



Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 1 / 71

Rev.: 02

JAPAN SPECIFIED RADIO EQUIPMENT

UPDATE TEST REPORT

For

Display Audio

Trade Name: PANASONIC

Model: YEAP4C1250ZA, YEAP4C1250ZD

Issued to

Panasonic Taiwan Co., Ltd.

No.579, Yuan Shan Road, Chung-Ho Dist.. New Taipei City, Taiwan

Issued by

Compliance Certification Services Inc.

Wugu Laboratory

**No.11, Wugong 6th Rd., Wugu Dist.,
New Taipei City 24891, Taiwan, R.O.C.**

Issued Date: January 29, 2019

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.
除非另有說明，此報告結果僅對測試之樣品負責，同時此樣品僅保留90天。本報告未經本公司書面許可，不可部分複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.



Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 2 / 71

Rev.: 02

Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	May 28, 2018	Initial Issue	ALL	Becca Chen
01	November 08, 2018	1. Revised the EUT description and RF shielding method. 2. Added the test results.	P.7, P.9, P.12, P.14, P.17, P.19	May Lin
02	January 29, 2019	1. Added one mode number	P.1, P.4, P.17	May Lin

TABLE OF CONTENTS

1. TEST RESULT CERTIFICATION.....	4
2. SUMMARY OF TEST RESULTS	5
2.1 BLUETOOTH (CH0~CH78) (FOR GFSK).....	5
2.2 BLUETOOTH (CH0~CH78) (FOR 8DPSK).....	10
2.3 BLUETOOTH 4.0 (CH0~CH39) (FOR GFSK).....	15
3 EUT DESCRIPTION	17
4 TEST METHODOLOGY & CONDITIONS.....	18
4.1 TEST CONDITIONS.....	18
4.2 DESCRIPTION OF TEST MODES	18
4.3 RF SHIELDING METHOD.....	19
4.4 SETUP OF EQUIPMENT UNDER TEST	19
5 INSTRUMENT AND CALIBRATION.....	20
5.1 MEASURING INSTRUMENT CALIBRATION	20
5.2 TEST AND MEASUREMENT EQUIPMENT	20
5.3 MEASUREMENT UNCERTAINTY	21
5.4 CALIBRATION.....	22
6 TEST RESULT FOR BLUETOOTH (CH0~CH78) (FOR GFSK)	23
6.1 FREQUENCY ERROR.....	23
6.2 ANTENNA POWER ERROR.....	23
6.3 SPURIOUS EMISSIONS INTENSITY.....	24
6.4 OCCUPIED BANDWIDTH –NORMAL (99%).....	34
6.5 SPREAD-SPECTRUM BANDWIDTH –NORMAL (90%)	35
6.6 OCCUPIED BANDWIDTH –AFH(99%)	36
6.7 SPREAD-SPECTRUM BANDWIDTH –AFH(90%)	37
6.8 LIMITATION OF COLLATERAL EMISSIONS OF RECEIVER.....	38
6.9 DWELL TIME.....	40
7 TEST RESULT FOR BLUETOOTH (CH0~CH78) (FOR 8DPSK)	41
7.1 FREQUENCY ERROR.....	41
7.2 ANTENNA POWER ERROR.....	41
7.3 SPURIOUS EMISSIONS INTENSITY.....	42
7.4 OCCUPIED BANDWIDT–NORMAL (99%)	52
7.5 SPREAD-SPECTRUM BANDWIDTH -NORMAL(90%)	53
7.6 OCCUPIED BANDWIDT–AFH (99%)	54
7.7 SPREAD-SPECTRUM BANDWIDTH -AFH(90%)	55
7.8 LIMITATION OF COLLATERAL EMISSIONS OF RECEIVER.....	56
7.9 DWELL TIME.....	58
8 TEST RESULT FOR BLUETOOTH4.0(CH0~CH39)(FOR GFSK)	59
8.1 FREQUENCY ERROR.....	59
8.2 ANTENNA POWER ERROR.....	59
8.3 SPURIOUS EMISSIONS INTENSITY.....	60
8.4 OCCUPIED BANDWIDTH (99%).....	68
8.5 LIMITATION OF COLLATERAL EMISSIONS OF RECEIVER.....	70
APPENDIX A - PHOTOGRAPHS OF TEST SETUP.....	A- 1



Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 4 / 71
Rev.: 02

1. TEST RESULT CERTIFICATION

Applicant: Panasonic Taiwan Co., Ltd.
No.579, Yuan Shan Road, Chung-Ho Dist.. New Taipei
City, Taiwan

Manufacturer: Panasonic Taiwan Co., Ltd.
No.579, Yuan Shan Road, Chung-Ho Dist.. New Taipei
City, Taiwan

Equipment Under Test: Display Audio

Trade Name: PANASONIC

Model Number: YEAP4C1250ZA, YEAP4C1250ZD

Detailed EUT Description: See Item 3 of this report

Date of Test: May 22 ~ November 06, 2018

EUT Receive Date May 18, 2018

APPLICABLE STANDARDS	
CLASSIFICATION	TEST RESULT
ARIB STD T-66 Ver.3.7	No non-compliance noted

The above equipment was tested by Compliance Certification Services Inc. for compliance with the requirements set forth in ARIB STD T-66 Ver.3.7. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Approved by:

Tested by:

Shawn Wu
Section Manager
Compliance Certification Services Inc.

Dally Hong
Engineer
Compliance Certification Services Inc.

2. SUMMARY OF TEST RESULTS

2.1 BLUETOOTH (CH0~CH78) (FOR GFSK)

APPLIED STANDARD: ARIB STD T-66 Ver.3.7			
Standard Section	Report Section	Test Type and Limit	Test Result
General provisions			
5	6.1	Frequency Error	PASS
6	6.3	Occupied Bandwidth	PASS
7	6.2	Spurious Emissions Intensity	PASS
Transmitting equipment			
14	2.1	Antenna Power	PASS
14.2	-	SAR	-
Transmitting antenna			
20	3	Type, Configuration, etc., of Transmitting Antenna	PASS
22	-	Direction Pattern of Transmitting Antenna (Provided at Individual Antenna Report)	PASS
Receiving antenna			
24	6.5	Limitation of Collateral Emission of Receiver	PASS
26	3	Refer to All Articles for Transmitting Antenna	PASS
Operating frequency 2400~2483MHz			
49.20(1);a	4.3	RF Shielding Method	PASS
49.20(1);a	3	Communication Method	PASS
49.20(1);b	3	Spread-spectrum Method	PASS
49.20(1);d	-	Absolute Antenna Gain (Provided at Individual Antenna Report)	PASS
49.20(1);e	6.4	Spread-Spectrum Bandwidth	PASS
49.20(1);g	6.6	Hopping Frequency Dwell Time (FH employed)	PASS



Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 6 / 71

Rev: 02

Test Report

Hardware Version: 1S
Software Version: P20180518V05.000

Test Date	2018/5/23
Test Location	Compliance Certification Services Inc. No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan R.O.C.
Temp. / Humid.	25°C / 55%
Test Conducted By	
Name	Dally.Hong
Department	RF Testing Department

Specified Radio Equipment	Class	Article 2 Paragraph 1 Item 19	Model	YEAP4C1250ZA
	Type of Emission	G1D	Serial No.	1
	Modulation Type	FHSS (GFSK)	Antenna Power	0.04[mW/MHz]
	Frequency	2402 ~ 2480 MHz (1MHz separation 79CH)		

2. Test Results

Test Voltage		V	Normal Voltage (5V)			High Voltage + 10 % (5.5 V)			Low Voltage - 10 % (4.5 V)			Remarks
Test Frequency		MHz	2402	2441	2480							
Measured Frequency		MHz	2402.03297	2441.03347	2480.03247							
Frequency Error		ppm	13.73	13.71	13.09							±50 ppm within
Occupied Bandwidth		MHz	77.142									83.5 MHz or below
Spread-spectrum Bandwidth		MHz	68.570									500 kHz or more
Spurious Emission Intensity	※ 1	μW/MHz	0.16634	0.15959	0.15668							2.5 uW/MHz or below
	※ 2	μW/MHz	0.23121	0.12912	0.13459							25 uW/MHz or below
	※ 3	μW/MHz	0.11641	0.14223	0.16482							25 uW/MHz or below
	※ 4	μW/MHz	0.53827	0.38726	0.45082							2.5 uW/MHz or below
Test Frequency			Hopping									
Antenna Power (EIRP)		dBm/MHz	-17.03134									Antenna Gain : Bluetooth = 2[dBi] Limit 6.91dBm/MHz
Antenna Power (Conductive)		mW/MHz	0.01250									3 mW/MHz or below
Antenna Power Error		mW/MHz	-0.02750									
		%	-68.75									+ 20 , - 80 % within
A-factor	※ 7	A	0.0012									A = EIRP (in mW) / 16.37
	※ 8	degrees	360.00									360/A
Limitation of Collateral Emission of Receiver		nW/100KHz	0.01795									4 nW or below
		nW/MHz	0.52602									20 nW or below
Hopping Frequency Dwell Time		msec	0.30303									0.4 sec or below
Radio Interference Prevention Function		ID Code	MAC Address (00045B000888)									
		Carrier Sense										

※ 1 : Frequency Band 1 (30MHz ~ less than 2387MHz)

※ 2 : Frequency Band 2 (2387MHz ~ 2400MHz)

※ 3 : Frequency Band 3 (more than 2,483.5MHz ~ 2,496.5GHz)

※ 4 : Frequency Band 4 (2,496.5MHz ~ less than 12.5GHz)

※ 5 : Frequency Band 5 (30MHz ~ 1,000GHz)

※ 6 : Frequency Band 6 (1,000MHz ~ 12.5GHz)

※ 7 : A is equal to EIRP (in mW) / 16.37 . The conducted power is limited to 10 mW.

※ 8 The calculated A is smaller than 1 by definition A becomes 1.



Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 7 / 71

Rev: 02

Test Report

Hardware Version: MP1
Software Version: P20181018V08.003

Test Date	2018/11/6
Test Location	Compliance Certification Services Inc. No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan R.O.C.
Temp. / Humid.	25°C / 55%
Test Conducted By	
Name	Dally.Hong
Department	RF Testing Department

Specified Radio Equipment	Class	Article 2 Paragraph 1 Item 19	Model	YEAP4C1250ZA
	Type of Emission	G1D	Serial No.	1
	Modulation Type	FHSS (GFSK)	Antenna Power	0.04[mW/MHz]
	Frequency	2402 ~ 2480 MHz (1MHz separation 79CH)		

2. Test Results

Test Voltage		V	Normal Voltage (5V)			High Voltage + 10 % (5.5 V)			Low Voltage - 10 % (4.5 V)			Remarks	
Testing for Electrical Specification	Test Frequency	MHz	2402	2441	2480								
	Measured Frequency	MHz	2402.03297	2441.03347	2480.03247								
	Frequency Error	ppm	13.73	13.71	13.09							±50 ppm within	
	Occupied Bandwidth	MHz	77.142									83.5 MHz or below	
	Spread-spectrum Bandwidth	MHz	68.570									500 kHz or more	
	Spurious Emission Intensity	※ 1	μW/MHz	0.16634	0.15959	0.15668							2.5 uW/MHz or below
		※ 2	μW/MHz	0.23121	0.12912	0.13459							25 uW/MHz or below
		※ 3	μW/MHz	0.11641	0.14223	0.16482							25 uW/MHz or below
		※ 4	μW/MHz	0.53827	0.38726	0.45082							2.5 uW/MHz or below
	Test Frequency		Hopping										
	Antenna Power (EIRP)	dBm/MHz	-18.92134									Antenna Gain : Bluetooth = 2[dBi] Limit 6.91dBm/MHz	
	Antenna Power (Conductive)	mW/MHz	0.00809									3 mW/MHz or below	
	Antenna Power Error	mW/MHz	-0.03191										
		%	-79.78									+ 20 , - 80 % within	
	A-factor	※ 7	A	0.0008									A = EIRP (in mW) / 16.37
		※ 8	degrees	360.00									360/A
Limitation of Collateral Emission of Receiver	※ 5	nW/100KHz	0.01795									4 nW or below	
	※ 6	nW/MHz	0.52602									20 nW or below	
Hopping Frequency Dwell Time		msec	0.30303									0.4 sec or below	
Radio Interference Prevention Function	ID Code	MAC Address (00045B000888)											
	Carrier Sense												

※ 1 : Frequency Band 1 (30MHz ~ less than 2387MHz)

※ 4 : Frequency Band 4 (2,496.5MHz ~ less than 12.5GHz)

※ 7 : A is equal to EIRP (in mW) / 16.37. The conducted power is limited to 10 mW.

※ 2 : Frequency Band 2 (2387MHz ~ 2400MHz)

※ 5 : Frequency Band 5 (30MHz ~ 1,000GHz)

※ 8 : The calculated A is smaller than 1 by definition A becomes 1.

※ 3 : Frequency Band 3 (more than 2,483.5MHz ~ 2,496.5GHz)

※ 6 : Frequency Band 6 (1,000MHz ~ 12.5GHz)

Output power: 2402 MHz / -4.64dBm, 2441 MHz / -3.55dBm, 2480MHz / -2.54dBm

Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 8 / 71

Rev.: 02

Test Report (AFH)

Hardware Version: 1S
Software Version: P20180518V05.000

Test Date	2018/5/23
Test Location	Compliance Certification Services Inc. No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan R.O.C.
Temp. / Humid.	25°C / 55%
Test Conducted By	
Name	Dally.Hong
Department	RF Testing Department

Specified Radio Equipment	Class	Article 2 Paragraph 1 Item 19	Model	YEAP4C1250ZA
	Type of Emission	G1D	Serial No.	1
	Modulation Type	FHSS (GFSK)	Antenna Power	0.02[mW/MHz]
	Frequency	AFH (1MHz separation 20CH)		

2. Test Results

Testing for Electrical Specification	Test Voltage		V	Normal Voltage (5V)			High Voltage + 10 % (5.5 V)			Low Voltage - 10 % (4.5 V)			Remarks
	Test Frequency		MHz		2441								
	Measured Frequency		MHz										
	Frequency Error		ppm										±50 ppm within
	Occupied Bandwidth		MHz		19.576								83.5 MHz or below
	Spread-spectrum Bandwidth		MHz		17.968								500 kHz or more
	※ 1	μW/MHz											2.5 uW/MHz or below
		μW/MHz											25 uW/MHz or below
		μW/MHz											25 uW/MHz or below
		μW/MHz											2.5 uW/MHz or below
	Antenna Power (EIRP) (AFH)		dBm/MHz		-11.21500								Antenna Gain : Bluetooth = 2[dBi] Limit 6.91dBm/MHz
	Antenna Power (Conductive) (AFH)		mW/MHz		0.04770								3 mW/MHz or below
	Antenna Power Error (AFH)		mW/MHz		0.02770								
			%		138.49								+ 20 , - 80 % within
	A-factor	※ 7	A		0.0046								A = EIRP (in mW) / 16.37
		※ 8	degrees		360.00								360/A
	Limitation of Collateral Emission of Receiver	※ 5	nW/100KHz										4 nW or below
		※ 6	nW/MHz										20 nW or below
	Hopping Frequency Dwell Time (DH5)		sec										0.4 sec or below
	Radio Interference Prevention Function		ID Code	MAC Address (00045B000888)									
			Carrier Sense										

※ 1 : Frequency Band 1 (30MHz ~ less than 2387MHz)

※ 4 : Frequency Band 4 (2,496.5MHz ~ less than 12.5GHz)

※ 7 : A is equal to EIRP (in mW) / 16.37 .The conducted power is limited to 10 mW.

※ 2 : Frequency Band 2 (2387MHz ~ 2400MHz)

※ 5 : Frequency Band 5 (30MHz ~ 1,000GHz)

※ 8 The calculated A is smaller than 1 by definition A becomes 1.

※ 3 : Frequency Band 3 (more than 2,483.5MHz ~ 2,496.5GHz)

※ 6 : Frequency Band 6 (1,000MHz ~ 12.5GHz)

Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 9 / 71

Rev.: 02

Test Report (AFH)

Hardware Version: MP1
Software Version: P20181018V08.003

Test Date	2018/11/6
Test Location	Compliance Certification Services Inc. No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan R.O.C.
Temp. / Humid.	25°C / 55%
Test Conducted By	
Name	Dally.Hong
Department	RF Testing Department

Specified Radio Equipment	Class	Article 2 Paragraph 1 Item 19	Model	YEAP4C1250ZA
	Type of Emission	G1D	Serial No.	1
	Modulation Type	FHSS (GFSK)	Antenna Power	0.03[mW/MHz]
	Frequency	AFH (1MHz separation 20CH)		

2. Test Results

Testing for Electrical Specification	Test Voltage		V	Normal Voltage (5V)			High Voltage + 10 % (5.5 V)			Low Voltage - 10 % (4.5 V)			Remarks
	Test Frequency		MHz		2441								
	Measured Frequency		MHz										
	Frequency Error		ppm										±50 ppm within
	Occupied Bandwidth		MHz		19.576								83.5 MHz or below
	Spread-spectrum Bandwidth		MHz		17.968								500 kHz or more
	※ 1	μW/MHz											2.5 uW/MHz or below
		μW/MHz											25 uW/MHz or below
		μW/MHz											25 uW/MHz or below
		μW/MHz											2.5 uW/MHz or below
	Antenna Power (EIRP) (AFH)		dBm/MHz		-13.10500								Antenna Gain : Bluetooth = 2[dBi] Limit 6.91dBm/MHz
	Antenna Power (Conductive) (AFH)		mW/MHz		0.03087								3 mW/MHz or below
	Antenna Power Error (AFH)	mW/MHz			0.00087								
		%			2.89								+ 20 , - 80 % within
	A-factor	※ 7	A		0.0030								A = EIRP (in mW) / 16.37
		※ 8	degrees		360.00								360/A
	Limitation of Collateral Emission of Receiver	※ 5	nW/100KHz										4 nW or below
		※ 6	nW/MHz										20 nW or below
	Hopping Frequency Dwell Time (DH5)		sec										0.4 sec or below
	Radio Interference Prevention Function		ID Code	MAC Address (00045B000888)									
			Carrier Sense										

※ 1 : Frequency Band 1 (30MHz ~ less than 2387MHz)

※ 4 : Frequency Band 4 (2,496.5MHz ~ less than 12.5GHz)

※ 7 : A is equal to EIRP (in mW) / 16.37 .The conducted power is limited to 10 mW.

※ 2 : Frequency Band 2 (2387MHz ~ 2400MHz)

※ 5 : Frequency Band 5 (30MHz ~ 1,000GHz)

※ 8 The calculated A is smaller than 1 by definition A becomes 1.

※ 3 : Frequency Band 3 (more than 2,483.5MHz ~ 2,496.5GHz)

※ 6 : Frequency Band 6 (1,000MHz ~ 12.5GHz)

2.2 BLUETOOTH (CH0~CH78) (FOR 8DPSK)

APPLIED STANDARD: ARIB STD T-66 Ver.3.7			
Standard Section	Report Section	Test Type and Limit	Test Result
General provisions			
5	7.1	Frequency Error	PASS
6	7.3	Occupied Bandwidth	PASS
7	7.2	Spurious Emissions Intensity	PASS
Transmitting equipment			
14	2.2	Antenna Power	PASS
14.2	-	SAR	-
Transmitting antenna			
20	3	Type, Configuration, etc., of Transmitting Antenna	PASS
22	-	Direction Pattern of Transmitting Antenna (Provided at Individual Antenna Report)	PASS
Receiving antenna			
24	7.5	Limitation of Collateral Emission of Receiver	PASS
26	3	Refer to All Articles for Transmitting Antenna	PASS
Operating frequency 2400~2483MHz			
49.20(1);a	4.3	RF Shielding Method	PASS
49.20(1);a	3	Communication Method	PASS
49.20(1);b	3	Spread-spectrum Method	PASS
49.20(1);d	-	Absolute Antenna Gain (Provided at Individual Antenna Report)	PASS
49.20(1);e	7.4	Spread-Spectrum Bandwidth	PASS
49.20(1);g	7.6	Hopping Frequency Dwell Time (FH employed)	PASS



Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 11 / 71

Rev: 02

Test Report

Hardware Version: 1S
Software Version: P20180518V05.000

Test Date	2018/5/23
Test Location	Compliance Certification Services Inc. No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan R.O.C.
Temp. / Humid.	25°C / 55%
Test Conducted By	
Name	Dally.Hong
Department	RF Testing Department

Specified Radio Equipment	Class	Article 2 Paragraph 1 Item 19	Model	YEAP4C1250ZA
	Type of Emission	G1D	Serial No.	1
	Modulation Type	FHSS (8DPSK)	Antenna Power	0.04[mW/MHz]
	Frequency	2402 ~ 2480 MHz (1MHz separation 79CH)		

2. Test Results

Testing for Electrical Specification		V	Normal Voltage (5V)			High Voltage + 10 % (5.5 V)			Low Voltage - 10 % (4.5 V)			Remarks
Test Voltage		MHz	2402	2441	2480							
Test Frequency		MHz	2402.03247	2441.03297	2480.03197							
Measured Frequency		ppm	13.52	13.51	12.89							
Frequency Error		MHz	77.532									±50 ppm within
Occupied Bandwidth		MHz	68.831									83.5 MHz or below
Spread-spectrum Bandwidth		μW/MHz	0.17061	0.14322	0.14997							500 kHz or more
Spurious Emission Intensity		※ 1	μW/MHz	0.40179	0.13552	0.11117						2.5 uW/MHz or below
		※ 2	μW/MHz	0.12882	0.12303	0.13366						25 uW/MHz or below
		※ 3	μW/MHz	0.51761	0.57810	0.47424						25 uW/MHz or below
		※ 4	μW/MHz									2.5 uW/MHz or below
Test Frequency		dBm/MHz		Hopping								
Antenna Power (EIRP)		mW/MHz		0.01384								Antenna Gain : Bluetooth = 2[dBi] Limit 6.91dBm/MHz
Antenna Power (Conductive)		mW/MHz		-0.02616								3 mW/MHz or below
Antenna Power Error		%		-65.39								
												+ 20 , - 80 % within
A-factor		※ 7	A	0.0013								A = EIRP (in mW) / 16.37
		※ 8	degrees	360.00								360/A
Limitation of Collateral Emission of Receiver		※ 5	nW/100KHz	0.01545								4 nW or below
		※ 6	nW/MHz	0.57016								20 nW or below
Hopping Frequency Dwell Time (DH5)		sec		0.30090								0.4 sec or below
Radio Interference Prevention Function		ID Code	MAC Address (00045B000888)									
		Carrier Sense										

※ 1 : Frequency Band 1 (30MHz ~ less than 2387MHz)

※ 2 : Frequency Band 2 (2387MHz ~ 2400MHz)

※ 3 : Frequency Band 3 (more than 2,483.5MHz ~ 2,496.5GHz)

※ 4 : Frequency Band 4 (2,496.5MHz ~ less than 12.5GHz)

※ 5 : Frequency Band 5 (30MHz ~ 1,000GHz)

※ 6 : Frequency Band 6 (1,000MHz ~ 12.5GHz)

※ 7 : A is equal to EIRP (in mW) / 16.37 .The conducted power is limited to 10 mW.

※ 8 The calculated A is smaller than 1 by definition A becomes 1.



Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 12 / 71

Rev.: 02

Test Report

Hardware Version: MP1
Software Version: P20181018V08.003

Test Date	2018/11/6
Test Location	Compliance Certification Services Inc. No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan R.O.C.
Temp. / Humid.	25°C / 55%
Test Conducted By	
Name	Dally.Hong
Department	RF Testing Department

Specified Radio Equipment	Class	Article 2 Paragraph 1 Item 19	Model	YEAP4C1250ZA
	Type of Emission	G1D	Serial No.	1
	Modulation Type	FHSS (8DPSK)	Antenna Power	0.01[mW/MHz]
	Frequency	2402 ~ 2480 MHz (1MHz separation 79CH)		

2. Test Results

Testing for Electrical Specification	Test Voltage	V	Normal Voltage (5V)			High Voltage + 10 % (5.5 V)		Low Voltage - 10 % (4.5 V)		Remarks
	Test Frequency	MHz	2402	2441	2480					
	Measured Frequency	MHz	2402.03247	2441.03297	2480.03197					
	Frequency Error	ppm	13.52	13.51	12.89					±50 ppm within
	Occupied Bandwidth	MHz	77.532							83.5 MHz or below
	Spread-spectrum Bandwidth	MHz	68.831							500 kHz or more
	Spurious Emission Intensity	※ 1	μW/MHz	0.17061	0.14322	0.14997				2.5 uW/MHz or below
		※ 2	μW/MHz	0.40179	0.13552	0.11117				25 uW/MHz or below
		※ 3	μW/MHz	0.12882	0.12303	0.13366				25 uW/MHz or below
		※ 4	μW/MHz	0.51761	0.57810	0.47424				2.5 uW/MHz or below
	Test Frequency		Hopping							
	Antenna Power (EIRP)	dBm/MHz	-21.50784							Antenna Gain : Bluetooth = 2[dBi] Limit 6.91dBm/MHz
	Antenna Power (Conductive)	mW/MHz	0.00446							3 mW/MHz or below
	Antenna Power Error	mW/MHz	-0.00554							
		%	-55.41							+ 20 , - 80 % within
	A-factor	※ 7	A	0.0004						A = EIRP (in mW) / 16.37
		※ 8	degrees	360.00						360/A
	Limitation of Collateral Emission of Receiver	※ 5	nW/100KHz	0.01545						4 nW or below
		※ 6	nW/MHz	0.57016						20 nW or below
	Hopping Frequency Dwell Time (DH5)	sec		0.30090						0.4 sec or below
	Radio Interference Prevention Function	ID Code	MAC Address (00045B000888)							
		Carrier Sense								

※ 1 : Frequency Band 1 (30MHz ~ less than 2387MHz)

※ 4 : Frequency Band 4 (2,496.5MHz ~ less than 12.5GHz)

※ 7 : A is equal to EIRP (in mW) / 16.37 .The conducted power is limited to 10 mW.

※ 2 : Frequency Band 2 (2387MHz ~ 2400MHz)

※ 5 : Frequency Band 5 (30MHz ~ 1,000GHz)

※ 8 The calculated A is smaller than 1 by definition A becomes 1.

