



HCS CABLING SYSTEMS

HCS GIGA PDU EMC Test Report

Version : V1.00

Date : 04/27/2023

Table of content

Revision History	2
1. EMC Test Details.....	4
2. Abbreviation	4
3. Sample List	4
4. EMC Test Summary.....	5
4.1 Radiated Test Setup	5
4.2 Radiated Test Result for Single Phase	7
4.3 Radiated Test Result for Three Phase.....	9
4.4 Conducted Test Setup	11
4.5 Conducted Test Result for Single Phase.....	11
4.6 Conducted Test Result for Three Phase	13
4.7 ESD Test Setup	15
4.8 ESD Test Result for Single Phase.....	16
4.9 ESD Test Result for Three Phase.....	17
4.10 Surge Test Setup.....	17
4.11 Surge Test Result (Included Single & Three Phase)	18

1. Test Details

Test Site		DEKRA EMC LAB.
Production Type		PIM, POS, POM, POMS Series
EUT Model		Banchao II PDU GIGA
H/W Version	Inlet Board(Single Phase)	0101J8203-000-G A3
	Inlet Board(Three Phase)	0101JBP02-000-G A2
	SNMP Board	0101J7P03-000-G A3
	SNMP Conn Board	0101J8302-000-G A2
	SNMP Bridge Board	0101J8502-000-G A2
	Outlet Board	0101J8002-000-G A2
	LCM Module	PCB-IB128128CA-2A
F/W Version		PWT_v0.30a39

2. Abbreviation

- DUT: Device Under Test
- RS: Radiated Susceptibility
- Conducted Susceptibility
- P: PASS
- F: FAIL
- N: Not Available

3. Sample List

Sample	Inlet Board	SNMP Board			Outlet Board	LCM Module
		Main Board	Conn Board	Bridge Board		
S-1(Single)	PM2207378 A100MB0016	PM2207241 9Z00MB0003	PM2207328 A000MB001C	PM2207342 A300MB000B	9302M1000F	PM2105278
S-2(Three)	PM2207371 A100MB001C PM2207292(L2/L3) A200MB001A(L2/L3)	PM2207240 9Z00MB0006	PM2207313 A000MB000D	PM2207339 A300MB0001	9302M10024	PM1506196

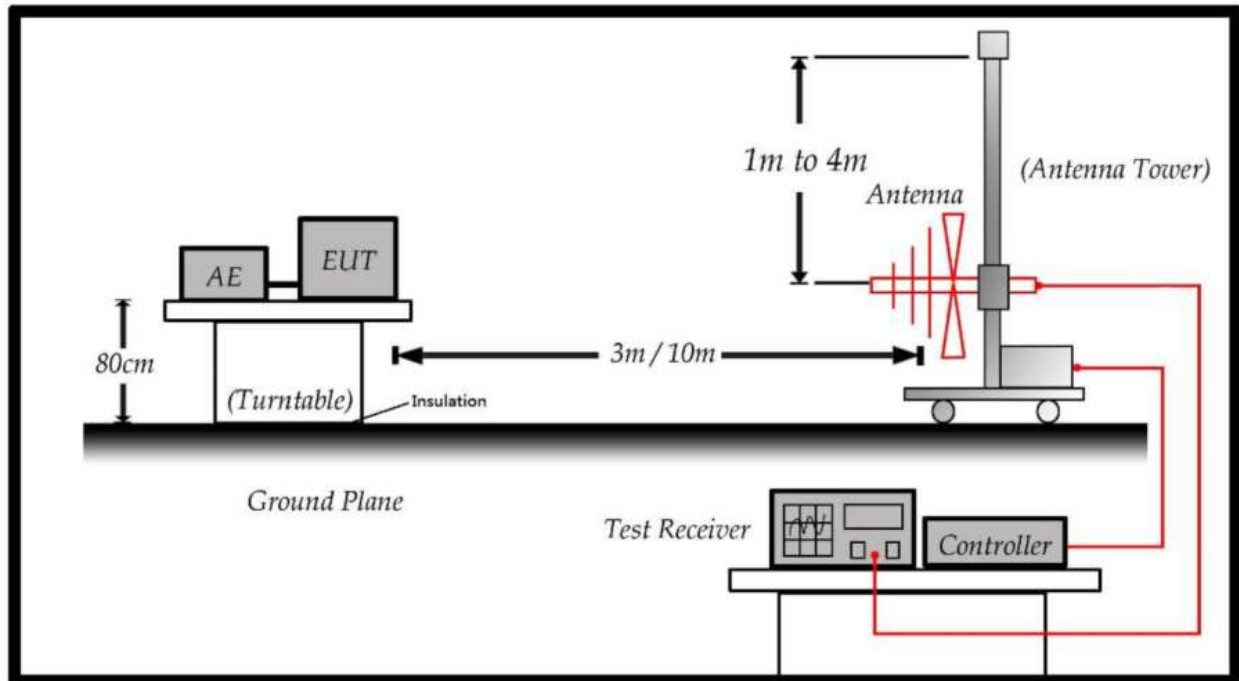
4. Test Summary

EMC Test for	Test Result	
	Pass	Fail
Emission		
Radiated Emission Test (EN55032:2015/A1:2020, Class A; AS/NZS CISPR 32:2015 AMD 1:2020)	●	
Conducted Emission Test (EN55032:2015/A1:2020, Class A; AS/NZS CISPR 32:2015 AMD 1:2020)	●	
Immunity		
Electrostatic Discharge (IEC 61000-4-2 Ed. 2.0: 2008)	●	
Surge (IEC 61000-4-5 Ed. 3.1: 2017)	●	

