





FCC PART 15.247

TEST REPORT

For

FUJIAN YESOUL HEALTH TECHNOLOGY CO.,LTD

RM-B616, BLDG., NO.1, STRAIT ECONOMIC AND TRADE PLAZA, FUZHOU FREE TRADE ZONE, FUZHOU, FUJIAN, China

FCC ID: 2A3YB-YS-BA3

Report Type:		Product Name:
Original Report		Sperax BIKE
Report Number:	2407Z38678E-F	RF-01
Report Date:	2025-02-25	
Reviewed By:	Ash Lin	Ash Lin
Approved By:	Miles Chen	
Prepared By:	Unit 102, No. 90	

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REPORT REVISION HISTORY

Number of Revisions	Report No.	Version	Issue Date	Description
0	2407Z38678E-RF-01	R1V1	2025-02-25	Initial Release

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product Name:	Sperax BIKE
Tested Model:	YS-BA3
Multiple Model(s):	SPX-DC001, YS-BA5
Power Supply:	DC 3V by battery
Maximum Peak Output Power (Conducted):	-1.42dBm
Frequency Range:	2402-2480MHz
Modulation Technique:	GFSK
Antenna Type:	PCB Antenna
★Maximum Antenna Gain:	-0.48dBi
EUT Received Status:	Good

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Note.

- 1. The Maximum Antenna Gain was declared by manufacturer.
- 2. The test model is identify with the series models except for the model name and distribution chains, please refer to declaration letter for more detail.
- 3. All measurement and test data in this report was gathered from production sample serial number: 2RG1-2 (Assigned by the BACL(Xiamen). The EUT supplied by the applicant was received on 2024-09-09)

Objective

This report is prepared on behalf of *FUJIAN YESOUL HEALTH TECHNOLOGY CO.,LTD* in accordance with Part 2-Subpart J, Part 15-Subparts A and C of the Federal Communication Commission's rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.209 and 15.247 rules.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices and KDB 558074 D01 15.247 Meas Guidance v05r02.

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Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Xiamen) to collect test data is located on the Unit 102, No. 902 Meifeng South Road, Binhai West Avenue, Science and Technology Innovation Park, Torch High tech Zone XiaMen.

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Bay Area Compliance Laboratories Corp. (Xiamen) Lab is accredited to ISO/IEC 17025 by A2LA (Certificate Number: 7134.01) and the lab has been recognized as the FCC accredited lab under the KDB 974614 D01, the FCC Designation No.: CN1384.

Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the product as specified in CISPR 16-4-2. This uncertainty represents expanded uncertainty expressed at 95% confidence level using a coverage factor of k=2.

Item		$U_{ m lab}$	
Conducted Emissions	150kHz-30MHz	2.33 dB	
	9kHz-30MHz	2.59 dB	
	30MHz~200MHz	4.38 dB	
Dodieted Couniese Emission	200MHz~1GHz	4.50 dB	
Radiated Spurious Emission	1GHz~6GHz	4.58 dB	
	6GHz~18GHz	5.43 dB	
	18GHz~26.5GHz	5.47 dB	
Transmitter Conducted Power		0.624 dB	
Power S ₁	pectral Density	0.61 dB	
Occupy Bandwidth		0.053 kHz	
Voltage (DC)		0.4%	
Temperature		1°C	
Н	umidity	5%	

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SYSTEM TEST CONFIGURATION

Test Mode and Voltage

The system was configured for testing in a typical mode (as normally used by a typical user).		
Test mode: Transmitting		
Test voltage:	DC 3V	
Remark:	During all emission tests, the EUT was configured to measure its highest possible emission level and the worst case's test data was presented in this test report.	

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Description of Test Configuration

For BLE mode, 40 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	20	2442
1	2404	21	2444
2	2406	22	2446
3	2408	23	2448
4	2410	24	2450
5	2412	25	2452
6	2414	26	2454
7	2416	27	2456
8	2418	28	2458
9	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
19	2440	39	2480

EUT was tested with Channel 0, 19 and 39.

Equipment Modifications

No modification was made to the EUT tested.

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★EUT Exercise Software

RF Test Tool: WS8100 RF Test_V1.0.1_SRRC.EXE

The device was tested with the worst case was performed as below:

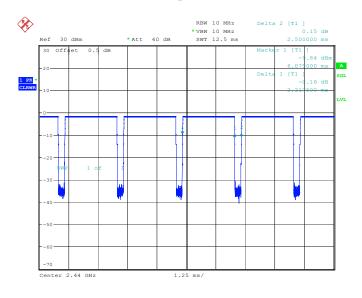
Mode	Data wata	Power level		
Mode	Data rate	Low channel	Middle channel	High channel
BLE	1 Mbps	-1	-1	-1

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Duty cycle

Test Mode:		Transmitting Test Engineer:		Jason Hu			
Test Date:		2025-01-18	Test Voltage:		DC 3V		
Test Result:		Compliance		Environment:		Temp.: 23.3°C Humi.: 43% Atm.: 100.1kPa	
Test Modes	Test Frequency (MHz)	Ton (ms)	Ton+off Duty cycle (%)		1/T (Hz)	VBW Setting (kHz)	
BLE 1Mbps	2440	2.218	2	.5	88.72	451	0.50

BLE 1Mbps Middle Channel



ProjectNo.:2407Z38678E-RF Tester:Jason Hu
Date: 18.JAN.2025 13:17:25

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Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Lenovo	Laptop	T480	PF1P5K4F
Unknown	Debug	Unknown	Unknown

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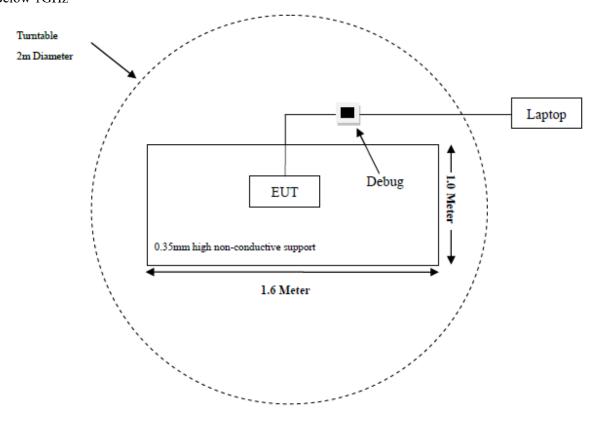
External I/O Cable

Cable Description	Length (m)	From Port	То
Cable	0.1	EUT	Debug
USB Cable	10	Debug	Laptop

Block Diagram of Test Setup

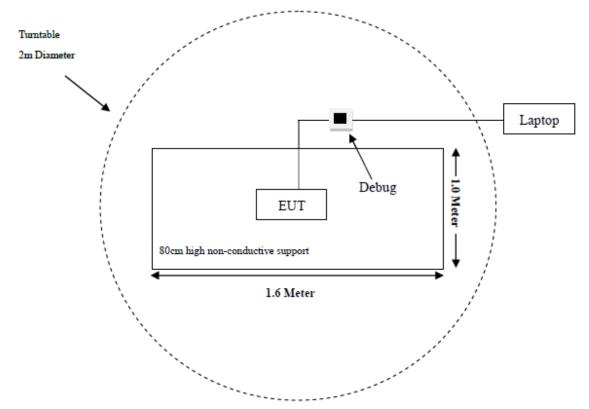
Radiated Emission:

Below 1GHz



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Above 1GHz



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Note: Antenna is 1.5m above ground.

