FCC Test Report

FCC ID	:	**IPH-B3958**
Equipment	:	**Smart Watch**
Model No.	:	**AB3958**
Brand Name	:	**GARMIN**
Applicant	:	**Garmin International, Inc.**
Address	:	**1200 E. 151st Street Olathe, KS 66062 United States**
Standard	:	**47 CFR FCC Part 15.225**
Received Date	:	**Apr. 16, 2021**
Tested Date	:	**May 06 ~ May 12, 2021**

We, International Certification Corporation, would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by: **Approved by:**

Along Chen / Assistant Manager **Gary Chang / Manager**

Testing Laboratory 2732

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Release Record

Report No.	Version	Description	Issued Date
FR141601NF	Rev. 01	Initial issue	Jun. 21, 2021
FR141601NF	Rev. 02	Adding Power Index of Test Tool (P.5)	Jun. 23, 2021

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.779MHz 21.09 (Margin -24.91dB) - AV	Pass
15.225(a)~(c)	Field strength of fundamental emissions and spectrum mask	Meet the requirement of limit	Pass
15.225(d)	Field strength of any emissions appearing outside of the 13.110-14.010 MHz band	Meet the requirement of limit	Pass
15.225(e)	Frequency tolerance	Meet the requirement of limit	Pass
15.215 (c)	20dB bandwidth	Meet the requirement of limit	Pass
15.203	Antenna Requirement	Meet the requirement of limit	Pass

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

1 General Description

1.1 Information

1.1.1 Specification of the Equipment under Test (EUT)

RF General Information			
Frequency Range (MHz)	**Modulation**	**Ch. Frequency (MHz)**	**Channel Number**
13.553 – 13.567	NFC-ASK	13.56	1

1.1.2 Antenna Details

Ant. No.	Brand	Model	Type	Connector	Gain (dBi)
1	INPAQ	700-00139-00	Loop	N/A	---

1.1.3 EUT Operational Condition

Supply Voltage	5.0Vdc from AC adapter 3.87Vdc from Battery		
Operational Voltage	☒ Vnom (3.87 V)	☒ Vmax (4.45 V)	☒ Vmin (3.4 V)
Operational Climatic	☒ Tnom (20°C)	☒ Tmax (60°C)	☒ Tmin (-20°C)

1.1.4 Accessories

No.	Equipment	Description
1	Battery	Brand: GARMIN Model: 361-00136-10 Power Rating: 3.87Vdc, 195mAh
2	USB cable	Brand: GARMIN Model: 320-01069-10 Power line: 0.52m shielded without core

1.1.5 Test Tool and Power Index

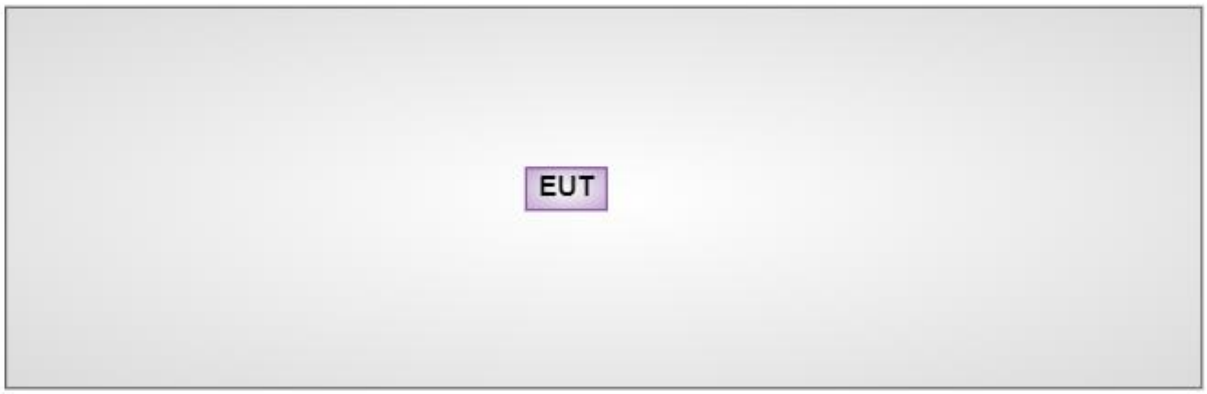
Test Tool	NFC Test, Version: 1.2
Modulation Mode	NFC-ASK
Power Index	default

1.2 Local Support Equipment List

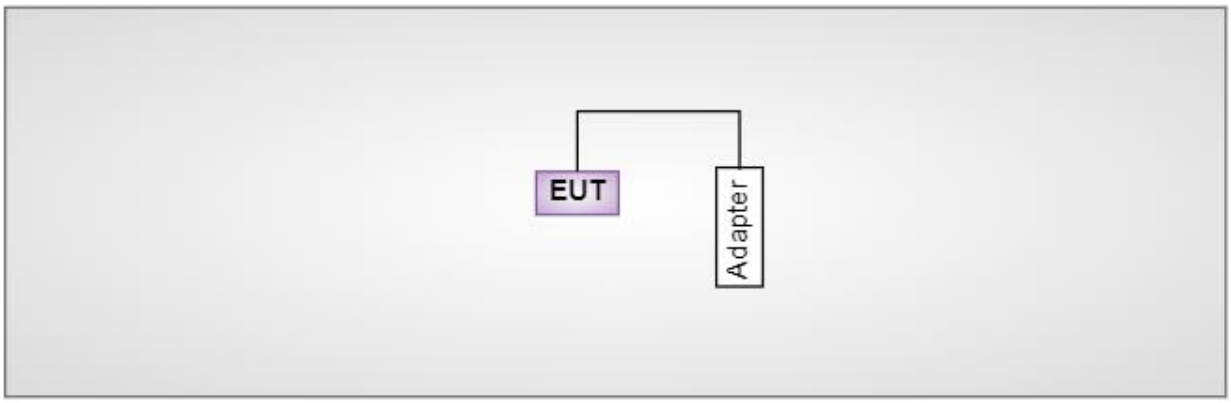
Support Equipment List					
No.	**Equipment**	**Brand**	**Model**	**FCC ID**	**Remarks**
1	Adapter	Samsung	ETA-U90JWS	---	---

