FCC 47 CFR PART 15 SUBPART C

CERTIFICATION TEST REPORT

For

Enrollment Station

MODEL NUMBER: DS-K1F600U-D6E-F

ADDITIONAL MODEL NUMBER:
DS-K1F600U-D6E, DS-K1F600U-D6E-FUHK, DS-K1F600U-D6E-FCKV, DS-K1F600U-D6E-FUVS, DS-K1F600U-D6E-FKVO, DS-K1F600U-D6E-FHUN, DS-K1F600U-D6EUHK, DS-K1F600U-D6ECKV,DS-K1F600U-D6EUVS, DS-K1F600U-D6EKVO, DS-K1F600U-D6EHUN

PROJECT NUMBER: 4789684577

REPORT NUMBER: 4789684577-7

FCC ID: 2ADTD-K1F600U-D6E-F

ISSUE DATE: Nov. 10, 2020

Prepared for

HANGZHOU HIKVISION DIGITAL TECHNOLOGY CO., LTD.

Prepared by

UL-CCIC COMPANY LIMITED

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The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing period only and are not to be used to indicate applicability to other similar products.

Revision History

Rev.	Issue Date	Revisions	Revised By
V0	11/10/2020	Initial Issue	

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Summary of Test Results			
Clause	Test Items	FCC Rules	Test Results
1	Transmitter AC Conducted Emissions	Part 15.207	PASS
2	Transmitter Radiated Emissions	Part 15.209(a)	PASS
3	Transmitter 20dB Bandwidth	Part 15.215 (c)	PASS

Remark:
1) The measurement result for the sample received is <Pass> according to < ANSI C63.10-2013, FCC CFR 47 Part 2, FCC CFR 47 Part 15> when <Accuracy Method> decision rule is applied.
2) Tested with and without tag in field during the investigation. Only the worse case (with tag) result has been recorded in the report.

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1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name:	HANGZHOU HIKVISION DIGITAL TECHNOLOGY CO., LTD.
Address:	No.555 Qianmo Road,Binjiang District Hangzhou 310052,China

Manufacturer Information

Company Name:	HANGZHOU HIKVISION DIGITAL TECHNOLOGY CO., LTD.
Address:	No.555 Qianmo Road,Binjiang District Hangzhou 310052,China

Factory Information-1

Company Name:	Hangzhou Hikvision Technology Co., Ltd.
Address:	No.700,DongliuRoad, Binjiang District, Hangzhou Ctiy,Zhejiang, 310052, China.

Factory Information-2

Company Name:	Hangzhou Hikvision Technology Co., Ltd.
Address:	No.700,DongliuRoad, Binjiang District, Hangzhou Ctiy,Zhejiang, 310052, China.

Factory Information-3

Company Name:	Hangzhou Hikvision Technology Co., Ltd.
Address:	No.700,DongliuRoad, Binjiang District, Hangzhou Ctiy,Zhejiang, 310052, China.

EUT Description

Product Name	Enrollment Station
Model Name	DS-K1F600U-D6E-F
Additional No.	DS-K1F600U-D6E, DS-K1F600U-D6E-FUHK, DS-K1F600U-D6E-FCKV, DS-K1F600U-D6E-FUVS, DS-K1F600U-D6E-FKVO, DS-K1F600U-D6E-FHUN, DS-K1F600U-D6EUHK, DS-K1F600U-D6ECKV, DS-K1F600U-D6EUVS, DS-K1F600U-D6EKVO, DS-K1F600U-D6EHUN
Sample Number	3393879
Data of Receipt Sample	Oct. 26, 2020
Date Tested	Oct. 26, 2020 ~ Nov. 10, 2020

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APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	PASS

Prepared By:

Jason Yang
Engineer

Reviewed By:

Tom Tang
Engineer Project Associate

Authorized By:

Chris Zhong
Laboratory Leader

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2013, FCC CFR 47 Part 2, FCC CFR 47 Part 15 , KDB414788 D01 Radiated Test Site v01r01.

3. FACILITIES AND ACCREDITATION

Accreditation Certificate	**A2LA (Certificate No.: 4829.01)** **UL-CCIC COMPANY LIMITED has been assessed and proved to be in compliance with A2LA.** **FCC (FCC Designation No.: CN1247)** **UL-CCIC COMPANY LIMITED has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules.** **IC (IC Designation No.: 25056)** **UL-CCIC COMPANY LIMITED has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules.**

Note 1: All tests measurement facilities use to collect the measurement data are located at No. 2, Chengwan Road, Suzhou Industrial Park, Suzhou 215122, People's Republic of China

Note 2: For below 30MHz, lab had performed measurements at test anechoic chamber and comparing to measurements obtained on an open field site. These measurements below 30MHz had been correlated to measurements performed on an OFS.

Note 3: The test anechoic chamber in UL-CCIC COMPANY LIMITED had been calibrated and compared to the open field sites and the test anechoic chamber is shown to be equivalent to or worst case from the open field site.

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4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognize national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test Item	Uncertainty
Conduction emission	3.1dB
Radiation Emission test(include Fundamental emission) (9KHz-30MHz)	3.3dB
Radiation Emission test(include Fundamental emission) (30MHz-1GHz)	3.3dB
Radiation Emission test (1GHz to 26GHz)(include Fundamental emission)	3.9dB (1GHz-18Gz)
	4.2dB (18GHz-26.5Gz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

Product Name:	Enrollment Station
Model No.:	DS-K1F600U-D6E-F
Sample Type:	Fixed production

Remak: The EUT has 13.56MHz NFC and 125KHz function, but the 13.56MHz NFC and 125KHz can not operate at the same time.

Remark:
Model No.:

No.:	Name:	No.:	Name:	No.:	Name:
1	DS-K1F600U-D6E	2	DS-K1F600U-D6E-FUHK	3	DS-K1F600U-D6E-FCKV
4	DS-K1F600U-D6E-FUVS	5	DS-K1F600U-D6E-FKVO	6	DS-K1F600U-D6E-FHUN
7	DS-K1F600U-D6EUHK	8	DS-K1F600U-D6ECKV	9	DS-K1F600U-D6EUVS
10	DS-K1F600U-D6EKVO	11	DS-K1F600U-D6EHUN		

Only the main model DS-K1F600U-D6E-F was tested and only the data of this model is shown in this test report. Since Their electrical circuit design, layout, components used and internal wiring are identical, only the model name and software are different.

