TESTING LABORATORY
CERTIFICATE #4820.01

FCC PART 15C

TEST REPORT

For

Rosslare Enterprises Ltd

Room 905, 12 Wang Tai Road,Kowloon Bay, Kowloon,Hong Kong

FCC ID: GCD-AYCF6X

Report Type:	**Product Name:**
Original Report	Convertible Reader with Genuine HID Technology

Report Number:	RDG180629003-00A
Report Date:	2018-07-26
Reviewed By:	Jerry Zhang EMC Manager
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

EUT Name:	Convertible Reader with Genuine HID Technology
EUT Model:	AYC-F60
Multiple Model:	AYC-F64
FCC ID:	GCD-AYCF6X
Rated Input Voltage:	DC 5-16V
External Dimension:	120mm(L)* 76mm(W)* 21mm(H)
Serial Number:	180629003
EUT Received Date:	2018.06.29

Note: The series product, models AYC-F60, AYC-F64 are electrically identical, we selected AYC-F60 fully test, and please refer to the declaration letter for details.

Objective

This Type approval report is prepared on behalf of *Rosslare Enterprises Ltd* in accordance with Part 2, Subpart J, and Part 15, Subparts A and C of the Federal Communications Commission's rules.

The objective is to determine the compliance of the EUT with FCC rules, sec 15.203, 15.205, 15.207, 15.209, 15.215.

Related Submittal(s)/Grant(s)

No Related Submittal.

Test Methodology

All measurements detailed in this Test Report were performed in accordance with ANSI C63.10-2013 "American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices".

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Dongguan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	±5 %
radiated Emissions	30M~200MHz: 4.55 dB,200M~1GHz: 5.92 dB,1G~6GHz: 4.98 dB, 6G~18GHz: 5.89 dB,18G~26.5G:5.47 dB,26.5G~40G:5.63 dB
Temperature	±1℃
Humidity	±5%
DC and low frequency voltages	±0.4%
Duty Cycle	1%
AC Power Lines Conducted Emission	3.12 dB (150 kHz to 30 MHz)

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 897218,the FCC Designation No. : CN1220.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062D.

SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in a test mode

The device operates in 125 kHz with ASK and FSK, the modulation depend on difference RFID Card.

Note: AYC-F64 only support ASK modulation, FSK shielded by firmware.

EUT Exercise Software

No software used in test.

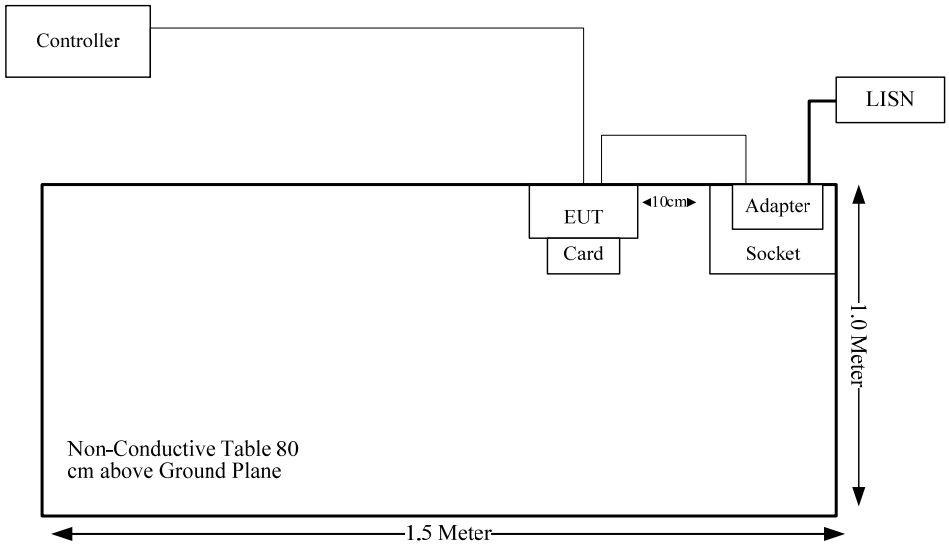
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
ABELL	adapter	SHCY-SP1201000	/
Rosslare	Controller	AC225	/
Rosslare	RFID Card	ASK	/
Rosslare	RFID Card	FSK	/

Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From	To
Adapter Cable	yes	no	1.2	adapter	EUT
Data Cable	yes	no	10	EUT	Controller

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliance
§15.207	AC Line Conducted Emission	Compliance
§15.209 §15.205	Radiated Emission Test	Compliance
§15.215(c)	20 dB Emission Bandwidth	Compliance

FCC§15.203 - ANTENNA REQUIREMENT

Applicable Standard

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.

