IM13037A

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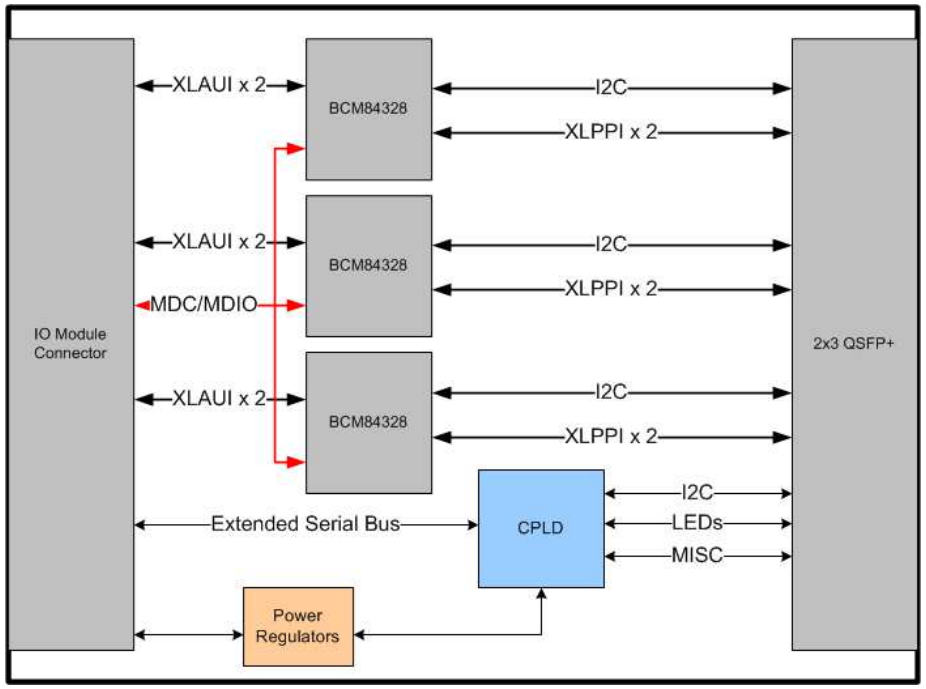
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227 Devcon Dr.
San Jose, CA 95112
www.interfacemasters.com

