

TEST REPORT

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

Manufacturer or Supplier	Hangzhou Hikvision Digital Technology Co., Ltd.
Address	No. 555, Qianmo Road, Binjiang District, Hangzhou
Product	Fingerprint Card Reader
Brand Name	HIKVISION
Model	DS-K1201EF
Additional Model & Model Difference	DS-K1200EF, DS-K12XXABC-XYZ, See items 3.1
Date of tests	Dec. 27, 2017 ~ Jan. 17, 2018

The submitted sample of the above equipment has been tested for according to the requirements of the following standards:

☒ **FCC Part 15, Subpart C**

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Tested by Andy Zhu Project Engineer / EMC Department	Approved by Glyn He Supervisor / EMC Department
	
Date: Feb. 06, 2018	

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Test Report No.: RF171227N010

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF171227N010	Original release	Feb. 06, 2018

1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
§15.203	Antenna Requirement	PASS	No antenna connector is used.
§15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit.
§15.209	Radiated Emission	PASS	Meet the requirement of limit.
§15.215 (c)	20dB Bandwidth	PASS	Meet the requirement of limit.

2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.70dB
Radiated emissions	9KHz ~ 30MHz	2.16dB
	30MHz ~ 1GMHz	3.83dB

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

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Fingerprint Card Reader
MODEL NO.	DS-K1201EF
ADDITIONAL MODEL	DS-K1200EF、DS-K12XXABC-XYZ
FCC ID	2ADTD-K1201EF
POWER SUPPLY	DC 12V
MODULATION TYPE	ASK
OPERATING FREQUENCY	125KHz
NUMBER OF CHANNEL	1
ANTENNA TYPE	Loop Antenna
CABLE SUPPLIED	N/A

NOTE:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
3. Additional models DS-K1200EF、DS-K12XXABC-XYZ are identical with the test model DS-K1201EF except the model number for marketing purpose

3.2 DESCRIPTION OF TEST MODES

The EUT was tested under the following modes the final worst mode was marked in boldface and recorded in this report.

TEST FREQUENCY	TEST MODE	TEST VOLTAGE
125KHz	Card reader normal Working	DC 12V from Adapter
	Fingerprint normal Working	

3.2.1. CONFIGURATION OF SYSTEM UNDER TEST

Please see section 5 photograph of the test configuration for reference.

3.2.2. TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports

The worst case was found when positioned on X axis for radiated emission. Following channel(s) was (were) selected for the final test as listed below:

EUT CONFIGURE MODE	APPLICABLE TO			DESCRIPTION
	RE	PLC	BW	
A	√	√	√	Power by Adapter

Where **RE**: Radiated Emission

PLC: Power Line Conducted Emission

BW: 20dB Bandwidth

RADIATED EMISSION TEST:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, XYZ axis, antenna ports (if EUT with antenna diversity architecture) and packet type.

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	TESTED CHANNEL	TESTED FREQUENCY (KHZ)	MODULATION TYPE	AXIS
A	1	125K	ASK	X

POWER LINE CONDUCTED EMISSION TEST:

- ☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, antenna ports (if EUT with antenna diversity architecture), and packet types.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	TESTED CHANNEL	TESTED FREQUENCY (KHZ)	MODULATION TYPE	AXIS
A	1	125K	ASK	X

20dB BANDWIDTH:

- ☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, antenna ports (if EUT with antenna diversity architecture), and packet types.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	TESTED CHANNEL	TESTED FREQUENCY (KHZ)	MODULATION TYPE	AXIS
A	1	125K	ASK	X

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	TEST VOLTAGE (SYSTEM)	TESTED BY
RE	22deg. C, 54%RH	DC 12V From Adapter	Wang
PLC	22deg. C, 54%RH	DC 12V From Adapter	Dragon
BW	25deg. C, 60%RH	DC 12V From Adapter	Robert Cheng

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C

ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

NOTE: 1. All test items have been performed and recorded as per the above standards.

3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as a dependent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Adapter	CWT	KPL-040-VI	N/A	N/A

NO.	DESCRIPTION OF THE ABOVE SUPPORT UNITS
1,	AC Line: Unshielded, Detachable , 1.4m. DC Line: Unshielded, Non-detachable , 1.2m.

4 EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

- NOTES:**
- (1) The lower limit shall apply at the transition frequencies.
 - (2) The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
 - (3) All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR7	101588	Jan. 22,17	Jan. 21,18
Artificial Mains Network	Rohde&Schwarz	ENV216	101173	Mar. 04,17	Mar. 03,18
Artificial Mains Network	Rohde&Schwarz	ESH3-Z5	100317	Apr. 05,17	Apr. 04,18
Voltage probe	SCHWARZBECK	TK 9421	TK 9421-176	Jan. 08,18	Jan. 07,19
Test software	ADT	ADT_Cond V7.3.7	N/A	N/A	N/A

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GREGT/CHINA and NIM/CHINA.
 2. The test was performed in shielding room 553.

4.1.3 TEST PROCEDURE

The basic test procedure was in accordance with ANSI C63.4:2014 (section 7).

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit – 20dB) were not recorded.