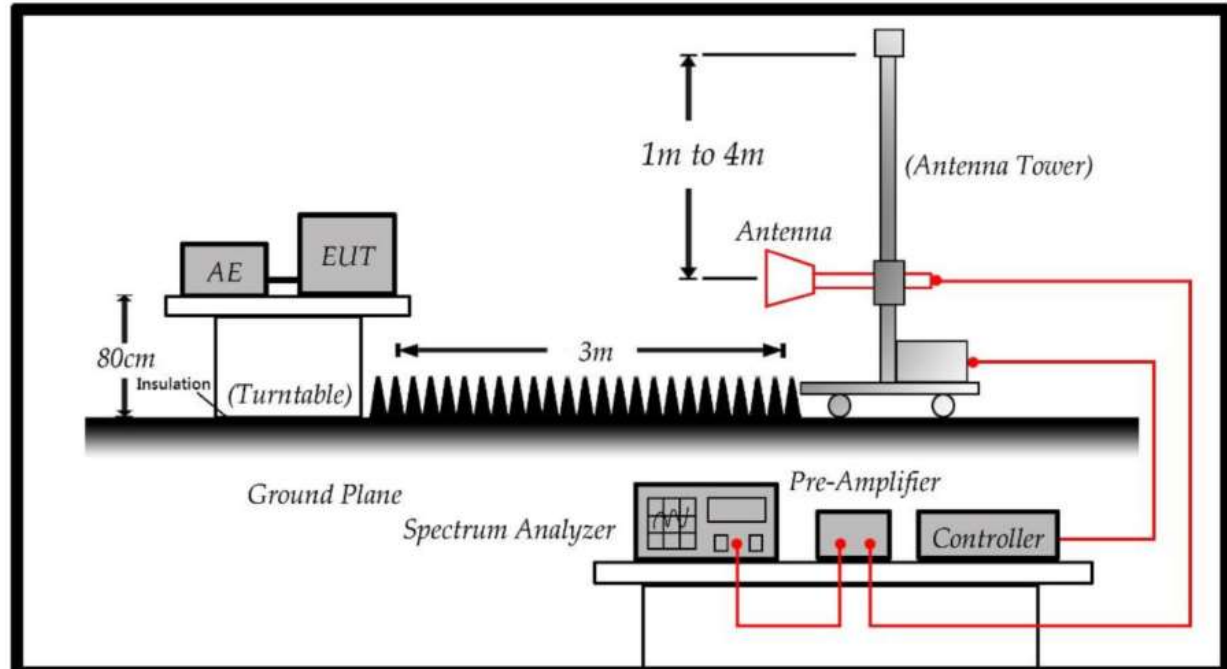
4.1 Radiated Test Setup



Under 1GHz



Above 1GHz



4.2 Radiated Test Result for Single Phase

德凱認證股份有限公司

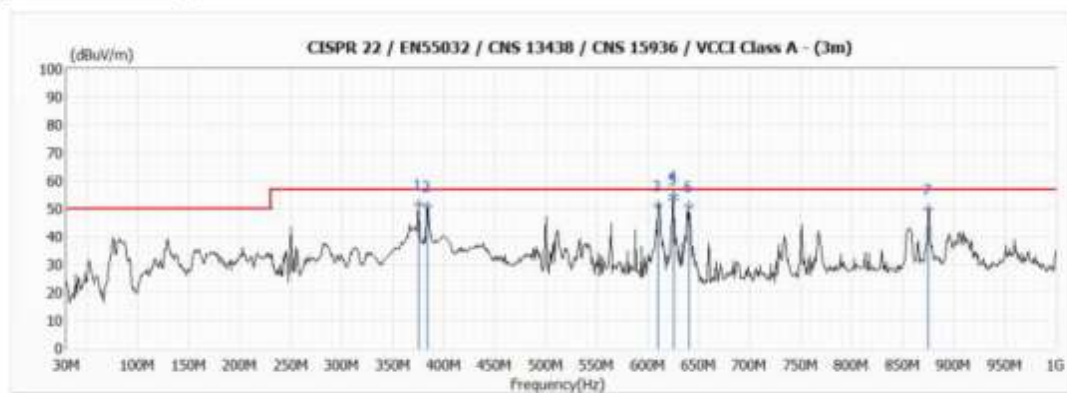
DEKRA Testing and Certification Co.,Ltd.



Profile Name : 鴻騰 20221228 ; Page No : 5 ;

Pretest_LK-Site01_2022_H

Model No.	BANCHAO II	Site	CB6
Test Voltage	AC 230V/50Hz	Test Date	2022/12/28
Test Mode	Mode 1	Engineer	Aby Guo
Polarity	Horizontal	Temperature (°C)	17.8
Test Condition		Humidity (%RH)	73
Note			



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	375.320	51.82	57.00	-5.18	67.81	-15.99	PK
2	384.050	51.10	57.00	-5.90	66.18	-15.08	PK
3	610.060	51.26	57.00	-5.74	61.52	-10.26	PK
* 4	625.580	54.66	57.00	-2.34	65.42	-10.76	PK
5	625.580	53.50	57.00	-3.50	64.26	-10.76	QP
6	640.130	51.20	57.00	-5.80	60.15	-8.95	PK
7	874.870	49.84	57.00	-7.16	54.51	-4.67	PK

Remark:

1. "*" means this data is the worst emission level; "!" means this data is over limit.
2. Emission Level=Reading Level + Correct Factor(Correct Factor=LISN Factor+Cable Loss).
3. Margin=Emission Level - Limit.

