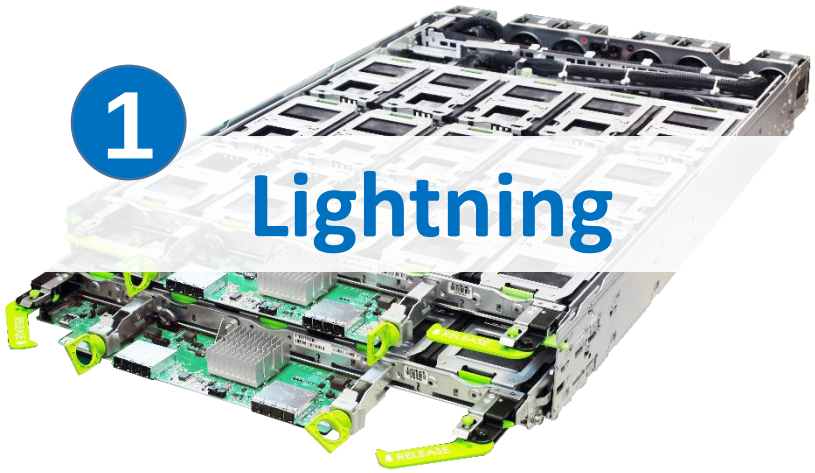
Wiwynn OCP Design Contribution Guideline

Jan. 11, 2018

Agenda

- **2 Designs and 5 Product Contributions**
- **Datasheets**
- **System Block Diagrams**
- **Guide for Design Files**
  (Bryce Canyon as the example)

2 Design and 5 Product Contribution List



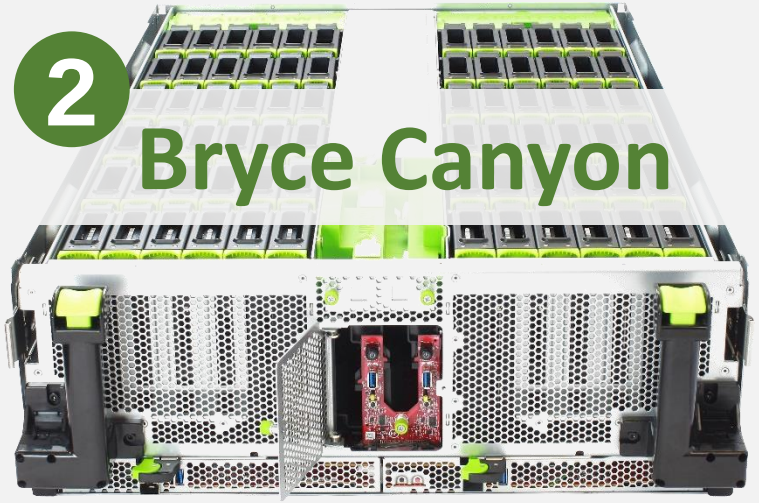
1 Lightning

A ST7200-30P

30 U.2 Bays

B ST7200-60M

60 M.2 Bays



2 Bryce Canyon

A SV7000G2

Mono Lake | Mono Lake

B SV7000G2-L

Mono Lake | IOM

C ST7000G2

IOM | IOM

SV7200-30P/60M (Lightning Series) Datasheet

Model : Wiwynn ST7200-30P/60M

Storage and I/O	
Expander	PCIe 3.0 Switch
Storage	60 M.2 NVMe SSDs: ・22110 or 2280 30 U.2 NVMe SSDs ・15mm or 7mm
Expansion Ports	Up to 4 PCIe 3.0 (x16) ports
Remote Management	BMC
Power Supply and Physical Specifications	
Power Supply	Centralized 12V DC bus bar
Form Factor and Dimension	2 OU (Open Rack); 93.5(H) x 536 (W) x 795 (D)
Weight	38 kg ~ 55 kg

ST7000G2/SV7000G2 (Bryce Canyon) Datasheet

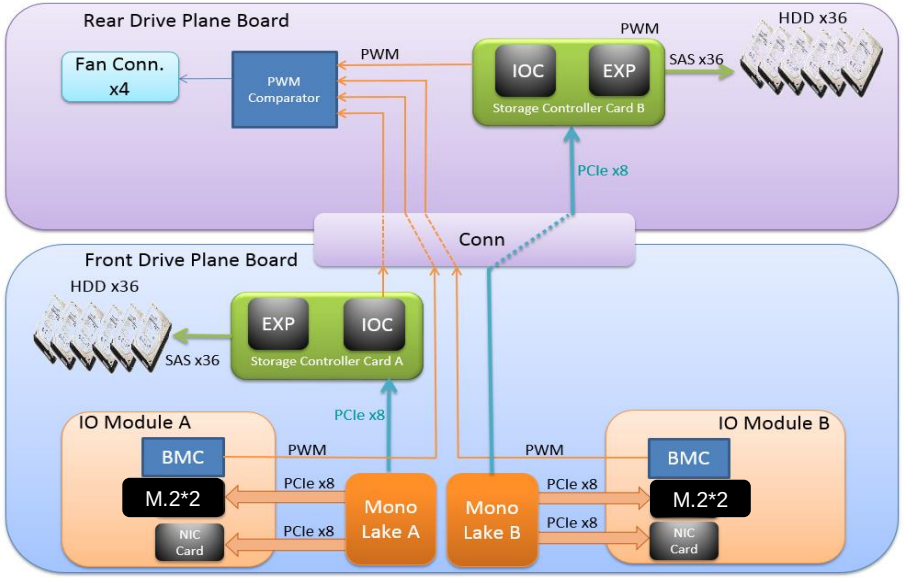
Model : Wiwynn ST7000G2/SV7200G2 Series

Storage and I/O	SV7000G2	SV7000G2-L	ST7000G2
Expander	SAS12G expander		
Storage	72 3.5" hot-plug drive bay		
Micro Server	2	1	
Processor	Intel® Xeon® Broadwell-DE	Intel® Xeon® Broadwell-DE	
Memory	DDR4 x 8 (4 per server), up to 2400MT/s	DDR4 x 4, up to 2400MT/s	
Boot Drive	2 x M.2 (1 per server)	1 x M.2	
IO Module (IOM)	2	1	
OCP Mezzanine	2 (1 per server)	1	
Expansion Ports	N/A	Two EXT mini-SAS 12G HD ports (SASx4)	Two EXT mini-SAS 12G HD ports (SASx4)
Remote Management	IPMI v2.0 Compliant, iKVM, Wiwynn Cluster Manager		SES, SMP

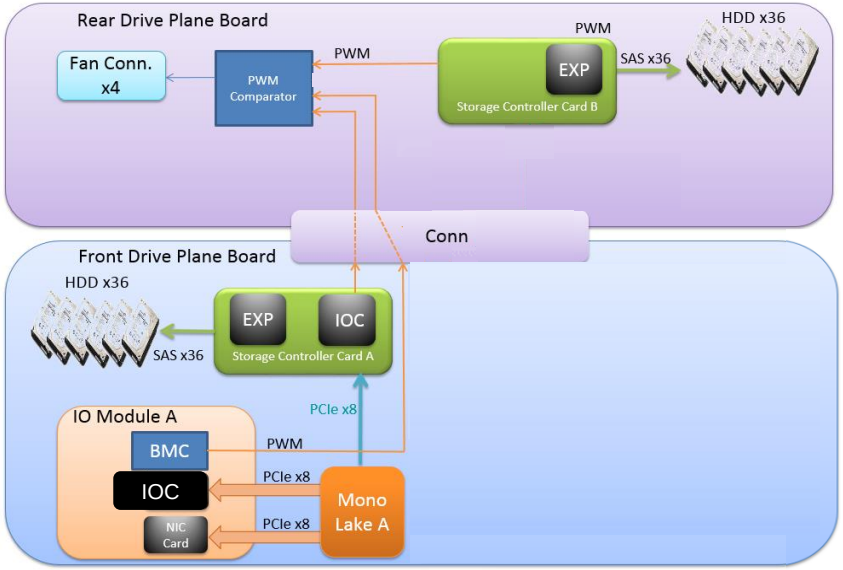
Power Supply and Physical Specifications	
Power Supply	Centralized 12.5 V DC bus bar
Form Factor and Dimensions	4 OU Rack; 4U; 185 (H) x 537 (W) x 879 (D)

Bryce Canyon Contribution

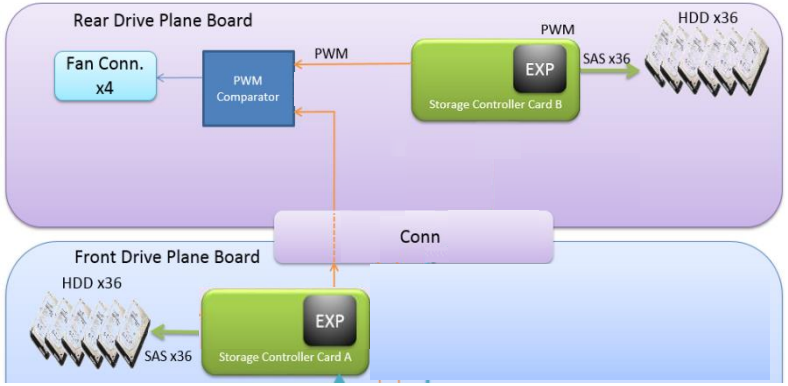
System Topology



SV7000G2



SV7000G2-L



ST7000G2

Design Files

The following folders are included in the zip file

➢ Schematic:

Contain designed DSN files (Cadence OrCAD) and .pdf files

➢ Layout and Stackup:

Contain designed BRD files (Allegro) and Excel files show detail stack up information

➢ BOMs (Bill of material):

An excel file shows full component information. (Including EE & ME)

➢ Manufacture files:

- Gerber files for PCB manufacture.
- Contain PCBAs DXF, PDF and EMN.