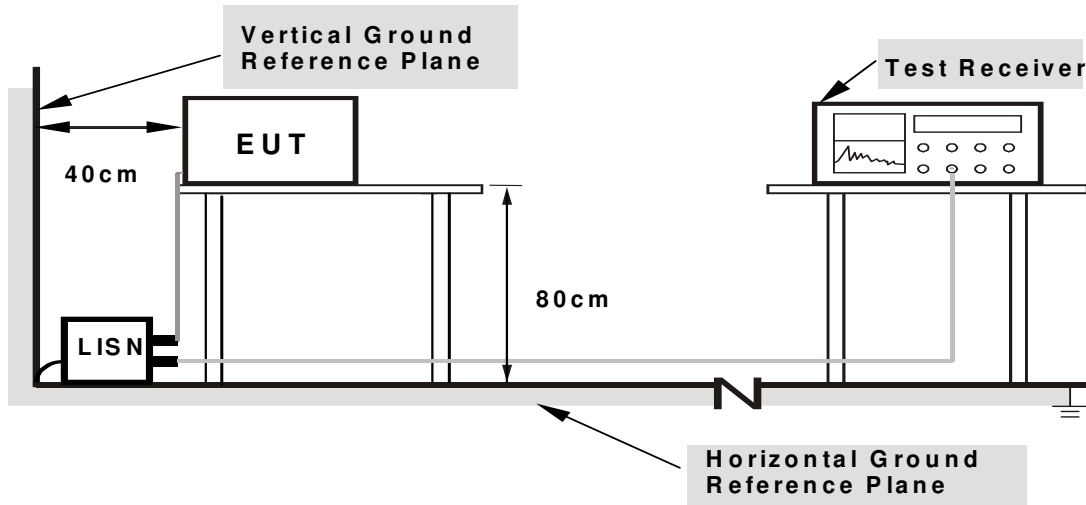
NOTE:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

4.1.4 DEVIATION FROM TEST STANDARD

No deviation.

4.1.5 TEST SETUP



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

4.1.6 EUT OPERATING CONDITIONS

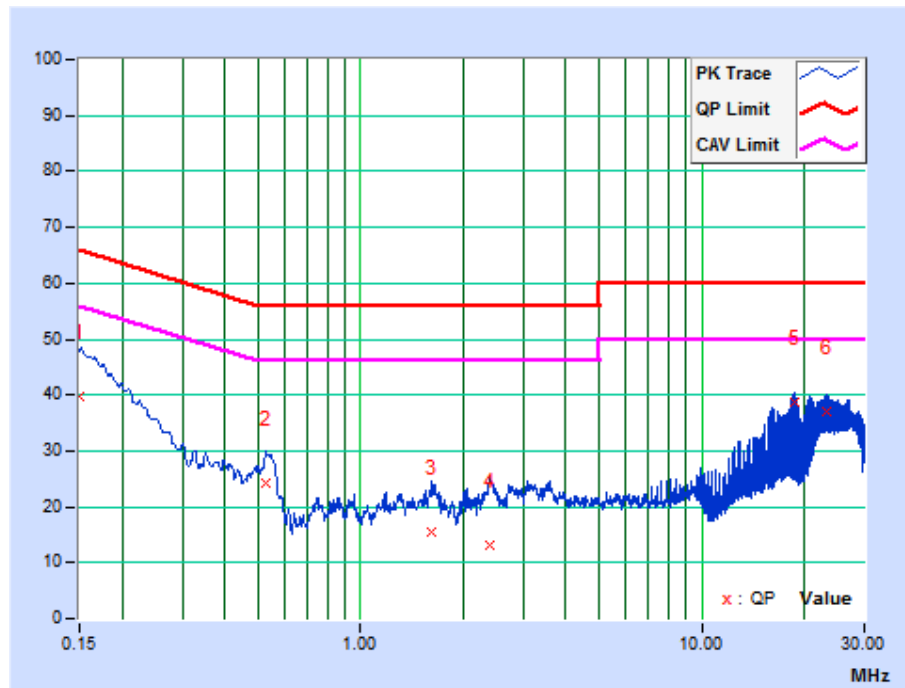
- Turned on the power of all equipment.
- EUT was operated according to the type description in manufacturer's specifications or the User's Manual.

4.1.7 TEST RESULTS

TEST MODE	Card reader normal Working	6DB BANDWIDTH	9 kHz
TEST VOLTAGE	DC 12V from Adapter	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	19deg. C, 43% RH	TESTED BY	Dragon

No.	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.83	29.97	11.04	39.80	20.87	66.00	56.00	-26.20	-35.13
2	0.52801	9.99	14.26	4.31	24.25	14.30	56.00	46.00	-31.75	-31.70
3	1.61321	9.86	5.67	-1.69	15.53	8.17	56.00	46.00	-40.47	-37.83
4	2.39082	9.87	3.41	-3.07	13.28	6.80	56.00	46.00	-42.72	-39.20
5	18.75075	9.97	28.88	28.61	38.85	38.58	60.00	50.00	-21.15	-11.42
6	23.37450	10.02	26.98	25.35	37.00	35.37	60.00	50.00	-23.00	-14.63