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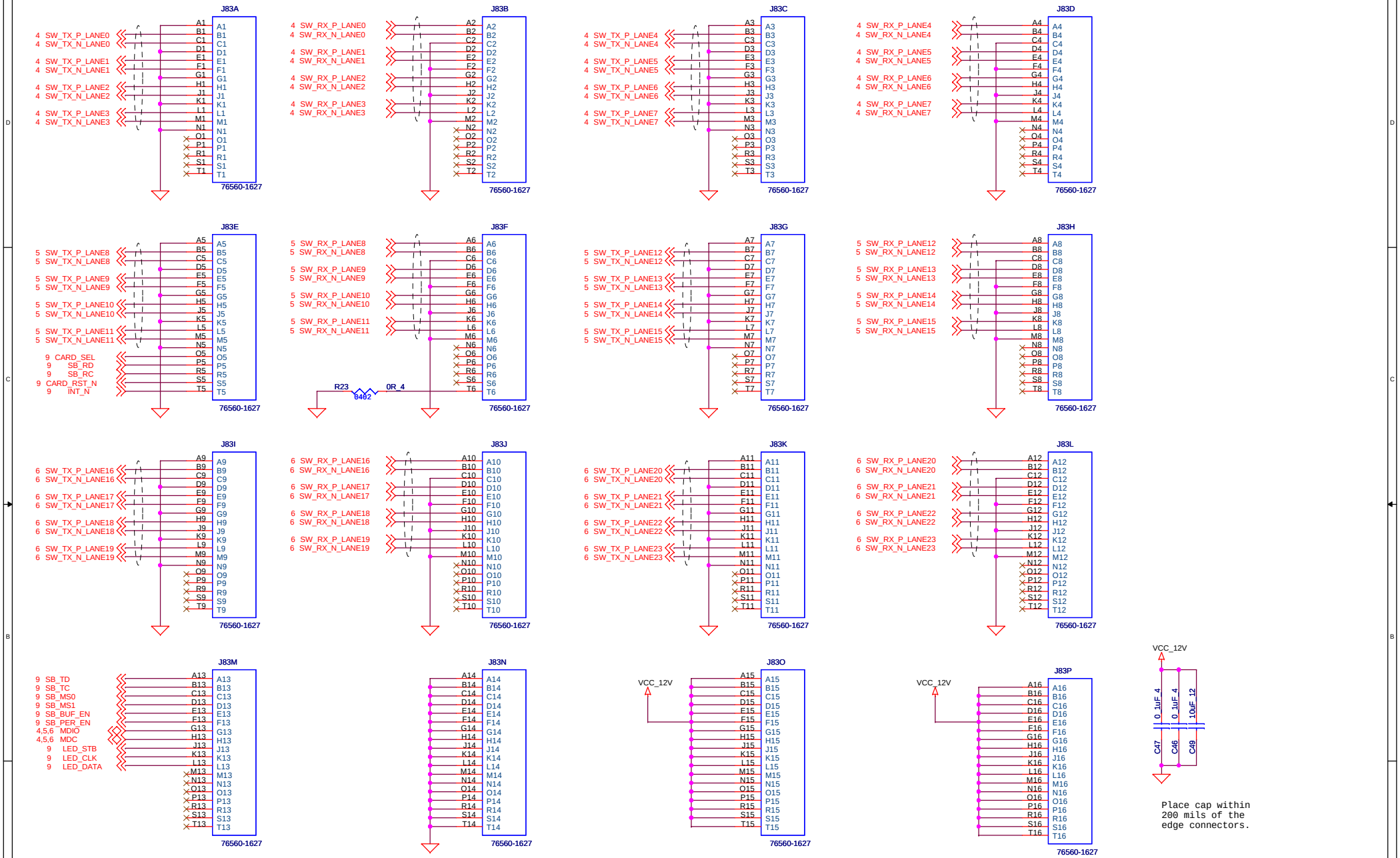
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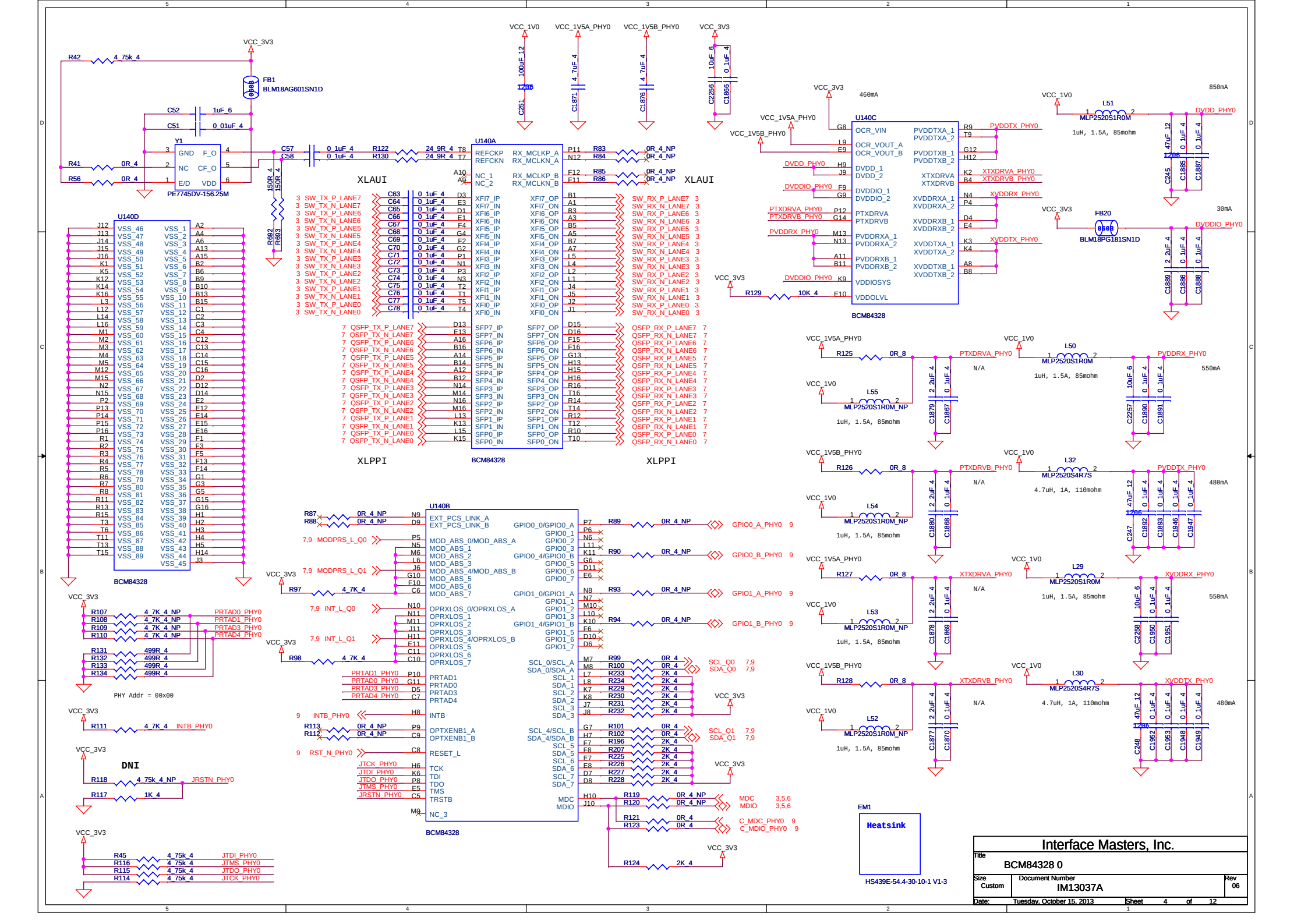
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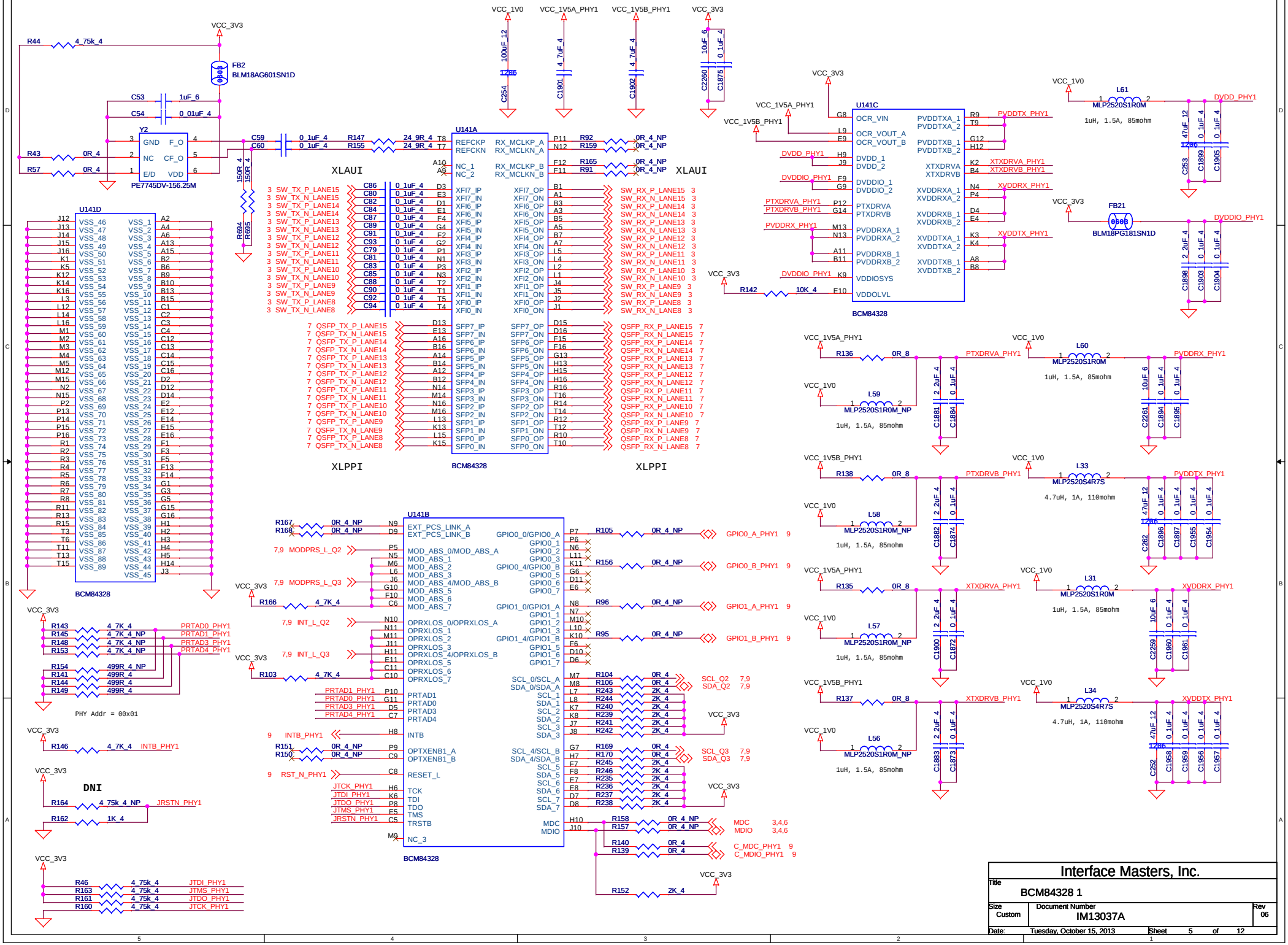
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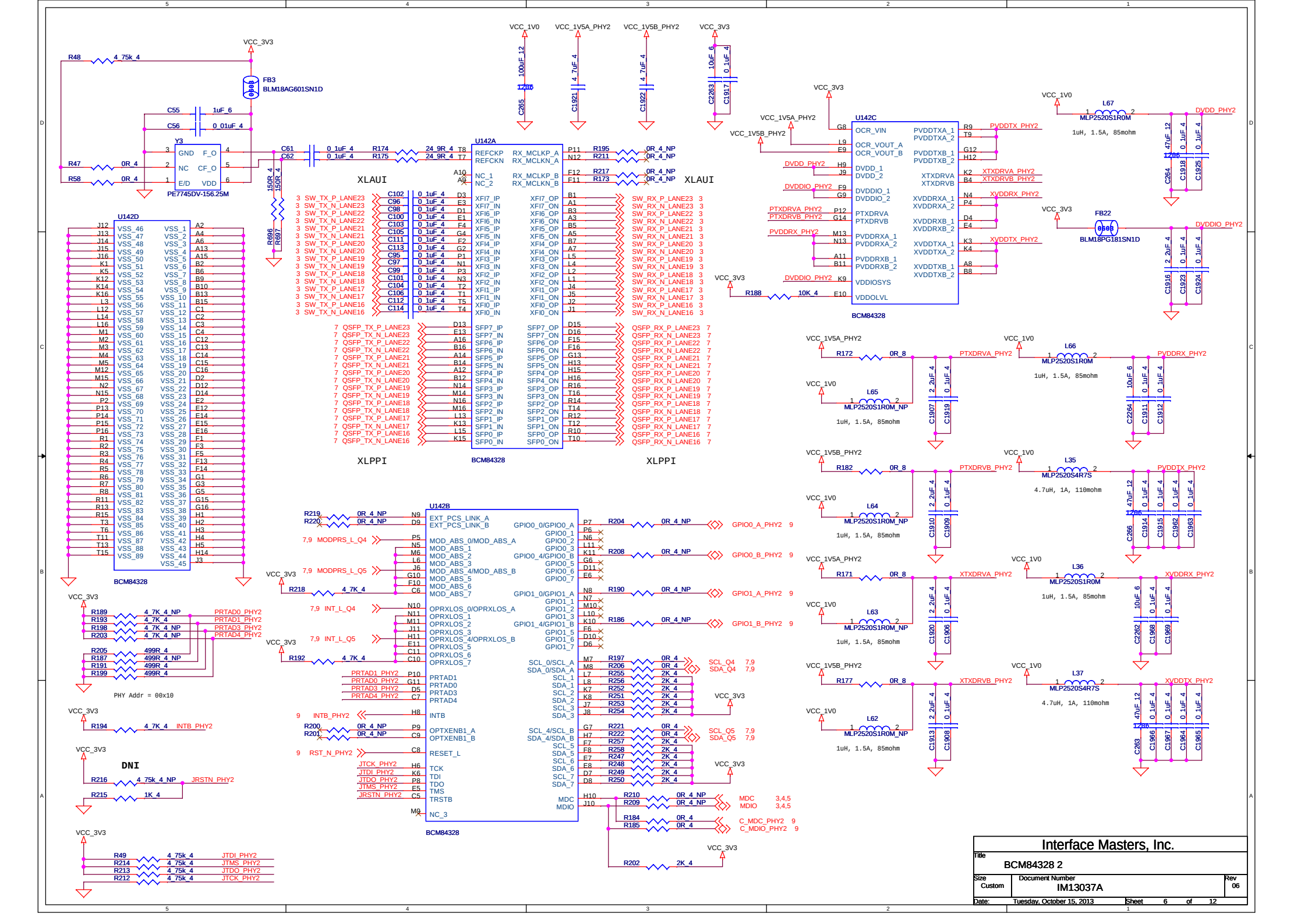