➢ MB Placement

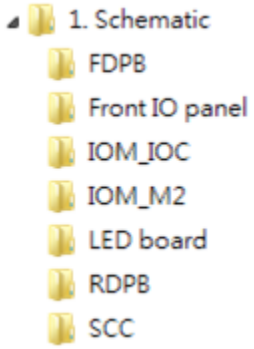
➢ ME CAD(3D & 2D):

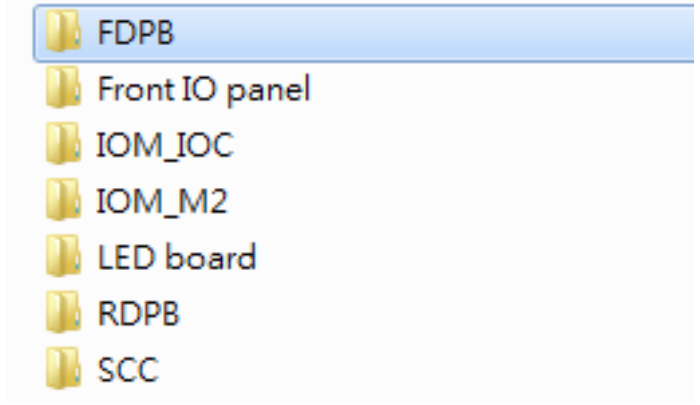
- Contain all system Solidworks files and neutral file. (STEP)
- Contain all chassis assemblies, metals, plastics, accessories, cables 2D files.

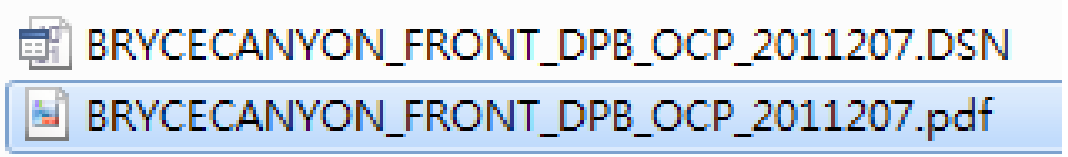
➢ oBMC:

- https://github.com/facebook/openbmc

Schematic



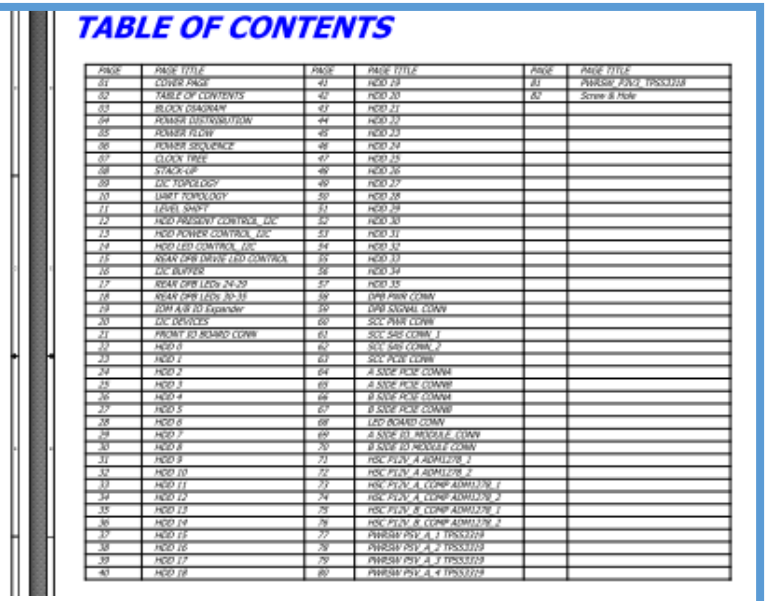




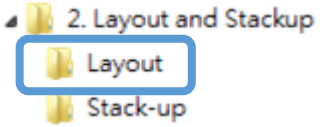
Bryce Canyon

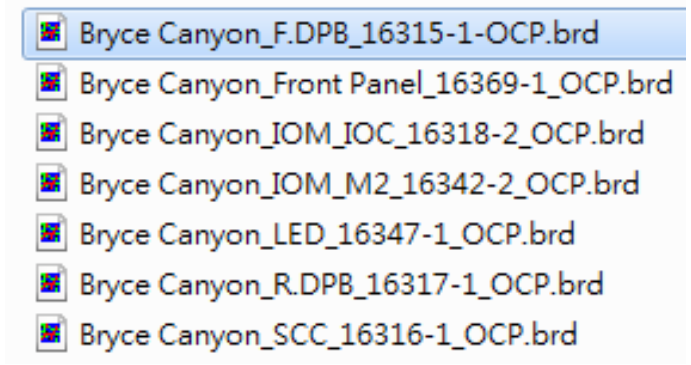
Front Drive Plan Board 36 HDDs

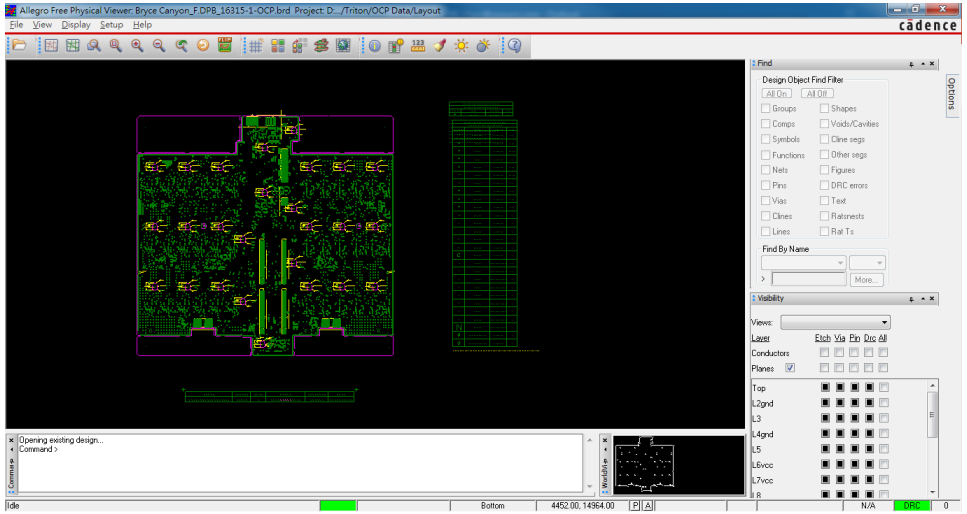
PCB P/N: 16315
Version: 1
Layer: 12 Layers

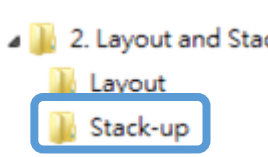


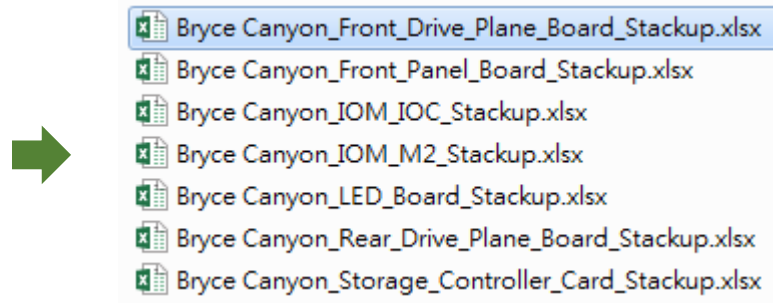
Layout and Stackup

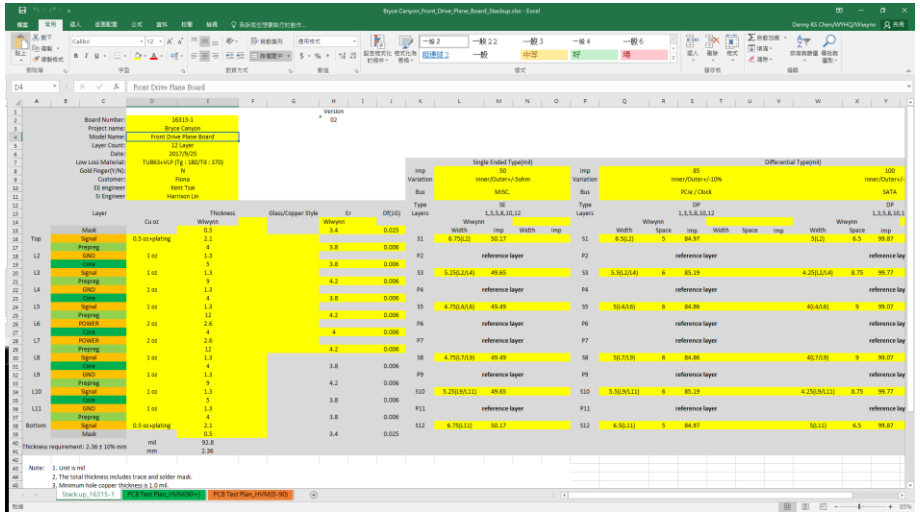




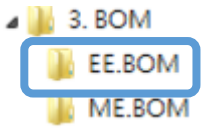


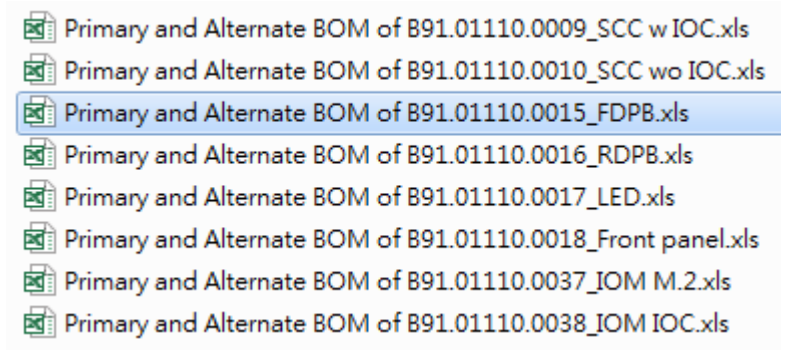






BOMs (EE & ME)

