TEST REPORT

For

RF MCU Evaluation Kit

In conformity with

FCC CFR 47 Part15 Subpart C / RSS-247 Issue 2

Model	**: EB-RE01B**
FCC ID	**: X8U0003**
ISED ID	**: 27334-0001**
Report No.	**: WE210514BB2-11**
Issue Date	**: June 7, 2021**

Prepared for

TESSERA TECHNOLOGY INC.
6F, Oak Yokohama Bldg., 2-15-10, Kitasaiwai, Nishi-ku,
Yokohama, Kanagawa 220-0004, JAPAN

Prepared by

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Table of contents

1 General information 3
1.1 Product information from applicant 3
1.2 Test(s) performed/ Summary of test result 4
1.3 Test facility 5
1.4 Measurement uncertainty 5
1.5 Summary of test results 6
1.6 Setup of equipment under test (EUT) 7
1.6.1 Test configuration of EUT 7
1.6.2 Operating condition: 7
1.6.3 Setup diagram of tested system 8
1.7 Equipment modifications 8
1.8 Deviation from the standard 8
2 Test procedure and test data 9
2.1 Occupied Bandwidth (99%) 9
2.2 6dB Bandwidth 11
2.3 Peak Output Power 13
2.4 Conducted Spurious Emissions 15
2.5 Power Spectral density 20
2.6 Transmitter Radiated Spurious Emissions 22
2.7 AC power line conducted emissions 47
2.8 Radiated emissions (Receiver) 51
2.9 AC power line conducted emissions (Receiver) 60
3 Test setup photographs 63
3.1 Radiated emissions 63
3.2 AC power line conducted emissions 64
3.3 RF conducted test 64
4 List of utilized test equipment / calibration 65

History

Report No.	Date	Revisions	Issued By
WE210514BB2-11	June 7, 2021	Initial Issue	K. Onishi

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1 General information

1.1 Product information from applicant

Test item	: RF MCU Evaluation Kit
Manufacturer	: TESSERA TECHNOLOGY INC.
Address	: 6F, Oak Yokohama Bldg., 2-15-10, Kitasaiwai, Nishi-ku, Yokohama, Kanagawa 220-0004, JAPAN
Model	: EB-RE01B
PMN	: EB-RE01B
Host Marketing Name (HMN)	: EB-RE01B
FCC ID	: X8U0003
ISED ID	: 27334-0001
Serial number	: 10:07:23:A0:92:E8
Hardware version (HVIN)	: V1.02
Software version (FVIN)	: V1.00
Operating frequency	: 2402 - 2480 MHz
Modulation	: GFSK (Bluetooth Ver. 5.0 LE)
Antenna Gain	: -1.2 dBi
Receipt date of EUT	: May 27, 2021
Nominal power source voltages	: DC 5.0 V (USB)

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1.2 Test(s) performed/ Summary of test result

Test specification(s)	: FCC CFR 47 Part 15 Subpart C (01 Oct. 2020) RSS-247 Issue 2, RSS-Gen Issue 5+A1+A2
Test method(s)	: ANSI C63.10: 2013
Test(s) started	: May 27, 2021
Test(s) completed	: June 2, 2021
Summary of test result	: *Complied*

Note: The above judgment is only based on the measurement data and it does not include the measurement uncertainty. Accordingly, the statement below is applied to the test result.
The EUT complies with the limit required in the standard in case that the margin is not less than the measurement uncertainty in the Laboratory.
Compliance of the EUT is more probable than non-compliance is case that the margin is less than the measurement uncertainty in the Laboratory.

Test engineer : K. Onishi
Kazuyuki Onishi
C&P Connectivity Wireless RF Operation RF/EMC Lab.

Reviewer : _____
Yoshihiko Taki
Manager
C&P Connectivity Wireless RF Operation RF/EMC Lab.

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1.3 Test facility

[Kitayamata laboratory]

Address: 3-5-23, Kitayamata, Tsuzuki-ku, Yokohama, 224-0021, Japan
TEL: +81-45-550-3520
FAX: +81-45-592-7506

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1.4 Measurement uncertainty

The treatment of uncertainty is based on the general matters on the definition of uncertainty in "Guide to the expression of uncertainty in measurement (GUM)" published by ISO. The Lab's uncertainty is determined by referring ETSI TR 100 028-1 V1.4.1 (2001-12).
The uncertainty of the measurement results in the level of confidence of approximately 95% (k=2) is as follows;

Conducted emission (150 kHz - 30 MHz):	± 3.3 dB
Radiated emission (9 kHz - 30 MHz):	± 6.7 dB
Radiated emission (30 MHz - 1000 MHz):	± 5.2 dB
Radiated emission (1 GHz - 6 GHz):	± 4.3 dB
Radiated emission (6 GHz - 18 GHz):	± 4.4 dB
Radiated emission (18 GHz - 26 GHz):	± 4.5 dB

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1.5 Summary of test results

Requirement	Section in FCC	Section in RSS-247	Result	Section in this report
Occupied Bandwidth (99 %)	2.1049	6.7 (RSS-Gen)	Complied	2.1
6 dB Bandwidth	15.247 (a) (2)	5.2 (a)	Complied	2.2
Conducted Output Power	15.247 (b) (3)	5.4 (d)	Complied	2.3
Conducted Spurious Emission	15.247 (d)	5.5	Complied	2.4
Power Spectral Density	15.247 (e)	5.2 (b)	Complied	2.5
Transmitter Radiated Spurious Emissions	15.247(d), 15.205 (a)	8.9/8.10 (RSS-Gen)	Complied	2.6
AC power line conducted emissions	15.207	8.8 (RSS-Gen)	Complied	2.7
Radiated Emissions (Receiver)	-	7.3 (RSS-Gen)	Complied	2.8
AC power line conducted emissions (Receiver)	-	7.2 (RSS-Gen)	Complied	2.9

