FCC Test Report

FCC ID	:	**IPH-A3958**
Equipment	:	**Smart Watch**
Model No.	:	**AA3958**
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. 30, 2020**
Tested Date	:	**Jun. 06 ~ Jun. 11, 2020**

We, International Certification Corp., 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.
The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

Reviewed by: Along Chen / Assistant Manager

Approved by: Gary Chang / Manager

Testing Laboratory 2732

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Release Record

Report No.	Version	Description	Issued Date
FR051402NF	Rev. 01	Initial issue	Jul. 01, 2020

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.796MHz 19.98 (Margin -26.02dB) - AV	Pass
15.225(a)~(c)	Field strength of fundamental emissions and spectrum mask	[dBuV/m at 3m]: 13.56 MHz 49.48 (Margin -55.91dB)	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
N/A means Not Applicable.			

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	ASK	13.56	1

1.1.2 Antenna Details

Ant. No.	Type	Connector	Gain (dBi)	Remarks
1	Loop antenna	---	---	---

1.1.3 EUT Operational Condition

Power Supply Type	5Vdc from host 3.87Vdc from battery		
Operational Voltage	☒ Vnom (3.87 V)	☒ Vmax (4.45 V)	☒ Vmin (3.40 V)
Operational Climatic	☒ Tnom (20°C)	☒ Tmax (60°C)	☒ Tmin (-20°C)

1.1.4 Accessories

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

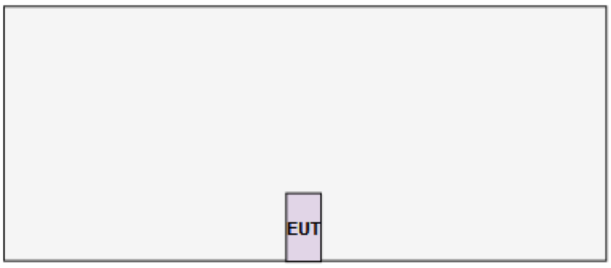
1.1.5 Test Tool and Power Index

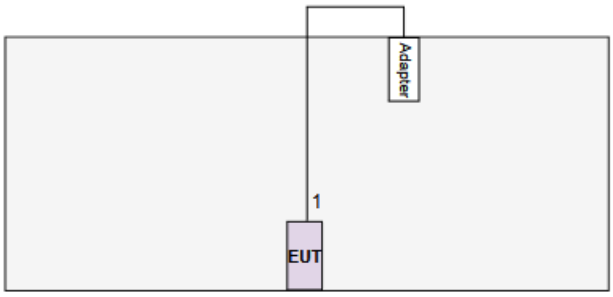
Test Tool	Hardware control, Version: V61.34
Power Index	Default

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 (Charging Mode)	
	
No.	**Signal cable / Length (m)**
1	USB, 0.52m shielded.

1.4 The Equipment List

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Receiver	R&S	ESR3	101658	Dec. 12, 2019	Dec. 11, 2020
LISN	R&S	ENV216	101579	Mar. 12, 2020	Mar. 11, 2021
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Oct. 22, 2019	Oct. 21, 2020
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)				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	R&S	FSV40	101498	Dec. 17, 2019	Dec. 16, 2020
Receiver	R&S	ESR3	101657	Feb. 14, 2020	Feb. 13, 2021
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Jul. 12, 2019	Jul. 11, 2020
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Dec. 12, 2019	Dec. 11, 2020
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Nov. 15, 2019	Nov. 14, 2020
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 13, 2019	Nov. 12, 2020
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Oct. 07, 2019	Oct. 06, 2020
Preamplifier	EMC	EMC02325	980225	Jul. 09, 2019	Jul. 08, 2020
Preamplifier	Agilent	83017A	MY39501308	Oct. 08, 2019	Oct. 07, 2020
Preamplifier	EMC	EMC184045B	980192	Aug. 01, 2019	Jul. 31, 2020
RF Cable	EMC	EMC104-SM-SM-8000	181106	Oct. 07, 2019	Oct. 06, 2020
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16019/4	Oct. 07, 2019	Oct. 06, 2020
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16014/4	Oct. 07, 2019	Oct. 06, 2020
LF cable 1M	EMC	EMCCFD400-NM-NM-1000	160502	Oct. 07, 2019	Oct. 06, 2020
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Oct. 07, 2019	Oct. 06, 2020
LF cable 10M	Woken	CFD400NL-LW	CFD400NL-002	Oct. 07, 2019	Oct. 06, 2020
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)				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	R&S	FSV40	101063	Apr. 30, 2020	Apr. 29, 2021
Power Meter	Anritsu	ML2495A	1241002	Oct. 23, 2019	Oct. 22, 2020
Power Sensor	Anritsu	MA2411B	1207366	Oct. 23, 2019	Oct. 22, 2020
DC POWER SOURCE	GW INSTEK	GPC-6030D	GES855395	Oct. 29, 2019	Oct. 28, 2020
AC POWER SOURCE	APC	AFC-500W	F312060012	Dec. 02, 2019	Dec. 01, 2020
Measurement Software	Sporton	Sporton_1	1.3.30	NA	NA
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 ^{o}C

