



FCC 47 CFR PART 15 SUBPART C 15.247

TEST REPORT

FOR

Wireless Pocket Scanner

Model : MB300i, MB200i

Trade Name: Champtek

Issued to

Champtek Incorporated
5/F, No. 2, Alley 2, Shih-Wei Lane, Chung-Cheng Rd., Xindian Dist.,
New Taipei City 231, Taiwan

Issued by
WEISHANG Certification Co., Ltd.

Xizhi Office	12F.-3, No.27-1, Ln. 169, Kangning St., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)
Test Site	No. 74-1, Shibachong Xi, Shiding Shiang, New Taipei City 223, Taiwan (R.O.C.)

Note: This test refers exclusively to the test presented test model and sample. This report shall not be reproduced except in full, without the written approval of WEISHANG Certification Co., Ltd. This document may be altered or revised by WEISHANG Certification Co., Ltd. Personnel only, and shall be noted in the revision section of the document.



Contents

1. General Information	4
2. Report of Measurements and Examinations	5
2.1 List of Measurements and Examinations	5
3. Test Configuration of Equipment under Test	6
3.1 Description of the tested samples	6
3.2 Carrier Frequency of Channels	7
3.3 Test Mode and Test Software	8
3.4 TEST Methodology & General Test Procedures	9
3.5 Measurement Uncertainty	10
3.6 Description of the Support Equipments	10
4. Test and measurement equipment	11
4.1 calibration	11
4.2 equipment	11
5. Antenna Requirements	13
5.1 Standard Applicable	13
5.2 Antenna Construction and Directional Gain	13
6. Test of Conducted Emission	14
6.1 Test Limit	14
6.2 Test Procedures	14
6.3 Typical Test Setup	15
6.4 Test Result and Data	16
7. Test of Radiated Emission	17
7.1 Test Limit	17
7.2 Test Procedures	17
7.3 Typical Test Setup	18
7.4 Test Result and Data (9kHz ~ 30MHz)	20
7.5 Test Result and Data (30MHz ~ 1GHz, worst emissions found)	20
7.6 Test Result and Data (Above 1GHz)	22
8. 20dB Bandwidth Measurement Data	41
8.1 Test Limit	41
8.2 Test Procedures	41
8.3 Test Setup Layout	41
8.4 Test Result and Data	42
9. Frequencies Separation	48
9.1 Test Limit	48
9.2 Test Procedures	48
9.3 Test Setup Layout	48
9.4 Test Result and Data	49
10. Dwell Time on each channel	55
10.1 Test Limit	55



10.2	Test Procedures	55
10.3	Test Setup Layout	55
10.4	Test Result and Data	56
11.	Number of Hopping Channels.....	75
11.1	Test Limit	75
11.2	Test Procedures	75
11.3	Test Setup Layout	75
11.4	Test Result and Data	75
12.	Pseudorandom Frequency Hopping Sequence.....	81
13.	Maximum Peak Output Power.....	82
13.1	Test Limit	82
13.2	Test Procedures	82
13.3	Test Setup Layout	82
13.4	Test Result and Data	83
14.	Band Edges Measurement	89
14.1	Test Limit	89
14.2	Test Procedure	89
14.3	Test Setup Layout	89
14.4	Test Result and Data	89
14.5	Restrict Band Emission Measurement Data	96
15.	Restricted Bands of Operation.....	99
15.1	Labeling Requirement	99



1. General Information

Applicant : **Champtek Incorporated**

Address : **5/F, No. 2, Alley 2, Shih-Wei Lane, Chung-Cheng Rd.,
Xindian Dist., New Taipei City 231, Taiwan**

Manufacturer : **Champtek Incorporated**

Address : **5/F, No. 2, Alley 2, Shih-Wei Lane, Chung-Cheng Rd.,
Xindian Dist., New Taipei City 231, Taiwan**

EUT : **Wireless Pocket Scanner**

Model Name : **MB300i, MB200i**

Model Differences : **All covered models have electrically identical on the
circuitry to each other, except on MB200i that no OLED
display panel and less functions are provided.**

Is here with confirmed to comply with the requirements set out in the FCC Rules and Regulations Part 15 Subpart C and the measurement procedures were according to ANSI C63.10-2013. The said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment are within the compliance requirements.

FCC part 15 subpart C

Receipt Date : 11/12/2015

Final Test Date : 12/21/2015

Tested By:

Reviewed by:

Dec. 22, 2015

Date

Ben Lu / Engineer

Dec. 22, 2015

Date

Brian Yu / Manager
Designation Number: TW1048



2. Report of Measurements and Examinations

2.1 List of Measurements and Examinations

FCC Rule	Description of Test	Result
15.203	. Antenna Requirement	Pass
15.207	. Conducted Emission	Not applicable
15.209	. Radiated Emission	Pass
15.247(a)(1)	. Channel Carrier Frequencies Separation	Pass
15.247(a)(1)	. 20dB Bandwidth Measurement	Pass
15.247(a)(1)	. Dwell Time	Pass
15.247(b)	. Number of Hopping Channels	Pass
FCC PUBLIC NOTICE DA-00-0705	Pseudorandom Frequency Hopping Sequence	Pass
15.247(b)	. Peak Output Power Measurement Data	Pass
15.247(d)	. Band Edges Measurement Data	Pass

*Note : All test sites and the data are completed in the lab with TAF qualifications. (TW1048)

Test location;

Max Light Technology Co., Ltd.

No. 74-4, Shibachong Xi, Shiding Dist., New Taipei City, Taiwan (R.O.C.)



3. Test Configuration of Equipment under Test

3.1 Description of the tested samples

EUT Name : Wireless Pocket Scanner

Model Number : MB300i

FCC ID : WOIMB300I

Receipt Date : 11/12/2015

Input Voltage : (1) DC 3.7V (From Li-ion Battery)
(2) DC 5V (From PC or Notebook)

RF Output Power : 4.266 dBm

Power From : ☒Inside ☒Outside
☐Adaptor ☒Battery ☐AC Power Source ☐DC Power Source
☒Support Unit PC or Notebook

Operate Frequency : Refer to the channel list as described below (2.402 ~2.480 GHz)

Modulation Technique : GFSK , $\pi/4$ -DQPSK , 8DPSK

Number of Channels : 79

Channel spacing : ☐N/A ☒ 1 MHz

Operating Mode : ☐Simplex ☒Duplex

Antenna Type : Chip antenna

Channel bandwidth : 1 MHz

Antenna gain : -0.5 dBi



3.2 Carrier Frequency of Channels

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	20	2422	40	2442	60	2462
01	2403	21	2423	41	2443	61	2463
02	2404	22	2424	42	2444	62	2464
03	2405	23	2425	43	2445	63	2465
04	2406	24	2426	44	2446	64	2466
05	2407	25	2427	45	2447	65	2467
06	2408	26	2428	46	2448	66	2468
07	2409	27	2429	47	2449	67	2469
08	2410	28	2430	48	2450	68	2470
09	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461	---	---



3.3 Test Mode and Test Software

- a. During testing, the interface cables and equipment positions were varied according to ANSI C63.10.
- b. The complete test system included Notebook and EUT for RF test.
- c. An executive "BLUETEST3" under WIN8 was executed to keep transmitting and receiving data via Wireless.
- d. New Battery was used for all testing and the worst radiated emission case from X,Y and Z axis evaluation was selected for testing.
- e. The following test modes were performed for test:
 - GFSK: CH 00: 2402MHz, CH 39: 2441MHz, CH 78: 2480MHz.
 - $\pi/4$ -DQPSK: CH 00: 2402MHz, CH 39: 2441MHz, CH 78: 2480MHz.
 - 8DPSK: CH 00: 2402MHz, CH 39: 2441MHz, CH 78: 2480MHz.

3.4 TEST Methodology & General Test Procedures

All testing as described bellowed were performed in accordance with ANSI C63.4:2014, C63.10:2013 and FCC CFR 47 Part 15 Subpart C.

Conducted Emissions

The EUT is placed on a wood table, which is at 0.8 m above ground plane acceding to clause 15.207 and requirements of ANSI C63.4 and C63.10. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz are using CISPR Quasi-Peak / Average detectors. The resolution bandwidth of test receiver/spectrum analyzer is 9 KHz and video bandwidth is 100 KHz.

Radiated Emissions

The EUT is a placed on a turn table, which is 0.8 m above ground plane (1.5 m for above 1GHz). The turntable was rotated through 360 degrees to determine the position of maximum emission level. The EUT is placed at 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

- 1) Putting the EUT on the platform and turning on the EUT (on/off button on the bottom of the EUT).
- 2) Setting test channel described as "Channel setting and operating condition", and testing channel by channel.
- 3) For the spurious emission test based on ANSI C63.4 and C63.10, the resolution bandwidth of test receiver/spectrum analyzer is 120 KHz and video bandwidth is 300 KHz for Quasi-peak detection at frequency 30 MHz~1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3 MHz for Peak detection at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz Peak detector for Average Value at frequency above 1GHz



3.5 Measurement Uncertainty

Measurement Item	Uncertainty
Conducted emissions	± 2.24 dB
Radiated emissions (30MHz ~ 1GHz)	± 3.96 dB
Radiated emissions (above 1GHz)	± 3.74 dB

3.6 Description of the Support Equipments

Setup Diagram

See test photographs attached in appendix 1 for the actual connections between EUT and support equipment.

Support Equipment

Peripherals Devices:

OUTSIDE SUPPORT EQUIPMENT							
No.	Equipment	Model	Serial No.	FCC ID/ BSMI ID	Trade name	Data Cable	Power Cord
1.	N/A						

Note: All the above equipment /cable were placed in worse case position to maximize emission signals during emission test

Grounding: Grounding was in accordance with the manufacturer's requirement and conditions for the intended use.



4. Test and measurement equipment

4.1 calibration

The measuring equipment utilized to perform the tests documented in the report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2 equipment

The following list contains measurement equipment used for testing. The equipment conforms to the requirement of CISPR 16-1, ANSI C63.2 and. Other required standards.

Calibration of all test and measurement, including any accessories that may effect such calibration, is checked frequently to ensure the accuracy. Adjustments are made and correction factors are applied in accordance with the instructions contained in the respective.

