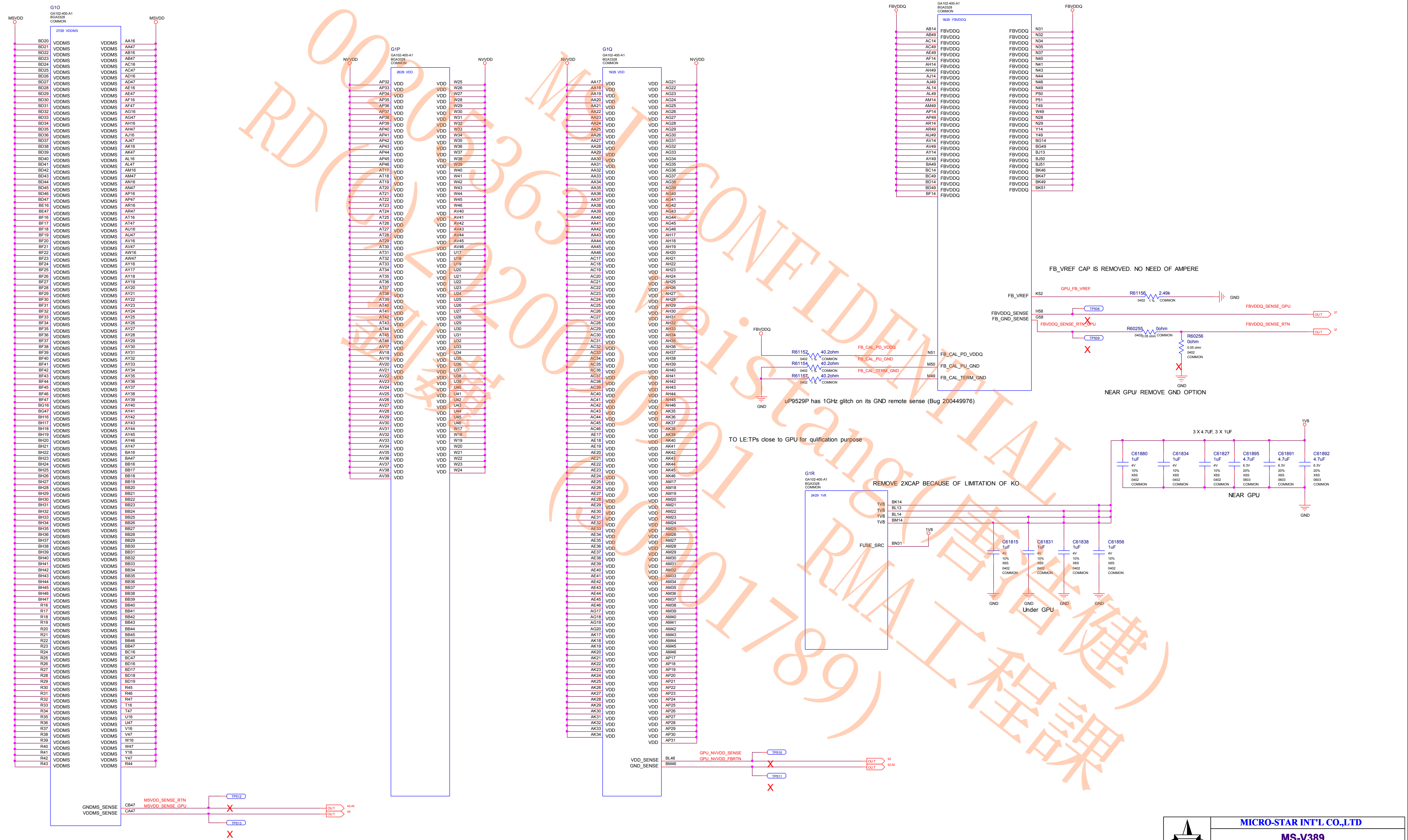
GPU PWR and GND



G1O
G1P
G1Q
G1S
G1R
GA102-400-A1
BGA3328
COMMON
MSVDD
NVVDD
FBVDDQ
VDDMS
VDD
GNDMS_SENSE
VDDMS_SENSE
MSVDD_SENSE_RTN
MSVDD_SENSE_GPU
VDD_SENSE
GND_SENSE
GPU_NVVDD_SENSE
GPU_NVVDD_FBRTN
FB_VREF CAP IS REMOVED. NO NEED OF AMPERE
FB_VREF
GPU_FB_VREF
FBVDDQ_SENSE
FB_GND_SENSE
FBVDDQ_SENSE_GPU
FBVDDQ_SENSE_RTN
FB_CAL_PD_VDDQ
FB_CAL_PU_GND
FB_CAL_TERM_GND
NEAR GPU/ REMOVE GND OPTION
uP9529P has 1GHz glitch on its GND remote sense (Bug 200449976)
TO LE:TPs close to GPU for qulification purpose
3 X 4.7UF, 3 X 1UF
NEAR GPU
REMOVE 2XCAP BECAUSE OF LIMITATION OF KO
FUSE_SRC
1V8
GND
Under GPU

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Page 21: GPU: NVVDD DECOUPLING

NVVDD

UNDER GPU

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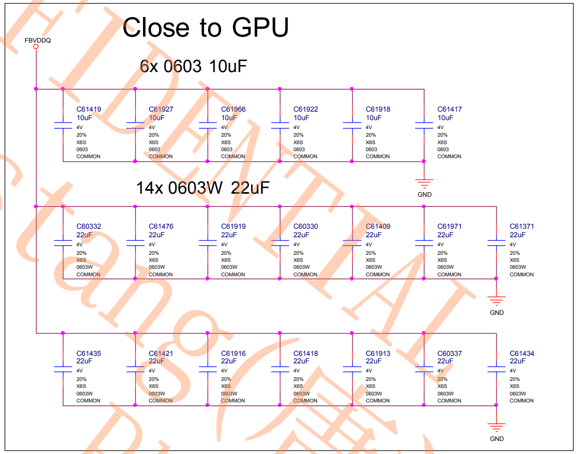
FBVDDQ



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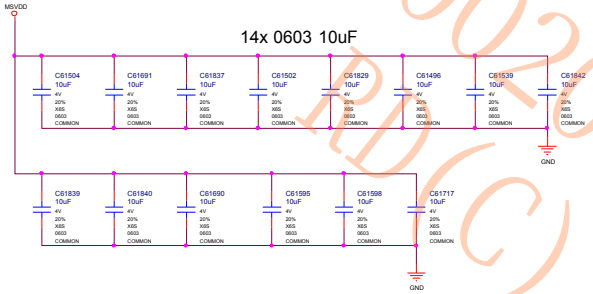
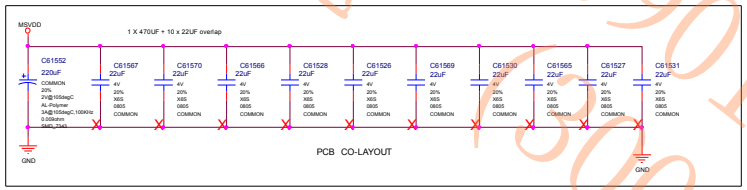
UNDER GPU

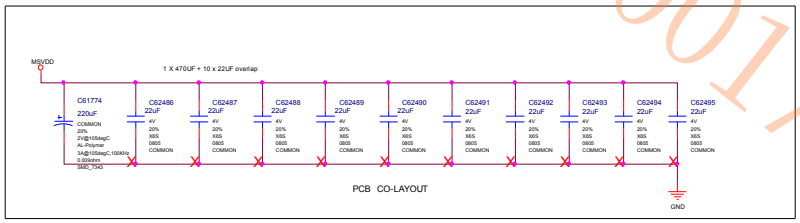
MSVDD

14x 0603 10uF

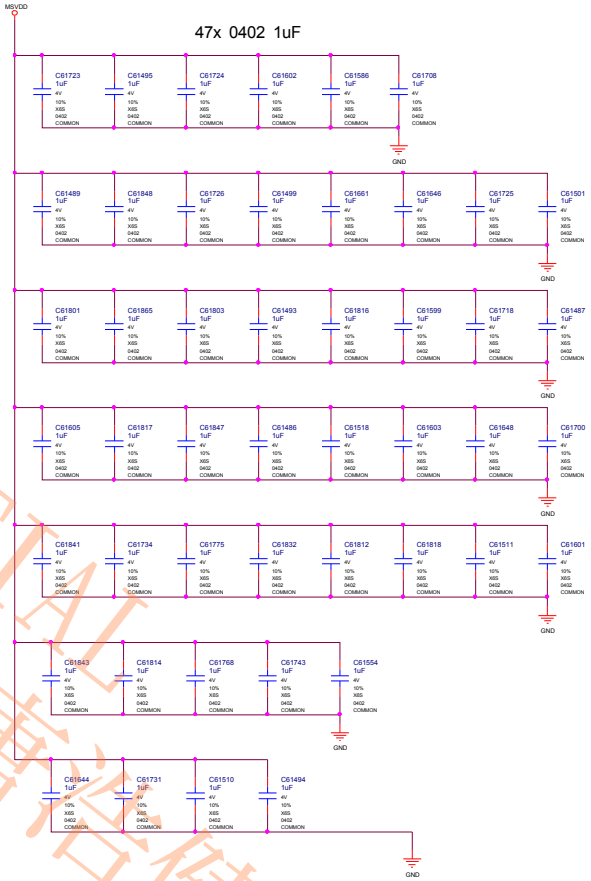


2x SMD7343 220uF (EACH CO-LAYOUT WITH 10x 22uF 0805)





47x 0402 1uF



REMOVED 3X 1uF 0402 DUE TO SPACE RESTRICTION

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BLANK

NVHS Interface and FRAME LOCK

BRIDGE POR

LED -> NO

ID ROM ->YES

REMOVED 4x 0805
TO OPTIMIZE FBVDDQ PLANE

NEAR GPU
UNDER GPU
C60169 22uF
C60092 22uF
C60160 10uF
C60173 10uF
C60175 10uF
C61797 4.7uF
C61798 4.7uF
C61763 4.7uF
C61876 1uF
C61760 1uF
C61878 1uF
C61732 1uF
C61776 1uF
C61741 1uF
C61777 1uF
GND
REMOVE ONE BECAUSE OF KO LIMITATION
NEAR GPU
UNDER GPU
C61905 10uF
C61877 4.7uF
C61822 4.7uF
C61820 4.7uF
C61807 1uF
C61857 1uF
C61806 1uF
C61845 1uF
C61846 1uF
C61844 1uF
GND
REMOVE ONE BECAUSE OF KO LIMITATION
PEX_DVDD
1V8
G1U
GA102-400-A1
BGA3328
COMMON
13/29 NVHS0
NVHS_DVDD
NVHS_HVDD
NVHS_PLL_HVDD
NVHS_TERMP
NVHS0_0_RX0
NVHS0_0_RX1
NVHS0_0_RX2
NVHS0_0_RX3
NVHS0_1_RX0
NVHS0_1_RX1
NVHS0_1_RX2
NVHS0_1_RX3
NVHS0_0_TX0
NVHS0_0_TX1
NVHS0_0_TX2
NVHS0_0_TX3
NVHS0_1_TX0
NVHS0_1_TX1
NVHS0_1_TX2
NVHS0_1_TX3
NVHS_REFCLK
EXT_REFCLK_SLI
G1T
GA102-400-A1
BGA3328
COMMON
14/29 NVHS1
PEX_DVDD
NVHS_CVDD
SHARE CAP WITH NVHS_DVDD
NVHS0_2_RX0
NVHS0_2_RX1
NVHS0_2_RX2
NVHS0_2_RX3
NVHS0_3_RX0
NVHS0_3_RX1
NVHS0_3_RX2
NVHS0_3_RX3
NVHS0_2_TX0
NVHS0_2_TX1
NVHS0_2_TX2
NVHS0_2_TX3
NVHS0_3_TX0
NVHS0_3_TX1
NVHS0_3_TX2
NVHS0_3_TX3

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MISC1: Fan, Thermal, JTAG, GPIO, STEREO

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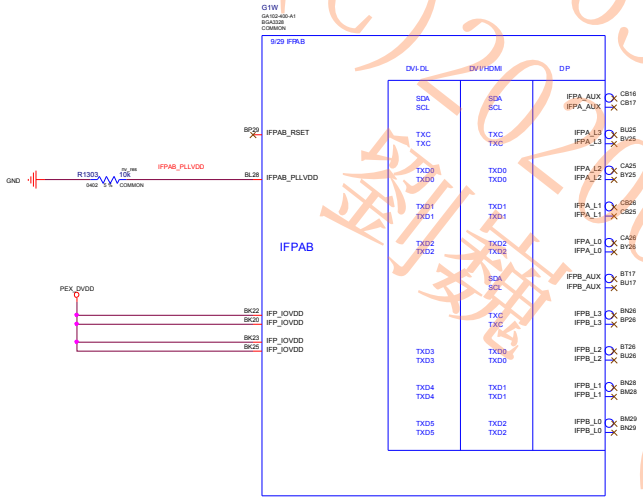
IFPA UNUSED, IFPB UNUSED



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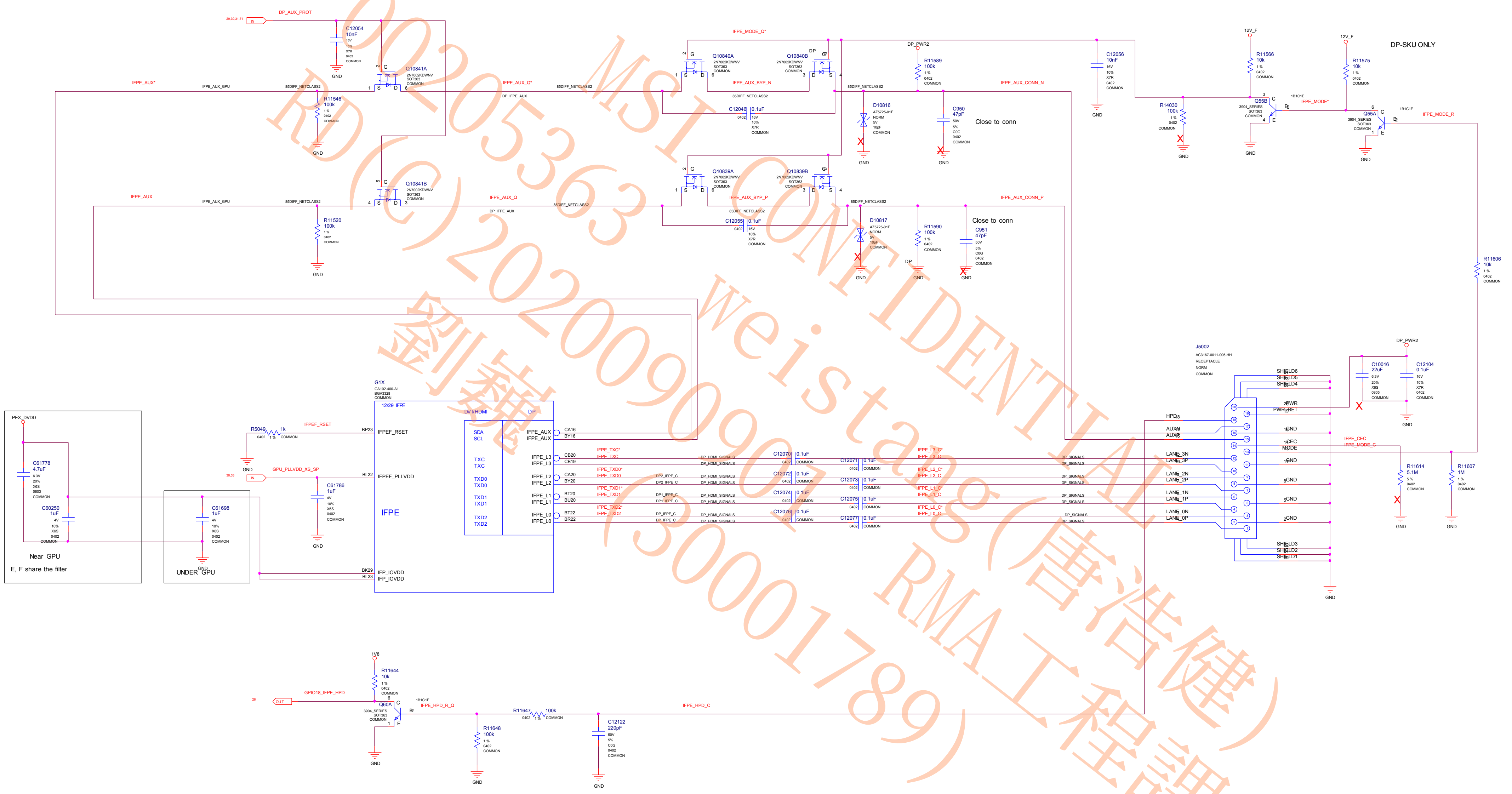
IFPE DP



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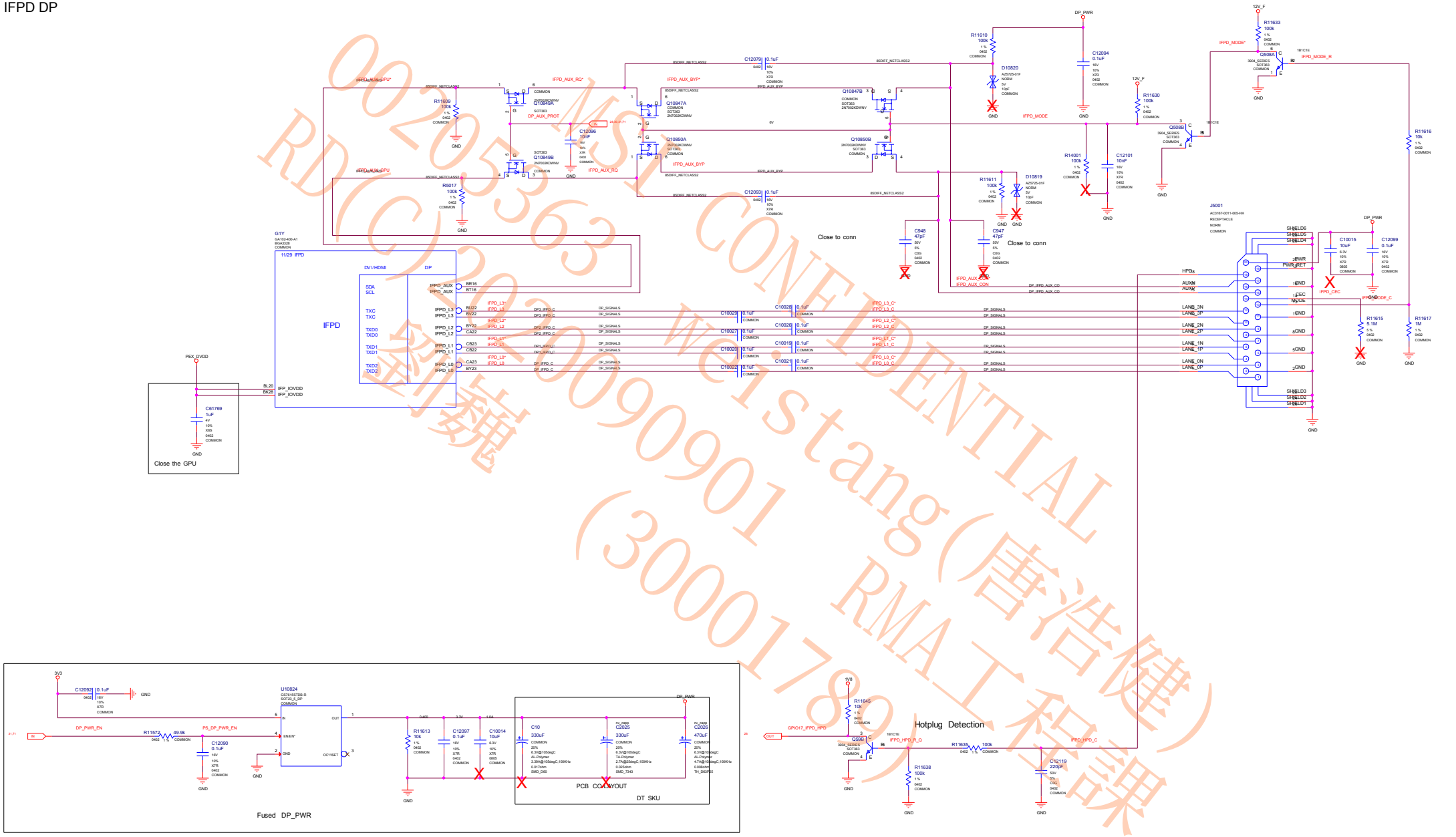
IFPD DP



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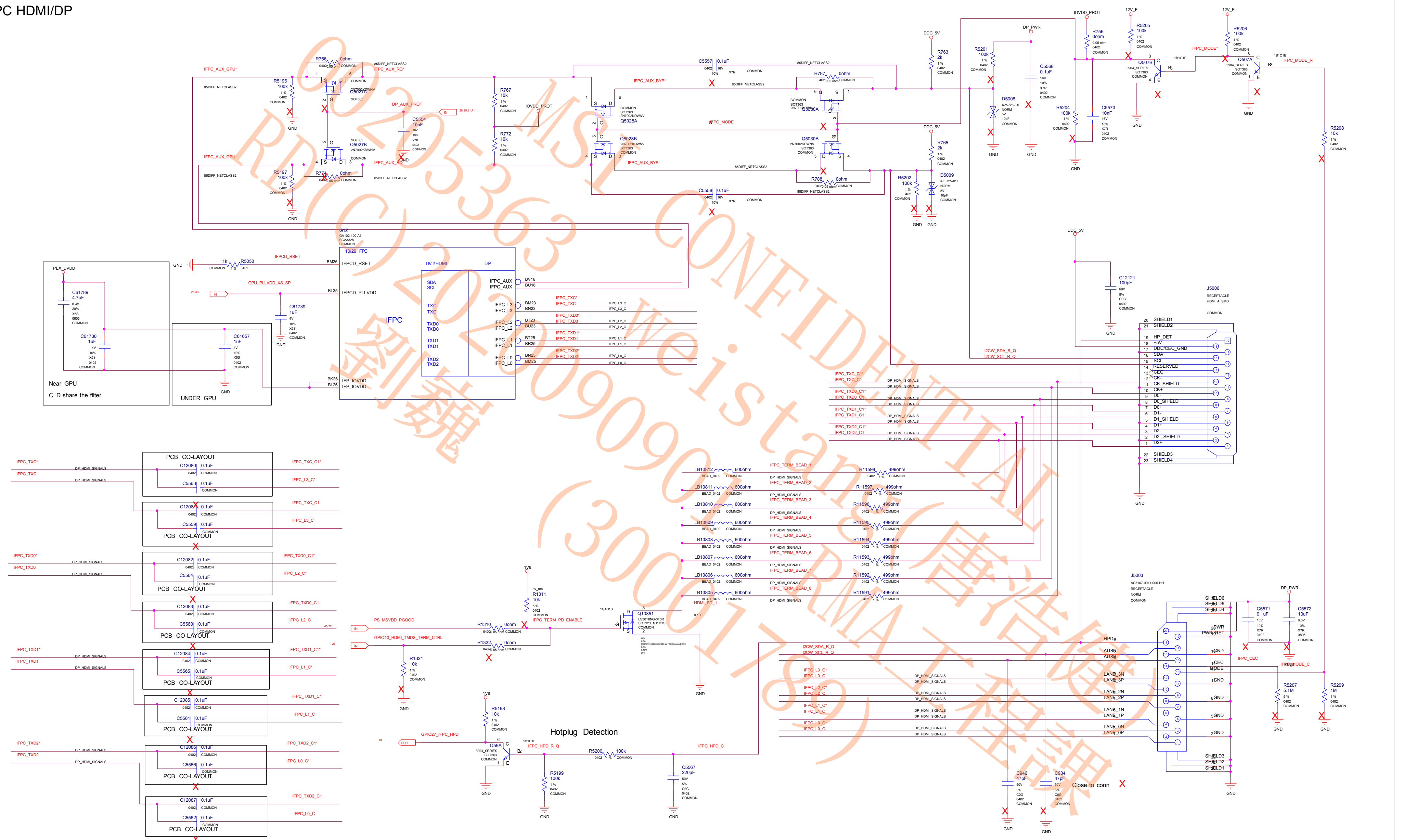
IFPC HDMI/DP



IFPC
IFPC_RSET
IFPCD_PLLVDD
IFP_IOVDD
DVI/HDMI
DP
IFPC_AUX
IFPC_AUX_GPU
IFPC_AUX_BYP
IFPC_MODE
DP_AUX_PROT
IOVDD_PROT
DDC_5V
DP_PWR
12V_F
PEX_DVDD
Near GPU
C, D share the filter
UNDER GPU
PCB CO-LAYOUT
IFPC_TXC
IFPC_TXD0
IFPC_TXD1
IFPC_TXD2
J5006
RECEPTACLE
HDMI_A_SMD
J5003
SHIELD1
SHIELD2
HP_DET
+5V
DDC/CEC_GND
SDA
SCL
RESERVED
CEC
CK-
CK_SHIELD
CK+
D0-
D0_SHIELD
D0+
D1-
D1_SHIELD
D1+
D2-
D2_SHIELD
D2+
SHIELD3
SHIELD4
IFPC_TERM_BEAD_1
PS_MSVDD_PGOOD
GPIO10_HDMI_TMDS_TERM_CTRL
IFPC_TERM_PD_ENABLE
GPIO27_IFPC_HPD
IFPC_HPD_R_Q
IFPC_HPD_C
Hotplug Detection
Close to conn
I2CW_SDA_R_Q
I2CW_SCL_R_Q
GND

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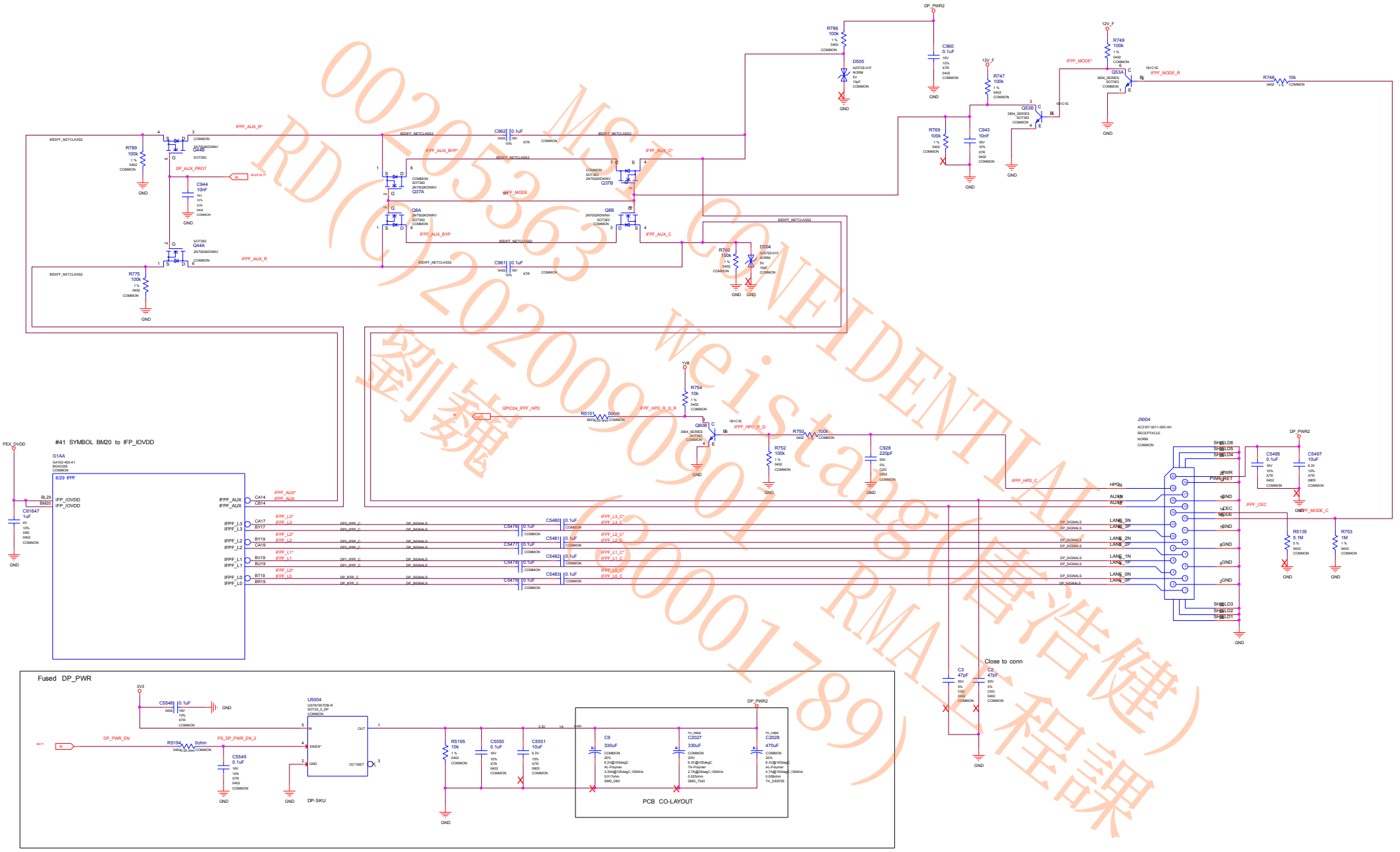

