

Prüfbericht-Nr.: <i>Test Report No.:</i>	50085878 001	Auftrags-Nr.: <i>Order No.:</i>	154243722	Seite 1 von 30 <i>Page 1 of 30</i>
Kunden-Referenz-Nr.: <i>Client Reference No.:</i>	52195561	Auftragsdatum: <i>Order date:</i>	26.04.2017	
Auftraggeber: <i>Client:</i>	AXENT Corporation Ltd. 3 Musick, Irvine CA 92618 USA			
Prüfgegenstand: <i>Test item:</i>	Intelligent toilet			
Bezeichnung / Typ-Nr.: <i>Identification / Type No.:</i>	E322-02 FCC ID: 2AL4GAXENT-ONE-C			
Auftrags-Inhalt: <i>Order content:</i>	Complete test			
Prüfgrundlage: <i>Test specification:</i>	FCC CFR47 Part 15, Subpart C Section 15.247 ANSI C63.10: 2013 KDB 558074 D01 DTS Meas Guidance v04			
Wareneingangsdatum: <i>Date of receipt:</i>	05.05.2017			
Prüfmuster-Nr.: <i>Test sample No.:</i>	A000540881-003			
Prüfzeitraum: <i>Testing period:</i>	16.06.2017 to 20.06.2017			
Ort der Prüfung: <i>Place of testing:</i>	MRT Technology(Suzhou) Co., Ltd.			Please refer to the External Photos
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Shanghai) Co., Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von / tested by:	kontrolliert von / reviewed by:			
11.07.2017 Datum Date	Elliot Zhang / Assistant Project Manager Name / Stellung Name / Position	 Unterschrift Signature	11.07.2017 Datum Date	Shi Li / Department Manager Name / Stellung Name / Position
Sonstiges / Other				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>			
* Legende: 1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n) Legend: 1 = very good P(ass) = passed a.m. test specification(s)	2 = gut 2 = good	3 = befriedigend Fail) = entspricht nicht o.g. Prüfgrundlage(n) 3 = satisfactory Fail) = failed a.m. test specification(s)	4 = ausreichend N/A = nicht anwendbar 4 = sufficient N/A = not applicable	5 = mangelhaft N/T = nicht getestet 5 = poor N/T = not tested
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

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TEST SUMMARY

5.1.1 ANTENNA REQUIREMENT

RESULT: Pass

5.1.2 PEAK OUTPUT POWER

RESULT: Pass

5.1.3 6dB & 99% BANDWIDTH

RESULT: Pass

5.1.4 CONDUCTED SPURIOUS EMISSIONS

RESULT: Pass

5.1.5 POWER SPECTRAL DENSITY

RESULT: Pass

5.2.1 CONDUCTED EMISSION

RESULT: Pass

5.3.1 RADIATED SPURIOUS EMISSION

RESULT: Pass

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1. General Remarks

1.1 Complementary Materials

Null.

2. Test Sites

2.1 Test Facilities

MRT Technology (Suzhou) Co., Ltd.

D8 Building, Youxin Industrial Park, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China

The used test equipment is in accordance with CISPR 16 for measurement of radio interference.

The Federal Communications Commission has reviewed the technical characteristics of the radiated and conducted emission facility, and has found these test facilities to be in compliance with the requirements of section 2.948 of the FCC rules. The description of the test facility is listed under FCC registration number 809388.

The Industry Canada has reviewed the technical characteristics of the radiated and conducted emission facility, and has found these test facilities to be in compliance. The description of the test facility is listed under chambers filing number 11384A.

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Radiated Test Equipments

Instrument	Manufacturer	Type No.	Asset No.	Cali. Due Date
Spectrum Analyzer	Agilent	E4447A	MY45300136	08.12.2017
EMI Test Receiver	R&S	ESR7	101209	03.11.2017
Preamplifier	Schwarzbeck	BBV 9721	9721-008	16.04.2018
Preamplifier	Agilent	83017A	MY53270040	29.03.2018
Loop Antenna	Schwarzbeck	FMZB1519	1519-041	14.12.2017
TRILOG Antenna	Schwarzbeck	VULB9162	9162-047	07.11.2017
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1167	07.11.2017
Broadband Horn Antenna	Schwarzbeck	BBHA9170	BBHA9170549	04.01.2018
Digital Thermometer & Hygrometer	Minggao	N/A	N/A	30.11.2017

Conducted Test Equipments

Instrument	Manufacturer	Type No.	Asset No.	Cali. Due Date
Spectrum Analyzer	Agilent	N9020A	MY52090106	05.08.2018
USB Wideband Power Sensor	Boonton	55006	8911	08.05.2018
Temperature/Humidity Meter	Yuhuaze	N/A	N/A	20.12.2017

Conducted Emissions

Instrument	Manufacturer	Type No.	Asset No.	Cali. Due Date
EMI Test Receiver	R&S	ESR7	101209	03.11.2017
Two-Line V-Network	R&S	ENV216	101683	03.11.2017
Two-Line V-Network	R&S	ENV216	101684	03.11.2017
Temperature/Humidity Meter	Yuhuaze	N/A	N/A	20.12.2017

2.3 Traceability

All measurement equipment calibrations are traceable to NIST or where calibration is performed outside the United States, to equivalent nationally recognized standards organizations.

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2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basics using in house standards or comparisons.

2.5 Measurement Uncertainty

Table 2: Measurement Uncertainty

Measurement Type	Frequency	Uncertainty
Antenna Port Conducted Emission	< 1GHz	±0.39dB
	> 1GHz	±0.68dB
Radiated Emission	30MHz - 1GHz	±5.34dB
	> 1GHz	±5.40dB

3. General Product Information

3.1 Product Function and Intended Use

The EUT (Equipment Under Test) is an intelligent toilet which contains a 2.4GHz wireless modular and a Bluetooth Dual Mode module.

The aim of this report is to evaluate the RF characteristic of the Bluetooth Low Energy Part of the Bluetooth modular.

For details refer to the User Manual and Circuit Diagram.

3.2 Ratings and System Details

Table 3: Technical Specification of EUT

General Description of EUT	
Product Name:	Intelligent toilet
Brand Name:	AXENT
Model No.:	E322-02
Rated Voltage:	AC 120V, 60Hz
Bluetooth Classical	
Frequency Range:	2402 – 2480MHz
Modulation Type:	BDR: GFSK EDR: π/4-DQPSK; 8DPSK
Antenna Type:	PCB Antenna
Antenna Gain:	1.6dBi
Bluetooth Low Energy	
Frequency Range:	2402 – 2480MHz
Modulation Type:	GFSK
Antenna Type:	PCB Antenna
Antenna Gain:	1.6dBi
2.4GHz Wireless Module	
Frequency Range:	2411MHz
Modulation Type:	FSK
Antenna Type:	PCB
Antenna Gain:	0dBi

3.3 Independent Operation Modes

Table 4: Independent Operation Modes

Test Mode	Channel	Frequency
TM1	00	2402
TM2	19	2440
TM3	39	2480
TM4		Normal Operating Mode

Note: The EUT was set into continuous transmitting or receiving mode from TM1 to TM3 in the related tests.

3.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

3.5 Submitted Documents

- Bill of Material
- PCB Layout
- Photo Document
- Circuit Diagram
- Instruction Manual
- Rating Label

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4. Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

The equipment under test (EUT) was configured to measure its maximum power level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5. All testing were performed according to the procedures in ANSI C63.10: 2013.

4.3 Special Accessories and Auxiliary Equipment

Null.

4.4 Countermeasures to achieve EMC Compliance

Null.

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5. Test Results

5.1 Conducted Testing at Antenna Port

5.1.1 Antenna Requirement

RESULT: **Pass****Table 5: Antenna Requirement****FCC 15.203 – Antenna Requirement 1**

Requirement: No antenna other than that furnished by the responsible party shall be used with the device

- Use of a permanently attached antenna, or
- Use an antenna that uses a unique coupling to the intentional radiator.

Results: Antenna type: PCB antenna

Verdict: **PASS****FCC 15.204 – Antenna Requirement 2**

Requirement: An intentional radiator may be operated only with the antenna with which it is authorized. If an antenna is marketed with the intentional radiator, it shall be of a type which is authorized with the intentional radiator.

