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Test Report for FCC

FCC ID :2AWCDRP70A-BIO

Report Number		ESTRFC2004-001		
Applicant	Company name	Gen2wave		
	Address	7th fl., Point town B/D, 187-4, Gumi-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, Rep of Korea		
	Telephone	+82 607 7537		
Product	Product name	Tablet PC		
	Model No.	RP70A BIO	Manufacturer	Gen2wave
	Serial No.	NONE	Country of origin	KOREA
Test date	01-Apr-20 ~ 03-Apr-20		Date of issue	28-Apr-20
Testing location	140-16, Eongmalli-ro, Majang-myeon, Icheon-si, Gyeonggi-do, Korea			
Standard	FCC PART 15 Subpart C(15.225), ANSI C 63.10(2013)			
Result		Complied		
Measurement facility registration number		659627		
Tested by	Engineer H.G. Lee	(Signature)		
Reviewed by	Engineering Manager I.k. Hong	(Signature)		
Abbreviation	OK, Pass = Complied, Fail = Failed, N/A = not applicable			

* Note

- This test report is not permitted to copy partly without our permission
- This test result is dependent on only equipment to be used
- This test result based on a single evaluation of one sample of the above mentioned
- This test report is not related to KOLAS accreditation
- Additional models name:MetaDolce MD7200-BIO, RP70
- (Basic and additional Model(s) are same products, only model name are different)

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Contents

1. Laboratory Information

1.1 General

This EUT (Equipment Under Test) has been shown to be capable of compliance with the applicable technical standards and is tested in accordance with the measurement procedures as indicated in this report.ESTECH Lab attests to accuracy of test data. All measurement reported herein were performed by ESTECH Co., Ltd.
ESTECH Lab assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

1.2 Test Lab.

Corporation Name : ESTECH Co., Ltd.

Head Office : Suite 1015 World Meridian II, 123 Gasan Digital 2-ro, Geumcheon-gu,
Seoul 153-759, R. O. Korea

EMC/Telecom/Safety Test Lab : 347-69, Jungbu-daero 147beon-gil, Majang-myeon, Icheon-si,
Gyeonggi-do 467-811, R. O. Korea

1.3 Official Qualification(s)

MSIP : Granted Accreditation from Ministry of Information & Communication for EMC, Safety and Telecommunication
KOLAS : Accredited Lab By Korea Laboratory Accreditation Schema base on CENELEC requirements
FCC : Conformity Assessment Body(CAB) with registration number 659627 under APEC TEL MRA between the RRA and the FCC
VCCI : Granted Accreditation from Voluntary Control Council for Interference from ITE

2. Description of EUT

2.1 Summary of Equipment Under Test

Product	: Tablet PC
Model Number	: RP70A BIO
Serial Number	: NONE
Manufacturer	: Gen2wave
Country of origin	: KOREA
Operating Frequency	: 13.56 MHz
Antenna Type	: PCB Patten Antenna
Modulation Type	: ASK
Channel	: 1 ch
Power Rating	INPUT: AC(100 - 240) V, (50-60)Hz, 1 A OUTPUT: DC 5 V, 5 A
Receipt Date	: 18-Feb-20
X-tal list(s) or Frequencies generated	: The highest operating frequency is 13.56 MHz

2.2 General descriptions of EUT

Category	Specification	
Perfomance Characteristics	CPU	Hexa core CPU Cortex A72 Dual-core 1.8GHz, Cortex A53 Quad core 1.4Ghz
	RAM	4GB
	ROM	32GB (64GB / 128GB optional)
	OS	Android 8.1 Oreo
Integrated Radios	Wireless WAN	LTE, HSPA+
	Wireless LAN	IEEE 802.11 a/b/g/n/ac (2.4, 5GHz)
	Bluetooth	Bluetooth 4.2 BLE
	GPS	AGPS (GLONASS optional)
DATA CAPTURE	Camera	Front Camera : 2MP / Rear Camera : 13MP Auto Focus
		LED Flash
	1D/2D Imager	2D Imager (SW Decoder) : Zebra SE4710
	RFID	NXP PN548 HF 13.56MHz, Read Tag : 14443A/B, 15693
	SAM	2 SAM Slot
	OCR(MRZ)	Font : OCR B MRZ Lines : 1 line : IDL, CAN, etc 2 line : ID2 cards, Epp
	Fingerprint	Module : BM-Slim 2 (Suprema) Sensor Type : Optical Sensor Sensing Area : 16.5mm(W) x 21.0mm(L) Pixel Resolution : 500 ppi Gray Scale : 256 level Output Image Format : RAW, BMP, WSQ, ISO 19794-4 Format : FBI PIV certified, FBI Mobile ID FAP 20 certified

