Prüfbericht-Nr.: *Test report no.:*	**CN22W872 001**	**Auftrags-Nr.:** *Order no.:*	**168376504**	**Seite 1 von 21** *Page 1 of 21*
Kunden-Referenz-Nr.: *Client reference no.:*	N/A	**Auftragsdatum:** *Order date:*	2022-06-06	
Auftraggeber: *Client:*	**Godox Photo Equipment Co.,Ltd** 1st to 4th Floor, Building 2/1st to 4th Floor, Building 4 ,Yaochuan Industrial Zone, Tangwei Community, Fuhai Street, Baoan District, Shenzhen, 518103 China			
Prüfgegenstand: *Test item:*	Knowled Bi-color LED Light			
Bezeichnung / Typ-Nr.: *Identification / Type no.:*	M300Bi, M200Bi (Trademark: Godox)			
Auftrags-Inhalt: *Order content:*	FCC and IC approval			
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 2.1093		RSS-247 Issue 2 February 2017 RSS-Gen Issue 5 February 2021 RSS-102 Issue 5 February 2021	

Wareneingangsdatum: *Date of receipt:*	2022-07-14	Please refer to photo documents
Prüfmuster-Nr.: *Test sample No.:*	A003298902-009 to 012	
Prüfzeitraum: *Testing period:*	2022-07-27 – 2022-09-30	
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	**genehmigt von:** *authorized by:*	X Winnie Hou
Datum: *Date:* 2022-10-25	Signed by: Alex Lan	**Ausstellungsdatum:** *Issue date:* 2022-10-26	Signed by: Winnie Hou
Stellung / Position	Assistant Project Manager	**Stellung** / Position	Department Manager

Sonstiges / *Other:* FCC ID: 2ABYN048

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 = mangelhalt
	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 specifications(s)		*F(ail) = failed a.m. test specifications(s)*	*N/A = not applicable*	*N/T = not tested*

TÜV Rheinland (Shenzhen) Co., Ltd. 1601 R&D Room, 1602-1604, 17-18F, Building 7 Site C, Vanke Cloud City Phase I, Xingke First Street, Xili Street, Xili Community, Nanshan District, Shenzhen 518052, P.R. China
Mail: service@de.tuv.com · Web: www.tuv.com

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 99%DB BANDWIDTH
RESULT: Pass

5.1.5 6DB 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

6.1.1 ELECTROMAGNETIC FIELDS
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 Conducted & Radiated Testing

2 Test Sites

2.1 Test Facilities

TÜV Rheinland (Shenzhen) Co., Ltd.

No. 362 Huanguan Road Middle, Longhua District, Shenzhen 518110, People's Republic of China

FCC Registration No.: 694916

IC Registration No.: 25069 and the CAB identifier is CN0078.

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	2023-09-27
MXG X-Series RF Vector Signal Generator	Keysight	N5182B	MY61250137	2023-09-27
EXG X-Series Microwave Analog Signal Generator	Keysight	N5173B	MY61250141	2023-09-27
DC Power Supply	Keysight	E3642A	MY61276100	2023-09-27
Wireless Connectivity Tester	R&S	CMW270	102505	2023-09-27
Power Control Unit	Tonscend	JS0806-4ADC	N/A	2023-09-27
Automation Control Unit	Tonscend	JS0806-2	21C8060396	2023-09-27
Test Software	Tonscend	JS1120-3	N/A	N/A
Control PC	Lenovo	TianYi510S-071MB	YLX23JMF	N/A
Unwanted Emission Testing (TS9975)				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Cal. until**
EMI Test Receiver	R&S	ESR 7	102021	2024-08-02
Signal Analyzer	R&S	FSV 40	101439	2024-08-01
System Controller Interface	R&S	SCI-100	S10010038	N/A
Filterbank	R&S	Wlan	100759	2024-08-01
OSP	R&S	OSP 120	102040	N/A
Pre-amplifier	R&S	SCU08F1	08320031	2024-08-02
Amplifier	R&S	SCU-18F	180070	2024-08-02
Amplifier	R&S	SCU40A	100475	2024-08-02
Trilog Broadband Antenna (30 MHz - 7 GHz)	Schwarzbeck	VULB 9162	193	2024-08-06
Double-Ridged Antenna (1 -18 GHz)	ETS-LINDGREN	3117	00218717	2024-08-06
Wideband Ridged Horn Antenna (18-40 GHz)	Steatite	QMS-00880	19067	2024-08-07
Active Loop Antenna	Schwarzbeck	FMZB 1513	302	2024-08-06
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 Emissions				
Equipment	**Manufacturer**	**M/N**	**S/N**	**Calibrated until**
EMI Test Receiver	R&S	ESR3	102428	2023-07-31
Artificial Mains Network	R&S	ENV216	102333	2023-08-01
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 (k=2)
Occupied Channel Bandwidth	± 2.08 %
RF output power, conducted	± 0.99 dB
RF power density, conducted	± 0.99 dB
Unwanted Emissions, conducted	± 0.89 dB
All emissions, radiated	± 4.17 dB
Conducted Emission, (9kHz to 150kHz)/(150kHz to 30MHz)	± 3.70 dB / ± 3.30 dB

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) 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, Shenzhen 518110, People's Republic of 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 EUTs are professional luminaires for stage lighting and studios, and it supports generic 2.4GHz receive and Bluetooth BLE (Low Energy mode) functions,

Two models use the same wireless modules and the built-in power supply is different.

For details refer to the User Manual and Circuit Diagram.

3.2 Ratings and System Details

Table 2: Technical Specification of EUT

General Information of EUT	Value
Kind of Equipment	Knowled Bi-color LED Light
Type Designation	M300Bi, M200Bi
Trademark	Godox
FCC ID	2ABYN048
Operating Voltage	For model M300Bi: Controller: 1、AC Input:100-240V~ ,50/60Hz,Max.3.5A 2、DC Input:DC48V 3、Battery：DC14.8V /DC26V Output:DC48V,Max.7A Lamp body：Input: DC48V,Max.7A For model M200Bi: Controller: 1、AC Input:100-240V~ ,50/60Hz,Max.2.3A 2、DC Input:DC48V 3、Battery：DC14.8V /DC26V Output:DC48V,Max.4.6A Lamp body:Input:DC48V,Max.4.6A
Technical Specification of Bluetooth Low Energy	
Bluetooth Core Version	Bluetooth 5.0, single mode
Operating Frequency band	2402 ~ 2480 MHz
Channel Number	40 channels
Channel separation	2MHz
Data rate	1Mbps
Modulation	GFSK
Antenna Type	Internal Antenna
Antenna Gain	0.54 dBi

Table 3: RF Channel and Frequency of Bluetooth Low Energy

RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)
00	**2402.00**	10	2422.00	20	2442.00	30	2462.00
01	2404.00	11	2424.00	21	2444.00	31	2464.00
02	2406.00	12	2426.00	22	2446.00	32	2466.00
03	2408.00	13	2428.00	23	2448.00	33	2468.00
04	2410.00	14	2430.00	24	2450.00	34	2470.00
05	2412.00	15	2432.00	25	2452.00	35	2472.00
06	2414.00	16	2434.00	26	2454.00	36	2474.00
07	2416.00	17	2436.00	27	2456.00	37	2476.00
08	2418.00	18	2438.00	28	2458.00	38	2478.00
09	2420.00	**19**	**2440.00**	29	2460.00	**39**	**2480.00**

3.3 Independent Operation Modes

The basic operation modes are:

A. On, Bluetooth LE transmitting mode
    1. Low channel
    2. Middle channel
    3. High channel

B. On, operating

C. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

- Application Form
- Block Diagram
- FCC/IC Label and Location Info
- Operation Description
- Photo Document
- Schematics
- User Manual

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 testing were performed according to the procedures in ANSI C63.10: 2013.

According to clause 3.1, all tests were performed on model *M300Bi* in this report.

4.3 Special Accessories and Auxiliary Equipment

Table 4: List of Accessories and Auxiliary Equipment

Description	Manufacturer	Model	S/N
Laptop	Lenovo	T480	PF-16A6N8

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 30MHz)

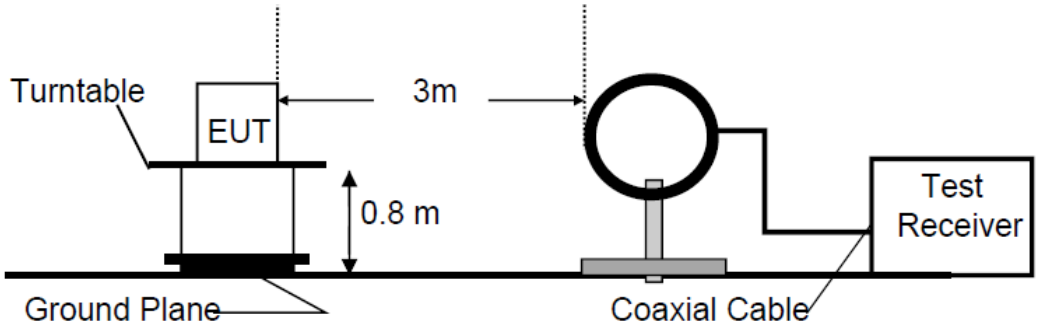


Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

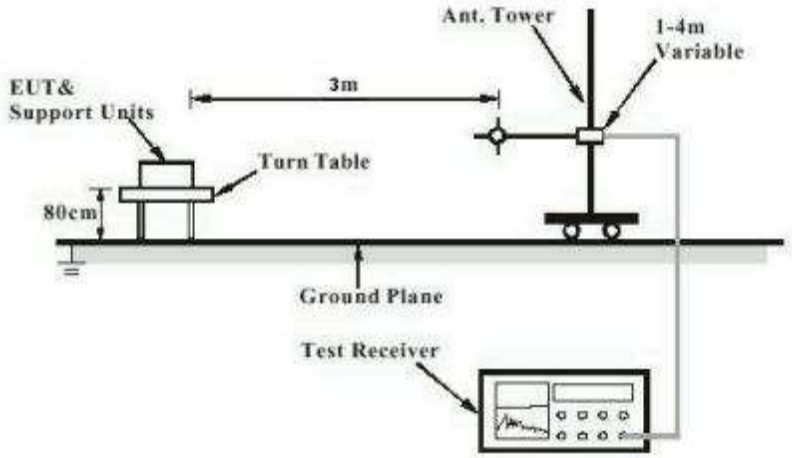


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)

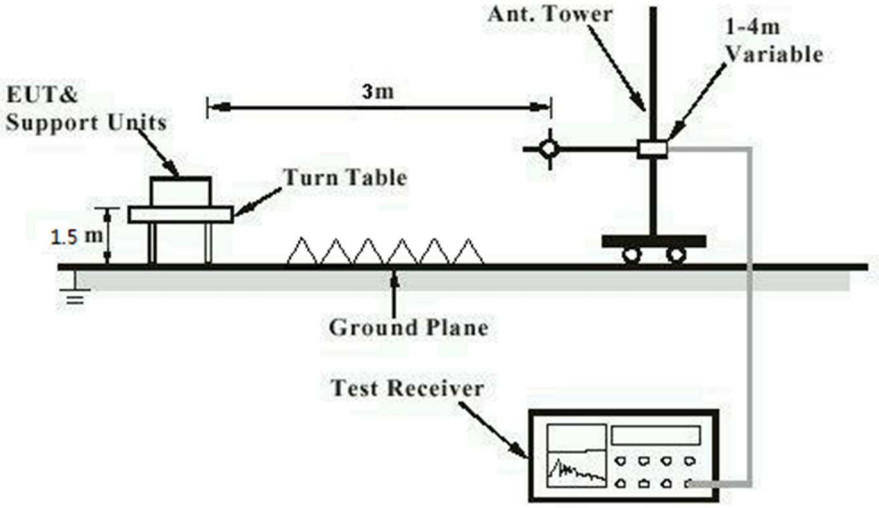


Diagram of Measurement Configuration for Mains Conduction Measurement

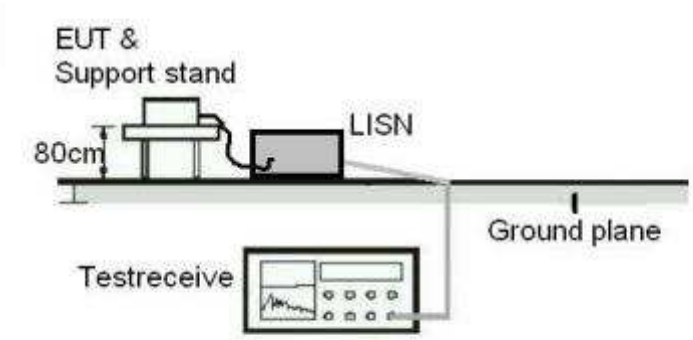
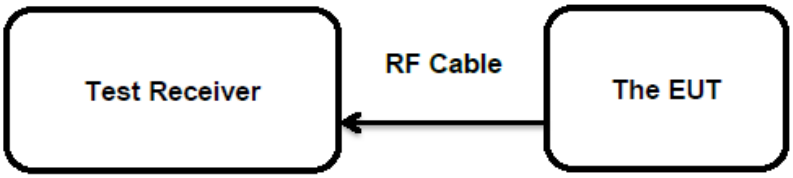


Diagram of Measurement Configuration for Conducted Transmitter Measurement



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 RSS-Gen Clause 6.7
Limit	:	the use of antennas with directional gains that do not exceed 6 dBi

According to the manufacturer declared, the EUT has one integral antenna, the directional gain of antennas is 0.54 dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement. Therefore the EUT is considered sufficient to comply with the provision.