※ 3 : Frequency Band 3 (more than 2,483.5MHz ~ 2,496.5GHz)

※ 6 : Frequency Band 6 (1,000MHz ~ 12.5GHz)

Output power: 2402 MHz / -7.62dBm, 2441 MHz / -5.85dBm, 2480MHz / -4.83dBm



Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 13 / 71

Rev.: 02

Test Report (AFH)

Hardware Version: 1S
Software Version: P20180518V05.000

Test Date	2018/5/23
Test Location	Compliance Certification Services Inc. No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan R.O.C.
Temp. / Humid.	25°C / 55%
Test Conducted By	
Name	Dally.Hong
Department	RF Testing Department

Specified Radio Equipment	Class	Article 2 Paragraph 1 Item 19	Model	YEAP4C1250ZA
	Type of Emission	G1D	Serial No.	1
	Modulation Type	FHSS (8DPSK)	Antenna Power	0.02[mW/MHz]
	Frequency	AFH (1MHz separation 20CH)		

2. Test Results

Testing for Electrical Specification	Test Voltage	V	Normal Voltage (5V)			High Voltage + 10 % (5.5 V)			Low Voltage - 10 % (4.5 V)			Remarks
	Test Frequency	MHz		2441								
	Measured Frequency	MHz										
	Frequency Error	ppm										±50 ppm within
	Occupied Bandwidth	MHz		19.940								83.5 MHz or below
	Spread-spectrum Bandwidth	MHz		18.152								500 kHz or more
	※ 1	μW/MHz										2.5 uW/MHz or below
		μW/MHz										25 uW/MHz or below
		μW/MHz										25 uW/MHz or below
		μW/MHz										2.5 uW/MHz or below
	Antenna Power (EIRP) (AFH)	dBm/MHz		-10.79920								Antenna Gain : Bluetooth = 2[dBi] Limit 6.91dBm/MHz
	Antenna Power (Conductive) (AFH)	mW/MHz		0.05249								3 mW/MHz or below
	Antenna Power Error (AFH)	mW/MHz		0.03249								
		%		162.45								+ 20 , - 80 % within
	A-factor	※ 7 A		0.01								A = EIRP (in mW) / 16.37
		※ 8 degrees		360.00								360/A
	Limitation of Collateral Emission of Receiver	※ 5 nW/100KHz										4 nW or below
		※ 6 nW/MHz										20 nW or below
	Hopping Frequency Dwell Time (DH5)	sec										0.4 sec or below
	Radio Interference Prevention Function	ID Code	MAC Address (00045B000888)									
		Carrier Sense										

※ 1 : Frequency Band 1 (30MHz ~ less than 2387MHz)

※ 4 : Frequency Band 4 (2,496.5MHz ~ less than 12.5GHz)

※ 7 : A is equal to EIRP (in mW) / 16.37 .The conducted power is limited to 10 mW.

※ 2 : Frequency Band 2 (2387MHz ~ 2400MHz)

※ 5 : Frequency Band 5 (30MHz ~ 1,000GHz)

※ 8 : The calculated A is smaller than 1 by definition A becomes 1.

※ 3 : Frequency Band 3 (more than 2,483.5MHz ~ 2,496.5GHz)

※ 6 : Frequency Band 6 (1,000MHz ~ 12.5GHz)



Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 14 / 71

Rev.: 02

Test Report (AFH)

Hardware Version: MP1
Software Version: P20181018V08.003

Test Date	2018/11/6
Test Location	Compliance Certification Services Inc. No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan R.O.C.
Temp. / Humid.	25°C / 55%
Test Conducted By	
Name	Dally.Hong
Department	RF Testing Department

Specified Radio Equipment	Class	Article 2 Paragraph 1 Item 19	Model	YEAP4C1250ZA
	Type of Emission	G1D	Serial No.	1
	Modulation Type	FHSS (8DPSK)	Antenna Power	0.03[mW/MHz]
	Frequency	AFH (1MHz separation 20CH)		

2. Test Results

Test Voltage		V	Normal Voltage (5V)		High Voltage + 10 % (5.5 V)		Low Voltage - 10 % (4.5 V)		Remarks
Testing for Electrical Specification	Test Frequency	MHz		2441					
	Measured Frequency	MHz							
	Frequency Error	ppm							±50 ppm within
	Occupied Bandwidth	MHz		19.940					83.5 MHz or below
	Spread-spectrum Bandwidth	MHz		18.152					500 kHz or more
	※ 1	μW/MHz							2.5 uW/MHz or below
	※ 2	μW/MHz							25 uW/MHz or below
	※ 3	μW/MHz							25 uW/MHz or below
	※ 4	μW/MHz							2.5 uW/MHz or below
	Antenna Power (EIRP) (AFH)	dBm/MHz		-15.71920					Antenna Gain : Bluetooth = 2[dBi] Limit 6.91dBm/MHz
	Antenna Power (Conductive) (AFH)	mW/MHz		0.01691					3 mW/MHz or below
	Antenna Power Error (AFH)	mW/MHz		-0.01309					
		%		-43.64					+ 20 , - 80 % within
	※ 7	A		0.00					A = EIRP (in mW) / 16.37
	※ 8	degrees		360.00					360/A
	Limitation of Collateral Emission of Receiver	※ 5 nW/100KHz							4 nW or below
		※ 6 nW/MHz							20 nW or below
	Hopping Frequency Dwell Time (DH5)	sec							0.4 sec or below
	Radio Interference Prevention Function	ID Code	MAC Address (00045B000888)						
		Carrier Sense							

※ 1 : Frequency Band 1 (30MHz ~ less than 2387MHz)

※ 2 : Frequency Band 2 (2387MHz ~ 2400MHz)

※ 3 : Frequency Band 3 (more than 2,483.5MHz ~ 2,496.5GHz)

※ 4 : Frequency Band 4 (2,496.5MHz ~ less than 12.5GHz)

※ 5 : Frequency Band 5 (30MHz ~ 1,000GHz)

※ 6 : Frequency Band 6 (1,000MHz ~ 12.5GHz)

※ 7 : A is equal to EIRP (in mW) / 16.37 .The conducted power is limited to 10 mW.

※ 8 The calculated A is smaller than 1 by definition A becomes 1.

2.3 BLUETOOTH 4.2 (CH0~CH39) (FOR GFSK)

APPLIED STANDARD: ARIB STD T-66 Ver.3.7			
Standard Section	Report Section	Test Type and Limit	Test Result
General provisions			
5	8.1	Frequency Error	PASS
6	8.4	Occupied Bandwidth	PASS
7	8.3	Spurious Emissions Intensity	PASS
Transmitting equipment			
14	2.3	Antenna Power	PASS
14.2	-	SAR	-
Transmitting antenna			
20	3	Type, Configuration, etc., of Transmitting Antenna	PASS
22	-	Direction Pattern of Transmitting Antenna (Provided at Individual Antenna Report)	PASS
Receiving antenna			
24	8.5	Limitation of Collateral Emission of Receiver	PASS
26	3	Refer to All Articles for Transmitting Antenna	PASS
Operating frequency 2400~2483MHz			
49.20(1);a	4.3	RF Shielding Method	PASS
49.20(1);a	3	Communication Method	PASS
49.20(1);b	3	Spread-spectrum Method	PASS
49.20(1);d	-	Absolute Antenna Gain (Provided at Individual Antenna Report)	PASS
49.20(1);e	6.5	Spread-Spectrum Bandwidth	-

Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 16 / 71

Rev: 02

Test Report

Specified Radio Equipment	Class	Article 2 Paragraph 1 Item 19	Model	YEAP4C1250ZA	Test Date	2018/5/23
	Type of Emission	F1D	Serial No.		Test Location	Compliance Certification Services Inc. No.11, Wugong 6th Rd., Wugu Dist., Xinbei City 24891, Taiwan R.O.C.
	Modulation Type	GFSK	Antenna Power	2[mW]	Temp. / Humid.	25°C / 52%
	Frequency	2402 ~ 2480 MHz			Test Conducted By	
					Name	Dally.Hong
					Department	RF Testing Department

2. Test Results

Testing for Electrical Specification	Test Voltage		V	Normal Voltage (5V)			High Voltage + 10 % (5.5 V)			Low Voltage - 10 % (4.5 V)			Remarks
	Test Frequency		MHz	2402.00	2440.00	2480.00							
	Measured Frequency		MHz	2402.03387	2440.03267	2480.03297							
	Frequency Error		ppm	14.10	13.39	13.29							±50 ppm within
	Occupied Bandwidth		MHz	1.28	1.26	1.26							26 MHz or below
	Spurious Emission Intensity	※1	μW/MHz	0.33113	0.35810	0.35075							2.5 uW/MHz or below
		※2	μW/MHz	0.12589	0.12531	0.14289							25 uW/MHz or below
		※3	μW/MHz	0.14655	0.12618	0.16032							25 uW/MHz or below
		※4	μW/MHz	0.42756	0.50466	0.59704							2.5 uW/MHz or below
	Antenna Power (EIRP)		dBm	-0.16000	4.07000	6.00000							Antenna Gain = 2
	Antenna Power (Conductive)		mW	0.60814	1.61065	2.51189							10 mW or below
	Antenna Power Error		mW	-1.39186	-0.38935	0.51189							
			%	-69.59	-19.47	25.59							+ 20 , - 80 % within
	A-factor	※ 7	A	0.06	0.16	0.24							A = EIRP (in mW) / 16.37
		※ 8	degrees	360	360	360							360/A
	Limitation of Collateral Emission of Receiver	※ 5	nW/MHz		0.02080								4 nW or below
		※ 6	nW/MHz		0.54828								20 nW or below
	Hopping Frequency Dwell Time		sec										
	Radio Interference Prevention Function	ID Code	MAC Address (00045B000888)										
		Carrier Sense											

※ 1 : Frequency Band 1 (30MHz ~ less than 2387MHz)

※ 4 : Frequency Band 4 (2,496.5MHz ~ less than 12.5GHz)

※ 7 : A is equal to EIRP (in mW) / 16.37 .The conducted power is limited to 10 mW .

※ 2 : Frequency Band 2 (2387MHz ~ 2400MHz)

※ 5 : Frequency Band 5 (30MHz ~ 1,000GHz)

※ 8 The calculated A is smaller than 1 by definition A becomes 1.

※ 3 : Frequency Band 3 (more than 2,483.5MHz ~ 2,496.5GHz)

※ 6 : Frequency Band 6 (1,000MHz ~ 12.5GHz)

3 EUT DESCRIPTION

Product	Display Audio
Trade Name	PANASONIC
Model Number	YEAP4C1250ZA, YEAP4C1250ZD
Power Supply	Powered from host device
Model Discrepancy	Difference of the model numbers (list on this report) is just for marketing purpose only.
Frequency Range	Bluetooth (CH0~78): 2402~2480MHz Bluetooth (CH0~39): 2402~2480MHz
Rated Antenna Power	Bluetooth 2.0 for GFSK: 0.04mW/MHz(Normal) Bluetooth 2.0 for GFSK: 0.02mW/MHz(AFH) Bluetooth 2.0 for 8DPSK: 0.04mW/MHz(Normal) Bluetooth 2.0 for 8DPSK: 0.02mW/MHz(AFH) Bluetooth 4.2: 2 mW
Measured Antenna Power	Bluetooth 2.0 for GFSK: 0.01250mW/MHz(Normal) Bluetooth 2.0 for GFSK: 0.04770mW/MHz(AFH) Bluetooth 2.0 for 8DPSK: 0.01384mW/MHz(Normal) Bluetooth 2.0 for 8DPSK: 0.05249mW/MHz(AFH) Bluetooth 4.2: 2.51189mW
Modulation Technique	Bluetooth: FHSS (GFSK , $\pi/4$ -DQPSK , 8DPSK) Bluetooth 4.2: GFSK
Number of Channels	Bluetooth (CH0~78): 79 channels Bluetooth 4.2(CH0~39): 40 channels
Antenna Specification	Antenna Gain: 2 dBi
Hardware Version	MP1
Software Version	P20181018V08.003

Remark: for more details, please refer to the User's manual of the EUT.

4 TEST METHODOLOGY & CONDITIONS

4.1 TEST CONDITIONS

Voltage Fluctuation Test	Normal Voltage	High Voltage + 10% of Normal Voltage	Low Voltage - 10% of Normal Voltage
Input DC Power	5	5.5	4.5
Output DC Power	3.27	3.28	3.27
Voltage Variation (%)	-	0.305810	0.000000

Voltage Variation (%) = (Output High or Low Voltage - Output Normal Voltage) / Output Normal Voltage * 100

During the input supply voltage to the EUT from the external power source is varied by +/- 10%, if output voltage had been confirmed that the fluctuation of power supply to the RF circuit of EUT (excluding power source) is equal to or less than +/- 1%.Exempt extremely high and low supply voltage condition tests, EUT only operated in normal voltage to test all regulations.

4.2 DESCRIPTION OF TEST MODES

The EUT (model: YEAP4C1250ZA) had been tested under operating condition.

Software used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Bluetooth BLE: Measurement was conducted by the following test method.

4.3 RF SHIELDING METHOD

The RF part is not easily accessible because the EUT is using a shielding case as below.



4.4 SETUP OF EQUIPMENT UNDER TEST

Setup Diagram

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

Support Equipment

No	Equipment	Trade Name	Model	Serial No.	FCC ID	Data Cable	Power Cord
1	Notebook PC	Toshiba	voyager	N/A	N/A	N/A	N/A

5 INSTRUMENT AND CALIBRATION

5.1 MEASURING INSTRUMENT CALIBRATION

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

5.2 TEST AND MEASUREMENT 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 equivalent 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 manual.

Equipment Used for Emission Measurement

Conducted Emission Test Site							
Name of Equipment	Manufacturer	Model	Serial Number	Cal Date	Cal Due	Calibration Lab.	Accreditation Organization of the Cal. Lab
Power Meter	Anritsu	ML2495A	1012009	9/18/2017	09/17/2018	ETC	TAF
Power Sensor	Anritsu	MA2411B	917072	9/18/2017	09/17/2018	ETC	TAF
Spectrum Analyzer	R&S	FSV 40	101073	10/02/2017	10/01/2018	ETC	TAF
Directional Coupler	Agilent	87301D	MY44350252	07/25/2017	07/24/2018	ETC	TAF
SUCOFLEX Cable	HUBER SUHNER	SUCOFLEX 104PEA	25157	07/31/2017	07/30/2018	ETC	TAF
Divider	Solvang Technology	2-18GHz 4Way	STI08-0015	07/26/2017	07/25/2018	ETC	TAF

Conducted Emission Test Site							
Name of Equipment	Manufacturer	Model	Serial Number	Cal Date	Cal Due	Calibration Lab.	Accreditation Organization of the Cal. Lab
Coaxial Cable	Woken	WC12	CC002	06/29/2018	06/28/2019	CCS	TAF
S.G.	Agilent	E8257C	US42340383	07/06/2018	07/05/2019	ETC	TAF
Signal Analyzer	R&S	FSV 40	101073	09/27/2018	09/26/2019	R&S	TAF

Remark: Each piece of equipment is scheduled for calibration once a year.

5.3 MEASUREMENT UNCERTAINTY

For the test methods, according to the present document, the measurement uncertainty figures shall be calculated in accordance with TR 100 028-1 [2] and shall correspond to an expansion factor (coverage factor) $k = 1,96$ or $k = 2$ (which provide confidence levels of respectively 95 % and 95,45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).

Table 6 is based on such expansion factors.

Table: Maximum measurement uncertainty

Parameter	Uncertainty
RF frequency	$\pm 1 \cdot 10^{-5}$
Total RF power conducted	$\pm 1,5$ dB
RF power density, conducted	± 3 dB
Spurious emissions, conducted	± 3 dB
All emissions, radiated	± 6 dB
Humidity	± 5 %
Temperature	$\pm 1^{\circ}\text{C}$
DC and low frequency voltages	$\pm 3\%$

PARAMETER	UNCERTAINTY
Frequency Error	226Hz
Antenna Power	1.906 dB
Spurious Emission	0.182 dB
Occupied Bandwidth	0.178 kHz
Dwell Time	0.054 ms

5.4 CALIBRATION

(1) Spectrum Analyser and Power Meter

Signal Generator (dBm)	Spectrum Analyser (dBm)	Power Meter (dBm)	Remark
0	-0.81	-0.20	• Frequency : 2450MHz • ATT : 10dB • RLV: 0dBm • RBW, VBW : 1MHz • SP: 0Hz
-5	-5.81	-5.39	
-10	-10.75	-10.53	

Remark: For FHSS, connect SG to SA with cable and 10dB external attenuator. Connect SG to power meter with cable and 10dB external attenuator.

(2) Spectrum Analyser

Signal Generator (dBm)	Spectrum Analyser (MHz)	Tolerance (Hz)	Remark
2,450.00	2,450.000580	580	• SG: -10dBm • RBW, VBW : 10kHz, SP: 100kHz

1.2 Cable Factor Measurement

Signal Generator (dBm)	Direct Power Meter (dBm)	Cable + Att Power Meter (dBm)	Cable Factor (dB)	Remark
1,000.00	0.21	-10.16	10.37	• SG: 0dBm
2,450.00	-0.20	-10.81	10.61	
5,250.00	-0.51	-11.43	10.92	
12,500.00	-2.64	-13.61	10.97	

6 TEST RESULT FOR BLUETOOTH (CH0~CH78) (FOR GFSK)

6.1 FREQUENCY ERROR

TEST RESULT

Frequency (MHz)	Reading (MHz)	Deviation (Hz)	Tolerance (ppm)	Remark
2402.0000	2402.032970	32970	13.7261	Normal Voltage
2441.0000	2441.033470	33470	13.7116	
2480.0000	2480.032470	32470	13.0927	

6.2 ANTENNA POWER

NORMAL

Frequency (MHz)	Spectrum Analyser (dBm/MHz)	Cable Factor (dB)	Output Power (mW/MHz)	EIRP Power (dBm/MHz)	Remark
Hopping	-11.28	10.61	0.01250	-17.03134	Normal Voltage

AFH

Frequency (MHz)	Spectrum Analyser (dBm/MHz)	Cable Factor (dB)	Output Power (mW/MHz)	EIRP Power (dBm/MHz)	Remark
Hopping	-11.28	10.61	0.01111	-17.54295	Normal Voltage

Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 24 / 71
Rev.: 02

6.3 SPURIOUS EMISSIONS INTENSITY

TEST RESULT

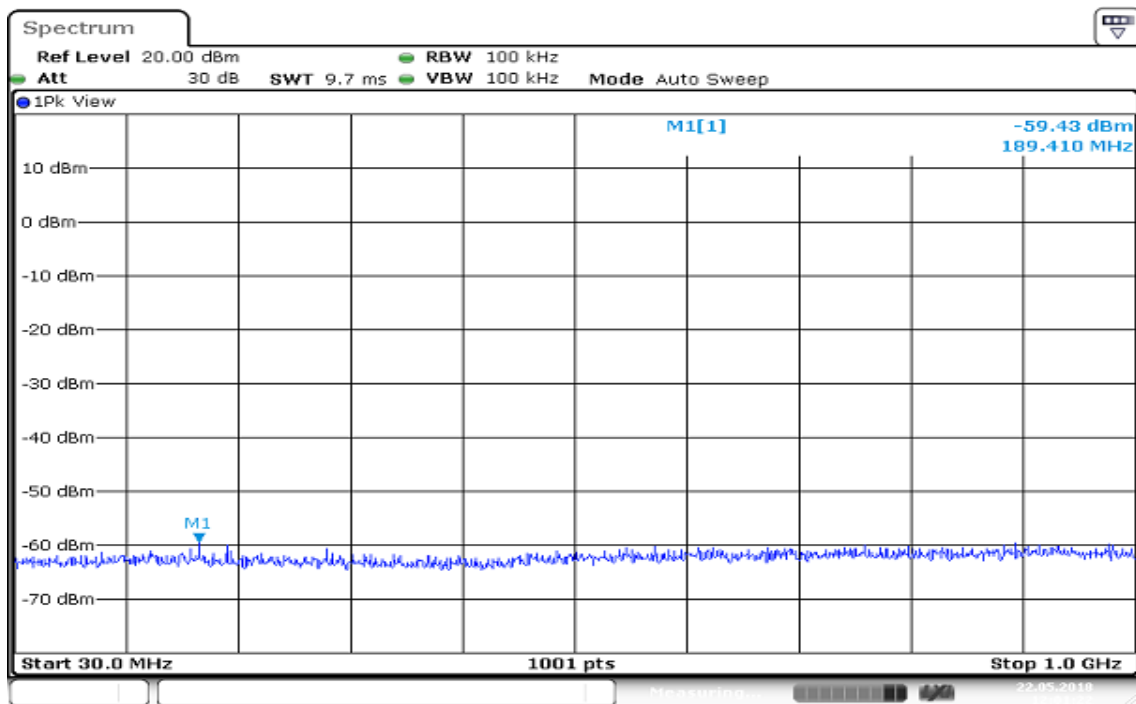
30MHz ~ 1000MHz

(1) Spurious Emission Intensity : 30MHz~less than 1,000MHz

Frequency (MHz)	Reading (MHz)	Reading (dBm)	Cable Factor (dB)	Result (μW/MHz)	Remark
2402.0000	189.4100	-59.43	10.37	0.01242	Normal Voltage
2441.0000	642.9100	-59.27	10.37	0.01288	
2480.0000	800.8600	-59.27	10.37	0.01288	

TEST PLOTS

CH Low



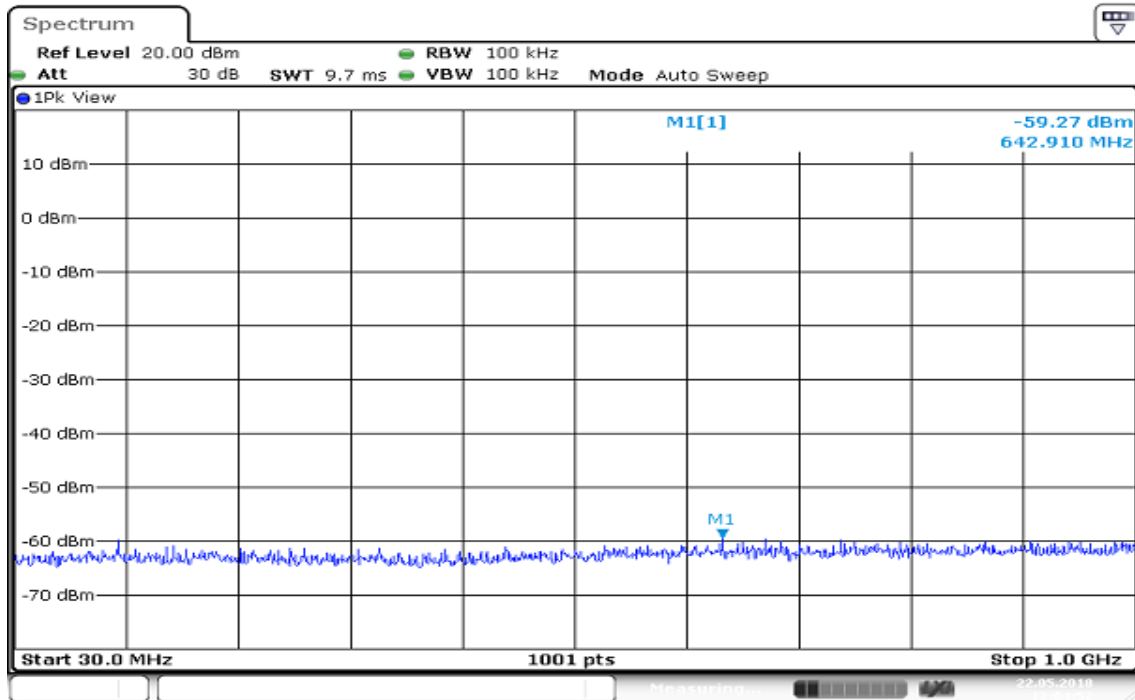
Date: 22.MAY.2018 12:01:22

Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

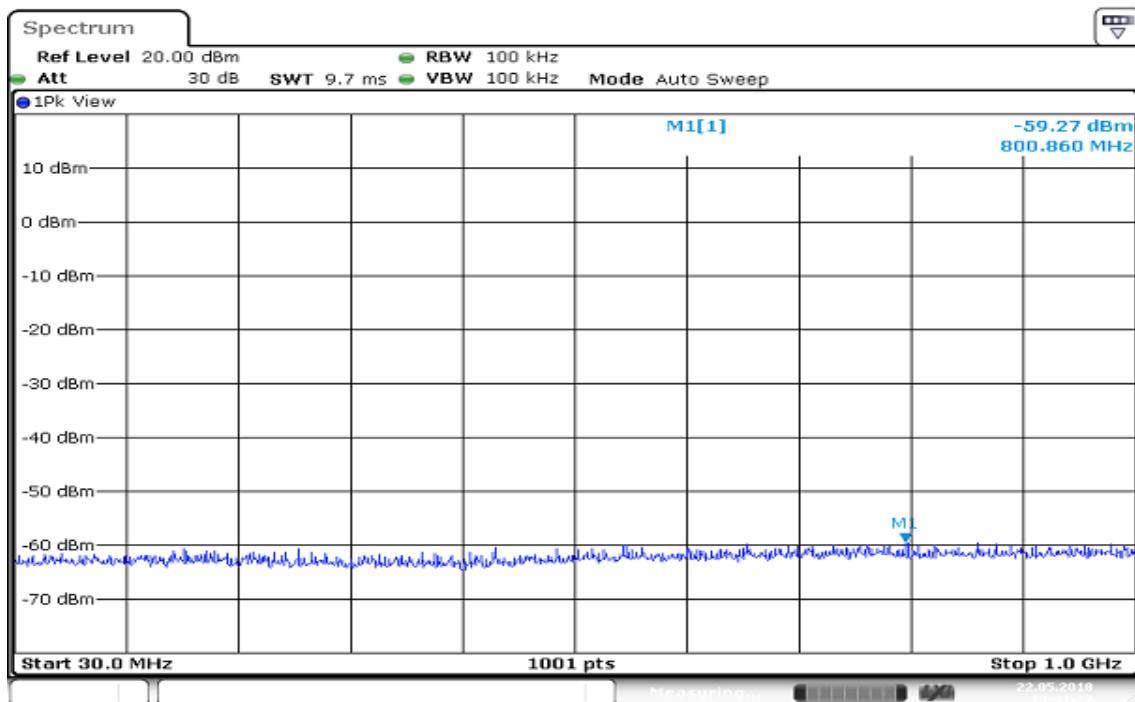
Page: 25 / 71
Rev.: 02

CH Mid



Date: 22.MAY.2018 12:04:52

CH High



Date: 22.MAY.2018 13:41:23

Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 26 / 71
Rev.: 02

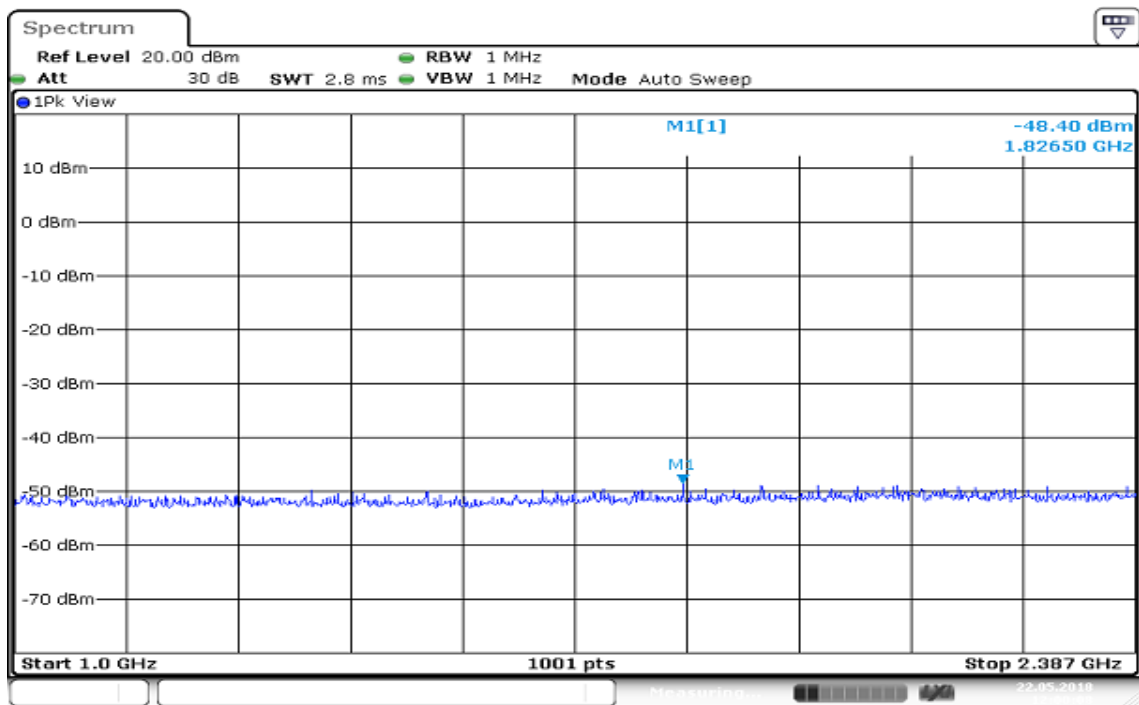
1000MHz ~ 2387MHz

(2) Spurious Emission Intensity : 1,000MHz~less than 2,387MHz

Frequency (MHz)	Reading (MHz)	Reading (dBm)	Cable Factor (dB)	Result (μW/MHz)	Remark
2402.0000	1826.5000	-48.40	10.61	0.16634	Normal Voltage
2441.0000	2096.7000	-48.58	10.61	0.15959	
2480.0000	2243.6000	-48.66	10.61	0.15668	

