

FCC RF Test Report

(WPT)

Applicant: SHENZHEN JESY TECHNOLOGY CO., LTD.

Address of Applicant: Room 201, Building M6, Sinosteel Science and Technology Park, Nanshan District, Shenzhen, Guangdong, China

Equipment Under Test (EUT)

Product Name: JESY Rugged Smartphone

Model No.: JESY J20

FCC ID: 2A649-JESYJ20

Applicable Standards: FCC CFR Title 47 Part 15C (§15.209)

Date of Sample Receipt: 25 Mar., 2022

Date of Test: 26 Mar., to 21 Jun., 2022

Date of Report Issue: 13 Jul., 2022

Test Result: PASS

Tested by:
Test Engineer**Date:**

13 Jul., 2022

Reviewed by:
Project Engineer**Date:**

13 Jul., 2022

Approved by:
Manager**Date:**

13 Jul., 2022

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in above the application standard version. Test results reported herein relate only to the item(s) tested.

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2 Version

Version No.	Date	Description
00	22 Jun., 2022	Original
01	13 Jul., 2022	Updated section 6.5

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4 General Information

4.1 Client Information

Applicant:	SHENZHEN JESY TECHNOLOGY CO., LTD.
Address:	Room 201, Building M6, Sinosteel Science and Technology Park, Nanshan District, Shenzhen, Guangdong, China
Manufacturer/Factory:	SHENZHEN JESY TECHNOLOGY CO., LTD.
Address:	Room 201, Building M6, Sinosteel Science and Technology Park, Nanshan District, Shenzhen, Guangdong, China

4.2 General Description of E.U.T.

Product Name:	JESY Rugged Smartphone
Model No.:	JESY J20
Operation Frequency:	112kHz~174.54kHz
Modulation Type:	ASK
Antenna Type:	Coil Antenna
Test Sample Condition:	The test samples were provided in good working order with no visible defects.
Power Supply:	Rechargeable Li-Polymer Battery DC3.85V, 6000mAh
AC Adapter:	Model: XY-PQ018U02 Input: AC100-240V, 50/60Hz, 0.5A Output: DC 5.0V, 3A, DC 9V, 2A, 12V,1.5A

4.3 Test Mode and Environment

Test Mode:	
WPT mode:	Keep the EUT in wireless charging mode
Operating Environment:	
Temperature:	15°C ~ 35°C
Humidity:	20 % ~ 75 % RH
Atmospheric Pressure:	1010 mbar

4.4 Description of Support Units

Manufacturer	Description	Model	S/N	FCC ID/DoC
HiDANCE ATORCH	Qi Wireless Charger	Q7	N/A	N/A

4.5 Measurement Uncertainty

Parameter	Expanded Uncertainty (Confidence of 95%(U = 2Uc(y)))
Conducted Emission for LISN (9kHz ~ 150kHz)	±3.11 dB
Conducted Emission for LISN (150kHz ~ 30MHz)	±2.62 dB
Radiated Emission (9kHz ~ 30MHz) (3m SAC)	±3.13 dB
Radiated Emission (30MHz ~ 1GHz) (3m SAC)	±4.45 dB
Radiated Emission (30MHz ~ 1GHz) (10m SAC)	±4.32 dB

Note: All the measurement uncertainty value were shown with a coverage k=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

4.6 Additions to, Deviations, or Exclusions From the Method

No

4.7 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

● **FCC - Designation No.: CN1211**

JianYan Testing Group Shenzhen Co., Ltd. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Registration No. is 727551.

● **ISED – CAB identifier.: CN0021**

The 3m Semi-anechoic chamber and 10m Semi-anechoic chamber of JianYan Testing Group Shenzhen Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

● **CNAS - Registration No.: CNAS L15527**

JianYan Testing Group Shenzhen Co., Ltd. is accredited to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L15527.

● **A2LA - Registration No.: 4346.01**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: <https://portal.a2la.org/scopepdf/4346-01.pdf>

4.8 Laboratory Location

JianYan Testing Group Shenzhen Co., Ltd.
Address: No.101, Building 8, Innovation Wisdom Port, No.155 Hongtian Road, Huangpu Community, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, People's Republic of China.
Tel: +86-755-23118282, Fax: +86-755-23116366
Email: info-JYTee@lets.com, Website: <http://jyt.lets.com>

