TESTING LABORATORY
CERTIFICATE#4323.01

FCC PART 15B

TEST REPORT

For

Shanghai Sunmi Technology Co., Ltd.

Room 605, Block 7, KIC Plaza, No.388 Song Hu Road, Yang Pu District, Shanghai 200433 China

FCC ID: 2AH25T2SW

Report Type:	**Product Type:**
Original Report	POS System

Test Engineer:	Jett Zhao
Report Number:	RKSA200804002-00A
Report Date:	2020-10-09
Reviewed By:	Oscar Ye EMC Manager
Prepared By:	Bay Area Compliance Laboratories Corp. (Kunshan) No.248 Chenghu Road, Kunshan, Jiangsu province, China Tel: +86-0512-86175000 Fax: +86-0512-88934268 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant	Shanghai Sunmi Technology Co., Ltd.
Test Model	L1563, L1573
Series Model	L1562, L1561, L1572, L1571
Product	POS System
Rate Voltage	DC 24V from Adapter
Highest Operating Frequency	5825MHz

Adapter1 information（L1563/L1562/L1561）:
Model: CYSE65-240250
Input: AC 100V-240V, 50/60Hz, 1.7A
Output: DC 24.0V, 2.5A, 60.0W

Adapter2 information（L1573/L1572/L1571）:
Model: CYZS36-240150
Input: AC 100V-240V, 50/60Hz, 1.5A
Output: DC 24.0V, 1.5A

Note: The difference between test model and series model was explained in the attached declaration letter.

**All measurement and test data in this report was gathered from production sample serial number: 20200804002. (Assigned by the BACL. The EUT supplied by the applicant was received on 2020-08-04)*

Objective

This report is prepared on behalf of *Shanghai Sunmi Technology Co., Ltd* in accordance with Part 2-Subpart J, and Part 15-Subparts A and B of the Federal Communication Commission's rules.

The objective of the manufacturer is to determine the compliance of EUT with FCC Part 15, Class B device.

Related Submittal(s)/Grant(s)

FCC Part 15.247 DSS submissions with FCC ID: 2AH25T2SW
FCC Part 15.247 DTS submissions with FCC ID: 2AH25T2SW
FCC Part 15.407 NII submissions with FCC ID: 2AH25T2SW

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Kunshan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan, Jiangsu province, China.

Bay Area Compliance Laboratories Corp. (Kunshan) Lab is accredited to ISO/IEC 17025 by A2LA (Lab code: 4323.01) and the FCC designation No. CN1185 under the FCC KDB 974614 D01 and CAB identifier CN0004 under the ISED requirement. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in a typical mode (as normally used by a typical user).

Test mode: Display+ Print+ LANLINK+ Data transmission+ Adapter power supply

EUT Exercise Software

No exercise software was used to test.

Special Accessories

No special accessory was used.

Equipment Modifications

No modification was made to the EUT tested.

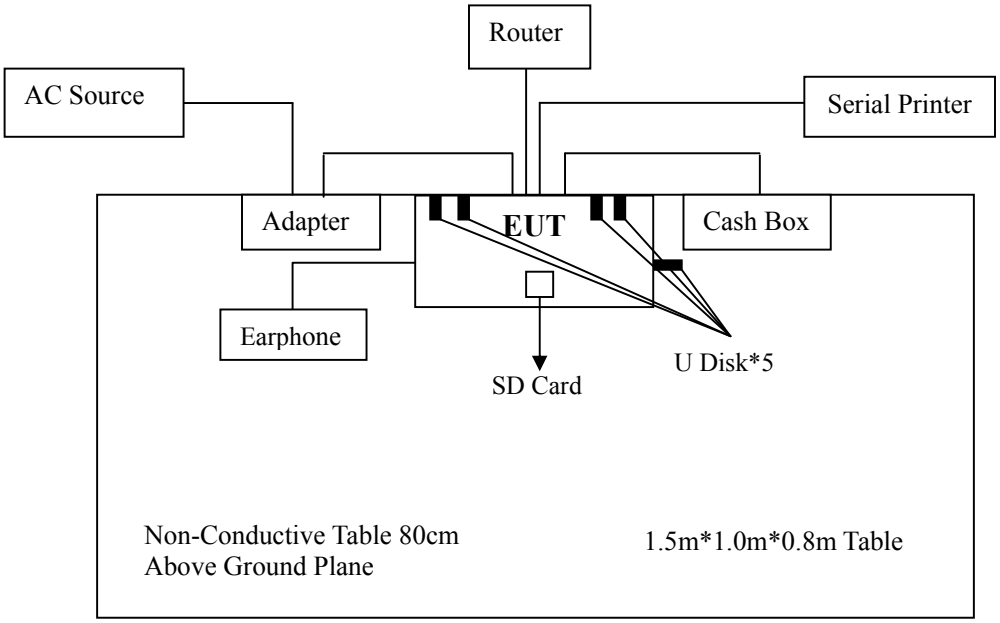
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Shanghai Sunmi Technology Co.,Ltd.	Cash Box	/	/
TP-LINK	Router	EC26CA652860	1153150000000
/	Printer	/	/
/	Earphone	/	/
Sandisk	USB flash disk	/	/
Sandisk	SD card	SDSQUNC-032G-ZN6MA	/