Category	Specification	
DATA CAPTURE	Contact Smart Card	Contact type Smart Card Reader (gemalto) : ISO7816
	Iris Recognition (Opal)	Camera : 5MP B&W CMOS sensor Operating Range : 320±0mm (11"~14") Resolution : Above 160 pixel/cm Iris Capture Volume : 130mm x 45mm x 80mm Illumination : IR LED Image : 2592 x 920 x 30 Frame
Physical Characteristics	Demensions	213mm(H) x 195.3mm(W) x 30.55mm / 21mm : Minimum Thickness (D)
	Weight	850g
	Display	7.0Inch / HD(1280x800)
	Display Visibility	700 nits (cd/m2)
	Touchpannel	Capacitive Touch / 10 point multi touch / Gorilla Glass 3
	Keypad	3 Front Key / 5 Side Key (Programmable)
	Battery	Built in Battery : Li-Polymer, 3.7V, 10,050mAh
	Expanslon Slot	MicroSDXC upto 2TB supported Communication
	Communication	Tablet side : USB3.0 Host, USB2.0 Client(OTG) Extension 10pin connector : Serial, USB2.0 Host I/0 25pin connector : USB2.0 Host, HDMI, Serial, Ethernet (with cradle)
ETC	Audio	Dual Speaker, MIC
	Jack	DC jack, USB3.0 Host, USB2.0 Client, 3.5phi Ear-Mic Jack
	IO connector	POGO 25 pin (Power, RS232, USB 3port, HDMI, Ethernet)
	Extention pin	POGO 10 pin
	LED	Front 2 LED : Charging, Power
	Sensor	Acceleration Sensor, Compass, Ambient Light Sensor
	power	DC Jack 5V / 5A Adaptor
	Use time	Stand-by time : > 150hr Working time : > 8hr
User Environment	Operating Temp	-20℃~ 70℃
	torage Temp	-30℃~ 70℃
	umidity	Non-condensing, 93%
	Drop	1.2 m

3. Test Standards

Test Standard : FCC PART 15 Subpart C(15.225)

This Standard sets out the regulations under which an intentional, unintentional, or incidental radiator may be operated without an individual license. It also contains the technical specifications, administrative requirements and other conditions relating to the marketing of Part 15 devices.

Test Method : ANSI C 63.10 (2013)

This standard sets forth uniform methods of measurement of radio-frequency (RF) signals and noise emitted from both unintentional and intentional emitters of RF energy in the frequency range 9 kHz to 40 GHz. Methods for the measurement of radiated and AC power-line conducted radio noise are covered and may be applied to any such equipment unless otherwise specified by individual equipment requirements. These methods cover measurement of certain decides that deliberately radiate energy, such as intentional emitters, but does not cover licensed transmitters. This standard is not intended for certification/approval of avionic equipment or for industrial, scientific, and medical (ISM) equipment These method apply to the measurement of individual units or systems comprised of multiple units

Summary of Test Results

Applied Satandard : 47 CFR Part 15, Subpart C				
Standard	Test Type	Result	Remark	Limit
15.203	Antenna Requirement	Pass	Meet the requirement	
15.207	AC Power Conducted Emission	Pass	Meet the requirement	
15.225(a)	Radiated Emission (13.553 ~13.567) MHz	Pass	Meet the requirement	15,848 uV/m at 30 m
15.225(b)	Radiated Emission (13.410 ~13.553 , 13.567 ~ 13.710) MHz	Pass	Meet the requirement	334 uV/m at 30 m
15.225(c)	Radiated Emission (13.110 ~13.410 , 13.710 ~ 14.010) MHz	Pass	Meet the requirement	106 uV/m at 30 m
15.225(d)	Apply section 15.209 (out side band of the 13.110 ~14.010) MHz	Pass	Meet the requirement	
15.225(e)	Frequency stability	Pass	Meet the requirement	
15.215(c)	20dB Bandwidth	Pass	Meet the requirement	