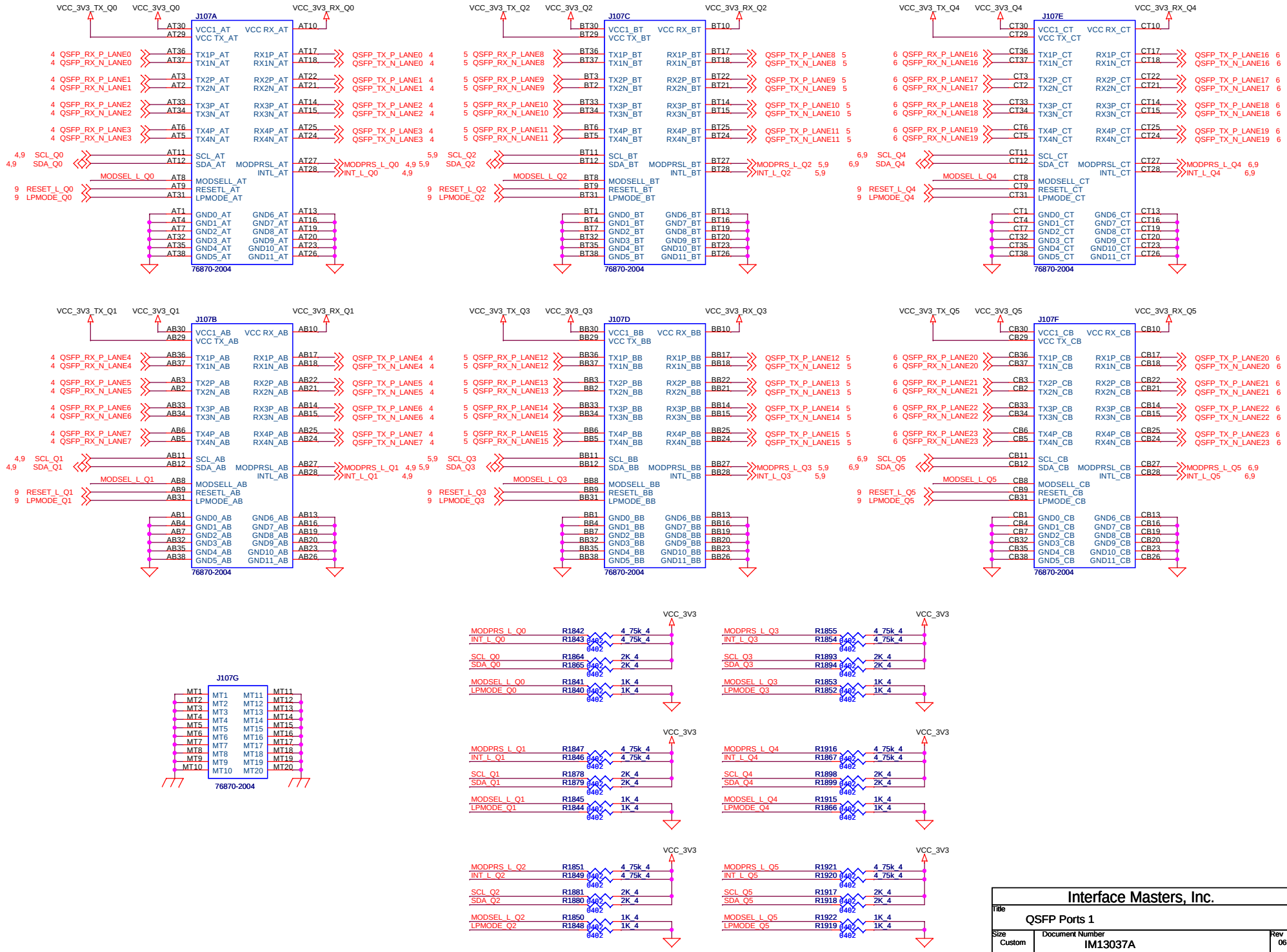
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J83A
4 SW_TX_P_LANE0
4 SW_TX_N_LANE0
4 SW_TX_P_LANE1
4 SW_TX_N_LANE1
4 SW_TX_P_LANE2
4 SW_TX_N_LANE2
4 SW_TX_P_LANE3
4 SW_TX_N_LANE3
76560-1627
J83B
4 SW_RX_P_LANE0
4 SW_RX_N_LANE0
4 SW_RX_P_LANE1
4 SW_RX_N_LANE1
4 SW_RX_P_LANE2
4 SW_RX_N_LANE2
4 SW_RX_P_LANE3
4 SW_RX_N_LANE3
76560-1627
J83C
4 SW_TX_P_LANE4
4 SW_TX_N_LANE4
4 SW_TX_P_LANE5
4 SW_TX_N_LANE5
4 SW_TX_P_LANE6
4 SW_TX_N_LANE6
4 SW_TX_P_LANE7
4 SW_TX_N_LANE7
76560-1627
J83D
4 SW_RX_P_LANE4
4 SW_RX_N_LANE4
4 SW_RX_P_LANE5
4 SW_RX_N_LANE5
4 SW_RX_P_LANE6
4 SW_RX_N_LANE6
4 SW_RX_P_LANE7
4 SW_RX_N_LANE7
76560-1627
J83E
5 SW_TX_P_LANE8
5 SW_TX_N_LANE8
5 SW_TX_P_LANE9
5 SW_TX_N_LANE9
5 SW_TX_P_LANE10
5 SW_TX_N_LANE10
5 SW_TX_P_LANE11
5 SW_TX_N_LANE11
9 CARD_SEL
9 SB_RD
9 SB_RC
9 CARD_RST_N
9 INT_N
76560-1627
J83F
5 SW_RX_P_LANE8
5 SW_RX_N_LANE8
5 SW_RX_P_LANE9
5 SW_RX_N_LANE9
5 SW_RX_P_LANE10
5 SW_RX_N_LANE10
5 SW_RX_P_LANE11
5 SW_RX_N_LANE11
R23
0R_4
0402
76560-1627
J83G
5 SW_TX_P_LANE12
5 SW_TX_N_LANE12
5 SW_TX_P_LANE13
5 SW_TX_N_LANE13
5 SW_TX_P_LANE14
5 SW_TX_N_LANE14
5 SW_TX_P_LANE15
5 SW_TX_N_LANE15
76560-1627
J83H
5 SW_RX_P_LANE12
5 SW_RX_N_LANE12
5 SW_RX_P_LANE13
5 SW_RX_N_LANE13
5 SW_RX_P_LANE14
5 SW_RX_N_LANE14
5 SW_RX_P_LANE15
5 SW_RX_N_LANE15
76560-1627
J83I
6 SW_TX_P_LANE16
6 SW_TX_N_LANE16
6 SW_TX_P_LANE17
6 SW_TX_N_LANE17
6 SW_TX_P_LANE18
6 SW_TX_N_LANE18
6 SW_TX_P_LANE19
6 SW_TX_N_LANE19
76560-1627
J83J
6 SW_RX_P_LANE16
6 SW_RX_N_LANE16
6 SW_RX_P_LANE17
6 SW_RX_N_LANE17
6 SW_RX_P_LANE18
6 SW_RX_N_LANE18
6 SW_RX_P_LANE19
6 SW_RX_N_LANE19
76560-1627
J83K
6 SW_TX_P_LANE20
6 SW_TX_N_LANE20
6 SW_TX_P_LANE21
6 SW_TX_N_LANE21
6 SW_TX_P_LANE22
6 SW_TX_N_LANE22
6 SW_TX_P_LANE23
6 SW_TX_N_LANE23
76560-1627
J83L
6 SW_RX_P_LANE20
6 SW_RX_N_LANE20
6 SW_RX_P_LANE21
6 SW_RX_N_LANE21
6 SW_RX_P_LANE22
6 SW_RX_N_LANE22
6 SW_RX_P_LANE23
6 SW_RX_N_LANE23
76560-1627
J83M
9 SB_TD
9 SB_TC
9 SB_MS0
9 SB_MS1
9 SB_BUF_EN
9 SB_PER_EN
4,5,6 MDIO
4,5,6 MDC
9 LED_STB
9 LED_CLK
9 LED_DATA
76560-1627
J83N
76560-1627
J83O
VCC_12V
76560-1627
J83P
VCC_12V
76560-1627
VCC_12V
0_1uF_4
0_1uF_4
10uF_12
C47
C46
C49
Place cap within
200 mils of the
edge connectors.
Route each p/n pair as a differential trace. Traces
within a pair should match within 5 mils in length.
Differential impedance should be 100 ohm.
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VCC_3V3
R42 4_75k_4
FB1
BLM18AG601SN1D
C52 1uF_6
C51 0_01uF_4
Y1
GND F_O
NC CF_O
E/D VDD
PE7745DV-156.25M
R41 0R_4
R56 0R_4
C57 0_1uF_4
C58 0_1uF_4
R122 24_9R_4
R130 24_9R_4
150R_4
150R_4
R692
R693
XLAUI
U140A
REFCKP RX_MCLKP_A
REFCKN RX_MCLKN_A
NC_1 RX_MCLKP_B
NC_2 RX_MCLKN_B
XFI7_IP XFI7_ON
XFI7_IN XFI7_OP
XFI6_IP XFI6_ON
XFI6_IN XFI6_OP
XFI5_IP XFI5_ON
XFI5_IN XFI5_OP