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1.6 Setup of equipment under test (EUT)

1.6.1 Test configuration of EUT

Equipment(s) under test

No.	Item	Model No.	Manufacture	Serial No.
A	RF MCU Evaluation Kit	EB-RE01	Tessera technology	10:07:23:A0:92:E8
-	-	-	-	-

Support Equipment(s)

No.	Item	Model No.	Manufacture	Serial No.
B	PC	Inspiron 3501	DELL	9RB0MB3
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

Connected cable(s)

No.	Item	From	To	Length [m]	Shield	Ferrite Core
1	USB cable 1	A	B	0.7	Yes	No
-	-	-	-	-	-	-
-	-	-	-	-	-	-

1.6.2 Operating condition:

- Power setting: High output mode
- Tx (2402MHz): The EUT is in normal transmission mode at 2402MHz (2Mbps, 1Mbps)
- Tx (2442MHz): The EUT is in normal transmission mode at 2442MHz (2Mbps, 1Mbps)
- Tx (2480MHz): The EUT is in normal transmission mode at 2480MHz (2Mbps, 1Mbps)
- Rx (2402MHz): The EUT is in normal transmission mode at 2402MHz
- Rx (2442MHz): The EUT is in normal transmission mode at 2442MHz
- Rx (2480MHz): The EUT is in normal transmission mode at 2480MHz

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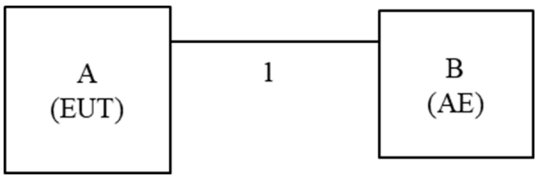
1.6.3 Setup diagram of tested system



1.7 Equipment modifications

No modifications have been made to the equipment in order to achieve compliance with the applicable standards described in clause 1.2.

1.8 Deviation from the standard

No deviations from the standards described in clause 1.2.

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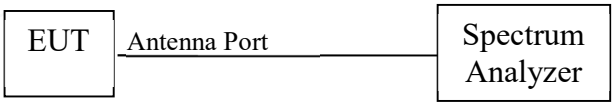
2 Test procedure and test data

2.1 Occupied Bandwidth (99%)

Test setup

Test setup is the following drawing. The antenna port of EUT was connected to the spectrum analyzer.



Test procedure

Spectrum analyzer is set as below according to ANSI C63.10 clause 6.9

- RBW: 1 to 5 % of OBW
- VBW > 3 x RBW
- Span: OBW x 1.5 to 5
- Trace: Max hold

Limitation

There are no limitations.
The measurement value is used for the emission designator.

Test equipment used (refer to List of utilized test equipment)

TR10	CL31	-	-	-	-

Test results

Transmission Frequency [MHz]	Occupied Bandwidth [MHz]	
	1Mbps	2Mbps
2402	1.041	2.062
2442	1.042	2.061
2480	1.047	2.070

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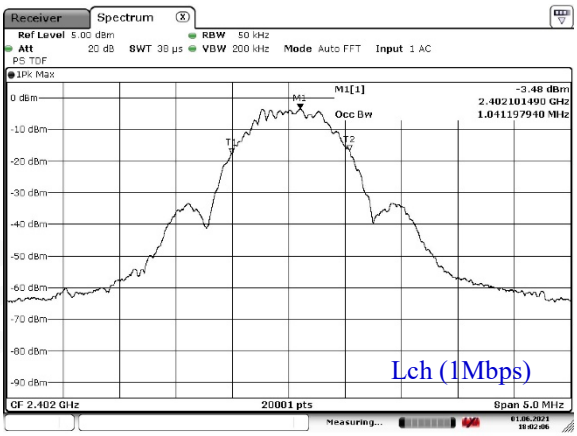