2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	19°C / 54%	Alex Tsai
Radiated Emissions	03CH01-WS	24°C / 64%	Akun Chung
RF Conducted	TH01-WS	25°C / 64%	Brad Wu

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

2.2 Testing Facility

Test Laboratory	International Certification Corp.
Test Site	CO01-WS, 03CH01-WS, TH01-WS
Address of Test Site	No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan District, Tao Yuan City 333, Taiwan, R.O.C.

2.3 The Worst Test Modes and Channel Details

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

NOTE:

1. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **Z-plane** result was found as the worst case and was shown in this report.
2. The test configurations are listed as follows:

   Test Configuration 1: Charging mode

   Test Configuration 2: Battery mode

3 Transmitter Test Results

3.1 Conducted Emissions

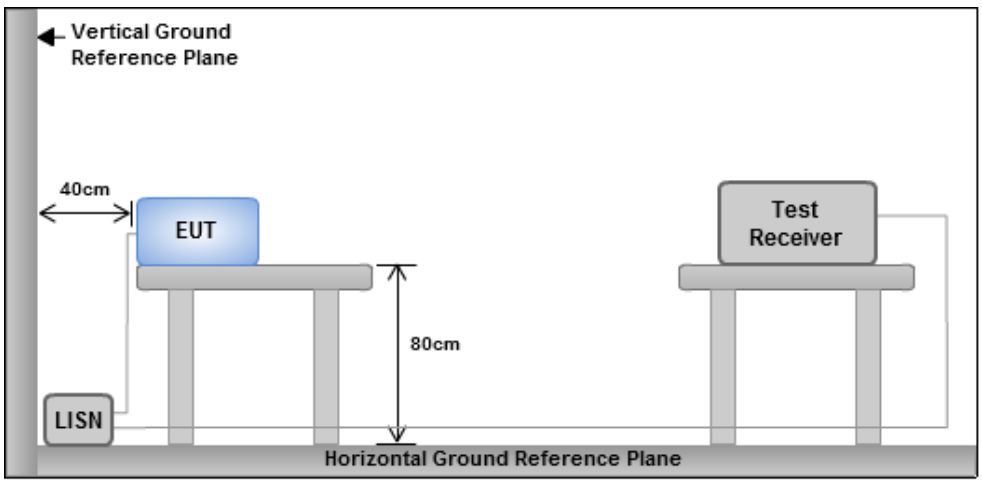
3.1.1 Limit of Conducted Emissions

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

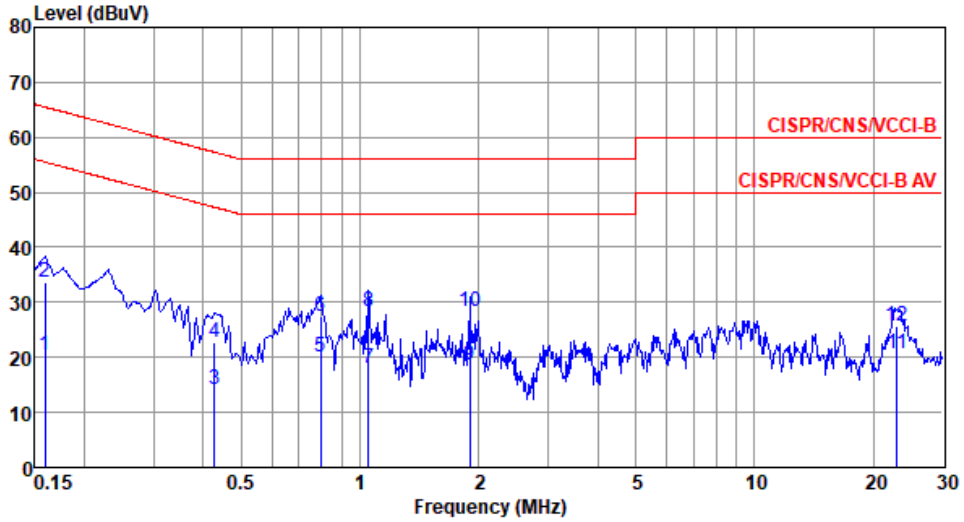


Note: 1. Support units were connected to second LISN.