XFI4_IP XFI4_ON
XFI4_IN XFI4_OP
XFI3_IP XFI3_ON
XFI3_IN XFI3_OP
XFI2_IP XFI2_ON
XFI2_IN XFI2_OP
XFI1_IP XFI1_ON
XFI1_IN XFI1_OP
XFI0_IP XFI0_ON
XFI0_IN XFI0_OP
SW_TX_P_LANE7
SW_TX_N_LANE7
SW_TX_P_LANE6
SW_TX_N_LANE6
SW_TX_P_LANE5
SW_TX_N_LANE5
SW_TX_P_LANE4
SW_TX_N_LANE4
SW_TX_P_LANE3
SW_TX_N_LANE3
SW_TX_P_LANE2
SW_TX_N_LANE2
SW_TX_P_LANE1
SW_TX_N_LANE1
SW_TX_P_LANE0
SW_TX_N_LANE0
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SW_RX_P_LANE2
SW_RX_N_LANE2
SW_RX_P_LANE1
SW_RX_N_LANE1
SW_RX_P_LANE0
SW_RX_N_LANE0
XLPPI
BCM84328
QSFP_TX_P_LANE7
QSFP_TX_N_LANE7
QSFP_TX_P_LANE6
QSFP_TX_N_LANE6
QSFP_TX_P_LANE5
QSFP_TX_N_LANE5
QSFP_TX_P_LANE4
QSFP_TX_N_LANE4
QSFP_TX_P_LANE3
QSFP_TX_N_LANE3
QSFP_TX_P_LANE2
QSFP_TX_N_LANE2
QSFP_TX_P_LANE1
QSFP_TX_N_LANE1
QSFP_TX_P_LANE0
QSFP_TX_N_LANE0
SFP7_IP SFP7_OP
SFP7_IN SFP7_ON
SFP6_IP SFP6_ON
SFP6_IN SFP6_OP
SFP5_IP SFP5_ON
SFP5_IN SFP5_OP
SFP4_IP SFP4_ON
SFP4_IN SFP4_OP
SFP3_IP SFP3_ON
SFP3_IN SFP3_OP
SFP2_IP SFP2_ON
SFP2_IN SFP2_OP
SFP1_IP SFP1_ON
SFP1_IN SFP1_OP
SFP0_IP SFP0_ON
SFP0_IN SFP0_OP
QSFP_RX_P_LANE7
QSFP_RX_N_LANE7
QSFP_RX_P_LANE6
QSFP_RX_N_LANE6
QSFP_RX_P_LANE5
QSFP_RX_N_LANE5
QSFP_RX_P_LANE4
QSFP_RX_N_LANE4
QSFP_RX_P_LANE3
QSFP_RX_N_LANE3
QSFP_RX_P_LANE2
QSFP_RX_N_LANE2
QSFP_RX_P_LANE1
QSFP_RX_N_LANE1
QSFP_RX_P_LANE0
QSFP_RX_N_LANE0
U140D
BCM84328
U140B
EXT_PCS_LINK_A
EXT_PCS_LINK_B
MOD_ABS_0/MOD_ABS_A
MOD_ABS_1
MOD_ABS_2
MOD_ABS_3
MOD_ABS_4/MOD_ABS_B
MOD_ABS_5
MOD_ABS_6
MOD_ABS_7
OPRXLOS_0/OPRXLOS_A
OPRXLOS_1
OPRXLOS_2
OPRXLOS_3
OPRXLOS_4/OPRXLOS_B
OPRXLOS_5
OPRXLOS_6
OPRXLOS_7
PRTAD1
PRTAD0
PRTAD3
PRTAD4
INTB
OPTXENB1_A
OPTXENB1_B
RESET_L
TCK
TDI
TDO
TMS
TRSTB
NC_3
GPIO0_0/GPIO0_A
GPIO0_1
GPIO0_2
GPIO0_3
GPIO0_4/GPIO0_B
GPIO0_5
GPIO0_6
GPIO0_7
GPIO1_0/GPIO1_A
GPIO1_1
GPIO1_2
GPIO1_3
GPIO1_4/GPIO1_B
GPIO1_5
GPIO1_6
GPIO1_7
SCL_0/SCL_A
SDA_0/SDA_A
SCL_1
SDA_1
SCL_2
SDA_2
SCL_3
SDA_3
SCL_4/SCL_B
SDA_4/SDA_B
SCL_5
SDA_5
SCL_6
SDA_6
SCL_7
SDA_7
MDC
MDIO
MODPRS_L_Q0
MODPRS_L_Q1
INT_L_Q0
INT_L_Q1
INTB_PHY0
RST_N_PHY0
JTCK_PHY0
JTDI_PHY0
JTMS_PHY0
JTDO_PHY0
JRSTN_PHY0
PRTAD0_PHY0
PRTAD1_PHY0
PRTAD3_PHY0
PRTAD4_PHY0
GPIO0_A_PHY0
GPIO0_B_PHY0
GPIO1_A_PHY0
GPIO1_B_PHY0
SCL_Q0
SDA_Q0
SCL_Q1
SDA_Q1
C_MDC_PHY0
C_MDIO_PHY0
PHY Addr = 00x00
DNI
VCC_1V0
VCC_1V5A_PHY0
VCC_1V5B_PHY0
U140C
OCR_VIN
OCR_VOUT_A
OCR_VOUT_B
DVDD_1
DVDD_2
DVDDIO_1
DVDDIO_2
PTXDRVA
PTXDRVB
PVDDRXA_1
PVDDRXA_2
PVDDRXB_1
PVDDRXB_2
VDDIOSYS
VDDOLVL
PVDDTXA_1
PVDDTXA_2
PVDDTXB_1
PVDDTXB_2
XTXDRVA
XTXDRVB
XVDDRXA_1
XVDDRXA_2
XVDDTXA_1
XVDDTXA_2
XVDDTXB_1
XVDDTXB_2
460mA
850mA
30mA
L51
MLP2520S1R0M
1uH, 1.5A, 85mohm
FB20
BLM18PG181SN1D
L55
MLP2520S1R0M_NP
L50
L54
L53
L32
MLP2520S4R7S
4.7uH, 1A, 110mohm
L29
L30
Heatsink
HS439E-54.4-30-10-1 V1-3
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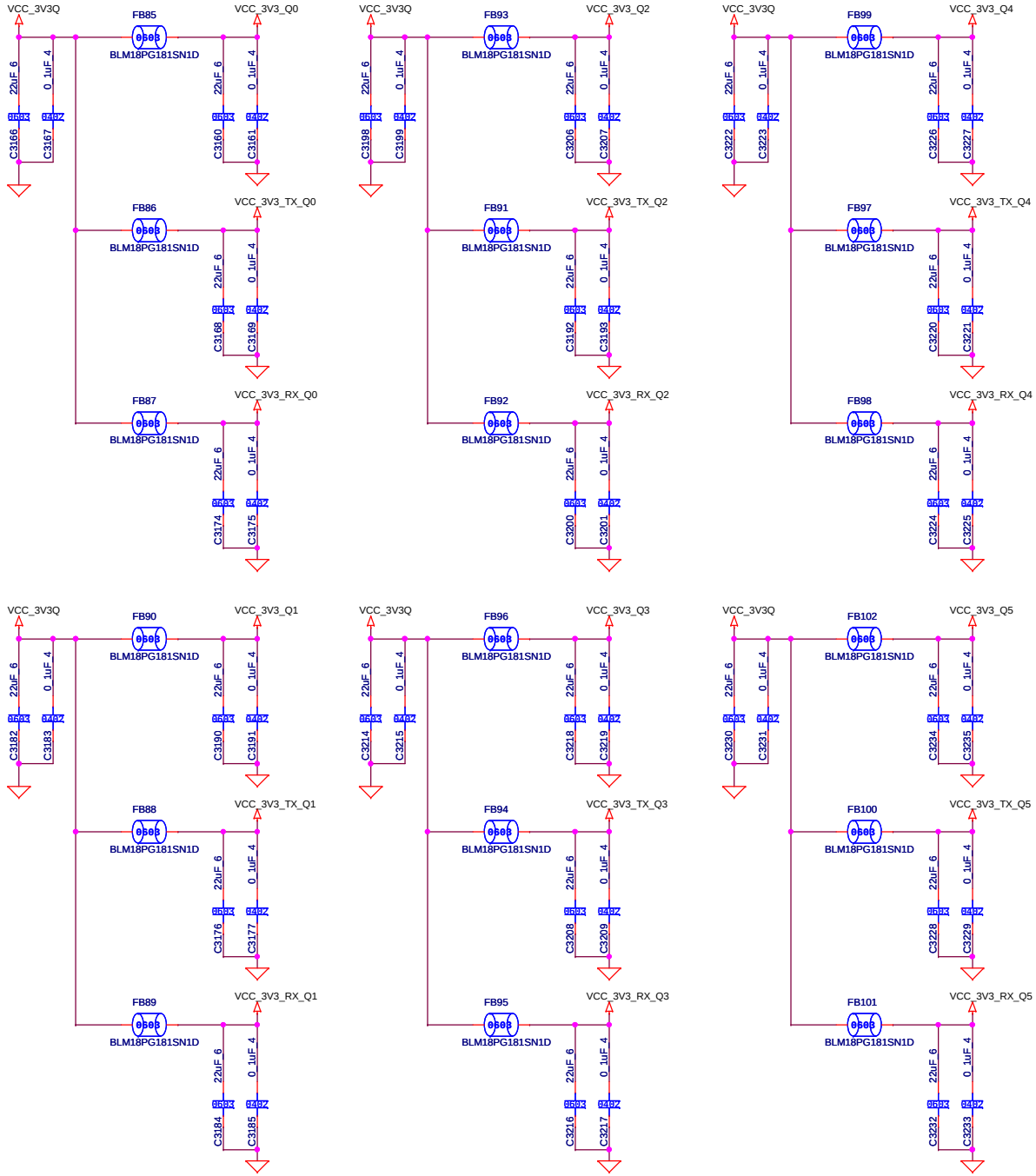