1.3 Test Setup Chart

Test Setup Diagram (Battery mode)



Test Setup Diagram (Changer mode)



1.4 The Equipment List

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Tested Date	May 12, 2021				
Instrument	**Brand**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Receiver	R&S	ESR3	101658	Feb. 08, 2021	Feb. 07, 2022
LISN	R&S	ENV216	101579	Mar. 17, 2021	Mar. 16, 2022
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Oct. 21, 2020	Oct. 20, 2021
Measurement Software	AUDIX	e3	6.120210k	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Radiated Emission				
Test Site	966 chamber1 / (03CH01-WS)				
Tested Date	May 06 ~ May 11, 2021				
Instrument	**Brand**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 17, 2020	Nov. 16, 2021
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Oct. 06, 2020	Oct. 05, 2021
Receiver	R&S	ESR3	101657	Mar. 12, 2021	Mar. 11, 2022
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 17, 2020	Nov. 16, 2021
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Jul. 10, 2020	Jul. 09, 2021
Preamplifier	EMC	EMC02325	980225	Jul. 03, 2020	Jul. 02, 2021
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Oct. 06, 2020	Oct. 05, 2021
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Oct. 06, 2020	Oct. 05, 2021
LF cable 11M	EMC	EMCCFD400-NW-NW-11000	200801	Oct. 06, 2020	Oct. 05, 2021
LF cable 1M	EMC	EMCCFD400-NM-NM-1000	160502	Oct. 06, 2020	Oct. 05, 2021
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Tested Date	May 11, 2021				
Instrument	**Brand**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	R&S	FSV40	101063	Apr. 19, 2021	Apr. 18, 2022
Power Meter	Anritsu	ML2495A	1241002	Nov. 04, 2020	Nov. 03, 2021
Power Sensor	Anritsu	MA2411B	1207366	Nov. 04, 2020	Nov. 03, 2021
TEMP&HUMIDITY CHAMBER	GIANT FORCE	GTH-150-40-CP-AR-T	MAA1407-012	Sep. 10, 2020	Sep. 09, 2021
DC POWER SOURCE	GW INSTEK	GPC-6030D	GES855395	Nov. 09, 2020	Nov. 08, 2021
AC POWER SOURCE	APC	AFC-500W	F312060012	Dec. 04, 2020	Dec. 03, 2021
Spectrum Analyzer	R&S	FSV40	101063	Apr. 19, 2021	Apr. 18, 2022
Note: Calibration Interval of instruments listed above is one year.					

1.5 Test Standards

47 CFR FCC Part 15.225
ANSI C63.10-2013

1.6 Deviation from Test Standard and Measurement Procedure

None

1.7 Measurement Uncertainty

The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)).

Measurement Uncertainty	
Parameters	**Uncertainty**
Bandwidth	±34.130 Hz
Radiated emission ≤ 30MHz	±2.3 dB
Radiated emission ≤ 1GHz	±3.41 dB
Temperature	±0.4 °C

2 Test Configuration

2.1 Testing Facility

Test Laboratory	International Certification Corporation
Test Site	CO01-WS, 03CH01-WS, TH01-WS
Address of Test Site	No.3-1, Lane 6, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 33381, Taiwan (R.O.C.)

- FCC Designation No.: TW2732
- FCC site registration No.: 181692
- ISED#: 10807A
- CAB identifier: TW2732

2.2 The Worst Test Modes and Channel Details

Test item	Mode	Test Frequency (MHz)	Test Configuration
Conducted Emissions	Charging	---	2
Unwanted Emissions into Restricted Frequency Bands < 30MHz	NFC	13.56	1
Unwanted Emissions into Restricted Frequency Bands > 30MHz	NFC	13.56	1
	Charging	---	2
Frequency tolerance	NFC	13.56	1
20dB bandwidth	NFC	13.56	1

NOTE:

1. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **Y-plane** results were found as the worst case and were shown in this report.
2. The EUT had been tested by following test configurations.
   1) Configuration 1: Battery mode
   2) Configuration 2: Charging mode