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5.2. MAXIMUM OUTPUT POWER

Frequency (MHz)	Number of Transmit Chains (NTX)	Frequency (MHz)	Channel Number	Max Power (dBμV/m)
0.125	1	0.125	1	-23.00

5.3. CHANNEL LIST

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	0.125	2	N/A	3	N/A	4	N/A

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

Ant.	Frequency (MHz)	Antenna Type	Antenna Gain (dBi)
1	0.125	PCB Antenna	0

Frequency (MHz)	Transmit and Receive Mode	Description
0.125	☒1TX, 1RX	Chain 1 can be used as transmitting/receiving antenna.

Remark: For the product, there is only one work mode and channel, and only data of the one mode was test and recorded in the report.

5.5. TEST ENVIRONMENT

Environment Parameter	Selected Values During Tests	
Relative Humidity	55 ~ 65%	
Atmospheric Pressure:	1025Pa	
Temperature	TN	TN
Voltage :	VL	VL
	VN	VN
	VH	VH

Note: VL= Lower Extreme Test Voltage
VN= Nominal Voltage
VH= Upper Extreme Test Voltage
TN= Normal Temperature

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5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	Description
1	Laptop	ThinkPad	E590	N/A
2	USB Flash Disk	SanDisk	N/A	N/A
3	PSAM1 Card	N/A	N/A	Supply by customer
4	PSAM2 Card	N/A	N/A	Supply by customer
5	PSAM3 Card	N/A	N/A	Supply by customer
6	PSAM4 Card	N/A	N/A	Supply by customer

I/O PORT

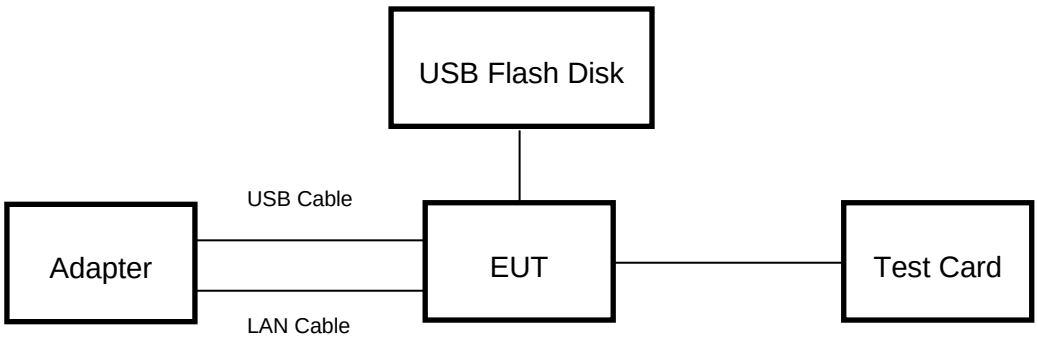
Cable No	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
1	USB	USB to TTL	USB	100cm Length	N/A
2	LAN	LAN	LAN	100cm Length	N/A
3	USB	USB	USB	100cm Length	N/A

ACCESSORY

Item	Accessory	Brand Name	Model Name	Description
1	DC Adapter	HONOTO	ADS-26FSG-12 12018EPG	INPUT:100-240V~50/60Hz 0.7A Max OUTPUT:12.0V⎓1.5A 18.0W

The EUT can continue work normally when a card touched.

SETUP DIAGRAM FOR TESTS



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5.7. MEASURING INSTRUMENT AND SOFTWARE USED

Conducted Emissions (Instrument**)**							
Used	Equipment	Manufacturer	Model No.	Serial No.	Upper Last Cal.	Last Cal.	Next Cal.
☑	EMI Test Receiver	R&S	ESR3	126700	2018-12-13	2019-12-12	2020-12-11
☑	Two-Line V-Network	R&S	ENV216	126701	2018-12-13	2019-12-12	2020-12-11
☑	Artificial Mains Networks	R&S	ENY81	126711	2018-12-13	2019-12-12	2020-12-11

Software					
Used	Description	Manufacturer	Name	Version	
☑	Test Software for Conducted disturbance	R&S	EMC32	Ver. 9.25	

Radiated Emissions (Instrument**)**							
Used	Equipment	Manufacturer	Model No.	Serial No.	Upper Last Cal.	Last Cal.	Next Cal.
☑	Spectrum Analyzer	Keysight	N9010B	MY57110128	2019-05-29	2020-05-10	2021-05-09
☑	EMI test receiver	R&S	ESR26	1267603	2018-12-13	2019-12-22	2020-12-21
☑	Receiver Antenna (9kHz-30MHz)	Schwarzbeck	FMZB 1513	513-265	N/A	2018-06-15	2021-06-14
☑	Receiver Antenna (30MHz-1GHz)	SunAR RF Motion	JB1	126704	N/A	2019-01-28	2022-01-27
☑	Pre-amplification (To 1GHz)	R&S	SCU-03D	134666	2019-02-06	2020-02-05	2021-02-04

Software					
Used	Description	Manufacturer	Name	Version	
☑	Test Software for Radiated disturbance	Tonscend	JS32	V1.0	

Other instruments							
Used	Equipment	Manufacturer	Model No.	Serial No.	Upper Last Cal.	Last Cal.	Next Cal.
☑	Spectrum Analyzer	Keysight	N9010B	MY57110128	2019-05-29	2020-05-10	2021-05-09
☑	Power Meter	Keysight	U2021XA	MY57110002	2019-06-12	2020-05-10	2021-05-09

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6. ANTENNA PORT TEST RESULTS

