Prüfbericht-Nr.: *Test report no.:*	**CN22DK64 001**	**Auftrags-Nr.:** *Order no.*:	**168343678**	**Seite 1 von 21** *Page 1 of 21*
Kunden-Referenz-Nr.: *Client reference no.:*	N/A	**Auftragsdatum:** *Order date:*	2021-10-19	
Auftraggeber: *Client:*	**Shenzhen Sonoff Technologies Co.,Ltd.** 3F & 6F, Bldg A, No. 663, Bulong Rd, Shenzhen, Guangdong, China			
Prüfgegenstand: *Test item:*	SONOFF ZBMINI Smart Switch (No Neutral Required)			
Bezeichnung / Typ-Nr.: *Identification / Type no.:*	ZBMINI-L0, ZBMINI-L (Trademark: Sonoff)			
Auftrags-Inhalt: *Order content*:	Test Report			
Prüfgrundlage: *Test specification:*	CFR47 FCC Part 15: Subpart C Section 15.247 CFR47 FCC Part 15: Subpart C Section 15.207 CFR47 FCC Part 15: Subpart C Section 15.209 CFR47 FCC Part 15: Subpart B Section 15.107 CFR47 FCC Part 15: Subpart B Section 15.109			

Wareneingangsdatum: *Date of sample receipt:*	2021-12-11	Please refer to Photo Document
Prüfmuster-Nr.: *Test sample no:*	A003164366-022~027 A003229518-001	
Prüfzeitraum: *Testing period:*	2022-01-06 – 2022-04-01	
Ort der Prüfung: *Place of testing:*	TÜV Rheinland (Shenzhen) Co., Ltd.	
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland (Shenzhen) Co., Ltd.	
Prüfergebnis*: *Test result*:*	Pass	

geprüft von: *tested by:*	X Alex Lan Signed by: Alex Lan	**genehmigt von:** *authorized by:*	X Winnie Hou Signed by: Winnie Hou
Datum: *Date:*	2022-04-08	**Ausstellungsdatum:** *Issue date:*	2022-04-12
Stellung / *Position:*	Senior Project Engineer	**Stellung** / *Position:*	Reviewer
Sonstiges / *Other:*	FCC ID: 2APN5ZBMINI-L		

Zustand des Prüfgegenstandes bei Anlieferung: *Condition of the test item at delivery:*	Prüfmuster vollständig und unbeschädigt *Test item complete and undamaged*

* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhaft
	P(ass) = entspricht o.g. Prüfgrundlage(n)		F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
** Legend:*	*1 = very good*	*2 = good*	*3 = satisfactory*	*4 = sufficient*	*5 = poor*
	P(ass) = passed a.m. test specification(s)		*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

Test Summary

5.1.1 ANTENNA REQUIREMENT
RESULT: Pass

5.1.2 MAXIMUM PEAK CONDUCTED OUTPUT POWER
RESULT: Pass

5.1.3 CONDUCTED POWER SPECTRAL DENSITY
RESULT: Pass

5.1.4 6DB BANDWIDTH
RESULT: Pass

5.1.5 99% BANDWIDTH
RESULT: Pass

5.1.6 CONDUCTED SPURIOUS EMISSIONS MEASURED IN 100 KHZ BANDWIDTH
RESULT: Pass

5.1.7 RADIATED SPURIOUS EMISSION
RESULT: Pass

5.1.8 CONDUCTED EMISSION ON AC MAINS
RESULT: Pass

5.1.9 RADIATED EMISSION
RESULT: Pass

Contents

1 General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A: Photographs of the Test Set-up

Appendix B: Test Results of FCC Part 15

2 Test Sites

2.1 Test Facilities

TÜV Rheinland (Shenzhen) Co., Ltd.
No. 362 Huanguan Road Middle, Longhua District, 518110, Shenzhen, P. R. China.

FCC Registration No.: 694916
ISED wireless device testing laboratory: 25069

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Radio Spectrum Testing (SRD-Tonscend)				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Cal. until**
EXA Signal Analyzer, Multi-touch	Keysight	N9010B	MY60241175	2022-09-28
MXG X-Series RF Vector Signal Generator	Keysight	N5182B	MY61250137	2022-09-28
EXG X-Series Microwave Analog Signal Generator	Keysight	N5173B	MY61250141	2022-09-28
DC power supply	Keysight	E3642A	MY61276100	2022-09-28
Power Control Unit	Tonscend	JS0806-4ADC	N/A	2022-09-28
Automation Control Unit	Tonscend	JS0806-2	21C8060396	2022-09-28
Test Software	Tonscend	JS1120-3	N/A	N/A
Control PC	Lenovo	TianYi510S-071MB	YLX23JMF	N/A
Shielding Room 8#	Albatross	SR8	APC17151-SR8	2024-06-22
Unwanted Emission Testing (TS9975)				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Cal. until**
EMI Test Receiver	R&S	ESR 7	102021	2022-08-10
Signal Analyzer	R&S	FSV 40	101439	2022-08-09
System Controller Interface	R&S	SCI-100	S10010038	N/A
Filterbank	R&S	Wlan	100759	2022-08-09
OSP	R&S	OSP 120	102040	N/A
Pre-amplifier	R&S	SCU08F1	08320031	2022-08-09
Amplifier	R&S	SCU-18F	180070	2022-08-09

Amplifier	R&S	SCU40A	100475	2022-08-09
Trilog Broadband Antenna (30 MHz - 7 GHz)	Schwarzbeck	VULB 9162	193	2022-08-08
Double-Ridged Antenna (1 -18 GHz)	ETS-LINDGREN	3117	00218717	2022-08-08
Wideband Ridged Horn Antenna (18-40 GHz)	Steatite	QMS-00880	19067	2022-08-08
Active Loop Antenna	Schwarzbeck	FMZB 1513	302	2022-09-13
Test software	R&S	EMC32 (V10.60.10)	N/A	N/A
Control PC	Dell	OptiPlex 7050	36NV9P2	N/A
3m Semi-Anechoic Chamber	Albatross	SAC-3m	APC17151-SAC	2024-06-22
Conducted Emission				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Cal. until**
EMI Test Receiver	R&S	ESR3	102428	2022-08-10
Artificial Mains Network	R&S	ENV216	102333	2022-08-10
EMC32 test software	R&S	EMC32(Ver.10.50.00)	N/A	N/A
Radiated Emission (3m chamber)				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Cal. until**
3m SAC	ETS−Lindgren	SAC3	CT001632-Q1362	2024-04-26
EMI Test Receiver	R&S	ESR7	102111	2022-12-01
Horn Antenna	R&S	HF907	102706	2022-08-07
Preamplifier (1-18GHz)	FIT	SCU-18F	180077	2022-08-13
Active magnetic loop antenna	SCHWARZBECK	FMZB1519B	00080	2022-09-08
Trilog-Broadband antenna	SCHWARZBECK	VULB9168	0945	2022-12-12
EMC32 test software	R&S	EMC32(Ver.10.50.00)	N/A	N/A

2.3 Traceability

All measurement equipment calibrations are traceable to NIM (National Institute of Metrology) or where calibration is performed in other countries, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basics using in house standards or comparisons.

2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements as below table.

Parameter	Uncertainty
Radio Frequency	±1 x 10-7
RF Power (conducted)	±2.5 dB
Radiated Emission of Transmitter, valid up to 26.5 GHz	±6 dB
Radiated Emission of Receiver, valid up to 26.5 GHz	±6 dB
Conducted Emission, (9kHz to 150kHz)/(150kHz to 30MHz)	± 3.70 dB / ± 3.30 dB
Radiated Emission (3m SAC), 30MHz to 1000MHz	± 5.34 dB
Radiated Emission (3m SAC), above 1000MHz	± 4.56 dB
Temperature	±1 °C
Humidity	±5 %
Voltage (DC)	±1 %
Voltage (AC, <10kHz)	±2 %

2.6 Location of Original Data

The original copies of all test data taken during actual testing were attached at Appendix A & B of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) Co., Ltd. file for certification follow-up purposes.

2.7 Status of Facility Used for Testing

The TÜV Rheinland (Shenzhen) Co., Ltd. Test facility located at No. 362 Huanguan Road Middle, Longhua District, 518110, Shenzhen, P. R. China. is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

3 General Product Information

3.1 Product Function and Intended Use

The products are Smart Switch which supports 2.4GHz ZigBee wireless technology.
Two models are identical in Function, Radio Frequency design, and components employed, expect different PCB layout in power supply part.
The EUT has alternative components as below:

Manufacturer	Model	Rating
Transformer		
Shenzhen xinchuanglong Electronics Co., Ltd.	EE8.3	2mH 5V/50mA
Dongguan hangci Electronics Co., Ltd.	EE8.3	2mH 5V/50mA
Fuse		
Dong Guan De He Electronic Co., Ltd.	RXF1WS39R	1W J 39R
Dong Guan DEEHO Electronic Co Ltd.	FKN-0414S-J-390-TGF	1W J 39R
Varistor		
SHANTOU HIGH-NEW ZONE SONGTIAN ENTERPRISE CO., LTD.	STE-10D471KBS	1mA 470V
HONGZHI ENTERPRISES LTD	HEL10D471K	1mA 470V

For details refer to the User Manual, Technical Description and Circuit Diagram.

3.2 Ratings and System Details

Table 2: Technical Specification of EUT

General Information of EUT	Value
Kind of Equipment:	SONOFF ZBMINI Smart Switch (No Neutral Required)
Type Designation:	ZBMINI-L0, ZBMINI-L
Trademark:	Sonoff
FCC ID:	2APN5ZBMINI-L
Operating Voltage:	AC 100~240V, 50Hz/60Hz
Testing Voltage:	AC 120V@60Hz
Technical Specification of ZigBee	
Frequency Range:	2405 MHz to 2480 MHz
Type of Modulation:	O-QPSK
Channel Number:	16 channels
Data Rate:	250kbps
Channel Separation:	5 MHz
Antenna Type:	PCB Antenna
Antenna Gain:	0.00 dBi

3.3 Independent Operation Modes

The basic operation modes are:

A. On, ZigBee transmitting mode
    1) Low Channel
    2) Middle Channel
    3) High Channel
B. On, ZigBee communication
C. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

- Application Form
- Schematics
- Block Diagram
- User Manual
- Rating Label
- Parts List

4 Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

Radio Spectrum: The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5. All tests were performed according to the procedures in ANSI C63.10: 2013.
According to clause 3.1, all Radio frequency tests were performed on model ZBMINI-L. All EMC tests were performed on both models and alternative components.

