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Test report No:
24C0528R-RF-US-P20V01

FCC&ISED EXPOSURE TEST REPORT

Product Name	Xiaomi TV Box S
Trademark	XIAOMI;Xiaomi;
Model and /or type reference	MDZ-32-AA
FCC ID	2AIMR-MDZ32AA
IC	25940-MDZ32AA
Applicant´s name / address	Beijing Xiaomi Electronics Co., Ltd Room 802, Floor 8, Building 5, No.15 KeChuang 10th Road, Beijing Economic and Technological Development Zone, Beijing City, China
Test method requested, standard	FCC 47CFR §2.1091 RSS-102 Issue 6
Verdict Summary	IN COMPLIANCE
Documented By (name / position & signature)	Tim Cao / Project Manager
Approved by (name / position & signature)	Frank He / Technical Manager
Date of issue	2025-03-19
Report Version	V1.0
Report template No	Template_FCC-MPE-RF-V1.0

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COMPETENCES AND GUARANTEES

DEKRA is a testing laboratory competent to carry out the tests described in this report.
In order to assure the traceability to other national and international laboratories, DEKRA has a calibration and maintenance program for its measurement equipment.

DEKRA guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated in the report and it is based on the knowledge and technical facilities available at DEKRA at the time of performance of the test.

DEKRA is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

GENERAL CONDITIONS

Test Location	No. 99, Hongye Road, Suzhou Industrial Park Suzhou, 215006, P.R. China
Date(receive sample)	Dec. 16, 2024
Date (start test)	Dec. 16, 2024
Date (finish test)	Feb. 17, 2025

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or Competent Authorities.
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4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA.

ENVIRONMENTAL CONDITIONS

The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment. The climatic conditions during the tests were within the following limits:

Ambient temperature	15 °C – 35 °C
Relative Humidity air	30% - 60%

If explicitly required in the basic standard or applied product / product family standard the climatic values are recorded and documented separately in this test report.

POSSIBLE TEST CASE VERDICTS

Test case does not apply to test object	N/A
Test object does meet requirement	P (Pass) / PASS
Test object does not meet requirement	F (Fail) / FAIL
Not measured	N/M

ABBREVIATIONS

For the purposes of the present document, the following abbreviations apply:

EUT : Equipment Under Test
QP : Quasi-Peak
CAV : CISPR Average
AV : Average
CDN : Coupling Decoupling Network
SAC : Semi-Anechoic Chamber
OATS : Open Area Test Site
BW : Bandwidth
AM : Amplitude Modulation
PM : Pulse Modulation
HCP : Horizontal Coupling Plane
VCP : Vertical Coupling Plane
U_N : Nominal voltage
*T*x : Transmitter
*R*x : Receiver
N/A : Not Applicable
N/M : Not Measured

DOCUMENT HISTORY

Report No.	Version	Description	Issued Date
24C0528R-RF-US-P20V01	V1.0	Initial issue of report.	2025-03-19

REMARKS AND COMMENTS

1. The equipment under test (EUT) does meet the essential requirements of the stated standard(s)/test(s).
2. These test results on a sample of the device are for the purpose of demonstrating Compliance with FCC 47CFR §2.1091, RSS-102 Issue 6.
3. The measurement result is considered in conformance with the requirement if it is within the prescribed limit, It is not necessary to account the uncertainty associated with the measurement result.
4. The test results relate only to the samples tested.
5. The test report shall not be reproduced without the written approval of DEKRA Testing and Certification (Suzhou) Co., Ltd.
6. This report will not be used for social proof function in China market.
7. DEKRA declines any responsibility with the following test data provided by customer that may affect the validity of result:

- Chapter 1.1 General Description of the Item(s);
- Chapter 1.2 Antenna Informaion;

1 GENERAL INFORMATION

1.1 General Description of the Item(s)

Product Name.....:	Xiaomi TV Box S
Model No. .....:	MDZ-32-AA
Trademark. .....:	XIAOMI;Xiaomi;
FCC ID .....:	2AIMR-MDZ32AA
IC .....:	25940-MDZ32AA
Hardware Version .....:	DKTB-OB1A-905X5M-AD
Software Version .....:	V816.0.25.2.10.UZFAABX
Manufacturer.....:	Beijing Xiaomi Electronics Co., Ltd
Manufacturer Address .....:	Room 802, Floor 8, Building 5, No.15 KeChuang 10th Road, Beijing Economic and Technological Development Zone, Beijing City, China
Factory .....:	Nanchang Qinsheng Electronic Technology CO.,LTD
Factory address .....:	No.638,Hangkongcheng Avenue,Nanchang Hi-tech Development Zone,Nanchang City, Jiangxi Province
Operating temperature.....:	0 ~ +40 ℃