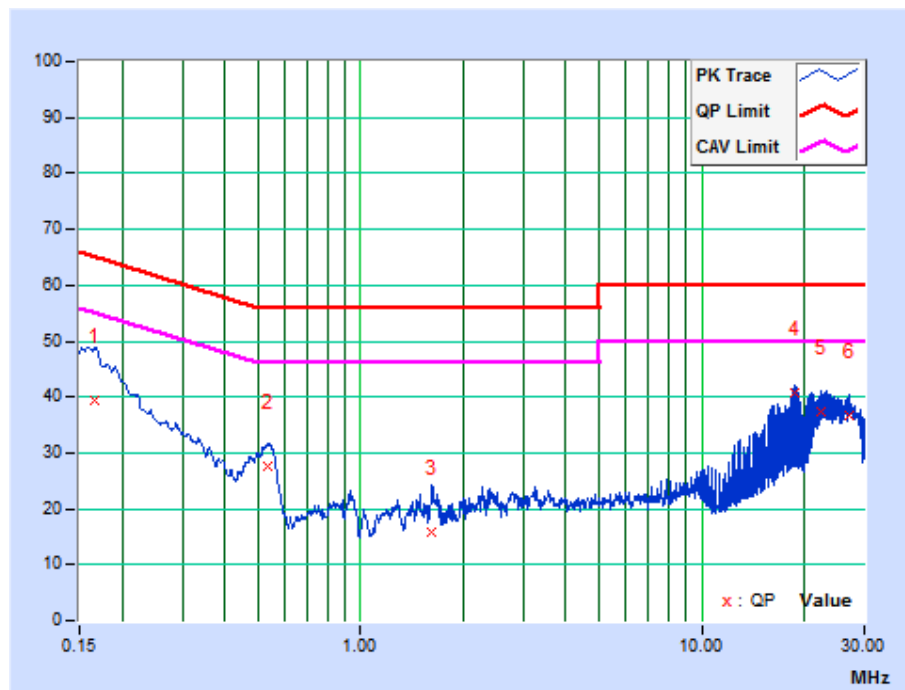
REMARKS: The emission levels of other frequencies were very low against the limit.



TEST MODE	Card reader normal Working	6DB BANDWIDTH	9 kHz
TEST VOLTAGE	DC 12V from Adapter	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	19deg. C, 43% RH	TESTED BY	Dragon

No.	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16567	9.61	29.90	11.63	39.51	21.24	65.17	55.17	-25.66	-33.93
2	0.53644	9.82	17.82	7.40	27.64	17.22	56.00	46.00	-28.36	-28.78
3	1.62375	9.89	5.86	-0.86	15.75	9.03	56.00	46.00	-40.25	-36.97
4	18.75075	9.76	30.97	30.71	40.73	40.47	60.00	50.00	-19.27	-9.53
5	22.37550	9.71	27.66	26.21	37.37	35.92	60.00	50.00	-22.63	-14.08
6	26.99925	9.75	26.90	24.52	36.65	34.27	60.00	50.00	-23.35	-15.73

REMARKS: The emission levels of other frequencies were very low against the limit.



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

TEST STANDARD: FCC Part 15, Subpart C, Section 15.209

Emissions radiated outside of the specified bands, shall be according to the general radiated limits as following:

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.
4. The measured field strength was extrapolated to distance 30 meters, using the formula that the limit of field strength varies as the inverse distance square (40dB per decade of distance)

Example:

$$\begin{aligned}
 13.56\text{MHz} &= 15848\text{uV/m} & 30\text{m} \\
 &= 84\text{dBuV/m} & 30\text{m} \\
 &= 84+20\log(30/3)^2 & 3\text{m} \\
 &= 124\text{dBuV/m}
 \end{aligned}$$

4.2.2 TEST INSTRUMENTS

FREQUENCY 9KHz-30MHz

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR7	101564	Feb. 27,17	Feb. 26,18
Active Loop Antenna	SCHWARZBECK	FMZB 1519B	1519B-045	May 31,17	May 30,18
Amplifier	Burgeon	BPA-530	100210	Apr. 05,17	Apr. 04,18
Test Software	ADT	ADT_Radiated V8.7.07	N/A	N/A	N/A

- NOTES:**
1. The test was performed in 10m Chamber.
 2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to CEPREI/CHINA, GREGT/CHINA and NIM/CHINA.
 3. The FCC Site Registration No. is 749762.

FREQUENCY 30MHz-1GHz

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESU40	100449	Mar. 11,17	Mar. 10,18
Bilog Antenna	Teseq	CBL 6111D	30643	Jul. 28, 17	Jul. 27, 18
Amplifier	Burgeon	BPA-530	100220	Apr. 05,17	Apr. 04,18
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	NSEMC003	Mar. 06,17	Mar. 05,18
Test software	ADT	ADT_Radiated V7.6.15.9.2	N/A	N/A	N/A

- NOTES:**
1. The test was performed in 3m Chamber
 2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to CEPREI/CHINA, GREGT/CHINA and NIM/CHINA.
 3. The FCC Site Registration No. is 749762.

4.2.3 TEST PROCEDURE

< Below 30MHz >

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meters Semi-anechoic chamber room. 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 height of antenna 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 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 quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. For below 30MHz, a loop antenna with its vertical plane is place 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1m above the ground.

<30MHz~1GHz >

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters 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 is a broadband antenna, and its 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 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.