Table 3: Test channel and frequency

Mode	Test Channels
ZIGBEE	L: 2405MHz; M: 2445MHz; H: 2480MHz

4.3 Special Accessories and Auxiliary Equipment

Table 4: Auxiliary Equipment Used during Test

Description	Manufacturer	Model	S/N
Laptop	Lenovo	T480	PF-16A6N8
Load (Bulbs)	--	--	--

4.4 Countermeasures to Achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Technical Construction File (TCF).

No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

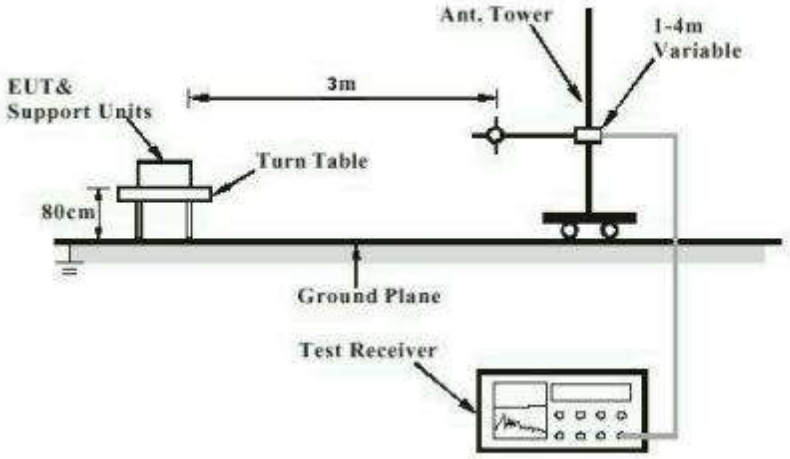


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)

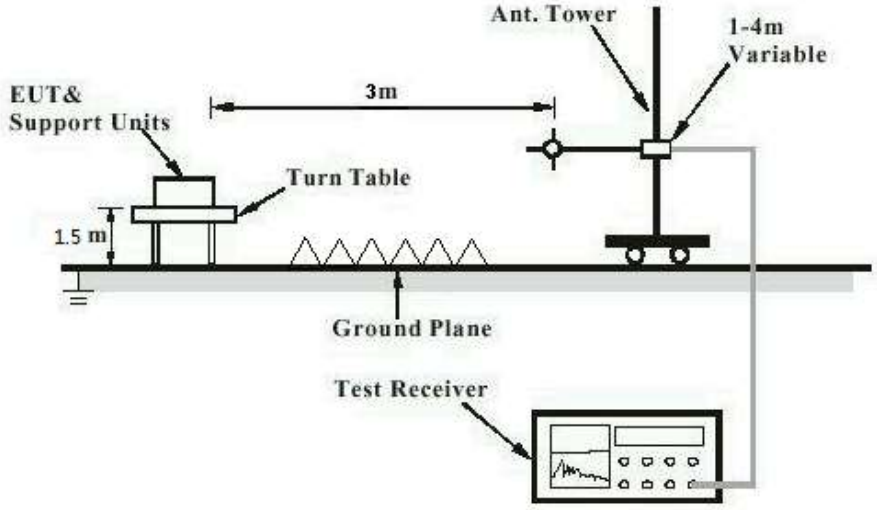


Diagram of Measurement Configuration for Mains Conduction Measurement

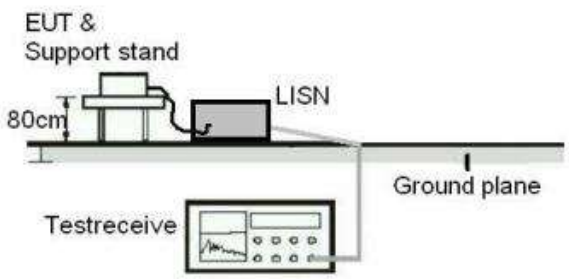
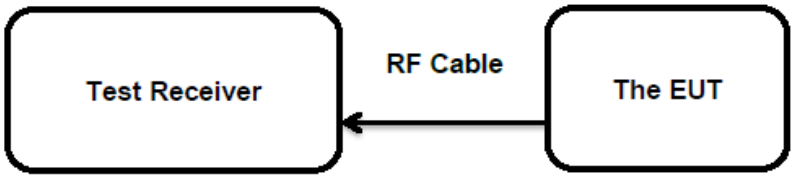


Diagram of Measurement Configuration for Conducted Transmitter Measurement



5 Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT: **Pass**

Test Specification
Test standard : FCC Part 15.247(b)(4) and Part 15.203

According to the manufacturer declared, the EUT has a PCB antenna, the directional gain of antenna is 0.00 dBi, permanent attachment and no consideration of replacement.

Therefore, the EUT is considered sufficient to comply with the provision.

5.1.2 Maximum Peak Conducted Output Power

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.247(b)(3)
Basic standard	:	ANSI C63.10: 2013
Limits	:	1.0 Watts
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2022-02-14
Input voltage	:	AC 120V@60Hz
Operation mode	:	A
Test channel	:	Low / Middle / High
Ambient temperature	:	24.8 ℃
Relative humidity	:	55 %
Atmospheric pressure	:	101 kPa

Table 5: Test Result of Maximum Peak Conducted Output Power

Test Mode	Test Channel (MHz)	Measured Peak Power		Limit (W)
		(dBm)	(W)	
ZigBee	2405	4.01	0.0010	< 1.0
	2445	3.86	0.0010	
	2480	4.52	0.0010	
Maximum Measured Value		4.52	0.0010	

Note:
1) The cable loss is taken into account in results.
2) Antenna gain(G): 0.00 dBi,
e.i.r.p.=$P_{(Peak\ power)}$+ G, which is far below the 4 W

5.1.3 Conducted Power Spectral Density

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.247(e)
Basic standard	:	ANSI C63.10: 2013
Limits	:	< 8 dBm / 3kHz
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2022-02-14
Input voltage	:	AC 120V@60Hz
Operation mode	:	A
Test channel	:	Low / Middle / High
Ambient temperature	:	24.8 ℃
Relative humidity	:	55 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix B.

5.1.4 6dB Bandwidth

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.247(a)(2)
Basic standard	:	ANSI C63.10: 2013
Limits	:	> 500 KHz
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2022-02-14
Input voltage	:	AC 120V@60Hz
Operation mode	:	A
Test channel	:	Low / Middle / High
Ambient temperature	:	24.8 ℃
Relative humidity	:	55 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix B.

5.1.5 99% Bandwidth

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.247
Basic standard	:	ANSI C63.10: 2013
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2022-02-14
Input voltage	:	AC 120V@60Hz
Operation mode	:	A
Test channel	:	Low / Middle / High
Ambient temperature	:	24.8 ℃
Relative humidity	:	55 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix B.

5.1.6 Conducted Spurious Emissions Measured in 100 kHz Bandwidth

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.247(d)
Basic standard	:	ANSI C63.10: 2013
Limits	:	20dB (below that in the 100kHz bandwidth within the band that contains the highest level of the desired power); In addition, radiated emissions which fall in the restricted bands, must also comply with the radiated emission limits specified in 15.209(a)
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2022-02-14 to 2022-04-01
Input voltage	:	AC 120V@60Hz
Operation mode	:	A
Test channel	:	Low / Middle / High
Ambient temperature	:	24.8 ℃
Relative humidity	:	55 %
Atmospheric pressure	:	101 kPa

Test results of 100kHz Bandwidth of Frequency Band Edge by Conducted method refer to test plots, and compliance is achieved as well.

For the measurement records, refer to the appendix B.

5.1.7 Radiated Spurious Emission

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.247(d) & FCC Part 15.205
Basic standard	:	ANSI C63.10: 2013
Limits	:	Refer to 15.209(a) of FCC part 15.247(d)
Kind of test site	:	3m Semi-anechoic Chamber

Test Setup

Date of testing	:	2022-02-16
Input voltage	:	AC 120V@60Hz
Operation mode	:	A
Test channel	:	Low / Middle / High
Ambient temperature	:	Refer to test result
Relative humidity	:	Refer to test result
Atmospheric pressure	:	101 kPa

Remark:
Testing carried out within frequency range 9kHz to the tenth harmonics. Only the worst-case spurious emissions configuration of the each mode were reported.

For the measurement records, refer to the appendix B.

5.1.8 Conducted Emission on AC Mains

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.207(a); FCC Part 15.107(a)
Basic standard	:	ANSI C63.10: 2013; ANSI C63.4:2014
Frequency range	:	0.15 – 30MHz
Classification	:	Class B
Limits	:	FCC Part 15.207(a); FCC Part 15.107(a)
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2022-01-06 to 2022-04-01
Input voltage	:	AC 120V@60Hz
Operation mode	:	B
Earthing	:	Not connected
Ambient temperature	:	23.5 ℃
Relative humidity	:	55 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix B.

5.1.9 Radiated Emission

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.209(a); FCC Part 15.109(a)
Basic standard	:	ANSI C63.10: 2013; ANSI C63.4:2014
Frequency range	:	Refer to FCC Part15.33
Classification	:	Class B
Limits	:	FCC Part 15.209(a); FCC Part 15.109(a)
Kind of test site	:	3m Semi-anechoic Chamber

Test Setup

Date of testing	:	2022-01-06 to 2022-04-01
Input voltage	:	AC 120V@60Hz
Operation mode	:	B
Earthing	:	Not connected
Ambient temperature	:	Refer to test result
Relative humidity	:	Refer to test result
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix B.

6 Photographs of the Test Set-Up

For photographs of the test set-up, refer to the appendix A.

7 List of Tables

Appendix B: Test Results of FCC PART15

Appendix B.1: Test Results of Conducted Power Spectral Density

TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
ZIGB	Ant1	2405	-7.34	≤8.00	PASS
		2445	-7.52	≤8.00	PASS
		2480	-7.16	≤8.00	PASS

ZIGB_Ant1_2405

ZIGB_Ant1_2445

ZIGB_Ant1_2480

Appendix B.2: Test Results of 6dB Bandwidth

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
ZIGB	Ant1	2405	1.610	2404.220	2405.830	0.5	PASS
		2445	1.610	2444.200	2445.810	0.5	PASS
		2480	1.690	2479.190	2480.880	0.5	PASS

ZIGB_Ant1_2405

ZIGB_Ant1_2445

ZIGB_Ant1_2480

Appendix B.3: Test Results of 99% Bandwidth

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
ZIGB	Ant1	2405	2.6446	2403.678	2406.322	---	---
		2445	2.5726	2443.712	2446.284	---	---
		2480	2.6563	2478.673	2481.330	---	---

ZIGB_Ant1_2405

ZIGB_Ant1_2445

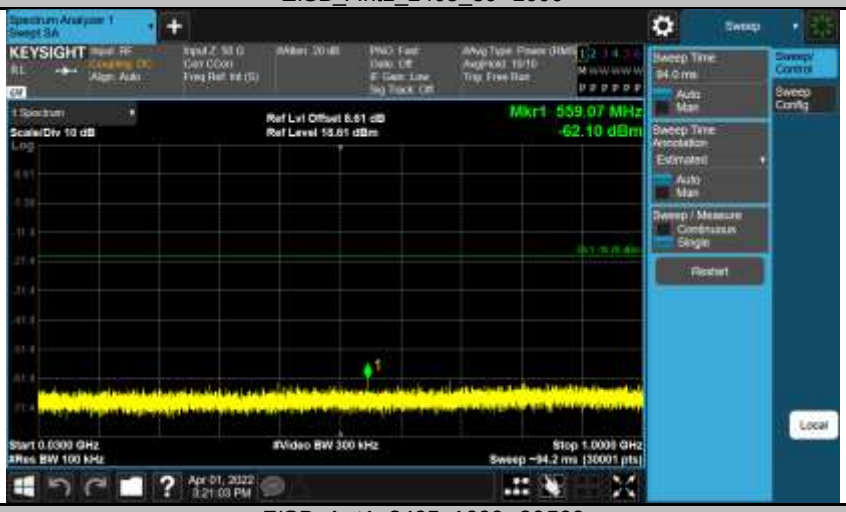
ZIGB_Ant1_2480

Appendix B.4: Test Results of Conducted Spurious Emissions Measured in 100 kHz Bandwidth

Conducted Spurious Emission

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
ZIGB	Ant1	2405	Reference	0.71	0.71	---	PASS
			30~1000	0.71	-62.1	≤-19.29	PASS
			1000~26500	0.71	-37.64	≤-19.29	PASS
		2440	Reference	1.51	1.51	---	PASS
			30~1000	1.51	-62.24	≤-18.49	PASS
			1000~26500	1.51	-38.88	≤-18.49	PASS
		2475	Reference	1.03	1.03	---	PASS
			30~1000	1.03	-61.59	≤-18.97	PASS
			1000~26500	1.03	-37.19	≤-18.97	PASS