**TABLELIST OF TEST AND MEASUREMENT EQUIPMENT**

Item	Instrument	Manufacturer	Model No.	S/N	Next Cal. Date
1.	Spectrum Analyzer	HP	8691EM	72412A00110	2016/09/29
2.	Pre Amplifier	MLT	PREAMP6G-01	20110209	2016/03/16
3.	Pre Amplifier	MLT	PREAMP6G-02	20110301	2016/03/16
4.	Biconilog Antenna	EMCO	3142C	00044568	2016/09/11
5.	Spectrum Analyzer	Agilent	E7403A	US40240137	2016/03/15
6.	LISN	EMCO	3825/2	2658	2016/11/09
7.	Spectrum Analyzer	Agilent	E4446A	US44300422	2016/02/03
8.	Biconilog Antenna	EMCO	3142C	00059739	2016/09/11
9.	Home Antenna	SCHWARZBECK	BBHA 9120D	304	2016/10/28
10.	Home Antenna	SCHWARZBECK	BBHA 9170	181	2016/10/29
11.	TA	TA	0.10~19.1GHz 60dBm	RF01	2016/08/21
12.	Herotek	Pre Amplifier	A402-417	30690	2016/11/16
13.	Spectrum Analyzer	Agilent	N9010A	MY50060164	2016/04/08

#: Calibration interval of instruments listed above is one year



5. Antenna Requirements

5.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 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.

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

5.2 Antenna Construction and Directional Gain

Antenna Type: Chip Antenna

Antenna Gain: -0.5 dBi

6. Test of Conducted Emission

6.1 Test Limit

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz on the 120 VAC power and return leads of the EUT according to the methods defined in ANSI C63.4-2014. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

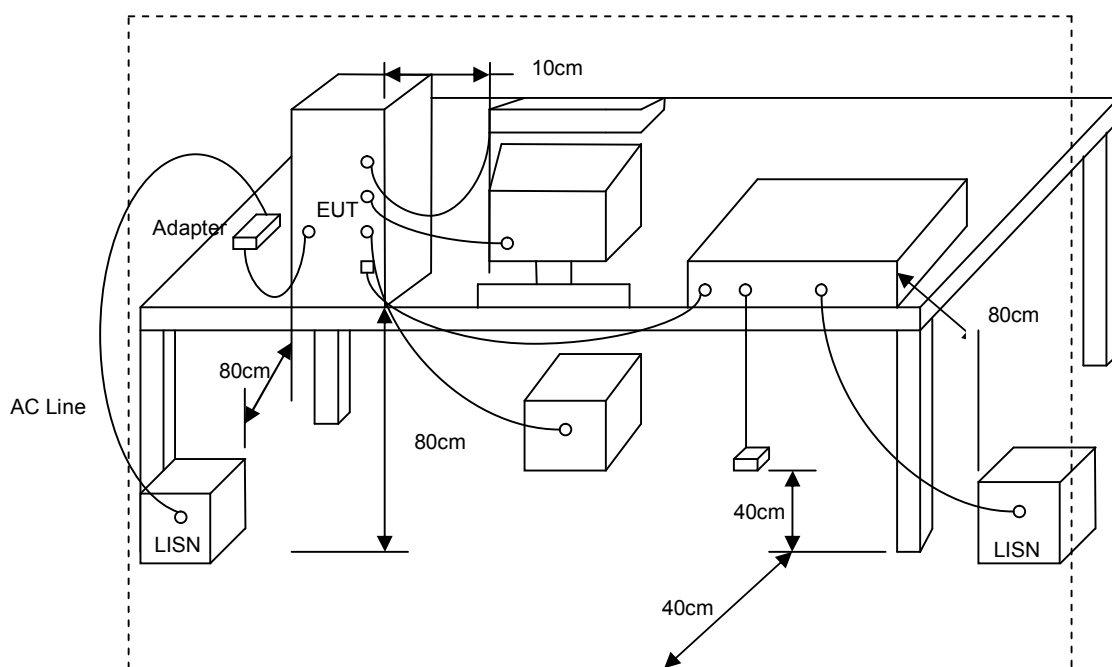
Frequency (MHz)	Quasi Peak (dB μ V)	Average (dB μ V)
0.15 – 0.5	66-56*	56-46*
0.5 – 5.0	56	46
5.0 – 30.0	60	50

*Decreases with the logarithm of the frequency.

6.2 Test Procedures

- The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- Connect EUT to the power mains through a line impedance stabilization network (LISN).
- All the support units are connecting to the other LISN.
- The LISN provides 50 ohm coupling impedance for the measuring instrument.
- The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
- Both sides of AC line were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30 MHz was searched.
- Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

6.3 Typical Test Setup





6.4 Test Result and Data

This EUT USB ports only charging function, and therefore do not need to test the power line conducted emissions.

7. Test of Radiated Emission

7.1 Test Limit

Radiated Emissions were measured from 9 KHz to 25 GHz and return leads of the EUT according to the methods defined in ANSI C63.4-2014. In any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. If the transmitter measurement is based on the maximum conducted output power, the attenuation required under this paragraph shall be 30dB instead of 20dB. In addition, radiated emissions which fall in section 15.205(a) the restricted bands must also comply with the radiated emission limit specified in section 15.209(a).

Frequency (MHz)	Field Strength (microvolt/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

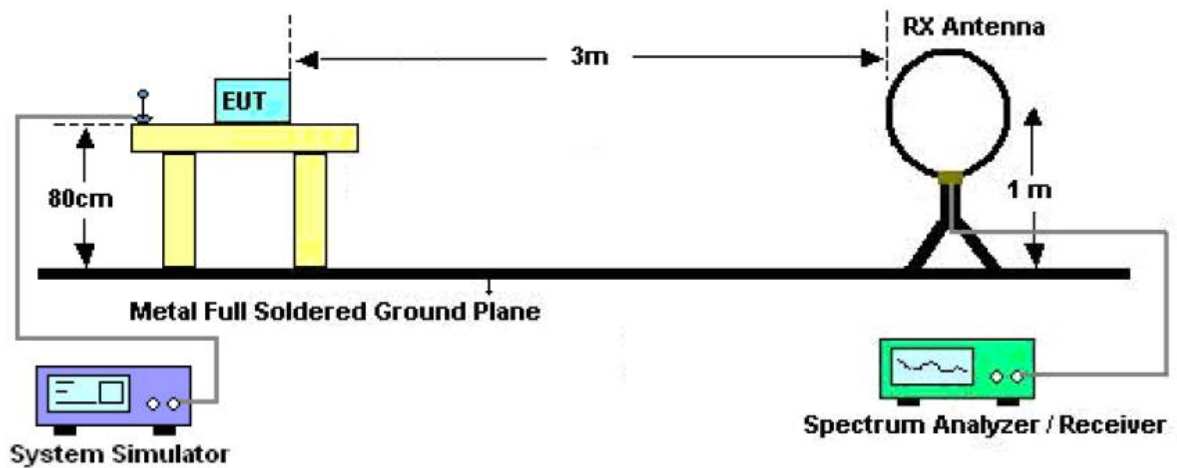
7.2 Test Procedures

- The EUT was placed on a rotatable table top 0.8 meter above ground (1.5m for above 1GHz).
- The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- The table was rotated 360 degrees to determine the position of the highest radiation.
- The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
- Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.
- For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

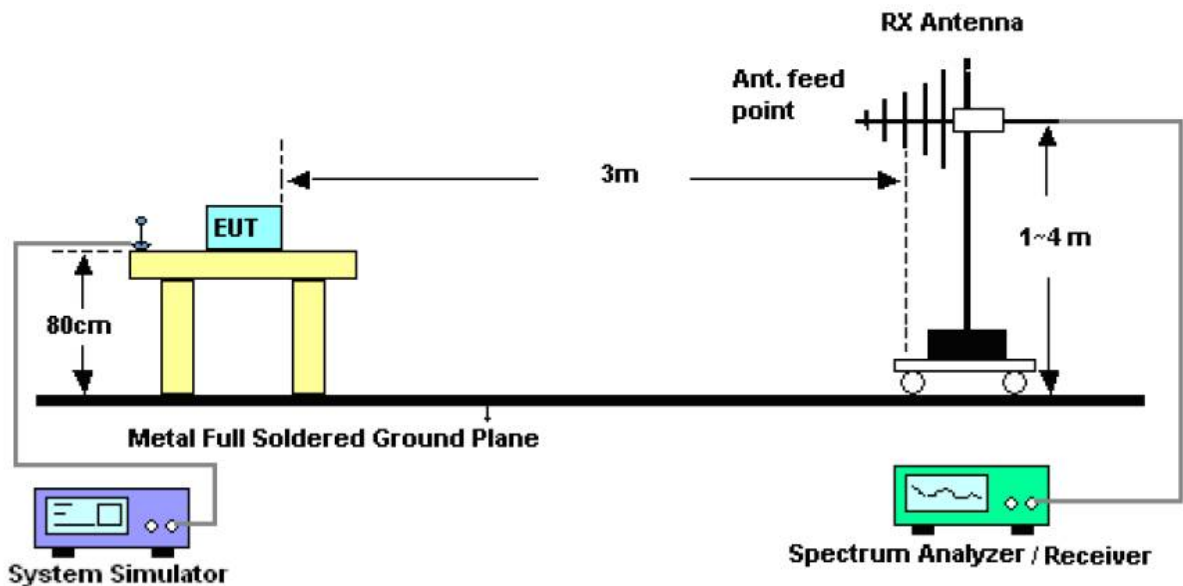
- i. "Cone of radiation" has been considered to be 3dB bandwidth of the measurement antenna.

