SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

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TEST REPORT

Application No.:	SHEM1804003139CR
FCC ID	2ADTD-K1A802EF
Applicant:	Hangzhou Hikvision Digital Technology Co., Ltd.
Address of Applicant:	No. 555 Qianmo Road, Binjiang District, Hangzhou 310052, China
Manufacturer:	Hangzhou Hikvision Digital Technology Co., Ltd.
Address of Manufacturer:	No. 555 Qianmo Road, Binjiang District, Hangzhou 310052, China
Factory:	1.Hangzhou Hikvision Technology Co., Ltd. 2.Hangzhou Hikvision Electronics Co., Ltd. 3.Hangzhou Hikvision Digital Technology Co., Ltd
Address of Factory:	1. No.700, Dongliu Road, Binjiang District, Hangzhou Ctiy, Zhejiang, 310052, China 2. No.299, Qiushi Road, Tonglu Economic Development Zone, Tonglu County, Hangzhou,Zhejiang,310052,China 3. No. 555, Qianmo Road, Binjiang District,Hangzhou City, Zhejiang Province,China
Equipment Under Test (EUT):	
EUT Name:	Fingerprint Time Attendance Terminal
Model No.:	DS-K1A802EF,DS-K1A802F,DS-K1A802EF-1,DS-K1A802F-1,DS-K1A802EF-B,DS-K1A802F-B,DS-K1A802EF-E,DS-K1A802F-E,DS-K1A8503F,DS-K1A8503EF,DS-K1A8503F-B,DS-K1A8503EF-B,DS-K1A802EFHGO,DS-K1A802FHGO,DS-K1A802EFOQU,DS-K1A802FOQU,DS-K1A802EFGPR,DS-K1A802FGPR,DS-K1A802EFROG,DS-K1A802FROG,DS-K1A802EFURG,DS-K1A802FURG ¤
¤	Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
Trade mark:	HIKVISION
Standard(s) :	47 CFR Part 15, Subpart C 15.209
Date of Receipt:	2018-04-26
Date of Test:	2018-05-14
Date of Issue:	2018-05-21
Test Result:	**Pass***

* In the configuration tested, the EUT complied with the standards specified above.

Parlam Zhan
E&E Section Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

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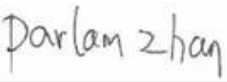
Revision Record			
Version	**Description**	**Date**	**Remark**
00	Original	2018-05-21	/

Authorized for issue by:				
				
		Vincent Zhu / Project Engineer		
				
		Parlam Zhan / Reviewer		

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2 Test Summary

Radio Spectrum Technical Requirement				
Item	**Standard**	**Method**	**Requirement**	**Result**
Antenna Requirement	47 CFR Part 15, Subpart C 15.209	N/A	47 CFR Part 15, Subpart C 15.203	Pass

Radio Spectrum Matter Part				
Item	**Standard**	**Method**	**Requirement**	**Result**
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.209	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass
20dB Bandwidth	47 CFR Part 15, Subpart C 15.215	ANSI C63.10 (2013) Section 6.9	47 CFR Part 15, Subpart C 15.237(b)	Pass
Radiated Emissions	47 CFR Part 15, Subpart C 15.209	ANSI C63.10 (2013) Section 6.4&6.5	47 CFR Part 15, Subpart C 15.237(c)	Pass

Note1: Declaration of EUT Family Grouping:

There are series models mentioned in this report and they are the similar in electrical and electronic characters. Only the model DS-K1A802EF was tested since their differences are silk and their naming.

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3 Contents

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4 General Information

4.1 Details of E.U.T.

Power supply: Battery:DC 3.7V by Built-in lithium-ion polymer battery (2000mAh)
DC 12V-1A by Adapter
Adapter:
Model: DSA-12PFT-12 FEU 120100
INPUT: 100~240V ~50/60Hz 0.5A
OUTPUT: +12V-1A

Test voltage: AC 120V 60Hz
Cable: DC Cable 150cm for Adapter
Operation Frequency 125KHz
Modulation Type ASK
Antenna Type Loop Antenna

4.2 Description of Support Units

The EUT has been tested as an independent unit.

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.25 x 10-8
2	Timeout	2s
3	Duty cycle	0.37%
4	Occupied Bandwidth	3%
5	RF conducted power	0.75dB
6	RF power density	2.84dB
7	Conducted Spurious emissions	0.75dB
8	RF Radiated power	4.5dB (Below 1GHz)
		4.8dB (Above 1GHz)
9	Radiated Spurious emission test	4.2dB (Below 30MHz)
		4.4dB (30MHz-1GHz)
		4.6dB (1GHz-18GHz)
		5.2dB (Above 18GHz)
10	Temperature test	1℃
11	Humidity test	3%
12	Supply voltages	1.5%
13	Time	3%

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4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. E&E Lab

588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China

Tel: +86 21 6191 5666 Fax: +86 21 6191 5678

No tests were sub-contracted.