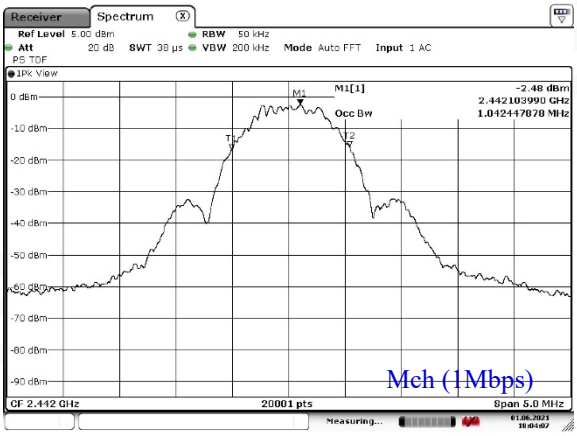

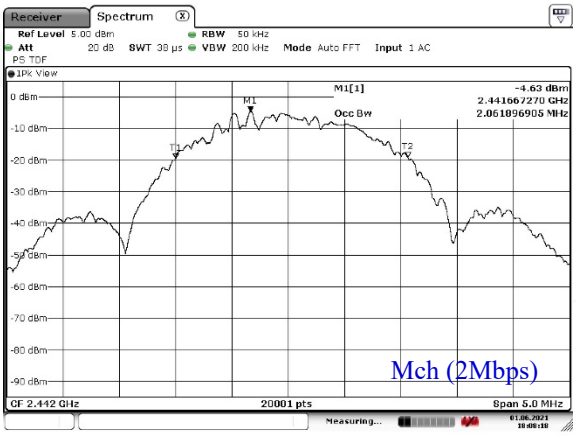

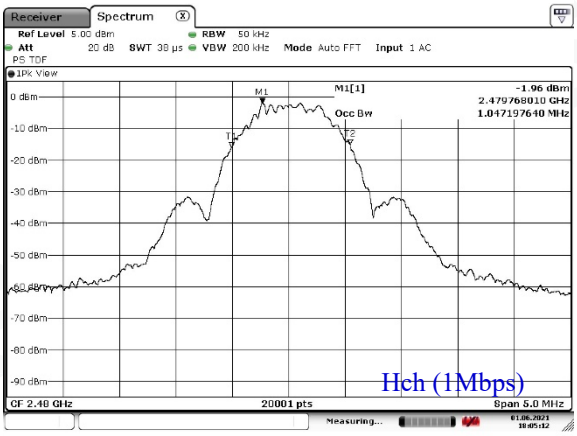

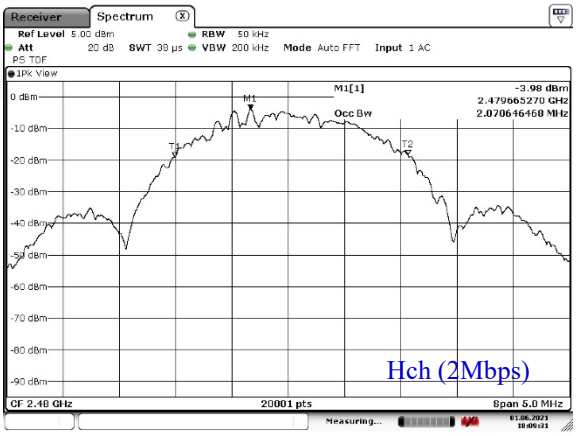

Tested Date:	June 1, 2021	Temperature:	21 deg. C
Humidity:	64 %	Atmos. Press:	1014 hPa

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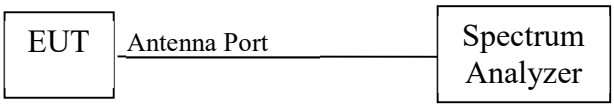
2.2 6dB Bandwidth

Test setup

Test setup is the following drawing. The antenna port of EUT was connected to the spectrum analyzer.



Test procedure

Spectrum analyzer is set as below according to ANSI C63.10 clause 11.8

- RBW: 100 kHz
- VBW: 300 kHz
- Detector: Peak
- Trace: Max hold

Applicable rule and limitation

15.247 (a) (2) / RSS-247 5.2 (a): Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

Test equipment used (refer to List of utilized test equipment)

TR10	CL31	-	-	-	-

Test results - *Complied with requirement*

Test Data

Transmission Frequency [MHz]	6 dB Bandwidth [kHz]		Limit [kHz]
	1Mbps	2Mbps	
2402	733.22	1395.68	500
2442	731.49	1398.93	500
2480	737.96	1407.18	500

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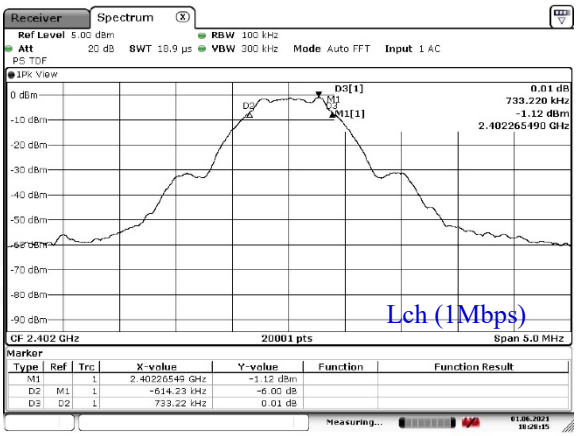