7.3 Typical Test Setup

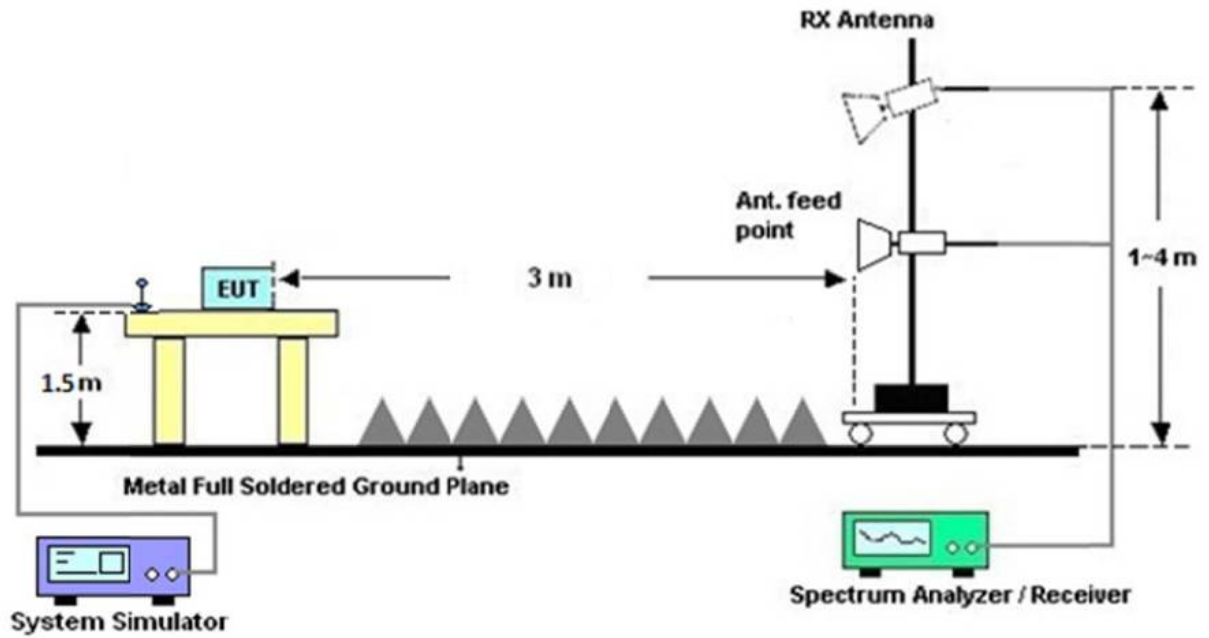
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz

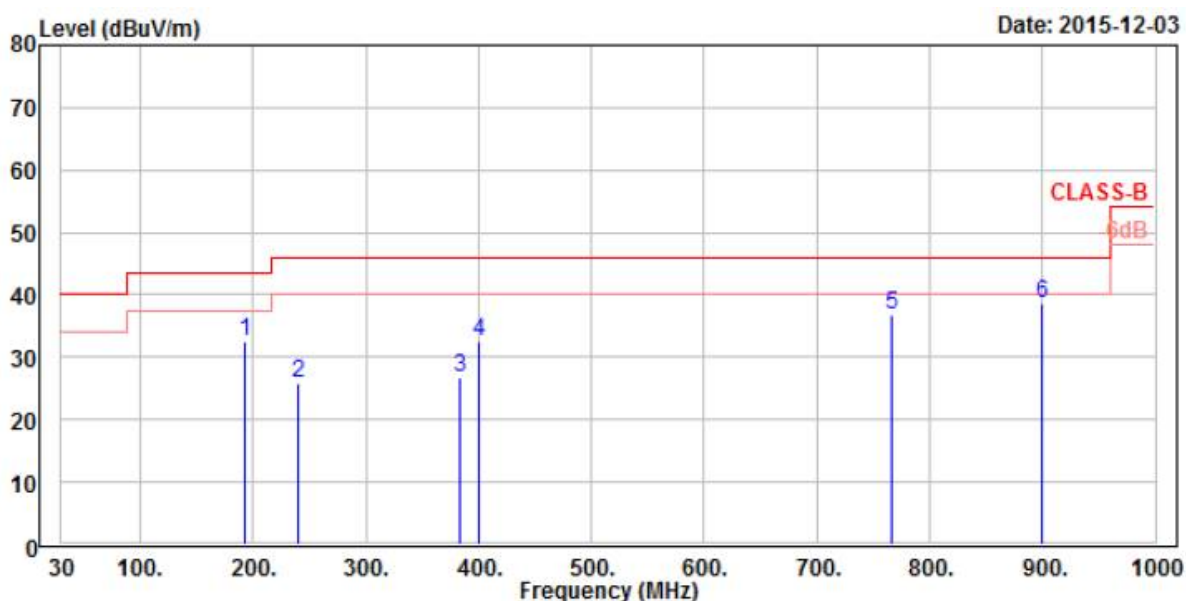


7.4 Test Result and Data (9kHz ~ 30MHz)

The 9kHz - 30MHz spurious emission is under limit 20dB more.

7.5 Test Result and Data (30MHz ~ 1GHz, worst emissions found)

Power	: DC 3.7V	Pol/Phase	: VERTICAL
Test Mode 1	: GFSK CH0	Temperature	: 20 °C
Test Date	: Dec. 03, 2015	Humidity	: 68 %
Memo	Z axis		



Condition: CLASS-B 3m Vertical

EUT : 1511017

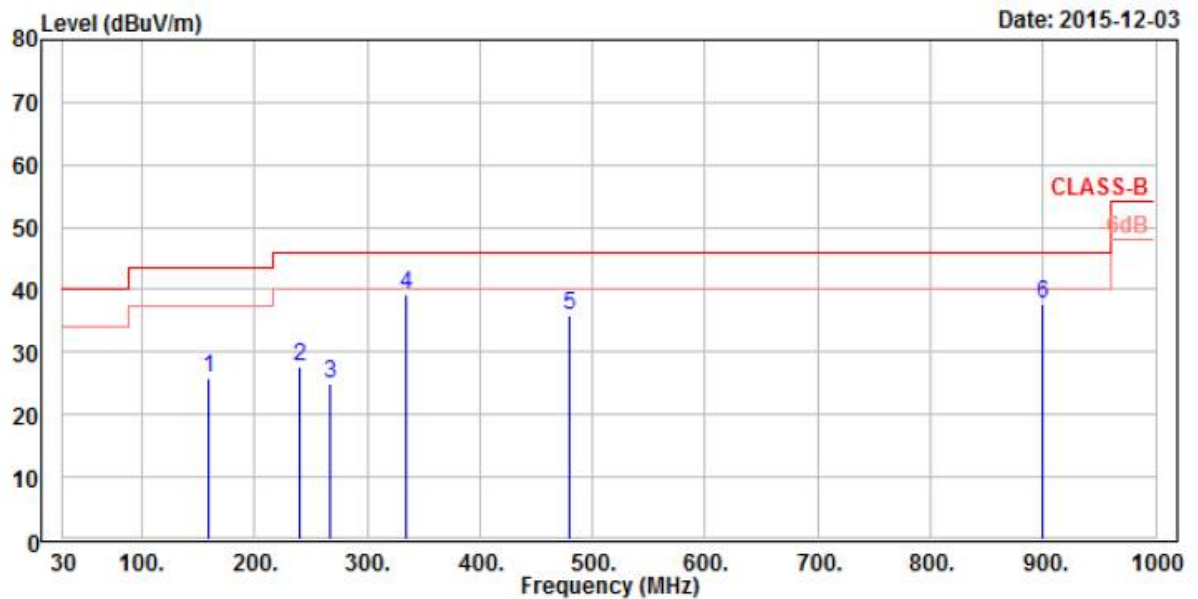
Mode : Transmit

Note : GFSK CH0

		Read		Limit	Over	
	Freq	Level	Factor	Level	Line	Limit Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB
1	193.25	35.08	-2.53	32.55	43.50	-10.95 QP
2	239.98	29.95	-3.97	25.98	46.00	-20.02 QP
3	384.10	18.88	7.86	26.74	46.00	-19.26 QP
4	399.95	21.58	10.91	32.49	46.00	-13.51 QP
5	766.75	24.51	12.41	36.92	46.00	-9.08 QP
6	900.10	22.20	16.40	38.60	46.00	-7.40 QP



Power	: DC 3.7V	Pol/Phase	: HORIZONTAL
Test Mode 1	: GFSK CH0	Temperature	: 20 °C
Test Date	: Dec. 03, 2015	Humidity	: 68 %
Memo	Z axis		



Condition: CLASS-B 3m Horizontal

EUT : 1511017

Mode : Transmit

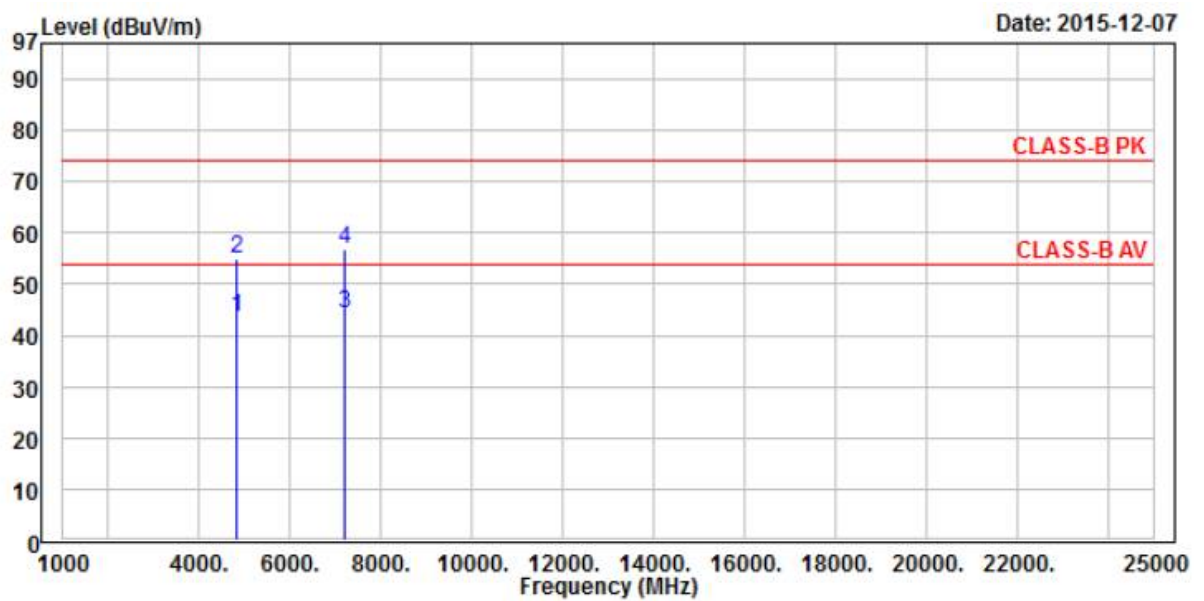
Note : GFSK CH0

		Read			Limit	Over	
	Freq	Level	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	159.56	27.45	-1.74	25.71	43.50	-17.79	QP
2	239.60	30.11	-2.52	27.59	46.00	-18.41	QP
3	266.70	27.12	-2.22	24.90	46.00	-21.10	QP
4	334.41	31.91	7.35	39.26	46.00	-6.74	QP
5	479.98	28.24	7.61	35.85	46.00	-10.15	QP
6	900.09	19.52	18.13	37.65	46.00	-8.35	QP



7.6 Test Result and Data (Above 1GHz)

Power	: DC 3.7V	Pol/Phase	: VERTICAL
Test Mode 1	: GFSK CH0	Temperature	: 20 °C
Test Date	: Dec. 07, 2015	Humidity	: 68 %
Memo	Z axis		