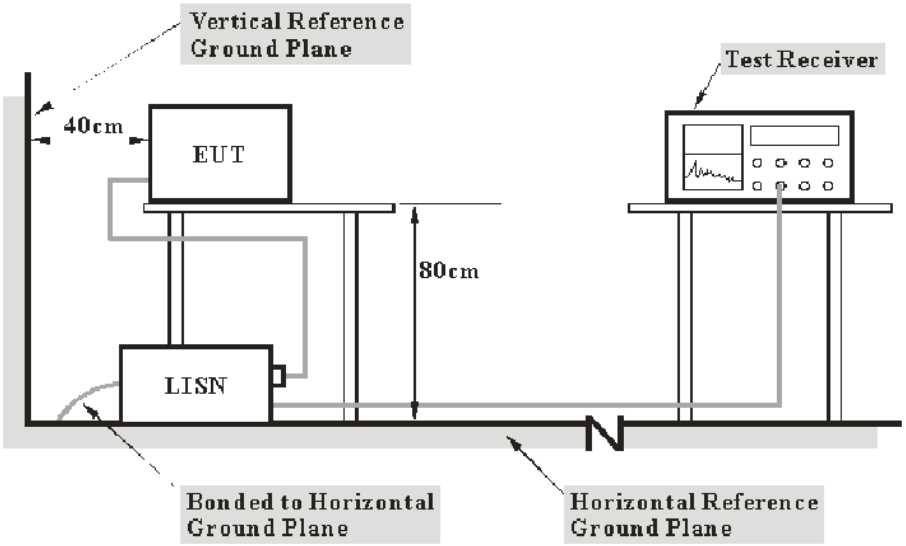
Antenna Connected Construction

The EUT has an integral antenna arrangement, which was permanently attached and fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliance.

FCC §15.207 – AC LINE CONDUCTED EMISSION

EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

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

The 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.

The adapter was connected to the main LISN with an AC 120V/60Hz power source.

EMI Test Receiver Setup

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

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

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCS 30	830245/006	2017-12-11	2018-12-11
R&S	Two-line V-network	ENV 216	101614	2017-12-08	2018-12-08
N/A	Coaxial Cable	C-NJNJ-50	C-0200-01	2017-09-05	2018-09-05
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A

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

Test Procedure

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

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

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

According FCC publication number 174176,for a device with a permanent antenna operating at or below 30 MHz, the measurements done with a suitable dummy load, in lieu of the permanent antenna under the following conditions: (1) perform the AC line conducted tests with the permanent antenna to determine compliance with the Section 15.207 limits outside the transmitter's fundamental emission band; (2) retest with a dummy load in lieu of the permanent antenna to determine compliance with the Section 15.207 limits within the transmitter's fundamental emission band.

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$V_C = V_R + A_C + VDF$

Herein,
V_C: corrected voltage amplitude
V_R: reading voltage amplitude

A_c: attenuation caused by cable loss

VDF: voltage division factor of AMN or ISN

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

Margin = Limit – Corrected Amplitude

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207.

Test Data

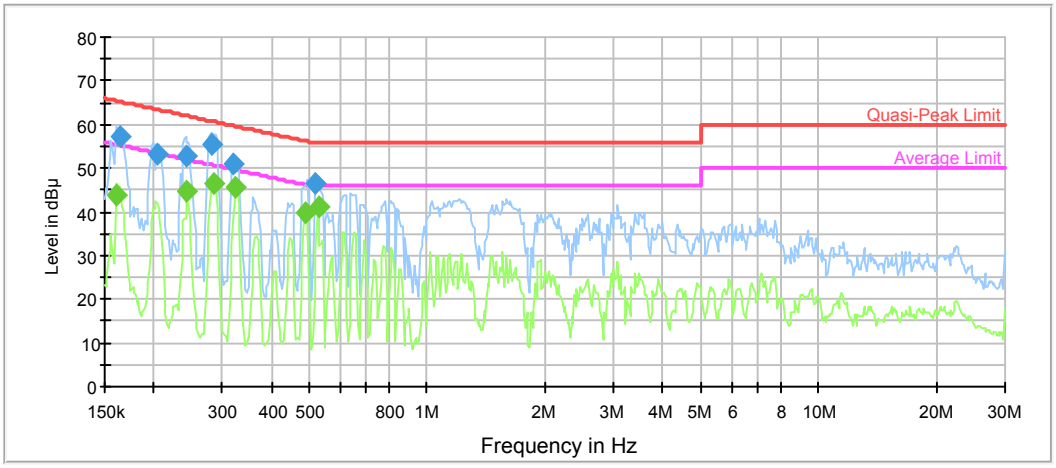
Environmental Conditions

Temperature:	28.5 °C
Relative Humidity:	56 %
ATM Pressure:	100.6 kPa

The testing was performed by Sider Huang on 2018-07-05.

Test Mode: Transmitting

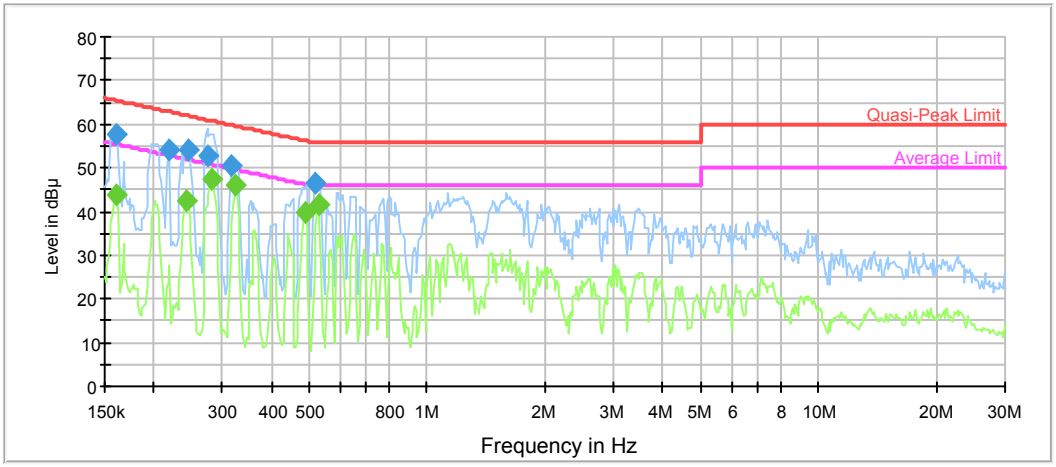
AC 120V, 60 Hz, Line:



Frequency (MHz)	Quasi Peak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.163741	57.6	9.000	L1	11.0	7.7	65.3	Compliance
0.204669	53.4	9.000	L1	10.6	10.0	63.4	Compliance
0.241949	52.8	9.000	L1	10.4	9.2	62.0	Compliance
0.281497	55.2	9.000	L1	10.2	5.6	60.8	Compliance
0.319773	50.9	9.000	L1	10.1	8.8	59.7	Compliance
0.519918	46.5	9.000	L1	9.9	9.3	55.8	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.161152	43.9	9.000	L1	11.0	11.5	55.4	Compliance
0.243884	44.5	9.000	L1	10.4	7.5	52.0	Compliance
0.283749	46.5	9.000	L1	10.2	4.2	50.7	Compliance
0.324910	45.2	9.000	L1	10.1	4.2	49.4	Compliance
0.487810	39.8	9.000	L1	9.9	6.3	46.1	Compliance
0.528270	41.2	9.000	L1	9.9	4.8	46.0	Compliance

AC120 V, 60 Hz, Neutral:



Frequency (MHz)	Quasi Peak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.159873	57.4	9.000	N	11.0	8.1	65.5	Compliance
0.219886	54.0	9.000	N	10.5	8.8	62.8	Compliance
0.245835	54.1	9.000	N	10.3	7.6	61.7	Compliance
0.274848	52.8	9.000	N	10.2	8.2	61.0	Compliance
0.317235	50.5	9.000	N	10.1	9.2	59.7	Compliance
0.519918	46.6	9.000	N	9.9	9.4	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.161152	43.5	9.000	N	11.0	11.6	55.1	Compliance
0.243884	42.3	9.000	N	10.4	9.7	52.0	Compliance
0.281497	47.2	9.000	N	10.2	3.6	50.8	Compliance
0.324910	46.1	9.000	N	10.1	3.5	49.6	Compliance
0.487810	39.5	9.000	N	9.9	6.4	45.9	Compliance
0.528270	41.6	9.000	N	9.9	4.4	46.0	Compliance

FCC §15.205 & §15.209 - RADIATED EMISSIONS TEST

Applicable Standard

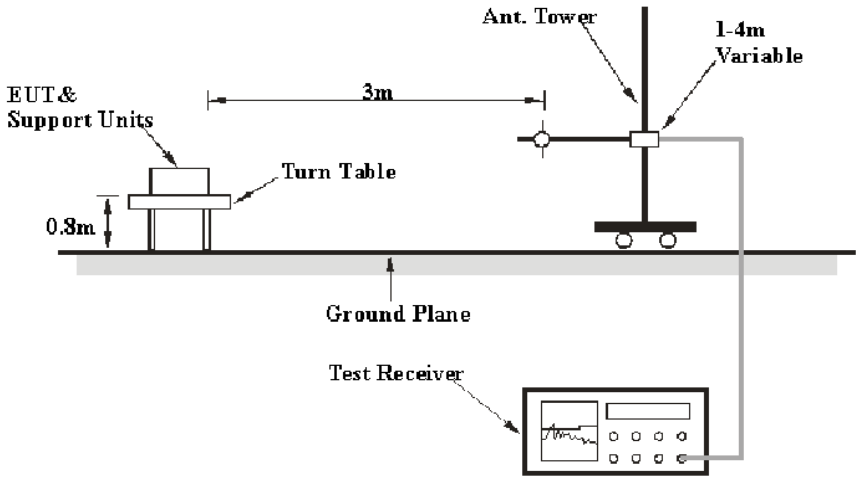
As per FCC Part 15.209

(a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength (microvolts/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

**Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permltted under other sections of this part, e.g., §§15.231 and 15.241.

EUT Setup



The radiated emission tests were performed in the 3-meter chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC Part 15.209 limits.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The system was investigated from 9 kHz to 1 GHz.

During the radiated emission test, the EMI test Receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	Measurement
9 kHz – 150 kHz	200 Hz	1 kHz	QP
150 kHz – 30 MHz	9 kHz	30 kHz	QP
30 MHz – 1000 MHz	120 kHz	300 kHz	QP

If the maximized peak measured value complies with the limit, then it is unnecessary to perform an QP/Average measurement

Corrected Amplitude & Margin Calculation

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

Corr. Ampl. = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain

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

Margin = Limit - Corr. Ampl.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Antenna	JB3	A060611-1	2017-11-10	2020-11-10
R&S	EMI Test Receiver	ESCI	100224	2017-12-11	2018-12-11
HP	Amplifier	8447D	2727A05902	2017-09-05	2018-09-05
EMCO	Passive Loop	6512	9706-1206	2017-03-05	2020-03-04
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2017-09-05	2018-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-01	2017-09-05	2018-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-1000-01	2017-09-05	2018-09-05
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A

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

Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.209.