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MISC: ROM, Straps

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

GROUP0

STRAP2	STRAP1	STRAP0	RAMCFG[4:0]		
L	L	L	00000	RAMCFG MICRON 8Gb G6X 19Gbps x16 (161-0430-900)	<-A01 PCB
H	L	L	00100	RAMCFG MICRON 8Gb G6X 19Gbps x8 (161-0430-900)	
H	L	H	00101	RAMCFG MICRON 8Gb G6X 21Gbps x8 (161-0431-900)	
L	L	M	01000	RAMCFG MICRON 8Gb G6X 20Gbps x16 (161-0424-900)	
L	L	H	00001	RAMCFG MICRON 8Gb G6X 21Gbps x16 (161-0431-900)	<-OLD
L	M	H	01010	RAMCFG MICRON 8Gb G6X 19Gbps x16 (161-0430-900)	<-LATEST A02 PCB

ROM_SO	ROM_SI	ROM_SCLK	SMARTFAN[2:0],FS_OVERT	1:ENABLE 0:DISABLE	
H	H	H	0111	FS_OVERT ENABLE	DEFAULT
L	L	L	0000	FS_OVERT DISABLE	

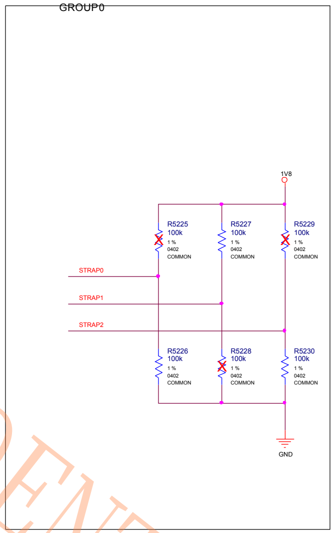
1:SMB_ALT_ADDR ENABLE
0:SMB_ALT_ADDR DISABLE

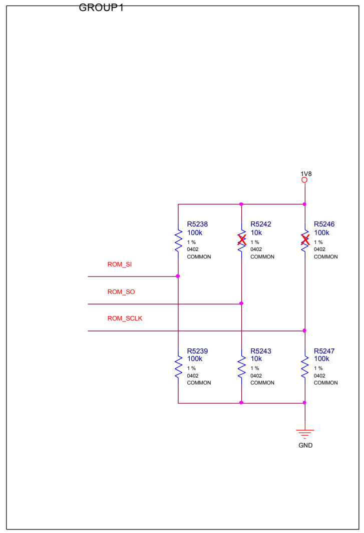
1:DEVID_SEL REBRAND
0:DEVID_SEL ORIGNAL

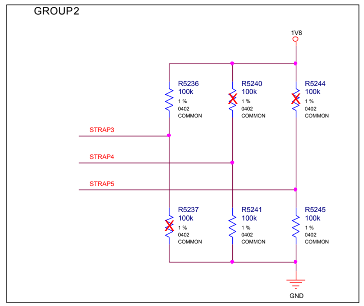
1:PCIE_CFG LOW POWER
0:PCIE_CFG HIGH POWER

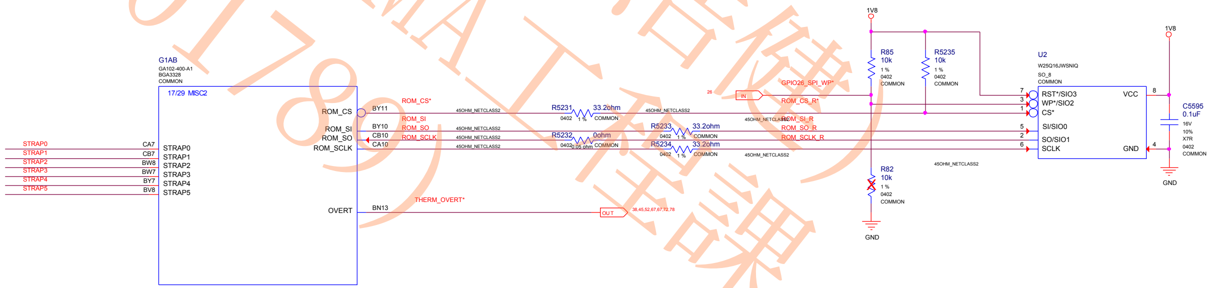
1:VGA_DEVICE ENABLE
0:VGA_DEVICE DISABLE

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	









MICRO-STAR INT'L CO.,LTD		
MS-V389		
Size: Custom	Document Description: MISC: ROM, Straps	Rev 1.2
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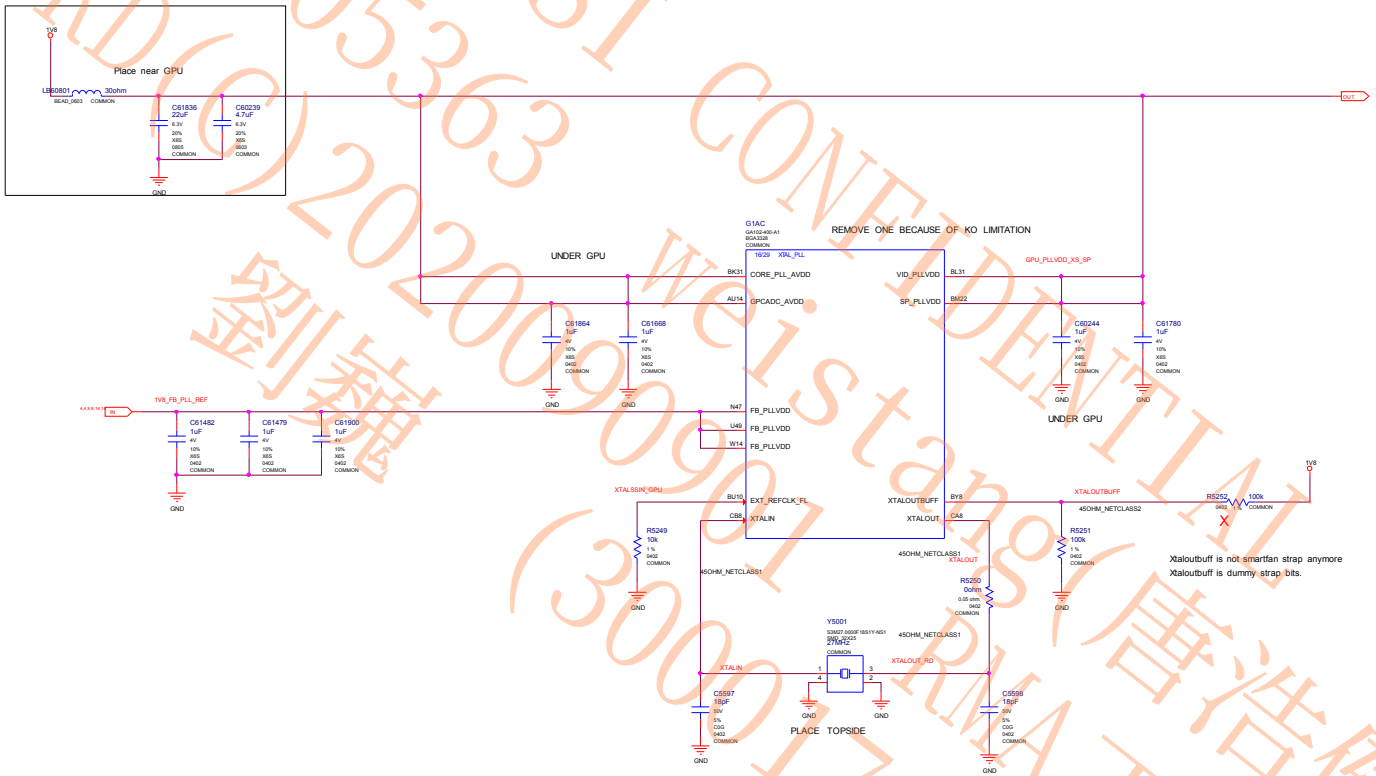
MISC: XTAL. PLL



MICRO-STAR INT'L CO.,LTD		
MS-V389		
Size: Custom	Document Description: MISC: XTAL. PLL	Rev: 1.2
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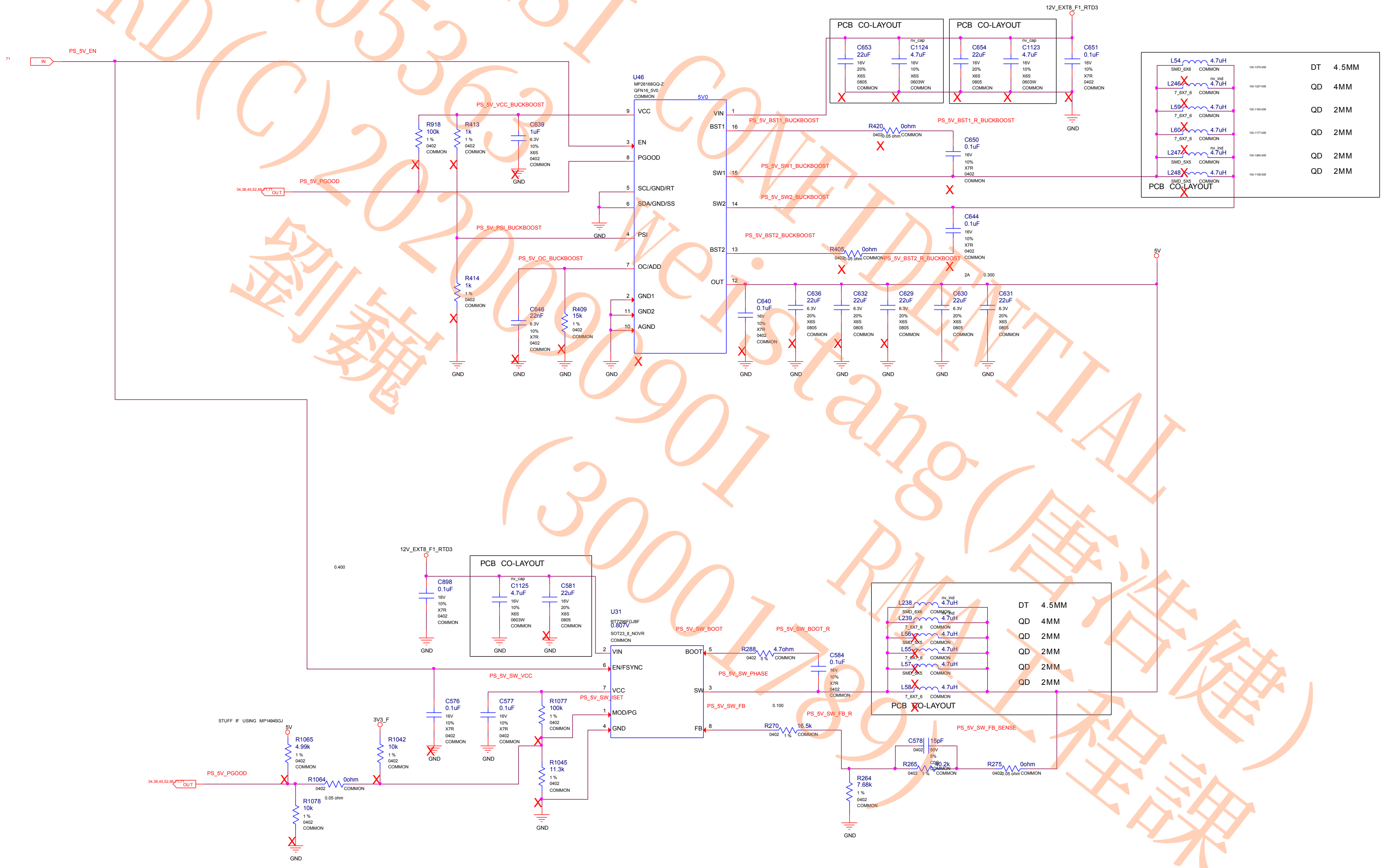
PS: 5V, 5V_BACKUP



PS_5V_EN
IN
U46
MP28168GQ-Z
QFN16_5V0
VCC
EN
PGOOD
SCL/GND/RT
SDA/GND/SS
PSI
OC/ADD
GND1
GND2
AGND
VIN
BST1
SW1
SW2
BST2
OUT
PS_5V_VCC_BUCKBOOST
PS_5V_PGOOD
PS_5V_PSI_BUCKBOOST
PS_5V_OC_BUCKBOOST
PS_5V_BST1_BUCKBOOST
PS_5V_BST1_R_BUCKBOOST
PS_5V_SW1_BUCKBOOST
PS_5V_SW2_BUCKBOOST
PS_5V_BST2_BUCKBOOST
PS_5V_BST2_R_BUCKBOOST
12V_EXT8_F1_RTD3
PCB CO-LAYOUT
5V
GND
U31
SOT23_8_NOVR
EN/FSYNC
BOOT
MOD/PG
SW
FB
PS_5V_SW_VCC
PS_5V_SW_BOOT
PS_5V_SW_BOOT_R
PS_5V_SW_PHASE
PS_5V_SW_ISET
PS_5V_SW_FB
PS_5V_SW_FB_R
PS_5V_SW_FB_SENSE
STUFF IF USING MP1494SGJ
3V3_F
DT 4.5MM
QD 4MM
QD 2MM

MICRO-STAR INT'L CO.,LTD		
MS-V389		
Size: Custom	Document Description: PS: 5V, 5V_BACKUP	Rev: 1.2
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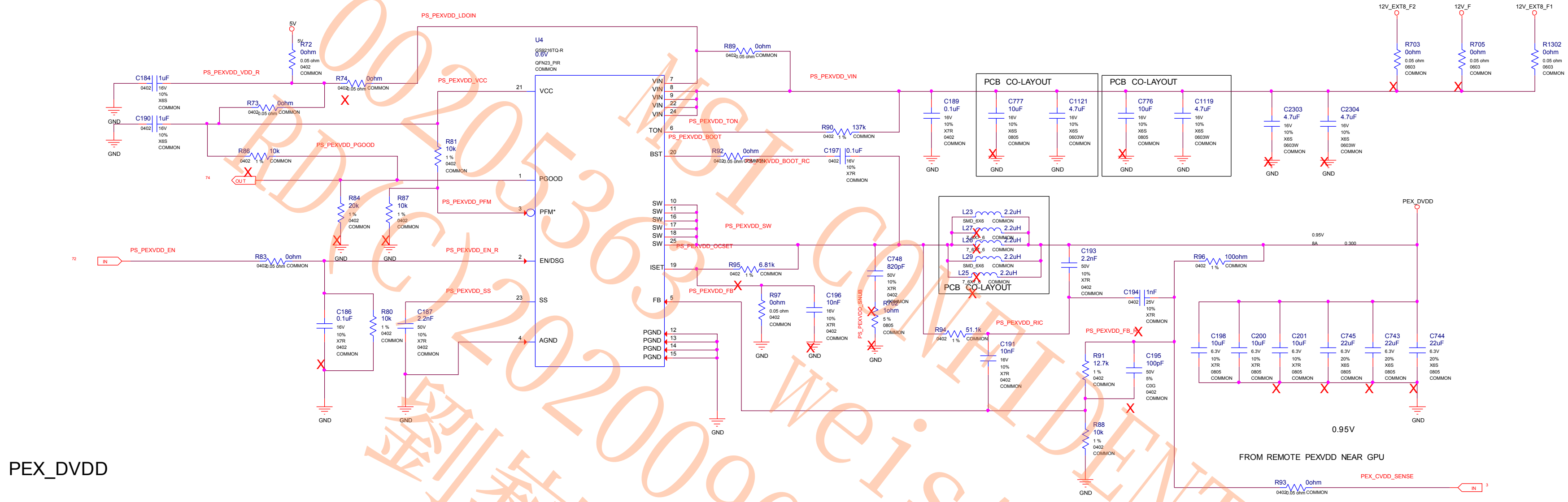
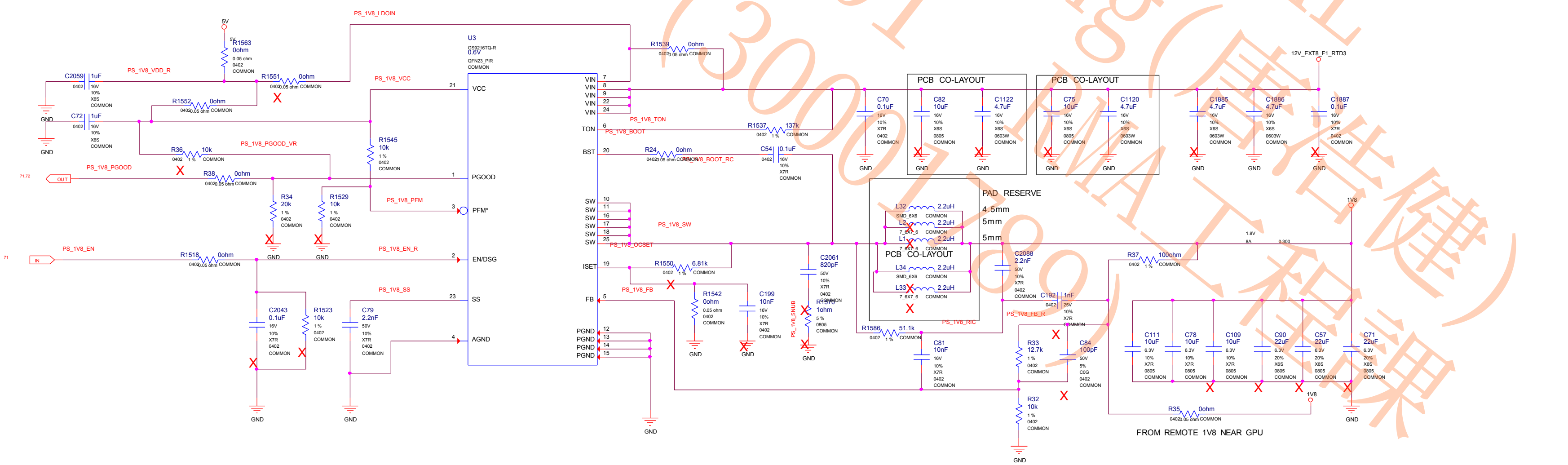
PS: PEX_DVDD 1V8 Rail



PS_PEXVDD_LDOIN
PS_PEXVDD_VDD_R
PS_PEXVDD_VCC
PS_PEXVDD_PGOOD
PS_PEXVDD_PFM
PS_PEXVDD_EN
PS_PEXVDD_EN_R
PS_PEXVDD_SS
PS_PEXVDD_VIN
PS_PEXVDD_TON
PS_PEXVDD_BOOT
PS_PEXVDD_BOOT_RC
PS_PEXVDD_SW
PS_PEXVDD_OCSET
PS_PEXVDD_FB
PS_PEXVDD_RIC
PS_PEXVDD_FB_R
PEX_CVDD_SENSE
U4
VCC
PGOOD
PFM*
EN/DSG
SS
AGND
VIN
TON
BST
SW
ISET
FB
PGND
5V
GND
12V_EXT8_F2
12V_F
12V_EXT8_F1
PEX_DVDD
PCB CO-LAYOUT
0.95V
FROM REMOTE PEXVDD NEAR GPU
PEX_DVDD



PS_1V8_LDOIN
PS_1V8_VDD_R
PS_1V8_VCC
PS_1V8_PGOOD_VR
PS_1V8_PGOOD
PS_1V8_PFM
PS_1V8_EN
PS_1V8_EN_R
PS_1V8_SS
PS_1V8_TON
PS_1V8_BOOT
PS_1V8_BOOT_RC
PS_1V8_SW
PS_1V8_OCSET
PS_1V8_FB
PS_1V8_RIC
PS_1V8_FB_R
U3
VCC
PGOOD
PFM*
EN/DSG
SS
AGND
VIN
TON
BST
SW
ISET
FB
PGND
5V
GND
12V_EXT8_F1_RTD3
1V8
PCB CO-LAYOUT
PAD RESERVE
4.5mm
5mm
5mm
FROM REMOTE 1V8 NEAR GPU
1V8

MICRO-STAR INT'L CO.,LTD		
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BLANK

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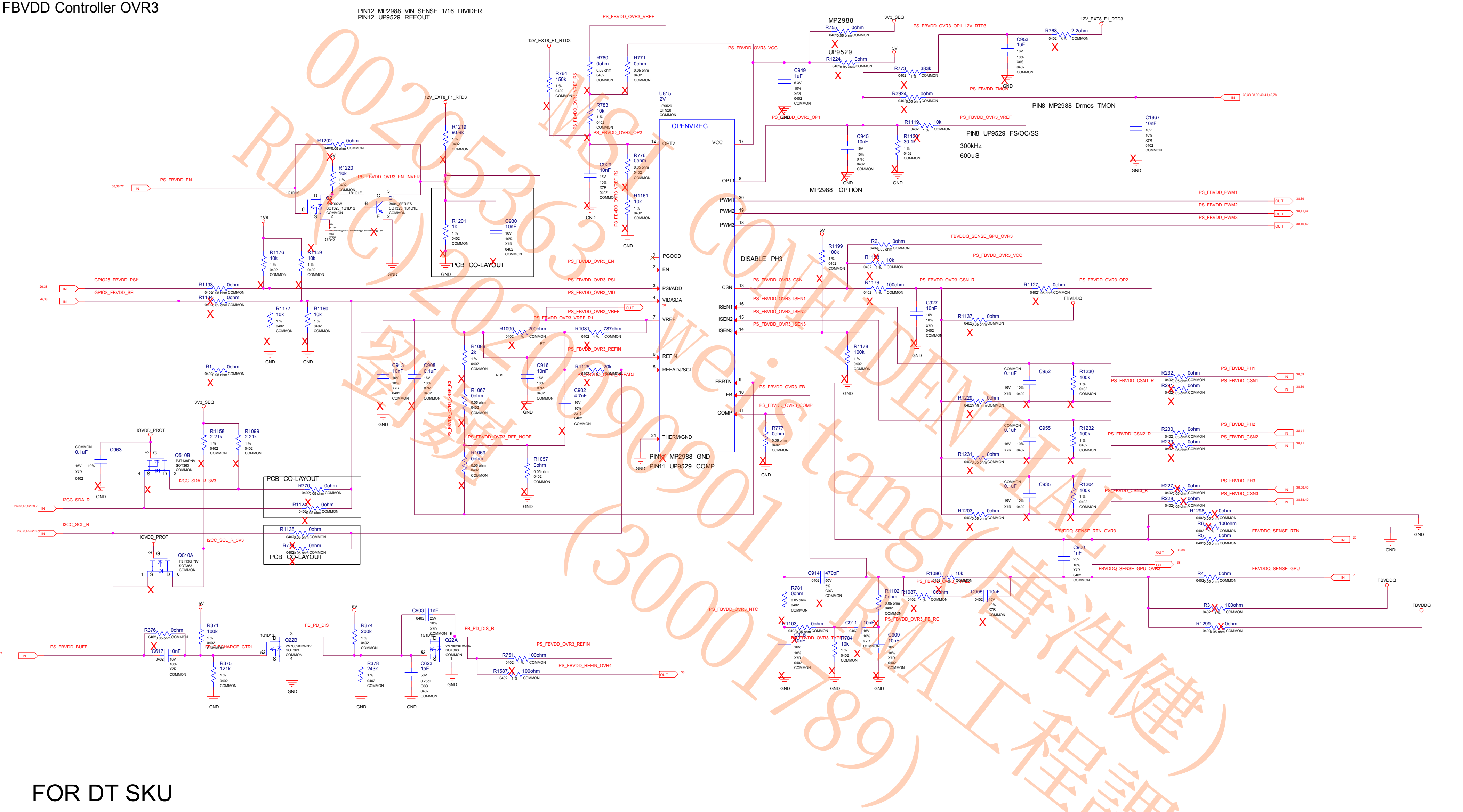
PS: FBVDD Controller OVR3



PIN12 MP2988 VIN SENSE 1/16 DIVIDER
PIN12 UP9529 REFOUT
U815
OPENVREG
MP2988
UP9529
PIN8 MP2988 Drmos TMON
PIN8 UP9529 FS/OC/SS
300kHz
600uS
MP2988 OPTION
DISABLE PH3
PIN11 MP2988 GND
PIN11 UP9529 COMP
PCB CO-LAYOUT
PS_FBVDD_EN
PS_FBVDD_OVR3_VREF
PS_FBVDD_OVR3_VCC
PS_FBVDD_PWM1
PS_FBVDD_PWM2
PS_FBVDD_PWM3
PS_FBVDD_PH1
PS_FBVDD_PH2
PS_FBVDD_PH3
PS_FBVDD_CSN1
PS_FBVDD_CSN2
PS_FBVDD_CSN3
FBVDDQ_SENSE_RTN
FBVDDQ_SENSE_GPU
PS_FBVDD_BUFF
FB_PD_DIS
FB_PD_DIS_R
I2CC_SDA_R
I2CC_SCL_R
GPIO25_FBVDD_PSI*
GPIO8_FBVDD_SEL