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

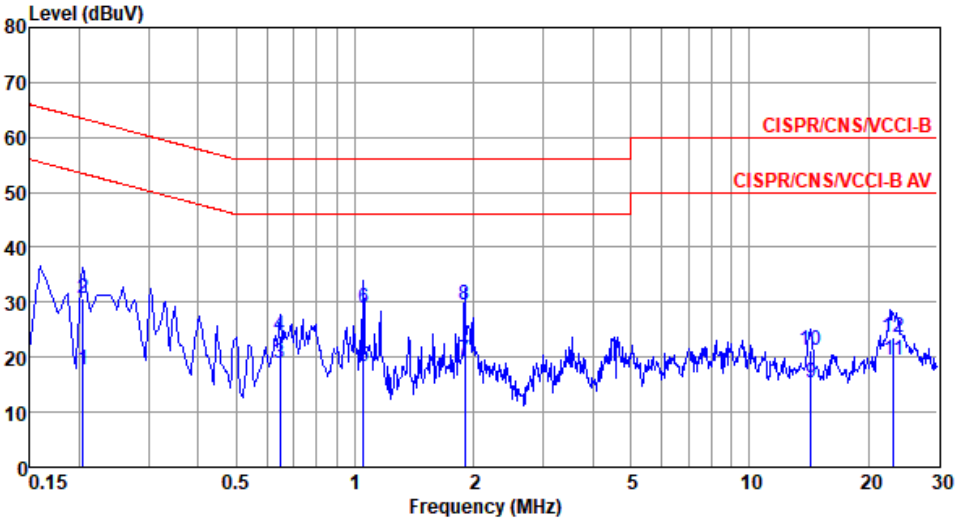
Modulation Mode	Charging	Test Freq. (MHz)	---
Power Phase	Line		



	Freq	Level	Limit Line	Over Limit	Read Level	LISN factor	cable loss	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	dB	
1	0.159	20.26	55.52	-35.26	10.40	9.64	0.05	Average
2	0.159	33.52	65.52	-32.00	23.66	9.64	0.05	QP
3	0.428	14.21	47.29	-33.08	4.24	9.63	0.08	Average
4	0.428	22.79	57.29	-34.50	12.82	9.63	0.08	QP
5*	0.796	19.98	46.00	-26.02	9.94	9.63	0.11	Average
6	0.796	27.40	56.00	-28.60	17.36	9.63	0.11	QP
7	1.049	17.92	46.00	-28.08	7.85	9.63	0.12	Average
8	1.049	28.25	56.00	-27.75	18.18	9.63	0.12	QP
9	1.898	18.73	46.00	-27.27	8.57	9.64	0.18	Average
10	1.898	28.37	56.00	-27.63	18.21	9.64	0.18	QP
11	23.018	20.56	50.00	-29.44	9.51	9.69	0.69	Average
12	23.018	25.62	60.00	-34.38	14.57	9.69	0.69	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		



	Freq	Level	Limit Line	Over Limit	Read Level	LISN factor	cable loss	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	dB	
1	0.204	17.82	53.45	-35.63	7.96	9.65	0.06	Average
2	0.204	30.65	63.45	-32.80	20.79	9.65	0.06	QP
3	0.644	18.87	46.00	-27.13	8.93	9.65	0.10	Average
4	0.644	23.78	56.00	-32.22	13.84	9.65	0.10	QP
5	1.049	18.33	46.00	-27.67	8.36	9.65	0.12	Average
6	1.049	28.99	56.00	-27.01	19.02	9.65	0.12	QP
7*	1.898	19.44	46.00	-26.56	9.34	9.66	0.18	Average
8	1.898	29.42	56.00	-26.58	19.32	9.66	0.18	QP
9	14.288	15.48	50.00	-34.52	4.75	9.79	0.57	Average
10	14.288	21.17	60.00	-38.83	10.44	9.79	0.57	QP
11	23.140	19.49	50.00	-30.51	8.37	9.81	0.69	Average
12	23.140	23.52	60.00	-36.48	12.40	9.81	0.69	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