德凱認證股份有限公司

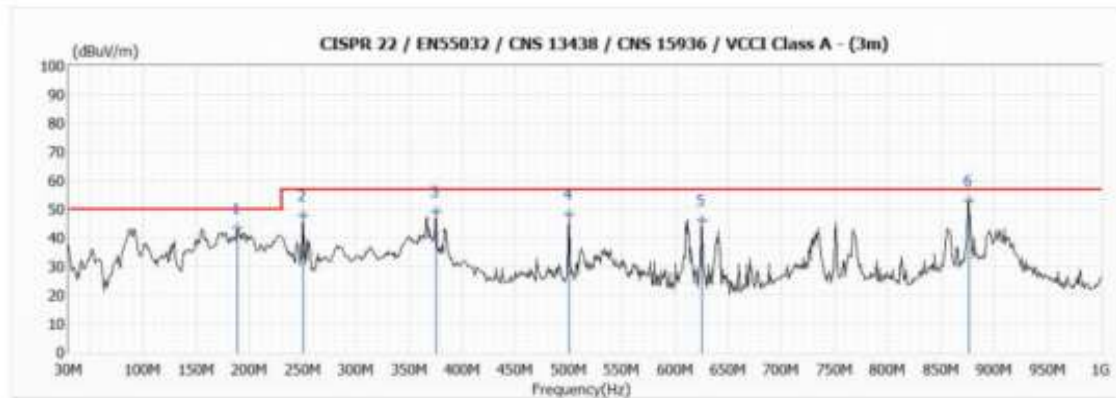
DEKRA Testing and Certification Co.,Ltd.



Profile Name : 鴻騰 20221228 ; Page No : 6 ;

Pretest_LK-Site01_2022_V

Model No	BANCHAO II	Site	CB6
Test Voltage	AC 230V/50Hz	Test Date	2022/12/28
Test Mode	Mode 1	Engineer	Aby Guo
Polarity	Vertical	Temperature (°C)	17.8
Test Condition		Humidity (%RH)	73
Note			



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	188.110	43.53	50.00	-6.47	55.90	-12.37	PK
2	250.190	47.78	57.00	-9.22	65.71	-17.93	PK
3	375.320	49.27	57.00	-7.73	65.21	-15.94	PK
4	500.450	48.11	57.00	-8.89	61.81	-13.70	PK
5	625.580	46.37	57.00	-10.63	62.70	-16.33	PK
* 6	875.840	53.06	57.00	-3.94	56.23	-3.17	PK

Remark:

1. "*" means this data is the worst emission level; "I" means this data is over limit.
2. Emission Level=Reading Level + Correct Factor(Correct Factor=LISN Factor+Cable Loss).
3. Margin=Emission Level - Limit.

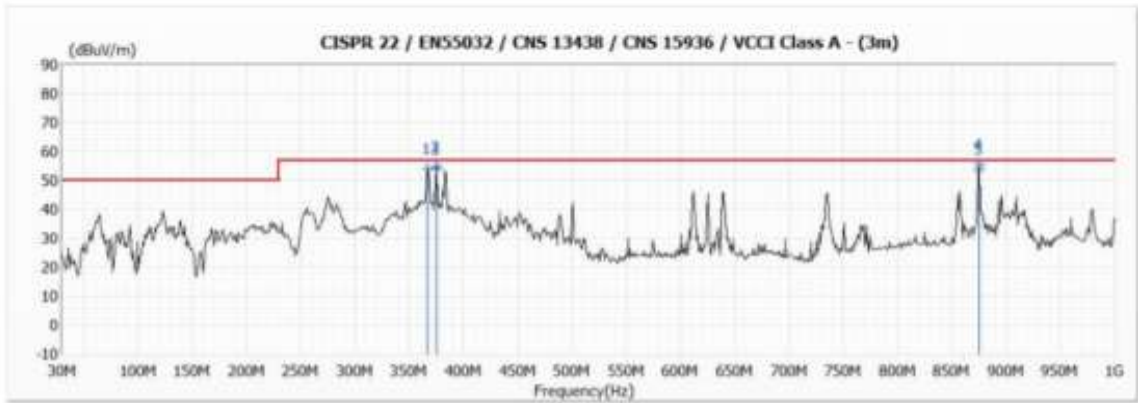
diated Test Result for Three Phase

德凱認證股份有限公司
DEKRA Testing and Certification Co.,Ltd.



Profile Name : 2340107A ; Page No : 2 ;
Pretest_LK-Site01_2022_H

Model No	Banchao II PDU(三相)	Site	CB6
Test Voltage	AC 230V/50Hz	Test Date	2023/4/15
Test Mode	Mode 2	Engineer	Jackal Chen
Polarity	Horizontal	Temperature (℃)	22.8
Test Condition		Humidity (%RH)	78
Note			



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	366.590	53.98	57.00	-3.02	70.81	-16.83	PK
2	375.320	54.98	57.00	-2.02	70.97	-15.99	PK
3	375.320	53.90	57.00	-3.10	69.89	-15.99	QP
* 4	875.840	55.46	57.00	-1.54	60.19	-4.73	PK
5	875.840	53.70	57.00	-3.30	58.43	-4.73	QP

Remark:

1. "*" means this data is the worst emission level;"I" means this data is over limit.

