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# TEST REPORT

**Application No.**: SHEM2001000169CR **FCC ID**: 2ADTD-K1T804AEF

Applicant:Hangzhou Hikvision Digital Technology Co.,Ltd.Address of Applicant:No. 555, Qianmo Road, Binjiang District,HangzhouManufacturer:Hangzhou Hikvision Digital Technology Co.,Ltd.Address of Manufacturer:No. 555, Qianmo Road, Binjiang District,Hangzhou

Hangzhou Hikvision Technology Co., Ltd.
 Hangzhou Hikvision Electronics Co., Ltd.

3, Hangzhou Hikvision Digital Technology Co., Ltd.

Address of Factory: 1. No.700, Dongliu Road, Binjiang District, Hangzhou City, 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 310052, China

#### **Equipment Under Test (EUT):**

**Factory:** 

**EUT Name:** Fingerprint Access Control Terminal

Model No.: DS-K1T804AEF,DS-K1T804AEFUHK,DS-K1T804AEFCKV,DS-

K1T804AEFUVS,DS-K1T804AEFKVO,DS-K1T804AEFHUN¤

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:** 2020-02-21

**Date of Test:** 2020-01-10 to 2020-01-20

**Date of Issue:** 2020-02-21

Test Result: Pass\*

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.

检验检测专用章

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<sup>\*</sup> In the configuration tested, the EUT complied with the standards specified above.



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Revision Record						
Version	Description	Date	Remark			
00	Original	2020-02-21	/			

Authorized for issue by:			
	Michael Nil		
	Micheal Niu / Project Engineer	-	
	Darlam Zhan		
	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 15.209	ANSI C63.10 (2013) Section 6.9	47 CFR Part 15, Subpart C 15.237(b)	Pass				
Radiated Emissions (9kHz-30MHz)	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				
Radiated Emissions (30MHz-1GHz)	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				

## **Declaration of EUT Family Grouping:**

There are series models mentioned in this report, and they are the identical in electrical and electronic characters. Only the model DS-K1T804AEF was tested since their differences were the model number and appearance.

# SGS

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# 4 General Information

## 4.1 Details of E.U.T.

Power supply: DC 12V 1A by adapter

Test voltage: AC 120V/60Hz

Antenna Type: Loop Modulation Type: ASK Number of Channels: 1

Operation Frequency: 125KHz

## 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	±8.4 x 10 <sup>-8</sup>
2	Timeout	±2s
3	Duty cycle	±0.37%
4	Occupied Bandwidth	±3%
5	RF conducted power	±0.6dB
6	RF power density	±2.84dB
7	Conducted Spurious emissions	±0.75dB
0	DE De diete de pouser	±4.6dB (Below 1GHz)
8	RF Radiated power	±4.1dB (Above 1GHz)
		±4.2dB (Below 30MHz)
0	Parliate I Oan de la calculata de de	±4.4dB (30MHz-1GHz)
9	Radiated Spurious emission test	±4.8dB (1GHz-18GHz)
		±5.2dB (Above 18GHz)
10	Temperature test	±1°C
11	Humidity test	±3%
12	Supply voltages	±1.5%
13	Time	±3%

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



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#### 4.4 Test Location

All tests were performed at:

All measurement facilities used to collect the measurement data are located at No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China. No tests were sub-contracted.

#### 4.5 Test Facility

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

#### CNAS (No. CNAS L4354)

CNAS has accredited Compliance Certification Services (Kunshan) Inc. to ISO/IEC 17025:2017 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. 2541.01)

Compliance Certification Services (Kunshan) Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 2541.01.

#### FCC –Designation Number: CN1172

Compliance Certification Services Inc. has been recognized as an accredited testing laboratory. Designation Number: CN1172. Test Firm Registration Number: 995260.

#### • Industry Canada (IC) - IC Assigned Code: 2324E

The 10m and 3m Semi-anechoic chamber of Compliance Certification Services (Kunshan) Inc. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 2324E-1 for 10m chamber, 2324E-2 for 3m chamber.