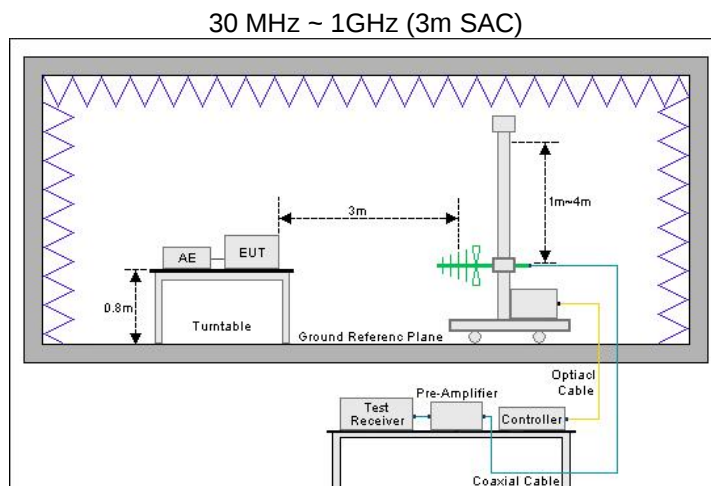
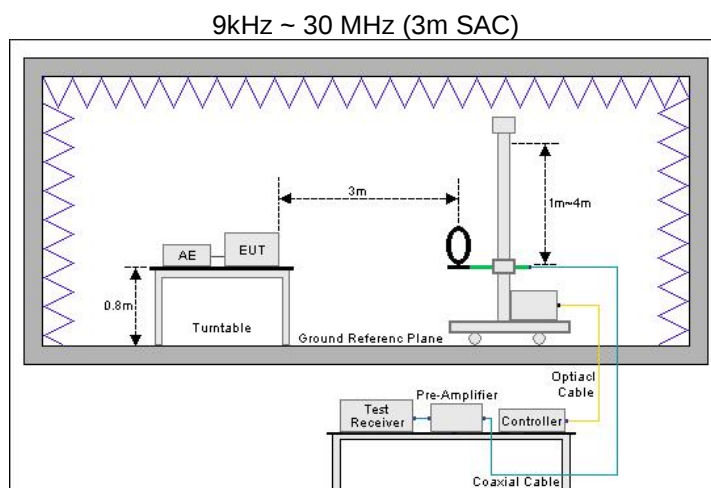
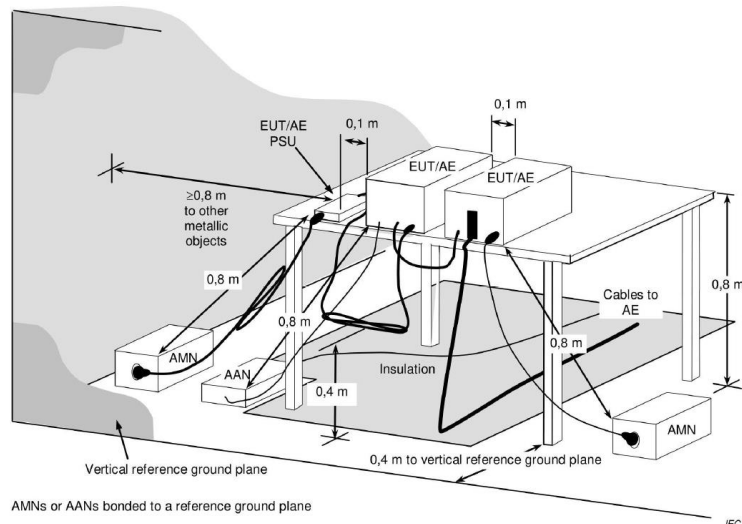
4.9 Test Instruments List

Radiated Emission(3m SAC):					
Test Equipment	Manufacturer	Model No.	Manage No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
3m SAC	ETS	9m*6m*6m	WXJ001-1	04-14-2021	04-13-2024
Loop Antenna	Schwarzbeck	FMZB 1519 B	WXJ002-4	03-07-2022	03-06-2023
BiConiLog Antenna	Schwarzbeck	VULB9163	WXJ002	03-08-2022	03-07-2023
Horn Antenna	Schwarzbeck	BBHA9120D	WXJ002-2	03-08-2022	03-07-2023
Pre-amplifier (30MHz ~ 1GHz)	Schwarzbeck	BBV9743B	WXJ001-2	01-20-2022	01-19-2023
Pre-amplifier (1GHz ~ 18GHz)	SKET	LNPA_0118G-50	WXJ001-3	01-20-2022	01-19-2023
EMI Test Receiver	Rohde & Schwarz	ESRP7	WXJ003-1	03-05-2022	03-04-2023
Spectrum Analyzer	Rohde & Schwarz	FSP 30	WXJ004	01-20-2022	01-19-2023
Coaxial Cable (30MHz ~ 1GHz)	JYTSZ	JYT3M-1G-NN-8M	WXG001-4	01-20-2022	01-19-2023
Coaxial Cable (1GHz ~ 18GHz)	JYTSZ	JYT3M-18G-NN-8M	WXG001-5	01-20-2022	01-19-2023
Coaxial Cable (9kHz ~ 30MHz)	JYT	JYT3M-1G-BB-5M	WXG001-6	01-20-2022	01-19-2023
Band Reject Filter Group	Tonscend	JS0806-F	WXJ089	N/A	
Test Software	Tonscend	TS+	Version: 3.0.0.1		
EMI Test Software	AUDIX	E3	Version: 6.110919b		