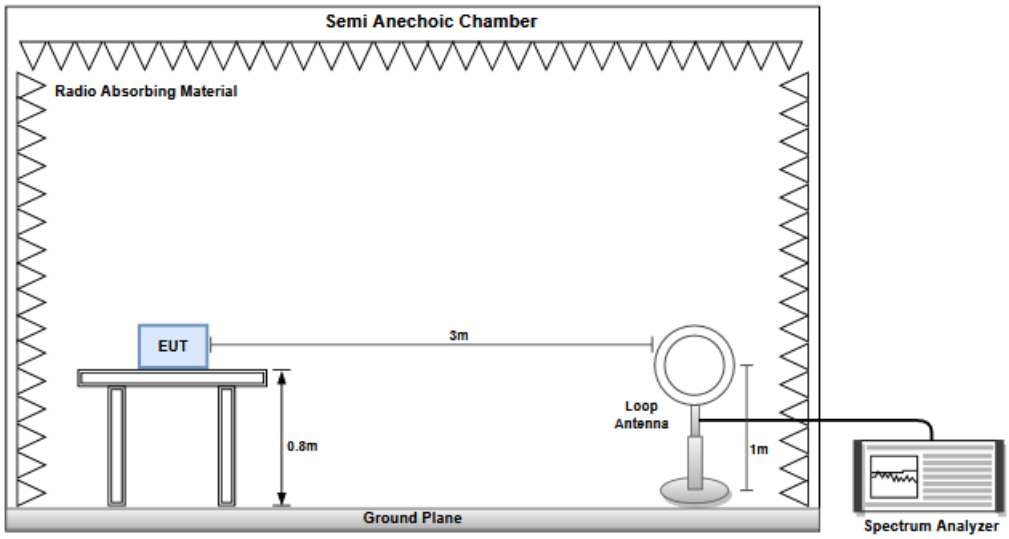
3.2.1 Limit of 20dB Bandwidth

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

3.2.2 Test Procedures

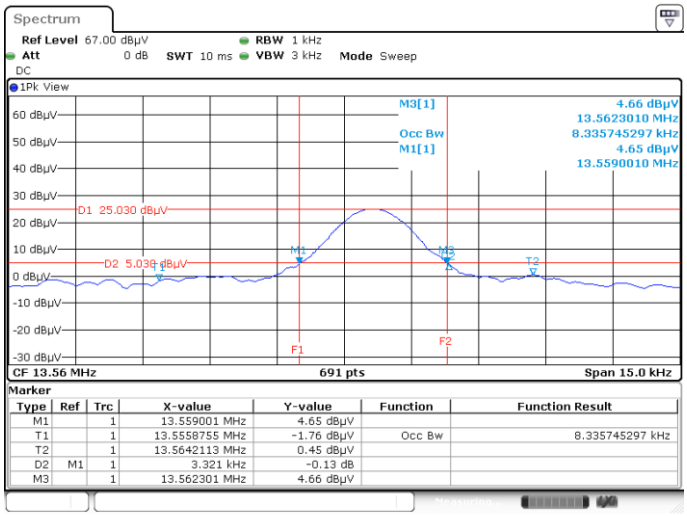
1. Set resolution bandwidth (RBW) = 1 kHz, Video bandwidth = 3 kHz.
2. Detector = Peak, Trace mode = max hold.
3. Sweep = auto couple, Allow the trace to stabilize.
4. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper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

Modulation Mode	Freq. (MHz)	20dB Bandwidth (kHz)	F_L at 20dB BW (MHz)	F_H at 20dBBW (MHz)	99% Bandwidth (kHz)
NFC	13.56	3.321	13.559001	13.562301	8.335745297
Limit		N/A	13.553	13.567	N/A