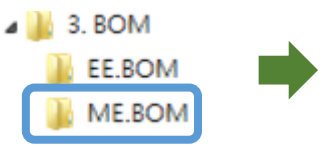


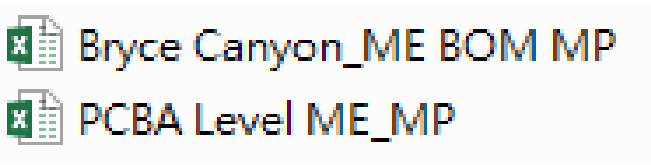


PDM BOM List

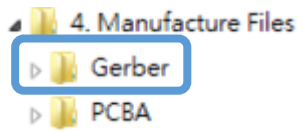
Level	Parent Number	Part Number	Description	Green Factor	Life Cycle State	Manufacturer	Manufacturer Part Number	Source	BOM Usage	M/P Code
1	B91.01110.0015	B55.01103.0002	BRYCE CANYON FRONT I	R2;	Released				M	Manufacture
2	B55.01103.0002	020.50215.0164	CONN EDGE 164P G630H/	R2_SA;HF_SA;	Released	AMPHENOL	G630HAA25062HR	Single		Purchase
2	B55.01103.0002	020.80417.0001	CONN CTR XCEDE 968-32(	R2_SA;HF_SA;	Released	AMPHENOL	968-3200-A1H	Single		Purchase
2	B55.01103.0002	020.80656.0001	CONN PWR XCEDE JX410-	R2_SA;HF_SA;	Released	AMPHENOL	JX410-50728	Single		Purchase
2	B55.01103.0002	020.80946.0001	CONN XCEDE JX924-3405-(	R2_SA;HF_SA;	Released	AMPHENOL	C-924-3405-505_RevA	Single		Purchase
2	B55.01103.0002	020.80956.0001	CONN SIGNAL XCEDE 923	R2_SA;HF_SA;	Released	AMPHENOL	923-3L0E-40H	Single		Purchase
2	B55.01103.0002	020.80957.0001	CONN SIGNAL XCEDE 923	R2_SA;HF_SA;	Released	AMPHENOL	923-300C-40H	Single		Purchase
2	B55.01103.0002	020.80958.0001	CONN SIGNAL XCEDE 92(	R2_SA;HF_SA;	Released	AMPHENOL	923-300E-40H	Single		Purchase
2	B55.01103.0002	020.80959.0001	CON SIGNAL XCEDE JX41(	R2_SA;	Released	AMPHENOL	JX412-50282_RevA	Single		Purchase
2	B55.01103.0002	020.80960.0001	CONN SIGNAL XCEDE JX4	R2_SA;	Released	AMPHENOL	JX430-50035_RevB	Single		Purchase
2	B55.01103.0002	020.80961.0001	CONN SIGNAL XCEDE 923	R2_SA;HF_SA;	Released	AMPHENOL	923-310E-30H	Single		Purchase
2	B55.01103.0002	038.0107I.0001	HOT GLUE DPB BRCA	R2_C;	Released	TBD		Single		Purchase
2	B55.01103.0002	086.000BF.0G20	SCRW #2-56_L3_8_INCH 5	R2_SA;HF_SA;	Released	TBD		Single		Purchase
2	B55.01103.0002	086.000LQ.0543	THUMB SCREW PRESSFI	R2_SA;HF_SA;	Released	FIVETECH	27-141-201-5	Single		Purchase
2	B55.01103.0002	40.58D03.001	LBL POLYIMIDE31.8*6.35	R2_SA;HF_SA;G_SA;	Released	LABELJET	40.58D03.001	Single		Purchase
2	B55.01103.0002	40.6E727.001	LBL 50X15MM BLANK WHI	R2_SA;HF_SA;	Released	TBD		Single		Purchase
2	B55.01103.0002	640.00X01.0001	LBL 7X7MM FOR SONIC	R2_SA;HF_SA;	Released	TBD		Single		Purchase
2	B55.01103.0002	B42.01101.0001	GUIDE PIN 914-3000-00A	R2_SA;HF_SA;	Released	TBD		Single		Purchase
2	B55.01103.0002	B42.0111I.1001	CVR XCEDE PWR JX410-5(	R2_SA;HF_SA;	Released	KANGYANG	COVER-18	Multiple		Purchase
A	B55.01103.0002	B42.0111I.0001	CVR XCEDE PWR JX410-5(	R2_SA;HF_SA;	Released	KANGYANG	COVER-18			Purchase
2	B55.01103.0002	B42.0111M.1001	CVR XCEDE SIGNAL JX41(	R2_SA;HF_SA;	Released	KANGYANG	COVER-19	Multiple		Purchase
A	B55.01103.0002	B42.0111M.0001	CVR XCEDE SIGNAL JX41(	R2_SA;HF_SA;	Released	KANGYANG	COVER-19			Purchase
2	B55.01103.0002	B42.0111N.1001	CVR XCEDE SIGNAL JX43(	R2_SA;HF_SA;	Released	KANGYANG	COVER-20	Multiple		Purchase
A	B55.01103.0002	B42.0111N.0001	CVR XCEDE SIGNAL JX43(	R2_SA;HF_SA;	Released	KANGYANG	COVER-20			Purchase

