SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch

No. 1 Workshop, M-10, Middle section, Science & Technology Park,
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1 Cover Page

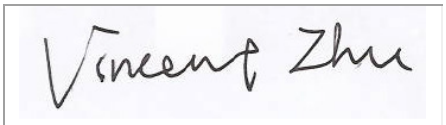
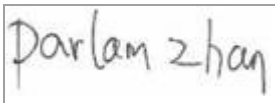
RF Test Report

Application No.:	SZEM1708008574CR
Applicant:	Hangzhou Hikvision Digital Technology Co., Ltd
FCC ID:	2ADTD-K1T803EF
Equipment Under Test (EUT): **NOTE:** The following sample(s) was/were submitted and identified by the client as	
Product Name:	Fingerprint Access Control Terminal
Model No.(EUT):	DS-K1T803EF
Add Model No.:	DS-K1T803F, DS-K1T803EF-1, DS-K1T803F-1, DS-K1T804F, DS-K1T804EF, DS-K1T804EF-1, DS-K1T804F-1, DS-K1T804EF-E, DS-K1T804F-E, DS-K1T803XYZ-UVW, DS-K1T804XYZ-UVW
Standards:	FCC PART 15 Subpart C: 2016
Date of Receipt:	2017-02-13
Date of Test:	2017-06-27 to 2017-08-08
Date of Issue:	2017-08-18
Test Result:	**Pass***

*In the configuration tested, the EUT detailed in this report complied with the standards specified above.

Jack Zhang
EMC Laboratory Manager

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
00	/	2017-08-18	/	Original

Authorized for issue by:				
Engineer		 **Vincent Zhu /Project Engineer**		2017-08-10 **Date**
Reviewer		 **Parlam Zhan /Reviewer**		2017-08-10 **Date**

2 Test Summary

Test Item	Test Requirement	Test Method	Result
Antenna Requirement	47 CFR Part 15, Subpart C Section 15.203	/	PASS
AC Power Line Conducted Emission	47 CFR Part 15, Subpart C Section 15.207	ANSI C63.10 (2013) Section 6.2	PASS
Radiated Emissions	47 CFR Part 15, Subpart C Section 15.209	ANSI C63.10 (2013) Section 6.4	PASS
20dB Bandwidth	47 CFR Part 15, Subpart C Section 15.215	ANSI C63.10 (2013) Section 6.8	PASS

3 Contents

4 General Information

4.1 Client Information

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.
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.

4.2 General Description of E.U.T.

Product Description: Fixed product with 125KHz RFID

4.3 Technical Specifications

Test Voltage:	AC 120V 60Hz for adapter
Operation Frequency:	125KHz
Modulation Type:	ASK
Antenna Type:	Integral Loop Antenna

4.4 Support Units / Associated Equipments

Description	Manufacturer	Model No.	Supplied by
Adapter	DVE	DSA-12G-12FEU	Client

Adapter:	Rated Input:	AC 100~240V, 50/60Hz	
	Rated Output:	DC 12V 1.0A	
	Cable length:	AC port:	2 wires
		DC port:	150 cm

4.5 E.U.T Operation Mode

Test Mode	Description of Test Mode
Engineering Mode	Keep EUT working in continuous transmitting mode.

4.6 Test Location

All tests were performed at:
SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch
No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China. 518057

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.7 Test Facility

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

• CNAS (No. CNAS L2929)

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab 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.

• A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

• VCCI

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-823, R-4188, T-1153 and C-2383 respectively.

• FCC –Designation Number: CN1178

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.
Designation Number: CN1178. Test Firm Registration Number: 406779.

• Industry Canada (IC)

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.

4.8 Measurement Uncertainty

No.	Parameter	Measurement Uncertainty
1	Radio Frequency	< ±1 x 10^{-5}
2	Total RF power, conducted	< ±1.5 dB
3	RF power density, conducted	< ±3 dB
4	Spurious emissions, conducted	< ±3 dB
5	All emissions, radiated	< ±6 dB (Below 1GHz) < ±6 dB (Above 1GHz)
6	Temperature	< ±1°C
7	Humidity	< ±5 %
8	DC and low frequency voltages	< ±3 %