External I/O Cable

Cable Description	Length (m)	Port From	To Port
Power Cable 1	1.0	EUT	Adapter
Power Cable 2	1.0	Adapter	AC Source
Power Cable 3	1.0	EUT	Router
Power Cable 4	1.0	EUT	Serial Printer
Power Cable 5	0.5	EUT	Cash Box
Power Cable 8	1.0	EUT	Earphone

Block Diagram of Radiated Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§15.107	Conducted Emissions	Compliant
§15.109	Radiated Emissions	Compliant

FCC §15.107 - CONDUCTED EMISSIONS

Applicable Standard

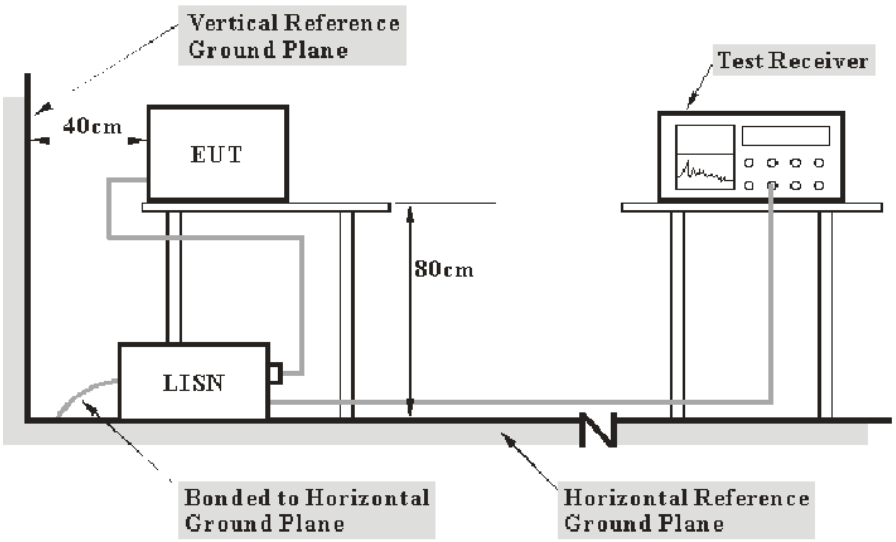
According to FCC§15.107

Measurement Uncertainty

Input quantities to be considered for conducted disturbance measurements maybe receiver reading, attenuation of the connection between LISN and receiver, LISN voltage division factor, LISN VDF frequency interpolation and receiver related input quantities, etc.

Item		Terminal	Measurement Uncertainty	U_{cispr}
Conducted Emission	150kHz~30MHz	AC Mains	3.19 dB	3.4 dB

EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The measurement procedure of EUT setup is according with ANSI C63.4-2014. The related limit was specified in FCC Part 15.107 Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESR	1316.3003K03 -101746-zn	2020-08-05	2021-08-04
Rohde & Schwarz	LISN	ENV216	101115	2019-12-14	2020-12-13
Audix	Test Software	e3	V9	--	--
MICRO-COAX	Coaxial Cable	Cable-15	015	2020-08-15	2021-08-14
Rohde & Schwarz	Pluse limiter	ESH3-Z2	100552	2020-08-10	2021-08-09

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

Factor & Over Limit Calculation

The Factor is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Attenuator. The basic equation is as follows:

Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Attenuator (dB)

The "**Over Limit**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, an Over Limit of 7 dB means the emission is 7 dB above the limit. The equation for Over Limit calculation is as follows:

Over Limit (dB) = Read level (dBµV) + Factor (dB) - Limit (dBµV)