VCC_3V3
R44 4_75k_4
FB2
BLM18AG601SN1D
C53 1uF_6
C54 0_01uF_4
Y2
PE7745DV-156.25M
R43 0R_4
R57 0R_4
C59 0_1uF_4
C60 0_1uF_4
R147 24_9R_4
R155 24_9R_4
150R_4
R694
R695
XLAUI
U141A
BCM84328
XLPPI
U141D
BCM84328
U141B
BCM84328
VCC_1V0
VCC_1V5A_PHY1
VCC_1V5B_PHY1
VCC_3V3
100uF_12
4_7uF_4
10uF_6
0_1uF_4
C254
C1901
C1902
C2260
C1875
U141C
BCM84328
R142 10K_4
L61
MLP2520S1R0M
1uH, 1.5A, 85mohm
DVDD_PHY1
FB21
BLM18PG181SN1D
DVDDIO_PHY1
L60
L59
L33
MLP2520S4R7S
4.7uH, 1A, 110mohm
L58
L31
L57
L34
L56
R136 0R_8
R138 0R_8
R135 0R_8
R137 0R_8
PTXDRVA_PHY1
PTXDRVB_PHY1
PVDDRX_PHY1
PVDDTX_PHY1
XTXDRVA_PHY1
XTXDRVB_PHY1
XVDDRX_PHY1
XVDDTX_PHY1
R143 4_7K_4
R145 4_7K_4_NP
R148 4_7K_4_NP
R153 4_7K_4_NP
PRTAD0_PHY1
PRTAD1_PHY1
PRTAD3_PHY1
PRTAD4_PHY1
PHY Addr = 00x01
R154 499R_4_NP
R141 499R_4
R144 499R_4
R149 499R_4
DNI
R146 4_7K_4 INTB_PHY1
R164 4_75k_4_NP JRSTN_PHY1
R162 1K_4
R46 4_75k_4 JTDI_PHY1
R163 4_75k_4 JTMS_PHY1
R161 4_75k_4 JTDO_PHY1
R160 4_75k_4 JTCK_PHY1
R167 0R_4_NP
R168 0R_4_NP
R166 4_7K_4
R103 4_7K_4
R151 0R_4_NP
R150 0R_4_NP
MODPRS_L_Q2
MODPRS_L_Q3
INT_L_Q2
INT_L_Q3
INTB_PHY1
RST_N_PHY1
JTCK_PHY1
JTDI_PHY1
JTDO_PHY1
JTMS_PHY1
JRSTN_PHY1
GPIO0_A_PHY1
GPIO0_B_PHY1
GPIO1_A_PHY1
GPIO1_B_PHY1
SCL_Q2
SDA_Q2
SCL_Q3
SDA_Q3
MDC
MDIO
C_MDC_PHY1
C_MDIO_PHY1
R152 2K_4
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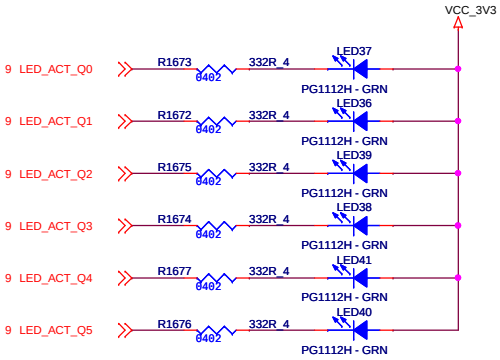