FOR DT SKU

MICRO-STAR INT'L CO.,LTD		
MS-V389		
Size: Custom	Document Description: PS: FBVDD Controller OVR3	Rev: 1.2
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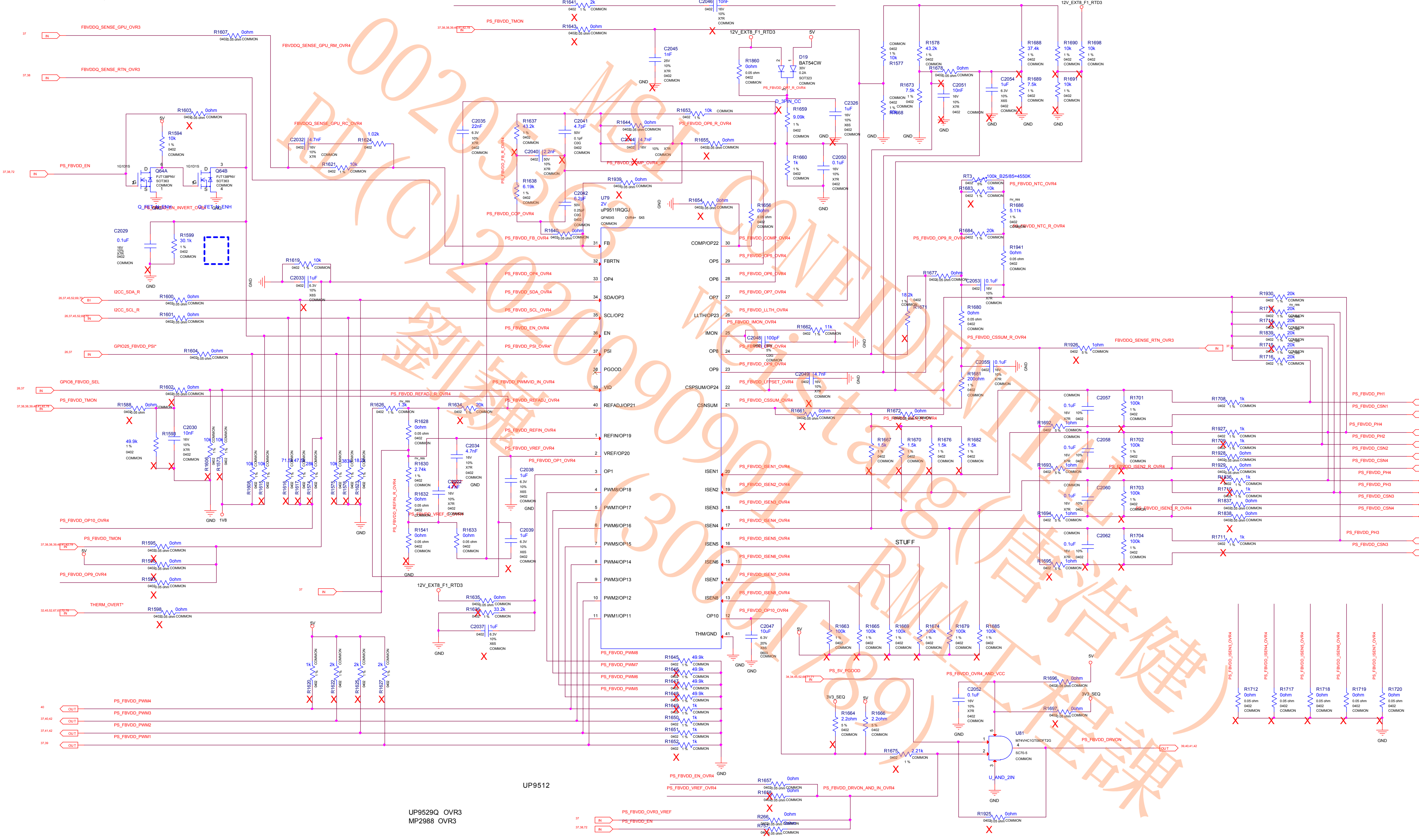
PS:FBVDDQ OVR4



U79
uP9511RQGJ
QFN5X5
FB
FBRTN
OP4
SDA/OP3
SCL/OP2
EN
PSI
PGOOD
VID
REFADJ/OP21
REFIN/OP19
VREF/OP20
OP1
PWM8/OP18
PWM7/OP17
PWM6/OP16
PWM5/OP15
PWM4/OP14
PWM3/OP13
PWM2/OP12
PWM1/OP11
COMP/OP22
OP5
OP6
OP7
LLTH/OP23
IMON
OP8
OP9
CSPSUM/OP24
CSNSUM
ISEN1
ISEN2
ISEN3
ISEN4
ISEN5
ISEN6
ISEN7
ISEN8
OP10
THM/GND
Q64A
Q64B
PJT138PNV
D19
BAT54CW
U81
U_AND_2IN
STUFF
UP9512
UP9529Q OVR3
MP2988 OVR3
FBVDDQ_SENSE_GPU_OVR3
FBVDDQ_SENSE_RTN_OVR3
FBVDDQ_SENSE_RTN_OVR3
PS_FBVDD_EN
PS_FBVDD_TMON
PS_FBVDD_OP10_OVR4
PS_FBVDD_OP9_OVR4
THERM_OVERT*
PS_FBVDD_PWM4
PS_FBVDD_PWM3
PS_FBVDD_PWM2
PS_FBVDD_PWM1
PS_FBVDD_PH1
PS_FBVDD_CSN1
PS_FBVDD_PH4
PS_FBVDD_PH2
PS_FBVDD_CSN2
PS_FBVDD_CSN4
PS_FBVDD_PH3
PS_FBVDD_CSN3
PS_FBVDD_DRVON
PS_5V_PGOOD
PS_FBVDD_OVR4_AND_VCC
PS_FBVDD_EN_OVR4
PS_FBVDD_VREF_OVR4
PS_FBVDD_DRVON_AND_IN_OVR4
PS_FBVDD_OVR3_VREF
12V_EXT8_F1_RTD3
3V3_SEQ

MICRO-STAR INT'L CO.,LTD		
MS-V389		
Size: Custom	Document Description: PS:FBVDDQ OVR4	Rev: 1.2
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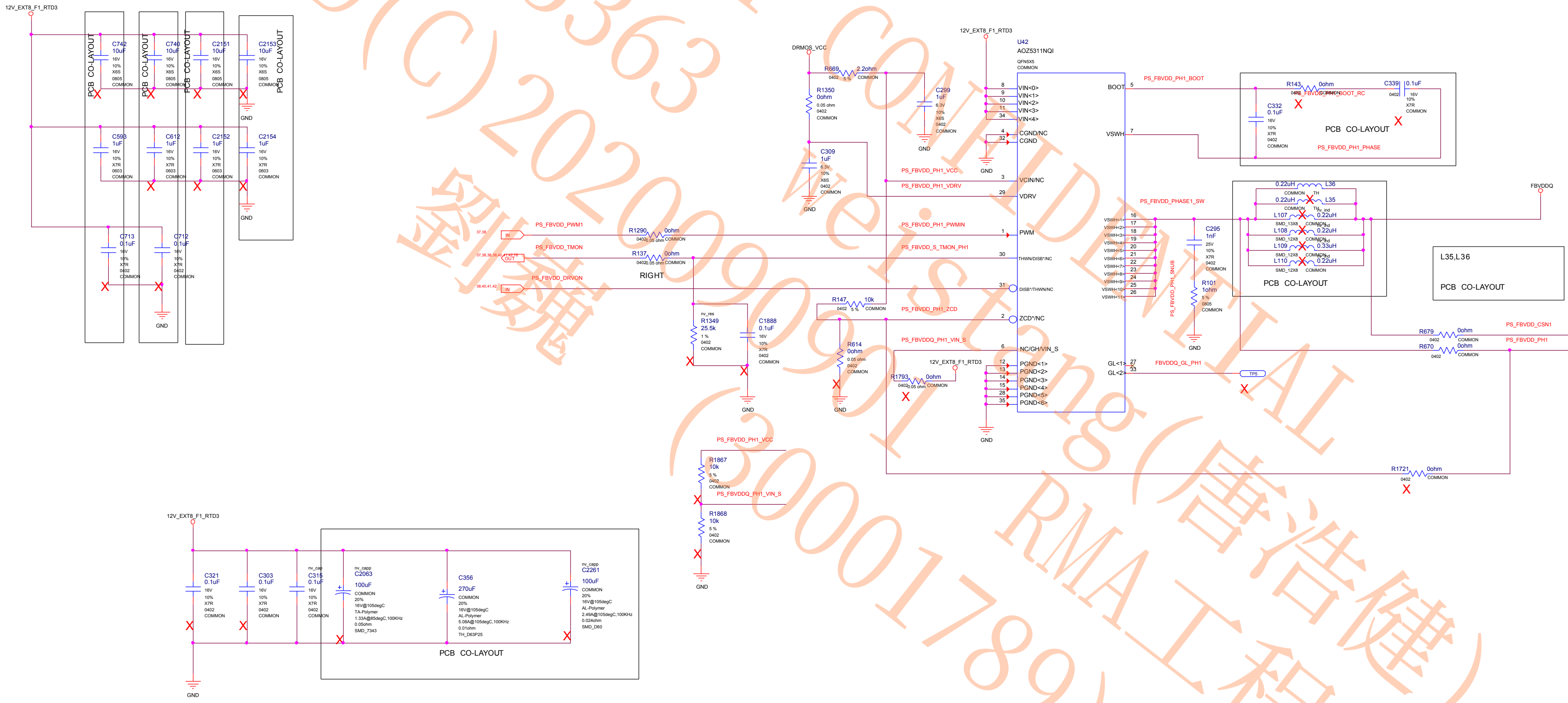
PS: FBVDD PH1


12V_EXT8_F1_RTD3
C742 10uF
C740 10uF
C2151 10uF
C2153 10uF
C593 1uF
C612 1uF
C2152 1uF
C2154 1uF
C713 0.1uF
C712 0.1uF
PCB CO-LAYOUT
GND
DRMOS_VCC
R669 2.2ohm
R1350 0ohm
C309 1uF
C299 1uF
U42
AOZ5311NQI
VIN<0>
VIN<1>
VIN<2>
VIN<3>
VIN<4>
CGND/NC
CGND
VCIN/NC
VDRV
PWM
THWN/DISB*/NC
DISB*/THWN/NC
ZCD*/NC
NC/GH/VIN_S
PGND<1>
PGND<2>
PGND<3>
PGND<4>
PGND<5>
PGND<6>
BOOT
VSWH
GL<1>
GL<2>
PS_FBVDD_PWM1
PS_FBVDD_TMON
PS_FBVDD_DRVON
R1290 0ohm
R137 0ohm
RIGHT
R1349 25.5k
C1888 0.1uF
R147 10k
R614 0ohm
R1793 0ohm
PS_FBVDD_PH1_VCC
PS_FBVDD_PH1_VDRV
PS_FBVDD_PH1_PWMIN
PS_FBVDD_S_TMON_PH1
PS_FBVDD_PH1_ZCD
PS_FBVDDQ_PH1_VIN_S
PS_FBVDD_PH1_BOOT
R143 0ohm
C339 0.1uF
C332 0.1uF
PS_FBVDD_PH1_PHASE
PS_FBVDD_PHASE1_SW
C295 1nF
R101 1ohm
L36 0.22uH
L35 0.22uH
L107 0.22uH
L108 0.22uH
L109 0.33uH
L110 0.22uH
FBVDDQ
L35,L36
PCB CO-LAYOUT
R679 0ohm
R670 0ohm
PS_FBVDD_CSN1
PS_FBVDD_PH1
FBVDDQ_GL_PH1
R1721 0ohm
R1867 10k
R1868 10k
C321 0.1uF
C303 0.1uF
C315 0.1uF
C2063 100uF
C356 270uF
C2261 100uF

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Size: Custom	Document Description: PS: FBVDD PH1	Rev 1.2
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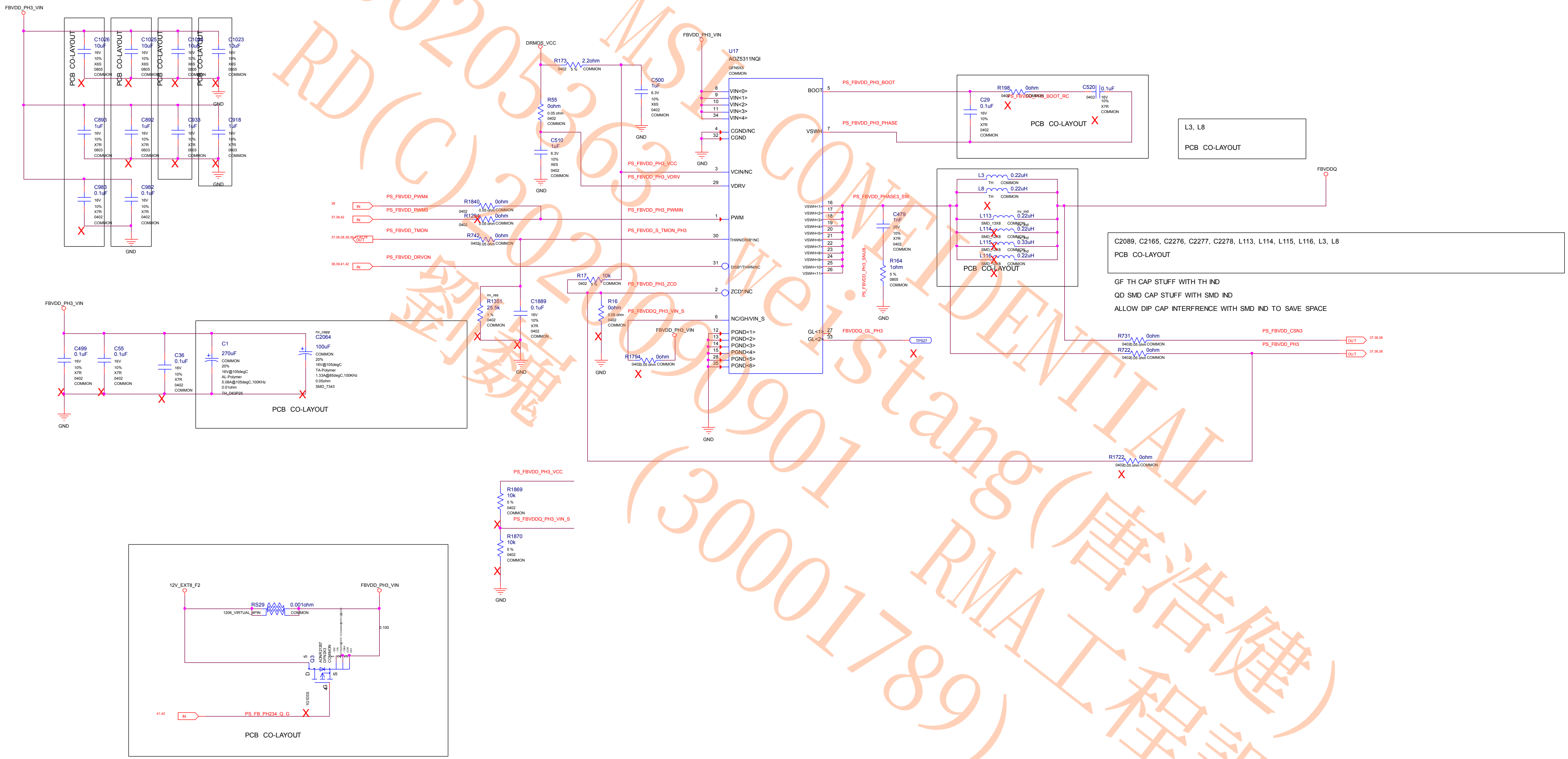
PS: FBVDD PH3


FBVDD_PH3_VIN
PCB CO-LAYOUT
C1026 10uF
C1025 10uF
C1024 10uF
C1023 10uF
C893 1uF
C892 1uF
C933 1uF
C918 1uF
C983 0.1uF
C982 0.1uF
GND
DRMOS_VCC
R173 2.2ohm
C500 1uF
R55 0ohm
C510 1uF
U17
AOZ5311NQI
VIN<0>
VIN<1>
VIN<2>
VIN<3>
VIN<4>
CGND/NC
CGND
VCIN/NC
VDRV
PWM
THWN/DISB#/NC
DISB#/THWN/NC
ZCD#/NC
NC/GH/VIN_S
PGND<1>
PGND<2>
PGND<3>
PGND<4>
PGND<5>
PGND<6>
BOOT
VSWH
GL<1>
GL<2>
PS_FBVDD_PH3_BOOT
PS_FBVDD_PH3_PHASE
PS_FBVDD_PH3_BOOT_RC
R198 0ohm
C520 0.1uF
C29 0.1uF
L3, L8
PCB CO-LAYOUT
FBVDDQ
L3 0.22uH
L8 0.22uH
L113 0.22uH
L114 0.22uH
L115 0.33uH
L116 0.22uH
PS_FBVDD_PHASE3_SW
C479 1nF
R164 1ohm
PS_FBVDD_PH3_VCC
PS_FBVDD_PH3_VDRV
PS_FBVDD_PWM4
PS_FBVDD_RWM3
PS_FBVDD_TMON
PS_FBVDD_DRVON
R1840 0ohm
R1291 0ohm
R742 0ohm
PS_FBVDD_PH3_PWMIN
PS_FBVDD_S_TMON_PH3
R17 10k
PS_FBVDD_PH3_ZCD
R1351 25.5k
C1889 0.1uF
R16 0ohm
PS_FBVDDQ_PH3_VIN_S
R1794 0ohm
FBVDDQ_GL_PH3
TP527
C2089, C2165, C2276, C2277, C2278, L113, L114, L115, L116, L3, L8
PCB CO-LAYOUT
GF TH CAP STUFF WITH TH IND
QD SMD CAP STUFF WITH SMD IND
ALLOW DIP CAP INTERFERENCE WITH SMD IND TO SAVE SPACE
R731 0ohm
R722 0ohm
PS_FBVDD_CSN3
PS_FBVDD_PH3
R1722 0ohm
C499 0.1uF
C55 0.1uF
C36 0.1uF
C1 270uF
C2264 100uF
R1869 10k
R1870 10k
12V_EXT8_F2
RS29 0.001ohm
Q3
PS_FB_PH234_Q_G

FBVDD PH3 INPUT ANTI-BACKDRIVE

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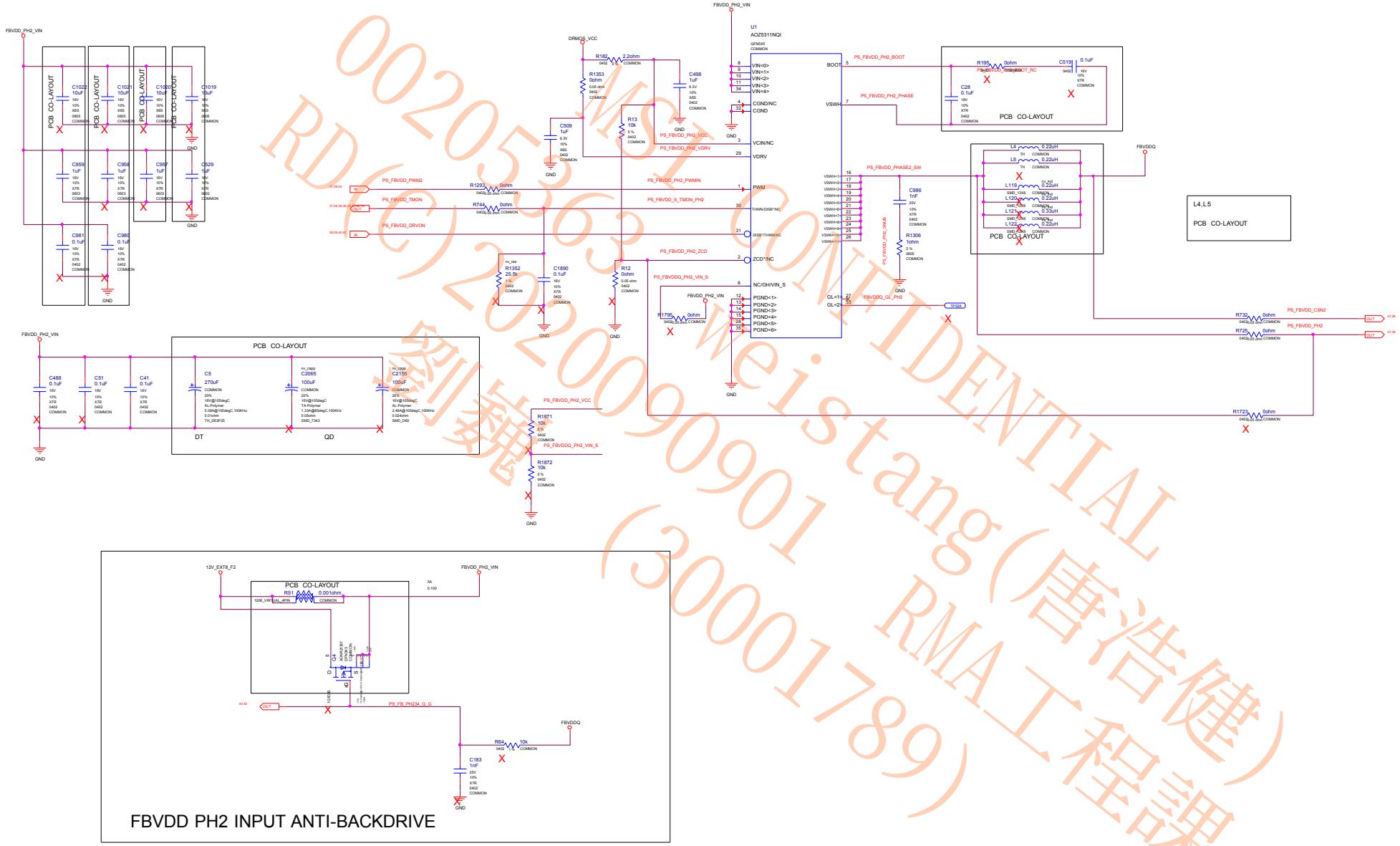
PS: FBVDD PH2



MSI	MICRO-STAR INT'L CO.,LTD	
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Size: Custom	Document Description: PS: FBVDD PH2	Rev: 1.2
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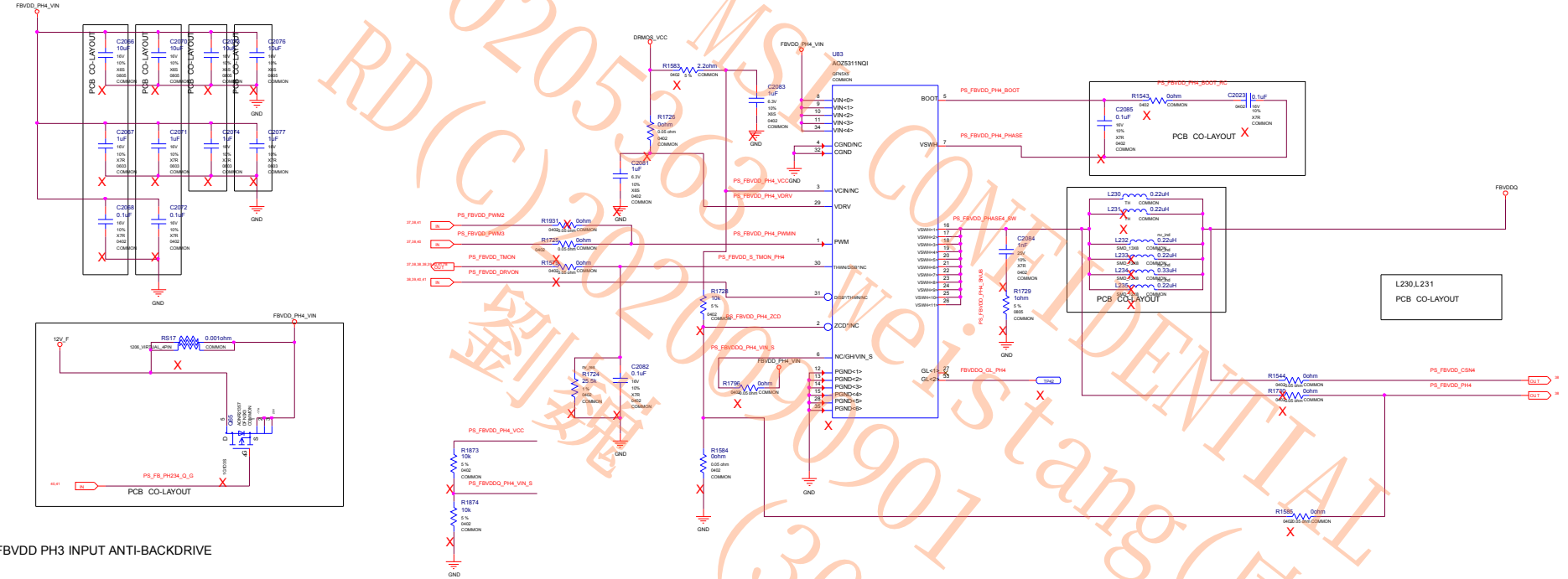
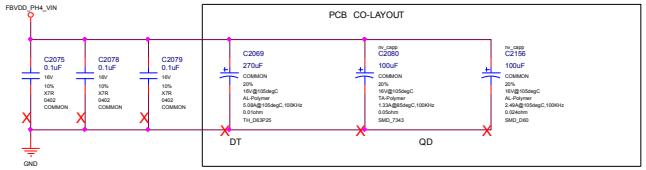
PS: FBVDD PH4



FBVDD PH3 INPUT ANTI-BACKDRIVE



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Size: Custom	Document Description: PS: FBVDD PH4	Rev: 1.2
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PS: FBVDD OUTPUT CAP

3x 820uF TH FBVDD OUTPUT BULK CAPS

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Size: Custom	Document Description: PS: FBVDD OUTPUT CAP	Rev: 1.2
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Added for A01 x16

ADDED FOR A00 X16 DESIGN: PLACE UNDER MEMORIES

MSI	MICRO-STAR INT'L CO.,LTD	
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Size: Custom	Document Description: PS: FBVDD_OUTPUT_CAP_NEAR_MEMORY	Rev: 1.2
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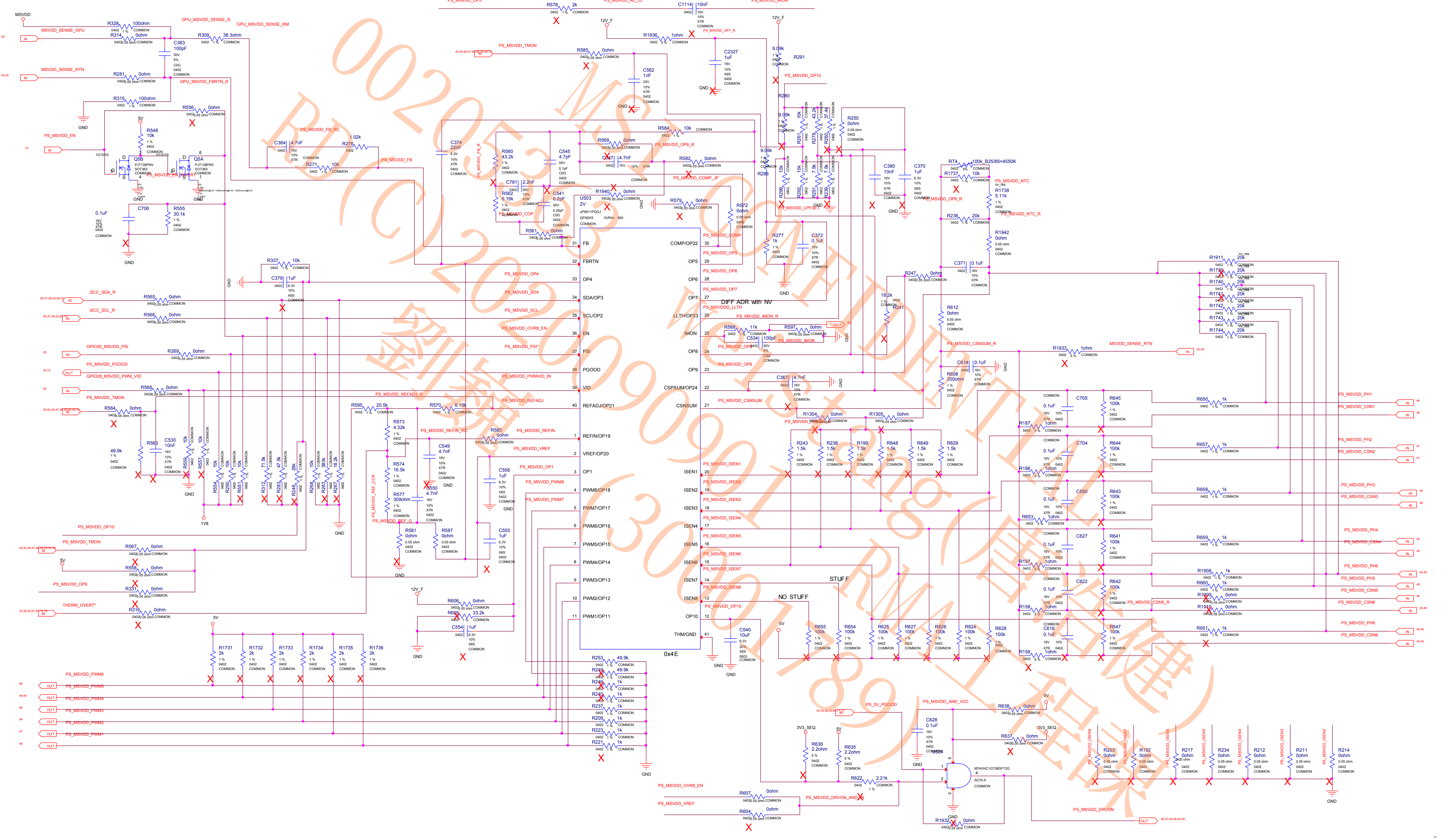
PS: MSVDD



