TESTING LABORATORY
CERTIFICATE#4323.01

FCC PART 15B

MEASUREMENT AND TEST REPORT

For

Gouldin Technologies, LLC

2150 Chenault Dr., Carrollton, Texas, 75006 United States

FCC ID: 2AOQ7-W410

Report Type:	**Product Type:**
Original Report	TALKMAN

Test Engineer:	CK Huang
Report Number:	RXM190912050-00A
Report Date:	2019-09-25
Reviewed By:	Oscar Ye EMC Leader
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	Gouldin Technologies, LLC
Test Model	W410
Product	TALKMAN
Rate Voltage	DC 12V from Adapter or DC 48V from POE
Highest Operation Frequency	400 MHz
Dimension	163mm (L)*140mm (W)*215.3mm(H)

**All measurement and test data in this report was gathered from production sample serial number: 20190912050. (Assigned by the BACL. The EUT supplied by the applicant was received on 2019-09-12)*

Objective

This report is prepared on behalf of *Gouldin Technologies, LLC* 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)

No related submittal(s).

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 fashion (as normally used by a typical user).

Test mode 1: Powered by adapter & LAN Link & Camera on
Test mode 2: Powered by POE & LAN Link & Camera on

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
DELL	Notebook	E6410	3094742521
NTEGEAR	POE	GS308P	4F217B5000891
TP-LINK	Router	EC26CA652860	1153150000000
GOLDEN PROFIT ELEC TRONICS	Adapter	GPE018W-120100-2	N/A
FuShi	Switch	AR22PR-310B	N/A
AnYong	Load	RXLG	N/A
WeiShi	Entrance Guard	Q3	N/A
Schneider Electric	Relay	RXM2LB2BD	N/A

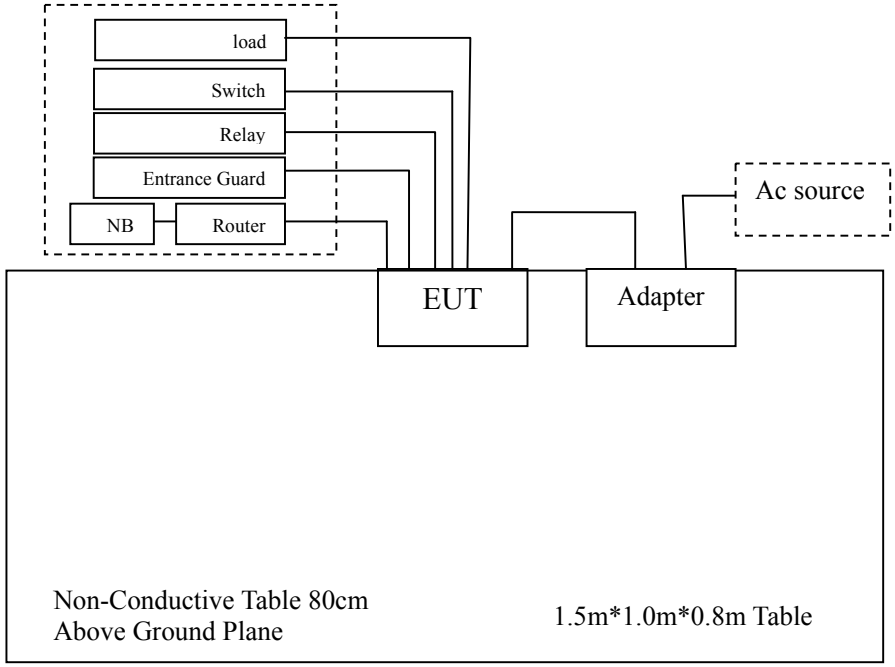
External I/O Cable

Cable Description	Length (m)	From/Port	To
Power supply cable	1.0	EUT	AC Power Supply
RJ45 cable	1.2	EUT	Notebook
RJ45 cable	5.0	EUT	POE
Power supply cable	1.2	POE	POE Adapter
RJ45 cable	1.5	EUT	Router
Power supply cable	5.0	EUT	Load