3 Transmitter Test Results

3.1 Conducted Emissions

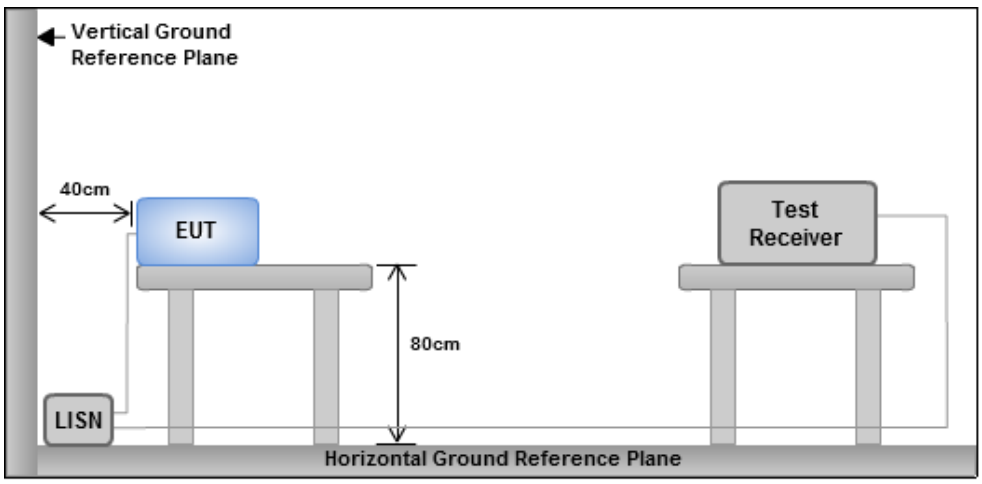
3.1.1 Limit of Conducted Emissions

Conducted Emissions Limit		
Frequency Emission (MHz)	**Quasi-Peak**	**Average**
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50
Note 1: * Decreases with the logarithm of the frequency.		

3.1.2 Test Procedures

1. The device is placed on a test table, raised 80 cm above the reference ground plane. The vertical conducting plane is located 40 cm to the rear of the device.
2. The device is connected to line impedance stabilization network (LISN) and other accessories are connected to other LISN. Measured levels of AC power line conducted emission are across the 50 Ω LISN port.
3. AC conducted emission measurements is made over frequency range from 150 kHz to 30 MHz.
4. This measurement was performed with AC 120V/60Hz

3.1.3 Test Setup



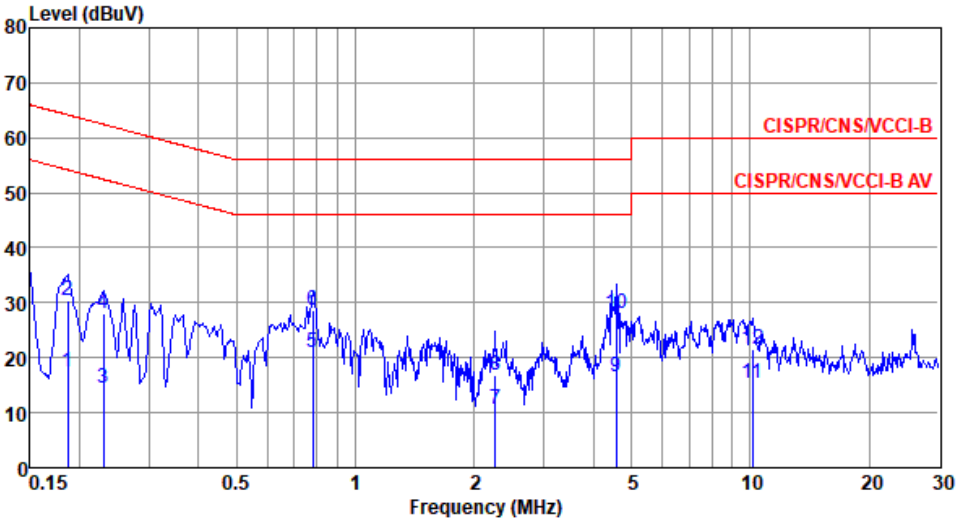
Note: 1. Support units were connected to second LISN.

2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

3.1.4 Test Result of Conducted Emissions

Modulation Mode	Charging	Test Freq. (MHz)	---
Power Phase	Line		

Test by : BRAD WU Temperature: 24°C Humidity: 64%

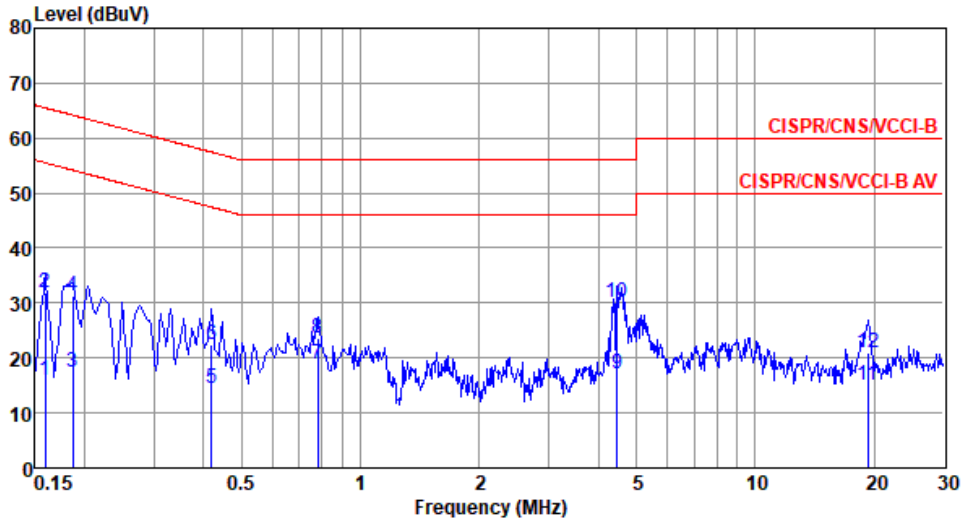


	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Cable loss	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	dB	
1	0.186	17.48	54.20	-36.72	7.58	9.84	0.06	Average
2	0.186	30.27	64.20	-33.93	20.37	9.84	0.06	QP
3	0.230	14.38	52.44	-38.06	4.47	9.85	0.06	Average
4	0.230	27.90	62.44	-34.54	17.99	9.85	0.06	QP
5*	0.779	21.09	46.00	-24.91	11.02	9.96	0.11	Average
6	0.779	28.71	56.00	-27.29	18.64	9.96	0.11	QP
7	2.261	10.73	46.00	-35.27	0.52	10.01	0.20	Average
8	2.261	16.72	56.00	-39.28	6.51	10.01	0.20	QP
9	4.574	16.46	46.00	-29.54	6.10	10.05	0.31	Average
10	4.574	28.12	56.00	-27.88	17.76	10.05	0.31	QP
11	10.125	15.44	50.00	-34.56	4.92	10.11	0.41	Average
12	10.125	21.60	60.00	-38.40	11.08	10.11	0.41	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