U503
uP9511PQGJ
QFN5X5
FB
FBRTN
OP4
SDA/OP3
SCL/OP2
EN
PSI
PGOOD
VID
REFADJ/OP21
REFIN/OP19
VREF/OP20
OP1
PWM8/OP18
PWM7/OP17
PWM6/OP16
PWM5/OP15
PWM4/OP14
PWM3/OP13
PWM2/OP12
PWM1/OP11
COMP/OP22
OP5
OP6
OP7
LLTH/OP23
IMON
OP8
OP9
CSPSUM/OP24
CSNSUM
ISEN1
ISEN2
ISEN3
ISEN4
ISEN5
ISEN6
ISEN7
ISEN8
OP10
THM/GND
0x4E
DIFF ADR with NV
STUFF
NO STUFF
MSVDD_SENSE_GPU
MSVDD_SENSE_RTN
GPU_MSVDD_SENSE_R
GPU_MSVDD_SENSE_RM
GPU_MSVDD_FBRTN_R
PS_MSVDD_EN
I2CC_SDA_R
I2CC_SCL_R
GPIO30_MSVDD_PSI
PS_MSVDD_PGOOD
GPIO28_MSVDD_PWM_VID
PS_MSVDD_TMON
PS_MSVDD_OP10
PS_MSVDD_OP9
THERM_OVERT*
PS_MSVDD_PWM6
PS_MSVDD_PWM5
PS_MSVDD_PWM4
PS_MSVDD_PWM3
PS_MSVDD_PWM2
PS_MSVDD_PWM1
PS_MSVDD_OVR8_EN
PS_MSVDD_VREF
PS_MSVDD_DRVON_AND_VCC
PS_MSVDD_DRVON
PS_5V_PGOOD
MSVDD_SENSE_RTN
PS_MSVDD_PH1
PS_MSVDD_CSN1
PS_MSVDD_PH2
PS_MSVDD_CSN2
PS_MSVDD_PH3
PS_MSVDD_CSN3
PS_MSVDD_PH4
PS_MSVDD_CSN4
PS_MSVDD_PH5
PS_MSVDD_CSN5
PS_MSVDD_PH6
PS_MSVDD_CSN6
MSVDD
12V_F
5V
3V3_SEQ
1V8
GND

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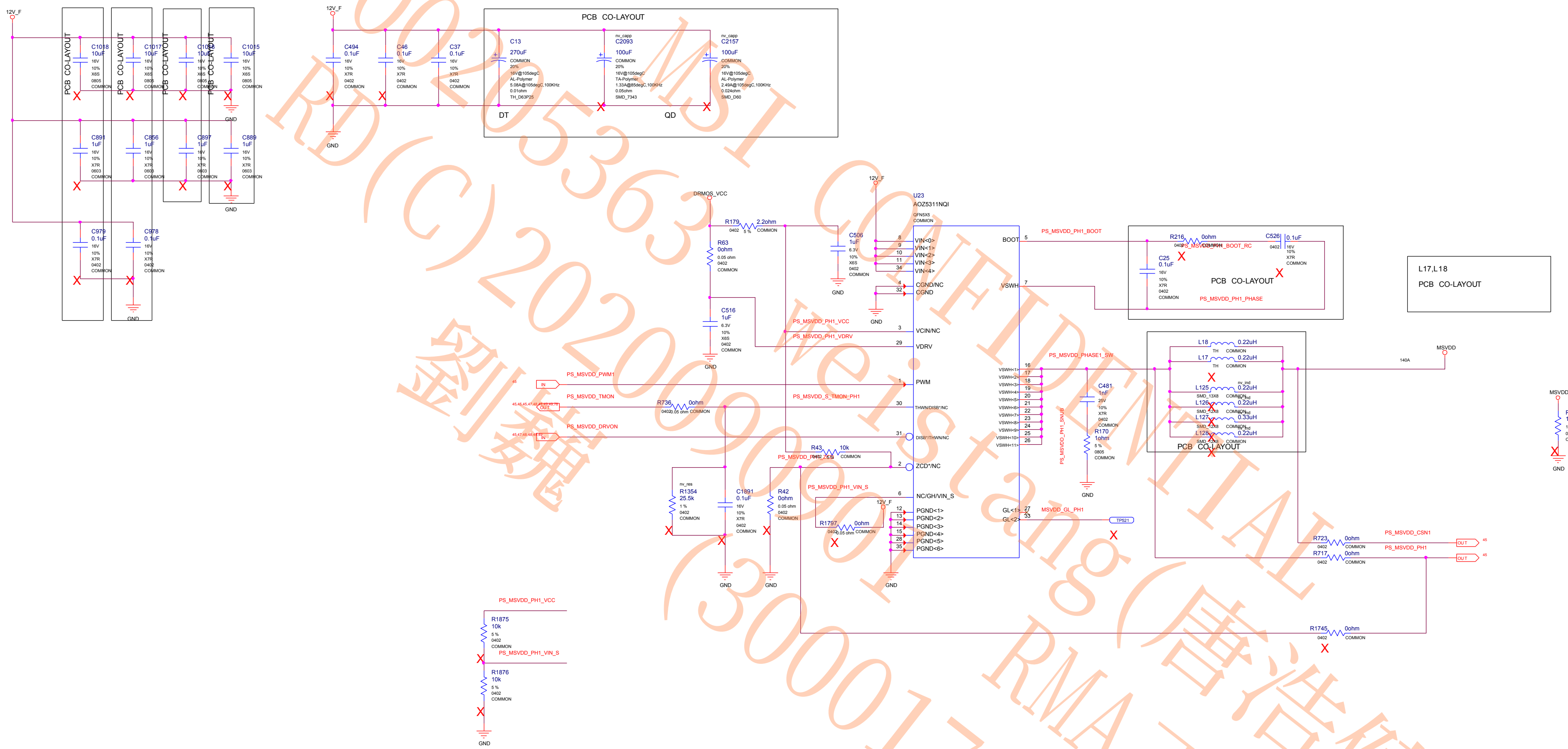
PS: MSVDD Phase 1



12V_F
PCB CO-LAYOUT
C1018 10uF
C1017 10uF
C1015 10uF
C891 1uF
C856 1uF
C897 1uF
C889 1uF
C979 0.1uF
C978 0.1uF
GND
C494 0.1uF
C46 0.1uF
C37 0.1uF
C13 270uF
C2093 100uF
C2157 100uF
DT
QD
DRMOS_VCC
R179 2.2ohm
R63 0ohm
C516 1uF
C506 1uF
U23
AOZ5311NQI
BOOT
VSWH
VIN<0>
VIN<1>
VIN<2>
VIN<3>
VIN<4>
CGND/NC
CGND
VCIN/NC
VDRV
PWM
THWN/DISB*/NC
DISB*/THWN/NC
ZCD*/NC
NC/GH/VIN_S
PGND<1>
PGND<2>
PGND<3>
PGND<4>
PGND<5>
PGND<6>
GL<1>
GL<2>
PS_MSVDD_PH1_BOOT
PS_MSVDD_PH1_BOOT_RC
PS_MSVDD_PH1_PHASE
PS_MSVDD_PH1_VCC
PS_MSVDD_PH1_VDRV
PS_MSVDD_PWM1
PS_MSVDD_TMON
PS_MSVDD_S_TMON_PH1
PS_MSVDD_DRVON
PS_MSVDD_PH1_VIN_S
PS_MSVDD_PHASE1_SW
PS_MSVDD_GL_PH1
PS_MSVDD_CSN1
PS_MSVDD_PH1
R216 0ohm
C526 0.1uF
C25 0.1uF
L17,L18
L18 0.22uH
L17 0.22uH
L125 0.22uH
L126 0.22uH
L127 0.33uH
L128 0.22uH
C481 1nF
R170 1ohm
MSVDD
140A
R100 1k
R736 0ohm
R43 10k
R1354 25.5k
C1891 0.1uF
R42 0ohm
R1797 0ohm
R723 0ohm
R717 0ohm
R1745 0ohm
TP521
R1875 10k
R1876 10k

MICRO-STAR INT'L CO.,LTD		
MS-V389		
Size: Custom	Document Description: PS: MSVDD Phase 1	Rev: 1.2
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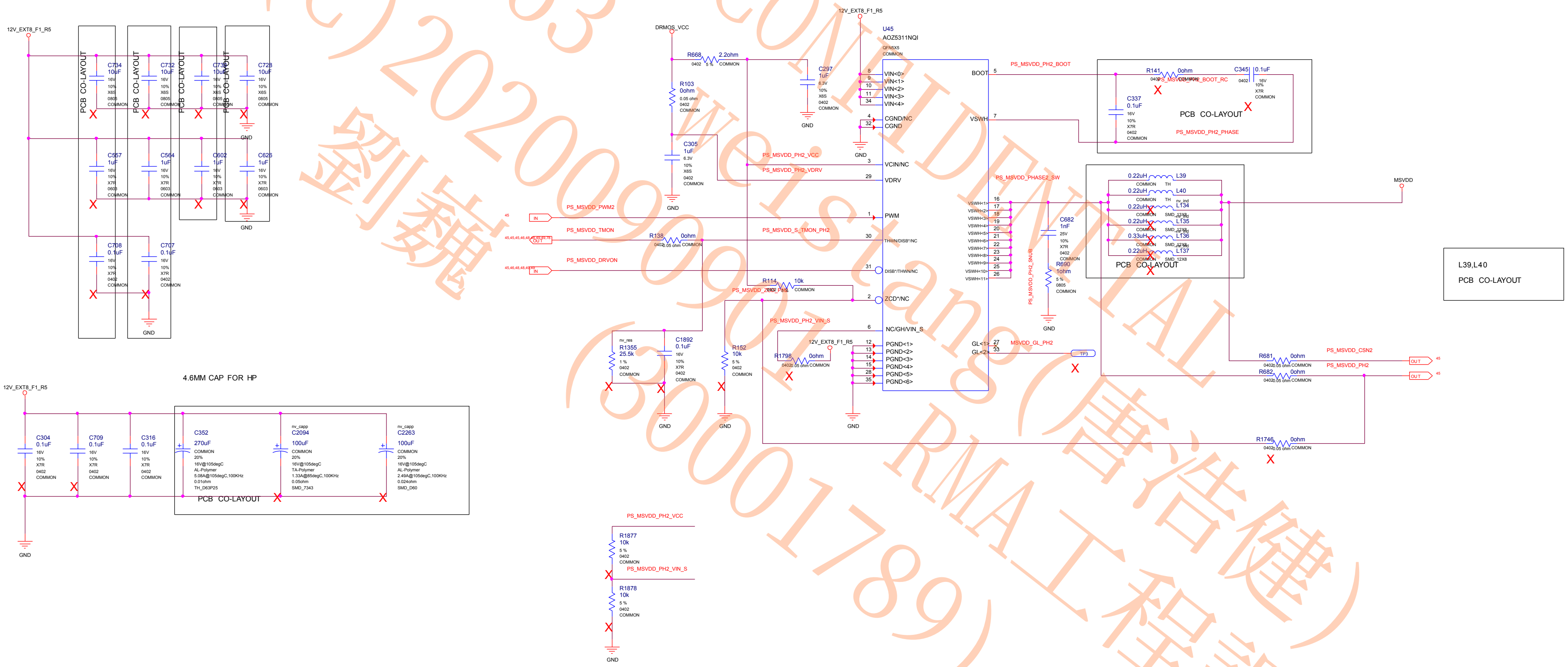
PS: MSVDD PH 2



12V_EXT8_F1_R5
PCB CO-LAYOUT
C734 10uF
C732 10uF
C733 10uF
C728 10uF
C557 1uF
C564 1uF
C602 1uF
C625 1uF
C708 0.1uF
C707 0.1uF
GND
4.6MM CAP FOR HP
C304 0.1uF
C709 0.1uF
C316 0.1uF
C352 270uF
C2094 100uF
C2263 100uF
DRMOS_VCC
R668 2.2ohm
R103 0ohm
C305 1uF
C297 1uF
U45
AOZ5311NQI
BOOT
VSWH
VIN<0>
VIN<1>
VIN<2>
VIN<3>
VIN<4>
CGND/NC
CGND
VCIN/NC
VDRV
PWM
THWN/DISB*/NC
DISB*/THWN/NC
ZCD*/NC
NC/GH/VIN_S
PGND<1>
PGND<2>
PGND<3>
PGND<4>
PGND<5>
PGND<6>
GL<1>
GL<2>
PS_MSVDD_PH2_BOOT
PS_MSVDD_PH2_VCC
PS_MSVDD_PH2_VDRV
PS_MSVDD_PWM2
PS_MSVDD_TMON
PS_MSVDD_S_TMON_PH2
PS_MSVDD_DRVON
PS_MSVDD_PH2_VIN_S
PS_MSVDD_PHASE2_SW
MSVDD_GL_PH2
R141 0ohm
C345 0.1uF
C337 0.1uF
PS_MSVDD_PH2_PHASE
PCB CO-LAYOUT
0.22uH L39
0.22uH L40
0.22uH L134
0.22uH L135
0.33uH L136
0.22uH L137
C682 1nF
R690 1ohm
MSVDD
L39,L40
PCB CO-LAYOUT
R138 0ohm
R114 10k
R1355 25.5k
C1892 0.1uF
R152 10k
R1798 0ohm
R681 0ohm
R682 0ohm
R1746 0ohm
PS_MSVDD_CSN2
PS_MSVDD_PH2
TP3
R1877 10k
R1878 10k

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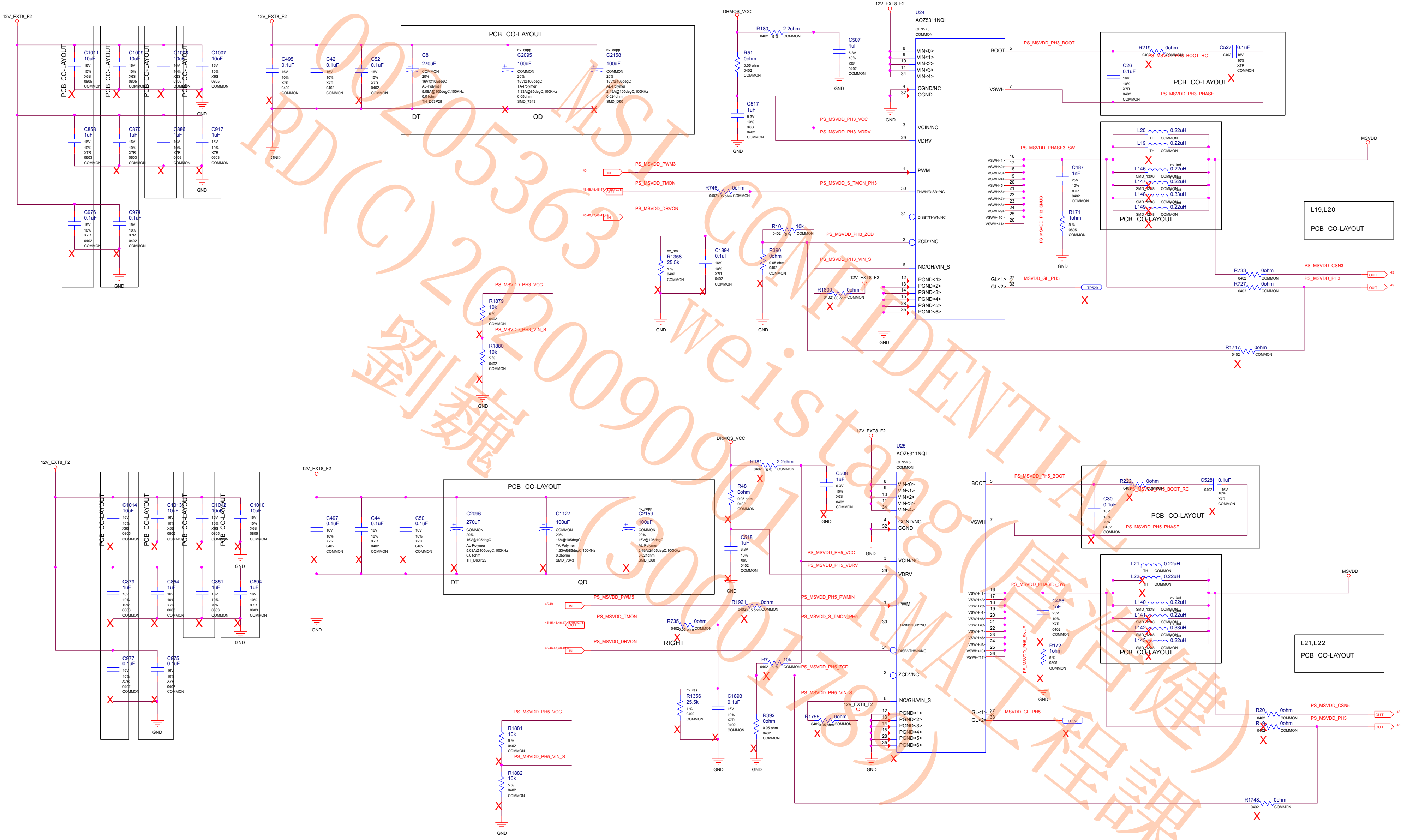
PS:MSVDD Phase 3, 5



12V_EXT8_F2
PCB CO-LAYOUT
DRMOS_VCC
U24
AOZ5311NQI
U25
AOZ5311NQI
VIN<0>
VIN<1>
VIN<2>
VIN<3>
VIN<4>
CGND/NC
CGND
VCIN/NC
VDRV
PWM
THWN/DISB*/NC
DISB*/THWN/NC
ZCD*/NC
NC/GH/VIN_S
PGND<1>
PGND<2>
PGND<3>
PGND<4>
PGND<5>
PGND<6>
BOOT
VSWH
GL<1>
GL<2>
PS_MSVDD_PH3_BOOT
PS_MSVDD_PH3_VCC
PS_MSVDD_PH3_VDRV
PS_MSVDD_PWM3
PS_MSVDD_TMON
PS_MSVDD_S_TMON_PH3
PS_MSVDD_DRVON
PS_MSVDD_PH3_ZCD
PS_MSVDD_PH3_VIN_S
PS_MSVDD_PHASE3_SW
PS_MSVDD_PH3_PHASE
MSVDD_GL_PH3
PS_MSVDD_CSN3
PS_MSVDD_PH3
PS_MSVDD_PH5_BOOT
PS_MSVDD_PH5_VCC
PS_MSVDD_PH5_VDRV
PS_MSVDD_PWM5
PS_MSVDD_PH5_PWMIN
PS_MSVDD_S_TMON_PH5
PS_MSVDD_PH5_ZCD
PS_MSVDD_PH5_VIN_S
PS_MSVDD_PHASE5_SW
PS_MSVDD_PH5_PHASE
MSVDD_GL_PH5
PS_MSVDD_CSN5
PS_MSVDD_PH5
MSVDD
L19,L20
PCB CO-LAYOUT
L21,L22
PCB CO-LAYOUT
DT
QD
RIGHT
GND

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Size: Custom	Document Description: PS:MSVDD Phase 3, 5		Rev: 1.2
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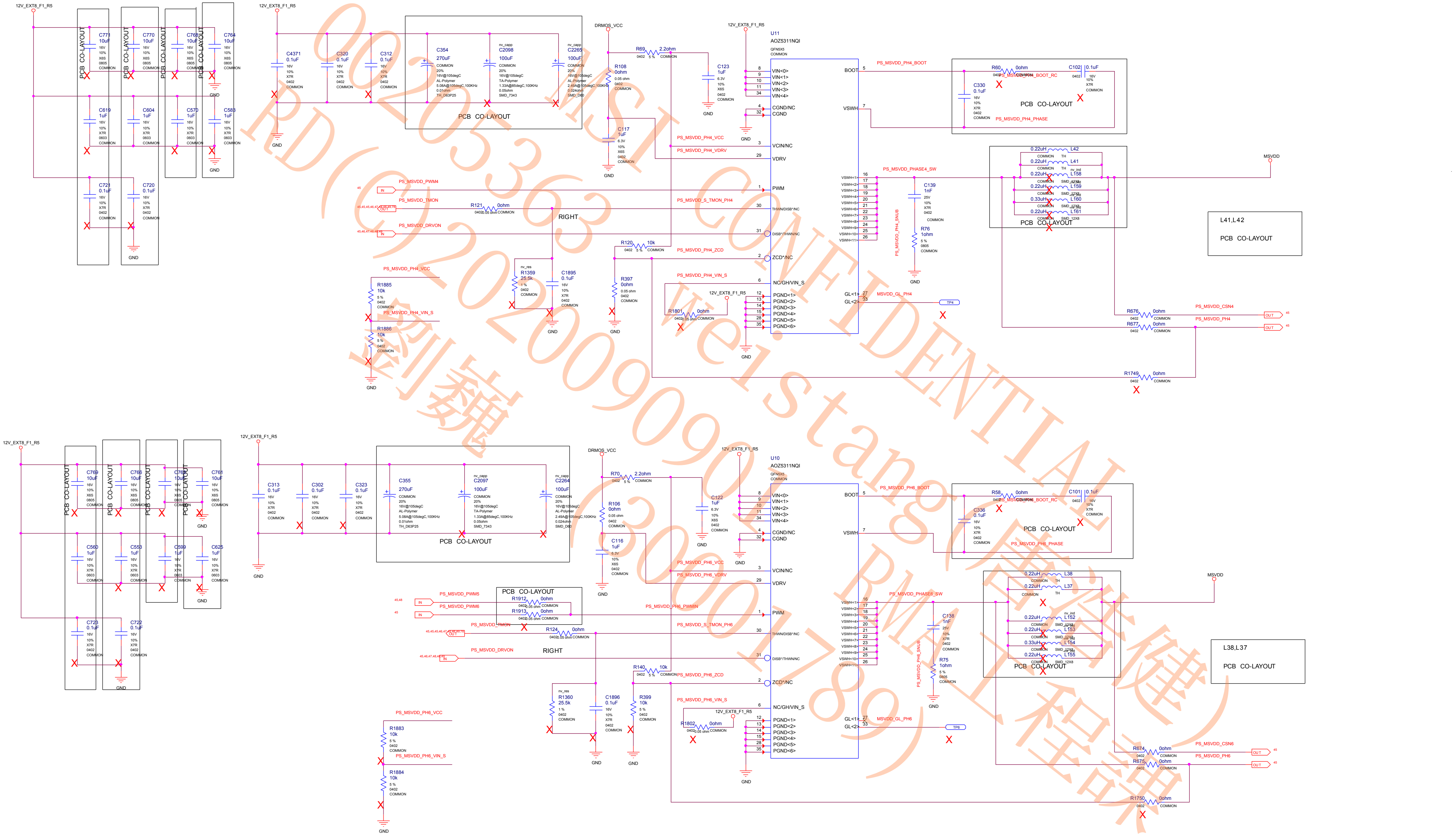
PS: MSVDD PH 4,6



12V_EXT8_F1_R5
DRMOS_VCC
MSVDD
PCB CO-LAYOUT
U11
AOZ5311NQI
U10
AOZ5311NQI
BOOT
VSWH
VCIN/NC
VDRV
PWM
THWN/DISB*/NC
DISB*/THWN/NC
ZCD*/NC
NC/GH/VIN_S
CGND/NC
CGND
GL<1>
GL<2>
RIGHT
PS_MSVDD_PH4_BOOT
PS_MSVDD_PH4_PHASE
PS_MSVDD_PH4_VCC
PS_MSVDD_PH4_VDRV
PS_MSVDD_PWM4
PS_MSVDD_TMON
PS_MSVDD_DRVON
PS_MSVDD_S_TMON_PH4
PS_MSVDD_PH4_ZCD
PS_MSVDD_PH4_VIN_S
PS_MSVDD_PHASE4_SW
MSVDD_GL_PH4
PS_MSVDD_CSN4
PS_MSVDD_PH4
PS_MSVDD_PH6_BOOT
PS_MSVDD_PH6_PHASE
PS_MSVDD_PH6_VCC
PS_MSVDD_PH6_VDRV
PS_MSVDD_PWM5
PS_MSVDD_PWM6
PS_MSVDD_PH6_PWMIN
PS_MSVDD_S_TMON_PH6
PS_MSVDD_PH6_ZCD
PS_MSVDD_PH6_VIN_S
PS_MSVDD_PHASE6_SW
MSVDD_GL_PH6
PS_MSVDD_CSN6
PS_MSVDD_PH6
L41,L42
PCB CO-LAYOUT
L38,L37
PCB CO-LAYOUT
GND

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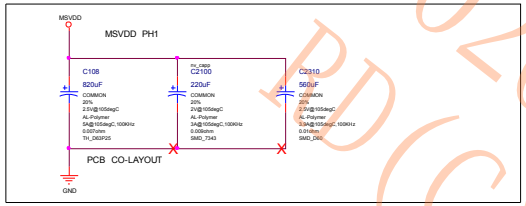
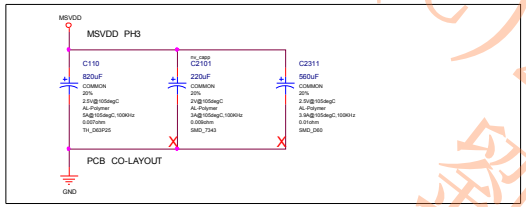
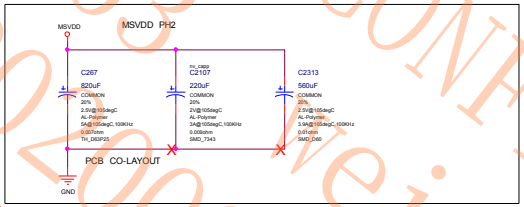
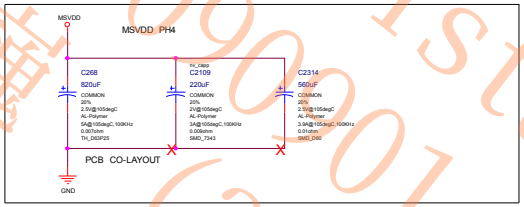
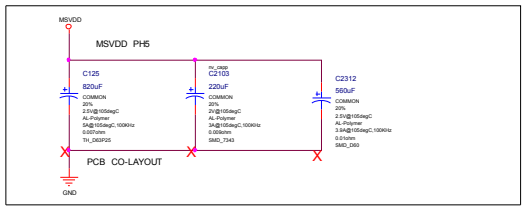
PS:MSVDD OUTPUT CAP (TOP)