Refer to EUT Photo for further details.

5.1.2 Maximum Peak Conducted Output Power

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.247(b)(3) RSS-247 Clause 5.4(d)
Basic standard	:	ANSI C63.10: 2013
Limits	:	< 1 Watt (Maximum Conducted Peak Power) e.i.r.p. <4W
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2022-07-27 to 2022-09-30
Input voltage	:	Battery
Operation mode	:	A
Test channel	:	Low / Middle / High
Ambient temperature	:	25.6 ℃
Relative humidity	:	42 %
Atmospheric pressure	:	101 kPa

For details refer to following test result.

Table 5: Test Result of Maximum Peak Conducted Output Power

Test Mode	Data Rate	Test Channel (MHz)	Measured Peak Power		Limit (W)
			(dBm)	(W)	
Bluetooth (Low Energy)	1 Mbps	2402	7.63	0.0058	< 1.0
		2440	6.42	0.0044	
		2480	5.28	0.0034	
Maximum Measured Value			7.63	0.0058	

Note: The cable loss is taken into account in results and the maximum e.i.r.p. is 8.17 dBm less than 4W (36 dBm).

5.1.3 Conducted Power Spectral Density

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.247(e) RSS-247 Clause 5.2(b)
Basic standard	:	ANSI C63.10: 2013
Limits	:	8 dBm / 3kHz
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2022-07-27 to 2022-09-30
Input voltage	:	Battery
Operation mode	:	A
Test channel	:	Low / Middle / High
Ambient temperature	:	25.6 ℃
Relative humidity	:	42 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix B.

Table 6: Test Result of Power Spectral Density

Test Mode	Data Rate	Test Channel (MHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
Bluetooth (Low Energy)	1 Mbps	2402	-4.80	8
		2440	-6.03	
		2480	-7.22	

5.1.4 99%dB Bandwidth

RESULT: **Pass**

Test Specification

Test standard	:	RSS-Gen clause 6.7
Basic standard	:	ANSI C63.10: 2013
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2022-07-27 to 2022-09-30
Input voltage	:	Battery
Operation mode	:	A
Test channel	:	Low / Middle / High
Ambient temperature	:	25.6 ℃
Relative humidity	:	42 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix B.

Table 7: Test Result of 99% Bandwidth

Test Mode	Data Rate	Channel Frequency (MHz)	99% Bandwidth (MHz)	Limit (MHz)
Bluetooth (Low Energy)	1 Mbps	2402	1.0413	/
		2440	1.0402	/
		2480	1.0345	/

5.1.5 6dB Bandwidth

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.247(a)(2) RSS-247 Clause 5.2(a)
Basic standard	:	ANSI C63.10: 2013
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2022-07-27 to 2022-09-30
Input voltage	:	Battery
Operation mode	:	A
Test channel	:	Low / Middle / High
Ambient temperature	:	25.6 ℃
Relative humidity	:	42 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix B.

Table 8: Test Result of 6dB Bandwidth

Test Mode	Data Rate	Channel Frequency (MHz)	-6dB Bandwidth (kHz)	Limit (kHz)
Bluetooth (Low Energy)	1 Mbps	2402	644	500
		2440	660	500
		2480	672	500

5.1.6 Conducted Spurious Emissions Measured in 100 kHz Bandwidth

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.247(d) RSS-247 Clause 5.5
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	:	2022-07-27 to 2022-09-30
Input voltage	:	Battery
Operation mode	:	A
Test channel	:	Low / Middle / High
Ambient temperature	:	25.6 ℃
Relative humidity	:	42 %
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 RSS-247 Clause 3.3 & 5.5
Basic standard	:	ANSI C63.10: 2013
Limits	:	Refer to 15.209(a) of FCC part 15.247(d) RSS-Gen Table 4 & Table 5
Kind of test site	:	3m Semi-anechoic Chamber

Test Setup

Date of testing	:	2022-07-27 to 2022-09-30
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 was 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) RSS-Gen Clause 8.8
Basic standard	:	ANSI C63.10: 2013
Frequency range	:	0.15 – 30MHz
Limits	:	FCC Part 15.207(a) RSS-Gen Table 4
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2022-09-21
Input voltage	:	AC 120V, 60Hz
Operation mode	:	B
Earthing	:	Not connected
Ambient temperature	:	24.9℃
Relative humidity	:	52.1%
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix B.

6 Safety Human Exposure

6.1 Radio Frequency Exposure Compliance

6.1.1 Electromagnetic Fields

RESULT: **Pass**

Test Specification

Test standard : FCC KDB Publication 447498 v06
CFR47 FCC Part 2: Section 2.1093
CFR47 FCC Part 1: Section 1.1310
RSS-102 Issue 5 February 2021

FCC requirement:
The measured maximum conducted output power of the EUT is 7.63dBm ≈ 5.79mW, which is far below the SAR exclusion threshold level 10mW (SAR Test Exclusion Thresholds for 100 MHz – 6 GHz and ≤ 50 mm), hence the EUT is excluded from SAR evaluation according to FCC KDB publication 447498 D01: Mobile and Portable RF Exposure. Guidance v06.

IC requirements: The EUT shall comply with the requirement of RSS-102 section 2.5.2.

Exemption from Routine Evaluation Limits – RF Exposure Evaluation
RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2}\ f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;

- RF exposure evaluation exempted power for BLE: 2.67 W

The worst-case mode (the configuration having highest EIRP) specified:

BLE: 7.63 dBm

Antenna Gain: 0.54 dBi

The Max. e.i.r.p. for Lora DTS: 8.17dBm = 0.007 W

The e.i.r.p. for the BLE are less than the RF exposure evaluation exempted power. So RF exposure evaluation is not required.

"RF Radiation Exposure Statement Caution: This Transmitter must be installed to provide a separation distance of at least 20 cm from all persons."

7 Photographs of the Test Set-Up

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

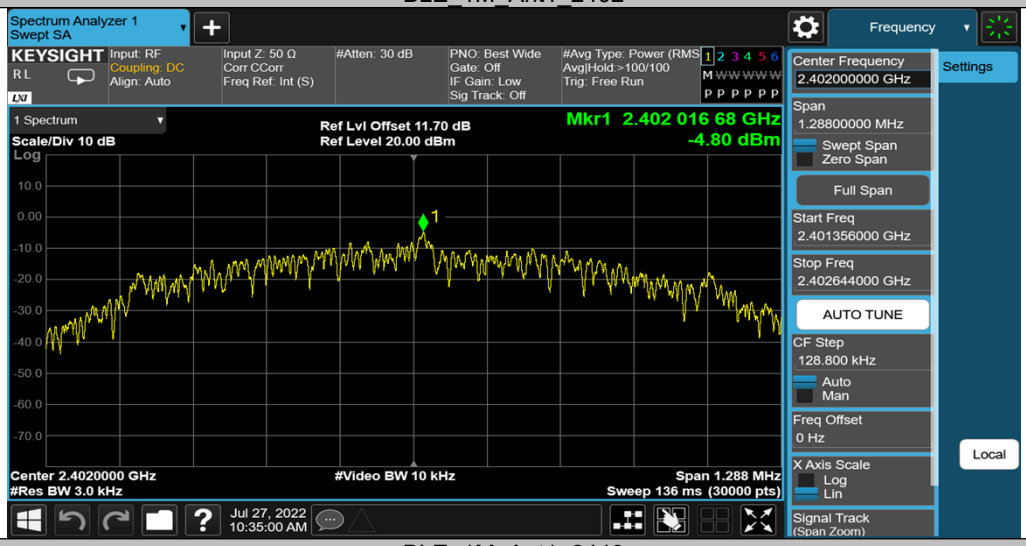
8 List of Tables

Appendix B: Test Results

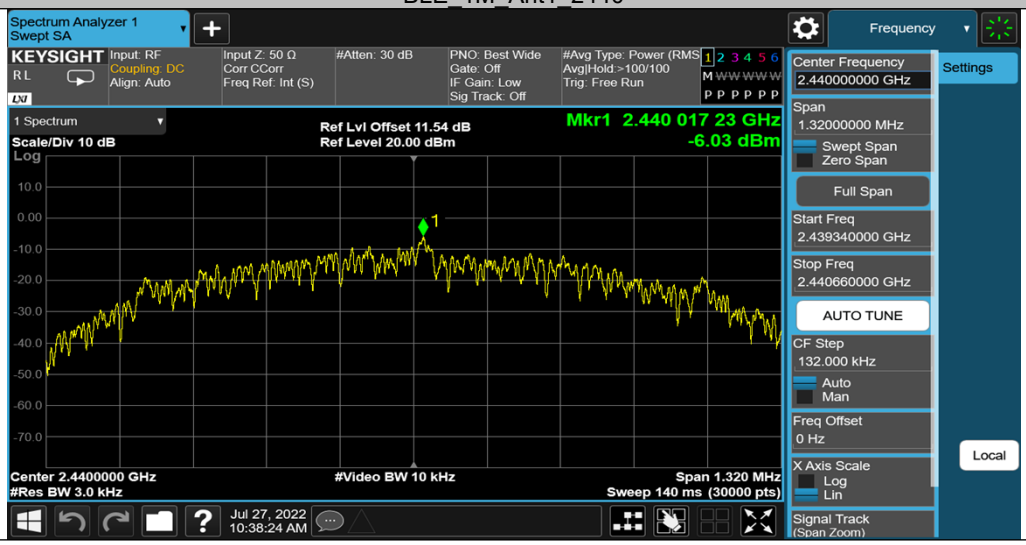
Appendix B.1: Test Results of Conducted Power Spectral Density

TestMode	Antenna	Channel [MHz]	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
BLE_1Mbps	Ant1	2402	-4.80	≤8.00	PASS
		2440	-6.03	≤8.00	PASS
		2480	-7.22	≤8.00	PASS

BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



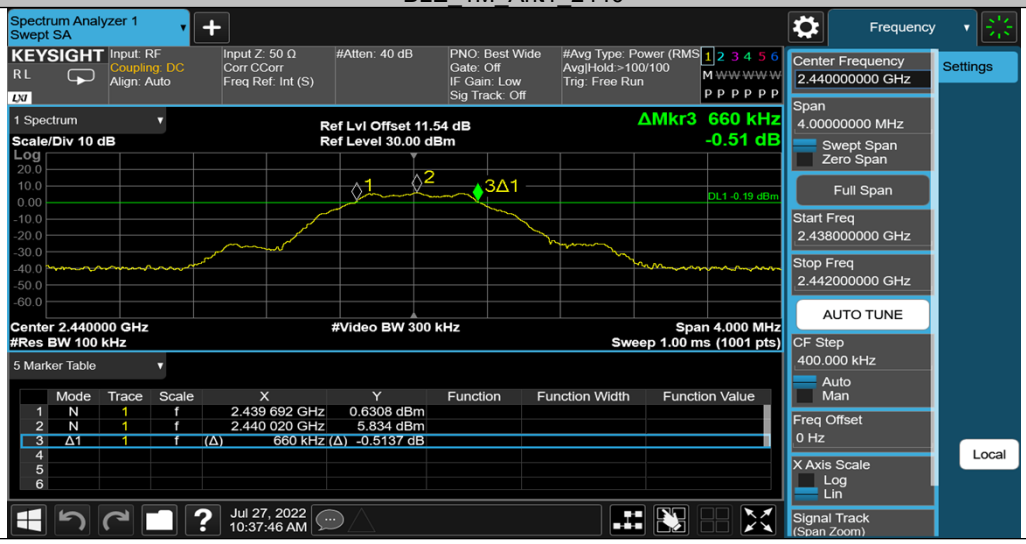
BLE_1M_Ant1_2480

Appendix B.2: Test Results of 6dB Bandwidth

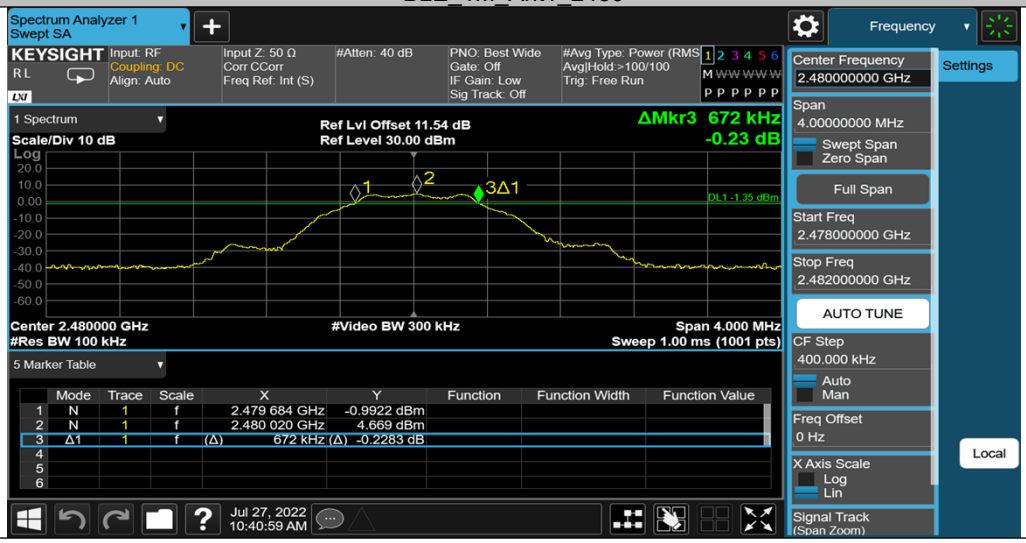
TestMode	Antenna	Channel [MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1Mbps	Ant1	2402	0.644	2401.708	2402.352	0.5	PASS
		2440	0.660	2439.692	2440.352	0.5	PASS
		2480	0.672	2479.684	2480.356	0.5	PASS

BLE_1M_Ant1_2402

BLE_1M_Ant1_2440



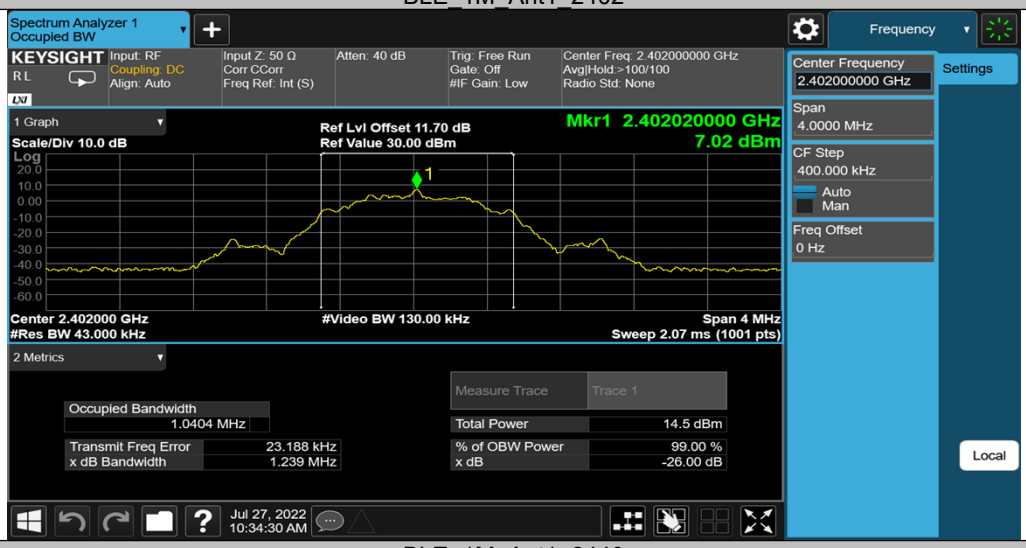
BLE_1M_Ant1_2480



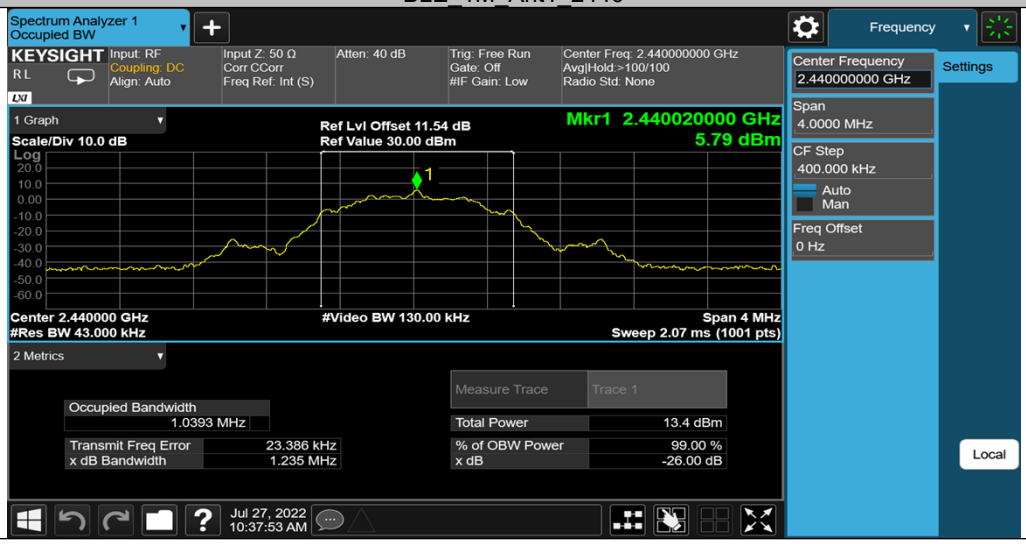
Appendix B.3: Test Results of 99% Bandwidth

TestMode	Antenna	Channel [MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1Mbps	Ant1	2402	1.0413	2401.503	2402.544	---	PASS
		2440	1.0402	2439.504	2440.544	---	PASS
		2480	1.0345	2479.504	2480.538	---	PASS

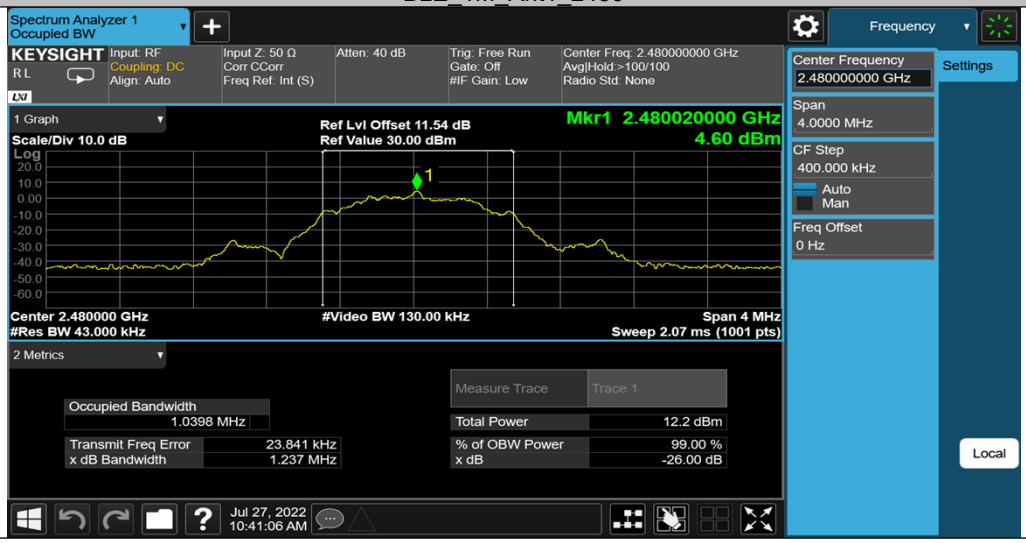
BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



BLE_1M_Ant1_2480

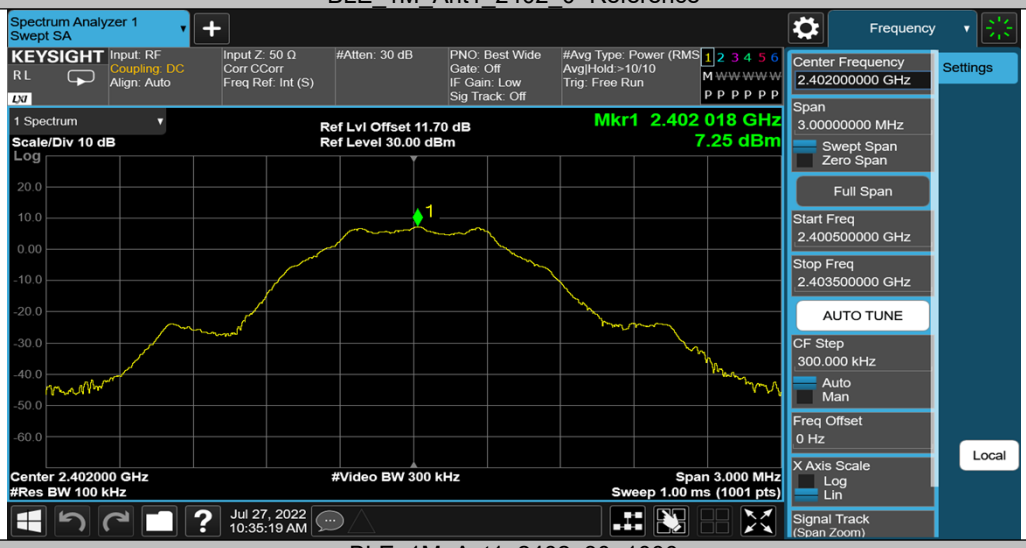


Appendix B.4: Test Results of Conducted Spurious Emissions Measured in 100 kHz Bandwidth

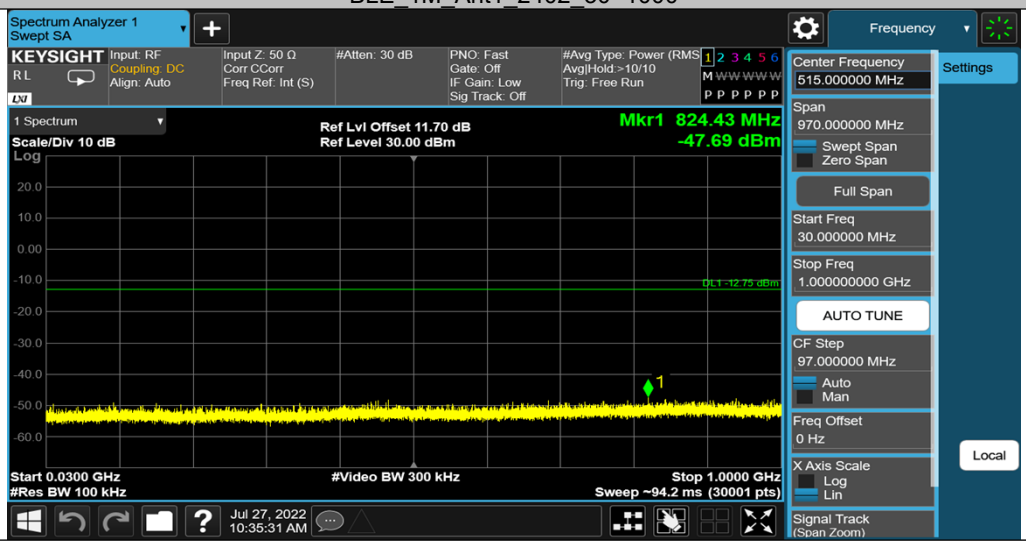
Conducted Spurious Emission

TestMode	Antenna	Channel [MHz]	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1Mbps	Ant1	2402	Reference	7.25	7.25	---	PASS
			30~1000	7.25	-47.69	≤-12.75	PASS
			1000~26500	7.25	-38.85	≤-12.75	PASS
		2440	Reference	6.07	6.07	---	PASS
			30~1000	6.07	-48.05	≤-13.93	PASS
			1000~26500	6.07	-38.58	≤-13.93	PASS
		2480	Reference	4.85	4.85	---	PASS
			30~1000	4.85	-48	≤-15.15	PASS
			1000~26500	4.85	-39	≤-15.15	PASS

