

# Johnson Health Tech. Co., Ltd.

# RF TEST REPORT

## **Report Type:**

FCC Part 15.225 RF report

#### Model:

TOUCH-02-C, TOUCH XL-02-C, Virtual training-02-C

#### **REPORT NUMBER:**

221100599SHA-001

#### **ISSUE DATE:**

August 24, 2023

## DOCUMENT CONTROL NUMBER:

TTRFFCCPART15C V1 © 2018 Intertek





Intertek Testing Services Shanghai Building No.86, 1198 Qinzhou Road (North) Caohejing Development Zone Shanghai 200233, China

Telephone: 86 21 6127 8200

www.intertek.com

Report no.: 221100599SHA-001

**Applicant**: Johnson Health Tech. Co., Ltd.

No. 999, Sec. 2, Dongda Rd., Daya Dist., Taichung City 428, China.

Manufacturer : Same as applicant

Factory 1 : Same as applicant

Factory 2 Johnson Industries (Shanghai) CO., LTD.

2217 hechen highway, JIADING DISTRICT, Shanghai, China

FCC ID : TN7TOUCH-02

#### **SUMMARY:**

The equipment complies with the requirements according to the following standard(s) or Specification:

47CFR Part 15 (2021): Radio Frequency Devices (Subpart C)

ANSI C63.10 (2020): American National Standard of Procedures for Compliance Testing of Unlicensed

Wireless Devices

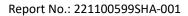
Project Engineer
Eric Li

REVIEWED BY:

REVIEWED BY:

Reviewer
Wakeyou Wang

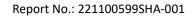
This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.



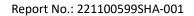


# **Content**

RE	VISIO	ON HISTORY	5		
M	EASU	JREMENT RESULT SUMMARY	6		
1	G	GENERAL INFORMATION	7		
	1.1	DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)	7		
	1.2	TECHNICAL SPECIFICATION	7		
	1.3	DESCRIPTION OF TEST FACILITY	8		
2	Т	EST SPECIFICATIONS	9		
	2.1	STANDARDS OR SPECIFICATION	g		
	2.2	MODE OF OPERATION DURING THE TEST	9		
	2.3	TEST SOFTWARE LIST	g		
	2.4	TEST PERIPHERALS LIST			
	2.5	TEST ENVIRONMENT CONDITION:			
	2.6	Instrument list			
	2.7	MEASUREMENT UNCERTAINTY	12		
3	F	UNDAMENTAL EMISSION	13		
	3.1	LIMIT	13		
	3.2	MEASUREMENT PROCEDURE	13		
	3.3	TEST CONFIGURATION	14		
	3.4	TEST RESULTS OF FUNDAMENTAL EMISSIONS	15		
4	S	PURIOUS EMISSION	16		
	4.1	LIMIT	16		
	4.2	MEASUREMENT PROCEDURE			
	4.3	TEST CONFIGURATION	17		
	4.4	TEST RESULTS OF RADIATED EMISSIONS	19		
5	F	REQUENCY STABILITY (TEMPERATURE VARIATION)	<b>2</b> 4		
	5.1	TEST LIMIT	24		
	5.2	TEST CONFIGURATION			
	5.3	TEST PROCEDURE AND TEST SETUP			
	5.4	TEST PROTOCOL	25		
6	FI	REQUENCY STABILITY (VOLTAGE VARIATION)	26		
	6.1	TEST LIMIT	26		
	6.2	TEST CONFIGURATION			
	6.3	TEST PROCEDURE AND TEST SETUP			
	6.4	TEST PROTOCOL			
7	C	CONDUCTED EMISSIONS	28		
	7.1	LIMIT			
	7.2	TEST CONFIGURATION			
	7.3	MEASUREMENT PROCEDURE			
	7.4	TEST RESULTS OF CONDUCTED EMISSIONS	30		
8	9	9% AND 20DB BANDWIDTH	32		
	8.1 L	LIMIT	32		
		Test configuration			
	8.3 T	TEST PROCEDURE AND TEST SET UP	33		
	8.4 Test protocol				



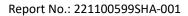






# **Revision History**

Report No.	Version	Description	Issued Date
221100599SHA-001	Rev. 01	Initial issue of report	August 24, 2023



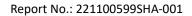


# **Measurement result summary**

TEST ITEM	FCC REFERANCE	RESULT
Fundamental emission	15.225(a) (b) (c)	Pass
Spurious emission	15.225(d)	Pass
Frequency stability	15.225(e)	Pass
Conducted emissions	15.207	Pass
99% and 20dB Bandwidth	15.215(c)	Pass
Antenna requirement	15.203	Pass

Notes: 1: NA =Not Applicable

2: Determination of the test conclusion is based on IEC Guide 115 in consideration of measurement uncertainty.





