

FCC Test Report

Product Name	Data Collector
Model No.	PI-1060
FCC ID.	NBF-PI-1X60

Applicant	Argox Information Co.,Ltd.
Address	7F., No.126, Ln. 235, Baociao Rd., Xindian Dist., New Taipei City 231, Taiwan (R.O.C.)

Date of Receipt	Mar. 30, 2018
Issued Date	Oct. 02, 2018
Report No.	1850384R-RFUSP25V00
Report Version	V1.0



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.

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Test Report

Issued Date: Oct. 02, 2018

Report No.: 1850384R-RFUSP25V00



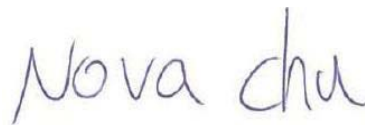
Product Name	Data Collector
Applicant	Argox Information Co.,Ltd.
Address	7F., No.126, Ln. 235, Baociao Rd., Xindian Dist., New Taipei City 231, Taiwan (R.O.C.)
Manufacturer	Argox Information Co.,Ltd.
Model No.	PI-1060
FCC ID.	NBF-PI-1X60
EUT Rated Voltage	AC 100-240V / 50-60Hz or DC 3.6V by Battery or DC 5V by USB
EUT Test Voltage	AC 120V / 60Hz
Trade Name	ARGOX
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2017 ANSI C63.4: 2014, ANSI C63.10: 2013 KDB 558074 D01 15.247 Meas Guidance v05
Test Result	Complied

Documented By :



(Senior Adm. Specialist / Joanne Lin)

Tested By :



(Engineer / Nova Chu)

Approved By :



(Director / Vincent Lin)

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Data Collector
Trade Name	ARGOX
Model No.	PI-1060
FCC ID.	NBF-PI-1X60
Frequency Range	902.8- 927.2MHz
Channel Number	7CH
Type of Modulation	2-GFSK
Antenna Type	Print on PCB Antenna
Antenna Gain	Refer to the table “Antenna List”
Power Adapter	MFR: Powertron Electronics Corp., M/N: PS1012-050HIB200 Input: AC 100-240V~50-60Hz, 0.4A Output: DC 5V, 2.0A Cable Out: Non-Shielded, 1.5m

Center Frequency of Each Channel:

Channel	Frequency
01	902.8MHz
02	915.0MHz
03	915.8MHz
04	920.8MHz
05	923.3MHz
06	924.2MHz
07	927.2MHz

Note:

1. The EUT is a Data Collector with a built-in Sub-1G transceiver.
2. These tests were conducted on a sample for the purpose of demonstrating compliance of Sub-1G transmitter with Part 15 Subpart C Paragraph 15.247 for spread spectrum devices.
3. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

Test Mode	Mode 1: Transmit
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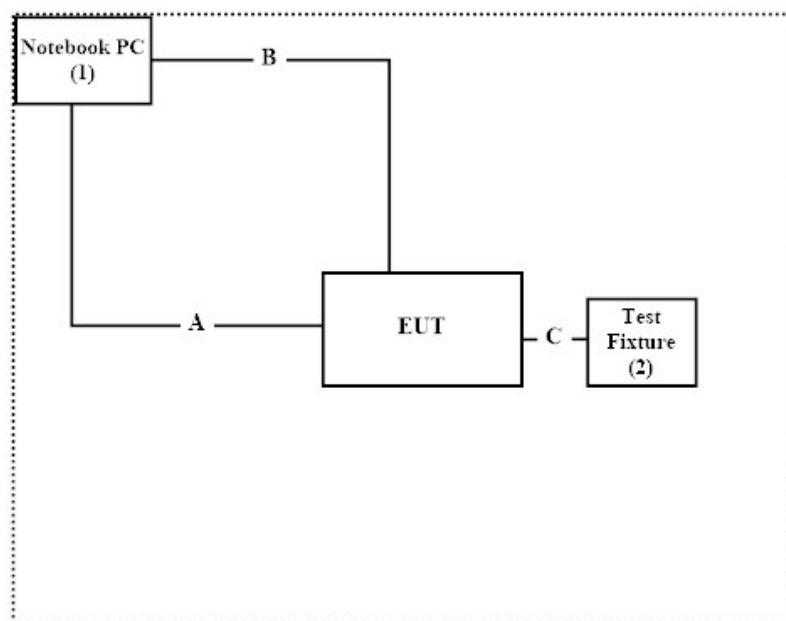
1.3. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product	Manufacturer	Model No.	Serial No.	Power Cord	
1	Notebook PC	DELL	P62G	229FJC2	N/A
2	Test Fixture	N/A	N/A	N/A	N/A

Signal Cable Type	Signal Cable Description
A	USB Cable
B	USB Cable
C	Single Cable

1.4. Configuration of Tested System



1.5. EUT Exercise Software

- (1) Setup the EUT as shown in Section 1.4.
- (2) Execute smart RF studio07 V2.3.1 program on the Notebook
- (3) Configure the test mode, the test channel, and the data rate.
- (4) Verify that the EUT works properly.

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

The related certificate for our laboratories about the test site and management system can be downloaded from DEKRA Testing and Certification Co., Ltd. Web Site:

<http://www.dekra.com.tw/english/about/certificates.aspx?bval=5>

The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our Web site: http://www.dekra.com.tw/index_en

Site Description: Accredited by TAF
Accredited Number: 3023

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FCC Accreditation Number: TW0023

1.7. List of Test Equipment

For Conduction measurements / ASR1

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
X	EMI Test Receiver	R&S	ESR7	101601	2018.02.08	2019.02.07
X	Two-Line V-Network	R&S	ENV216	101306	2018.03.09	2019.03.08
X	Two-Line V-Network	R&S	ENV216	101307	2018.03.20	2019.03.19
X	Coaxial Cable	Quietek	RG400_BNC	RF001	2018.05.24	2019.05.23

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with “X” are used to measure the final test results.
3. Test Software version : QuieTek EMI 2.0 V2.1.113

For Conducted measurements / ASR4

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
X	Spectrum Analyzer	R&S	FSV30	103464	2018.01.23	2019.01.22
X	Power Meter	Anritsu	ML2496A	1548003	2017.12.11	2018.12.10
X	Power Sensor	Anritsu	MA2411B	1531024	2017.12.11	2018.12.10
X	Power Sensor	Anritsu	MA2411B	1531025	2017.12.11	2018.12.10
	Bluetooth Tester	R&S	CBT	101238	2018.01.18	2019.01.17

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with “X” are used to measure the final test results.
3. Test Software version : QuieTek Conduction Test System V8.0.110