NOTE:

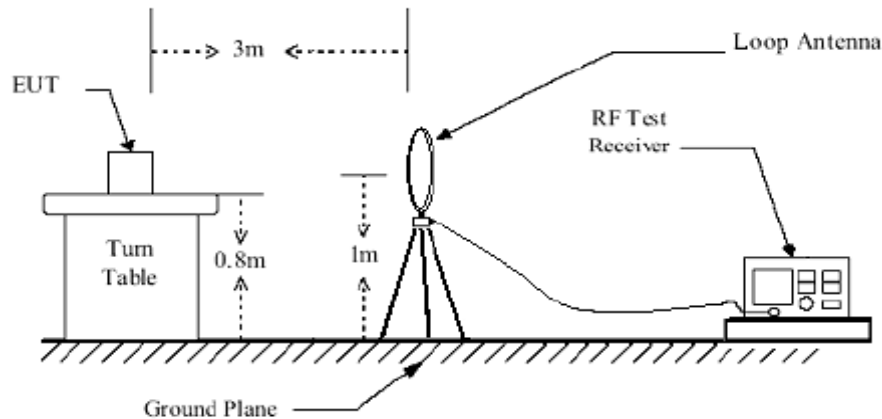
1. The resolution bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
3. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
4. Margin value = Emission level – Limit value.

4.2.4 DEVIATION FROM TEST STANDARD

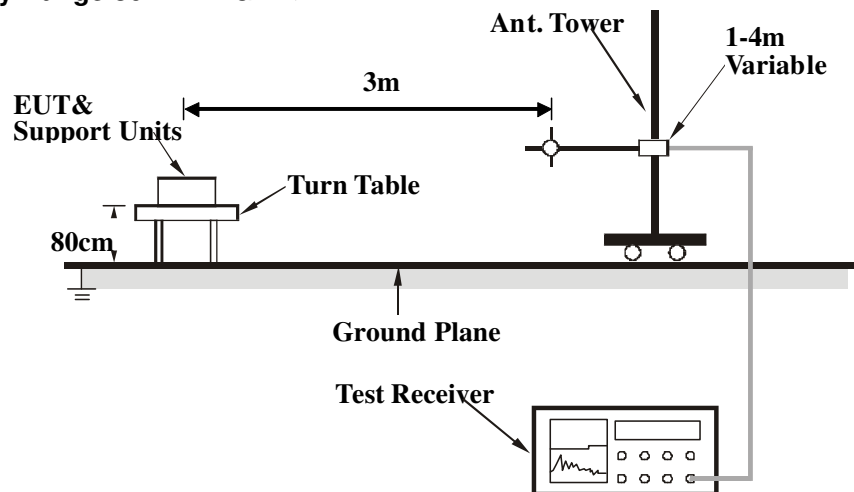
No deviation.

4.2.5 TEST SETUP

<Frequency Range below 30MHz>



<Frequency Range 30MHz~1GHz >



* : depends on the EUT height and the antenna 3dB beamwidth both, refer to section 7.3 of CISPR 16-2-3.

4.2.6 EUT OPERATING CONDITIONS

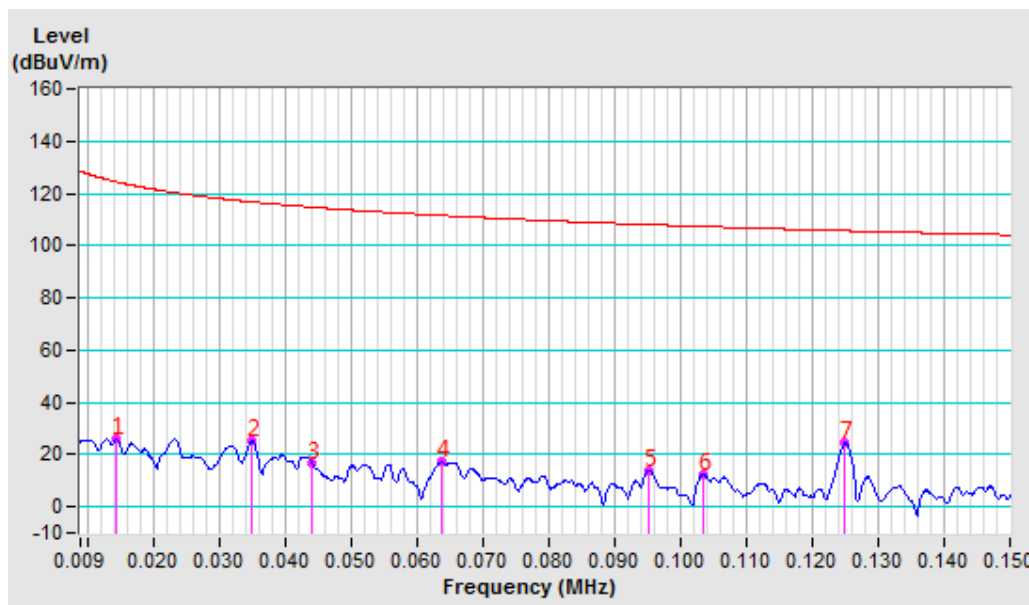
- a. Turn on the power supply of the EUT.
- b. EUT was operated according to the type description in manufacturer's specifications or the User's Manual.