RF Conduction:



Note: The cable assembly insertion loss of 0.5dB was entered as an offset in the spectrum analyzer. (Actual cable loss was unavailable at the time of testing, therefore loss of 0.5dB was assumed as worst case.) This was later verified to be true by laboratory.

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SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliance
§15.207 (a)	AC Line Conducted Emissions	Not Applicable (See note 1)
\$15.205, \$15.209, \$15.247 (d)	Spurious Emissions	Compliance
§15.247 (a)(2)	6 dB Emission Bandwidth	Compliance
§15.247 (b)(3)	Maximum Conducted Output Power	Compliance
§15.247 (d)	100 kHz Bandwidth of Frequency Band Edge	Compliance
§15.247 (e)	Power Spectral Density	Compliance

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Note:

1. The EUT is powered by battery.

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TEST EQUIPMENT LIST

Test Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date				
Radiated Emissions Below 1GHz									
EMI Test Receiver	Rohde & Schwarz	ESR	103103	2024/03/29	2025/03/28				
Loop Antenna	Rohde & Schwarz	HFH2-Z2	830749/001	2023/07/27	2026/07/26				
Antenna	Sunol Sciences	JB6	A122022-5	2023/07/27	2026/07/26				
Amplifier	Sonoma	310B	120903	2024/03/29	2025/03/28				
Coaxial Cable	XINHANGWEIBO	XH400T-N-4M	CC002	2024/03/29	2025/03/28				
Coaxial Cable	XINHANGWEIBO	XH460B-N-2M	CC006	2024/03/29	2025/03/28				
Coaxial Cable	XINHANGWEIBO	XH460B-N- 12M	CC007	2024/03/29	2025/03/28				
Coaxial Cable	XINHANGWEIBO	HFH2-CC	335.3609	2024/03/29	2025/03/28				
Test Software	Audix	E3	18621a	N/A	N/A				
	Radi	ated Emissions A	bove 1 GHz						
Spectrum Analyzer	Rohde & Schwarz	FSV40-N	102051	2024/03/29	2025/03/28				
Filter Switch Unit	Decentest	DT7220FSU	DS79904	2024/02/23	2025/02/22				
Multiplex Switch Test Control Set	Decentest	DT7220SCU	DS79901	2024/02/23	2025/02/22				
Horn Aantenna	EMCO	3115	9002-3355	2024/11/19	2027/11/18				
Preamplifier	A.H.Systems	PAM-0118P	489	2024/03/29	2025/03/28				
Coaxial Cable	XINHANGWEIBO	XH800A-N- 6M	CC003	2024/03/29	2025/03/28				
Coaxial Cable	XINHANGWEIBO	XH800A-N- 1M	CC005	2024/03/29	2025/03/28				
Horn Antenna	EMCO	3116	9407-2232	2023/07/31	2026/07/30				
Preamplifier	A.H.Systems	PAM-1840	200	2024/03/29	2025/03/28				
Coaxial Cable	XINHANGWEIBO	XH360A-2.92- 3M	CC008	2024/03/29	2025/03/28				
Coaxial Cable	XINHANGWEIBO	XH360A-2.92- 1M	CC009	2024/03/29	2025/03/28				
Test Software	Audix	E3	18621a	N/A	N/A				
		RF Conducted	Test						
Spectrum Analyzer	Rohde & Schwarz	FSU	100405	2024/03/29	2025/03/28				
Coaxial Cable	N/A	N/A	N/A	2024/03/29	2025/03/28				

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Statement of Traceability: Bay Area Compliance Laboratories Corp. (Xiamen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

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FCC §15.203 - ANTENNA REQUIREMENT

Applicable Standard

According to § 15.203, 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 shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

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- a. Antenna must be permanently attached to the unit.
- b. Antenna must use a unique type of connector to attach to the EUT.
- c. Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT has one PCB antenna arrangement for BLE, which was permanently attached and the antenna gain is -0.48 dBi, fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliance

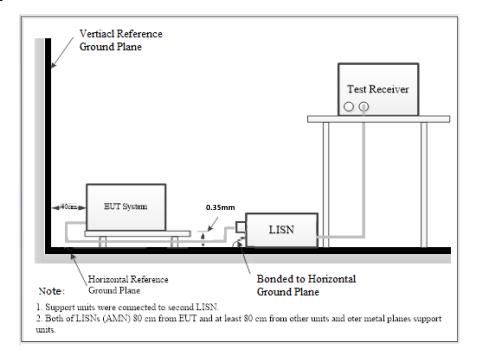
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FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207

EUT Setup



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The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All final data was recorded in the Quasi-peak and average detection mode.

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Result & Margin Calculation

The Result is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation from the Meter Reading. The basic equation is as follows:

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Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB) Result (dB\muV) = Reading (dB\muV) + Factor (dB)
```

The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin (dB) = Limit (dB μ V) –Result (dB μ V)

Test Data

Test Result: N/A

Note: The EUT is powered by battery.

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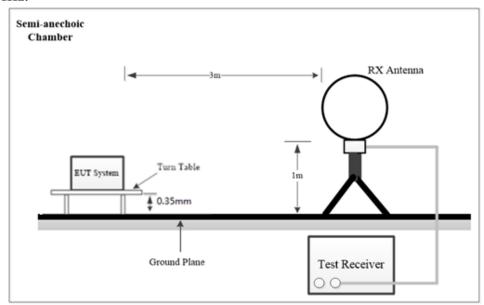
FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS

Applicable Standard

FCC §15.247 (d); §15.209; §15.205;

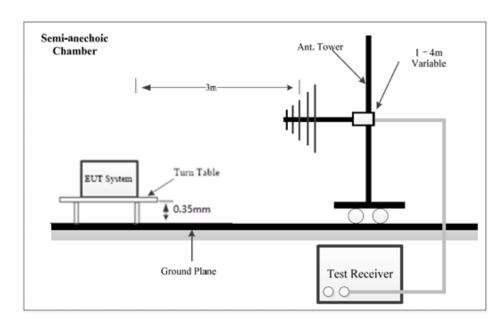
EUT Setup

9 kHz-30MHz:



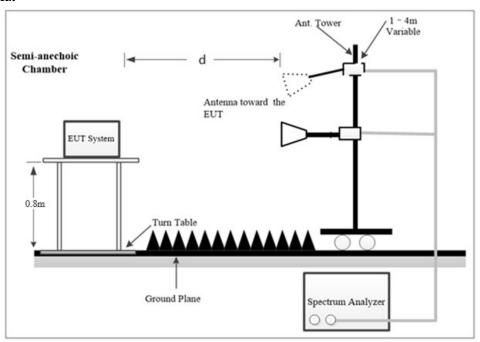
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30MHz -1 GHz:



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Above 1GHz:



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The radiated emission tests using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, and FCC 15.247 limits.

NOTE: d is testing distance;

For Radiated Emission test (1GHz-18GHz) and Bandedge Emission test, which was performed at 3 m distance.

For Radiated Emission test (18GHz-25GHz), which was performed at 1.0 m distance, according to ANSI C63.10-2013, the test result shall be extrapolated to the specified distance using an extrapolation Factor of 20dB/decade from 3m to 1.0m.

Distance extrapolation Factor =20 log (specific distance [3m]/test distance [1.0m]) dB= 9.54 dB

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 9 kHz to 25 GHz.

During the radiated emission test, the EMI test receiver & spectrum analyzer setup were set with the following configurations:

Below 1GHz:

Frequency Range	RBW	Video B/W	Measurement
9 kHz – 150 kHz	300Hz	1 kHz	PK
9 KHZ – 130 KHZ	200Hz	/	QP
150 kHz – 30 MHz	10 kHz	30 kHz	PK
130 kHz – 30 MHz	9 kHz	/	QP
30 MHz – 1000 MHz	100 kHz	300 kHz	PK
30 MHZ – 1000 MHZ	120 kHz	/	QP

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Above 1GHz:

Pre-scan:

Duty Cycle	RBW	VBW	Measurement	
Any	1MH z	3MHz	PK	
>98%	1MH z	5kHz	AV	
<98%	1MHz	≥1/T, not less than 5kHz	AV	

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Final measurement for emission identified during the pre-scan:

Duty Cycle	RBW	VBW	Measurement
Any	1MHz	3MHz	PK
>98%	1MHz	10Hz	AV
<98%	1MHz	1/T	AV

Note: T is minimum transmission duration

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

For each measurement antenna alignment, the EUT shall be rotated through 0°to 360° on a turntable. The report shall list the six emissions with the smallest margin relative to the limit, for each of the three antenna orientations (parallel, perpendicular, and ground parallel) unless the margin is greater than 20 dB, then the following statement shall be made: "all emissions were greater than 20 dB below the limit."

Below 1GHz, if the measured peak level of the emissions that the measuring receiver reading level plus corrected factor is at least 6 dB below the QP emission limit, there's no need to record the measured QP level of the emissions in the report.

Above 1GHz, if the measured peak level of the emissions that the measuring receiver reading level plus corrected factor is below the AV emission limit, there's no need to record the measured AV level of the emissions in the report.

Result & Margin Calculation

The Result is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

For 9 kHz to 18GHz Radiated emission test

Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB) - Amplifier Gain (dB)

For 18GHz to 25GHz Radiated emission test and Bandedge emissions test

Factor (dB/m) =Antenna Factor (dB/m) + Cable Loss (dB) - Amplifier Gain (dB) - Extrapolation factor (dB)

Extrapolation factor=9.54dB (distance=1m)

Result $(dB\mu V/m) = Reading (dB\mu V) + Factor (dB/m)$

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The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

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Margin (dB) = Limit (dB μ V/m) –Result (dB μ V/m)

Test Data

Please refer to the below table and plots.

Frequency Range:	Below 1 GHz	Above 1 GHz
Temperature:	24.5°C	22.2°C~24.5°C
Relative Humidity:	53 %	48%~53%
ATM Pressure:	100.1kPa	100.1kPa
Test Date:	2025-02-07	2025-01-17~2025-02-07
Test Engineer:	Wlif Wu	Wlif Wu

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1) 9 kHz~30MHz

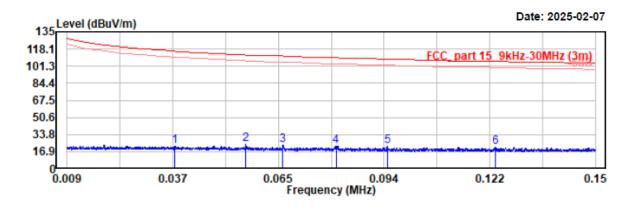
EUT operation mode: Transmitting in BLE 1Mbps low channel in parallel (worst case).

Project No.: 2407Z38678E-RF Temp/Humi/ATM: 24.5℃/53%/100.1kPa

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Test Mode: BLE 1M 2402 Tested by: Wlif Wu EUT Model: YS-BA3 Power Source: DC 3V