3.3 Field Strength of Fundamental Emissions

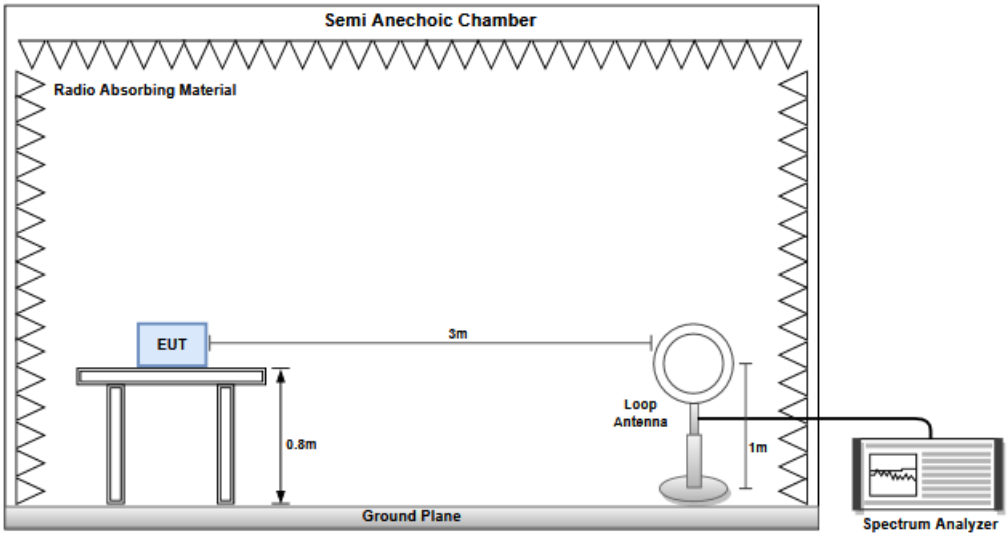
3.3.1 Field Strength of Fundamental Emissions

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

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	49.48	105.39	-55.91	25.44	24.04	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	46	105.39	-59.39	21.96	24.04	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

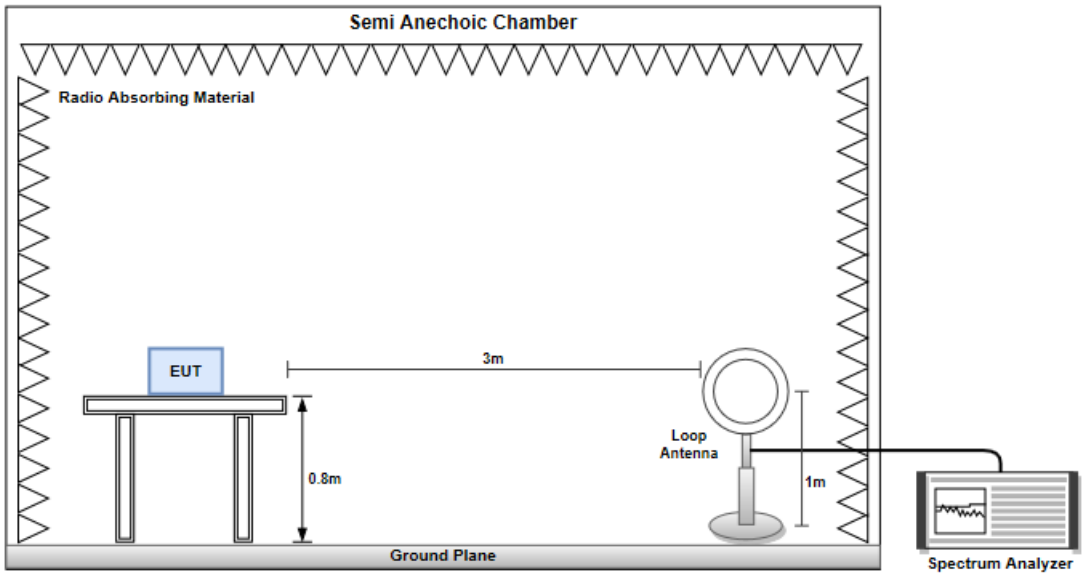
4. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission 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:

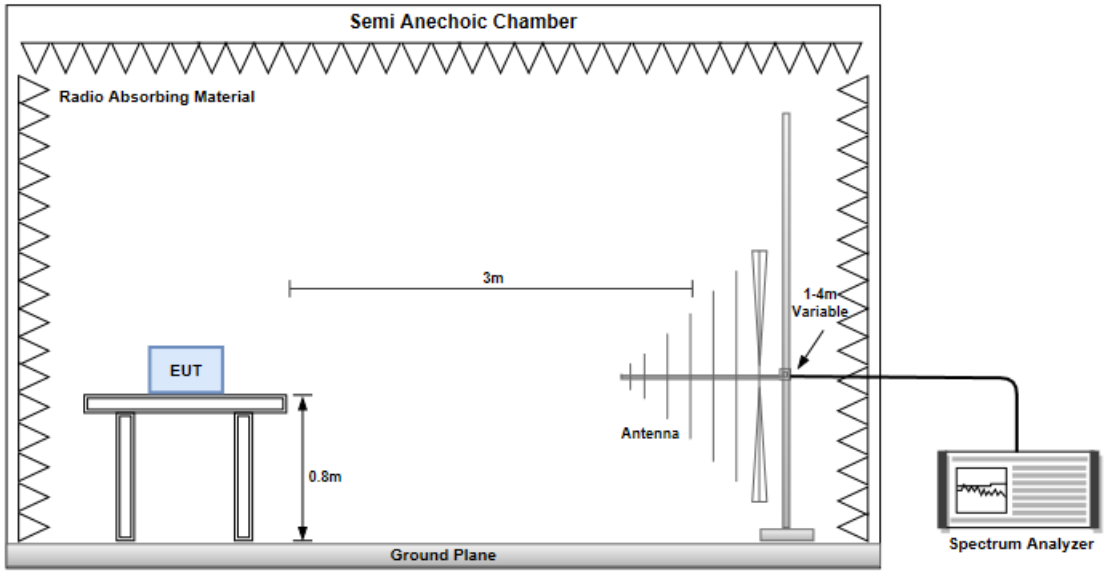
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.