2. Emission Level=Reading Level + Correct Factor(Correct Factor=LISN Factor+Cable Loss).

3. Margin=Emission Level - Limit.

德凱認證股份有限公司

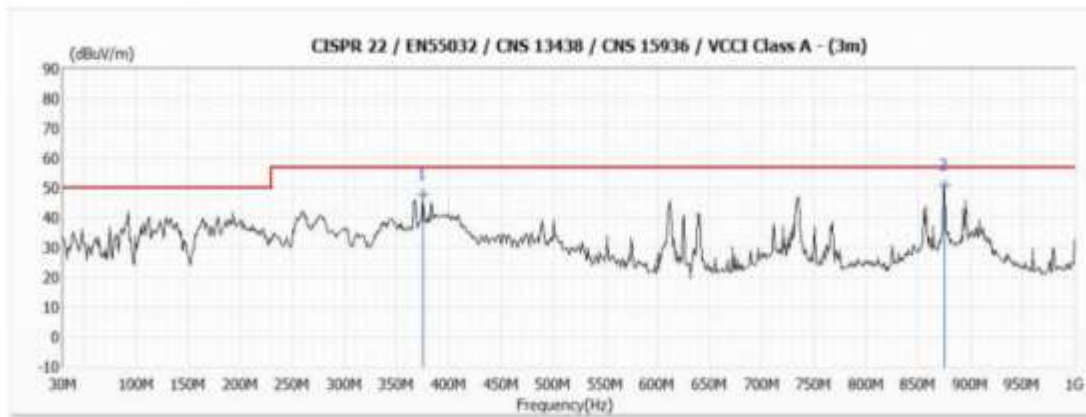
DEKRA Testing and Certification Co.,Ltd.



Profile Name : 2340107A ; Page No : 1 ;

Pretest_LK-Site01_2022_V

Model No	Banchao II PDU(三相)	Site	CB6
Test Voltage	AC 230V/50Hz	Test Date	2023/4/15
Test Mode	Mode 2	Engineer	Jackal Chen
Polarity	Vertical	Temperature (°C)	22.8
Test Condition		Humidity (%RH)	78
Note			

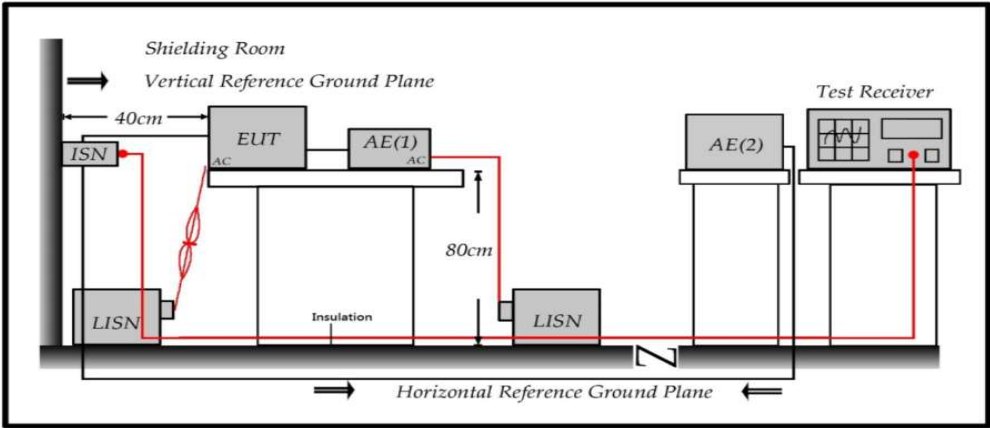


No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	375.320	47.78	57.00	-9.22	63.72	-15.94	PK
* 2	875.840	51.14	57.00	-5.86	54.31	-3.17	PK

Remark:

1. "*" means this data is the worst emission level;"!" means this data is over limit.
2. Emission Level=Reading Level + Correct Factor(Correct Factor=LISN Factor+Cable Loss).
3. Margin=Emission Level - Limit.

nducted Test Setup



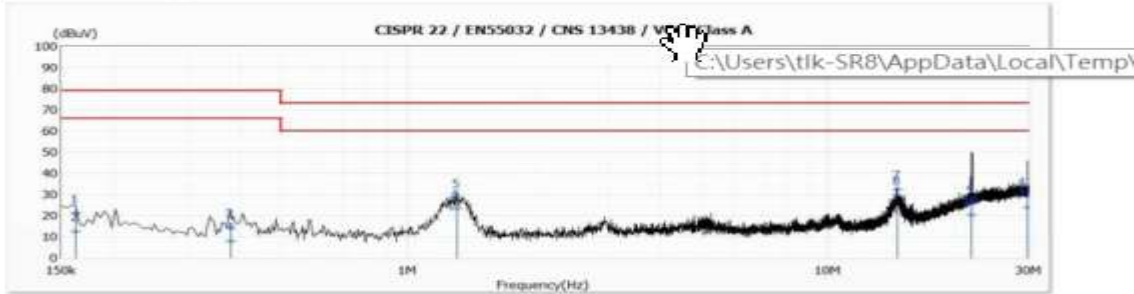
4.5 Conducted Test Result for Single Phase

德凱認證股份有限公司
DEKRA Testing and Certification Co.,Ltd.