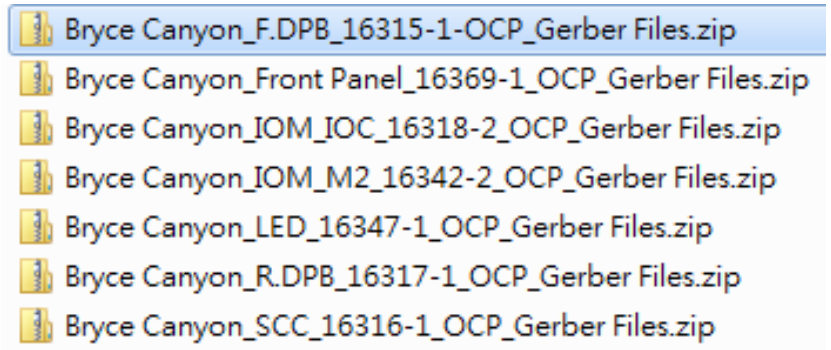
Sheet0

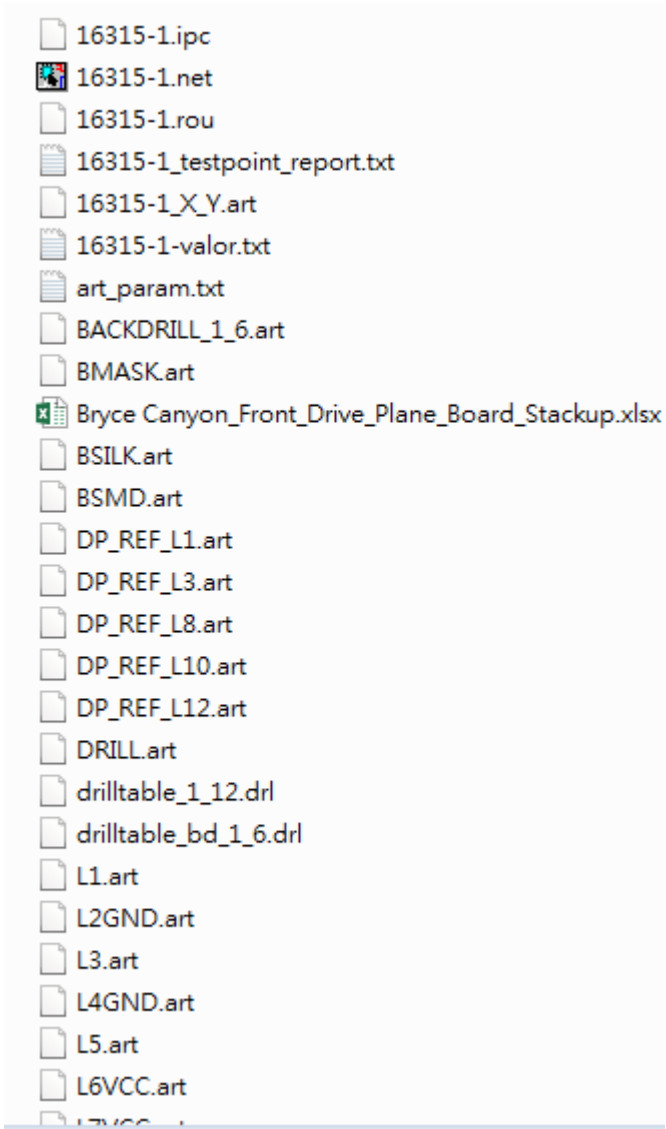




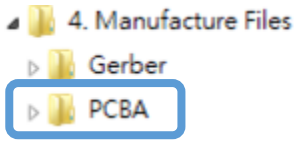
Manufacture Files _ Gerber

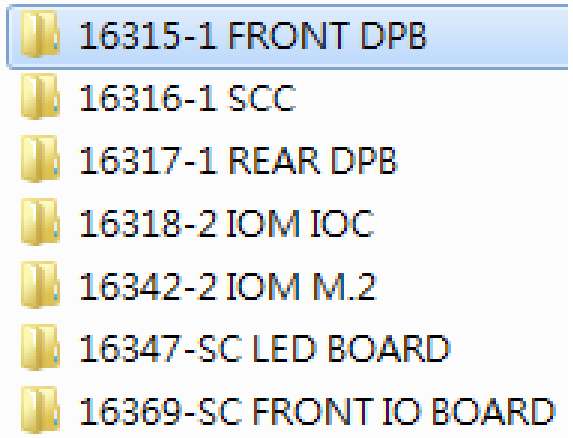


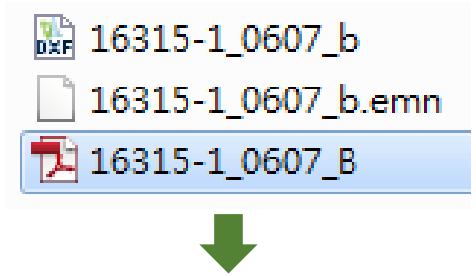


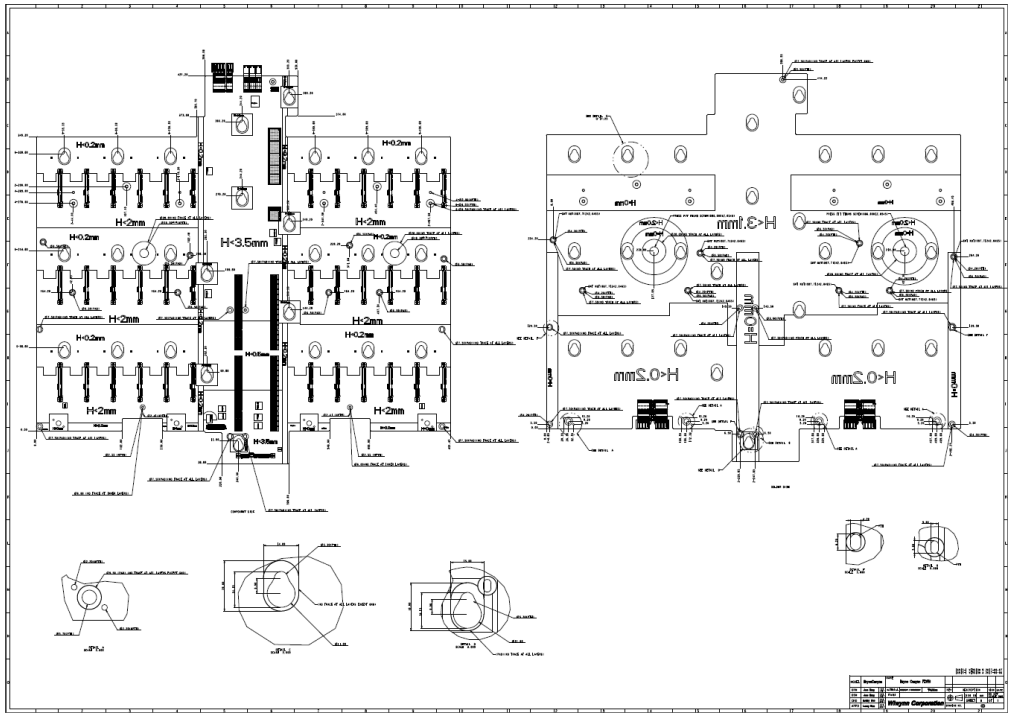


Manufacture Files _ PCBA



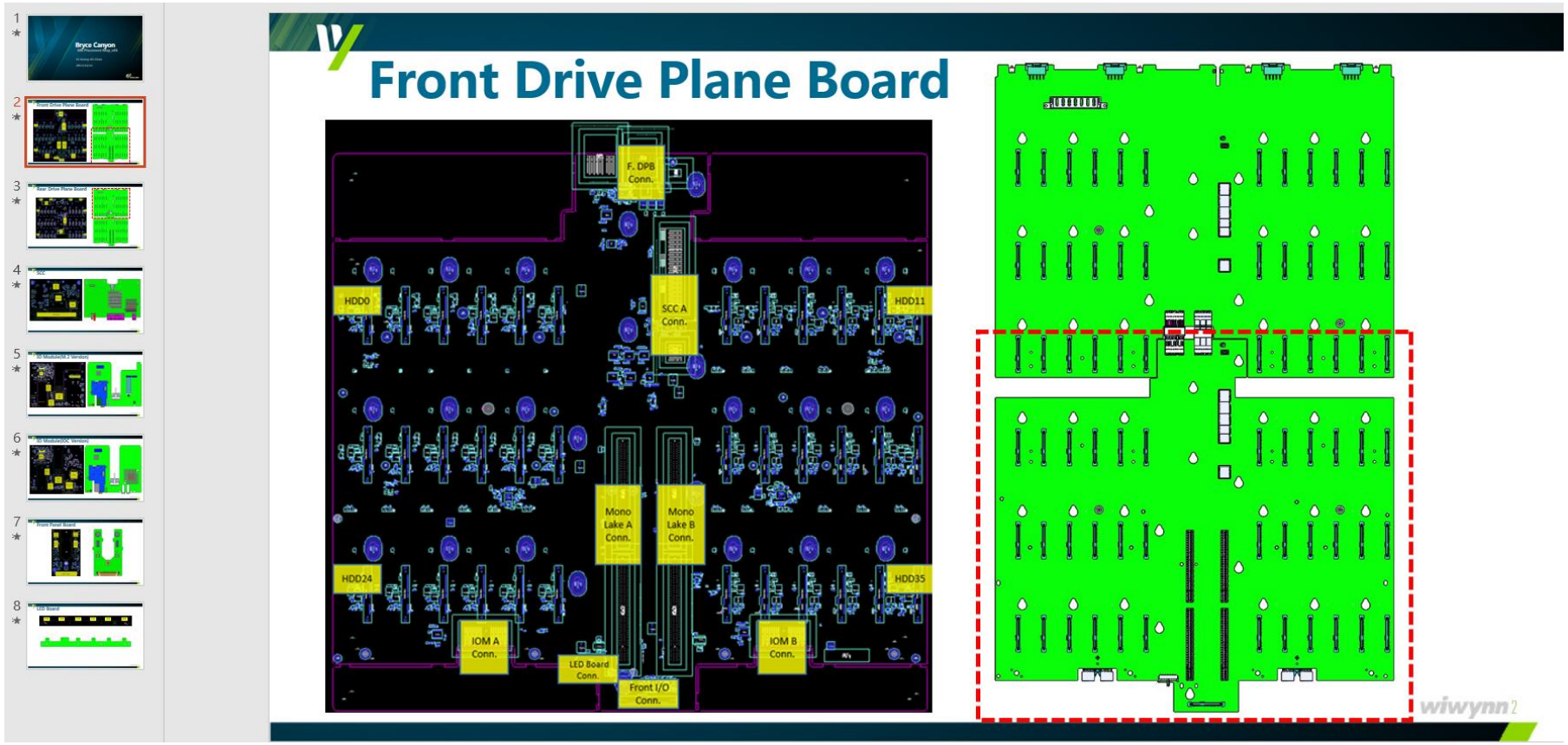




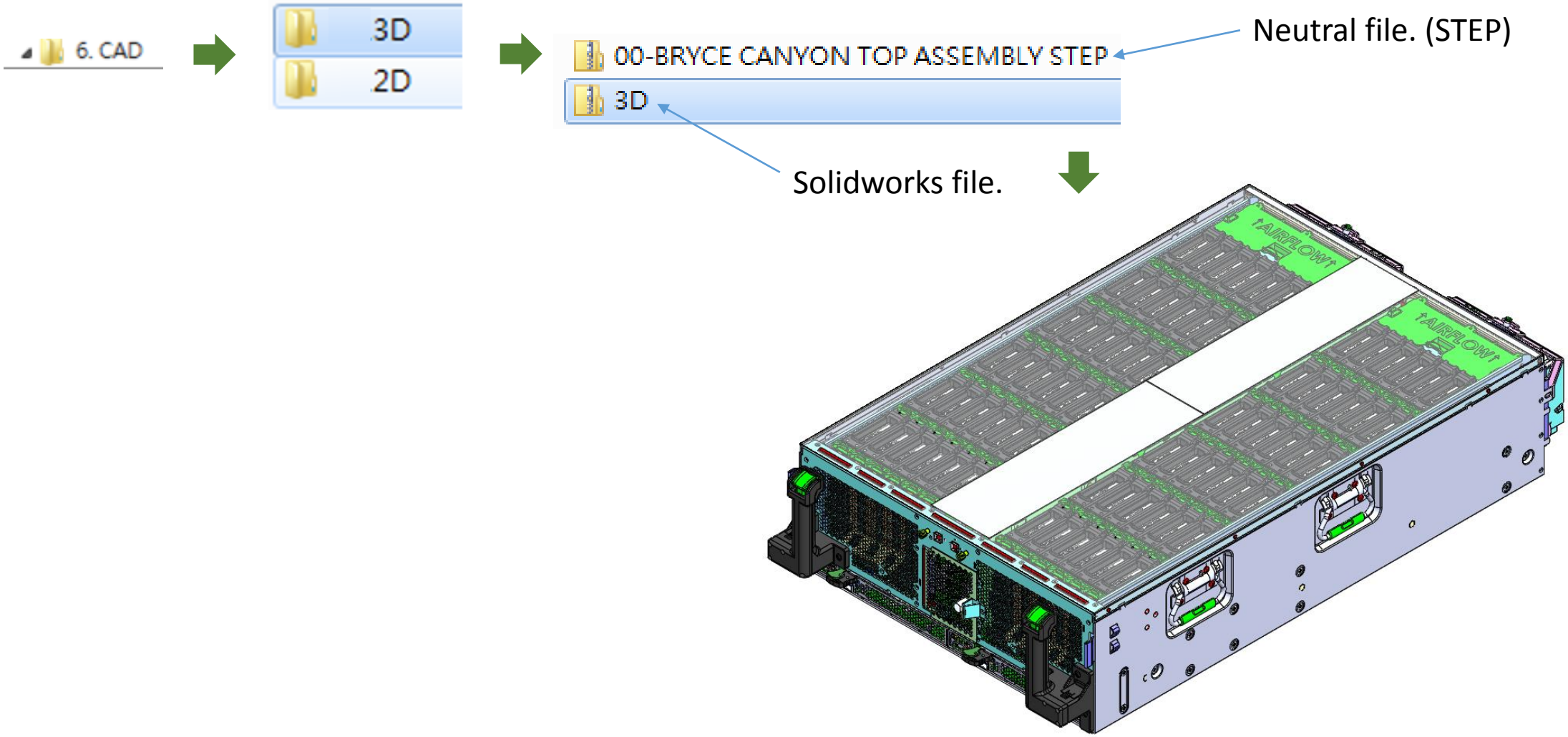


MB Placement

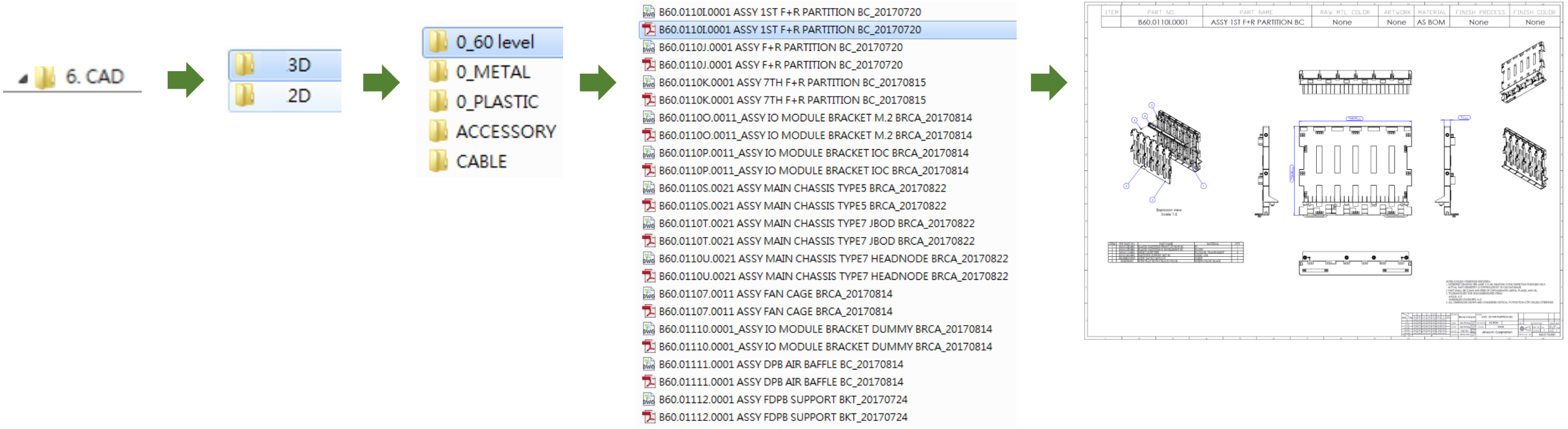
5. MB Placement → MB Placement Map_20171213.pptx