ZIGB_Ant1_2405_0~Reference

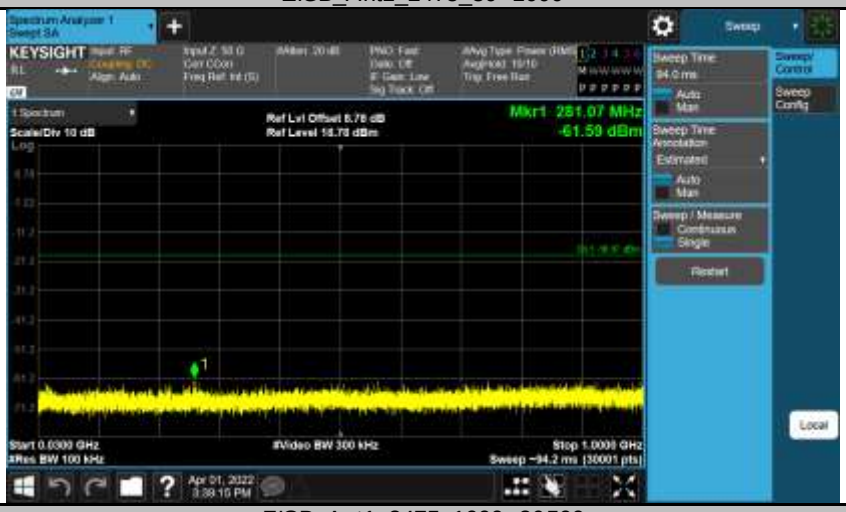
ZIGB_Ant1_2405_30~1000

ZIGB_Ant1_2405_1000~26500


ZIGB_Ant1_2440_0~Reference

ZIGB_Ant1_2440_30~1000

ZIGB_Ant1_2440_1000~26500


ZIGB_Ant1_2475_0~Reference

ZIGB_Ant1_2475_30~1000

ZIGB_Ant1_2475_1000~26500


Band Edge

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
ZIGB	Ant1	Low	2405	0.36	-45.26	≤-19.64	PASS
		High	2480	0.93	-40.92	≤-19.07	PASS

ZIGB_Ant1_Low _2405

ZIGB_Ant1_High_2480

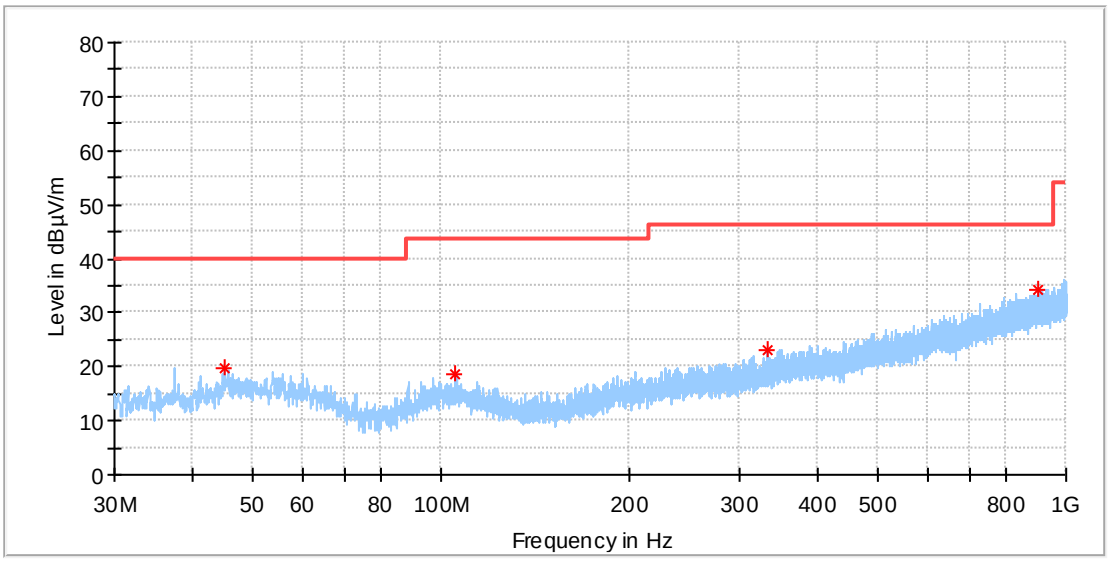
Appendix B.5: Test Results of Radiated Spurious Emissions

Note:
1) This testing was carried out on different modulations, but only the worst case was presented in this report.
2) Testing was carried out within frequency range 9kHz to the tenth harmonics. The measurement results below 30MHz and 18GHz - 26.5GHz were greater than 20dB below the limit, so only the radiated spurious emissions from 30MHz to 18GHz were reported.

30 MHz to 1GHz

EUT Information

EUT Name:	SONOFF ZBMINI Smart Switch
Model:	ZBMINI-L
Test Mode:	Zigbee_2405MHz
Order No/Sample No:	168343678/A003164366-023
Test Voltage::	AC 120V@60Hz
Remark:	Temp 22 Humi:55%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
44.986500	19.72	40.00	20.28	100.0	H	49.0	-18.8
105.078000	18.54	43.50	24.96	100.0	H	159.0	-18.7
333.513000	23.12	46.00	22.88	100.0	H	111.0	-15.3
901.302500	34.16	46.00	11.84	100.0	H	49.0	-5.0

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
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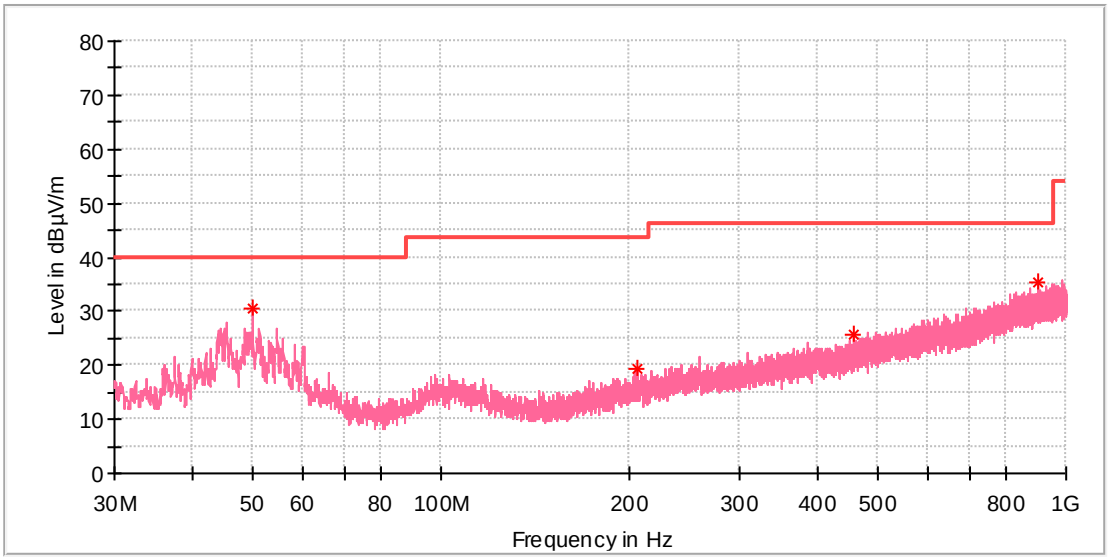
EUT Information

EUT Name:	SONOFF ZBMINI Smart Switch
Model:	ZBMINI-L
Test Mode:	Zigbee_2405MHz
Order No/Sample No:	168343678/A003164366-023
Test Voltage::	AC 120V@60Hz
Remark:	Temp 22 Humi:55%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

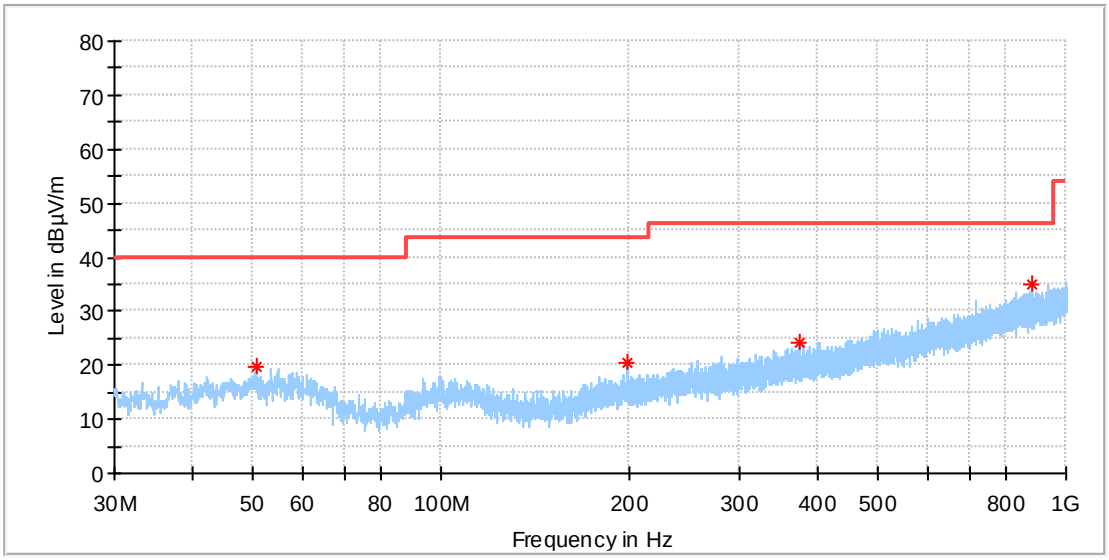
Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
49.982000	30.51	40.00	9.49	100.0	V	13.0	-18.3
206.637000	19.28	43.50	24.22	100.0	V	342.0	-18.9
455.975500	25.74	46.00	20.26	100.0	V	170.0	-12.8
904.455000	35.41	46.00	10.59	100.0	V	359.0	-5.0

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	SONOFF ZBMINI Smart Switch
Model:	ZBMINI-L
Test Mode:	Zigbee_2480MHz
Order No/Sample No:	168343678/A003164366-023
Test Voltage::	AC 120V@60Hz
Remark:	Temp 22 Humi:55%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

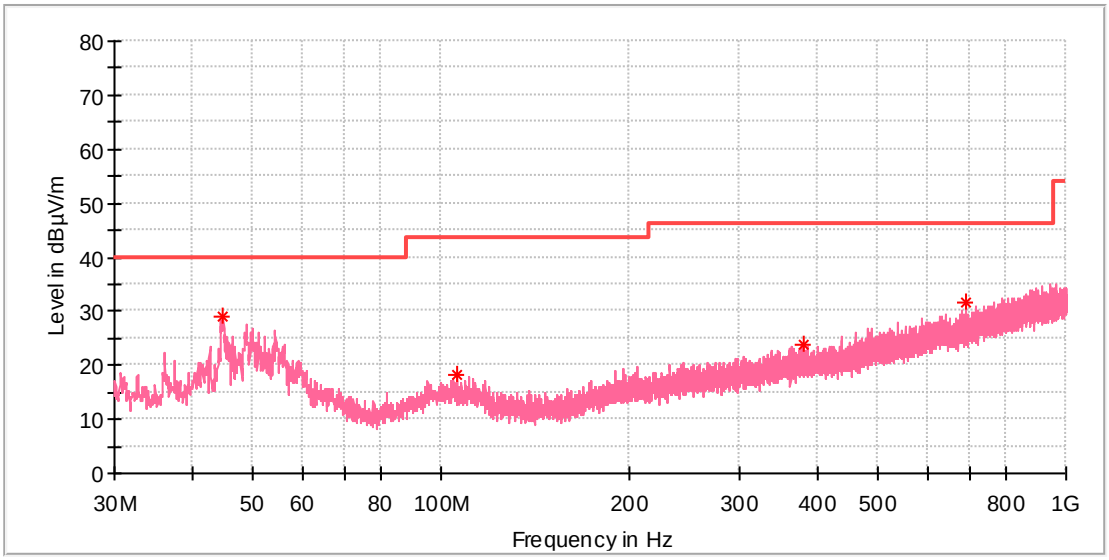
Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
50.758000	19.89	40.00	20.11	100.0	H	299.0	-18.3
198.974000	20.45	43.50	23.05	100.0	H	4.0	-19.0
373.331500	24.24	46.00	21.76	100.0	H	147.0	-14.4
881.660000	34.79	46.00	11.21	100.0	H	319.0	-5.1