3.4.3 Test Setup

Radiated Emissions below 30MHz



Radiated Emissions below 1 GHz



3.4.4 Transmitter Radiated Unwanted Emissions (Below 30MHz)

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	36.45	62	-25.55	12.46	23.99	QP
Open	13.553	40.28	71.87	-31.59	16.25	24.03	QP
Open	13.567	40.72	71.86	-31.14	16.68	24.04	QP
Open	13.71	34.84	61.81	-26.97	10.76	24.08	QP
Open	27.12	32.06	49.54	-17.48	12.4	19.66	QP

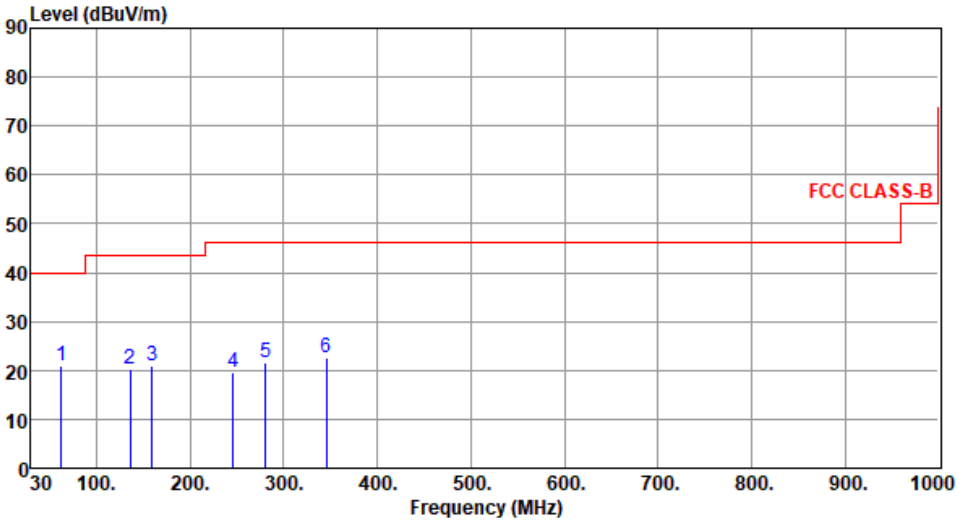
Field Strength of Fundamental Emissions Result							
Polarization	**Emission Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**SA Reading (dBuV)**	**Factor(dB)**	**Remark**
Close	13.41	36.23	62	-25.77	12.24	23.99	QP
Close	13.553	37.04	71.87	-34.83	13.01	24.03	QP
Close	13.567	38.86	71.86	-33	14.82	24.04	QP
Close	13.71	36.72	61.81	-25.09	12.64	24.08	QP
Close	27.12	31.97	49.54	-17.57	12.31	19.66	QP