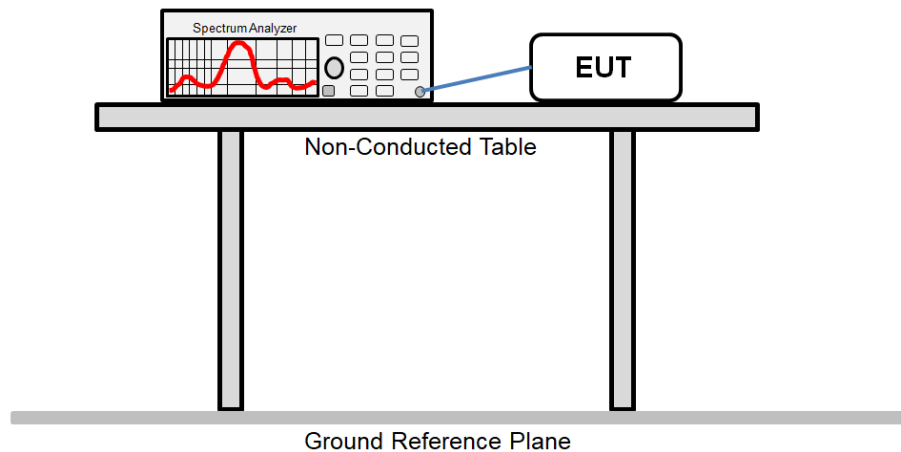
Radiated Emission(10m SAC):					
Test Equipment	Manufacturer	Model No.	Manage No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
10m SAC	ETS	RFSD-100-F/A	WXJ090	04-28-2021	04-27-2024
BiConiLog Antenna	SCHWARZBECK	VULB 9168	WXJ090-1	04-02-2021	04-01-2022
				04-01-2022	03-31-2023
BiConiLog Antenna	SCHWARZBECK	VULB 9168	WXJ090-2	04-02-2021	04-01-2022
				03-31-2022	03-30-2023
EMI Test Receiver	R&S	ESR 3	WXJ090-3	04-08-2021	04-07-2022
				03-30-2022	03-29-2023
EMI Test Receiver	R&S	ESR 3	WXJ090-4	04-08-2021	04-07-2022
				03-30-2022	03-29-2023
Low Pre-amplifier	Bost	LNA 0920N	WXJ090-6	01-20-2022	01-19-2023
Low Pre-amplifier	Bost	LNA 0920N	WXJ090-7	01-20-2022	01-19-2023
Cable	Bost	JYT10M-1G-NN-10M	WXG002-7	01-20-2022	01-19-2023
Cable	Bost	JYT10M-1G-NN-10M	WXG002-8	01-20-2022	01-19-2023
Test Software	R&S	EMC32	Version: 10.50.40		

Conducted Emission:					
Test Equipment	Manufacturer	Model No.	Manage No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
EMI Test Receiver	Rohde & Schwarz	ESR3	WXJ003-2	10-21-2021	10-20-2022
LISN	Schwarzbeck	NSLK 8127	QCJ001-13	02-24-2022	02-23-2023
LISN	Rohde & Schwarz	ESH3-Z5	WXJ005-1	06-18-2020	06-17-2022
				03-30-2022	03-29-2023
LISN Coaxial Cable (9kHz ~ 30MHz)	JYTSZ	JYTCE-1G-NN-2M	WXG003-1	02-24-2022	02-23-2023
RF Switch	TOP PRECISION	RSU0301	WXG003	N/A	
Test Software	AUDIX	E3	Version: 6.110919b		

5.1 Test Setup



Conducted test method:



5.2 Test Procedure

Test method	Test step
Conducted emission	1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.
Radiated emission	1. The EUT was placed on the tabletop of a rotating table 0.8 m the ground at a 3 m semi anechoic chamber. The measurement distance from the EUT to the receiving antenna is 3 m. 2. EUT works in each mode of operation that needs to be tested, and having the EUT continuously working, respectively on 3 axis (X, Y & Z) and considered typical configuration to obtain worst position. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations. 3. Open the test software to control the test antenna and test turntable. Perform the test, save the test results, and export the test data.
Conducted test method	1. The antenna port of EUT was connected to the RF port of the spectrum analyzer through an RF cable. 2. The EUT is keeping in continuous transmission mode and tested in all modulation modes. 3. The test data is saved by the screenshot function of the spectrum analyzer.