Wireless Card .....:	K265B-UU					
Wireless specification .....:	Bluetooth (BR/EDR)					
Operating frequency range(s).....:	2402~2480MHz					
Type of Modulation .....:	GFSK					
PHYs.....:	☒	GFSK	☒	Pi/4 DQPSK	☒	8DPSK
Data Rate.....:	☒	1Mbit/s	☒	2Mbit/s	☒	3Mbit/s
Number of channel .....:	79					
Wireless specification .....:	Bluetooth (BLE)					
Operating frequency range(s)	2402~2480MHz					
Type of Modulation .....:	GFSK					
PHYs.....:	☒	LE 1M	☒	LE 2M	☐	LE Coded S=2/8
Data Rate.....:	☒	1Mbit/s	☒	2Mbit/s	☐	500/125 Kbit/s
Number of channels.....:	40					
Wireless specifiction .....:	802.11b/g/n (Wi-Fi 2.4G)					
Operating frequency range(s).....:	2412~2462MHz					
Number of channel .....:	802.11b/g/n/ax(20MHz) : 11 802.11n/ax(40MHz) : 07					
Wireless specifiction .....:	802.11a / n / ac / ax (Wi-Fi 5G)					
Frequency Range .....:	U-NII-1: 5150 MHz to 5250 MHz					
	U-NII-2A: 5250 MHz to 5350 MHz					
	U-NII-2C: 5470 MHz to 5725 MHz					
	U-NII-3: 5725 MHz to 5850 MHz					
Channel Bandwidth.....:	802.11a 20 MHz 802.11n 20 MHz, 40 MHz					

	802.11ac 20 MHz, 40 MHz, 80 MHz 802.11ax 20 MHz, 40 MHz, 80 MHz
Modulation technology.....:	OFDM / OFDMA
Number of channel .....:	802.11a/n/ac/ax(20MHz) : 25 802.11n/ac/ax(40MHz) : 12 802.11ac/ax(80MHz) : 6

Rated power supply.....:	Voltage and Frequency	
	☐	AC: 220 - 240 V, 50/60 Hz
	☒	AC: 100 - 240 V, 50/60 Hz 0.3A
	☒	DC: 5.2 Vdc, 2.1 A
	☐	Battery:
	☒	Adapter:
Adapter model No.....:	AD-0100520210US-1	
INPUT .....:	100 - 240 V, 50/60 Hz 0.3 A	
OUTPUT .....:	5.2 V, 2.1 A	
Mounting position.....:	☒	Tabletop equipment
	☐	Wall mounted equipment
	☐	Floor standing equipment
	☐	Hand-held/Portable equipment
	☐	Other:

1.2 Antenna Informaion

Antenna Delivery .....:	☒	1TX + 1RX		
	☒	2TX + 2RX		
	☐	Others:……		
Antenna technology .....:	☒	SISO		
	☒	MIMO	☒	CDD
			☐	Beam-forming
Antenna Type .....:	☐	External	☐	Dipole
			☐	Sectorized
	☒	Internal	☐	Ceramic Chip
			☐	PIFA
			☒	PCB
			☐	Others……..

Antenna Gain .....:	Wireless specification	Frequency range (MHz)	Gain (dBi)	
			Main	Aux
	Wi-Fi 2.4GHz	2412~2472	2.29	1.52
	Wi-Fi 5.2GHz	5180~5240	2.47	2.13
	Wi-Fi 5.3GHz	5260~5320	2.54	2.70
	Wi-Fi 5.6GHz	5500~5700	2.79	2.76
	Wi-Fi 5.8GHz	5745~5825	2.45	2.18
	Bluetooth	2402~2480	0.96	

Note: The general description of the Item(s), antenna information in clause 1 are provided and confirmed by the client.

2. RF Exposure Evaluation

2.1. Limits: KDB 447498 D04 V01 & RSS-102 Issue 6

Mobile Device:
CFR Title 47 §2.1091(b)
(b) For purposes of this section, a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons.