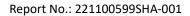
# 1 GENERAL INFORMATION

# 1.1 Description of Equipment Under Test (EUT)

Product name:	Fitness Equipment TV Console		
Type/Model:	TOUCH-02-C, TOUCH XL-02-C, Virtual training-02-C		
	The EUT is Fitness Equipment TV Console, there are three models, they		
	are the same except model name, display size and rating current. We		
	tested TOUCH XL-02-C as representative and listed the worst results in		
Description of EUT:	this report.		
	12Vdc, 2A for TOUCH-02-C		
Rating:	12Vdc, 3A for TOUCH XL-02-C, Virtual training-02-C.		
Category of EUT:	Class B		
EUT type:	☐ Table top ☐ Floor standing		
Software Version:	/		
Hardware Version:	/		
Sample received date:	July 14, 2023		
Date of test:	July 14, 2023 to July 26, 2023		

# 1.2 Technical Specification

Frequency Range:	13.56MHz ~ 13.56 MHz
------------------	----------------------





# 1.3 Description of Test Facility

Name:	Intertek Testing Services Shanghai
Address:	Building 86, No. 1198 Qinzhou Road(North), Shanghai 200233, P.R. China
Telephone:	86 21 61278200
Telefax:	86 21 54262353

The test facility is recognized,	CNAS Accreditation Lab Registration No. CNAS L0139
certified, or accredited by these organizations:	FCC Accredited Lab Designation Number: CN0175
	IC Registration Lab CAB identifier.: CN0014
	VCCI Registration Lab Registration No.: R-14243, G-10845, C-14723, T-12252
	A2LA Accreditation Lab Certificate Number: 3309.02



# **2 TEST SPECIFICATIONS**

# 2.1 Standards or specification

47CFR Part 15 (2021) ANSI C63.10 (2020)

# 2.2 Mode of operation during the test

While testing, the internal modulation and continuously transmission was applied. The test was conducted with test setup as below.

## 2.3 Test software list

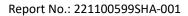
Test Items	Software	Manufacturer	Version
Conducted emission	ESxS-K1	R&S	V2.1.0
Radiated emission	ES-K1	R&S	V1.71

# 2.4 Test peripherals list

Item No	Description	Band and Model	Others
1	AC/DC adapter	TC-33097	Power supply only
2			
3			

#### 2.5 Test environment condition:

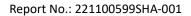
Test items	Temperature	Humidity
Radiated emission	25°C	54% RH
Power line conducted emission	26°C	54% RH





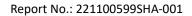
# 2.6 Instrument list

Conducted Emission/Disturbance Power/Tri-loop Test/CDN method							
Used	Equipment	Manufacturer	Type	Internal no.	Due date		
$\boxtimes$	Test Receiver	R&S	ESR7	EC 6194	2024-2-08		
	Attenuator	Hua Xiang	Ts5-10db-6g	EC 6194-1	2023-12-07		
$\boxtimes$	A.M.N.	R&S	ESH2-Z5	EC 3119	2023-11-09		
Radiated E	mission						
Used	Equipment	Manufacturer	Туре	Internal no.	Due date		
$\boxtimes$	Test Receiver	R&S	ESIB 26	EC 3045	2023-07-18		
$\boxtimes$	TRILOG broadband Antenna	Schwarzbeck	VULB9168	EC6402	2024-02-14		
$\boxtimes$	Pre-amplifier	tonscend	tap01018050	EC 6432-1	2023-12-07		
$\boxtimes$	Horn antenna	tonscend	bha9120d	EC 6432-2	2024-02-15		
$\boxtimes$	Horn antenna	TOYO	HAP18-26W	EC 4792-3	2023-07-29		
	Active loop antenna	Schwarzbeck	FMZB1519	EC 5345	2024-06-15		
RF test							
Used	Equipment	Manufacturer	Туре	Internal no.	Due date		
	PXA Signal Analyzer	Keysight	N9030A	EC 5338	2024-03-05		
	Vector Signal Generator	Agilent	N5182B	EC 5175	2024-03-05		
	Universal Radio Communication Tester	R&S	CMW500	EC5944	2024-03-05		
	MXG Analog Signal Generator	Agilent	N5181A	EC 5338-2	2024-03-05		
	Mobile Test System	Litepoint	lqxel	EC 5176	2024-01-11		
	Test Receiver	R&S	ESCI 7	EC 4501	2024-03-05		
$\boxtimes$	Climate chamber	GWS	MT3065	EC 6021	2024-03-06		
	Universal Radio Communication Tester	R&S	CMW500	Ec6209	2023-08-09		
Tet Site	Tet Site						
Used	Equipment	Manufacturer	Type	Internal no.	Due date		
	Shielded room	Zhongyu	-	EC 2838	2024-01-11		
	Shielded room	Zhongyu	-	EC 2839	2024-01-11		
$\boxtimes$	Semi-anechoic chamber	Albatross project	-	EC 3048	2024-07-08		
Additional	instrument						