Test Data

Environmental Conditions

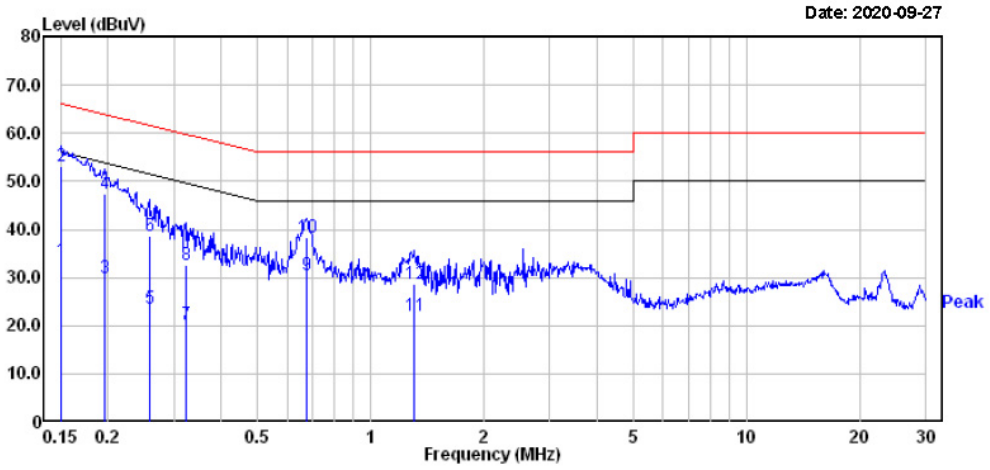
Temperature:	23.9℃-24.3℃
Relative Humidity:	52.9 %-53.5 %
ATM Pressure:	100.9 kPa-101.2 kPa

The testing was performed by Jett Zhao from 2020-09-14 to 2020-09-27.

Test mode: Display+ Print+ LANLINK+ Data transmission+ Adapter power supply

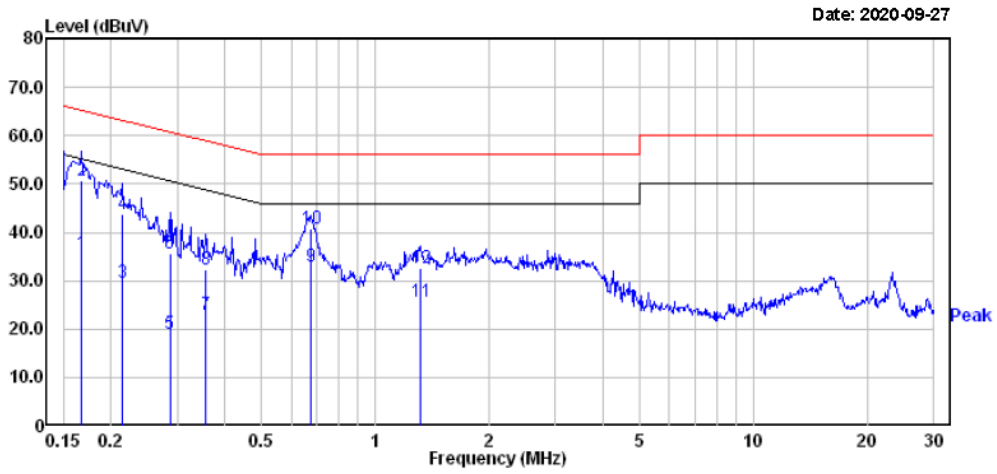
Model：L1563

Line:



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.150	13.70	19.82	33.52	56.00	-22.48	Average
2	0.150	33.30	19.82	53.12	66.00	-12.88	QP
3	0.196	10.20	19.82	30.02	53.80	-23.78	Average
4	0.196	27.70	19.82	47.52	63.80	-16.28	QP
5	0.258	3.60	19.82	23.42	51.51	-28.09	Average
6	0.258	18.90	19.82	38.72	61.51	-22.79	QP
7	0.322	0.50	19.82	20.32	49.66	-29.34	Average
8	0.322	12.90	19.82	32.72	59.66	-26.94	QP
9	0.675	10.80	19.75	30.55	46.00	-15.45	Average
10	0.675	18.70	19.75	38.45	56.00	-17.55	QP
11	1.303	2.20	19.82	22.02	46.00	-23.98	Average
12	1.303	8.80	19.82	28.62	56.00	-27.38	QP

Neutral:



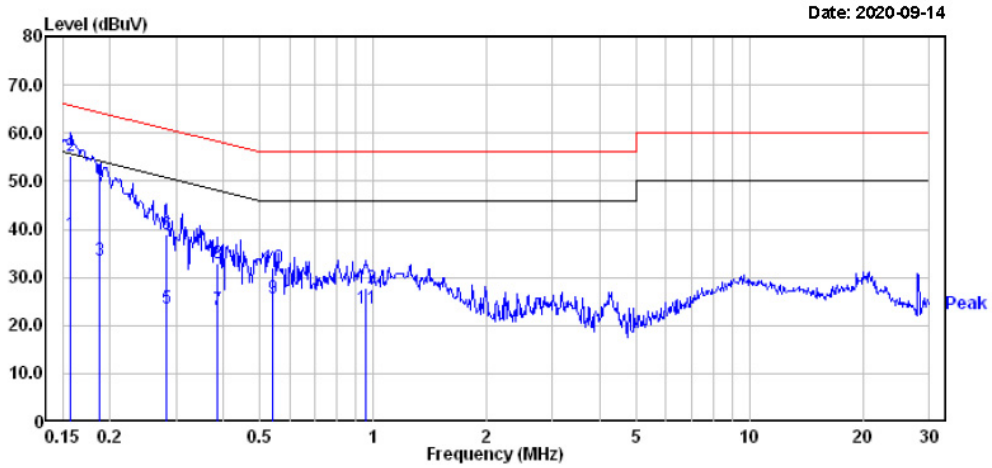
	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.168	15.70	19.83	35.53	55.08	-19.55	Average
2	0.168	30.80	19.83	50.63	65.08	-14.45	QP
3	0.214	9.70	19.82	29.52	53.05	-23.53	Average
4	0.214	24.10	19.82	43.92	63.05	-19.13	QP
5	0.286	-0.80	19.82	19.02	50.63	-31.61	Average
6	0.286	15.80	19.82	35.62	60.63	-25.01	QP
7	0.356	3.20	19.80	23.00	48.83	-25.83	Average
8	0.356	12.60	19.80	32.40	58.83	-26.43	QP
9	0.675	13.10	19.75	32.85	46.00	-13.15	Average
10	0.675	20.90	19.75	40.65	56.00	-15.35	QP
11	1.317	5.71	19.82	25.53	46.00	-20.47	Average
12	1.317	12.71	19.82	32.53	56.00	-23.47	QP