Results: Only one integral antenna can be used

Verdict: **PASS**

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5.1.2 Peak Output Power

RESULT:

Pass

Date of testing	:	16.06.2017
Test standard	:	FCC Part 15.247(b)(3)
Test procedure	:	ANSI C63.10: 2013 Clause 9.1 of KDB 558074 D01 v04
Limit	:	FCC Part 15.247(b)(3)
Kind of test site	:	Shielded room

Test setup

Test Channel	:	Low/ Middle/ High
Operation Mode	:	TM1 to TM3
Ambient temperature	:	25°C
Relative humidity	:	52%
Atmospheric pressure	:	101kPa

Table 6: Peak Output Power, TM1 to TM3

Mode	CH.	Freq. [MHz]	Maximum Peak Conducted Output Power [dBm]	Peak Conducted Output Power Limit [dBm]
TM1	00	2402	2.44	30
TM2	19	2440	2.16	30
TM3	39	2480	1.59	30

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5.1.3 6dB & 99% Bandwidth

RESULT:**Pass**

Date of testing	:	16.06.2017
Test standard	:	FCC Part 15.247(a)(2)
Test procedure	:	ANSI C63.10: 2013 Clause 8 of KDB 558074 D01 v04
Limit	:	FCC Part 15.247(a)(2)
Kind of test site	:	Shielded room

Test setup

Test Channel	:	Low/ Middle/ High
Operation Mode	:	TM1 to TM3
Ambient temperature	:	25°C
Relative humidity	:	52%
Atmospheric pressure	:	101kPa

Table 7: 6dB & 99% Bandwidth, TM1 to TM3

Mode	Frequency [MHz]	6dB Bandwidht [kHz]	99% Bandwidth [kHz]
TM1	2402	701.6	1079.2
TM2	2440	700.9	1081.0
TM3	2480	703.8	1083.1

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Figure 1: 6dB & 99% Bandwidth, TM1

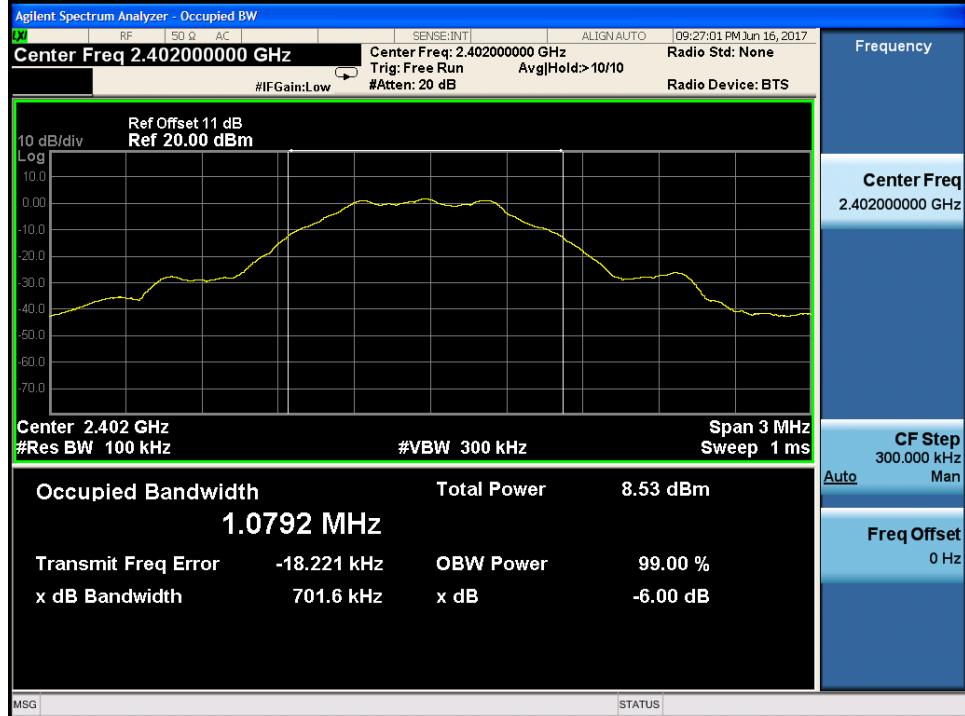


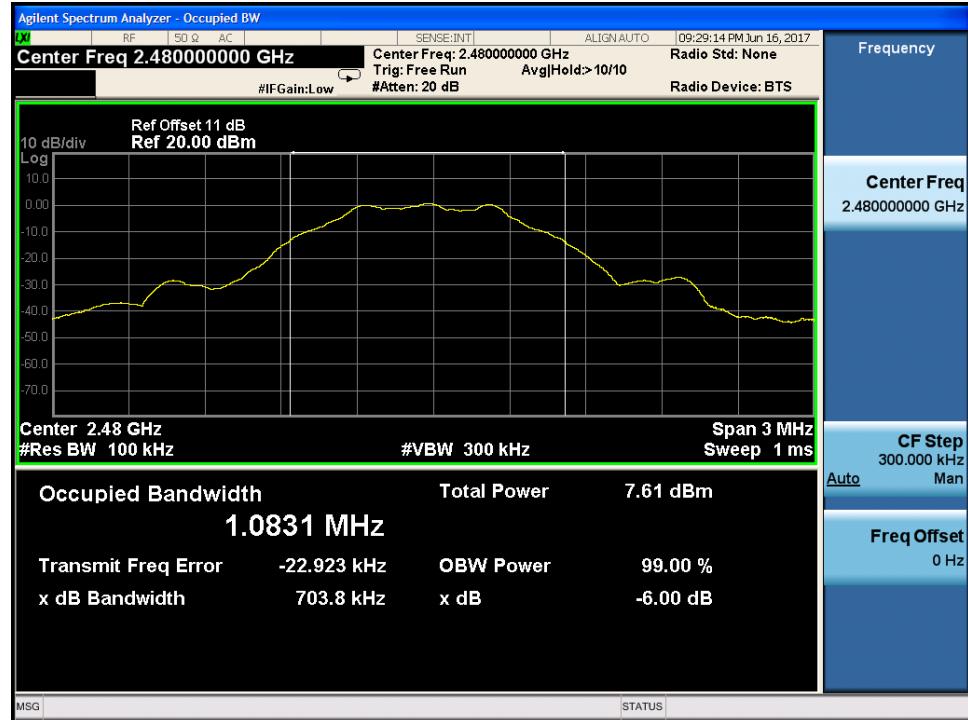
Figure 2: 6dB & 99% Bandwidth, TM2



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Figure 3: 6dB & 99% Bandwidth, TM3



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5.1.4 Conducted Spurious Emissions

RESULT:

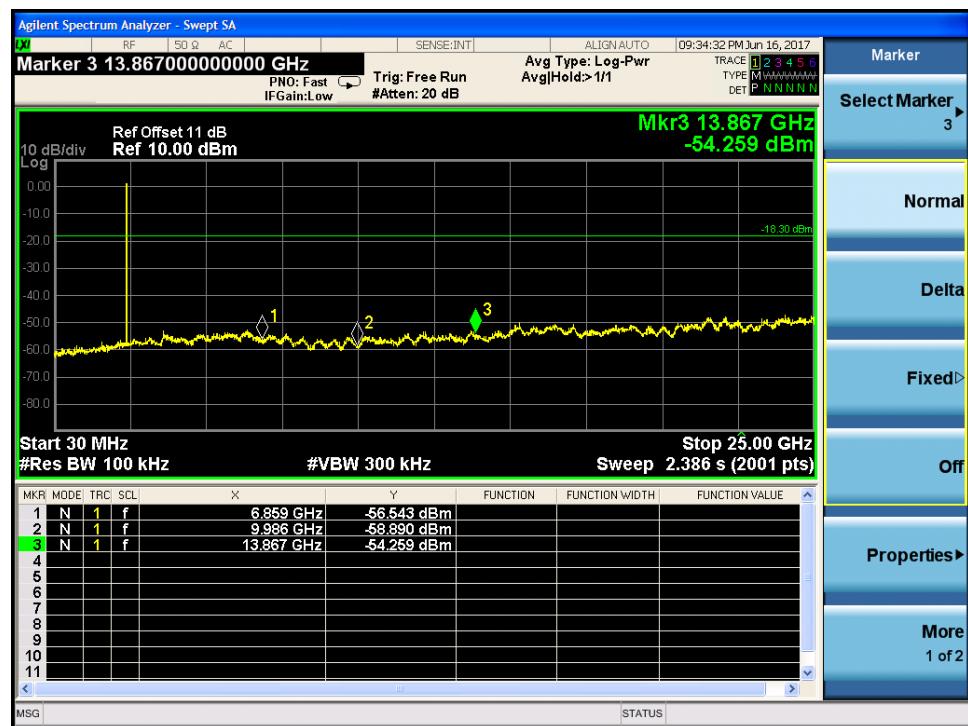
Pass

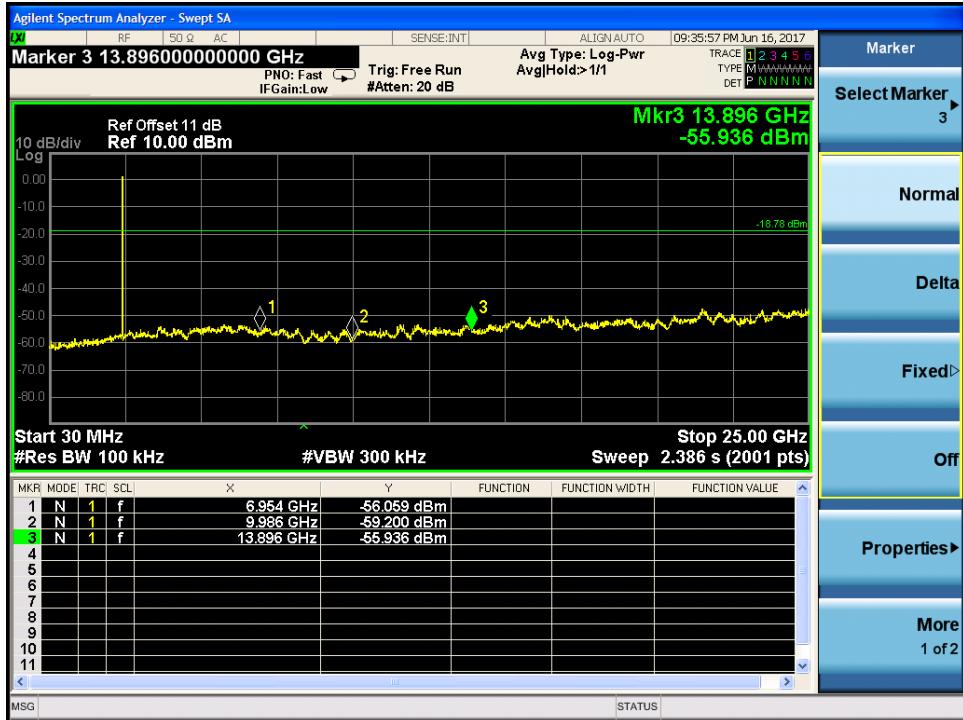
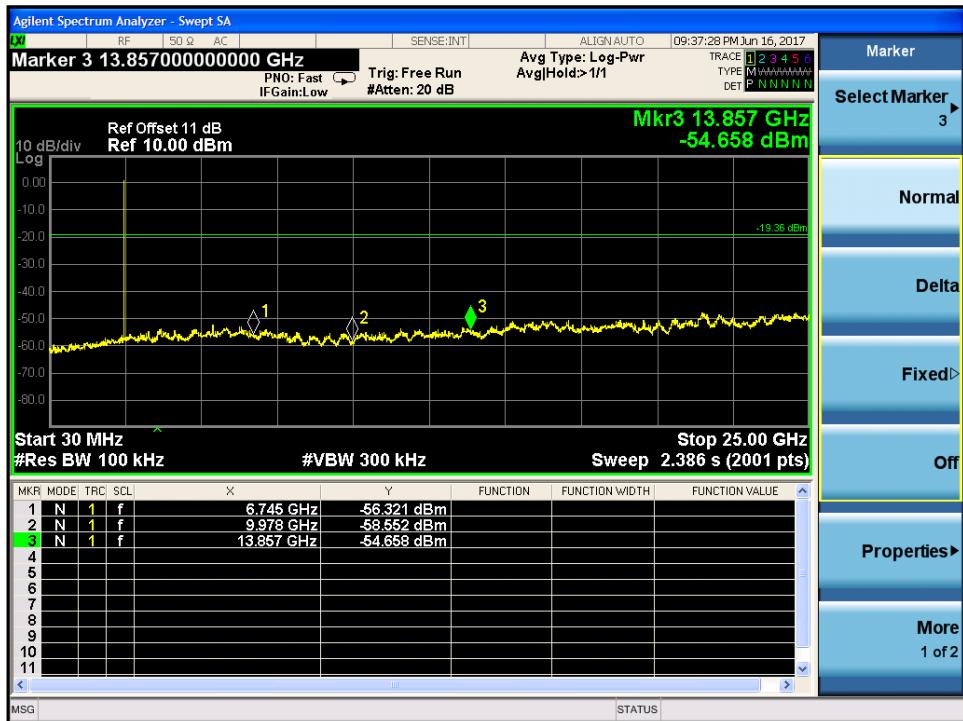
Date of testing : 16.06.2017
Test standard : FCC Part 15.247(d)
Test procedure : ANSI C63.10: 2013
Clause 11&12 of KDB 558074 D01 v04
Limit : FCC Part 15.247(d)
Kind of test site : Shielded room

Test setup

Test Channel	:	Low/ Middle/ High
Operation Mode	:	TM1 to TM3
Ambient temperature	:	25°C
Relative humidity	:	52%
Atmospheric pressure	:	101kPa

Figure 4: Conducted Spurious Emission, TM1



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Figure 5: Conducted Spurious Emission, TM2

Figure 6: Conducted Spurious Emission, TM3


Produkte *Products*

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Figure 7: Conducted Bandedge, TM1