VCC_3V3
VCC_1V0
VCC_1V5A_PHY2
VCC_1V5B_PHY2
R48 4_75k_4
FB3 BLM18AG601SN1D
C55 1uF_6
C56 0_01uF_4
Y3 PE7745DV-156.25M
R47 0R_4
R58 0R_4
C61 0_1uF_4
C62 0_1uF_4
R174 24_9R_4
R175 24_9R_4
150R_4
R696 R697
U142A
REFCKP REFCKN
RX_MCLKP_A RX_MCLKN_A
NC_1 NC_2
RX_MCLKP_B RX_MCLKN_B
XLAUI
XLAUI
U142C
OCR_VIN OCR_VOUT_A OCR_VOUT_B
DVDD_1 DVDD_2
DVDDIO_1 DVDDIO_2
PTXDRVA PTXDRVB
PVDDRXA_1 PVDDRXA_2
PVDDRXB_1 PVDDRXB_2
VDDIOSYS VDDOLVL
PVDDTXA_1 PVDDTXA_2
PVDDTXB_1 PVDDTXB_2
XTXDRVA XTXDRVB
XVDDRXA_1 XVDDRXA_2
XVDDTXA_1 XVDDTXA_2
XVDDTXB_1 XVDDTXB_2
BCM84328
R188 10K_4
PVDDTX_PHY2
XTXDRVA_PHY2
XTXDRVB_PHY2
XVDDRX_PHY2
XVDDTX_PHY2
L67 MLP2520S1R0M
1uH, 1.5A, 85mohm
FB22 BLM18PG181SN1D
DVDD_PHY2
DVDDIO_PHY2
PTXDRVA_PHY2
PTXDRVB_PHY2
PVDDRX_PHY2
U142D
BCM84328
XLPPI
XLPPI
U142B
EXT_PCS_LINK_A EXT_PCS_LINK_B
MOD_ABS_0/MOD_ABS_A
MOD_ABS_1
MOD_ABS_2
MOD_ABS_3
MOD_ABS_4/MOD_ABS_B
MOD_ABS_5
MOD_ABS_6
MOD_ABS_7
OPRXLOS_0/OPRXLOS_A
OPRXLOS_1
OPRXLOS_2
OPRXLOS_3
OPRXLOS_4/OPRXLOS_B
OPRXLOS_5
OPRXLOS_6
OPRXLOS_7
PRTAD1
PRTAD0
PRTAD3
PRTAD4
INTB
OPTXENB1_A
OPTXENB1_B
RESET_L
TCK
TDI
TDO
TMS
TRSTB
NC_3
GPIO0_0/GPIO0_A
GPIO0_1
GPIO0_2
GPIO0_3
GPIO0_4/GPIO0_B
GPIO0_5
GPIO0_6
GPIO0_7
GPIO1_0/GPIO1_A
GPIO1_1
GPIO1_2
GPIO1_3
GPIO1_4/GPIO1_B
GPIO1_5
GPIO1_6
GPIO1_7
SCL_0/SCL_A
SDA_0/SDA_A
SCL_1
SDA_1
SCL_2
SDA_2
SCL_3
SDA_3
SCL_4/SCL_B
SDA_4/SDA_B
SCL_5
SDA_5
SCL_6
SDA_6
SCL_7
SDA_7
MDC
MDIO
BCM84328
R189 4_7K_4_NP
R193 4_7K_4
R198 4_7K_4_NP
R203 4_7K_4_NP
R205 499R_4
R187 499R_4_NP
R191 499R_4
R199 499R_4
PHY Addr = 00x10
R194 4_7K_4 INTB_PHY2
DNI
R216 4_75k_4_NP JRSTN_PHY2
R215 1K_4
R49 4_75k_4 JTDI_PHY2
R214 4_75k_4 JTMS_PHY2
R213 4_75k_4 JTDO_PHY2
R212 4_75k_4 JTCK_PHY2
R219 0R_4_NP
R220 0R_4_NP
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R192 4_7K_4
R200 0R_4_NP
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R184 0R_4
R185 0R_4
R202 2K_4
MODPRS_L_Q4
MODPRS_L_Q5
INT_L_Q4
INT_L_Q5
RST_N_PHY2
GPIO0_A_PHY2
GPIO0_B_PHY2
GPIO1_A_PHY2
GPIO1_B_PHY2
SCL_Q4 SDA_Q4
SCL_Q5 SDA_Q5
MDC MDIO
C_MDC_PHY2
C_MDIO_PHY2
L66 MLP2520S1R0M
L65 MLP2520S1R0M_NP
L64 MLP2520S4R7S
L63 MLP2520S1R0M_NP
L36 MLP2520S1R0M
L35 MLP2520S4R7S
L62 MLP2520S1R0M_NP
L37 MLP2520S4R7S
Interface Masters, Inc.
Title
BCM84328 2
Size Custom
Document Number IM13037A
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Sheet 6 of 12