## • VCCI (Member No.: 1938)

The 3m and 10m Semi-anechoic chamber and Shielded Room of Compliance Certification Services (Kunshan) Inc. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-1600, C-1707, T-1499, G-10216 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 Pow				•	1
EMI Test Receive	R&S	ESCI	100781	02/25/2019	02/24/2020
LISN	R&S	ENV216	101604	10/24/2019	10/23/2020
LISN	Schwarzbeck	NNLK 8129	8129-143	10/24/2019	10/23/2020
Pulse Limiter	R&S	ESH3-Z2	100609	02/25/2019	02/24/2020
CE test Cable	Thermax	/	14	12/24/2019	12/23/2020
Conducted Test				I .	
Spectrum Analyzer	Agilent	E4446A	MY44020154	07/03/2019	07/02/2020
Spectrum Analyzer	Keysight	N9020A	MY55370209	12/19/2019	12/18/2020
Signal Generator	Agilent	E8257C	MY43321570	10/24/2019	10/23/2020
Vector Signal Generator	R&S	SMU 200A	102744	02/25/2019	02/24/2020
Universal Radio Communication Tester	R&S	CMU200	109525	12/19/2019	12/18/2020
Universal Radio Communication Tester	R&S	CMW500	159275	12/19/2019	12/18/2020
Power Meter	Anritsu	ML2495A	1445010	04/22/2019	04/21/2020
Switcher	CCSRF	FY562	KS301219	12/20/2019	12/19/2020
AC Power Source	EXTECH	6605	1570106	N.C.R	N.C.R
DC Power Supply	Aglient	E3632A	MY50340053	N.C.R	N.C.R
6dB Attenuator	Mini-Circuits	NAT-6-2W	15542-1	N.C.R	N.C.R
Power Divider	AISI	IOWOPE2068	PE2068	N.C.R	N.C.R
Filter	MICRO- TRONICS	BRM50701	5	N.C.R	N.C.R
Conducted test cable	/	RF01-RF04	/	04/22/2019	04/21/2020
Temp. / Humidity Chamber	TERCHY	MHK-120AK	X30109	04/22/2019	04/21/2020
Radiated Test					
Spectrum Analyzer	R&S	FSV40	101493	01/08/2020	01/07/2021
Signal Generator	Agilent	E8257C	MY43321570	10/24/2019	10/23/2020
Loop Antenna	Schwarzbeck	HXYZ9170	9170-108	02/25/2019	02/24/2020
Bilog Antenna	TESEQ	CBL 6112D	35403	06/22/2019	06/21/2020
Bilog Antenna	SCHWARZBECK	VULB9160	9160-3342	04/29/2019	04/28/2021
Horn-antenna(1-18GHz)	Schwarzbeck	BBHA9120D	267	11/04/2018	11/03/2020
Horn-antenna(1-18GHz)	ETS-LINDGREN	3117	00143290	02/25/2019	02/24/2021
Horn Antenna(18-40GHz)	Schwarzbeck	BBHA9170	BBHA9170171	02/27/2018	02/26/2021
Pre-Amplifier(30MHz~18GHz)	CCSRF	AMP1277	1	12/19/2019	12/18/2020
Pre-Amplifier(0.1~26.5GHz)	EMCI	EMC012645	980060	07/03/2019	07/02/2020
Low Pass Filter	MICRO-TRONICS	VLFX-950	RV142900829	N.C.R	N.C.R
High Pass Filter	Mini-Circuits	VHF-1200	15542	N.C.R	N.C.R
Filter (5450MHz~5770 MHz)	MICRO-TRONICS	BRC50704-01	2	N.C.R	N.C.R
Filter (5690 MHz~5930 MHz)	MICRO-TRONICS	BRC50705-01	4	N.C.R	N.C.R
Filter (5150 MHz~5350 MHz)	MICRO-TRONICS	BRC50703-01	2	N.C.R	N.C.R
Filter (885 MHz~915 MHz)	MICRO-TRONICS	BRM14698	1	N.C.R	N.C.R
Filter (815 MHz~860 MHz)	MICRO-TRONICS	BRM14697	1	N.C.R	N.C.R
Filter (1745 MHz $\sim$ 1910 MHz)	MICRO-TRONICS	BRM14700	1	N.C.R	N.C.R
Filter (1922 MHz $\sim$ 1977 MHz)	MICRO-TRONICS	BRM50715	1	N.C.R	N.C.R
Filter (2550 MHz)	MICRO-TRONICS	HPM13362	5	N.C.R	N.C.R
Filter (1532 MHz $\sim$ 1845 MHz)	MICRO-TRONICS	BRM50713	1	N.C.R	N.C.R
Filter (2.4GHz)	MICRO-TRONICS	BRM50701	5	N.C.R	N.C.R
RE test cable	/	RE01-RE04	/	04/22/2019	04/21/2020