Devices operating in standalone mobile exposure conditions may contain a single transmitter or multiple transmitters that do not transmit simultaneously. A minimum test separation distance ≥ 20 cm is required between the antenna and radiating structures of the device and nearby persons to apply mobile device exposure limits. The distance must be fully supported by the operating and installation configurations of the transmitter and its antenna(s), according to the source-based time-averaged maximum power requirements of § 2.1091(d)(2). In cases where cable losses or other attenuations are applied to determine compliance, the most conservative operating configurations and exposure conditions must be evaluated. The minimum test separation distance required for a device to comply with mobile exposure conditions must be clearly identified in the installation and operating instructions, for all installation and exposure conditions, to enable users and installers to comply with RF exposure requirements. For mobile devices that have the potential to operate in portable device exposure conditions, similar to the configurations described in § 2.1091(d)(4), a KDB inquiry is required to determine the SAR test requirements for demonstrating compliance.
When the categorical exclusion provision of § 2.1091(c) applies, the minimum test separation distance may be estimated, when applicable, by simple calculations according to plane-wave equivalent conditions, to ensure the transmitter and its antenna(s) can operate in manners that meet or exceed the estimated distance. The source-based time-averaged maximum radiated power, according to the maximum antenna gain, must be applied to calculate the field strength and power density required to establish the minimum test separation distance. When the estimated test separation distance becomes overly conservative and does not support compliance, MPE measurement or computational modeling may be used to determine the required minimum separation distance.

According to FCC Part 1.1307, systems operating under the provisions of this section shall be operated in a manner the ensures that the public is not exposed to radio frequency energy level in excess of the commission's guidelines.

Limits for General Population/ Uncontrolled Exposure			
Frequency Range (MHz)	Electric Field Strength(E)(V/m)	Magnetic Field Strength (H)(A/m)	Power Density (S)(mW/cm^2)
0.3-1.34	614	1.63	(100)*
1.34-30	824/f	2.19/f	(180/f2)*
30-300	27.5	0.073	0.2
300-1500			f/1500
1500-100,000			1.0

According to RSS-102 Issue 6, systems operating under the provisions of this section shall be operated in a manner the ensures that the public is not exposed to radio frequency energy level in excess of the commission's guidelines.

Frequency range (MHz)	Electric field (V_{RMS}/m)	Magnetic field (A_{RMS}/m)	Power density (W/m²)	Reference period (minutes)
10-20	27.46	0.0728	2	6
20-48	$58.07 / f^{0.25}$	$0.1540 / f^{0.25}$	$8.944 / f^{0.5}$	6
48-300	22.06	0.05852	1.291	6
300-6000	$3.142\ f^{0.3417}$	$0.008335\ f^{0.3417}$	$0.02619\ f^{0.6834}$	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	$616000/f^{1.2}$
150000-300000	$0.158\ f^{0.5}$	$4.21 \times 10^{-4}\ f^{0.5}$	$6.67 \times 10^{-5}\ f$	$616000/f^{1.2}$

Note: f is frequency in MHz.

MPE calculation formula

$$S = \frac{PG}{4\pi R^2}$$

P = output power (mW)
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = Separation distance between radiator and human body (cm)

Simultaneous Transmission SAR Test Exemption with Respect to Multiple Exemption Criteria

Either SAR-based or MPE-based exemption may be considered for test exemption for fixed, mobile, or portable device exposure conditions; therefore, the contributions from each exemption in conjunction with the measured SAR (Evaluatedk term) shall be used to determine exemption for simultaneous transmission according to Formula (C.1) [repeated from § 1.1307(b)(3)(ii)(B)].

$$\sum_{i=1}^{a} \frac{P_i}{P_{\text{th},i}} + \sum_{j=1}^{b} \frac{ERP_j}{ERP_{\text{th},j}} + \sum_{k=1}^{c} \frac{Evaluated_k}{Exposure\ Limit_k} \leq 1 \qquad (C.1)$$

a. number of fixed, mobile, or portable RF sources claiming exemption using the § 1.1307(b)(3)(i)(B) formula for Pth, including existing exempt transmitters and those being added.

b. number of fixed, mobile, or portable RF sources claiming exemption using the applicable § 1.1307(b)(3)(i)(C) Table 1 formula for Threshold ERP, including existing exempt transmitters and those being added.

c. number of existing fixed, mobile, or portable RF sources with known evaluation for the specified minimum distance.

Pi the available maximum time-averaged power or the ERP, whichever is greater, for fixed, mobile, or portable RF source i at a distance between 0.5 cm and 40 cm (inclusive).