6 Test Results

6.1 Summary

6.1.1 Clause and Data Summary

Test items	Standard clause	Test data	Result
Antenna Requirement	15.203	See Section 6.2	Pass
AC Power Line Conducted Emission	15.207	See Section 6.3	Pass
20dB Bandwidth	15.215(c)	See Section 6.4	Pass
Field Strength of Fundamental	15.209	See Section 6.5	Pass
Field Strength of Spurious Emissions	15.209	See Section 6.5	Pass
Remark:			
1. Pass: The EUT complies with the essential requirements in the standard.			
Test Method:	ANSI C63.10-2013		

6.1.2 Test Limit

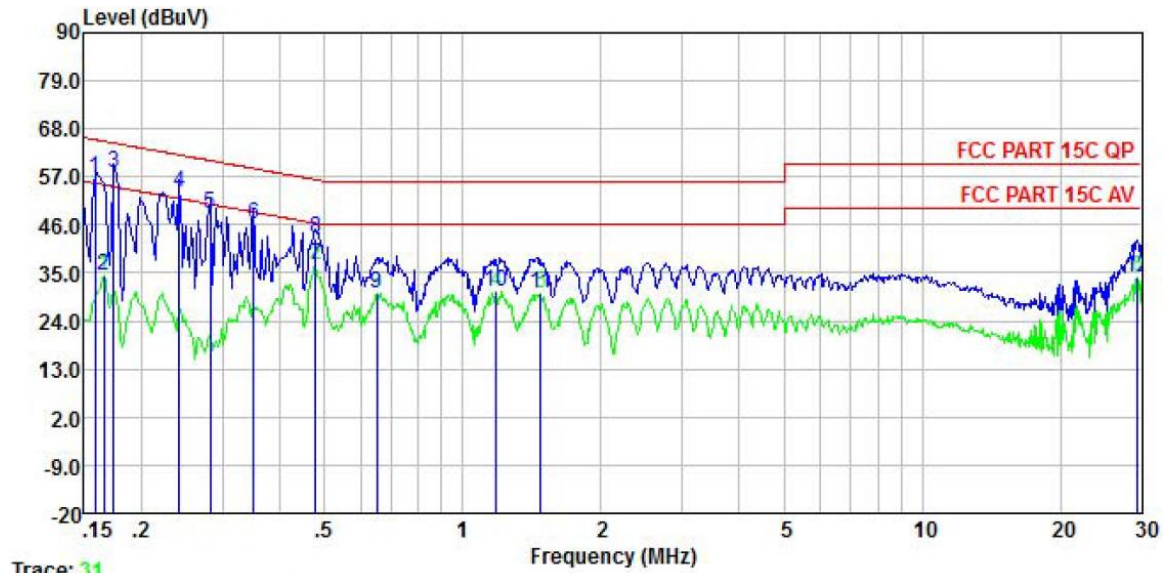
Test items	Limit																								
AC Power Line Conducted Emission	<table><tr><th rowspan="2">Frequency (MHz)</th><th colspan="2">Limit (dBμV)</th></tr><tr><th>Quasi-Peak</th><th>Average</th></tr><tr><td>0.15 – 0.5</td><td>66 to 56 Note 1</td><td>56 to 46 Note 1</td></tr><tr><td>0.5 – 5</td><td>56</td><td>46</td></tr><tr><td>5 – 30</td><td>60</td><td>50</td></tr></table> Note 1: The limit level in dBμV decreases linearly with the logarithm of frequency. Note 2: The more stringent limit applies at transition frequencies.	Frequency (MHz)	Limit (dBμV)		Quasi-Peak	Average	0.15 – 0.5	66 to 56 Note 1	56 to 46 Note 1	0.5 – 5	56	46	5 – 30	60	50										
Frequency (MHz)	Limit (dBμV)																								
	Quasi-Peak	Average																							
0.15 – 0.5	66 to 56 Note 1	56 to 46 Note 1																							
0.5 – 5	56	46																							
5 – 30	60	50																							
20dB Bandwidth	N/A																								
Field Strength of Fundamental	<table><tr><th>Frequency (MHz)</th><th>Field strength (microvolts/meter)</th><th>Measurement distance (meters)</th></tr><tr><td>0.009 – 0.490</td><td>2400/F(kHz)</td><td>300</td></tr><tr><td>0.490 – 1.705</td><td>24000/F(kHz)</td><td>30</td></tr><tr><td>1.705 – 30.0</td><td>30</td><td>30</td></tr><tr><td>30 – 88</td><td>100**</td><td>3</td></tr><tr><td>88 – 216</td><td>150**</td><td>3</td></tr><tr><td>216 – 960</td><td>200**</td><td>3</td></tr><tr><td>Above 960</td><td>500</td><td>3</td></tr></table> ** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.	Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)	0.009 – 0.490	2400/F(kHz)	300	0.490 – 1.705	24000/F(kHz)	30	1.705 – 30.0	30	30	30 – 88	100**	3	88 – 216	150**	3	216 – 960	200**	3	Above 960	500	3
Frequency (MHz)		Field strength (microvolts/meter)	Measurement distance (meters)																						
0.009 – 0.490		2400/F(kHz)	300																						
0.490 – 1.705		24000/F(kHz)	30																						
1.705 – 30.0		30	30																						
30 – 88		100**	3																						
88 – 216		150**	3																						
216 – 960		200**	3																						
Above 960		500	3																						
Field Strength of Spurious Emissions																									

6.2 Antenna Requirement

Standard requirement:	FCC Part15 C Section 15.203
15.203 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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.
E.U.T Antenna:	The EUT make use of a coil antenna.