Condition: CLASS-B PK 3m Vertical

EUT : 1511017

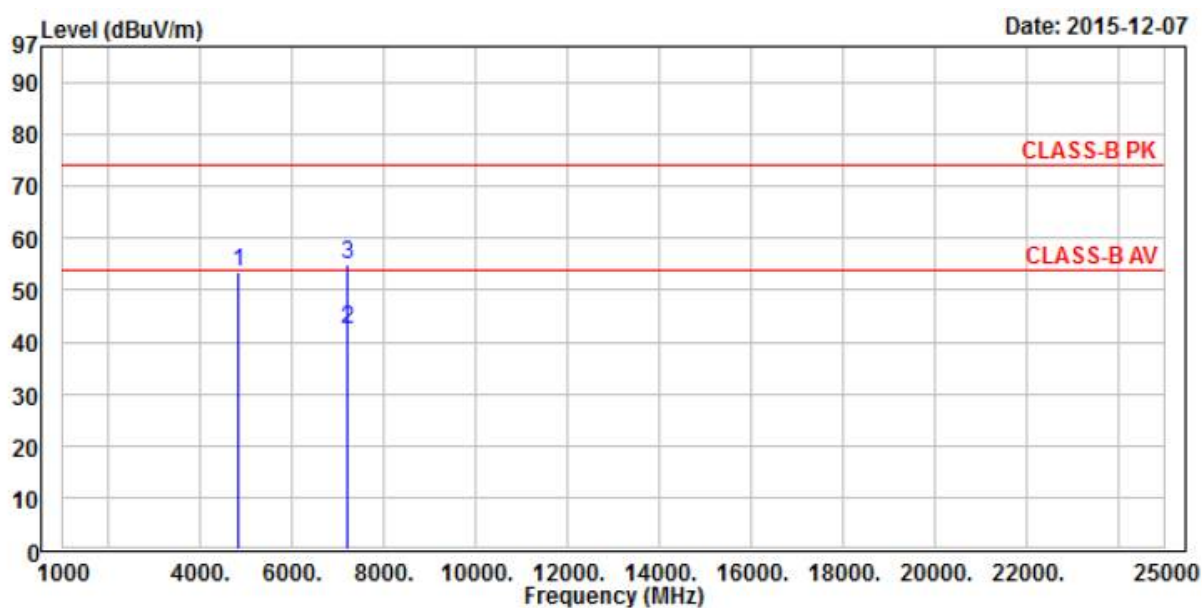
Mode : Transmit

Note : GFSK CH0

		Read			Limit	Over	
	Freq	Level	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	4804.20	51.61	-8.25	43.36	54.00	-10.64	Average
2	4804.20	63.36	-8.25	55.11	74.00	-18.89	Peak
3	7205.49	46.96	-2.76	44.20	54.00	-9.80	Average
4	7205.49	59.46	-2.76	56.70	74.00	-17.30	Peak



Power	: DC 3.7V	Pol/Phase	: HORIZONTAL
Test Mode 1	: GFSK CH0	Temperature	: 20 °C
Test Date	: Dec. 07, 2015	Humidity	: 68 %
Memo	: Z axis		



Condition: CLASS-B PK 3m Horizontal

EUT : 1511017

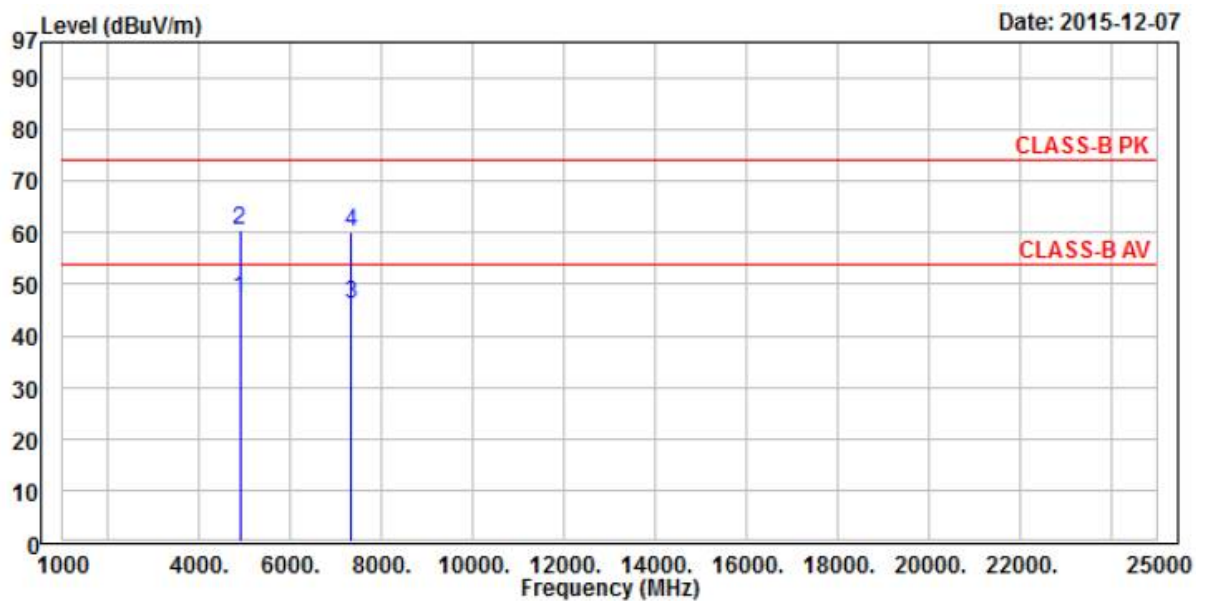
Mode : Transmit

Note : GFSK CH0

		Read		Limit	Over	
	Freq	Level	Factor	Level	Line	Limit Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB
1	4804.33	61.80	-8.25	53.55	74.00	-20.45 Peak
2	7206.53	45.23	-2.76	42.47	54.00	-11.53 Average
3	7206.53	57.83	-2.76	55.07	74.00	-18.93 Peak



Power	: DC 3.7V	Pol/Phase	: VERTICAL
Test Mode 1	: GFSK CH39	Temperature	: 20 °C
Test Date	: Dec. 07, 2015	Humidity	: 68 %
Memo	: Z axis		



Condition: CLASS-B PK 3m Vertical

EUT : 1511017

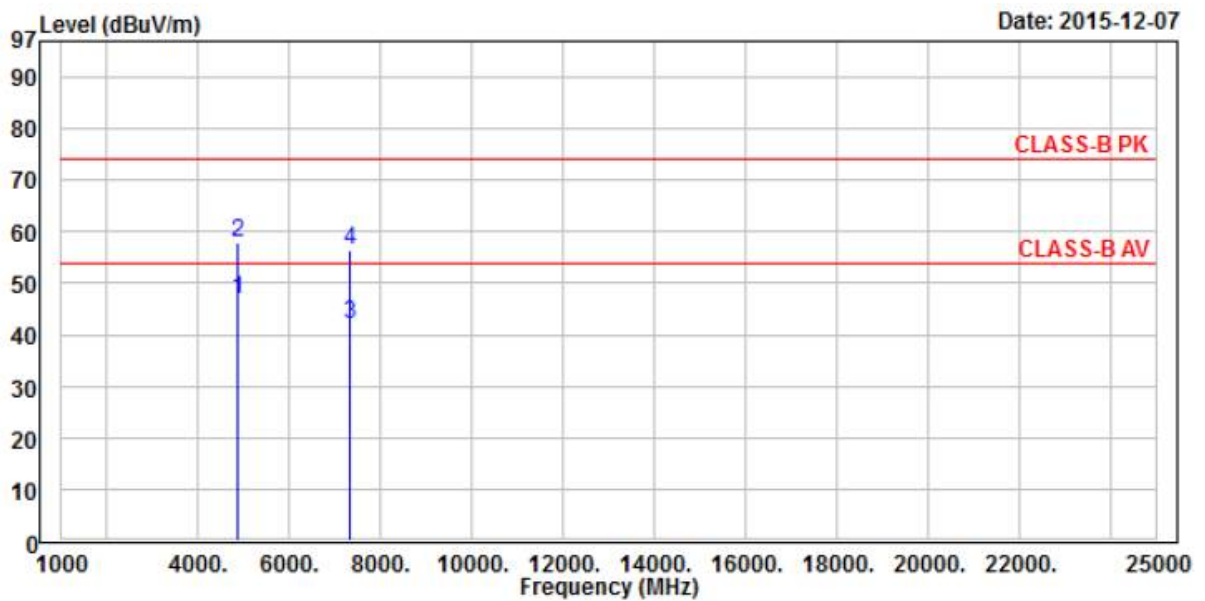
Mode : Transmit

Note : GFSK CH39

		Read		Limit	Over	
	Freq	Level	Factor	Level	Line	Limit Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB
1	4882.32	55.16	-7.91	47.25	54.00	-6.75 Average
2	4882.32	68.49	-7.91	60.58	74.00	-13.42 Peak
3	7323.40	48.71	-2.46	46.25	54.00	-7.75 Average
4	7323.40	62.55	-2.46	60.09	74.00	-13.91 Peak



Power	: DC 3.7V	Pol/Phase	: HORIZONTAL
Test Mode 1	: GFSK CH39	Temperature	: 20 °C
Test Date	: Dec. 07, 2015	Humidity	: 68 %
Memo	: Z axis		



Condition: CLASS-B PK 3m Horizontal

EUT : 1511017

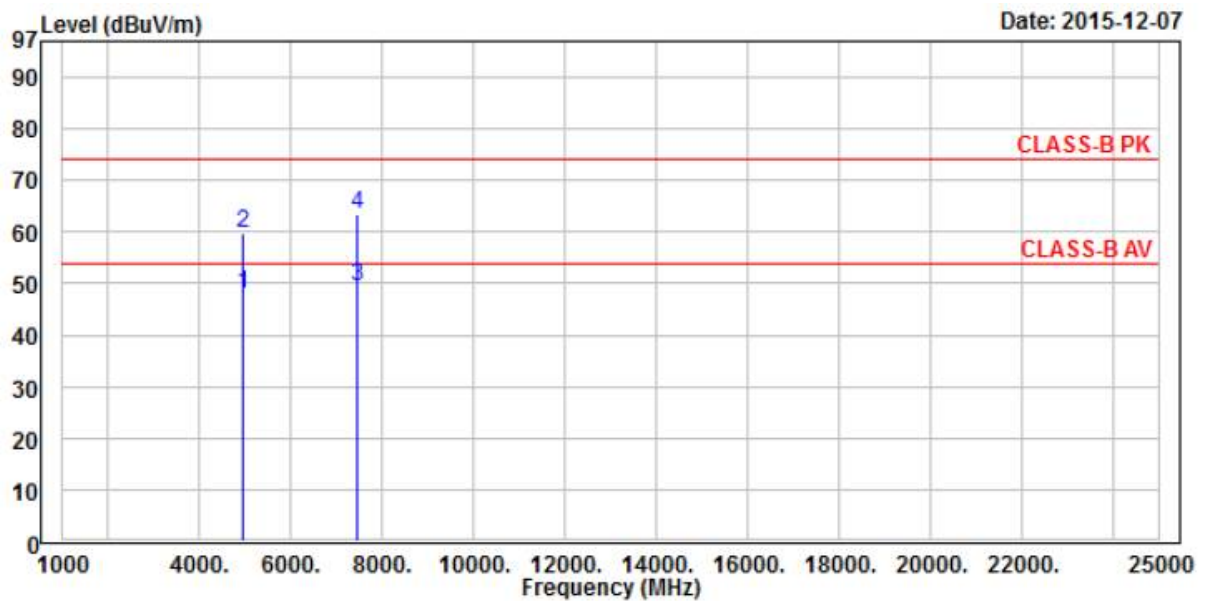
Mode : Transmit

Note : GFSK CH39

		Read			Limit	Over	
	Freq	Level	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	4881.61	54.57	-7.91	46.66	54.00	-7.34	Average
2	4881.61	65.69	-7.91	57.78	74.00	-16.22	Peak
3	7323.60	44.58	-2.46	42.12	54.00	-11.88	Average
4	7323.60	58.90	-2.46	56.44	74.00	-17.56	Peak