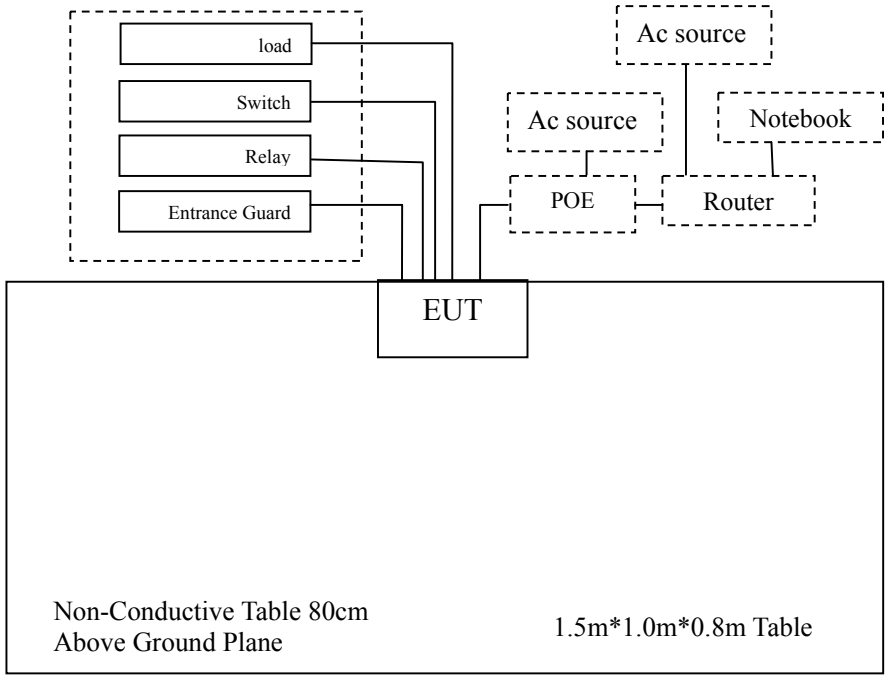
Signal Cable	5.0	EUT	Switch
Signal Cable	5.0	EUT	Relay
Signal Cable	5.0	EUT	Entrance Guard

Block Diagram of Radiated Test Setup

Test Mode 1



Test Mode 2



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

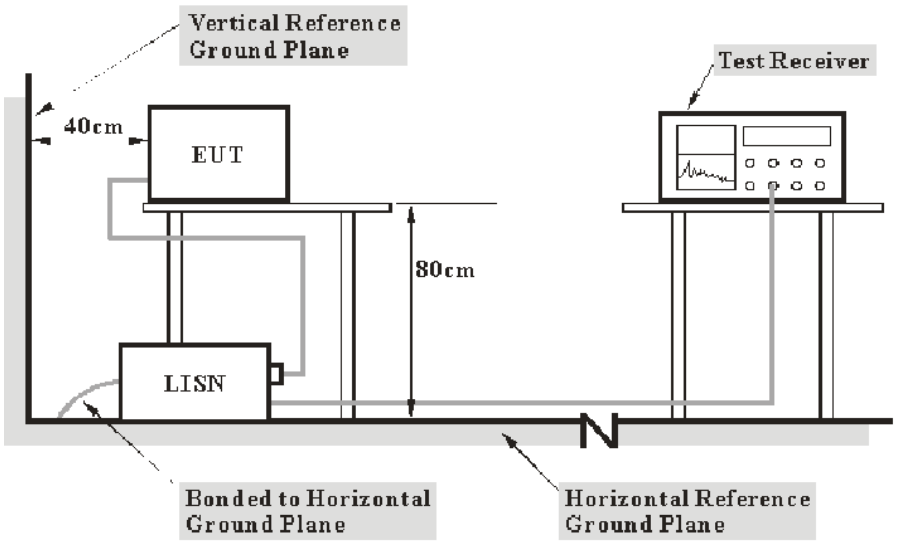
Measurement Uncertainty

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		Measurement Uncertainty	U_{cispr}
AMN	150kHz~30MHz	3.19 dB	3.4 dB

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

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

During the conducted emission test, the adapter was connected to the outlet of the LISN.

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

All final data was recorded in the Quasi-peak and average detection mode.

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	2019-07-11	2020-07-10
ROHDE&SCHWARZ	LISN	ENV216	3560655016	2018-11-30	2019-11-29
Audix	Test Software	e3	V9	--	--
MICRO-COAX	Coaxial Cable	Cable-6	006	2019-09-08	2020-09-07

*** 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 Factor & Over Limit Calculation

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

Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)

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

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

Test Data

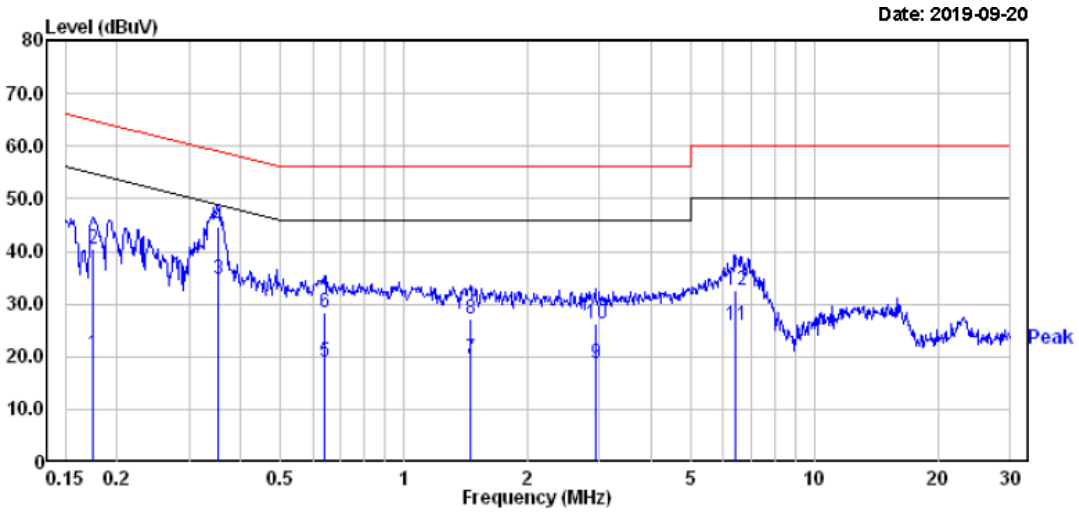
Environmental Conditions

Temperature:	22 ℃
Relative Humidity:	50 %
ATM Pressure:	101.1 kPa

The testing was performed by CK Huang on 2019-09-20.