5 Equipments List

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	Spectrum Analyzer	R&S	FSP-30	2705121009	2017-01-14	2018-01-13
2	Spectrum Analyzer	Agilent	N9020A	MY51240197	2017-07-03	2018-07-02
3	Power meter	R&S	NRP	101641	2017-01-14	2018-01-13
4	Power Sensor	R&S	NRP-Z22	101096	2017-08-06	2018-08-05
5	Signal Generator	R&S	SMR40	100555	2017-07-03	2018-07-02
6	Signal Generator	Agilent	N5182A	MY50143776	2017-07-03	2018-07-02
7	Communication Tester	R&S	CMW500	1201.0002K75	2016-12-24	2017-12-23
8	Switcher	Tonscend	JS0806	JS0806-2	/	/
9	Splitter	Anritsu	MA1612A	M12265	/	/
10	Coupler	e-meca	803-S-1	900-M01	/	/
11	High-low Temperature Cabinet	Suzhou Zhihe	TL-40	50110050	2016-09-11	2017-09-10
12	AC Power Stabilizer	WOCEN	6100	51122	2017-01-14	2018-01-13
13	DC Power Supply	QJE	QJ30003SII	3573/4/3	2017-01-14	2018-01-13
14	EMI Test Receiver	R&S	ESU40	100109	2017-02-13	2018-01-15
15	Active Loop Antenna (9kHz to 30MHz)	R&S	FMZB1519	1519-034	2017-02-13	2018-01-15
16	Broadband Antenna (25MHz to 2GHz)	Schwarzbeck	VULB9168	9168-313	2017-02-13	2018-01-15
17	Broadband Antenna (25MHz to 3GHz)	R&S	HL562	100227	2016-08-30	2017-08-29
18	Horn Antenna (1 -18GHz)	R&S	HF906	100284	2017-02-13	2018-01-15
19	Horn Antenna (1 - 18GHz)	Schwarzbeck	BBHA9120D	9120D-679	2017-02-13	2018-01-15
20	Horn Antenna (14 - 40GHz)	Schwarzbeck	BBHA 9170	BBHA917-0373	2017-02-13	2018-01-15
21	Pre-amplifier (9KHz – 2GHz)	LNA6900	TESEQ	71033	2017-02-13	2018-01-15
22	Pre-amplifier (1 – 26.5GHz)	Schwarzbeck	SCU-F0118-G40-BZ4-CSS(F)	10001	2017-01-14	2018-01-13
23	Pre-amplifier (14 – 40GHz)	Schwarzbeck	SCU-F1840-G35-BZ3-CSS(F)	10001	2017-01-14	2018-01-13
24	Tunable Notch Filter	Wainwright	WRCT800.0/880.0-0.2/40-5SSK	170397 169777 169780 192507	/	/
25	High pass Filter	FSCW	HP 12/2800-5AA2	19A45-02	/	/
26	EMI test receiver	Rohde & Schwarz	ESR7	101391	2016-12-29	2017-12-28
27	Line impedance stabilization network	SCHWARZBECK	NSLK8127	8127490	2017-01-14	2018-01-13
28	Line impedance stabilization network	EMCO	3816/2	00034161	2017-01-14	2018-01-13

6 Test results and Measurement Data

6.1 Antenna Requirement

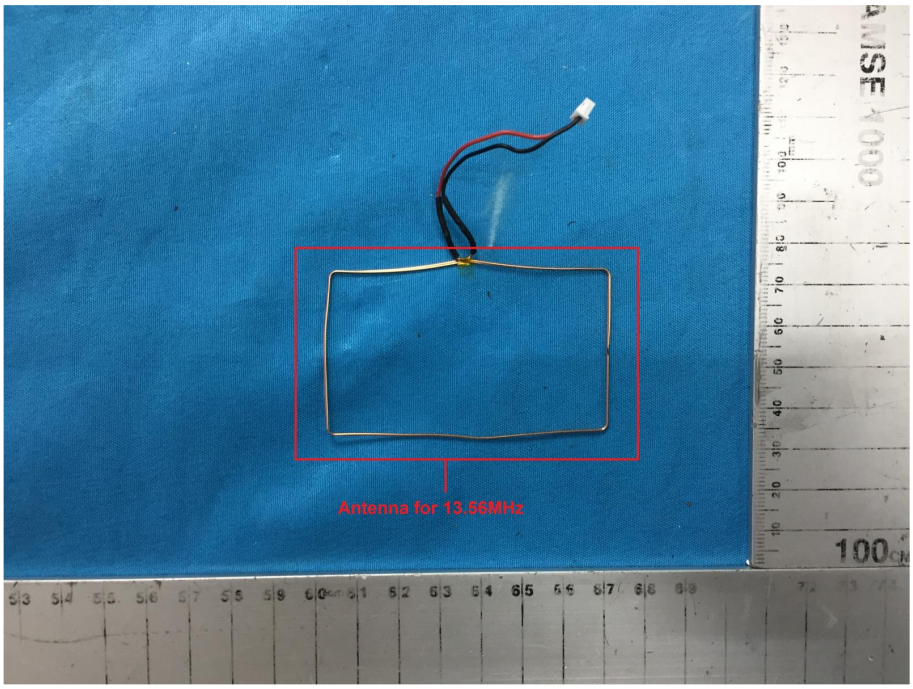
Standard requirement: 47 CFR Part 15C Section 15.203