Test distance: 3m



Condition: PK RBW:300Hz VBW:1kHz SWT:auto

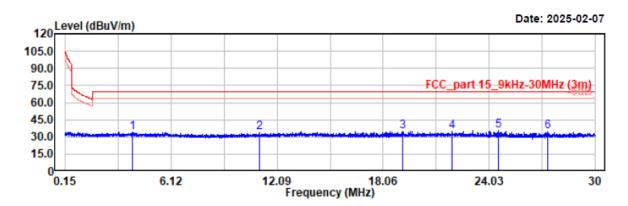
Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Remark
0.038	2.50	19.91	22.41	116.09	93.68	Peak
0.057	4.36	19.91	24.27	112.54	88.27	Peak
0.067	3.16	19.84	23.00	111.14	88.14	Peak
0.081	2.63	19.72	22.35	109.46	87.11	Peak
0.094	2.92	19.78	22.70	108.10	85.40	Peak
0.123	1.29	19.73	21.02	105.79	84.77	Peak

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Test Mode: BLE 1M 2402 Tested by: Wlif Wu EUT Model: YS-BA3 Power Source: DC 3V

Test distance: 3m



Condition: PK RBW:10kHz VBW:30kHz SWT:auto

Freq	Reading	Factor	Result	Limit	Margin	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
3.950	14.28	19.77	34.05	69.54	35.49	Peak
11.105	14.14	19.71	33.85	69.54	35.69	Peak
19.158	14.91	20.03	34.94	69.54	34.60	Peak
21.964	14.71	20.14	34.85	69.54	34.69	Peak
24.579	14.98	20.21	35.19	69.54	34.35	Peak
27.343	15.05		35.15	69.54	34.39	Peak

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2) 30 MHz-1GHz

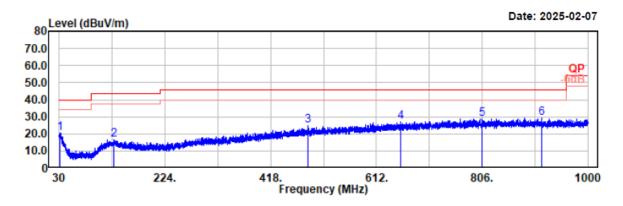
EUT operation mode: Transmitting in BLE 1Mbps low channel (worst case).

Project No.: 2407Z38678E-RF Temp/Humi/ATM: 24.5°C/53%/100.1kPa

Report No.: 2407Z38678E-RF-01

Test Mode: BLE 1M 2402 Tested by: Wlif Wu EUT Model: YS-BA3 Power Source: DC 3V

Test distance: 3m



Condition: PK RBW:100kHz VBW:300kHz SWT:auto

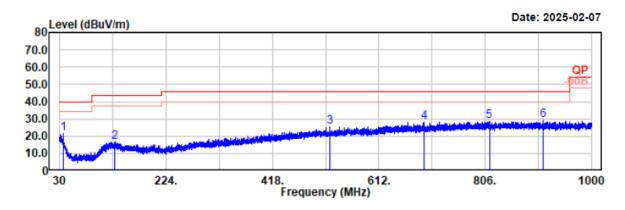
Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
32.13	27.10	-6.48	20.62	40.00	19.38	Horizontal	Peak
130.98	26.88	-10.19	16.69	43.50	26.81	Horizontal	Peak
486.09	28.39	-3.61	24.78	46.00	21.22	Horizontal	Peak
655.94	28.09	-0.96	27.13	46.00	18.87	Horizontal	Peak
805.61	27.46	1.28	28.74	46.00	17.26	Horizontal	Peak
914.64	26.42	2.70	29.12	46.00	16.88	Horizontal	Peak

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Test Mode: BLE 1M 2402 Tested by: Wlif Wu EUT Model: YS-BA3 Power Source: DC 3V

Test distance: 3m



Condition: PK RBW:100kHz VBW:300kHz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
36.98 130.40	31.21 26.77	-9.49 -10.14	21.72 16.63	40.00 43.50	18.28 26.87	Vertical Vertical	Peak Peak
523.25	28.84	-3.39	25.45	46.00	20.55	Vertical	Peak
694.45	28.49	-0.44	28.05	46.00	17.95	Vertical	Peak
813.66	27.20	1.40	28.60	46.00	17.40	Vertical	Peak
911.05	26.29	2.68	28.97	46.00	17.03	Vertical	Peak

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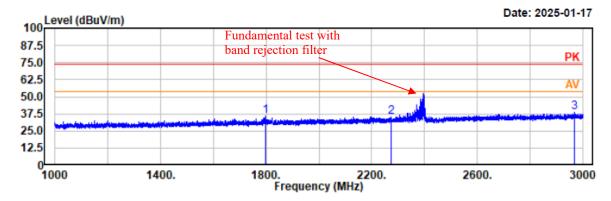
3) 1GHz~3GHz

Project No.: 2407Z38678E-RF Temp/Humi/ATM: 22.2℃/48%/100.1kPa

Report No.: 2407Z38678E-RF-01

Test Mode: BLE 1M 2402MHz Tested by: Wlif Wu EUT Model: YS-BA3 Power Source: DC 3V

Test distance: 3m



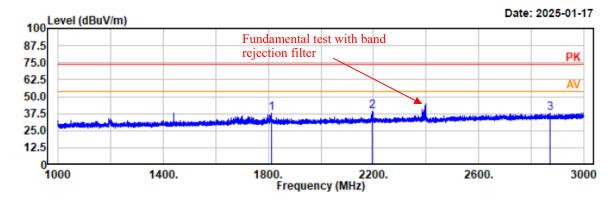
Condition Freq MHz	: PK RBW: Reading dBuV		MHz SWT:au Result dBuV/m		Margin dB	Polarity	Remark
1798.20 2274.00	49.28 46.93	-13.23 -11.62	36.05 35.31	74.00 74.00	37.95 38.69	horizontal horizontal	
2968.20	48.02	-9.11	38.91	74.00	35.09	horizontal	Peak

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Report No.: 2407Z38678E-RF-01

Test Mode: BLE 1M 2402MHz Tested by: Wlif Wu EUT Model: YS-BA3 Power Source: DC 3V

Test distance: 3m



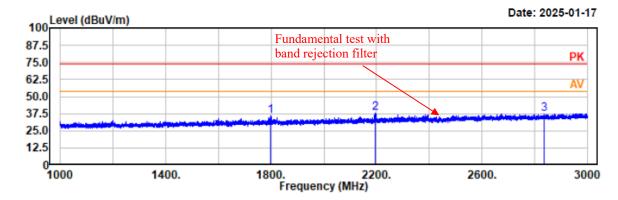
Condition	: PK RBW:	1MHz VBW:3N	1Hz SWT:au	to			
Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
MIZ	abav	ub/III	ubuv/iii	ubuv/III	ub		
1810.60	51.29	-13.19	38.10	74.00	35.90	vertical	Peak
2196.20	51.03	-11.97	39.06	74.00	34.94	vertical	Peak
2873.40	47.43	-9.59	37.84	74.00	36.16	vertical	Peak

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Report No.: 2407Z38678E-RF-01

Test Mode: BLE 1M 2440MHz Tested by: Wlif Wu EUT Model: YS-BA3 Power Source: DC 3V

Test distance: 3m



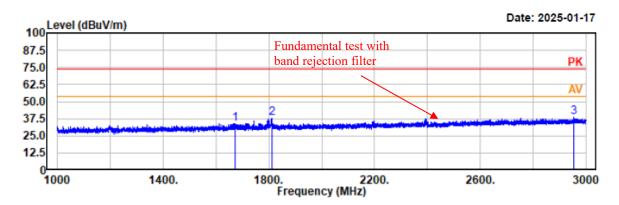
Condition	Condition: PK RBW:1MHz VBW:3MHz SWT:auto									
Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark			
1798.20	49.01	-13.23	35.78	74.00	38.22	horizontal	Peak			
2195.60	49.68	-11.97	37.71	74.00	36.29	horizontal	Peak			
2837.60	47.11	-9.66	37.45	74.00	36.55	horizontal	Peak			

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Report No.: 2407Z38678E-RF-01

Test Mode: BLE 1M 2440MHz Tested by: Wlif Wu EUT Model: YS-BA3 Power Source: DC 3V

Test distance: 3m



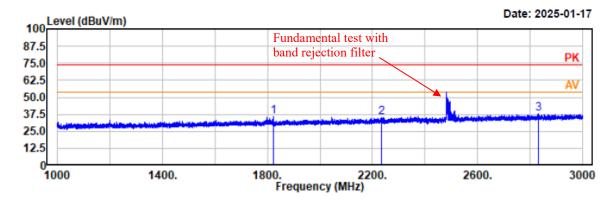
Condition	: PK RBW:	1MHz VBW:3N	MHz SWT:au	to			
Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
1672.60	47.79	-13.71	34.08	74.00	39.92	vertical	Peak
1811.40	50.93	-13.19	37.74	74.00	36.26	vertical	Peak
2954.40	47.60	-9.18	38.42	74.00	35.58	vertical	Peak

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Report No.: 2407Z38678E-RF-01