For Radiated measurements / ACB1

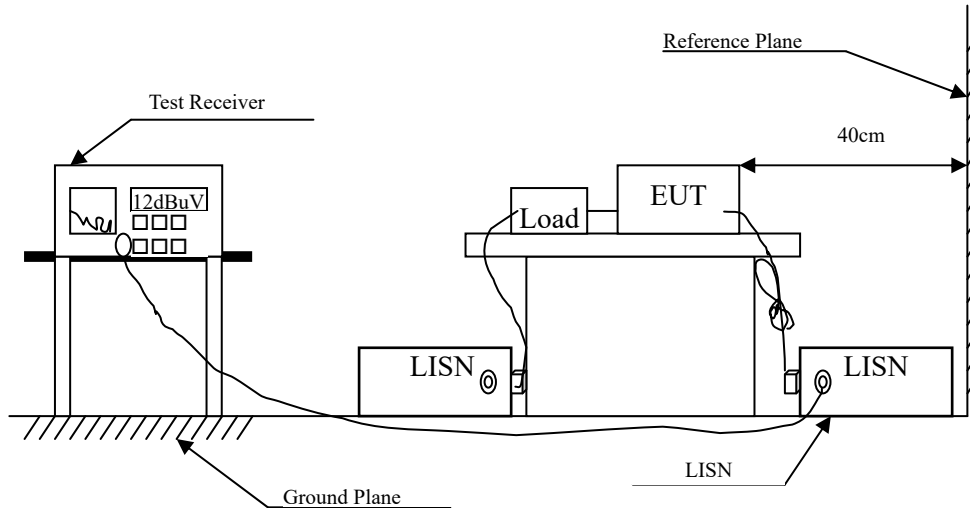
	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
X	Loop Antenna	TESEQ	HLA6121	37133	2018.01.26	2019.01.25
X	Bi-Log Antenna	SCHWARZBECK	VULB9168	9168-674	2018.04.02	2019.04.01
X	Horn Antenna	ETS-Lindgren	3117	00203800	2017.11.10	2018.11.09
	Horn Antenna	Com-Power	AH-840	101087	2018.06.01	2019.05.31
X	Pre-Amplifier	EMCI	EMC001330	980316	2018.06.01	2019.05.31
X	Pre-Amplifier	EMCI	EMC051835SE	980311	2018.06.04	2019.06.03
	Pre-Amplifier	EMCI	EMC05820SE	980310	2018.06.04	2019.06.03
	Pre-Amplifier	EMCI	EMC184045SE	980314	2018.05.16	2019.05.15
	Filter	MICRO TRONICS	BRM50702	G249	2017.08.30	2018.08.29
	Filter	MICRO TRONICS	BRM50716	G187	2017.08.30	2018.08.29
X	EMI Test Receiver	R&S	ESR7	101602	2017.12.11	2018.12.10
X	Spectrum Analyzer	R&S	FSV40	101148	2018.02.08	2019.02.07
X	Coaxial Cable	SUHNER	SUCOFLEX 106	RF002	2018.05.25	2019.05.24
	Mircoflex Cable	HUBER SUHNER	SUCOFLEX 102	MY3381/2	2018.05.16	2019.05.15

Note:

1. Loop Antenna is calibrated every two year, the other equipments are calibrated every one year.
2. The test instruments marked with “X” are used to measure the final test results.
3. Test Software version : QuieTek EMI 2.0 V2.1.113

2. Conducted Emission

2.1. Test Setup



2.2. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBuV) Limit		
Frequency MHz	Limits	
	QP	AV
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

Remarks: In the above table, the tighter limit applies at the band edges.

2.3. Test Procedure

The EUT and Peripherals are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.

Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

The EUT setup and the test procedure are according to ANSI C63.4, 2014 to comply with the requirements of FCC 47CFR Subpart C.

2.4. Uncertainty

±2.35dB

2.5. Test Result of Conducted Emission

Product : Data Collector
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Date : 2018/07/03
 Test Mode : Mode 1: Transmit (915.0 MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V	Margin dB	Limit dB μ V
LINE 1					
Quasi-Peak					
0.161	9.560	43.288	52.848	-12.838	65.686
0.501	9.579	30.009	39.588	-16.412	56.000
0.798	9.580	23.641	33.221	-22.779	56.000
2.722	9.587	20.312	29.899	-26.101	56.000
4.997	9.610	13.016	22.626	-33.374	56.000
24.576	9.690	20.222	29.912	-30.088	60.000
Average					
0.161	9.560	17.264	26.824	-28.862	55.686
0.501	9.579	17.893	27.473	-18.527	46.000
0.798	9.580	11.497	21.077	-24.923	46.000
2.722	9.587	11.365	20.952	-25.048	46.000
4.997	9.610	6.546	16.156	-29.844	46.000
24.576	9.690	16.357	26.047	-23.953	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "█" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Data Collector
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Date : 2018/07/03
 Test Mode : Mode 1: Transmit (915.0 MHz)

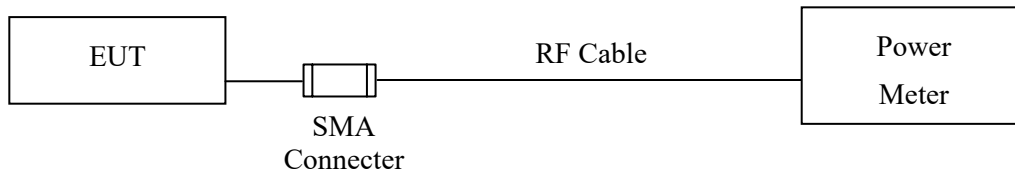
Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V	Margin dB	Limit dB μ V
LINE 2					
Quasi-Peak					
0.161	9.861	42.650	52.510	-13.176	65.686
0.510	9.866	20.664	30.530	-25.470	56.000
0.798	9.793	26.748	36.540	-19.460	56.000
2.744	9.701	21.520	31.221	-24.779	56.000
5.001	9.650	15.627	25.277	-34.723	60.000
28.270	9.810	4.857	14.667	-45.333	60.000
Average					
0.161	9.861	17.767	27.628	-28.058	55.686
0.510	9.866	7.663	17.529	-28.471	46.000
0.798	9.793	9.119	18.912	-27.088	46.000
2.744	9.701	12.211	21.912	-24.088	46.000
5.001	9.650	8.655	18.305	-31.695	50.000
28.270	9.810	7.260	17.070	-32.930	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "█" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

3. Peak Power Output

3.1. Test Setup



3.2. Limit

The maximum peak power shall be less 1Watt.

3.3. Test Procedure

Tested according to DTS test procedure of KDB 558074 section 8.3.1.3 PKPM1 Peak-reading power meter method for compliance to FCC 47CFR 15.247 requirements.

3.4. Uncertainty

± 0.86 dB

3.5. Test Result of Peak Power Output

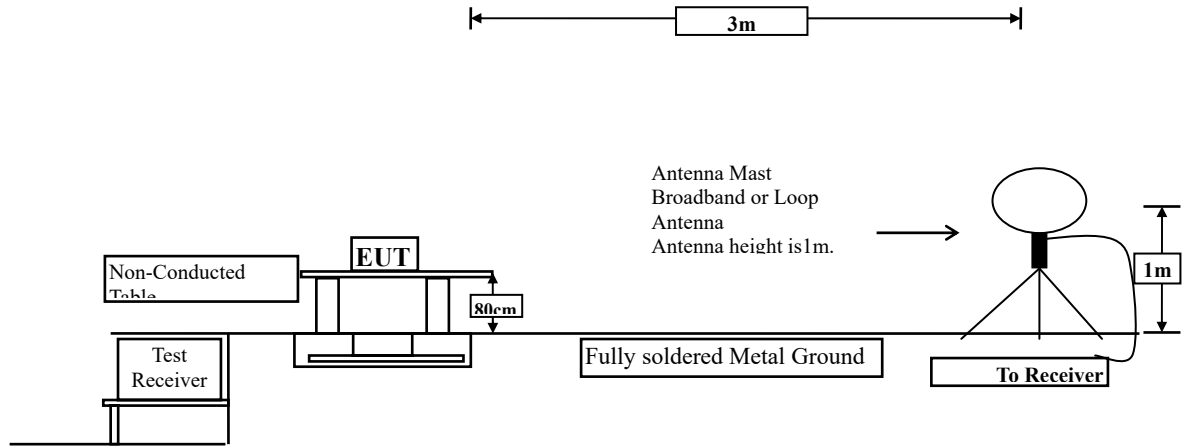
Product : Data Collector
Test Item : Peak Power Output
Test Mode : Mode 1: Transmit
Test Date : 2018/08/01

Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit	Result
01	902.8	14.49	1 Watt= 30 dBm	Pass
02	915.0	14.30	1 Watt= 30 dBm	Pass
07	927.2	14.09	1 Watt= 30 dBm	Pass

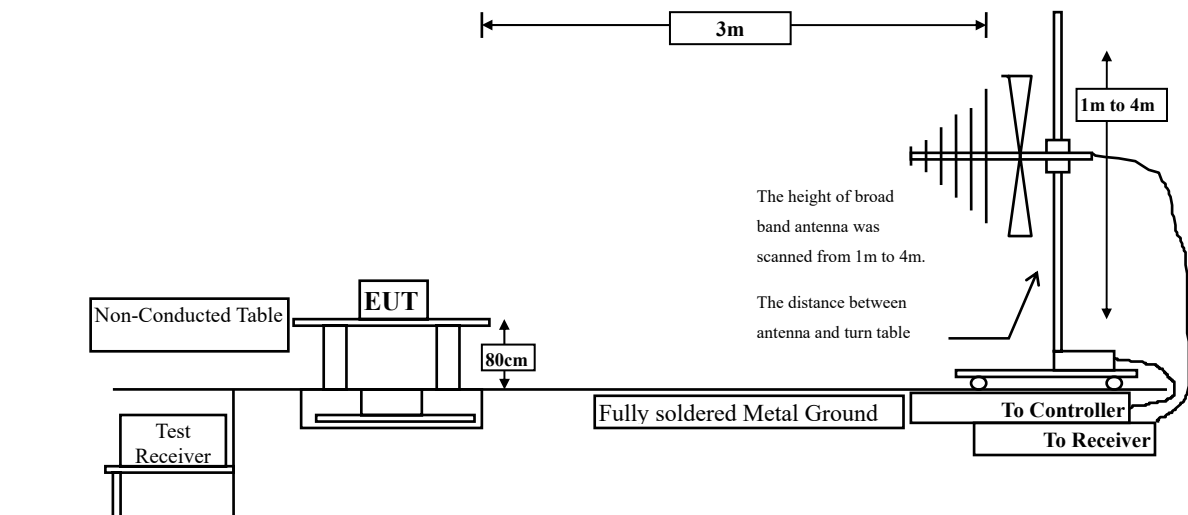
4. Radiated Emission

4.1. Test Setup

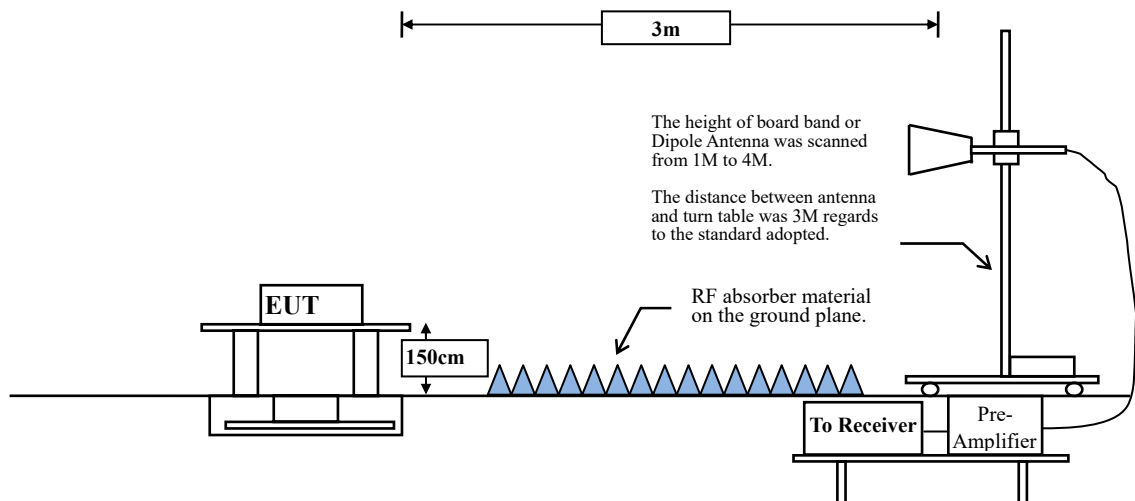
Radiated Emission Under 30MHz



Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



4.2. Limits

➤ General Radiated Emission Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209 Limits		
Frequency MHz	Field strength (microvolts/meter)	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

- Remarks:
1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
 2. In the Above Table, the tighter limit applies at the band edges.
 3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

4.3. Test Procedure

The EUT was setup according to ANSI C63.10: 2013 and tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Measuring the frequency range below 1GHz, the EUT is placed on a turn table which is 0.8 meter above ground, when measuring the frequency range above 1GHz, the EUT is placed on a turn table which is 1.5 meter above ground.

The turn table is rotated 360 degrees to determine the position of the maximum emission level.

The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10: 2013 on radiated measurement.

The resolution bandwidth below 30MHz setting on the field strength meter is 9kHz and 30MHz~1GHz is 120kHz and above 1GHz is 1MHz.

Radiated emission measurements below 30MHz are made using Loop Antenna and 30MHz~1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

The measurement frequency range from 9kHz - 10th Harmonic of fundamental was investigated.

4.4. Uncertainty

Horizontal polarization :

30-300MHz: ± 4.08 dB ; 300M-1GHz: ± 3.86 dB ; 1-18GHz: ± 3.77 dB ; 18-40GHz: ± 3.98 dB

Vertical polarization :

30-300MHz: ± 4.81 dB ; 300M-1GHz: ± 3.87 dB ; 1-18GHz : ± 3.83 dB ; 18-40GHz: ± 3.98 dB

4.5. Test Result of Radiated Emission

Product : Data Collector
 Test Item : Harmonic Radiated Emission
 Test Mode : Mode 1: Transmit (902.8 MHz)
 Test Date : 2018/07/26

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
1805.600	-8.204	56.890	48.687	-25.313	74.000
2708.400	-5.270	54.830	49.560	-24.440	74.000
3611.200	-4.409	55.530	51.121	-22.879	74.000
4514.000	-2.577	48.590	46.012	-27.988	74.000
5416.800	-1.875	46.060	44.185	-29.815	74.000
6319.600	0.057	45.020	45.076	-28.924	74.000
7222.400	0.714	45.200	45.914	-28.086	74.000
8125.200	1.373	43.860	45.232	-28.768	74.000
9028.000	2.454	43.950	46.403	-27.597	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
1805.600	-8.204	56.340	48.137	-25.863	74.000
2708.400	-5.270	54.480	49.210	-24.790	74.000
3611.200	-4.409	56.090	51.681	-22.319	74.000
4514.000	-2.577	48.390	45.812	-28.188	74.000
5416.800	-1.875	45.860	43.985	-30.015	74.000
6319.600	0.057	45.660	45.716	-28.284	74.000
7222.400	0.714	45.000	45.714	-28.286	74.000
8125.200	1.373	43.700	45.072	-28.928	74.000
9028.000	2.454	44.240	46.693	-27.307	74.000
Average Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Data Collector
 Test Item : Harmonic Radiated Emission
 Test Mode : Mode 1: Transmit (915.0 MHz)
 Test Date : 2018/07/27