15.203 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 permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit 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 integrated loop antenna and no consideration of replacement.

Antenna Configuration:



6.2 Conducted Emissions

Frequency Range: 150 KHz to 30 MHz

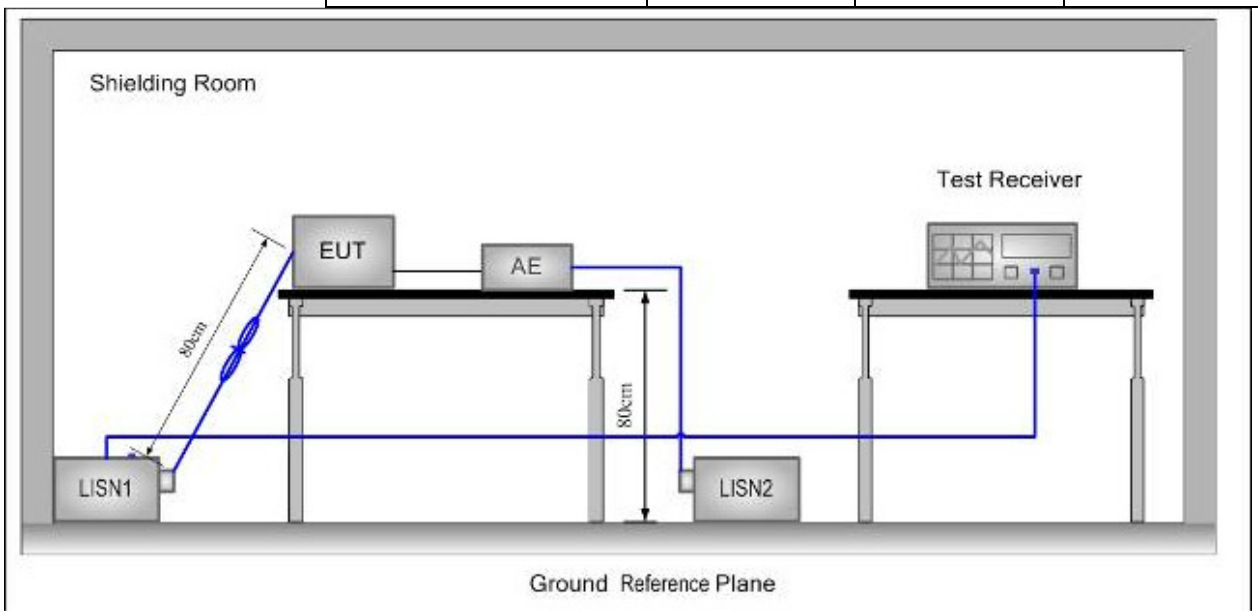
Class/Severity: Class B

Limit:

Frequency range MHz	Class B Limits: dB (μV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
Note1: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50MHz. Note2: The lower limit is applicable at the transition frequency.		

Test site/setup: Test instrumentation set-up:

Frequency Range	Detector	RBW	VBW
9KHz to 150Hz	Quasi-peak	200Hz	500Hz
150KHz to 30MHz	Quasi-peak	9kHz	30kHz



Test Procedure:

1. The mains terminal disturbance voltage was measured with the EUT in a shielded room.
2. The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN, which was bonded to the ground reference plane in the same way as the LISN 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, but separated from metallic contact with the ground reference plane by 0.1m of insulation.