4.2.7 TEST RESULTS

TEST MODE	Card reader normal Working	FREQUENCY RANGE	9 -150KHz
TEST VOLTAGE	DC 12V from Adapter	DETECTOR FUNCTION & RESOLUTION BANDWIDTH	Quasi-Peak, 200Hz
ENVIRONMENTAL CONDITIONS	21deg. C, 57% RH	TESTED BY: Xin Peng	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3M								
No.	Freq. (MHz)	Correction Factor (dB/m)	Raw Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
1	0.01440	-9.69	35.48	25.79	124.44	-98.65	100	2
2	0.03510	-10.27	35.31	25.04	116.70	-91.66	100	275
3	0.04420	-10.29	26.65	16.36	114.69	-98.33	100	34
4	0.06380	-10.37	27.53	17.16	111.51	-94.35	100	360
5	0.09530	-10.38	24.47	14.09	108.02	-93.93	100	25
6	0.10350	-10.34	22.54	12.20	107.30	-95.10	100	42
7	0.12500	-10.44	34.77	24.33	105.66	-81.33	100	36

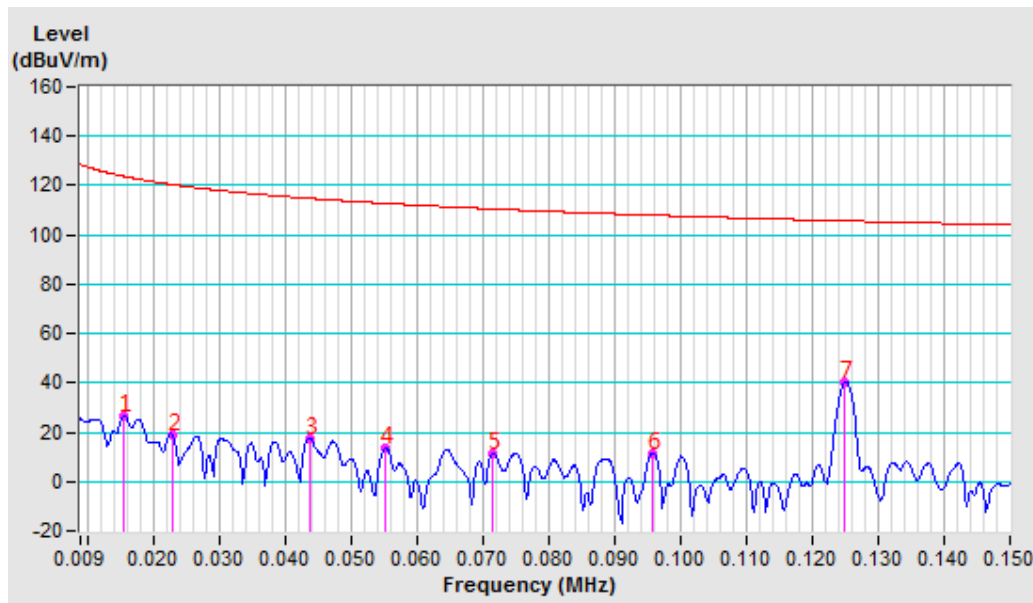
- REMARKS:**
1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
 2. Negative sign (-) in the margin column signify levels below the limit.
 3. Frequency range scanned: 0.009-0.15MHz.
 4. Only emissions significantly above equipment noise floor are reported.



TEST MODE	Card reader normal Working	FREQUENCY RANGE	9 -150KHz
TEST VOLTAGE	DC 12V from Adapter	DETECTOR FUNCTION & RESOLUTION BANDWIDTH	Quasi-Peak, 200Hz
ENVIRONMENTAL CONDITIONS	21deg. C, 57% RH	TESTED BY: Xin Peng	

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Correction Factor (dB/m)	Raw Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
1	0.01570	-9.73	36.44	26.71	123.69	-96.98	100	24
2	0.02290	-9.99	29.06	19.07	120.41	-101.34	100	356
3	0.04370	-10.30	27.94	17.64	114.79	-97.15	100	360
4	0.05520	-10.33	23.85	13.52	112.76	-99.24	100	263
5	0.07160	-10.39	21.78	11.39	110.50	-99.11	100	276
6	0.09580	-10.37	21.90	11.53	107.97	-96.44	100	25
7	0.12500	-10.44	50.91	40.47	105.66	-65.19	100	360

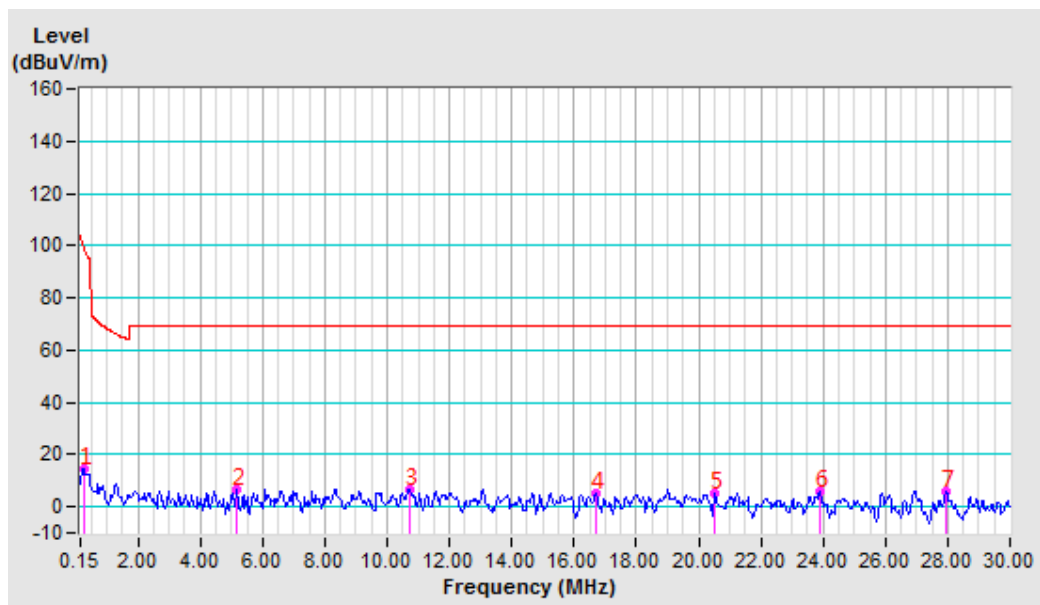
- REMARKS:**
1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
 2. Negative sign (-) in the margin column signify levels below the limit.
 3. Frequency range scanned: 0.009-0.15MHz.
 4. Only emissions significantly above equipment noise floor are reported.