4. Measurement Condition

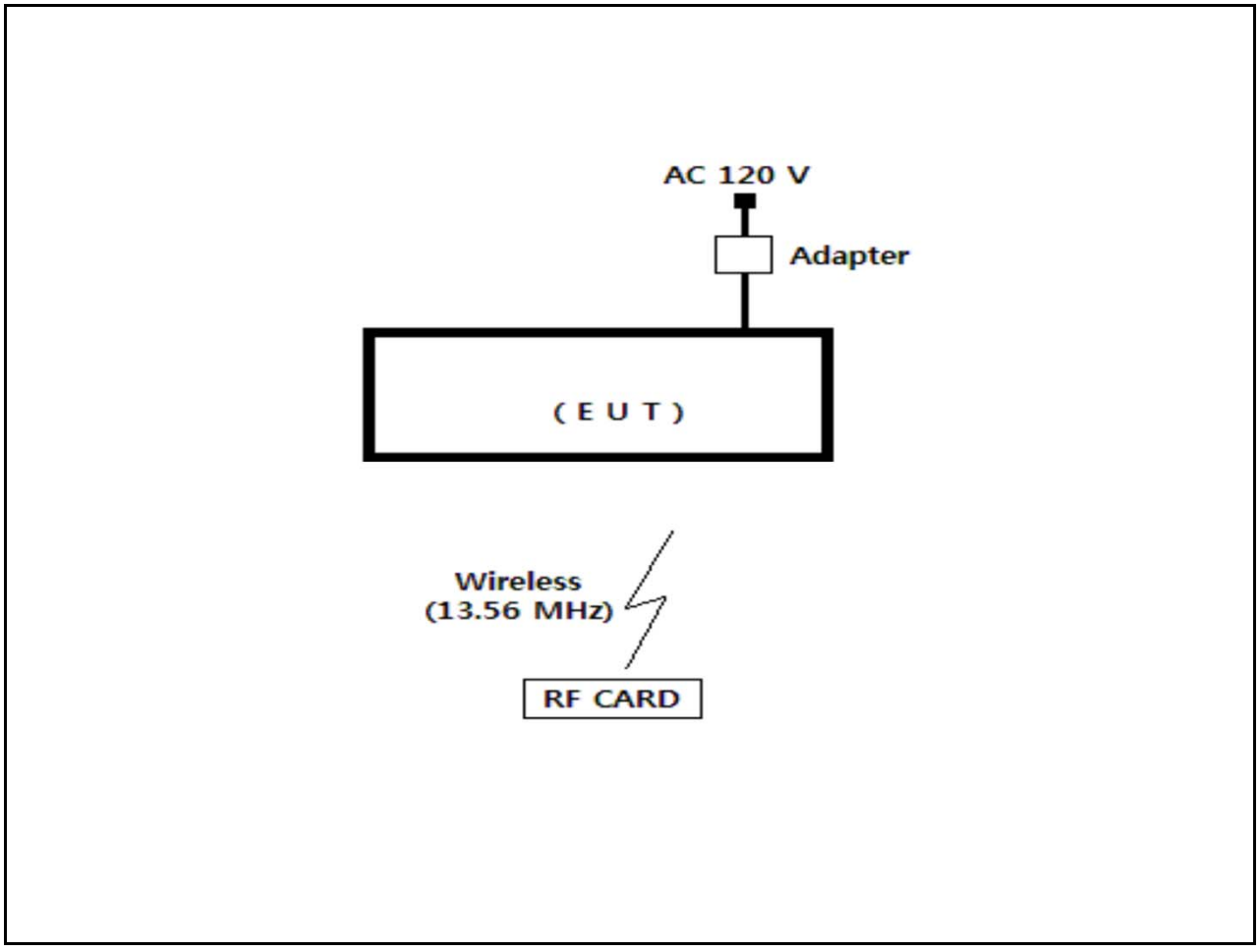
4.1 EUT Operation.

-The EUT was tested, under transmission / receiving

1. Normal communication with RF OUT Frequeny(13.56 MHz).

2. Monitoring the operation status of frequency by using RF CARD.

4.2 Configuration and Peripherals



4.3 EUT and Support equipment

Equipment Name	Model Name	S/N	Manufacturer	Remark (FCC ID)
RP70A BIO	NONE	NONE	Gen2wave	EUT
Adapter	ATS036T-P050	NONE	Boayang Electronics Co., Ltd.	

4.4 Cable Connecting

Start Equipment		End Equipment		Cable Standard		Remark
Name	I/O port	Name	I/O port	Length	Shielded	
RP70A BIO	Power	Adapter	-	2.0	Unshielded	

5. 20 dB Bandwidth

5.1 Procedure

The transmitter output was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measured by spectrum analyzer. The 20 dB bandwidth is defined as the bandwidth at 20 dB below from peak power point.