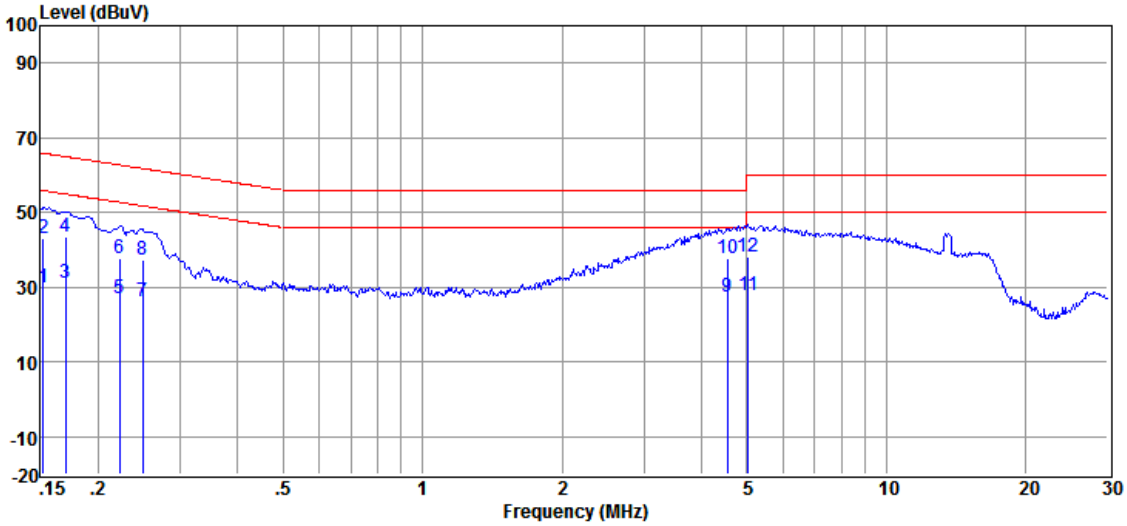
4. The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance was between the closest points of the LISN and the EUT. The mains lead of EUT excess 0.8m was folded back and forth parallel to the lead so as to form a horizontal bundle with a length between 0.3m and 0.4m. All other units of the EUT and associated equipment were at least 0.8 m from the LISN.

Remark: Pre-scan was performed with peak detected on all ports, Quasi-peak & average measurements were performed at the frequencies at which maximum peak emission level were detected. Please see the attached Quasi-peak and Average test results.

Test Result: Pass

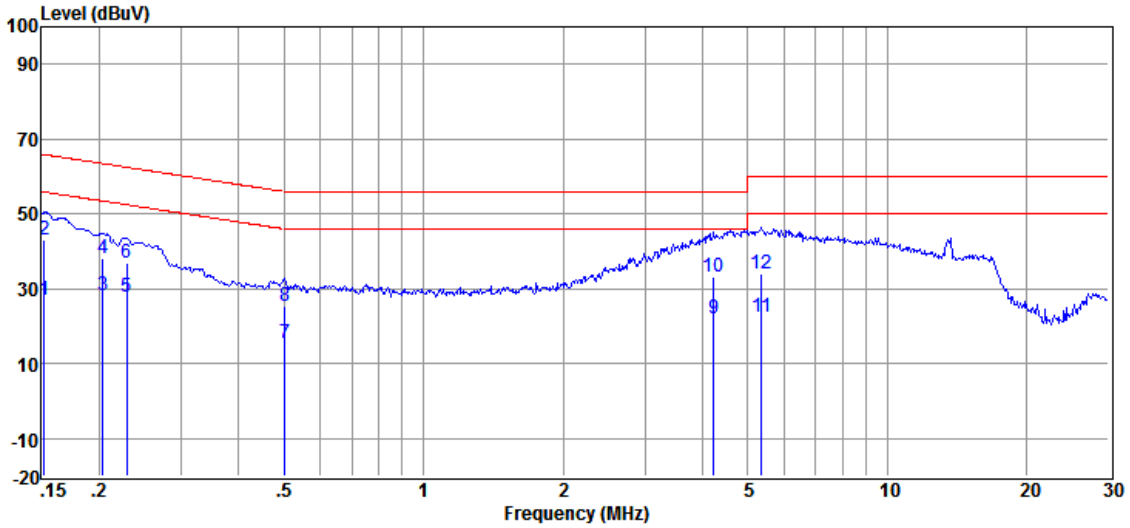
Test data:

Live Line:



Item	Freq.	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBµV)	(dB)	(dB)	(dBµV)	(dBµV)	(dB)	
1	0.152	19.77	0.11	9.81	29.69	55.87	-26.18	Average
2	0.152	33.37	0.11	9.81	43.29	65.87	-22.58	QP
3	0.170	21.08	0.11	9.81	31.00	54.94	-23.94	Average
4	0.170	33.61	0.11	9.81	43.53	64.94	-21.41	QP
5	0.222	17.20	0.11	9.81	27.12	52.74	-25.62	Average
6	0.222	27.74	0.11	9.81	37.66	62.74	-25.08	QP
7	0.249	16.41	0.11	9.81	26.33	51.78	-25.45	Average
8	0.249	27.25	0.11	9.81	37.17	61.78	-24.61	QP
9	4.549	17.28	0.11	9.86	27.25	46.00	-18.75	Average
10	4.549	27.96	0.11	9.86	37.93	56.00	-18.07	QP
11	5.031	17.81	0.11	9.86	27.78	50.00	-22.22	Average
12	5.031	28.37	0.11	9.86	38.34	60.00	-21.66	QP

Neutral Line:



Item	Freq.	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBµV)	(dB)	(dB)	(dBµV)	(dBµV)	(dB)	
1	0.152	17.20	0.12	9.81	27.13	55.87	-28.74	Average
2	0.152	33.00	0.12	9.81	42.93	65.87	-22.94	QP
3	0.204	18.21	0.12	9.81	28.14	53.45	-25.31	Average
4	0.204	28.17	0.12	9.81	38.10	63.45	-25.35	QP
5	0.229	18.03	0.11	9.81	27.95	52.48	-24.53	Average
6	0.229	27.05	0.11	9.81	36.97	62.48	-25.51	QP
7	0.502	5.61	0.11	9.82	15.54	46.00	-30.46	Average
8	0.502	15.61	0.11	9.82	25.54	56.00	-30.46	QP
9	4.224	12.05	0.13	9.85	22.03	46.00	-23.97	Average
10	4.224	23.41	0.13	9.85	33.39	56.00	-22.61	QP
11	5.362	12.65	0.13	9.86	22.64	50.00	-27.36	Average
12	5.362	24.20	0.13	9.86	34.19	60.00	-25.81	QP

Notes:

1. The following Quasi-Peak and Average measurements were performed on the EUT:

2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.

6.3 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 @3m (dBμV/m)
0.009-0.490	2400/F(kHz)	300	128.5 ~ 93.8
0.490-1.705	24000/F(kHz)	30	73.8 ~63.0
1.705-30	30	30	69.5
30-88	100	3	40.0
88-216	150	3	43.5
216-960	200	3	46.0
960-1000	500	3	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 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:

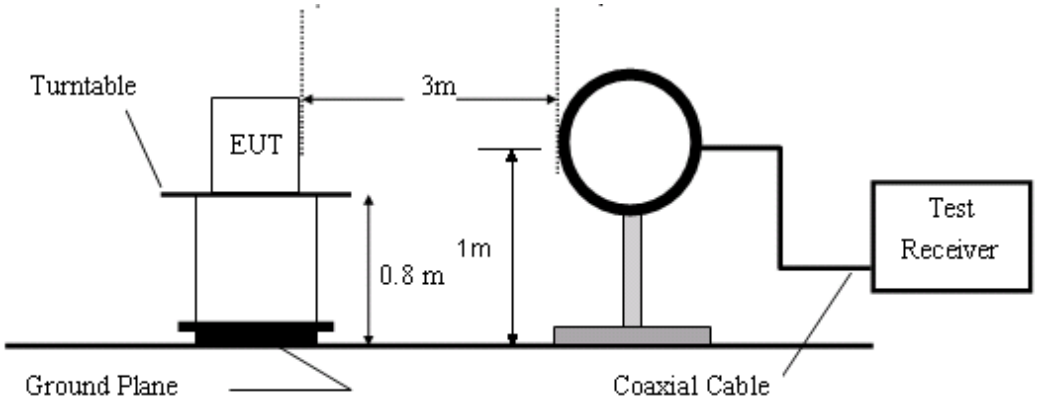


Figure 1. Below 30MHz

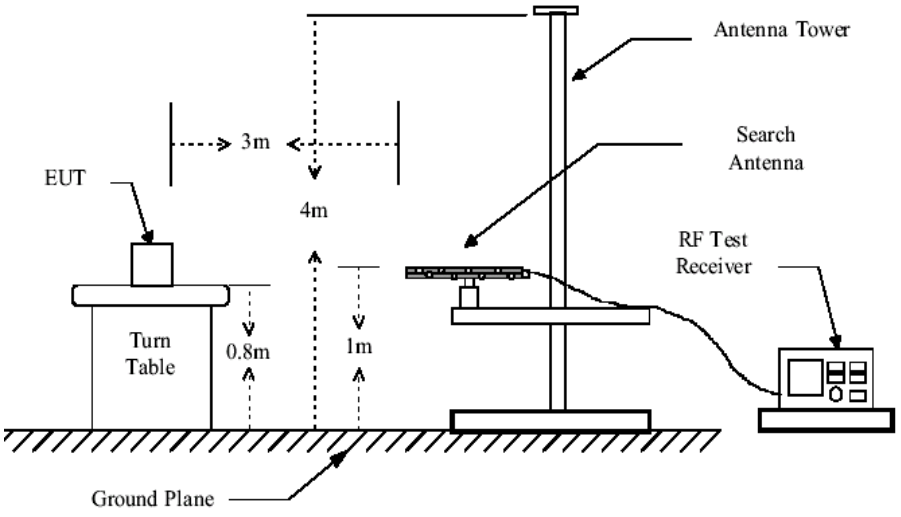


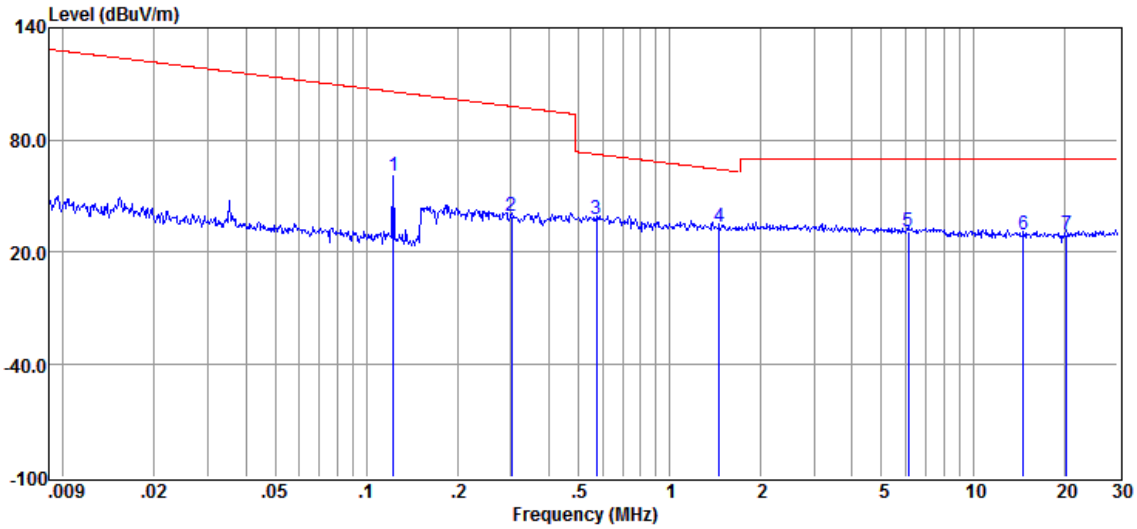
Figure 2. 30MHz to 1GHz

Test Results: Pass

Measurement Data

9kHz - 30MHz:

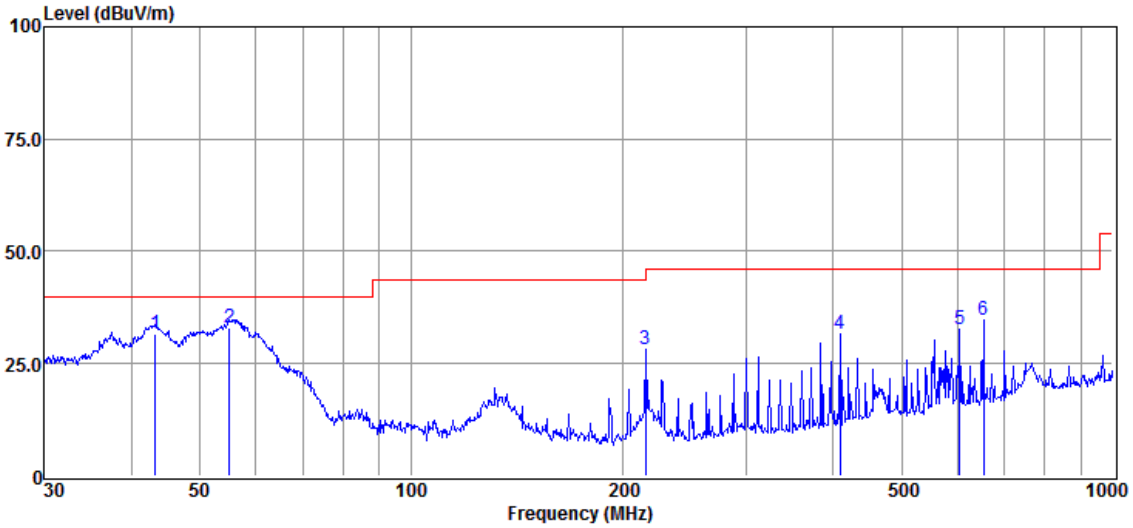
Z:



Item	Freq.	Read Level	Antenna Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBµV)	(dBµA/µVm)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	
1	0.12	41.25	19.90	0.05	61.20	105.83	-44.63	QP
2	0.30	19.56	19.80	0.06	39.42	98.01	-58.59	QP
3	0.57	18.00	19.70	0.07	37.77	72.45	-34.68	QP
4	1.46	13.94	19.35	0.08	33.37	64.37	-31.00	QP
5	6.12	11.53	19.60	0.09	31.22	69.50	-38.28	QP
6	14.69	9.95	19.22	0.13	29.30	69.50	-40.20	QP
7	20.33	10.53	19.04	0.15	29.72	69.50	-39.78	QP

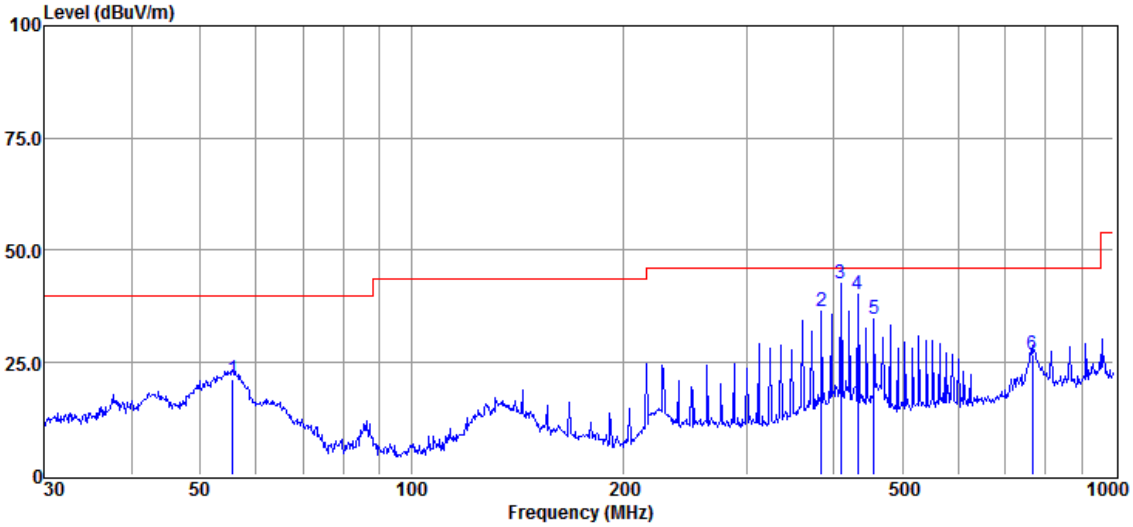
30MHz-1GHz:

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	43.20	59.81	14.34	42.68	0.23	31.70	40.00	-8.30	QP
2	55.03	63.60	11.64	42.68	0.28	32.84	40.00	-7.16	QP
3	216.02	59.70	10.12	42.47	0.72	28.07	46.00	-17.93	QP
4	408.95	57.43	15.30	42.06	1.01	31.68	46.00	-14.32	QP
5	605.66	54.12	19.45	42.19	1.38	32.76	46.00	-13.24	QP
6	654.23	55.38	19.85	42.22	1.55	34.56	46.00	-11.44	QP