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	SONOFF ZBMINI Smart Switch
Model:	ZBMINI-L
Test Mode:	Zigbee_2480MHz
Order No/Sample No:	168343678/A003164366-023
Test Voltage::	AC 120V@60Hz
Remark:	Temp 22 Humi:55%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
44.792500	29.21	40.00	10.79	100.0	V	71.0	-18.9
106.048000	18.30	43.50	25.20	100.0	V	256.0	-18.8
381.043000	23.88	46.00	22.12	100.0	V	354.0	-14.2
689.939500	31.71	46.00	14.29	100.0	V	229.0	-8.2

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
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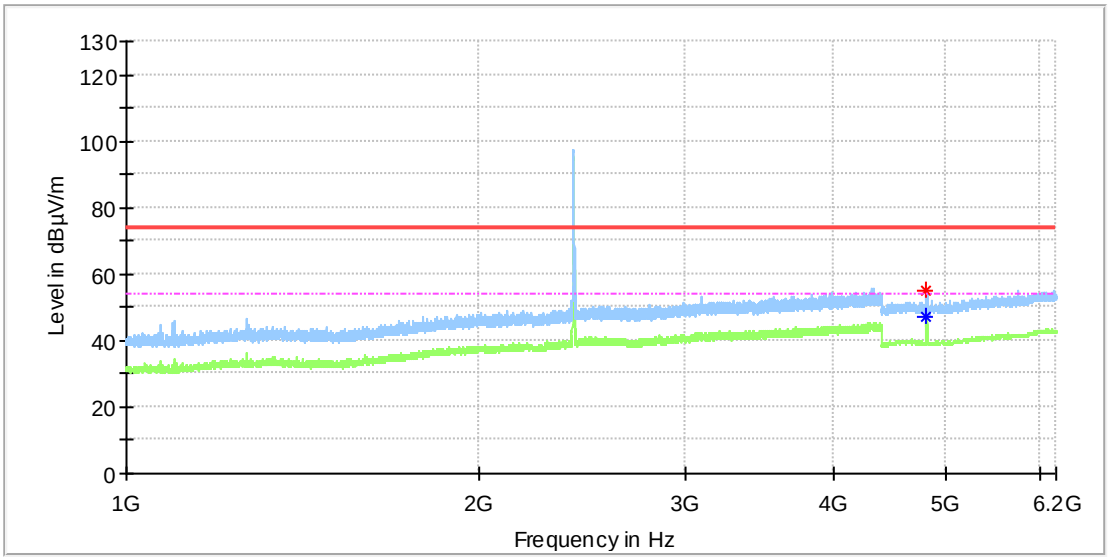
1GHz-18GHz

Note: The highest waveform in the figure is Zigbee Fundamental.

EUT Information

EUT Name:	SONOFF ZBMINI Smart Switch
Model:	ZBMINI-L
Test Mode:	Zigbee_2405MHz
Order No/Sample No:	168343678/A003164366-023
Test Voltage::	AC 120V@60Hz
Remark:	Temp 22 Humi:55%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

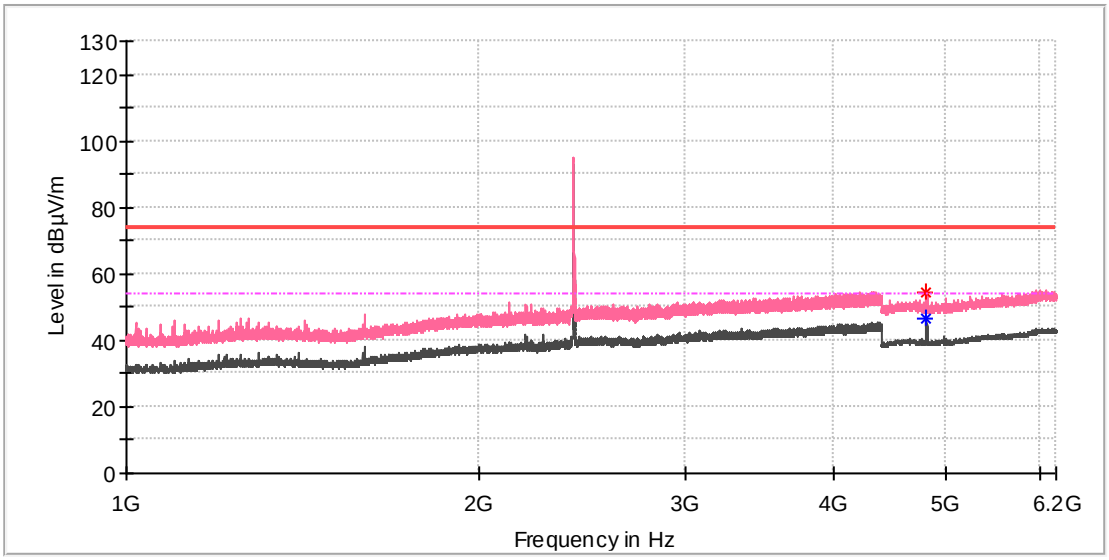
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4809.000000	---	47.39	54.00	6.61	100.0	H	341.0	11.8
4811.000000	54.81	---	74.00	19.19	100.0	H	341.0	11.8

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	SONOFF ZBMINI Smart Switch
Model:	ZBMINI-L
Test Mode:	Zigbee_2405MHz
Order No/Sample No:	168343678/A003164366-023
Test Voltage::	AC 120V@60Hz
Remark:	Temp 22 Humi:55%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

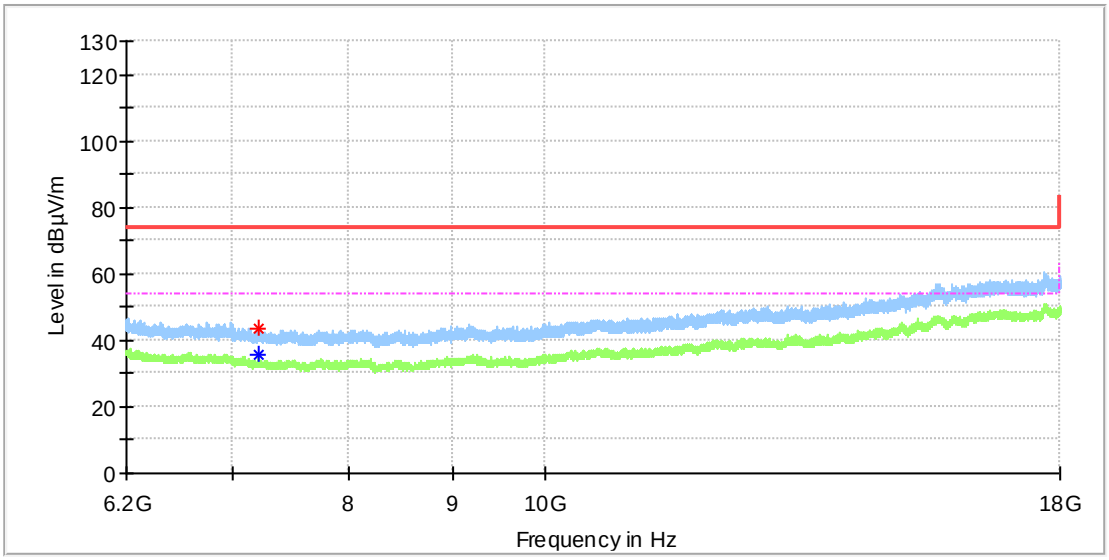
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4809.000000	---	46.86	54.00	7.14	100.0	V	328.0	11.8
4809.000000	54.34	---	74.00	19.66	100.0	V	328.0	11.8

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	SONOFF ZBMINI Smart Switch
Model:	ZBMINI-L
Test Mode:	Zigbee_2405MHz
Order No/Sample No:	168343678/A003164366-023
Test Voltage::	AC 120V@60Hz
Remark:	Temp 22 Humi:55%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

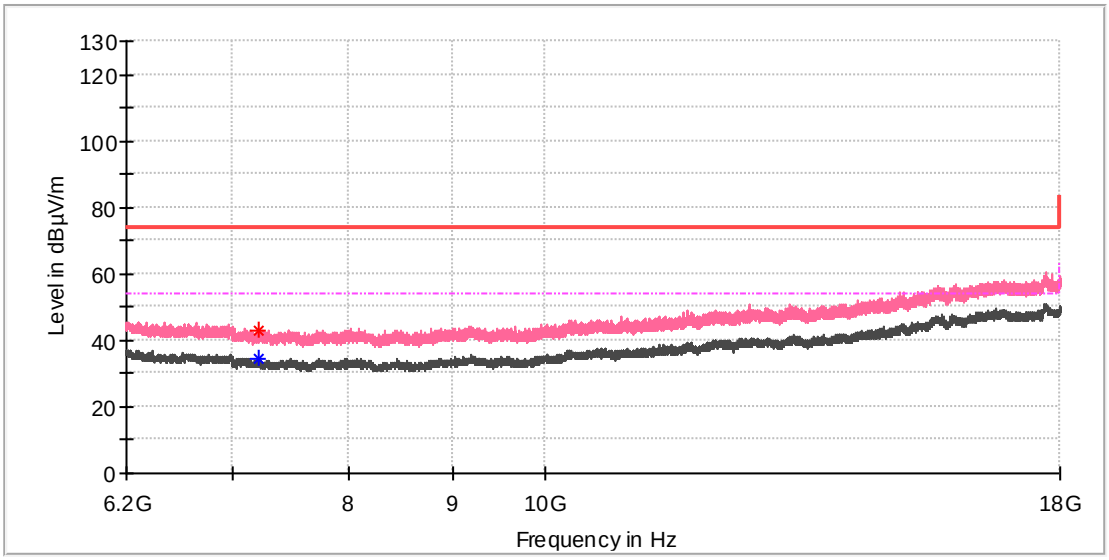
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7213.816667	43.37	---	74.00	30.63	100.0	H	352.0	8.7
7216.275000	---	35.73	54.00	18.27	100.0	H	352.0	8.7

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	SONOFF ZBMINI Smart Switch
Model:	ZBMINI-L
Test Mode:	Zigbee_2405MHz
Order No/Sample No:	168343678/A003164366-023
Test Voltage::	AC 120V@60Hz
Remark:	Temp 22 Humi:55%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

