

FCC Part 15C Measurement and Test Report

For

BlueCats Incorporated

301-A Chicon St Austin US 78702 United States Of America

FCC ID: 2AHXCBC510

FCC Rule(s): FCC Part 15.247

Product Description: BC510 Edge Relay 1

Tested Model: BC510

Report No.: HCT18CR055E-2

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: BlueCats Incorporated
Address of applicant: 301-A Chicon St, Austin, Texas, United States, 78702

Manufacturer: BlueCats Incorporated
Address of manufacturer: 301-A Chicon St, Austin, Texas, United States, 78702

General Description of EUT

Product Name:	BC510 Edge Relay 1
Model No.:	BC510
Adding Model(s):	/
Rated Voltage:	Input: DC 5V/1A from micro USB connection or from a POE through the WAN port

Note: The test data is gathered from a production sample provided by the manufacturer.

Technical Characteristics of EUT

Bluetooth Version:	V4.0 BLE
Frequency Range:	2402-2480MHz
RF Output Power:	3.685dBm (Conducted)
Modulation:	GFSK
Quantity of Channels:	40
Channel Separation:	2MHz
Type of Antenna:	Rod antenna
Antenna Gain:	2dBi

1.2 Test Standards

The following report is prepared on behalf of the **BlueCats Incorporated** in accordance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 of the Federal Communication Commissions rules.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard for Testing Unlicensed Wireless Devices.

1.4 Test Facility

FCC – Registration No.: 934118

Shenzhen SEM.Test Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files and the Registration is 934118.

Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Shenzhen SEM.Test Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

1.5 EUT Setup and Test Mode

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, and to measure its highest possible emissions level, more detailed description as follows:

Test Mode List		
Test Mode	Description	Remark
TM1	GFSK(BLE)	2402MHz, 2440MHz, 2480MHz

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
Adapter Cable	1.45	PSAC05R-050L6	Without Core

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
RJ45 Cabel	0.2	Non-Shielded	Without Ferrite

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
Network switch	LINKSYS	LGS108P	13U10C95702137
Notebook	Dell	Inspiron 15	/
RJ45 Adapter	Cabel Matters® Inc	202013	WISWEYB4

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
RF Output Power	Conducted	$\pm 0.42\text{dB}$
Occupied Bandwidth	Conducted	$\pm 1.5\%$
Power Spectral Density	Conducted	$\pm 1.8\text{dB}$
Conducted Spurious Emission	Conducted	$\pm 2.17\text{dB}$
Conducted Emissions	Conducted	$\pm 2.88\text{dB}$
Transmitter Spurious Emissions	Radiated	$\pm 5.1\text{dB}$

1.7 Test Equipment List and Details

No.	Description	Manufacturer	Model	Serial No.	Cal Date	Due Date
SEMT-1072	Spectrum Analyzer	Agilent	E4407B	MY41440400	2017-06-12	2018-06-11
SEMT-1031	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2017-06-12	2018-06-11
SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2017-06-12	2018-06-11
SEMT-1008	Amplifier	Agilent	8447F	3113A06717	2017-06-12	2018-06-11
SEMT-1043	Amplifier	C&D	PAP-1G18	2002	2017-06-12	2018-06-11
SEMT-1011	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2017-06-08	2018-06-07
SEMT-1042	Horn Antenna	ETS	3117	00086197	2017-06-08	2018-06-07
SEMT-1121	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170582	2017-06-08	2018-06-07
SEMT-1069	Loop Antenna	Schwarz beck	FMZB 1516	9773	2017-06-08	2018-06-07
SEMT-1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2017-06-12	2018-06-11
SEMT-1003	L.I.S.N	Schwarz beck	NSLK8126	8126-224	2017-06-12	2018-06-11
SEMT-1002	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2017-06-12	2018-06-11

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§ 2.1093	RF Exposure	Compliant
§ 15.203; § 15.247(b)(4)(i)	Antenna Requirement	Compliant
§15.205	Restricted Band of Operation	Compliant
§ 15.207(a)	Conducted Emission	Compliant
§ 15.247(e)	Power Spectral Density	Compliant
§ 15.247(a)(2)	6 dB Bandwidth	Compliant
§ 15.247(b)(3)	RF Output Power	Compliant
§ 15.209(a)	Radiated Emission	Compliant
§ 15.247(d)	Band Edge (Out of Band Emissions)	Compliant

N/A: not applicable

3. RF Exposure

3.1 Standard Applicable

According to § 1.1307 and § 2.1093, the portable transmitter must comply the RF exposure requirements.

3.2 Test Result

This product complied with the requirement of the RF exposure, please see the RF Exposure Report.

4. Antenna Requirement

4.1 Standard Applicable

According to FCC Part 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.

4.2 Evaluation Information

This device has a permanent antenna fixed by glue, fulfill the requirement of this section.

5. Power Spectral Density

5.1 Standard Applicable

According to 15.247(a)(1)(iii), 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.

5.2 Test Procedure

According to the KDB 558074 D01 v04, the test method of power spectral density as below:

- Set analyzer center frequency to DTS channel center frequency.
- Set the span to 1.5 times the DTS bandwidth.
- Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- Set the VBW $\geq 3 \times \text{RBW}$.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level within the RBW.
- If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

5.3 Environmental Conditions

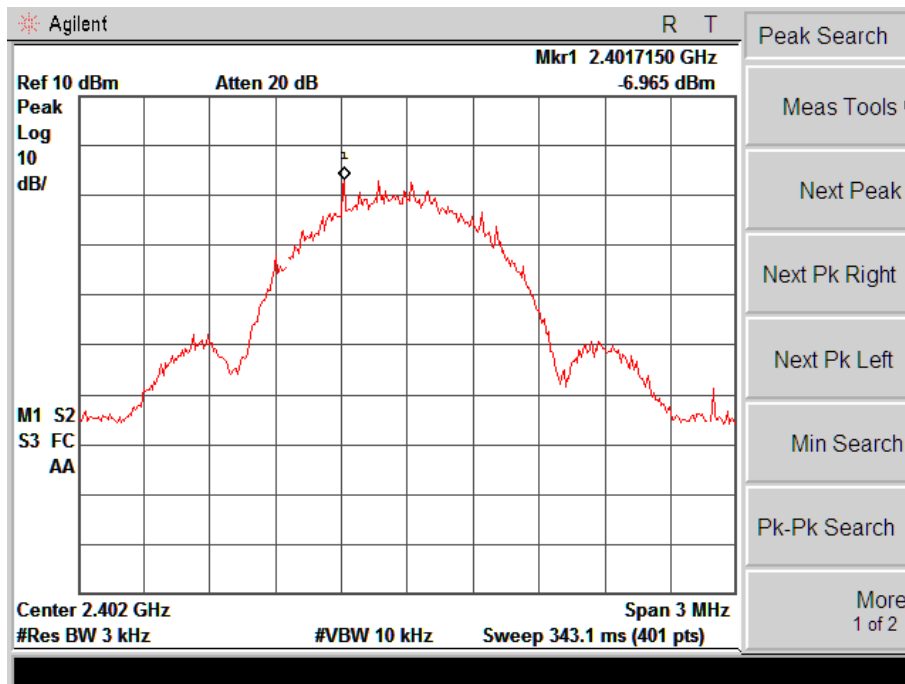
Temperature:	26° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

5.4 Summary of Test Results/Plots

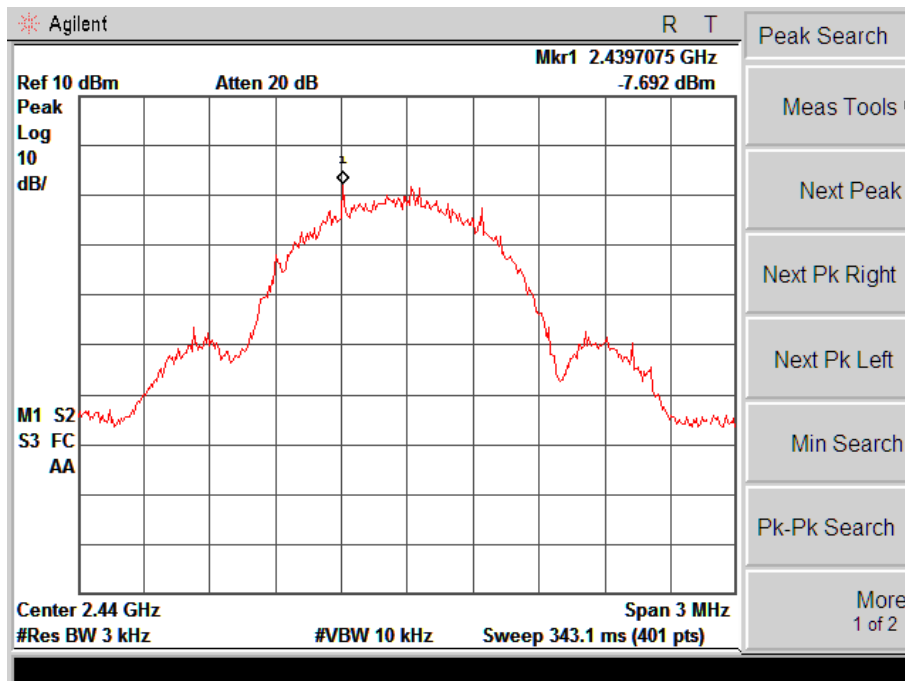
Test Mode	Test Channel MHz	Power Spectral Density dBm/3kHz	Limit dBm/3kHz
GFSK(BLE)	2402	-6.965	8
	2440	-7.692	8
	2480	-8.252	8

Please refer to the following test plots:

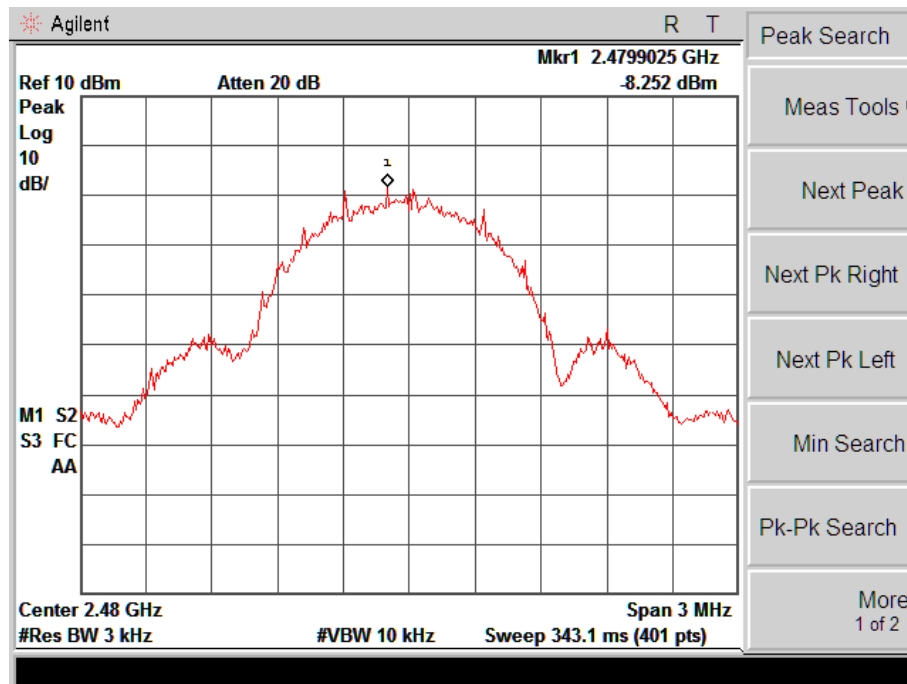
Low Channel



Middle Channel



High Channel



6. 6dB Bandwidth

6.1 Standard Applicable

According to 15.247(a)(2). 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.