Modulation Mode	Charging	Test Freq. (MHz)	---
Power Phase	Neutral		

Test by : BRAD WU Temperature: 24°C Humidity: 64%



	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Cable loss	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	dB	
1	0.159	15.90	55.52	-39.62	6.03	9.82	0.05	Average
2	0.159	31.90	65.52	-33.62	22.03	9.82	0.05	QP
3	0.186	17.31	54.20	-36.89	7.42	9.83	0.06	Average
4	0.186	31.39	64.20	-32.81	21.50	9.83	0.06	QP
5	0.419	14.38	47.46	-33.08	4.45	9.85	0.08	Average
6	0.419	22.53	57.46	-34.93	12.60	9.85	0.08	QP
7	0.779	18.81	46.00	-27.19	8.83	9.87	0.11	Average
8	0.779	23.70	56.00	-32.30	13.72	9.87	0.11	QP
9	4.478	17.22	46.00	-28.78	6.94	9.98	0.30	Average
10*	4.478	30.21	56.00	-25.79	19.93	9.98	0.30	QP
11	19.326	15.08	50.00	-34.92	4.11	10.31	0.66	Average
12	19.326	21.10	60.00	-38.90	10.13	10.31	0.66	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

3.2 20dB and Occupied Bandwidth

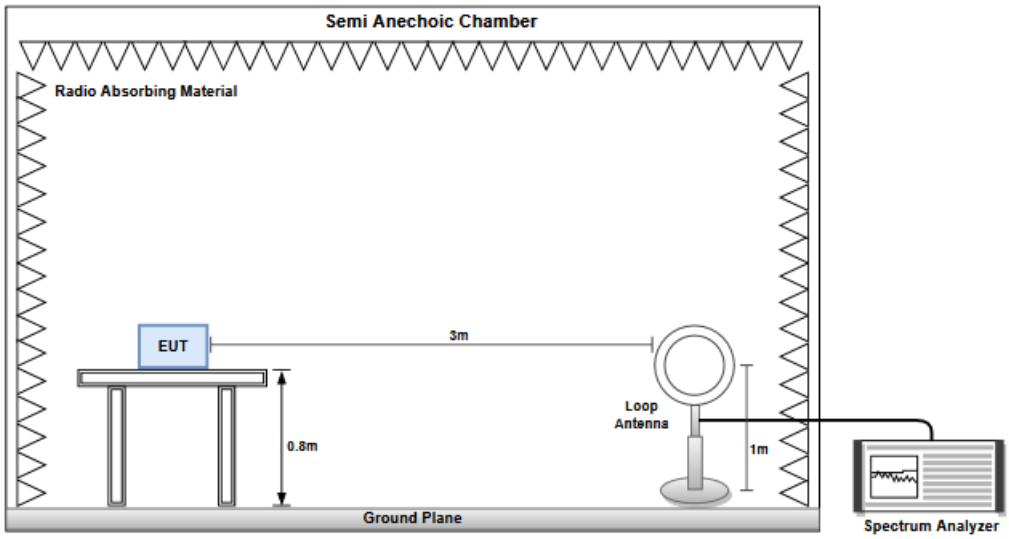
3.2.1 Limit of 20dB Bandwidth

The upper and lower frequency of the 20dB bandwidth shall within 13.553~13.567 MHz

3.2.2 Test Procedures

1. Set resolution bandwidth (RBW) = 1 kHz, Video bandwidth = 3 kHz.
2. Detector = Peak, Trace mode = max hold.
3. Sweep = auto couple, Allow the trace to stabilize.
4. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 20dB relative to the maximum level measured in the fundamental emission.

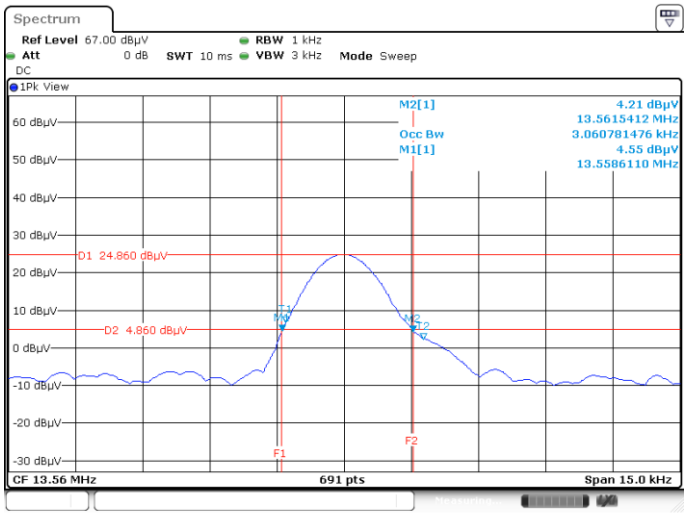
3.2.3 Test Setup



3.2.4 Test Result of 20dB and Occupied Bandwidth

Ambient Condition	24°C / 67%	Tested By	Akun Chung

Occupied Channel Bandwidth Result					
Modulation Mode	Ch. Freq. (MHz)	20dB Bandwidth (kHz)	FL at 20dB BW (MHz)	FH at 20dB BW (MHz)	99% Bandwidth (kHz)
NFC	13.56	2.9302	13.558611	13.5615412	3.060781476
Limit		N/A	13.553	13.567	N/A
Result		Pass			