Power	: DC 3.7V	Pol/Phase	: VERTICAL
Test Mode 1	: GFSK CH78	Temperature	: 20 °C
Test Date	: Dec. 07, 2015	Humidity	: 68 %
Memo	: Z axis		



Condition: CLASS-B PK 3m Vertical

EUT : 1511017

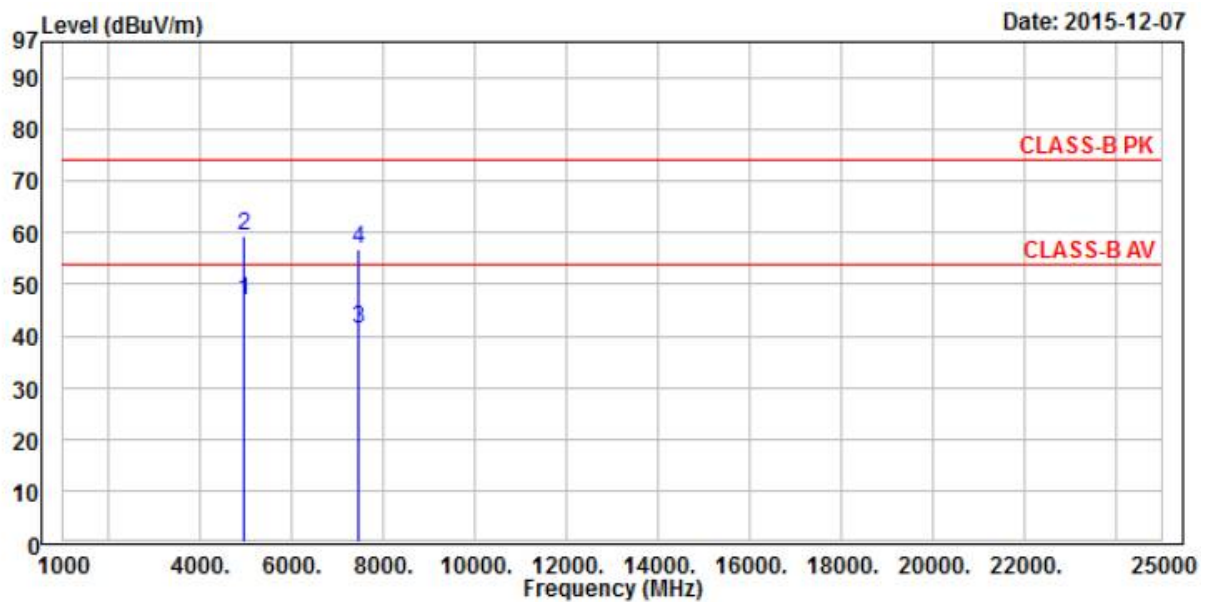
Mode : Transmit

Note : GFSK CH78

	Freq	Read Level	Factor	Level	Limit	Over	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	4960.36	55.61	-7.58	48.03	54.00	-5.97	Average
2	4960.36	67.40	-7.58	59.82	74.00	-14.18	Peak
3	7440.35	51.68	-2.16	49.52	54.00	-4.48	Average
4	7440.35	65.68	-2.16	63.52	74.00	-10.48	Peak



Power	: DC 3.7V	Pol/Phase	: HORIZONTAL
Test Mode 1	: GFSK CH78	Temperature	: 20 °C
Test Date	: Dec. 07, 2015	Humidity	: 68 %
Memo	: Z axis		



Condition: CLASS-B PK 3m Horizontal

EUT : 1511017

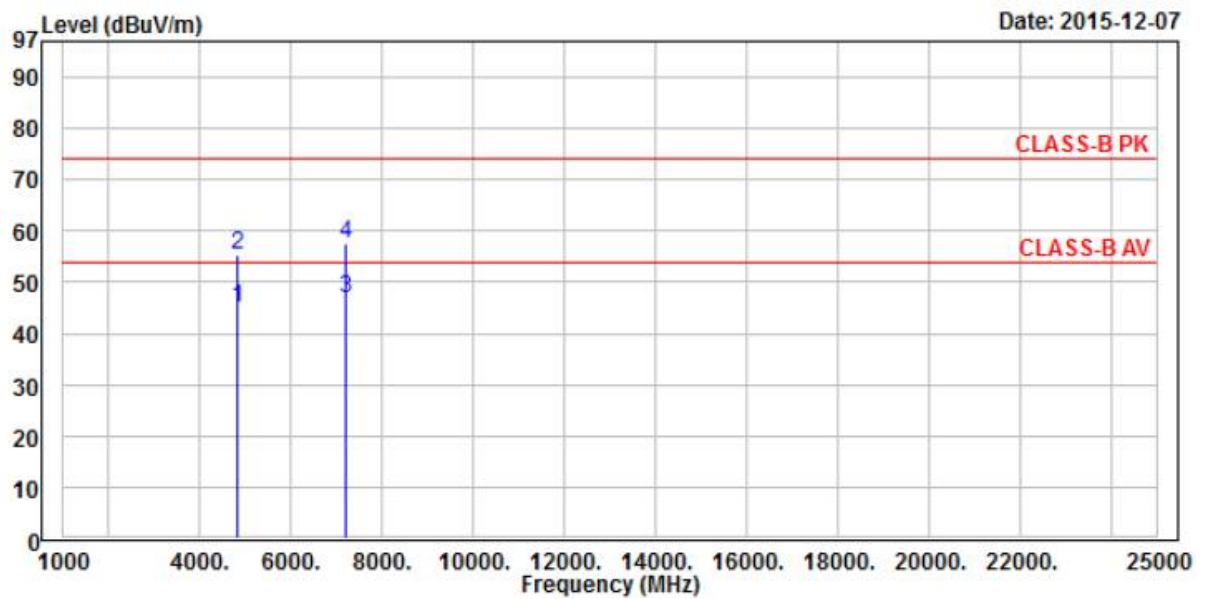
Mode : Transmit

Note : GFSK CH78

		Read		Limit	Over	
	Freq	Level	Factor	Level	Line	Limit Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB
1	4959.62	54.49	-7.58	46.91	54.00	-7.09 Average
2	4959.62	66.85	-7.58	59.27	74.00	-14.73 Peak
3	7440.53	43.55	-2.16	41.39	54.00	-12.61 Average
4	7440.53	58.91	-2.16	56.75	74.00	-17.25 Peak



Power	: DC 3.7V	Pol/Phase	: VERTICAL
Test Mode 1	: pi/4-DQPSK CH0	Temperature	: 20 °C
Test Date	: Dec. 07, 2015	Humidity	: 68 %
Memo	: Z axis		



Condition: CLASS-B PK 3m Vertical

EUT : 1511017

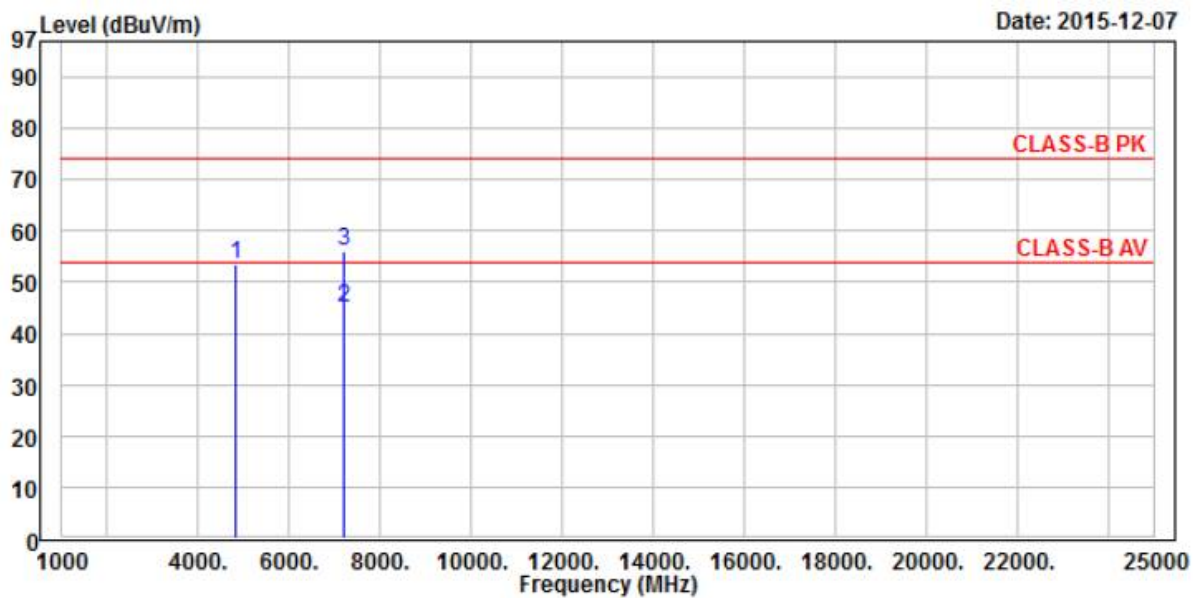
Mode : Transmit

Note : pi/4-DQPSK CH0

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	4804.34	53.29	-8.25	45.04	54.00	-8.96	Average
2	4804.34	63.48	-8.25	55.23	74.00	-18.77	Peak
3	7206.40	49.48	-2.76	46.72	54.00	-7.28	Average
4	7206.40	60.43	-2.76	57.67	74.00	-16.33	Peak