TEST PLOTS

CH Low



Date: 22.MAY.2018 12:00:09

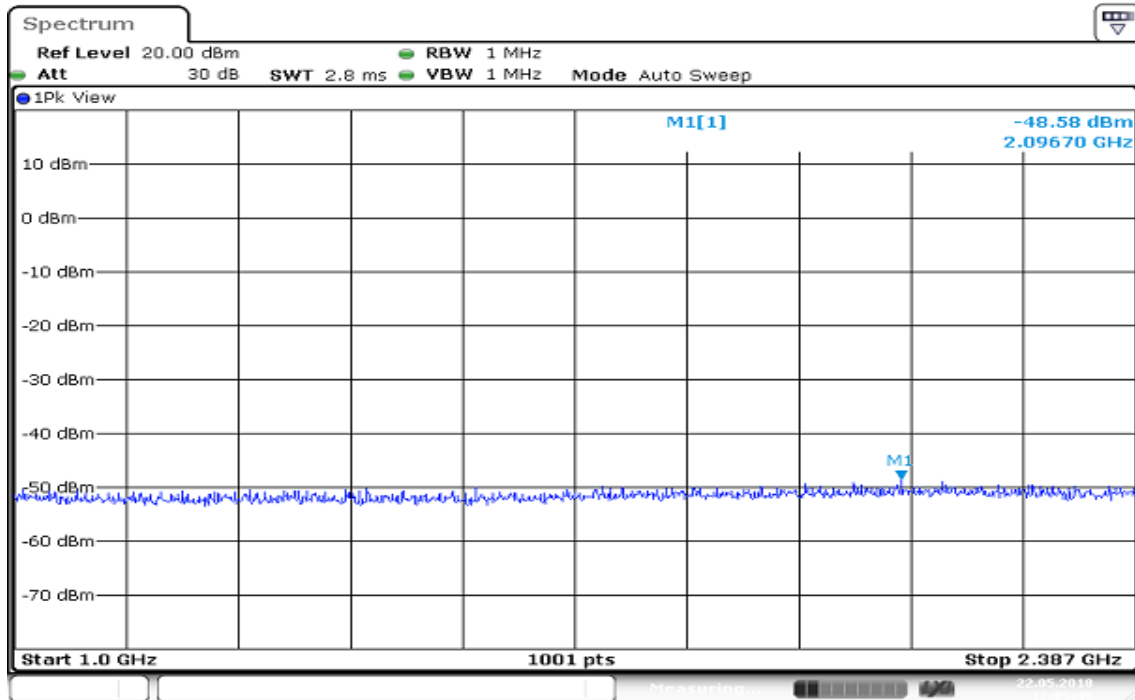


Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

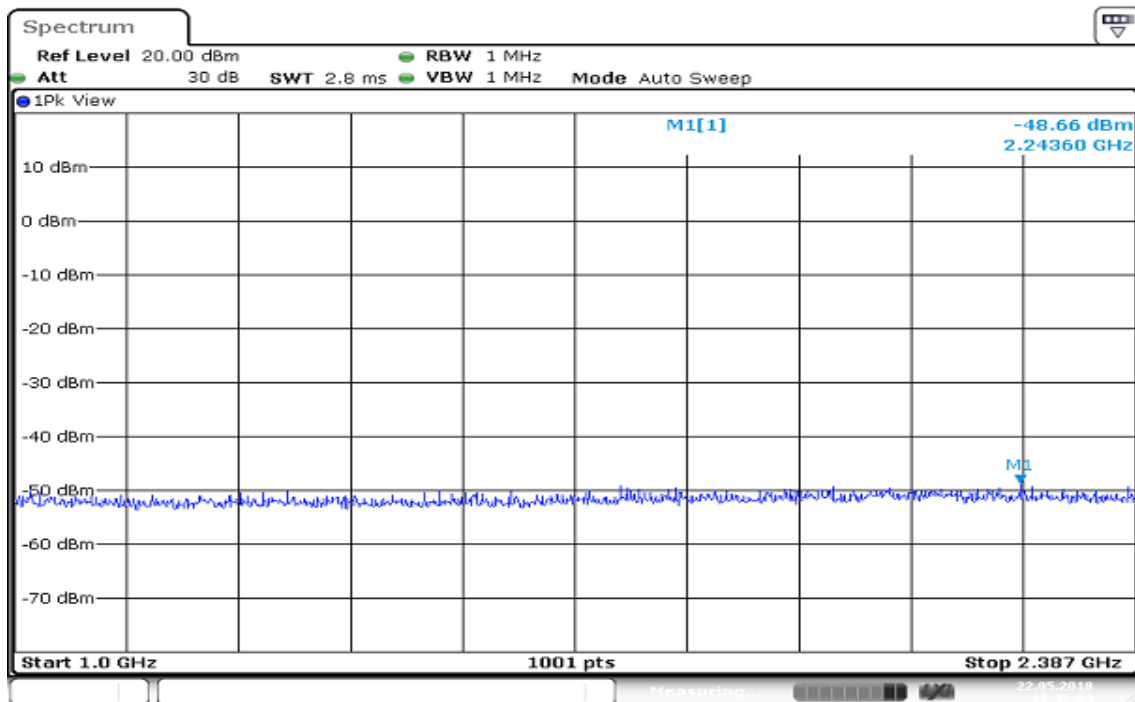
Page: 27 / 71
Rev.: 02

CH Mid



Date: 22.MAY.2018 12:05:49

CH High



Date: 22.MAY.2018 13:42:10

Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 28 / 71
Rev.: 02

TEST RESULT

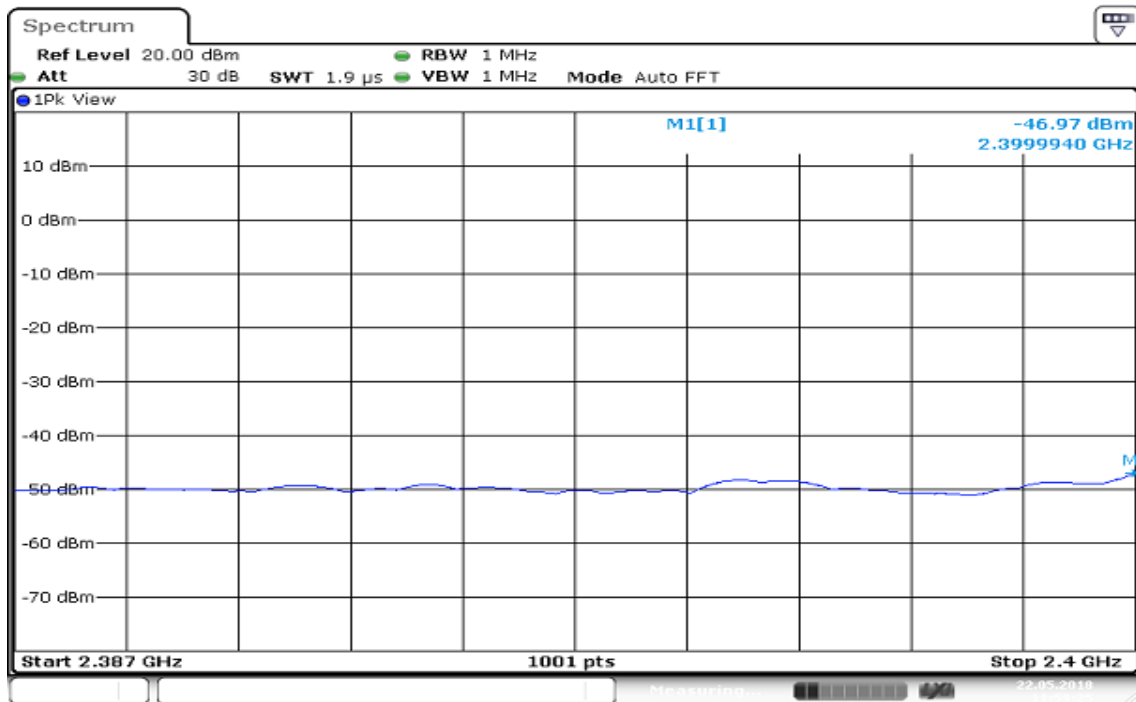
2387MHz ~ 2400MHz

(3) Spurious Emission Intensity : 2,387MHz~less than 2,400MHz

Frequency (MHz)	Reading (MHz)	Reading (dBm)	Cable Factor (dB)	Result (μW/MHz)	Remark
2402.0000	2399.9940	-46.97	10.61	0.23121	Normal Voltage
2441.0000	2394.2010	-49.50	10.61	0.12912	
2480.0000	2394.3700	-49.32	10.61	0.13459	

TEST PLOTS

CH Low



Date: 22.MAY.2018 11:59:25

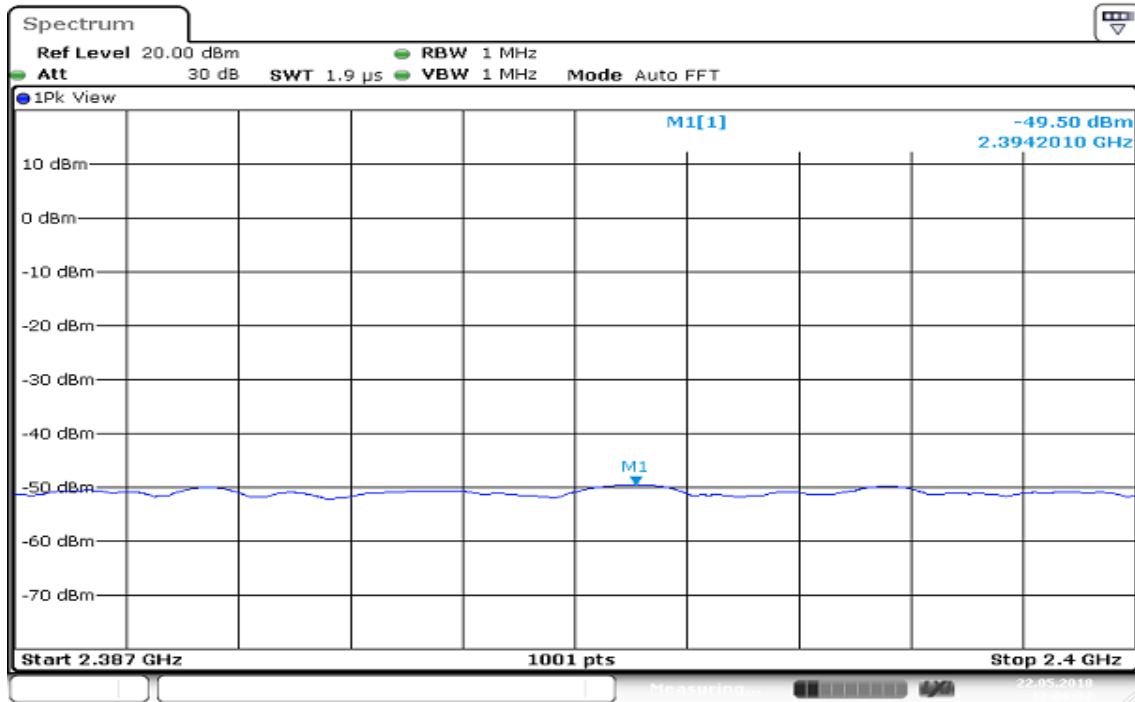


Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

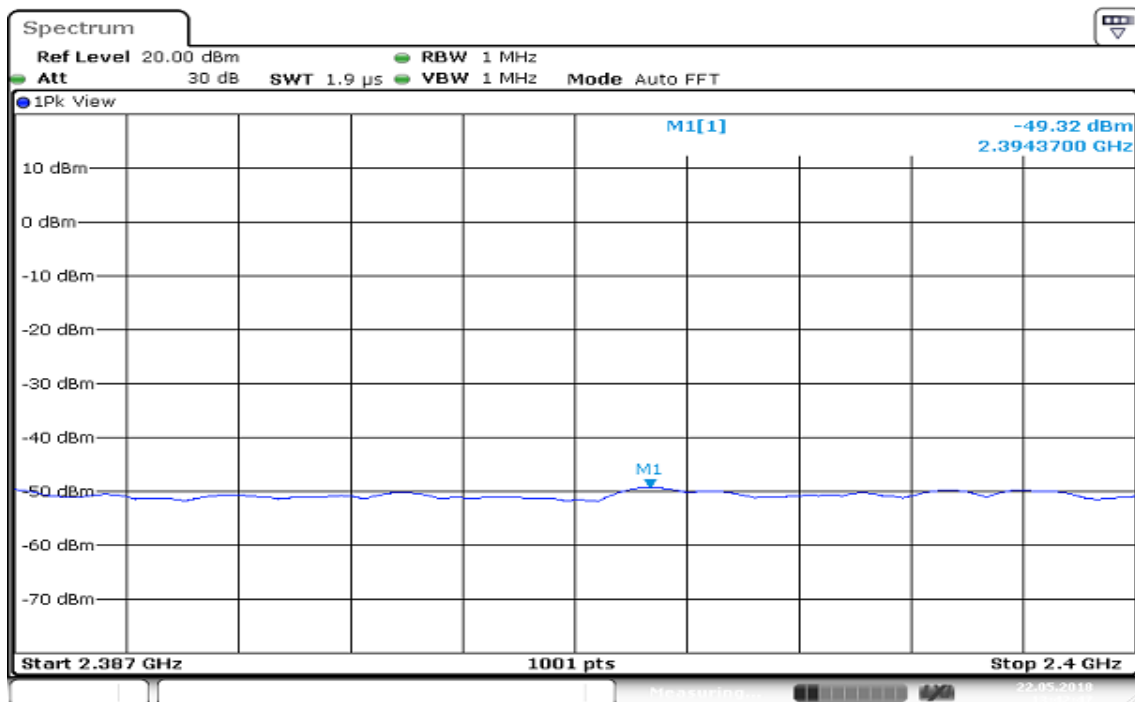
Page: 29 / 71
Rev.: 02

CH Mid



Date: 22.MAY.2018 12:06:32

CH High



Date: 22.MAY.2018 13:42:48

Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 30 / 71
Rev.: 02

TEST RESULT

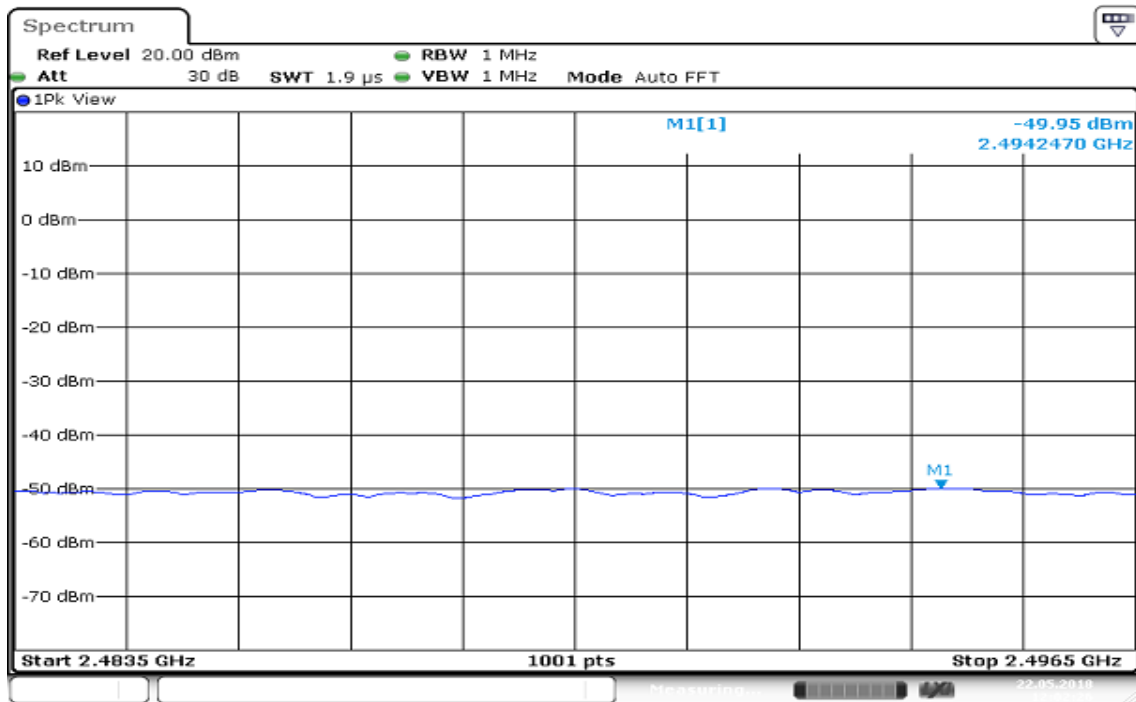
2483.5MHz ~ 2496.5MHz

(4) Spurious Emission Intensity : 2,483.5MHz~2,496.5MHz

Frequency (MHz)	Reading (MHz)	Reading (dBm)	Cable Factor (dB)	Result (μW/MHz)	Remark
2402.0000	2494.2470	-49.95	10.61	0.11641	Normal Voltage
2441.0000	2487.3510	-49.08	10.61	0.14223	
2480.0000	2495.9350	-48.44	10.61	0.16482	

TEST PLOTS

CH Low



Date: 22.MAY.2018 12:02:26

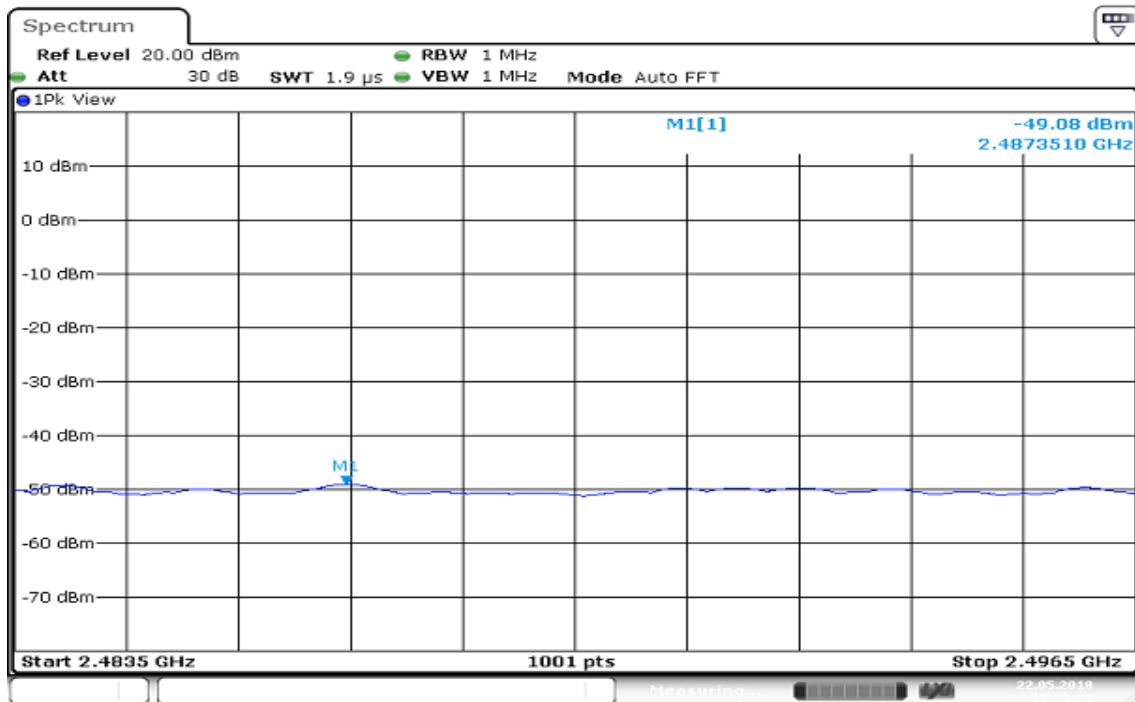


Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

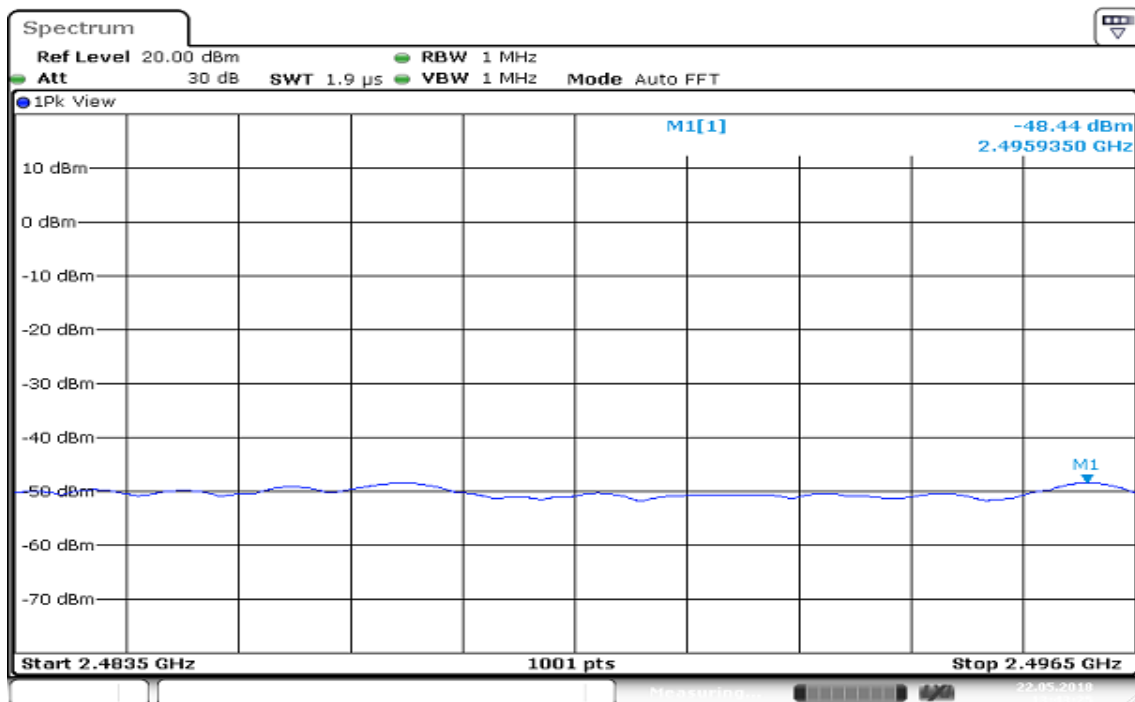
Page: 31 / 71
Rev.: 02

CH Mid



Date: 22.MAY.2018 13:39:37

CH High



Date: 22.MAY.2018 13:43:26

Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 32 / 71
Rev.: 02

TEST RESULT

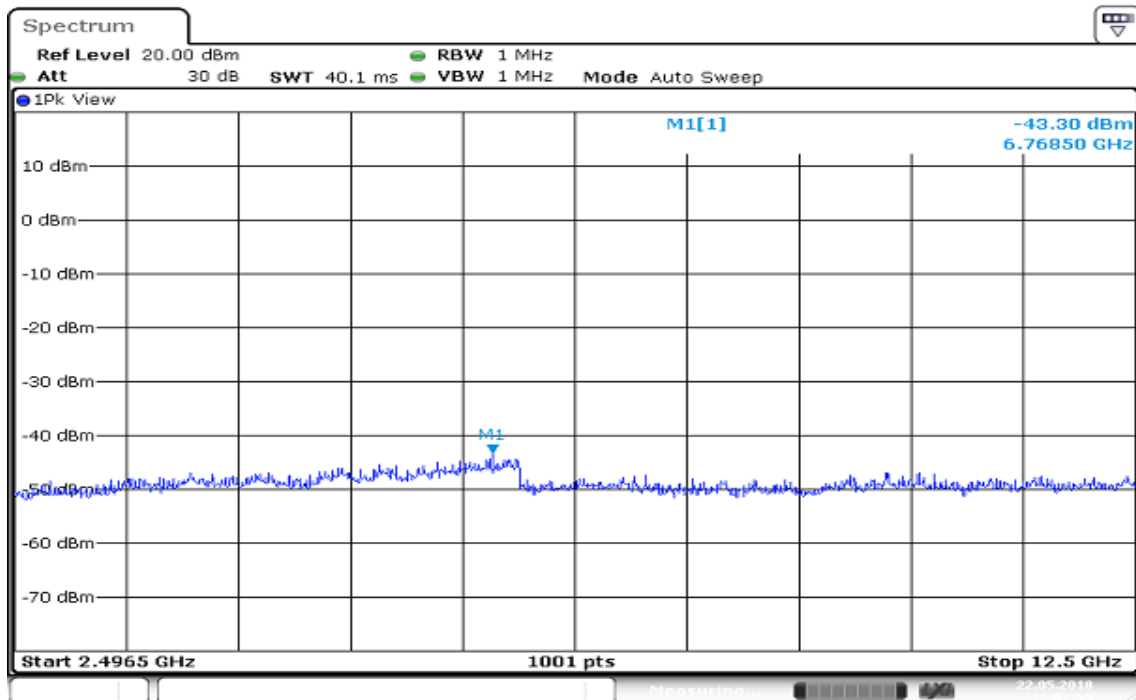
2496.5MHz~12.5GHz

(5) Spurious Emission Intensity : more than 2,496.5MHz~12.5GHz

Frequency (MHz)	Reading (MHz)	Reading (dBm)	Cable Factor (dB)	Result (μW/MHz)	Remark
2402.0000	6768.5000	-43.30	10.61	0.53827	Normal Voltage
2441.0000	6918.5000	-44.73	10.61	0.38726	
2480.0000	6678.5000	-44.07	10.61	0.45082	