Pth,i. the exemption threshold power (Pth) according to the § 1.1307(b)(3)(i)(B) formula for fixed, mobile, or portable RF source i. ERPj. the available maximum time-averaged power or the ERP, whichever is greater, of fixed, mobile, or portable RF source j. ERPth,j. exemption threshold ERP for fixed, mobile, or portable RF source j,

at a distance of at least λ/2π, according to the applicable § 1.1307(b)(3)(i)(C) Table 1 formula at the location in question.

Evaluatedk . the maximum reported SAR or MPE of fixed, mobile, or portable RF source k either in the device or at the transmitter site from an existing evaluation.

Exposure
Limitk. either the general population/uncontrolled maximum permissible exposure (MPE) or specific absorption rate (SAR) limit for each fixed, mobile, or portable sources, as applicable

The sum of the ratios of the applicable terms for SAR-based, MPE-based and measured SAR or MPE shall be less than 1, to determine simultaneous transmission exposure compliance.

2.2. Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.
The temperature and related humidity: 18℃and 78% RH.

2.3. Test Result of RF Exposure Evaluation

FCC RF Exposure

Mode	Frequency (MHz)	Antenna	Maximum Conducted power Tune up (dBm)	Antenna Gain (dBi)	Maximum EIRP/ERP power (mW)	Distance (mm)	Power Density (mW/cm²)	Limit of Power Density (mW/cm²)	P/P limit	Verdict
Wi-Fi 2.4GHz	2402~2462	Main	20.50	2.29	190.1	20	0.0378	1.000	0.0378	PASS
		Aux	20.50	1.52	159.2	20	0.0317	1.000	0.0317	PASS
Wi-Fi 5GHz	5180~5825	Main	16.00	2.79	75.7	20	0.0151	1.000	0.0151	PASS
		Aux	16.00	2.76	75.2	20	0.0150	1.000	0.0150	PASS
Bluetooth	2402~2480	--	9.00	0.96	9.9	20	0.0020	1.000	0.0020	PASS

Simultaneous Transmission

Mode	Frequency (MHz)	Antenna	P/P limit	(Power / Limit) of Wi-Fi 2.4G+Bluetooth	Verdict
Wi-Fi 2.4GHz	2402~2462	Main	0.0378	0.0715	PASS
		Aux	0.0317		
Bluetooth	2402~2480	--	0.0020		

Mode	Frequency (MHz)	Antenna	P/P limit	(Power / Limit) of Wi-Fi 5G+Bluetooth	Verdict
Wi-Fi 5GHz	5180~5825	Main	0.0151	0.0321	PASS
		Aux	0.0150		
Bluetooth	2402~2480	--	0.0020		

ISED RF Exposure

Mode	Frequency (MHz)	Antenna	Maximum Conducted power Tune up (dBm)	Antenna Gain (dBi)	Maximum EIRP/ERP power (mW)	Distance (mm)	Power Density (mW/cm²)	Limit of Power Density (mW/cm²)	P/P limit	Verdict
Wi-Fi 2.4GHz	2402~2462	Main	20.50	2.29	190.1	20	0.0378	5.44	0.0069	PASS
		Aux	20.50	1.52	159.2	20	0.0317	5.44	0.0058	PASS
Wi-Fi 5GHz	5180~5825	Main	16.00	2.79	75.7	20	0.0151	9.52	0.0016	PASS
		Aux	16.00	2.76	75.2	20	0.0150	9.52	0.0016	PASS
Bluetooth	2402~2480	--	9.00	0.96	9.9	20	0.0020	5.41	0.0004	PASS

Simultaneous Transmission

Mode	Frequency (MHz)	Antenna	P/P limit	(Power / Limit) of Wi-Fi 2.4G+Bluetooth	Verdict
Wi-Fi 2.4GHz	2402~2462	Main	0.0069	0.0131	PASS
		Aux	0.0058		
Bluetooth	2402~2480	--	0.0004		

Mode	Frequency (MHz)	Antenna	P/P limit	(Power / Limit) of Wi-Fi 5G+Bluetooth	Verdict
Wi-Fi 5GHz	5180~5825	Main	0.0016	0.0036	PASS
		Aux	0.0016		
Bluetooth	2402~2480	--	0.0004		

Conclusion: This EUT is deemed to comply with the reference level limits, therefore the basic restrictions are compliant with human exposure limits.

The End