Power	: DC 3.7V	Pol/Phase	: HORIZONTAL
Test Mode 1	: pi/4-DQPSK CH0	Temperature	: 20 °C
Test Date	: Dec. 07, 2015	Humidity	: 68 %
Memo	: Z axis		



Condition: CLASS-B PK 3m Horizontal

EUT : 1511017

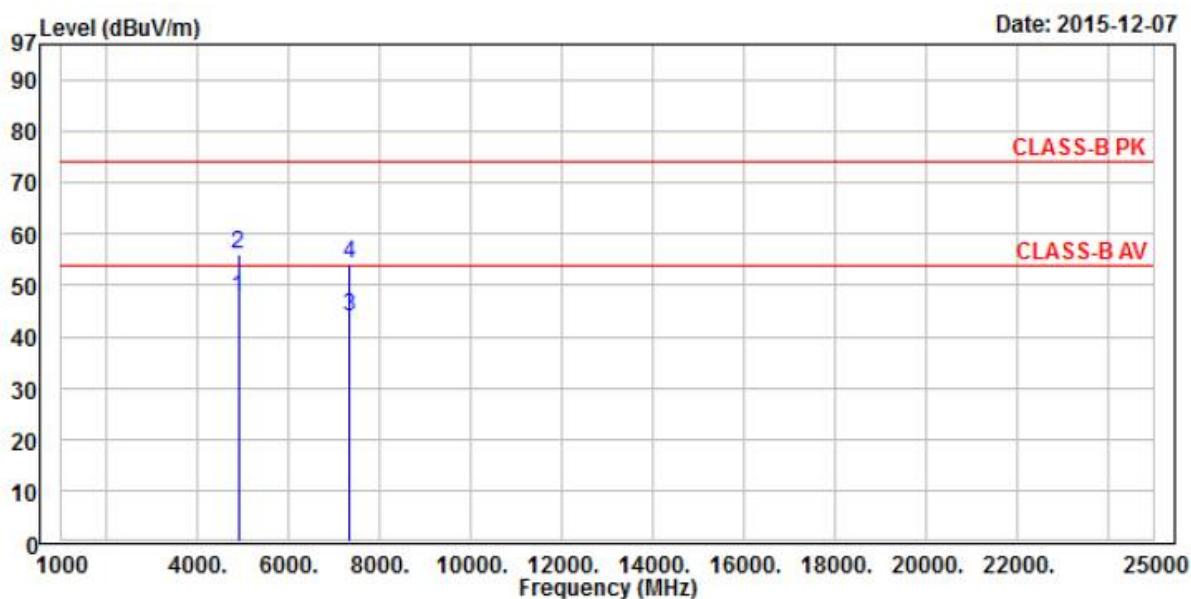
Mode : Transmit

Note : pi/4-DQPSK CH0

	Read			Limit	Over	
Freq	Level	Factor	Level	Line	Limit	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	4804.29	61.60	-8.25	53.35	74.00	-20.65 Peak
2	7206.50	47.62	-2.76	44.86	54.00	-9.14 Average
3	7206.50	58.74	-2.76	55.98	74.00	-18.02 Peak



Power	: DC 3.7V	Pol/Phase	: VERTICAL
Test Mode 1	: pi/4-DQPSK CH39	Temperature	: 20 °C
Test Date	: Dec. 07, 2015	Humidity	: 68 %
Memo	: Z axis		



Condition: CLASS-B PK 3m Vertical

EUT : 1511017

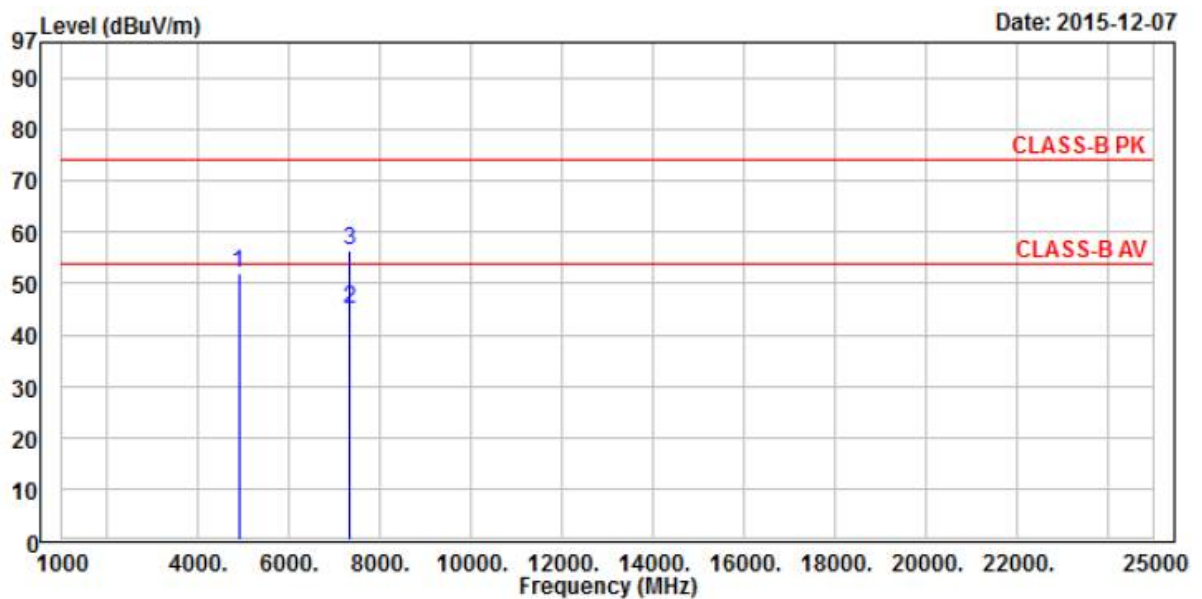
Mode : Transmit

Note : pi/4-DQPSK CH39

		Read			Limit	Over	
	Freq	Level	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	4882.37	55.43	-7.91	47.52	54.00	-6.48	Average
2	4882.37	63.90	-7.91	55.99	74.00	-18.01	Peak
3	7323.37	46.38	-2.46	43.92	54.00	-10.08	Average
4	7323.37	56.70	-2.46	54.24	74.00	-19.76	Peak



Power	: DC 3.7V	Pol/Phase	: HORIZONTAL
Test Mode 1	: pi/4-DQPSK CH39	Temperature	: 20 °C
Test Date	: Dec. 07, 2015	Humidity	: 68 %
Memo	: Z axis		



Condition: CLASS-B PK 3m Horizontal

EUT : 1511017

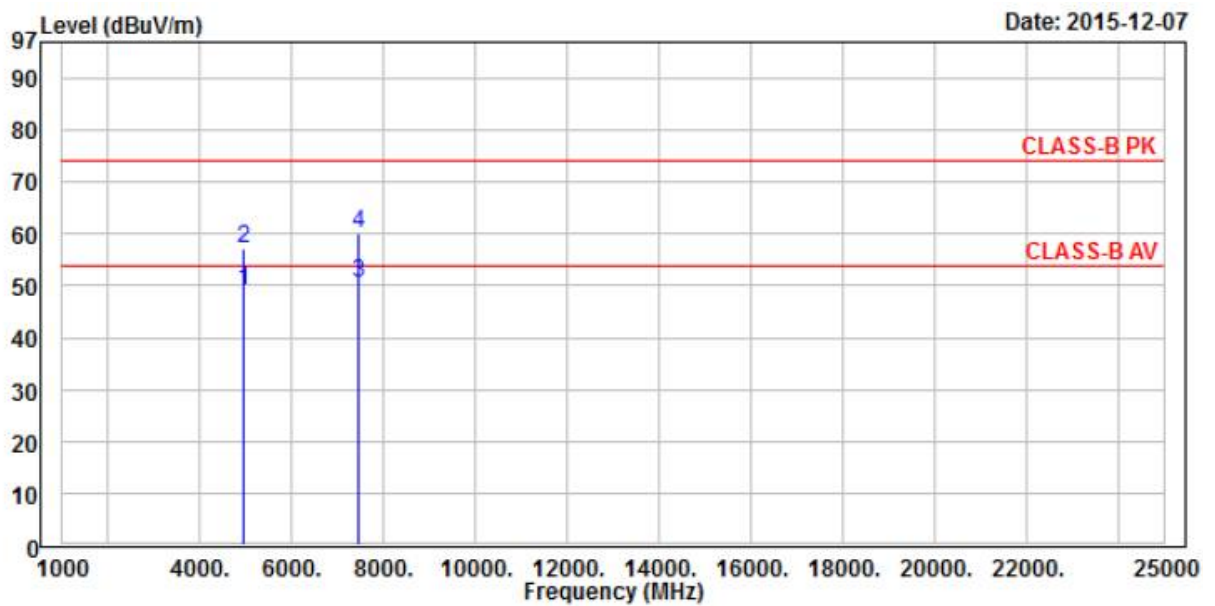
Mode : Transmit

Note : pi/4-DQPSK CH39

		Read		Limit	Over	
	Freq	Level	Factor	Level	Line	Limit Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB
1	4882.33	59.86	-7.91	51.95	74.00	-22.05 Peak
2	7323.32	47.46	-2.46	45.00	54.00	-9.00 Average
3	7323.32	58.81	-2.46	56.35	74.00	-17.65 Peak



Power	: DC 3.7V	Pol/Phase	: VERTICAL
Test Mode 1	: pi/4-DQPSK CH78	Temperature	: 20 °C
Test Date	: Dec. 07, 2015	Humidity	: 68 %
Memo	: Z axis		