TEST PLOTS

CH Low



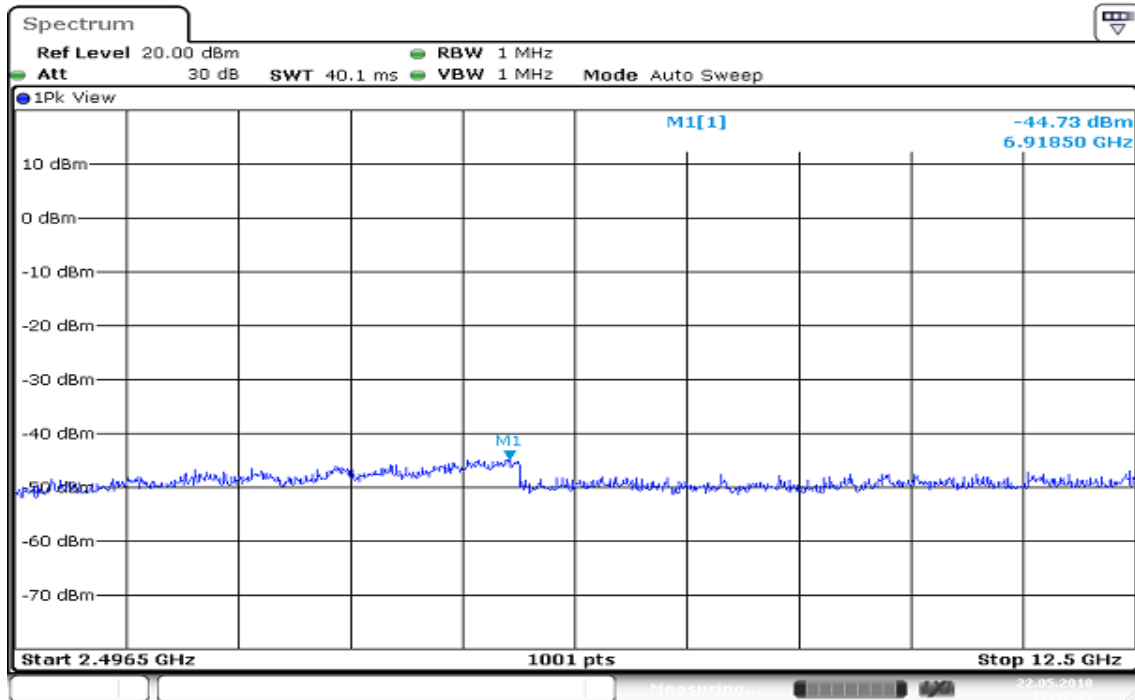
Date: 22.MAY.2018 12:02:56

Report No.: T190107L05-RJ

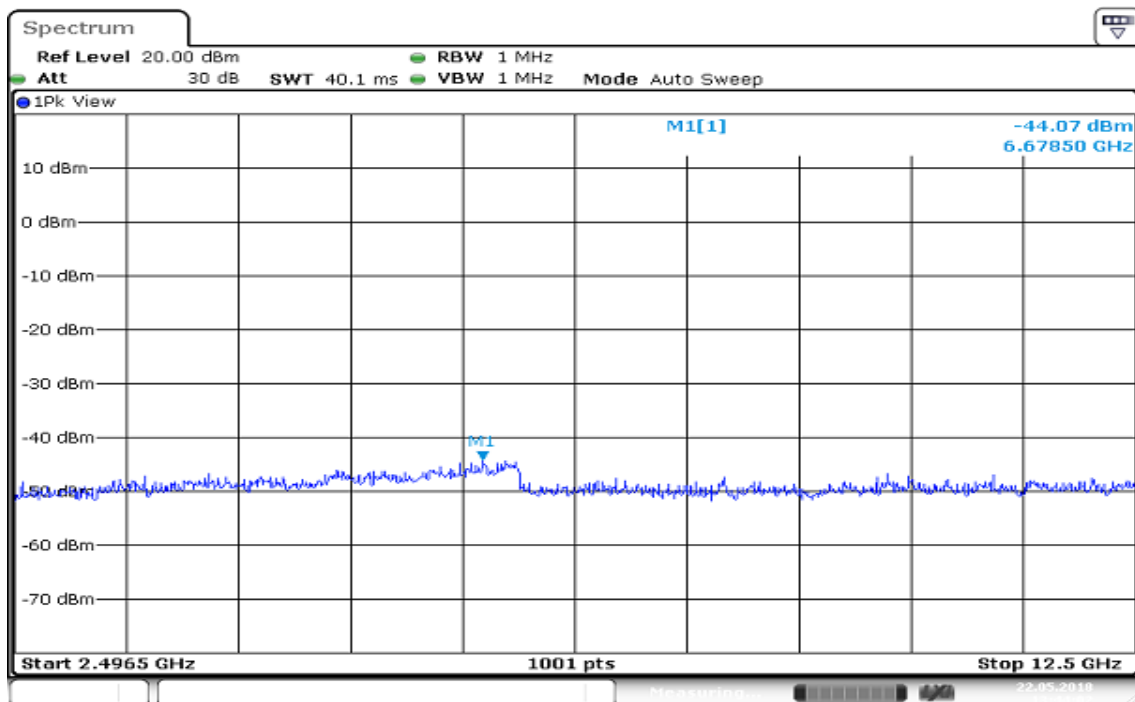
Ref. No.: T181031L01-RJ

Page: 33 / 71
Rev.: 02

CH Mid



CH High



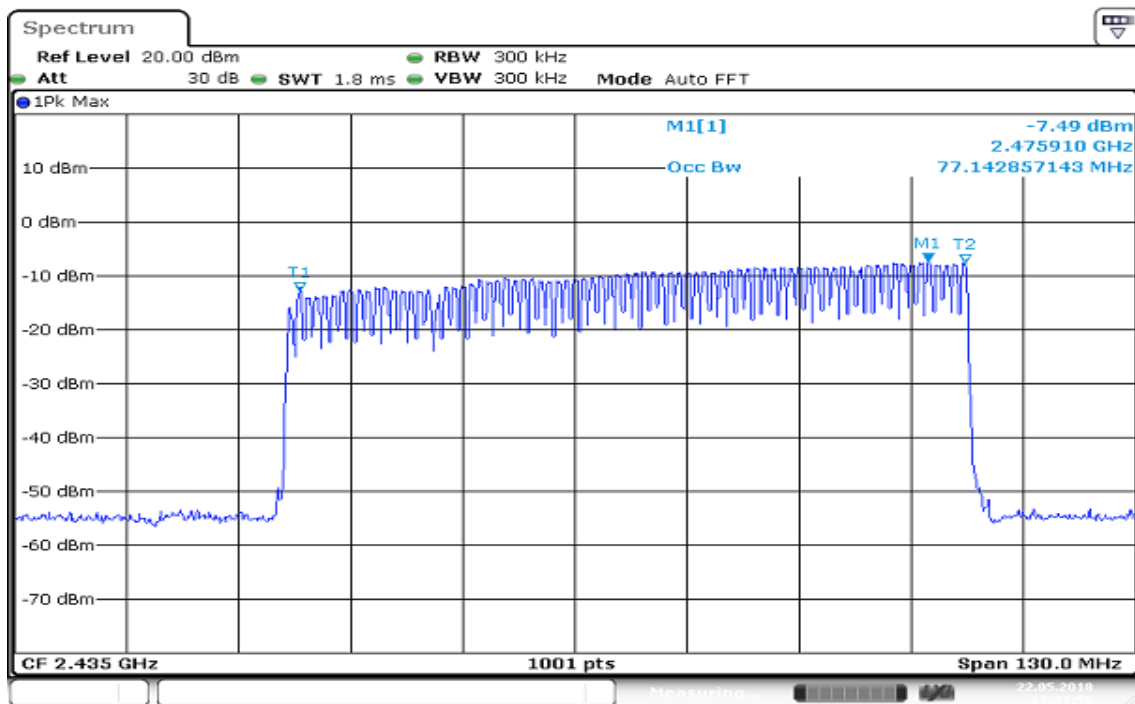
6.4 OCCUPIED BANDWIDTH –NORMAL (99%)

TEST RESULT

Frequency (MHz)	Center Frequency (MHz)	Bandwidth (MHz)	Remark
Hopping	2441	77.14	Normal Voltage

TEST PLOTS

Hopping



Date: 22.MAY.2018 11:31:57

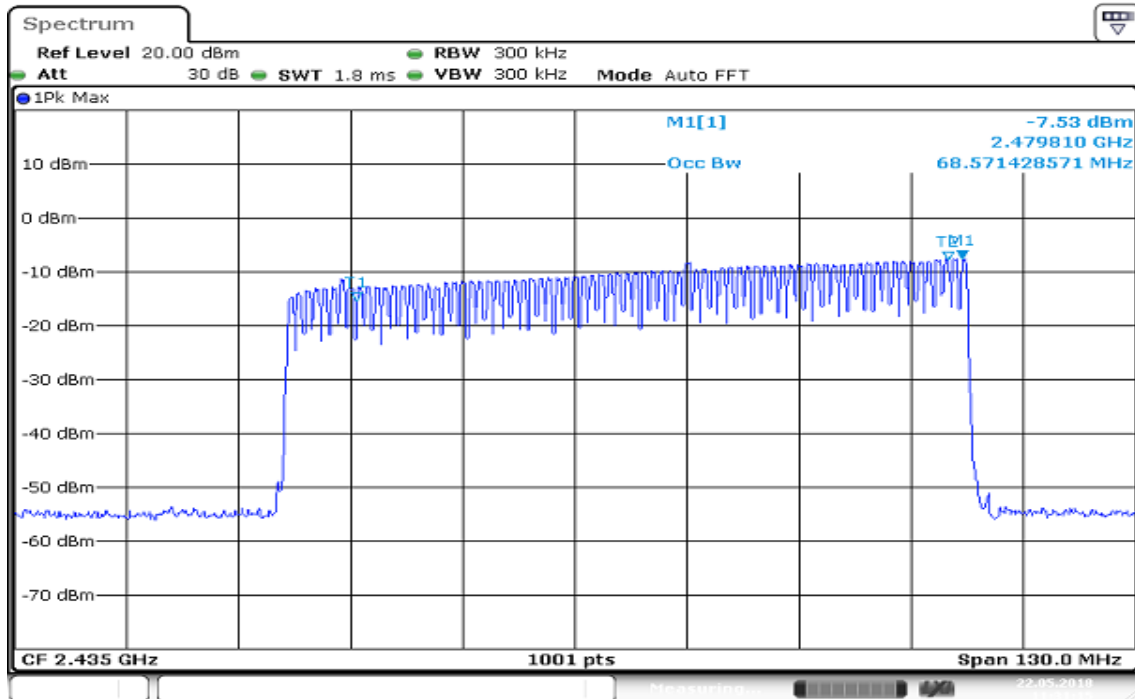
6.5 SPREAD-SPECTRUM BANDWIDTH –NORMAL (90%)

TEST RESULT

Frequency (MHz)	Center Frequency (MHz)	Bandwidth (MHz)	Remark
Hopping	2441	68.57	Normal Voltage

TEST PLOTS

Hopping



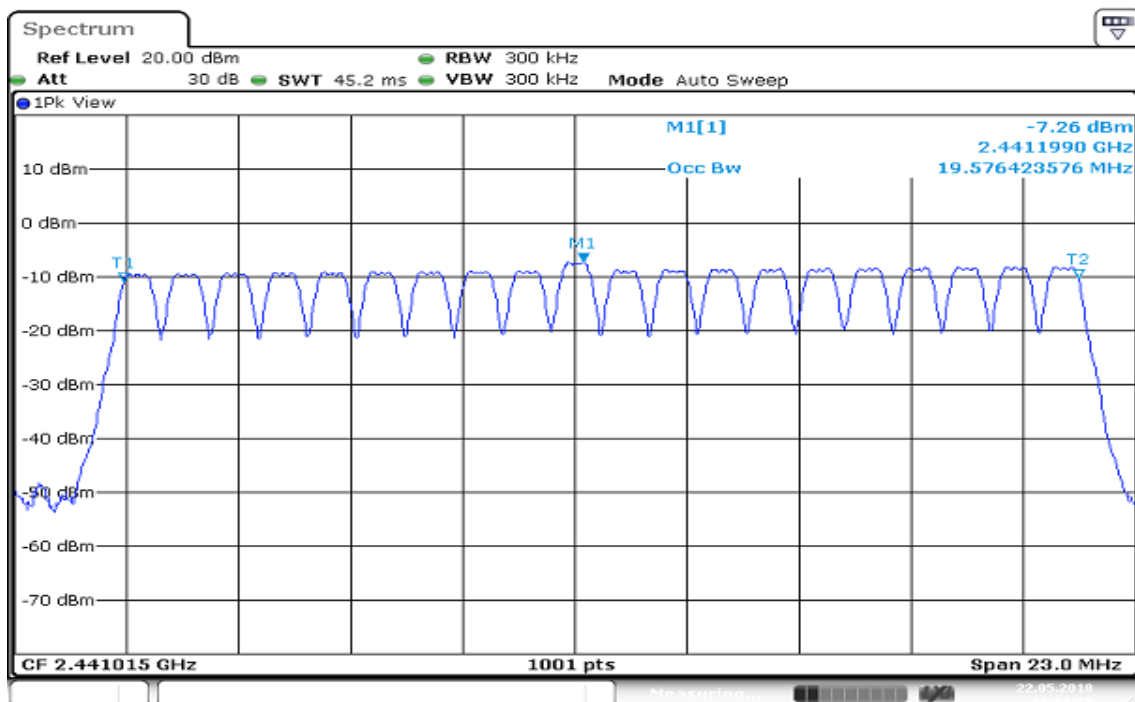
Date: 22.MAY.2018 11:31:16

6.6 OCCUPIED BANDWIDTH –AFH-(99%)

TEST RESULT

Frequency (MHz)	Center Frequency (MHz)	Bandwidth (MHz)	Remark
Hopping	2441	19.58	Normal Voltage

TEST PLOTS



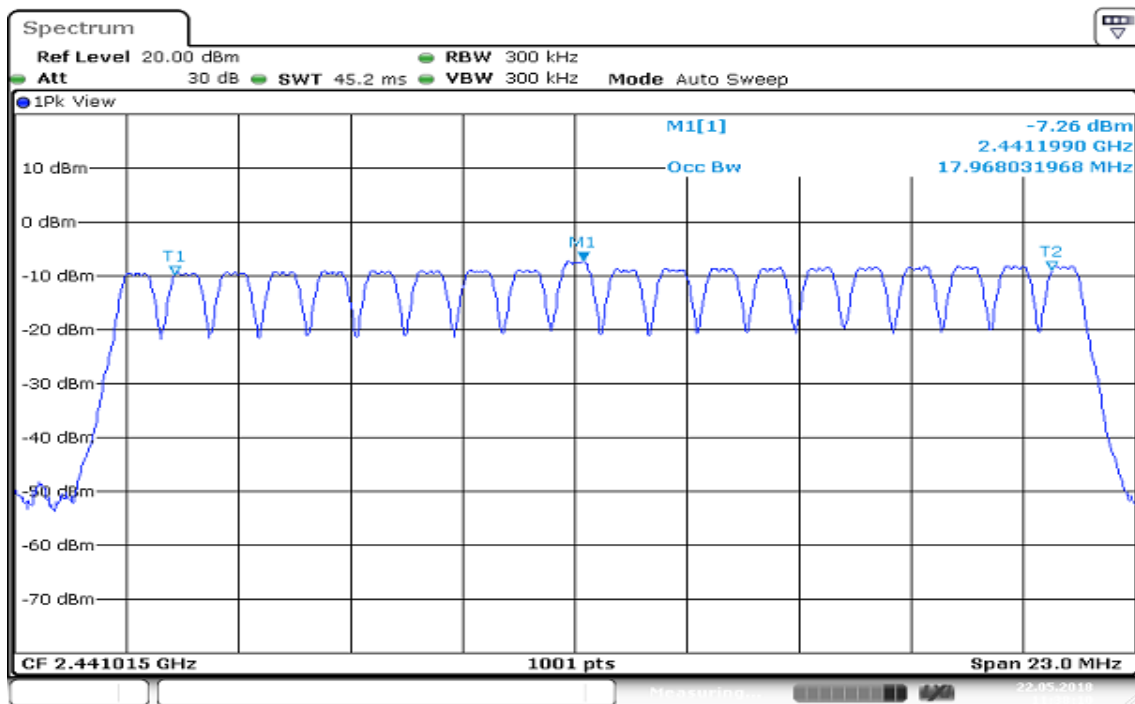
Date: 22.MAY.2018 11:37:40

6.7 SPREAD-SPECTRUM BANDWIDTH –AFH(90%)

TEST RESULT

Frequency (MHz)	Center Frequency (MHz)	Bandwidth (MHz)	Remark
Hopping	2441	17.97	Normal Voltage

TEST PLOTS



Date: 22.MAY.2018 11:38:11

6.8 LIMITATION OF COLLATERAL EMISSIONS OF RECEIVER

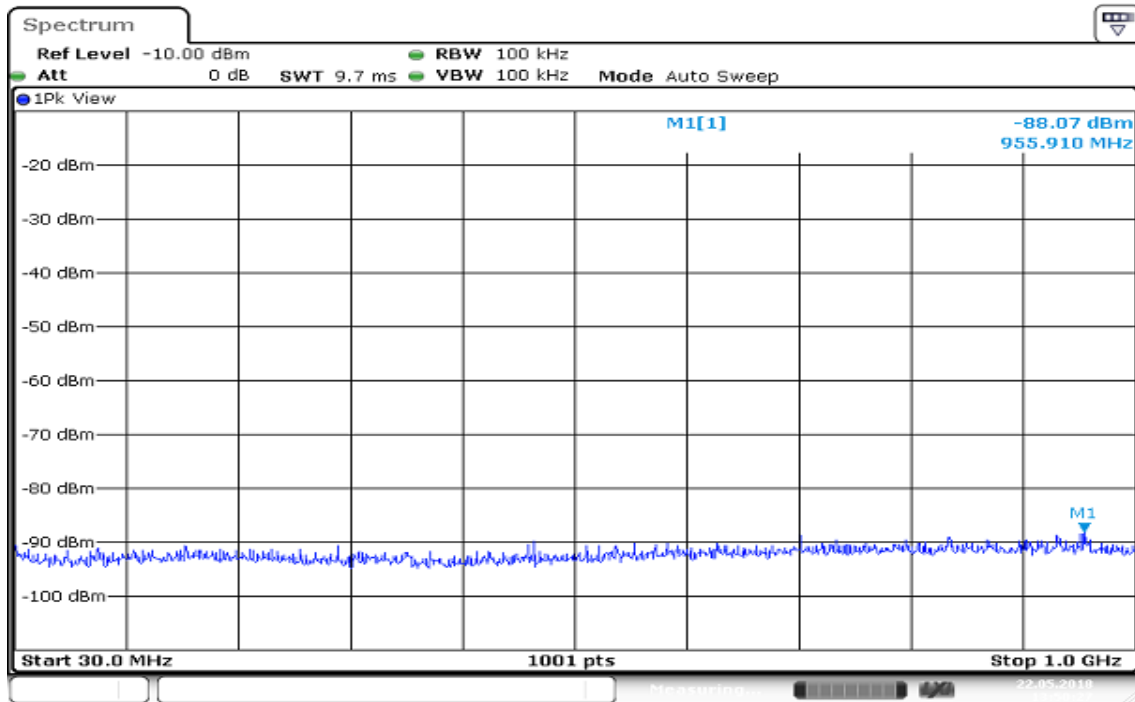
TEST RESULT

30MHz~1GHz

	Frequency (MHz)	Reading (dBm)	Cable Factor (dB)	Result (nW/MHz)	Remark
30MHz~1GHz	955.9100	-88.07	10.61	0.0179	Normal Voltage

TEST PLOTS

CH Mid



Date: 22.MAY.2018 13:50:27

Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

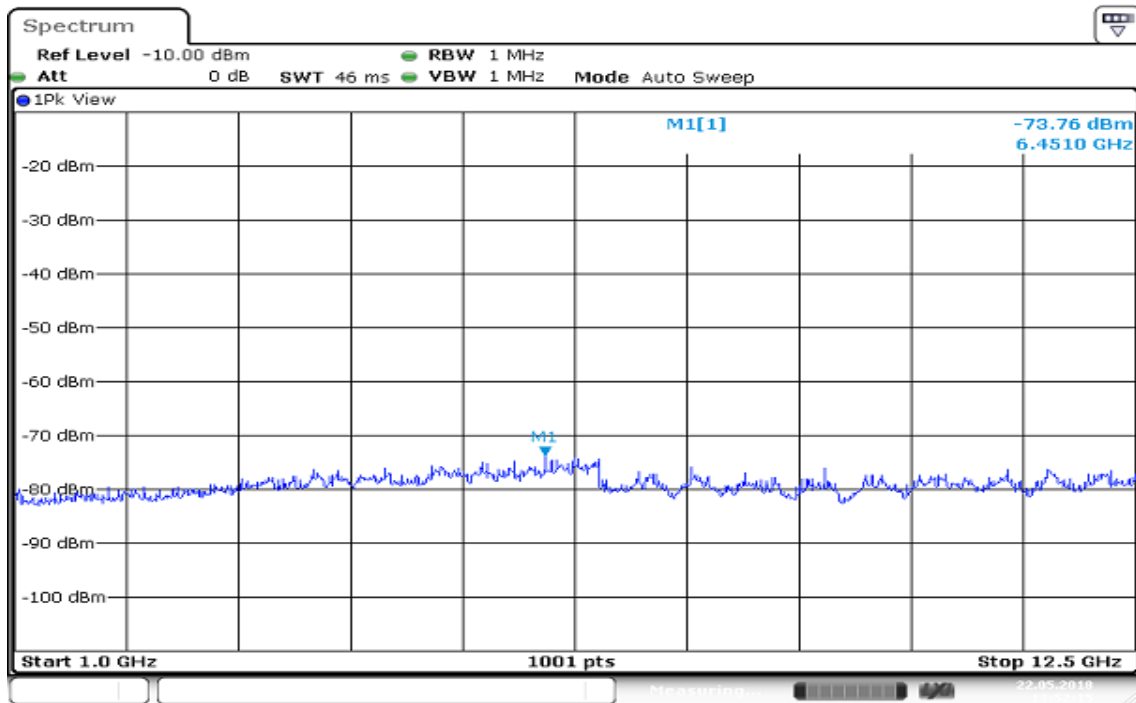
Page: 39 / 71
Rev.: 02

1GHz~12.5GHz

	Frequency (MHz)	Reading (dBm)	Cable Factor (dB)	Result (nW/MHz)	Remark
1GHz~12.5GHz	6451.0000	-73.76	10.97	0.5260	Normal Voltage

TEST PLOTS

CH Mid



Date: 22.MAY.2018 13:52:15



Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 40 / 71

Rev.: 02

6.9 DWELL TIME

Time per one hopping (ON time)	hopping numbers	Dwell Time(ms)
2.942	103.00	0.303

Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 41 / 71

Rev.: 02

7 TEST RESULT FOR BLUETOOTH (CH0~CH78) (FOR 8DPSK)**7.1 FREQUENCY ERROR****TEST RESULT**

Frequency (MHz)	Reading (MHz)	Deviation (Hz)	Tolerance (ppm)	Remark
2402.0000	2402.032470	32470	13.5179	Normal Voltage
2441.0000	2441.032970	32970	13.5068	
2480.0000	2480.031970	31970	12.8911	

7.2 ANTENNA POWER

NORMAL

Frequency (MHz)	Power Meter (dBm)	Cable Factor (dB)	Output Power (mW/MHz)	EIRP Power (dBm/MHz)	Remark
					Normal Voltage
Hopping	-10.82	10.61	0.01384	-16.58784	

AFH

Frequency (MHz)	Power Meter (dBm/MHz)	Cable Factor (dB)	Output Power (mW/MHz)	EIRP Power (dBm/MHz)	Remark
					Normal Voltage
Hopping	-10.82	10.61	0.05249	-10.79920	

Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 42 / 71
Rev.: 02

7.3 SPURIOUS EMISSIONS INTENSITY

TEST RESULT

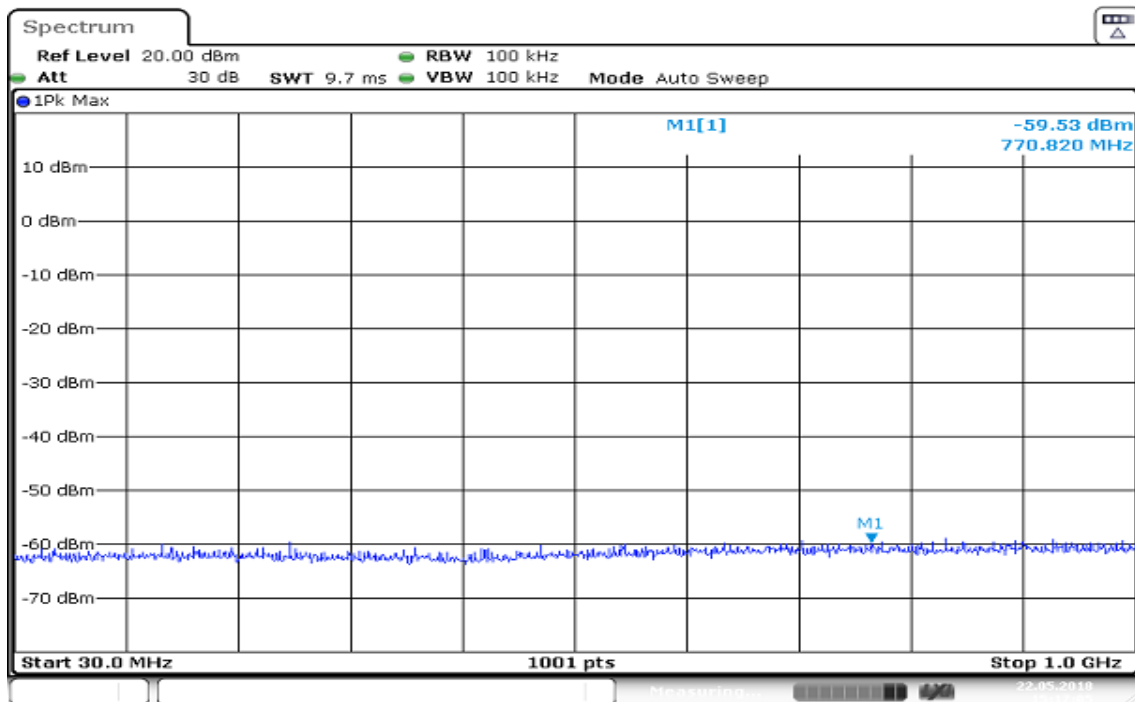
30MHz ~ 1000MHz

(1) Spurious Emission Intensity : 30MHz~less than 1,000MHz

Frequency (MHz)	Reading (MHz)	Reading (dBm)	Cable Factor (dB)	Result (μW/MHz)	Remark
2402	770.8200	-59.53	10.37	0.01213	Normal Voltage
2441	766.9500	-59.85	10.37	0.01127	
2480	802.8000	-58.79	10.37	0.01439	