Test Mode: BLE 1M 2480MHz Tested by: Wlif Wu EUT Model: YS-BA3 Power Source: DC 3V

Test distance: 3m



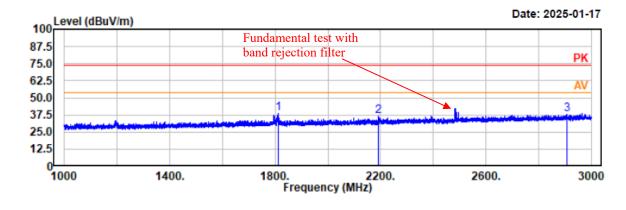
Condition	: PK RBW:	1MHz VBW:3N	MHz SWT:au	to			
Freq	Reading	Factor	Result	Limit	Margin	Polarity	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1022 40	40.60	12.16	25 52	74.00	20.47	h	Deals
1823.40	48.69	-13.16	35.53	74.00	38.47	horizontal	Peak
2235.00	47.18	-11.84	35.34	74.00	38.66	horizontal	Peak
2831.20	47.48	-9.68	37.80	74.00	36.20	horizontal	Peak

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Report No.: 2407Z38678E-RF-01

Test Mode: BLE 1M 2480MHz Tested by: Wlif Wu EUT Model: YS-BA3 Power Source: DC 3V

Test distance: 3m



Condition	: PK RBW:	1MHz VBW:3N	∕Hz SWT:au	to			
Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
		•	•				
1811.00	52.13	-13.19	38.94	74.00	35.06	vertical	Peak
2190.80	48.25	-11.98	36.27	74.00	37.73	vertical	Peak
2908.40	47.34	-9.49	37.85	74.00	36.15	vertical	Peak

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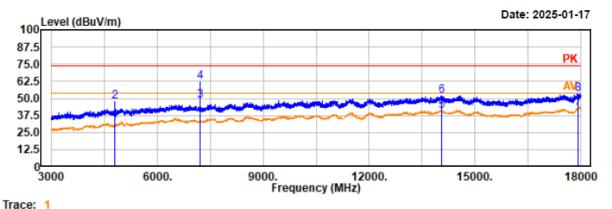
5) 3GHz~18GHz

Project No.: 2407Z38678E-RF Temp/Humi/ATM: 22.2℃/48%/100.1kPa

Report No.: 2407Z38678E-RF-01

Test Mode: BLE 1M 2402MHz Tested by: Wlif Wu EUT Model: YS-BA3 Power Source: DC 3V

Test distance: 3m



Condition: PK RBW:1MHz VBW:3MHz SWT:auto
AV RBW:1MHz VBW:5kHz SWT:auto

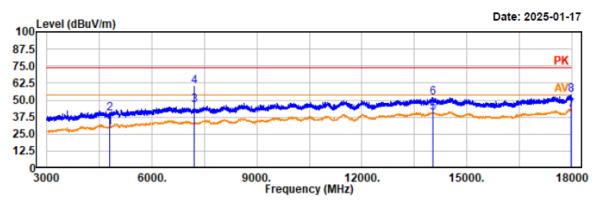
Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
4804.50	38.71	-5.24	33.47	54.00	20.53	horizontal	Average
4804.50	52.94	-5.24	47.70	74.00	26.30	horizontal	Peak
7206.00	50.58	-2.55	48.03	54.00	5.97	horizontal	Average
7206.00	64.32	-2.55	61.77	74.00	12.23	horizontal	Peak
14061.00	35.46	5.28	40.74	54.00	13.26	horizontal	Average
14061.00	46.42	5.28	51.70	74.00	22.30	horizontal	Peak
17919.00	35.72	6.82	42.54	54.00	11.46	horizontal	Average
17919.00	46.41	6.82	53.23	74.00	20.77	horizontal	Peak

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Report No.: 2407Z38678E-RF-01

Test Mode: BLE 1M 2402MHz Tested by: Wlif Wu EUT Model: YS-BA3 Power Source: DC 3V

Test distance: 3m



Trace: 1

Condition: PK RBW:1MHz VBW:3MHz SWT:auto

AV RBW:1MHz VBW:5kHz SWT:auto Freq Reading Factor Result Limit Margin Polarity Remark MHz dBuV dB/m dBuV/m dBuV/m dΒ 4804.00 35.19 -5.24 29.95 54.00 24.05 vertical Average

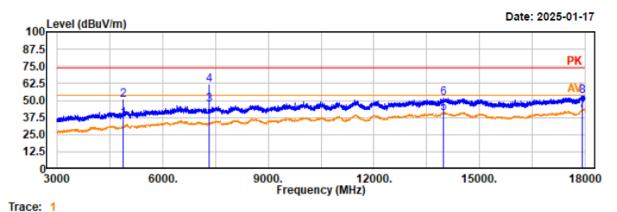
Peak	vertical	33.79	74.00	40.21	-5.24	45.45	4804.00
Average	vertical	7.46	54.00	46.54	-2.55	49.09	7206.00
Peak	vertical	14.10	74.00	59.90	-2.55	62.45	7206.00
Average	vertical	13.20	54.00	40.80	5.25	35.55	14041.50
Peak	vertical	21.99	74.00	52.01	5.25	46.76	14041.50
Average	vertical	11.02	54.00	42.98	6.90	36.08	17989.50
Peak	vertical	20.32	74.00	53.68	6.90	46.78	17989.50

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Report No.: 2407Z38678E-RF-01

Test Mode: BLE 1M 2440MHz Tested by: Wlif Wu EUT Model: YS-BA3 Power Source: DC 3V

Test distance: 3m



Condition: PK RBW:1MHz VBW:3MHz SWT:auto
AV RBW:1MHz VBW:5kHz SWT:auto

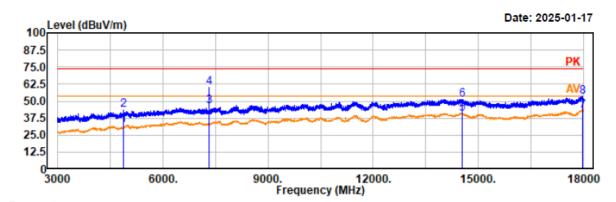
Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
4879.50	42.03	-5.30	36.73	54.00	17.27	horizontal	Average
4879.50	55.30	-5.30	50.00	74.00	24.00	horizontal	Peak
7320.00	48.84	-2.25	46.59	54.00	7.41	horizontal	Average
7320.00	63.80	-2.25	61.55	74.00	12.45	horizontal	Peak
13989.00	35.38	5.20	40.58	54.00	13.42	horizontal	Average
13989.00	46.75	5.20	51.95	74.00	22.05	horizontal	Peak
17926.50	35.95	6.84	42.79	54.00	11.21	horizontal	Average
17926.50	46.39	6.84	53.23	74.00	20.77	horizontal	Peak

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Report No.: 2407Z38678E-RF-01

Test Mode: BLE 1M 2440MHz Tested by: Wlif Wu EUT Model: YS-BA3 Power Source: DC 3V

Test distance: 3m



Trace: 1
Condition: PK RBW:1MHz VBW:3MHz SWT:auto
AV RBW:1MHz VBW:5kHz SWT:auto

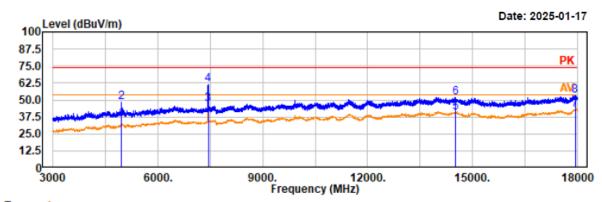
Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
4879.50 4879.50 7320.00 7320.00 14532.00 14532.00 17982.00 17982.00	37.54 48.87 48.23 62.02 35.34 46.30 36.15 46.19	-5.30 -5.30 -2.25 -2.25 5.05 5.05 6.89 6.89	32.24 43.57 45.98 59.77 40.39 51.35 43.04 53.08	54.00 74.00 54.00 74.00 54.00 74.00 54.00 74.00	21.76 30.43 8.02 14.23 13.61 22.65 10.96 20.92	vertical vertical vertical vertical vertical vertical vertical	Average Peak Average Peak Average Peak Average Peak Average

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Report No.: 2407Z38678E-RF-01

Test Mode: BLE 1M 2480MHz Tested by: Wlif Wu EUT Model: YS-BA3 Power Source: DC 3V

Test distance: 3m



Trace: 1
Condition: PK RBW:1MHz VBW:3MHz SWT:auto