6.3 AC Power Line Conducted Emission

Product name:	JESY Rugged Smartphone	Product model:	JESY J20
Test by:	Mike	Test mode:	WPT mode
Test frequency:	150 kHz ~ 30 MHz	Phase:	Line
Test voltage:	AC 120 V/60 Hz		

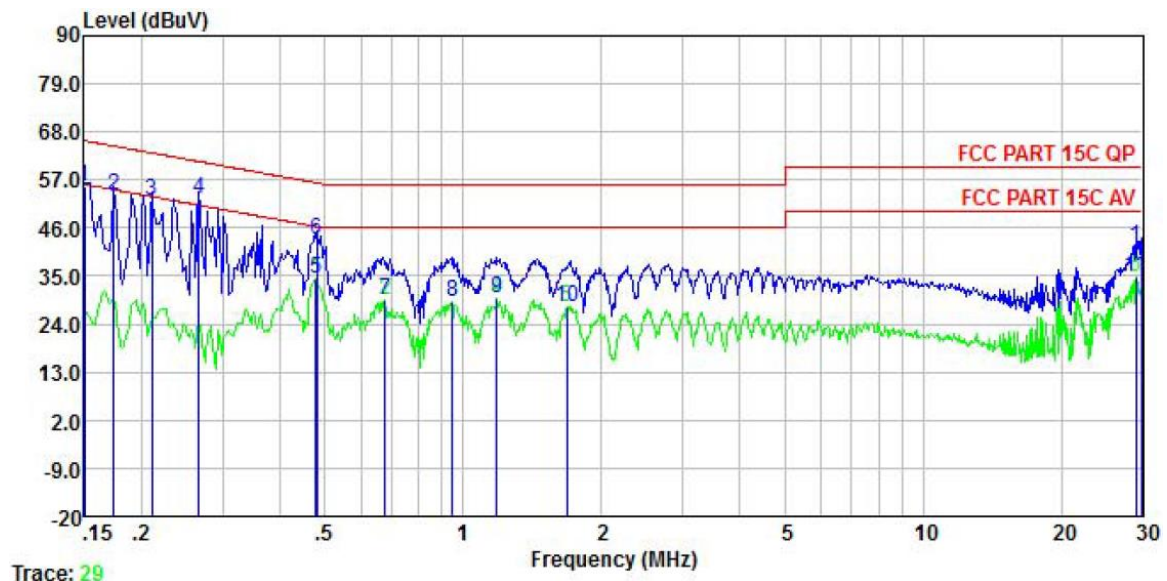


	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.158	56.59	0.04	0.01	56.64	65.56	-8.92	QP
2	0.166	34.39	0.04	0.01	34.44	55.16	-20.72	Average
3	0.174	57.80	0.04	0.01	57.85	64.77	-6.92	QP
4	0.242	53.23	0.04	0.01	53.28	62.04	-8.76	QP
5	0.282	48.66	0.04	0.02	48.72	60.76	-12.04	QP
6	0.350	46.21	0.04	0.02	46.27	58.96	-12.69	QP
7	0.479	36.64	0.04	0.03	36.71	46.36	-9.65	Average
8	0.479	42.96	0.04	0.03	43.03	56.36	-13.33	QP
9	0.651	30.30	0.04	0.03	30.37	46.00	-15.63	Average
10	1.184	30.60	0.05	0.09	30.74	46.00	-15.26	Average
11	1.480	30.33	0.06	0.14	30.53	46.00	-15.47	Average
12	29.371	33.20	0.40	0.21	33.81	50.00	-16.19	Average

Remark:

1. Level = Read level + LISN Factor + Cable Loss.

Product name:	JESY Rugged Smartphone	Product model:	JESY J20
Test by:	Mike	Test mode:	WPT mode
Test frequency:	150 kHz ~ 30 MHz	Phase:	Neutral
Test voltage:	AC 120 V/60 Hz		