TEST PLOTS

CH Low



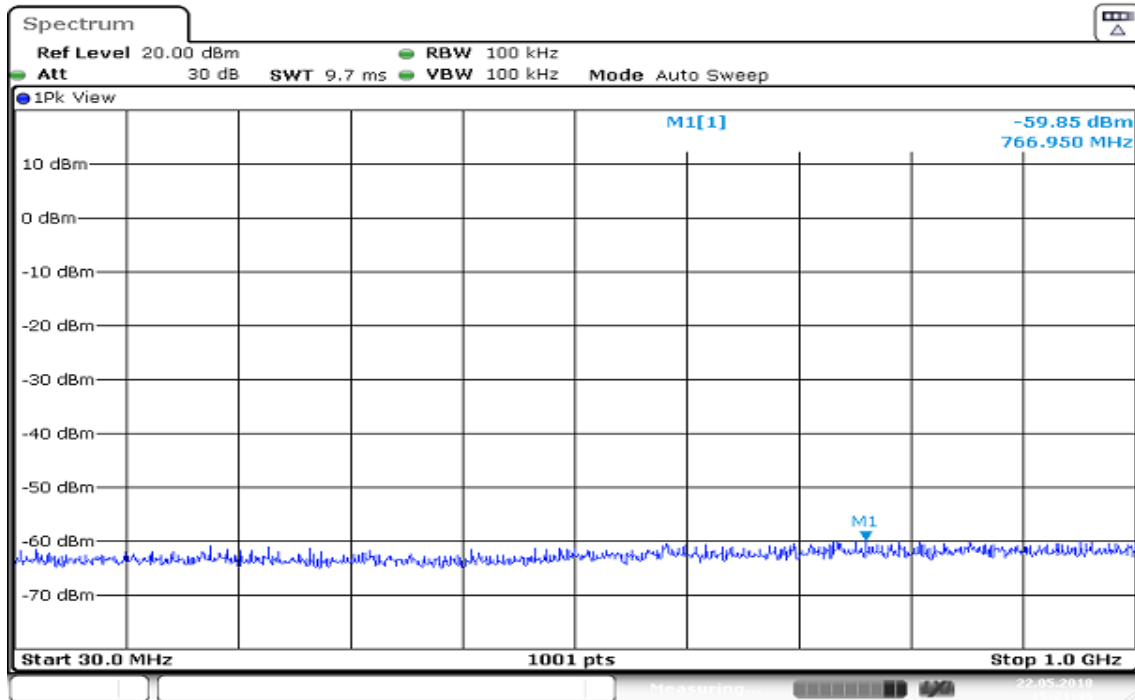
Date: 22.MAY.2018 15:17:05

Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

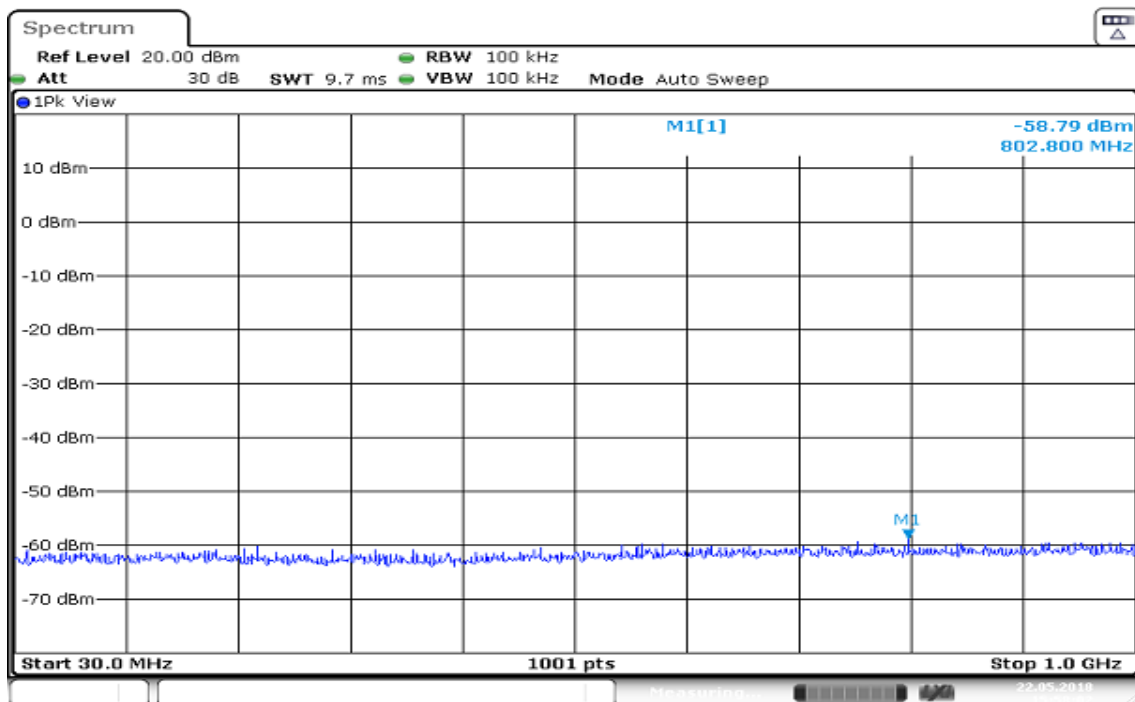
Page: 43 / 71
Rev.: 02

CH Mid



Date: 22.MAY.2018 15:21:46

CH High



Date: 22.MAY.2018 15:58:02

Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 44 / 71
Rev.: 02

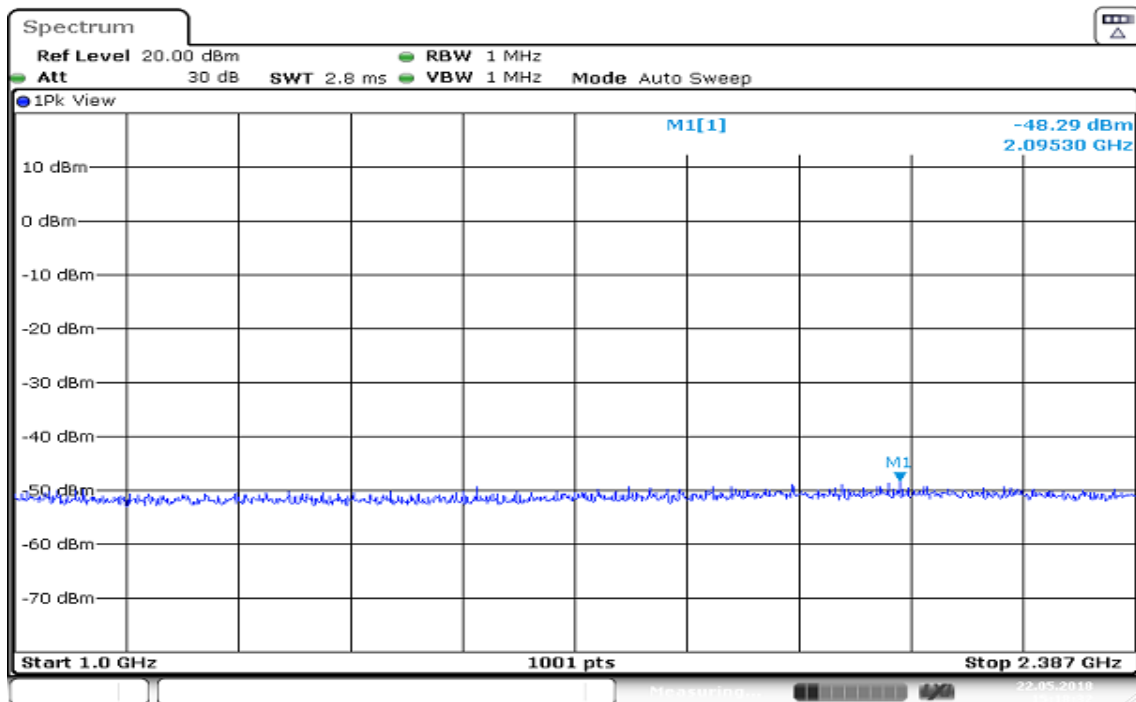
1000MHZ ~ 2387MHZ

(2) Spurious Emission Intensity : 1,000MHz~less than 2,387MHz

Frequency (MHz)	Reading (MHz)	Reading (dBm)	Cable Factor (dB)	Result (μW/MHz)	Remark
2402	2095.3000	-48.29	10.61	0.17061	Normal Voltage
2441	2197.9000	-49.05	10.61	0.14322	
2480	2084.2000	-48.85	10.61	0.14997	

TEST PLOTS

CH Low



Date: 22.MAY.2018 15:18:32

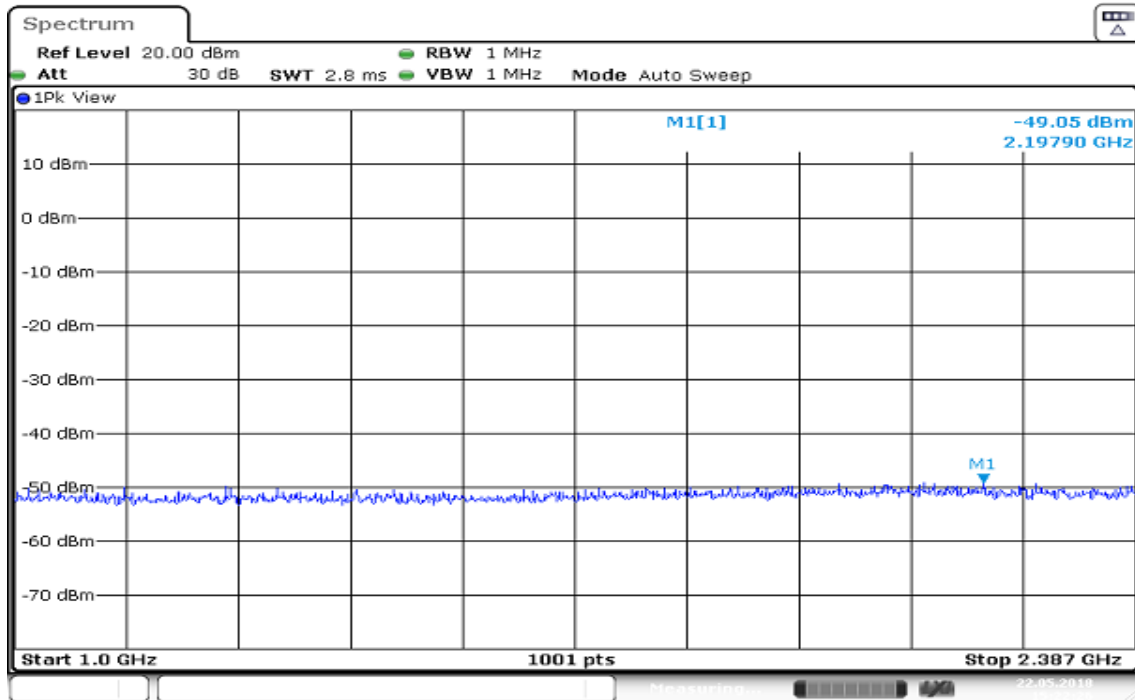


Report No.: T190107L05-RJ

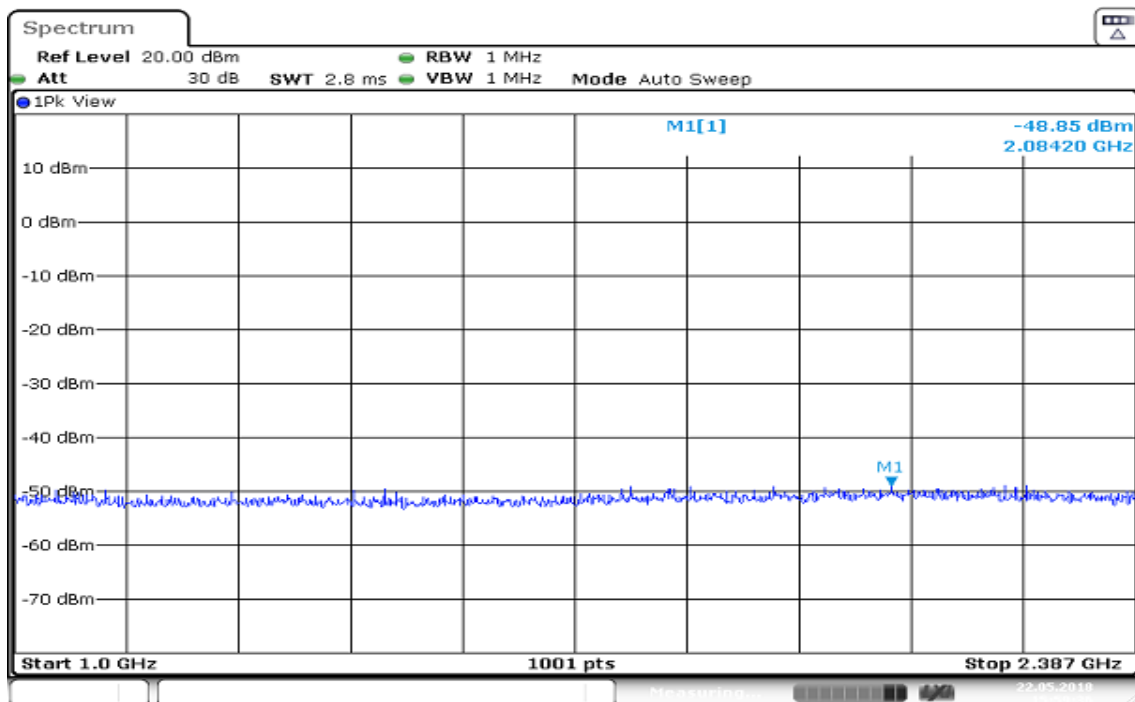
Ref. No.: T181031L01-RJ

Page: 45 / 71
Rev.: 02

CH Mid



CH High



Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 46 / 71
Rev.: 02

TEST RESULT

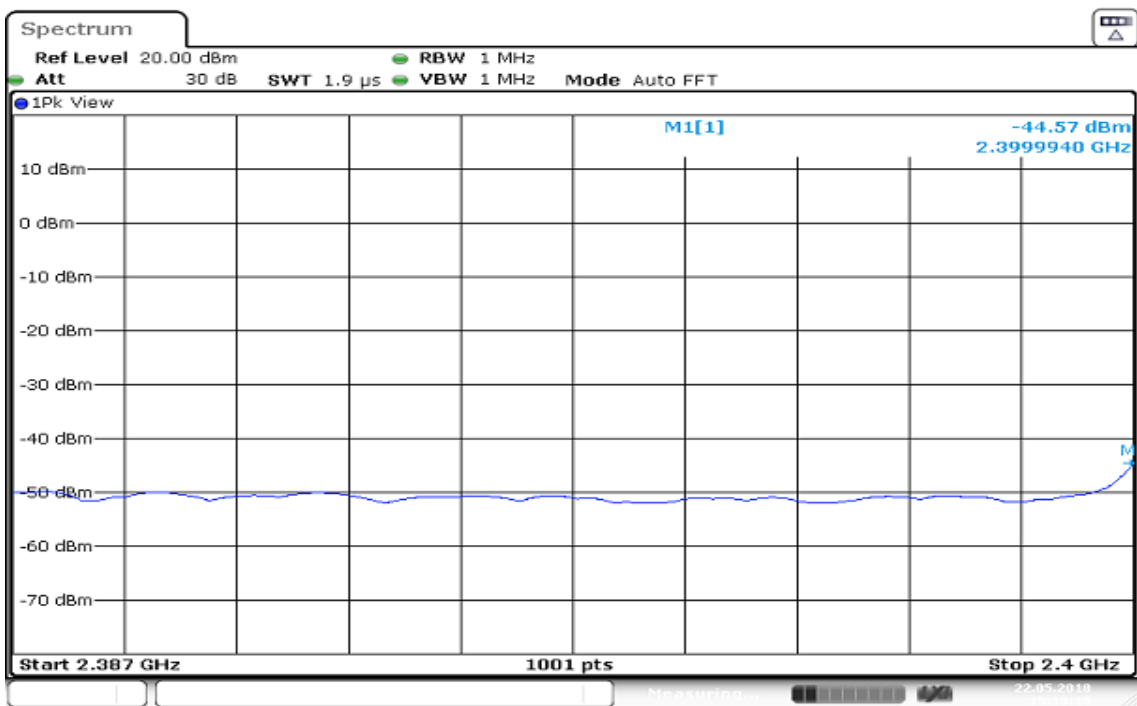
2387MHZ ~ 2400MHZ

(3) Spurious Emission Intensity : 2,387MHz~less than 2,400MHz

Frequency (MHz)	Reading (MHz)	Reading (dBm)	Cable Factor (dB)	Result (μW/MHz)	Remark
2402	2399.9940	-44.57	10.61	0.40179	Normal Voltage
2441	2395.0320	-49.29	10.61	0.13552	
2480	2394.9160	-50.15	10.61	0.11117	

TEST PLOTS

CH Low



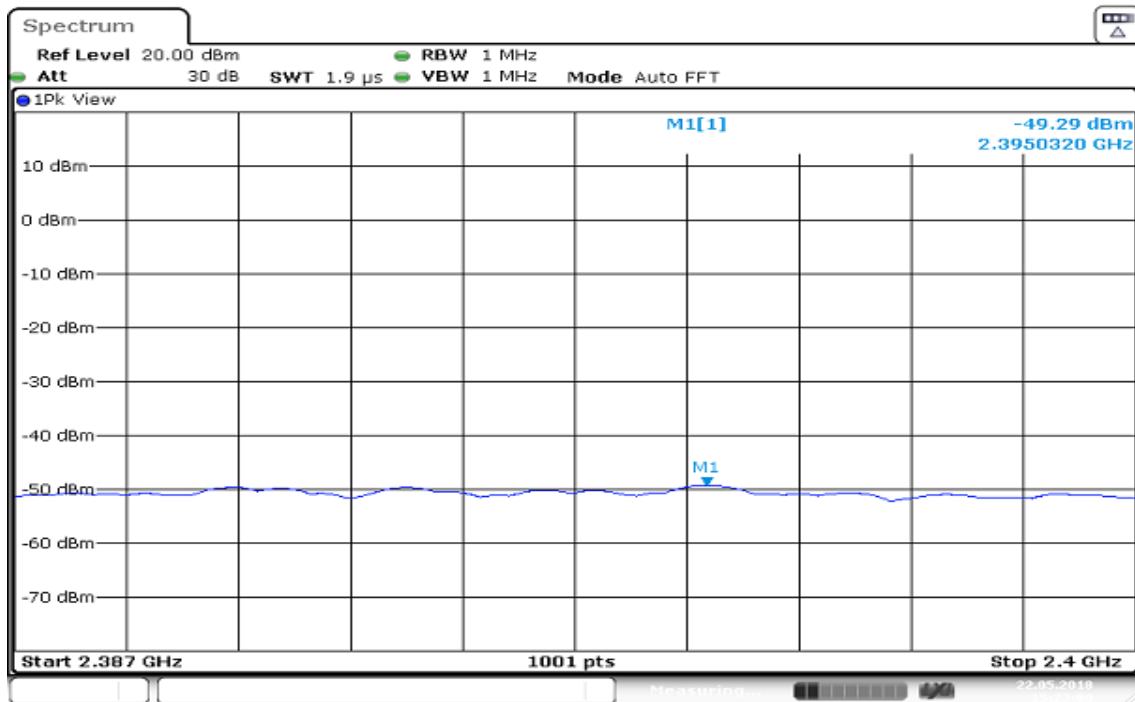
Date: 22.MAY.2018 15:19:15

Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

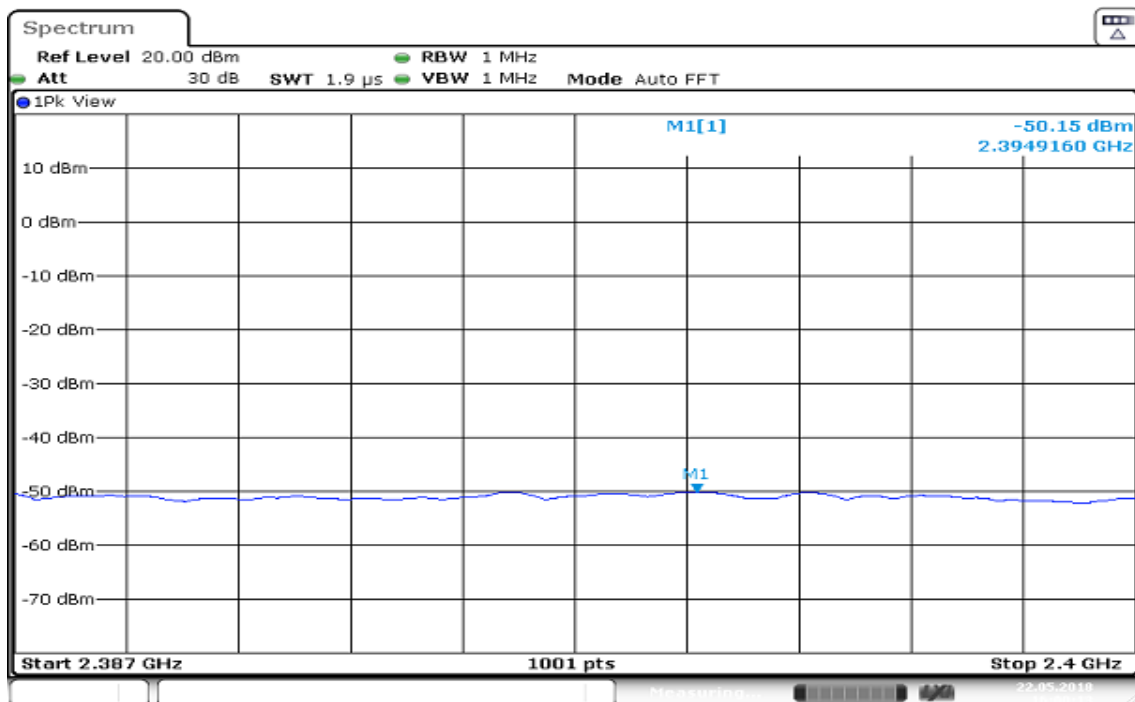
Page: 47 / 71
Rev.: 02

CH Mid



Date: 22.MAY.2018 15:23:01

CH High



Date: 22.MAY.2018 16:00:14

Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 48 / 71
Rev.: 02

TEST RESULT

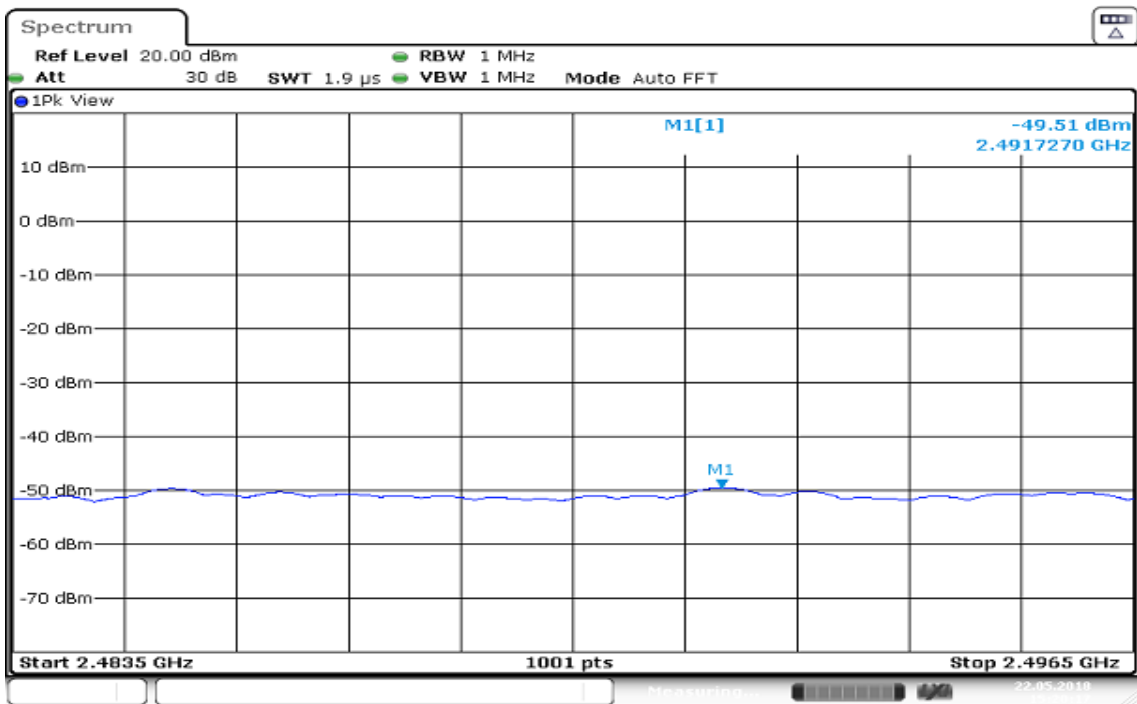
2483.5MHz ~ 2496.5MHz

(4) Spurious Emission Intensity : 2,483.5MHz~2,496.5MHz

Frequency (MHz)	Reading (MHz)	Reading (dBm)	Cable Factor (dB)	Result (μW/MHz)	Remark
2402	2491.7270	-49.51	10.61	0.12882	Normal Voltage
2441	2492.9480	-49.71	10.61	0.12303	
2480	2495.1430	-49.35	10.61	0.13366	