4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• CNAS (No. CNAS L0599)

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

• NVLAP (Certificate No. 201034-0)

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the National Voluntary Laboratory Accreditation Program(NVLAP). Certificate No. 201034-0.

• FCC –Designation Number: CN5033

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory.

Designation Number: CN5033. Test Firm Registration Number: 479755.

• Industry Canada (IC) – IC Assigned Code: 8617A

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A-1.

• VCCI (Member No.: 3061)

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-3868,C-4336,T-12221,G-10830 respectively.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

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5 Equipment List

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Conducted Emission at AC Power Line					
EMI test receiver	R&S	ESR7	SHEM162-1	2017-12-20	2018-12-19
LISN	Schwarzbeck	NSLK8127	SHEM061-1	2017-12-20	2018-12-19
LISN	EMCO	3816/2	SHEM019-1	2017-12-20	2018-12-19
Pulse limiter	R&S	ESH3-Z2	SHEM029-1	2017-12-20	2018-12-19
CE test Cable	/	CE01	/	2017-12-26	2018-12-25
Conducted Test					
Spectrum Analyzer	R&S	FSP-30	SHEM002-1	2017-12-20	2018-12-19
Spectrum Analyzer	Agilent	N9020A	SHEM181-1	2017-09-26	2018-09-25
Power meter	R&S	NRP	SHEM057-1	2017-12-26	2018-12-25
Power Sensor	R&S	NRP-Z22	SHEM136-1	2017-07-22	2018-07-21
Power Sensor	R&S	NRP-Z91	SHEM057-2	2017-12-26	2018-12-25
Signal Generator	R&S	SMR40	SHEM058-1	2017-07-03	2018-07-02
Signal Generator	Agilent	N5182A	SHEM182-1	2017-09-26	2018-09-25
Communication Tester	R&S	CMW270	SHEM183-1	2017-10-22	2018-10-21
Switcher	Tonscend	JS0806	SHEM184-1	2017-09-26	2018-09-25
Splitter	Anritsu	MA1612A	SHEM185-1	/	/
Coupler	e-meca	803-S-1	SHEM186-1	/	/
High-low Temp Cabinet	Suzhou Zhihe	TL-40	SHEM087-1	2017-09-26	2018-09-25
AC Power Stabilizer	WOCEN	6100	SHEM045-1	2017-12-26	2018-12-25
DC Power Supply	QJE	QJ30003SII	SHEM046-1	2017-12-26	2018-12-25
Conducted test Cable	/	RF01, RF 02	/	2017-12-26	2018-12-25
Radiated Test					
EMI test receiver	R&S	ESU40	SHEM051-1	2017-12-20	2018-12-19
Spectrum Analyzer	R&S	FSP-30	SHEM002-1	2017-12-20	2018-12-19
Loop Antenna (9kHz-30MHz)	Schwarzbeck	FMZB1519	SHEM135-1	2017-04-10	2020-04-09
Antenna (25MHz-2GHz)	Schwarzbeck	VULB9168	SHEM048-1	2017-02-28	2020-02-27
Antenna (25MHz-3GHz)	Schwarzbeck	HL562	SHEM010-1	2017-02-28	2020-02-27
Horn Antenna (1-8GHz)	Schwarzbeck	HF906	SHEM009-1	2017-10-24	2020-10-23
Horn Antenna (1-18GHz)	Schwarzbeck	BBHA9120D	SHEM050-1	2017-01-14	2020-01-13
Horn Antenna (14-40GHz)	Schwarzbeck	BBHA 9170	SHEM049-1	2017-12-03	2020-12-02
Pre-amplifier (9KHz-2GHz)	CLAVIIO	BDLNA-0001-412010	SHEM164-1	2017-08-22	2018-08-21
Pre-amplifier (1-18GHz)	CLAVIIO	BDLNA-0118-352810	SHEM050-2	2017-08-22	2018-08-21
High-amplifier (14-40GHz)	Schwarzbeck	10001	SHEM049-2	2017-12-20	2018-12-19
Band filter	LORCH	9BRX-875/X150-SR	SHEM156-1	/	/
Band filter	LORCH	13BRX-1950/X500-SR	SHEM083-2	/	/
Band filter	LORCH	5BRX-2400/X200-SR	SHEM155-1	/	/
Band filter	LORCH	5BRX-5500/X1000-SR	SHEM157-2	/	/
High pass Filter	Wainwright	WHK3.0/18G-100SS	SHEM157-1	/	/
High pass Filter	Wainwright	WHKS1700-3SS	SHEM157-3	/	/
Semi/Fully Anechoic	ST	11*6*6M	SHEM078-2	2017-07-22	2020-07-21
RE test Cable	/	RE01, RE02, RE06	/	2017-12-26	2018-12-25

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6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