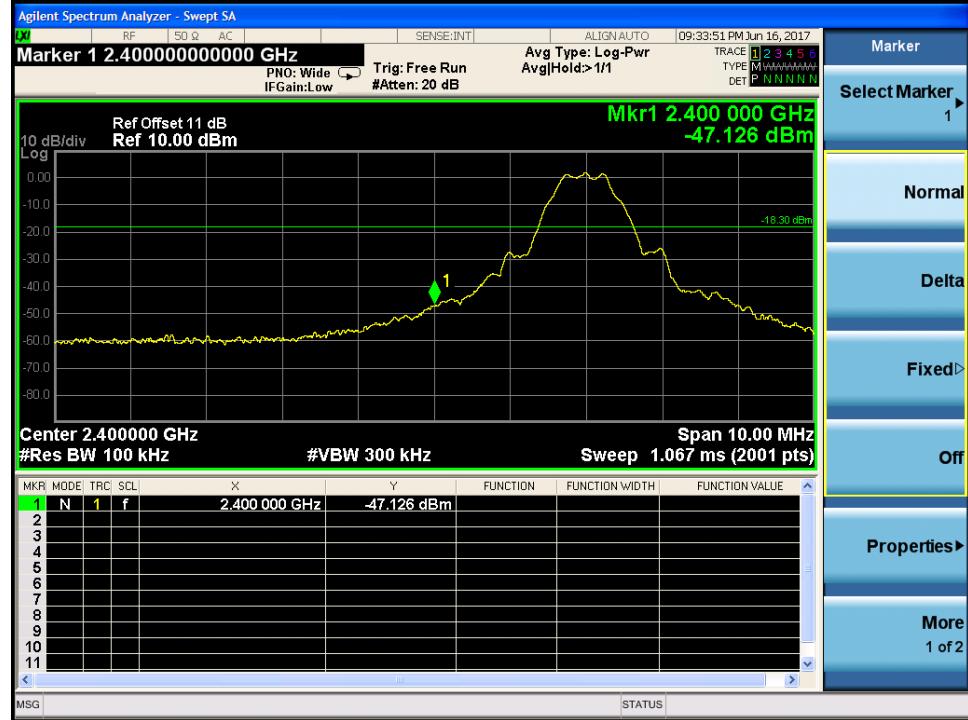
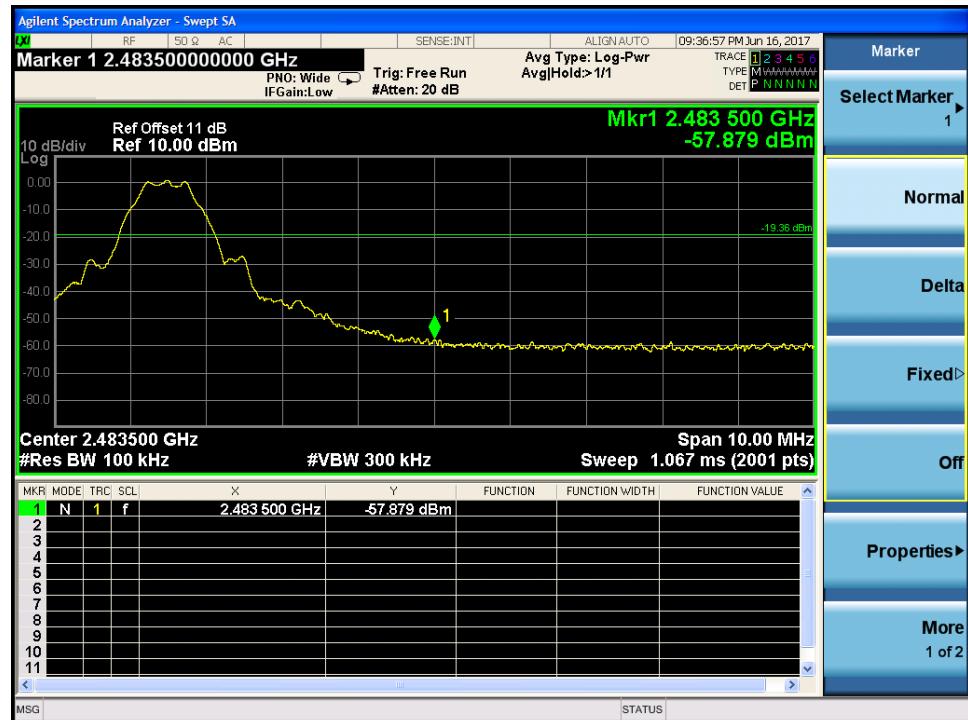


Figure 8: Conducted Bandedge, TM3



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5.1.5 Power Spectral Density

RESULT:**Pass**

Date of testing	:	16.06.2017
Test standard	:	FCC Part 15.247(e)
Test procedure	:	ANSI C63.10: 2013 Clause 10 of KDB 558074 D01 v04
Limit	:	FCC Part 15.247(e)
Kind of test site	:	Shielded room

Test setup

Test Channel	:	Low/ Middle/ High
Operation Mode	:	TM1 to TM3
Ambient temperature	:	25°C
Relative humidity	:	52%
Atmospheric pressure	:	101kPa

Table 8: Power Spectral Density, TM1 to TM3

Mode	Frequency [MHz]	Result [dBm/3kHz]	Limit [dBm/3kHz]
TM1	2402	-12.247	8
TM2	2440	-12.894	8
TM3	2480	-13.465	8

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Figure 9: Power Spectral Density, TM1

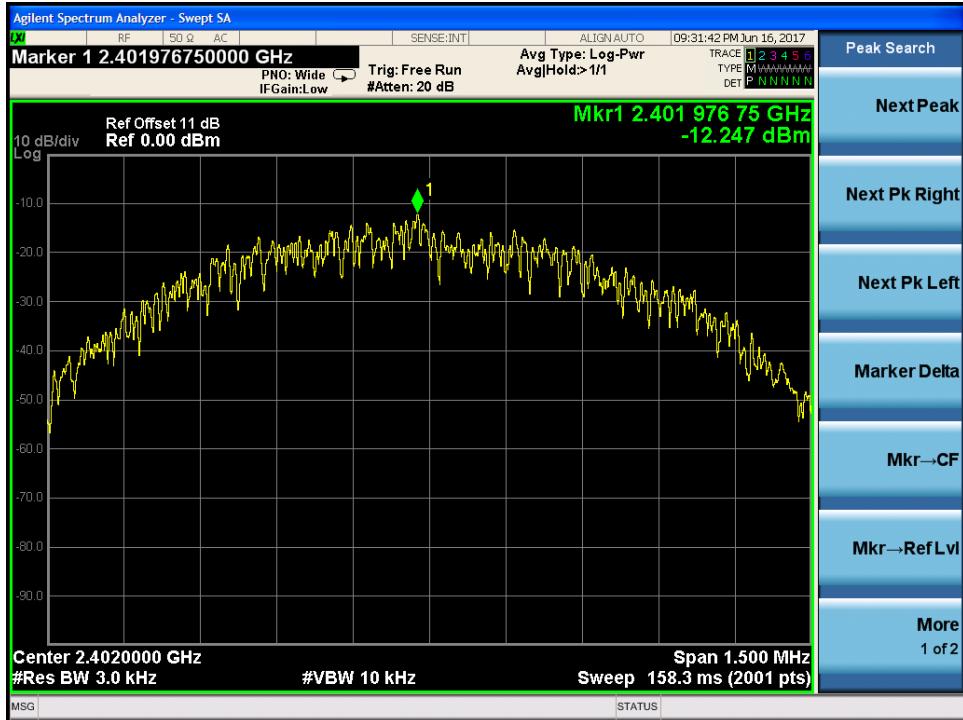
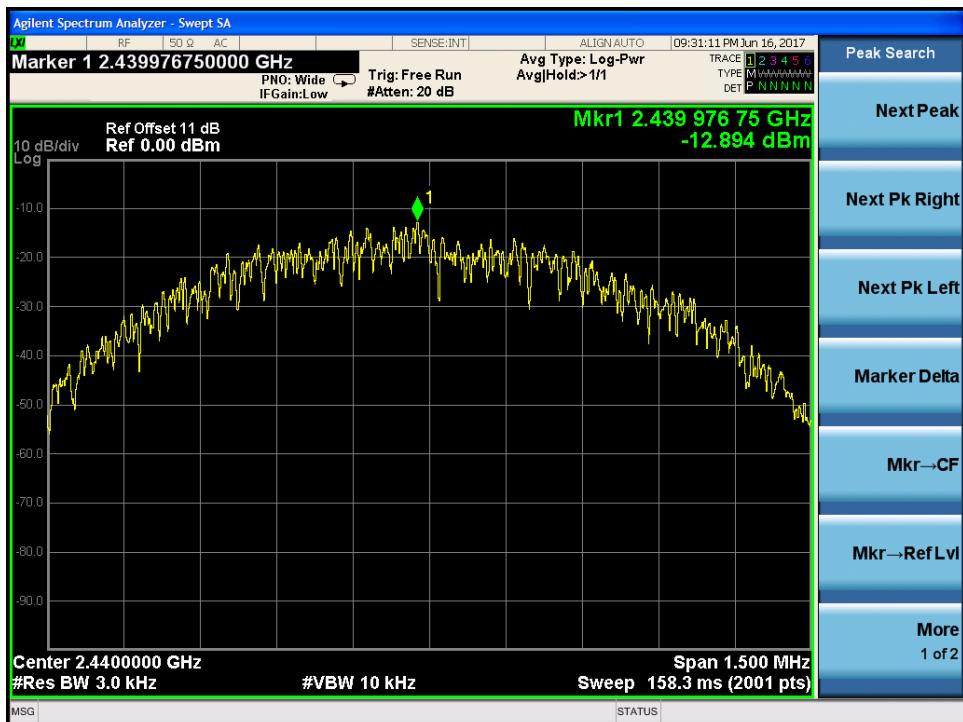