ME CAD(3D)


6. CAD
3D
2D
00-BRYCE CANYON TOP ASSEMBLY STEP
3D
Neutral file. (STEP)
Solidworks file.
↑AIRFLOW↑
↑AIRFLOW↑

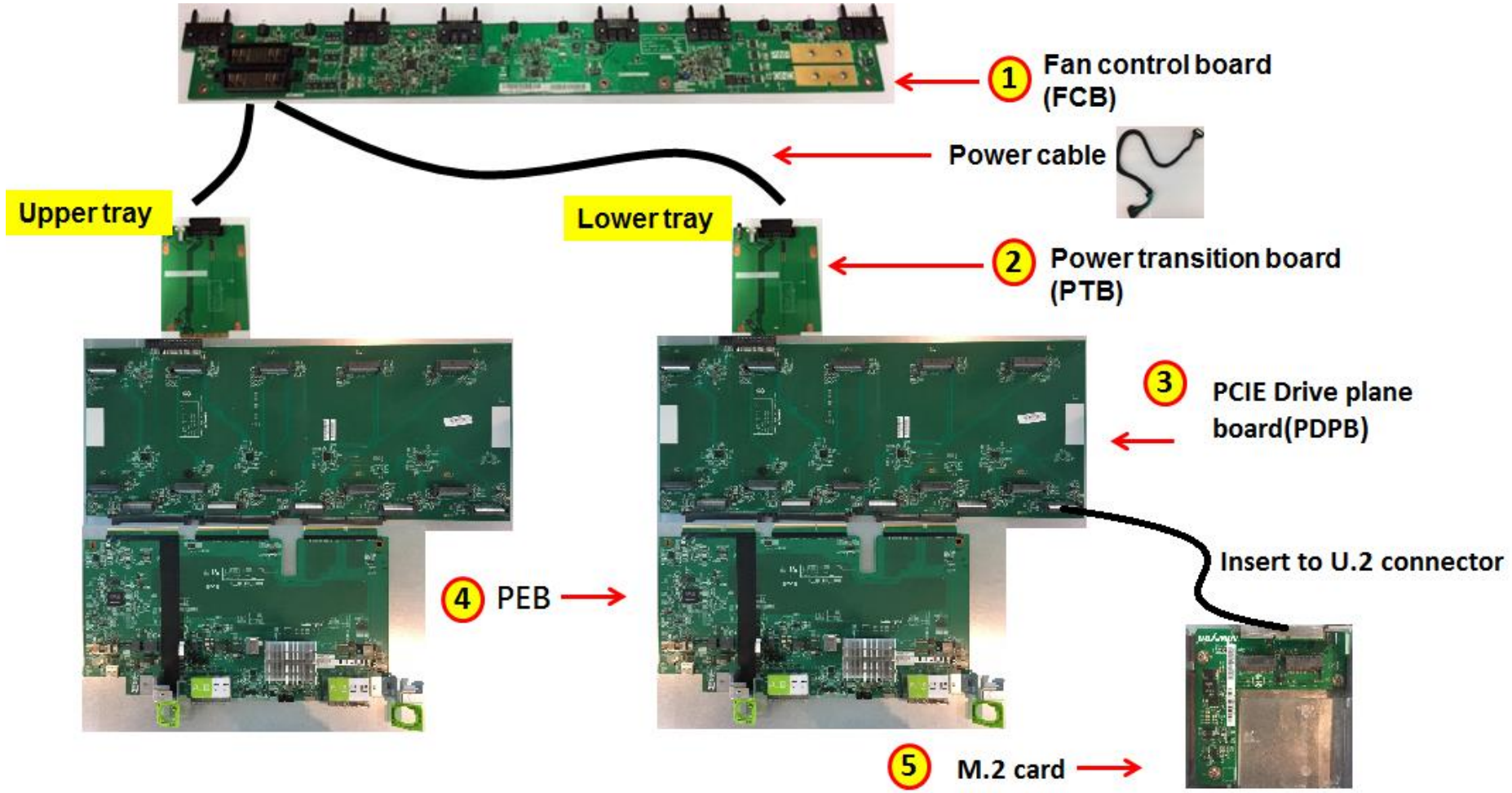
ME CAD(2D)


6. CAD
3D
2D
0_60 level
0_METAL
0_PLASTIC
ACCESSORY
CABLE
B60.0110L0001 ASSY 1ST F+R PARTITION BC_20170720
B60.0110L0001 ASSY 1ST F+R PARTITION BC_20170720
B60.0110J.0001 ASSY F+R PARTITION BC_20170720
B60.0110J.0001 ASSY F+R PARTITION BC_20170720
B60.0110K.0001 ASSY 7TH F+R PARTITION BC_20170815
B60.0110K.0001 ASSY 7TH F+R PARTITION BC_20170815
B60.0110O.0011_ASSY IO MODULE BRACKET M.2 BRCA_20170814
B60.0110O.0011_ASSY IO MODULE BRACKET M.2 BRCA_20170814
B60.0110P.0011_ASSY IO MODULE BRACKET IOC BRCA_20170814
B60.0110P.0011_ASSY IO MODULE BRACKET IOC BRCA_20170814
B60.0110S.0021 ASSY MAIN CHASSIS TYPE5 BRCA_20170822
B60.0110S.0021 ASSY MAIN CHASSIS TYPE5 BRCA_20170822
B60.0110T.0021 ASSY MAIN CHASSIS TYPE7 JBOD BRCA_20170822
B60.0110T.0021 ASSY MAIN CHASSIS TYPE7 JBOD BRCA_20170822
B60.0110U.0021 ASSY MAIN CHASSIS TYPE7 HEADNODE BRCA_20170822
B60.0110U.0021 ASSY MAIN CHASSIS TYPE7 HEADNODE BRCA_20170822
B60.01107.0011 ASSY FAN CAGE BRCA_20170814
B60.01107.0011 ASSY FAN CAGE BRCA_20170814
B60.01110.0001_ASSY IO MODULE BRACKET DUMMY BRCA_20170814
B60.01110.0001_ASSY IO MODULE BRACKET DUMMY BRCA_20170814
B60.01111.0001 ASSY DPB AIR BAFFLE BC_20170814
B60.01111.0001 ASSY DPB AIR BAFFLE BC_20170814
B60.01112.0001 ASSY FDPB SUPPORT BKT_20170724
B60.01112.0001 ASSY FDPB SUPPORT BKT_20170724
ITEM
PART NO.
PART NAME
RAW MTL COLOR
ARTWORK
MATERIAL
FINISH PROCESS
FINISH COLOR
B60.0110L0001
ASSY 1ST F+R PARTITION BC
None
None
AS BOM
None
None

Lightning Contribution

Lightning System topology

Lightning has 5 types board, including FCB, PTB, PDPB, PEB and M.2 card.

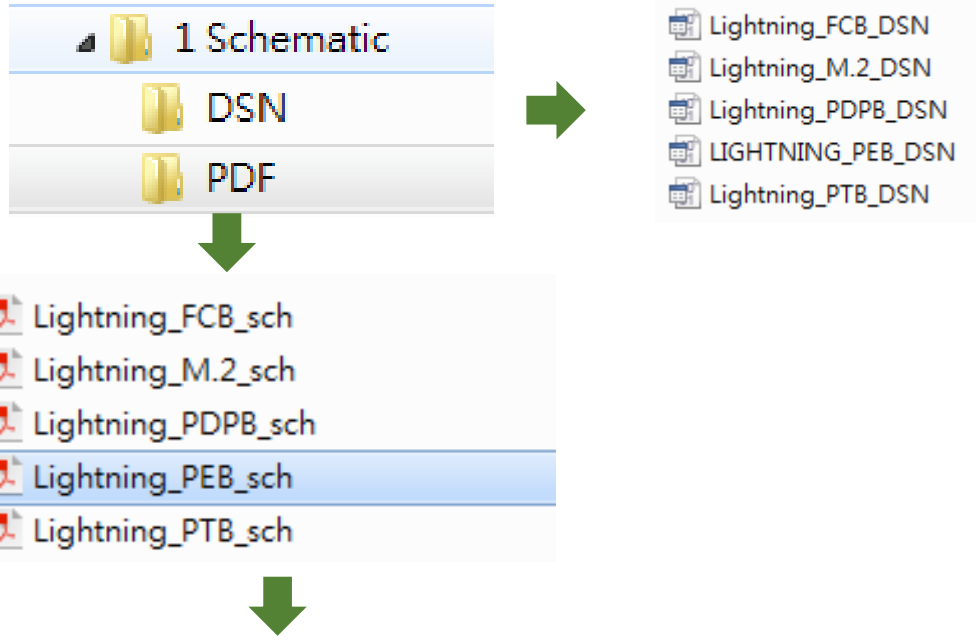


Design Files

The following folders are included in the zip file

- 1 Schematic:
  Contain designed DSN files (Cadence OrCAD) and .pdf files
- 2 Layout and Stackup:
  Contain designed BRD files (Allegro) and Excel files show detail stack up / Equal length table / SI constraints information
- 3 BOMs (Bill of material):
  An excel file shows full component information. (Including EE & ME)
- 4 Manufacture files:
  Gerber files for PCB manufacture and Excel files show component coordinates / Test coverage percentage.
- 5 Placement Map:
  Contain component placement of top/bot view.
- 6 ME CAD(3D & 2D):
  - Contain all system Solidworks files and neutral file. (STEP)
  - Contain all chassis assemblies, metals, plastics, accessories, cables 2D files.
- oBMC:
  - https://github.com/facebook/openbmc