Note:

1) Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Attenuator (dB)
2) Over Limit (dB) = Read level (dBμV) + Factor (dB) - Limit (dBμV)

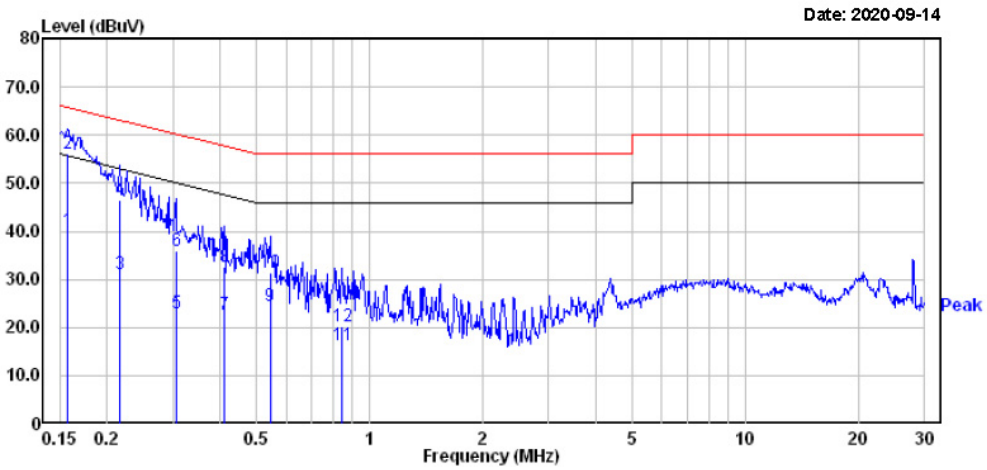
Model：L1573

Line:



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.157	19.10	19.82	38.92	55.60	-16.68	Average
2	0.157	35.30	19.82	55.12	65.60	-10.48	QP
3	0.187	13.61	19.82	33.43	54.15	-20.72	Average
4	0.187	30.21	19.82	50.03	64.15	-14.12	QP
5	0.283	3.60	19.82	23.42	50.72	-27.30	Average
6	0.283	19.10	19.82	38.92	60.72	-21.80	QP
7	0.385	3.40	19.76	23.16	48.17	-25.01	Average
8	0.385	13.10	19.76	32.86	58.17	-25.31	QP
9	0.541	6.01	19.75	25.76	46.00	-20.24	Average
10	0.541	12.11	19.75	31.86	56.00	-24.14	QP
11	0.953	3.80	19.78	23.58	46.00	-22.42	Average
12	0.953	8.10	19.78	27.88	56.00	-28.12	QP

Neutral:



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.157	20.20	19.82	40.02	55.60	-15.58	Average
2	0.157	36.40	19.82	56.22	65.60	-9.38	QP
3	0.216	11.40	19.82	31.22	52.96	-21.74	Average
4	0.216	26.80	19.82	46.62	62.96	-16.34	QP
5	0.305	3.19	19.83	23.02	50.10	-27.08	Average
6	0.305	16.19	19.83	36.02	60.10	-24.08	QP
7	0.410	2.80	19.74	22.54	47.64	-25.10	Average
8	0.410	12.80	19.74	32.54	57.64	-25.10	QP
9	0.544	4.60	19.75	24.35	46.00	-21.65	Average
10	0.544	11.50	19.75	31.25	56.00	-24.75	QP
11	0.844	-3.50	19.71	16.21	46.00	-29.79	Average
12	0.844	0.40	19.71	20.11	56.00	-35.89	QP

Note:

1) Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Attenuator (dB)
2) Over Limit (dB) = Read level (dBμV) + Factor (dB) - Limit (dBμV)