TEST MODE	Card reader normal Working	FREQUENCY RANGE	150KHz-30MHz
TEST VOLTAGE	DC 12V from Adapter	DETECTOR FUNCTION & RESOLUTION BANDWIDTH	Quasi-Peak, 200Hz
ENVIRONMENTAL CONDITIONS	21deg. C, 57% RH	TESTED BY: Xin Peng	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 10 M								
No.	Freq. (MHz)	Correction Factor (dB/m)	Raw Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
1	0.24330	-10.55	25.20	14.65	99.88	-85.23	100	27
2	5.17970	-10.34	17.22	6.88	69.54	-62.66	100	26
3	10.71320	-10.12	16.92	6.80	69.54	-62.74	100	275
4	16.68690	-10.09	15.57	5.48	69.54	-64.06	100	253
5	20.51140	-10.48	15.78	5.30	69.54	-64.24	100	263
6	23.88450	-10.15	16.05	5.90	69.54	-63.64	100	276
7	27.96270	-10.47	16.43	5.96	69.54	-63.58	100	236

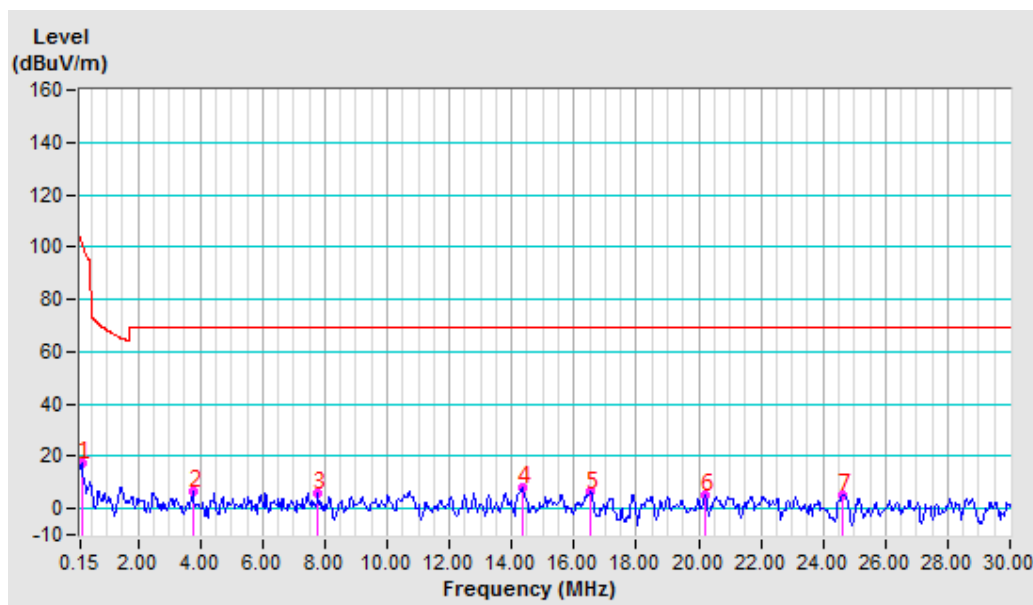
- REMARKS:**
1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
 2. Negative sign (-) in the margin column signify levels below the limit.
 3. Frequency range scanned: 0.15-30MHz.
 4. Only emissions significantly above equipment noise floor are reported.



TEST MODE	Card reader normal Working	FREQUENCY RANGE	150KHz-30MHz
TEST VOLTAGE	DC 12V from Adapter	DETECTOR FUNCTION & RESOLUTION BANDWIDTH	Quasi-Peak, 200Hz
ENVIRONMENTAL CONDITIONS	21deg. C, 57% RH	TESTED BY: Xin Peng	

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 10 M								
No.	Freq. (MHz)	Correction Factor (dB/m)	Raw Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
1	0.18730	-10.53	27.72	17.19	102.15	-84.96	100	152
2	3.76180	-10.43	16.80	6.37	69.54	-63.17	100	42
3	7.78790	-10.27	16.12	5.85	69.54	-63.69	100	42
4	14.32130	-9.96	17.80	7.84	69.54	-61.70	100	47
5	16.52650	-10.06	16.29	6.23	69.54	-63.31	100	142
6	20.22410	-10.51	15.36	4.85	69.54	-64.69	100	2
7	24.63820	-10.08	15.56	5.48	69.54	-64.06	100	225