1 Schematic : DSN and PDF



Lightning - PMC PEB

PCB P/N: 15105

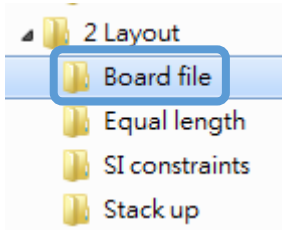
Version: 1

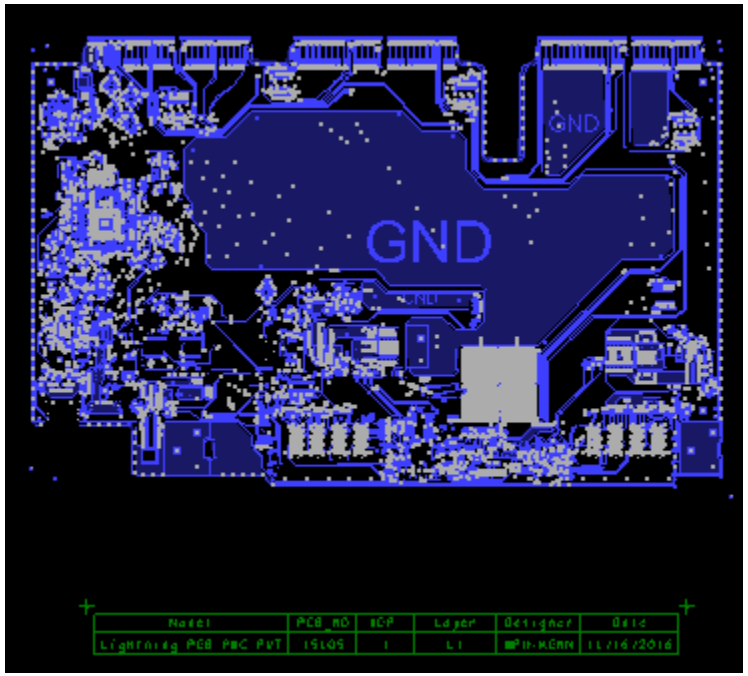
Project Code: BPD00Q010001

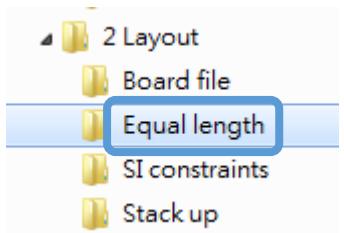
TABLE OF CONTENTS

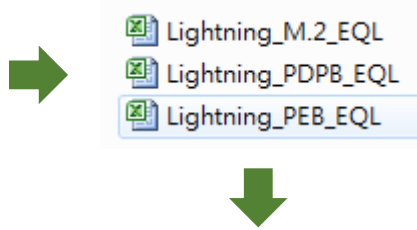
PAGE	PAGE TITLE	PAGE	PAGE TITLE
01	COVER PAGE	41	GPIO EXPANDER
02	TABLE OF CONTENTS	42	SPI NOR FLASH
03	SYSTEM BLOCK DIAGRAM	43	MBP CONN
04	POWER DISTRIBUTION DIAGRAM	44	INTEL I210
05	POWER FLOW & SEQUENCE	45	INTEL I210 DEC
06	RESET DIAGRAM	46	12V-DCIN_ADM1
07	CLOCK TREE	47	PWRSW_P5V_ST
08	STACK-UP INFORMATION	48	PWRSW_P3V3_P
09	I2C\SMBUS DIAGRAM	49	PWRLDO_P1V8_
10	SPI MUX	50	PWRLDO_P1V53_
11	AST2400 I2C DEVICE	51	PWRLDO_P1V26_
12	AST2400 I2C DDR LPC	52	PWRSW_P0V9_T
13	AST2400 UART LAN SPI	53	PWRSW_P0V9_E
14	AST2400 FAN ADC VGA JTAG	54	ME
15	AST2400 Power	55	History EVT1
16	AST2400 Strapping	56	History EVT2
17	AST2400_VOLTAGE_SENSE	57	History DVT
18	BLANK	58	History DVT
19	LAN CONNECTOR	59	History DVT
20	USB2.0 x1	60	History PVT
21	I2C_BUFFER		
22	LED		

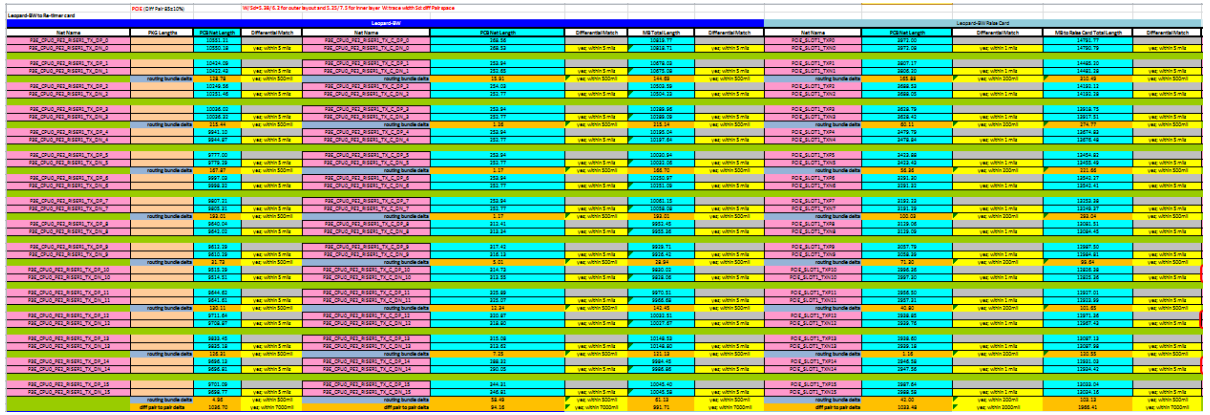
2 Layout : Board file and Equal Length



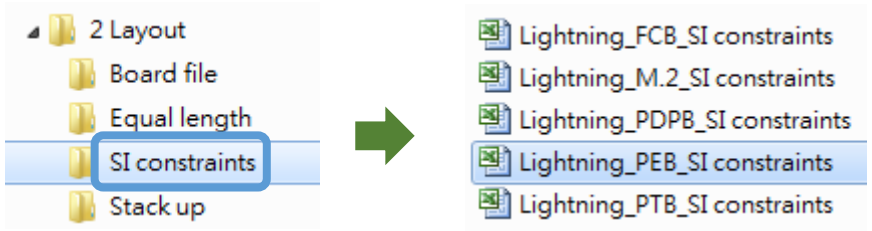


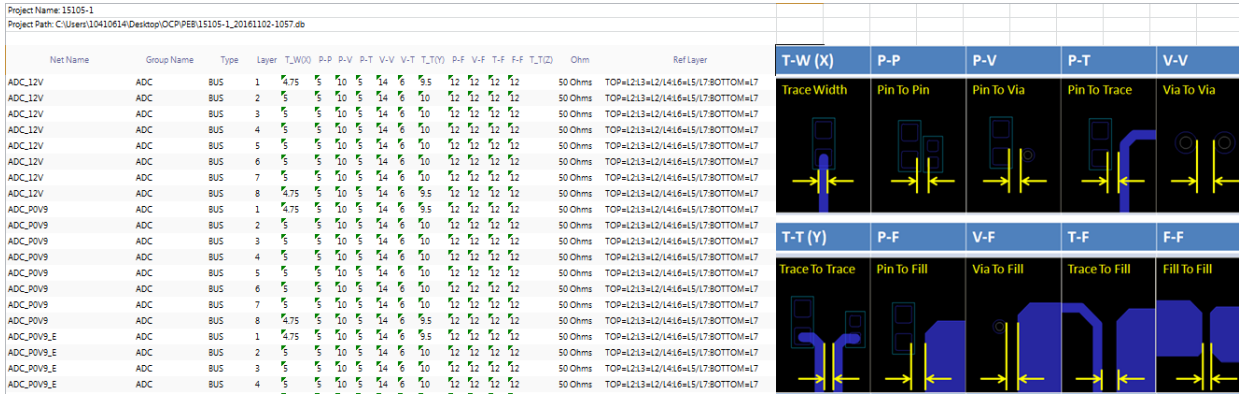


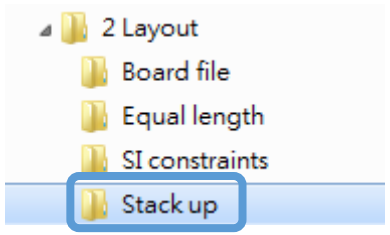


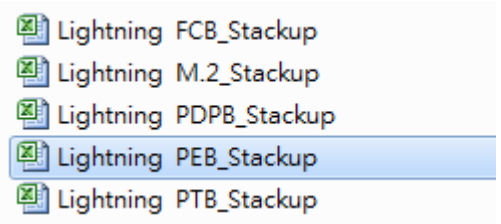


2 Layout : SI constraints and Stackup

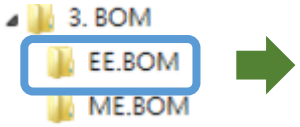






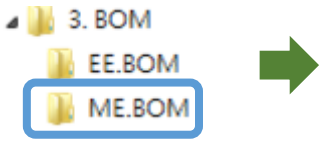


3 BOMs (EE & ME)



- Lightning_FCB_BOM
- Lightning_M.2_BOM
- Lightning_PDPB_BOM
- Lightning_PEB_BOM
- Lightning_PTB_BOM