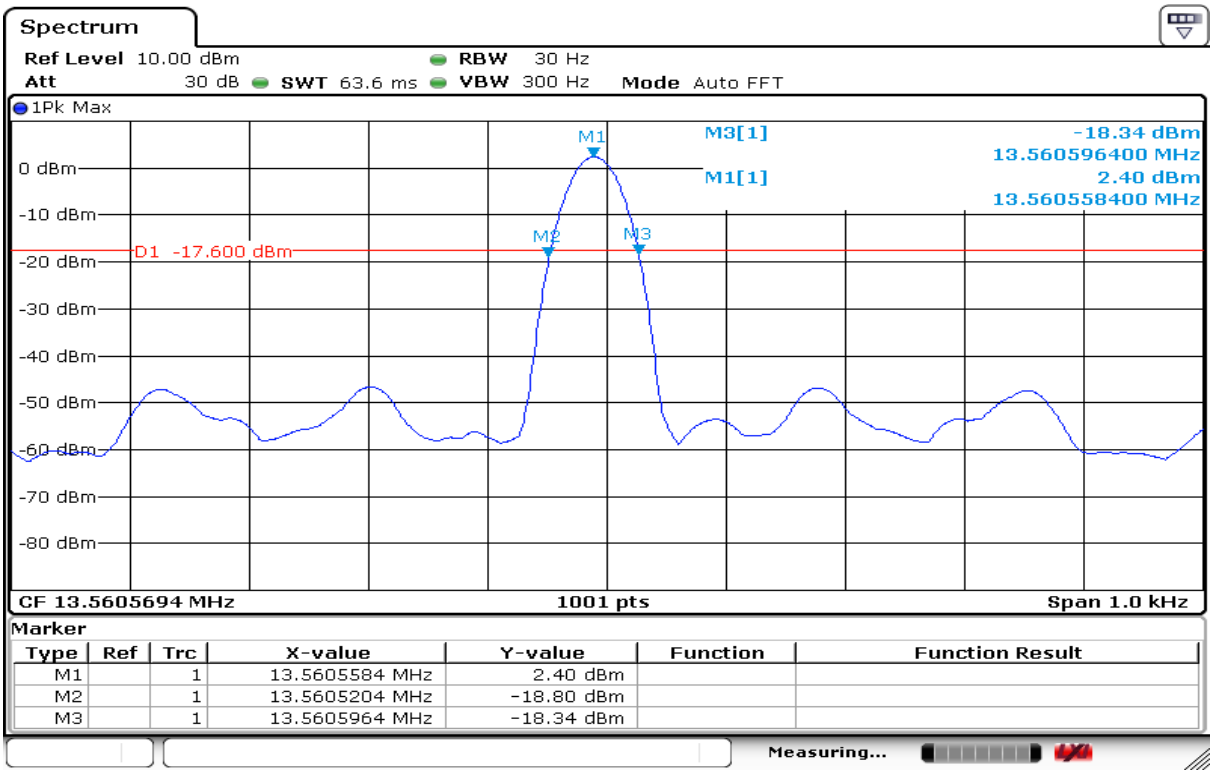
5.2 20dB Bandwidth setup

The spectrum analyzer is set to as following
RBW: 30 Hz
VBW: 300 Hz
Span: 1 kHz
Sweep:suitable duration based on the EUT specification

20dB Bandwidth Test Instruments

Decription	Model	Serial Number	Cal. Due Data
Signal Analyzer	FSV40	100939	2-Dec-20

5.3 Measurement Data



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6. Frequency Tolerance

6.1 Procedure

The frequency stability of the transmitter is measured by:

a) Temperature: The temperature is varied from -20 ℃ to +50 ℃ using an environmental chamber.

b) Primary Supply Voltage: The primary supply voltage is varied from 85 % to 115 % of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied.

The frequency tolerance of the carrier shall be maintained within ±0.01 % of the operating frequency.

6.2 Equipment lists

The following test equipments are used during test

Decription	Model	Serial Number	Cal. Due Data
Signal Analyzer	FSV40	100939	2-Dec-20
Temp./Humidity Chamber	PSL-2GT	1955798	2-Dec-20

6.3 Frequency stability Data (Adapter)

Operting Frequency :	13,560,596	Hz
Reference Voltage :	5.00	Vd.c.
Deviatin Limit :	± 0.01	%

Voltage (%)	Power (Vdc)	Temperature (℃)	Frequency (Hz)	Deviation (%)
100	5.00	+20 ℃(Ref)	13,560,531	-0.000479
100		-20	13,560,546	-0.000369
100		-10	13,560,625	0.000214
100		**0**	13,560,457	-0.001025
100		10	13,560,389	-0.001526
100		20	13,560,492	-0.000767
100		30	13,560,451	-0.001069
100		40	13,560,342	-0.001873
100		50	13,560,448	-0.001091
85	4.25	20	13,560,572	-0.000177
115	5.75	20	13,560,615	0.000140