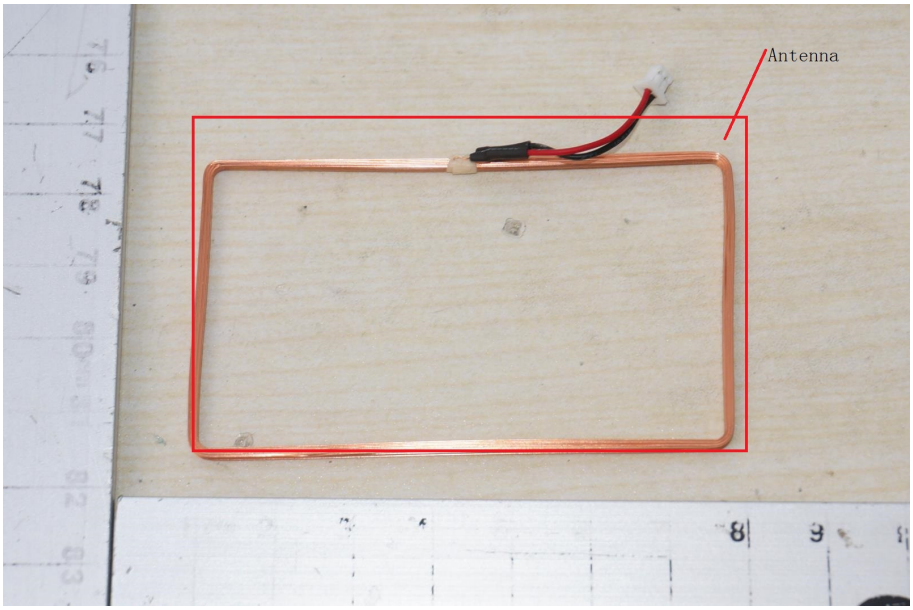
6.1.2 Conclusion

Standard Requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of an so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:

The antenna is loop antenna and no consideration of replacement.



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7 Radio Spectrum Matter Test Results

7.1 Conducted Emissions at AC Power Line (150kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.207

Test Method: ANSI C63.10 (2013) Section 6.2

Limit:

Frequency of emission(MHz)	Conducted limit(dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50
*Decreases with the logarithm of the frequency.		

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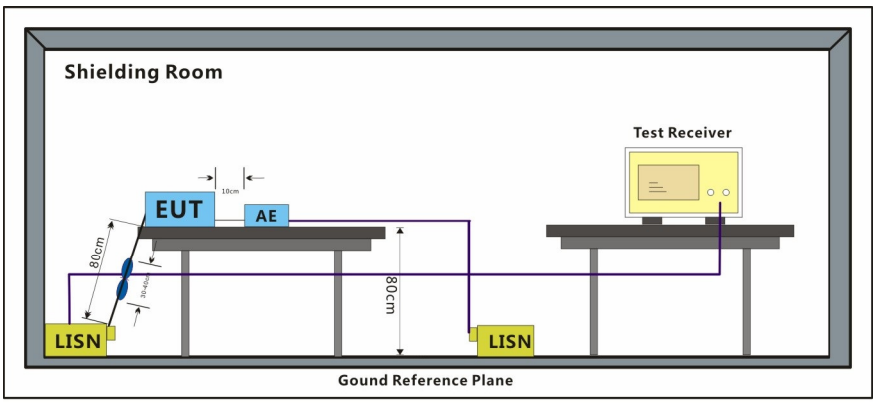
7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

Test mode b:Charge + TX mode_Keep the EUT in charging and transmitting with modulation mode.

7.1.2 Test Setup Diagram



7.1.3 Measurement Procedure and Data

1) The mains terminal disturbance voltage test was conducted in a shielded room.

2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50μH + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.

3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,

4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.

5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

Remark: LISN=Read Level+ Cable Loss+ LISN Factor

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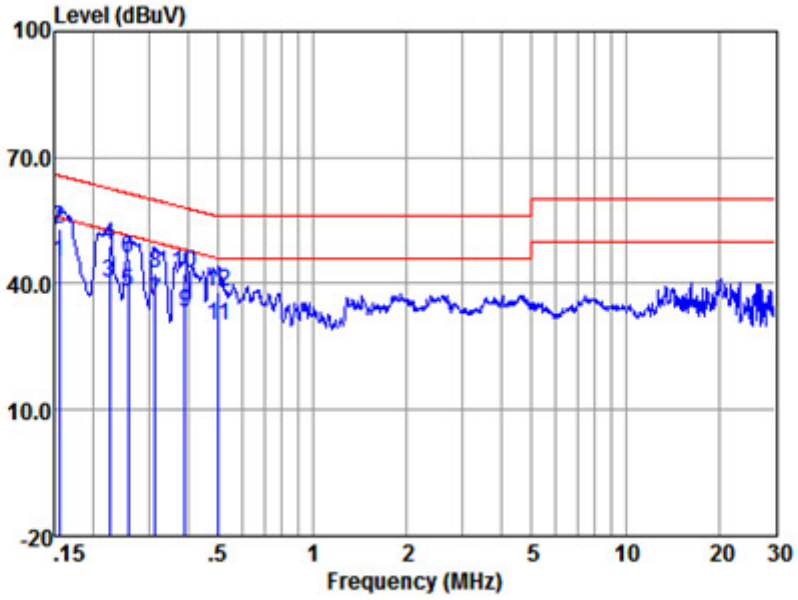
Mode:b; Line:Live Line