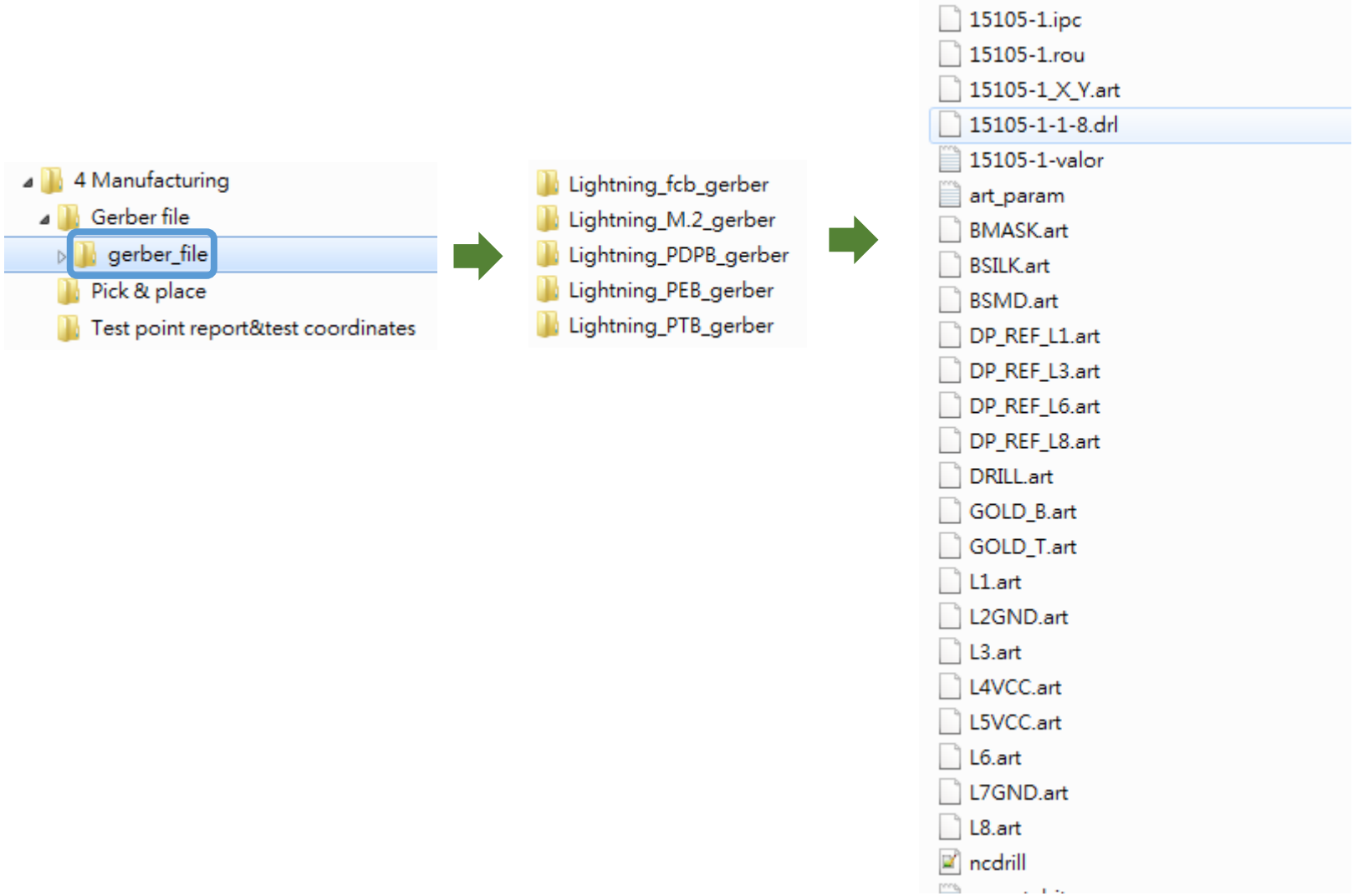
Level	Parent Nur	Part Numb	Descriptio	Green	Fact	Life Cycle	Manufactu	Manufactu	Source	BOM Usag	M/P Code	S/D	Qty	UoM	Location
1	B55.00Q0	020.F0528	CONN CT	R2_SA;HF		Released	FCI	91931-311	Single		Purchase	SMT	1	PCS	CN11
1	B55.00Q0	062.10029	SKT SPI C	R2_SA;HF		Released	LOTES	ACA-SPI-(	Single		Purchase	SMT	1	PCS	SKT4
1	B55.00Q0	064.82R05	CHIP RES	R2_SA;HF		Released	ROHM;YA	MCR01M/	Multiple		Purchase	SMT	1	PCS	R958
1	B55.00Q0	071.07311	IC EXPAN	R2_SA;HF		Released	MAXIM	MAX7311	Single		Purchase	SMT	5	PCS	U198 U199 U200 U201 U203
1	B55.00Q0	071.08536	IC PCIE G	R2_SA;HF		Released	PMC	PM8536B	Single		Purchase	SMT	1	PCS	U1
1	B55.00Q0	071.90431	IC CLK G	R2_SA;HF		Released	IDT	9FGV043	Single		Purchase	SMT	1	PCS	U196
1	B55.00Q0	072.02464	IC EEPRM	R2_SA;HF		Obsoleted	MICROCH	24LC64-I/	Single		Purchase	SMT	1	PCS	U16
1	B55.00Q0	072.42164	IC SDRAM	R2_SA;HF		Released	SAMSUNG	K4B2G16	Single		Purchase	SMT	1	PCS	U18
1	B55.00Q0	074.01278	IC SWAP (	R2_SA;HF		Released	ADI	ADM1278	Single		Purchase	SMT	1	PCS	U2
1	B55.00Q0	074.06315	IC RESET	R2_SA;HF		Released	ANALOG	ADM6315	Single		Purchase	SMT	1	PCS	U82
1	B55.00Q0	074.06654	IC TEMP S	R2_SA;HF		Released	MAXIM	MAX6654	Single		Purchase	SMT	1	PCS	U4
1	B55.00Q0	074.53355	IC PWM C	R2_SA;HF		Released	TI	TPS53355	Single		Purchase	SMT	2	PCS	PU1 PU3
1	B55.00Q0	074.74801	IC LDO TI	R2_SA;HF		Released	TI	TPS74801	Single		Purchase	SMT	3	PCS	PU4 PU5 PU6
1	B55.00Q0	077.51571	CHIP CAP	R2_SA;HF		Released	PANASON	EEJRX0J1	Single		Purchase	SMT	2	PCS	PTC38 TC17
1	B55.00Q0	078.10421	CHIP CAP	R2_SA;HF		Released	MURATA	GRM033C	Single		Purchase	SMT	169	PCS	C27 C28 C29 C30 C31 C32 C33 C34 C35 C36 C37 C38 C39 C40 C428 C42
1	B55.00Q0	078.10711	CHIP CAP	R2_SA;HF		Released	MURATA	GRM21BC	Multiple		Purchase	SMT	6	PCS	C454 C455 C456 C459 C494 C495
1	B55.00Q0	078.22611	CHIP CAP	R2_SA;HF		Released	MURATA	GRM21BC	Multiple		Purchase	SMT	2	PCS	PC66 PC68
1	B55.00Q0	078.22622	CHIP CAP	R2_SA;HF		Released	MURATA	GRM31C(	Single		Purchase	SMT	16	PCS	PC196 PC199 PC201 PC210 PC211 PC213 PC214 PC215 PC216 PC217 PC2
1	B55.00Q0	078.47522	CHIP CAP	R2_SA;HF		Obsoleted	DARFON;I	C2012X7F	Multiple		Purchase	SMT	4	PCS	PC184 PC212 PC26 PC72
1	B55.00Q0	082.30003	XTAL 32.7	R2_SA;HF		Released	KDS	1TJF125D	Single		Purchase	SMT	1	PCS	X2
1	B55.00Q0	082.30005	XTAL 25M	R2_SA;HF		Released	HARMON	X3S02500	Single		Purchase	SMT	1	PCS	X3



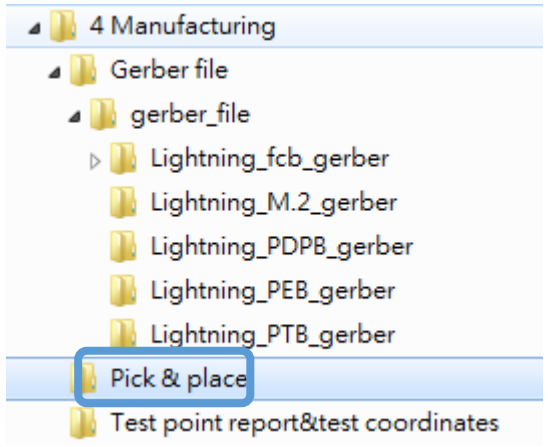
- Lightning Chassis BOM OCP
- Lightning M2 Carrier BOM
- Lightning U2 Carrier BOM

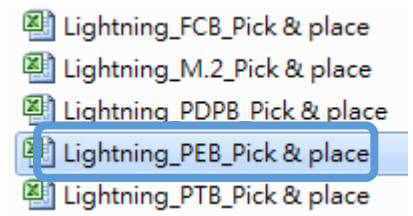
		Main housing	Old Part Number							
V	1	B60.00Q15.0001	B60.00Q0W.0001	ASSY MAIN HOUSING FOR LIGHTNING PVT		1	Priver			A
V	2	60.64W04.001		ASSY TOP COVER HU230		1	Priver			M
	3			CVR TOP COVER HU230		1	Priver	SGCC (T=1.0mm)		M
	3			26-411-201-5		2	Fivetech	Hardened carbon steel	PENTON 376C	SC
	3			SO_D4_L4		10	Priver			SO
	3			TOP_COVER_PIN		1	Priver			SO
V	2	60.64W05.001		ASSY LOWER CASE HU230		1	Priver			A
V	3	30.64W01.001		CAS LOWER CASE HU230		1	Priver	SGCC (T=1.6mm)		M
	4			SO-M3-L12.18MM-GUIDE		2	Priver			SO