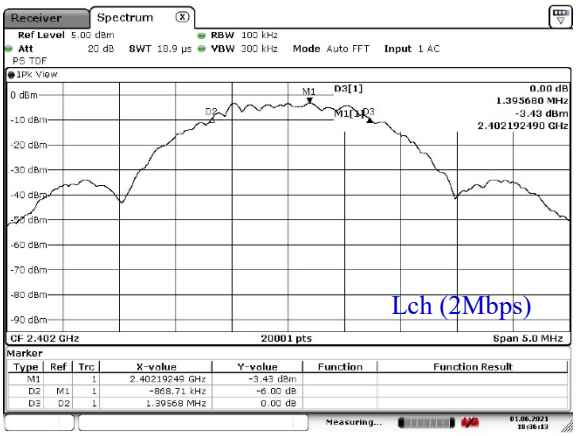

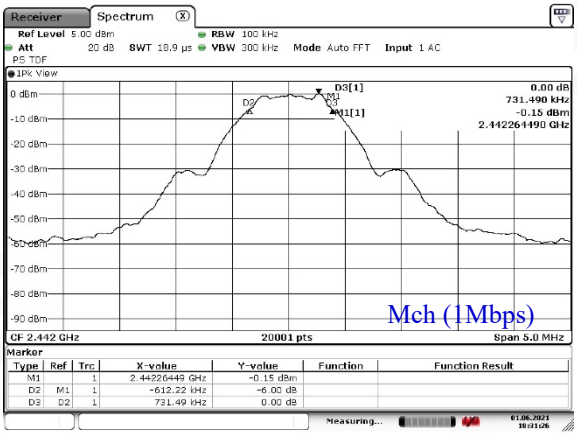

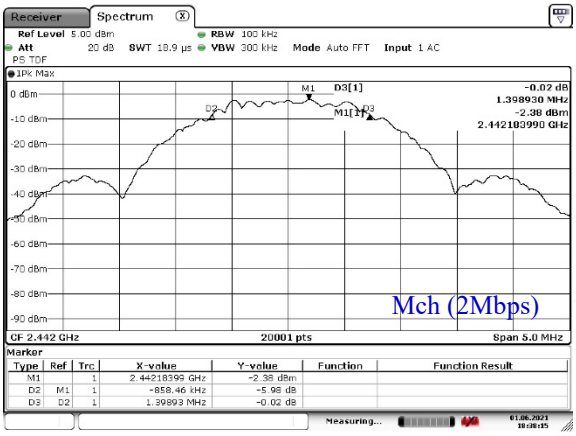

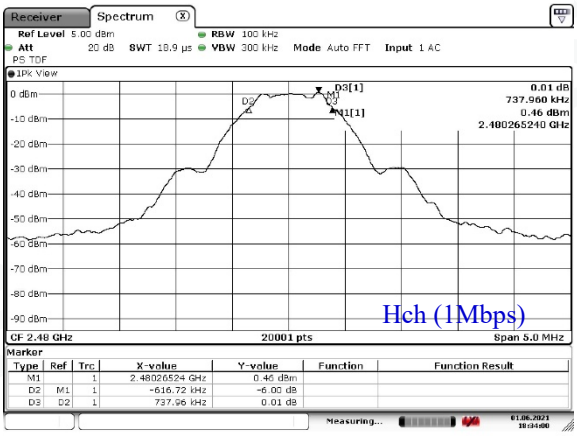

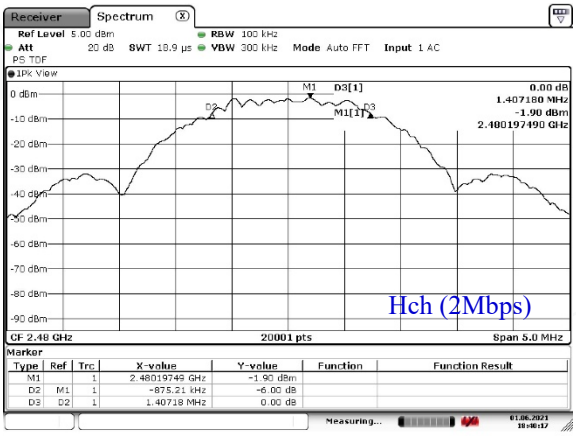

Tested Date:	June 1, 2021	Temperature:	21 deg. C
Humidity:	64 %	Atmos. Press:	1014 hPa

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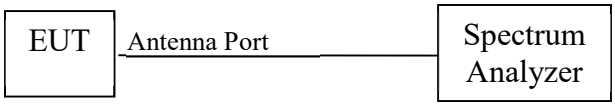
2.3 Peak Output Power

Test setup

Test setup is the following drawing. The antenna port of EUT was connected to the spectrum analyzer.



Test procedure

Spectrum analyzer is set as below according to ANSI C63.10 clause 11.9

- RBW > 6dB BW
- VBW > 3 x RBW
- Span > 3 x RBW
- Detector: Peak
- Trace: Max hold

Applicable rule and limitation

15.247(b) (3) / RSS-247 5.4 (d): For systems using digital modulation in the 902-928 MHz, 2400-2483.5MHz, and 5725-5850 MHz bands: 1 Watt (30 dBm).

Test equipment used (refer to List of utilized test equipment)

TR10	CL31	-	-	-	-

Test results - *Complied with requirement*

Test Data

Transmission Frequency [MHz]	Output Power [dBm]		Limit [dBm]
	1Mbps	2Mbps	
2402	-0.37	-0.36	30
2442	0.60	0.60	30
2480	1.22	1.23	30

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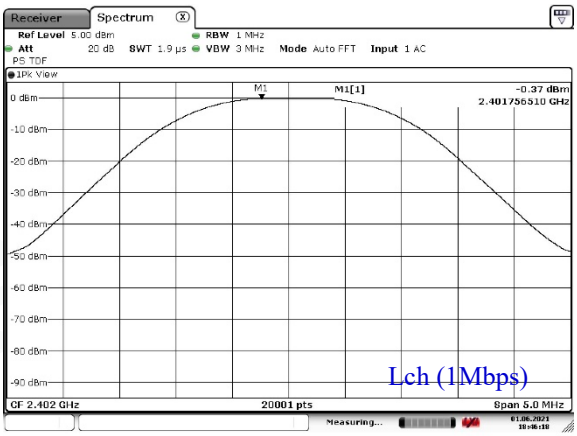