FCC §15.109 - RADIATED EMISSIONS

Applicable Standard

FCC §15.109

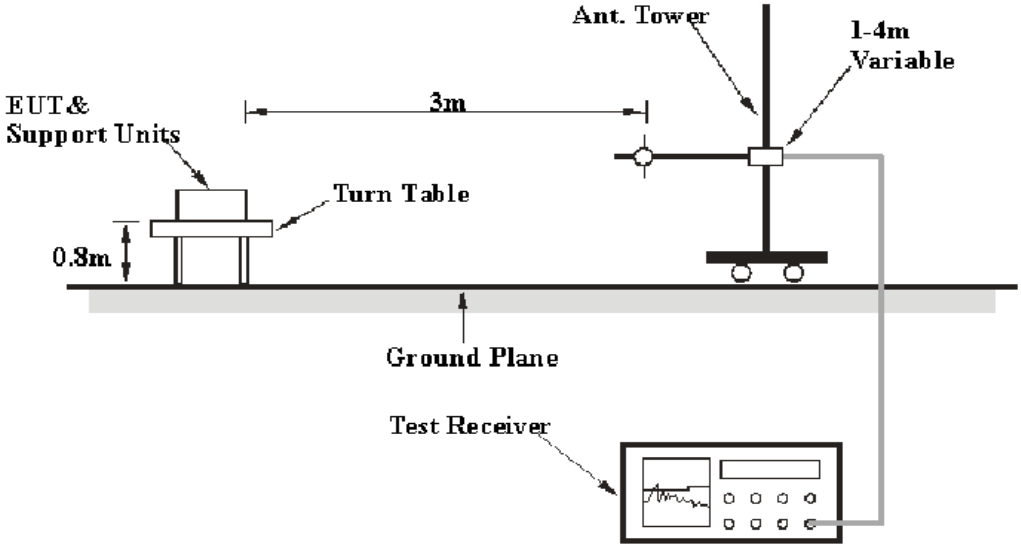
Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average) and system repeatability.

Item		Measurement Uncertainty	U_{cispr}
Radiated Emission	30MHz~1GHz	6.11dB	6.3 dB

EUT Setup

Below 1GHz:



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.4-2014. The specification used was the FCC Part 15.109 Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 30 GHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30MHz – 1000 MHz	120 kHz	300 kHz	120kHz	QP
Above 1GHz	1MHz	3 MHz	/	PK
	1MHz	3 MHz	/	Ave.

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sonoma Instrument	Pre-amplifier	310N	185700	2020-08-14	2021-08-13
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2019-11-30	2020-11-29
Sunol Sciences	Broadband Antenna	JB3	A090413-1	2018-12-26	2021-12-25
Champrotek	Chamber 1#	3m-SAC 966	-	2019-05-08	2022-05-07
Albatross	Chamber 2#	3m-SAC 966	-	2019-05-08	2022-05-07
Rohde & Schwarz	Auto test Software	EMC32	100361	-	-
ETS	Horn Antenna	3115	6229	2018-12-12	2021-12-11
Rohde & Schwarz	EMI Test Receiver	ESU40	100207	2020-04-01	2021-03-31
A.H.Systems, inc	Amplifier	'PAM-0118P	512	2020-02-20	2021-02-19
MICRO-COAX	Coaxial Cable	Cable-8	008	2020-08-15	2021-08-14
MICRO-COAX	Coaxial Cable	Cable-9	009	2020-08-15	2021-08-14
MICRO-COAX	Coaxial Cable	Cable-10	010	2020-08-15	2021-08-14
MICRO-COAX	Coaxial Cable	Cable-4	004	2019-12-12	2020-12-11
MICRO-COAX	Coaxial Cable	Cable-5	005	2019-12-12	2020-12-11

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

Margin = Limit –Corrected Amplitude

Test Data

Environmental Conditions

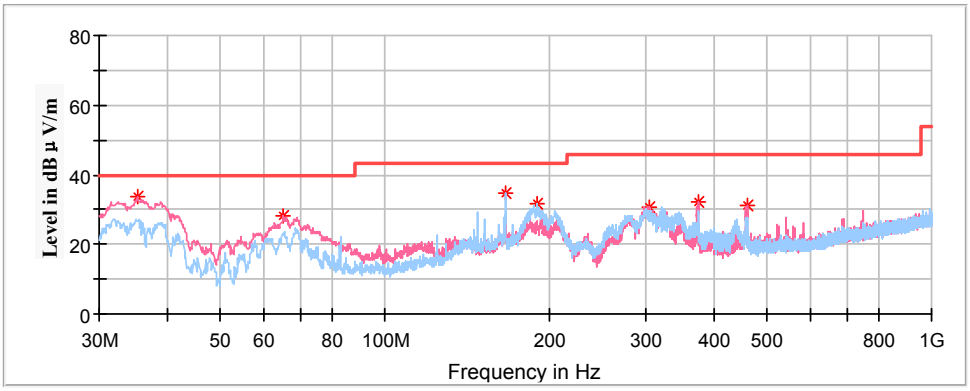
Temperature:	23.9℃-24.8℃
Relative Humidity:	52.9 %-53.7 %
ATM Pressure:	100.9 kPa-101.3 kPa

The testing was performed by Jett Zhao from 2020-09-14 to 2020-09-29.