AV RBW:1MHz VBW:5kHz SWT:auto

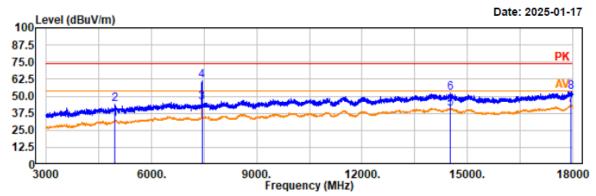
4959.00 53.08 -5.11 47.97 74.00 26.03 horizontal Peak 7440.00 48.84 -2.03 46.81 54.00 7.19 horizontal Averag 7440.00 63.21 -2.03 61.18 74.00 12.82 horizontal Peak	Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
14514.00 46.87 5.07 51.94 74.00 22.06 horizontal Peak 17938.50 35.73 6.84 42.57 54.00 11.43 horizontal Averag 17938.50 46.55 6.84 53.39 74.00 20.61 horizontal Peak	4959.00 7440.00 7440.00 14514.00 14514.00 17938.50	53.08 48.84 63.21 35.95 46.87 35.73	-5.11 -2.03 -2.03 5.07 5.07 6.84	47.97 46.81 61.18 41.02 51.94 42.57	74.00 54.00 74.00 54.00 74.00 54.00	26.03 7.19 12.82 12.98 22.06 11.43	horizontal horizontal horizontal horizontal horizontal horizontal	Average Peak Average Peak Average

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Report No.: 2407Z38678E-RF-01

Test Mode: BLE 1M 2480MHz Tested by: Wlif Wu EUT Model: YS-BA3 Power Source: DC 3V

Test distance: 3m



Trace: 1

Condition: PK RBW:1MHz VBW:3MHz SWT:auto

AV RBW:1MHz VBW:5kHz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
4960.50 4960.50 7440.00 7440.00 14508.00 14508.00 17952.00	38.49 49.08 47.59 63.73 35.71 47.06 36.33 46.43	-5.11 -5.11 -2.03 -2.03 5.06 5.06 6.86 6.86	33.38 43.97 45.56 61.70 40.77 52.12 43.19 53.29	54.00 74.00 54.00 74.00 54.00 74.00 54.00 74.00	20.62 30.03 8.44 12.30 13.23 21.88 10.81 20.71	vertical vertical vertical vertical vertical vertical vertical vertical	Average Peak Average Peak Average Peak Average Peak

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5) 18GHz~25GHz

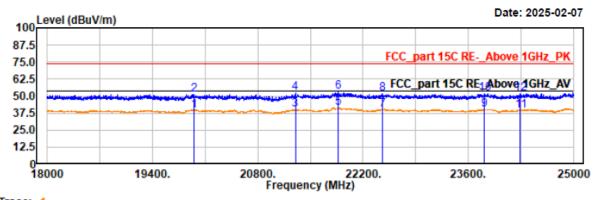
EUT operation mode: Transmitting in BLE 1Mbps low channel (worst case).

Project No.: 2407Z38678E-RF Temp/Humi/ATM: 24.5℃/53%/100.1kPa

Report No.: 2407Z38678E-RF-01

Test Mode: BLE 1M 2402 Tested by: Wlif Wu EUT Model: YS-BA3 Power Source: DC 3V

Test distance: 1m



Trace: 1

Condition: PK RBW:1MHz VBW:3MHz SWT:auto AV RBW:1MHz VBW:5kHz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
19947.00	39.62	-0.04	39.58	54.00	14.42	horizontal	Average
19947.00	51.32	-0.04	51.28	74.00	22.72	horizontal	Peak
21300.00	39.21	0.78	39.99	54.00	14.01	horizontal	Average
21300.00	51.30	0.78	52.08	74.00	21.92	horizontal	Peak
21867.60	39.52	1.63	41.15	54.00	12.85	horizontal	Average
21867.60	51.37	1.63	53.00	74.00	21.00	horizontal	Peak
22463.80	38.52	1.43	39.95	54.00	14.05	horizontal	Average
22463.80	49.98	1.43	51.41	74.00	22.59	horizontal	Peak
23810.20	38.05	1.71	39.76	54.00	14.24	horizontal	Average
23810.20	50.07	1.71	51.78	74.00	22.22	horizontal	Peak
24292.00	37.04	2.38	39.42	54.00	14.58	horizontal	Average
24292.00	49.36	2.38	51.74	74.00	22.26	horizontal	Peak

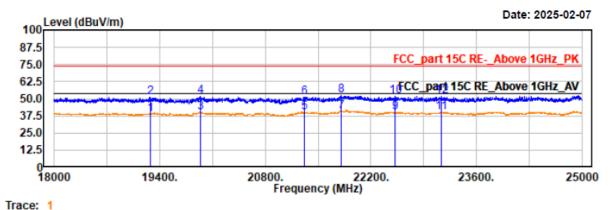
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Project No.: 2407Z38678E-RF Temp/Humi/ATM: 24.5℃/53%/100.1kPa

Report No.: 2407Z38678E-RF-01

Test Mode: BLE 1M 2402 Tested by: Wlif Wu EUT Model: YS-BA3 Power Source: DC 3V

Test distance: 1m



Condition: PK RBW:1MHz VBW:3MHz SWT:auto
AV RBW:1MHz VBW:5kHz SWT:auto

	AV KOW.	LINIZ VOW. JI	CIIZ SWI.GU	CO			
Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
1112	abav	GD/III	aba v / iii	abav, iii	ub		
19276.00	39.56	-0.81	38.75	54.00	15.25	vertical	Average
19276.00	51.80	-0.81	50.99	74.00	23.01	vertical	Peak
19942.60	39.95	-0.04	39.91	54.00	14.09	vertical	Average
19942.60	51.76	-0.04	51.72	74.00	22.28	vertical	Peak
21324.20	38.96	0.82	39.78	54.00	14.22	vertical	Average
21324.20	50.48	0.82	51.30	74.00	22.70	vertical	Peak
21801.60	39.42	1.48	40.90	54.00	13.10	vertical	Average
21801.60	50.90	1.48	52.38	74.00	21.62	vertical	Peak
22516.60	38.18	1.55	39.73	54.00	14.27	vertical	Average
22516.60	49.96	1.55	51.51	74.00	22.49	vertical	Peak
23130.40	38.32	1.39	39.71	54.00	14.29	vertical	Average
23130.40	50.62	1.39	52.01	74.00	21.99	vertical	Peak

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Restricted Bands Emissions:

Project No.: 2407Z38678E-RF Temp/Humi/ATM: 22.2°C/48%/100.1kPa

Report No.: 2407Z38678E-RF-01

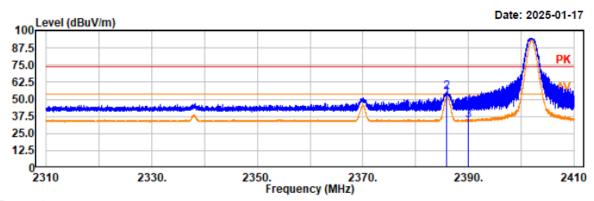
Average

Peak

horizontal

Test Mode: BLE 1M 2402MHz Tested by: Wlif Wu EUT Model: YS-BA3 Power Source: DC 3V

Test distance: 3m



Trace: 1

2390.00

Condition: PK RBW:1MHz VBW:3MHz SWT:auto AV RBW:1MHz VBW:5kHz SWT:auto

-1.15

45.71

Factor Result Polarity Freq Reading Limit Margin Remark MHz dBuV dB/m dBuV/m dBuV/m dΒ 2385.88 52.32 -1.17 51.15 54.00 2.85 horizontal Average 2385.88 56.45 -1.17 55.28 74.00 18.72 horizontal Peak 2390.00 35.85 -1.15 34.70 54.00 19.30 horizontal

74.00

29.44

44.56