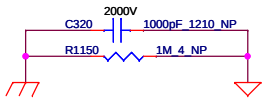


Interface Masters, Inc.	
Title	QSFP Ports 1
Size: Custom	Document Number: IM13037A
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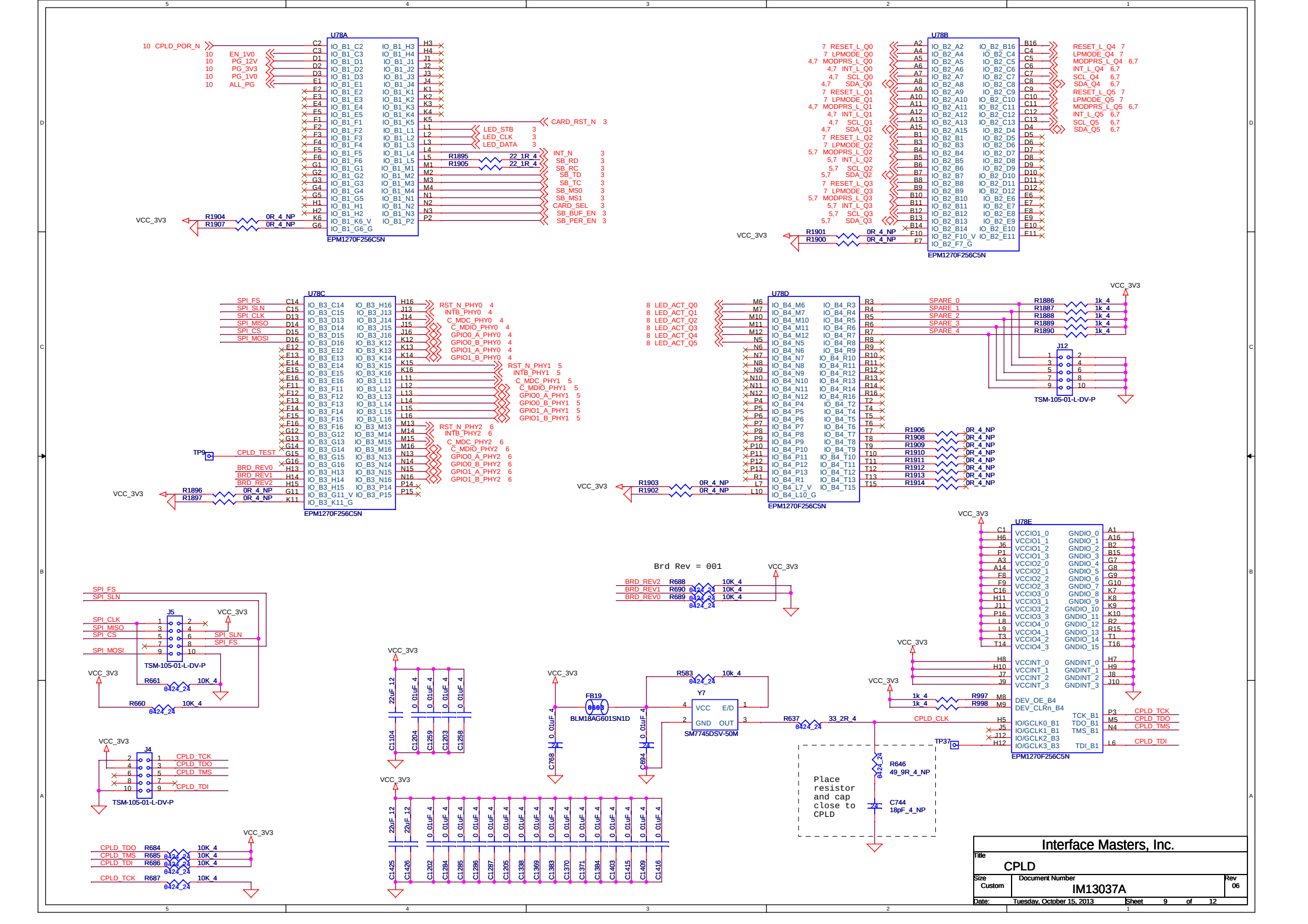
Place close to each QSFP Connector