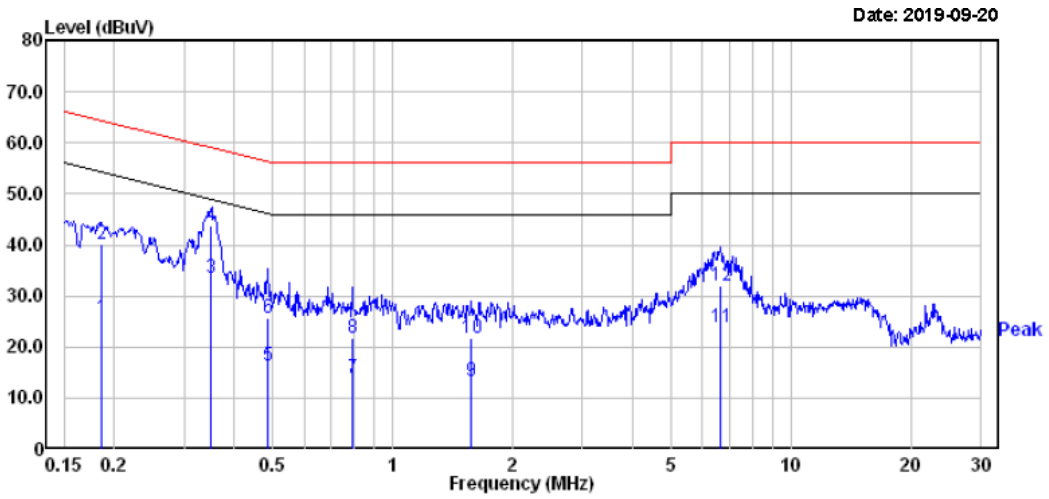
Test mode 1

Line:



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.175	0.60	19.83	20.43	54.72	-34.29	Average
2	0.175	20.50	19.83	40.33	64.72	-24.39	QP
3	0.354	15.00	19.80	34.80	48.87	-14.07	Average
4	0.354	24.80	19.80	44.60	58.87	-14.27	QP
5	0.641	-0.80	19.75	18.95	46.00	-27.05	Average
6	0.641	8.60	19.75	28.35	56.00	-27.65	QP
7	1.456	-0.30	19.84	19.54	46.00	-26.46	Average
8	1.456	7.40	19.84	27.24	56.00	-28.76	QP
9	2.931	-0.60	19.46	18.86	46.00	-27.14	Average
10	2.931	6.70	19.46	26.16	56.00	-29.84	QP
11	6.454	6.50	19.51	26.01	50.00	-23.99	Average
12	6.454	13.10	19.51	32.61	60.00	-27.39	QP

Neutral:



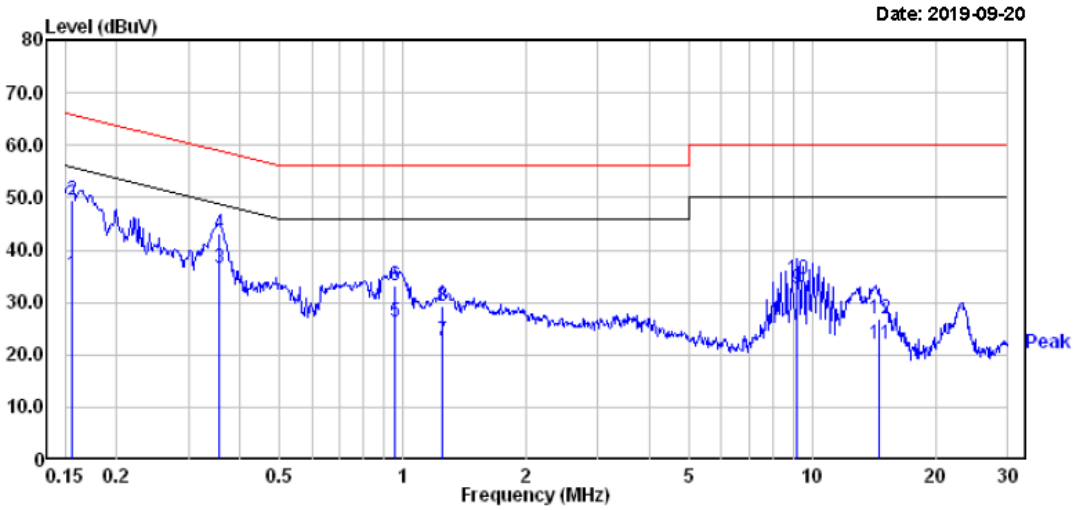
	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.185	5.81	19.82	25.63	54.24	-28.61	Average
2	0.185	20.41	19.82	40.23	64.24	-24.01	QP
3	0.350	13.70	19.81	33.51	48.96	-15.45	Average
4	0.350	23.90	19.81	43.71	58.96	-15.25	QP
5	0.486	-3.60	19.76	16.16	46.23	-30.07	Average
6	0.486	6.00	19.76	25.76	56.23	-30.47	QP
7	0.792	-5.79	19.70	13.91	46.00	-32.09	Average
8	0.792	2.01	19.70	21.71	56.00	-34.29	QP
9	1.577	-6.51	19.85	13.34	46.00	-32.66	Average
10	1.577	1.89	19.85	21.74	56.00	-34.26	QP
11	6.662	4.20	19.51	23.71	50.00	-26.29	Average
12	6.662	12.40	19.51	31.91	60.00	-28.09	QP