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
1830.000	-8.015	55.770	47.755	-26.245	74.000
2745.000	-5.211	55.640	50.430	-23.570	74.000
3660.000	-4.450	57.000	52.549	-21.451	74.000
4575.000	-2.693	50.000	47.307	-26.693	74.000
5490.000	-1.744	45.630	43.886	-30.114	74.000
6405.000	0.040	44.670	44.710	-29.290	74.000
7320.000	0.794	45.680	46.474	-27.526	74.000
8235.000	1.456	42.870	44.326	-29.674	74.000
9150.000	2.600	45.010	47.610	-26.390	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
1830.000	-8.015	57.110	49.095	-24.905	74.000
2745.000	-5.211	58.240	53.030	-20.970	74.000
3660.000	-4.450	57.680	53.229	-20.771	74.000
4575.000	-2.693	50.870	48.177	-25.823	74.000
5490.000	-1.744	47.190	45.446	-28.554	74.000
6405.000	0.040	45.100	45.140	-28.860	74.000
7320.000	0.794	45.390	46.184	-27.816	74.000
8235.000	1.456	43.350	44.806	-29.194	74.000
9150.000	2.600	44.150	46.750	-27.250	74.000
Average Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Data Collector
 Test Item : Harmonic Radiated Emission
 Test Mode : Mode 1: Transmit (927.2 MHz)
 Test Date : 2018/07/27

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
1854.400	-7.833	56.200	48.367	-25.633	74.000
2781.600	-5.160	56.120	50.960	-23.040	74.000
3708.800	-4.280	60.410	56.130	-17.870	74.000
4636.000	-2.503	50.370	47.867	-26.133	74.000
5563.200	-1.593	46.070	44.478	-29.522	74.000
6490.400	0.230	45.300	45.531	-28.469	74.000
7417.600	0.829	44.680	45.509	-28.491	74.000
8344.800	1.545	44.280	45.825	-28.175	74.000
9272.000	2.861	44.390	47.250	-26.750	74.000
Average Detector:					
3708.800	-4.280	53.170	48.890	-5.110	54.000
Vertical					
Peak Detector:					
1854.400	-7.833	56.340	48.507	-25.493	74.000
2781.600	-5.160	60.130	54.970	-19.030	74.000
3708.800	-4.280	62.190	57.910	-16.090	74.000
4636.000	-2.503	50.550	48.047	-25.953	74.000
5563.200	-1.593	46.800	45.208	-28.792	74.000
6490.400	0.230	45.790	46.021	-27.979	74.000
7417.600	0.829	44.260	45.089	-28.911	74.000
8344.800	1.545	43.900	45.445	-28.555	74.000
9272.000	2.861	43.620	46.480	-27.520	74.000
Average Detector:					
2781.600	-5.160	55.360	50.200	-3.800	54.000
3708.800	-4.280	55.430	51.150	-2.850	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Data Collector
 Test Item : General Radiated Emission
 Test Mode : Mode 1: Transmit (915.0 MHz)
 Test Date : 2018/06/30

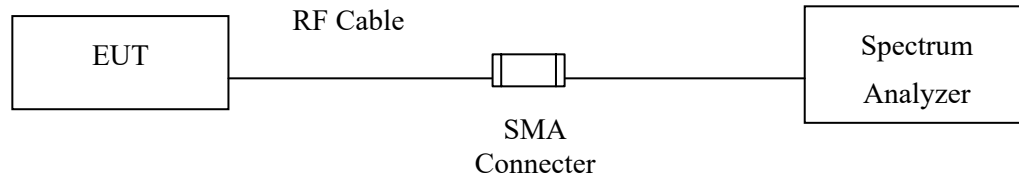
Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
66.551	-13.101	50.346	37.245	-2.755	40.000
173.391	-11.636	43.512	31.876	-11.624	43.500
283.043	-10.822	45.878	35.055	-10.945	46.000
600.754	-4.000	34.743	30.743	-15.257	46.000
863.638	-0.691	36.863	36.171	-9.829	46.000
990.159	0.879	38.441	39.320	-14.680	54.000
Average Detector:					
--					
Vertical					
66.551	-13.101	50.346	37.245	-2.755	40.000
285.855	-10.759	46.005	35.247	-10.753	46.000
409.565	-7.800	37.558	29.759	-16.241	46.000
621.841	-3.871	35.068	31.196	-14.804	46.000
804.594	-1.585	37.369	35.784	-10.216	46.000
973.290	0.659	38.429	39.087	-14.913	54.000
Average Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. No emission found between lowest internal used/generated frequency to 30MHz.

5. RF Antenna Conducted Test

5.1. Test Setup



5.2. Limits

According to FCC Section 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 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, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

5.3. Test Procedure

Tested according to DTS test procedure of KDB558074 section 8.5 DTS emissions in non-restricted frequency bands for compliance to FCC 47CFR 15.247 requirements.

Set RBW = 100 kHz, Set VBW > RBW, scan up through 10th harmonic.

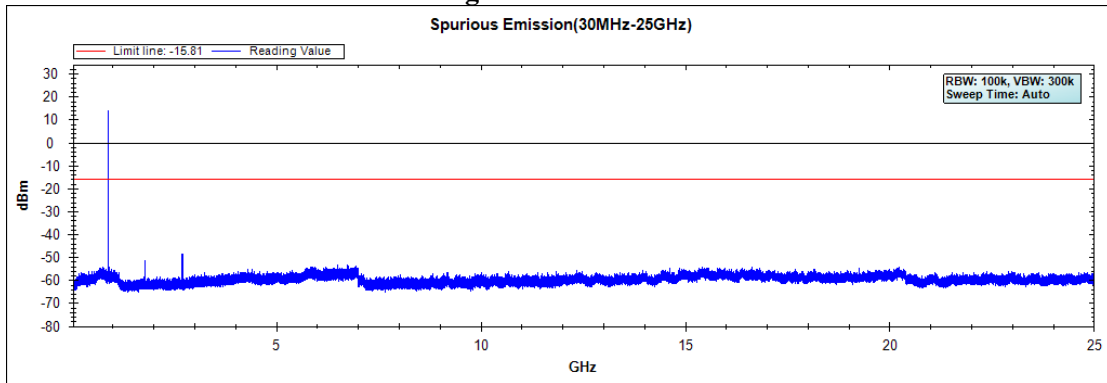
5.4. Uncertainty

±1.23dB

5.5. Test Result of RF Antenna Conducted Test

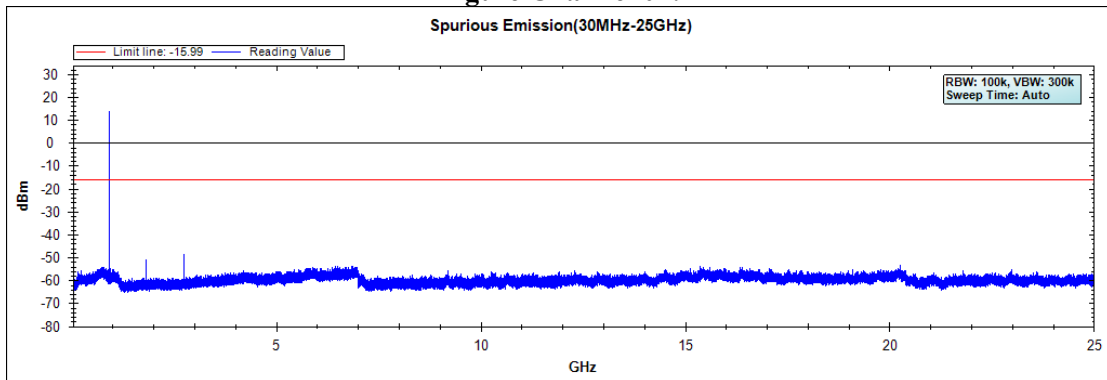
Product : Data Collector
 Test Item : RF Antenna Conducted Test
 Test Mode : Mode 1: Transmit
 Test Date : 2018/08/01

Figure Channel 01:



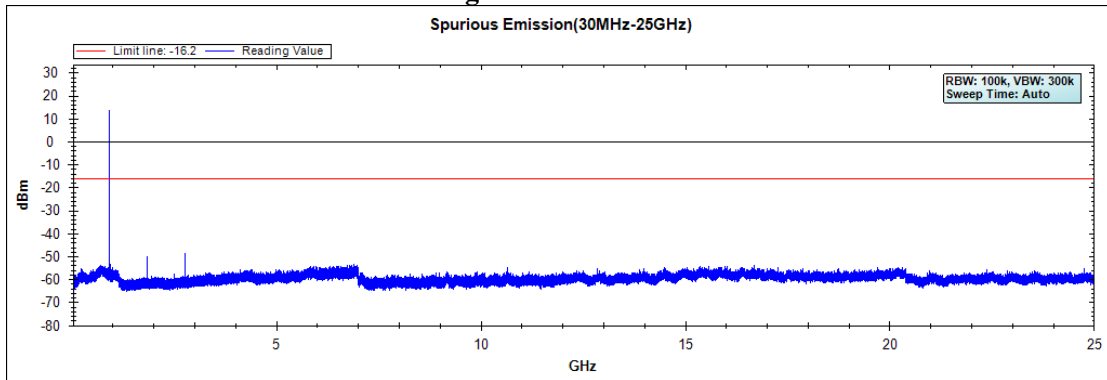
Note: The above test pattern is synthesized by multiple of the frequency range.

Figure Channel 02:



Note: The above test pattern is synthesized by multiple of the frequency range.

Figure Channel 07:

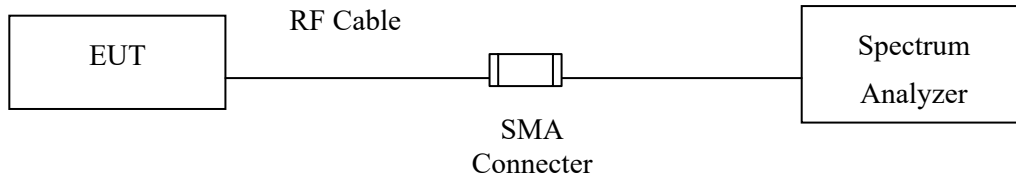


Note: The above test pattern is synthesized by multiple of the frequency range.

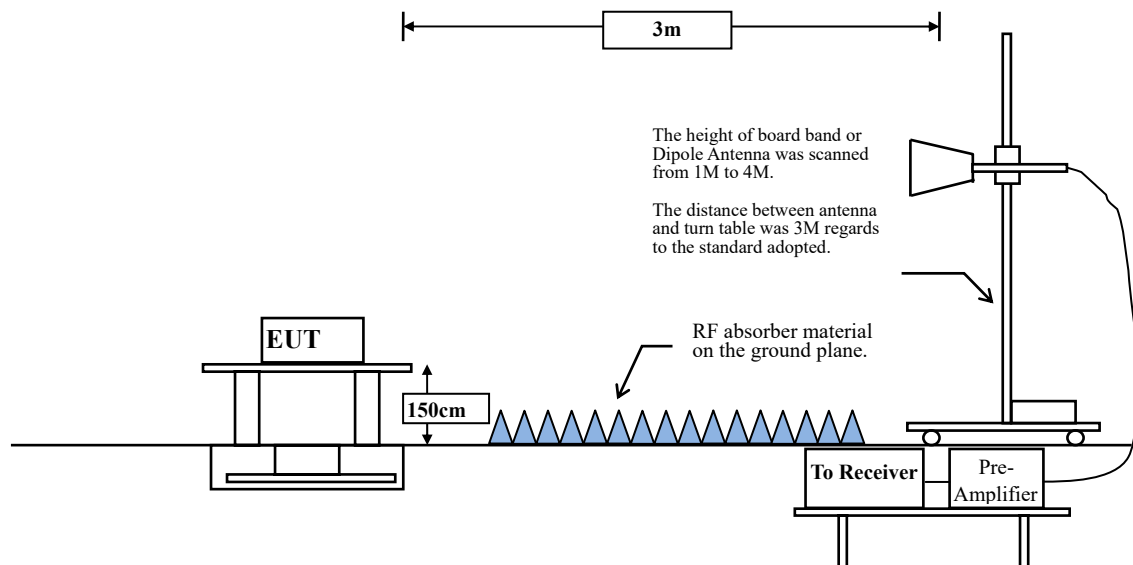
6. Band Edge

6.1. Test Setup

RF Conducted Measurement



RF Radiated Measurement:



6.2. Limit

According to FCC Section 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 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, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

6.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.

6.4. Uncertainty

Conducted: ± 1.23 dB

Radiated:

Horizontal polarization :

30-300MHz: ± 4.08 dB ; 300M-1GHz: ± 3.86 dB ; 1-18GHz: ± 3.77 dB ; 18-40GHz: ± 3.98 dB

Vertical polarization :

30-300MHz: ± 4.81 dB ; 300M-1GHz: ± 3.87 dB ; 1-18GHz : ± 3.83 dB ; 18-40GHz: ± 3.98 dB

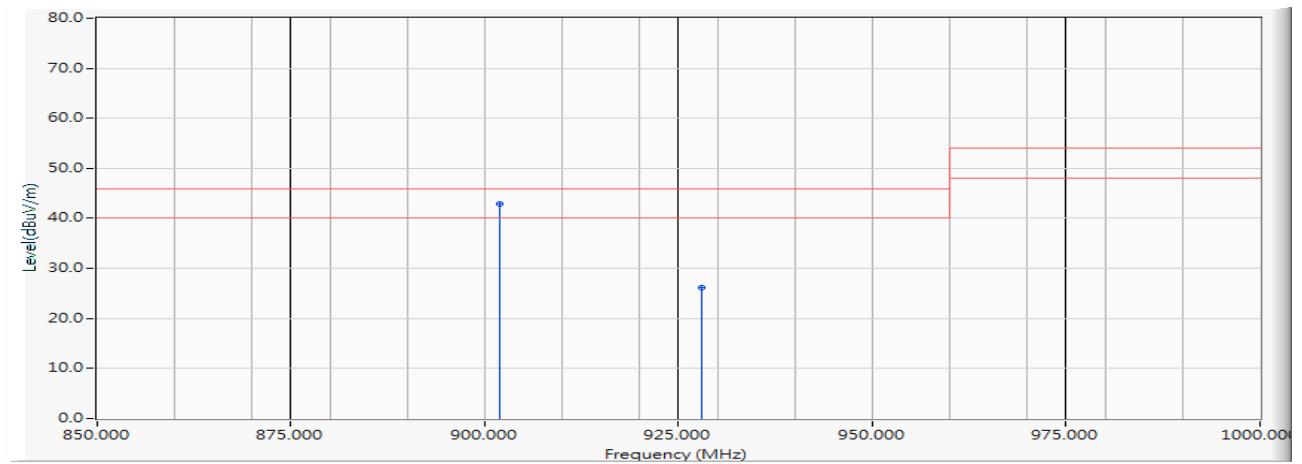
6.5. Test Result of Band Edge

Product : Data Collector
 Test Item : Band Edge
 Test Mode : Mode 1: Transmit (902.8MHz)

RF Radiated Measurement:

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Margin (dB)	Limit (dBμV/m)	Result
(Quasi-Peak)	902.000	1.119	41.800	42.918	-3.082	46.000	Pass
(Quasi-Peak)	928.000	1.414	24.800	26.213	-19.787	46.000	Pass

Figure Channel 01: Horizontal (Quasi-Peak)