7. Measurement of radiated disturbance

The EUT was placed on the top of a rotating table 0.8 m above the ground at a 10 m semi-anechoic chamber . The table was rotated 360° to determine the position of the highest radiation.Then antenna is a loop antenna is fixed at 1 m above the ground to determine the maximum value of the field strength. Both parallel and perpendicular of the antenna are set to make the measurement. For each suspected emission, the EUT was arranged to its worst case and then the table was turned from 0° to 360° to find the maximum reading. The test receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

7.1 Radiated emission limits, general requirements

Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Distance(Meters)	Field strength @3m (dBuV/m)
0.009 to 0.490	3	128.5 to 93.8
0.490 to 1.705	3	73.8 to 63
1.705 to 30	3	69.5
30 to 88	3	40
88 to 216	3	43.5
216 to 960	3	46
> 960	3	54

* dBuV/m=20*log(uV/m) * Distance factor=40dB / decade(15.31(f))

7.2 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
TEST Receiver	ESCI7	ROHDE & SCHWARZ	100916	9-Sep-20
Logbicon Antenna	VULB 9168	SCHWARZBECK	193	14-Jan-22
Turn Table	DT3000-2t	Innco System GmbH	N/A	-
Antenna Mast	MA4000-EP	Innco System GmbH	N/A	-
Antenna Master & Turn table controller	CO2000-P	Innco System GmbH	CO2000/641 /28051111/L	-
Loop Antenna	HFH2-Z2	ROHDE & SCHWARZ	100188	21-Aug-20

7.3 Environmental Condition

Test Place : 10 m Semi-anechoic chamber
Below 1 GHz
Temperature (°C) : 23.7 ℃
Humidity (% R.H.) : 44.2 % R.H.

Test Place : 3 m Semi-anechoic chamber(3 m)
Above 1 GHz-N/A
Temperature (°C) :
Humidity (% R.H.) :

7.4 Test data(9 kHz ~ 30 MHz)

Test Date : 2-Apr-20 Measurement Distance : 3 m

Frequency (MHz)	Reading (dBμV)	Vertical Position [Angle]	EUT Position	Height (m)	Correction Factor		Result Value(Quasi-Peak)		
					Ant Factor (dB)	Cable (dB)	Limit (dBμV/m)	Result (dBμV/m)	Margin (dB)
Below 13.110 MHz									
Noise Floor	-	-	-	-	19.48	0.5	69.5	-	-
13.110 MHz to 13.410 MHz									
Noise Floor	-	-	-	-	19.46	0.5	80.5	-	-
13.410 MHz to 13.552 MHz									
Noise Floor	-	-	-	-	19.46	0.5	90.5	-	-
13.553 MHz to 13.567 MHz									
13.5600	42.87	260 °	X	0.8	19.46	0.5	124.0	62.87	61.13
13.567 MHz to 13.710 MHz									
Noise Floor	-	-	-	-	19.45	0.5	90.5	-	-
13.710 MHz to 14.010 MHz									
Noise Floor	-	-	-	-	19.44	0.6	80.5	-	-
14.010 MHz to 30 MHz									
Noise Floor	-	-	-	-	19.44	0.6	69.5	-	-

Remark	
	*The 30 m limit was converted to 3 m Limit using square factor(x) as it was found by measurements as follows; *3 m Limit(dBuV/m) = 20log(X)+40log(30/3)= 20log(15848)+40log(30/3) = 124 dBuV *3 m Limit(dBuV/m) = 20log(X)+40log(30/3)= 20log(30)+40log(30/3) = 69.5 dBuV * The EUT was measured for the worst case by rotating of antenna angle. * The EUT performed at X,Y,Z and recorded the worst data in the report.

7.5 Test data(30 MHz ~ 1 000 MHz)

Test Date : 2-Apr-20 Measurement Distance : 3 m

Frequency (MHz)	Reading (dBμV)	Position (V/H)	Height (m)	Correction Factor		Result Value(Quasi-peak)		
				Ant Factor (dB)	Cable (dB)	Limit (dBμV/m)	Result (dBμV/m)	Margin (dB)
30.20	8.47	V	1.0	11.41	0.82	40.00	20.70	19.30
207.50	10.72	V	1.0	10.11	2.22	43.50	23.05	20.45
400.00	6.66	H	1.4	16.00	3.18	46.00	25.84	20.16
600.00	10.41	H	1.0	20.07	3.98	46.00	34.46	11.54
677.60	3.49	V	1.4	21.03	4.27	46.00	28.79	17.21
800.00	7.76	V	1.6	22.55	4.68	46.00	34.99	11.01

Remark	H : Horizontal, V : Vertical *Result Value = Reading + Antenna + Cable loss *Correction Factor = Ant Factor + Cable *The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection