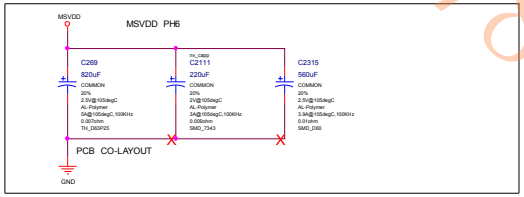












MSVDD PH6 ASIDE

MSI	MICRO-STAR INT'L CO.,LTD	
	MS-V389	
Size: Custom	Document Description: PS:MSVDD OUTPUT CAP (TOP)	Rev: 1.2
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BLANK

MSI	MICRO-STAR INT'L CO.,LTD	
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Size: Custom	Document Description: BLANK	Rev: 1.2
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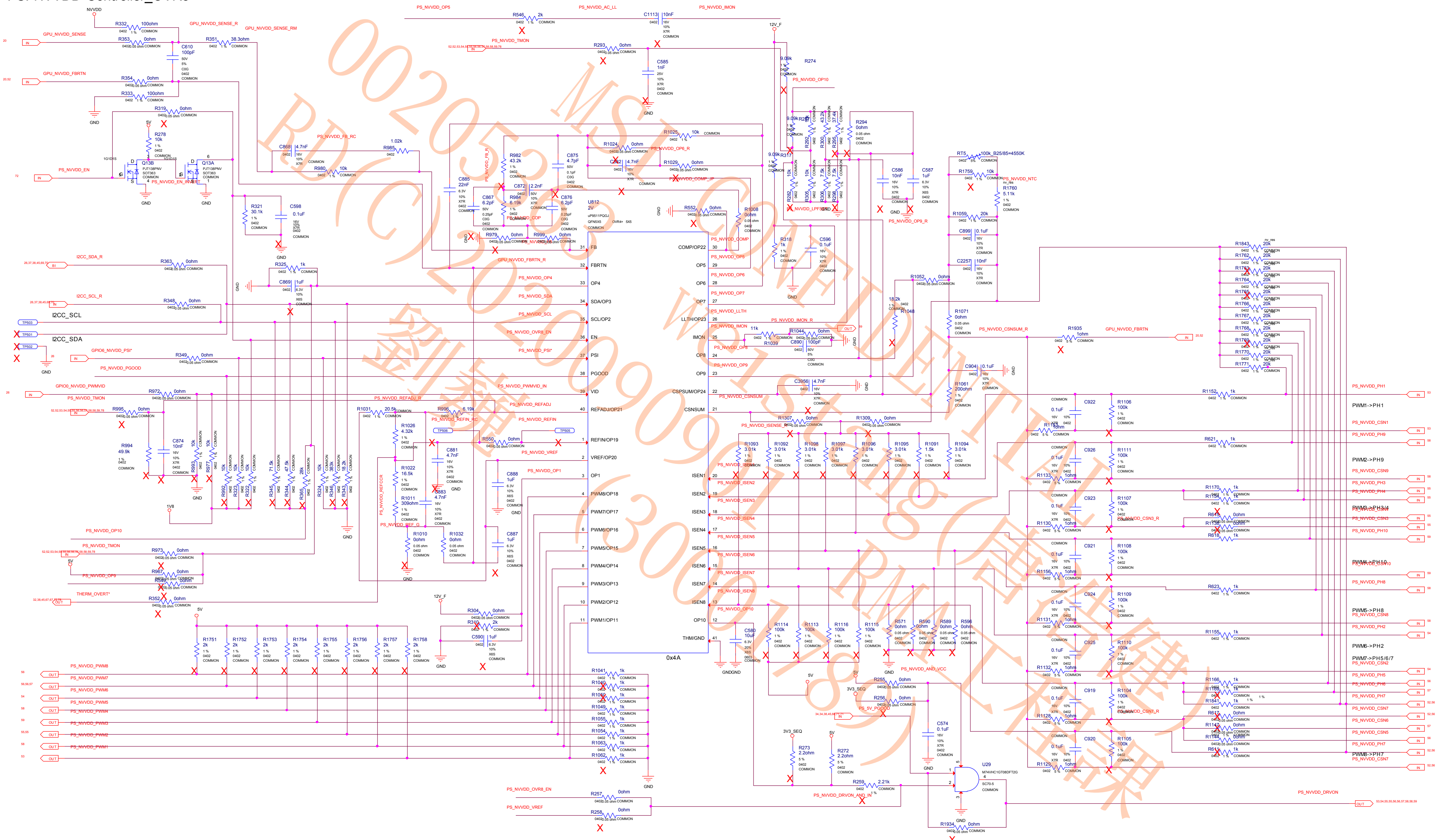
PS: NVVDD Controller_OVR8



NVVDD
GPU_NVVDD_SENSE
GPU_NVVDD_FBRTN
PS_NVVDD_EN
I2CC_SDA_R
I2CC_SCL_R
I2CC_SCL
I2CC_SDA
GPIO6_NVVDD_PSI*
PS_NVVDD_PGOOD
GPIO0_NVVDD_PWMVID
PS_NVVDD_TMON
PS_NVVDD_OP10
PS_NVVDD_OP9
THERM_OVERT*
PS_NVVDD_PWM8
PS_NVVDD_PWM7
PS_NVVDD_PWM6
PS_NVVDD_PWM5
PS_NVVDD_PWM4
PS_NVVDD_PWM3
PS_NVVDD_PWM2
PS_NVVDD_PWM1
PS_NVVDD_OP5
PS_NVVDD_AC_LL
PS_NVVDD_IMON
12V_F
U812
uP9511PQGJ
FB
FBRTN
OP4
SDA/OP3
SCL/OP2
EN
PSI
PGOOD
VID
REFADJ/OP21
REFIN/OP19
VREF/OP20
OP1
PWM8/OP18
PWM7/OP17
PWM6/OP16
PWM5/OP15
PWM4/OP14
PWM3/OP13
PWM2/OP12
PWM1/OP11
COMP/OP22
OP5
OP6
OP7
LLTH/OP23
IMON
OP8
OP9
CSPSUM/OP24
CSNSUM
ISEN1
ISEN2
ISEN3
ISEN4
ISEN5
ISEN6
ISEN7
ISEN8
OP10
THM/GND
0x4A
GPU_NVVDD_FBRTN
PS_NVVDD_CSNSUM_R
PWM1->PH1
PWM2->PH9
PWM3->PH3/4
PWM4->PH10
PWM5->PH8
PWM6->PH2
PWM7->PH5/6/7
PWM8->PH7
U29
PS_NVVDD_DRVON
PS_NVVDD_OVR8_EN
PS_NVVDD_VREF

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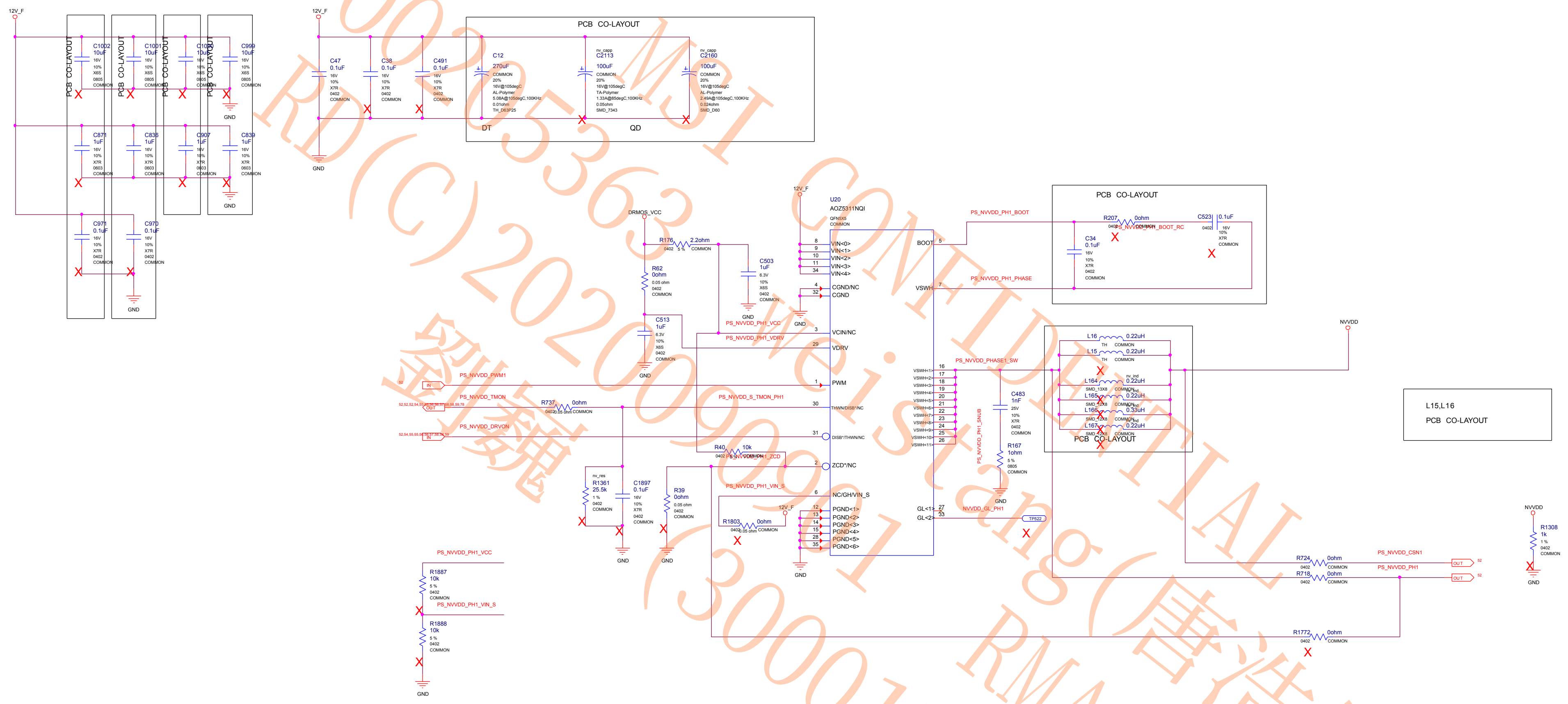
PS: NVVDD Phase 1



12V_F
PCB CO-LAYOUT
C1002 10uF
C1001 10uF
C999 10uF
C871 1uF
C836 1uF
C907 1uF
C839 1uF
C971 0.1uF
C970 0.1uF
C47 0.1uF
C38 0.1uF
C491 0.1uF
C12 270uF
C2113 100uF
C2160 100uF
DT
QD
GND
U20
AOZ5311NQI
DRMOS_VCC
R176 2.2ohm
R62 0ohm
C513 1uF
C503 1uF
BOOT
VSWH
VIN<0>
VIN<1>
VIN<2>
VIN<3>
VIN<4>
CGND/NC
CGND
VCIN/NC
VDRV
PWM
THWN/DISB*/NC
DISB*/THWN/NC
ZCD*/NC
NC/GH/VIN_S
PGND<1>
PGND<2>
PGND<3>
PGND<4>
PGND<5>
PGND<6>
GL<1>
GL<2>
PS_NVVDD_PH1_BOOT
PS_NVVDD_PH1_PHASE
PS_NVVDD_PH1_VCC
PS_NVVDD_PH1_VDRV
PS_NVVDD_PWM1
PS_NVVDD_TMON
PS_NVVDD_DRVON
PS_NVVDD_S_TMON_PH1
PS_NVVDD_PH1_ZCD
PS_NVVDD_PH1_VIN_S
PS_NVVDD_PHASE1_SW
PS_NVVDD_PH1_SNUB
NVVDD_GL_PH1
R207 0ohm
C523 0.1uF
C34 0.1uF
R737 0ohm
R40 10k
R1361 25.5k
C1897 0.1uF
R39 0ohm
R1803 0ohm
C483 1nF
R167 1ohm
L16 0.22uH
L15 0.22uH
L164 0.22uH
L165 0.22uH
L166 0.33uH
L167 0.22uH
NVVDD
L15,L16
PCB CO-LAYOUT
R724 0ohm
R718 0ohm
R1772 0ohm
PS_NVVDD_CSN1
PS_NVVDD_PH1
R1308 1k
R1887 10k
R1888 10k
TP622

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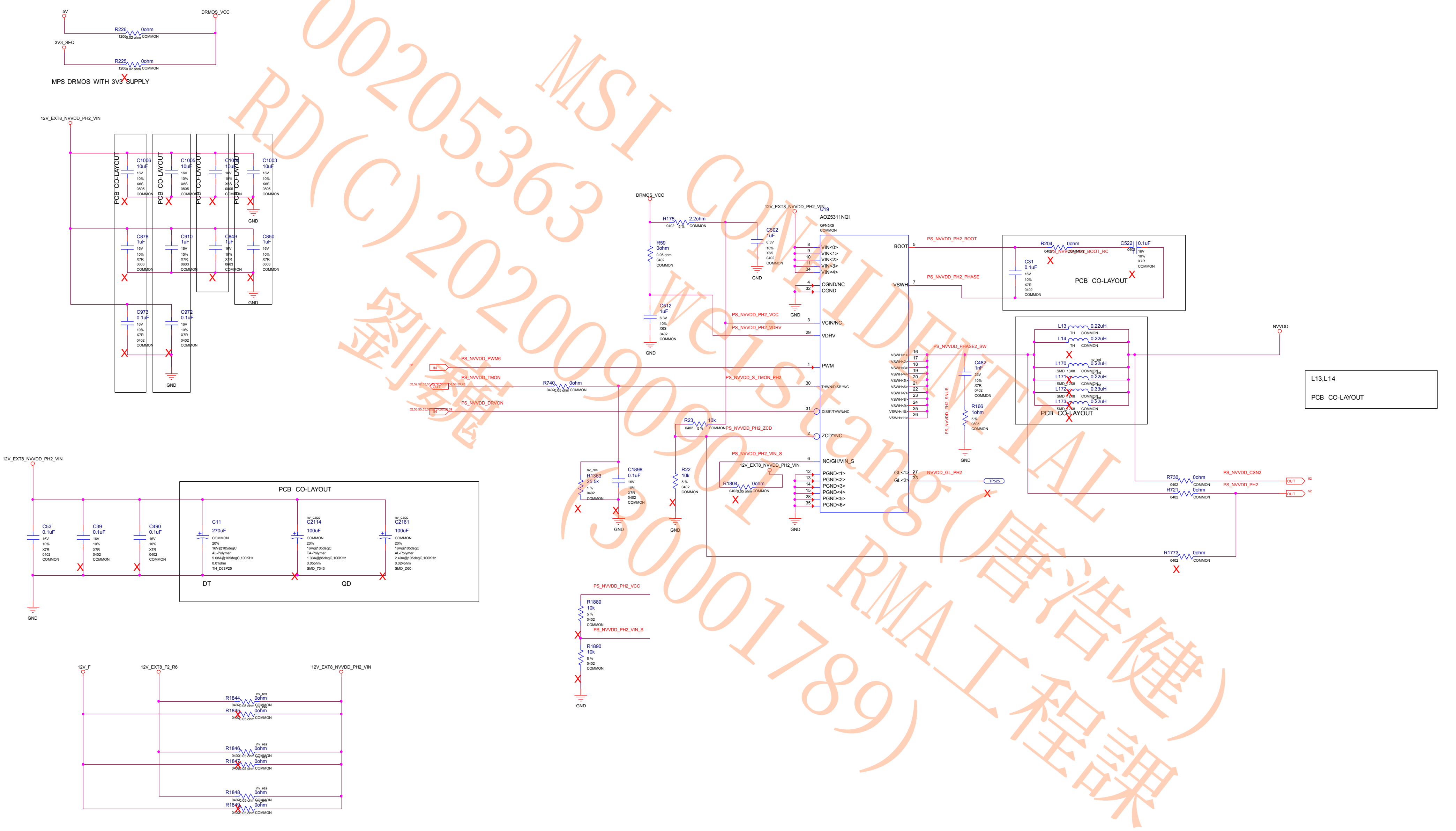
PS: NVVDD Phase 2



5V
DRMOS_VCC
3V3_SEQ
R226 0ohm
R225 0ohm
MPS DRMOS WITH 3V3 SUPPLY
12V_EXT8_NVVDD_PH2_VIN
PCB CO-LAYOUT
C1006 10uF
C1005 10uF
C1003 10uF
C878 1uF
C910 1uF
C849 1uF
C850 1uF
C973 0.1uF
C972 0.1uF
GND
U19
AOZ5311NQI
R175 2.2ohm
C502 1uF
R59 0ohm
C512 1uF
VIN<0>
VIN<1>
VIN<2>
VIN<3>
VIN<4>
CGND/NC
CGND
VCIN/NC
VDRV
PWM
ZCD*/NC
NC/GH/VIN_S
PGND<1>
PGND<2>
PGND<3>
PGND<4>
PGND<5>
PGND<6>
BOOT
VSWH
GL<1>
GL<2>
PS_NVVDD_PH2_BOOT
PS_NVVDD_PH2_PHASE
PS_NVVDD_PHASE2_SW
PS_NVVDD_PH2_VCC
PS_NVVDD_PH2_VDRV
PS_NVVDD_PWM6
PS_NVVDD_TMON
PS_NVVDD_DRVON
PS_NVVDD_S_TMON_PH2
PS_NVVDD_PH2_ZCD
PS_NVVDD_PH2_VIN_S
NVVDD_GL_PH2
R740 0ohm
R23 10k
R1363 25.5k
C1898 0.1uF
R22 10k
R1804 0ohm
R204 0ohm
C522 0.1uF
C31 0.1uF
L13 0.22uH
L14 0.22uH
L170 0.22uH
L171 0.22uH
L172 0.33uH
L173 0.22uH
C482 1nF
R166 1ohm
NVVDD
L13,L14
PCB CO-LAYOUT
R730 0ohm
R721 0ohm
R1773 0ohm
PS_NVVDD_CSN2
PS_NVVDD_PH2
C53 0.1uF
C39 0.1uF
C490 0.1uF
C11 270uF
C2114 100uF
C2161 100uF
DT
QD
R1889 10k
R1890 10k
12V_F
12V_EXT8_F2_R6
R1844 0ohm
R1845 0ohm
R1846 0ohm
R1847 0ohm
R1848 0ohm
R1849 0ohm

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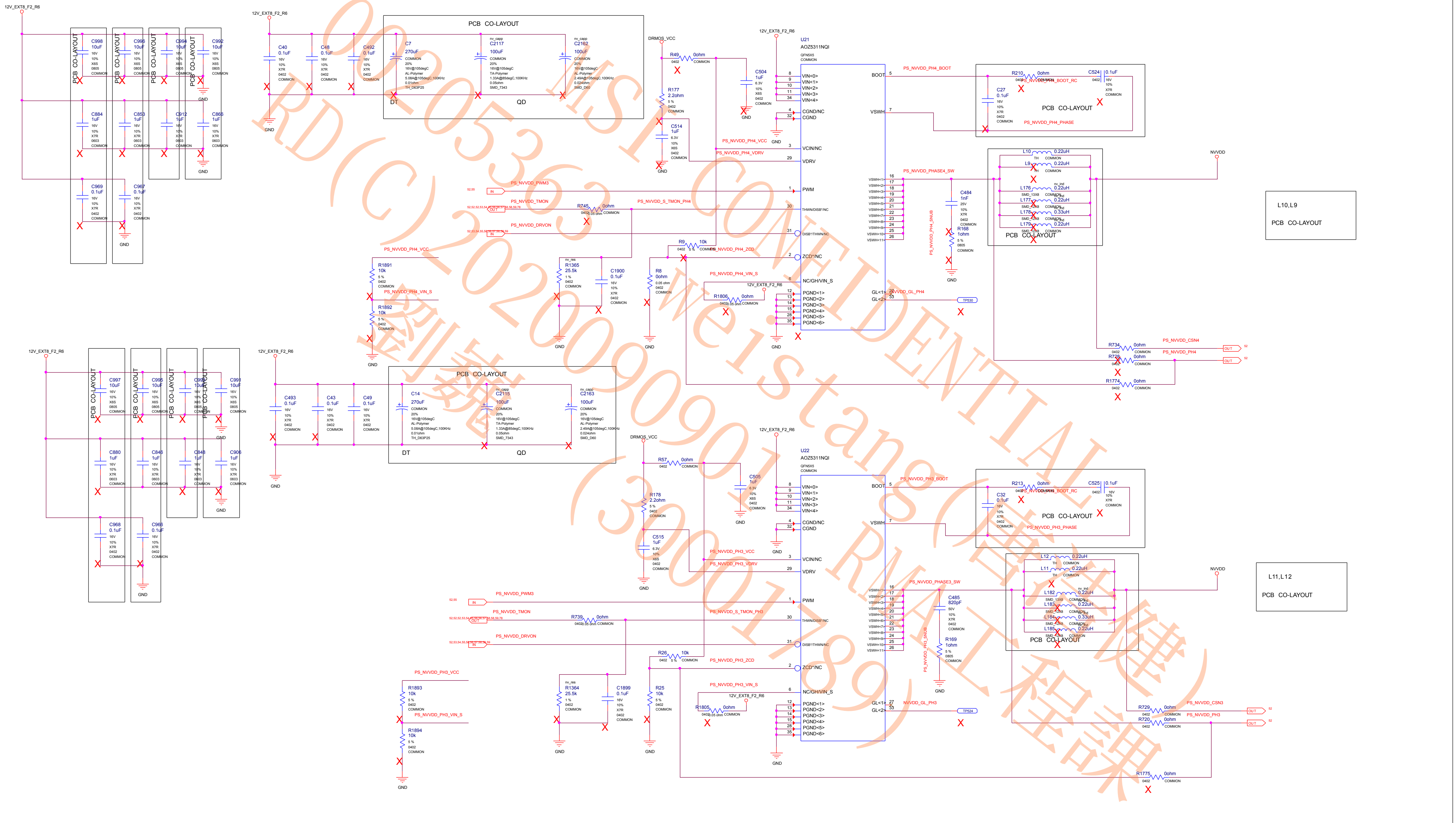
PS: NVVDD Phase 3 (PWM6), PHASE 4(PWM2)



12V_EXT8_F2_R6
PCB CO-LAYOUT
DRMOS_VCC
U21
AOZ5311NQI
U22
AOZ5311NQI
BOOT
VSWH
VIN<0>
VIN<1>
VIN<2>
VIN<3>
VIN<4>
CGND/NC
CGND
VCIN/NC
VDRV
PWM
THWN/DISB*/NC
DISB*/THWN/NC
ZCD*/NC
NC/GH/VIN_S
PGND<1>
PGND<2>
PGND<3>
PGND<4>
PGND<5>
PGND<6>
GL<1>
GL<2>
PS_NVVDD_PH4_BOOT
PS_NVVDD_PH4_PHASE
PS_NVVDD_PHASE4_SW
PS_NVVDD_PH4_VCC
PS_NVVDD_PH4_VDRV
PS_NVVDD_PWM3
PS_NVVDD_TMON
PS_NVVDD_S_TMON_PH4
PS_NVVDD_DRVON
PS_NVVDD_PH4_ZCD
PS_NVVDD_PH4_VIN_S
PS_NVVDD_GL_PH4
PS_NVVDD_CSN4
PS_NVVDD_PH4
PS_NVVDD_PH3_BOOT
PS_NVVDD_PH3_PHASE
PS_NVVDD_PHASE3_SW
PS_NVVDD_PH3_VCC
PS_NVVDD_PH3_VDRV
PS_NVVDD_S_TMON_PH3
PS_NVVDD_PH3_ZCD
PS_NVVDD_PH3_VIN_S
PS_NVVDD_GL_PH3
PS_NVVDD_CSN3
PS_NVVDD_PH3
NVVDD
L10,L9
PCB CO-LAYOUT
L11,L12
PCB CO-LAYOUT
DT
QD
GND

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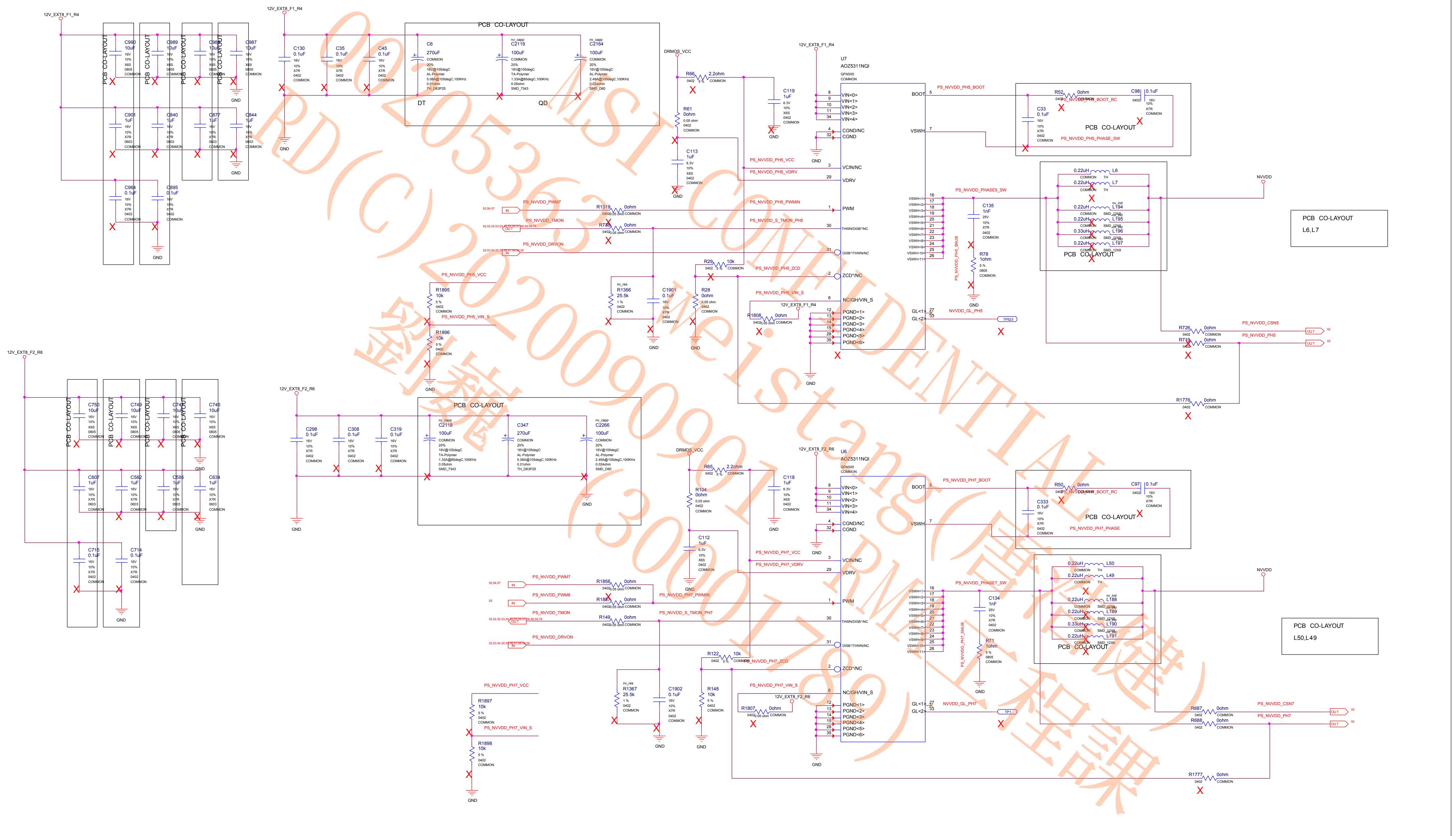
PS: NVVDD PH 5(PWM2), PH7(PWM3)