6.2 Test Procedure

- 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.

6.3 Environmental Conditions

Temperature:	25° C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

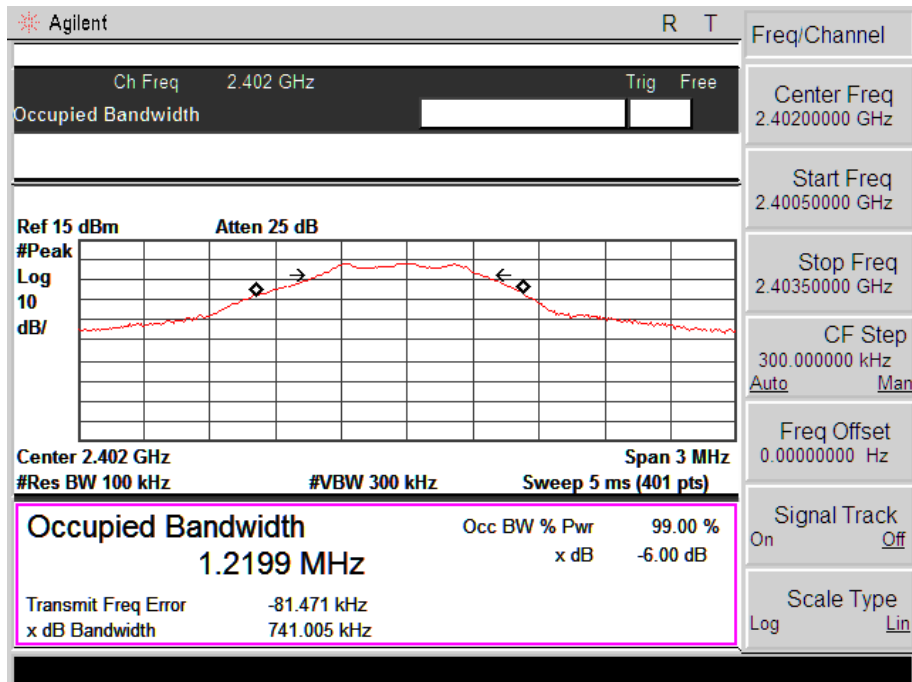
6.4 Summary of Test Results/Plots

Test Mode	Test Channel MHz	6 dB Bandwidth MHz	99% Bandwidth MHz	Limit kHz
GFSK(BLE)	2402	0.741	1.2199	≥ 500
	2440	0.735	1.3096	≥ 500
	2480	0.752	1.3477	≥ 500

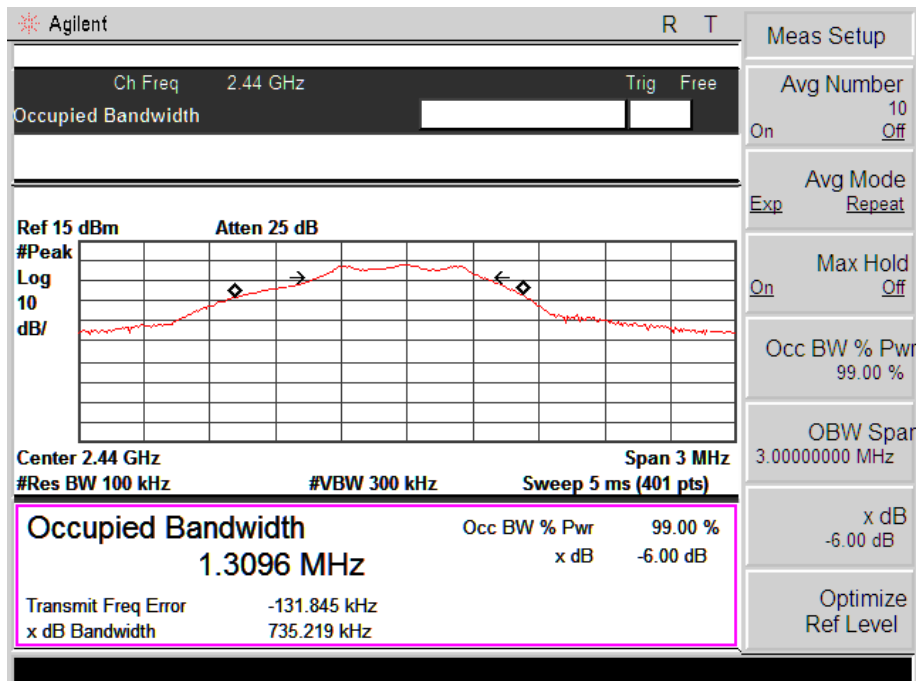
Please refer to the following test plots:

For BLE

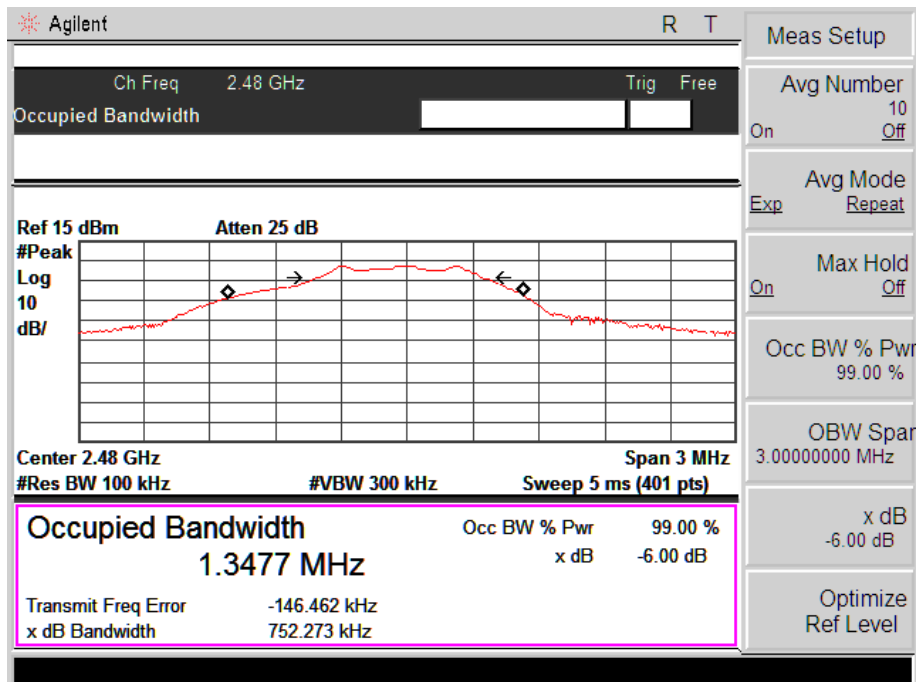
Low Channel:



Middle Channel:



High Channel:



7. RF Output Power

7.1 Standard Applicable

According to 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.

7.2 Test Procedure

According to section KDB-558074 D01 v04 section 9.1.1, this procedure shall be used when the measurement instrument has available a resolution bandwidth that is greater than the DTS bandwidth.

- Set the RBW \geq DTS bandwidth.
- Set VBW $\geq 3 \times$ RBW.
- Set span $\geq 3 \times$ RBW
- Sweep time = auto couple.
- Detector = peak.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use peak marker function to determine the peak amplitude level.

7.3 Environmental Conditions

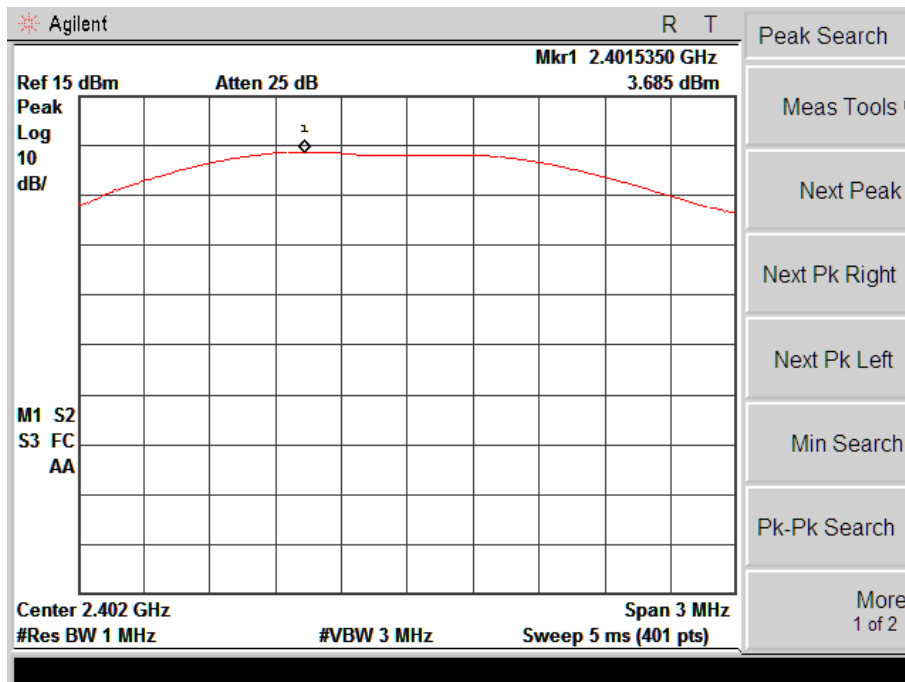
Temperature:	26° C
Relative Humidity:	57%
ATM Pressure:	1011 mbar

7.4 Summary of Test Results/Plots

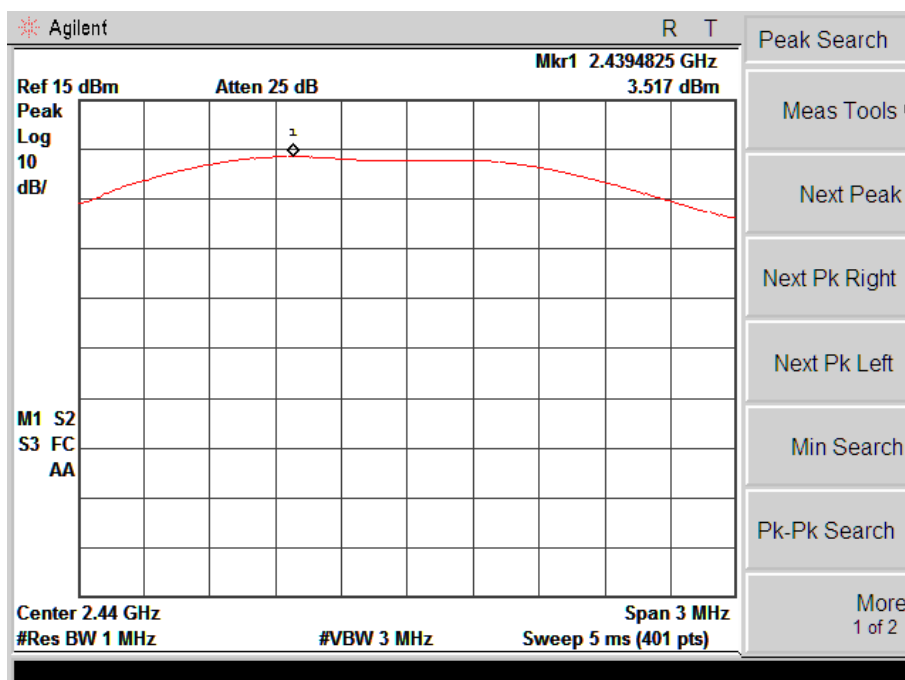
Test Mode	Frequency MHz	Reading dBm	Output Power mW	Limit mW
GFSK(BLE)	2402	3.685	2.300	1000
	2440	3.517	2.200	1000
	2480	3.365	2.200	1000

Note: the antenna gain of 2dBi less than 6dBi maximum permission antenna gain value based on 1 watt peak output power limit.