BLE_1M_Ant1_2402_0~Reference



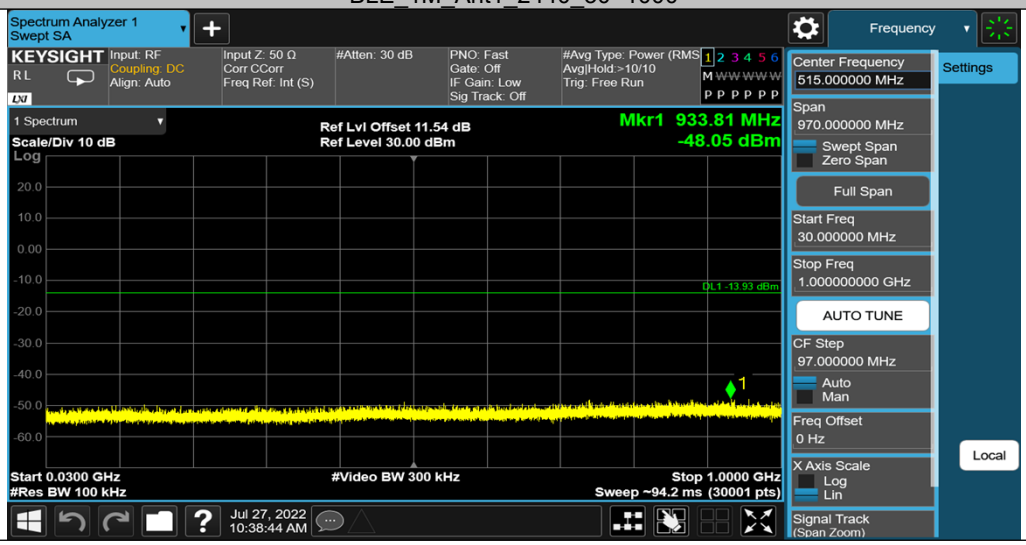
BLE_1M_Ant1_2402_30~1000



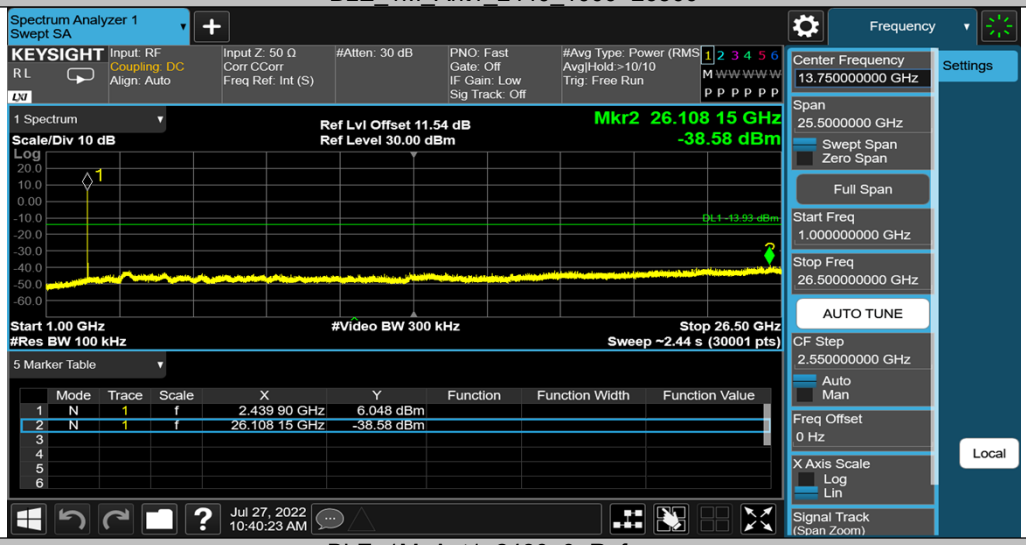
BLE_1M_Ant1_2402_1000~26500

BLE_1M_Ant1_2440_0~Reference

BLE_1M_Ant1_2440_30~1000

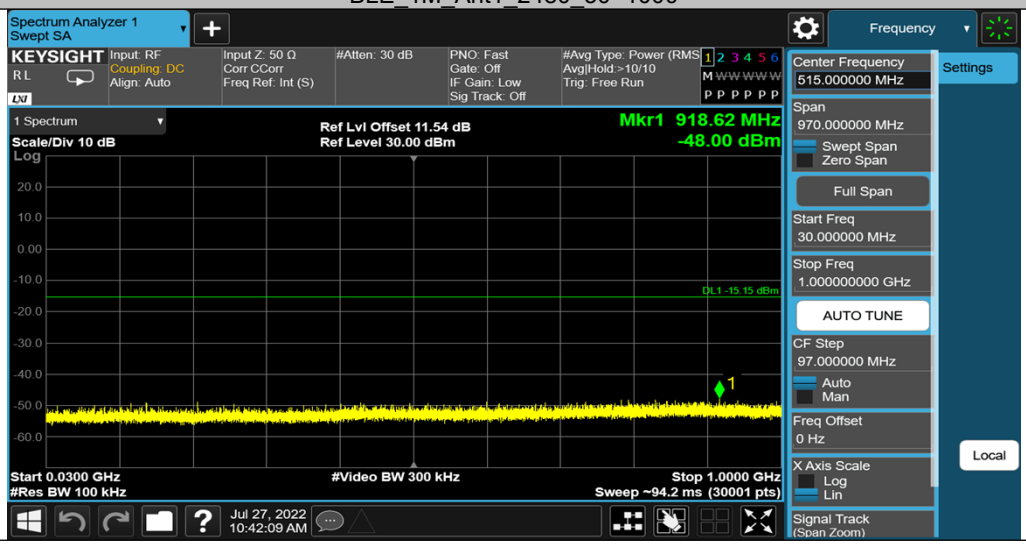


BLE_1M_Ant1_2440_1000~26500

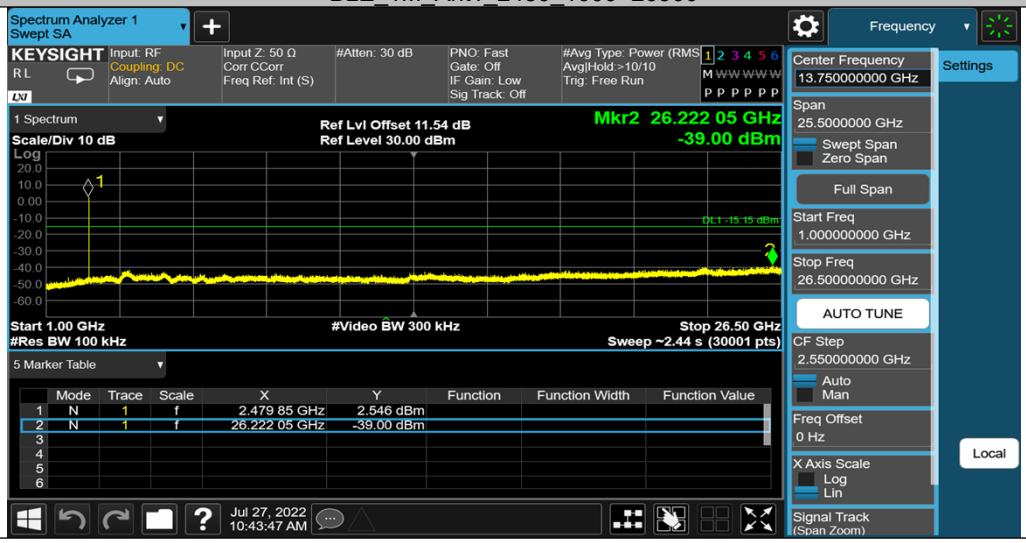


BLE_1M_Ant1_2480_0~Reference

BLE_1M_Ant1_2480_30~1000



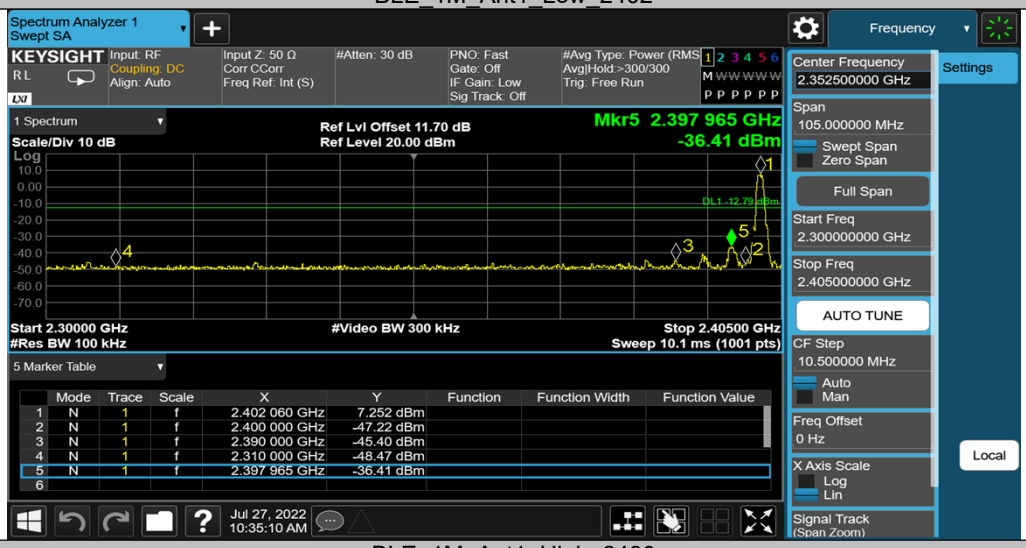
BLE_1M_Ant1_2480_1000~26500



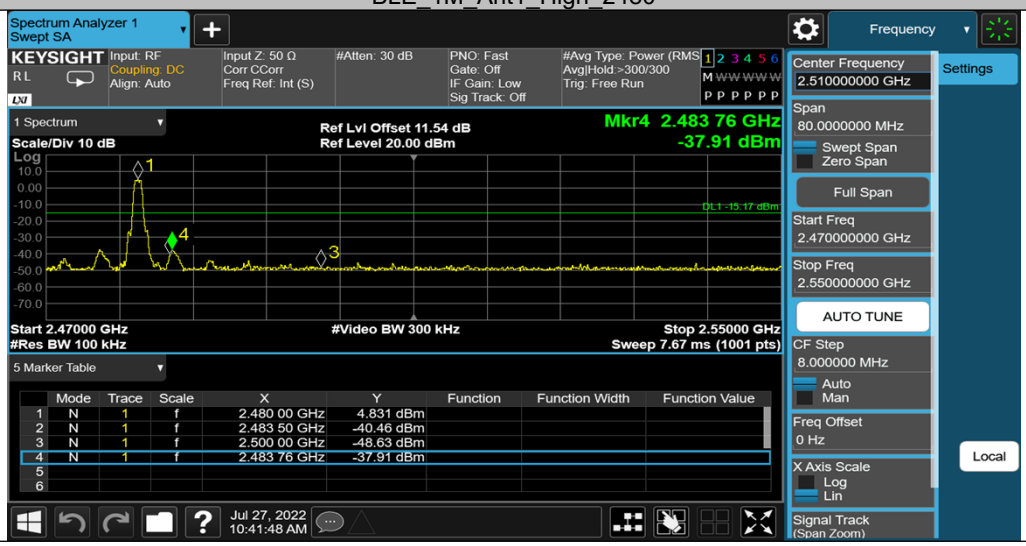
Band Edge

TestMode	Antenna	ChName	Channel [MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1Mbps	Ant1	Low	2402	7.21	-36.41	≤-12.79	PASS
		High	2480	4.83	-38	≤-15.17	PASS