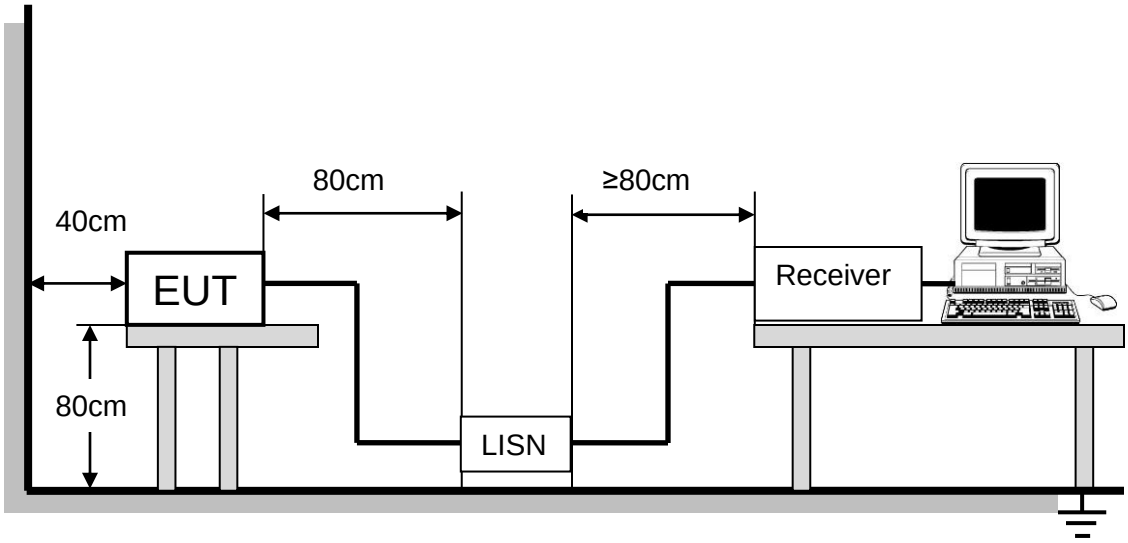
6.1. AC Conducted Spurious Emissions

LIMITS

FCC Reference:	Part 15.207
Test Method Used:	ANSI C63.10 Section 6.2

FREQUENCY (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

TEST SETUP AND PROCEDURE



The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI Measurement Receiver (R&S Test Receiver ESR3) is used to test the emissions from both sides of AC line. According to the requirements in Section 6.2 of ANSI C63.10-2003.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9kHz.
The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application.

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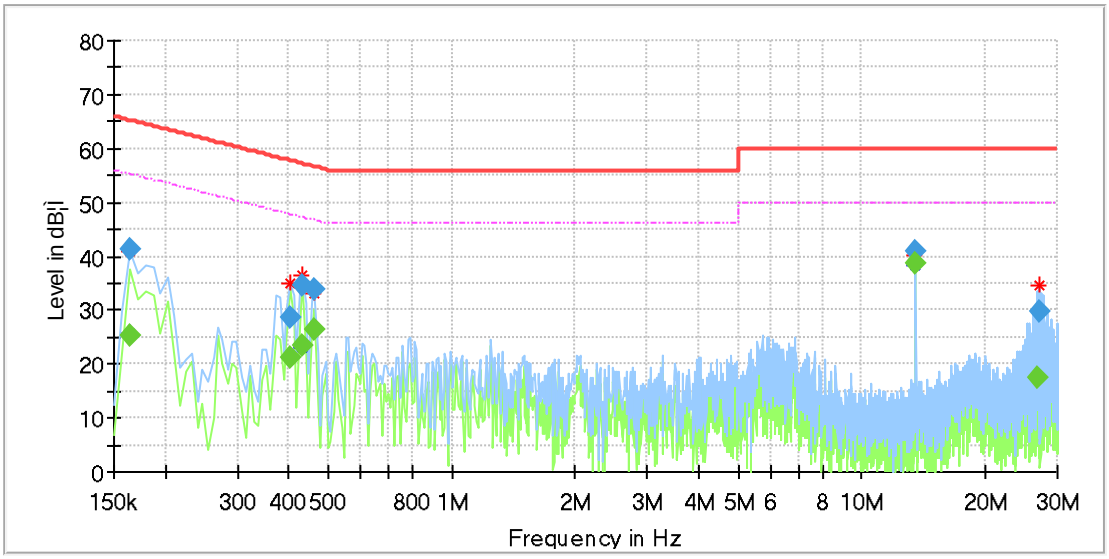
TEST ENVIRONMENT

Temperature	22°C	Relative Humidity	56%
Atmosphere Pressure	101kPa	Test Voltage	AC 120V

RESULTS WITH THE ANTENNA CONNECTED

LINE L RESULTS (WORST-CASE CONFIGURATION)



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.164925	---	25.29	55.21	29.92	1000.0	9.000	L1	OFF	9.4
0.164925	41.34	---	65.21	23.87	1000.0	9.000	L1	OFF	9.4
0.403725	---	21.09	47.78	26.69	1000.0	9.000	L1	OFF	9.7
0.403725	28.48	---	57.78	29.29	1000.0	9.000	L1	OFF	9.7
0.433575	---	23.49	47.18	23.70	1000.0	9.000	L1	OFF	9.7
0.433575	34.65	---	57.18	22.54	1000.0	9.000	L1	OFF	9.7
0.463425	33.98	---	56.63	22.65	1000.0	9.000	L1	OFF	9.7
0.463425	---	26.34	46.63	20.29	1000.0	9.000	L1	OFF	9.7
13.560113	41.11	---	60.00	18.89	1000.0	9.000	L1	OFF	9.6
13.560113	---	38.67	50.00	11.33	1000.0	9.000	L1	OFF	9.6
26.686650	---	17.57	50.00	32.43	1000.0	9.000	L1	OFF	10.2
27.209025	29.77	---	60.00	30.23	1000.0	9.000	L1	OFF	10.2

Note: 1. Result = Reading +Correct Factor.
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).
4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

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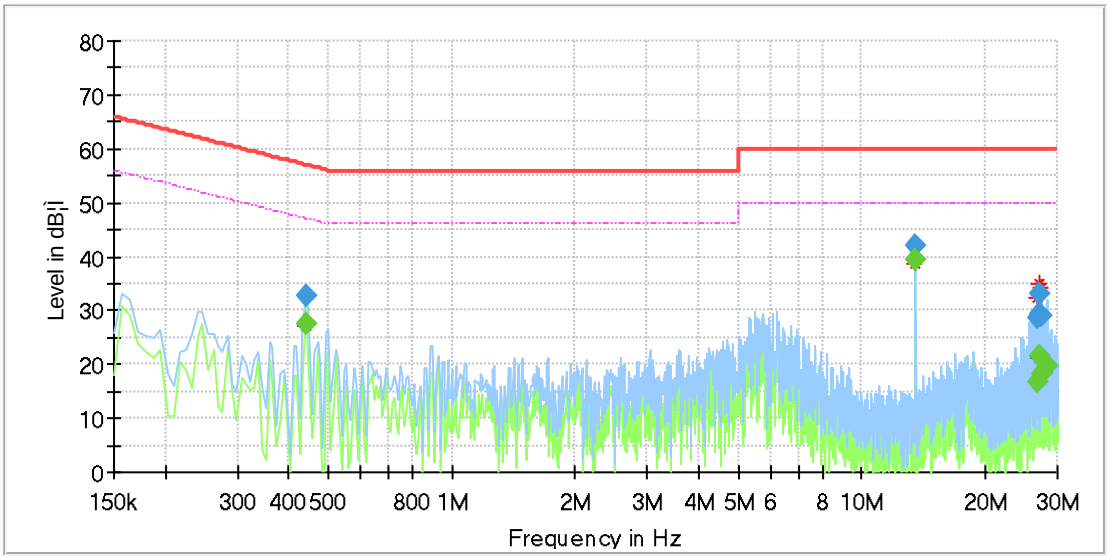
LINE N RESULTS (WORST-CASE CONFIGURATION)