Condition: CLASS-B PK 3m Vertical

EUT : 1511017

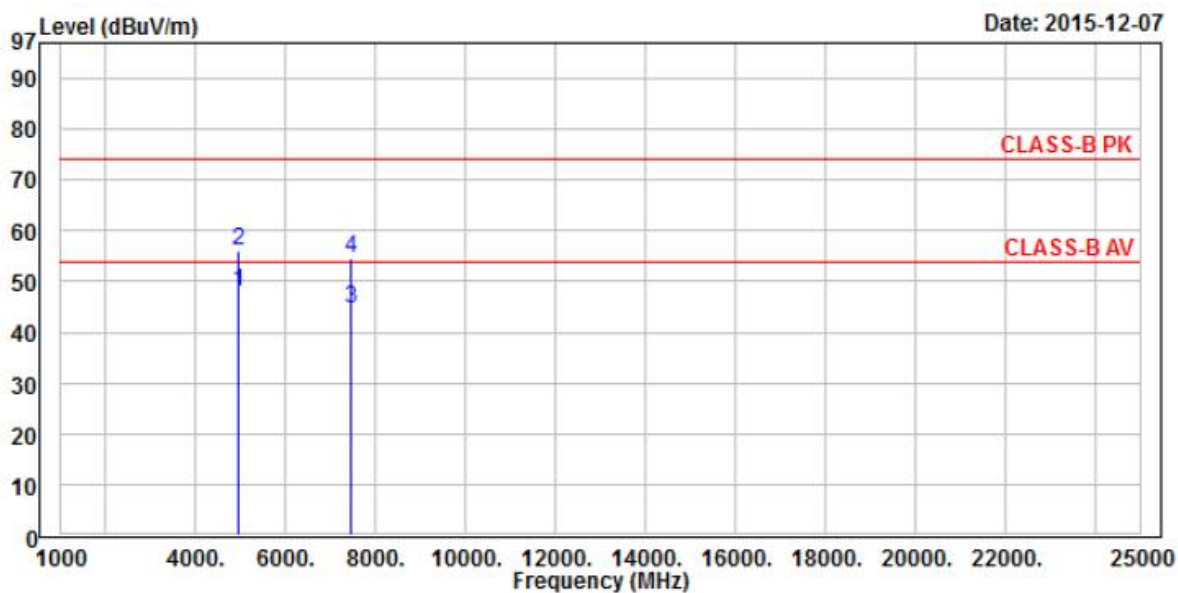
Mode : Transmit

Note : pi/4-DQPSK CH78

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	4959.57	56.46	-7.58	48.88	54.00	-5.12	Average
2	4959.57	64.80	-7.58	57.22	74.00	-16.78	Peak
3	7440.48	52.65	-2.16	50.49	54.00	-3.51	Average
4	7440.48	62.44	-2.16	60.28	74.00	-13.72	Peak



Power	: DC 3.7V	Pol/Phase	: HORIZONTAL
Test Mode 1	: pi/4-DQPSK CH78	Temperature	: 20 °C
Test Date	: Dec. 07, 2015	Humidity	: 68 %
Memo	: Z axis		



Condition: CLASS-B PK 3m Horizontal

EUT : 1511017

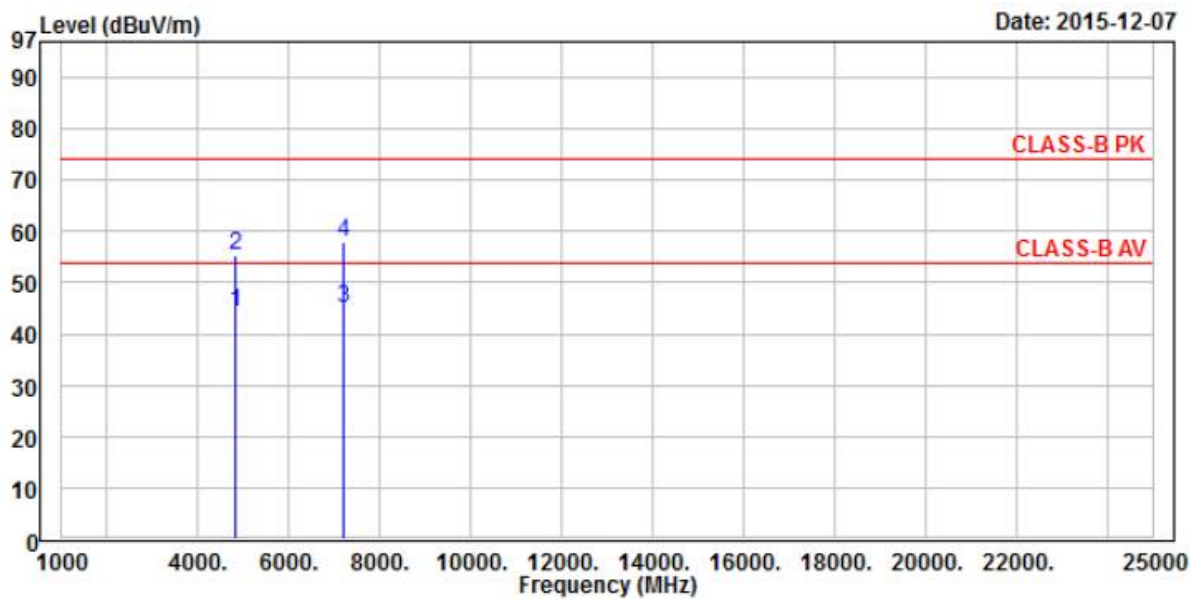
Mode : Transmit

Note : pi/4-DQPSK CH78

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	4959.68	55.56	-7.58	47.98	54.00	-6.02	Average
2	4959.68	63.80	-7.58	56.22	74.00	-17.78	Peak
3	7440.00	46.70	-2.16	44.54	54.00	-9.46	Average
4	7440.00	56.79	-2.16	54.63	74.00	-19.37	Peak



Power	: DC 3.7V	Pol/Phase	: VERTICAL
Test Mode 1	: 8DPSK CH0	Temperature	: 20 °C
Test Date	: Dec. 07, 2015	Humidity	: 68 %
Memo	: Z axis		



Condition: CLASS-B PK 3m Vertical

EUT : 1511017

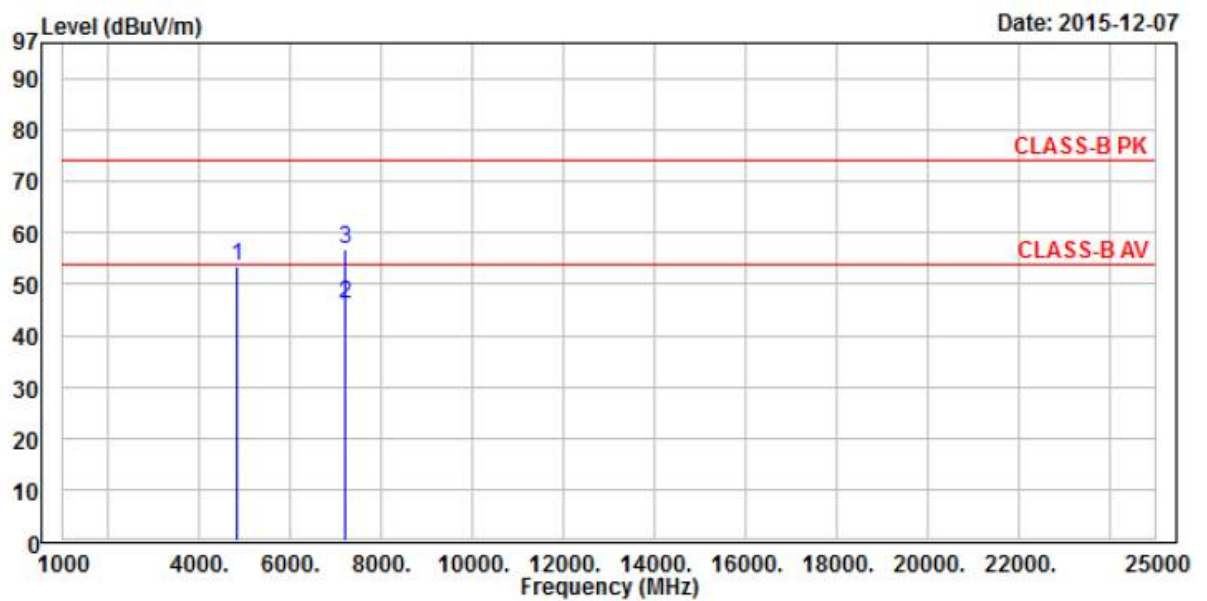
Mode : Transmit

Note : 8DPSK CH0

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	4804.31	52.62	-8.25	44.37	54.00	-9.63	Average
2	4804.31	63.67	-8.25	55.42	74.00	-18.58	Peak
3	7205.58	47.93	-2.76	45.17	54.00	-8.83	Average
4	7205.58	60.67	-2.76	57.91	74.00	-16.09	Peak



Power	: DC 3.7V	Pol/Phase	: HORIZONTAL
Test Mode 1	: 8DPSK CH0	Temperature	: 20 °C
Test Date	: Dec. 07, 2015	Humidity	: 68 %
Memo	: Z axis		



Condition: CLASS-B PK 3m Horizontal

EUT : 1511017

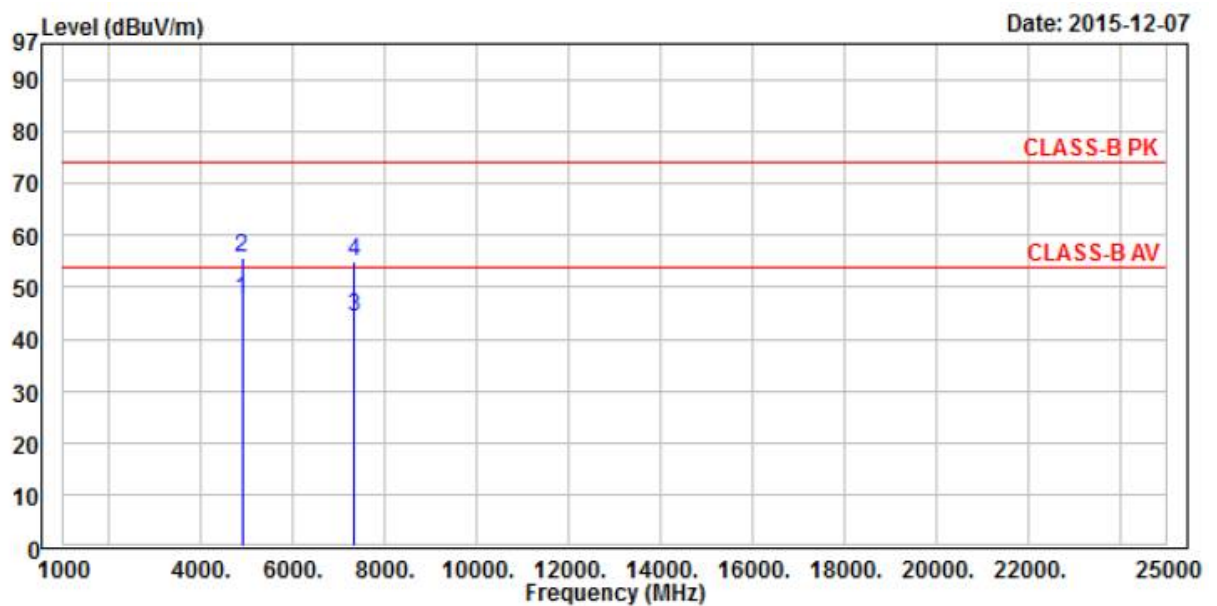
Mode : Transmit

Note : 8DPSK CH0

		Read			Limit	Over	
	Freq	Level	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	4804.37	61.70	-8.25	53.45	74.00	-20.55	Peak
2	7206.45	48.69	-2.76	45.93	54.00	-8.07	Average
3	7206.45	59.40	-2.76	56.64	74.00	-17.36	Peak