Profile Name : 鴻騰 20220401 ; Page No : 41
LISN_ENV216_SR8_101479-2021.8.13_L1

Model No	BANCHAO II 單相	Site	SR8
Test Voltage	AC 230V/50Hz	Test Date	2022/4/1
Test Mode	Mode 1	Engineer	Gary Luo
Phase	L1	Temperature (°C)	21.1
Test Condition		Humidity (%RH)	52
Note			



No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	0.162	21.20	79.00	-57.80	11.60	9.60	QP
2	0.162	12.40	66.00	-53.60	2.80	9.60	AV
3	0.379	14.20	79.00	-64.80	4.58	9.62	QP
4	0.379	7.86	66.00	-58.14	-1.76	9.62	AV
5	1.310	28.24	73.00	-44.76	18.57	9.67	QP
6	1.310	23.38	60.00	-36.62	13.71	9.67	AV
7	14.634	32.49	73.00	-40.51	22.51	9.98	QP
*8	14.634	29.70	60.00	-30.30	19.72	9.98	AV
9	21.891	25.54	73.00	-47.46	15.49	10.05	QP
10	21.891	20.32	60.00	-39.68	10.27	10.05	AV
11	29.788	29.30	73.00	-43.70	19.19	10.11	QP
12	29.788	23.82	60.00	-36.18	13.71	10.11	AV

Remark:

- 1. "*" means this data is the worst emission level;"!" means this data is over limit.
- 2. Emission Level=Reading Level + Correct Factor(Correct Factor=LISN Factor+Cable Loss).
- 3. Margin=Emission Level-Limit

德凱認證股份有限公司

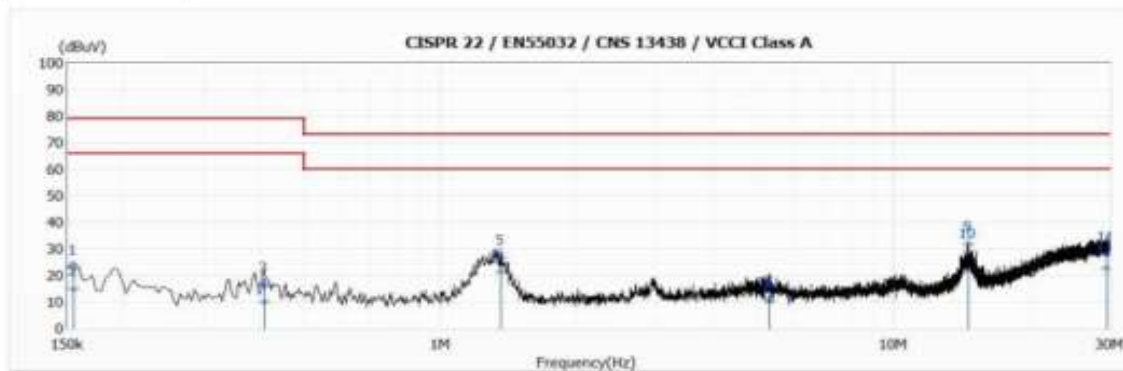
DEKRA Testing and Certification Co., Ltd.



Profile Name : 鴻騰 20220401 ; Page No : 42

LISN_ENV216_SR8_101479-2021.8.13_N

Model No	BANCHAO II 單相	Site	SR8
Test Voltage	AC 230V/50Hz	Test Date	2022/4/1
Test Mode	Mode 1	Engineer	Gary Luo
Phase	N	Temperature (°C)	21.1
Test Condition		Humidity (%RH)	52
Note			



No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	0.155	22.62	79.00	-56.38	13.02	9.60	QP
2	0.155	14.77	66.00	-51.23	5.17	9.60	AV
3	0.407	16.20	79.00	-62.80	6.59	9.61	QP
4	0.407	9.85	66.00	-56.15	0.24	9.61	AV
5	1.359	26.72	73.00	-46.28	17.05	9.67	QP
6	1.359	21.46	60.00	-38.54	11.79	9.67	AV
7	5.328	11.16	73.00	-61.84	1.38	9.78	QP
8	5.328	9.91	60.00	-50.09	0.13	9.78	AV
9	14.632	31.61	73.00	-41.39	21.58	10.03	QP
*10	14.632	28.81	60.00	-31.19	18.78	10.03	AV
11	29.481	27.99	73.00	-45.01	17.75	10.24	QP
12	29.481	22.64	60.00	-37.36	12.40	10.24	AV

Remark:

1. "*" means this data is the worst emission level; "!" means this data is over limit.
2. Emission Level=Reading Level + Correct Factor(Correct Factor=LISN Factor+Cable Loss).
3. Margin=Emission Level-Limit