BLE_1M_Ant1_Low_2402



BLE_1M_Ant1_High_2480



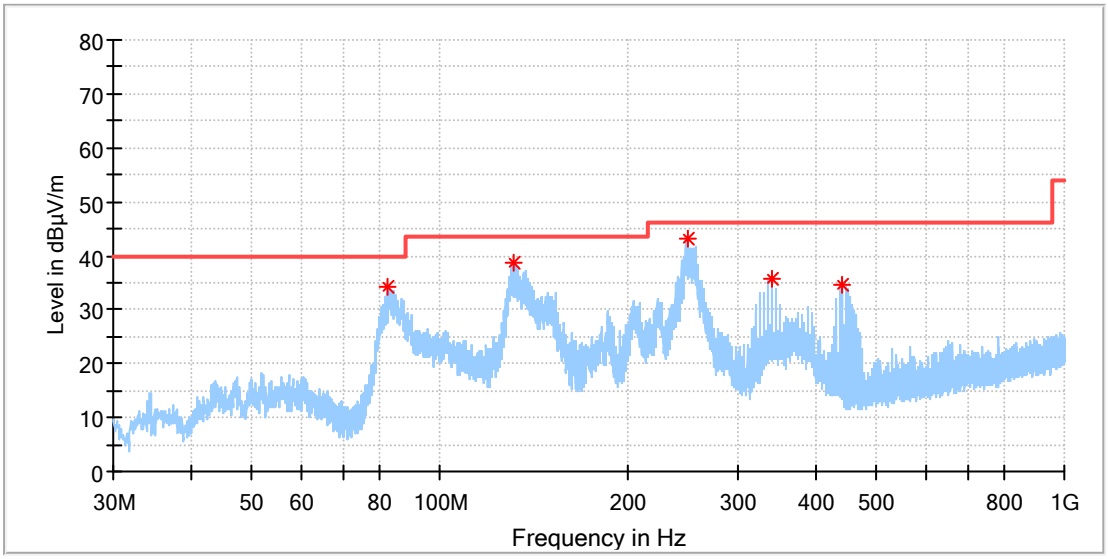
Appendix B.5: Test Results of Radiated Spurious Emissions

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:	Knowled Bi-color LED Light
Model:	M300Bi
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	168376504/A003298902-012
Test Voltage::	AC 120V/60Hz
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

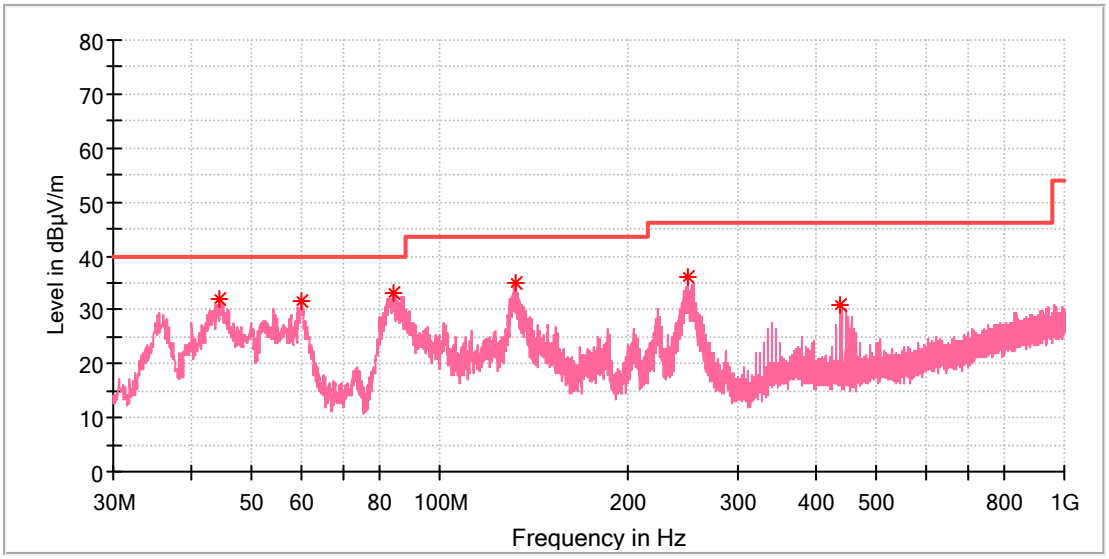


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
82.753077	34.25	40.00	5.75	100.0	H	222.0	-23.2
131.066539	38.82	43.50	4.68	100.0	H	215.0	-22.2
249.816923	43.33	46.00	2.67	100.0	H	238.0	-17.7
340.959615	35.71	46.00	10.29	100.0	H	279.0	-15.4
441.018846	34.52	46.00	11.48	100.0	H	316.0	-13.4

EUT Information

EUT Name:	Knowled Bi-color LED Light
Model:	M300Bi
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	168376504/A003298902-012
Test Voltage::	AC 120V/60Hz
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

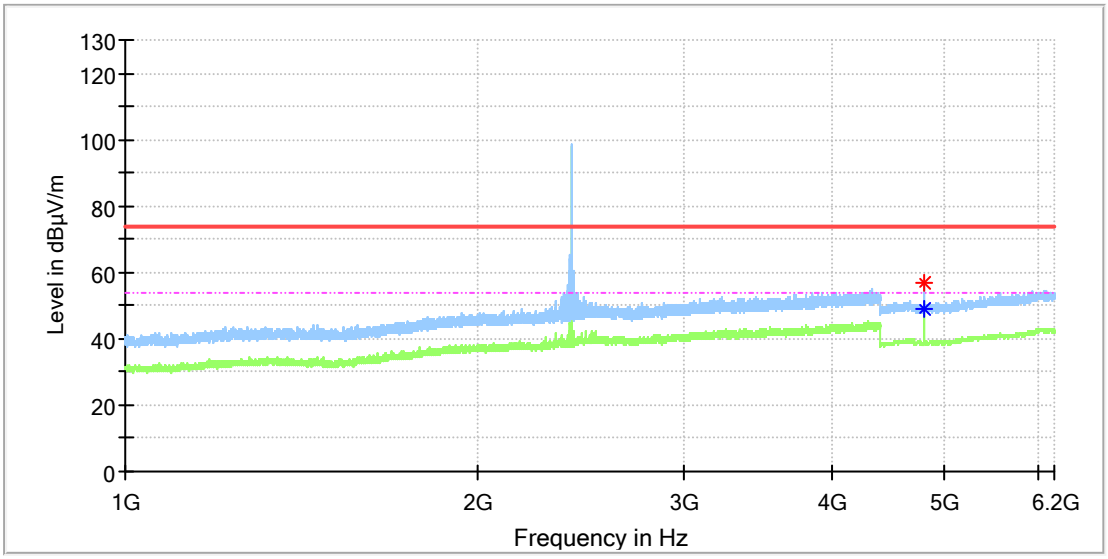
Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
44.404500	31.83	40.00	8.17	100.0	V	94.0	-18.9
60.264000	31.45	40.00	8.55	100.0	V	267.0	-19.0
84.223000	32.94	40.00	7.06	100.0	V	275.0	-22.5
132.238000	34.89	43.50	8.61	100.0	V	240.0	-22.0
249.559500	36.00	46.00	10.00	100.0	V	275.0	-17.4
436.721000	30.99	46.00	15.01	100.0	V	267.0	-13.2

1GHz-6.2GHz

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

EUT Information

EUT Name:	Knowled Bi-color LED Light
Model:	M300Bi
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	168376504/A003298902-012
Test Voltage::	AC 120V/60Hz
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

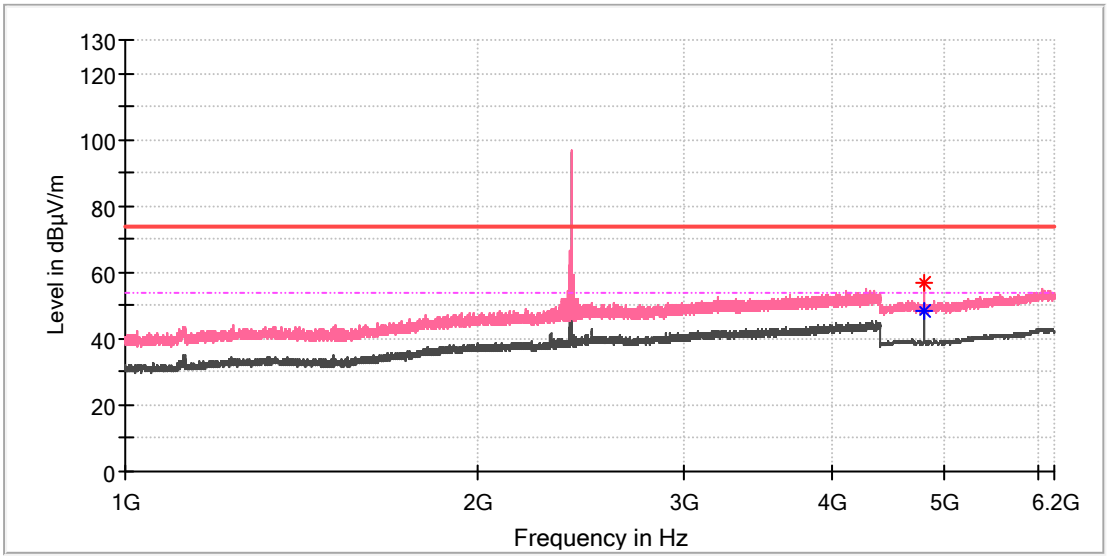


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4803.000000	---	48.74	54.00	5.26	100.0	H	148.0	11.8
4803.500000	56.64	---	74.00	17.36	100.0	H	148.0	11.8

EUT Information

EUT Name:	Knowled Bi-color LED Light
Model:	M300Bi
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	168376504/A003298902-012
Test Voltage::	AC 120V/60Hz
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

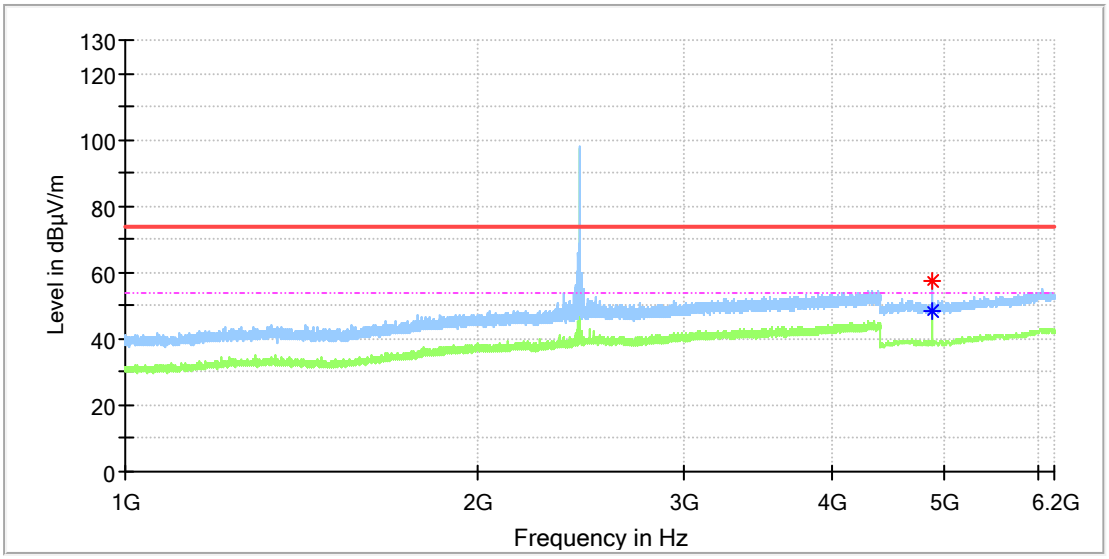


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4803.000000	---	48.17	54.00	5.83	100.0	V	208.0	11.8
4803.000000	56.93	---	74.00	17.07	100.0	V	208.0	11.8

EUT Information

EUT Name:	Knowled Bi-color LED Light
Model:	M300Bi
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	168376504/A003298902-012
Test Voltage::	AC 120V/60Hz
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