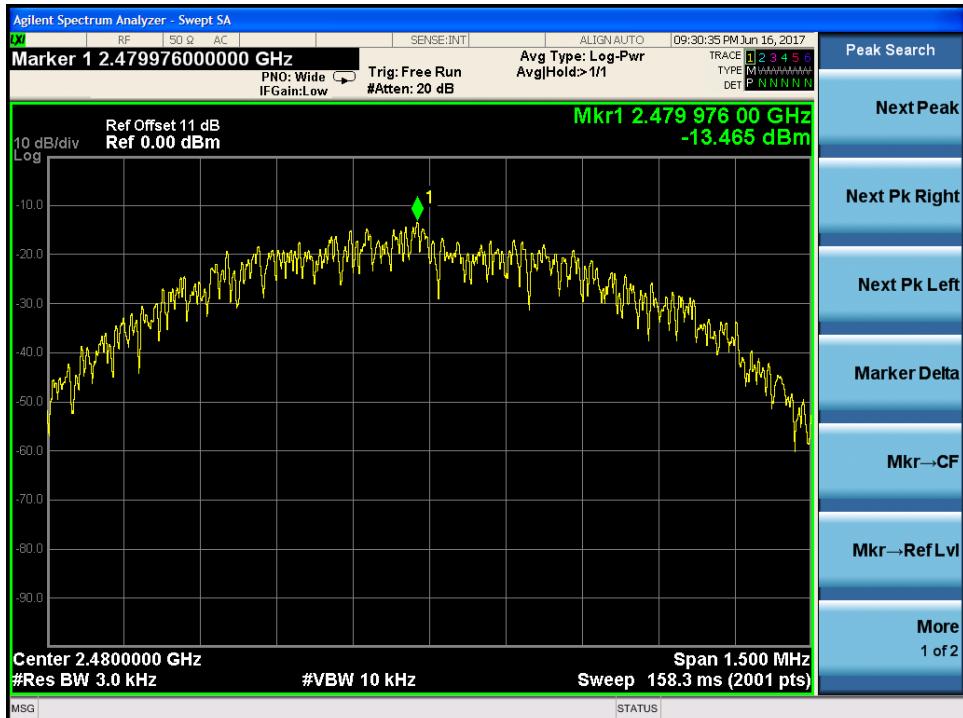
Figure 10: Power Spectral Density, TM2



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Figure 11: Power Spectral Density, TM3



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5.2 Emission in the Frequency Range up to 30MHz

5.2.1 Conducted Emission

RESULT:

Pass

Date of testing	:	20.06.2017
Test standard	:	FCC Part 15.207 (a)
Test procedure	:	ANSI C63.10: 2013
Limit	:	FCC Part 15.207(a)
Kind of test site	:	Shielded room

Test setup

Operation Mode	:	TM4
Ambient temperature	:	25°C
Relative humidity	:	52%
Atmospheric pressure	:	101kPa

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Figure 12: Conducted Emission, L line

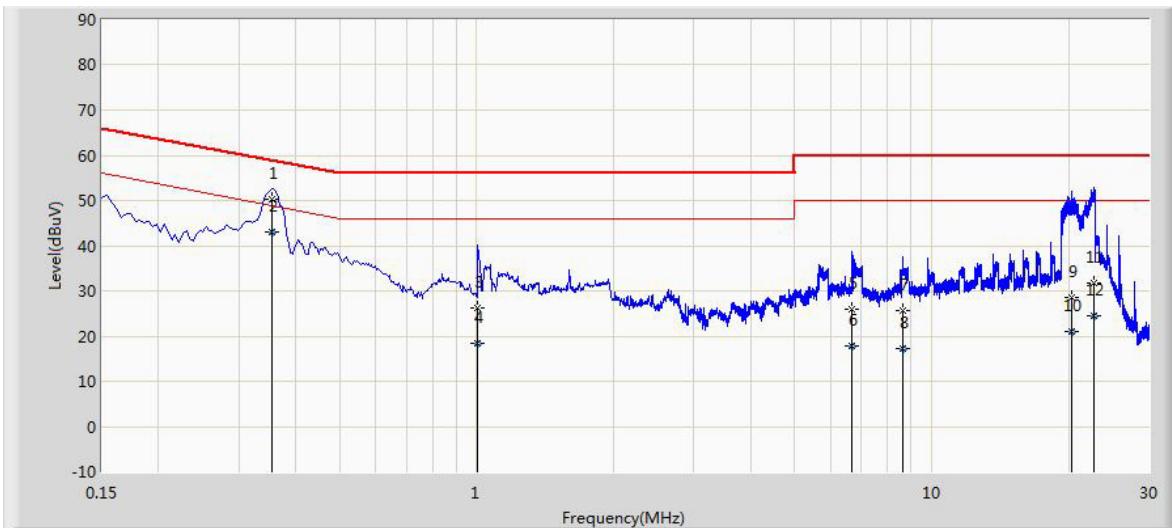


Table 9: Conducted Emission, L line

Frequency [MHz]	Measure Level [dBuV]	Reading Level [dBuV]	Over Limit [dB]	Limit [dBuV]	Factor [dB]	Type
0.354	50.355	40.308	-8.513	58.868	10.048	QP
0.354	43.034	32.986	-5.835	48.868	10.048	AV
1.006	26.129	16.220	-29.871	56.000	9.909	QP
1.006	18.290	8.382	-27.710	46.000	9.909	AV
6.690	25.862	15.713	-34.138	60.000	10.149	QP
6.690	17.848	7.699	-32.152	50.000	10.149	AV
8.630	25.641	15.459	-34.359	60.000	10.182	QP
8.630	17.131	6.950	-32.869	50.000	10.182	AV
20.354	28.434	18.288	-31.566	60.000	10.146	QP
20.354	20.903	10.757	-29.097	50.000	10.146	AV
22.762	31.703	21.524	-28.297	60.000	10.180	QP
22.762	24.483	14.304	-25.517	50.000	10.180	AV

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Figure 13: Conducted Emission, N line

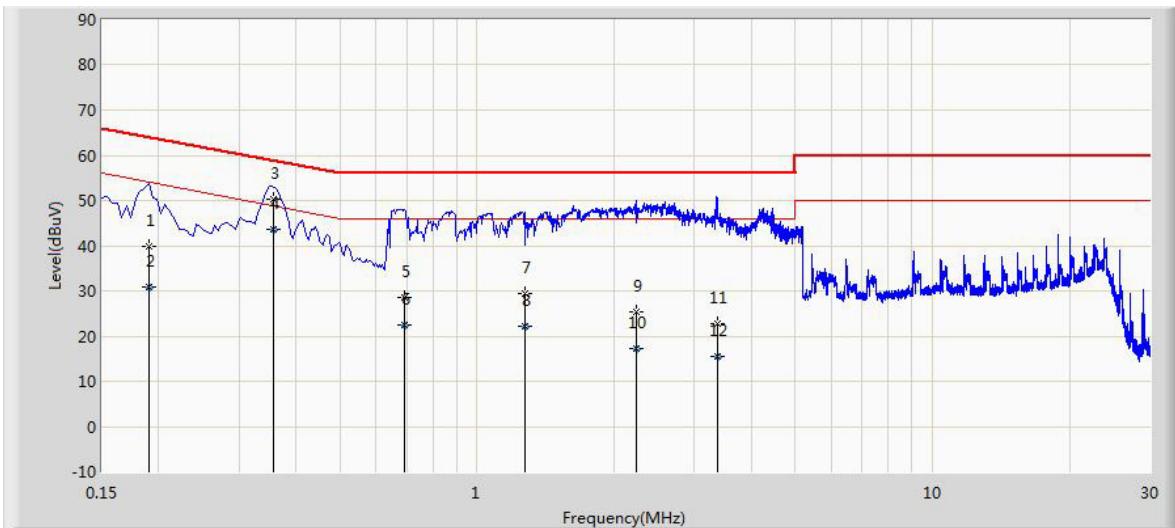


Table 10: Conducted Emission, N line

Frequency [MHz]	Measure Level [dBuV]	Reading Level [dBuV]	Over Limit [dB]	Limit [dBuV]	Factor [dB]	Type
0.190	39.890	29.862	-24.146	64.037	10.028	QP
0.190	31.000	20.972	-23.036	54.037	10.028	AV
0.358	50.406	40.325	-8.369	58.775	10.081	QP
0.358	43.755	33.674	-5.020	48.775	10.081	AV
0.694	28.616	18.538	-27.384	56.000	10.078	QP
0.694	22.422	12.343	-23.578	46.000	10.078	AV
1.270	29.525	19.626	-26.475	56.000	9.899	QP
1.270	22.091	12.192	-23.909	46.000	9.899	AV
2.238	25.253	15.385	-30.747	56.000	9.868	QP
2.238	17.316	7.448	-28.684	46.000	9.868	AV
3.362	22.868	12.965	-33.132	56.000	9.902	QP
3.362	15.402	5.500	-30.598	46.000	9.902	AV