2/2

Inducted Test Result for Three Phase

德凱認證股份有限公司

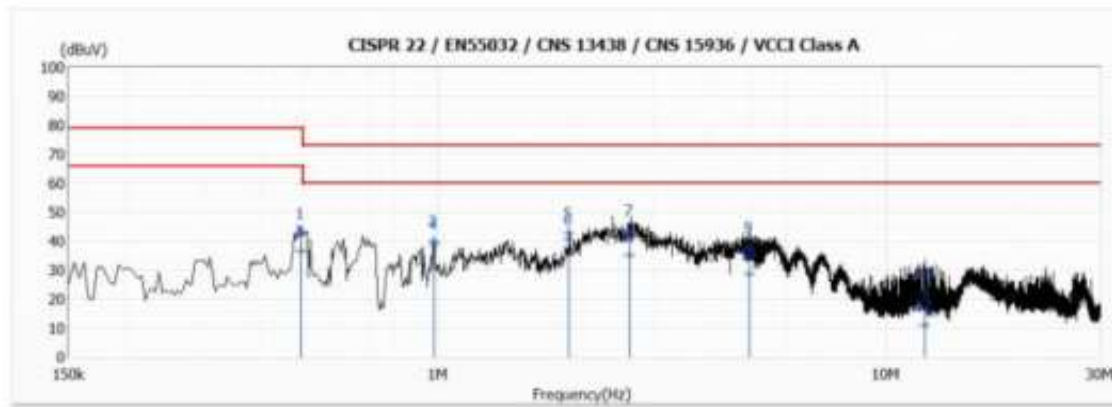
DEKRA Testing and Certification Co.,Ltd.



Profile Name : 2340107A ; Page No : 2

LISN_ENV216_LK-SR01_1803B_2022.9.5_L1

Model No	Banchao II PDU(三相)	Site	SR1
Test Voltage	AC 230V/50Hz	Test Date	2023/4/13
Test Mode	Mode 2	Engineer	Jackal Chen
Phase	L1	Temperature (°C)	21.2
Test Condition		Humidity (%RH)	54
Note			



No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	0.494	42.91	79.00	-36.09	33.20	9.71	QP
2	0.494	36.40	66.00	-29.60	26.69	9.71	AV
3	0.979	40.02	73.00	-32.98	30.23	9.79	QP
4	0.979	38.96	60.00	-21.04	29.17	9.79	AV
5	1.959	42.84	73.00	-30.16	33.00	9.84	QP
*6	1.959	40.73	60.00	-19.27	30.89	9.84	AV
7	2.681	43.80	73.00	-29.20	33.94	9.86	QP
8	2.681	35.25	60.00	-24.75	25.39	9.86	AV
9	4.943	37.88	73.00	-35.12	27.93	9.95	QP
10	4.943	28.74	60.00	-31.26	18.79	9.95	AV
11	12.208	22.05	73.00	-50.95	11.94	10.11	QP
12	12.208	10.96	60.00	-49.04	0.85	10.11	AV

Remark:

1. "*" means this data is the worst emission level; "I" means this data is over limit.
2. Emission Level=Reading Level + Correct Factor(Correct Factor=LISN Factor+Cable Loss).
3. Margin=Emission Level-Limit.

1/2

德凱認證股份有限公司

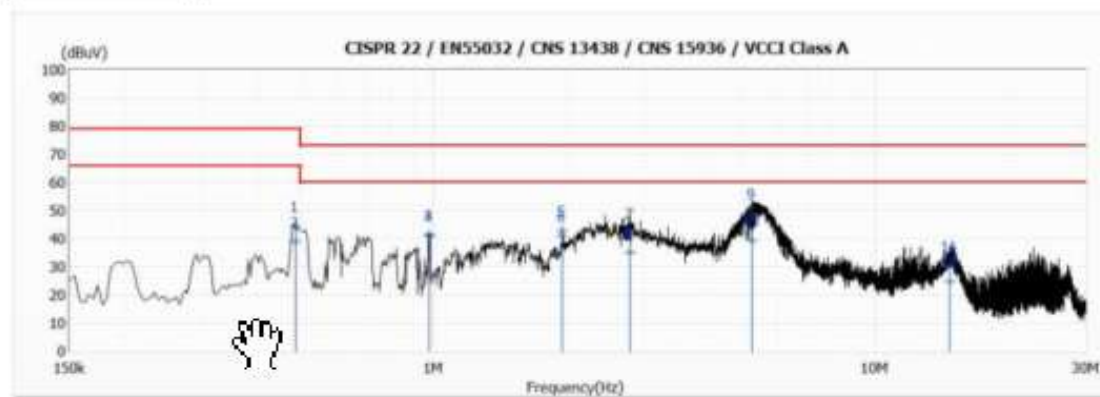
DEKRA Testing and Certification Co.,Ltd.



Profile Name : 2340107A ; Page No : 3

LISN_ENV216_LK-SR01_1803B_2022.9.5_N

Model No	Banchao II PDU(三相)	Site	SR1
Test Voltage	AC 230V/50Hz	Test Date	2023/4/13
Test Mode	Mode 2	Engineer	Jackal Chen
Phase	N	Temperature (°C)	21.2
Test Condition		Humidity (%RH)	54
Note			