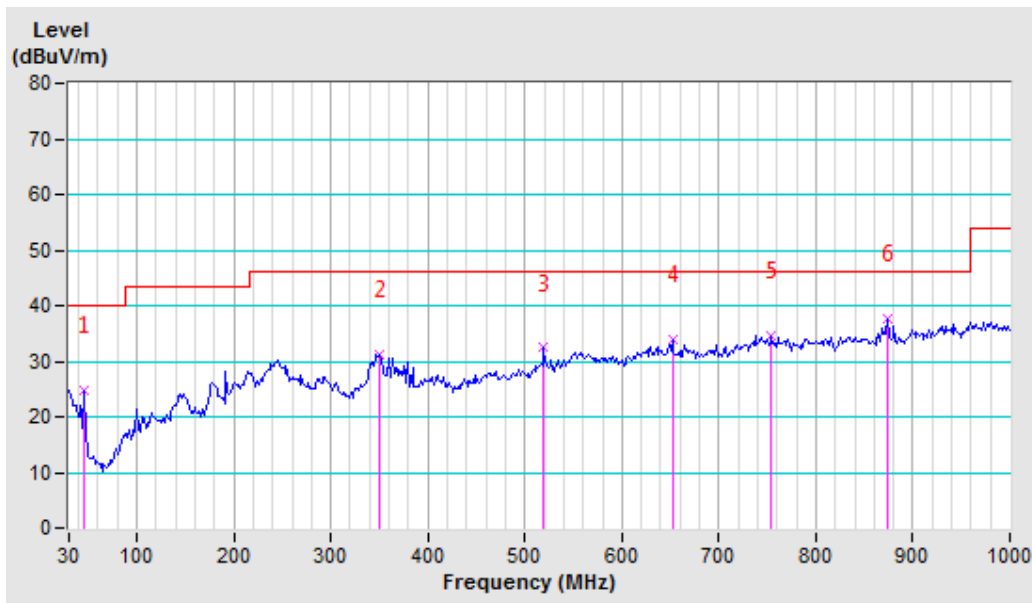
REMARKS: 1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
2. Negative sign (-) in the margin column signify levels below the limit.
3. Frequency range scanned: 0.15-30MHz
4. Only emissions significantly above equipment noise floor are reported.



TEST MODE	Card reader normal Working	FREQUENCY RANGE	30-1000MHz
TEST VOLTAGE	DC 12V from Adapter	DETECTOR FUNCTION & RESOLUTION BANDWIDTH	Quasi-Peak, 120kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 55% RH	TESTED BY: Arnold	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Correction Factor (dB/m)	Raw Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
1	45.54	-13.92	38.60	24.68	40.00	-15.32	200	0
2	350.22	-4.29	35.63	31.34	46.00	-14.66	200	0
3	519.66	0.42	32.01	32.43	46.00	-13.57	200	0
4	651.79	3.15	30.81	33.96	46.00	-12.04	200	0
5	754.39	4.95	29.76	34.71	46.00	-11.29	200	0
6	874.09	5.79	31.81	37.60	46.00	-8.40	200	0

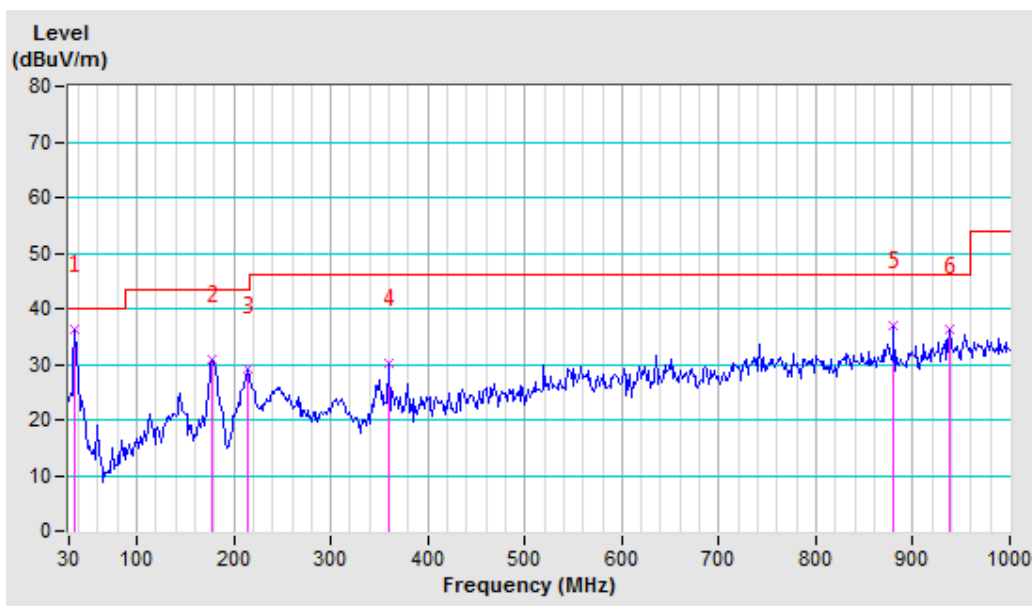
- REMARKS:**
1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
 2. Negative sign (-) in the margin column signify levels below the limit.
 3. Frequency range scanned: 30MHz to 1000MHz.
 4. Only emissions significantly above equipment noise floor are reported.