Note: Emission level = SA reading + Factor

Test Configuration 1: Charging mode

3.4.5 Transmitter Radiated Unwanted Emissions (Above 30MHz)

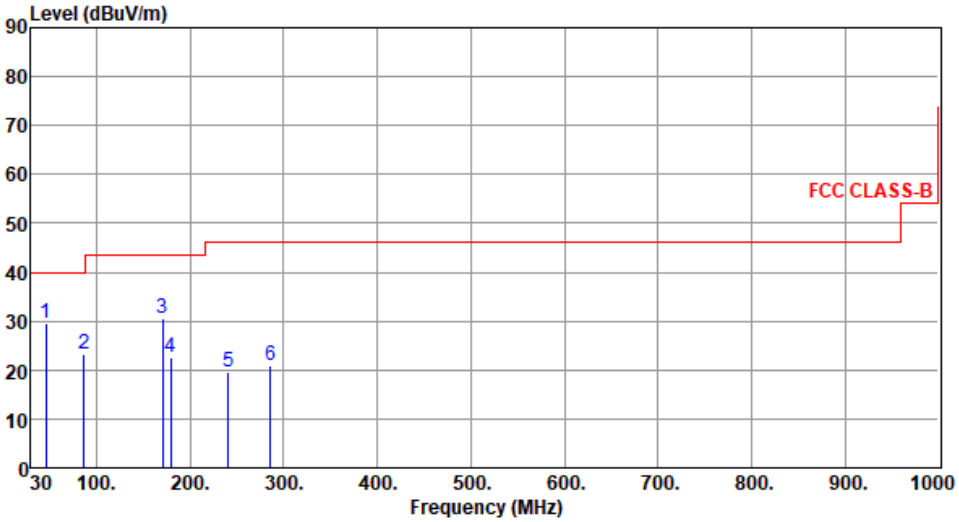
Polarization	Horizontal	**Test Freq. (MHz)**	13.56



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	62.01	21.01	40.00	-18.99	30.21	-9.20	Peak	---	---
2	135.73	20.18	43.50	-23.32	29.34	-9.16	Peak	---	---
3	159.01	20.98	43.50	-22.52	29.30	-8.32	Peak	---	---
4	246.31	19.68	46.00	-26.32	29.65	-9.97	Peak	---	---
5	280.26	21.73	46.00	-24.27	30.37	-8.64	Peak	---	---
6	345.25	22.48	46.00	-23.52	29.56	-7.08	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*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



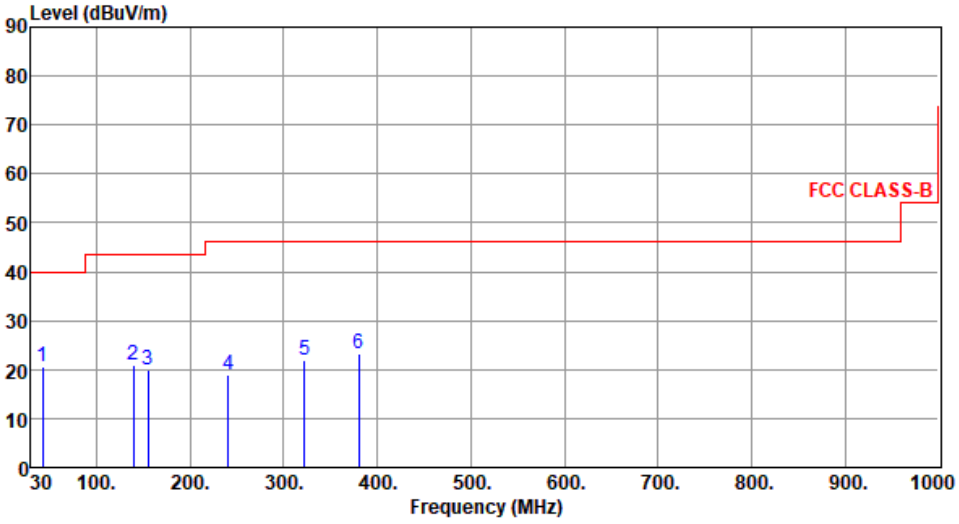
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	45.52	29.67	40.00	-10.33	38.04	-8.37	Peak	---	---
2	86.26	23.28	40.00	-16.72	37.48	-14.20	Peak	---	---
3	170.65	30.66	43.50	-12.84	39.62	-8.96	Peak	---	---
4	179.38	22.58	43.50	-20.92	32.39	-9.81	Peak	---	---
5	240.49	19.56	46.00	-26.44	29.73	-10.17	Peak	---	---
6	286.08	20.84	46.00	-25.16	29.26	-8.42	Peak	---	---