FCC Part 15.247 Page 38 of 55 Project No.: 2407Z38678E-RF Temp/Humi/ATM: 22.2℃/48%/100.1kPa

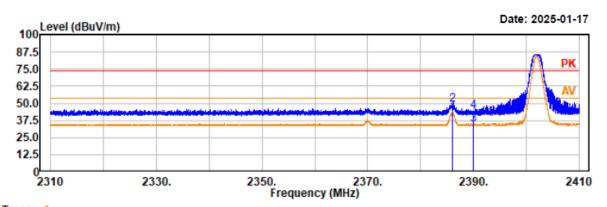
Report No.: 2407Z38678E-RF-01

Test Mode: BLE 1M 2402MHz Tested by: Wlif Wu EUT Model: YS-BA3 Power Source: DC 3V

Test distance: 3m

Freq

MHz



Trace: 1
Condition: PK RBW:1MHz VBW:3MHz SWT:auto

AV RBW:1MHz VBW:5kHz SWT:auto
Reading Factor Result Limit Margin Polarity Remark
dBuV dB/m dBuV/m dBuV/m dB

2386.07	43.68	-1.17	42.51	54.00	11.49	vertical	Average
2386.07	49.88	-1.17	48.71	74.00	25.29	vertical	Peak
2390.00	35.47	-1.15	34.32	54.00	19.68	vertical	Average
2390.00	45.25	-1.15	44.10	74.00	29.90	vertical	Peak

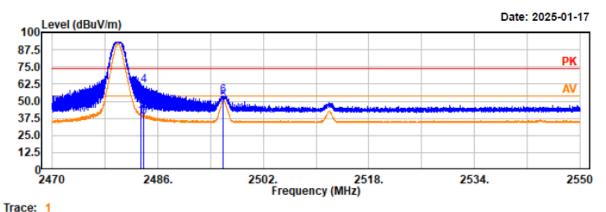
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Project No.: 2407Z38678E-RF Temp/Humi/ATM: 22.2℃/48%/100.1kPa

Report No.: 2407Z38678E-RF-01

Test Mode: BLE 1M 2480MHz Tested by: Wlif Wu EUT Model: YS-BA3 Power Source: DC 3V

Test distance: 3m



Condition: PK RBW:1MHz VBW:3MHz SWT:auto
AV RBW:1MHz VBW:5kHz SWT:auto

	/ (V INDIV. 1	UNITE VENT. SI	uiz Swii.uu	-			
Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
2483.50 2483.50 2483.88 2483.88 2495.90 2495.90	39.64 49.80 39.32 62.25 50.19 54.67	-0.77 -0.77 -0.76 -0.76 -0.72 -0.72	38.87 49.03 38.56 61.49 49.47 53.95	54.00 74.00 54.00 74.00 54.00 74.00	15.13 24.97 15.44 12.51 4.53 20.05	horizontal horizontal horizontal horizontal horizontal	Peak Average Peak

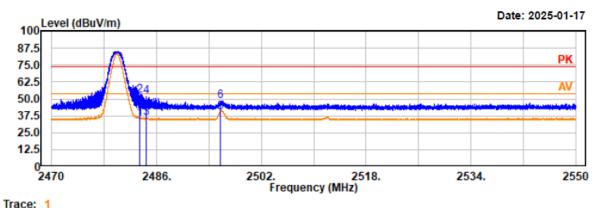
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Project No.: 2407Z38678E-RF Temp/Humi/ATM: 22.2℃/48%/100.1kPa

Report No.: 2407Z38678E-RF-01

Test Mode: BLE 1M 2480MHz Tested by: Wlif Wu EUT Model: YS-BA3 Power Source: DC 3V

Test distance: 3m



Condition: PK RBW:1MHz VBW:3MHz SWT:auto

	AV KBW:	TUMZ ARM:21	KHZ SWI:au	ILO			
Freq	Reading	Factor	Result	Limit	Margin	Polarity	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
2483.50	36.29	-0.77	35.52	54.00	18.48	vertical	Average
2483.50	53.00	-0.77	52.23	74.00	21.77	vertical	Peak
2484.40	36.47	-0.76	35.71	54.00	18.29	vertical	Average
2484.40	52.29	-0.76	51.53	74.00	22.47	vertical	Peak
2495.75	40.83	-0.72	40.11	54.00	13.89	vertical	Average
2495.75	49.18	-0.72	48.46	74.00	25.54	vertical	Peak

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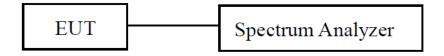
FCC §15.247(a) (2) – 6 dB EMISSION BANDWIDTH

Applicable Standard

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

Report No.: 2407Z38678E-RF-01

EUT Setup



Test Procedure

According to ANSI C63.10-2013 Section 11.8

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW) $\geq 3 \times RBW$.
- c) Detector = Peak.
- d) Trace mode = \max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Test Data

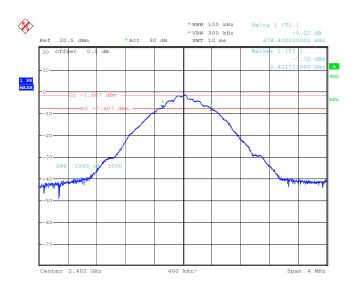
For BLE:

Test Mode:	Transmitting	Test Engineer:	Jason Hu
Test Date:	2025-01-18	Test Voltage:	DC 3V
Test Result:	Compliance	Environment:	Temp.: 23.3°C Humi.: 43% Atm.: 100.1kPa
Test Modes	Test Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)
	2402	0.678	≥0.5
BLE 1Mbps	2440	0.637	≥0.5
	2480	0.643	≥0.5

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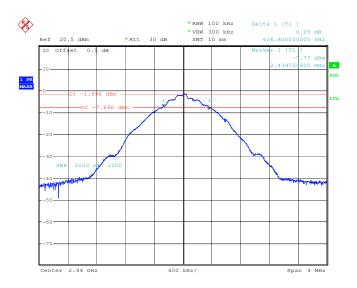
BLE 1Mbps Low Channel

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ProjectNo.:2407Z38678E-RF Tester:Jason Hu
Date: 18.JAN.2025 13:12:02

BLE 1Mbps Middle Channel

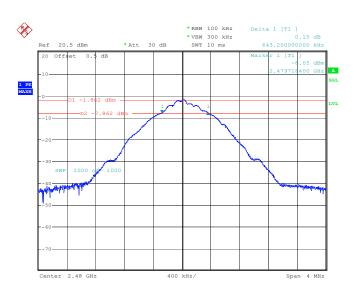


ProjectNo.:2407Z38678E-RF Tester:Jason Hu
Date: 18.JAN.2025 13:15:29

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BLE 1Mbps High Channel

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ProjectNo.:2407Z38678E-RF Tester:Jason Hu
Date: 18.JAN.2025 13:20:40

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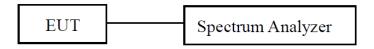
FCC §15.247(b) (3) - MAXIMUM CONDUCTED OUTPUT POWER

Applicable Standard

According to FCC §15.247(b) (3), for systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

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EUT Setup



Test Procedure

According to ANSI C63.10-2013 11.9.1.1

- a) Set the RBW \geq DTS bandwidth.
- b) Set VBW \geq [3 × RBW].
- c) Set span $\geq [3 \times RBW]$.
- d) Sweep time = auto couple.
- e) Detector = peak.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use peak marker function to determine the peak amplitude level.

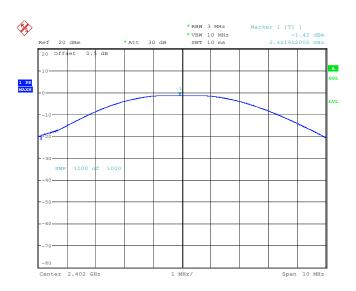
Test Data

Test Mode:	Transmitting	Test Engineer:	Jason Hu
Test Date:	2025-01-18	Test Voltage:	DC 3V
Test Result:	Compliance	Environment:	Temp.: 23.3°C Humi.: 43% Atm.: 100.1kPa
Test Modes	Test Frequency (MHz)	Maximum Peak Conducted Output Power(dBm)	Limit (dBm)