7.6 Test data (Above 1 GHz) - N / A

Test Date : Measurement Distance : 3 m

Frequency (MHz)	Reading (dBμV)	Position (V/H)	Height (m)	Correction Factor		Result Value		
				Ant Factor (dB)	Cable (dB)	Limit (dBμV/m)	Result (dBμV/m)	Margin (dB)
Peak(RBW:1 MHz VBW:1 MHz)								
Average(RBW:1 MHz VBW:10 Hz)								
Remark	H : Horizontal, V : Vertical *Reading = receiver reading + Amplifier Gain *CL = Cable Loss-Amplifier Gain *The resolution bandwidth and video bandwidth of spectrum analyzer is 1 MHz and 10 Hz for average detection at frequency above 1 GHz. *This test does not require because the highest operating frequency of the EUT is less than 108 MHz. *Application method of the highest frequency is in the following *Highest frequency of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz. *Highest frequency of the EUT is between 108 MHz and 500 MHz, the measurement shall only be made up to 2 GHz. *Highest frequency of the EUT is between 500 MHz and 1 GHz, the measurement shall only be made up to 5 GHz. *Highest frequency of the EUT is above 1 GHz, the measurement shall be made up to 10 times the highest frequency or 40 GHz,							

8. Measurement of conducted disturbance

The continuous disturbance voltage of AC Mains in the frequency from 0.15 MHz to 30 MHz was measured in accordance to FCC Part 15 & ANSI C 63.10 (2013) The test setup was made according to FCC Part 15 & ANSI C 63.10 (2013) in a shielded Room. The EUT was placed on a non-conductive table at least 0.8 m above the ground plan. A grounded vertical reference plane was positioned in a distance of 0.4 m from the EUT. The distance from the EUT to other metal surfaces was at least 0.8 m. The EUT was only earthen by its power cord through the line impedance stabilizing network. The power cord has been bundled to a length of 1.0 m. The test receiver with Quasi Peak detector complies with CISPR 16.

8.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
TEST RECEIVER	ESPI	Rohde & Schwarz	100005	9-Sep-20
LISN	ESH3-Z5	Rohde & Schwarz	836679/025	9-Sep-20
Pulse Limiter	ESH3Z2	Rohde & Schwarz	NONE	9-Sep-20

8.2 Environmental Condition

Test Place : Shielded Room
Temperature (°C) : 23.1 ℃
Humidity (% R.H.) : 43.7 % R.H.

8.3 Test data

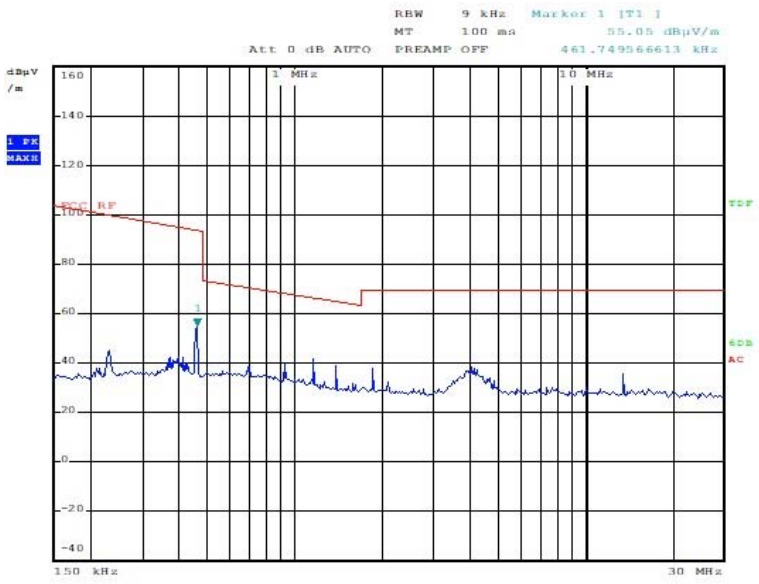
Test Date : 3-Apr-20

Frequency (MHz)	Correction Factor		Line (H/N)	Quasi-peak Value			Average Value		
	Lisn (dB)	Cable (dB)		Limit (dBμV)	Reading (dBμV)	Result (dBμV)	Limit (dBμV)	Reading (dBμV)	Result (dB)
0.16	0.41	0.29	N	65.46	42.27	42.97	55.46	32.35	33.05
0.17	0.59	0.28	H	64.96	46.77	47.64	54.96	32.29	33.16
0.21	0.43	0.27	N	63.32	39.53	40.23	53.32	27.15	27.85
0.22	0.62	0.27	H	62.74	43.09	43.98	52.74	28.57	29.46
0.27	0.63	0.27	H	61.21	40.52	41.42	51.21	27.57	28.47
0.32	0.64	0.27	H	59.68	38.50	39.41	49.68	26.13	27.04
27.12	0.21	0.54	N	60.00	38.04	38.79	50.00	37.79	38.54