Used	Equipment	Manufacturer	Туре	Internal no.	Due date
$\boxtimes$	Thermo- Hygrograph	ZJ1-2A	S.M.I.F.	EC 3783	2024-03-24
	Thermo- Hygrograph	ZJ1-2A	S.M.I.F.	EC 5198	2024-03-08
$\boxtimes$	Thermo- Hygrograph	ZJ1-2A	S.M.I.F.	EC 5199	2024-03-13
	Thermo- Hygrograph	ZJ1-2A	S.M.I.F.	EC 5844	2024-03-08
	Pressure meter	YM3	Shanghai Mengde	EC 3320	2023-09-13





# 2.7 Measurement uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2)
Conducted emission at mains nexts	9kHz ~ 150kHz	3.52 dB
Conducted emission at mains ports	150kHz ~ 30MHz	3.19 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	4.90 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.02 dB
Radiated Emissions above 1 GHZ	6GHz ~ 18GHz	5.28 dB



ntactak Report No.: 221100599SHA-001

# 3 Fundamental Emission

Test result: Pass

#### 3.1 Limit

**TEST REPORT** 

Frequencies (MHz)	Limit at 30m (dBuV/m)	Limit at 3m (dBuV/m)
13.110 – 13.410	40.50	80.50
13.410 – 13.553	50.50	90.50
13.553 – 13.567	84.00	124.00
13.567 – 13.710	50.50	90.50
13.710 – 14.010	40.50	80.50

#### 3.2 Measurement Procedure

- a) The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter 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) Both X and Y axes of the antenna are set to make the measurement.
- d) For each suspected emission, the EUT was arranged to its worst case 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 PK Detect Function and Specified Bandwidth with Maximum Hold Mode.

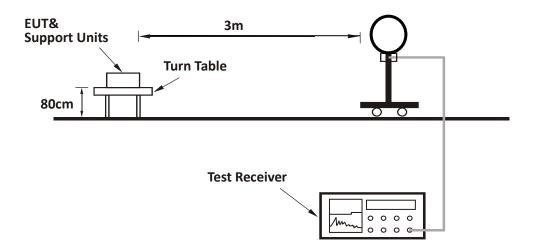
#### NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.



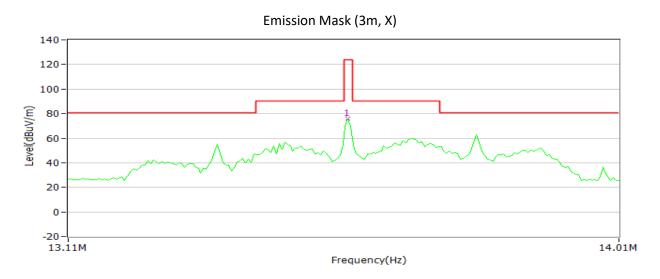
#### **TEST REPORT**

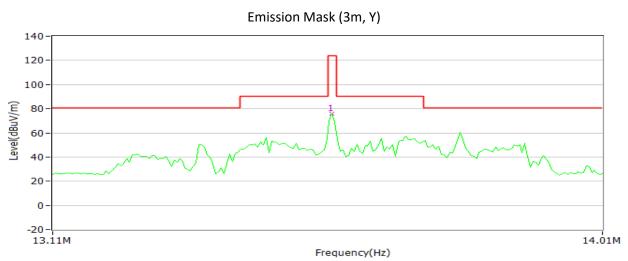
# 3.3 Test Configuration





#### 3.4 Test Results of Fundamental Emissions





Antenna Polarization	Frequency (MHz)	Corrected Reading (dBuV/m)	Correct Factor (dB/m)	Limit (dBuV/m)	Margin	Detector
Х	13.56	75.90	20.50	124.00	48.10	PK
Υ	13.56	75.60	20.50	124.00	48.40	PK

Remark: 1. Correct Factor = Antenna Factor + Cable Loss (+ Amplifier, for higher than 1GHz), the value was added to Original Receiver Reading by the software automatically.

- 2. Corrected Reading = Original Receiver Reading + Correct Factor
- 3. Margin = Limit Corrected Reading

Example: Assuming Antenna Factor = 30.20dB/m, Cable Loss = 2.00dB,

Gain of Preamplifier = 32.00dB, Original Receiver Reading = 10.00dBuV,

Limit = 40.00dBuV/m.