LISN : LINE
EUT/Project No : 3143CR
Test Mode : b

	Freq (MHz)	Read level (dBuV)	LISN Factor (dB)	Cable Loss (dB)	Emission Level (dBuV)	Limit (dBuV)	Over Limit (dB)	Remark
1	0.15	34.97	0.11	9.81	44.89	55.74	-10.85	Average
2	0.15	42.97	0.11	9.81	52.89	65.74	-12.85	QP
3	0.22	30.34	0.11	9.81	40.26	52.66	-12.40	Average
4	0.22	39.34	0.11	9.81	49.26	62.66	-13.40	QP
5	0.26	27.90	0.11	9.81	37.82	51.51	-13.69	Average
6	0.26	35.90	0.11	9.81	45.82	61.51	-15.69	QP
7	0.31	25.69	0.11	9.81	35.61	49.84	-14.23	Average
8	0.31	32.69	0.11	9.81	42.61	59.84	-17.23	QP
9	0.39	23.32	0.11	9.81	33.24	48.03	-14.79	Average
10	0.39	32.32	0.11	9.81	42.24	58.03	-15.79	QP
11	0.50	20.19	0.11	9.82	30.12	46.00	-15.88	Average
12	0.50	28.19	0.11	9.82	38.12	56.00	-17.88	QP

Notes: Emission Level = Read Level +LISN Factor + Cable loss

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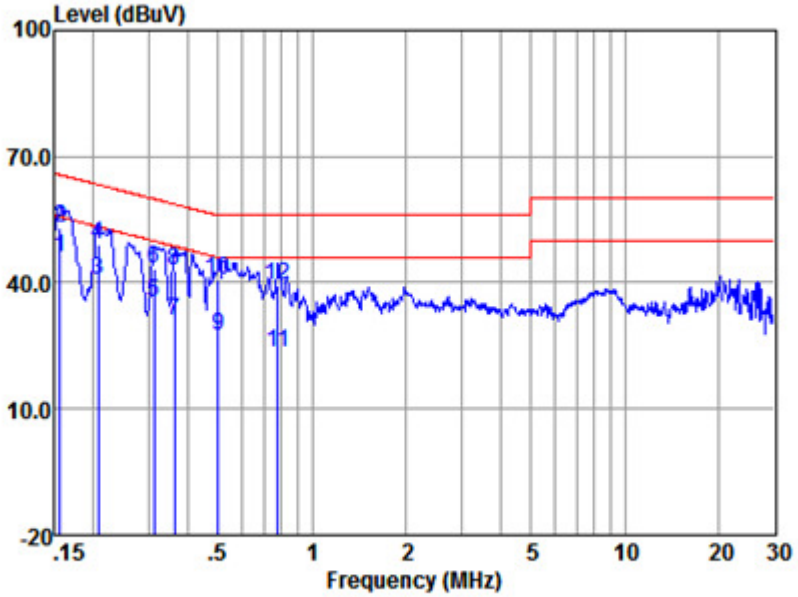
Mode:b; Line:Neutral Line



LISN : NEUTRAL
EUT/Project No : 3143CR
Test Mode : b

	Freq (MHz)	Read level (dBuV)	LISN Factor (dB)	Cable Loss (dB)	Emission Level (dBuV)	Limit (dBuV)	Over Limit (dB)	Remark
1	0.16	36.07	0.12	9.81	46.00	55.65	-9.65	Average
2	0.16	43.07	0.12	9.81	53.00	65.65	-12.65	QP
3	0.21	30.93	0.12	9.81	40.86	53.36	-12.50	Average
4	0.21	38.93	0.12	9.81	48.86	63.36	-14.50	QP
5	0.31	25.50	0.11	9.81	35.42	49.93	-14.51	Average
6	0.31	33.50	0.11	9.81	43.42	59.93	-16.51	QP
7	0.36	21.00	0.11	9.81	30.92	48.69	-17.77	Average
8	0.36	33.00	0.11	9.81	42.92	58.69	-15.77	QP
9	0.50	17.60	0.11	9.82	27.53	46.00	-18.47	Average
10	0.50	30.60	0.11	9.82	40.53	56.00	-15.47	QP
11	0.78	13.53	0.11	9.83	23.47	46.00	-22.53	Average
12	0.78	29.53	0.11	9.83	39.47	56.00	-16.53	QP