3.3 Field Strength of Fundamental Emissions

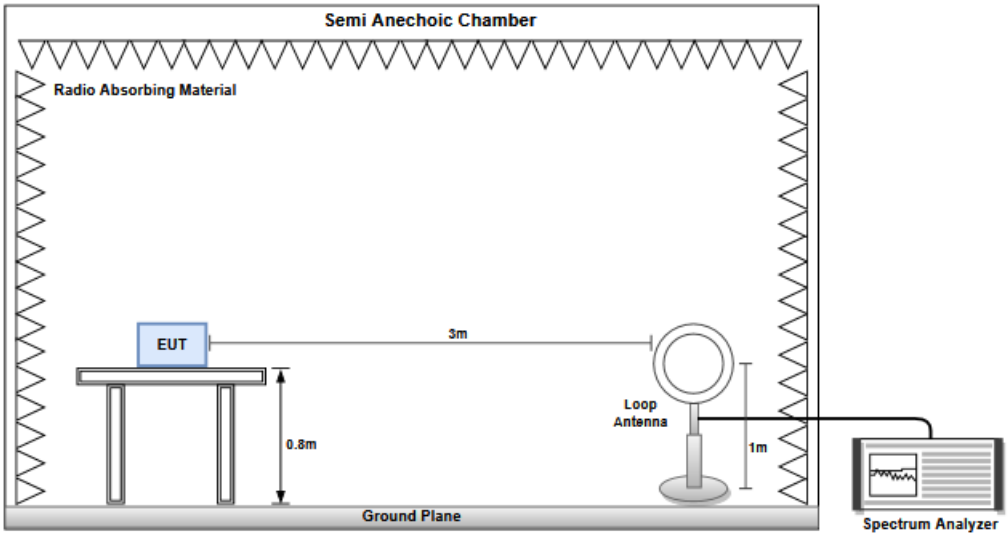
3.3.1 Field Strength of Fundamental Emissions

The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.

3.3.2 Test Procedures

1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at a height of 0.8 m test table above the ground plane.
2. Measurement is made with the antenna positioned in both the open and close planes of polarization. . Distance between EUT and antenna is 3 m.
3. This investigation is performed with the EUT rotated 360°, and the antenna rotated to repeat the measurements for both the open and close antenna polarizations.

3.3.3 Test Setup



3.3.4 Test Result of Field Strength of Fundamental Emissions

Ambient Condition	24°C / 67%	Tested By	Akun Chung

Field Strength of Fundamental Emissions Result							
Polarization	**Emission Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**SA Reading (dBuV)**	**Factor**	**Remark**
Open	13.56	48.01	105.39	-57.38	23.69	24.32	QP

Field Strength of Fundamental Emissions Result							
Polarization	**Emission Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**SA Reading (dBuV)**	**Factor**	**Remark**
Close	13.56	44.31	105.39	-61.08	19.99	24.32	QP

Note: Emission level = SA reading + Factor

3.4 Unwanted Emissions into Restricted Frequency Bands

3.4.1 Limit of Unwanted Emissions into Restricted Frequency Bands

1) Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.
2) Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.
3) The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in below table

Restricted Band Emissions Limit			
Frequency Range (MHz)	**Field Strength (uV/m)**	**Field Strength (dBuV/m)**	**Measure Distance (m)**
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1:
Qusai-Peak value is measured for frequency below 1GHz except for 9–90 kHz, 110–490 kHz frequency band. Peak and average value are measured for frequency above 1GHz. The limit on average radio frequency emission is as above table. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit
Note 2:
Measurements may be performed at a distance other than what is specified provided. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor as below, Frequency at or above 30 MHz: 20 dB/decade Frequency below 30 MHz: 40 dB/decade.

3.4.2 Test Procedures

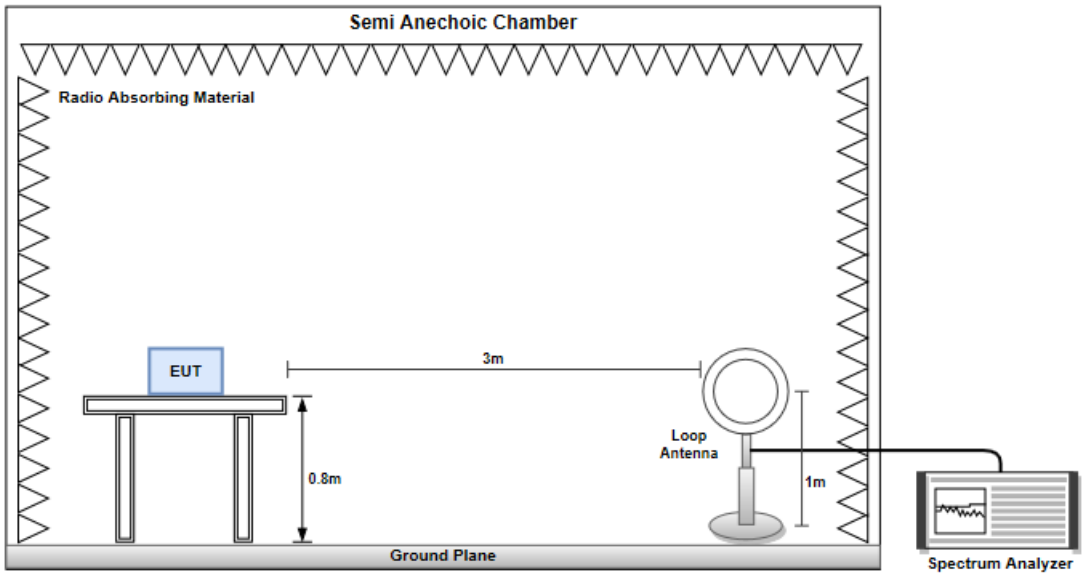
4. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at a height of 0.8 m test table above the ground plane.
5. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
6. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