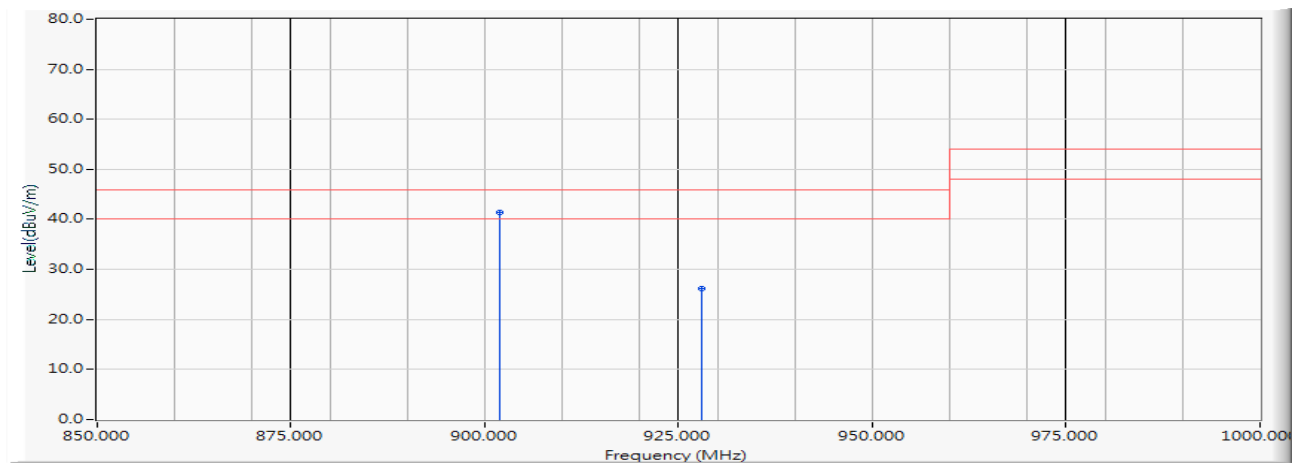


Product : Data Collector
 Test Item : Band Edge
 Test Mode : Mode 1: Transmit (902.8MHz)

RF Radiated Measurement:

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Margin (dB)	Limit (dBμV/m)	Result
(Quasi-Peak)	902.000	1.119	40.300	41.418	-4.582	46.000	Pass
(Quasi-Peak)	928.000	1.414	24.800	26.213	-19.787	46.000	Pass

Figure Channel 01: VERTICAL (Quasi-Peak)

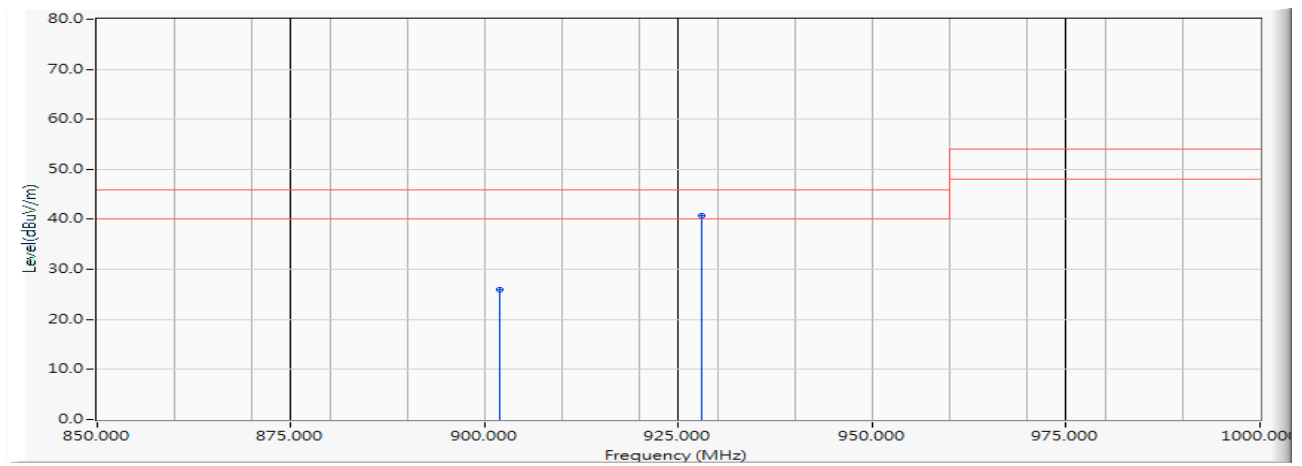


Product : Data Collector
 Test Item : Band Edge
 Test Mode : Mode 1: Transmit (927.2MHz)

RF Radiated Measurement:

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Margin (dB)	Limit (dBμV/m)	Result
(Quasi-Peak)	902.000	1.119	24.800	25.918	-20.082	46.000	Pass
(Quasi-Peak)	928.000	1.414	39.300	40.713	-5.287	46.000	Pass

Figure Channel 07: Horizontal (Quasi-Peak)

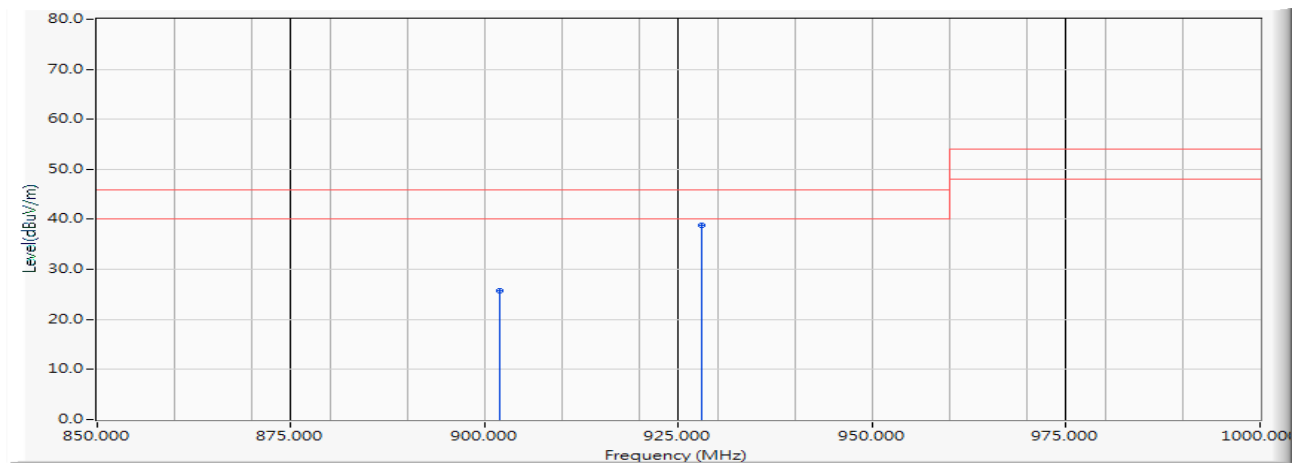


Product : Data Collector
 Test Item : Band Edge
 Test Mode : Mode 1: Transmit (927.2MHz)

RF Radiated Measurement:

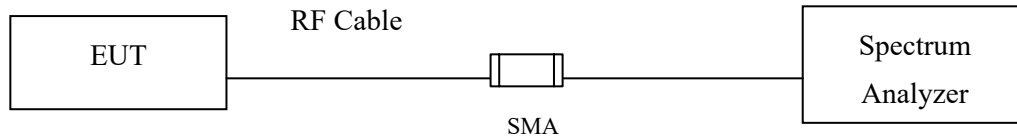
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Margin (dB)	Limit (dBμV/m)	Result
(Quasi-Peak)	902.000	1.119	24.600	25.718	-20.282	46.000	Pass
(Quasi-Peak)	928.000	1.414	37.300	38.713	-7.287	46.000	Pass

Figure Channel 07: VERTICAL (Quasi-Peak)



7. 6dB Bandwidth

7.1. Test Setup



7.2. Limits

The minimum bandwidth shall be at least 500 kHz.