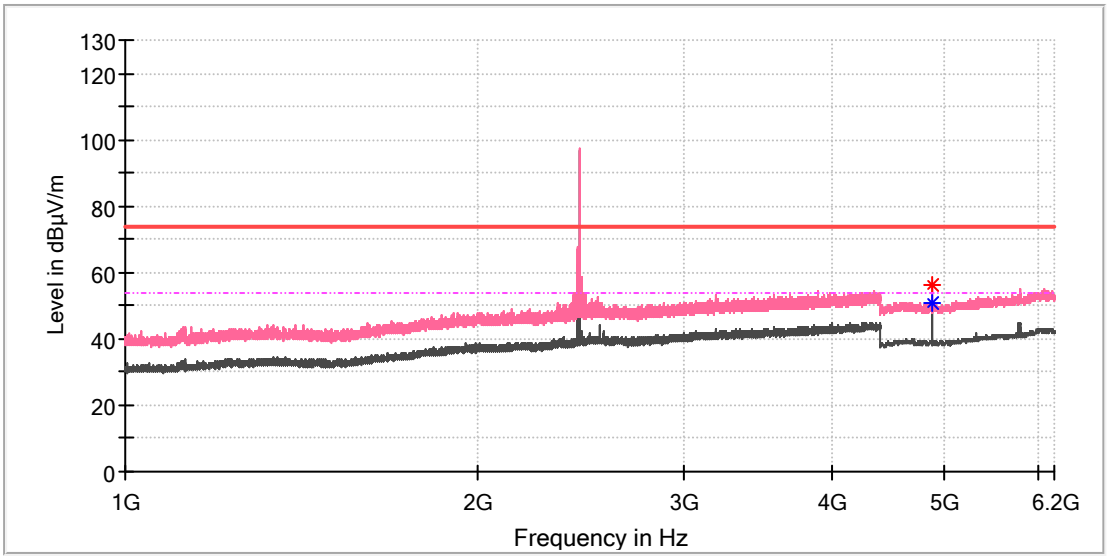


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4879.000000	---	48.44	54.00	5.56	100.0	H	41.0	11.8
4879.500000	57.39	---	74.00	16.61	100.0	H	41.0	11.8

EUT Information

EUT Name:	Knowled Bi-color LED Light
Model:	M300Bi
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	168376504/A003298902-012
Test Voltage::	AC 120V/60Hz
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

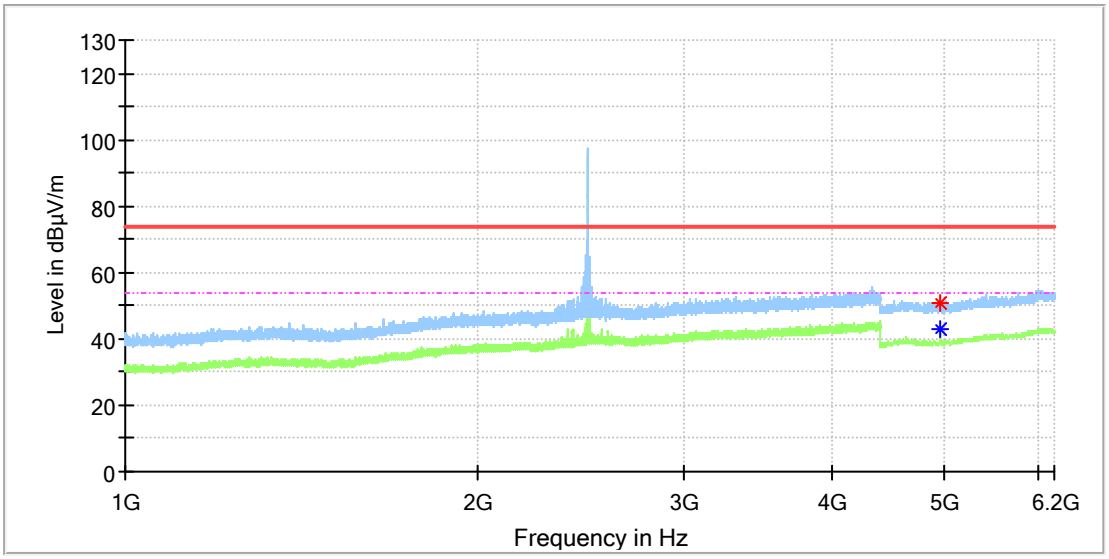


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4879.500000	---	50.85	54.00	3.15	100.0	V	339.0	11.8
4880.000000	56.21	---	74.00	17.79	100.0	V	339.0	11.8

EUT Information

EUT Name:	Knowled Bi-color LED Light
Model:	M300Bi
Test Mode:	BLE 1M_High channel
Order No/Sample No:	168376504/A003298902-012
Test Voltage::	AC 120V/60Hz
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

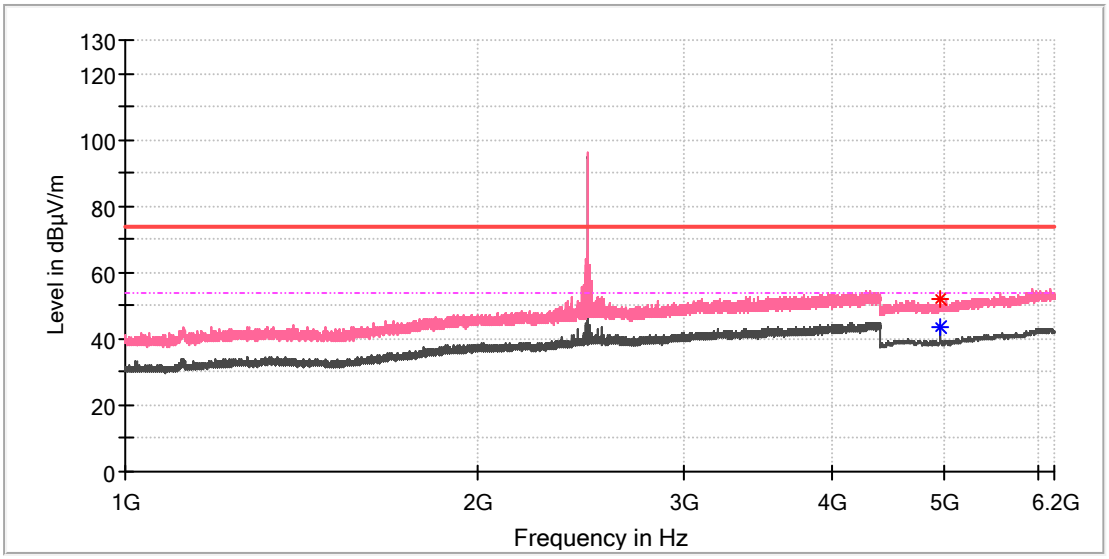


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4960.000000	50.72	---	74.00	23.28	100.0	H	63.0	11.8
4960.000000	---	42.73	54.00	11.27	100.0	H	63.0	11.8

EUT Information

EUT Name:	Knowled Bi-color LED Light
Model:	M300Bi
Test Mode:	BLE 1M_High channel
Order No/Sample No:	168376504/A003298902-012
Test Voltage::	AC 120V/60Hz
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



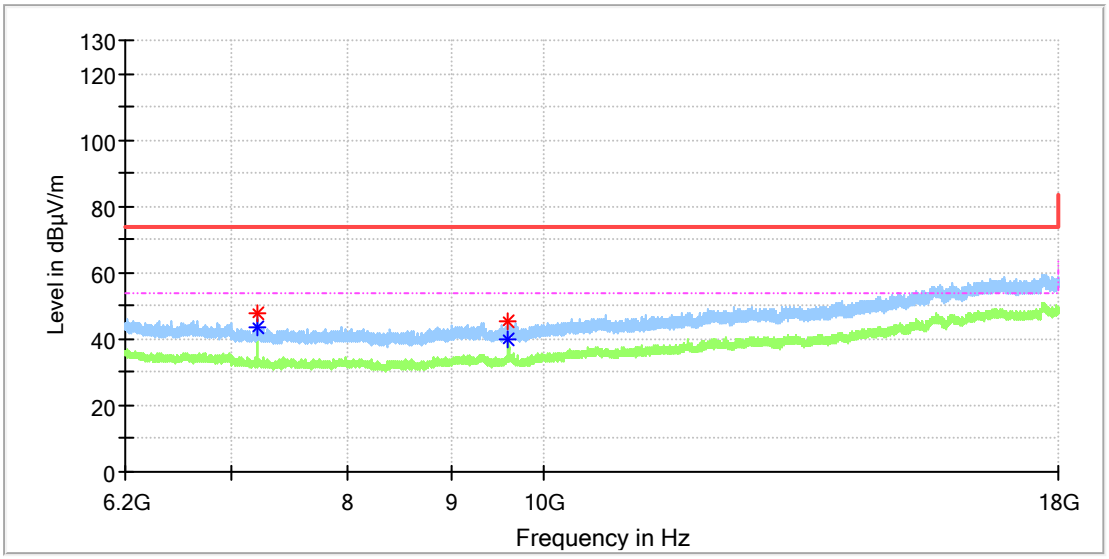
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4959.500000	---	43.83	54.00	10.17	100.0	V	205.0	11.8
4960.500000	51.98	---	74.00	22.02	100.0	V	191.0	11.8

6.2GHz-18GHz

EUT Information

EUT Name:	Knowled Bi-color LED Light
Model:	M300Bi
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	168376504/A003298902-012
Test Voltage::	AC 120V/60Hz
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

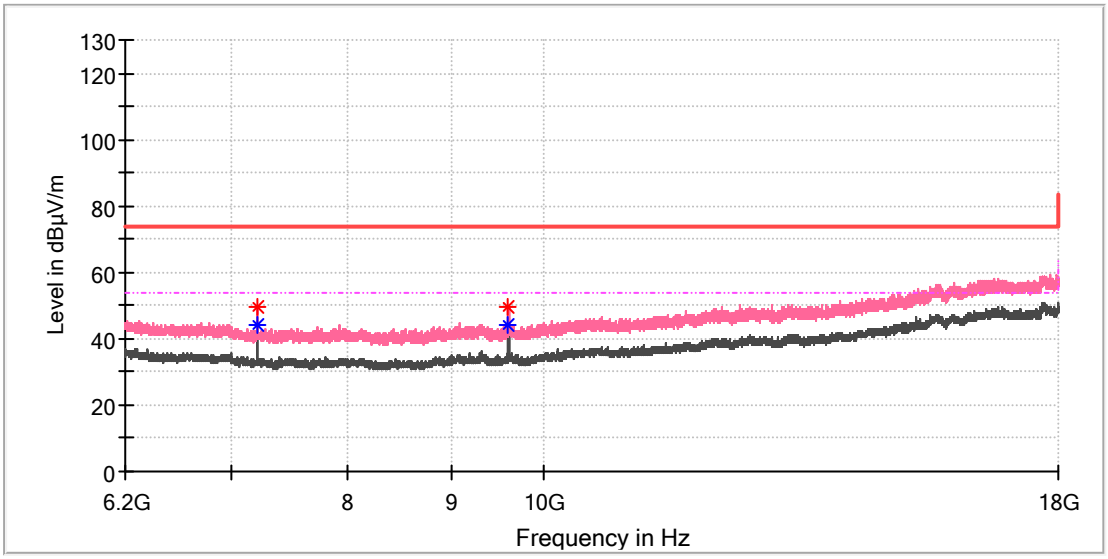


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7205.950000	---	43.77	54.00	10.23	100.0	H	177.0	8.8
7206.933333	47.90	---	74.00	26.10	100.0	H	177.0	8.8
9607.250000	45.22	---	74.00	28.78	100.0	H	264.0	10.4
9607.250000	---	39.73	54.00	14.27	100.0	H	264.0	10.4

EUT Information

EUT Name:	Knowled Bi-color LED Light
Model:	M300Bi
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	168376504/A003298902-012
Test Voltage::	AC 120V/60Hz
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

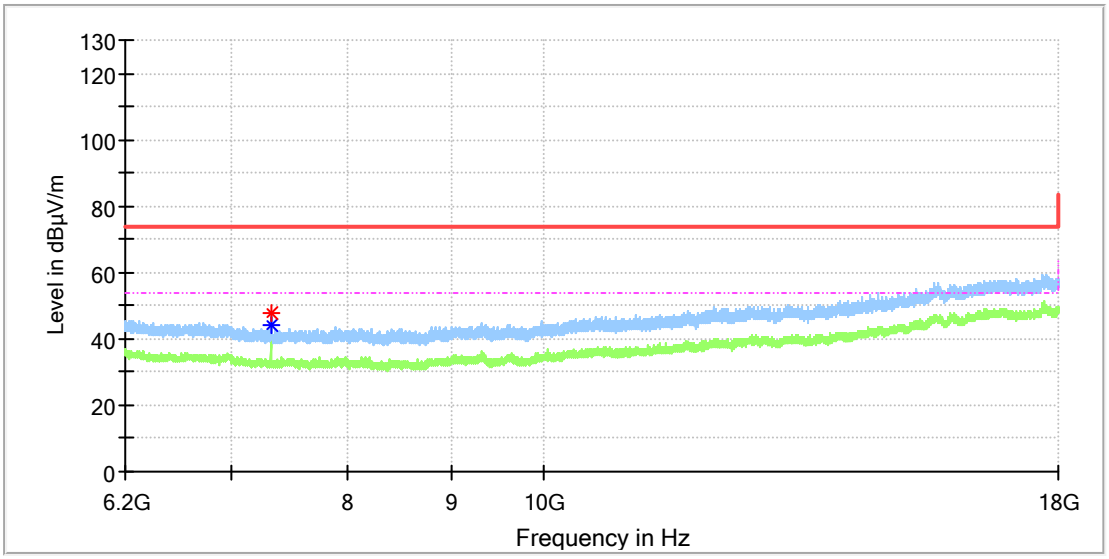


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7206.441667	49.44	---	74.00	24.56	100.0	V	144.0	8.8
7206.441667	---	44.09	54.00	9.91	100.0	V	144.0	8.8
9606.758333	---	44.36	54.00	9.64	100.0	V	204.0	10.4
9607.250000	49.67	---	74.00	24.33	100.0	V	132.0	10.4