Then Correct Factor = 30.20 + 2.00 - 32.00 = 0.20dB/m;

Corrected Reading = 10dBuV + 0.20dB/m = 10.20dBuV/m;

Margin = 40.00dBuV/m - 10.20dBuV/m = 29.80dB.



# 4 Spurious Emission

Test result: Pass

#### 4.1 Limit

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

#### 4.2 Measurement Procedure

#### For Radiated emission below 30MHz:

- f) The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- g) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- h) Both X and Y axes of the antenna are set to make the measurement.
- i) For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- j) The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

#### NOTE:

2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

#### For Radiated emission above 30MHz:

- a) The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz  $^{\sim}$  1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. 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



#### **TEST REPORT**

set to make the measurement.

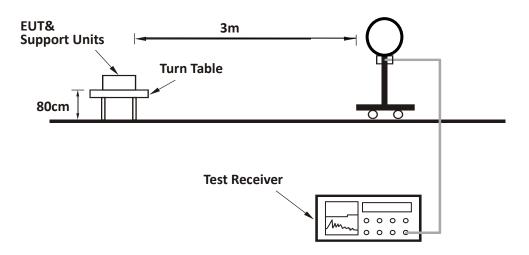
- d) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e) The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f) The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

#### Note:

- 1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
- 2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
- 3. All modes of operation were evaluated and the worst-case emissions were reported

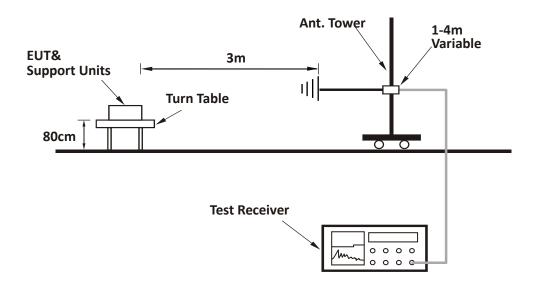
## 4.3 Test Configuration

For Radiated emission below 30MHz:

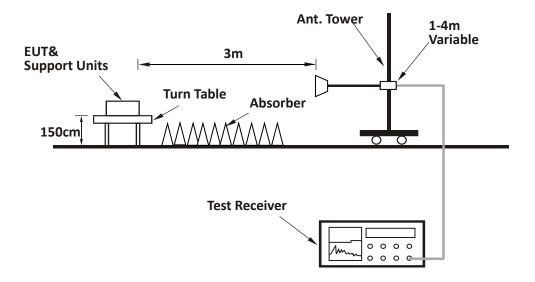


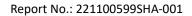


#### For Radiated emission 30MHz to 1GHz:



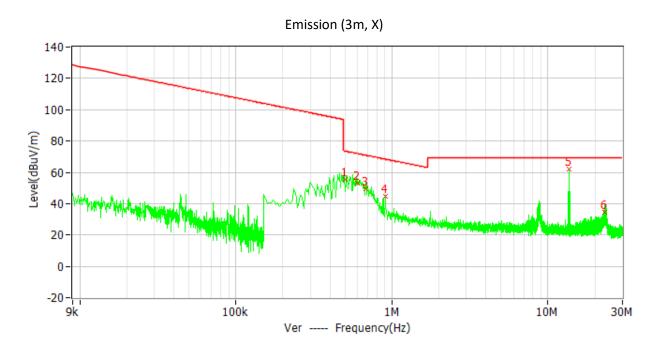
#### For Radiated emission above 1GHz:



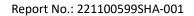




## 4.4 Test Results of Radiated Emissions



No.	Fraguency	Limit	Level	Delta	Reading	Factor	Dotostor	Polar
INO.	Frequency	dBuV/m	dBuV/m	dB	dBuV	dB/m	Detector	
1	501.000kHz	73.6	55.3	-18.3	35.1	20.2	QP	Ver
2	600.000kHz	72.0	52.9	-19.1	32.7	20.2	QP	Ver
3	676.500kHz	71.0	49.4	-21.6	29.2	20.2	QP	Ver
4	910.040kHz	68.4	44.6	-23.8	24.5	20.1	QP	Ver
5	13.560MHz	69.5	62.0	-7.5	41.5	20.5	QP	Ver
6	23.142MHz	69.5	34.6	-34.9	13.9	20.7	QP	Ver





No.