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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:** 

Antenna location: Refer to Appendix (Internal Photos)





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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:

Fraguency of amission(MU=)	Conducted limit(dBµV)				
Frequency of emission(MHz)	Quasi-peak	Average			
0.15-0.5	66 to 56*	56 to 46*			
0.5-5	56	46			
5-30	60	50			

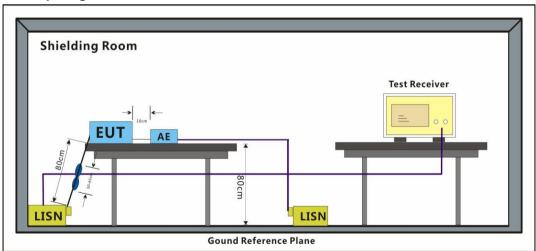
### 7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C Humidity: 45 % RH Atmospheric Pressure: 1001 mbar

Test mode b:TX mode\_Keep the EUT in transmitting with modulation mode.

## 7.1.2 Test Setup Diagram



NO.588 West Jindu Road,Songjiang District,Shanghai,China 201612 中国・上海・松江区金都西路588号 邮编: 201612  $\begin{array}{lll} t(86\text{-}21)\, 61915666 & f(86\text{-}21)\, 61915678 & \text{www.sgsgroup.com.cn} \\ t(86\text{-}21)\, 61915666 & f(86\text{-}21)\, 61915678 & \text{e sgs.china@sgs.com} \end{array}$ 



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#### 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  $50 \text{ohm}/50 \mu\text{H} + 5 \text{ohm}$  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.

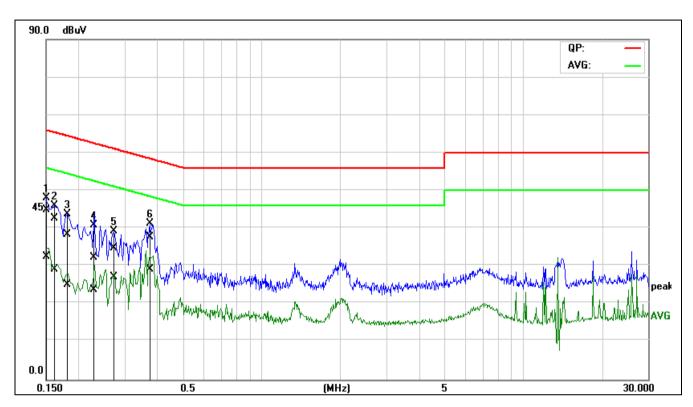
Remark: LISN=Read Level+ Cable Loss+ LISN Factor