Note:

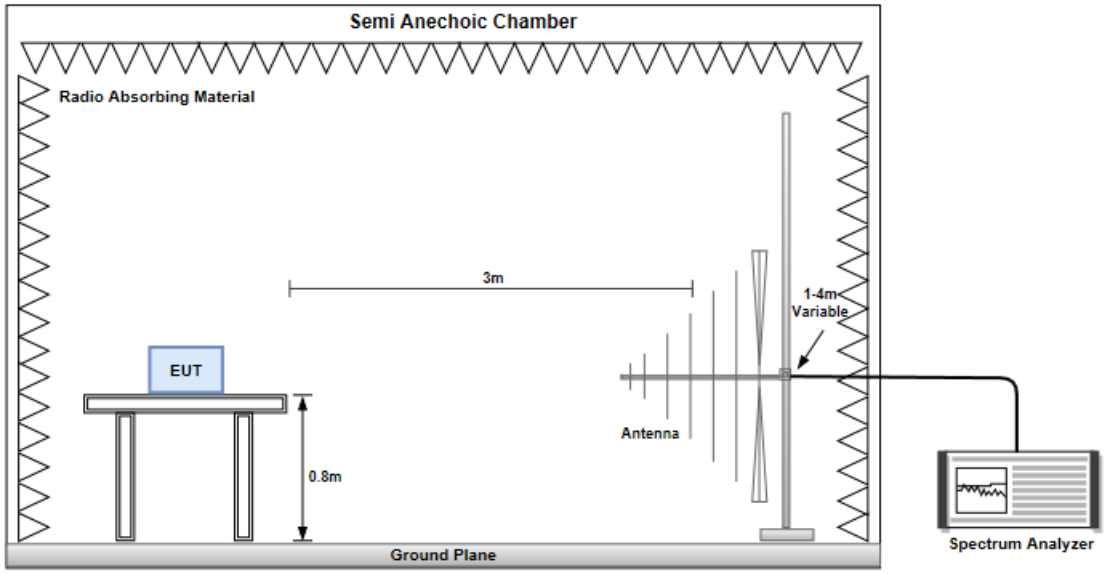
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.

3.4.3 Test Setup

Radiated Emissions below 30MHz



Radiated Emissions below 1 GHz



3.4.4 Transmitter Radiated Unwanted Emissions (Below 30MHz)

Ambient Condition	24°C / 67%	Tested By	Akun Chung

Field Strength of Fundamental Emissions Result							
Polarization	**Emission Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**SA Reading (dBuV)**	**Factor(dB)**	**Remark**
Open	13.41	37.14	62	-24.86	12.87	24.27	QP
Open	13.553	39.56	71.87	-32.31	15.25	24.31	QP
Open	13.567	39.36	71.86	-32.5	15.04	24.32	QP
Open	13.71	36.58	61.81	-25.23	12.22	24.36	QP
Open	27.12	30.11	49.54	-19.43	10.38	19.73	QP

Field Strength of Fundamental Emissions Result							
Polarization	**Emission Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**SA Reading (dBuV)**	**Factor(dB)**	**Remark**
Close	13.41	36.18	62	-25.82	11.91	24.27	QP
Close	13.553	37.61	71.87	-34.26	13.3	24.31	QP
Close	13.567	38.09	71.86	-33.77	13.77	24.32	QP
Close	13.71	35.75	61.81	-26.06	11.39	24.36	QP
Close	27.12	30.26	49.54	-19.28	10.53	19.73	QP

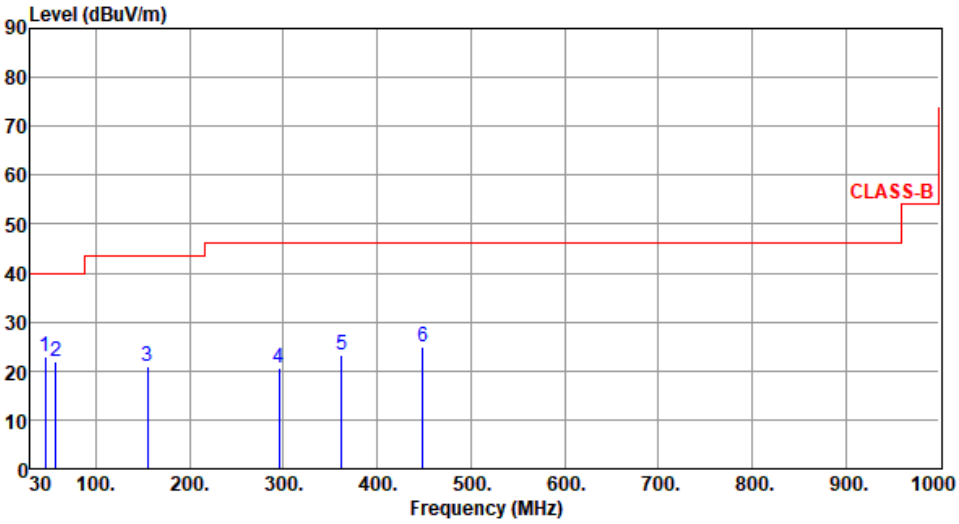
Note: Emission level = SA reading + Factor