5.3 Emission in the Frequency Range above 30MHz

5.3.1 Radiated Spurious Emission

RESULT:

Pass

Date of testing	:	20.06.2017
Test standard	:	FCC Part 15.247(d)
Test procedure	:	ANSI C63.10: 2013 Clause 11&12 of KDB 558074 D01 v04
Limit	:	FCC Part 15.247(d) FCC Part 15.209(a)
Kind of test site	:	3m Semi-Anechoic Chamber

Test setup

Test Channel	:	Low/ Middle/ High
Operation Mode	:	TM1 to TM3
Ambient temperature	:	25°C
Relative humidity	:	52%
Atmospheric pressure	:	101kPa

Table 11: Radiated Spurious Emission, below 1GHz, TM1

Mode	Freq. [MHz]	Measure Level [dBuV/m]	Reading Level [dBuV]	Over Limit [Db]	Limit [dBuV/m]	Factor [dB]	Type	Ant. Pol.
TM1	111.965	34.245	22.020	-9.255	43.500	12.225	QP	H
	127.970	36.696	23.091	-6.804	43.500	13.605	QP	
	224.970	34.266	22.060	-11.734	46.000	12.206	QP	
	336.035	36.837	21.659	-9.163	46.000	15.178	QP	
	384.050	38.127	21.950	-7.873	46.000	16.177	QP	
	798.725	30.856	7.650	-15.144	46.000	23.206	QP	
	44.065	26.570	12.326	-13.430	40.000	14.244	QP	V
	79.955	26.145	16.061	-13.855	40.000	10.084	QP	
	135.730	28.476	14.320	-15.024	43.500	14.156	QP	
	224.485	30.121	17.950	-15.879	46.000	12.172	QP	
	299.660	31.038	16.750	-14.962	46.000	14.288	QP	
	798.725	30.156	6.950	-15.844	46.000	23.206	QP	

Note:

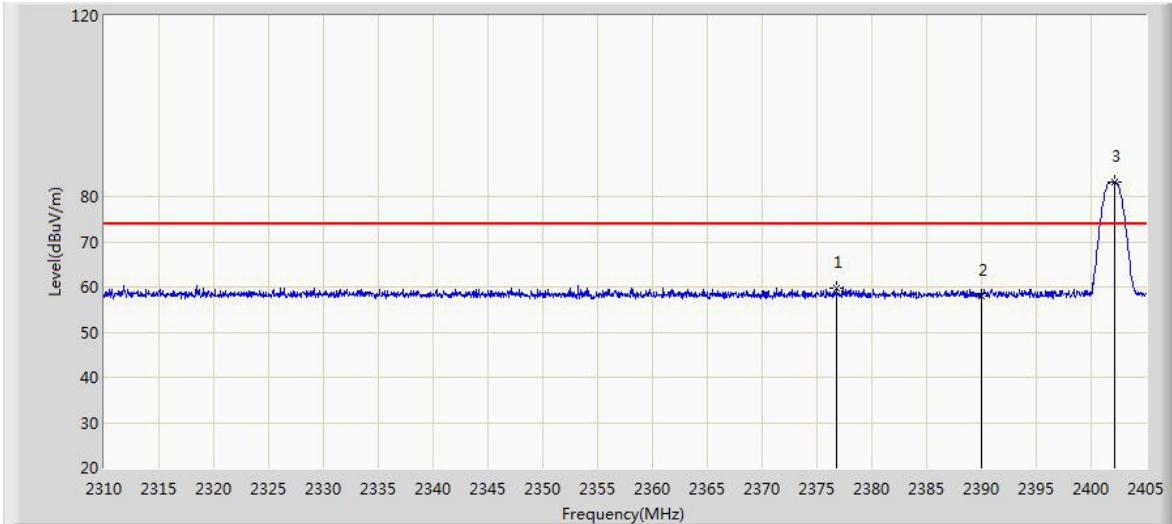
All the modes were performed, only the worst case was listed in the table above.
The radiated emission below 30MHz are very low, so they are not shown in this report.

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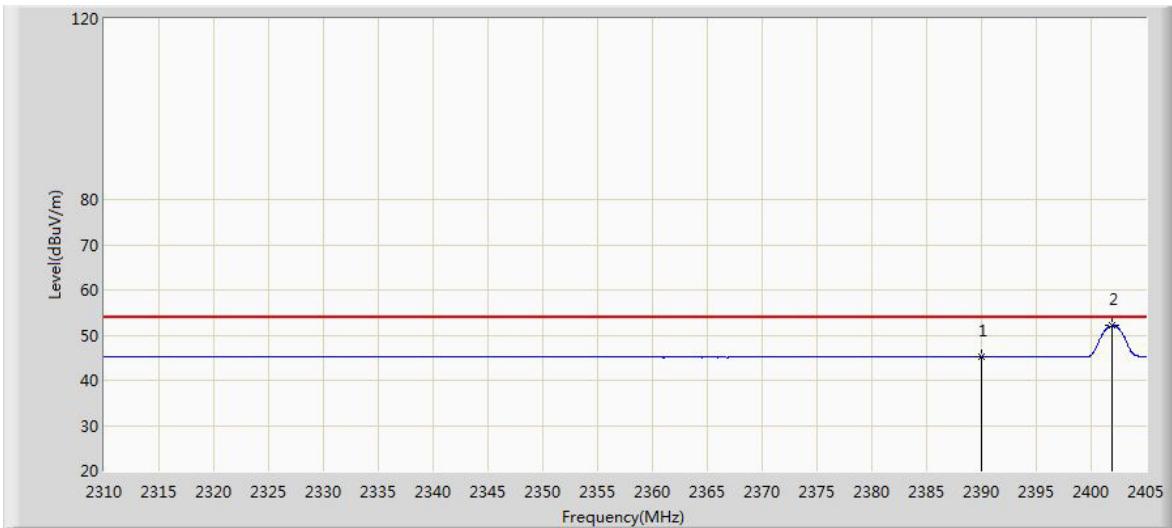
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Table 12: Radiated Spurious Emission, above 1GHz, TM1 to TM3

Channel	Freq. [MHz]	Measure Level [dBuV/m]	Reading Level [dBuV]	Over Limit [dB]	Limit [dBuV/m]	Factor [dB]	Type	Ant. Pol.
TM1	4145.000	35.677	34.930	-38.323	74.000	0.747	PK	H
	4978.000	39.236	36.249	-34.764	74.000	2.987	PK	H
	8743.500	42.928	33.966	-31.072	74.000	8.962	PK	H
	10044.000	45.459	33.880	-28.541	74.000	11.579	PK	H
	3949.500	34.226	33.940	-39.774	74.000	0.286	PK	V
	4986.500	45.562	42.546	-28.438	74.000	3.016	PK	V
	8718.000	44.072	35.098	-29.928	74.000	8.974	PK	V
	9704.000	44.877	33.920	-29.123	74.000	10.957	PK	V
	3890.000	34.386	34.232	-39.614	74.000	0.154	PK	H
TM2	4978.000	38.890	35.903	-35.110	74.000	2.987	PK	H
	8896.500	43.925	34.740	-30.075	74.000	9.186	PK	H
	10299.000	45.799	33.776	-28.201	74.000	12.023	PK	H
	3949.500	34.657	34.371	-39.343	74.000	0.286	PK	V
	4978.000	44.919	41.932	-29.081	74.000	2.987	PK	V
	8505.500	43.194	34.836	-30.806	74.000	8.358	PK	V
	10392.500	47.077	34.754	-26.923	74.000	12.323	PK	V
	4051.500	34.457	33.946	-39.543	74.000	0.511	PK	H
TM3	4995.000	39.503	36.459	-34.497	74.000	3.044	PK	H
	8777.500	43.371	34.462	-30.629	74.000	8.909	PK	H
	10163.000	45.565	33.892	-28.435	74.000	11.673	PK	H
	3915.500	34.585	34.351	-39.415	74.000	0.234	PK	V
	4986.500	45.108	42.092	-28.892	74.000	3.016	PK	V
	8930.500	42.877	33.845	-31.123	74.000	9.032	PK	V
	10384.000	46.511	34.216	-27.489	74.000	12.295	PK	V