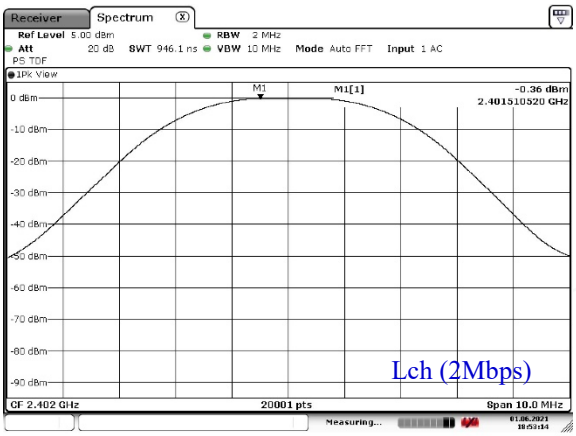

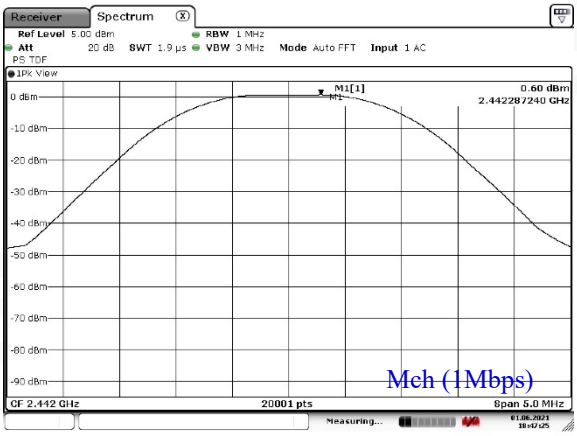

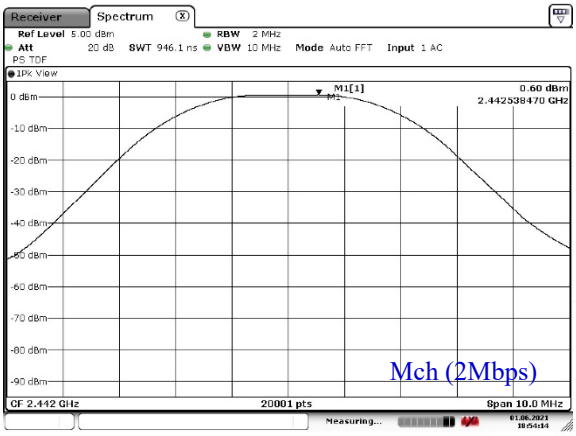

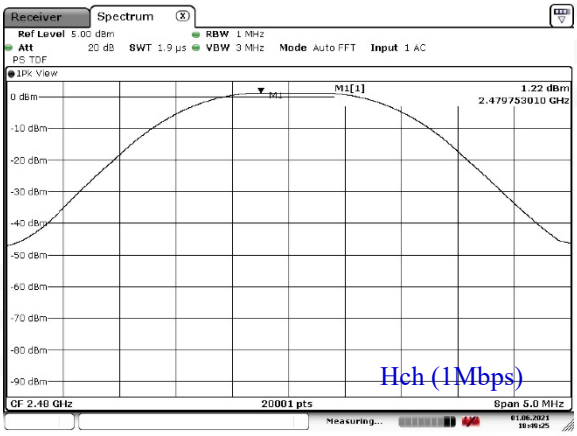

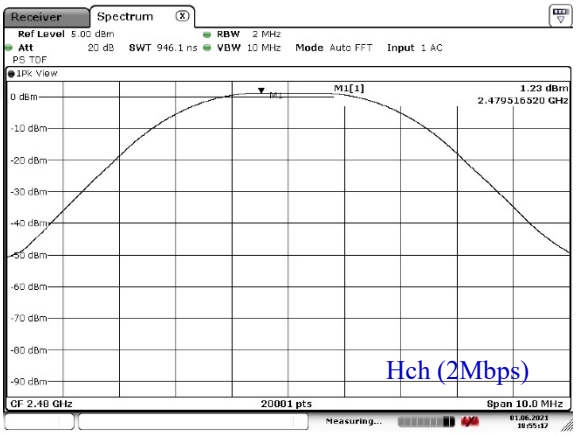

Tested Date:	June 1, 2021	Temperature:	21 deg. C
Humidity:	64 %	Atmos. Press:	1014 hPa

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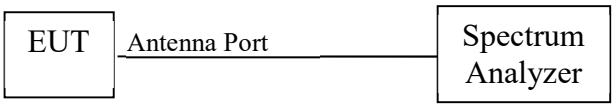
2.4 Conducted Spurious Emissions

Test setup

Test setup is the following drawing. The antenna port of EUT was connected to the spectrum analyzer.



Test procedure

Spectrum analyzer is set as below according to ANSI C63.10 clause 7.8.8

- RBW: 100 kHz
- VBW: 300 kHz
- Detector: Peak
- Trace: Max hold

Limitation

15.247(d) / RSS-247 5.5: 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 a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

Test equipment used (refer to List of utilized test equipment)

TR10	CL31	-	-	-	-

Test results - *Complied with requirement*

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Test Data

Operating mode: Tx (2402MHz, 1Mbps)

Frequency [GHz]	Spurious level [dBm]	Carrier level [dBm]	Limit (-20dBc) [dBm]	Result
4.803	-52.82	-1.13	-21.13	Pass
9.609	-43.70	-1.13	-21.13	Pass
12.011	-52.96	-1.13	-21.13	Pass
14.410	-41.82	-1.13	-21.13	Pass
19.218	-55.04	-1.13	-21.13	Pass

Operating mode: Tx (2442MHz, 1Mbps)

Frequency [GHz]	Spurious level [dBm]	Carrier level [dBm]	Limit (-20dBc) [dBm]	Result
4.884	-55.35	-0.18	-20.18	Pass
9.769	-45.51	-0.18	-20.18	Pass
12.211	-53.44	-0.18	-20.18	Pass
14.653	-43.77	-0.18	-20.18	Pass
19.534	-54.67	-0.18	-20.18	Pass

Operating mode: Tx (2480MHz, 1Mbps)