3.4.5 Transmitter Radiated Unwanted Emissions (Above 30MHz)

Battery mode

Polarization	Horizontal	**Test Freq. (MHz)**	13.56

Test By :Akun Chung Temperature(℃):24 Humidity(%):67

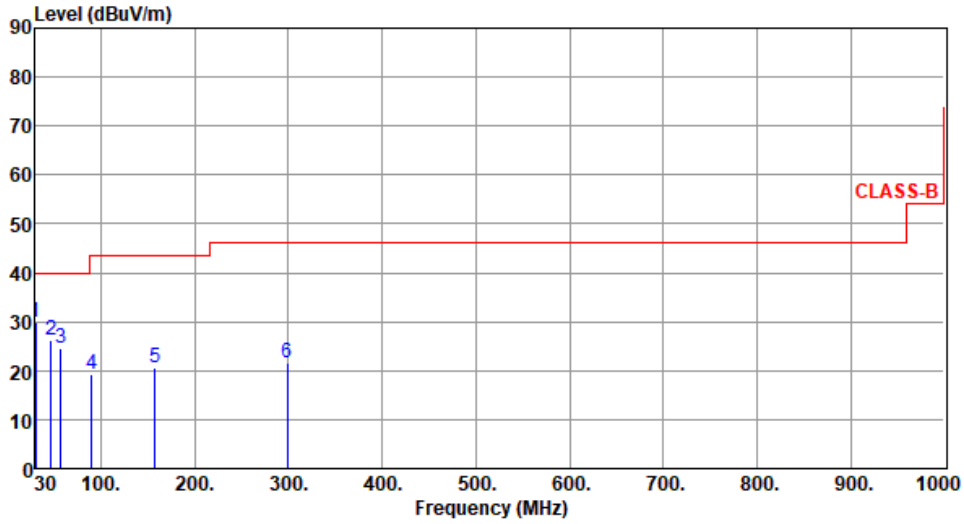


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	45.52	22.81	40.00	-17.19	31.10	-8.29	Peak	---	---
2	57.16	21.87	40.00	-18.13	30.81	-8.94	Peak	---	---
3	155.13	20.86	43.50	-22.64	29.61	-8.75	Peak	---	---
4	295.78	20.59	46.00	-25.41	28.87	-8.28	Peak	---	---
5	361.74	23.24	46.00	-22.76	29.67	-6.43	Peak	---	---
6	449.04	24.79	46.00	-21.21	29.09	-4.30	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Polarization	Vertical	Test Freq. (MHz)	13.56

Test By :Akun Chung Temperature(℃):24 Humidity(%):67



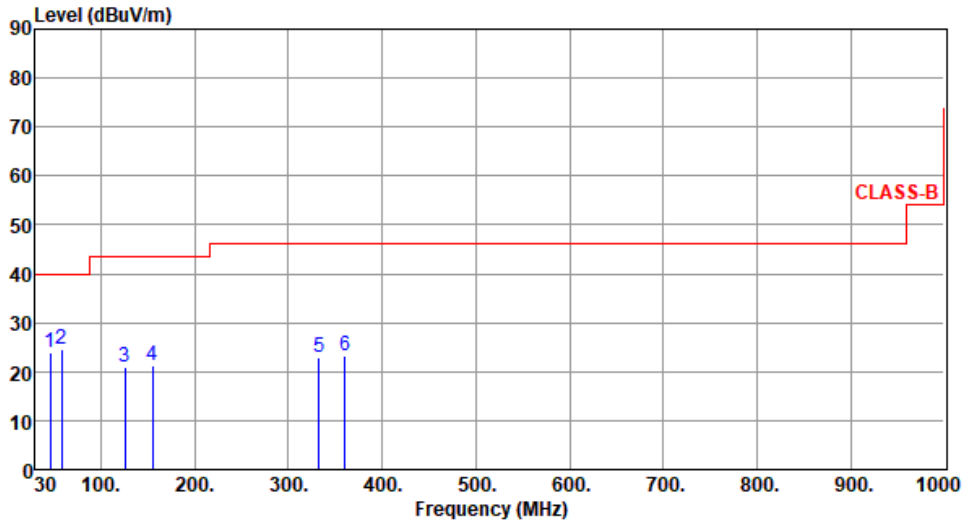
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	30.00	29.78	40.00	-10.22	39.26	-9.48	Peak	---	---
2	46.49	26.35	40.00	-13.65	34.68	-8.33	Peak	---	---
3	57.16	24.51	40.00	-15.49	33.45	-8.94	Peak	---	---
4	90.14	19.29	43.50	-24.21	33.86	-14.57	Peak	---	---
5	158.04	20.70	43.50	-22.80	29.63	-8.93	Peak	---	---
6	298.69	21.59	46.00	-24.41	29.81	-8.22	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Charging mode