	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.150	55.44	0.05	0.01	55.50	66.00	-10.50	QP
2	0.174	53.62	0.04	0.01	53.67	64.77	-11.10	QP
3	0.211	52.30	0.04	0.03	52.37	63.18	-10.81	QP
4	0.266	52.42	0.04	0.02	52.48	61.25	-8.77	QP
5	0.479	34.27	0.04	0.03	34.34	46.36	-12.02	Average
6	0.481	43.44	0.04	0.03	43.51	56.32	-12.81	QP
7	0.675	29.34	0.04	0.03	29.41	46.00	-16.59	Average
8	0.948	28.88	0.05	0.05	28.98	46.00	-17.02	Average
9	1.184	29.91	0.05	0.09	30.05	46.00	-15.95	Average
10	1.680	27.52	0.06	0.17	27.75	46.00	-18.25	Average
11	29.061	34.12	0.39	0.21	34.72	50.00	-15.28	Average
12	29.841	41.11	0.40	0.22	41.73	60.00	-18.27	QP

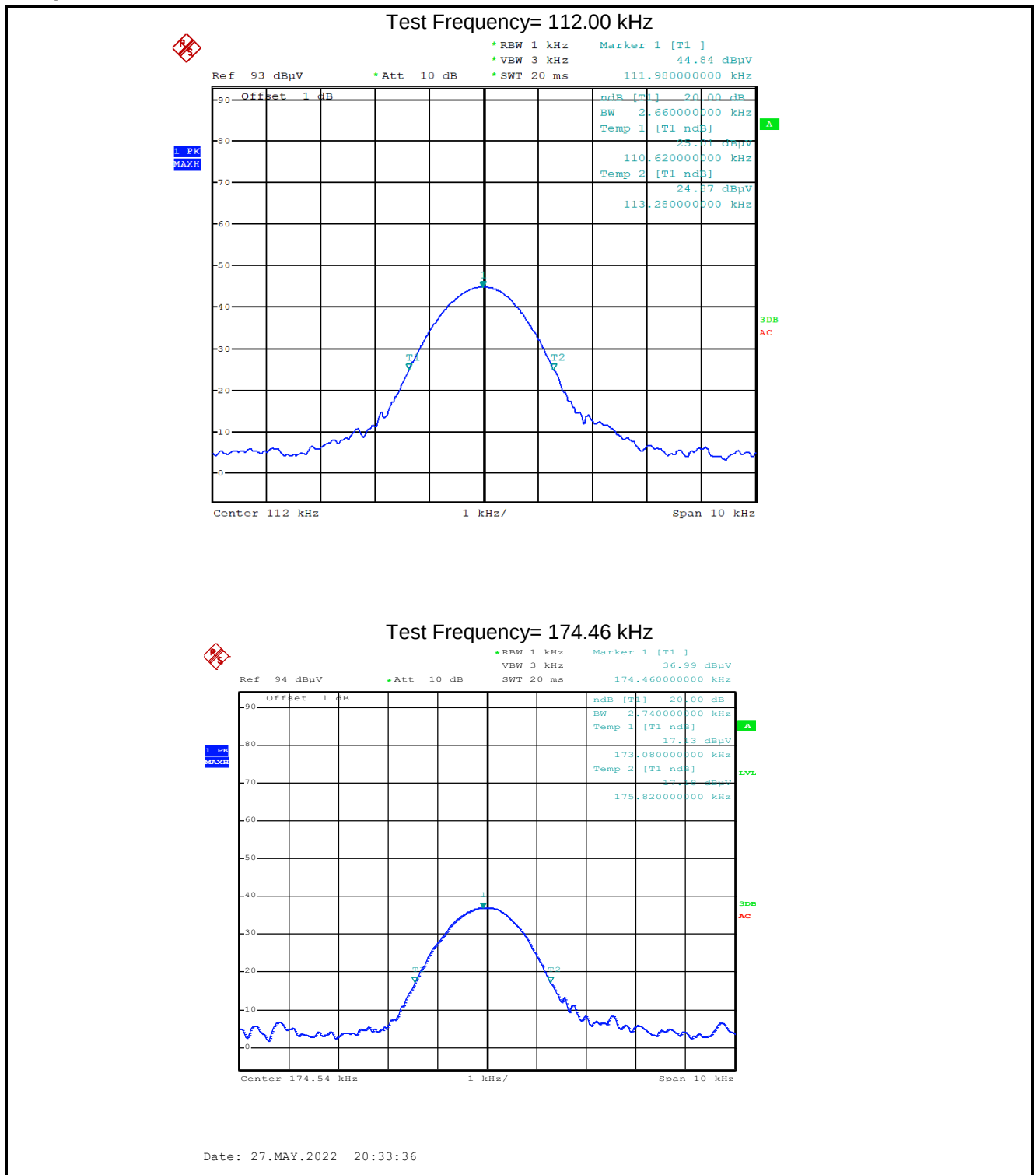
Remark:

1. Level = Read level + LISN Factor + Cable Loss.

6.4 20dB Bandwidth

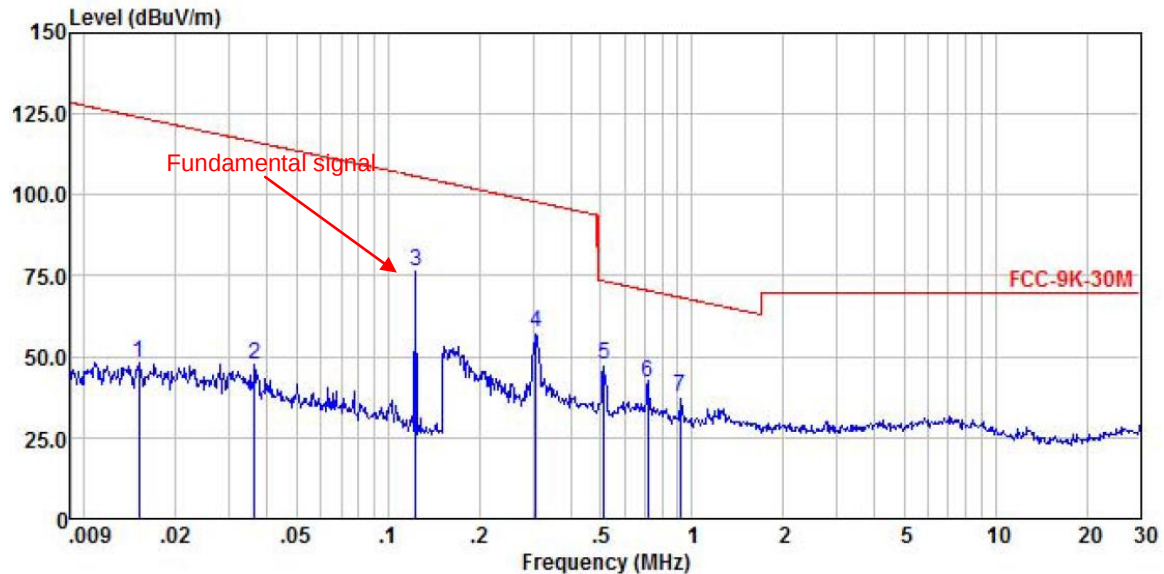
20dB bandwidth (kHz)	Limits
2.66	N/A
2.74	
Remark: For report purpose only.	

Test plot as follows:



6.5 Field Strength of Fundamental and Field Strength of Spurious Emissions

Product Name:	JESY Rugged Smartphone	Product Model:	JESY J20
Test By:	Mike	Test mode:	WPT mode
Test Frequency:	9 kHz – 30 MHz	Polarization:	Vertical
Test Voltage:	AC 120V/60Hz		

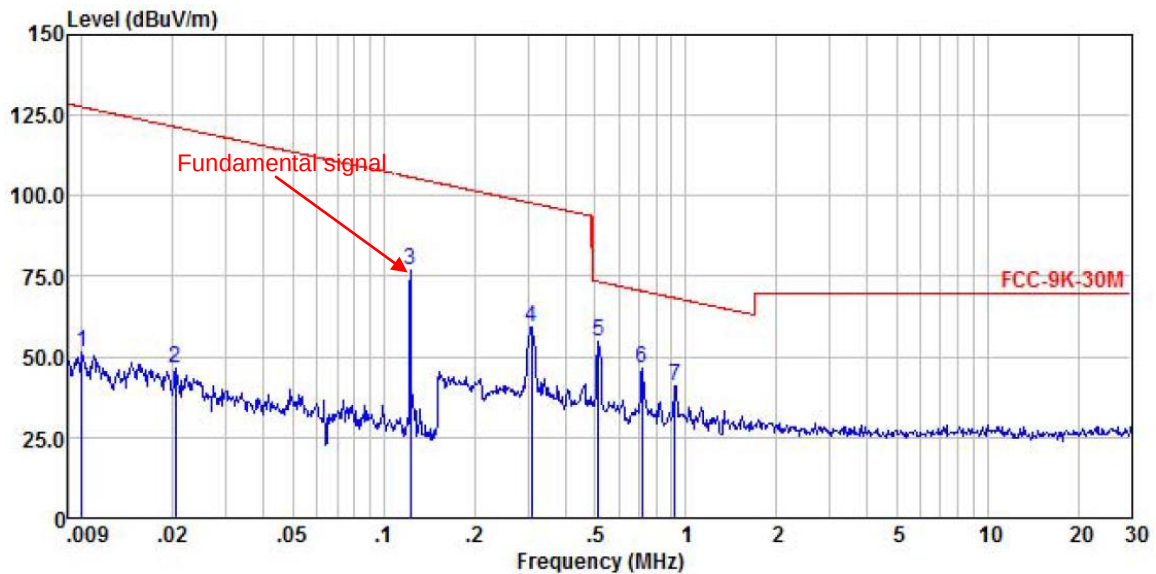


	Read	Antenna	Cable	Preamp	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit
-----	-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	0.015	28.00	20.39	0.01	0.00	48.40	123.99
2	0.036	27.48	20.35	0.02	0.00	47.85	116.38
3	0.124	56.57	20.02	0.03	0.00	76.62	105.78
4	0.307	36.86	20.56	0.06	0.00	57.48	97.88
5	0.515	26.60	20.79	0.08	0.00	47.47	73.36
6	0.719	21.11	20.64	0.10	0.00	41.85	70.48
7	0.917	16.83	20.54	0.11	0.00	37.48	68.37