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

Test Configuration 2: Battery mode

3.4.6 Transmitter Radiated Unwanted Emissions (Above 30MHz)

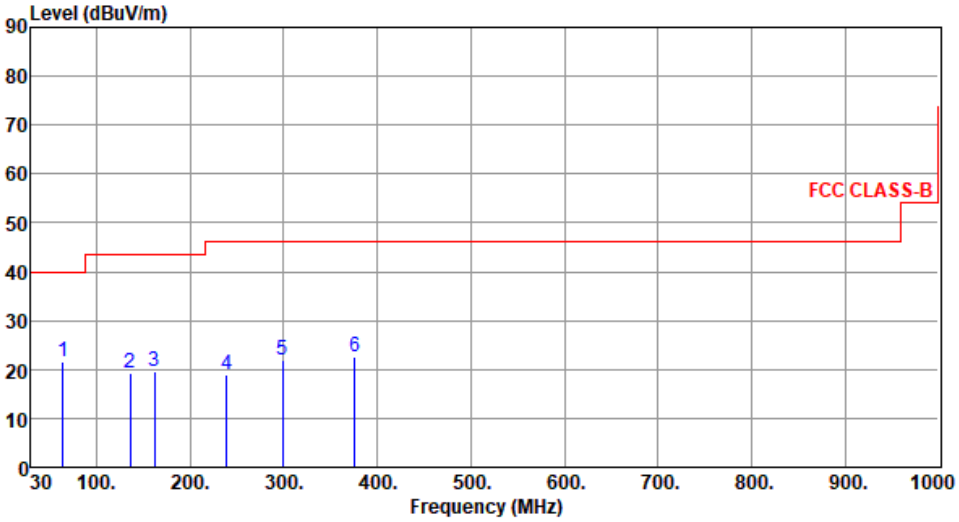
Polarization	Horizontal	**Test Freq. (MHz)**	13.56



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	42.61	20.44	40.00	-19.56	28.70	-8.26	Peak	---	---
2	139.61	20.79	43.50	-22.71	29.69	-8.90	Peak	---	---
3	155.13	19.99	43.50	-23.51	28.32	-8.33	Peak	---	---
4	240.49	18.92	46.00	-27.08	29.09	-10.17	Peak	---	---
5	321.97	21.84	46.00	-24.16	29.18	-7.34	Peak	---	---
6	380.17	23.28	46.00	-22.72	29.22	-5.94	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*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



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	63.95	21.56	40.00	-18.44	30.84	-9.28	Peak	---	---
2	135.73	19.22	43.50	-24.28	28.38	-9.16	Peak	---	---
3	161.92	19.69	43.50	-23.81	28.11	-8.42	Peak	---	---
4	239.52	18.84	46.00	-27.16	29.09	-10.25	Peak	---	---
5	298.69	21.81	46.00	-24.19	29.93	-8.12	Peak	---	---
6	376.29	22.75	46.00	-23.25	28.78	-6.03	Peak	---	---

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

3.5 Frequency Stability

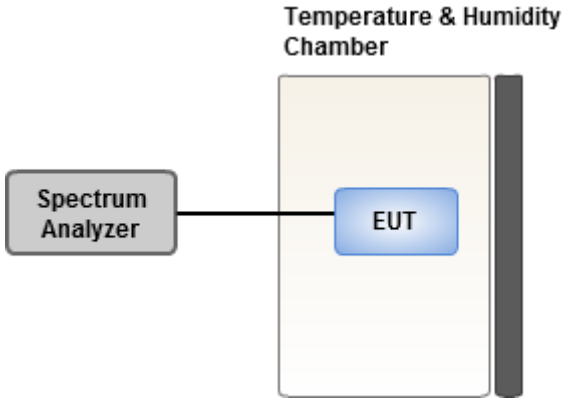
3.5.1 Frequency Stability Limit

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

Frequency: 13.56 MHz	Frequency Drift (ppm)			
Temperature (°C)	0 minute	2 minutes	5 minutes	10 minutes
T20°C Vmax	-5.90	-5.16	-5.90	-5.16
T20°C Vmin	-5.16	-5.90	-5.90	-5.90
T60°C Vnom	-2.21	-2.95	-2.21	-2.95
T50°C Vnom	-2.95	-2.21	-2.95	-2.21
T40°C Vnom	-2.95	-2.95	-3.69	-4.42
T30°C Vnom	-3.69	-4.42	-2.95	-3.69
T20°C Vnom	-4.42	-5.16	-4.42	-5.16
T10°C Vnom	-5.16	-5.16	-5.90	-5.90
T0°C Vnom	-5.90	-5.90	-5.90	-5.16
T-10°C Vnom	-8.85	-9.59	-9.59	-9.59
T-20°C Vnom	-9.59	-9.59	-8.85	-9.59
Vnom [V]: 3.87		Vmax [V]: 4.45		Vmin [V]: 3.4
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 Corp (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 District, Tao Yuan City 333, Taiwan, R.O.C.	No. 14-1, Lane 19, Wen San 3rd St., Kwei Shan District, Tao Yuan City 333, Taiwan, R.O.C.

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

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