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Figure 14: Radiated Restricted Band Edge, TM1, Horizontal, PK


Frequency [MHz]	Measure Level [dBuV/m]	Reading Level [dBuV]	Over Limit [dB]	Limit [dBuV/m]	Factor [dB]	Type
2376.785	59.600	28.373	-14.400	74.000	31.227	PK
2390.000	57.954	26.751	-16.046	74.000	31.203	PK
2402.150	83.242	52.058	N/A	N/A	31.184	PK

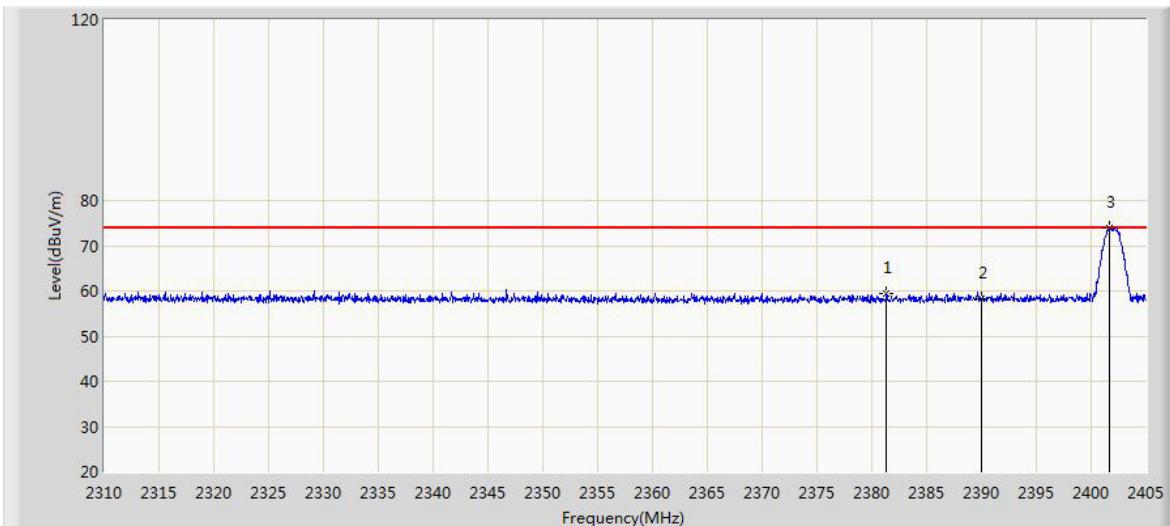
Figure 15: Radiated Restricted Band Edge, TM1, Horizontal, AV


Frequency [MHz]	Measure Level [dBuV/m]	Reading Level [dBuV]	Over Limit [dB]	Limit [dBuV/m]	Factor [dB]	Type
2390.000	45.244	14.041	-8.756	54.000	31.203	AV
2401.913	52.070	20.886	N/A	N/A	31.184	AV

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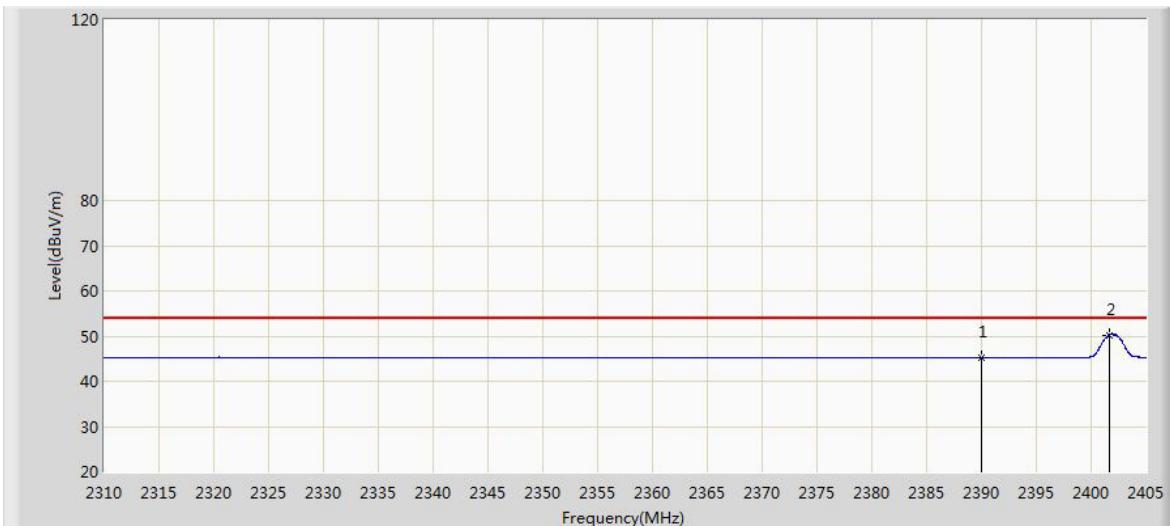
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Figure 16: Radiated Restricted Band Edge, TM1, Vertical, PK



Frequency [MHz]	Measure Level [dBuV/m]	Reading Level [dBuV]	Over Limit [dB]	Limit [dBuV/m]	Factor [dB]	Type
2381.345	59.338	28.119	-14.662	74.000	31.218	PK
2390.000	58.127	26.924	-15.873	74.000	31.203	PK
2401.722	73.898	42.714	N/A	N/A	31.184	PK

Figure 17: Radiated Restricted Band Edge, TM1, Vertical, AV

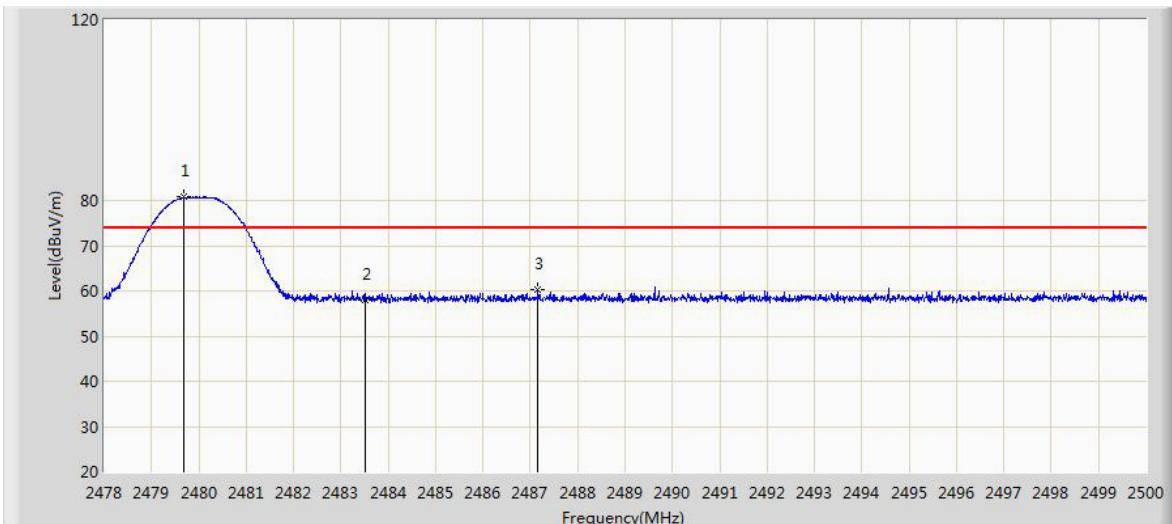


Frequency [MHz]	Measure Level [dBuV/m]	Reading Level [dBuV]	Over Limit [dB]	Limit [dBuV/m]	Factor [dB]	Type
2390.000	45.268	14.065	-8.732	54.000	31.203	AV
2401.675	50.286	19.101	N/A	N/A	31.184	AV