Horizontal



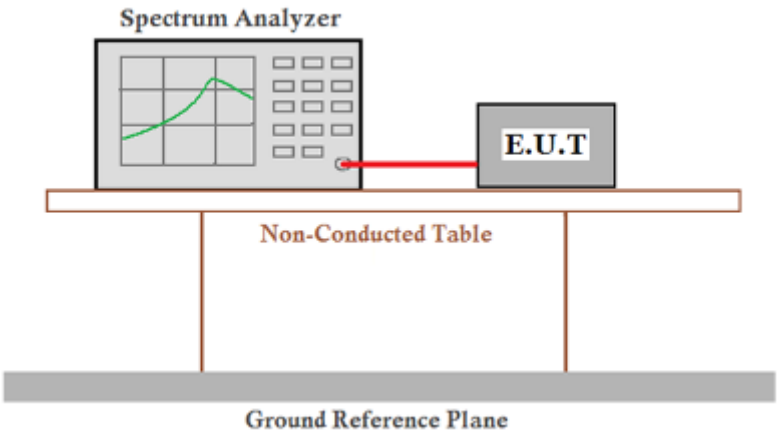
Item	Freq.	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	
1	55.61	52.08	11.75	42.69	0.28	21.42	40.00	-18.58	QP
2	383.93	62.71	14.82	42.13	0.97	36.37	46.00	-9.63	QP
3	408.95	68.36	15.30	42.06	1.01	42.61	46.00	-3.39	QP
4	432.55	65.22	15.83	42.03	1.06	40.08	46.00	-5.92	QP
5	455.91	59.54	16.33	42.09	1.10	34.88	46.00	-11.12	QP
6	766.06	46.11	21.36	42.62	1.91	26.76	46.00	-19.24	QP

Remark:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
2) Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

6.4 20dB Bandwidth

Test Setup:

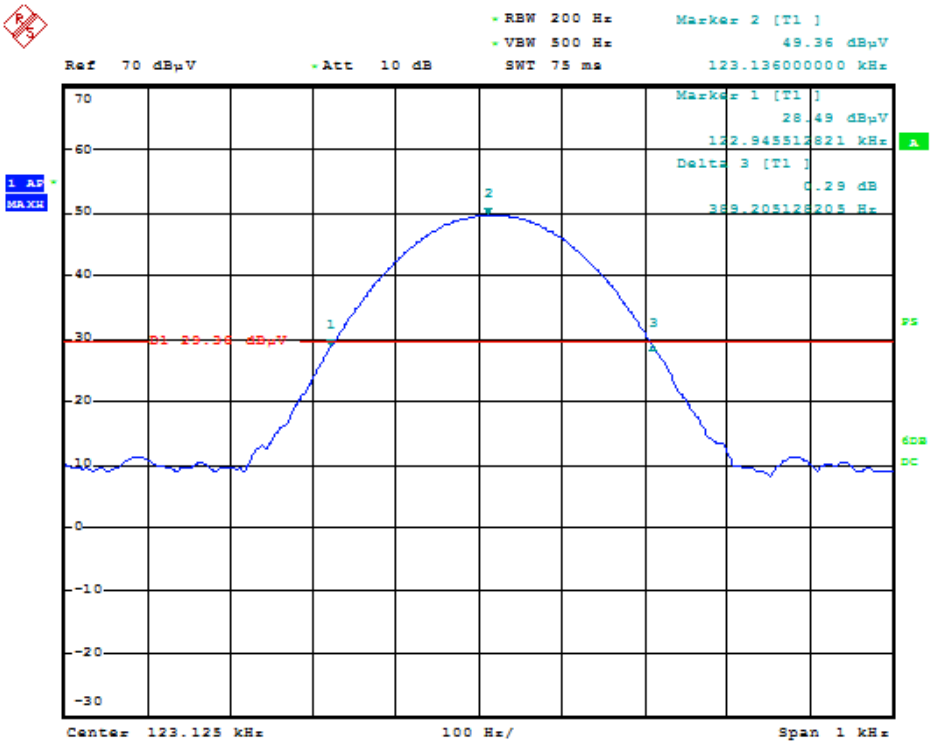


Requirements: Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §15.217 through §15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the 20 dB bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

Test Data:

20dB bandwidth (Hz)	Result
389.205	Pass

Test plot as follows:



7 Test Setup Photographs

Refer to the < Test Setup Photos-FCC >

8 EUT Constructional Details

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

--End of the Report--