4 Manufacture Files : Gerber



4 Manufacture Files : Pick & Place / Test point report

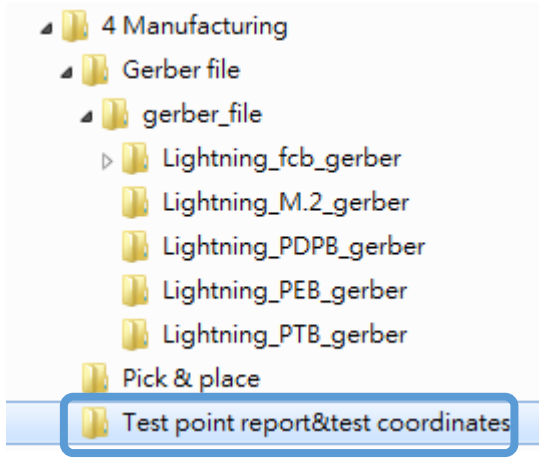


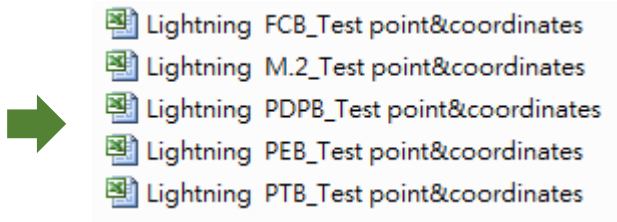


15105-1.1116WPH0457.brd
Date Tue Mar 07 11:50:07 2017
Total Components: 2560

Component Report

REFDES	COMP_DEVICE_TYPE	COMP_VALUE	COMP_TOL	COMP_PACKAGE	SYM_X	SYM_Y	SYM_ROTATE	SYM_MIRROR
BAT1	AAA-BAT	AAA-BAT	0007.0091	AAA-BAT	4732.31	2552.45	270	NO
C1	C402H22	SCD22U10	78.22423.5	C402H22	10785	500	90	NO
C2	C402H22	SCD22U10	78.22423.5	C402H22	10785	535	90	NO
C4	C402H22	SCD1U16V	78.10421.2	C402H22	8960	45	180	NO
C6	C402H22	SCD22U10	78.22423.5	C402H22	10785	605	90	NO
C7	C402H22	SCD22U10	78.22423.5	C402H22	10785	570	90	NO
C8	C402H22	SCD22U10	78.22423.5	C402H22	11279	1333	90	NO
C9	C402H22	SCD22U10	78.22423.5	C402H22	11279	1298	90	NO
C10	C402H22	SCD22U10	78.22423.5	C402H22	11385	1320	0	NO
C11	C402H22	SCD22U10	78.22423.5	C402H22	11420	1320	0	NO
C12	C402H22	SCD22U10	78.22423.5	C402H22	11579.07	1326.54	0	NO
C13	C402H22	SCD22U10	78.22423.5	C402H22	11614.07	1326.54	0	NO





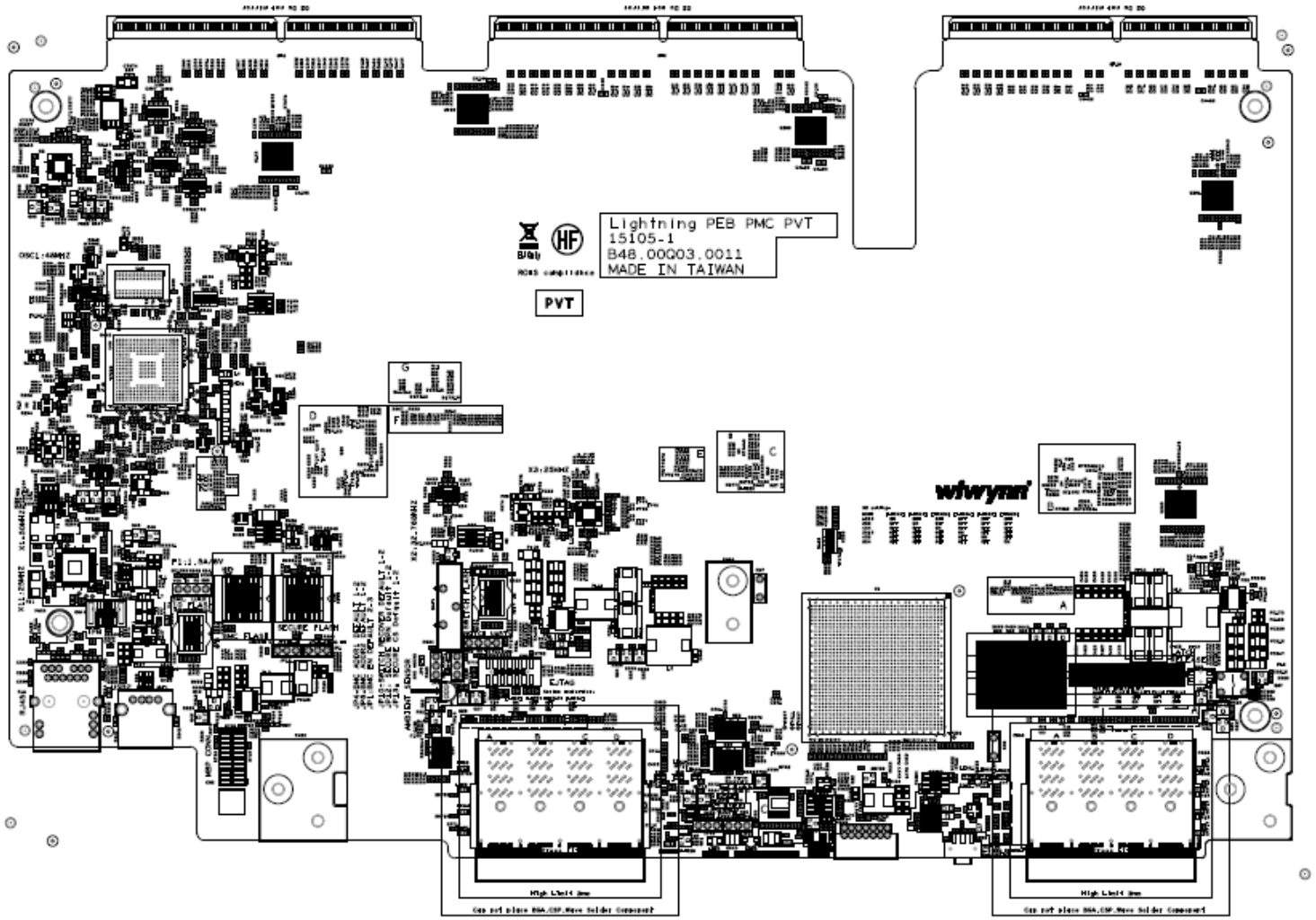
PROJECT NAME:	15105-1
Total No. of Nets	1996
Testable Nets	1161
Untestable Nets	60
No. of Nets not required testpoint	775
Testability Percentage	58.17%
Total Testability Percentage	95.09%

NETS NOT REQUIRED TO HAVE TESTPOINT				
CLK GEN AREA	Comment	NC PINS	Comment	HI-SPEED
50M_CLK_OUT		MB0_CM_SENSE_R1_P		8644_USB_DN1
50M_CLK_OUT_R		MB0_CM_SENSE_R1_N		8644_USB_DN2
CLK_N_2		MB0_CM_SENSE_P		8644_USB_DN3
CLK_N_4		MB0_CM_SENSE_N		8644_USB_DN4
CLK_N_6		ADM1278_HS_N		8644_USB_DN5
CLK_N_8		ADM1278_HS_P		8644_USB_DN7
CLK_P_2		P5V_STBY_FB		8644_USB_DN8
CLK_P_4		VR_P1V538_STBY_FB		8644_USB_DP1
CLK_P_6		VR_P1V26_STBY_FB		8644_USB_DP2
CLK_P_8		VR_P1V8_STBY_FB		8644_USB_DP3
CLKGEN_N1_R		P3V3_STBY_VBST		8644_USB_DP4
CLKGEN_N2_R		P3V3_STBY_VBST_RC		8644_USB_DP6
CLKGEN_N3_R		P3V3_STBY_LL		8644_USB_DP7

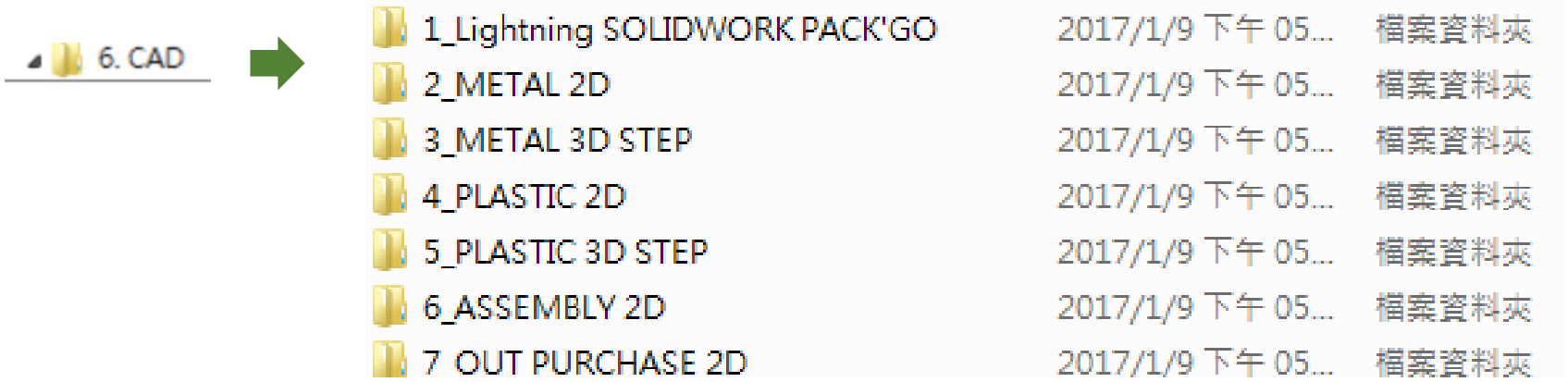
5 Placement Map

5 Placement Map

- Placement-FCB-Bot
- Placement-FCB-Top
- Placement-M.2-Bot
- Placement-M.2-Top
- Placement-PDPB-Bot
- Placement-PDPB-Top
- Placement-PEB-Bot
- Placement-PEB-Top
- Placement-PTB-Bot
- Placement-PTB-Top



6 ME CAD(2D & 3D files)



Thank you