Remark:

1. Level = Read level + Antenna Factor + Cable Loss – Preamplifier Factor.

Product Name:	JESY Rugged Smartphone	Product Model:	JESY J20
Test By:	Mike	Test mode:	WPT mode
Test Frequency:	9 kHz – 30 MHz	Polarization:	Horizontal
Test Voltage:	AC 120V/60Hz		

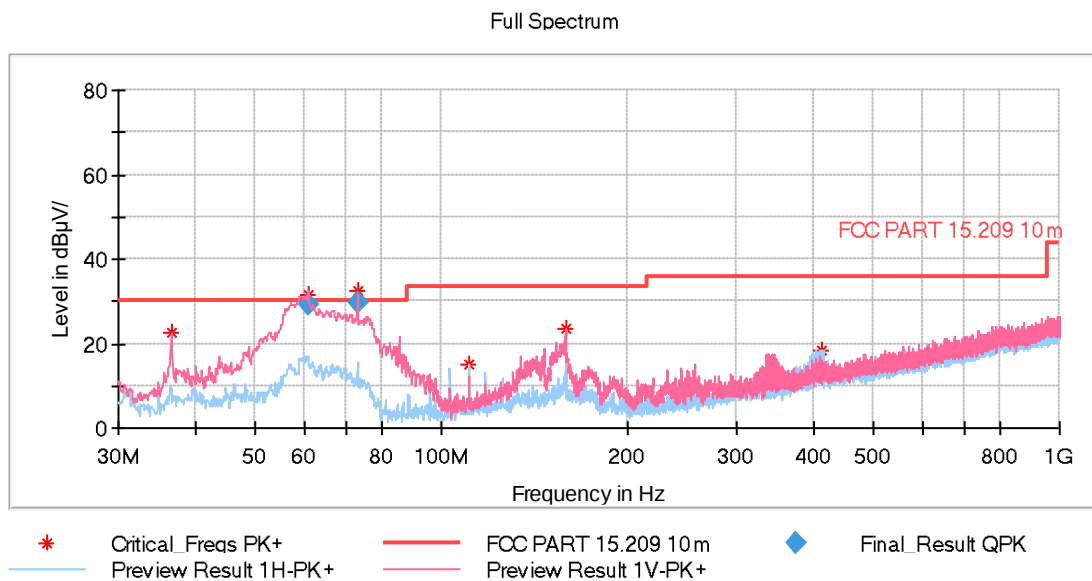


	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit	Over	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	0.010	30.88	20.50	0.01	0.00	51.39	127.58	-76.19	Peak
2	0.020	26.29	20.30	0.01	0.00	46.60	121.38	-74.78	Peak
3	0.123	56.64	20.04	0.02	0.00	76.70	105.85	-29.15	Peak
4	0.309	38.75	20.56	0.06	0.00	59.37	97.81	-38.44	Peak
5	0.515	33.87	20.79	0.08	0.00	54.74	73.36	-18.62	Peak
6	0.719	25.52	20.64	0.10	0.00	46.26	70.48	-24.22	Peak
7	0.924	20.39	20.53	0.11	0.00	41.03	68.30	-27.27	Peak

Remark:

1. Level = Read level + Antenna Factor + Cable Loss – Preamplifier Factor.

Product Name:	JESY Rugged Smartphone	Product Model:	JESY J20
Test By:	Mike	Test mode:	Charing mode
Test Frequency:	30 MHz – 1000 MHz	Polarization:	Vertical & Horizontal
Test Voltage:	AC 120V/60Hz		



Frequency (MHz)	MaxPeak (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
36.499000	22.81	30.00	7.19	100.0	V	126.0	-16.4
60.943000	31.66	30.00	-1.92	110.0	V	275.0	-17.2
73.125000	32.65	30.00	-2.24	125.0	V	42.0	-18.9
110.510000	14.98	33.50	18.52	100.0	H	92.0	-18.6
158.525000	23.37	33.50	10.13	100.0	V	180.0	-15.2
412.374000	18.38	36.00	17.62	100.0	H	138.0	-11.8

Frequency (MHz)	QuasiPeak (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
60.943000	29.33	30.00	0.67	110.0	V	275.0	-17.2
73.125000	29.45	30.00	0.55	125.0	V	42.0	-18.9

Remark:

1. Level = Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).

-----End of report-----