TEST PLOTS

CH Low



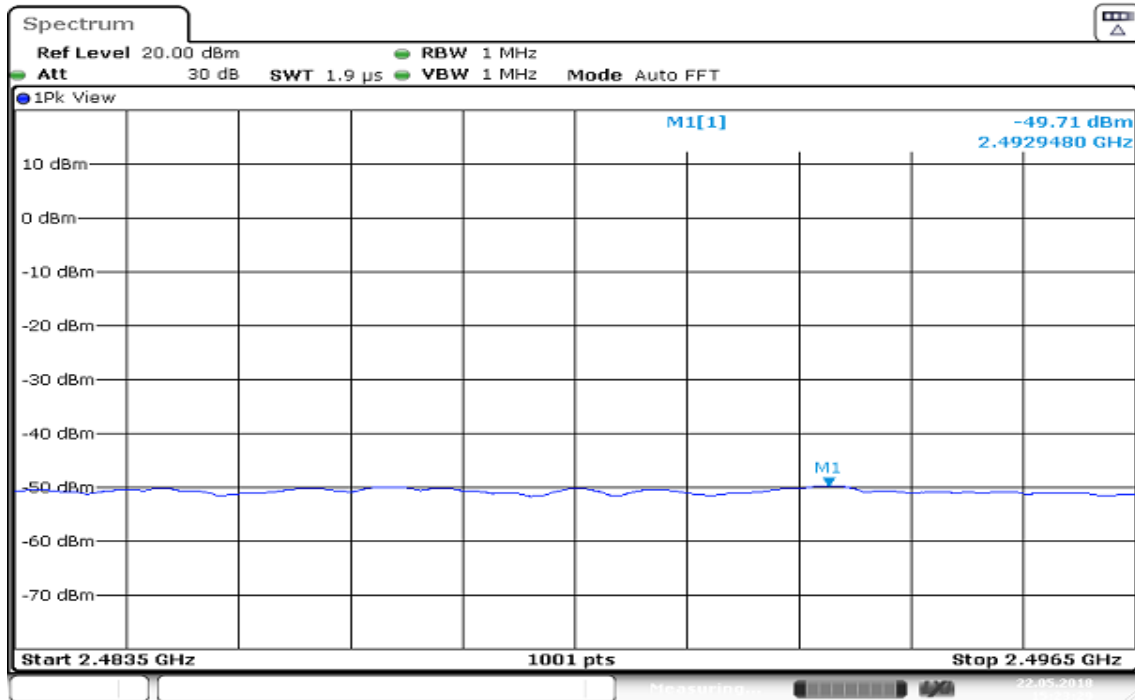
Date: 22.MAY.2018 15:20:18

Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

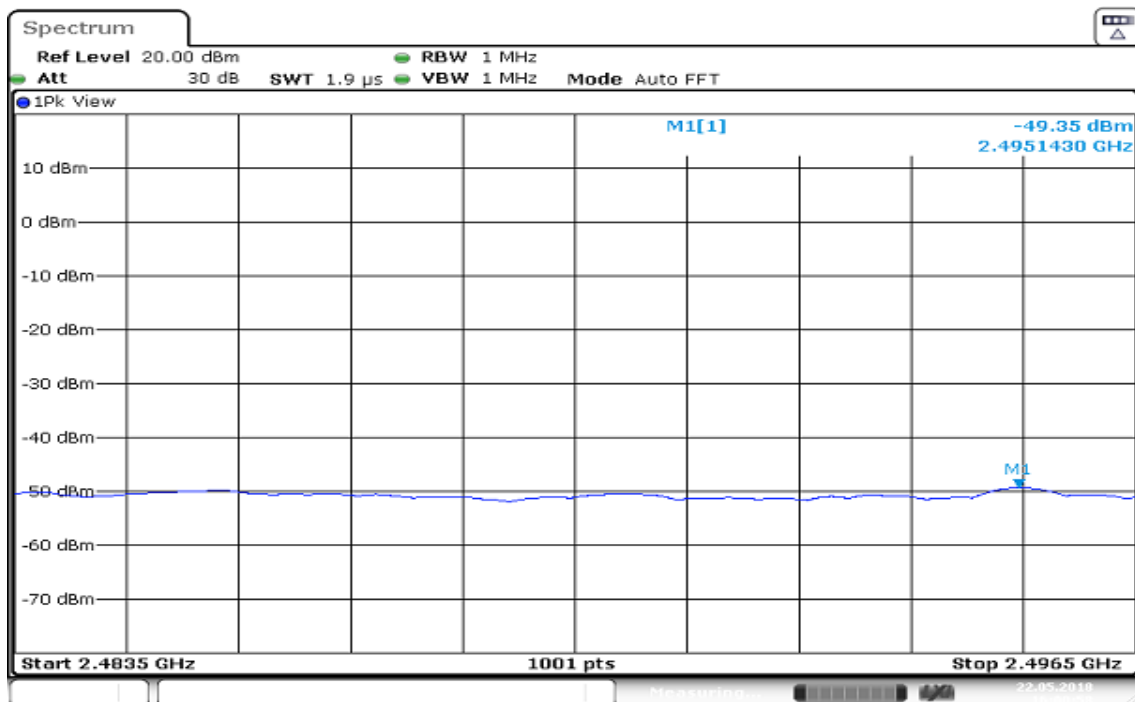
Page: 49 / 71
Rev.: 02

CH Mid



Date: 22.MAY.2018 15:23:30

CH High



Date: 22.MAY.2018 16:00:59

Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 50 / 71
Rev.: 02

TEST RESULT

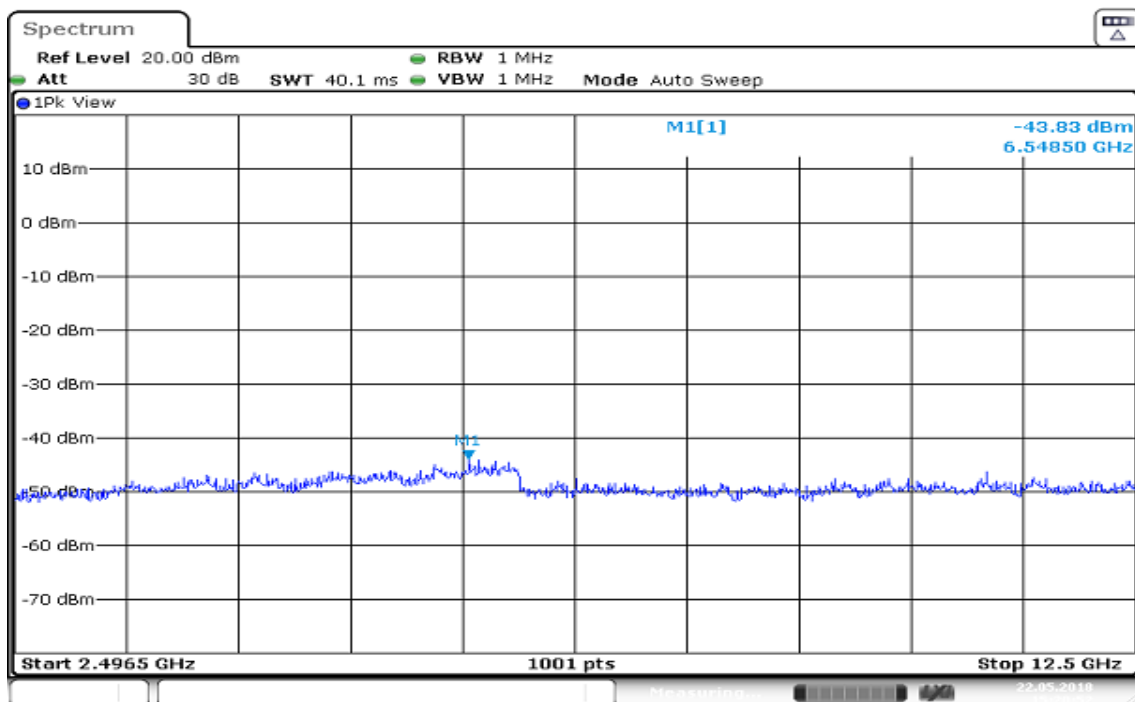
2496.5MHz~12.5GHz

(5) Spurious Emission Intensity : more than 2,496.5MHz~12.5GHz

Frequency (MHz)	Reading (MHz)	Reading (dBm)	Cable Factor (dB)	Result (μW/MHz)	Remark
2402	6548.5000	-43.83	10.97	0.51761	Normal Voltage
2441	6908.5000	-43.35	10.97	0.57810	
2480	6898.5000	-44.21	10.97	0.47424	

TEST PLOTS

CH Low



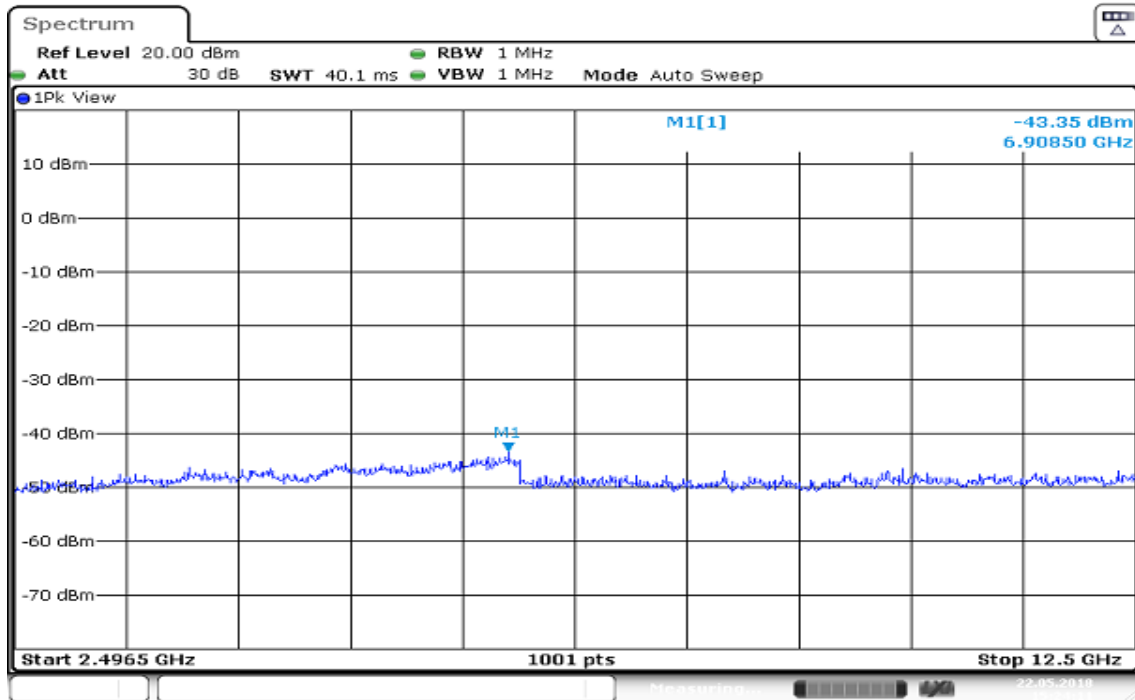
Date: 22.MAY.2018 15:20:53

Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

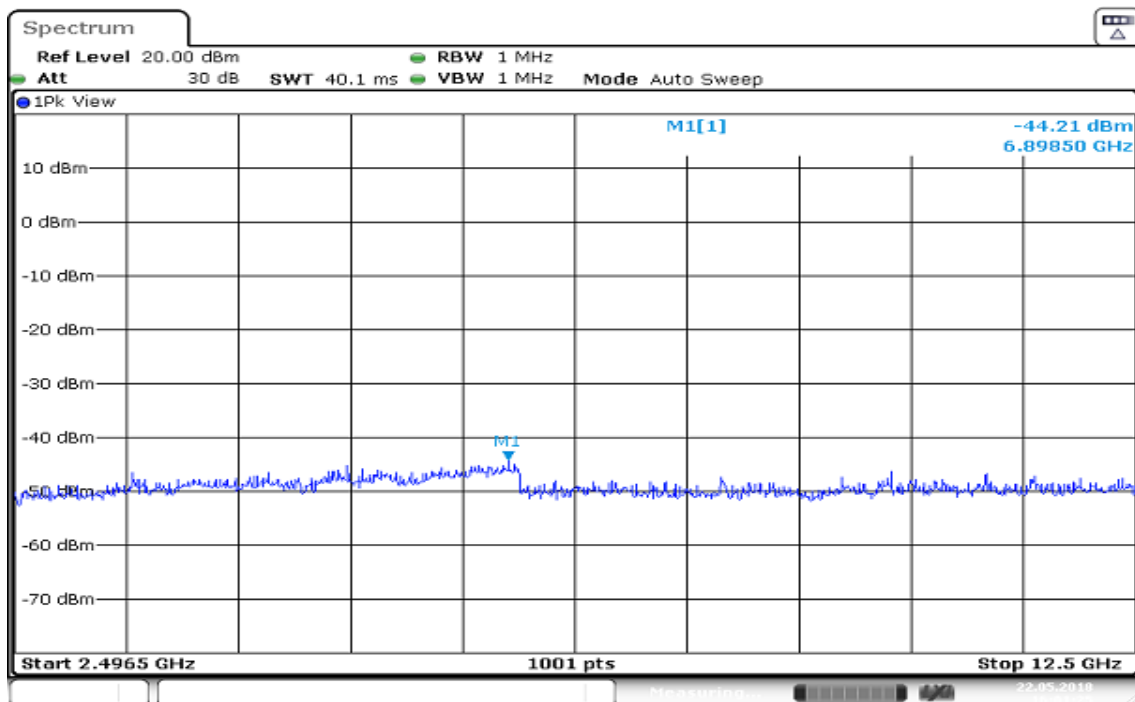
Page: 51 / 71
Rev.: 02

CH Mid



Date: 22.MAY.2018 15:24:12

CH High



Date: 22.MAY.2018 16:01:25

Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 52 / 71
Rev.: 02

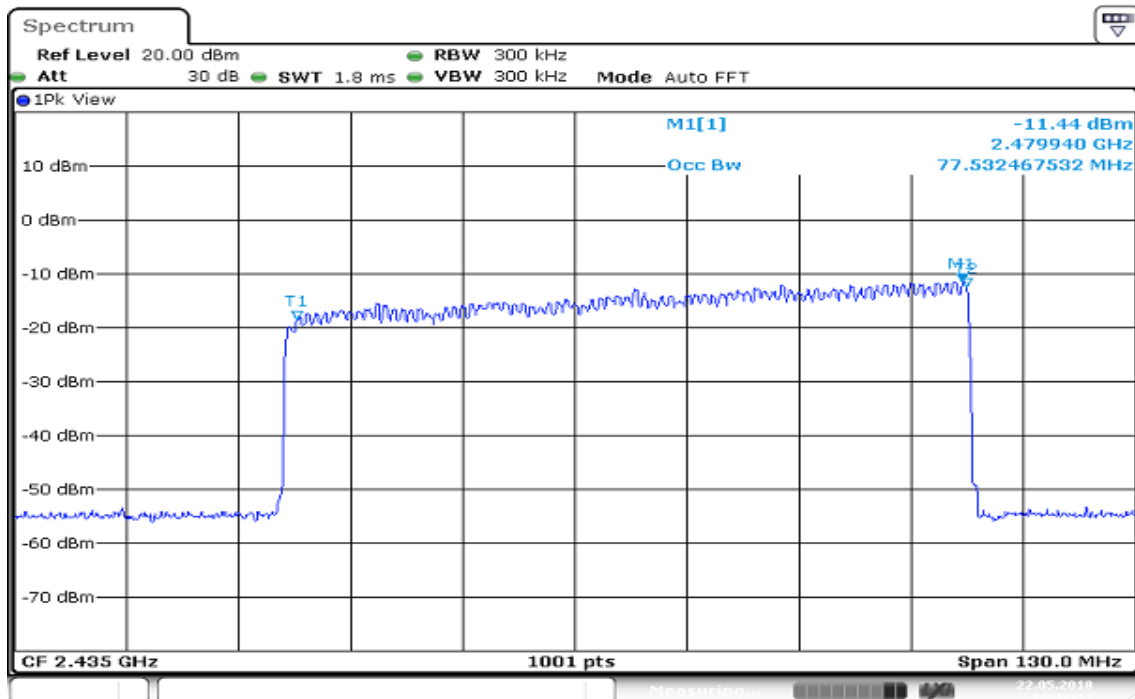
7.4 OCCUPIED BANDWIDTH-NORMAL (99%)

TEST RESULT

Frequency (MHz)	Center Frequency (MHz)	Bandwidth (MHz)	Remark
Hopping	2441	77.53	Normal Voltage

TEST PLOTS

CH Mid



Date: 22.MAY.2018 14:47:23

Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 53 / 71

Rev.: 02

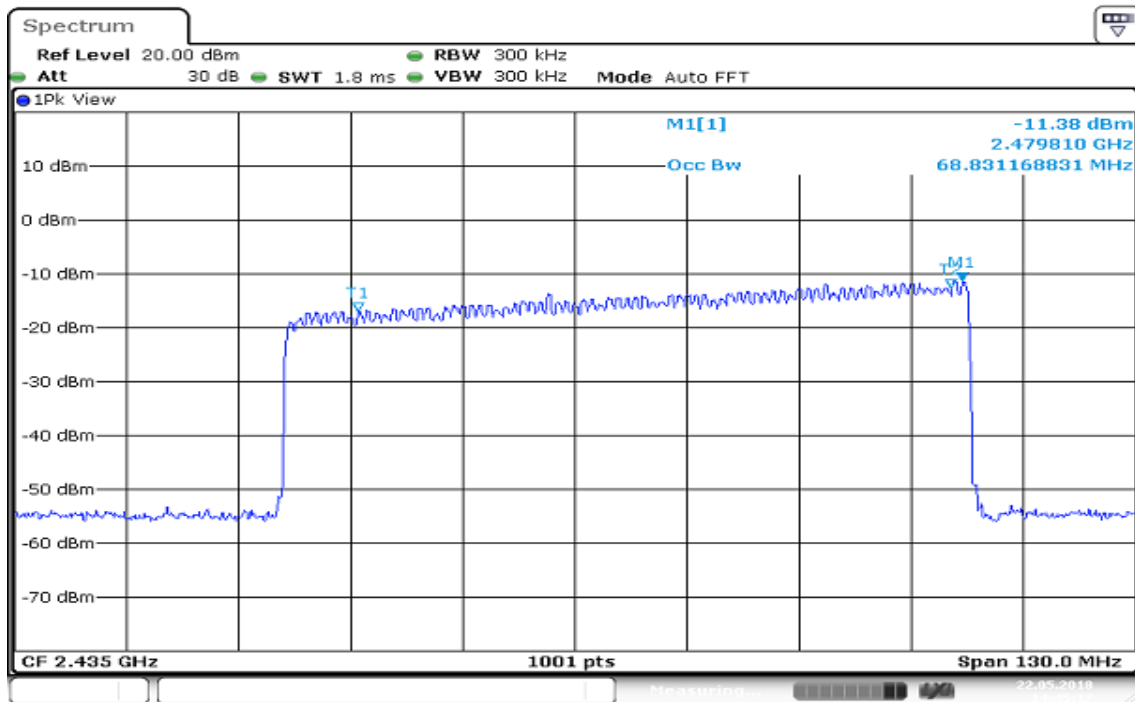
7.5 SPREAD-SPECTRUM BANDWIDTH -NORMAL(90%)

TEST RESULT

Frequency (MHz)	Center Frequency (MHz)	Bandwidth (MHz)	Remark
Hopping	2441	68.83	Normal Voltage

TEST PLOTS

CH Min



Date: 22.MAY.2018 14:45:18

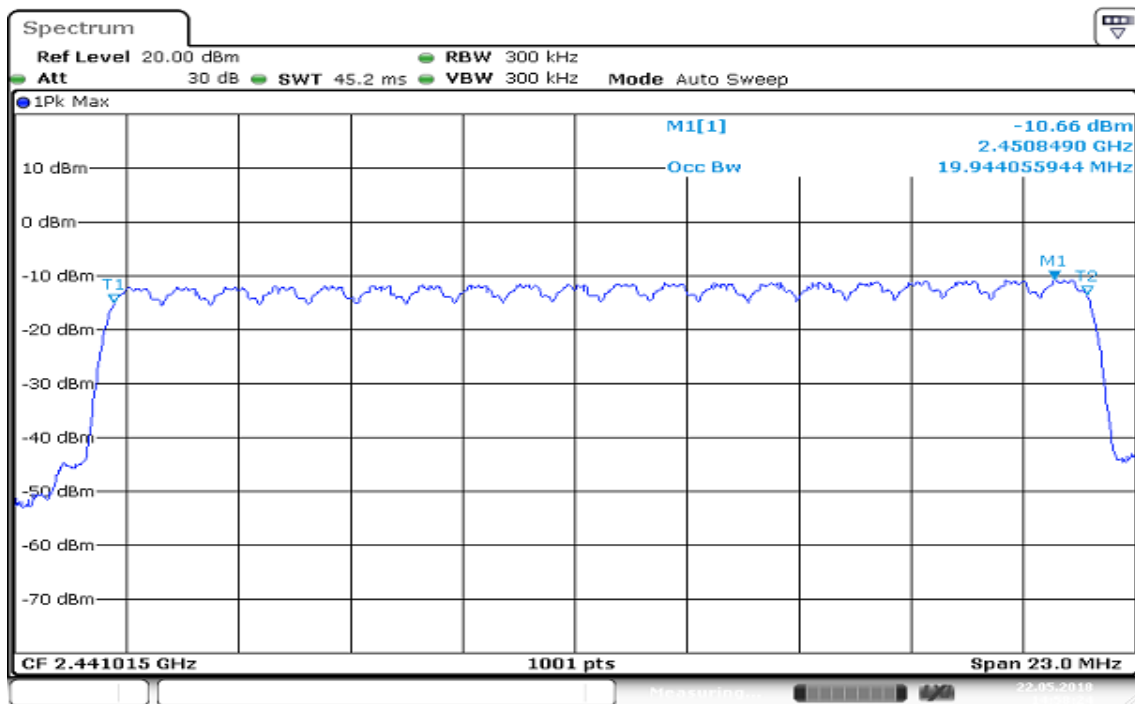
7.6 OCCUPIED BANDWIDTH-AFH (99%)

TEST RESULT

Frequency (MHz)	Center Frequency (MHz)	Bandwidth (MHz)	Remark
Hopping	2441	19.94	Normal Voltage

TEST PLOTS

CH Mid



Date: 22.MAY.2018 14:58:24

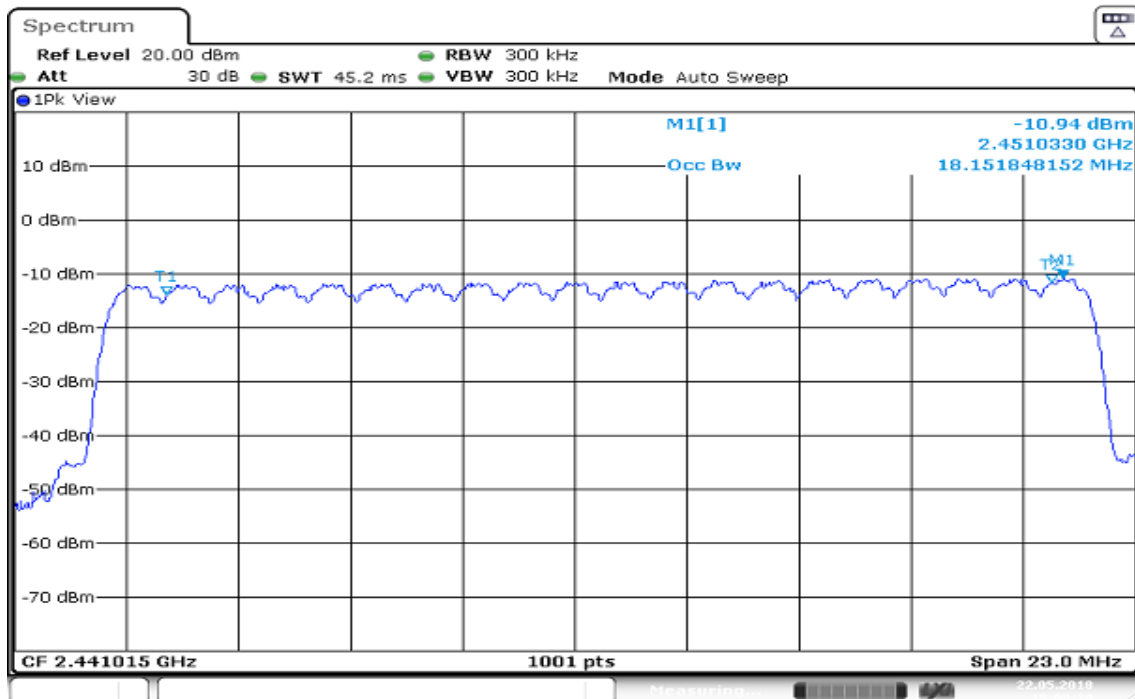
7.7 SPREAD-SPECTRUM BANDWIDTH -AFH(90%)

TEST RESULT

Frequency (MHz)	Center Frequency (MHz)	Bandwidth (MHz)	Remark
Hopping	2441	18.15	Normal Voltage

TEST PLOTS

CH Mid



Date: 22.MAY.2018 15:00:11

Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 56 / 71
Rev.: 02

7.8 LIMITATION OF COLLATERAL EMISSIONS OF RECEIVER

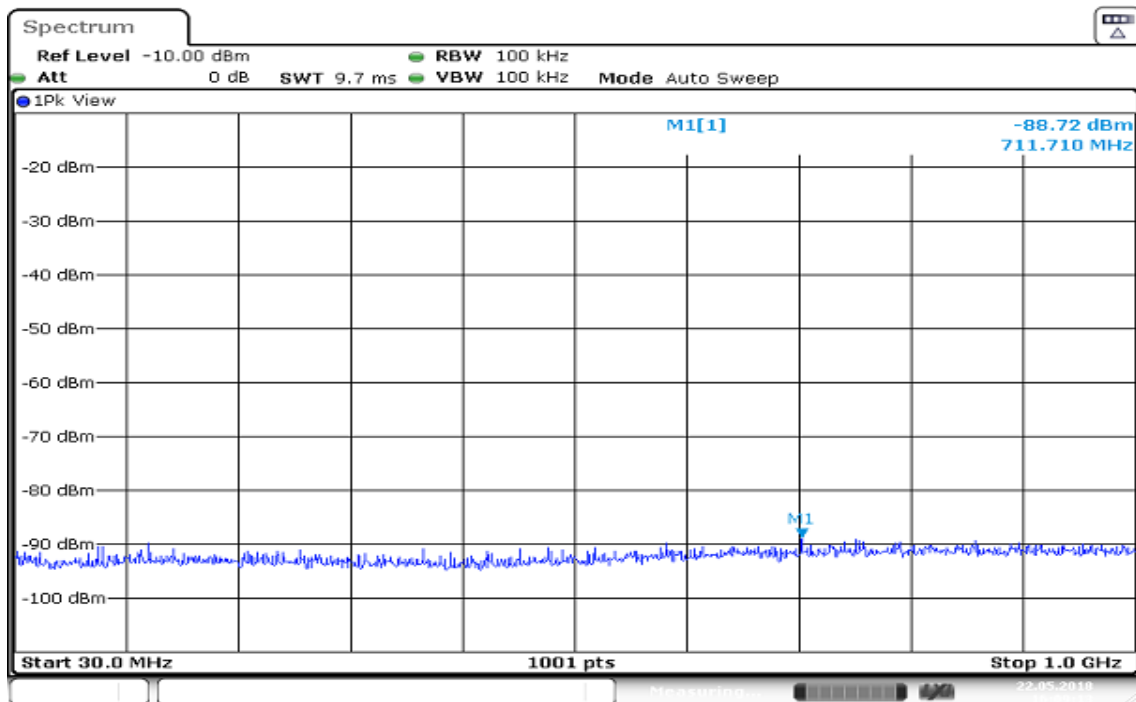
TEST RESULT

30MHz~1000MHz

	Frequency (MHz)	Reading (dBm)	Cable Factor (dB)	Result (nW/MHz)	Remark
30MHz~less than 1GHz	711.7100	-88.72	10.61	0.0155	Normal Voltage