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Mode:b; Line:Live Line



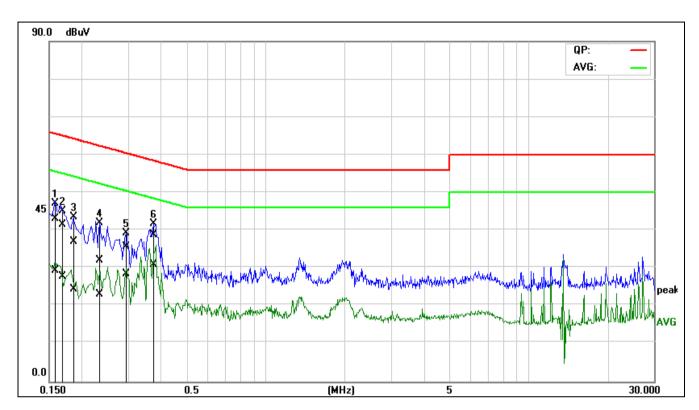
No.	Frequency	QuasiPeak	Average	Correction	QuasiPeak	Average	QuasiPeak	Average	QuasiPeak	Average	Remark
		reading	reading	factor	result	result	limit	limit	margin	margin	
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1	0.1505	25.46	13.02	19.52	44.98	32.54	65.97	55.97	-20.99	-23.43	Pass
2	0.1599	23.16	9.58	19.52	42.68	29.10	65.47	55.47	-22.79	-26.37	Pass
3	0.1825	18.81	5.52	19.51	38.32	25.03	64.37	54.37	-26.05	-29.34	Pass
4	0.2256	12.81	4.31	19.49	32.30	23.80	62.61	52.61	-30.31	-28.81	Pass
5	0.2753	15.23	7.74	19.48	34.71	27.22	60.96	50.96	-26.25	-23.74	Pass
6*	0.3740	18.28	9.55	19.51	37.79	29.06	58.41	48.41	-20.62	-19.35	Pass



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Mode:b; Line:Neutral Line



No.	Frequency	QuasiPeak	Average	Correction	QuasiPeak	Average	QuasiPeak	Average	QuasiPeak	Average	Remark
		reading	reading	factor	result	result	limit	limit	margin	margin	
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1	0.1593	23.62	9.87	19.47	43.09	29.34	65.50	55.50	-22.41	-26.16	Pass
2	0.1691	22.02	8.34	19.47	41.49	27.81	65.00	55.00	-23.51	-27.19	Pass
3	0.1848	17.58	4.87	19.47	37.05	24.34	64.27	54.27	-27.22	-29.93	Pass
4	0.2343	12.70	3.61	19.47	32.17	23.08	62.30	52.30	-30.13	-29.22	Pass
5	0.2949	16.16	9.09	19.47	35.63	28.56	60.39	50.39	-24.76	-21.83	Pass
6*	0.3749	19.40	11.41	19.48	38.88	30.89	58.39	48.39	-19.51	-17.50	Pass



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## 7.2 20dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.237(b)
Test Method: ANSI C63.10 (2013) Section 6.9

Limit: <200 kHz

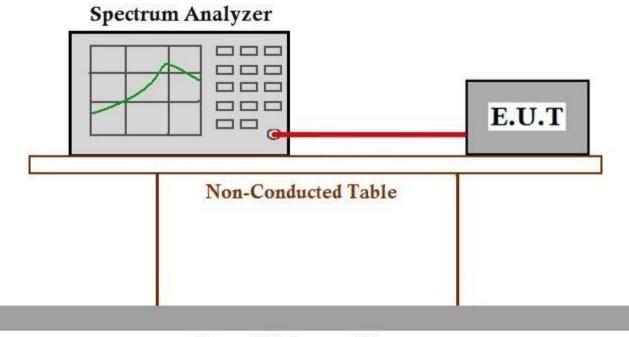
## 7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 45 % RH Atmospheric Pressure: 1001 mbar

Test mode b:TX mode\_Keep the EUT in transmitting with modulation mode.