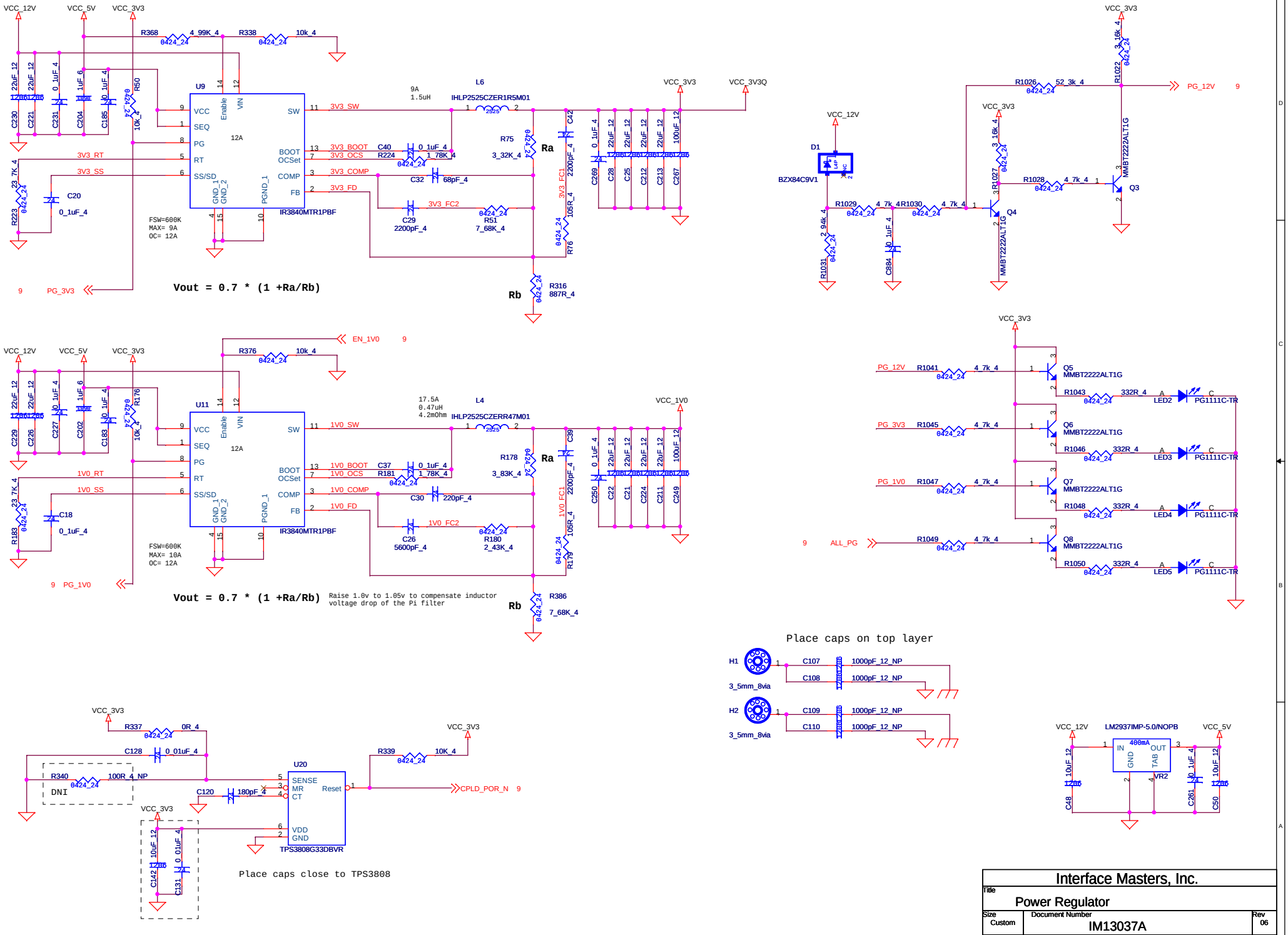






Interface Masters, Inc.		
Title: QSFP PWR 1		
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U78A
EPM1270F256C5N
U78B
EPM1270F256C5N
U78C
EPM1270F256C5N
U78D
EPM1270F256C5N
U78E
EPM1270F256C5N
VCC_3V3
CPLD_POR_N
EN_1V0
PG_12V
PG_3V3
PG_1V0
ALL_PG
CARD_RST_N
LED_STB
LED_CLK
LED_DATA
INT_N
SB_RD
SB_RC
SB_TD
SB_TC
SB_MS0
SB_MS1
CARD_SEL
SB_BUF_EN
SB_PER_EN
R1895
R1905
22_1R_4
R1904
R1907
R1901
R1900
0R_4_NP
RESET_L_Q0
LPMODE_Q0
MODPRS_L_Q0
INT_L_Q0
SCL_Q0
SDA_Q0
RESET_L_Q1
LPMODE_Q1
MODPRS_L_Q1
INT_L_Q1
SCL_Q1
SDA_Q1
RESET_L_Q2
LPMODE_Q2
MODPRS_L_Q2
INT_L_Q2
SCL_Q2
SDA_Q2
RESET_L_Q3
LPMODE_Q3
MODPRS_L_Q3
INT_L_Q3
SCL_Q3
SDA_Q3
RESET_L_Q4
LPMODE_Q4
MODPRS_L_Q4
INT_L_Q4
SCL_Q4
SDA_Q4
RESET_L_Q5
LPMODE_Q5
MODPRS_L_Q5
INT_L_Q5
SCL_Q5
SDA_Q5
SPI_FS
SPI_SLN
SPI_CLK
SPI_MISO
SPI_CS
SPI_MOSI
RST_N_PHY0
INTB_PHY0
C_MDC_PHY0
C_MDIO_PHY0
GPIO0_A_PHY0
GPIO0_B_PHY0
GPIO1_A_PHY0
GPIO1_B_PHY0
RST_N_PHY1
INTB_PHY1
C_MDC_PHY1
C_MDIO_PHY1
GPIO0_A_PHY1
GPIO0_B_PHY1
GPIO1_A_PHY1
GPIO1_B_PHY1
RST_N_PHY2
INTB_PHY2
C_MDC_PHY2
C_MDIO_PHY2
GPIO0_A_PHY2
GPIO0_B_PHY2
GPIO1_A_PHY2
GPIO1_B_PHY2
TP9
CPLD_TEST
BRD_REV0
BRD_REV1
BRD_REV2
R1896
R1897
R1903
R1902
LED_ACT_Q0
LED_ACT_Q1
LED_ACT_Q2
LED_ACT_Q3
LED_ACT_Q4
LED_ACT_Q5
SPARE_0
SPARE_1
SPARE_2
SPARE_3
SPARE_4
R1886
R1887
R1888
R1889
R1890
1k_4
J12
TSM-105-01-L-DV-P
R1906
R1908
R1909
R1910
R1911
R1912
R1913
R1914
Brd Rev = 001
R688
R690
R689
10K_4
0424_24
J5
J4
R661
R660
FB19
BLM18AG601SN1D
0805
Y7
SM7745DSV-50M
R583
R637
33_2R_4
CPLD_CLK
TP37
R997
R998
DEV_OE_B4
DEV_CLRn_B4
R646
49_9R_4_NP
C744
18pF_4_NP
Place resistor and cap close to CPLD
CPLD_TCK
CPLD_TDO
CPLD_TMS
CPLD_TDI
R684
R685
R686
R687
C1104
C1204
C1259
C1203
C1258
C768
C694
C1425
C1426
C1202
C1284
C1285
C1286
C1287
C1205
C1338
C1369
C1383
C1370
C1371
C1384
C1403
C1415
C1409
C1416
22uF_12
0_01uF_4
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CPLD
Size
Custom
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Interface Masters, Inc.		
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Overall Power Sequencing:

VCC_12V
VCC_5V
VCC_3V3 --> VCC_1V0 --> ALL_PWR_GOOD --> RESET

	Voltage Rails	
	1	3.3
QSFP+ x 6 (mA)		6363
BCM84328 x3 (mA)	8730	1470
CPLD (mA)		200
Total Current (mA)	8730	8033
Power (W)	8.73	26.5089
Total Power (W)	35.2389	
Total Raw Power (W) Assume 80% Efficiency	44.048625	

Interface Masters, Inc.		
Title: Power Sequence		
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REVISIONS

REV	PCB Rev	DESCRIPTIONS	ENGINEER	DATE
01		Genesis	Kevin Y	3/20/2013
04		update to avoid rework for MDC/MDIO CPLD access	Kevin Y	9/5/2013
06		update PHY power connection	Kevin Y	10/15/2013

Interface Masters, Inc.

Title: History

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