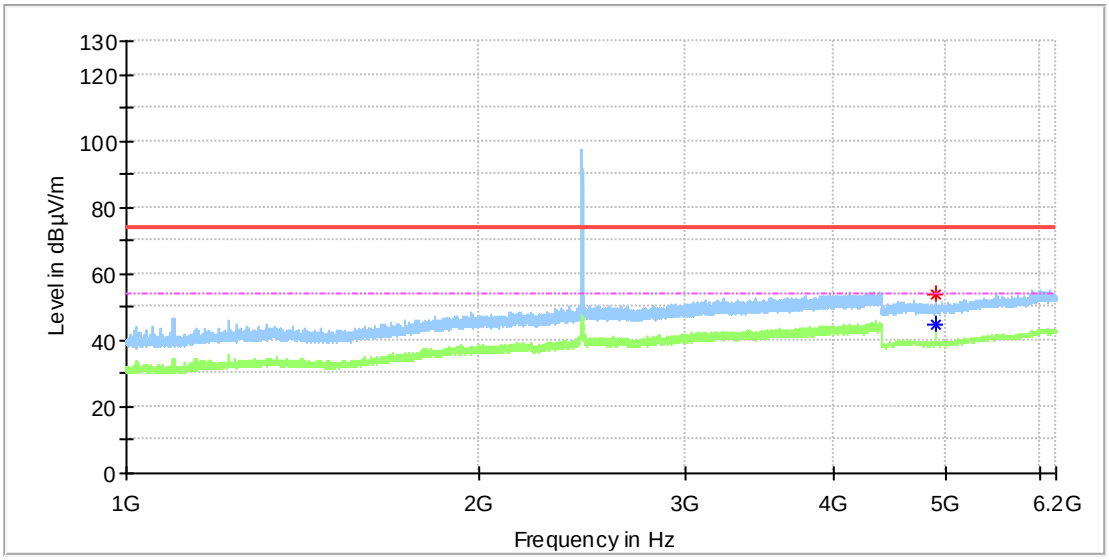
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7212.833333	42.95	---	74.00	31.05	100.0	V	184.0	8.7
7215.783333	---	34.25	54.00	19.75	100.0	V	261.0	8.7

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	SONOFF ZBMINI Smart Switch
Model:	ZBMINI-L
Test Mode:	Zigbee_2445MHz
Order No/Sample No:	168343678/A003164366-023
Test Voltage::	AC 120V@60Hz
Remark:	Temp 22 Humi:55%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

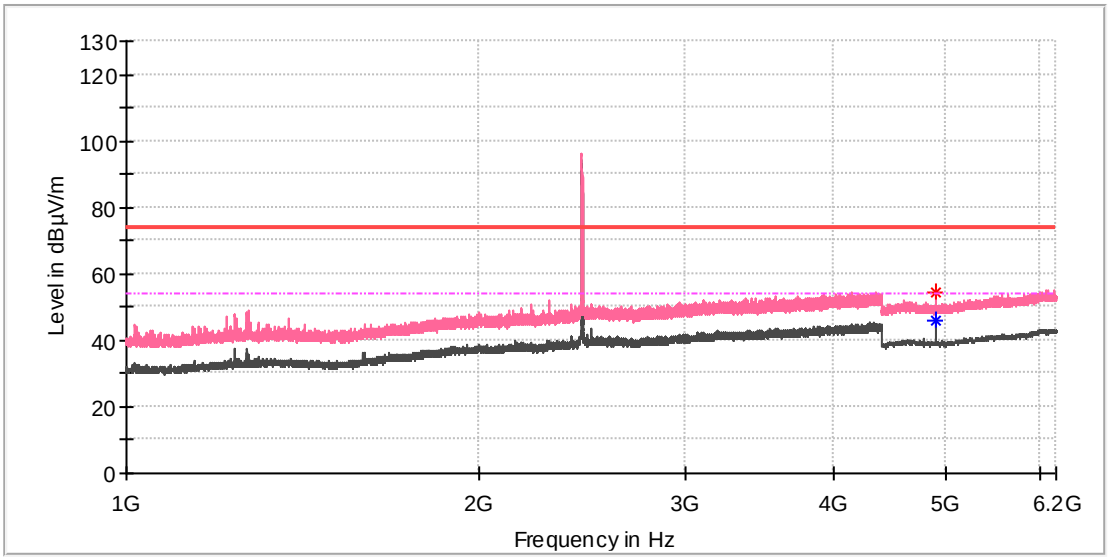
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4889.000000	---	44.81	54.00	9.19	100.0	H	339.0	11.8
4890.500000	53.62	---	74.00	20.38	100.0	H	339.0	11.8

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	SONOFF ZBMINI Smart Switch
Model:	ZBMINI-L
Test Mode:	Zigbee_2445MHz
Order No/Sample No:	168343678/A003164366-023
Test Voltage::	AC 120V@60Hz
Remark:	Temp 22 Humi:55%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

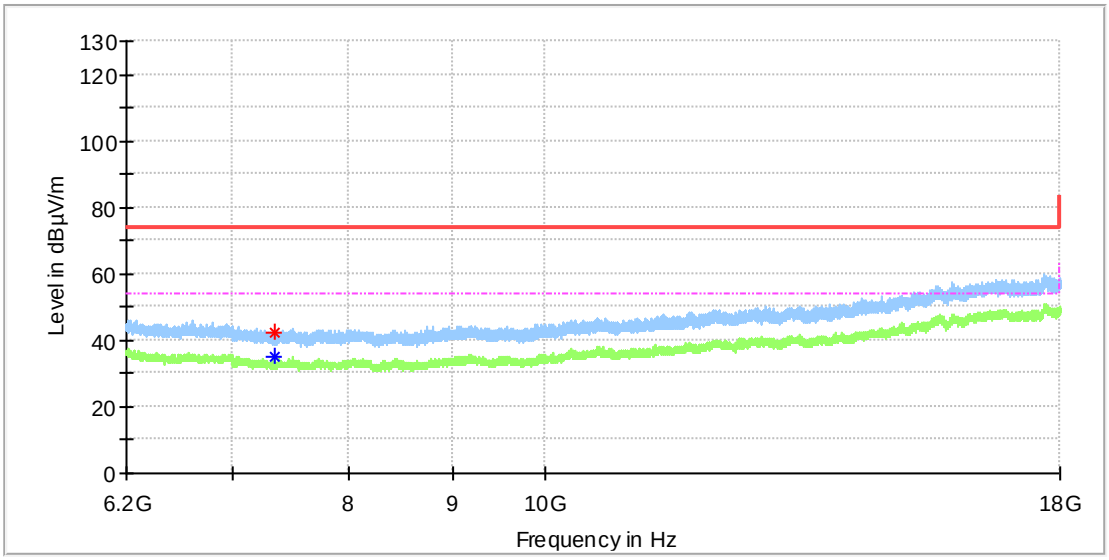
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4889.000000	---	45.86	54.00	8.14	100.0	V	332.0	11.8
4891.000000	54.65	---	74.00	19.35	100.0	V	353.0	11.8

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	SONOFF ZBMINI Smart Switch
Model:	ZBMINI-L
Test Mode:	Zigbee_2445MHz
Order No/Sample No:	168343678/A003164366-023
Test Voltage::	AC 120V@60Hz
Remark:	Temp 22 Humi:55%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

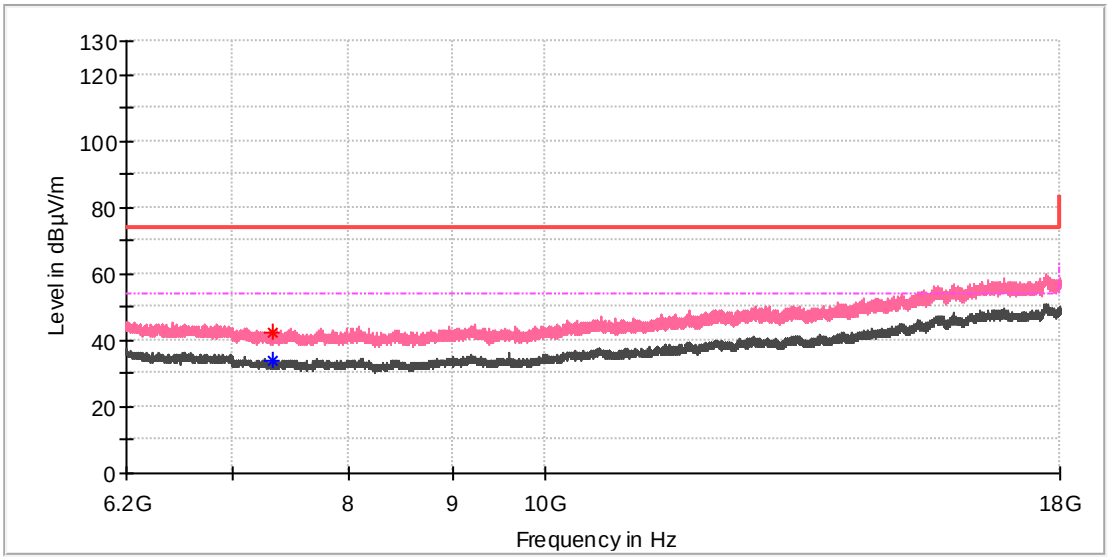
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7336.241667	---	35.37	54.00	18.63	100.0	H	26.0	8.1
7338.208333	42.10	---	74.00	31.90	100.0	H	15.0	8.1

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	SONOFF ZBMINI Smart Switch
Model:	ZBMINI-L
Test Mode:	Zigbee_2445MHz
Order No/Sample No:	168343678/A003164366-023
Test Voltage::	AC 120V@60Hz
Remark:	Temp 22 Humi:55%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

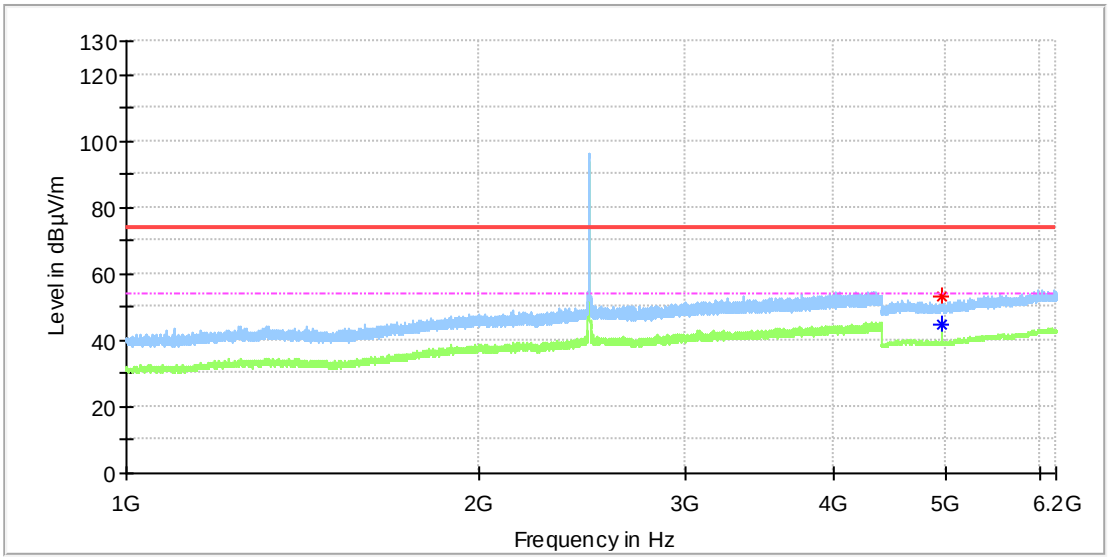
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7326.408333	42.05	---	74.00	31.95	100.0	V	319.0	8.1
7333.291667	---	34.04	54.00	19.96	100.0	V	124.0	8.1

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	SONOFF ZBMINI Smart Switch
Model:	ZBMINI-L
Test Mode:	Zigbee_2480MHz
Order No/Sample No:	168343678/A003164366-023
Test Voltage::	AC 120V@60Hz
Remark:	Temp 22 Humi:55%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