7.3. Test Procedure

Tested according to DTS test procedure of KDB558074 section 8.2 for compliance to FCC 47CFR 15.247 requirements.

Set RBW = 1-5% of the emission bandwidth, $VBW \geq 3 * RBW$

7.4. Uncertainty

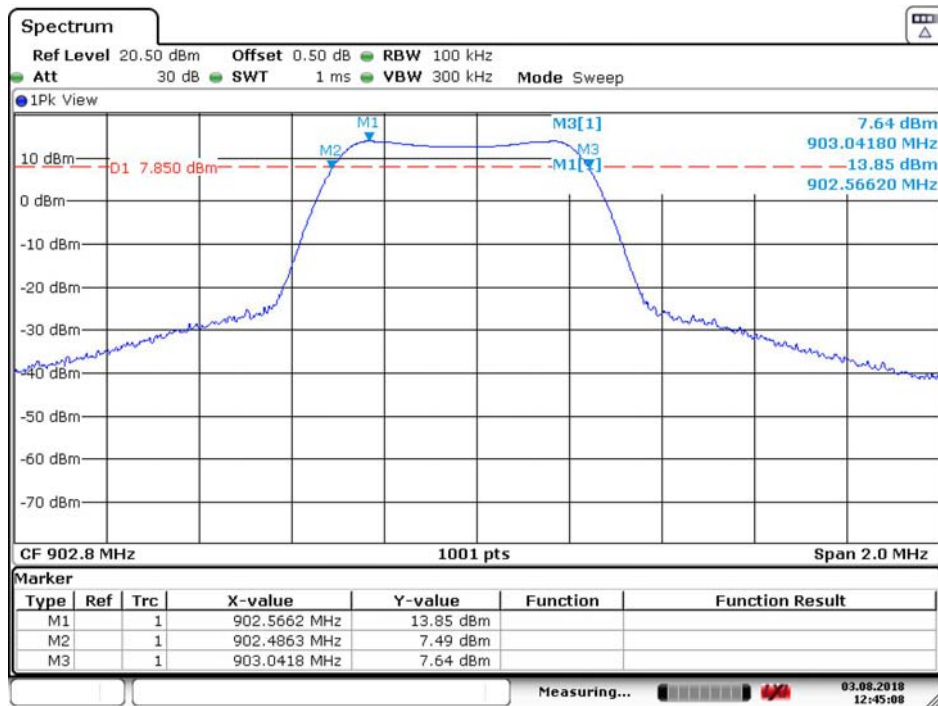
$\pm 279.2 \text{ Hz}$

7.5. Test Result of 6dB Bandwidth

Product : Data Collector
 Test Item : 6dB Bandwidth Data
 Test Mode : Mode 1: Transmit

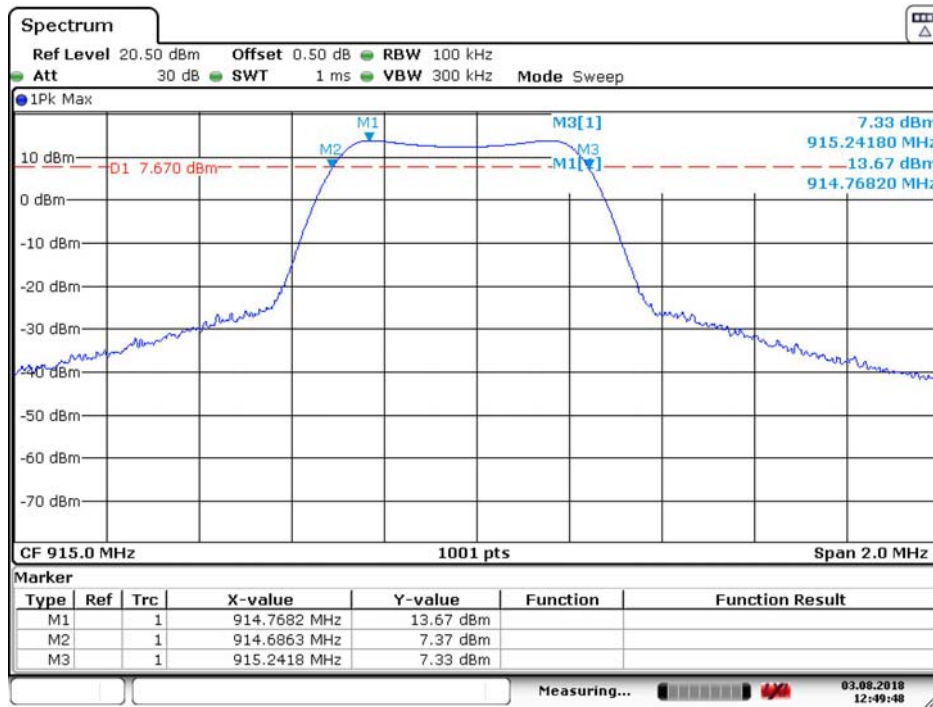
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
01	902.8	556	≥ 500	Pass
02	915.0	554	≥ 500	Pass
07	927.2	556	≥ 500	Pass

Figure Channel 01:



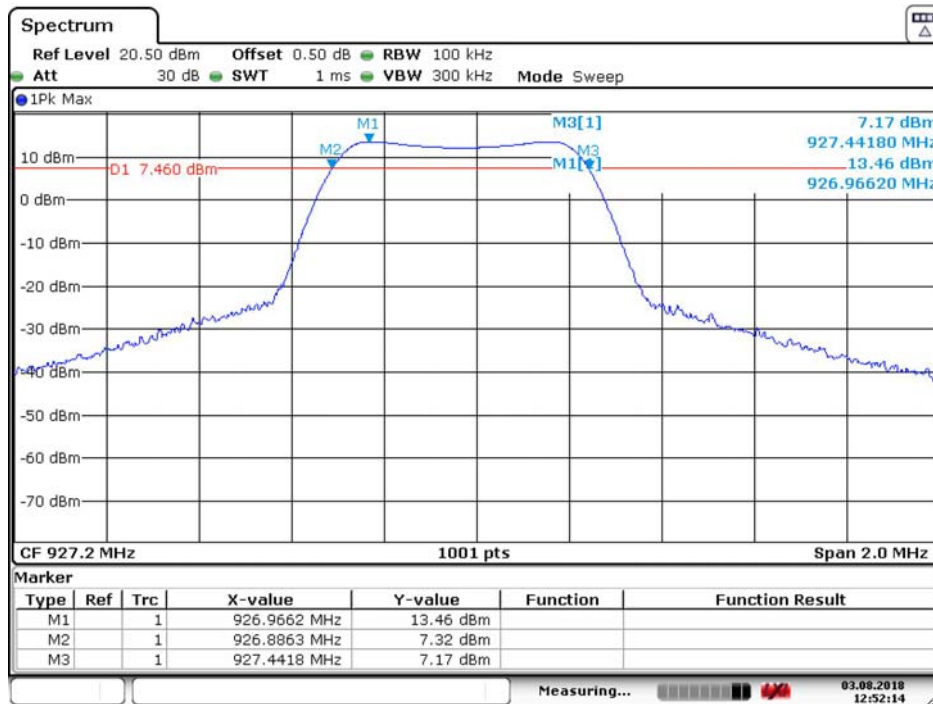
Date: 3.AUG.2018 12:45:08

Figure Channel 02:



Date: 3.AUG.2018 12:49:48

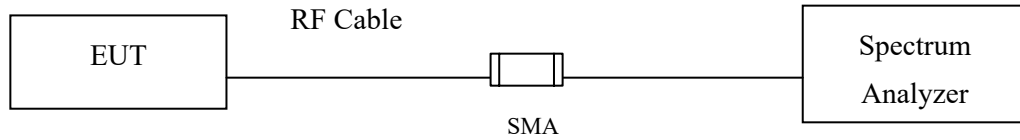
Figure Channel 07:



Date: 3.AUG.2018 12:52:14

8. Power Density

8.1. Test Setup



8.2. Limits

The transmitted power density averaged over any 1 second interval shall not be greater +8dBm in any 3kHz bandwidth.