Frequency [GHz]	Spurious level [dBm]	Carrier level [dBm]	Limit (-20dBc) [dBm]	Result
4.959	-56.42	0.42	-19.58	Pass
9.919	-44.33	0.42	-19.58	Pass
14.878	-51.45	0.42	-19.58	Pass
19.842	-54.73	0.42	-19.58	Pass

Operating mode: Tx (2402MHz, 2Mbps)

Frequency [GHz]	Spurious level [dBm]	Carrier level [dBm]	Limit (-20dBc) [dBm]	Result
4.803	-54.38	-3.51	-23.51	Pass
9.606	-46.25	-3.51	-23.51	Pass
12.007	-56.64	-3.51	-23.51	Pass
14.409	**-43.16**	**-3.51**	**-23.51**	**Pass**
19.212	-55.95	-3.51	-23.51	Pass

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Operating mode: Tx (2442MHz, 2Mbps)

Frequency [GHz]	Spurious level [dBm]	Carrier level [dBm]	Limit (-20dBc) [dBm]	Result
4.883	-55.89	-2.51	-22.51	Pass
9.766	-44.44	-2.51	-22.51	Pass
12.212	-57.27	-2.51	-22.51	Pass
14.649	-45.25	-2.51	-22.51	Pass
19.532	-54.96	-2.51	-22.51	Pass

Operating mode: Tx (2480MHz, 2Mbps)

Frequency [GHz]	Spurious level [dBm]	Carrier level [dBm]	Limit (-20dBc) [dBm]	Result
4.959	-56.54	-1.90	-21.90	Pass
9.918	-46.24	-1.90	-21.90	Pass
12.397	-58.08	-1.90	-21.90	Pass
14.877	-53.22	-1.90	-21.90	Pass
19.836	-56.70	-1.90	-21.90	Pass

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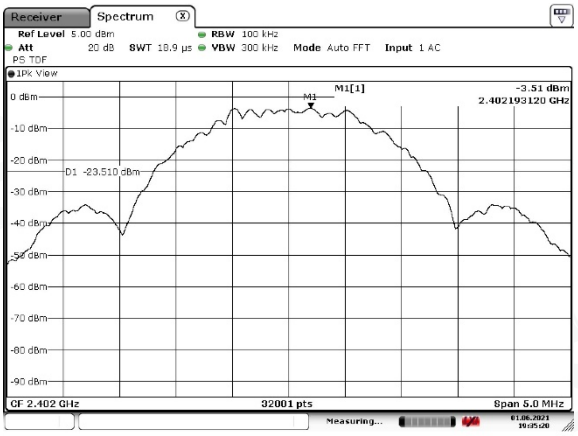
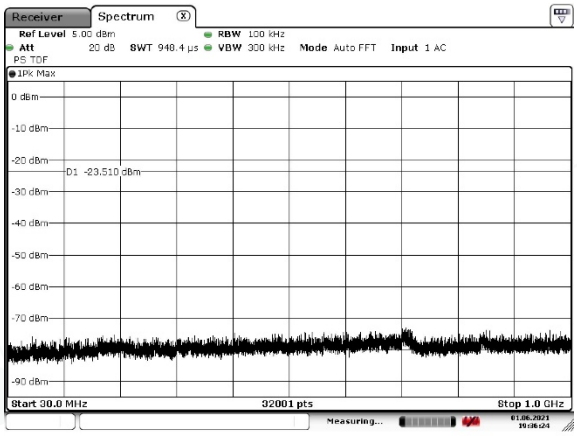
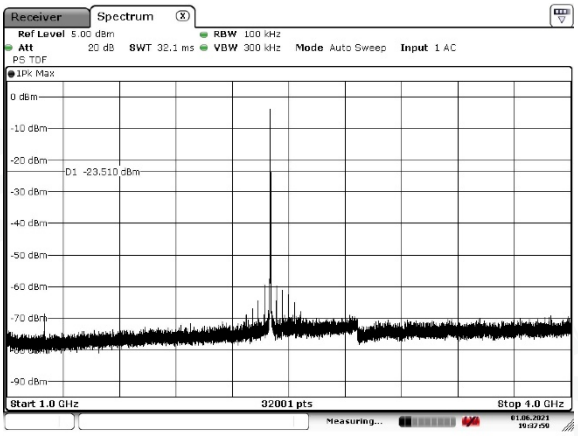
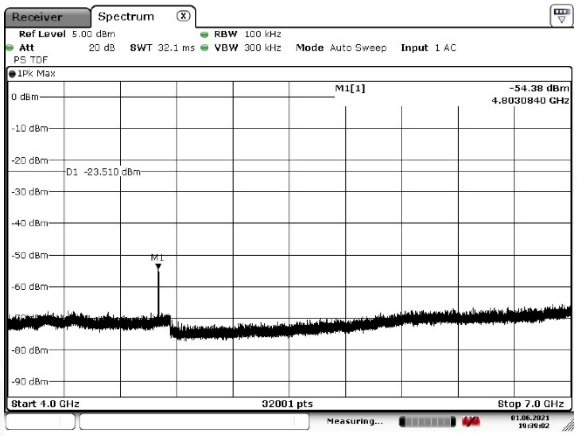
[Chart]