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.441038	---	27.38	47.04	19.67	1000.0	9.000	N	OFF	9.6
0.441038	32.90	---	57.04	24.14	1000.0	9.000	N	OFF	9.6
13.560113	---	39.27	50.00	10.73	1000.0	9.000	N	OFF	9.7
13.560113	42.11	---	60.00	17.89	1000.0	9.000	N	OFF	9.7
26.746350	---	16.69	50.00	33.31	1000.0	9.000	N	OFF	10.0
26.746350	28.78	---	60.00	31.22	1000.0	9.000	N	OFF	10.0
27.007538	29.52	---	60.00	30.48	1000.0	9.000	N	OFF	10.0
27.238875	---	21.48	50.00	28.52	1000.0	9.000	N	OFF	10.0
27.238875	32.98	---	60.00	27.02	1000.0	9.000	N	OFF	10.0
27.522450	---	18.06	50.00	31.94	1000.0	9.000	N	OFF	10.1
27.522450	29.18	---	60.00	30.82	1000.0	9.000	N	OFF	10.1
28.403025	---	19.60	50.00	30.40	1000.0	9.000	N	OFF	10.1

Note: 1. Result = Reading +Correct Factor.
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).
4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

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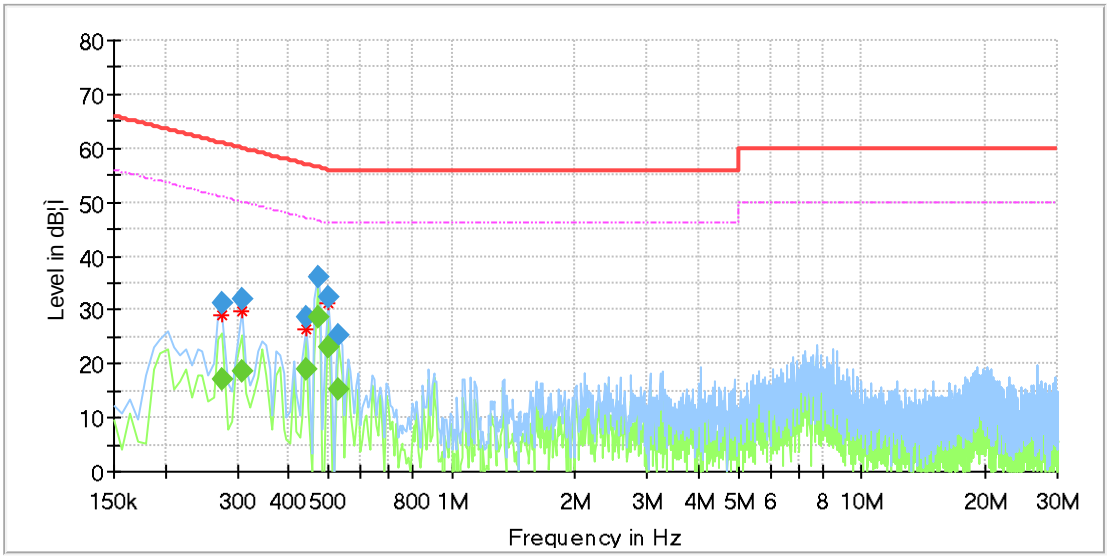
RESULTS WITH A DUMMY LOAD IN LIEU OF THE ANTENNA

LINE L RESULTS (WORST-CASE CONFIGURATION)



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.276863	---	16.97	50.91	33.94	1000.0	9.000	L1	OFF	9.5
0.276863	31.32	---	60.91	29.59	1000.0	9.000	L1	OFF	9.5
0.306713	---	18.60	50.06	31.46	1000.0	9.000	L1	OFF	9.6
0.306713	31.85	---	60.06	28.21	1000.0	9.000	L1	OFF	9.6
0.441038	---	19.13	47.04	27.91	1000.0	9.000	L1	OFF	9.7
0.441038	28.80	---	57.04	28.25	1000.0	9.000	L1	OFF	9.7
0.470888	36.17	---	56.50	20.32	1000.0	9.000	L1	OFF	9.7
0.470888	---	28.80	46.50	17.70	1000.0	9.000	L1	OFF	9.7
0.500738	32.42	---	56.00	23.58	1000.0	9.000	L1	OFF	9.7
0.500738	---	23.22	46.00	22.78	1000.0	9.000	L1	OFF	9.7
0.530588	---	15.36	46.00	30.64	1000.0	9.000	L1	OFF	9.7
0.530588	25.40	---	56.00	30.60	1000.0	9.000	L1	OFF	9.7

Note: 1. Result = Reading +Correct Factor.
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).
4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