TEST MODE	Card reader normal Working	FREQUENCY RANGE	30-1000MHz
TEST VOLTAGE	DC 12V from Adapter	DETECTOR FUNCTION & RESOLUTION BANDWIDTH	Quasi-Peak, 120kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 55% RH	TESTED BY: Arnold	

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Correction Factor (dB/m)	Raw Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
1	36.22	-8.49	44.71	36.22	40.00	-3.78	100	0
2	177.68	-12.40	43.19	30.79	43.50	-12.71	100	0
3	214.98	-12.29	41.35	29.06	43.50	-14.44	100	0
4	359.55	-4.18	34.38	30.20	46.00	-15.80	100	0
5	880.30	5.46	31.65	37.11	46.00	-8.89	100	0
6	937.82	7.16	28.96	36.12	46.00	-9.88	100	0

- REMARKS:**
1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
 2. Negative sign (-) in the margin column signify levels below the limit.
 3. Frequency range scanned: 30MHz to 1000MHz.
 4. Only emissions significantly above equipment noise floor are reported.



4.3. 20dB BANDWIDTH

4.3.1 LIMITS OF 20dB BANDWIDTH

Reporting only.

4.3.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Power Sensor	Keysight	U2021XA	MY55060016	May 19,17	May 18,18
Power Sensor	Keysight	U2021XA	MY55060018	May 19,17	May 18,18
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 21, 17	Oct.20, 18
Humid & Temp Programmable Tester	Haida	HD-2257	110807201	Sep.05,17	Sep. 04,18
Oscilloscope	Agilent	DSO9254A	MY51260160	Nov. 08,17	Nov. 07,18
Signal Analyzer	Rohde & Schwarz	FSV7	102331	Nov. 04,17	Nov. 03,18
Signal Generator	Agilent	N5183A	MY50140980	Nov. 04,17	Nov. 03,18
Agile Signal Generator	Agilent	8645A	Agilent	Sep.01, 17	Aug.31, 18
Spectrum Analyzer	Keysight	N9020A	MY55400499	Apr. 10,17	Apr. 09,18
MXG-B RF Vector Signal Generator	Keysight	N5182B	MY56200288	Dec.05, 17	Dec. 04, 18
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	Aug.10, 17	Aug.09, 18
Attenuator	MINI	BW-S10W2+	S130129FGE2	N/A	N/A
DC Source	Keysight	E3642A	MY56146098	N/A	N/A

NOTE:

1. The test was performed in RF Oven room.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

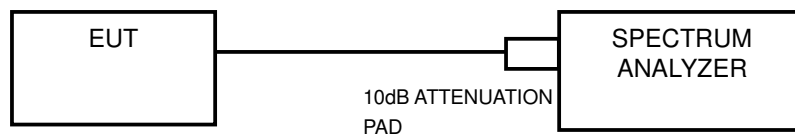
4.3.3 TEST PROCEDURE

- a. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- c. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
- d. Repeat above procedures until all frequencies measured were complete.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation.

4.3.5 TEST SETUP



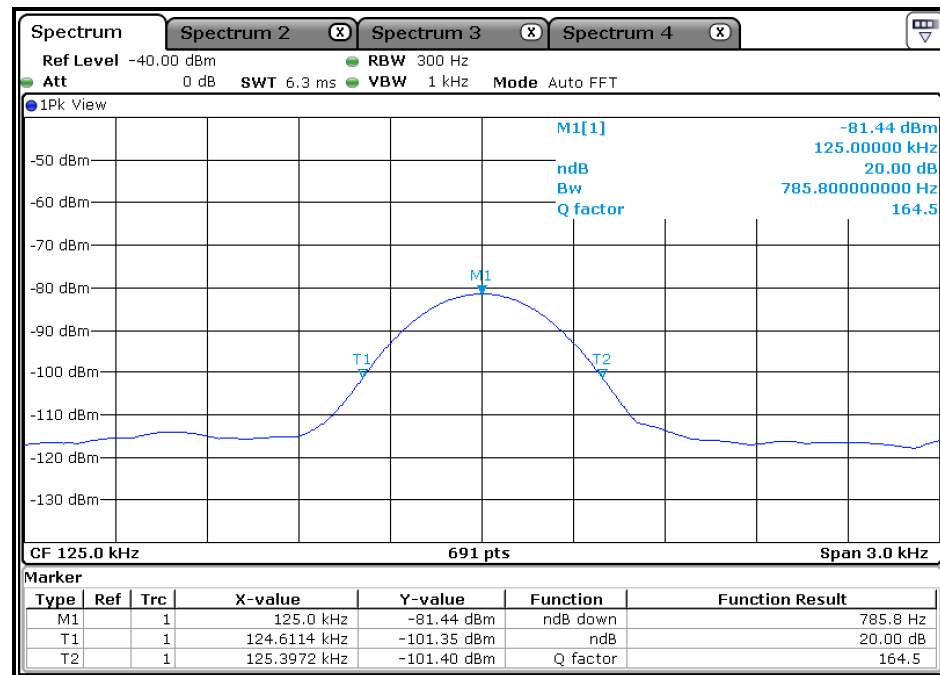
4.3.6 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously.

4.3.7 TEST RESULTS

CHANNEL	CHANNEL FREQUENCY (KHz)	20dB BANDWIDTH (Hz)
1	125	785.8

Lower & Upper Test Frequency Point (MHz)	Test Frequency (KHz)	P/F
Lower	124.6114	PASS
Upper	125.3972	PASS





Test Report No.: RF171227N010

5 PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).



Test Report No.: RF171227N010

6 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications were made to the EUT by the lab during the test.

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