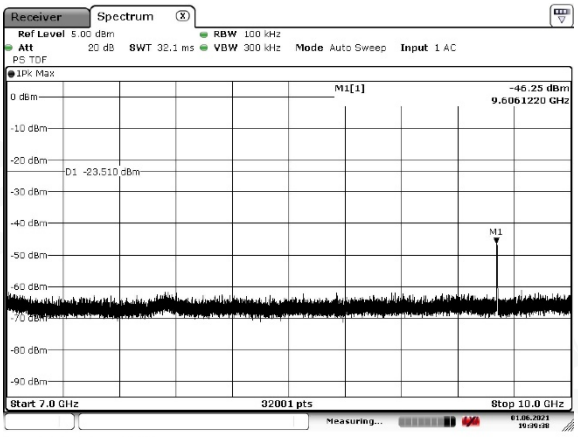
Tx (2402MHz, 2Mbps)

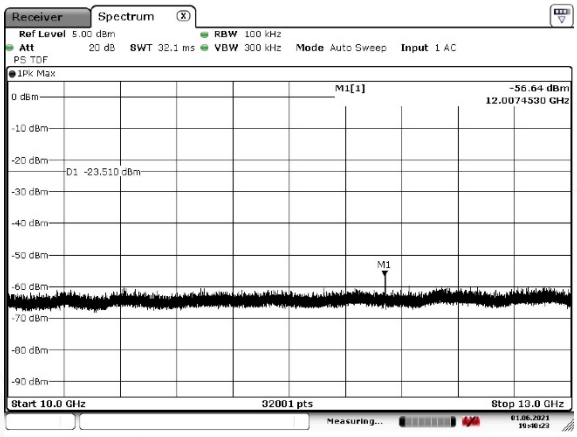












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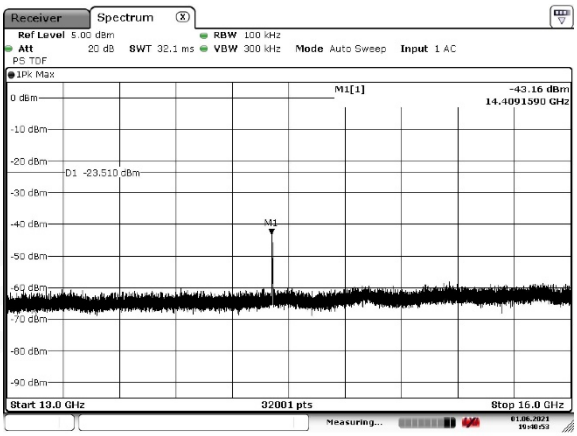

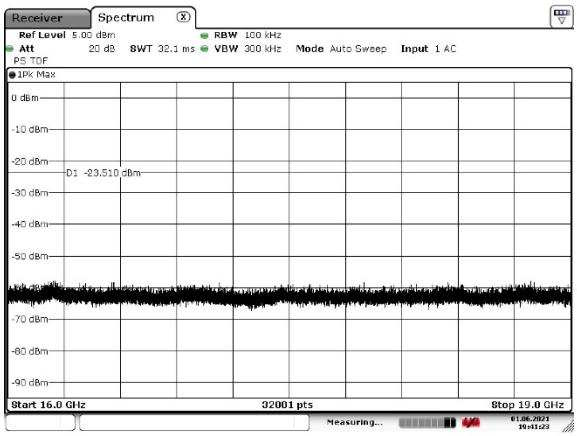

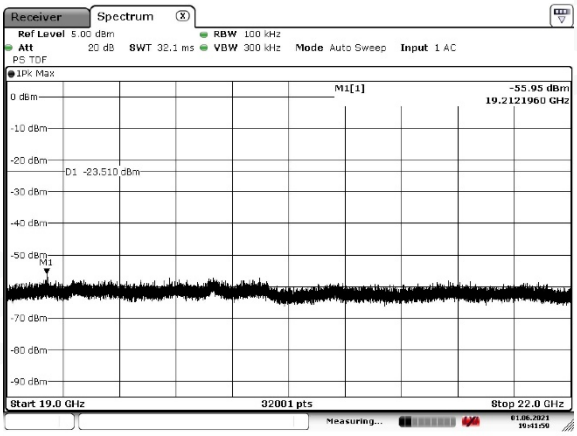

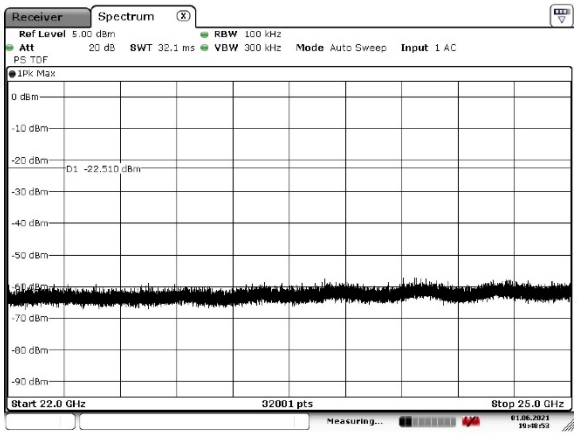

Tested Date:	June 1, 2021	Temperature:	21 deg. C
Humidity:	64 %	Atmos. Press:	1014 hPa

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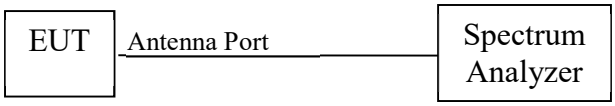
2.5 Power Spectral density

Test setup

Test setup is the following drawing. The antenna port of EUT was connected to the spectrum analyzer.