For GFSK
Low Channel



Middle Channel





Agilent R T

Peak Search

Meas Tools

Next Peak

Next Pk Right

Next Pk Left

Min Search

Pk-Pk Search

More
1 of 2

Ref 15 dBm Atten 25 dB Mkr1 2.4794150 GHz 3.365 dBm

Peak Log 10 dB/

M1 S2
S3 FC
AA

Center 2.48 GHz Span 3 MHz
#Res BW 1 MHz #VBW 3 MHz Sweep 5 ms (401 pts)

8. Field Strength of Spurious Emissions

8.1 Standard Applicable

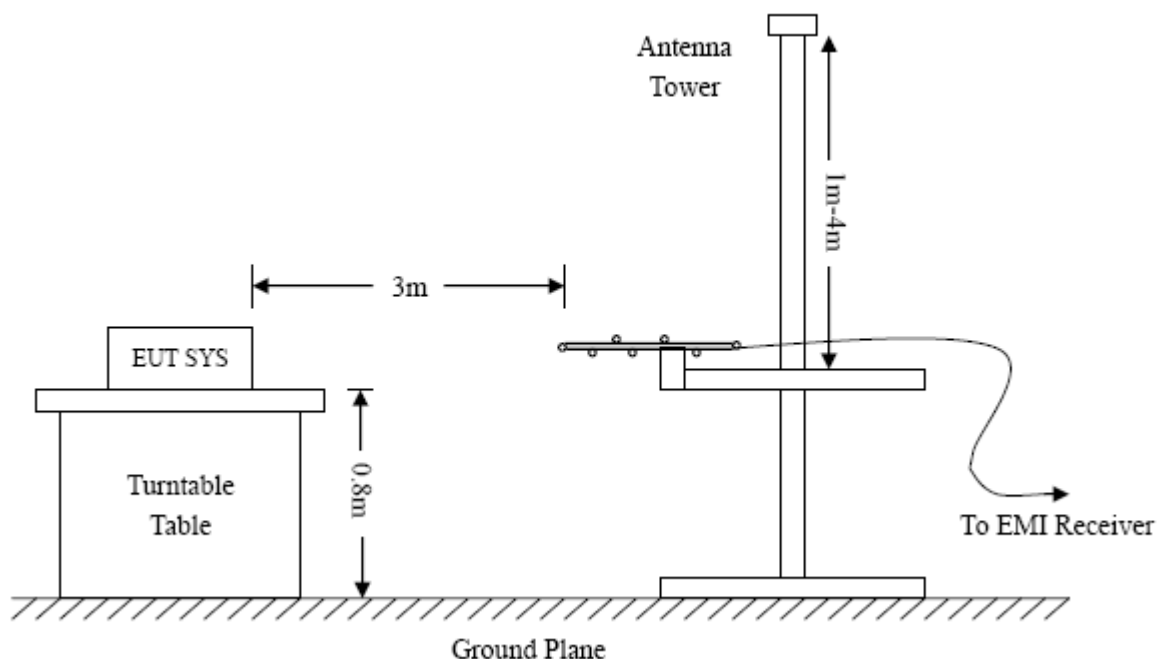
According to §15.247(d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within 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).

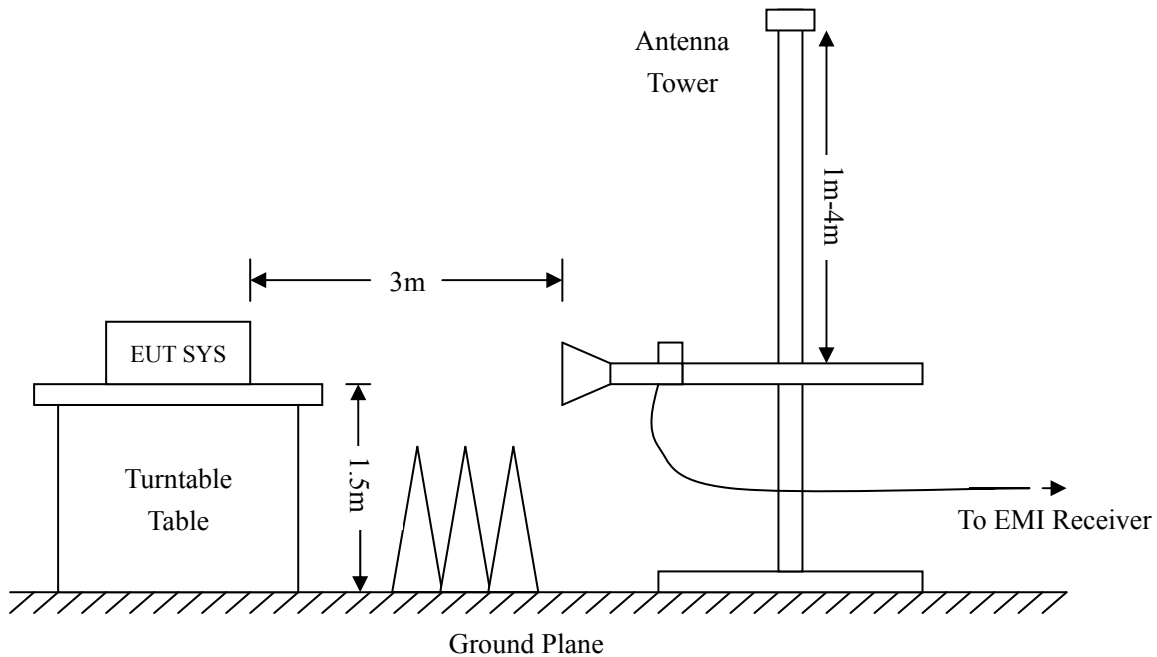
The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

8.2 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.205 15.247(a) and FCC Part 15.209 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle. The spacing between the peripherals was 10 cm.





Frequency :9kHz-30MHz

RBW=10KHz,

VBW =30KHz

Sweep time= Auto

Trace = max hold

Detector function = peak

Frequency :30MHz-1GHz

RBW=120KHz,

VBW=300KHz

Sweep time= Auto

Trace = max hold

Detector function = peak, QP

Frequency :Above 1GHz

RBW=1MHz,

VBW=3MHz(Peak), 10Hz(AV)

Sweep time= Auto

Trace = max hold

Detector function = peak, AV

8.3 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Ant. Factor} + \text{Cable Loss} - \text{Ampl. Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dBμV means the emission is 6dBμV below the maximum limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15 Limit}$$

8.4 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

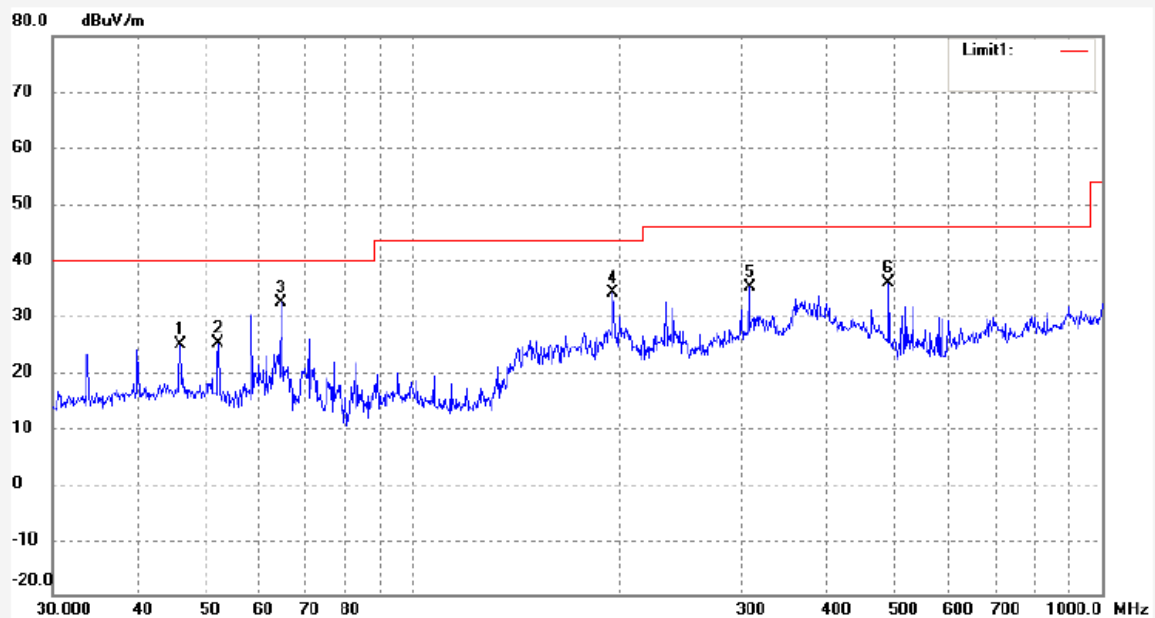
8.5 Summary of Test Results/Plots

According to the data below, the FCC Part 15.205, 15.209 and 15.247 standards, and had the worst cases:

Plot of Radiated Emissions Test Data

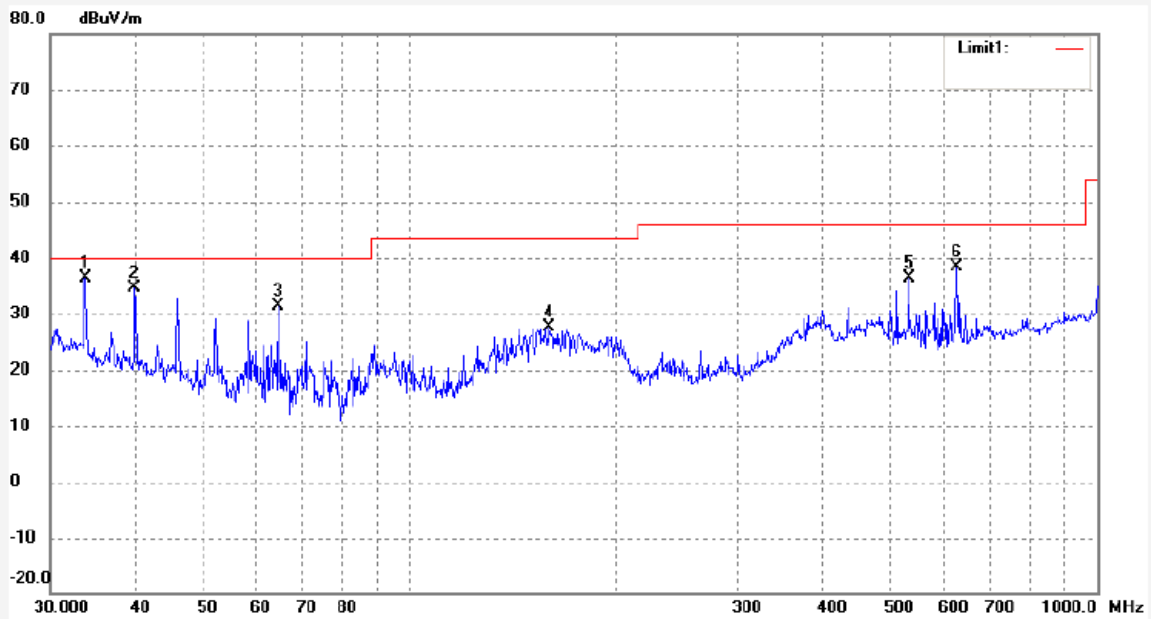
EUT: BC510 Edge Relay 1
 Tested Model: BC510
 Operating Condition: Transmitting-Low channel (2402MHz)
 Comment: 120V/60Hz; Adapter DC 5V/1A

Test Specification: Horizontal



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Margin (dB)	Detector	Remark
1	46.0164	35.47	-10.62	24.85	40.00	-15.15	peak	
2	52.2079	35.96	-10.94	25.02	40.00	-14.98	peak	
3*	64.4331	45.37	-13.10	32.27	40.00	-7.73	peak	
4	195.1365	46.30	-12.24	34.06	43.50	-9.44	peak	
5	307.8313	44.83	-9.70	35.13	46.00	-10.87	peak	
6	490.7447	41.56	-5.80	35.76	46.00	-10.24	peak	

Test Specification: Vertical



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Margin (dB)	Detector	Remark
1*	33.7986	48.33	-11.83	36.50	40.00	-3.50	peak	
2	39.8542	45.14	-10.44	34.70	40.00	-5.30	peak	
3	64.4331	46.11	-14.82	31.29	40.00	-8.71	peak	
4	159.7844	42.58	-15.03	27.55	43.50	-15.95	peak	
5	531.9635	42.18	-5.86	36.32	46.00	-9.68	peak	
6	625.0780	41.35	-2.90	38.45	46.00	-7.55	peak	

Plot of Radiated Emissions Test Data

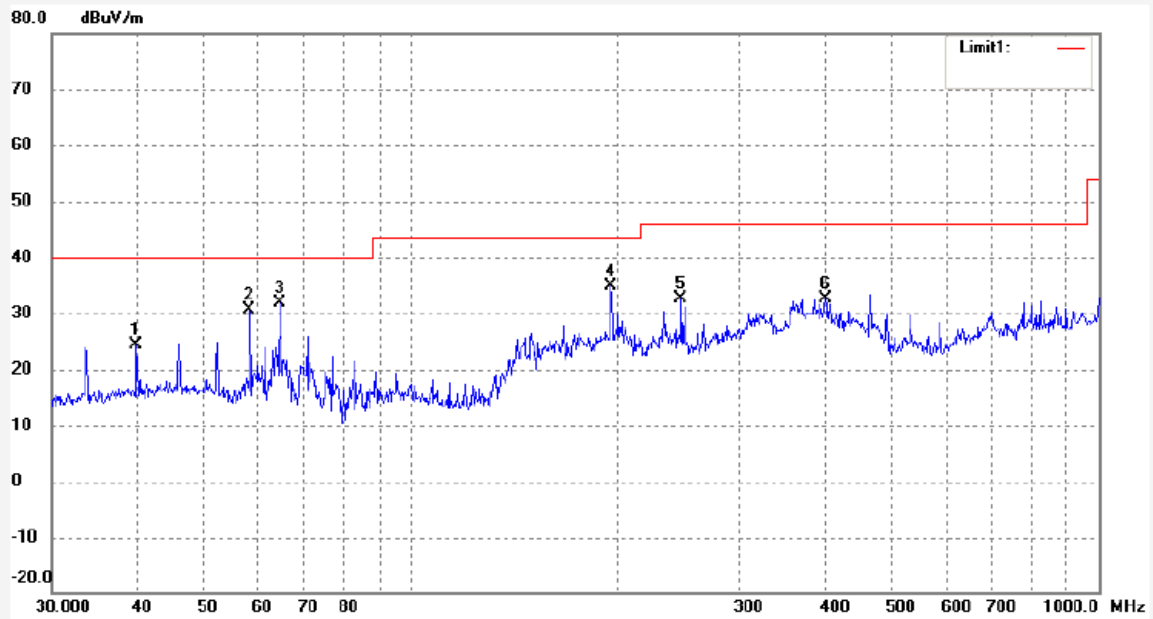
EUT: BC510 Edge Relay 1

Tested Model: BC510

Operating Condition: Transmitting-Middle channel (2440MHz)

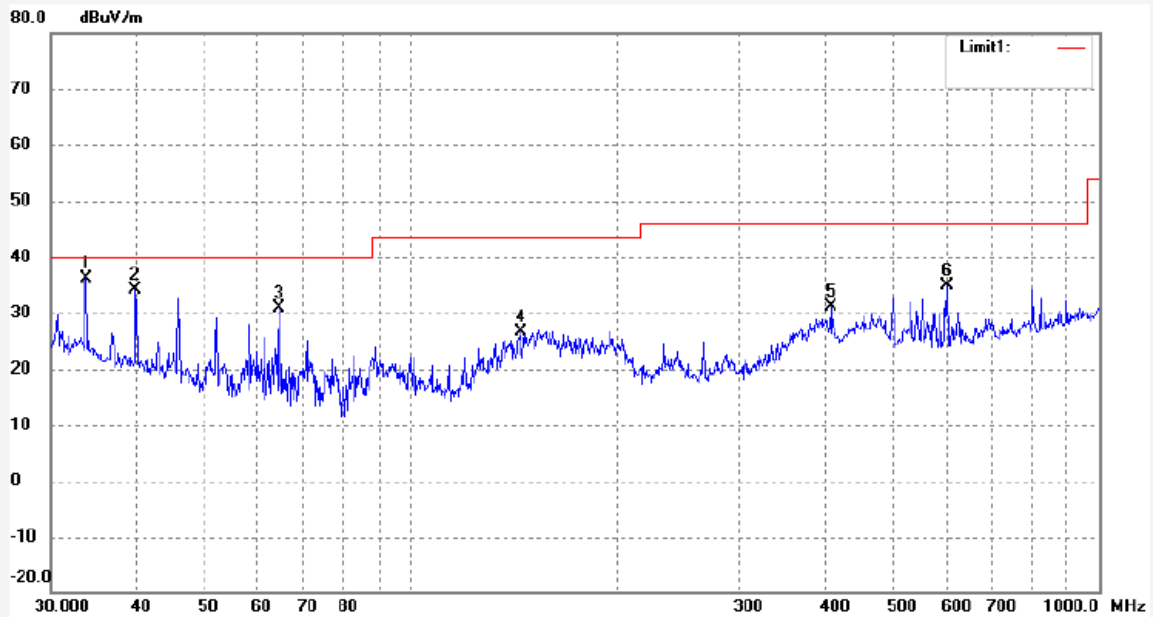
Comment: 120V/60Hz; Adapter DC 5V/1A

Test Specification: Horizontal



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Margin (dB)	Detector	Remark
1	39.8542	34.78	-10.44	24.34	40.00	-15.66	peak	
2	58.2030	42.13	-11.58	30.55	40.00	-9.45	peak	
3*	64.4331	45.07	-13.10	31.97	40.00	-8.03	peak	
4	195.1365	47.02	-12.24	34.78	43.50	-8.72	peak	
5	246.8149	43.35	-10.65	32.70	46.00	-13.30	peak	
6	400.4319	40.25	-7.61	32.64	46.00	-13.36	peak	

Test Specification: Vertical

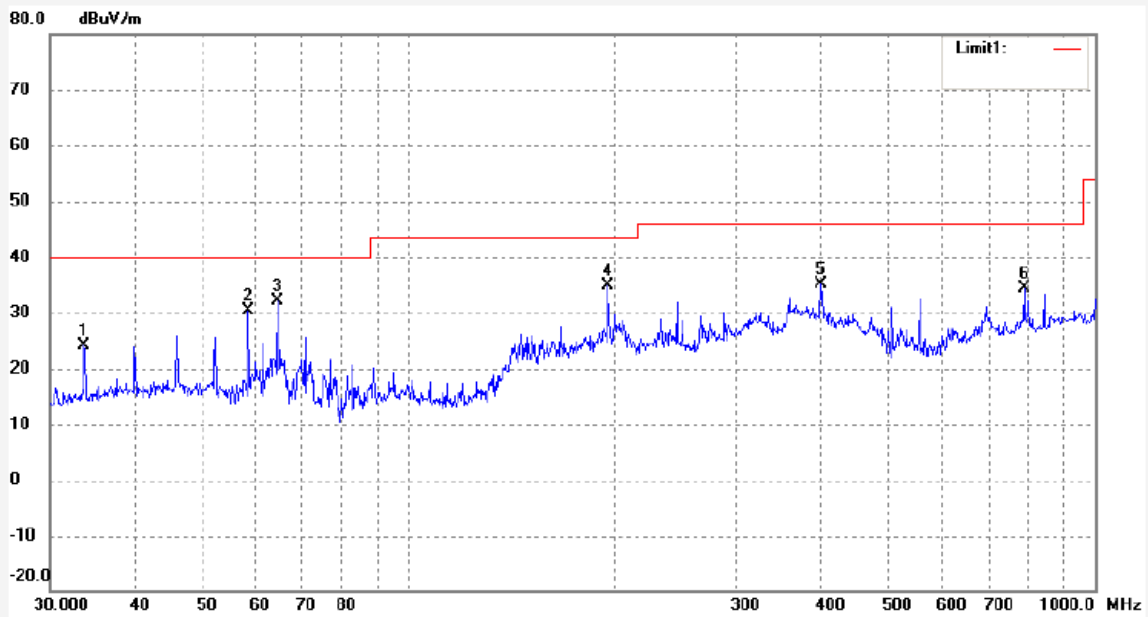


No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Margin (dB)	Detector	Remark
1*	33.7986	47.97	-11.83	36.14	40.00	-3.86	peak	
2	39.8542	44.51	-10.44	34.07	40.00	-5.93	peak	
3	64.4331	45.76	-14.82	30.94	40.00	-9.06	peak	
4	144.3348	41.49	-14.87	26.62	43.50	-16.88	peak	
5	407.5145	38.86	-7.72	31.14	46.00	-14.86	peak	
6	601.4265	39.01	-4.20	34.81	46.00	-11.19	peak	