1

2

3

4

5

6

Frequency

573.000kHz

675.499kHz

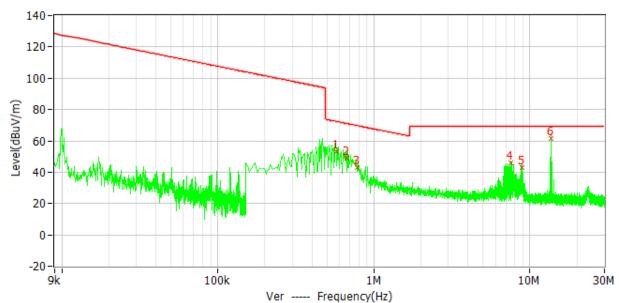
784.500kHz

7.537MHz

8.910MHz

13.560MHz

#### Emission (3m, Y)



-26.4

-8.1

43.1

61.4

Limit

dBuV/m

72.4 71.0

69.7

69.5

69.5

69.5

Level dBuV/m	Delta dB	Reading dBuV	Factor dB/m	Detector	Polar
53.4	-19.0	33.2	20.2	QP	Ver
48.7	-22.3	28.5	20.2	QP	Ver
42.7	-27.0	22.6	20.1	QP	Ver
46.1	-23.4	25.7	20.4	QP	Ver

20.4

20.5

QP

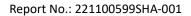
QP

Ver

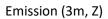
Ver

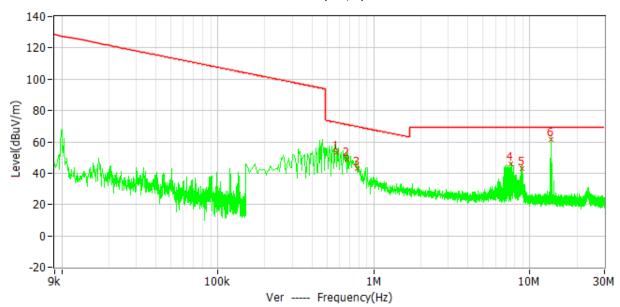
22.7

40.9

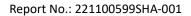




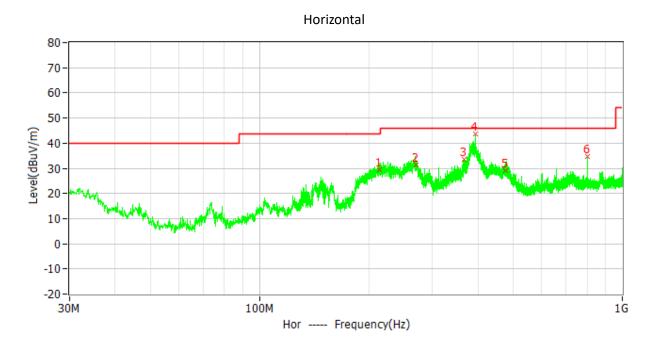




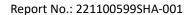
No.	Frequency	Limit	Level	Delta	Reading	Factor	Detector	Polar
		dBuV/m	dBuV/m	dB	dBuV	dB/m		
1	573.000kHz	72.4	53.4	-19.0	33.2	20.2	QP	Ver
2	675.499kHz	71.0	48.7	-22.3	28.5	20.2	QP	Ver
3	784.500kHz	69.7	42.7	-27.0	22.6	20.1	QP	Ver
4	7.537MHz	69.5	46.1	-23.4	25.7	20.4	QP	Ver
5	8.910MHz	69.5	43.1	-26.4	22.7	20.4	QP	Ver
6	13.560MHz	69.5	61.4	-8.1	40.9	20.5	QP	Ver





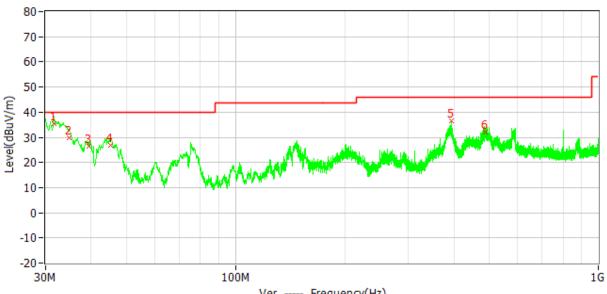


No.	Frequency	Limit dBuV/m	Level dBuV/m	Delta dB	Reading dBuV	Factor dB/m	Detector	Polar
1	214.401MHz	43.5	29.3	-14.2	18.0	11.3	QP	Hor
2	270.147MHz	46.0	31.3	-14.7	15.8	15.5	QP	Hor
3	366.098MHz	46.0	33.6	-12.4	16.0	17.6	QP	Hor
4	393.241MHz	46.0	43.7	-2.3	25.4	18.3	QP	Hor
5	477.431MHz	46.0	29.1	-16.9	9.1	20.0	QP	Hor
6	800.019MHz	46.0	34.6	-11.4	10.9	23.7	QP	Hor





# Vertical

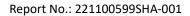


Ver ---- Frequency(Hz)

No.	Frequency	Limit dBuV/m	Level dBuV/m	Delta dB	Reading dBuV	Factor dB/m	Detector	Polar
1	31.693MHz	40.0	35.6	-4.4	15.2	20.4	QP	Ver
2	34.876MHz	40.0	29.9	-10.1	11.6	18.3	QP	Ver
3	39.426MHz	40.0	26.5	-13.5	11.0	15.5	QP	Ver
4	45.186MHz	40.0	27.0	-13.0	14.5	12.5	QP	Ver
5	393.241MHz	46.0	36.4	-9.6	18.1	18.3	QP	Ver
6	488.140MHz	46.0	31.9	-14.1	11.7	20.2	QP	Ver

Remark: 1. Correct Factor = Antenna Factor + Cable Loss (+ Amplifier, for higher than 1GHz), the value was added to Original Receiver Reading by the software automatically.