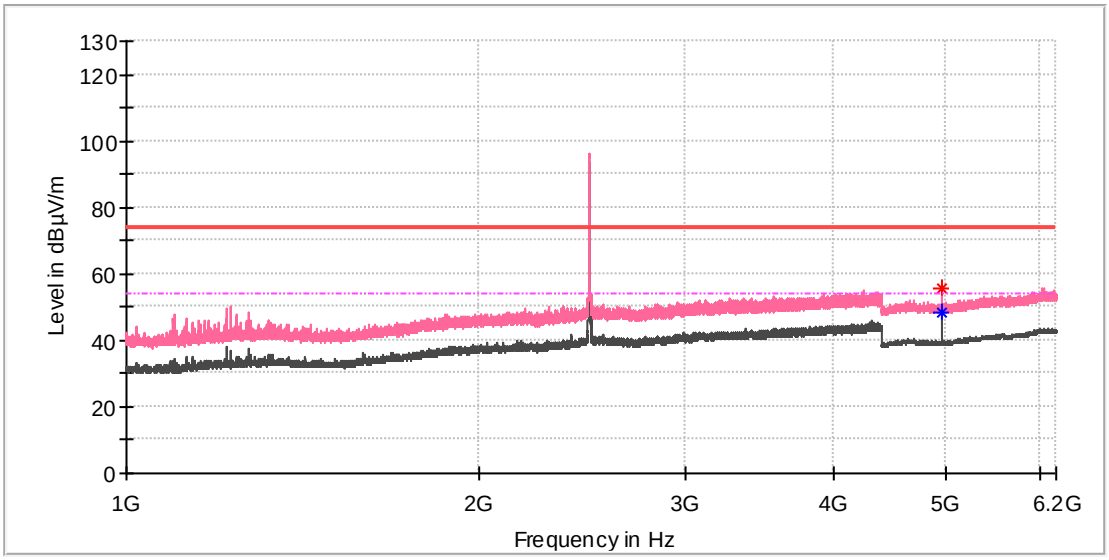
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4959.000000	53.09	---	74.00	20.91	100.0	H	244.0	11.8
4959.000000	---	44.93	54.00	9.07	100.0	H	244.0	11.8

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	SONOFF ZBMINI Smart Switch
Model:	ZBMINI-L
Test Mode:	Zigbee_2480MHz
Order No/Sample No:	168343678/A003164366-023
Test Voltage::	AC 120V@60Hz
Remark:	Temp 22 Humi:55%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

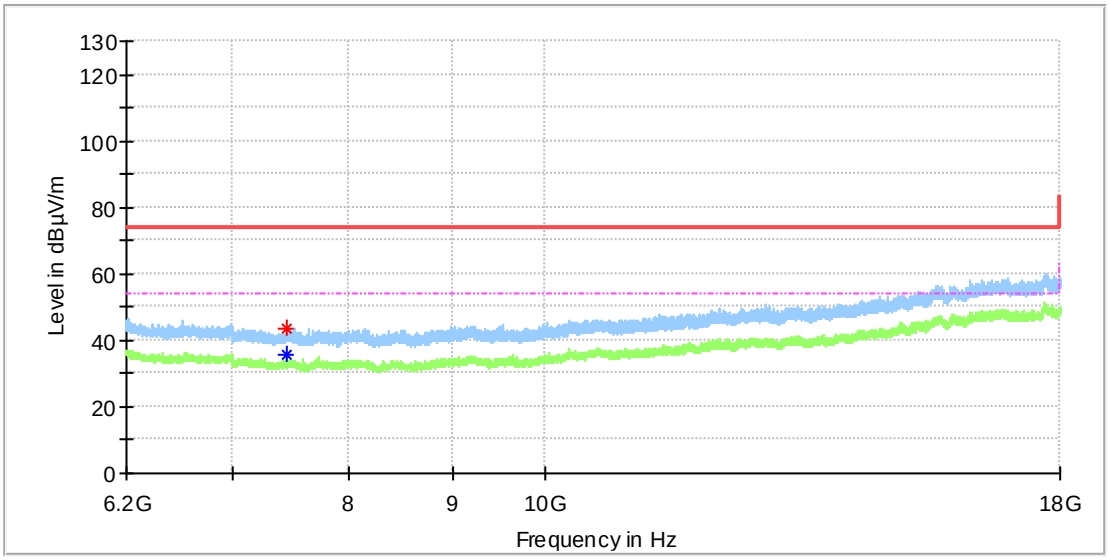
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4961.000000	---	48.13	54.00	5.87	100.0	V	309.0	11.8
4961.000000	55.71	---	74.00	18.29	100.0	V	309.0	11.8

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	SONOFF ZBMINI Smart Switch
Model:	ZBMINI-L
Test Mode:	Zigbee_2480MHz
Order No/Sample No:	168343678/A003164366-023
Test Voltage::	AC 120V@60Hz
Remark:	Temp 22 Humi:55%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

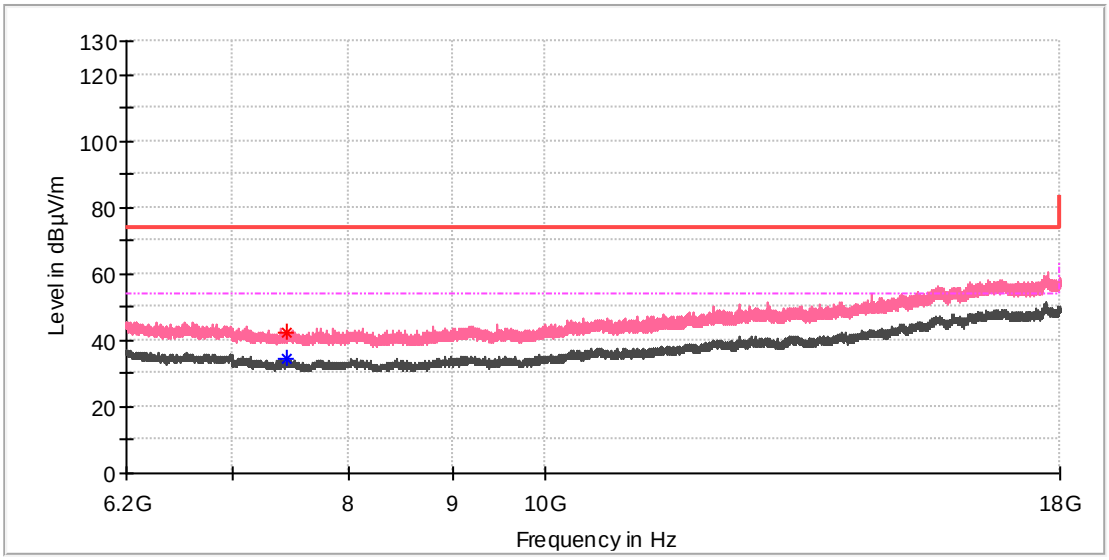
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7438.508333	43.41	---	74.00	30.59	100.0	H	313.0	8.4
7438.508333	---	35.89	54.00	18.11	100.0	H	313.0	8.4

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	SONOFF ZBMINI Smart Switch
Model:	ZBMINI-L
Test Mode:	Zigbee_2480MHz
Order No/Sample No:	168343678/A003164366-023
Test Voltage::	AC 120V@60Hz
Remark:	Temp 22 Humi:55%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7440.475000	---	34.19	54.00	19.81	100.0	V	233.0	8.4
7442.441667	42.51	---	74.00	31.49	100.0	V	95.0	8.4

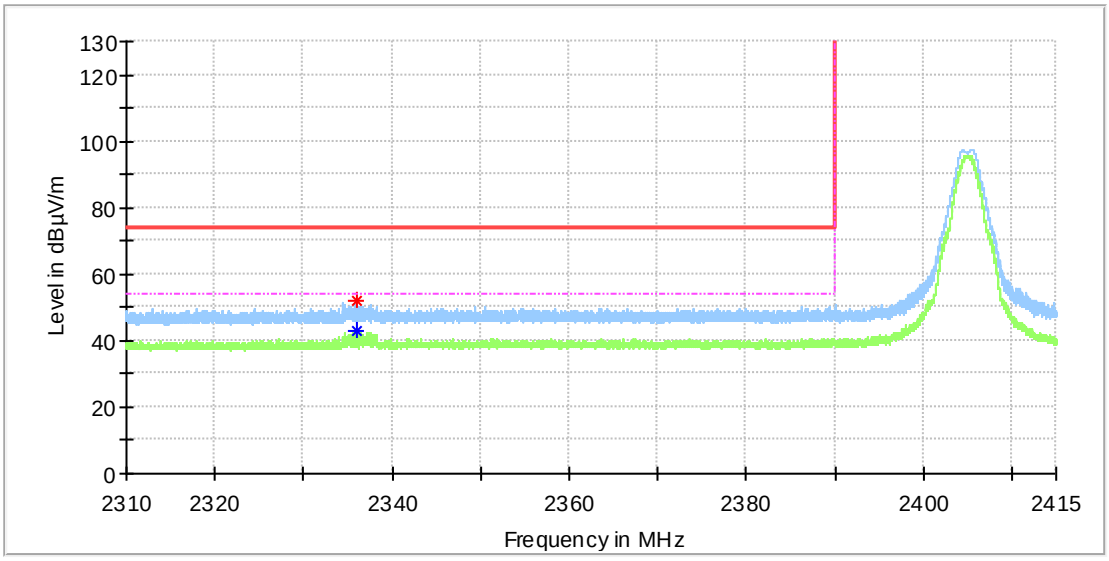
Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

Appendix B.6: Test Results of Radiated Emissions in Restricted Bands

EUT Information

EUT Name:	SONOFF ZBMINI Smart Switch
Model:	ZBMINI-L
Test Mode:	Zigbee_2405MHz
Order No/Sample No:	168343678/A003164366-023
Test Voltage::	AC 120V@60Hz
Remark:	Temp 22 Humi:55%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

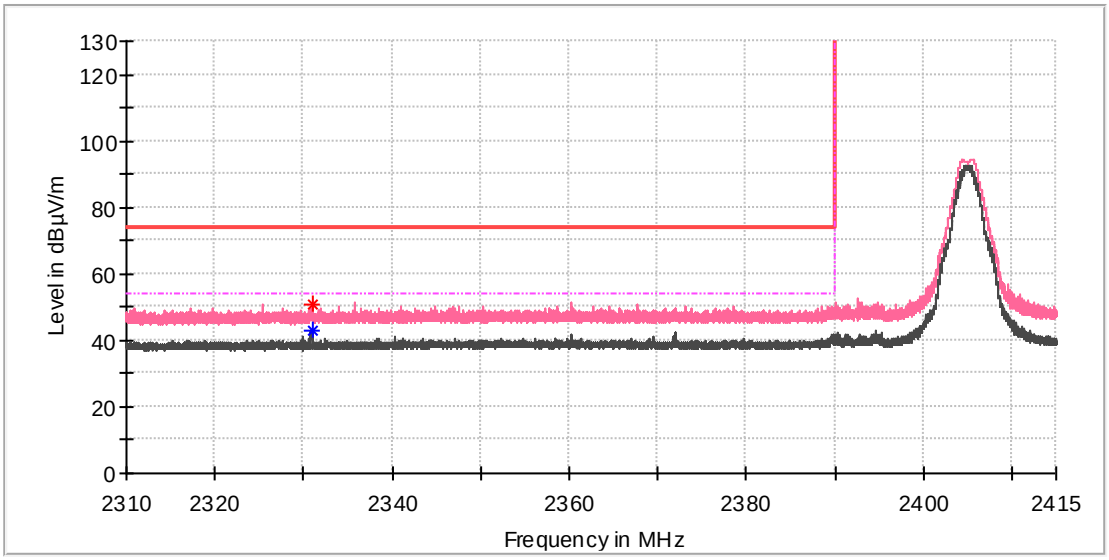
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2335.929750	51.74	---	74.00	22.26	100.0	H	176.0	6.8
2335.987500	---	42.92	54.00	11.08	100.0	H	176.0	6.8

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	SONOFF ZBMINI Smart Switch
Model:	ZBMINI-L
Test Mode:	Zigbee_2405MHz
Order No/Sample No:	168343678/A003164366-023
Test Voltage::	AC 120V@60Hz
Remark:	Temp 22 Humi:55%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