EUT Information

EUT Name:	Knowled Bi-color LED Light
Model:	M300Bi
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	168376504/A003298902-012
Test Voltage::	AC 120V/60Hz
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

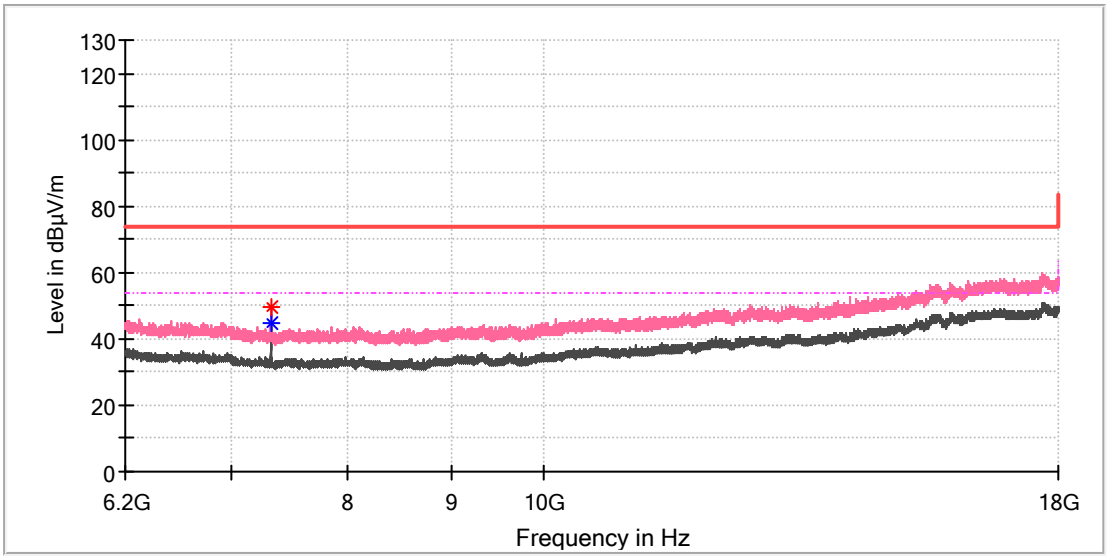


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7319.525000	48.05	---	74.00	25.95	100.0	H	168.0	8.2
7319.525000	---	43.94	54.00	10.06	100.0	H	168.0	8.2

EUT Information

EUT Name:	Knowled Bi-color LED Light
Model:	M300Bi
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	168376504/A003298902-012
Test Voltage::	AC 120V/60Hz
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

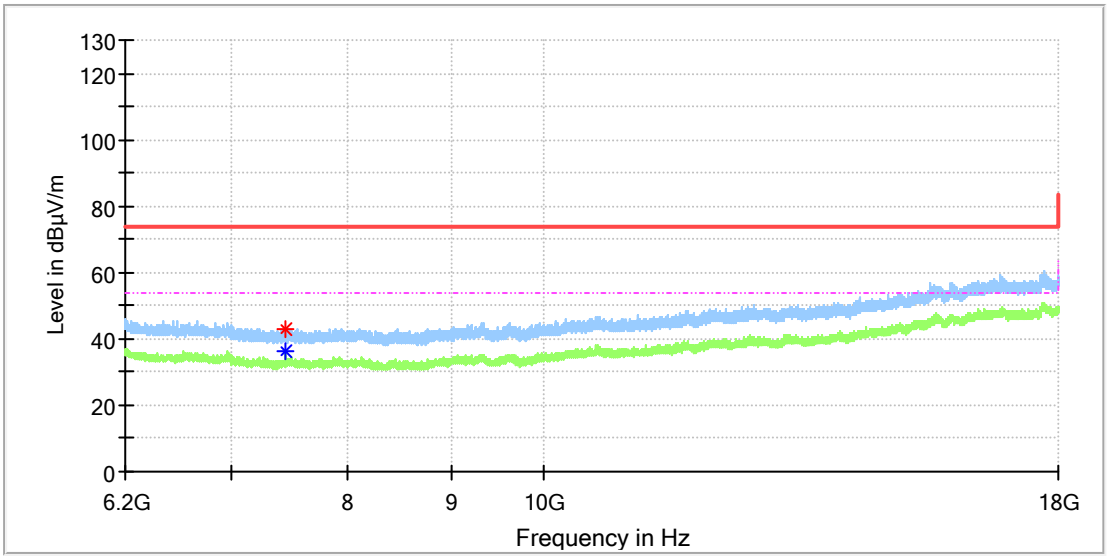


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7319.525000	49.86	---	74.00	24.14	100.0	V	355.0	8.2
7320.016667	---	44.56	54.00	9.44	100.0	V	355.0	8.2

EUT Information

EUT Name:	Knowled Bi-color LED Light
Model:	M300Bi
Test Mode:	BLE 1M_High channel
Order No/Sample No:	168376504/A003298902-012
Test Voltage::	AC 120V/60Hz
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

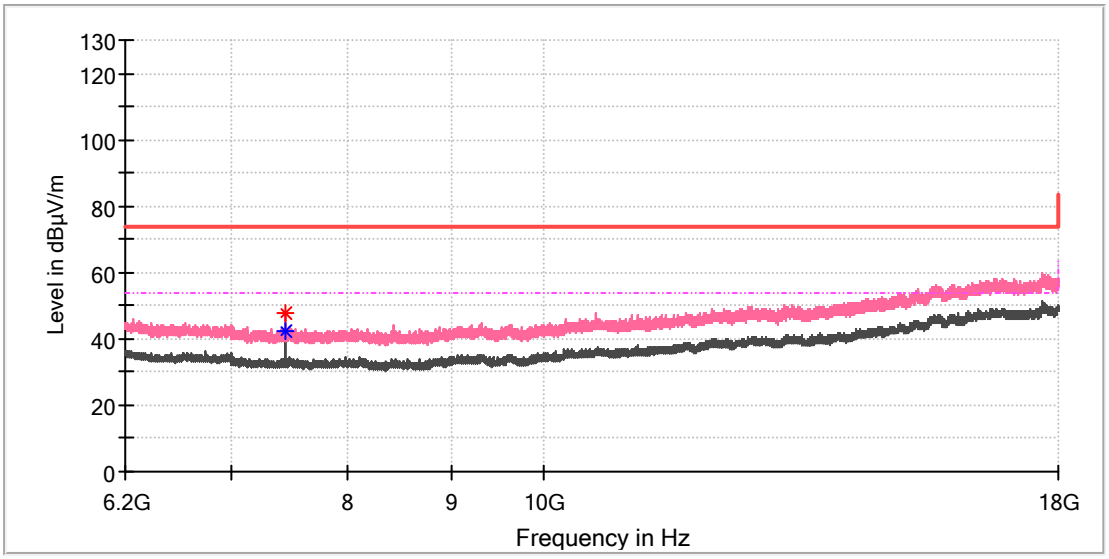


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7440.475000	---	36.11	54.00	17.89	100.0	H	64.0	8.4
7448.833333	43.20	---	74.00	30.80	100.0	H	17.0	8.5

EUT Information

EUT Name:	Knowled Bi-color LED Light
Model:	M300Bi
Test Mode:	BLE 1M_High channel
Order No/Sample No:	168376504/A003298902-012
Test Voltage::	AC 120V/60Hz
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



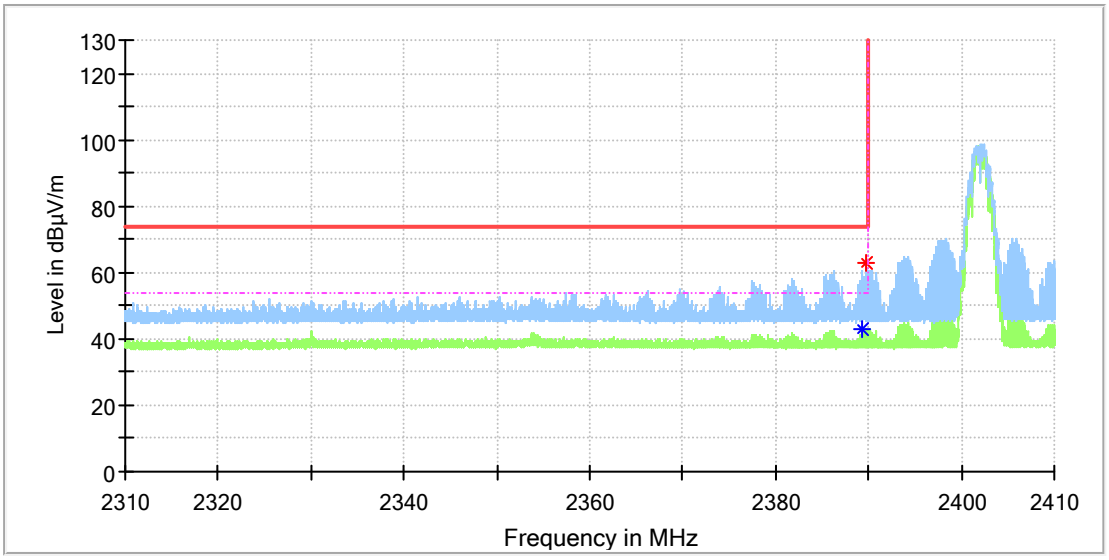
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7439.491667	---	42.07	54.00	11.93	100.0	V	355.0	8.4
7440.966667	48.05	---	74.00	25.95	100.0	V	355.0	8.4

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

EUT Information

EUT Name:	Knowled Bi-color LED Light
Model:	M300Bi
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	168376504/A003298902-012
Test Voltage::	AC 120V/60Hz
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

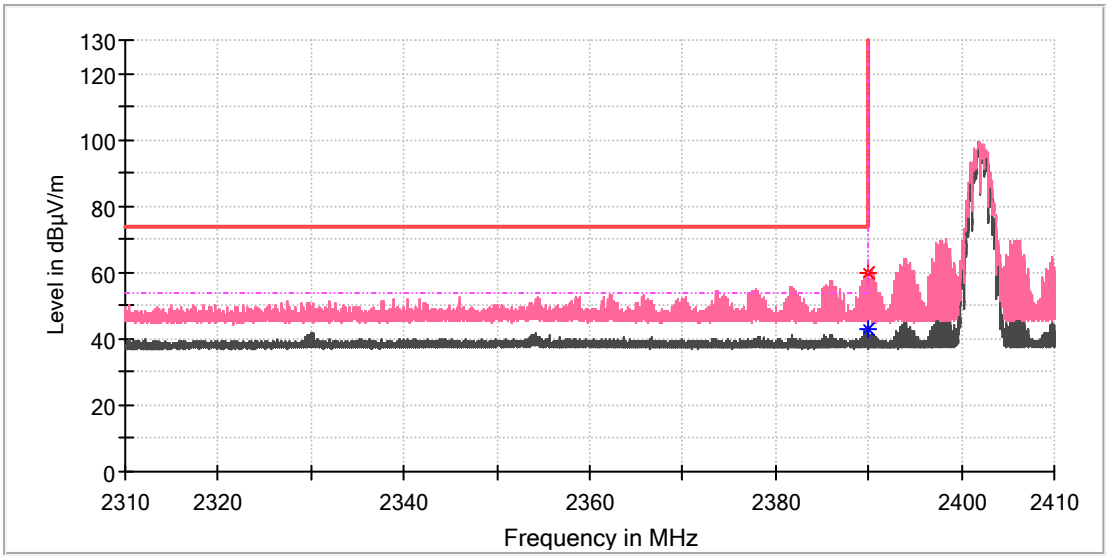


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2389.345000	---	42.78	54.00	11.22	100.0	H	244.0	7.0
2389.700000	62.79	---	74.00	11.21	100.0	H	160.0	7.0