12V_EXT8_F1_R4
12V_EXT8_F2_R6
PCB CO-LAYOUT
DRMOS_VCC
U7
AOZ5311NQI
U6
AOZ5311NQI
BOOT
VSWH
VIN<0>
CGND/NC
VCIN/NC
VDRV
PWM
THWN/DISB*/NC
DISB*/THWN/NC
ZCD*/NC
NC/GH/VIN_S
PGND<1>
GL<1>
GL<2>
PS_NVVDD_PH5_BOOT
PS_NVVDD_PH5_VCC
PS_NVVDD_PH5_VDRV
PS_NVVDD_PH5_PWMIN
PS_NVVDD_S_TMON_PH5
PS_NVVDD_PH5_ZCD
PS_NVVDD_PH5_VIN_S
PS_NVVDD_PHASE5_SW
PS_NVVDD_PH7_BOOT
PS_NVVDD_PH7_VCC
PS_NVVDD_PH7_VDRV
PS_NVVDD_PH7_PWMIN
PS_NVVDD_S_TMON_PH7
PS_NVVDD_PH7_ZCD
PS_NVVDD_PH7_VIN_S
PS_NVVDD_PHASE7_SW
PS_NVVDD_PWM7
PS_NVVDD_PWM8
PS_NVVDD_TMON
PS_NVVDD_DRVON
PS_NVVDD_CSN5
PS_NVVDD_PH5
PS_NVVDD_CSN7
PS_NVVDD_PH7
NVVDD
NVVDD_GL_PH5
NVVDD_GL_PH7
PCB CO-LAYOUT L6,L7
PCB CO-LAYOUT L50,L49
GND

MICRO-STAR INT'L CO.,LTD		
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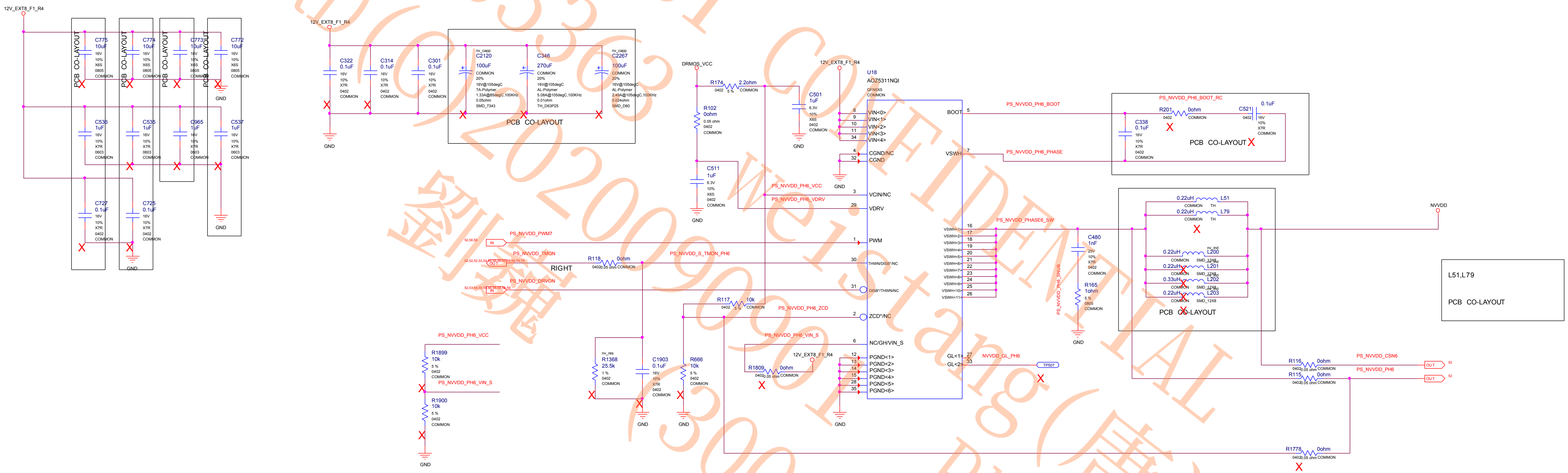
PS: NVVDD Phase 6(PWM7)



12V_EXT8_F1_R4
PCB CO-LAYOUT
C775 10uF
C774 10uF
C773 10uF
C772 10uF
C536 1uF
C535 1uF
C965 1uF
C537 1uF
C727 0.1uF
C726 0.1uF
GND
C322 0.1uF
C314 0.1uF
C301 0.1uF
C2120 100uF
C346 270uF
C2267 100uF
DRMOS_VCC
R174 2.2ohm
R102 0ohm
C511 1uF
C501 1uF
U18
AOZ5311NQI
VIN<0>
VIN<1>
VIN<2>
VIN<3>
VIN<4>
CGND/NC
CGND
VCIN/NC
VDRV
PWM
THWN/DISB*/NC
DISB*/THWN/NC
ZCD*/NC
NC/GH/VIN_S
PGND<1>
PGND<2>
PGND<3>
PGND<4>
PGND<5>
PGND<6>
BOOT
VSWH
GL<1>
GL<2>
PS_NVVDD_PH6_BOOT
PS_NVVDD_PH6_BOOT_RC
PS_NVVDD_PH6_PHASE
PS_NVVDD_PH6_VCC
PS_NVVDD_PH6_VDRV
PS_NVVDD_PWM7
PS_NVVDD_TMON
PS_NVVDD_DRVON
PS_NVVDD_S_TMON_PH6
PS_NVVDD_PH6_ZCD
PS_NVVDD_PH6_VIN_S
PS_NVVDD_PHASE6_SW
NVVDD_GL_PH6
TP507
R201 0ohm
C521 0.1uF
C338 0.1uF
0.22uH L51
0.22uH L79
0.22uH L200
0.22uH L201
0.33uH L202
0.22uH L203
NVVDD
C480 1nF
R165 1ohm
R118 0ohm
RIGHT
R117 10k
R1368 25.5k
C1903 0.1uF
R666 10k
R1809 0ohm
R1899 10k
R1900 10k
R116 0ohm
R115 0ohm
R1778 0ohm
PS_NVVDD_CSN6
PS_NVVDD_PH6
L51,L79
PCB CO-LAYOUT

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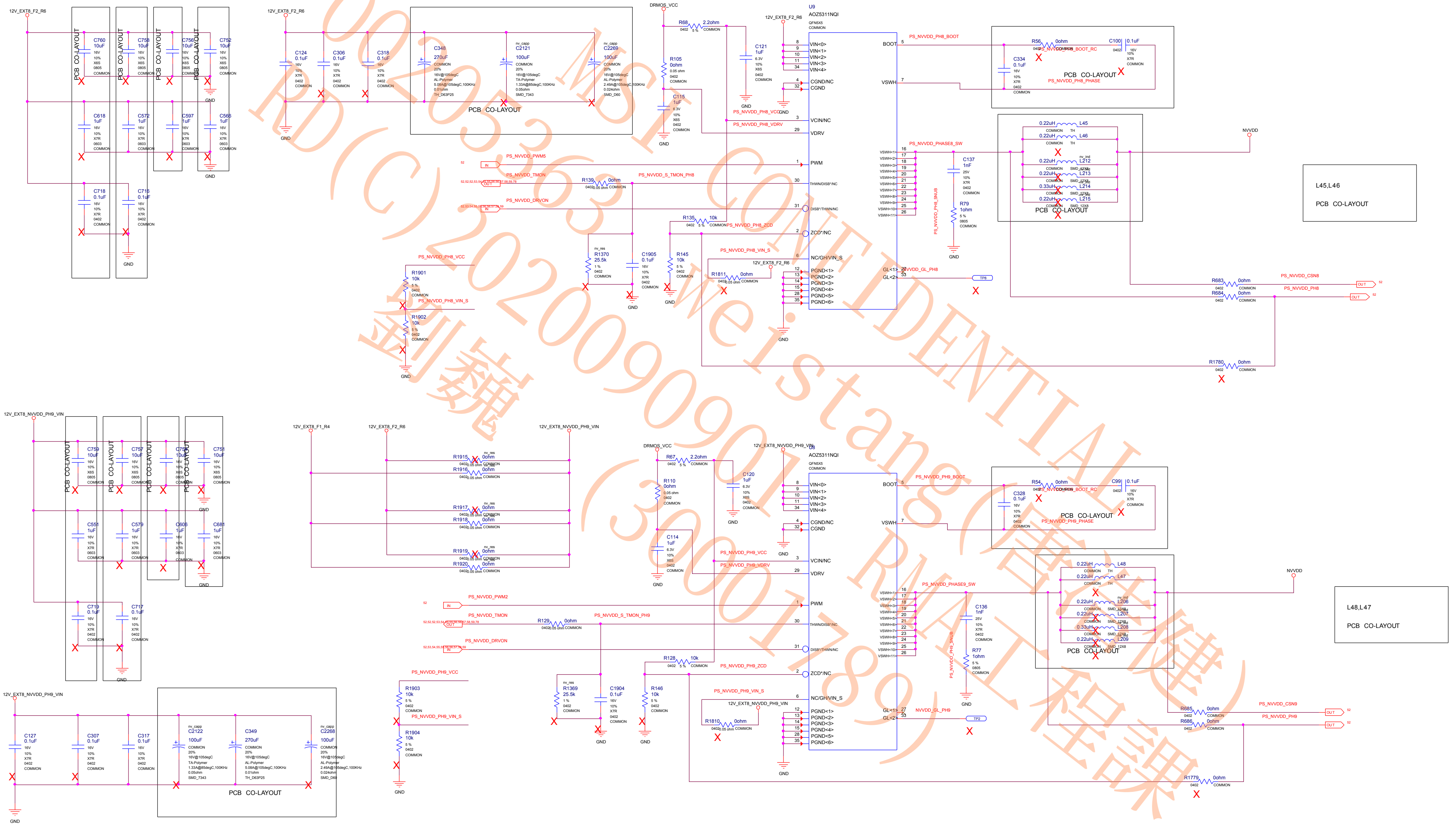
PS: NVVDD PH 8 (PWM5), PH 9(PWM8)



12V_EXT8_F2_R6
PCB CO-LAYOUT
DRMOS_VCC
U9
AOZ5311NQI
QFN5X5
COMMON
VIN<0>
VIN<1>
VIN<2>
VIN<3>
VIN<4>
CGND/NC
CGND
VCIN/NC
VDRV
PWM
THWN/DISB*/NC
DISB*/THWN/NC
ZCD*/NC
NC/GH/VIN_S
PGND<1>
PGND<2>
PGND<3>
PGND<4>
PGND<5>
PGND<6>
BOOT
VSWH
GL<1>
GL<2>
PS_NVVDD_PH8_BOOT
PS_NVVDD_PH8_BOOT_RC
PS_NVVDD_PH8_PHASE
PS_NVVDD_PHASE8_SW
PS_NVVDD_PH8_VCC
PS_NVVDD_PH8_VDRV
PS_NVVDD_PWM5
PS_NVVDD_TMON
PS_NVVDD_S_TMON_PH8
PS_NVVDD_DRVON
PS_NVVDD_PH8_ZCD
PS_NVVDD_PH8_VIN_S
NVVDD_GL_PH8
PS_NVVDD_CSN8
PS_NVVDD_PH8
NVVDD
L45,L46
PCB CO-LAYOUT
12V_EXT8_NVVDD_PH9_VIN
12V_EXT8_F1_R4
U8
PS_NVVDD_PH9_BOOT
PS_NVVDD_PH9_BOOT_RC
PS_NVVDD_PH9_PHASE
PS_NVVDD_PHASE9_SW
PS_NVVDD_PH9_VCC
PS_NVVDD_PH9_VDRV
PS_NVVDD_PWM2
PS_NVVDD_S_TMON_PH9
PS_NVVDD_PH9_ZCD
PS_NVVDD_PH9_VIN_S
NVVDD_GL_PH9
PS_NVVDD_CSN9
PS_NVVDD_PH9
L48,L47
PCB CO-LAYOUT
GND

MICRO-STAR INT'L CO.,LTD

MS-V389

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Custom	PS: NVVDD PH 8 (PWM5), PH 9(PWM8)	1.2

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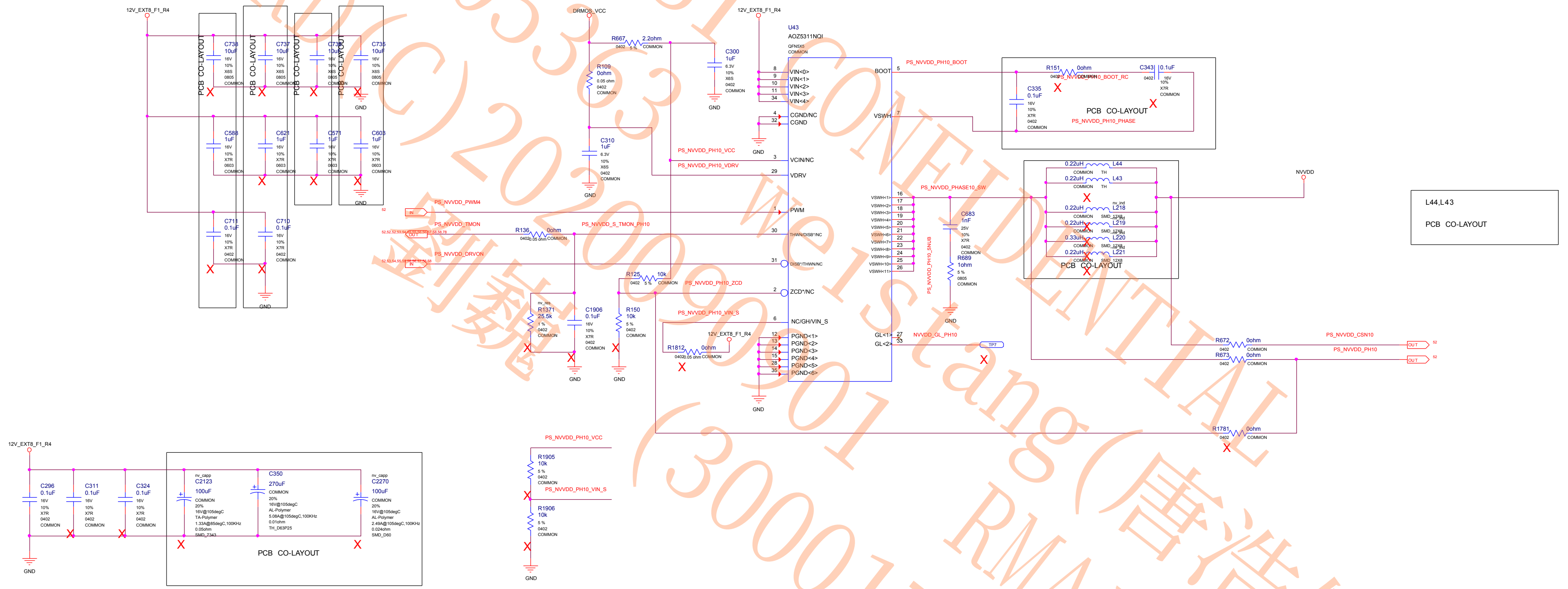
PS: NVVDD Phase 10 (PWM8)



12V_EXT8_F1_R4
PCB CO-LAYOUT
C738 10uF
C737 10uF
C736 10uF
C735 10uF
C588 1uF
C621 1uF
C571 1uF
C603 1uF
C711 0.1uF
C710 0.1uF
GND
DRMOS_VCC
R667 2.2ohm
R109 0ohm
C300 1uF
C310 1uF
U43
AOZ5311NQI
VIN<0>
VIN<1>
VIN<2>
VIN<3>
VIN<4>
CGND/NC
CGND
VCIN/NC
VDRV
PWM
THWN/DISB*/NC
DISB*/THWN/NC
ZCD*/NC
NC/GH/VIN_S
PGND<1>
PGND<2>
PGND<3>
PGND<4>
PGND<5>
PGND<6>
BOOT
VSWH
GL<1>
GL<2>
PS_NVVDD_PH10_BOOT
PS_NVVDD_PH10_VCC
PS_NVVDD_PH10_VDRV
PS_NVVDD_PWM4
PS_NVVDD_TMON
PS_NVVDD_S_TMON_PH10
PS_NVVDD_DRVON
PS_NVVDD_PH10_ZCD
PS_NVVDD_PH10_VIN_S
NVVDD_GL_PH10
PS_NVVDD_PHASE10_SW
R136 0ohm
R1371 25.5k
C1906 0.1uF
R125 10k
R150 10k
R1812 0ohm
R151 0ohm
C343 0.1uF
C335 0.1uF
PS_NVVDD_PH10_BOOT_RC
PS_NVVDD_PH10_PHASE
C683 1nF
R689 1ohm
L44 0.22uH
L43 0.22uH
L218 0.22uH
L219 0.22uH
L220 0.33uH
L221 0.22uH
NVVDD
R672 0ohm
R673 0ohm
R1781 0ohm
PS_NVVDD_CSN10
PS_NVVDD_PH10
L44,L43
PCB CO-LAYOUT
C296 0.1uF
C311 0.1uF
C324 0.1uF
C2123 100uF
C350 270uF
C2270 100uF
R1905 10k
R1906 10k

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PCB CO-LAYOUT

C131, C132, C133, C140, C141, C142, C2106, C2107, C2133, C2134, C2135, C2137, C264, C265, C266, C267, C61, C64, C65, C66, C67, C68, C69, C77, C80, C83, C88

PCB CO-LAYOUT

C103, C105, C106, C107, C108, C110, C1208, C125, C1254, C1256, C1267, C128, C144, C145, C146, C151, C152, C153, C154, C159, C160, C161, C162, C170, C173, C2092, C2100, C2101, C2102, C2103, C2104, C2138, C2139, C2140, C2141, C2142, C2143, C2144, C2272, C230, C231, C232, C233, C243, C245, C246, C248, C253, C254, C255, C256, C270, C274, C275, C276, C283, C289, C290, C291, C60202, C62004, C62005

C163, C164, C166, C167, C2087, C2105, C2109, C2110, C2111, C224, C225, C261, C268, C269, C60354, C61428, C62, C63, C89, C91, C96

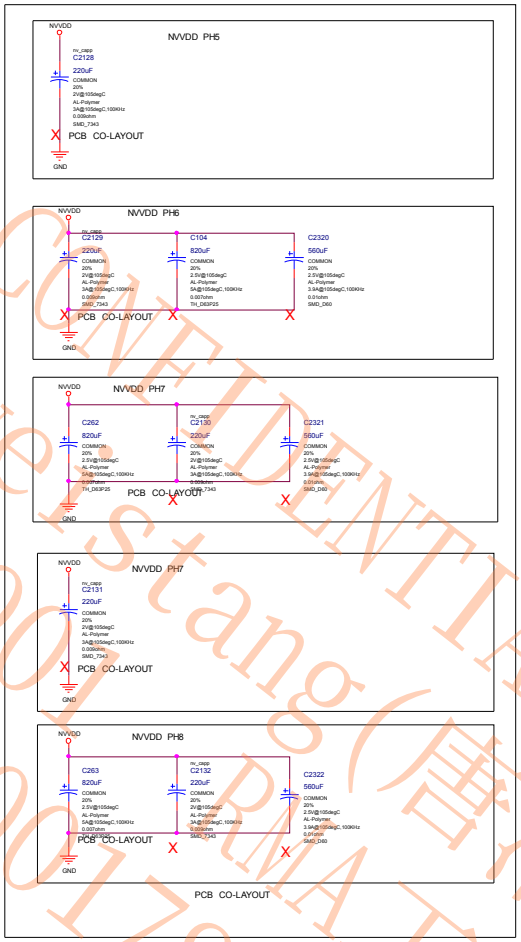
PCB CO-LAYOUT

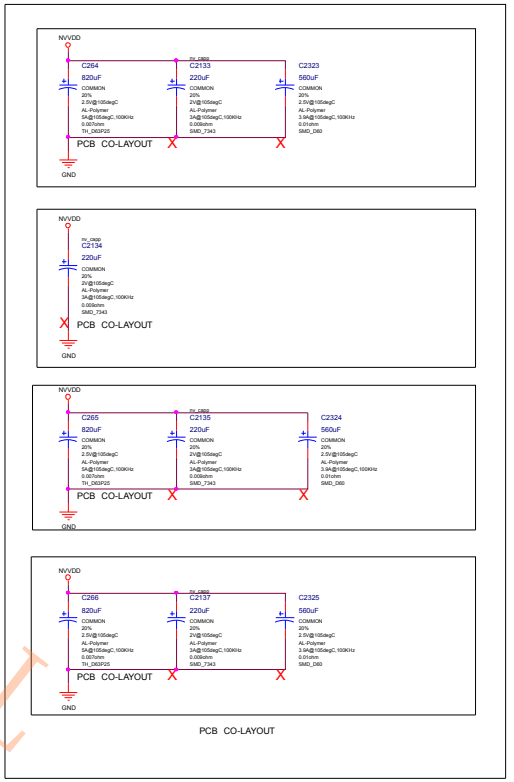
2020_06_17

1.Fix J1,J2 to reverse 8 pins

2.Change L238,L52,L53 footprint

PS: NVVDD OUTPUT CAP(TOP)





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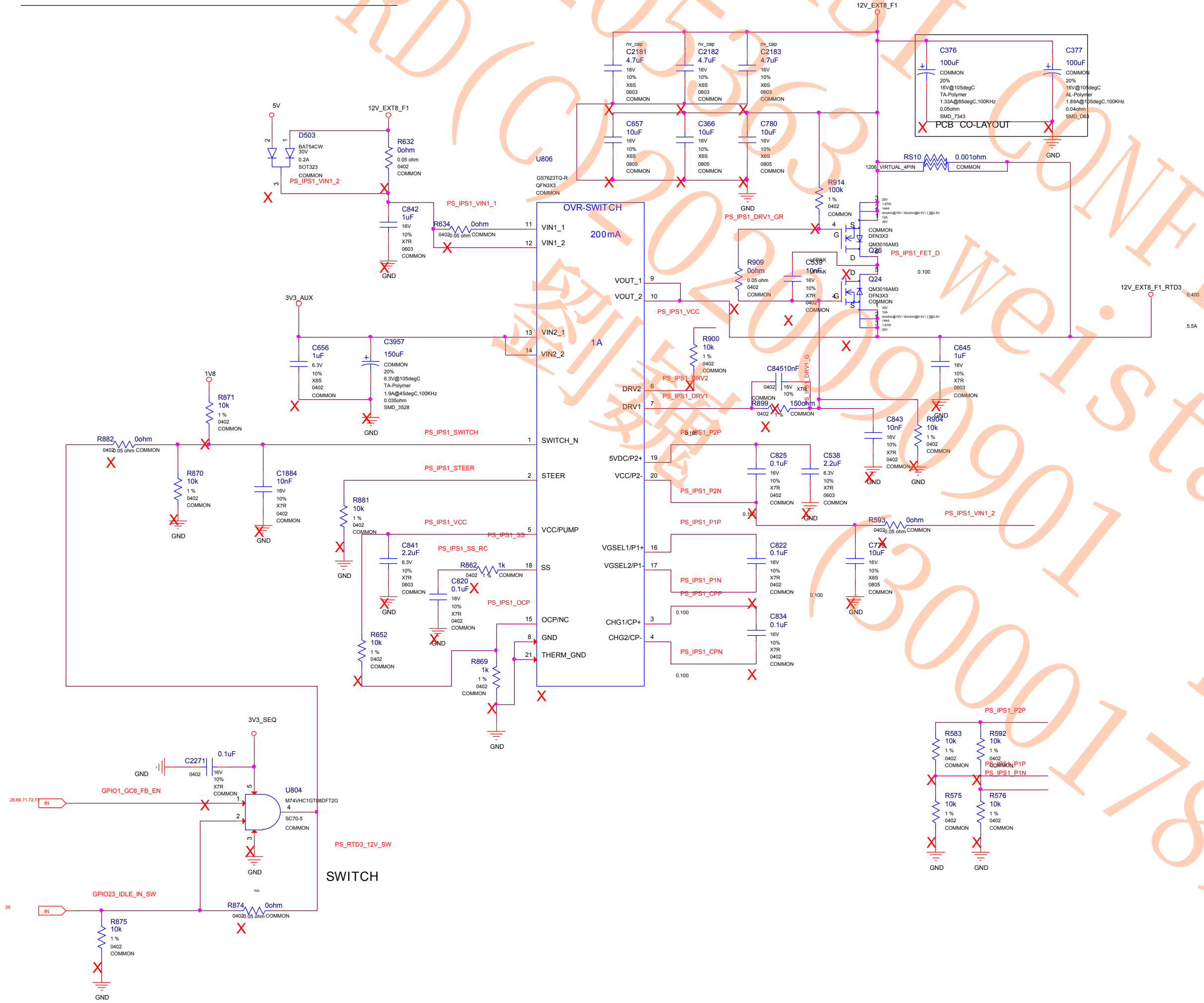
BLANK

PS: INPUT SWITCH RTD3

AND GATE LOGIC FOR P-BOARD

GPIO1	GPIO23	SWITCH	VOUT
0	0	0	12V_F
0	1	0	12V_F
1	0	0	12V_F
1	1	1	3V3A



MICRO-STAR INT'L CO.,LTD

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Size: Custom

Document Description: PS: INPUT SWITCH RTD3

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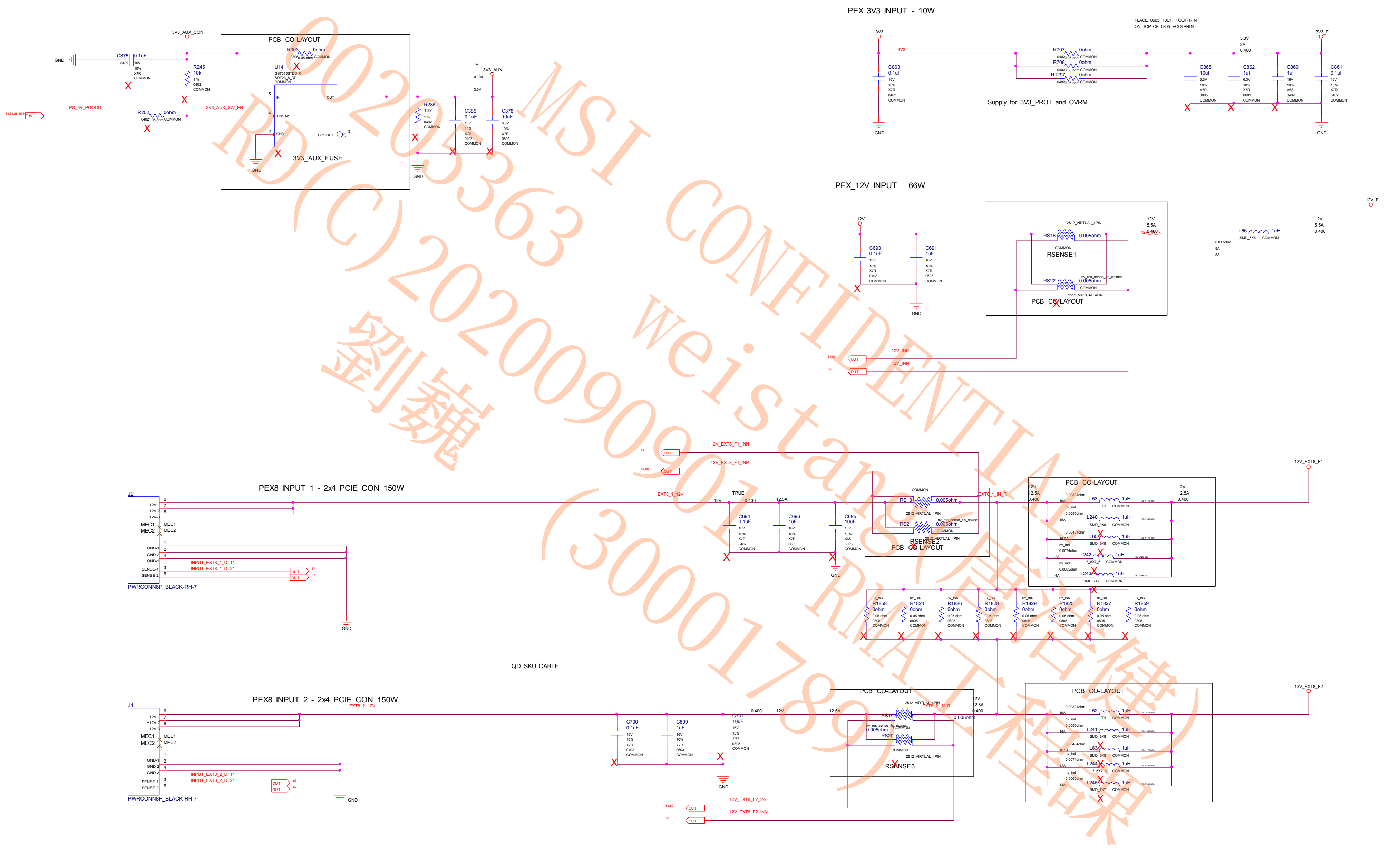
PS: Inputs, Filtering, and Monitoring