Plot of Radiated Emissions Test Data

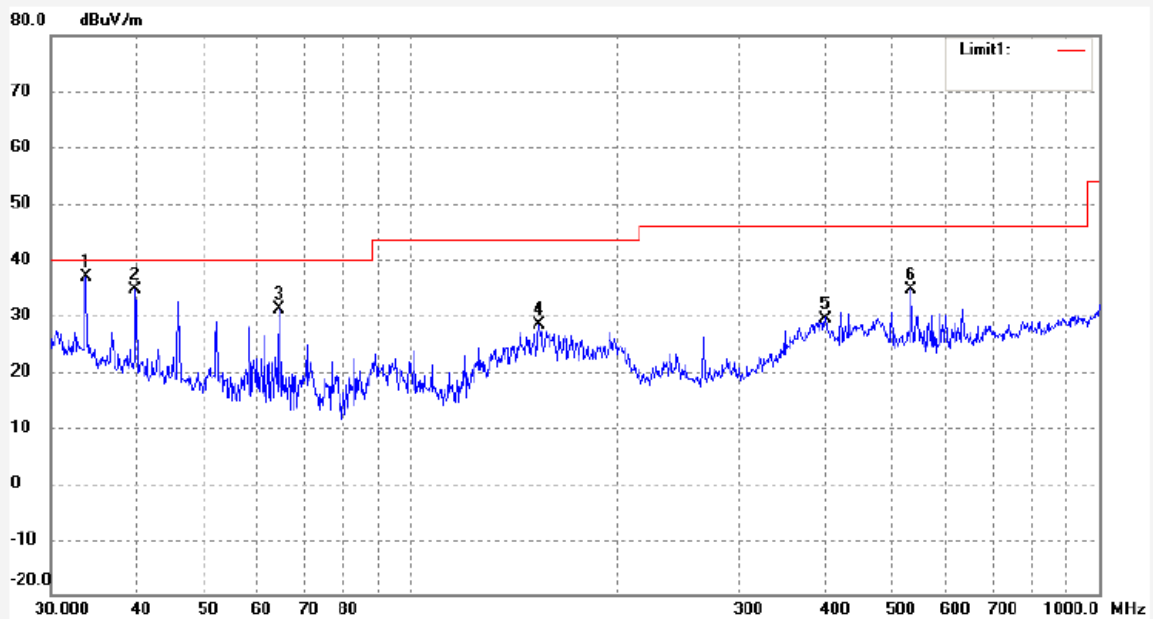
EUT: BC510 Edge Relay 1
 Tested Model: BC510
 Operating Condition: Transmitting-High channel (2480MHz)
 Comment: 120V/60Hz; Adapter DC 5V/1A

Test Specification: Horizontal



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Margin (dB)	Detector	Remark
1	33.6802	35.90	-11.86	24.04	40.00	-15.96	peak	
2	58.4074	42.00	-11.60	30.40	40.00	-9.60	peak	
3*	64.4331	45.34	-13.10	32.24	40.00	-7.76	peak	
4	195.1365	47.22	-12.24	34.98	43.50	-8.52	peak	
5	399.0302	42.74	-7.58	35.16	46.00	-10.84	peak	
6	787.8513	34.02	0.32	34.34	46.00	-11.66	peak	

Test Specification: Vertical



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Margin (dB)	Detector	Remark
1*	33.7986	48.67	-11.83	36.84	40.00	-3.16	peak	
2	39.8542	45.07	-10.44	34.63	40.00	-5.37	peak	
3	64.4331	45.93	-14.82	31.11	40.00	-8.89	peak	
4	153.7385	43.39	-14.98	28.41	43.50	-15.09	peak	
5	400.4319	37.11	-7.61	29.50	46.00	-16.50	peak	
6	533.8321	40.50	-5.82	34.68	46.00	-11.32	peak	

Spurious Emissions Above 1GHz

Transmitting: BLE mode:

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2402MHz							
4804	60.95	-3.39	57.56	74	-16.44	H	PK
4804	41.27	-3.19	38.08	54	-15.92	H	AV
7206	62.64	0.08	62.72	74	-11.28	H	PK
7206	42.03	0.18	42.21	54	-11.79	H	AV
4804	62.25	-3.49	58.76	74	-15.24	V	PK
4804	41.75	-3.09	38.66	54	-15.34	V	AV
7206	62.16	-0.22	61.94	74	-12.06	V	PK
7206	38.55	-0.22	38.33	54	-15.67	V	AV
Middle Channel-2440MHz							
4884	62.27	-3.29	58.98	74	-15.02	H	PK
4884	40.08	-3.09	36.99	54	-17.01	H	AV
7326	61.99	0.13	62.12	74	-11.88	H	PK
7326	42.34	0.23	42.57	54	-11.43	H	AV
4884	61.66	-3.39	58.27	74	-15.73	V	PK
4884	42.18	-2.99	39.19	54	-14.81	V	AV
7326	62.52	-0.17	62.35	74	-11.65	V	PK
7326	39.48	-0.17	39.31	54	-14.69	V	AV
High Channel-2480MHz							
4960	61.12	-3.21	57.91	74	-16.09	H	PK
4960	40.10	-3.01	37.09	54	-16.91	H	AV
7440	61.07	0.18	61.25	74	-12.75	H	PK
7440	42.02	0.28	42.30	54	-11.70	H	AV
4960	61.76	-3.31	58.45	74	-15.55	V	PK
4960	42.15	-2.91	39.24	54	-14.76	V	AV
7440	60.98	-0.12	60.86	74	-13.14	V	PK
7440	39.01	-0.12	38.89	54	-15.11	V	AV

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, other than listed in the table above are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

9. Out of Band Emissions

9.1 Standard Applicable

According to §15.247 (d) 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).

9.2 Test Procedure

According to the KDB 558074 D01 v04, the band-edge radiated test method as follows:

Set span = wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation (2310MHz to 2420MHz for low bandedge, 2460MHz to 2500MHz for the high bandedge)

RBW = 1MHz, VBW = 1MHz for peak value measured

RBW = 1MHz, VBW = 10Hz for average value measured

Sweep = auto; Detector function = peak/average; Trace = max hold

All the trace to stabilize, set the marker on the emission at the bandedge, or on the highest modulation product outside of the band, if this level is greater than that at the bandedge. Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. Those emission must comply with the 15.209 limit for fall in the restricted bands listed in section 15.205. Note that the method of measurement KDB publication number: 913591 may be used for the radiated bandedge measurements.

According to the KDB 558074 D01 v04, the conducted spurious emissions test method as follows:

1. Set start frequency to DTS channel edge frequency.
2. Set stop frequency so as to encompass the spectrum to be examined.
3. Set RBW = 100 kHz.
4. Set VBW \geq 300 kHz.
5. Detector = peak.
6. Trace Mode = max hold.
7. Sweep = auto couple.
8. Allow the trace to stabilize (this may take some time, depending on the extent of the span).
9. Use peak marker function to determine maximum amplitude of all unwanted emissions within any 100 kHz bandwidth.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements specified in section 8.1. Report the three highest emissions relative to the limit.

9.3 Environmental Conditions

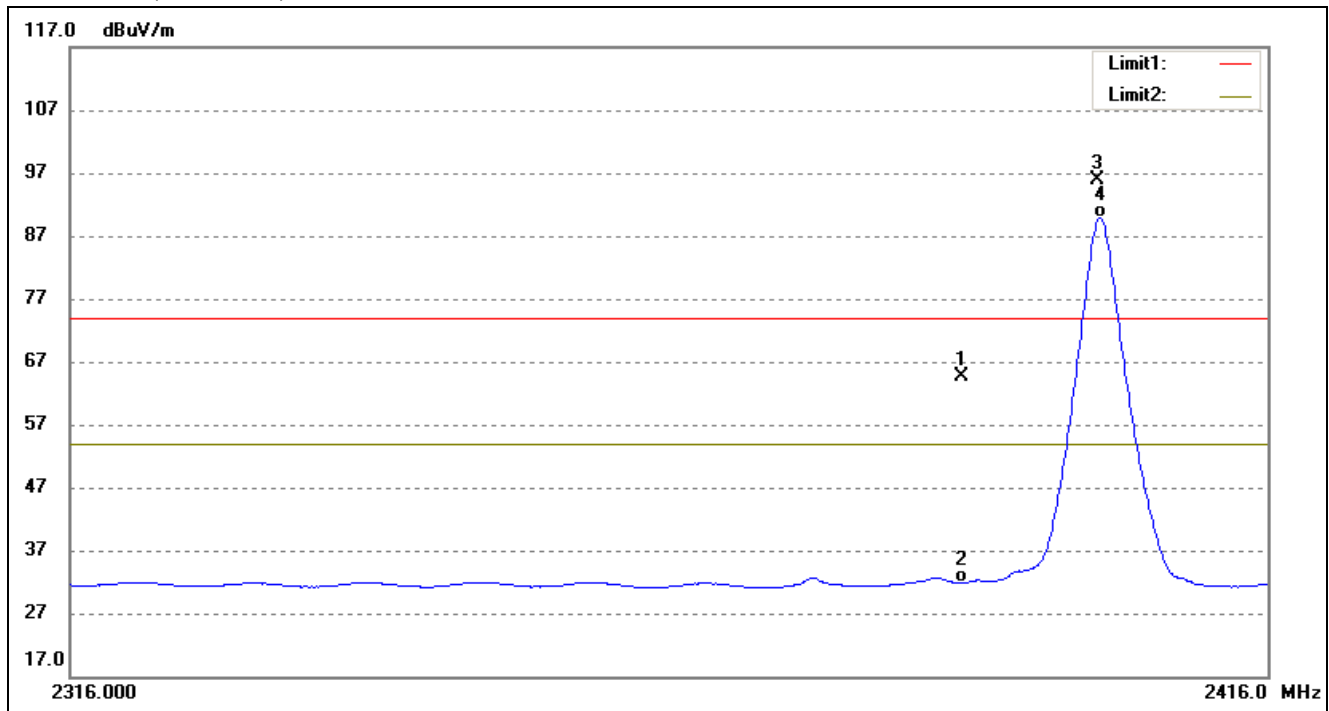
Temperature:	23°C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