- 2. Level = Original Receiver Reading + Correct Factor
- 3. Delta = Level Limit
- 4. If the PK Corrected Reading is lower than AV limit, the AV test can be elided.





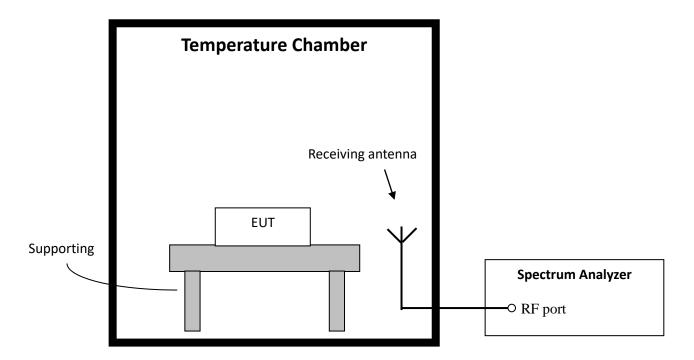
# 5 Frequency Stability (Temperature Variation)

**Test result: PASS** 

#### 5.1 Test limit

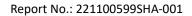
The frequency tolerance of the carrier signal shall be maintained within  $\pm 0.01\%$  of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage.

#### 5.2 Test Configuration



## 5.3 Test procedure and test setup

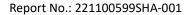
Test Procedure as per ANSI 63.10 clause 6.8.1.





# 5.4 Test protocol

Voltage	Temp	Freq measured	Freq nominal	Tolerance (%)	Limit
(V)	(°C)	(MHz)	(MHz)		(%)
	-20	13.560		0	
	-10	13.560		0	
	0	13.560		0	
120V	10	13.560	13.560	0	0.01
1207	20	13.560	20.000	0	0.01
	30	13.560		0	
	40	13.560		0	
	50	13.559		0.003	





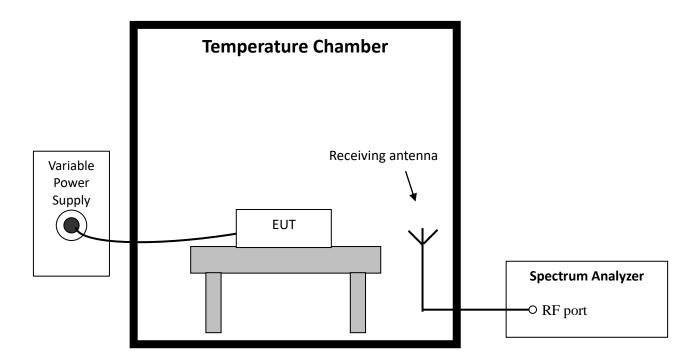
# 6 Frequency Stability (Voltage Variation)

**Test result: PASS** 

#### 6.1 Test limit

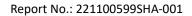
The frequency tolerance of the carrier signal shall be maintained within  $\pm 0.01\%$  for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

#### 6.2 Test Configuration



#### 6.3 Test procedure and test setup

Test Procedure as per ANSI 63.10 clause 6.8.2.

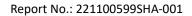




## 6.4 Test protocol

Temp (ºC)	Voltage (V)	Freq Measured (MHz)	Freq nominal (MHz)	Tolerance (%)	Limit (%)
	120	13.560		0	
20	102	13.560	13.560	0	0.01
	138	13.560		0	

Note: here the voltage is on the input port of the AC/DC Adapter.





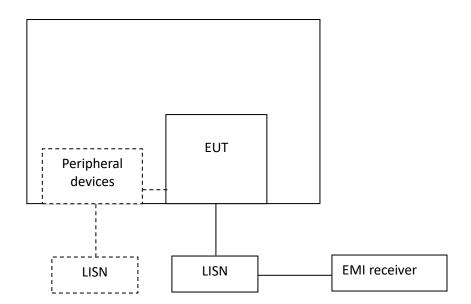
# 7 Conducted emissions

Test result: Pass

## **7.1** Limit

Francisco of Emission (MILE)	Conducted Emissio	ns Limit (dBuV)				
Frequency of Emission (MHz)	QP	AV				
0.15 ~ 0.5	79	66				
0.5 ~ 30	73	60				
* Decreases with the logarithm of the frequency.						