MICRO-STAR INT'L CO.,LTD
MS-V389
Size: Custom
Document Description: PS: Inputs, Filtering, and Monitoring
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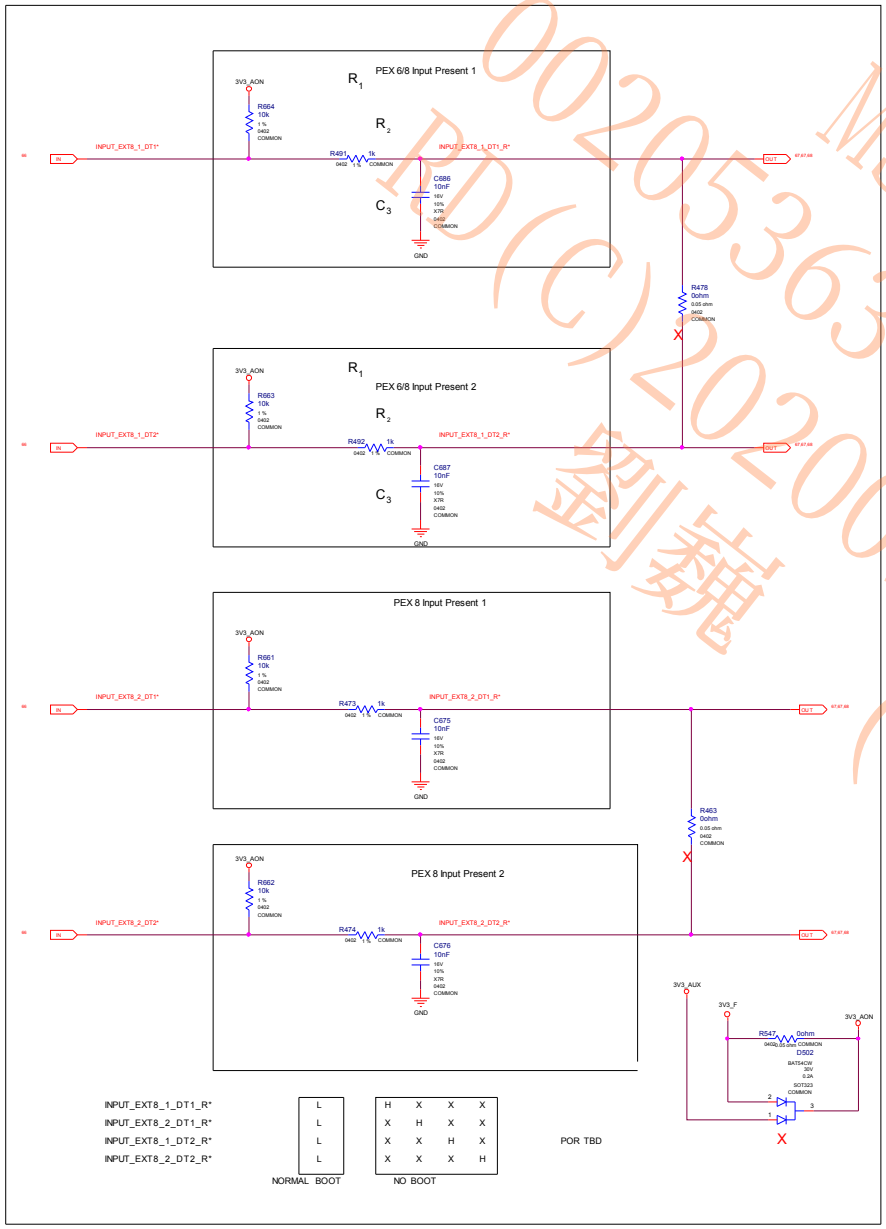
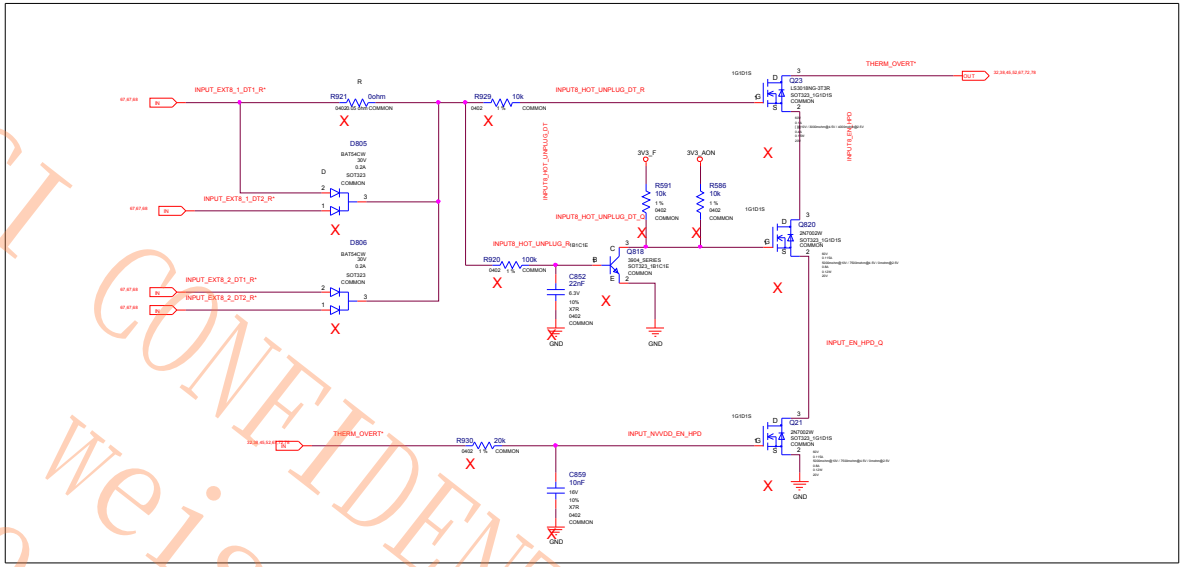
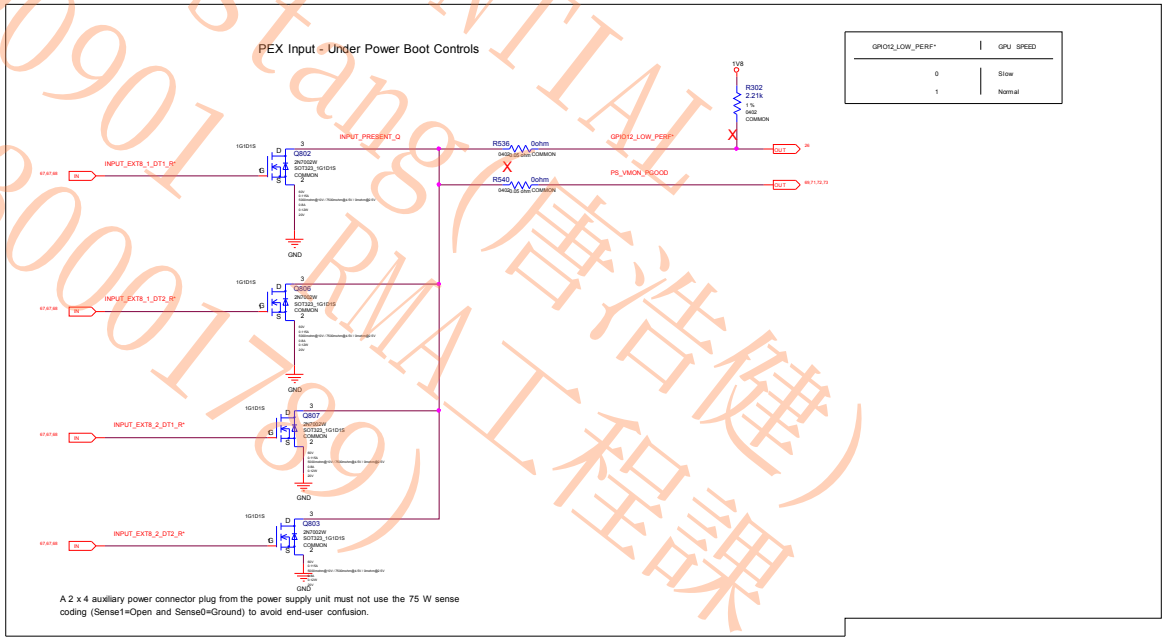
PS: 12V Current Steering & Hot Unplug Detect







MICRO-STAR INT'L CO.,LTD	
MS-V389	
Size: Custom	Document Description: PS: 12V Current Steering & Hot Unplug Detect
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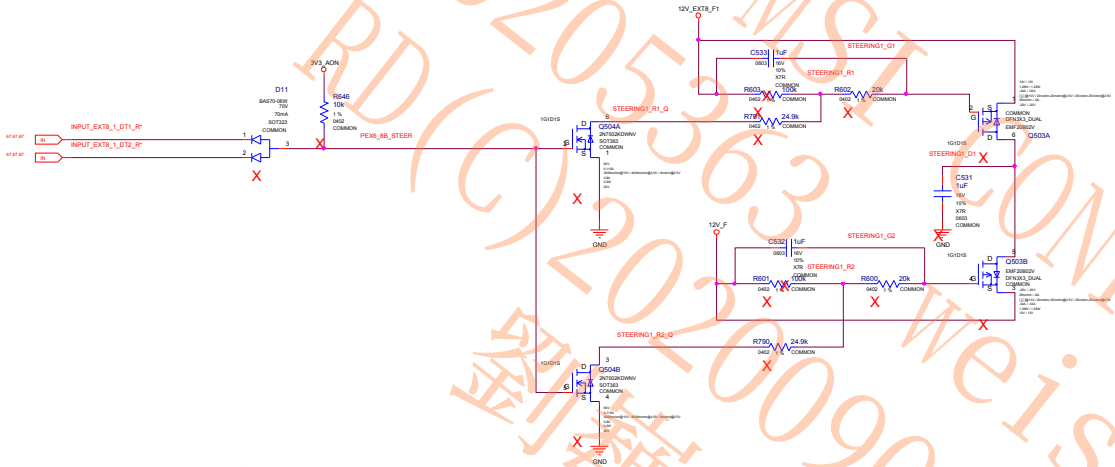
PS: Discrete Steering

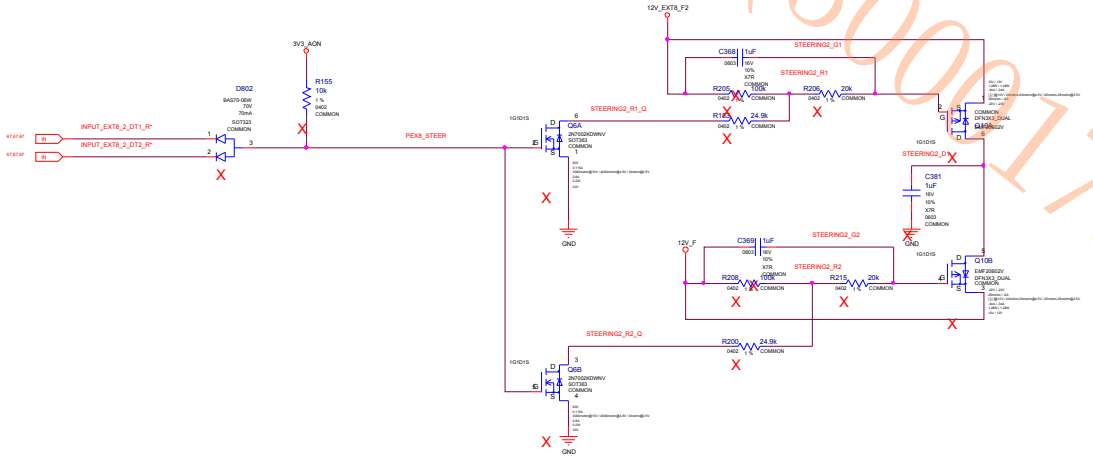
12V CURRENT STEERING (UNDER POWER BOOT):

PEX12V AND 12V_EXT8_F1



NO STUFF BY DEFAULT REF ONLY

PEX12V AND 12V_EXT8_F2



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Size: Custom	Document Description: PS: Discrete Steering	Rev:
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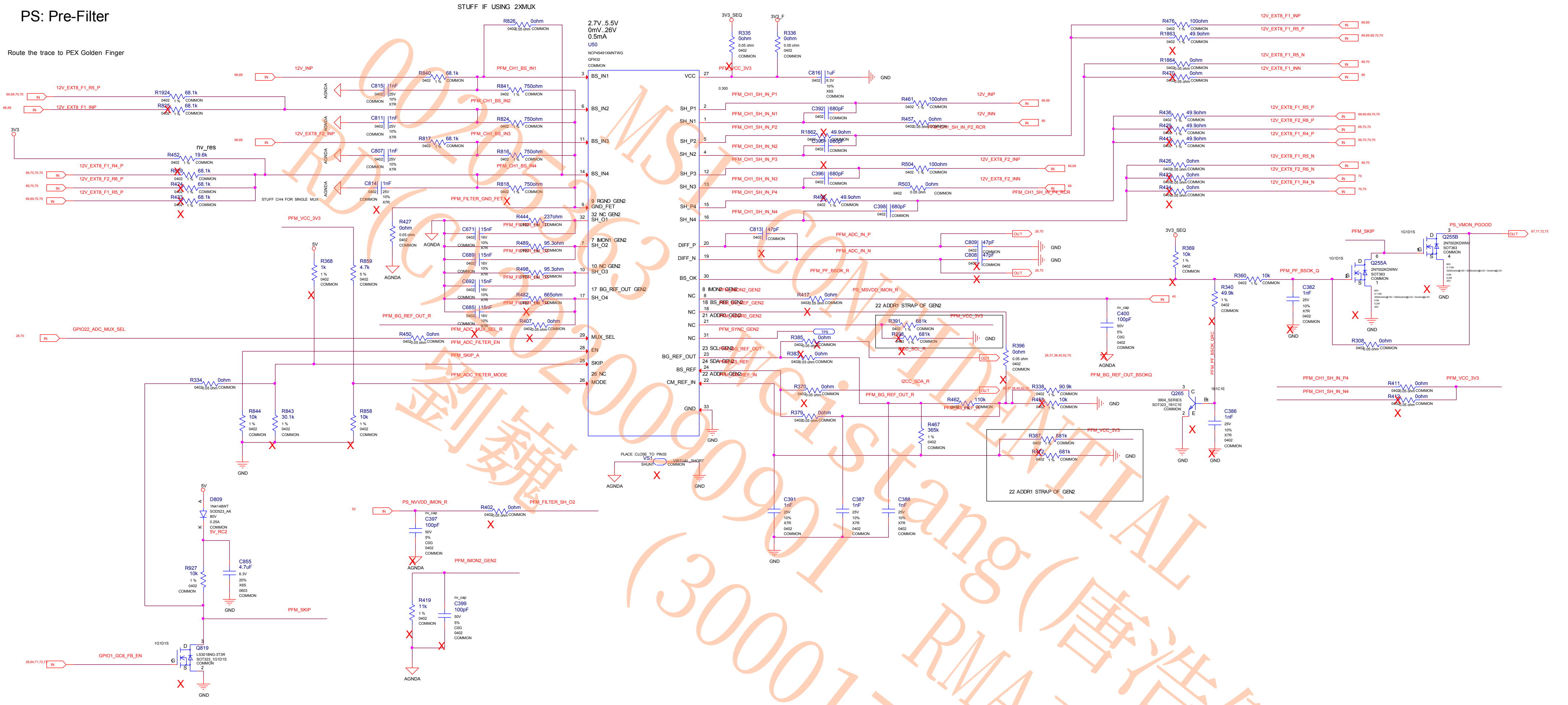
PS: Pre-Filter



MICRO-STAR INT'L CO.,LTD	
MS-V389	
Size: Custom	Document Description: PS: Pre-Filter
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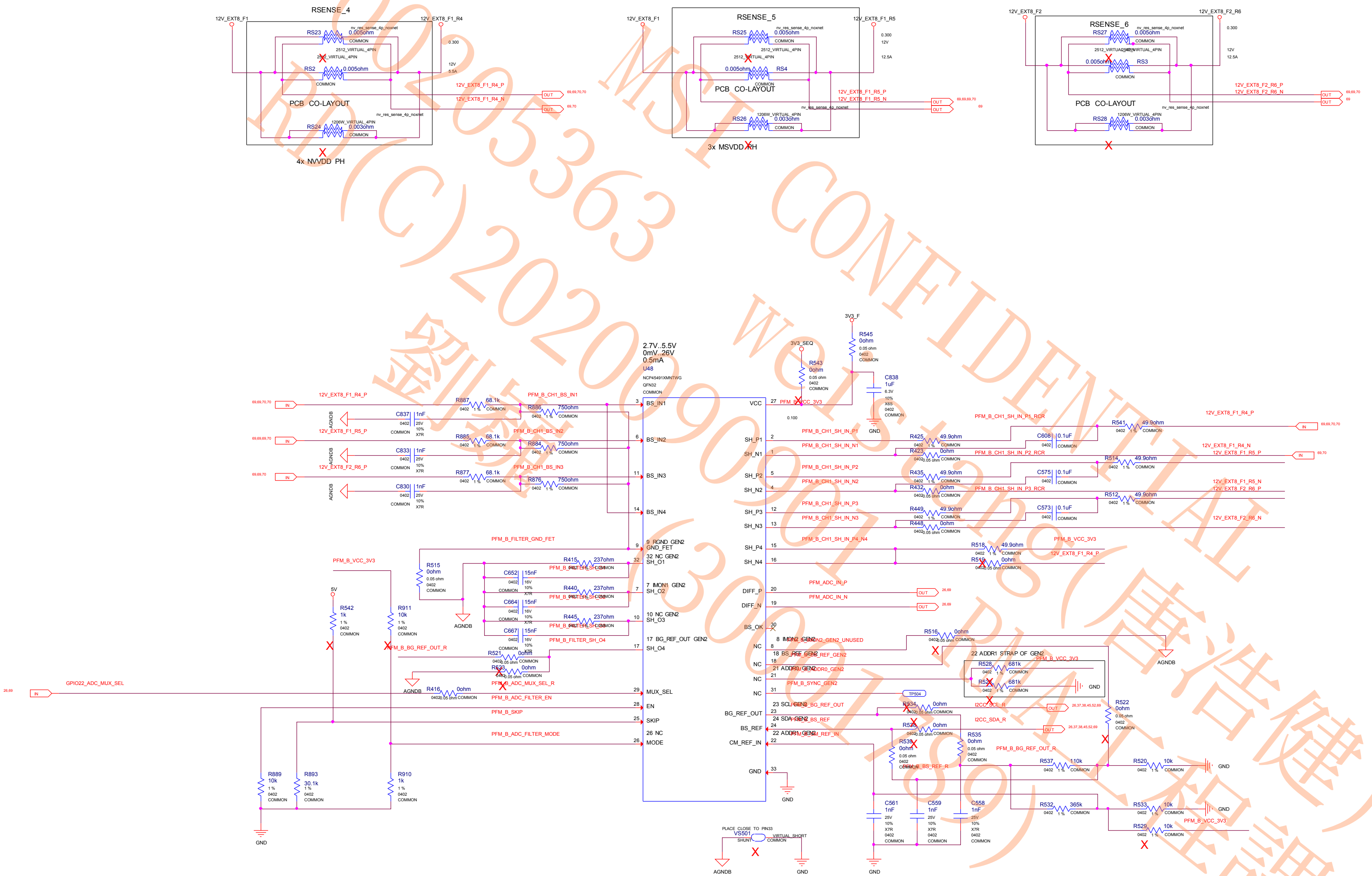
PS: Pre-Filter B



MICRO-STAR INT'L CO.,LTD		
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Size: Custom	Document Description: PS: Pre-Filter B	Rev
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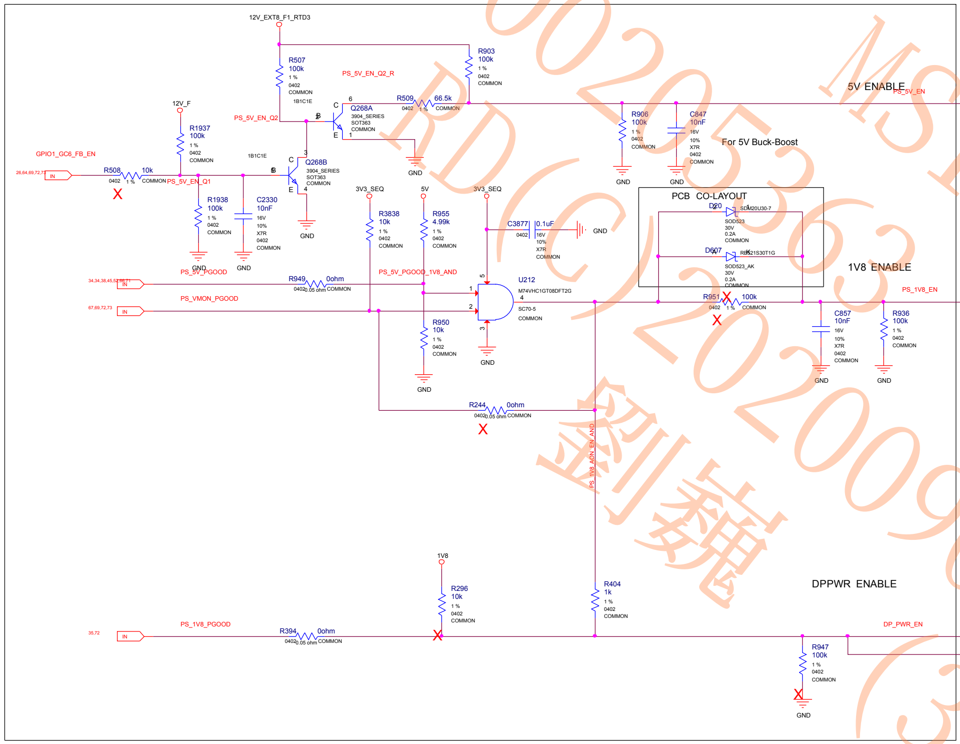
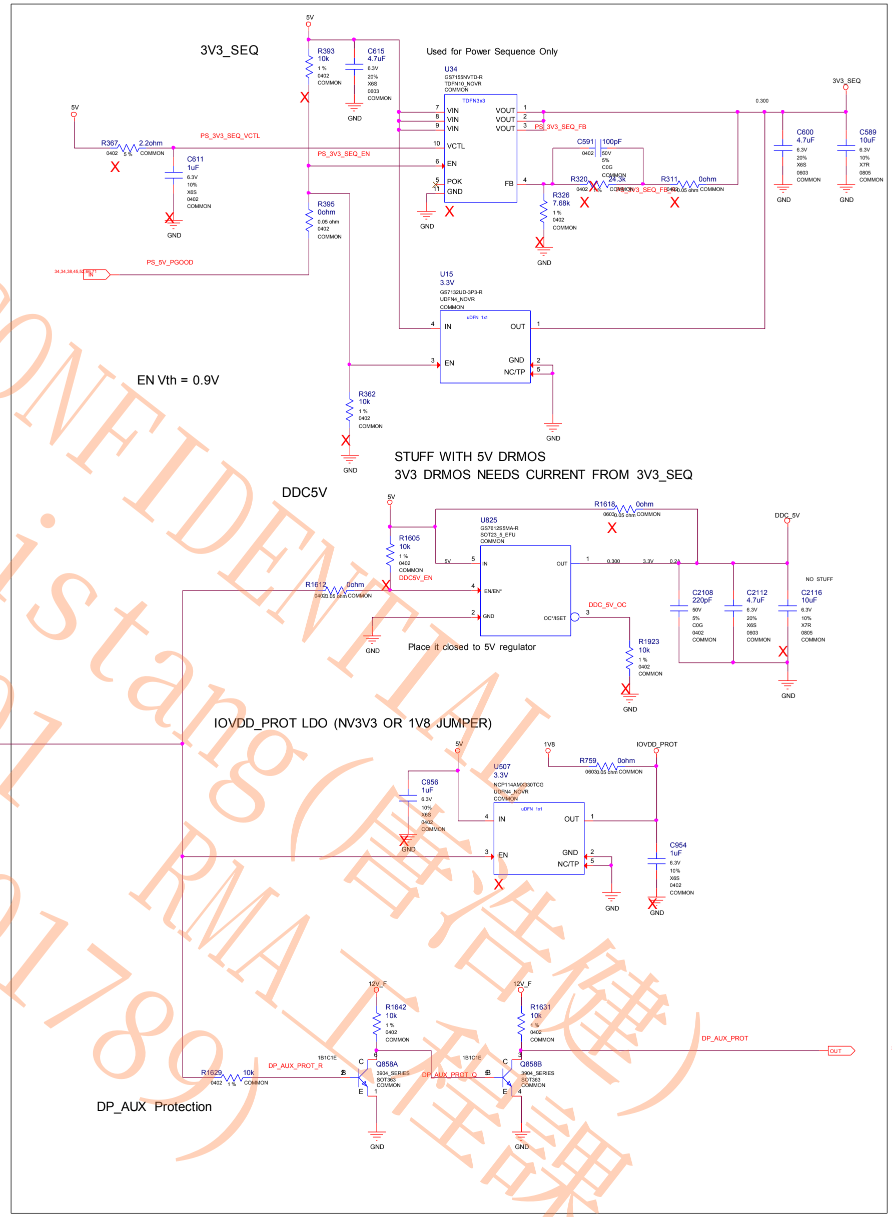
SEQUENCE:5V,1V8,3V3_SEQ ENABLE



5V ENABLE
For 5V Buck-Boost
PCB CO-LAYOUT
1V8 ENABLE
DPPWR ENABLE
12V_EXT8_F1_RTD3
PS_5V_EN_Q2_R
PS_5V_EN_Q2
PS_5V_EN_Q1
GPIO1_GC6_FB_EN
PS_5V_EN
PS_5V_PGOOD
PS_VMON_PGOOD
PS_5V_PGOOD_1V8_AND
PS_1V8_EN
PS_1V8_PGOOD
DP_PWR_EN
R507 100k
R903 100k
R509 66.5k
R906 100k
C847 10nF
R1937 100k
R508 10k
R1938 100k
C2330 10nF
Q268A
Q268B
R3838 10k
R955 4.99k
C3877 0.1uF
D20
D607
U212
R949 0ohm
R950 10k
R951 100k
C857 10nF
R936 100k
R244 0ohm
R296 10k
R404 1k
R394 0ohm
R947 100k