9.4 Summary of Test Results/Plots

Bandedge (Radiated)

Lowest Bandedge-BLE

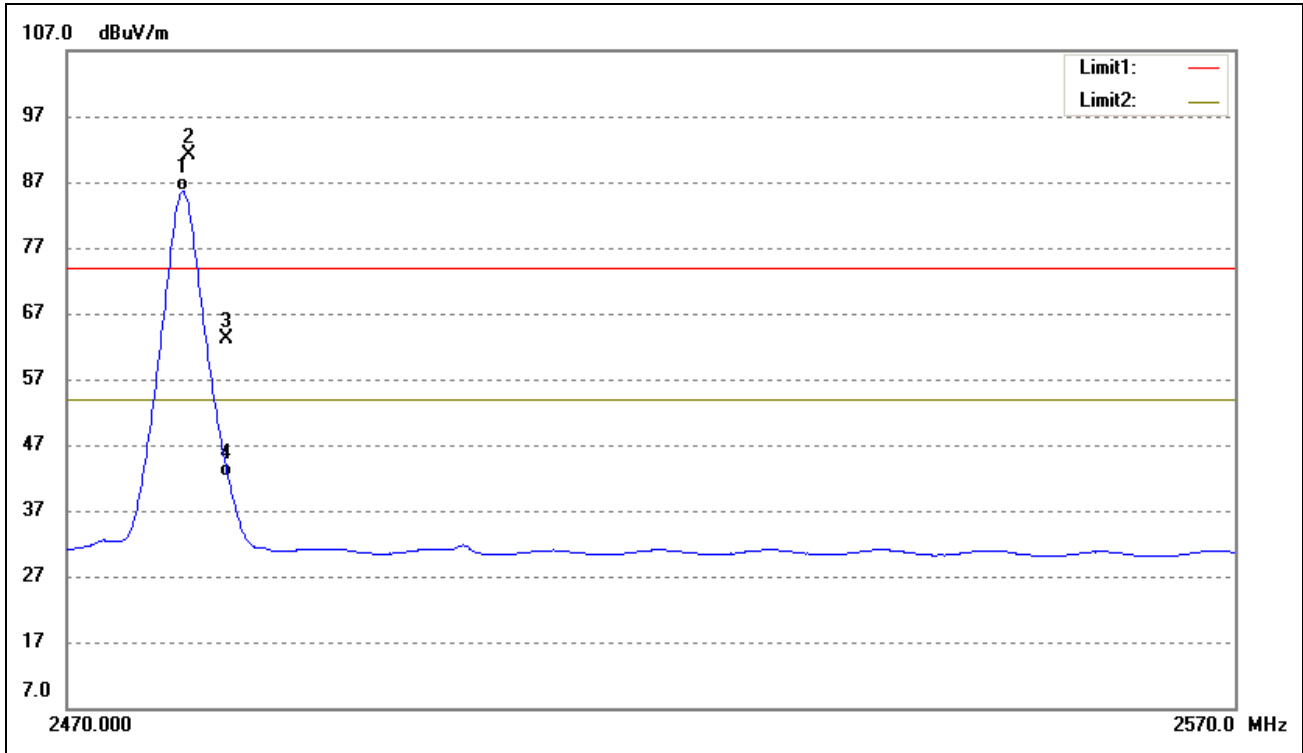
Horizontal (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	2390.000	71.79	-7.26	64.53	74.00	-9.47	153	100	peak
2	2390.000	39.21	-7.26	31.95	54.00	-22.05	187	100	AVG
3	2401.500	103.28	-7.38	95.90	/	/	235	100	peak
4	2401.744	97.34	-7.39	89.95	/	/	342	100	AVG

Highest Bandedge-BLE

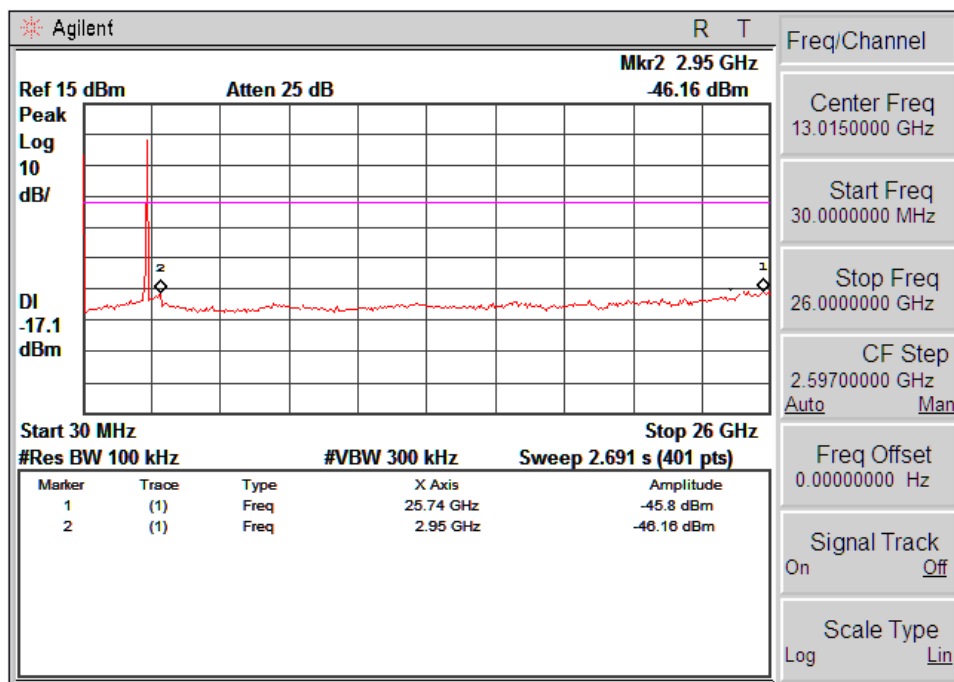
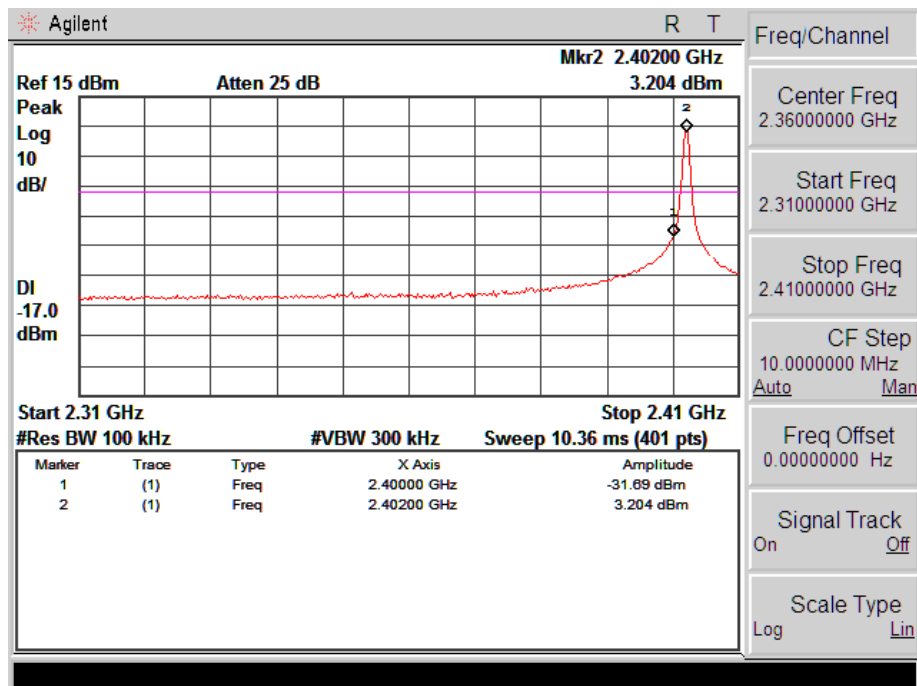
Horizontal (Worst case)



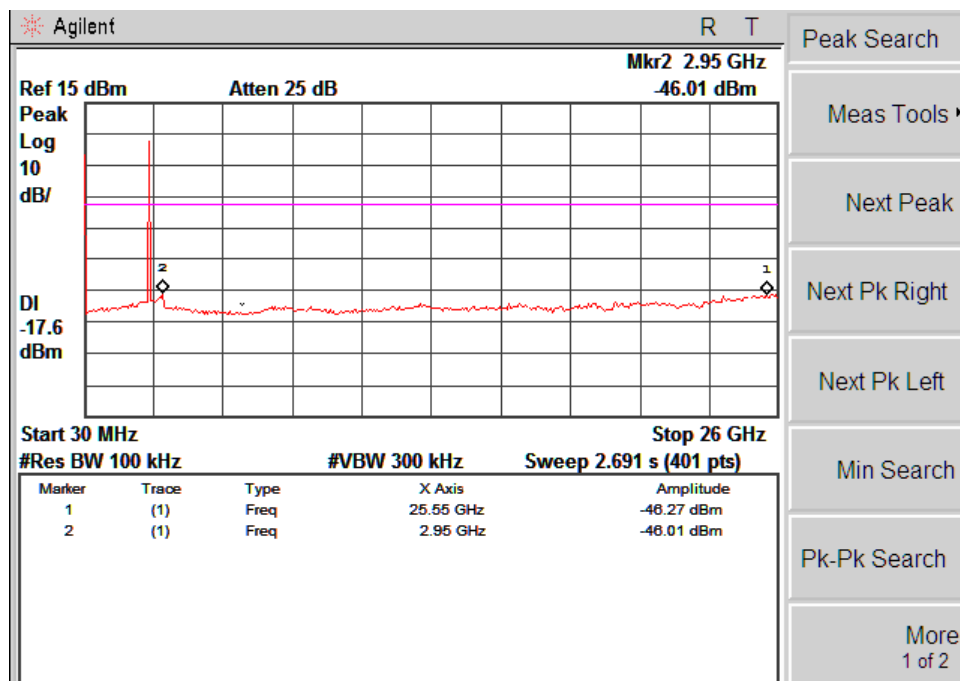
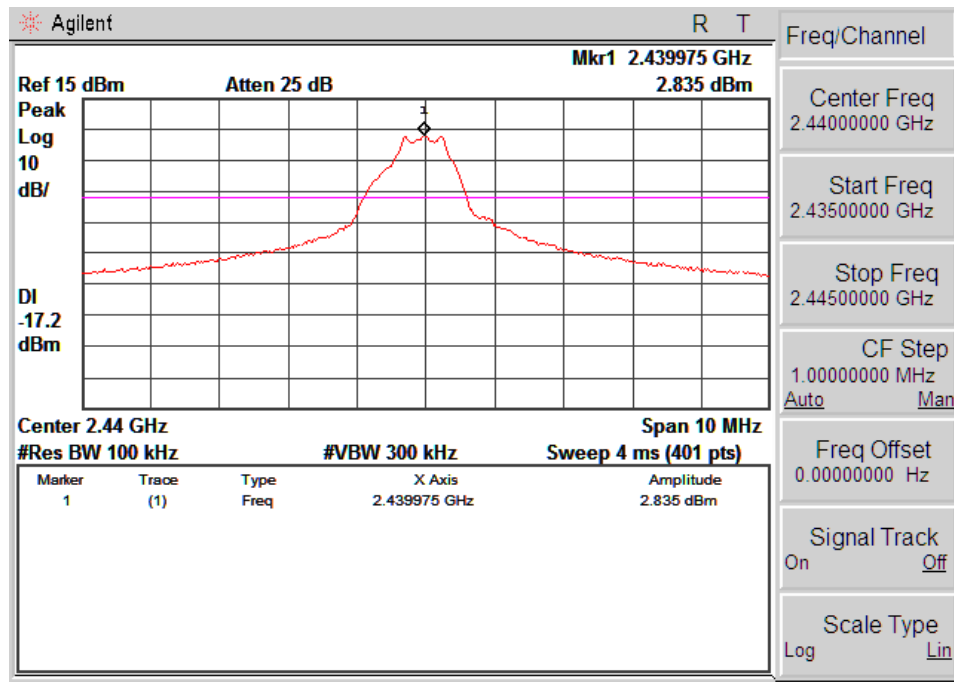
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	2479.724	92.94	-7.28	85.66	/	/	106	100	AVG
2	2480.300	98.49	-7.28	91.21	/	/	153	100	peak
3	2483.500	70.31	-7.28	63.03	74.00	-10.97	246	100	peak
4	2483.500	49.51	-7.28	42.23	54.00	-11.77	204	100	AVG