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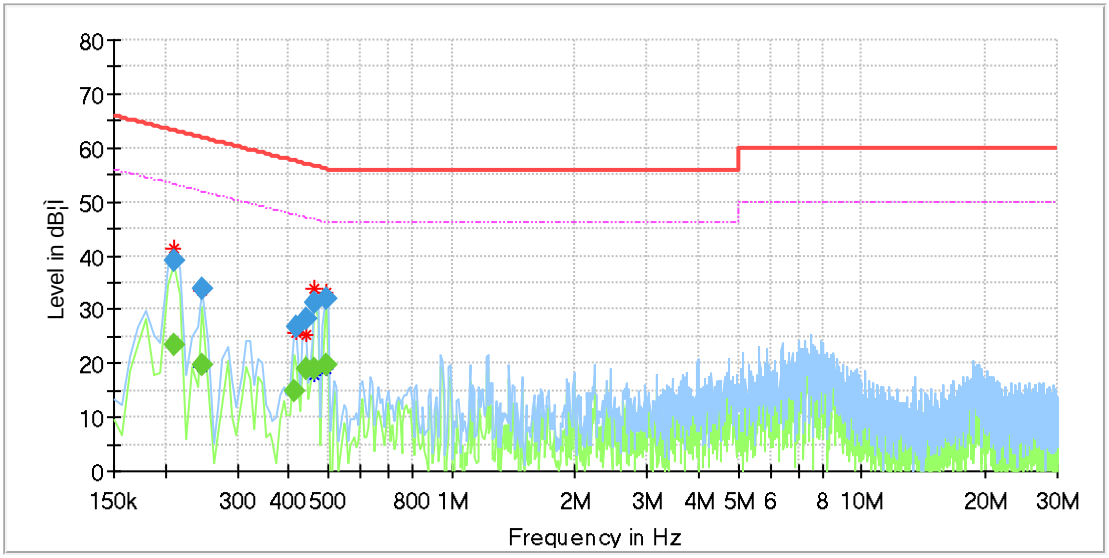
LINE N RESULTS (WORST-CASE CONFIGURATION)



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.209700	---	23.58	53.22	29.63	1000.0	9.000	N	OFF	9.6
0.209700	39.17	---	63.22	24.05	1000.0	9.000	N	OFF	9.6
0.247013	---	19.74	51.86	32.11	1000.0	9.000	N	OFF	9.6
0.247013	33.83	---	61.86	28.03	1000.0	9.000	N	OFF	9.6
0.411188	---	15.05	47.62	32.58	1000.0	9.000	N	OFF	9.6
0.418650	26.90	---	57.48	30.57	1000.0	9.000	N	OFF	9.6
0.441038	28.20	---	57.04	28.84	1000.0	9.000	N	OFF	9.6
0.441038	---	18.93	47.04	28.11	1000.0	9.000	N	OFF	9.6
0.463425	31.36	---	56.63	25.27	1000.0	9.000	N	OFF	9.6
0.463425	---	18.97	46.63	27.66	1000.0	9.000	N	OFF	9.6
0.493275	---	19.56	46.11	26.55	1000.0	9.000	N	OFF	9.6
0.493275	31.83	---	56.11	24.28	1000.0	9.000	N	OFF	9.6

Note: 1. Result = Reading +Correct Factor.
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).
4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

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6.2. RADIATED EMISSION

TEST PROCEDURE

Fundamental field strength

FCC Reference:	15.209(a)
Test Method Used:	ANSI C63.10 Sections 6.3, 6.4 and 6.5

2. The limit is specified at a test distance of 30 meters. However, as specified by FCC Section 15.31 (f)(2) / RSS-Gen Section 6.4, measurements may be performed at a closer distance and the measured level corrected to the specified measurement distance by using the square of an inverse linear distance extrapolation factor (40dB/decade).

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Radiation Disturbance Test Limit for FCC (Class B)(9KHz-1GHz)

Frequency (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
960~1000	500	3

Note: 1) At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

(2) At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). This paragraph (f) shall not apply to Access BPL devices operating below 30 MHz.

Restricted bands of operation

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1]0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	([2])
13.36-13.41			

Note: [1]Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
[2]Above 38.6c

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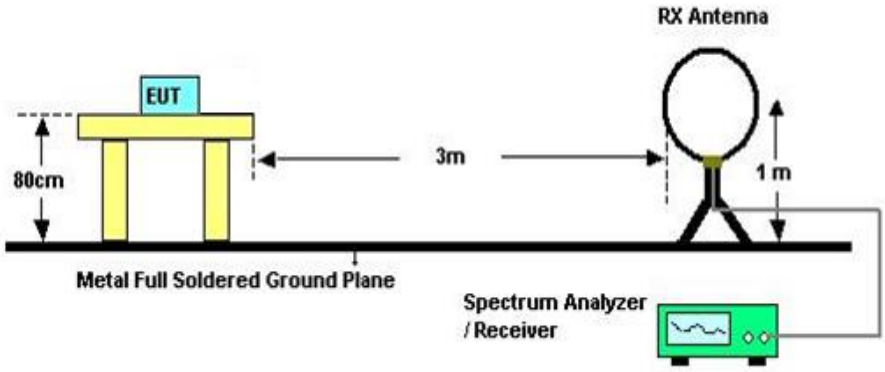
FCC Reference:	Parts 15.231(b) / 15.209
Test Method Used:	ANSI C63.10 Sections 6.3 and 6.5

TEST SETUP

Below 30MHz



The setting of the spectrum analyser

RBW	200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz)
VBW	200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz)
Sweep	Auto
Detector	Peak/QP/ Average
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013

2. The EUT was arranged to its worst case and then turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both Horizontal, Face-on and Face-off polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 80cm meter above ground.

4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a 1m height antenna tower.

5. The radiated emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

6. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

7. Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30m OFS. Therefore sufficient tests were made to