TEST PLOTS

CH Mid



Date: 22.MAY.2018 16:09:14

Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 57 / 71

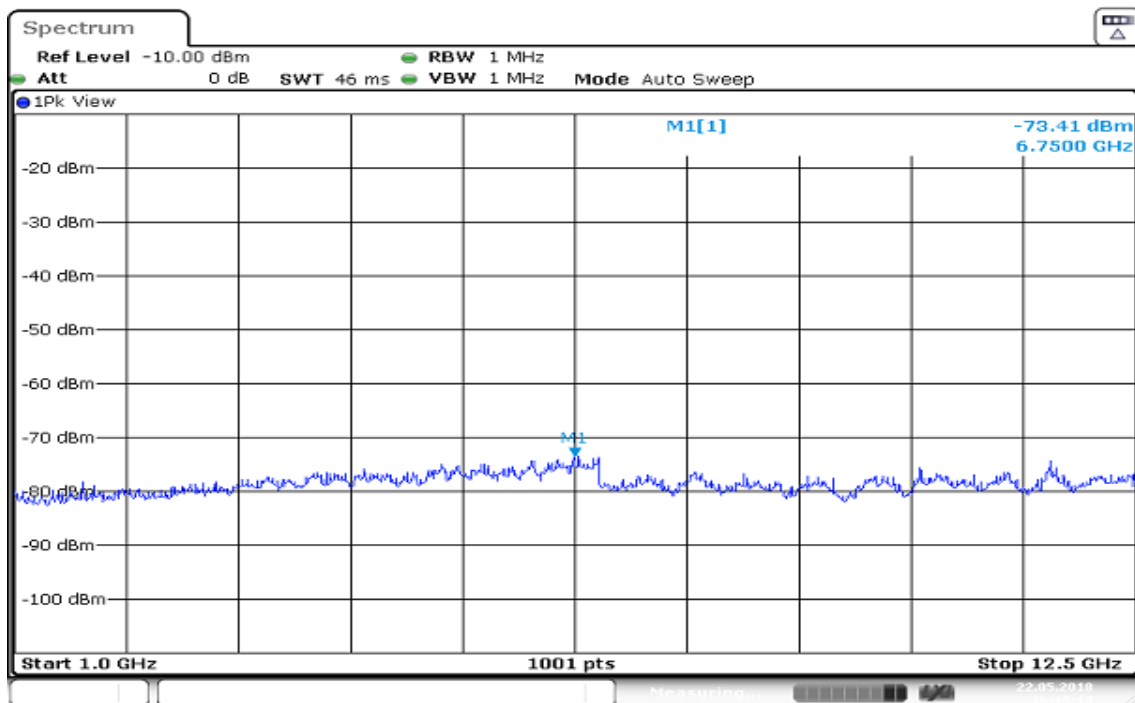
Rev.: 02

1GHz~12.5GHz

	Frequency (MHz)	Reading (dBm)	Cable Factor (dB)	Result (nW/MHz)	Remark
1GHz~12.5GHz	6750.0000	-73.41	10.97	0.5702	Normal Voltage

TEST PLOTS

CH Mid



Date: 22.MAY.2018 16:10:18



Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 58 / 71

Rev.: 02

7.9 DWELL TIME

Time per one hopping (ON time)	hopping numbers	Dwell Time(ms)
2.95	102.000	0.3009



Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 59 / 71

Rev.: 02

8 TEST RESULT FOR BLUETOOTH4.0(CH0~CH39)(FOR GFSK)

8.1 FREQUENCY ERROR

TEST RESULT

Frequency (MHz)	Reading (MHz)	2018/5/23 (Hz)	Tolerance (ppm)	Remark
2402	2402.033870	33870	14.1007	Normal Voltage
2440	2440.032670	32670	13.3893	
2480	2480.032970	32970	13.2944	

8.2 ANTENNA POWER

TEST RESULT

Frequency (MHz)	Spectrum Analyser	Cable Factor	Output Power		EIRP Power		Remark
	(dBm)	(dB)	(dBm)	(mW)	(dBm)	(mW)	
2402	-12.77	10.61	-2.16	0.60814	-0.16000	0.96383	Normal Voltage
2440	-8.54	10.61	2.07	1.61065	4.07000	2.55270	
2480	-6.61	10.61	4.00	2.51189	6.00000	3.98107	

8.3 SPURIOUS EMISSIONS INTENSITY

TEST RESULT

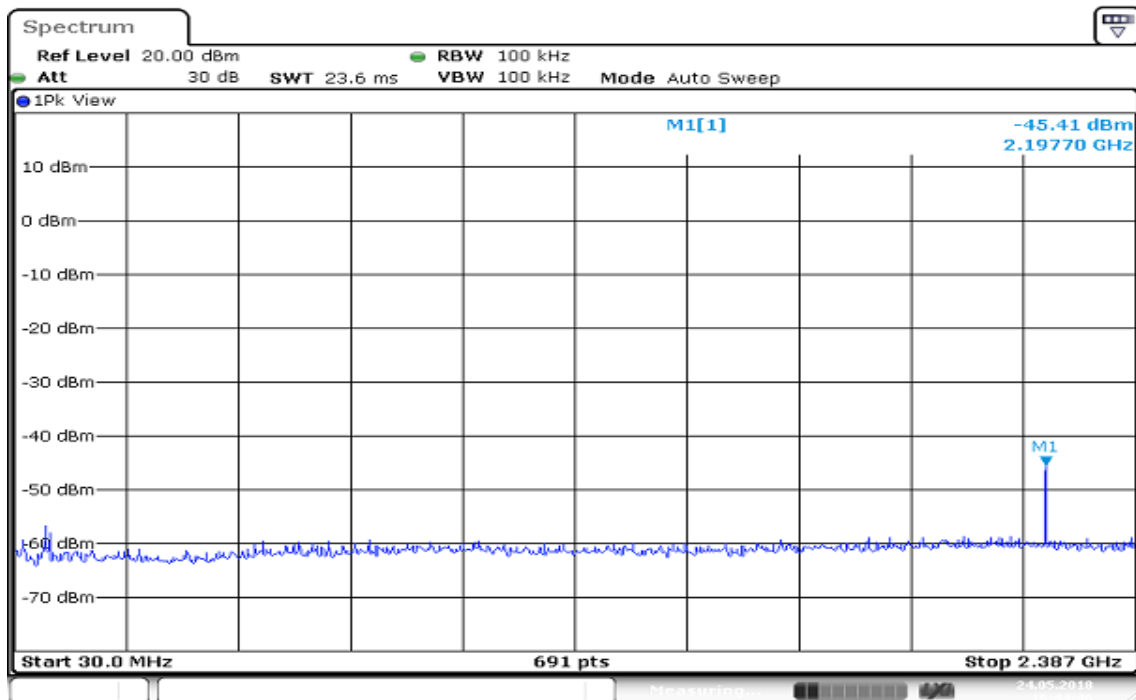
30MHz ~ 2387MHz

(1) Spurious Emission Intensity : 30MHz~less than 2,387MHz

Frequency (MHz)	Reading (MHz)	Reading (dBm)	Cable Factor (dB)	Result (μ W/MHz)	Remark
2402.0000	2197.7000	-45.41	10.61	0.33113	Normal Voltage
2440.0000	2197.7000	-45.07	10.61	0.35810	
2480.0000	2197.7000	-45.16	10.61	0.35075	

TEST PLOTS

CH Low



Date: 24.MAY.2018 16:44:47

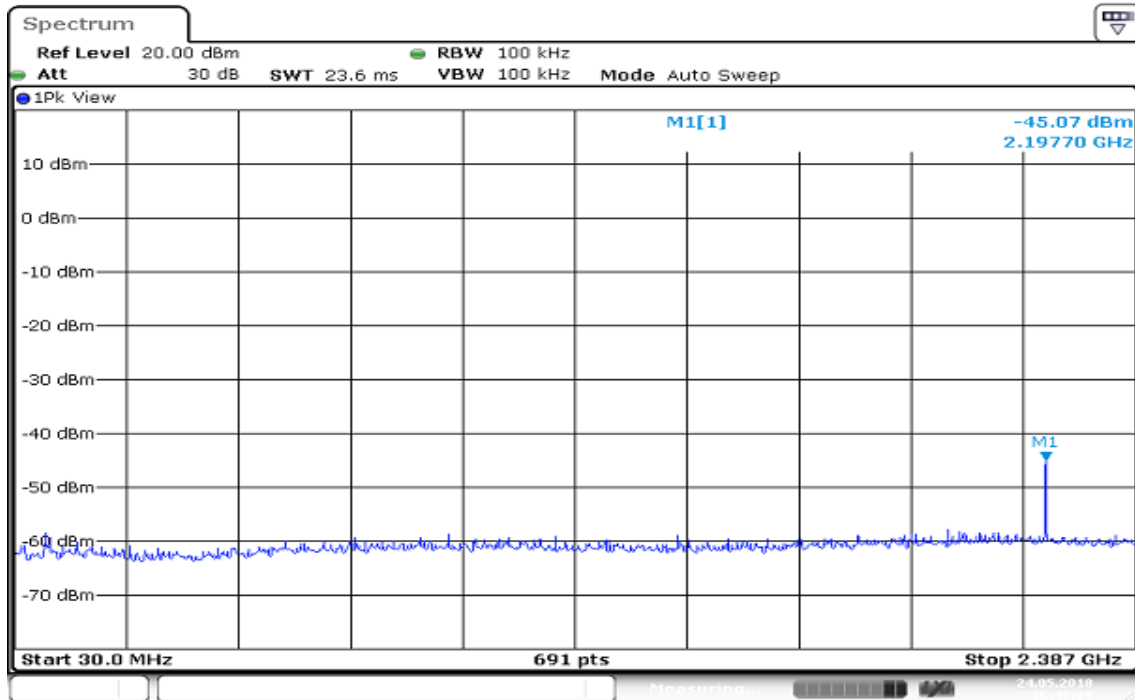


Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

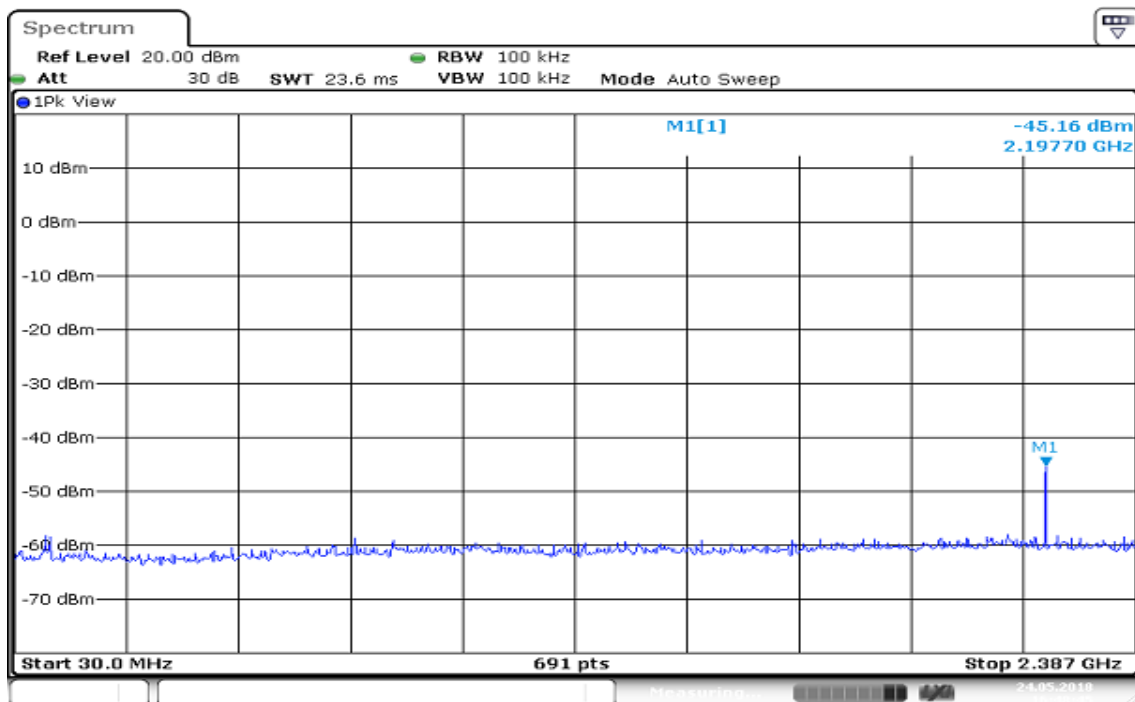
Page: 61 / 71
Rev.: 02

CH Mid



Date: 24.MAY.2018 16:48:06

CH High



Date: 24.MAY.2018 16:48:46

Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 62 / 71
Rev.: 02

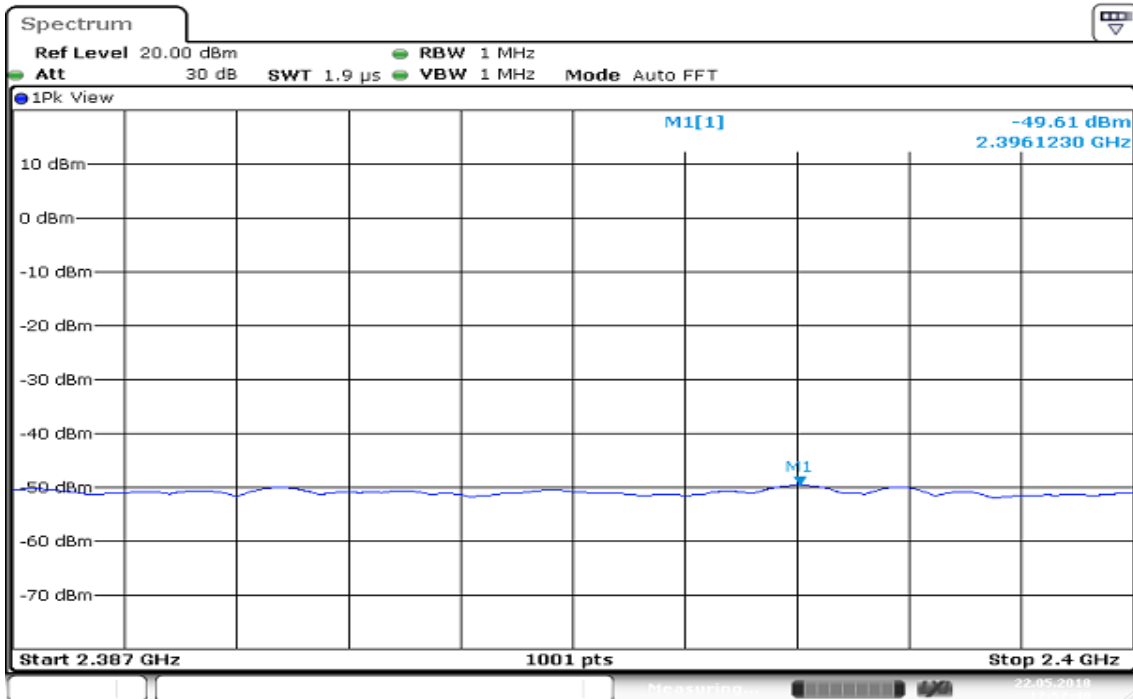
2387MHz ~ 2400MHz

(2) Spurious Emission Intensity : 2,387MHz~less than 2,400MHz

Frequency (MHz)	Reading (MHz)	Reading (dBm)	Cable Factor (dB)	Result (μW/MHz)	Remark
2402.0000	2396.1230	-49.61	10.61	0.12589	Normal Voltage
2440.0000	2387.9810	-49.63	10.61	0.12531	
2480.0000	2394.6300	-49.06	10.61	0.14289	

TEST PLOTS

CH Low



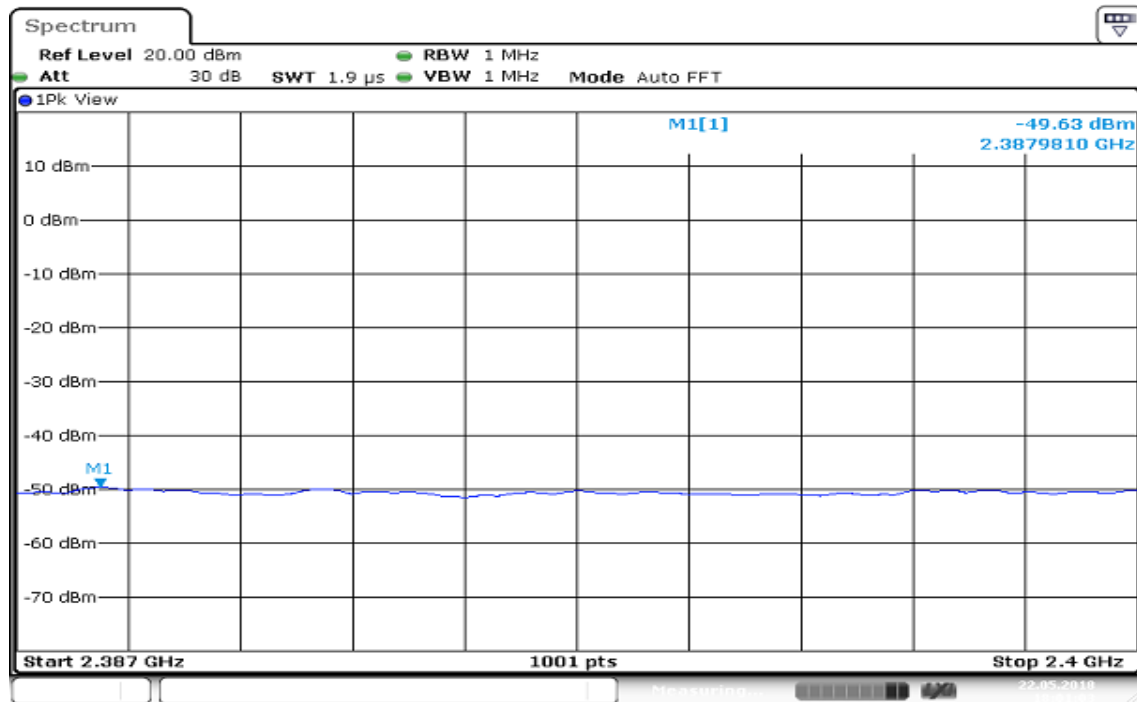


Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

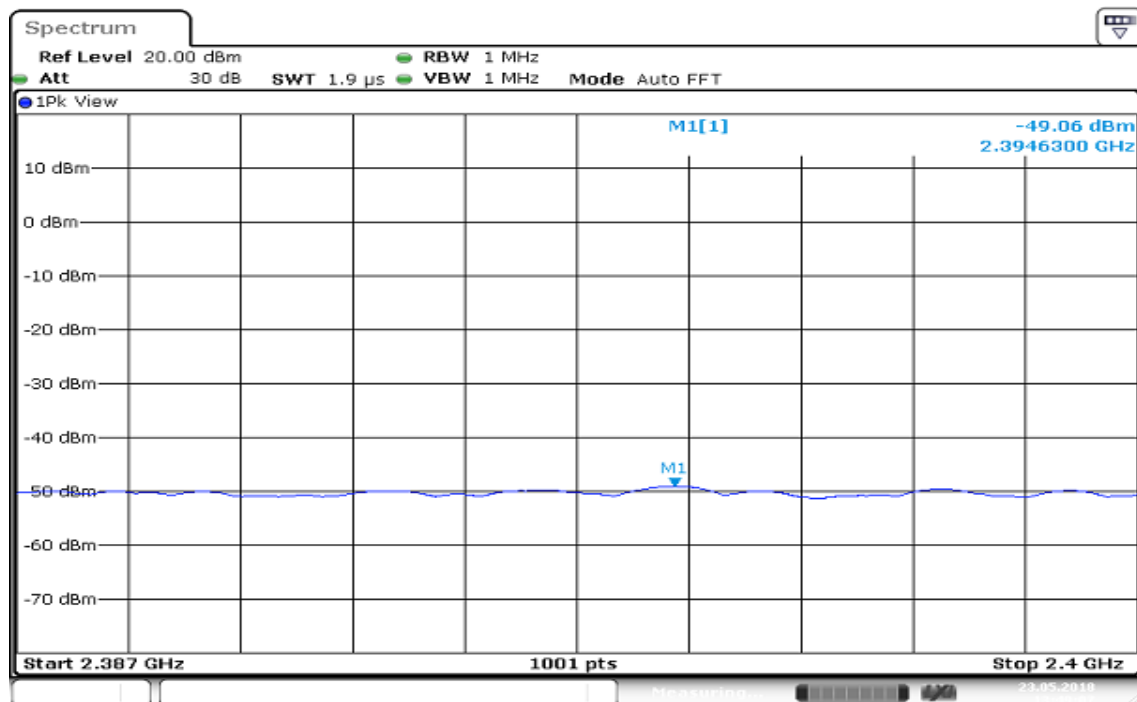
Page: 63 / 71
Rev.: 02

CH Mid



Date: 22.MAY.2018 18:01:03

CH High



Date: 23.MAY.2018 13:49:08



Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 64 / 71
Rev.: 02

TEST RESULT

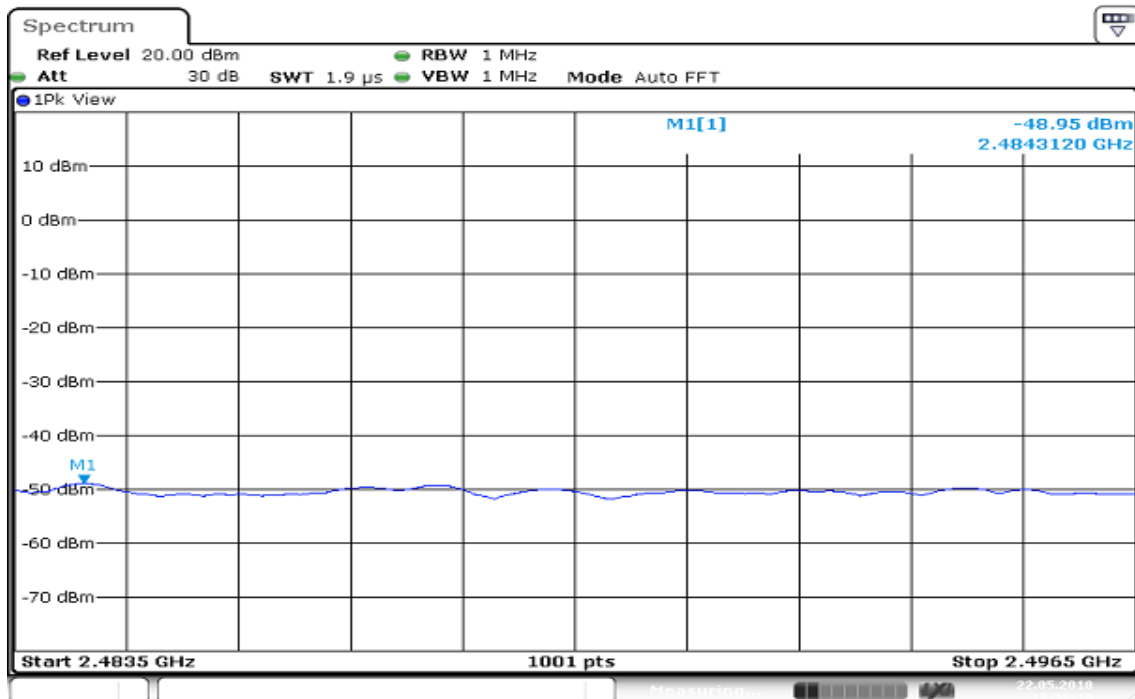
2483.5MHZ ~ 2496.5MHZ

(3) Spurious Emission Intensity : 2,483.5MHz~2,496.5MHz

Frequency (MHz)	Reading (MHz)	Reading (dBm)	Cable Factor (dB)	Result (μW/MHz)	Remark
2402.0000	2484.3120	-48.95	10.61	0.14655	Normal Voltage
2440.0000	2491.8830	-49.60	10.61	0.12618	
2480.0000	2496.2080	-48.56	10.61	0.16032	