#### 7.2.2 Test Setup Diagram



# Ground Reference Plane

#### 7.2.3 Measurement Procedure and Data

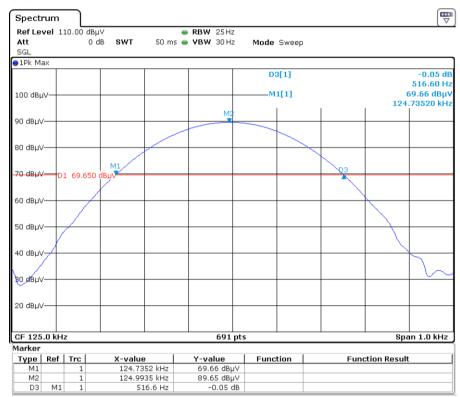


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20dB bandwidth (Hz)	Result	
516.600	Pass	

## Test plot as follows:





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## 7.3 Radiated Emissions (9kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.237(c)
Test Method: ANSI C63.10 (2013) Section 6.4&6.5

Measurement Distance: 3m

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for above 1000MHz. Radiated emission limits above 1000MHz is based on measurements employing an average detector.

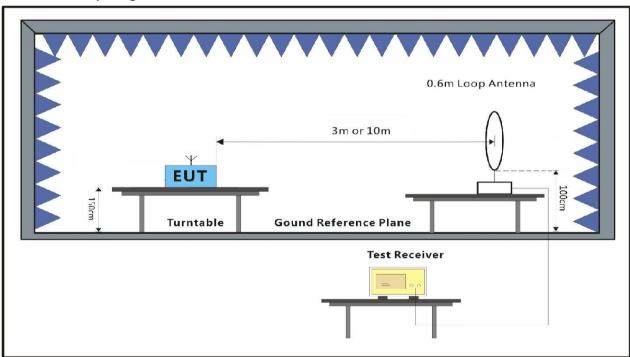
#### 7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C Humidity: 45 % RH Atmospheric Pressure: 1001 mbar

Test mode b:TX mode\_Keep the EUT in transmitting with modulation mode.

## 7.3.2 Test Setup Diagram



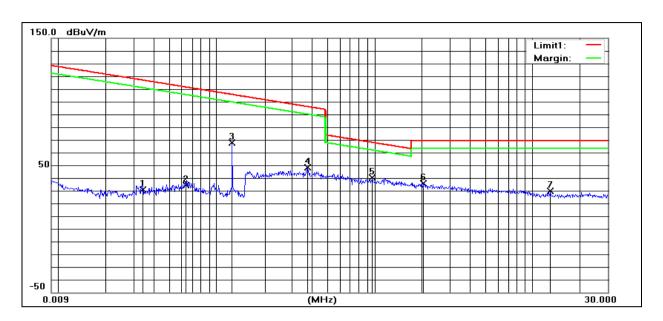
#### 7.3.3 Measurement Procedure and Data

For testing performed with the loop antenna, the center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane. Only the worst position of vertical was shown in the report.



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	Freq.	Read Level	Antenna Factor	Result Level@3m	Result Level@SPEC	Limit Line@SPEC	Over Limit	Detector
(Mark)	(MHz)	(dBµV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	0.0342	15.69	14.9	30.59	-49.41	36.91	-86.32	QP
2	0.0641	19.31	15.04	34.35	-45.65	31.46	-77.11	QP
3	0.1253	53.12	14.77	67.89	-12.11	25.64	-37.75	QP
4	0.375	33.05	15.23	48.28	-31.72	16.12	-47.84	QP
5	0.9633	24.84	15.28	40.12	0.12	27.95	-27.83	QP
6	2.044	20.27	15.7	35.97	-4.03	29.5	-33.53	QP
7	12.9885	14.16	15.48	29.64	-10.36	29.5	-39.86	QP



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# 7.4 Radiated Emissions (30MHz-1GHz)

Test Requirement 47 CFR Part 15, Subpart C 15.237(c)
Test Method: ANSI C63.10 (2013) Section 6.4&6.5

Measurement Distance: 3m

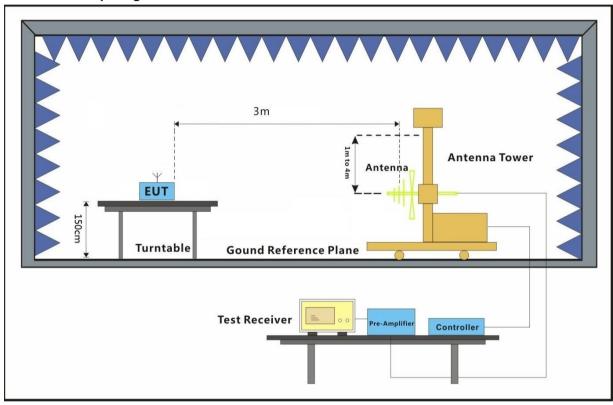
#### 7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C Humidity: 45 % RH Atmospheric Pressure: 1001 mbar

Test mode b:TX mode\_Keep the EUT in transmitting with modulation mode.