8.3. Test Procedure

Tested according to DTS test procedure of KDB558074 section 8.4 for compliance to FCC 47CFR 15.247 requirements.

8.4. Uncertainty

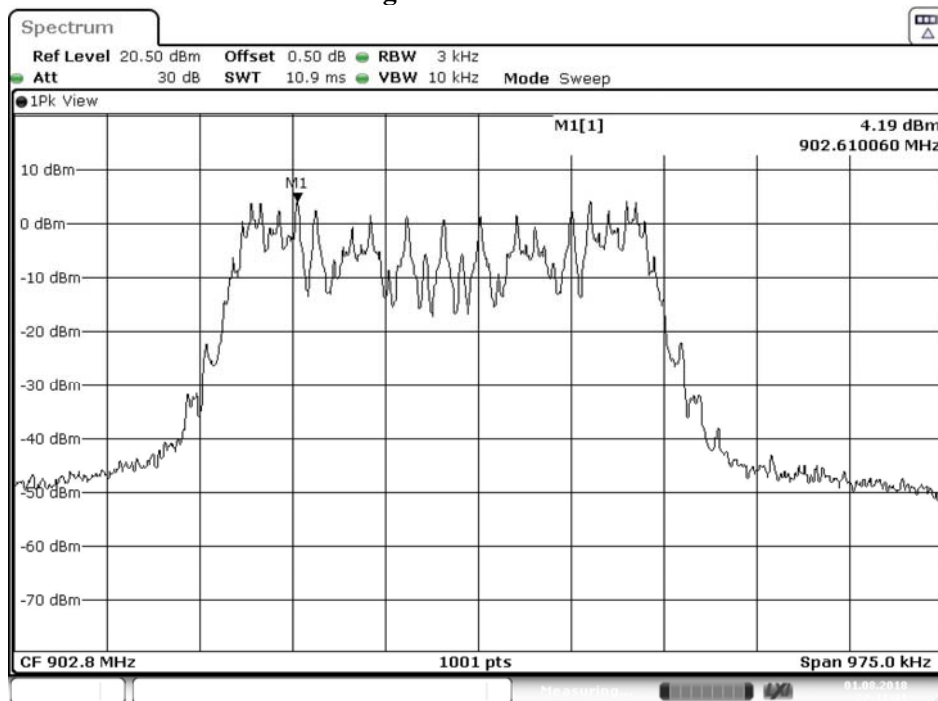
$\pm 1.23\text{dB}$

8.5. Test Result of Power Density

Product : Data Collector
 Test Item : Power Density Data
 Test Mode : Mode 1: Transmit

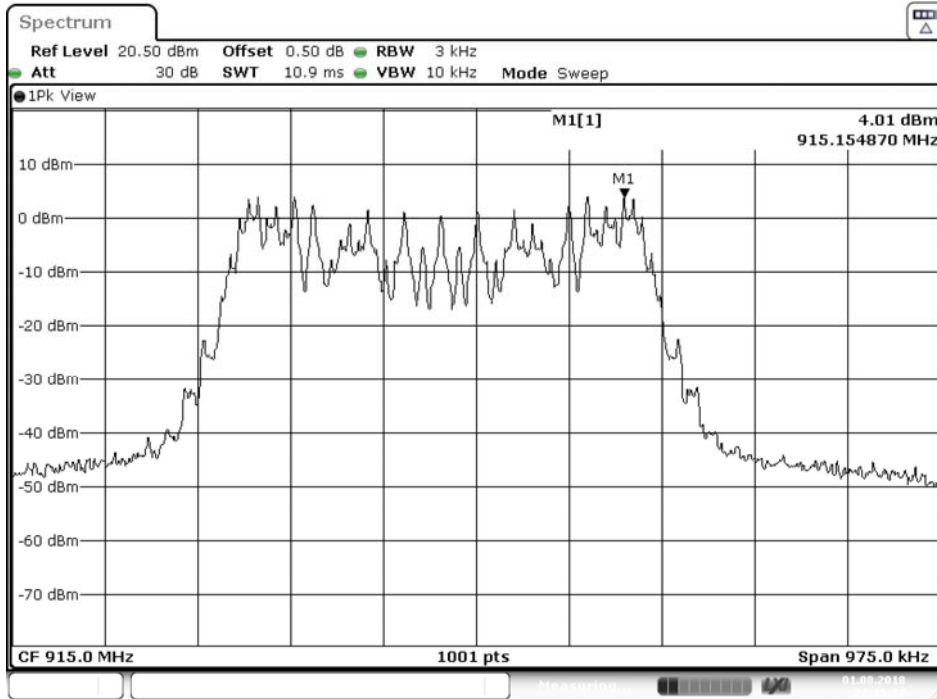
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
01	902.8	4.190	≤ 8dBm	Pass
02	915.0	4.010	≤ 8dBm	Pass
07	927.2	3.800	≤ 8dBm	Pass

Figure Channel 01:



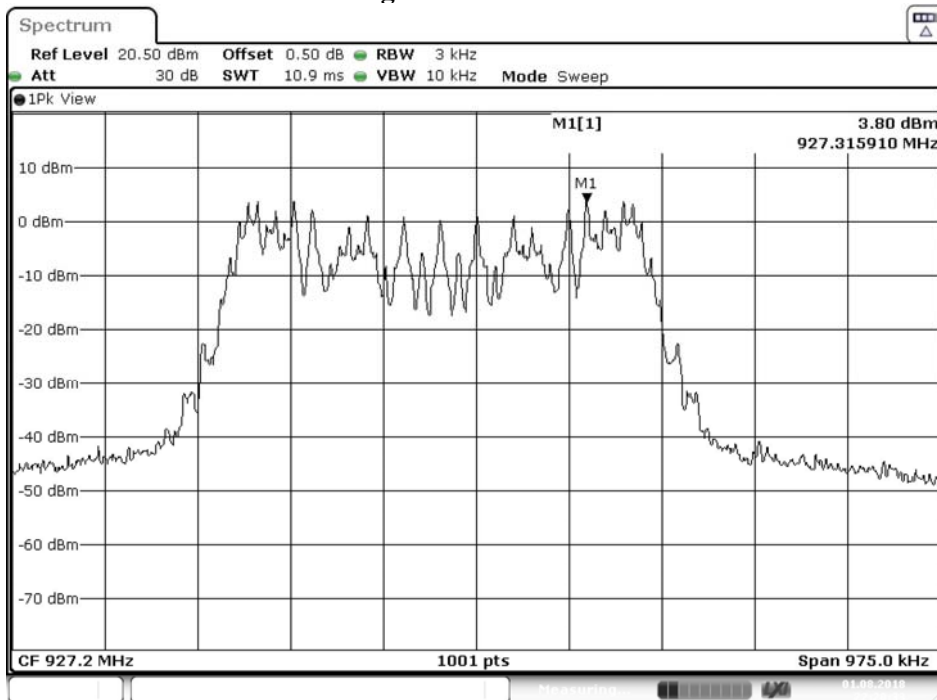
Date: 1.AUG.2018 22:11:31

Figure Channel 02:



Date: 1.AUG.2018 22:15:27

Figure Channel 07:



Date: 1.AUG.2018 22:20:33

9. EMI Reduction Method During Compliance Testing

No modification was made during testing.