Notes: Emission Level = Read Level +LISN Factor + Cable loss

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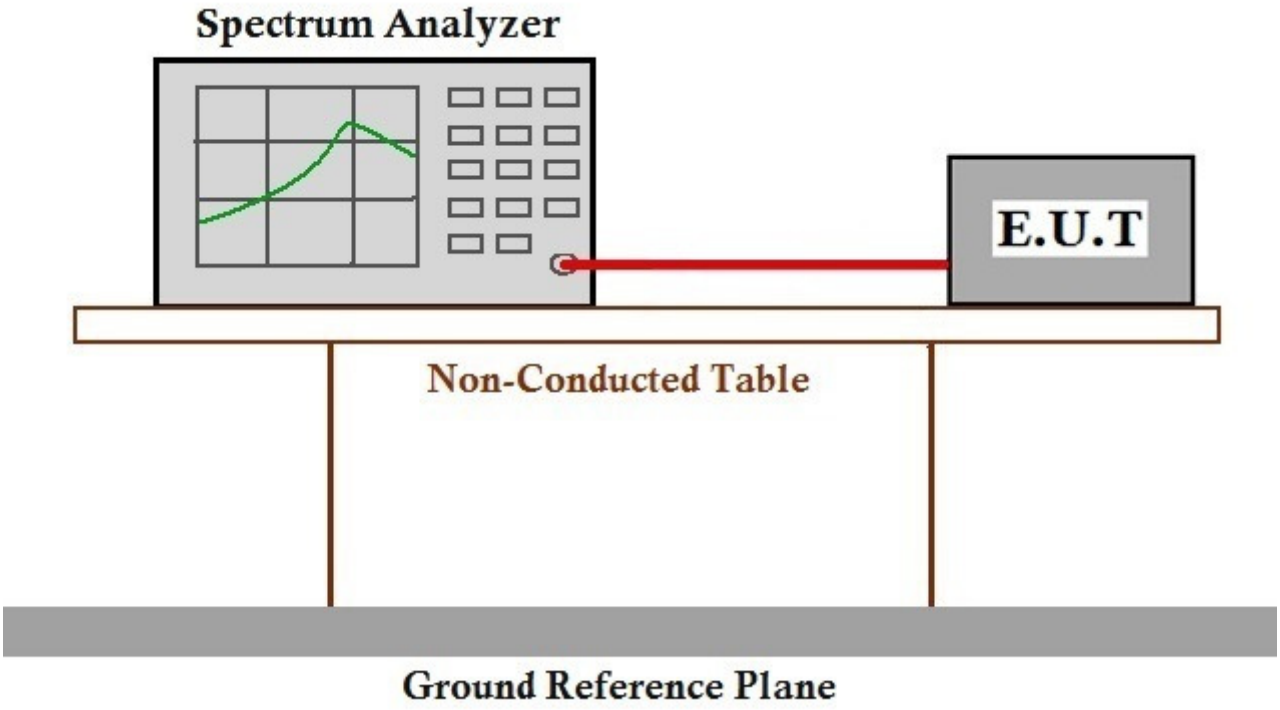
7.2 20dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.215
Test Method: ANSI C63.10 (2013) Section 6.9

7.2.1 E.U.T. Operation

Operating Environment:
Temperature: 21 °C Humidity: 45 % RH Atmospheric Pressure: 1010 mbar

7.2.2 Test Setup Diagram



7.2.3 Measurement Procedure and Data

20dB bandwidth (Hz)	Result
389.205	Pass

Test plot as follows:

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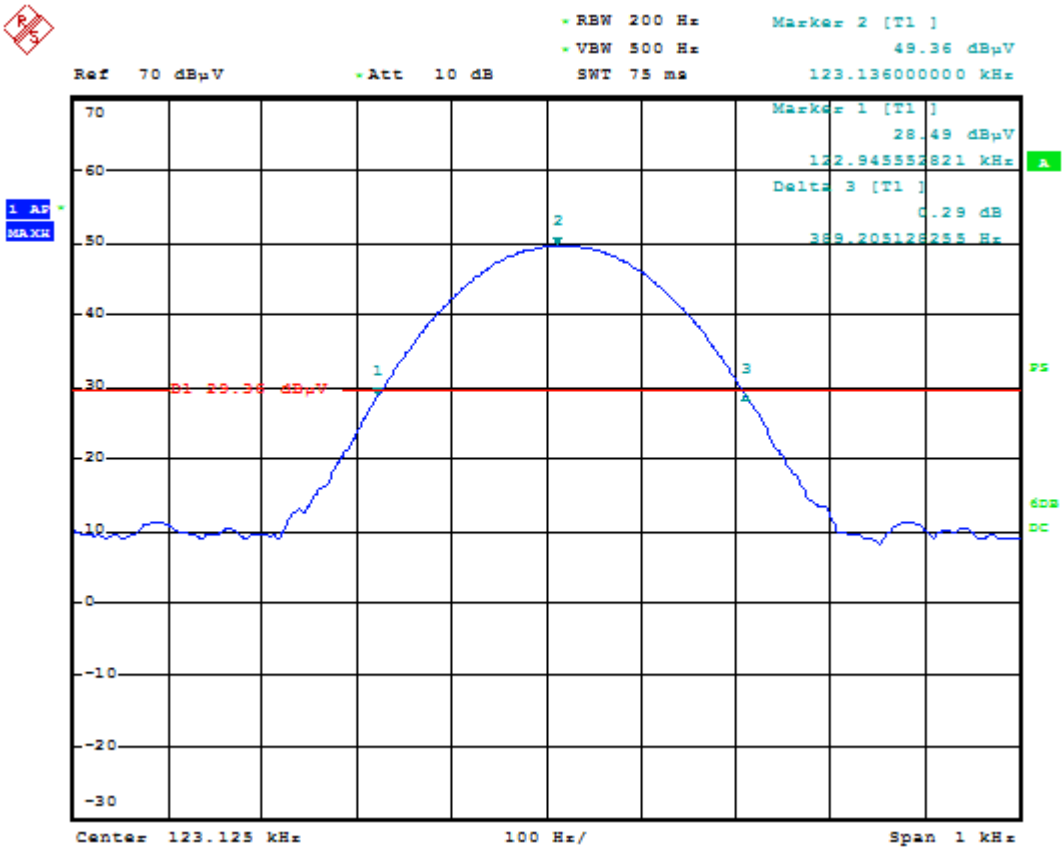