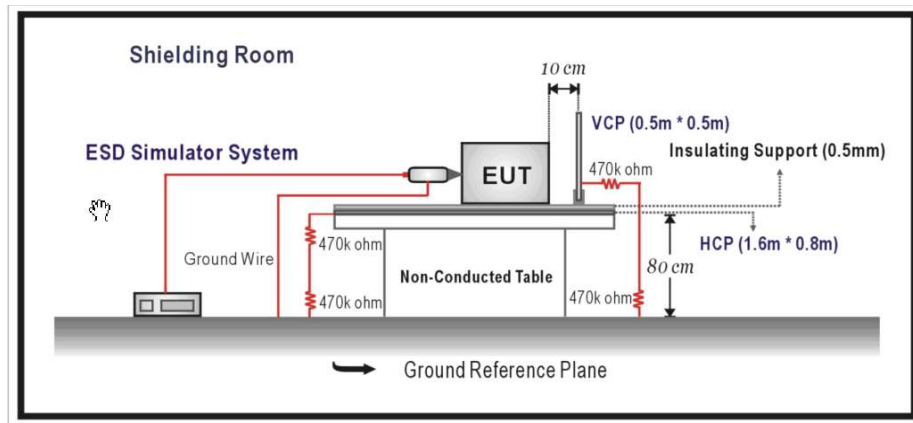
No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	0.487	44.47	79.00	-34.53	34.70	9.77	QP
2	0.487	38.83	66.00	-27.17	29.06	9.77	AV
3	0.979	41.44	73.00	-31.56	31.59	9.85	QP
4	0.979	41.12	60.00	-18.88	31.27	9.85	AV
5	1.958	42.88	73.00	-30.12	32.98	9.90	QP
*6	1.958	41.20	60.00	-18.80	31.30	9.90	AV
7	2.786	42.19	73.00	-30.81	32.26	9.93	QP
8	2.786	35.13	60.00	-24.87	25.20	9.93	AV
9	5.258	48.93	73.00	-24.07	38.90	10.03	QP
10	5.258	39.34	60.00	-20.66	29.31	10.03	AV
11	14.741	30.30	73.00	-42.70	20.06	10.24	QP
12	14.741	24.83	60.00	-35.17	14.59	10.24	AV

Remark:

1. "*" means this data is the worst emission level; "I" means this data is over limit.
2. Emission Level=Reading Level + Correct Factor(Correct Factor=LISN Factor+Cable Loss).
3. Margin=Emission Level-Limit.

2/2

4.7 ESD Test Setup



D Test Result for Single Phase



Electrostatic Discharge Measurement Results												
Applicant: 鴻騰						Data Sheet: 22B0444A						
EUT: Bancaho II PDU (單相)						Date of Measurement: 2022/11/17						
Input Voltage: AC 230V 50Hz						Temperature/Humidity: 25 °C 42%						
Test Mode: 2						Barometric pressure (mbar): 1003						
Standard : EN 55035						Test Site : ☐ LK-SR06, ☒ LK-SR07, ☐ LK-SR09, ☐ LK-SR11						
Item	Amount of Discharge	Voltage / Complied to Criteria										
Air Discharge	10	☒ +2kV	A	☒ +4kV	A	☒ +8kV	A	☐ +10kV		☐ +12kV		☐ +15kV
		☒ - 2kV	A	☒ - 4kV	A	☒ - 8kV	A	☐ - 10kV		☐ - 12kV		☐ - 15kV
Contact Discharge	10	☒ +2kV	A	☒ +4kV	D	☐ +6kV		☐ +8kV				
		☒ - 2kV	A	☒ - 4kV	A	☐ - 6kV		☐ - 8kV				
Indirect Discharge (HCP)	10	☒ +2kV	A	☒ +4kV	A	☐ +6kV		☐ +8kV				
		☒ - 2kV	A	☒ - 4kV	A	☐ - 6kV		☐ - 8kV				
Indirect Discharge (VCP)	10	☒ +2kV	A	☒ +4kV	A	☐ +6kV		☐ +8kV				
		☒ - 2kV	A	☒ - 4kV	A	☐ - 6kV		☐ - 8kV				
ESD Test Gun	Manufacturer : NOISEKEN					Model : ESS - B3011A						
Remark : Criteria A					Measurement Equipment:							
					Operator Signed: HASCHEL CHENG							