3V3_SEQ
Used for Power Sequence Only
EN Vth = 0.9V
STUFF WITH 5V DRMOS
3V3 DRMOS NEEDS CURRENT FROM 3V3_SEQ
DDC5V
Place it closed to 5V regulator
IOVDD_PROT LDO (NV3V3 OR 1V8 JUMPER)
DP_AUX Protection
R393 10k
C615 4.7uF
U34
R367 2.2ohm
C611 1uF
PS_3V3_SEQ_VCTL
PS_3V3_SEQ_EN
PS_3V3_SEQ_FB
PS_5V_PGOOD
R395 0ohm
C591 100pF
R320 24.3k
R311 0ohm
R326 7.68k
C600 4.7uF
C589 10uF
U15 3.3V
R362 10k
U825
R1618 0ohm
R1605 10k
R1612 0ohm
DDC5V_EN
DDC_5V_OC
C2108 220pF
C2112 4.7uF
C2116 10uF
R1923 10k
U507 3.3V
C956 1uF
R759 0ohm
C954 1uF
IOVDD_PROT
R1642 10k
R1631 10k
R1629 10k
Q858A
Q858B
DP_AUX_PROT_R
DP_AUX_PROT_Q
DP_AUX_PROT

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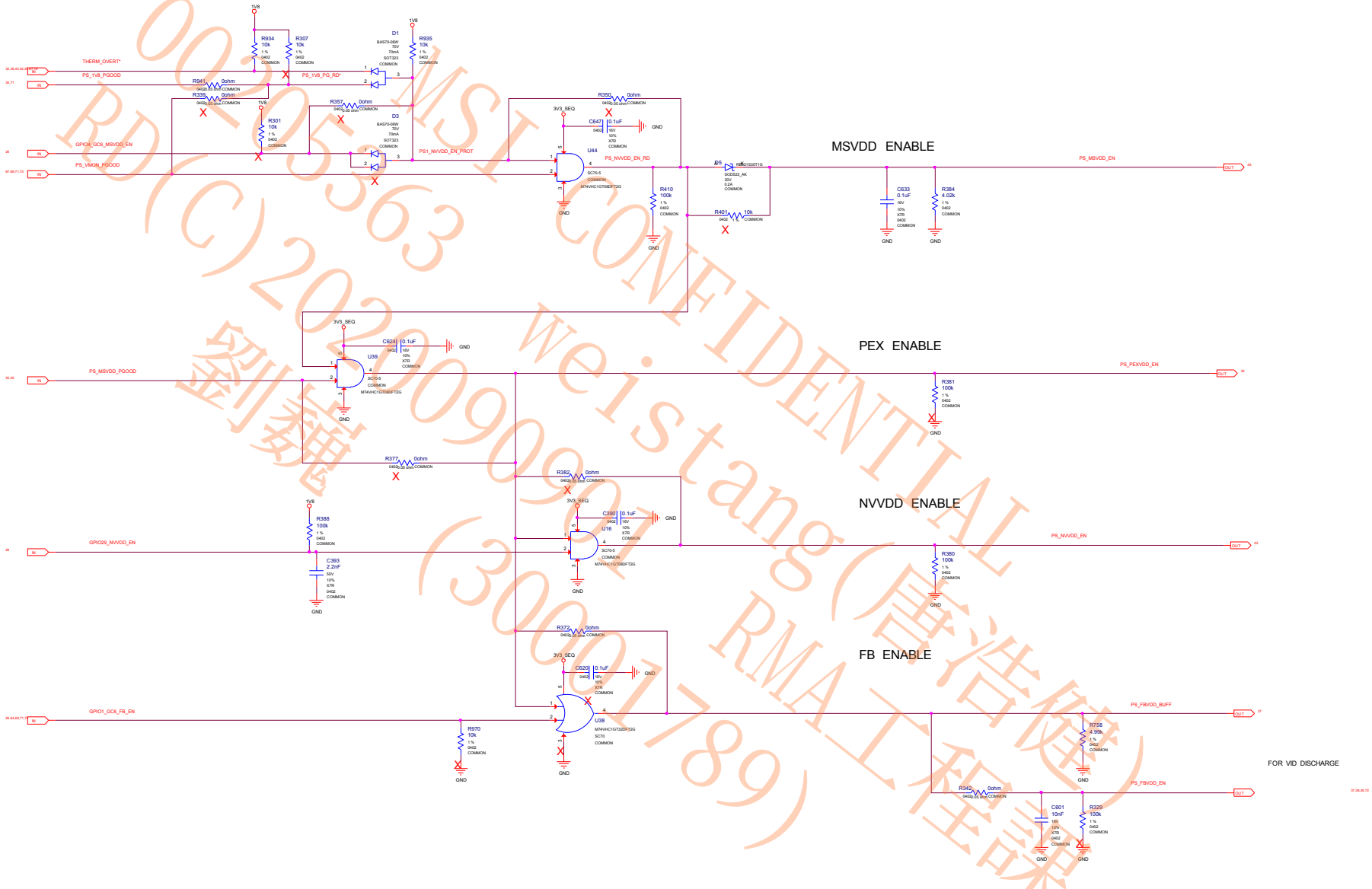
SEQUENCE:NV,PEX,FB ENABLE



MICRO-STAR INT'L CO.,LTD	
MS-V389	
Size: Custom	Document Description: SEQUENCE:NV,PEX,FB ENABLE
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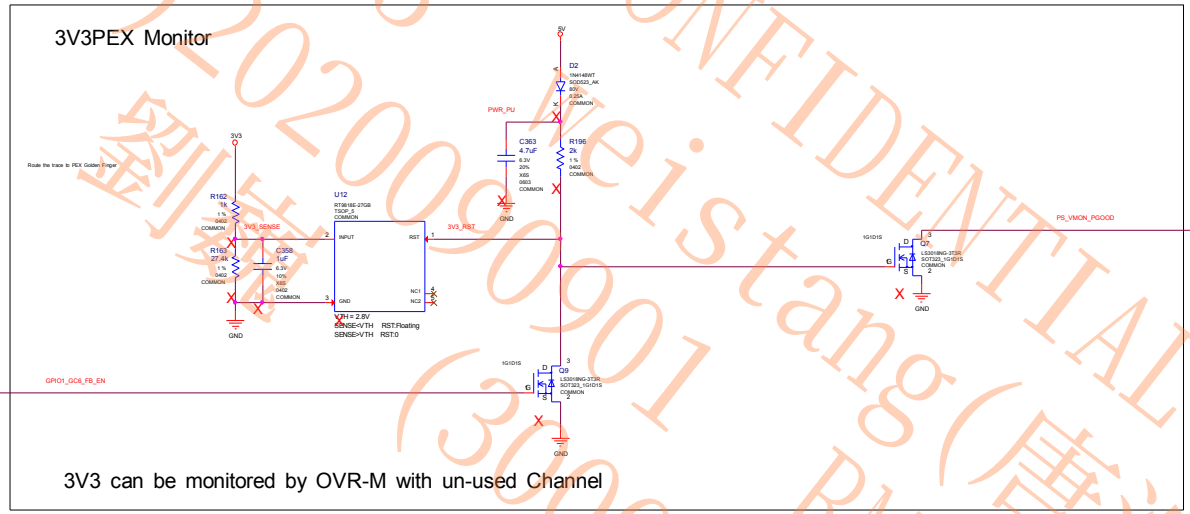
Sequence: 3V3 MONITOR



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	MS-V389	
Size: Custom	Document Description: Sequence: 3V3 MONITOR	Rev: 3.1
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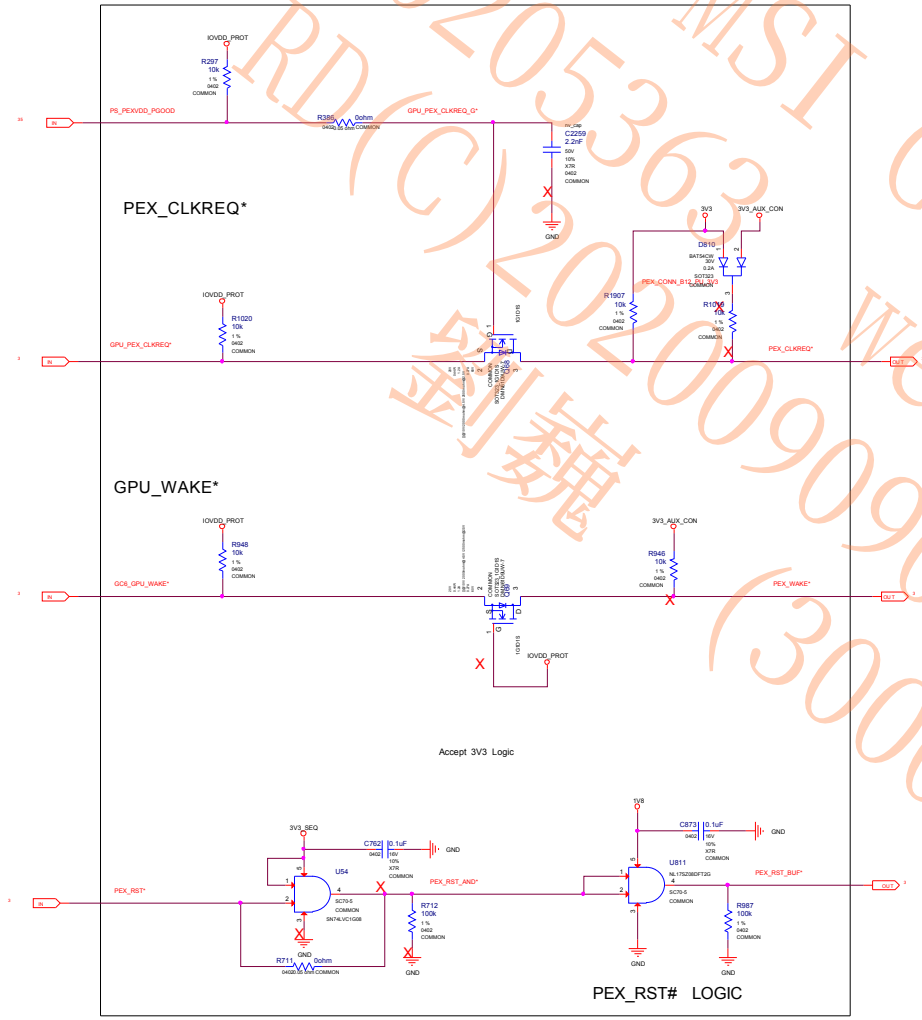
SEQUENCE:MISC



MSI	MICRO-STAR INT'L CO.,LTD	
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Size: Custom	Document Description: SEQUENCE:MISC	Rev:
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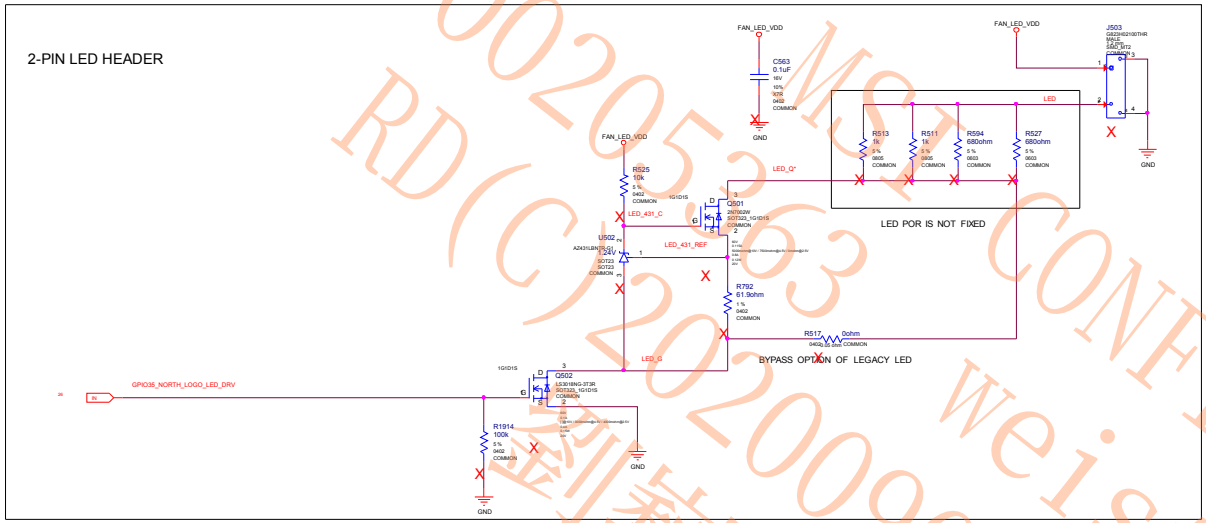
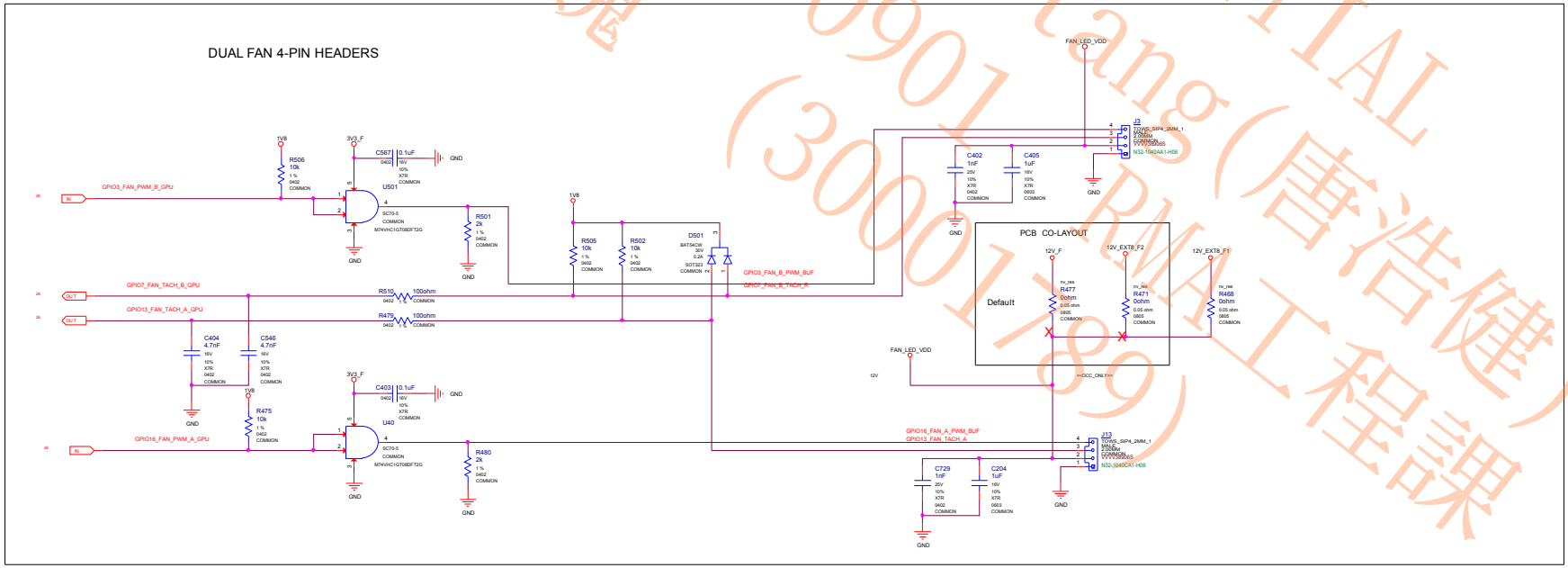
MISC: LED & FAN





MSI	MICRO-STAR INT'L CO.,LTD	
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Size: Custom	Document Description: MISC: LED & FAN	Rev:
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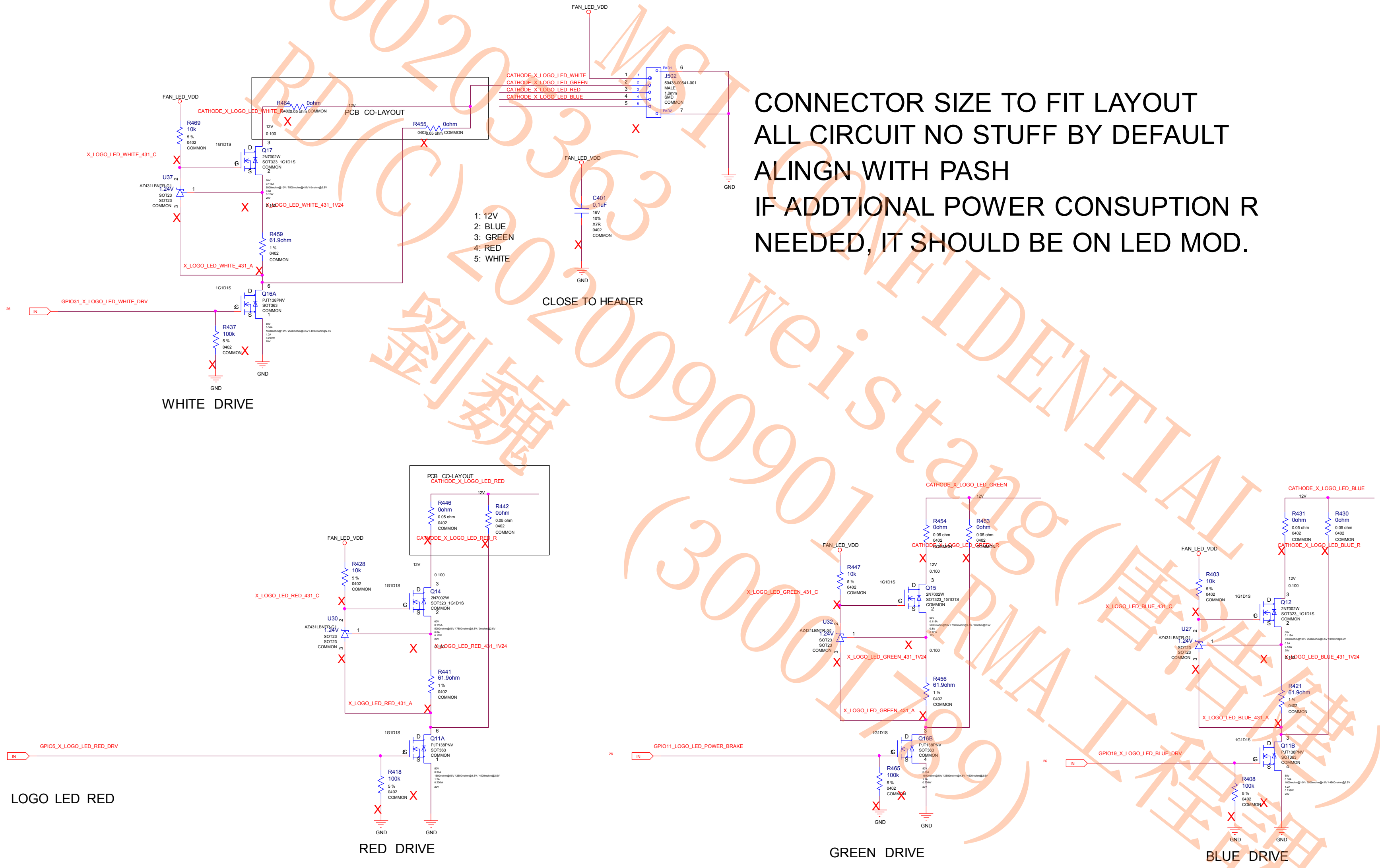
MISC: RGBW LED REF

CONNECTOR SIZE TO FIT LAYOUT
ALL CIRCUIT NO STUFF BY DEFAULT
ALINGN WITH PASH
IF ADDTIONAL POWER CONSUPTION R
NEEDED, IT SHOULD BE ON LED MOD.



FAN_LED_VDD
CATHODE_X_LOGO_LED_WHITE
CATHODE_X_LOGO_LED_GREEN
CATHODE_X_LOGO_LED_RED
CATHODE_X_LOGO_LED_BLUE
J502
GND
PCB CO-LAYOUT
R464 0ohm
R455 0ohm
R469 10k
Q17
U37
X_LOGO_LED_WHITE_431_C
X_LOGO_LED_WHITE_431_1V24
R459 61.9ohm
X_LOGO_LED_WHITE_431_A
Q16A
GPIO31_X_LOGO_LED_WHITE_DRV
R437 100k
C401 0.1uF
1: 12V
2: BLUE
3: GREEN
4: RED
5: WHITE
CLOSE TO HEADER
WHITE DRIVE
CATHODE_X_LOGO_LED_RED
R446 0ohm
R442 0ohm
CATHODE_X_LOGO_LED_RED_R
R428 10k
Q14
U30
X_LOGO_LED_RED_431_C
X_LOGO_LED_RED_431_1V24
R441 61.9ohm
X_LOGO_LED_RED_431_A
Q11A
GPIO5_X_LOGO_LED_RED_DRV
R418 100k
LOGO LED RED
RED DRIVE
R454 0ohm
R453 0ohm
R447 10k
Q15
U32
X_LOGO_LED_GREEN_431_C
X_LOGO_LED_GREEN_431_1V24
R456 61.9ohm
X_LOGO_LED_GREEN_431_A
Q16B
GPIO11_LOGO_LED_POWER_BRAKE
R465 100k
GREEN DRIVE
R431 0ohm
R430 0ohm
CATHODE_X_LOGO_LED_BLUE_R
R403 10k
Q12
U27
X_LOGO_LED_BLUE_431_C
X_LOGO_LED_BLUE_431_1V24
R421 61.9ohm
X_LOGO_LED_BLUE_431_A
Q11B
GPIO19_X_LOGO_LED_BLUE_DRV
R408 100k
BLUE DRIVE

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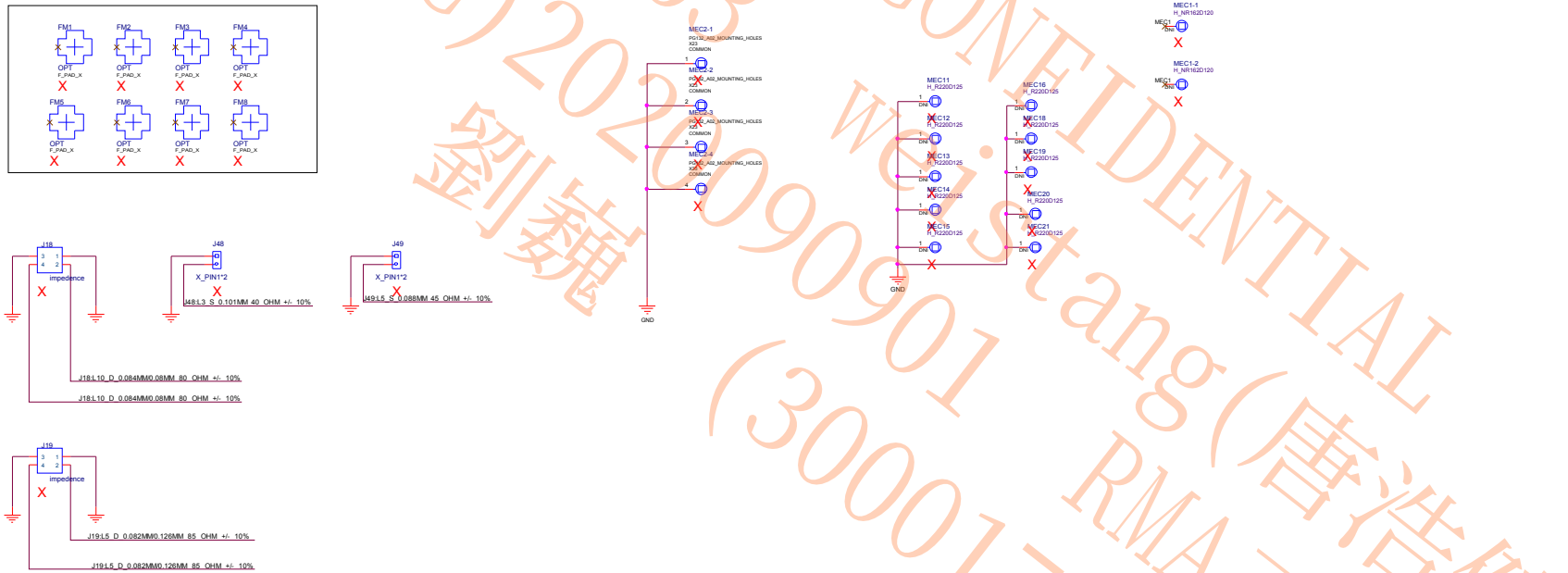
Mechanical: Mounting holes



MSI	MICRO-STAR INT'L CO.,LTD	
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Size: Custom	Document Description: Mechanical: Mounting holes	Rev: 3.1
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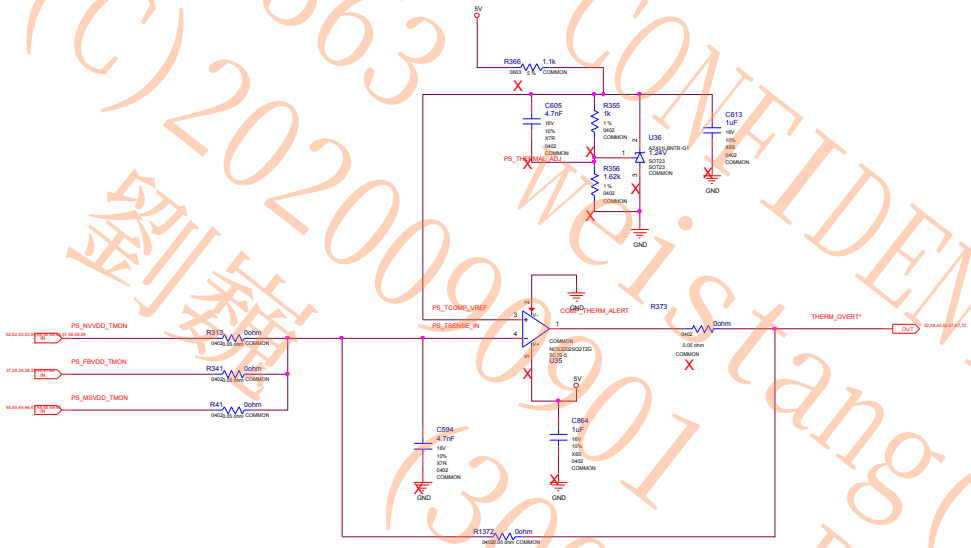
VR THERMAL PROTECTION



MICRO-STAR INT'L CO.,LTD	
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Size: Custom	Document Description: VR THERMAL PROTECTION
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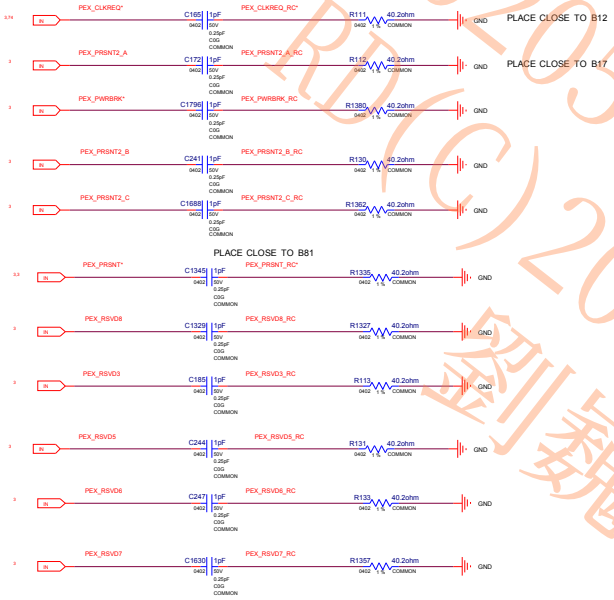
PCI TERM



MSI	MICRO-STAR INT'L CO.,LTD	
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Size: Custom	Document Description: PCI TERM	Rev:
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