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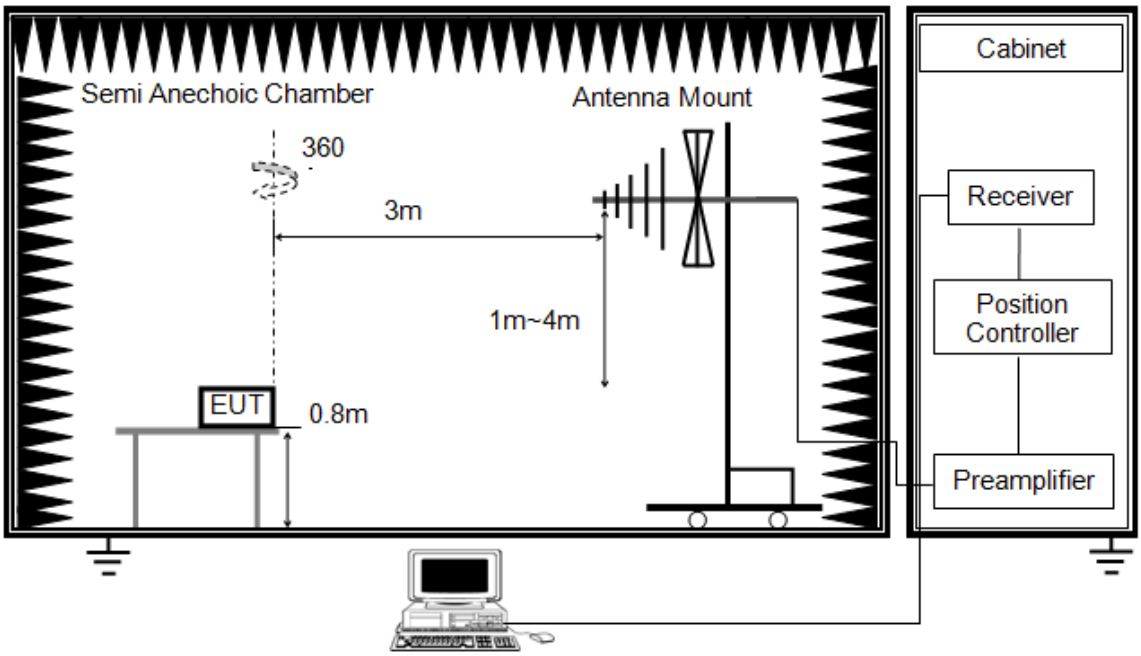
demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.

Below 1G



The setting of the spectrum analyser

RBW	120K
VBW	300K
Sweep	Auto
Detector	Peak/QP
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013.

2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 0.8 meter above ground.

4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

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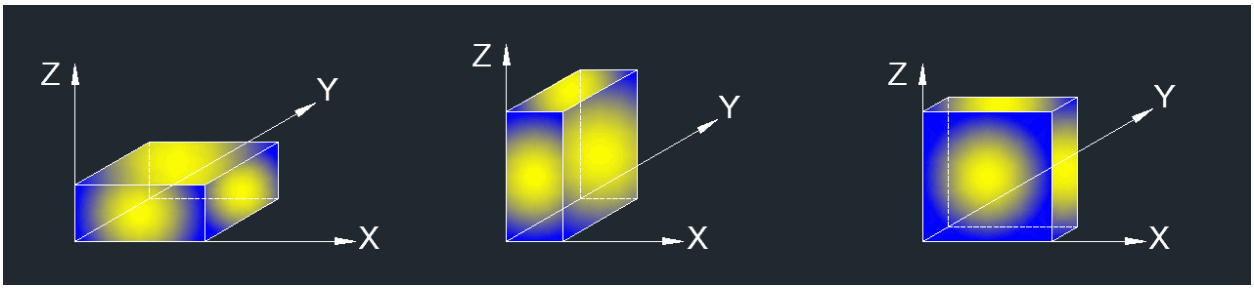
X axis, Y axis, Z axis positions:



Note: For all radiated test, EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

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RESULTS

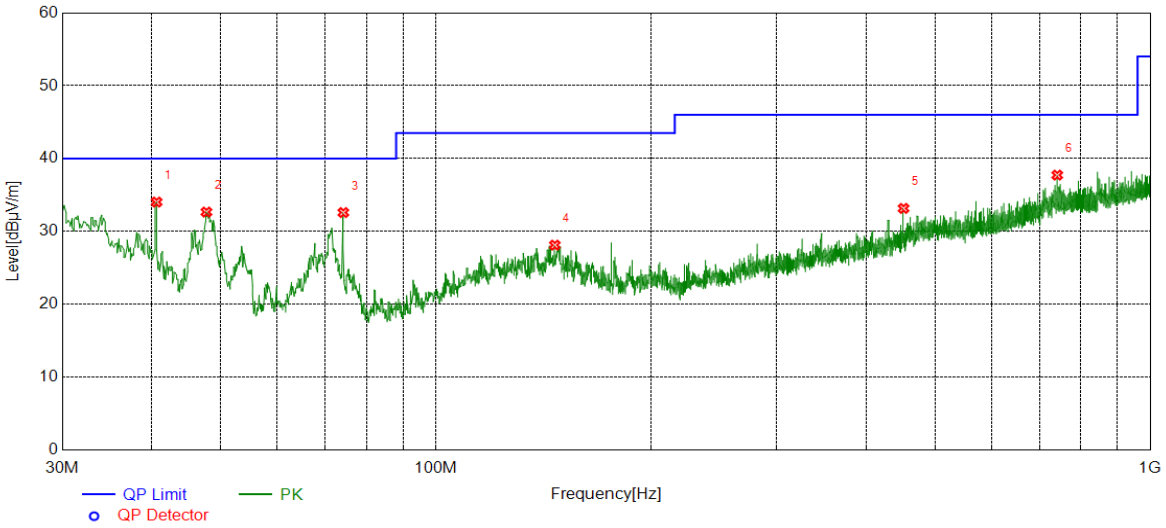
TEST ENVIRONMENT

Temperature	22°C	Relative Humidity	56%
Atmosphere Pressure	101kPa	Test Voltage	AC120V

Remark: Through pre-testing all test polarizations, including Horizontal, Face-on and Face-off polarizations of the antenna, but only the data of the worst case is included in this test report.

6.2.1. SPURIOUS EMISSIONS BELOW 1G

Horizontal



No.	Frequency (MHz)	Reading [dBµV/m]	Factor [dB]	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	40.6711	13.66	20.37	34.03	40.00	-5.97	peak
2	47.7528	16.61	16.05	32.66	40.00	-7.34	peak
3	74.2364	17.82	14.77	32.59	40.00	-7.41	peak
4	146.7997	8.30	19.82	28.12	43.50	-15.38	peak
5	451.6042	8.54	24.62	33.16	46.00	-12.84	peak
6	741.1781	8.71	29.02	37.73	46.00	-8.27	peak

Note: 1. Result Level = Read Level + Correct Factor.
2. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.
3. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