Note:

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

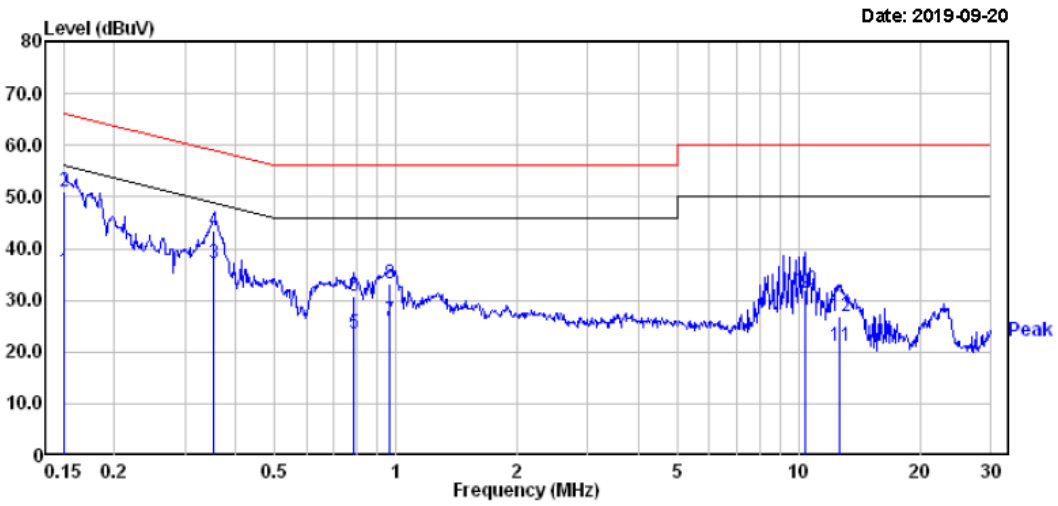
Test mode 2

Line:



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.156	15.40	19.82	35.22	55.69	-20.47	Average
2	0.156	29.70	19.82	49.52	65.69	-16.17	QP
3	0.356	16.70	19.80	36.50	48.83	-12.33	Average
4	0.356	23.40	19.80	43.20	58.83	-15.63	QP
5	0.958	6.40	19.78	26.18	46.00	-19.82	Average
6	0.958	13.40	19.78	33.18	56.00	-22.82	QP
7	1.249	2.90	19.82	22.72	46.00	-23.28	Average
8	1.249	9.60	19.82	29.42	56.00	-26.58	QP
9	9.204	13.00	19.55	32.55	50.00	-17.45	Average
10	9.204	14.90	19.55	34.45	60.00	-25.55	QP
11	14.634	2.39	19.63	22.02	50.00	-27.98	Average
12	14.634	7.29	19.63	26.92	60.00	-33.08	QP

Neutral:



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.150	15.90	19.82	35.72	56.00	-20.28	Average
2	0.150	31.20	19.82	51.02	66.00	-14.98	QP
3	0.354	17.30	19.80	37.10	48.87	-11.77	Average
4	0.354	23.60	19.80	43.40	58.87	-15.47	QP
5	0.783	3.80	19.71	23.51	46.00	-22.49	Average
6	0.783	11.10	19.71	30.81	56.00	-25.19	QP
7	0.963	6.30	19.79	26.09	46.00	-19.91	Average
8	0.963	13.40	19.79	33.19	56.00	-22.81	QP
9	10.397	11.70	19.56	31.26	50.00	-18.74	Average
10	10.397	12.50	19.56	32.06	60.00	-27.94	QP
11	12.649	1.40	19.60	21.00	50.00	-29.00	Average
12	12.649	7.20	19.60	26.80	60.00	-33.20	QP

Note:

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

FCC §15.109 - RADIATED EMISSIONS

Applicable Standard

FCC §15.109

Measurement Uncertainty

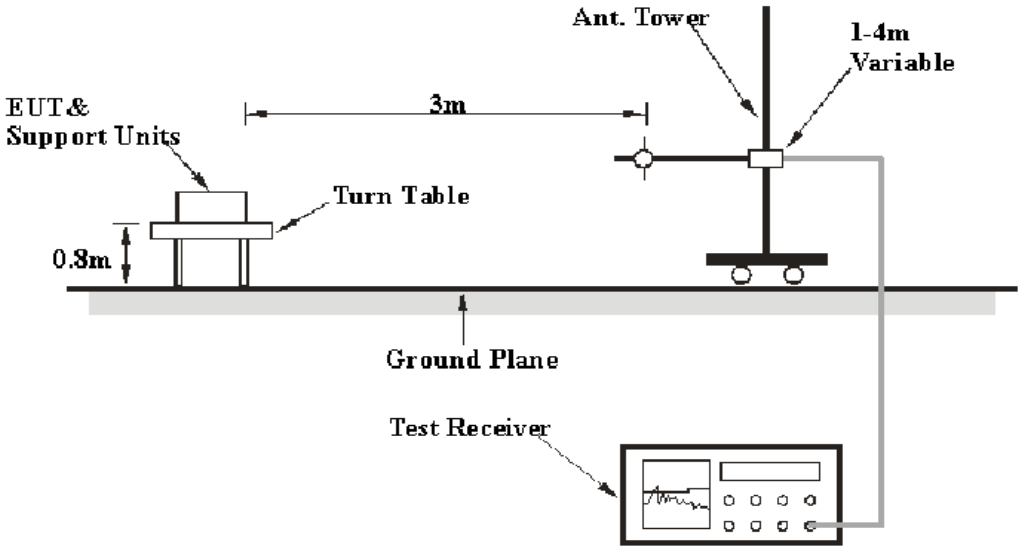
All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency 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
	1GHz~6GHz	4.45dB	5.2 dB
	6 GHz ~18 GHz	5.23dB	5.5 dB

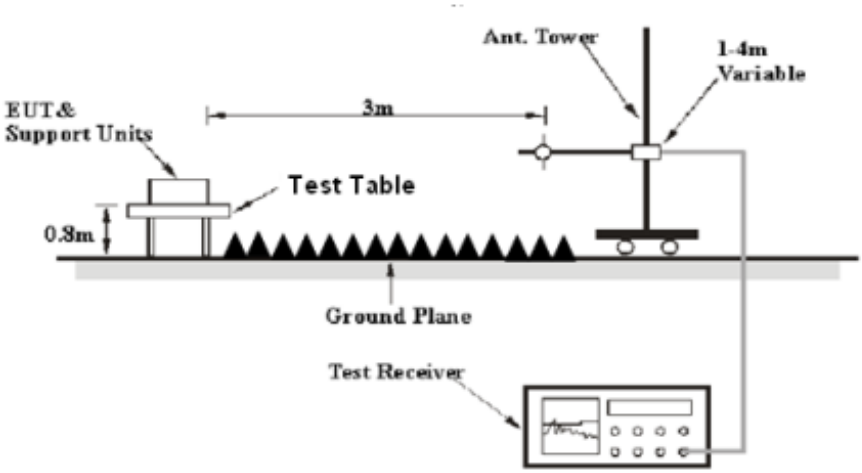
Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

EUT Setup

Below 1GHz:



Above 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 18 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 1 GHz	1MHz	3 MHz	/	Peak
	1MHz	3 MHz	1MHz	AVG

Test Procedure

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

All data was recorded in the Quasi-peak detector mode from 30 MHz to 1 GHz, Peak and average detection mode above 1 GHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sonoma Instrument	Amplifier	310N	185700	2019-08-14	2020-08-13
Rohde & Schwarz	EMI Test Receiver	ESR	1316.3003K03 -101746-zn	2019-07-11	2020-07-10
Sunol Sciences	Broadband Antenna	JB3	A090413-1	2016-12-26	2019-12-25
Champrotek	Chamber	Chamber A	T-KSEMC049	-	-
Champrotek	Chamber	Chamber B	T-KSEMC080	-	-
Audix	Test Software	e3	V9	--	--
R&S	Auto test Software	EMC32	100361	-	-
ETS	Horn Antenna	3115	6229	2016-12-12	2019-12-11
Rohde & Schwarz	EMI Receiver	ESU40	100207	2019-08-27	2020-08-26
A.H.Systems, inc	Amplifier	2641-1	491	2019-02-20	2020-02-19
MICRO-COAX	Coaxial Cable	Cable-8	008	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-9	009	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-10	010	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-4	004	2018-12-12	2019-12-11
MICRO-COAX	Coaxial Cable	Cable-5	005	2018-12-12	2019-12-11

*** 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).

Factor & Over Limit Calculation (For Below 1GHz)

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

Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)

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

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

Corrected Amplitude & Margin Calculation (For Above 1GHz)