# 7.2 Test Configuration



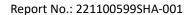


#### 7.3 Measurement Procedure

Measured levels of ac power-line conducted emission shall be the emission voltages from the voltage probe, where permitted, or across the 50  $\Omega$  LISN port (to which the EUT is connected), where permitted, terminated into a 50  $\Omega$  measuring instrument. All emission voltage and current measurements shall be made on each current-carrying conductor at the plug end of the EUT power cord by the use of mating plugs and receptacles on the LISN, if used. Equipment shall be tested with power cords that are normally supplied or recommended by the manufacturer and that have electrical and shielding characteristics that are the same as those cords normally supplied or recommended by the manufacturer. For those measurements using a LISN, the 50  $\Omega$  measuring port is terminated by a measuring instrument having 50  $\Omega$  input impedance. All other ports are terminated in 50  $\Omega$  loads.

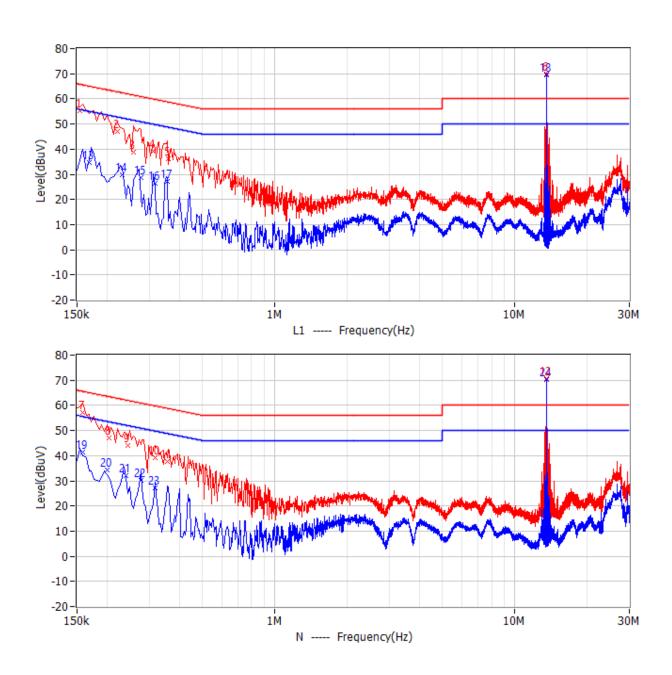
Tabletop devices shall be placed on a platform of nominal size 1 m by 1.5 m, raised 80 cm above the reference ground plane. The vertical conducting plane or wall of an RF-shielded (screened) room shall be located 40 cm to the rear of the EUT. Floor-standing devices shall be placed either directly on the reference ground-plane or on insulating material as described in ANSI C63.4. All other surfaces of tabletop or floor-standing EUTs shall be at least 80 cm from any other grounded conducting surface, including the case or cases of one or more LISNs.

The bandwidth of the test receiver is set at 9 kHz.





# 7.4 Test Results of Conducted Emissions





#### **TEST REPORT**

#### Data:

Data		ı			1			1	
No.	Frequency	Limit	Level	Delta	Reading	Factor	Detector	Phase	
		dBuV	dBuV	dB	dBuV	dB			
1	154.500kHz	65.8	55.1	-10.6	48.9	6.2	QP	L1	
2	222.000kHz	62.7	47.1	-15.6	40.9	6.2	QP	L1	
3	258.000kHz	61.5	38.8	-22.7	32.6	6.2	QP	L1	
4	312.000kHz	59.9	39.1	-20.8	32.9	6.2	QP	L1	
5	361.500kHz	58.7	36.2	-22.5	30.0	6.2	QP	L1	
!6	13.560MHz	60.0	69.9	9.9	63.5	6.4	QP	L1	
7	159.000kHz	65.5	57.0	-8.6	50.7	6.3	QP	Ν	
8	204.000kHz	63.4	47.1	-16.4	40.8	6.3	QP	Ν	
9	244.500kHz	61.9	43.9	-18.1	37.7	6.2	QP	Ν	
10	316.500kHz	59.8	39.0	-20.8	32.8	6.2	QP	Ν	
11	357.000kHz	58.8	37.6	-21.2	31.4	6.2	QP	Ν	
!12	13.560MHz	60.0	70.5	10.5	64.1	6.4	QP	Ν	
13	168.000kHz	55.1	34.6	-20.5	28.5	6.1	CAV	L1	
14	231.000kHz	52.4	30.0	-22.4	23.8	6.2	CAV	L1	
15	276.000kHz	50.9	28.7	-22.3	22.5	6.2	CAV	L1	
16	316.500kHz	49.8	26.5	-23.3	20.3	6.2	CAV	L1	
17	357.000kHz	48.8	27.3	-21.5	21.1	6.2	CAV	L1	
!18	13.560MHz	50.0	69.5	19.5	63.1	6.4	CAV	L1	
19	159.000kHz	55.5	41.4	-14.1	35.1	6.3	CAV	Ν	
20	199.500kHz	53.6	34.4	-19.2	28.1	6.3	CAV	N	
21	240.000kHz	52.1	32.2	-19.9	26.0	6.2	CAV	N	
22	276.000kHz	50.9	30.3	-20.6	24.1	6.2	CAV	N	
23	316.500kHz	49.8	27.3	-22.5	21.1	6.2	CAV	N	
!24	13.560MHz	50.0	70.2	20.2	63.8	6.4	CAV	N	
The 13.56MHz is the RFID frequency									
- d A									