Remark	H : Hot Line, N : Neutral Line *Correction Factor = Lisn + Cable *Result = Correction Factor + Reading

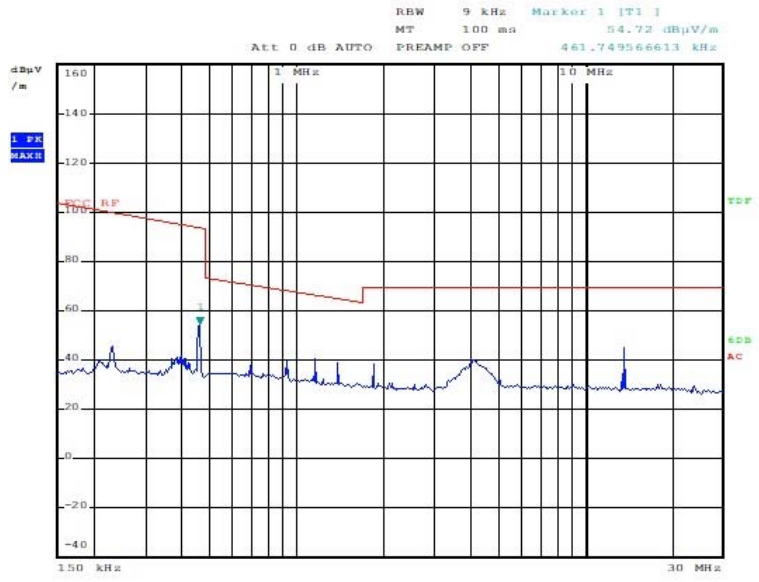
Appendix 1. Measurement Data Plot (9kHz ~ 30 MHz)

* Horizental



RP70A BIO_NFC_HOR

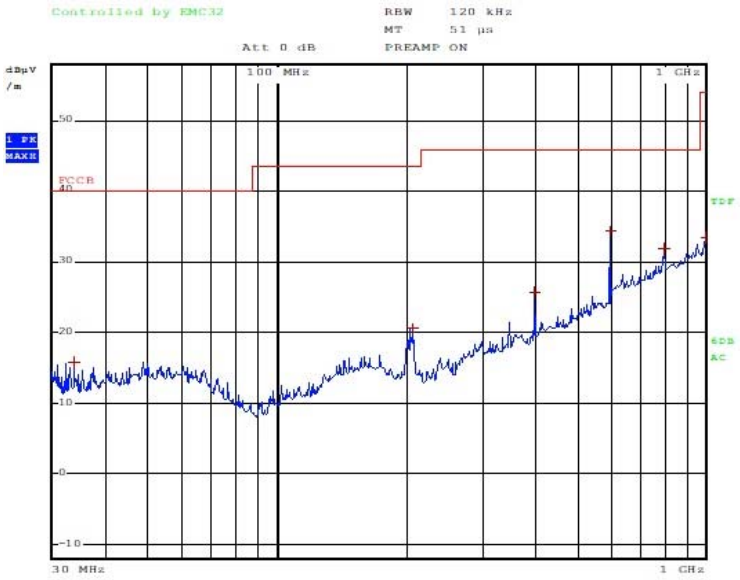
* Vertical



RP70A BIO_NFC_VER

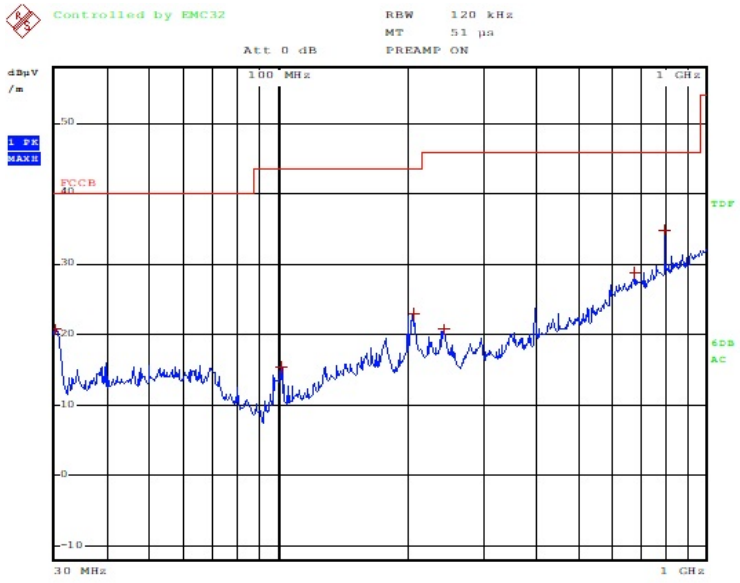
Appendix 1. Measurement Data Plot(30 MHz ~ 1 GHz)