	2402	-1.42	≤30
BLE 1Mbps	2440	-1.54	≤30
	2480	-1.63	≤30

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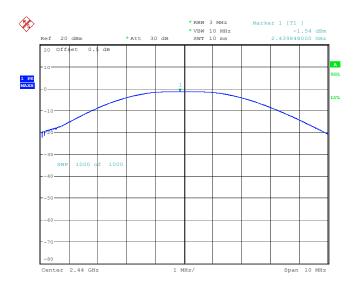
BLE 1Mbps Low Channel

Report No.: 2407Z38678E-RF-01



ProjectNo.:2407Z38678E-RF Tester:Jason Hu
Date: 18.JAN.2025 13:13:52

BLE 1Mbps Middle Channel

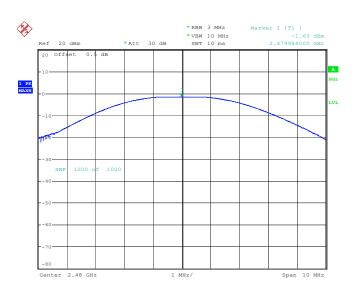


ProjectNo.:2407Z38678E-RF Tester:Jason Hu
Date: 18.JAN.2025 13:18:13

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BLE 1Mbps High Channel

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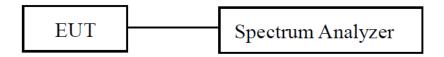
FCC §15.247(d) – 100 kHz BANDWIDTH OF FREQUENCY BAND EDGE

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Applicable Standard

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

EUT Setup



Test Procedure

According to ANSI C63.10-2013 Section 11.11

- a) Set the center frequency and span to encompass frequency range to be measured.
- b) Set the RBW = 100 kHz.
- c) Set the VBW \geq [3 × RBW].
- d) Detector = peak.
- e) Sweep time = auto couple.
- f) Trace mode = \max hold.
- g) Allow trace to fully stabilize.
- h) Use the peak marker function to determine the maximum amplitude level.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum requirements specified in 11.11. Report the three highest emissions relative to the limit.

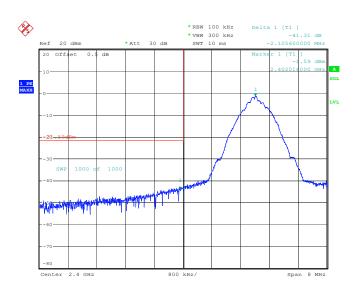
Test Data

Test Mode:	Transmitting	Test Engineer:	Jason Hu
Test Date:	2025-01-18	Test Voltage:	DC 3V
Test Result:	Compliance	Environment:	Temp.: 23.3°C Humi.: 43% Atm.: 100.1kPa

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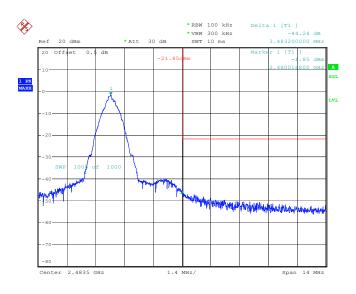
BLE 1Mbps Low Channel

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Date: 18.JAN.2025 13:11:13

BLE 1Mbps High Channel



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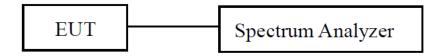
FCC §15.247(e) - POWER SPECTRAL DENSITY

Applicable Standard

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

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EUT Setup



Test Procedure

According to ANSI C63.10-2013 Section 11.10.2

- a) Set analyzer center frequency to DTS channel center frequency.
- b) Set the span to 1.5 times the DTS bandwidth.
- c) Set the RBW to $3 \text{ kHz} \le \text{RBW} \le 100 \text{ kHz}$.
- d) Set the VBW \geq [3 ×RBW].
- e) Detector = peak.
- f) Sweep time = auto couple.
- g) Trace mode = \max hold.
- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the maximum amplitude level within the RBW.
- j) If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat.

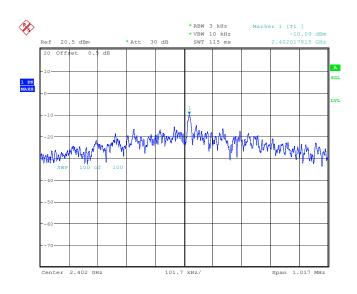
Test Data

Test Mode:	Transmitting	Test Engineer:	Jason Hu
Test Date:	2025-01-18	Test Voltage:	DC 3V
Test Result:	Compliance	Environment:	Temp.: 23.3°C Humi.: 43% Atm.: 100.1kPa
Test Modes	Test Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
	2402	-10.09	≤8.00
BLE 1Mbps	2440	-10.1	≤8.00
	2480	-10.2	€8.00

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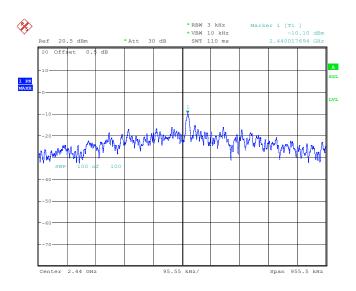
BLE 1Mbps Low Channel

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BLE 1Mbps Middle Channel

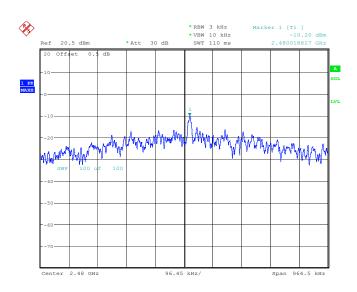


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EUT PHOTOGRAPHS

Please refer to the attachment 2407Z38678E-RF-EXP EUT EXTERNAL PHOTOGRAPHS and 2407Z38678E-RF-INP EUT INTERNAL PHOTOGRAPHS.

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TEST SETUP PHOTOGRAPHS

Please refer to the attachment 2407Z38678E-RF-TSP SETUP PHOTOGRAPHS.

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Declarations

Report No.: 2407Z38678E-RF-01

- 1. Bay Area Compliance Laboratories Corp. (Xiamen) is not responsible for authenticity of any information provided by the applicant. Information from the applicant that may affect test results are marked with an asterisk "★".
- 2. Unless otherwise stated, the results shown in this test report refer only to the sample(s) tested.
- 3. Unless required by the rule provided by the applicant or product regulations, then decision rule in this report did not consider the uncertainty.
- 4. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor k=2 with the 95% confidence interval.
- 5. This report cannot be reproduced except in full, without prior written approval of Bay Area Compliance Laboratories Corp. (Xiamen).
- 6. This report is valid only with a valid digital signature. The digital signature may be available only under the adobe software above version 7.0.

***** END OF REPORT *****

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