Remark: 1. Factor = LISN Factor + Cable Loss, the value was added to Original Receiver Reading by the software automatically.

- 2. Level = Reading + Factor
- 3. Delta = Level Limit
- 4. If the PK Corrected Reading is lower than AV limit, the AV test can be elided.



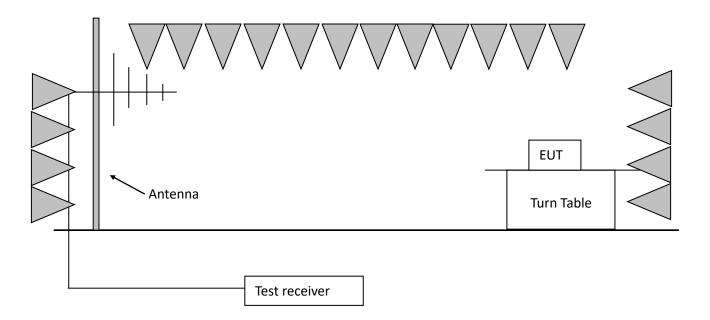
# 8 99% and 20dB Bandwidth

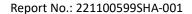
**Test result: Pass** 

#### 8.1 Limit

The 20dB bandwidth should be fallen in the allocated operating frequency range. No limit for 99% bandwidth.

## 8.2 Test configuration







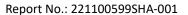
#### 8.3 Test procedure and test set up

The measurement was applied in a 3m semi-anechoic chamber.

The center of the loop antenna shall be 1 m above the horizontal metal ground plane.

The following procedure shall be used for measuring (99 %) power bandwidth:

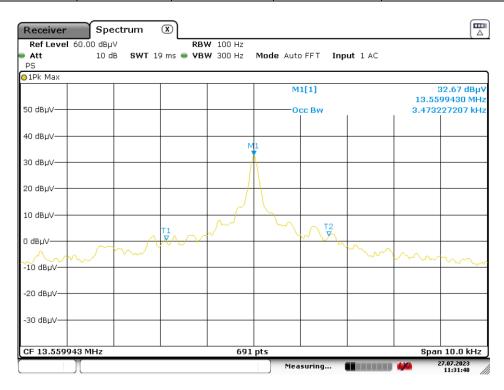
- 1. Set center frequency to the nominal EUT channel center frequency.
- 2. Set RBW = 1% to 5% of the OBW
- 3. Set VBW ≥  $3 \cdot RBW$
- 4. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
- 5. Use the 99 % power bandwidth function of the instrument (if available).
- 6. the 20dB bandwidth is also measured with the same setting.

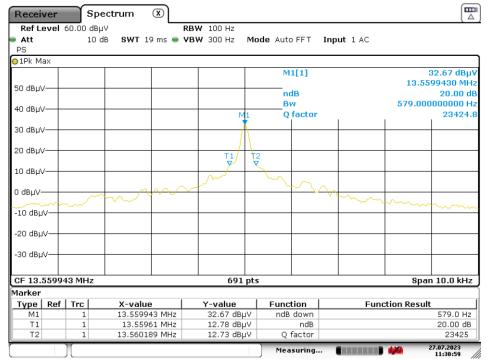


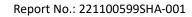


#### 8.4 Test protocol

	Lower point (MHz)	Higher point (MHz)	Bandwidth (kHz)	Allocated bandwidth (MHz)
99% Bandwidth	13.5593	13.5606	3.473	/
20dB Bandwidth	13.5596	13.5602	0.579	13.553 ~ 13.567









# 9 Antenna requirement

#### **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 shall be considered sufficient to comply with the provisions of this section.

#### **Result:**

EUT uses permanently attached antenna to the inten	itional radiator, so it can comply with the pro	visions
of this section		