Test Data

Environmental Conditions

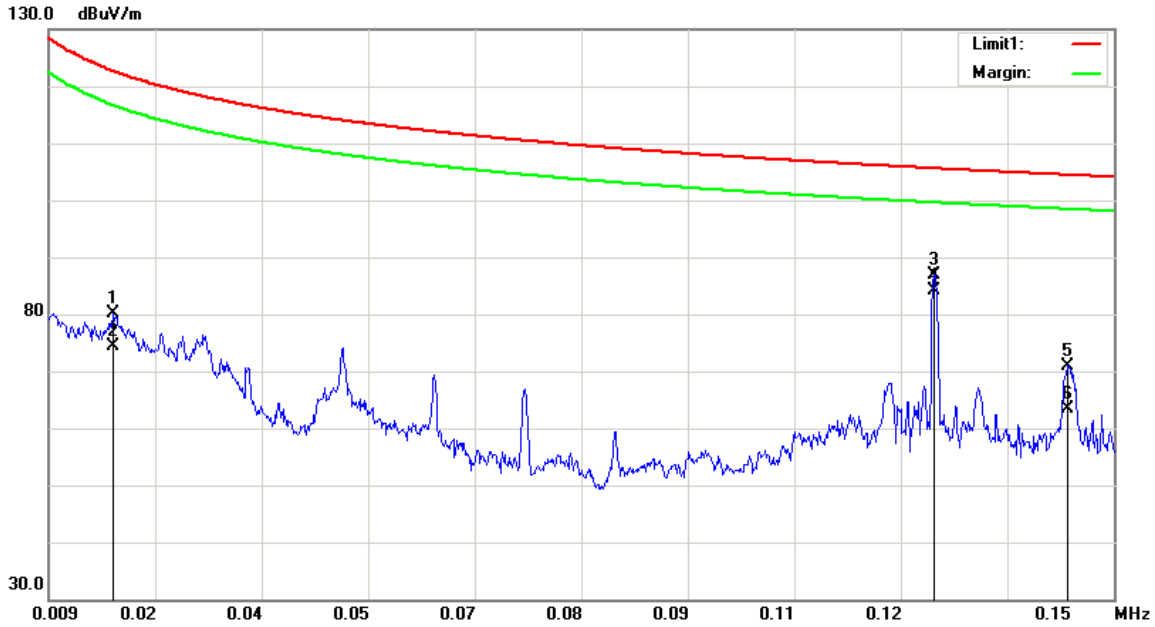
Temperature:	27.7 °C
Relative Humidity:	40 %
ATM Pressure:	99.6 kPa

** The testing was performed by Vern Shen on 2018-07-04.*

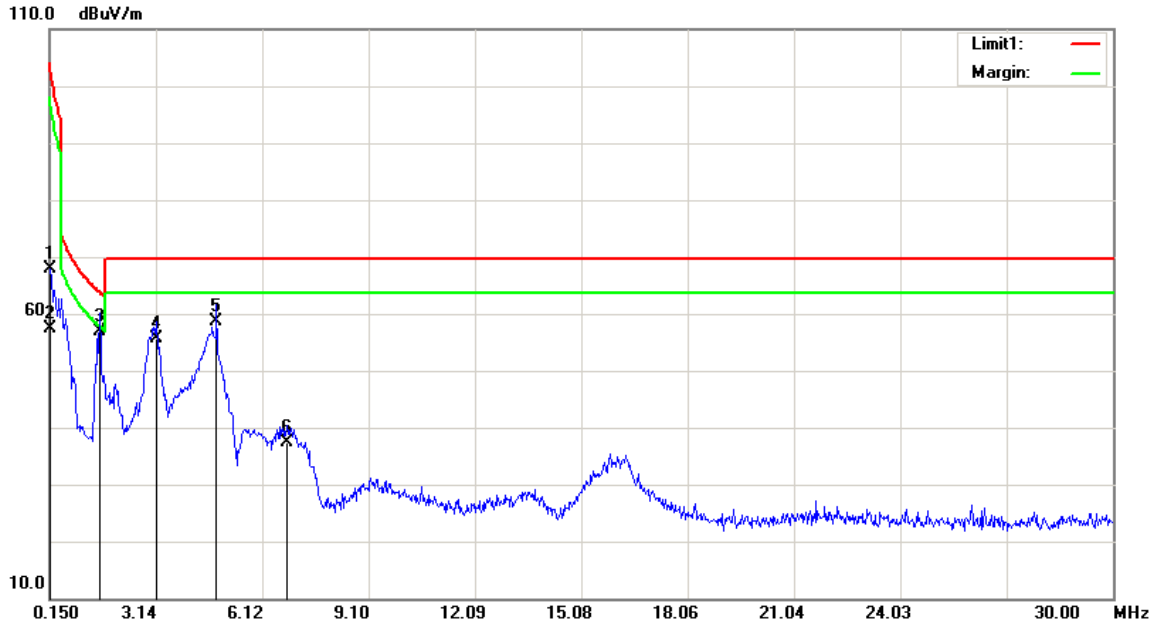
Test mode: Transmitting

For ASK Mode:

1) 9 kHz~30MHz:



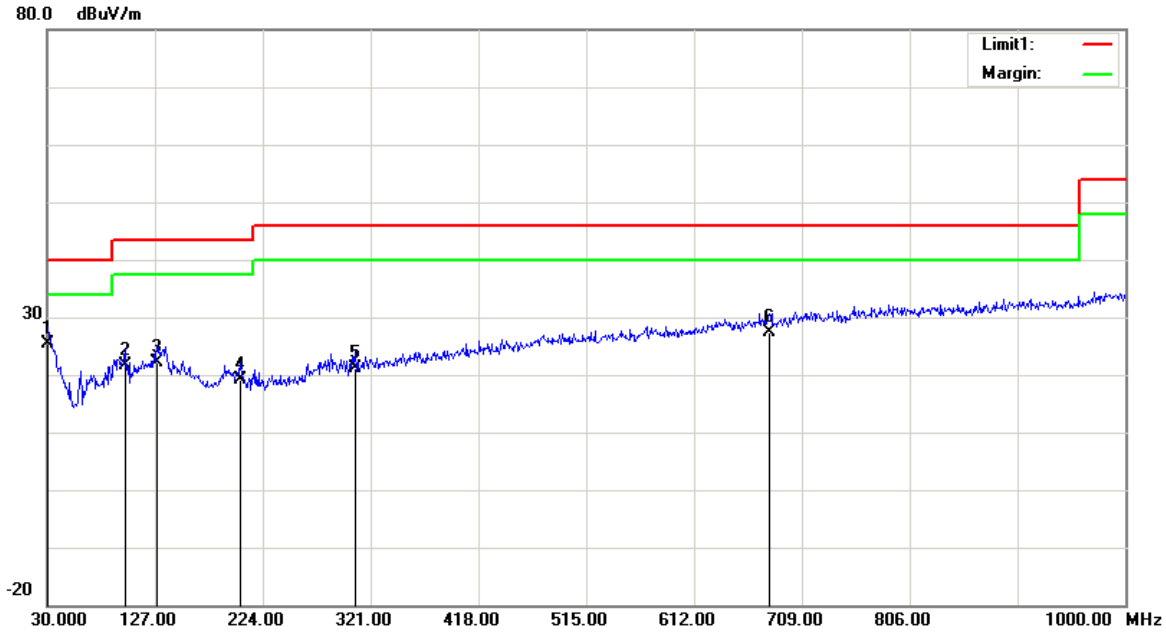
Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
0.0175	-2.32	peak	82.41	80.09	122.74	42.65
0.1262	21.73	peak	65.25	86.98	105.58	18.60
0.1438	6.62	peak	64.24	70.86	104.45	33.59



Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
0.1500	29.11	peak	38.68	67.79	104.08	36.29
1.5530	38.28	peak	18.72	57.00	63.77	6.77
3.1648	42.55	peak	13.05	55.60	69.54	13.94
4.8365	47.86	peak	10.74	58.60	69.54	10.94
6.8066	27.10	peak	10.20	37.30	69.54	32.24

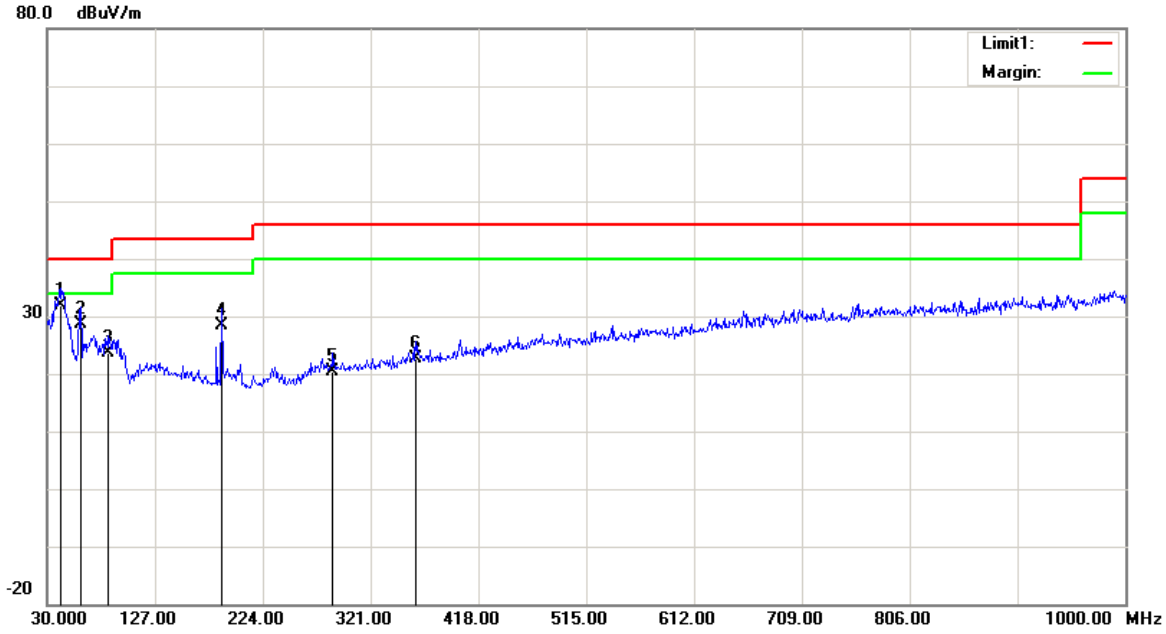
2) Above 30 MHz

Horizontal



Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
30.9700	24.48	QP	0.82	25.30	40.00	14.70
99.8400	30.48	QP	-8.88	21.60	43.50	21.90
128.9400	27.00	QP	-4.90	22.10	43.50	21.40
203.6300	25.46	QP	-6.36	19.10	43.50	24.40
307.4200	25.01	QP	-3.91	21.10	46.00	24.90
679.9000	24.77	QP	2.73	27.50	46.00	18.50