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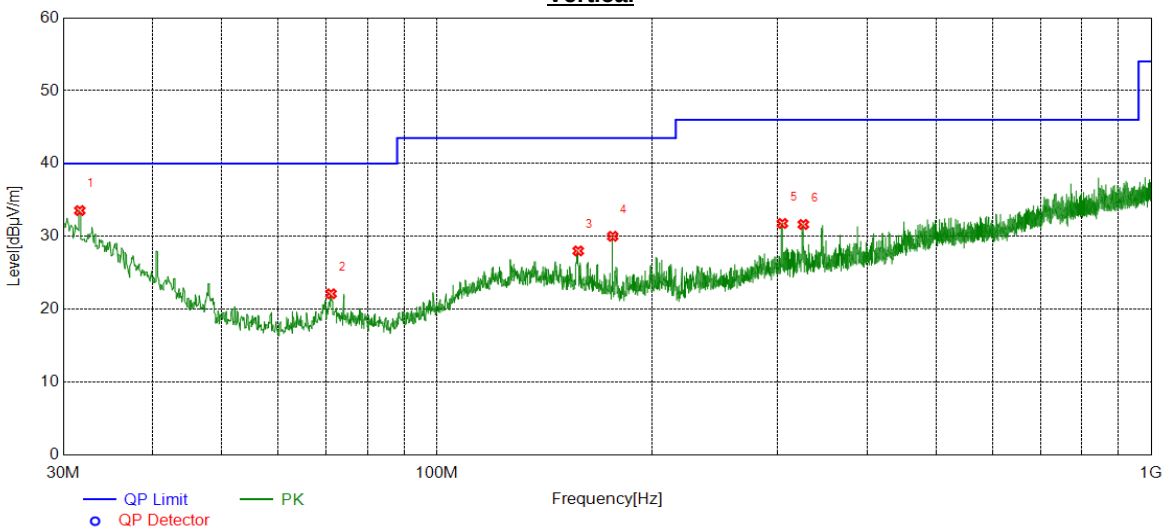
Vertical



No.	Frequency (MHz)	Reading [dBµV/m]	Factor [dB]	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	31.6492	7.40	26.15	33.55	40.00	-6.45	peak
2	71.1321	7.23	14.90	22.13	40.00	-17.87	peak
3	157.7618	8.84	19.17	28.01	43.50	-15.49	peak
4	176.2906	11.71	18.31	30.02	43.50	-13.48	peak
5	304.6345	10.87	20.91	31.78	46.00	-14.22	peak
6	325.8796	10.22	21.42	31.64	46.00	-14.36	peak

Note: 1. Result Level = Read Level + Correct Factor.
2. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.
3. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

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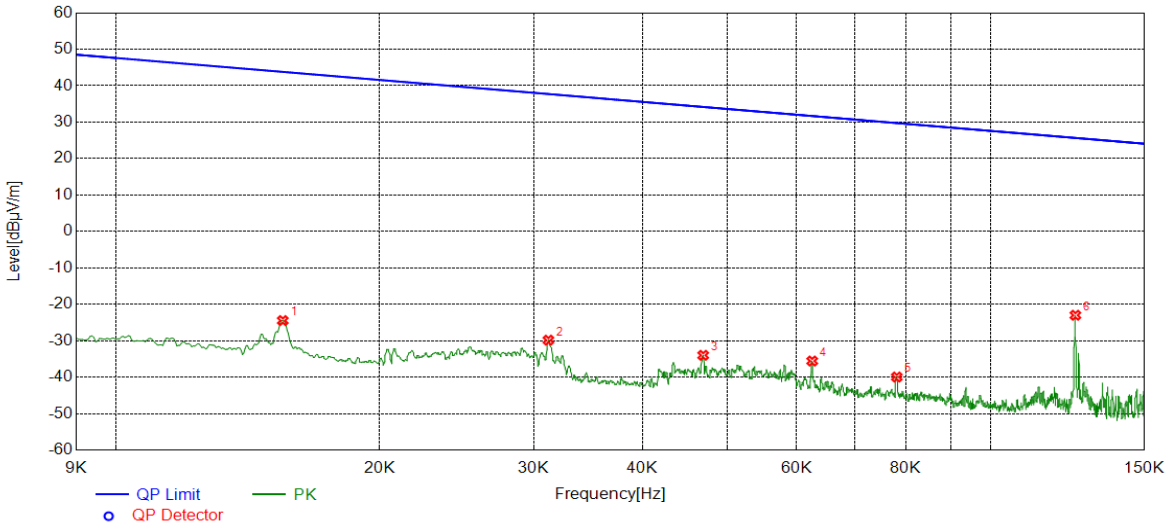
6.2.2. SPURIOUS EMISSIONS BELOW 30M

HORIZONTAL(THE WORST CASE)

9KHz~ 150KHz



No.	Frequency (MHz)	Reading [dBµV/m]	Factor [dB]	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0155	36.41	-60.88	-24.47	43.80	-68.27	peak
2	0.0312	30.97	-60.81	-29.84	37.71	-67.55	peak
3	0.0469	26.92	-60.92	-34.00	34.17	-68.17	peak
4	0.0625	25.57	-61.14	-35.57	31.68	-67.25	peak
5	0.0781	21.29	-61.25	-39.96	29.75	-69.71	peak
6	0.1250	37.94	-60.94	-23.00	25.67	-48.67	peak

Note: 1. Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.
3. All 3 polarizations(Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.
4. The 125kHz NFC can not transmit at the same time with the 13.56MHz NFC, the interval time is 10ms.

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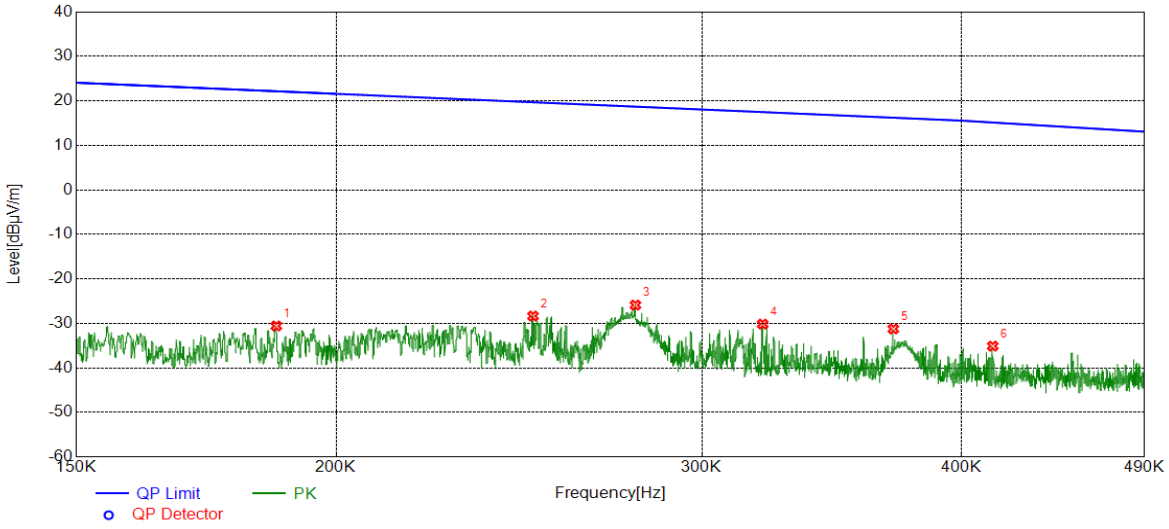
150KHz ~ 490KHz