* Horizental



RP70A BIO_NFC_HOR

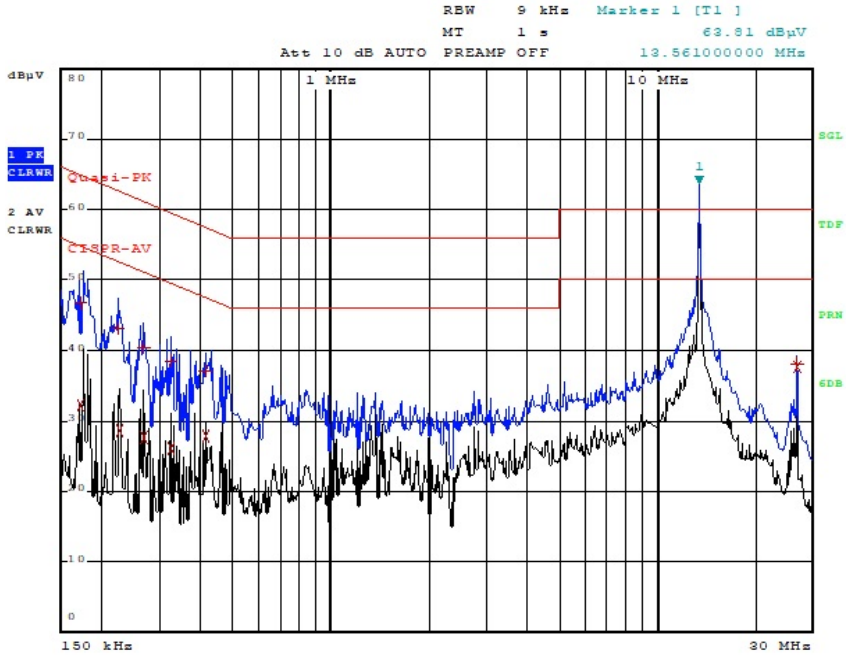
* Vertical



RP70A BIO_NFC_VER

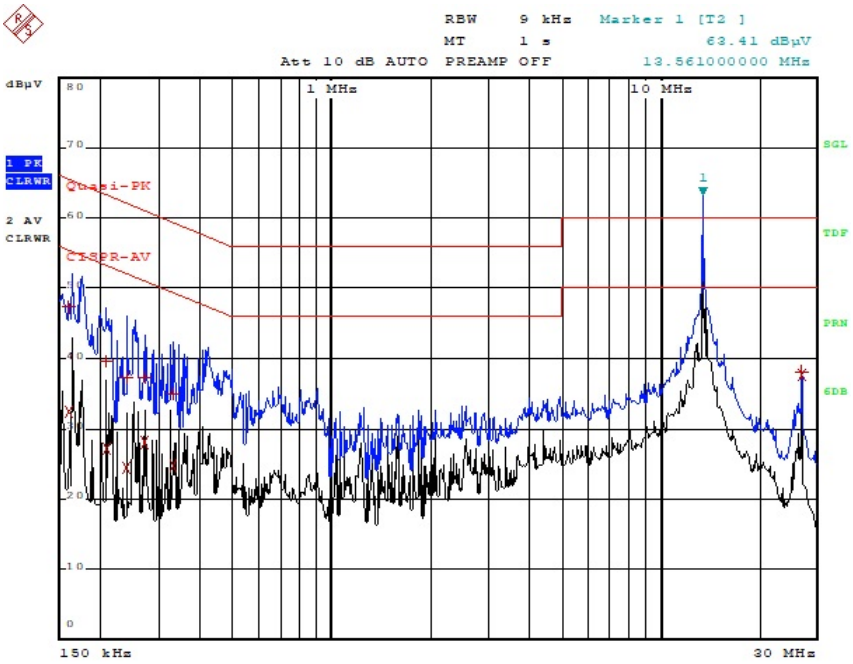
Appendix 2. Special diagram

* HOT LINE



Comment: ESTR-20-00077_NFC_HOT

* NEUTRAL LINE



Comment: ESTR-20-00077_NFC_NEUTRAL

Appendix 3. Antenna information

Requlation

antenna type : PCB Antenna

antenna location : internal

No temporary RF connector provided