TEST PLOTS

CH Low



Date: 22.MAY.2018 17:58:19

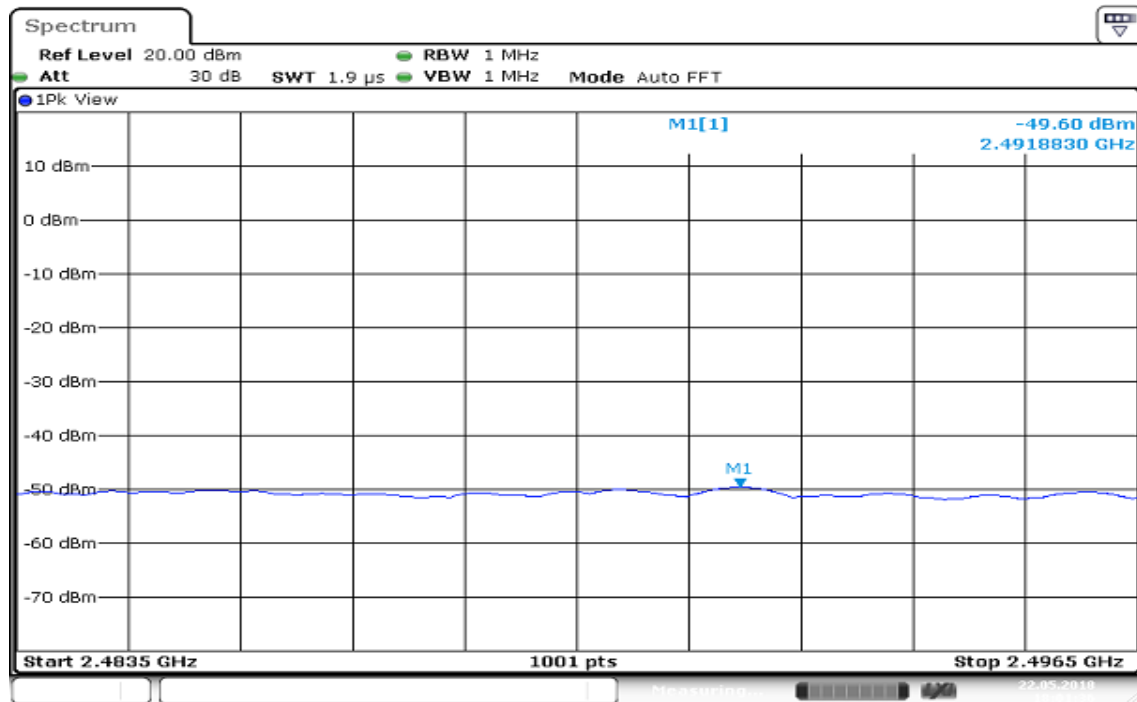


Report No.: T190107L05-RJ

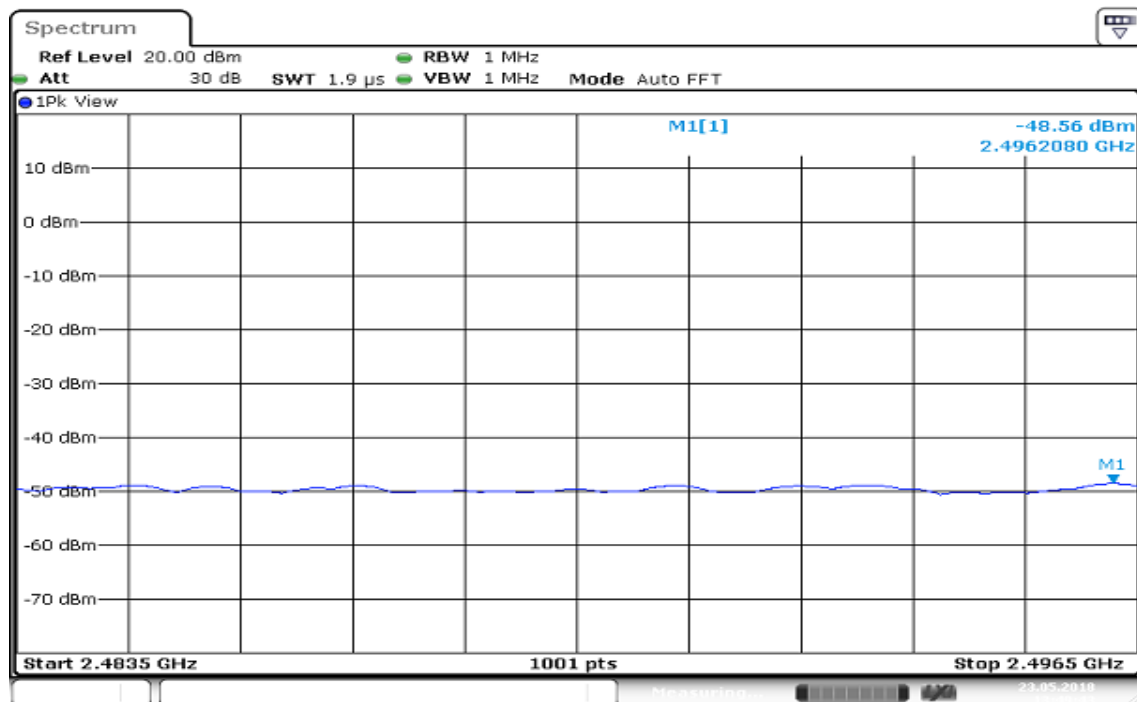
Ref. No.: T181031L01-RJ

Page: 65 / 71
Rev.: 02

CH Mid



CH High



Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 66 / 71
Rev.: 02

TEST RESULT

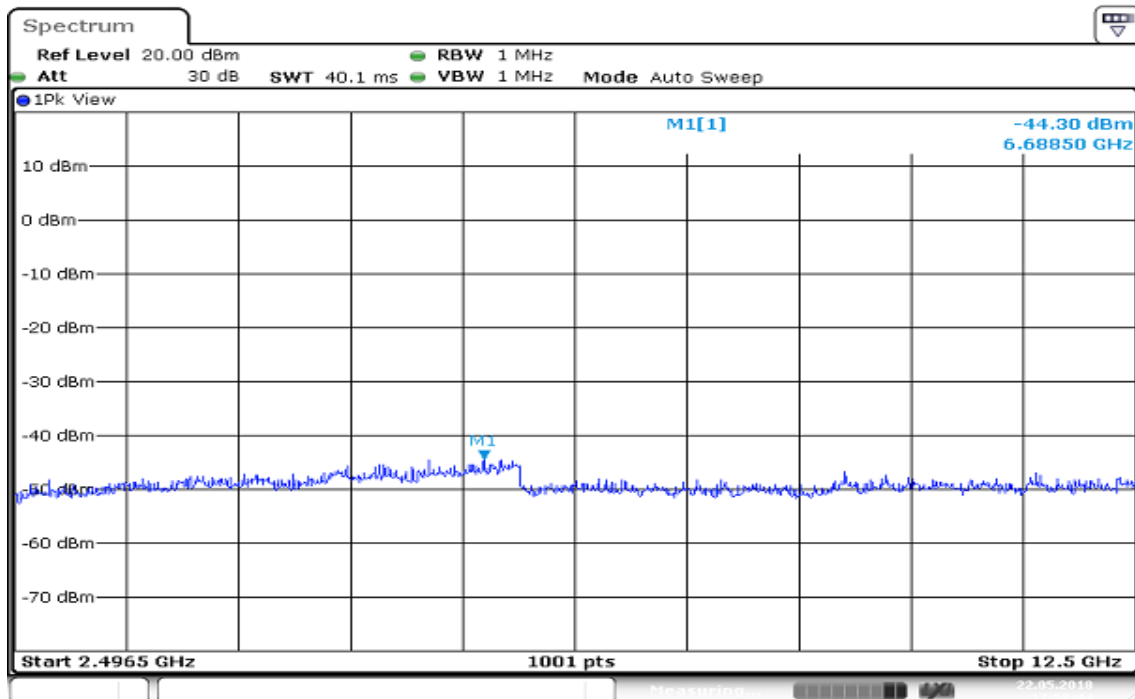
2496.5MHz ~ 12.5GHz

(4) Spurious Emission Intensity : more than 2,496.5MHz~12.5GHz

Frequency (MHz)	Reading (MHz)	Reading (dBm)	Cable Factor (dB)	Result (μW/MHz)	Remark
2402.0000	6688.5000	-44.30	10.61	0.42756	Normal Voltage
2440.0000	6928.5000	-43.58	10.61	0.50466	
2480.0000	6858.5000	-42.85	10.61	0.59704	

TEST PLOTS

CH Low



Date: 22.MAY.2018 17:58:45

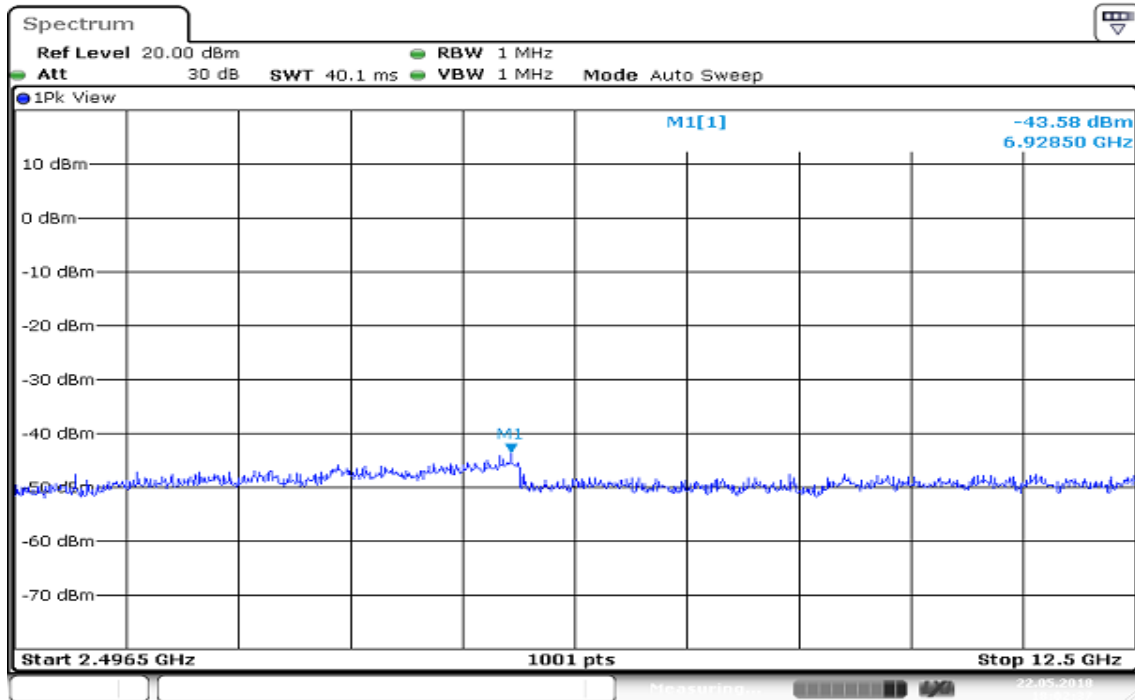


Report No.: T190107L05-RJ

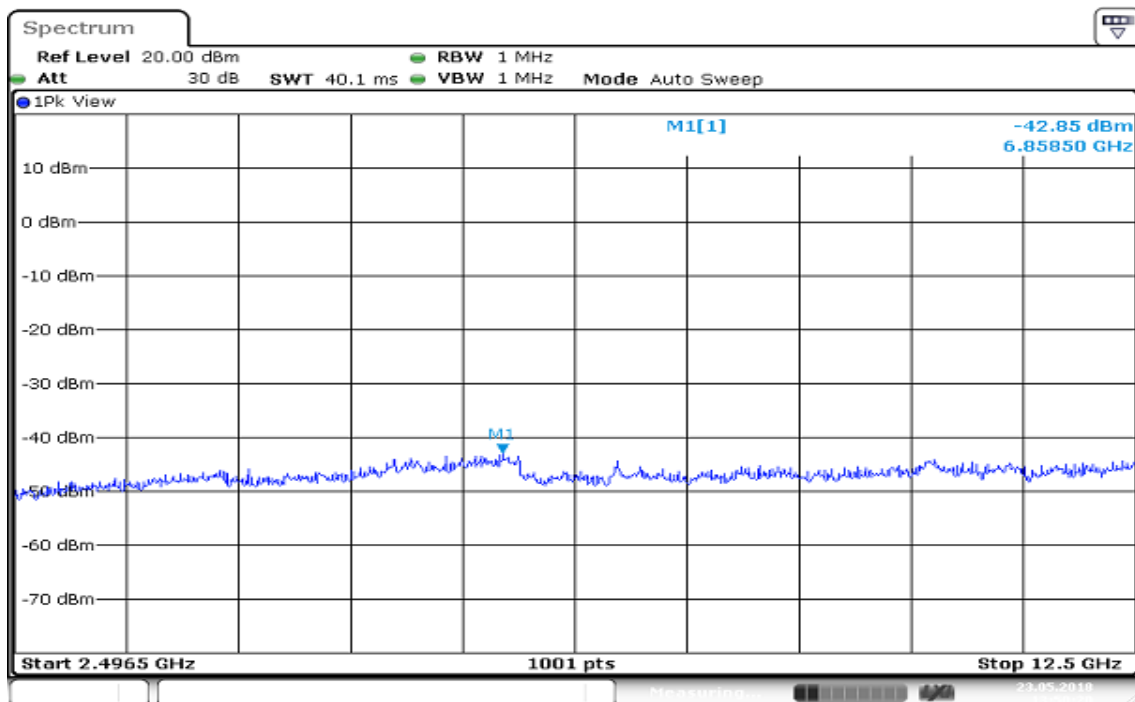
Ref. No.: T181031L01-RJ

Page: 67 / 71
Rev.: 02

CH Mid



CH High



Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 68 / 71
Rev.: 02

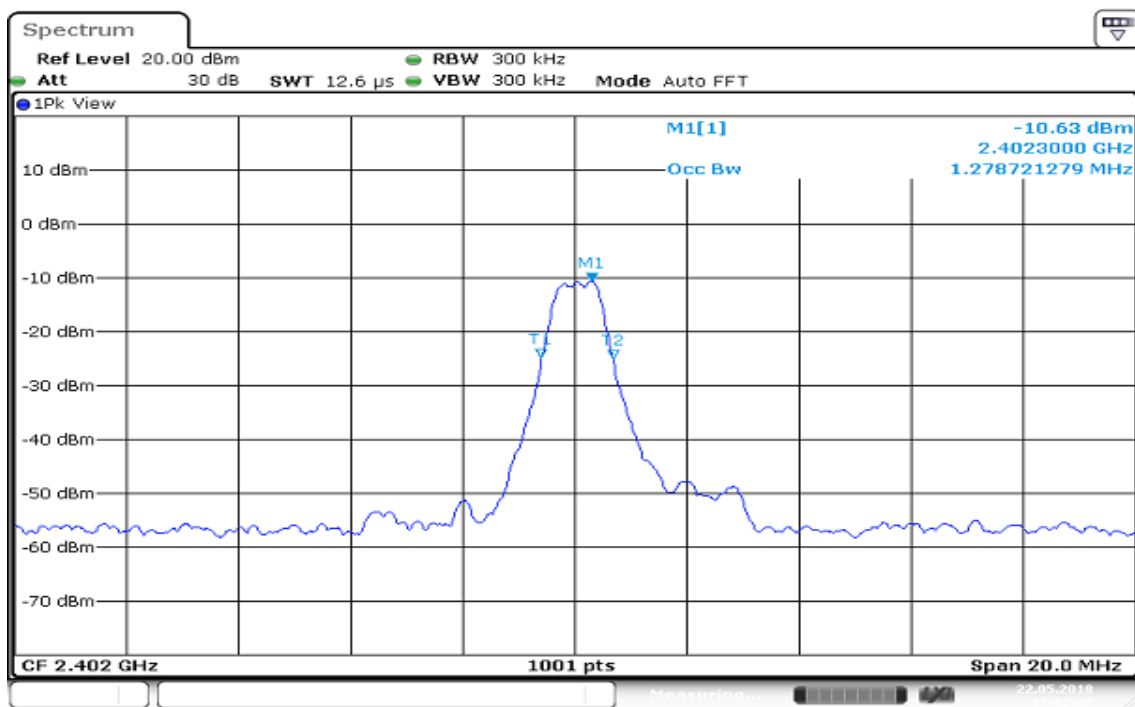
8.4 OCCUPIED BANDWIDTH (99%)

TEST RESULT

Frequency (MHz)	Center Frequency (MHz)	2018/5/23 (MHz)	Remark
2402.0000	2402.30	1.28	Normal Voltage
2440.0000	2440.28	1.26	
2480.0000	2479.78	1.26	

TEST PLOTS

CH Low



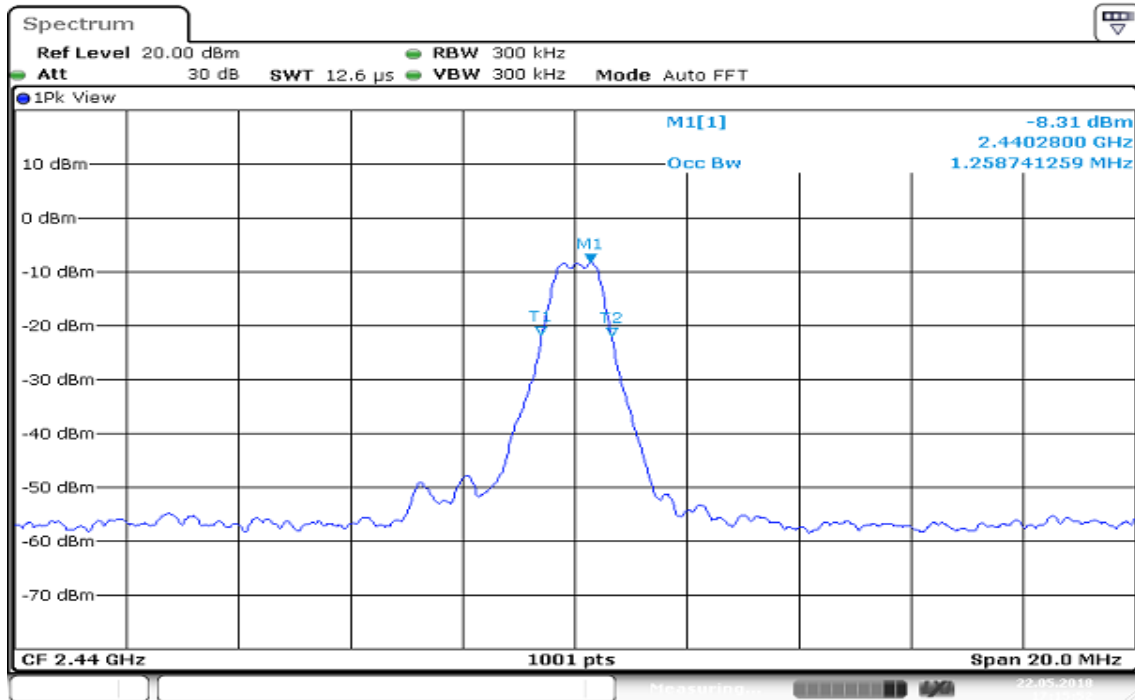
Date: 22.MAY.2018 17:12:37

Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

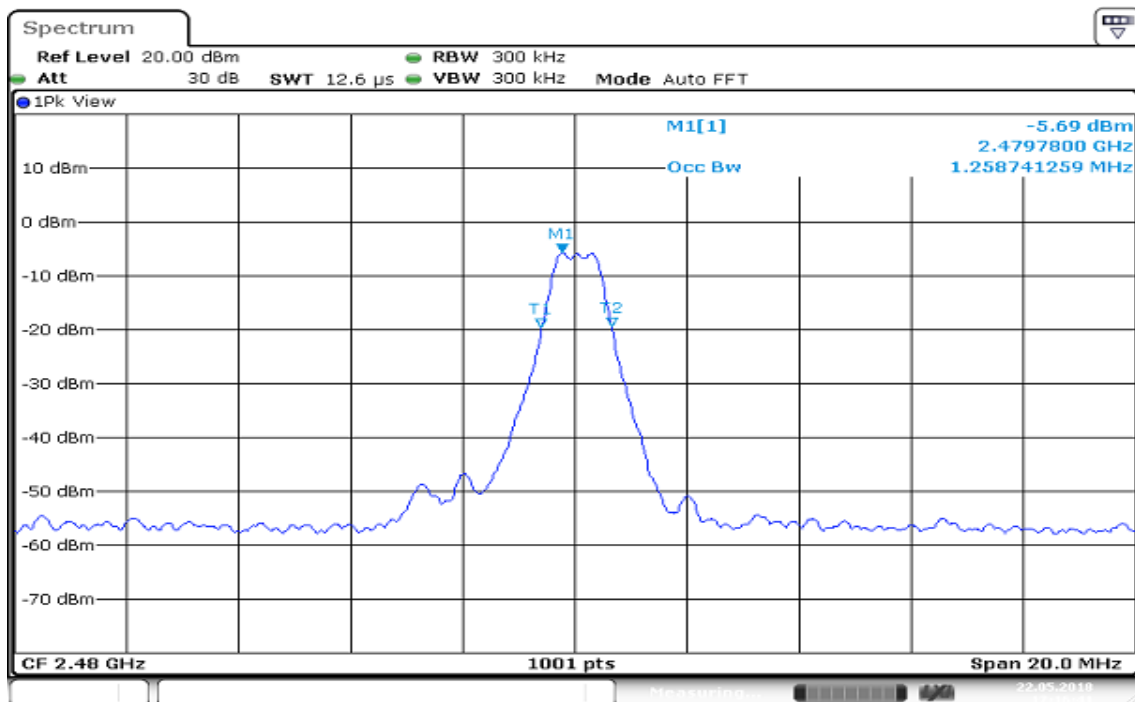
Page: 69 / 71
Rev.: 02

CH Mid



Date: 22.MAY.2018 17:15:53

CH High



Date: 22.MAY.2018 17:16:42



Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 70 / 71

Rev.: 02

8.5 LIMITATION OF COLLATERAL EMISSIONS OF RECEIVER

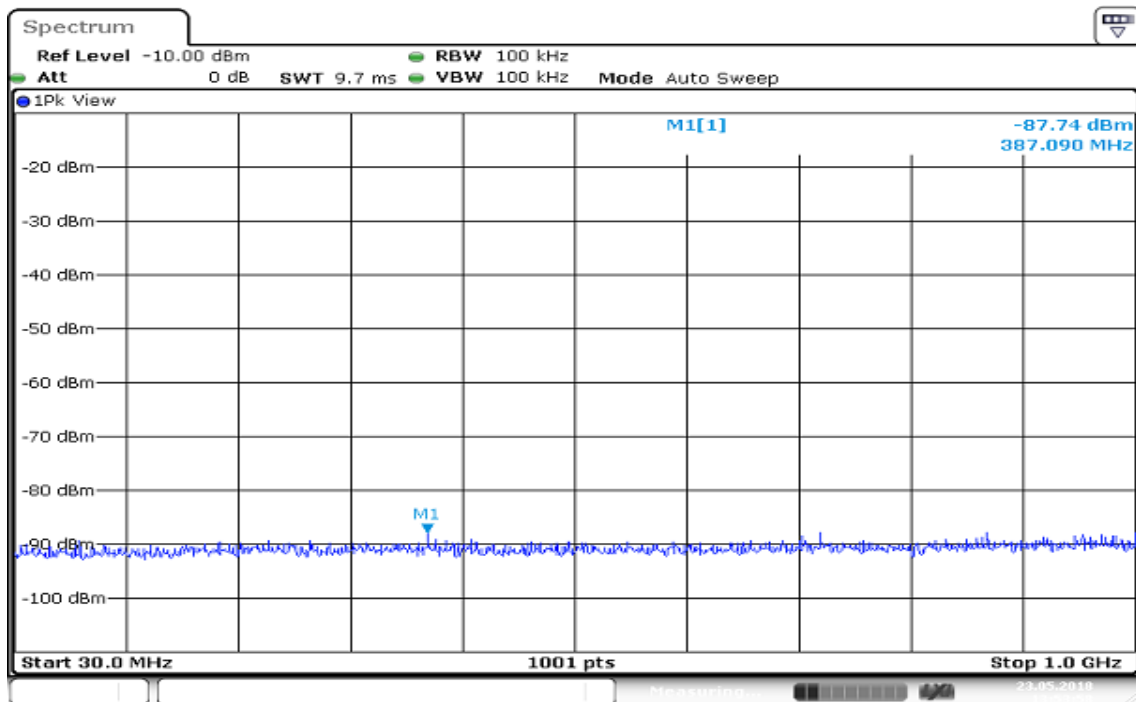
TEST RESULT

30MHz~1000MHz|

	Frequency (MHz)	Reading (dBm)	Cable Factor (dB)	Result (nW/MHz)	Remark
30MHz~less than 1GHz	387.0900	-87.74	10.92	0.0208	Normal Voltage

TEST PLOTS

CH Mid



Date: 23 MAY 2018 13:53:59



Report No.: T190107L05-RJ

Ref. No.: T181031L01-RJ

Page: 71 / 71
Rev.: 02

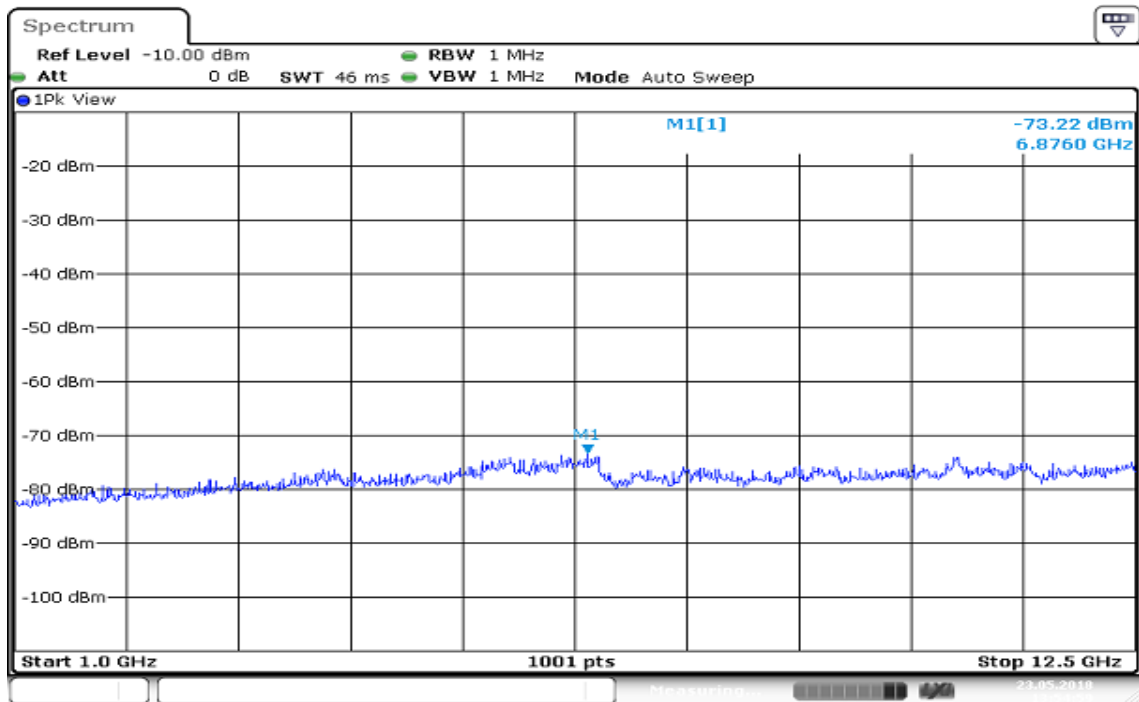
TEST RESULT

1GHz~12.5GHz

	Frequency (MHz)	Reading (dBm)	Cable Factor (dB)	Result (nW/MHz)	Remark
1GHz~12.5GHz	6876.0000	-73.22	10.61	0.5483	Normal Voltage

TEST PLOTS

CH Mid



Date: 23 MAY 2018 13:54:59

--End of Test Report--