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7.3 Radiated Emissions

Test frequency range: 9KHz – 1GHz

Test Site: Measurement Distance: 3m

Receiver Setup:

Frequency (MHz)	RBW	VBW	Detector
0.009-0.015	200Hz	1KHz	Quasi-peak
0.015-30	9kHz	30KHz	Quasi-peak
30-1000	120 kHz	300KHz	Quasi-peak

Note: The emission limits shown in the above table are based on measurement instrumentation employing a CISPR quasi-peak detector. For the frequency bands 9~90 kHz, 110~490 kHz and above 1000 MHz, the radiated emission limits are based on measurements employing an average detector.

Limit:

Frequency (MHz)	Field strength (μV/m)	Measurement distance (m)	Limit (dBμV/m)	Limit @3m (dBμV/m)
0.009-0.490	2400/F(kHz)	300	48.5 ~ 13.8	128.5 ~ 93.8
0.490-1.705	24000/F(kHz)	30	33.8 ~ 23.0	73.8 ~63.0
1.705-30	30	30	29.5	69.5
30-88	100	3	40.0	40.0
88-216	150	3	43.5	43.5
216-960	200	3	46.0	46.0
960-1000	500	3	54.0	54.0

NOTE:

(1) For test distance other than what is specified, but fulfilling the requirements of section 15.31(f) (2) the field strength is calculated by adding additionally an extrapolation factor of 40dB/decade (inverse linear distance for field strength measurements).

So the Distance Extrapolation Factor in dB is 40*log (D_{TEST} / D_{SPEC}) where D_{TEST} = Test Distance and D_{SPEC} = Specified Distance.

Field strength limit (dBμV/m)@test distance= Field strength limit (dBμV/m)@specified distance -Distance Extrapolation Factor

(2) The lower limit shall apply at the transition frequencies.

Limit:
(Fundamental signal)

Frequency	Limit (dBuV/m @3m)	Remark
13.56MHz	124	Quasi-peak Value

Test Procedure:

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case

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and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

g. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report.

Test Setup:

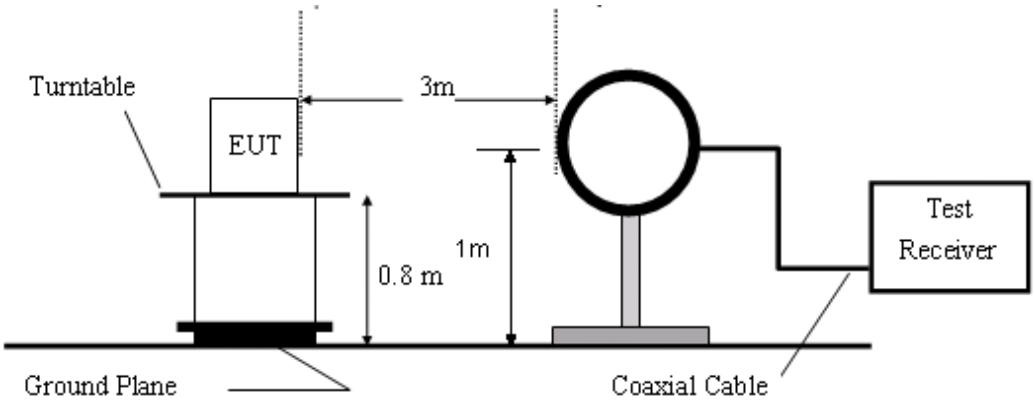

Figure 1. Below 30MHz

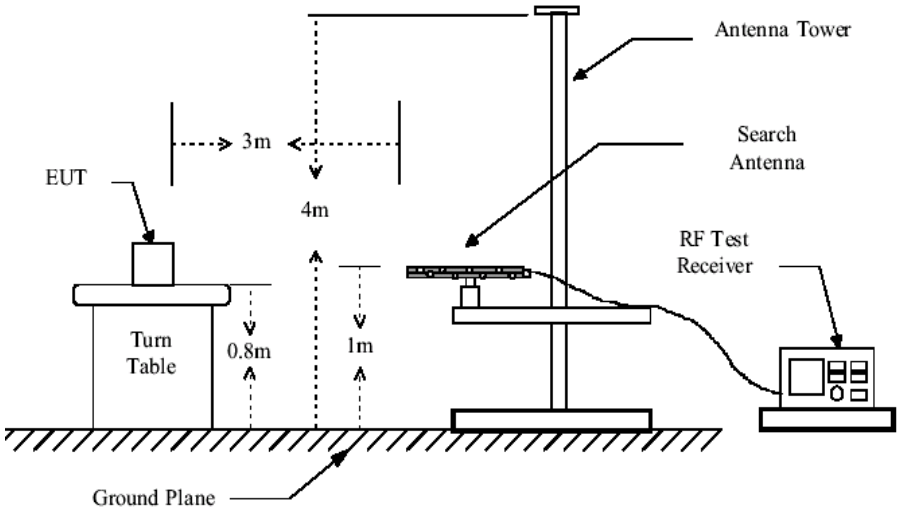

Figure 2. 30MHz to 1GHz

Test Results: Pass

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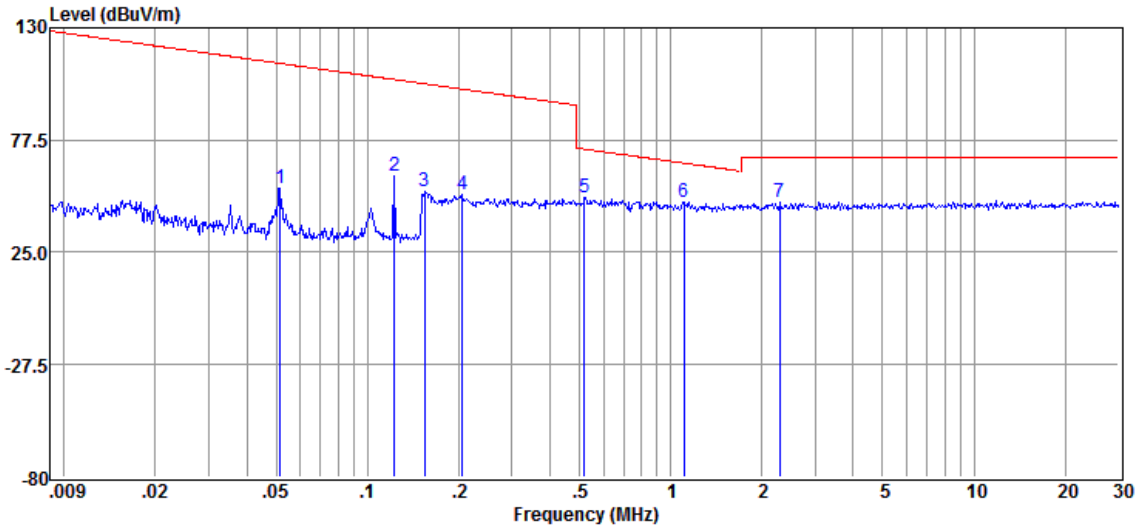
Below 30MHz:



Item	Freq.	Read Level	Antenna Factor	Cable Loss	Result Level@3m	Distance Factor	Result Leve	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBµV)	(dB/m)	(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	0.05	34.85	19.99	0.04	54.88	80	-25.12	33.36	-58.59	QP
2	0.12	41.09	19.90	0.05	61.04	80	-18.96	25.83	-51.41	Peak
3	0.15	33.20	19.99	0.05	53.24	80	-26.76	23.85	-29.93	QP
4	0.21	32.35	19.88	0.06	52.29	80	-27.71	21.32	-23.74	QP
5	0.52	30.63	19.77	0.07	50.47	40	10.47	33.29	-27.56	QP
6	1.11	29.36	19.31	0.07	48.74	40	8.74	26.76	-16.71	QP

Result Level = Read Level + Antenna Factor + Cable loss - Preamp Factor

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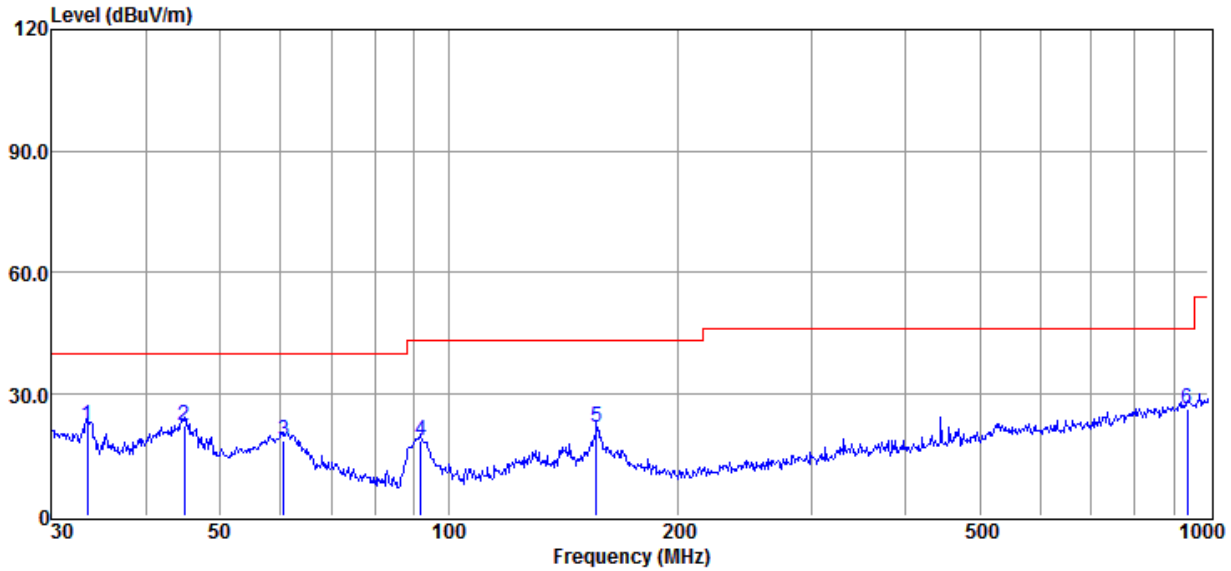
30MHz~1GHz:
Vertical