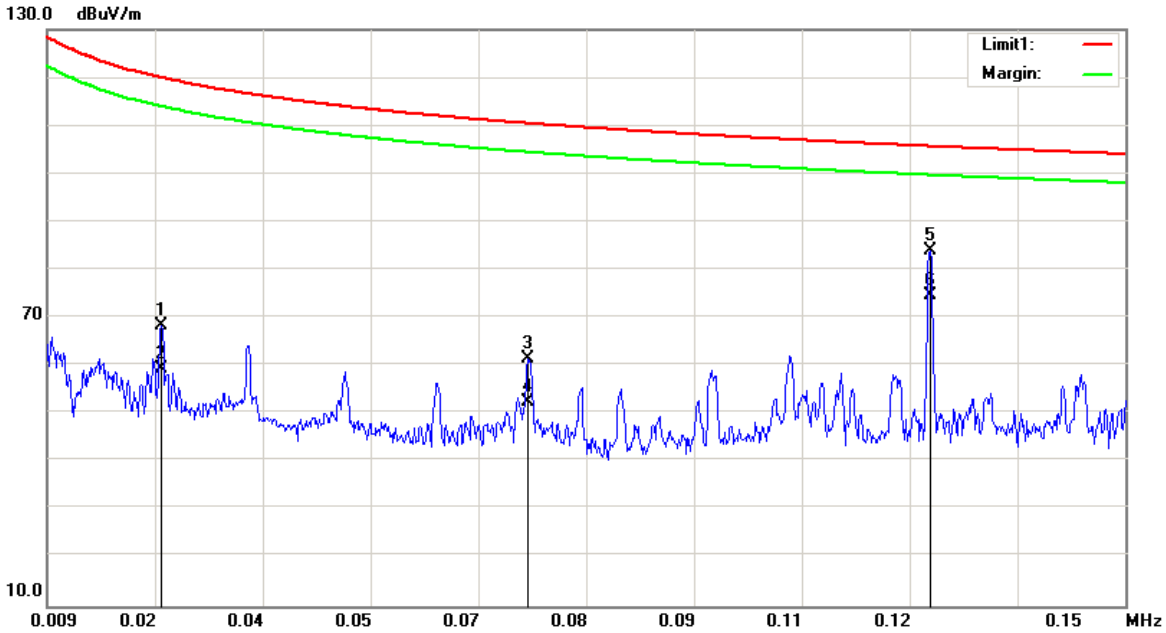
Vertical



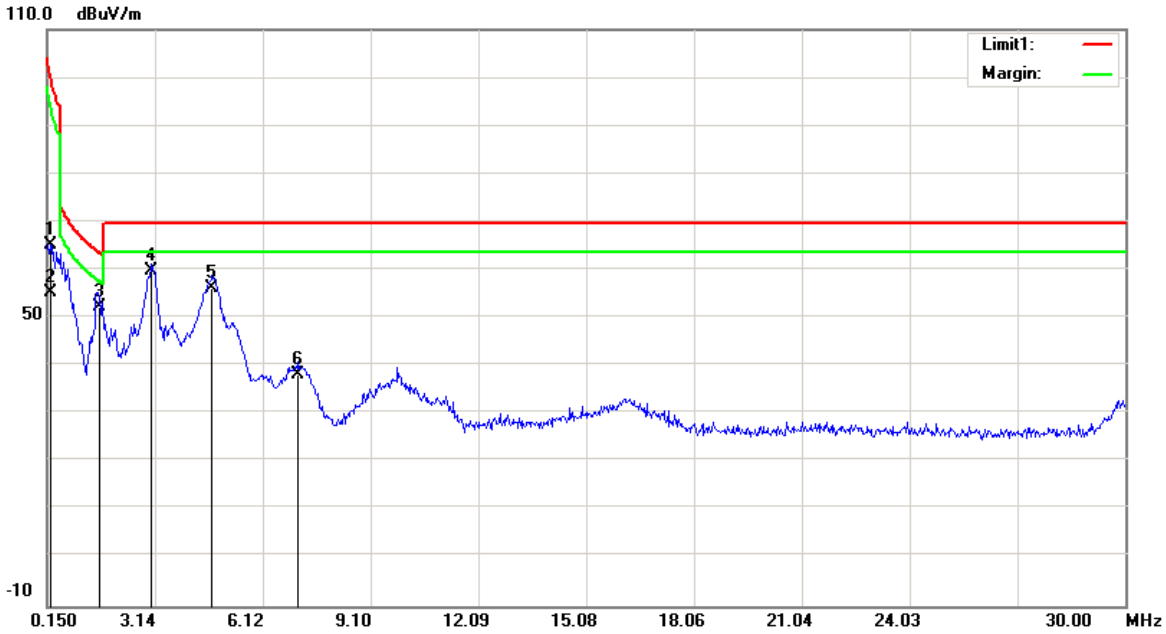
Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
41.6400	38.92	QP	-7.02	31.90	40.00	8.10
60.0700	40.80	QP	-12.20	28.60	40.00	11.40
85.2900	35.19	QP	-11.49	23.70	40.00	16.30
187.1400	35.84	QP	-7.44	28.40	43.50	15.10
287.0500	24.61	QP	-4.11	20.50	46.00	25.50
361.7400	25.50	QP	-2.80	22.70	46.00	23.30