Bandedge (Conducted)

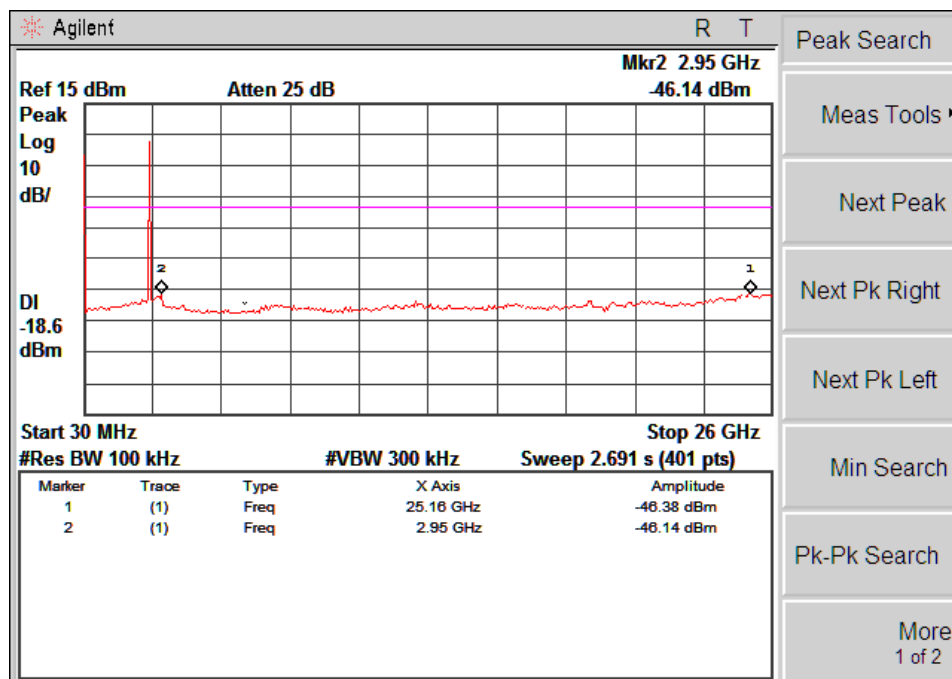
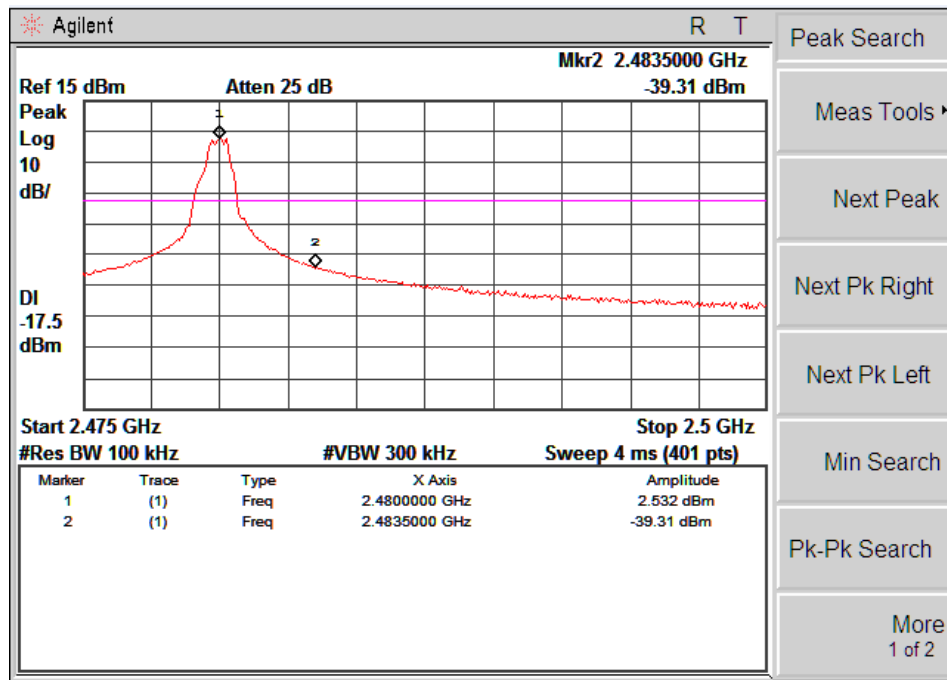
Lowest



Middle Channel:



High Channel:



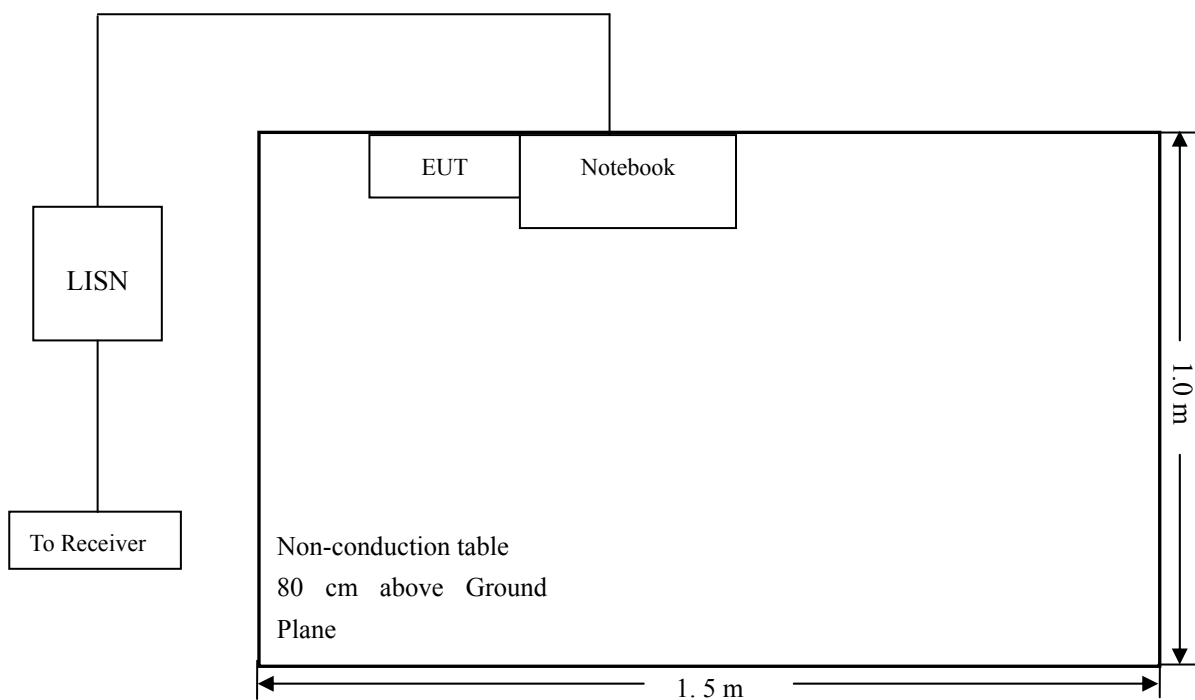
10. Conducted Emissions

10.1 Test Procedure

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

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle. The spacing between the peripherals was 10 cm.

10.2 Basic Test Setup Block Diagram



10.3 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

10.4 Test Receiver Setup

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

Start Frequency	150 kHz
Stop Frequency.....	30 MHz
Sweep Speed	Auto
IF Bandwidth.....	10 kHz
Quasi-Peak Adapter Bandwidth	9 kHz
Quasi-Peak Adapter Mode	Normal

10.5 Summary of Test Results/Plots

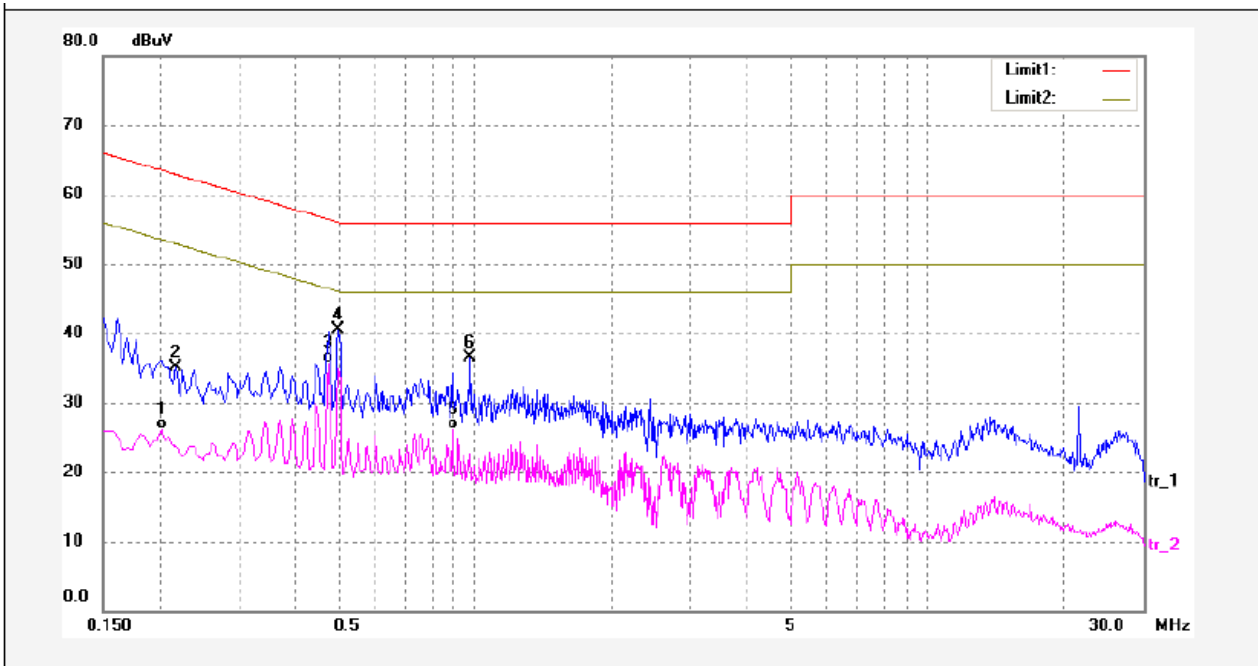
According to the data in section 10.6, the EUT complied with the FCC Part 15.207 Conducted margin for this device, with the *worst* margin reading of:

10.6 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

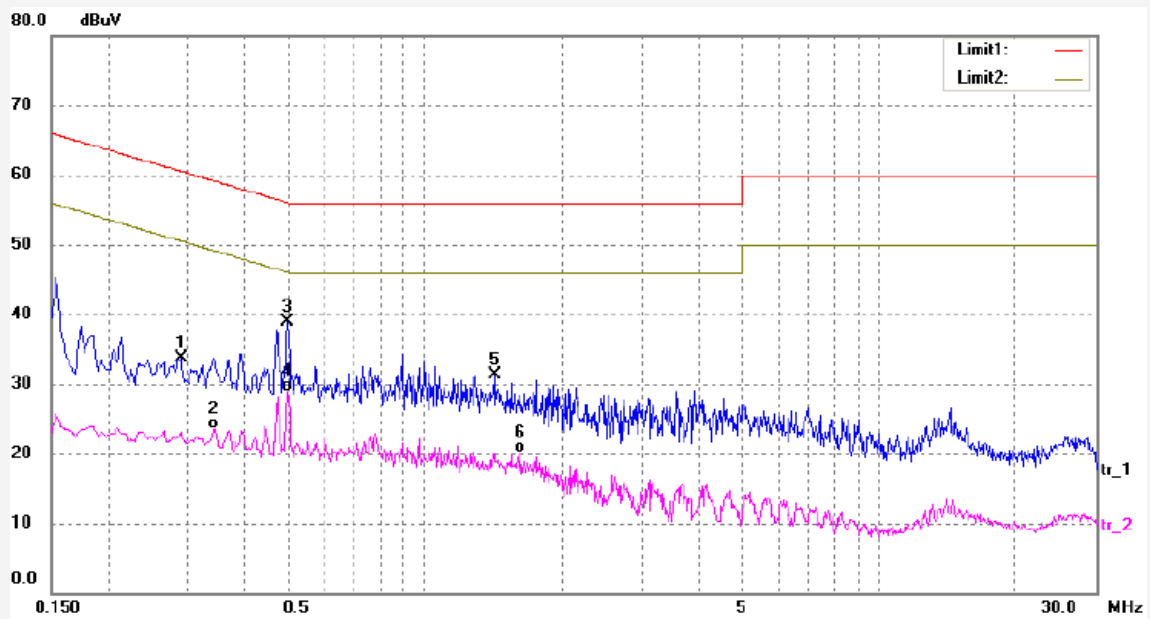
EUT: BC510 Edge Relay 1
 Tested Model: BC510
 Operating Condition: Transmitting USB
 Comment: AC 120V/60Hz; Adapter DC5V/1A

Test Specification: Neutral



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dB	Margin (dB)	Detector	Remark
1	0.2020	16.24	9.80	26.04	53.52	-27.48	AVG	
2	0.2180	25.32	9.80	35.12	62.89	-27.77	peak	
3	0.4740	25.89	9.80	35.69	46.44	-10.75	AVG	
4	0.4980	30.66	9.80	40.46	56.03	-15.57	peak	
5	0.8940	16.33	9.77	26.10	46.00	-19.90	AVG	
6	0.9740	26.68	9.76	36.44	56.00	-19.56	peak	

Test Specification: Line

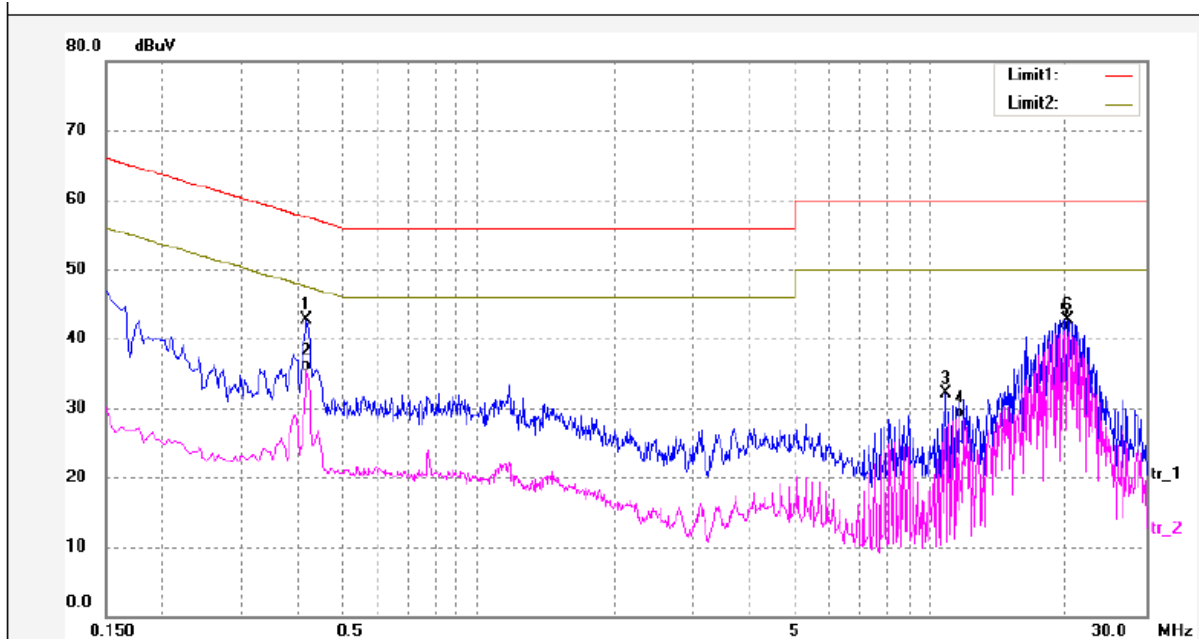


No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dB	Margin (dB)	Detector	Remark
1	0.2900	23.87	9.80	33.67	60.52	-26.85	peak	
2	0.3420	13.78	9.80	23.58	49.15	-25.57	AVG	
3	0.4980	29.03	9.80	38.83	56.03	-17.20	peak	
4	0.4980	19.15	9.80	28.95	46.03	-17.08	AVG	
5	1.4220	21.48	9.75	31.23	56.00	-24.77	peak	
6	1.6260	10.30	9.74	20.04	46.00	-25.96	AVG	

Plot of Conducted Emissions Test Data

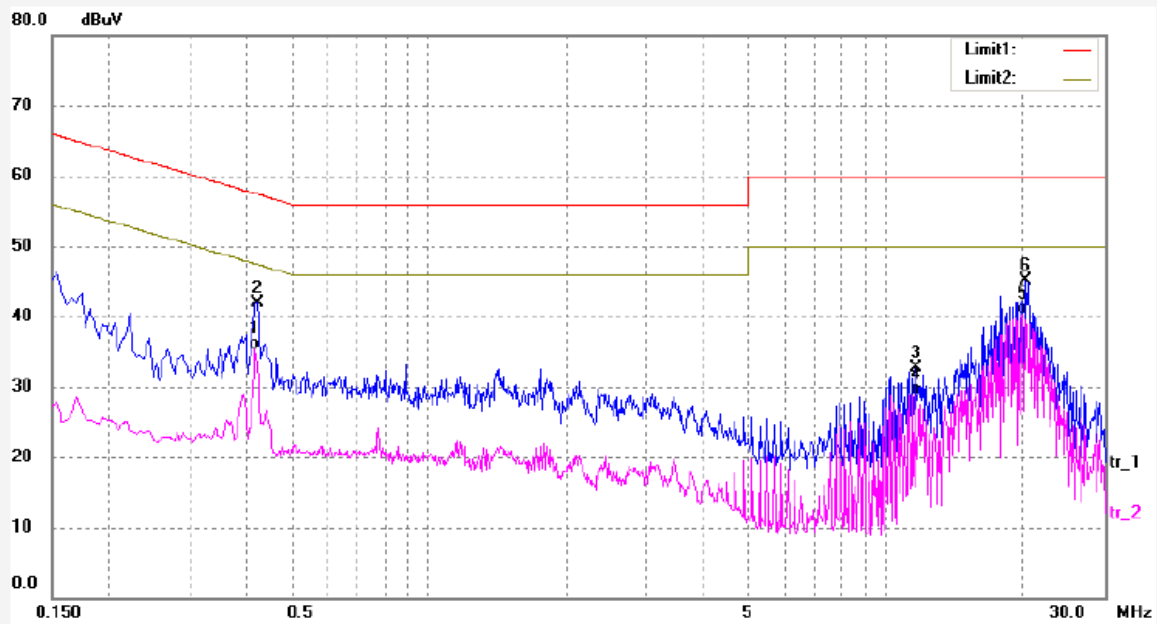
EUT: BC510 Edge Relay 1
 Tested Model: BC510
 Operating Condition: Transmitting GFSK POE-RJ45
 Comment: AC 120V/60Hz;

Test Specification: Neutral



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dB	Margin (dB)	Detector	Remark
1	0.4180	32.98	9.80	42.78	57.49	-14.71	peak	
2	0.4180	25.44	9.80	35.24	47.49	-12.25	AVG	
3	10.7940	22.59	9.53	32.12	60.00	-27.88	peak	
4	11.6100	18.87	9.55	28.42	50.00	-21.58	AVG	
5	19.8540	31.43	9.68	41.11	50.00	-8.89	AVG	
6	20.0940	33.02	9.68	42.70	60.00	-17.30	peak	

Test Specification: Line



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dB	Margin (dB)	Detector	Remark
1	0.4180	25.46	9.80	35.26	47.49	-12.23	AVG	
2	0.4220	32.18	9.80	41.98	57.41	-15.43	peak	
3	11.6059	23.08	9.55	32.63	60.00	-27.37	peak	
4	11.6059	19.43	9.55	28.98	50.00	-21.02	AVG	
5	19.8740	30.62	9.68	40.30	50.00	-9.70	AVG	
6	20.2580	35.36	9.68	45.04	60.00	-14.96	peak	

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