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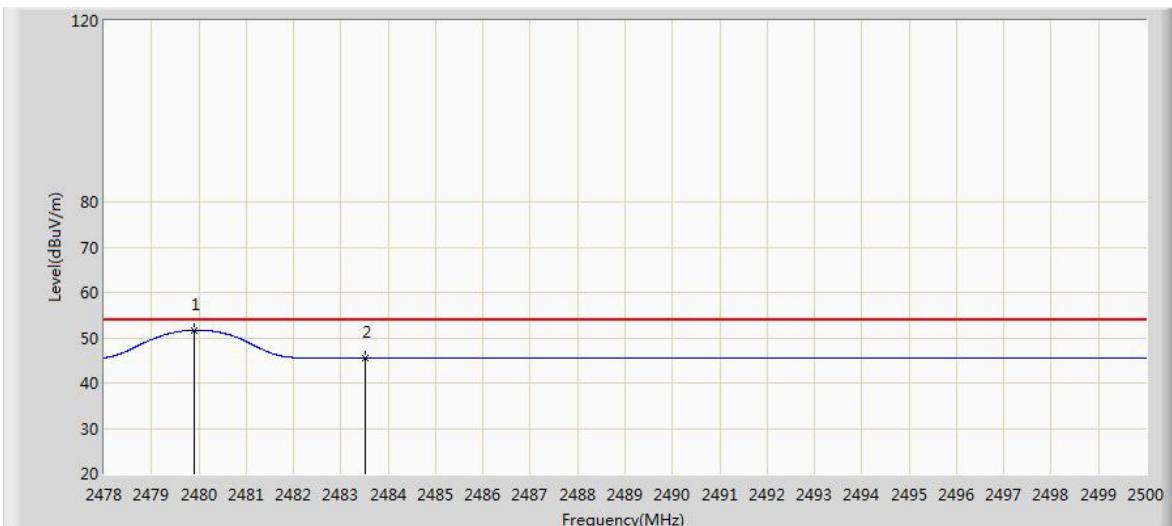
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Figure 18: Radiated Restricted Band Edge, TM3, Horizontal, PK



Frequency [MHz]	Measure Level [dBuV/m]	Reading Level [dBuV]	Over Limit [dB]	Limit [dBuV/m]	Factor [dB]	Type
2479.683	80.767	49.584	N/A	N/A	31.184	PK
2483.500	58.038	26.845	-15.962	74.000	31.194	PK
2487.163	60.355	29.152	-13.645	74.000	31.203	PK

Figure 19: Radiated Restricted Band Edge, TM3, Horizontal, AV

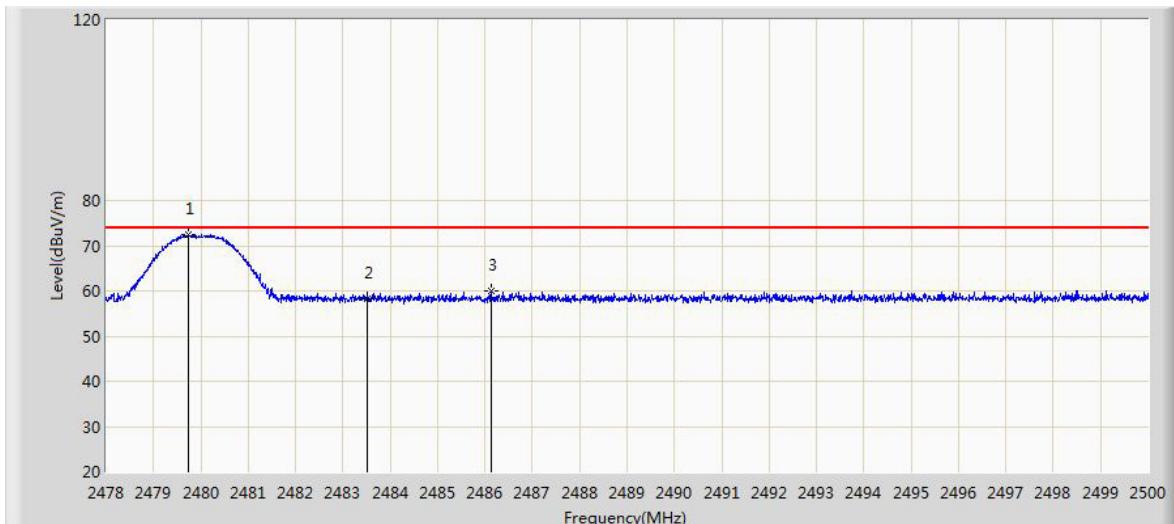


Frequency [MHz]	Measure Level [dBuV/m]	Reading Level [dBuV]	Over Limit [dB]	Limit [dBuV/m]	Factor [dB]	Type
2479.903	51.668	20.484	N/A	N/A	31.184	AV
2483.500	45.444	14.251	-8.556	54.000	31.194	AV

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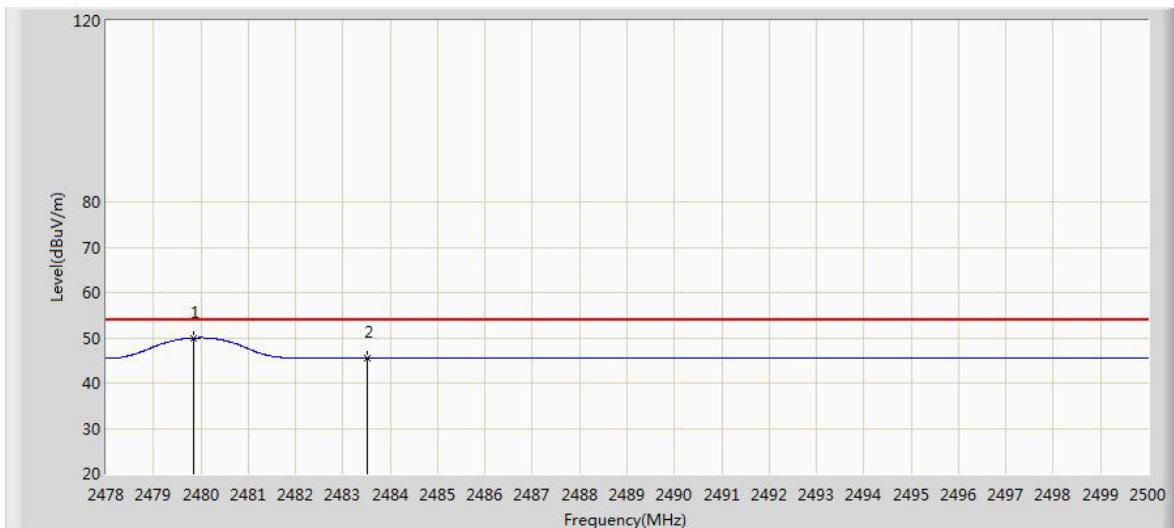
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Figure 20: Radiated Restricted Band Edge, TM3, Vertical, PK



Frequency [MHz]	Measure Level [dBuV/m]	Reading Level [dBuV]	Over Limit [dB]	Limit [dBuV/m]	Factor [dB]	Type
2479.727	72.403	41.220	N/A	N/A	31.184	PK
2483.500	58.296	27.103	-15.704	74.000	31.194	PK
2486.129	59.858	28.658	-14.142	74.000	31.200	PK

Figure 21: Radiated Restricted Band Edge, TM3, Vertical, AV



Frequency [MHz]	Measure Level [dBuV/m]	Reading Level [dBuV]	Over Limit [dB]	Limit [dBuV/m]	Factor [dB]	Type
2479.848	49.973	18.789	N/A	N/A	31.184	AV
2483.500	45.467	14.274	-8.533	54.000	31.194	AV

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