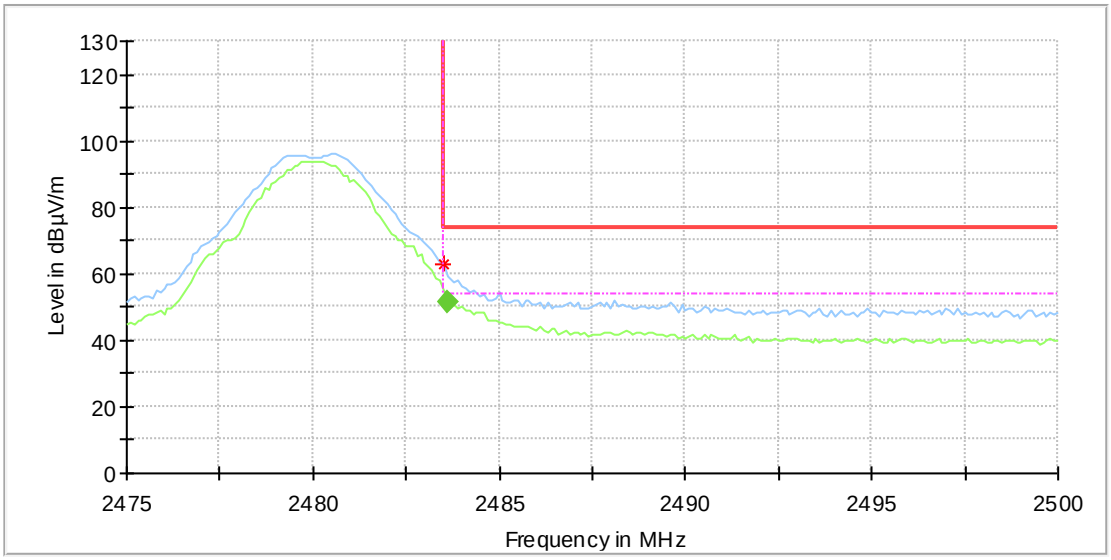
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2330.958000	50.55	---	74.00	23.45	100.0	V	223.0	6.7
2331.042000	---	43.14	54.00	10.86	100.0	V	223.0	6.7

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	SONOFF ZBMINI Smart Switch
Model:	ZBMINI-L
Test Mode:	Zigbee_2480MHz
Order No/Sample No:	168343678/A003164366-023
Test Voltage::	AC 120V@60Hz
Remark:	Temp 22 Humi:55%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

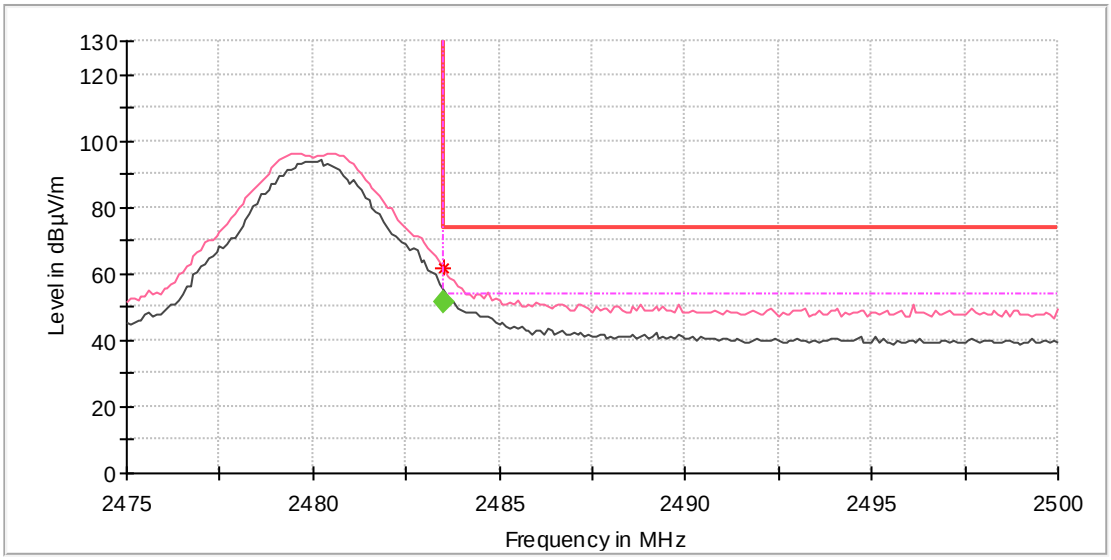
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.500000	63.01	---	74.00	10.99	100.0	H	0.0	7.4

Final_Result

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.605350	51.41	54.00	2.59	100.0	H	1.0	7.4

EUT Information

EUT Name:	SONOFF ZBMINI Smart Switch
Model:	ZBMINI-L
Test Mode:	Zigbee_2480MHz
Order No/Sample No:	168343678/A003164366-023
Test Voltage::	AC 120V@60Hz
Remark:	Temp 22 Humi:55%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.500000	61.55	---	74.00	12.45	100.0	V	313.0	7.4

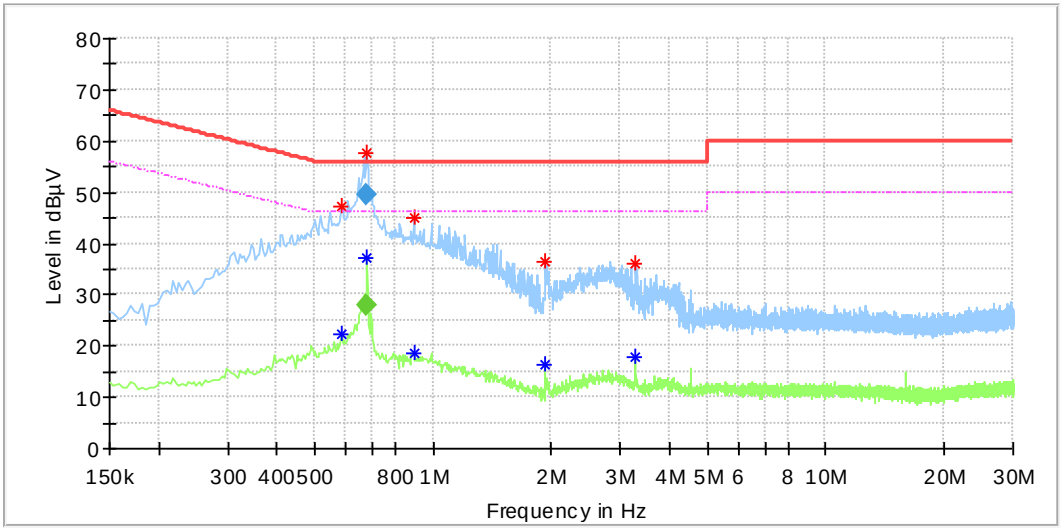
Final_Result

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.510950	51.69	54.00	2.31	100.0	V	286.0	7.4

Appendix B.7: Test Results of Conducted Emission

EUT Information

EUT Name:	SONOFF ZBMINI Smart Switch
Order No:	168343678 50
Model:	ZBMINI-L
Test Mode:	zigbee communication
Test Voltage:	AC 120V/60Hz
Test By:	Jianhua Lu
Review By:	Gary Chen
Remark:	SR2



Critical_Freqs

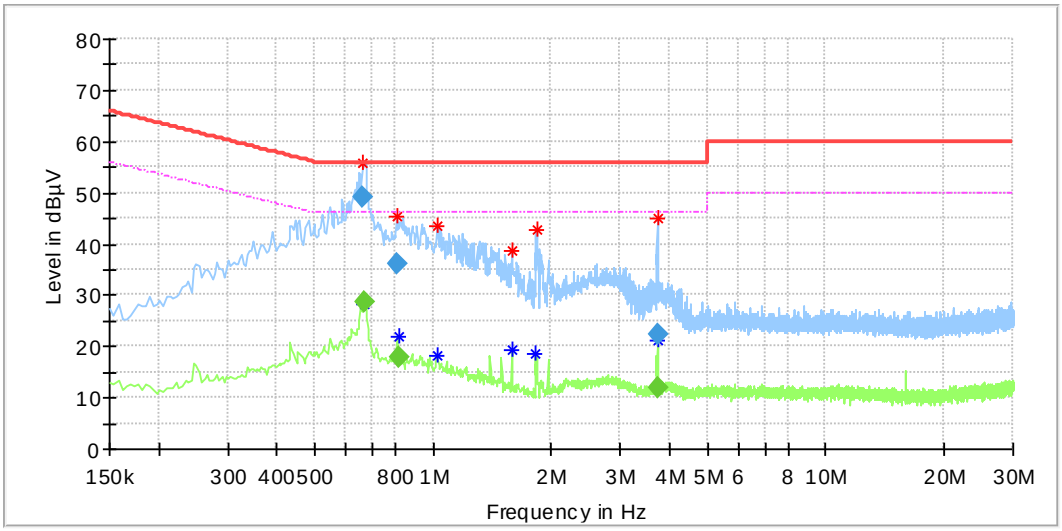
Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.582000	47.41	---	56.00	8.59	L1	10.0
0.582000	---	22.40	46.00	23.60	L1	10.0
0.673500	---	37.32	46.00	8.68	L1	10.0
0.673500	57.50	---	56.00	-1.50	L1	10.0
0.894000	---	18.66	46.00	27.34	L1	10.0
0.894000	45.10	---	56.00	10.90	L1	10.0
1.926000	---	16.31	46.00	29.69	L1	10.1
1.930000	36.42	---	56.00	19.58	L1	10.1
3.266000	---	17.98	46.00	28.02	L1	10.2
3.282000	36.20	---	56.00	19.80	L1	10.2

Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.673500	---	28.02	46.00	17.98	1000.0	9.000	L1	10.0
0.673500	49.53	---	56.00	6.47	1000.0	9.000	L1	10.0

EUT Information

EUT Name:	SONOFF ZBMINI Smart Switch
Order No:	168343678 50
Model:	ZBMINI-L
Test Mode:	zigbee communication
Test Voltage:	AC 120V/60Hz
Test By:	Jianhua Lu
Review By:	Gary Chen
Remark:	SR2



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.665500	55.95	---	56.00	0.05	N	9.8
0.669500	---	28.17	46.00	17.83	N	9.8
0.814500	45.32	---	56.00	10.68	N	9.8
0.818500	---	21.86	46.00	24.14	N	9.8
1.022000	---	18.31	46.00	27.69	N	9.8
1.022000	43.39	---	56.00	12.61	N	9.8
1.586000	---	19.28	46.00	26.72	N	9.8
1.586000	38.59	---	56.00	17.41	N	9.8
1.822000	---	18.74	46.00	27.26	N	9.8
1.834000	42.71	---	56.00	13.29	N	9.8
3.729500	45.03	---	56.00	10.97	N	9.9
3.730500	---	21.36	46.00	24.64	N	9.9