## 7.4.2 Test Setup Diagram



# SGS

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

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#### 7.4.3 Measurement Procedure and Data

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground for below 1GHz at a 3 meter semi-anechoic chamber. 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. Test the EUT in the lowest channel, the middle channel, the Highest channel
- h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case.
- i. Repeat above procedures until all frequencies measured was complete.

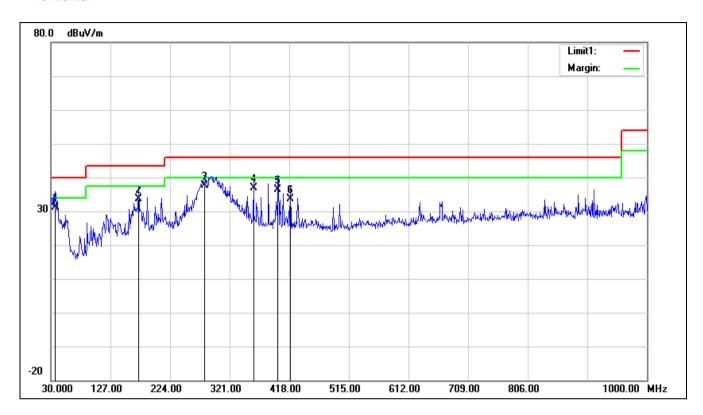
Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor



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## Horizontal:



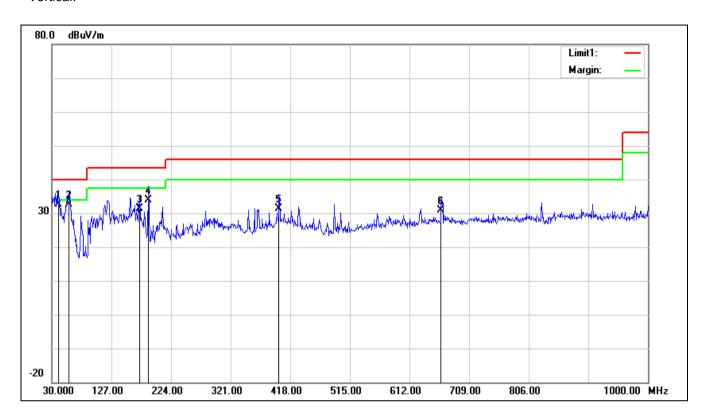
No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	36.7900	33.12	-1.87	31.25	40.00	-8.75	100	241	QP
2	172.5900	42.40	-8.66	33.74	43.50	-9.76	100	214	QP
3	280.2600	43.84	-6.26	37.58	46.00	-8.42	400	229	QP
4	359.8000	41.33	-4.37	36.96	46.00	-9.04	200	359	QP
5	399.5700	39.82	-3.48	36.34	46.00	-9.66	100	336	QP
6	419.9400	36.77	-3.14	33.63	46.00	-12.37	100	355	QP



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## Vertical:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	40.6700	36.07	-3.44	32.63	40.00	-7.37	100	360	QP
2	57.1600	44.16	-11.48	32.68	40.00	-7.32	100	247	QP
3	172.5900	39.93	-8.66	31.27	43.50	-12.23	200	255	QP
4	187.1400	43.43	-9.47	33.96	43.50	-9.54	100	247	QP
5	399.5700	34.95	-3.48	31.47	46.00	-14.53	400	174	QP
6	663.4100	29.83	1.13	30.96	46.00	-15.04	100	315	QP



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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 -