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

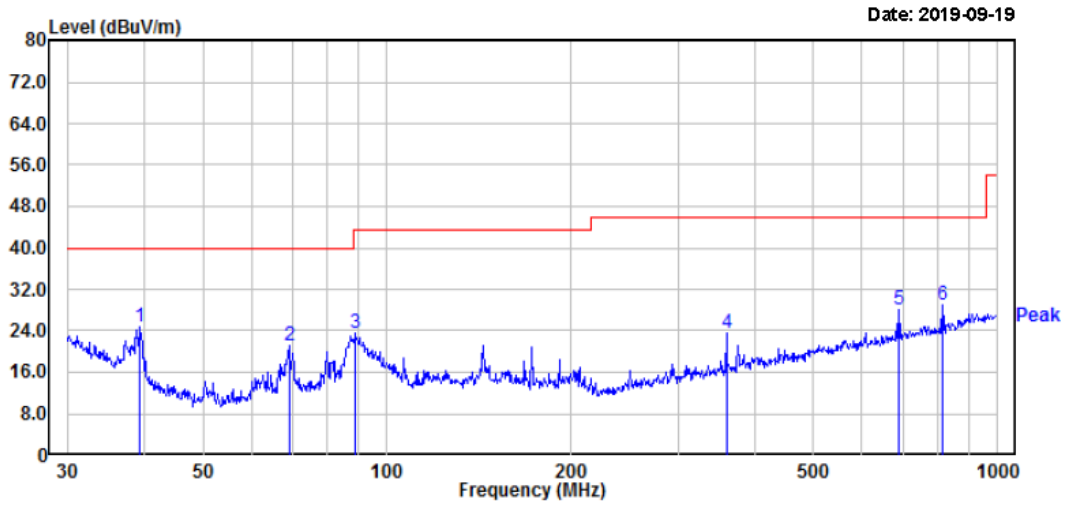
Temperature:	22 ℃
Relative Humidity:	50%
ATM Pressure:	101.1 kPa~102.1 kPa

The testing was performed by CK Huang on 2019-09-19.

Test mode 1

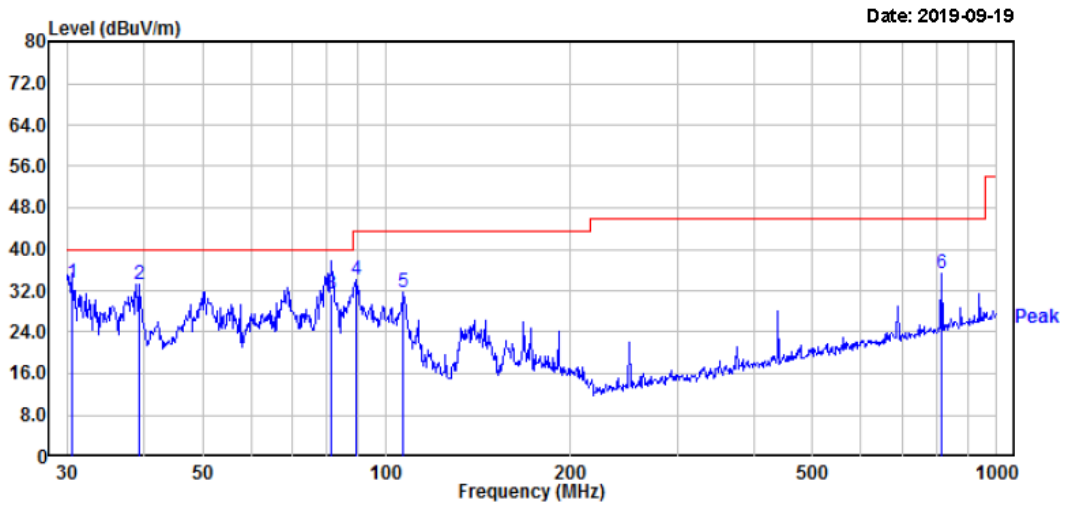
Below 1 GHz:

Horizontal:



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	APos	TPos	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	deg	
1	39.44	35.65	-10.97	24.68	40.00	-15.32	100	6	Peak
2	69.11	38.14	-16.94	21.20	40.00	-18.80	200	323	Peak
3	88.96	40.79	-17.24	23.55	43.50	-19.95	200	4	Peak
4	360.45	32.46	-8.81	23.65	46.00	-22.35	100	109	Peak
5	689.57	30.27	-2.28	27.99	46.00	-18.01	100	6	Peak
6	813.11	29.44	-0.57	28.87	46.00	-17.13	200	305	Peak

Vertical:

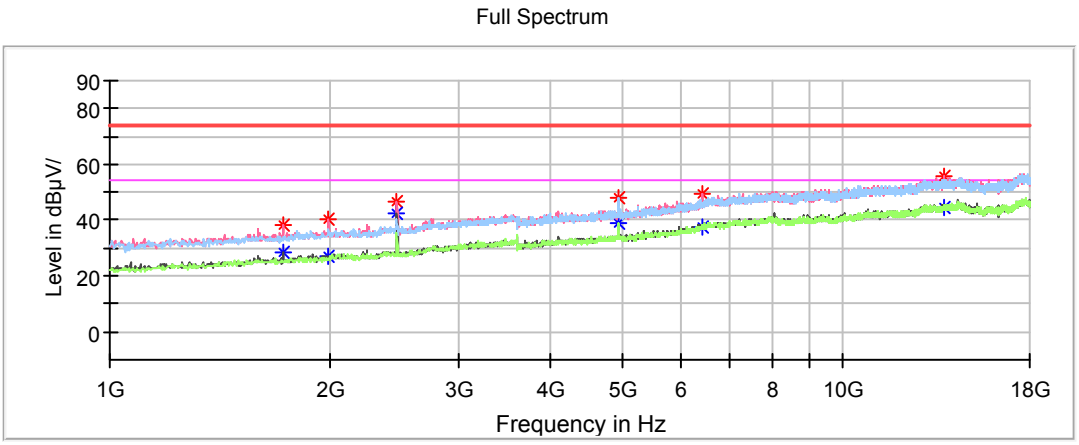


	Freq	Read Level	Factor	Level	Limit Line	Over Limit	APos	TPos	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	deg	
1	30.53	37.20	-3.57	33.63	40.00	-6.37	100	5	QP
2	39.44	44.13	-10.97	33.16	40.00	-6.84	100	337	Peak
3	81.21	48.50	-17.18	31.32	40.00	-8.68	100	5	QP
4	89.28	51.22	-17.25	33.97	43.50	-9.53	100	5	Peak
5	106.76	45.03	-13.27	31.76	43.50	-11.74	100	5	Peak
6	813.11	35.99	-0.57	35.42	46.00	-10.58	100	11	Peak

Note:

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

Above 1 GHz:

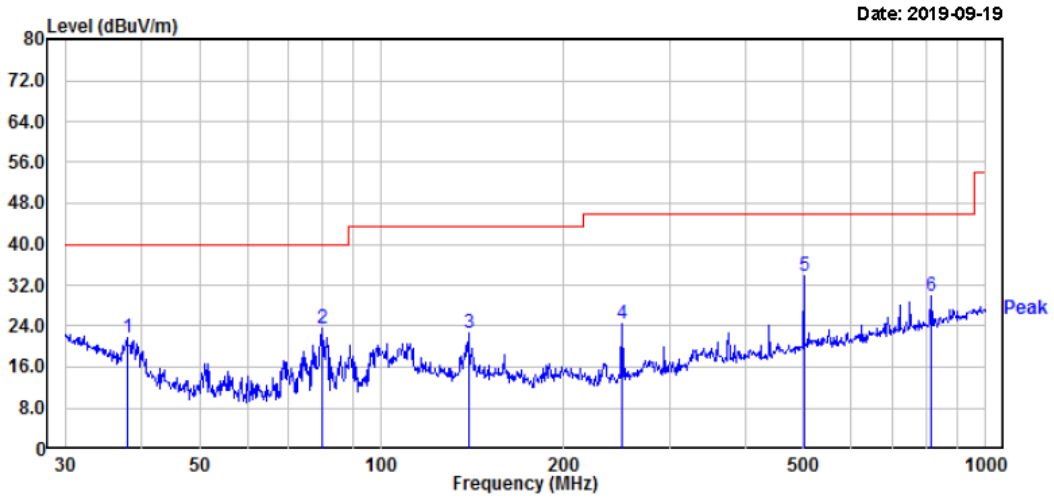


Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1724.200000	---	28.56	54.00	25.44	100.0	V	353.0	-9.2
1724.200000	37.95	---	74.00	36.05	100.0	V	353.0	-9.2
1989.400000	---	27.05	54.00	26.95	200.0	V	0.0	-8.3
1989.400000	40.65	---	74.00	33.35	200.0	V	0.0	-8.3
2465.400000	---	42.14	54.00	11.86	100.0	V	106.0	-7.0
2465.400000	46.66	---	74.00	27.34	100.0	V	106.0	-7.0
4933.800000	---	39.24	54.00	14.76	100.0	H	352.0	-0.4
4933.800000	48.06	---	74.00	25.94	100.0	H	352.0	-0.4
6419.600000	---	37.68	54.00	16.32	200.0	V	126.0	4.1
6419.600000	49.37	---	74.00	24.63	200.0	V	126.0	4.1
13784.000000	---	44.61	54.00	9.39	200.0	V	78.0	12.3
13784.000000	55.40	---	74.00	18.60	200.0	V	78.0	12.3