Test mode : Display+ Print+ LANLINK+ Data transmission+ Adapter power supply

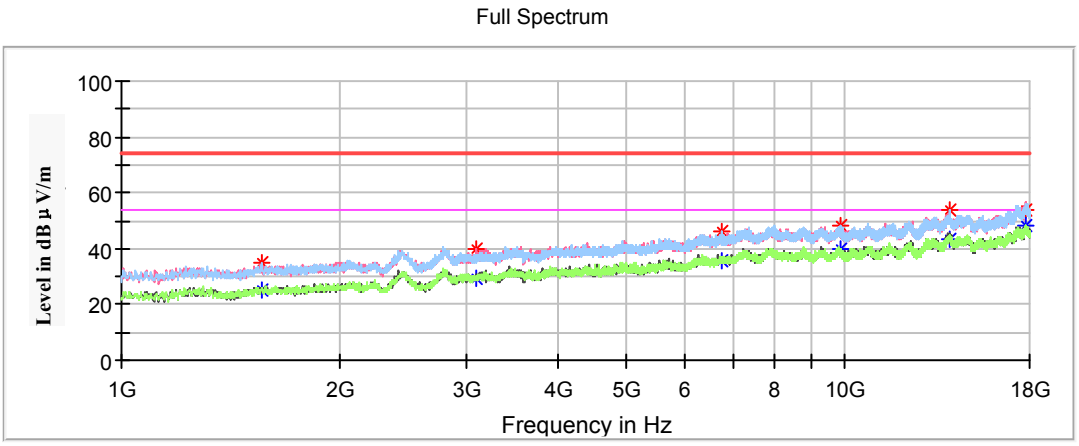
Model: L1563

1) 30MHz ~ 1GHz:



Frequency (MHz)	Corrected Amplitude MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
35.213750	33.67	40.00	6.33	100.0	V	156.0	-14.1
65.162500	28.01	40.00	11.99	100.0	V	167.0	-23.5
166.285000	34.68	43.50	8.82	200.0	H	268.0	-19.0
189.565000	31.46	43.50	12.04	200.0	H	210.0	-18.3
303.903750	30.82	46.00	15.18	200.0	V	149.0	-16.9
374.228750	32.44	46.00	13.56	200.0	V	24.0	-15.2

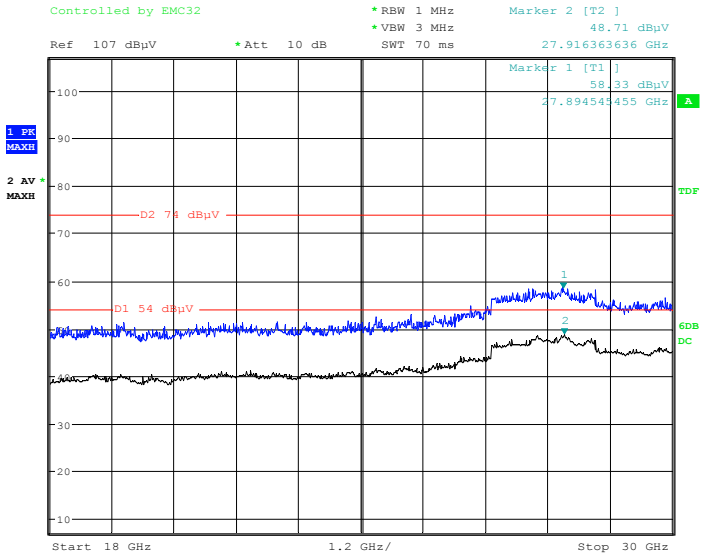
2) 1GHz-18GHz:



Frequency (MHz)	Corrected Amplitude		Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
	Max Peak (dBµV/m)	Average (dBµV/m)						
1559.300000	35.18	---	74.00	38.82	200.0	H	334.0	-16.1
1559.300000	---	25.43	54.00	28.57	200.0	H	334.0	-16.1
3085.900000	---	29.66	54.00	24.34	150.0	V	338.0	-9.9
3085.900000	39.96	---	74.00	34.04	150.0	V	338.0	-9.9
6771.500000	---	35.59	54.00	18.41	200.0	V	0.0	-0.6
6771.500000	46.12	---	74.00	27.88	200.0	V	0.0	-0.6
9851.900000	---	39.58	54.00	14.42	200.0	H	245.0	2.0
9851.900000	48.54	---	74.00	25.46	200.0	H	245.0	2.0
13964.200000	---	43.30	54.00	10.70	150.0	H	136.0	6.1
13964.200000	53.74	---	74.00	20.26	150.0	H	136.0	6.1
17770.500000	53.66	---	74.00	20.34	200.0	H	296.0	8.8
17770.500000	---	48.60	54.00	5.40	200.0	H	296.0	8.8