No.	Frequency (MHz)	Reading [dBµV/m]	Factor [dB]	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.1872	30.47	-61.05	-30.58	22.16	-52.74	peak
2	0.2488	32.39	-60.74	-28.35	19.69	-48.04	peak
3	0.2787	34.83	-60.71	-25.88	18.70	-44.58	peak
4	0.3209	30.52	-60.67	-30.15	17.47	-47.62	peak
5	0.3709	29.39	-60.63	-31.24	16.22	-47.46	peak
6	0.4141	25.49	-60.59	-35.10	15.14	-50.24	peak

Note: 1. Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.
3. All 3 polarizations(Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.

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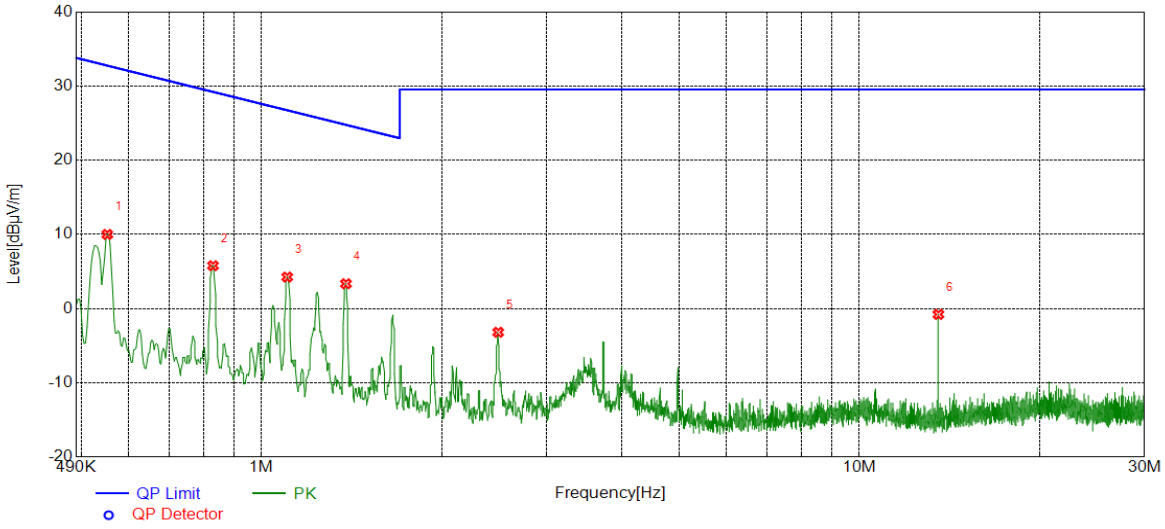
490KHz ~ 30MHz



No.	Frequency (MHz)	Reading [dBµV/m]	Factor [dB]	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.5520	30.54	-20.54	10.00	32.76	-22.76	peak
2	0.8294	26.29	-20.51	5.78	29.23	-23.45	peak
3	1.1039	24.54	-20.29	4.25	26.75	-22.50	peak
4	1.3842	23.60	-20.25	3.35	24.78	-21.43	peak
5	2.4880	17.10	-20.29	-3.19	29.54	-32.73	peak
6	13.5583	18.28	-19.07	-0.79	29.54	-30.33	peak

Note: 1. Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.
3. All 3 polarizations(Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.
4. The 125kHz NFC can not transmit at the same time with the 13.56MHz NFC, the interval time is 10ms.

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6.3. 99%/20dB BANDWIDTH

LIMITS

FCC Part15 (15.247) Subpart C		
Section	Test Item	Limit
Part 15.215 (c)	20 Bandwidth	For reporting purposes only.
RSS-GEN Clause 6.7	99% Bandwidth (Just For refer only)	For reporting purposes only.

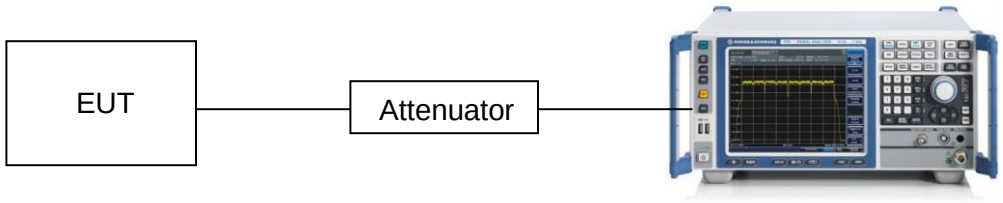
TEST PROCEDURE

Connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	1% to 5% of the occupied bandwidth
VBW	approximately 3×RBW
Trace	Max hold
Sweep	Auto couple

Allow the trace to stabilize and measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 99% relative to the maximum level measured in the fundamental emission.

TEST SETUP



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TEST ENVIRONMENT

Temperature	23°C	Relative Humidity	56%
Atmosphere Pressure	102kPa	Test Voltage	AC120V

RESULTS

Frequency (MHz)	99% bandwidth (KHz)	20dB bandwidth (KHz)
0.125	2.287	2.694

Remark: Because the measured signal is CW or CW-like adjusting the RBW per C63.10 would not be practical since measured bandwidth will always follow the RBW and the result will be approximately twice the RBW. And the signal was narrowband, therefore it was impossible to set RBW within 1% – 5%.

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7. ANTENNA REQUIREMENTS

PPLICABLE REQUIREMENTS

Please refer to FCC §15.203

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule.

ANTENNA CONNECTOR

EUT has an PCB antenna without antenna connector.

ANTENNA GAIN

The antenna gain of EUT is less than 6 dBi.

END OF REPORT

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