Item	Freq.	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
1	33.45	48.87	15.68	42.61	0.20	22.14	40.00	-17.86	QP
2	44.90	51.47	13.36	42.63	0.24	22.44	40.00	-17.56	QP
3	60.70	48.38	12.52	42.65	0.30	18.55	40.00	-21.45	QP
4	91.82	52.29	8.38	42.69	0.42	18.40	43.50	-25.10	QP
5	156.46	50.95	12.70	42.60	0.63	21.68	43.50	-21.82	QP
6	938.83	42.44	23.14	41.60	2.56	26.54	46.00	-19.46	QP

Result Level = Read Level + Antenna Factor + Cable loss - Preamp Factor

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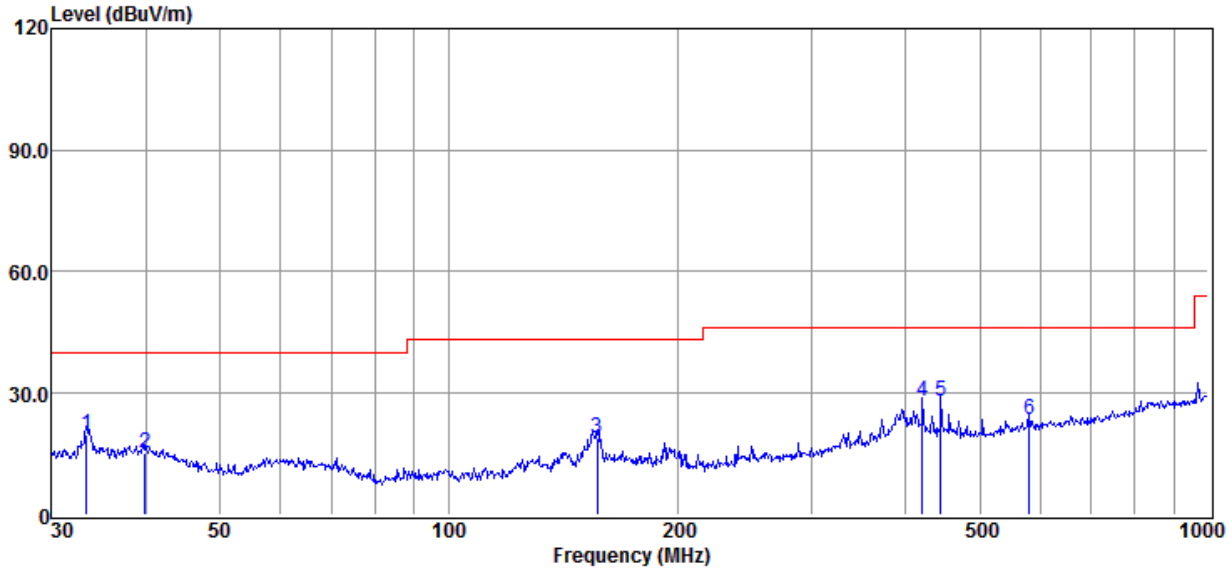
Horizontal



Item	Freq.	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	
1	33.33	46.48	15.67	42.61	0.20	19.74	40.00	-20.26	QP
2	39.85	41.50	16.29	42.62	0.22	15.39	40.00	-24.61	QP
3	157.01	48.30	12.77	42.60	0.63	19.10	43.50	-24.40	QP
4	420.58	53.49	15.57	42.11	1.03	27.98	46.00	-18.02	QP
5	444.85	53.17	16.10	42.12	1.08	28.23	46.00	-17.77	QP
6	580.70	45.18	19.02	42.18	1.33	23.35	46.00	-22.65	QP

Result Level = Read Level + Antenna Factor + Cable loss - Preamp Factor

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8 Test Setup Photographs

Refer to the < Test Setup Photos-FCC >

9 EUT Constructional Details

Refer to the < External Photos> & < Internal Photos>.

- End of the Report -

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