3) 18GHz-30GHz:

Horizontal:



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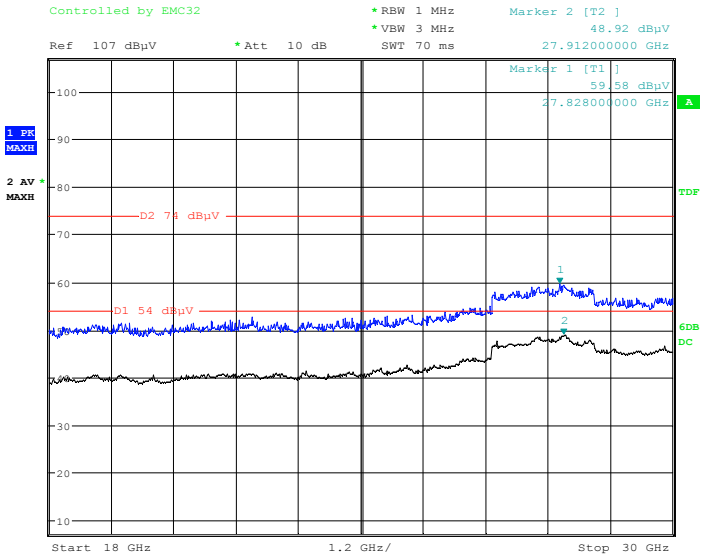
Vertical:



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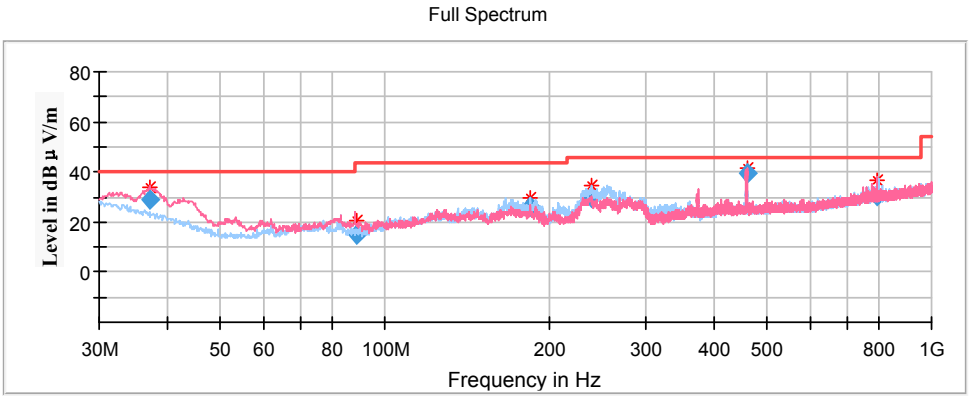
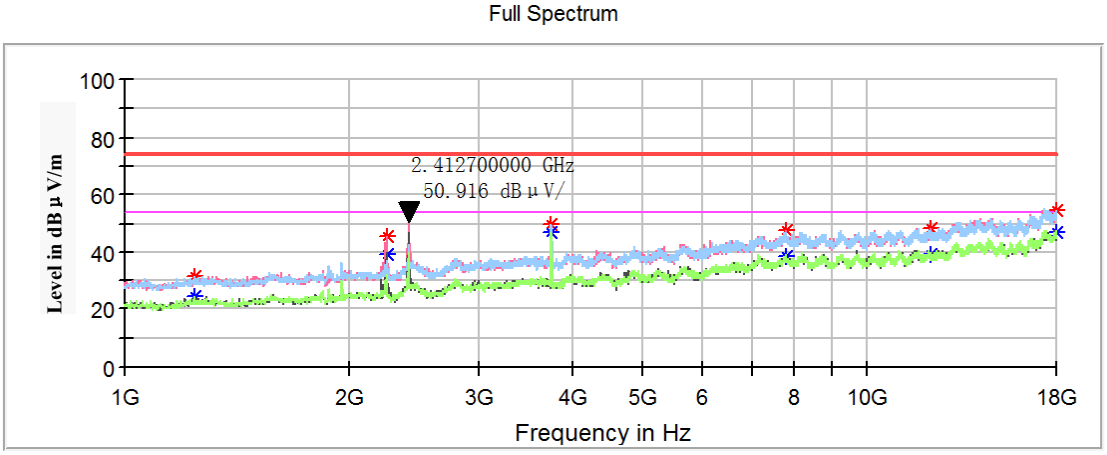
Model: L1573