Test Mode 2

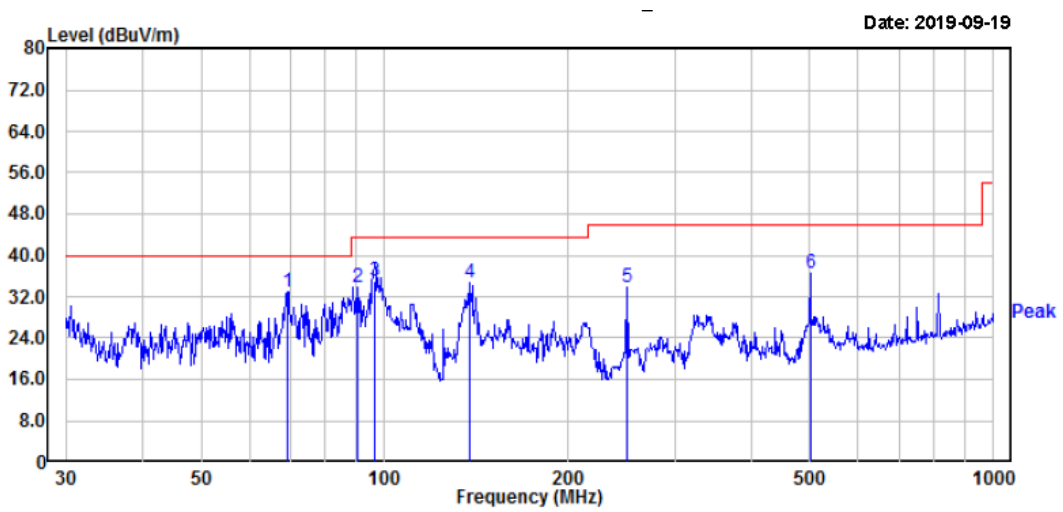
Below 1 GHz:

Horizontal:



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	APos	TPos	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	deg	
1	37.95	31.37	-9.73	21.64	40.00	-18.36	200	207	Peak
2	79.80	40.59	-17.16	23.43	40.00	-16.57	200	299	Peak
3	139.36	34.35	-11.72	22.63	43.50	-20.87	200	238	Peak
4	250.30	36.53	-12.12	24.41	46.00	-21.59	100	260	Peak
5	501.18	39.21	-5.48	33.73	46.00	-12.27	200	225	Peak
6	813.11	30.31	-0.57	29.74	46.00	-16.26	100	359	Peak

Vertical:

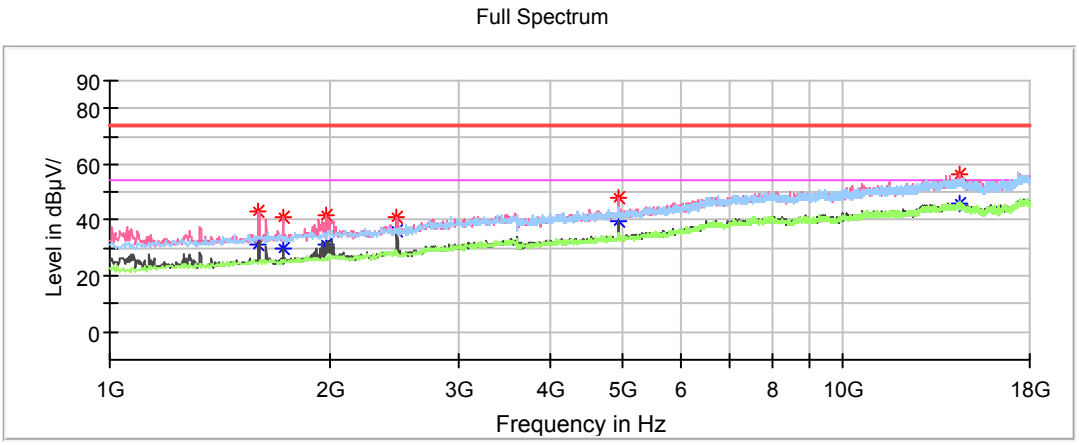


	Freq	Read Level	Factor	Level	Limit Line	Over Limit	APos	TPos	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	deg	
1	69.11	49.96	-16.94	33.02	40.00	-6.98	100	229	Peak
2	90.22	50.86	-17.19	33.67	43.50	-9.83	100	144	Peak
3	96.44	50.60	-15.56	35.04	43.50	-8.46	100	138	QP
4	138.39	46.30	-11.67	34.63	43.50	-8.87	100	328	Peak
5	250.30	45.80	-12.12	33.68	46.00	-12.32	100	334	Peak
6	501.18	41.98	-5.48	36.50	46.00	-9.50	100	82	Peak

Note:

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

Above 1 GHz:



Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1591.600000	---	31.10	54.00	22.90	200.0	V	0.0	-9.6
1591.600000	42.98	---	74.00	31.02	200.0	V	0.0	-9.6
1724.200000	---	29.68	54.00	24.32	100.0	V	161.0	-9.2
1724.200000	41.29	---	74.00	32.71	100.0	V	161.0	-9.2
1975.800000	---	31.39	54.00	22.61	100.0	V	341.0	-8.3
1975.800000	42.04	---	74.00	31.96	100.0	V	341.0	-8.3
2465.400000	---	36.24	54.00	17.76	100.0	V	201.0	-7.0
2465.400000	41.05	---	74.00	32.95	100.0	V	201.0	-7.0
4933.800000	---	39.36	54.00	14.64	200.0	V	124.0	-0.4
4933.800000	48.34	---	74.00	25.66	200.0	V	124.0	-0.4
14409.60000	---	46.12	54.00	7.88	200.0	V	265.0	12.7
14409.60000	56.65	---	74.00	17.35	200.0	V	265.0	12.7

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