Power	: DC 3.7V	Pol/Phase	: VERTICAL
Test Mode 1	: 8DPSK CH39	Temperature	: 20 °C
Test Date	: Dec. 07, 2015	Humidity	: 68 %
Memo	: Z axis		



Condition: CLASS-B PK 3m Vertical

EUT : 1511017

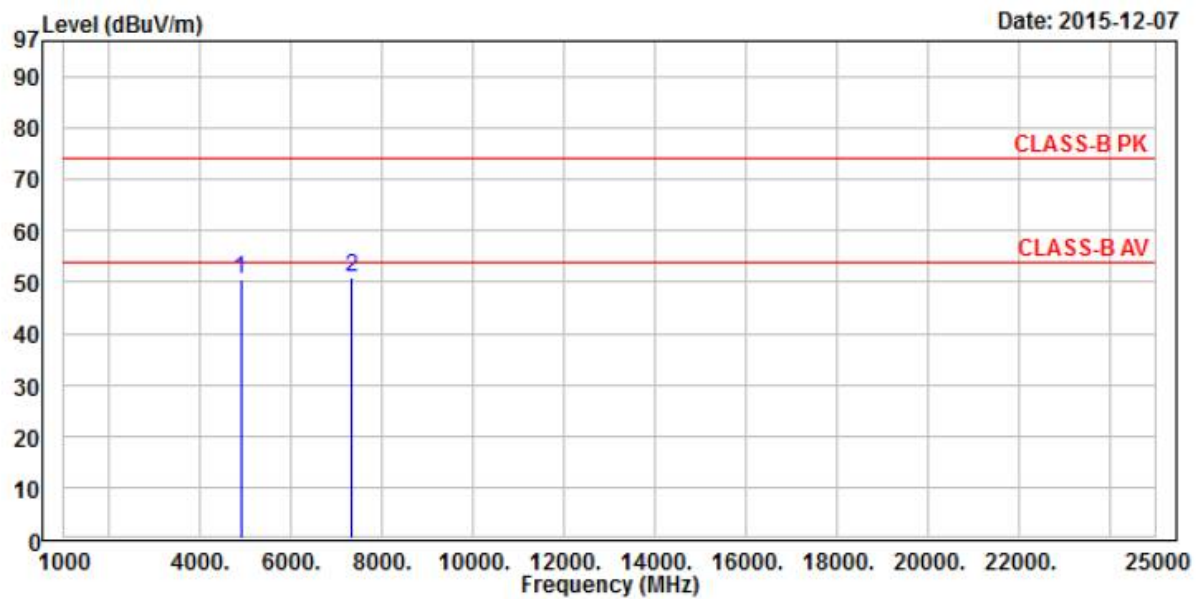
Mode : Transmit

Note : 8DPSK CH39

		Read			Limit	Over	
	Freq	Level	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	4881.95	55.58	-7.91	47.67	54.00	-6.33	Average
2	4881.95	63.69	-7.91	55.78	74.00	-18.22	Peak
3	7322.73	46.76	-2.46	44.30	54.00	-9.70	Average
4	7322.73	57.26	-2.46	54.80	74.00	-19.20	Peak



Power	: DC 3.7V	Pol/Phase	: HORIZONTAL
Test Mode 1	: 8DPSK CH39	Temperature	: 20 °C
Test Date	: Dec. 07, 2015	Humidity	: 68 %
Memo	: Z axis		



Condition: CLASS-B PK 3m Horizontal

EUT : 1511017

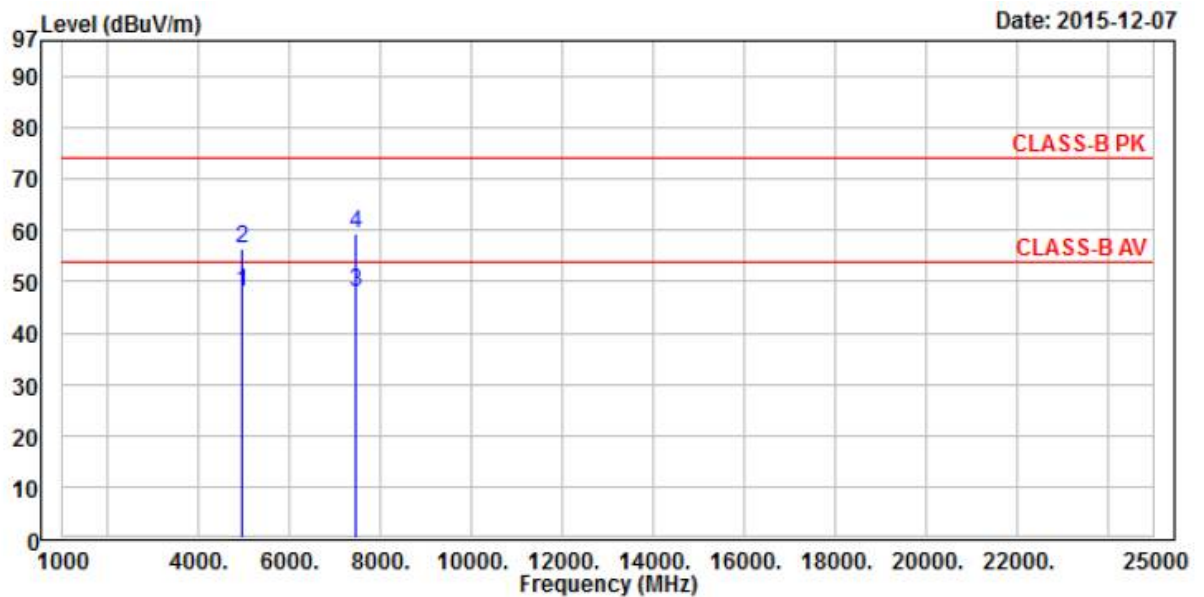
Mode : Transmit

Note : 8DPSK CH39

		Read			Limit	Over	
	Freq	Level	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	4882.00	58.49	-7.91	50.58	74.00	-23.42	Peak
2	7322.64	53.43	-2.46	50.97	74.00	-23.03	Peak



Power	: DC 3.7V	Pol/Phase	: VERTICAL
Test Mode 1	: 8DPSK CH78	Temperature	: 20 °C
Test Date	: Dec. 07, 2015	Humidity	: 68 %
Memo	: Z axis		



Condition: CLASS-B PK 3m Vertical

EUT : 1511017

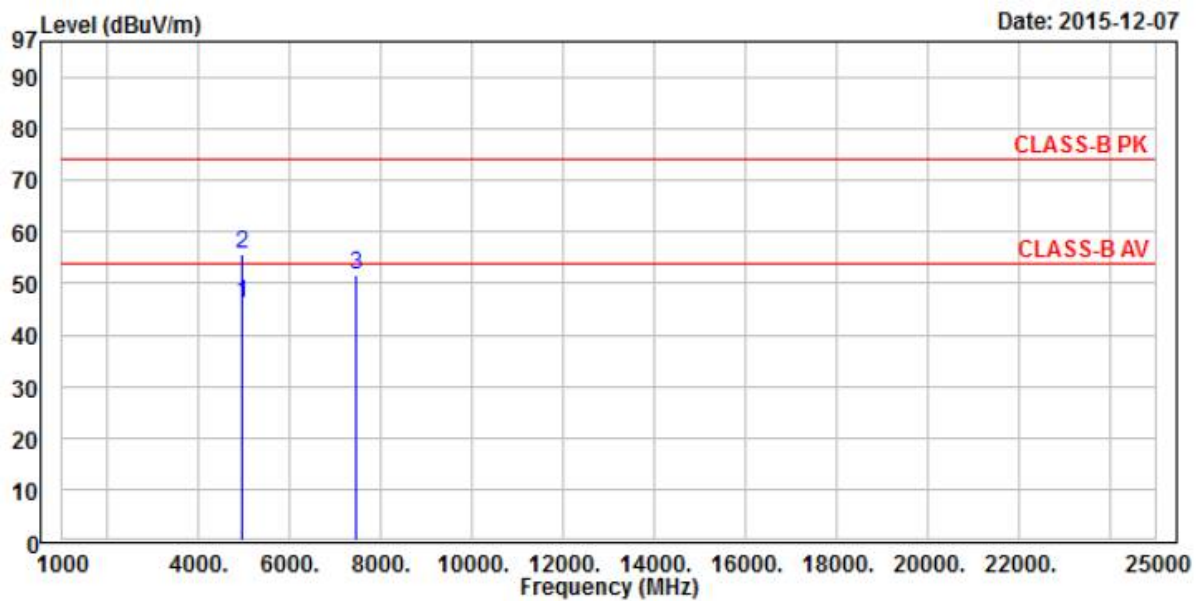
Mode : Transmit

Note : 8DPSK CH78

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	4960.29	55.56	-7.58	47.98	54.00	-6.02	Average
2	4960.29	63.84	-7.58	56.26	74.00	-17.74	Peak
3	7439.47	50.16	-2.16	48.00	54.00	-6.00	Average
4	7439.47	61.71	-2.16	59.55	74.00	-14.45	Peak



Power	: DC 3.7V	Pol/Phase	: HORIZONTAL
Test Mode 1	: 8DPSK CH78	Temperature	: 20 °C
Test Date	: Dec. 07, 2015	Humidity	: 68 %
Memo	: Z axis		



Condition: CLASS-B PK 3m Horizontal

EUT : 1511017

Mode : Transmit

Note : 8DPSK CH78

		Read			Limit	Over	
	Freq	Level	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	4960.32	53.53	-7.58	45.95	54.00	-8.05	Average
2	4960.32	63.31	-7.58	55.73	74.00	-18.27	Peak
3	7440.59	53.71	-2.16	51.55	74.00	-22.45	Peak



Notes:

1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss – Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120 KHz and video bandwidth is 300 KHz for Quasi-peak detection at frequency 30 MHz~1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3 MHz for Peak detection at frequency above 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz Peak detector for Average Value at frequency above 1GHz
6. All emissions as described above were determining by rotating the EUT through three orthogonal axes to maximizing the emissions if the EUT belongs to hand-held or body-worn devices.
7. Where limits are specified for both average and peak detector functions, if the peak measured value complies with the average limit, it is unnecessary to perform an average measurement at frequency above 1GHz.