Polarization	Charging	Test Freq. (MHz)	---

Test By :Akun Chung Temperature(℃):24 Humidity(%):67

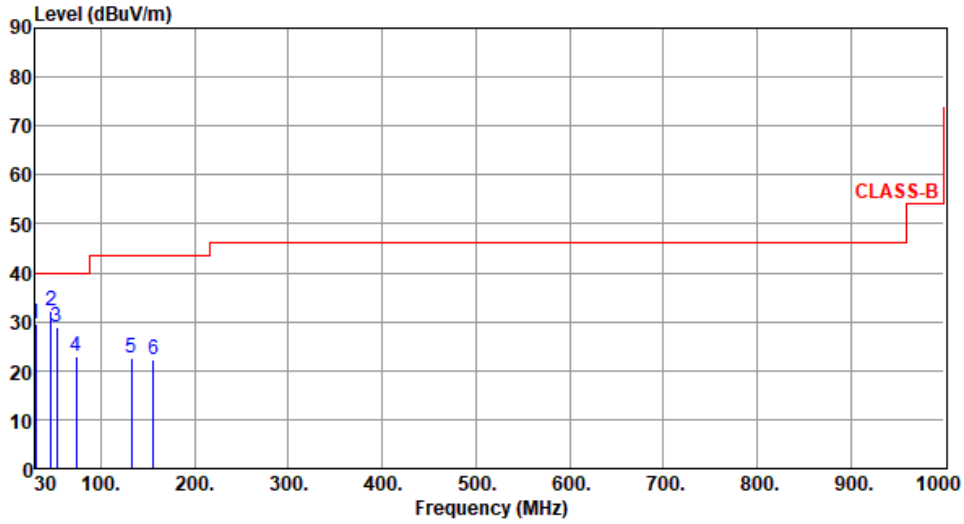


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	45.52	23.81	40.00	-16.19	32.10	-8.29	Peak	---	---
2	58.13	24.43	40.00	-15.57	33.40	-8.97	Peak	---	---
3	126.03	20.92	43.50	-22.58	31.21	-10.29	Peak	---	---
4	155.13	21.40	43.50	-22.10	30.15	-8.75	Peak	---	---
5	332.64	22.91	46.00	-23.09	30.04	-7.13	Peak	---	---
6	360.77	23.36	46.00	-22.64	29.80	-6.44	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Polarization	Charging	Test Freq. (MHz)	---

Test By :Akun Chung Temperature(℃):24 Humidity(%):67



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	30.00	29.62	40.00	-10.38	39.10	-9.48	Peak	---	---
2	46.49	32.32	40.00	-7.68	40.65	-8.33	Peak	---	---
3	53.28	28.83	40.00	-11.17	37.45	-8.62	Peak	---	---
4	73.65	22.93	40.00	-17.07	34.74	-11.81	Peak	---	---
5	132.82	22.72	43.50	-20.78	32.38	-9.66	Peak	---	---
6	156.10	22.22	43.50	-21.28	31.06	-8.84	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

3.5 Frequency Stability

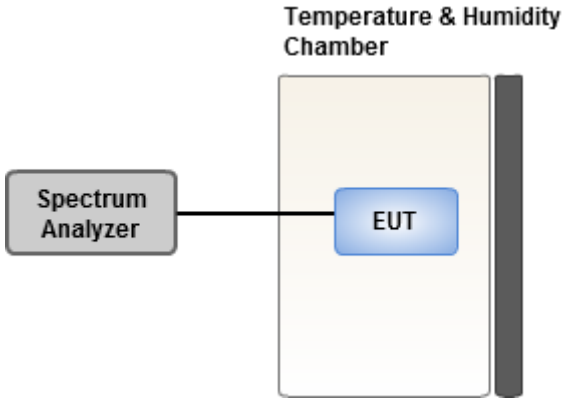
3.5.1 Frequency Stability Limit

Carrier frequency stability shall be maintained to ±0.01% (±100 ppm).

3.5.2 Test Procedures

Test Method	
☒	Refer as ANSI C63.10, clause 6.8 for frequency stability tests
	☒ Frequency stability with respect to ambient temperature
	☒ Frequency stability when varying supply voltage
☐	For conducted measurement.
☒	For radiated measurement. The equipment to be measured and the test antenna shall be oriented to obtain the maximum emitted power level.

3.5.3 Test Setup



3.5.4 Test Result of Frequency Stability

Ambient Condition	24°C / 67%	Tested By	Akun Chung

Frequency: 13.56 MHz	Frequency Drift (ppm)			
Temperature (°C)	0 minute	2 minutes	5 minutes	10 minutes
T20°C Vmax	3.69	2.95	3.69	2.95
T20°C Vmin	5.16	5.90	5.16	4.42
T60°C Vnom	5.90	6.64	5.16	5.16
T50°C Vnom	5.16	5.90	4.42	5.16
T40°C Vnom	4.42	5.16	5.16	3.69
T30°C Vnom	5.16	4.42	5.90	4.42
T20°C Vnom	3.69	4.42	4.42	2.95
T10°C Vnom	4.42	3.69	3.69	3.69
T0°C Vnom	4.42	2.95	3.69	5.16
T-10°C Vnom	5.16	4.42	2.95	4.42
T-20°C Vnom	2.95	2.21	3.69	3.69
Vnom [V]: 3.87		Vmax [V]: 4.4505		Vmin [V]: 3.2895
Tnom [°C]: 20		Tmax [°C]: 60		Tmin [°C]: -20

4 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corporation (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website http://www.icertifi.com.tw.

Linkou	**Kwei Shan**	**Kwei Shan Site II**
Tel: 886-2-2601-1640	Tel: 886-3-271-8666	Tel: 886-3-271-8640
No.30-2, Ding Fwu Tsuen, Lin Kou District, New Taipei City, Taiwan (R.O.C.)	No.3-1, Lane 6, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 33381, Taiwan (R.O.C.) No.2-1, Lane 6, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 33381, Taiwan (R.O.C.)	No.14-1, Lane 19, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 333, Taiwan (R.O.C.)

If you have any suggestion, please feel free to contact us as below information.

Tel: 886-3-271-8666
Fax: 886-3-318-0345
Email: ICC_Service@icertifi.com.tw

==END==