For FSK Mode:

1) 9 kHz~30MHz:



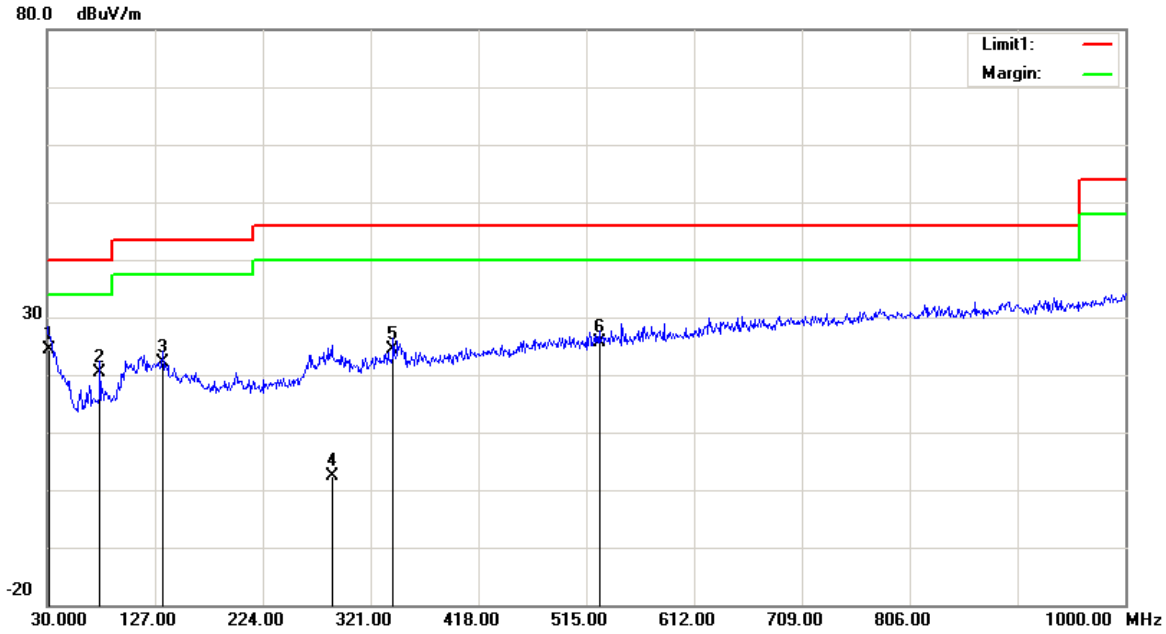
Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
0.0240	-10.67	peak	78.97	68.30	120.00	51.70
0.0720	-8.19	peak	69.51	61.32	110.46	49.14
0.1243	18.55	peak	65.35	83.90	105.71	21.81



Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
0.2394	31.57	peak	33.63	65.20	100.02	34.82
1.6127	34.02	peak	18.38	52.40	63.44	11.04
3.0455	46.47	peak	13.23	59.70	69.54	9.84
4.7171	45.21	peak	10.89	56.10	69.54	13.44
7.1051	28.10	peak	10.10	38.20	69.54	31.34

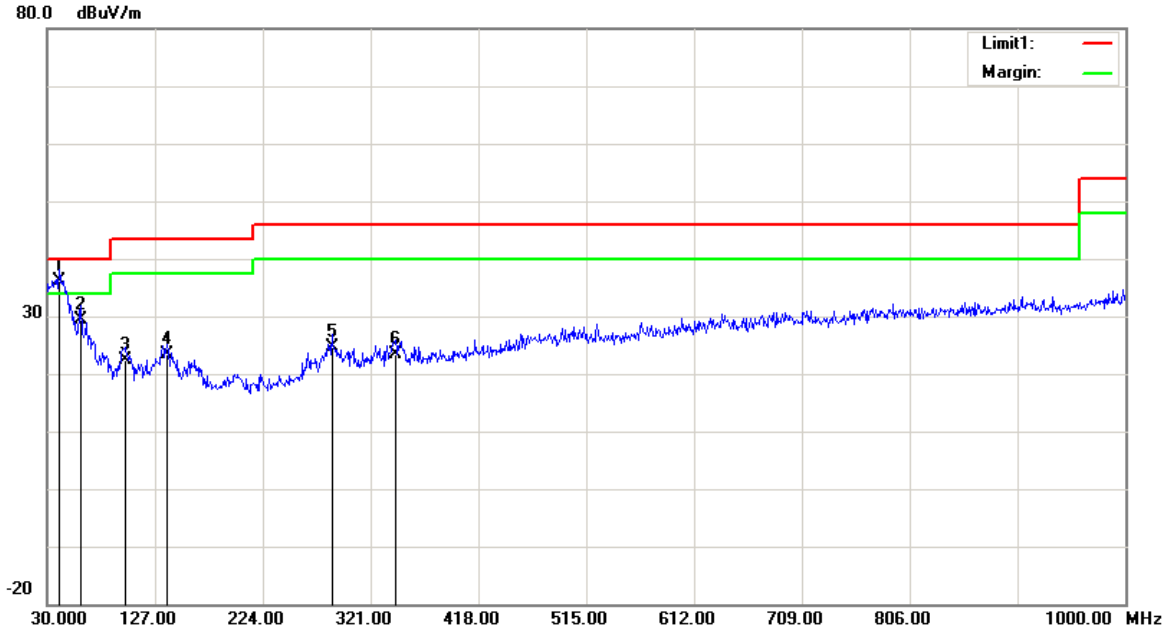
2) Above 30 MHz

Horizontal



Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
31.9400	24.19	QP	0.11	24.30	40.00	15.70
77.5300	31.56	QP	-11.26	20.30	40.00	19.70
133.7900	27.27	QP	-5.17	22.10	43.50	21.40
286.0800	6.62	QP	-4.12	2.50	46.00	43.50
341.3700	27.85	QP	-3.35	24.50	46.00	21.50
526.6400	25.48	QP	0.22	25.70	46.00	20.30