Final_Result

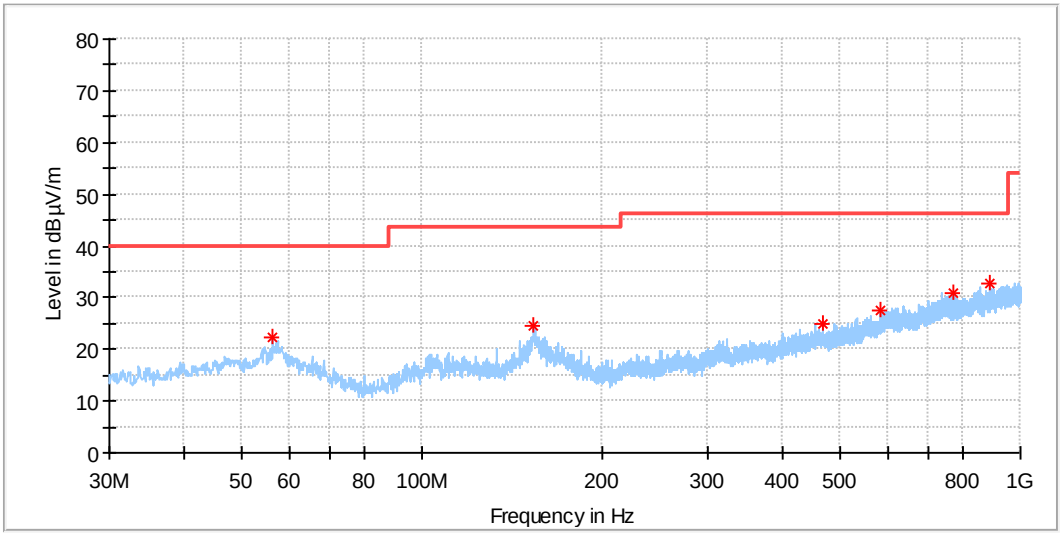
Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.665500	49.10	---	56.00	6.90	1000.0	9.000	N	9.8
0.669500	---	28.83	46.00	17.17	1000.0	9.000	N	9.8
0.814500	36.12	---	56.00	19.88	1000.0	9.000	N	9.8
0.818500	---	17.75	46.00	28.25	1000.0	9.000	N	9.8
3.729500	22.26	---	56.00	33.74	1000.0	9.000	N	9.9
3.730500	---	11.88	46.00	34.12	1000.0	9.000	N	9.9

Appendix B.8: Test Plots of Radiated Emission, Below 1GHz

Zigbee communication

EUT Information

EUT Name:	SONOFF ZBMINI Smart Switch
Order No:	168343678 50
Model:	ZBMINI-L
Test Mode:	zigbee communication
Test Voltage:	AC 120V/60Hz
Test By:	Jianhua Lu
Review By:	Gary Chen
Test T/H:	23.5℃/55%/
Pressure:	101kPa

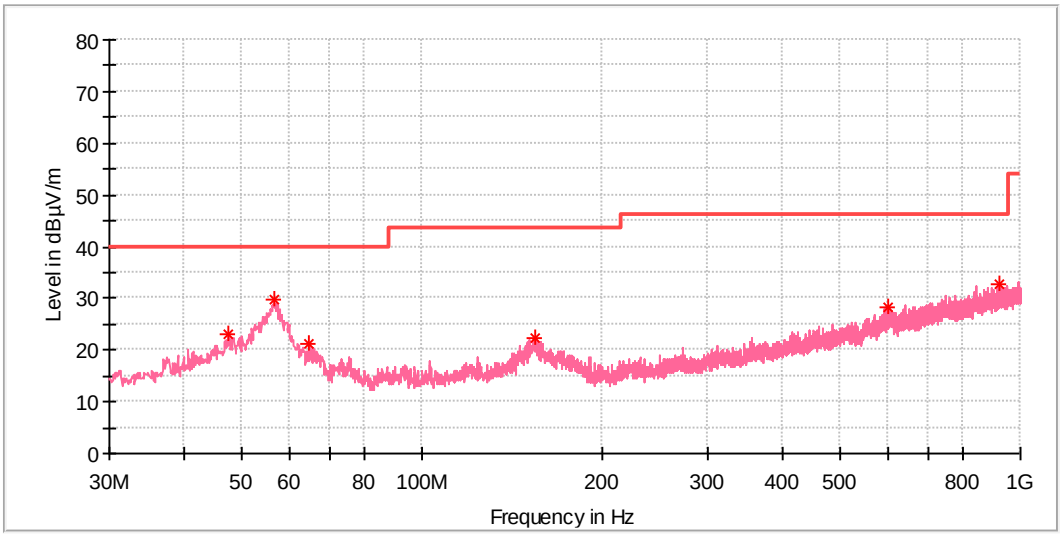


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
890.002000	32.88	46.00	13.12	100.0	H	7.0	31.5
466.888000	24.91	46.00	21.09	100.0	H	340.0	24.7
585.422000	27.54	46.00	18.46	200.0	H	121.0	26.9
773.020000	30.90	46.00	15.10	200.0	H	134.0	29.7
56.287000	22.41	40.00	17.59	200.0	H	261.0	21.2
153.578000	24.40	43.50	19.10	200.0	H	306.0	21.2

EUT Information

EUT Name:	SONOFF ZBMINI Smart Switch
Order No:	168343678 50
Model:	ZBMINI-L
Test Mode:	zigbee communication
Test Voltage:	AC 120V/60Hz
Test By:	Jianhua Lu
Review By:	Gary Chen
Test T/H:	23.5℃/55%/
Pressure:	101kPa



Critical_Freqs

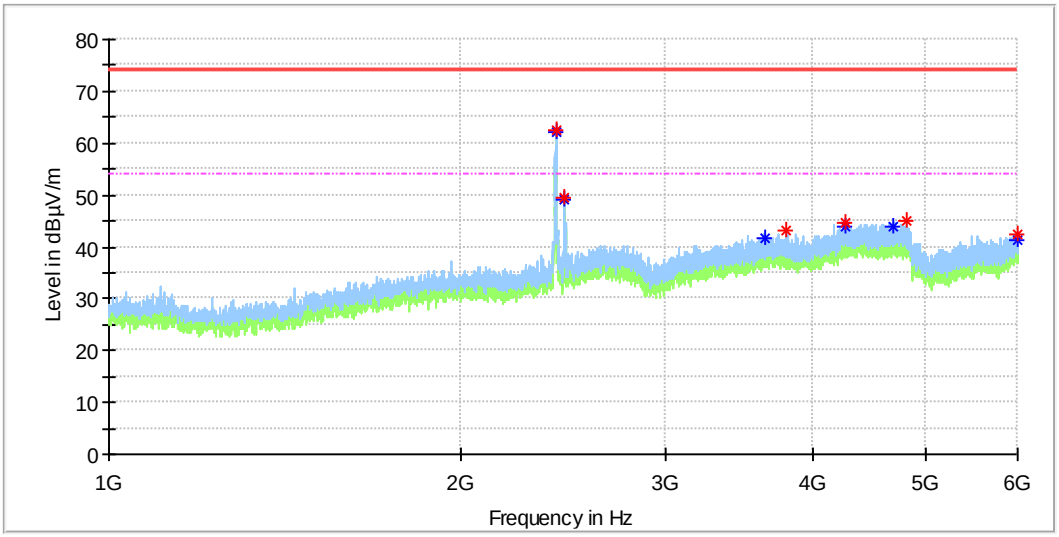
Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
47.557000	23.07	40.00	16.93	100.0	V	104.0	21.3
56.578000	29.94	40.00	10.06	100.0	V	273.0	21.2
64.823000	21.17	40.00	18.83	100.0	V	200.0	20.2
154.063000	22.20	43.50	21.30	100.0	V	261.0	21.3
600.748000	28.39	46.00	17.61	100.0	V	323.0	28.0
922.109000	32.70	46.00	13.30	200.0	V	230.0	31.6

Appendix B.9: Test Plots of Radiated Emission, Above 1GHz

Zigbee communication

EUT Information

EUT Name:	SONOFF ZBMINI Smart Switch
Order No:	168343678 50
Model:	ZBMINI-L
Test Mode:	zigbee communication
Test Voltage:	AC 120V/60Hz
Test By:	Jianhua Lu
Review By:	Gary Chen
Remark:	3m Chamber



Remark: The highest waveform in the figure is Fundamental and/or harmonics frequency.

Critical_Freqs

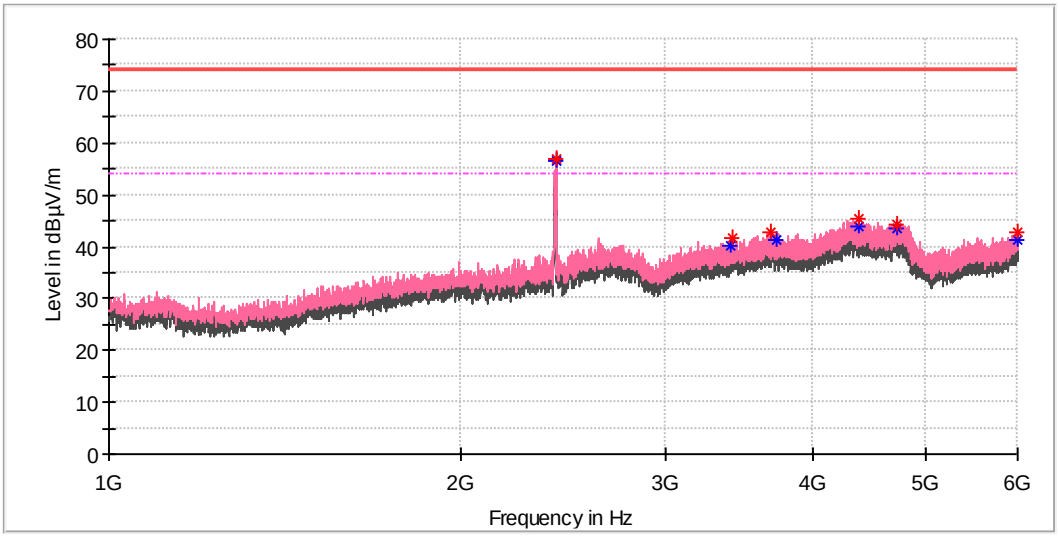
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
5989.500000	42.30	---	74.00	31.70	100.0	H	4.0	2.4
5989.500000	---	41.26	54.00	12.74	100.0	H	4.0	2.4
4815.000000	45.10	---	74.00	28.90	100.0	H	39.0	2.1
2452.500000	---	49.14	54.00	4.86	100.0	H	58.0	-5.1
2452.500000	49.56	---	74.00	24.44	100.0	H	58.0	-5.1
4691.000000	---	43.91	54.00	10.09	100.0	H	175.0	2.5
3650.500000	---	41.68	54.00	12.32	100.0	H	226.0	-0.1
2416.000000	---	61.98	---	---	100.0	H	236.0	-5.6
2417.000000	62.48	---	---	---	100.0	H	236.0	-5.6
3807.000000	43.02	---	74.00	30.98	100.0	H	260.0	0.0
4273.500000	---	43.80	54.00	10.20	100.0	H	307.0	2.0
4273.500000	44.47	---	74.00	29.53	100.0	H	307.0	2.0

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---	---		---	---

EUT Information

EUT Name:	SONOFF ZBMINI Smart Switch
Order No:	168343678 50
Model:	ZBMINI-L
Test Mode:	zigbee communication
Test Voltage:	AC 120V/60Hz
Test By:	Jianhua Lu
Review By:	Gary Chen
Remark:	3m Chamber



Remark: The highest waveform in the figure is Fundamental and/or harmonics frequency.

Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3412.000000	---	40.22	54.00	13.78	100.0	V	14.0	-1.5
4739.500000	---	43.40	54.00	10.60	100.0	V	34.0	2.8
4739.500000	44.41	---	74.00	29.59	100.0	V	34.0	2.8
3728.500000	---	41.13	54.00	12.87	100.0	V	39.0	0.3
4394.500000	---	43.96	54.00	10.04	100.0	V	87.0	1.9
4394.500000	45.51	---	74.00	28.49	100.0	V	87.0	1.9
3421.500000	41.75	---	74.00	32.25	100.0	V	111.0	-1.5
3686.500000	42.62	---	74.00	31.38	100.0	V	205.0	0.2
2415.000000	56.82	---	---	---	100.0	V	238.0	-5.6
2415.000000	---	56.49	---	---	100.0	V	238.0	-5.6
5992.500000	---	41.30	54.00	12.70	100.0	V	247.0	2.4
5992.500000	42.76	---	74.00	31.24	100.0	V	247.0	2.4

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---	---		---	---