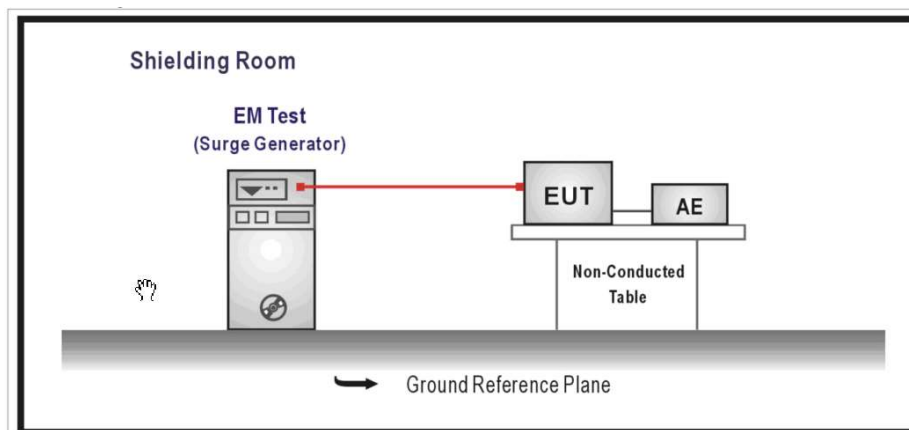
D Test Result for Three Phase



Electrostatic Discharge Measurement Results											
Applicant: <u>鴻騰</u>						Data Sheet: <u>22B0444A</u>					
EUT: <u>Bancaho II PDU (三相)</u>						Date of Measurement: <u>2022/11/17</u>					
Input Voltage: <u>AC 230V 50Hz</u>						Temperature/ Humidity: <u>25 ℃</u> <u>42%</u>					
Test Mode: <u>I</u>						Barometric pressure (mbar): <u>1003</u>					
Standard : <u>EN 55035</u>						Test Site : ☐ LK-SR06 , ☒ LK-SR07 , ☐ LK-SR09 , ☐ LK-SR11					
Item	Amount of Discharge	Voltage / Complied to Criteria									
Air Discharge	10	☒ +2kV	A	☒ +4kV	A	☒ +8kV	A	☐ +10kV		☐ +12kV	☐ +15kV
		☒ - 2kV	A	☒ - 4kV	A	☒ - 8kV	A	☐ - 10kV		☐ - 12kV	☐ - 15kV
Contact Discharge	10	☒ +2kV	A	☒ +4kV	A	☐ +6kV		☐ +8kV			
		☒ - 2kV	A	☒ - 4kV	A	☐ - 6kV		☐ - 8kV			
Indirect Discharge (HCP)	10	☒ +2kV	A	☒ +4kV	A	☐ +6kV		☐ +8kV			
		☒ - 2kV	A	☒ - 4kV	A	☐ - 6kV		☐ - 8kV			
Indirect Discharge (VCP)	10	☒ +2kV	A	☒ +4kV	A	☐ +6kV		☐ +8kV			
		☒ - 2kV	A	☒ - 4kV	A	☐ - 6kV		☐ - 8kV			
ESD Test Gun	Manufacturer : NOISEKEN					Model : ESS - B3011A					
Remark :	Criteria A					Measurement Equipment:					
					Operator Signed: <u>HASCHEL CHENG</u>						

L-EMW-01-01(Ver.00)

4.10 Surge Test Setup



Test Result (Included Single & Three Phase)

										
Surge Immunity Test Results										
Applicant: 鴻騰					Data Sheet: 22B0444A					
EUT: Bancaho II PDU					Date of Measurement: 2023/3/21					
Input Voltage: AC 230V 50Hz					Temperature: 23 °C					
Test Mode:					Humidity: 51 %					
Standard :					Test Site : ■ LK-SR03					
AC Surge Waveform			1.2/50 μs combination wave							Complied to Criteria
Inject Line	Polarity	Phase Angle	Voltage (KV)							
L1,L2,L3-N	Pos	0	1							☐ A, ☐ B, ☐ C, ☐ D
		90		☒ A, ☐ B, ☐ C, ☐ D						
		180		☐ A, ☐ B, ☐ C, ☐ D						
		270		☐ A, ☐ B, ☐ C, ☐ D						
	Neg	0	1							☐ A, ☐ B, ☐ C, ☐ D
		90		☐ A, ☐ B, ☐ C, ☐ D						
		180		☐ A, ☐ B, ☐ C, ☐ D						
		270		☒ A, ☐ B, ☐ C, ☐ D						
L1,L2,L3-PE	Pos	0	2							☐ A, ☐ B, ☐ C, ☐ D
		90		☒ A, ☐ B, ☐ C, ☐ D						
		180		☐ A, ☐ B, ☐ C, ☐ D						
		270		☐ A, ☐ B, ☐ C, ☐ D						
	Neg	0	2							☐ A, ☐ B, ☐ C, ☐ D
		90		☐ A, ☐ B, ☐ C, ☐ D						
		180		☐ A, ☐ B, ☐ C, ☐ D						
		270		☒ A, ☐ B, ☐ C, ☐ D						
N-PE	Pos	0	2							☐ A, ☐ B, ☐ C, ☐ D
		90		☐ A, ☐ B, ☐ C, ☐ D						
		180		☐ A, ☐ B, ☐ C, ☐ D						
		270		☒ A, ☐ B, ☐ C, ☐ D						
	Neg	0	2							☐ A, ☐ B, ☐ C, ☐ D
		90		☒ A, ☐ B, ☐ C, ☐ D						
		180		☐ A, ☐ B, ☐ C, ☐ D						
		270		☐ A, ☐ B, ☐ C, ☐ D						
DC Surge Waveform			1.2/50 μs combination wave							Complied to Criteria
Line to Line	Polarity									
Line to Line	Pos									☐ A, ☐ B, ☐ C, ☐ D
	Neg									☐ A, ☐ B, ☐ C, ☐ D
Line to Ground	Pos									☐ A, ☐ B, ☐ C, ☐ D
	Neg									☐ A, ☐ B, ☐ C, ☐ D
Signal Surge Waveform			☐ 1.2/50 μs combination wave, ☐ 10/700 μs combination wave							Complied to Criteria
(Line to Line)	Polarity									
(Line to Line)	Pos									☐ A, ☐ B, ☐ C, ☐ D
	Neg									☐ A, ☐ B, ☐ C, ☐ D
(Line to Ground)	Pos									☐ A, ☐ B, ☐ C, ☐ D
	Neg									☐ A, ☐ B, ☐ C, ☐ D
Remark : Criteria A *客戶重新提供三相樣品測試 *使用三相電					Measurement Equipment: Operator Signed: Kevin Wang					

L-EMW-01-01(V1.00)