Test procedure

Spectrum analyzer is set as below according to ANSI C63.10 clause 11.10

- RBW: 3 kHz
- VBW: 10 kHz
- Span > 1.5 x 6dB BW
- Detector: Peak
- Trace: Max hold

Limitation

15.247(e) / RSS-247 5.2 (b): For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

Test equipment used (refer to List of utilized test equipment)

TR10	CL31	-	-	-	-

Test results - *Complied with requirement*

Test Data

Transmission Frequency [MHz]	Spectral Density [dBm]		Limit [dBm]
	1Mbps	2Mbps	
2402	-17.63	-22.59	8
2442	-16.71	-21.63	8
2480	-16.17	-20.76	8

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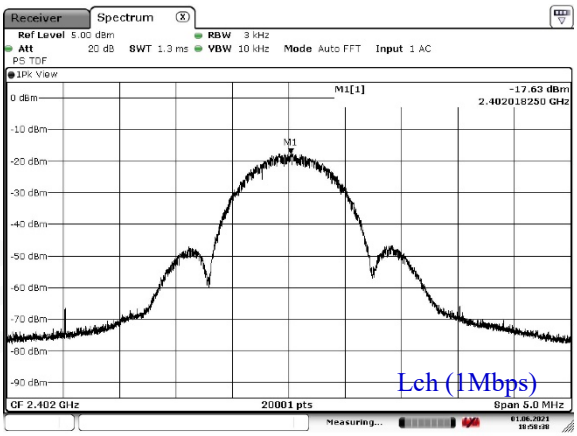

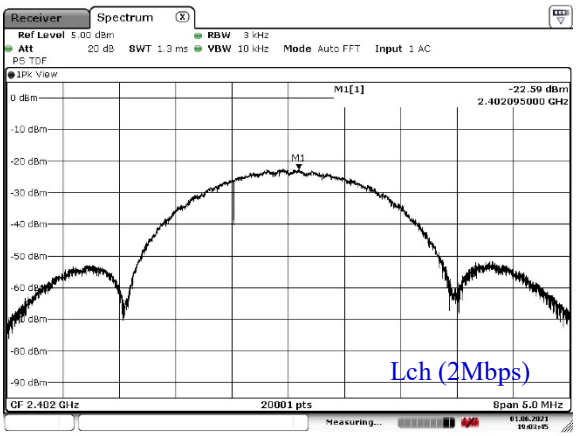

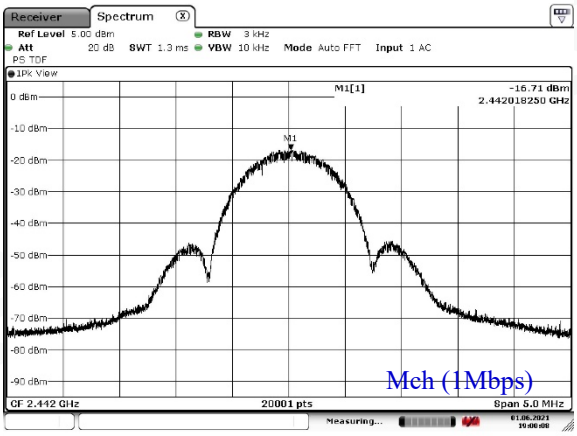

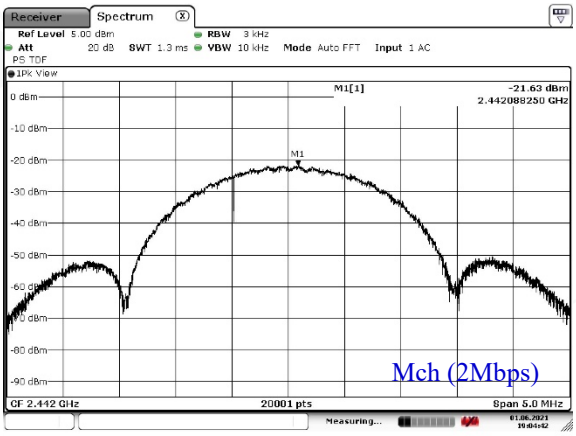

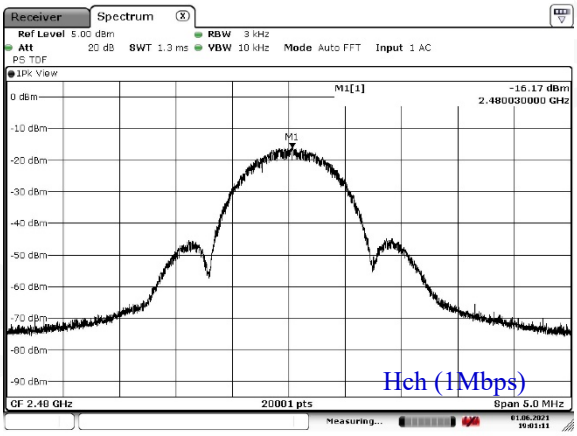

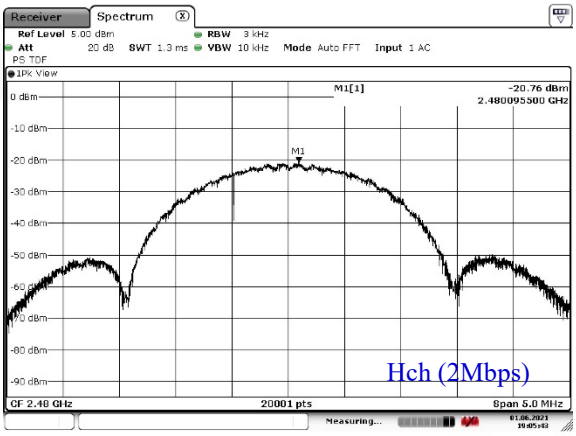

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