EUT Information

EUT Name:	Knowled Bi-color LED Light
Model:	M300Bi
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	168376504/A003298902-012
Test Voltage::	AC 120V/60Hz
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

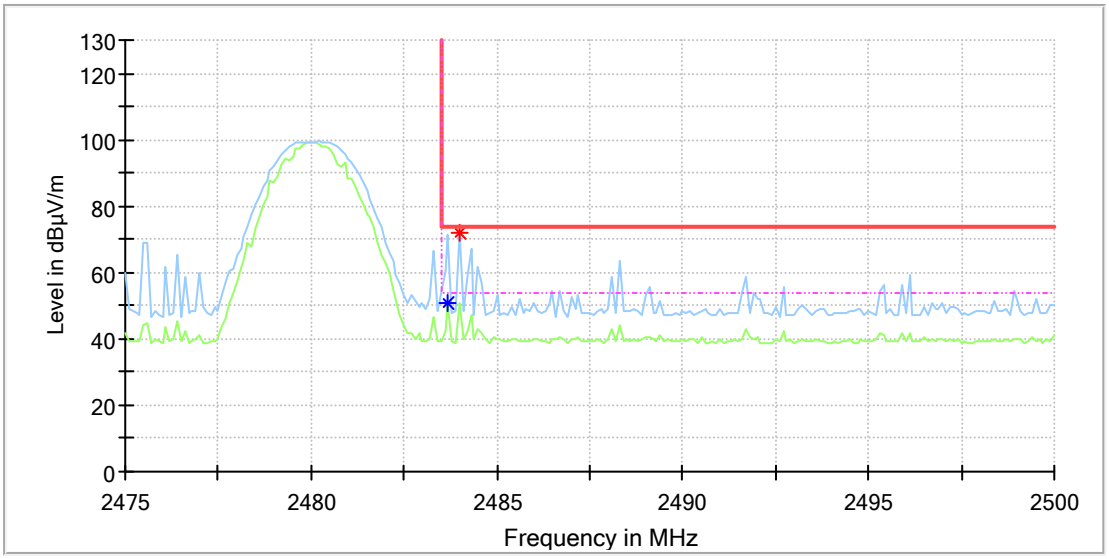


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2389.890000	---	42.73	54.00	11.27	100.0	V	181.0	7.0
2389.890000	60.02	---	74.00	13.98	100.0	V	181.0	7.0

EUT Information

EUT Name:	Knowled Bi-color LED Light
Model:	M300Bi
Test Mode:	BLE 1M_High channel
Order No/Sample No:	168376504/A003298902-012
Test Voltage::	AC 120V/60Hz
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

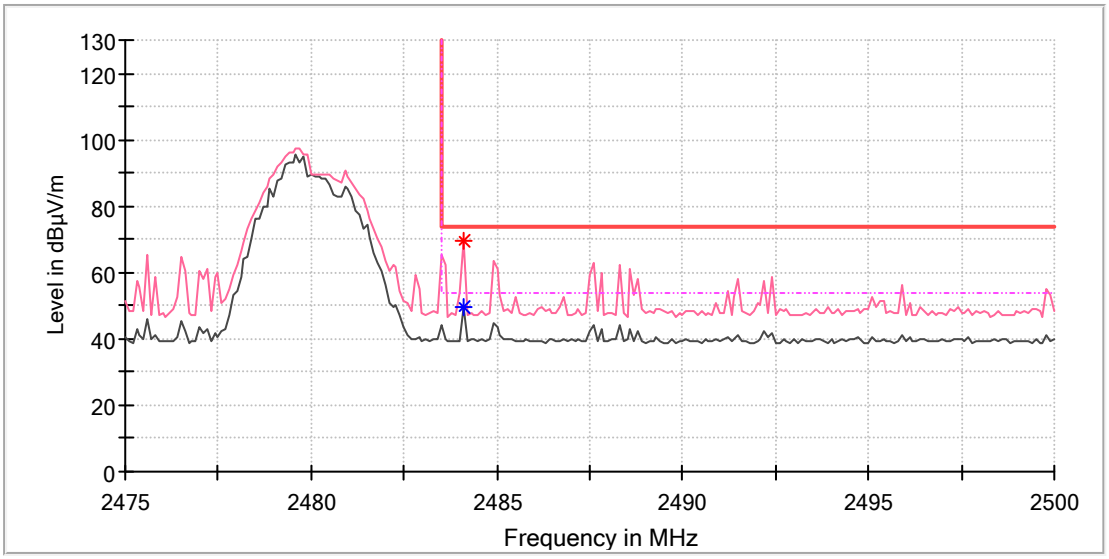


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.700000	---	50.89	54.00	3.11	100.0	H	213.0	7.4
2484.000000	71.93	---	74.00	2.07	100.0	H	66.0	7.4

EUT Information

EUT Name:	Knowled Bi-color LED Light
Model:	M300Bi
Test Mode:	BLE 1M_High channel
Order No/Sample No:	168376504/A003298902-012
Test Voltage::	AC 120V/60Hz
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



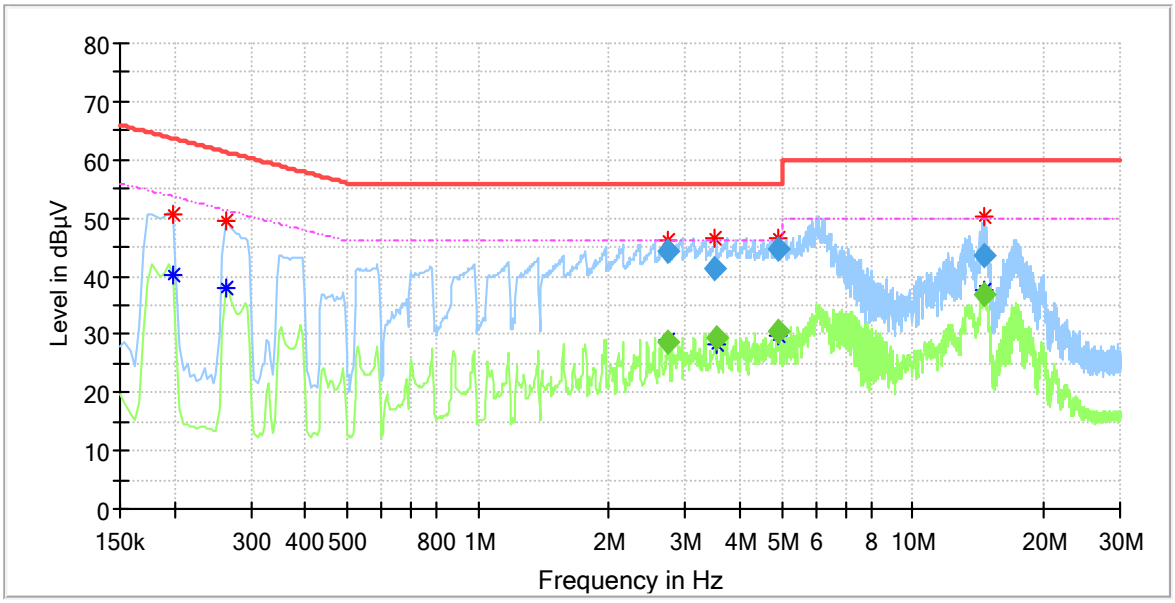
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2484.100000	---	49.56	54.00	4.44	100.0	V	179.0	7.4
2484.100000	69.80	---	74.00	4.20	100.0	V	179.0	7.4

Appendix B.7: Test Results of Conducted Emission on AC Mains

EUT Information

EUT Name:	Knowled Bi-color LED Light
Order No:	168376504_P00717509
Model:	M300Bi
Test Mode:	ON
Test Voltage:	AC 120V/60Hz
Standard:	FCC Part 15
Test By/Review By:	Soloman Wu/Gary Chen
Tem./Hum./Pressure:	24.9°C/52.1%/101kPa
Remark:	SR1



Critical_Freqs

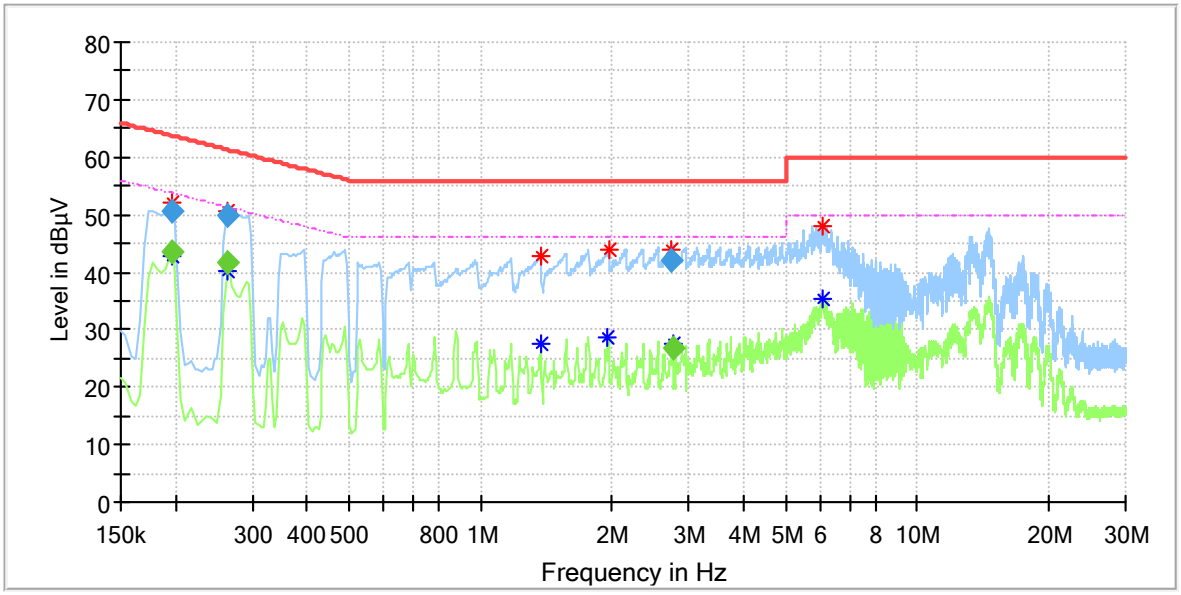
Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.198000	50.53	---	63.69	13.16	L1	9.6
0.198000	---	40.19	53.69	13.50	L1	9.6
0.262000	49.41	---	61.37	11.96	L1	9.6
0.262000	---	38.05	51.37	13.32	L1	9.6

Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
2.746500	44.30	---	56.00	11.70	1000.0	9.000	L1	9.8
2.746500	---	28.56	46.00	17.44	1000.0	9.000	L1	9.8
3.482500	41.40	---	56.00	14.60	1000.0	9.000	L1	9.8
3.534500	---	29.51	46.00	16.49	1000.0	9.000	L1	9.8
4.909500	---	30.38	46.00	15.62	1000.0	9.000	L1	9.9
4.910500	44.49	---	56.00	11.51	1000.0	9.000	L1	9.9
14.634500	43.64	---	60.00	16.36	1000.0	9.000	L1	10.3
14.650500	---	36.99	50.00	13.01	1000.0	9.000	L1	10.3

EUT Information

EUT Name:	Knowled Bi-color LED Light
Order No:	168376504_P00717509
Model:	M300Bi
Test Mode:	ON
Test Voltage:	AC 120V/60Hz
Standard:	FCC Part 15
Test By/Review By:	Soloman Wu/Gary Chen
Tem./Hum./Pressure:	24.9°C/52.1%/101kPa
Remark:	SR1



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
1.372000	---	27.40	46.00	18.60	N	9.7
1.372000	42.89	---	56.00	13.11	N	9.7
1.960000	---	28.58	46.00	17.42	N	9.7
1.964000	44.02	---	56.00	11.98	N	9.7
6.040000	---	35.52	50.00	14.48	N	10.0
6.040000	47.89	---	60.00	12.11	N	10.0

Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.196500	---	43.35	53.76	10.40	1000.0	9.000	N	9.6
0.196500	50.73	---	63.76	13.03	1000.0	9.000	N	9.6
0.264500	---	41.55	51.29	9.74	1000.0	9.000	N	9.6
0.264500	49.68	---	61.29	11.61	1000.0	9.000	N	9.6
2.746500	42.20	---	56.00	13.80	1000.0	9.000	N	9.8
2.750500	---	26.85	46.00	19.15	1000.0	9.000	N	9.8