Vertical



Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
40.6700	42.47	QP	-6.37	36.10	40.00	3.90
60.0700	41.60	QP	-12.20	29.40	40.00	10.60
99.8400	31.38	QP	-8.88	22.50	43.50	21.00
137.6700	29.07	QP	-5.57	23.50	43.50	20.00
286.0800	28.72	QP	-4.12	24.60	46.00	21.40
343.3100	26.78	QP	-3.28	23.50	46.00	22.50

FCC §15.215(c) – 20 dB EMISSION BANDWIDTH

Applicable Standard

Per FCC §15.215 (c) Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §15.217 through § 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of - band operation.

Test Procedure

Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100224	2017-12-11	2018-12-11
HP	Amplifier	8447D	2727A05902	2017-09-05	2018-09-05
EMCO	Passive Loop	6512	9706-1206	2017-03-05	2020-03-04
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2017-09-05	2018-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-01	2017-09-05	2018-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-1000-01	2017-09-05	2018-09-05

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

Test Data

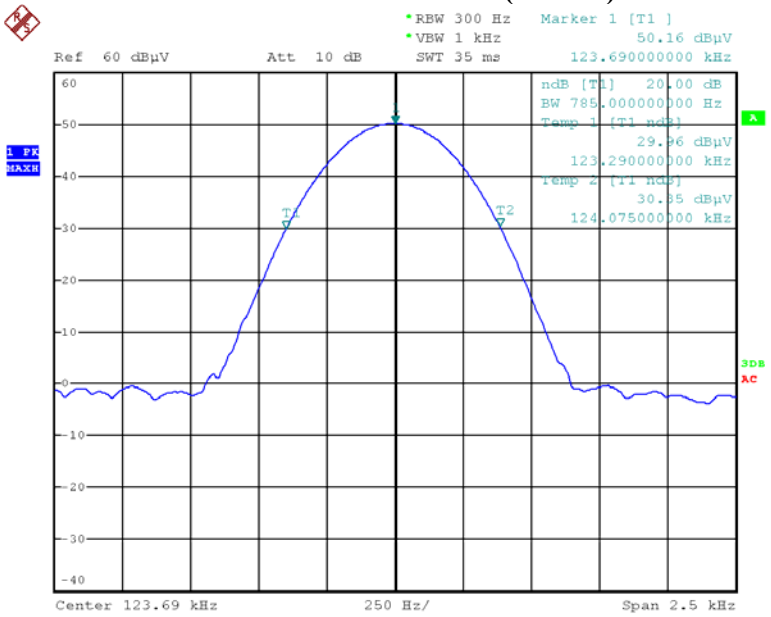
Environmental Conditions

Temperature:	26.4~28.2 °C
Relative Humidity:	40~59 %
ATM Pressure:	99.5~100 kPa

** The testing was performed by Vern Shen on 2018-07-14, 2018-07-23.*

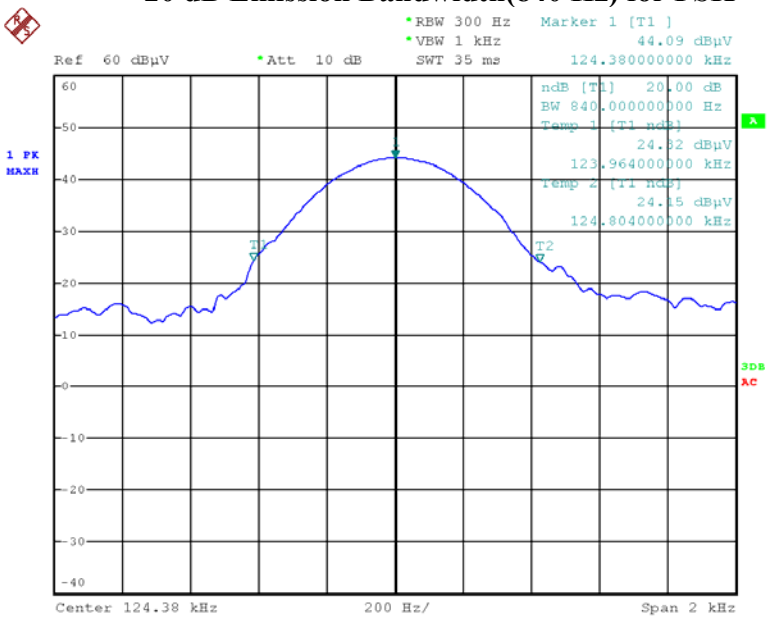
Test Mode: Transmitting

20 dB Emission Bandwidth(785 Hz) for ASK



Date: 14.JUL.2018 17:07:28

20 dB Emission Bandwidth(840 Hz) for FSK



Date: 23.JUL.2018 11:33:10

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