



Spot Check Evaluation

APPLICANT : Xiaomi Communications Co., Ltd.
EQUIPMENT : Mobile Phone
BRAND NAME : Redmi
MODEL NAME : 23021RAA2Y
FCC ID : 2AFZZAA2Y
STANDARD : 47 CFR Part 2, 22(H), 24(E), 27(M)
47 CFR Part 15 Subpart C §15.247
47 CFR Part 15 Subpart E §15.407

We, Sporton International Inc. (Kunshan), would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (Kunshan), the test report shall not be reproduced except in full.

Jason Jia

Approved by: Jason Jia



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
202911-01	Rev. 01	Initial issue of report	Dec. 27, 2022



1 General Description

1.1 Applicant

Xiaomi Communications Co., Ltd.

#019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 100085

1.2 Manufacturer

Xiaomi Communications Co., Ltd.

#019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 100085

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Phone
Brand Name	Redmi
Model Name	23021RAA2Y
FCC ID	2AFZZAA2Y
IMEI Code	Conducted: 869146060030807/869146060030815 Radiation: 869146060024925/869146060024933
HW Version	P1.1
SW Version	MIUI14
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Modification of EUT

No modifications are made to the EUT during all test items.



2 Re-use of Measured Data

2.1 Introduction Section

This application re-uses data collected on a similar device. The subject device of this application (Model: 23021RAA2Y, FCC ID: 2AFZZAA2Y) is electrically identical to the reference device (Model: 23028RA60L, FCC ID: 2AFZZA60L) for the portions of the circuitry corresponding to the data being re-used. Based on their similarity, the FCC Part 15C (equipment class: DTS, DSS) and FCC Part 15E (equipment class: NII) and FCC Part 22, 24, 27 (equipment class: PCE) reuse the original model's result and do spot-check, following the FCC KDB 484596 D01 v01.

The applicant takes full responsibility that the test data as referenced in this report represent compliance for this FCC ID: 2AFZZAA2Y .

2.2 Model Difference Information

The **main** difference between FCC ID: 2AFZZAA2Y and FCC ID: 2AFZZA60L is as below:

- Remove WCDMA Band II/IV/VI/IX and LTE Band 2/4/12/13/17/18/19/26/66.
- Add NFC function and LTE Band 20/28/32.

Other differences and all the details of similarity and difference can be found in the confidential documents (23021RAA2Y_Operational Description of Product Equality Declaration).

2.3 Reference detail Section:

Rule Part	Equipment Class	Frequency Band (MHz)	Reference FCC ID(Parent)	Type Grant/ Permissive Change	Reference Title	FCC ID Filling (Variant)	Report Title/Section
15C	DSS (BR/EDR)	2400~2483.5	2AFZZA60L	Original Grant	FR202911A	2AFZZAA2Y	All sections applicable
	DTS (BLE)	2400~2483.5	2AFZZA60L	Original Grant	FR202911B	2AFZZAA2Y	All sections applicable
	DTS (WLAN)	2400~2483.5	2AFZZA60L	Original Grant	FR202911C	2AFZZAA2Y	All sections applicable
15E	U-NII-1	5150~5250	2AFZZA60L	Original Grant	FR202911D	2AFZZAA2Y	All sections applicable
	U-NII-2A	5250~5350	2AFZZA60L	Original Grant	FR202911D	2AFZZAA2Y	All sections applicable
	U-NII-2C	5470~5725	2AFZZA60L	Original Grant	FR202911D	2AFZZAA2Y	All sections applicable
	U-NII-3	5725~5850	2AFZZA60L	Original Grant	FR202911E	2AFZZAA2Y	All sections applicable
	DFS	5250~5350 5470~5725	2AFZZA60L	Original Grant	FZ202911	2AFZZAA2Y	All sections applicable
22, 24, 27	PCE (GSM)	GSM 850/1900	2AFZZA60L	Original Grant	FG202911A	2AFZZAA2Y	All sections applicable
	PCE (WCDMA)	Band V	2AFZZA60L	Original Grant	FG202911A	2AFZZAA2Y	All sections applicable
	PCE (LTE)	B5/7/38/41 7C/38C	2AFZZA60L	Original Grant	FG202911B FG202911C	2AFZZAA2Y	All sections applicable



2.4 Spot Check Verification Data Section

Conducted power test and radiated spurious emission test against the variant model based on the worst-case condition from the original model was performed in this filing to demonstrate the test data from original model remains representative for the variant model

Summary for power and RSE spot check for each rule entry and technology is listed as below:

Test Item	Mode	2AFZZA60L Parent Worst Result	2AFZZAA2Y Variant Check Result	Difference (dB)
Conducted Power (dBm)	BT BR/EDR	11.28	11.03	-0.25
	BLE 1Mbps	-1.19	-1.35	-0.16
	11b, 2.4GHz	20.68	20.60	-0.08
	11g, 2.4GHz	22.82	22.59	-0.23
	11n HT20, 2.4GHz	22.76	22.64	-0.12
	11a, 5.2GHz	14.12	13.62	-0.5
	11a, 5.3GHz	13.76	13.42	-0.34
	11a, 5.5GHz	12.77	12.63	-0.14
	11a, 5.8GHz	13.77	13.53	-0.24
	11n HT20, 5.2GHz	13.78	13.30	-0.48
	11n HT20, 5.3GHz	13.68	13.18	-0.5
	11n HT20, 5.5GHz	12.47	12.37	-0.10
	11n HT20, 5.8GHz	13.63	13.30	-0.33
	11n HT40, 5.2GHz	13.96	13.49	-0.47
	11n HT40, 5.3GHz	13.56	13.38	-0.18
	11n HT40, 5.5GHz	12.97	12.75	-0.22
	11n HT40, 5.8GHz	14.08	13.64	-0.44
	11ac VHT20, 5.2GHz	13.82	13.42	-0.4
	11ac VHT20, 5.3GHz	13.70	13.32	-0.38
	11ac VHT20, 5.5GHz	12.51	12.47	-0.04
	11ac VHT20, 5.8GHz	13.68	13.38	-0.3
	11ac VHT40, 5.2GHz	13.99	13.59	-0.4
	11ac VHT40, 5.3GHz	13.62	13.52	-0.1
	11ac VHT40, 5.5GHz	13.01	12.94	-0.07
	11ac VHT40, 5.8GHz	14.09	13.90	-0.19
	11ac VHT80, 5.2GHz	12.70	12.38	-0.32
	11ac VHT80, 5.3GHz	13.63	13.36	-0.27
	11ac VHT80, 5.5GHz	12.41	12.39	-0.02
	11ac VHT80, 5.8GHz	13.63	13.35	-0.28
	GSM850	32.77	32.77	0
	GSM1900	29.69	29.69	0
	WCDMA B5	24.23	24.23	0
	LTE B5	24.32	24.32	0
	LTE B7	23.99	23.99	0
	LTE B41	24.46	24.46	0
	LTE B7C	23.53	23.53	0
	LTE B38C	24.25	24.25	0



Test Item	Mode	2AFZZA60L Parent Worst Result	2AFZZAA2Y Variant Check Result	Difference (dB)
Radiated Spurious Emission (dBuV/m) @ 3m	BT	61.42	61.82	0.4
	BLE(1Mbps)	40.44	43.43	-2.99
	11g_Tx_Ch11	50.69	47.9	-2.79
	11ac VHT40_Ch38	50.75	45.51	-5.06
	11a_Ch149	51.8	54.47	2.67

Conclusion:

Radiated spurious emission test against the variant model based on the worst-case condition from the original model was performed in this filing to demonstrate the test data from original model remains representative for the variant model.

Based on the spot check test result, the test data from the original model is representative for the variant model. The power level and RSE spot check are shown within expected level compliant to limit line.

We are using power and ERP/EIRP measurements from the original parent model reports to list on the grant.

The same DFS detection is used in the variant. Hence, there is no spot check data for DFS.

We confirm that the test data reuse policy of FCC KDB 484596 D01 Referencing Test Data v01 has been followed and the test data as referenced from the parent model report represents compliance with new FCC ID.



3 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Oct. 12, 2022	Dec. 13, 2022	Oct. 11, 2023	Conducted (TH01-KS)
Power divider	STI	STI08-0055	-	0.5~40GHz	Aug. 26, 2022	Dec. 13, 2022	Aug. 25, 2023	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 05, 2022	Dec. 13, 2022	Jan. 04, 2023	Conducted (TH01-KS)
Pulse Power Sensor	Anritsu	MA2411B	1339163	300MHz~40GHz	Oct. 12, 2022	Dec. 13, 2022	Oct. 11, 2023	Conducted (TH01-KS)
EXA Spectrum Analyzer	Keysight	N9010B	MY60242126	10Hz~44GHz	Oct. 13, 2022	Dec. 14, 2022	Oct. 12, 2023	Radiation (03CH06-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Oct. 16, 2022	Dec. 14, 2022	Oct. 15, 2023	Radiation (03CH06-KS)
Bilog Antenna	TeseQ	CBL6111D	49921	30MHz~1GHz	May 24, 2022	Dec. 14, 2022	May 23, 2023	Radiation (03CH06-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00218642	1GHz~18GHz	Apr. 18, 2022	Dec. 14, 2022	Apr. 17, 2023	Radiation (03CH06-KS)
SHF-EHF Horn	Com-power	AH-840	101093	18GHz~40GHz	Jan. 05, 2022	Dec. 14, 2022	Jan. 04, 2023	Radiation (03CH06-KS)
Amplifier	SONOMA	310N	380827	9KHz ~1GHZ	Jul. 11, 2022	Dec. 14, 2022	Jul. 10, 2023	Radiation (03CH06-KS)
Amplifier	MITEQ	EM18G40GGA	060728	18~40GHz	Jan. 05, 2022	Dec. 14, 2022	Jan. 04, 2023	Radiation (03CH06-KS)
high gain Amplifier	MITEQ	AMF-7D-00101800-30-10P	2082395	1Ghz-18Ghz	Jan. 05, 2022	Dec. 14, 2022	Jan. 05, 2023	Radiation (03CH06-KS)
Amplifier	Keysight	83017A	MY53270319	500MHz~26.5GHz	Oct. 12, 2022	Dec. 14, 2022	Oct. 12, 2023	Radiation (03CH06-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Dec. 14, 2022	NCR	Radiation (03CH06-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Dec. 14, 2022	NCR	Radiation (03CH06-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Dec. 14, 2022	NCR	Radiation (03CH06-KS)

NCR: No Calibration Required.

4 Uncertainty of Evaluation

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.26-2015. 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.

Uncertainty of Conducted Measurement

Test Item	Uncertainty
Conducted Power	± 0.46 dB

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	5.0dB
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	5.0dB
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Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	5.0dB
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-THE END-