1) 30MHz ~ 1GHz:



Frequency (MHz)	Corrected Amplitude QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
37.227200	29.26	40.00	10.74	101.0	V	111.0	-9.3
88.505700	14.62	40.00	25.38	101.0	V	310.0	-17.9
184.761250	26.23	40.00	13.77	101.0	H	103.0	-13.8
239.030000	30.00	47.00	17.00	101.0	H	281.0	-12.6
459.470500	39.12	47.00	7.88	101.0	V	172.0	-7.1
796.881200	30.58	47.00	16.42	101.0	V	341.0	-1.5

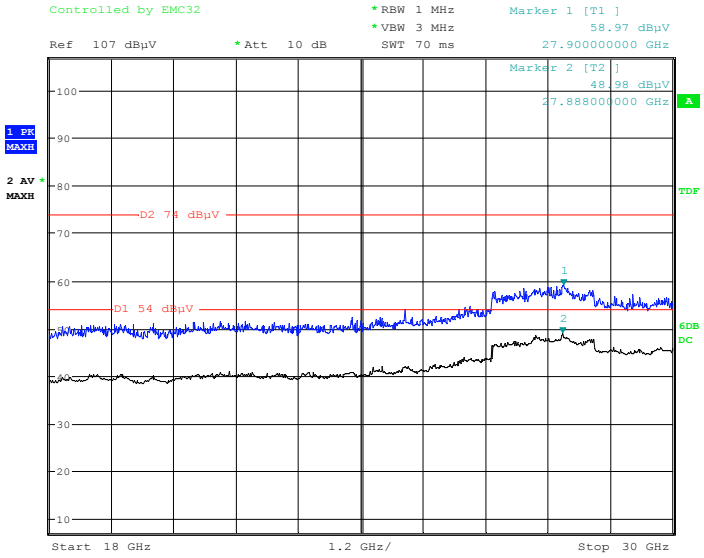
2) 1GHz-18GHz:



Frequency (MHz)	Corrected Amplitude		Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
	Max Peak (dBµV/m)	Average (dBµV/m)						
1239.700000	---	24.24	54.00	29.76	100.0	H	238.0	-17.8
1239.700000	31.73	---	74.00	42.27	100.0	H	238.0	-17.8
2251.200000	---	39.17	54.00	14.83	100.0	V	0.0	-13.4
2251.200000	45.11	---	74.00	28.89	100.0	V	0.0	-13.4
3759.100000	---	47.20	54.00	6.80	200.0	H	102.0	-7.9
3759.100000	49.88	---	74.00	24.12	200.0	H	102.0	-7.9
7771.100000	---	38.51	54.00	15.49	200.0	V	187.0	1.5
7771.100000	47.27	---	74.00	26.73	200.0	V	187.0	1.5
12165.600000	---	38.91	54.00	15.09	100.0	V	296.0	3.5
12165.600000	48.33	---	74.00	25.67	100.0	V	296.0	3.5
17969.400000	---	46.56	54.00	7.44	100.0	V	72.0	8.8
17969.400000	54.47	---	74.00	19.53	100.0	V	72.0	8.8

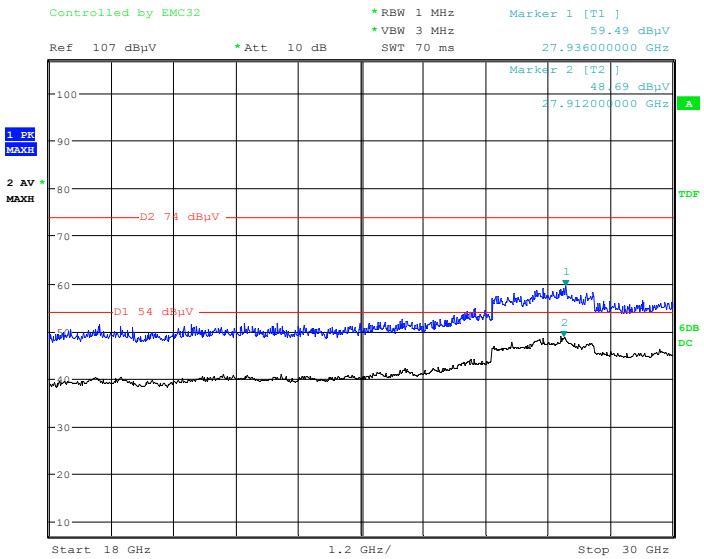
3) 18GHz-30GHz:

Horizontal:



Date: 9.SEP.2020 01:23:34

Vertical:



Date: 9.SEP.2020 02:19:01

Declarations

1: BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with an asterisk '*'. Customer model name, addresses, names, trademarks etc. are not considered data.

2: Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

3: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

4: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

5: This report cannot be reproduced except in full, without prior written approval of the Company.

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*******END OF REPORT*******