



Test report No:
20B0050R-RF-US-P06V03

FCC&ISED TEST REPORT

Product Name	Ring Bridge
Trademark	Ring
Model and /or type reference	5C28S8
FCC ID	2AEUPRBBR003
IC	20271-RBBR003
Applicant's name / address	Ring, LLC. 1523 26th St, Santa Monica, CA 90404
Factor's name / address	AZ e-lite Pte Ltd 31 Ubi Road 1 Aztech Building 408694 Singapore
Test method requested, standard	FCC CFR Title 47 Part 15 Subpart C Section 15.247 ANSI C63.10: 2013 RSS-Gen Issue 5 / RSS-247 Issue 2
Verdict Summary	IN COMPLIANCE
Documented By	Kitty Li/Project Assistant 
Reviewed by (name / position & signature)	Frank He/ Technical Supervisor 
Approved by (name / position & signature)	Jack Zhang/ Supervisor 
Date of issue	2021-02-03
Report template No	Template_FCC 15.247-RF-V1.0

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COMPETENCES AND GUARANTEES

DEKRA is a testing laboratory competent to carry out the tests described in this report.

In order to assure the traceability to other national and international laboratories, DEKRA has a calibration and maintenance program for its measurement equipment.

DEKRA guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated in the report and it is based on the knowledge and technical facilities available at DEKRA at the time of performance of the test.

DEKRA is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

IMPORTANT: No parts of this report may be reproduced or quoted out of context, in any form or by any means, except in full, without the previous written permission of DEKRA.

GENERAL CONDITIONS

Test Location	No. 99, Hongye Road, Suzhou Industrial Park Suzhou, 215006, P.R. China
Date(receive sample)	Nov. 02, 2020
Date (start test)	Nov. 11, 2020
Date (finish test)	Nov. 30, 2020

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or Competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA.

ENVIRONMENTAL CONDITIONS

The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment. The climatic conditions during the tests were within the following limits:

Ambient temperature	15 °C – 35 °C
Relative Humidity air	30% - 60%

If explicitly required in the basic standard or applied product / product family standard the climatic values are recorded and documented separately in this test report.

POSSIBLE TEST CASE VERDICTS

Test case does not apply to test object	N/A
Test object does meet requirement	P (Pass) / PASS
Test object does not meet requirement	F (Fail) / FAIL
Not measured	N/M

ABBREVIATIONS

For the purposes of the present document, the following abbreviations apply:

EUT	: Equipment Under Test
QP	: Quasi-Peak
CAV	: CISPR Average
AV	: Average
CDN	: Coupling Decoupling Network
SAC	: Semi-Anechoic Chamber
OATS	: Open Area Test Site
BW	: Bandwidth
AM	: Amplitude Modulation
PM	: Pulse Modulation
HCP	: Horizontal Coupling Plane
VCP	: Vertical Coupling Plane
U_N	: Nominal voltage
T_x	: Transmitter
R_x	: Receiver
N/A	: Not Applicable
N/M	: Not Measured

DOCUMENT HISTORY

Report No.	Version	Description	Issued Date
20B0050R-RF-US-P06V03	V1.0	Initial issue of report.	2020-11-30
20B0050R-RF-US-P06V03	V1.1	Page 1: Remove blank in IC ID; Page 7: Add information of power meter; Page 9: Add PMN, HVIN information; Page 9: Update information for power supply. (The test report No.: 20B0050R-RF-US-P06V03 V1.1 is to place the test report No.: 20B0050R-RF-US-P06V03 V1.0, and test report 20B0050R-RF-US-P06V03 V1.0 is obsoleted.)	2021-01-14
20B0050R-RF-US-P06V03	V2.0	Page 1&9: Update product name and model. Section 4.1.4: Add test data of simultaneous transmission. (The test report No.: 20B0050R-RF-US-P06V03 V2.0 is to place the test report No.: 20B0050R-RF-US-P06V03 V1.1, and test report 20B0050R-RF-US-P06V03 V1.1 is obsoleted.)	2021-02-03

REMARKS AND COMMENTS

1. The equipment under test (EUT) does meet the essential requirements of the stated standard(s)/test(s).
2. These test results on a sample of the device are for the purpose of demonstrating Compliance with FCC 15.247.
3. The measurement result is considered in conformance with the requirement if it is within the prescribed limit, It is not necessary to account the uncertainty associated with the measurement result.
4. The test results presented in this report relate only to the object tested.
5. The test report shall not be reproduced without the written approval of DEKRA Testing and Certification (Suzhou) Co., Ltd.
6. This report will not be used for social proof function in China market.
7. DEKRA declines any responsibility with the following test data provided by customer that may affect the validity of result:
 - Chapter 1.1 General Description of the Item(s);
 - Chapter 1.2 Antenna Informaion.

USED EQUIPMENT

RF conducted test / TR8(Chamber details)

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2020.08.15	2021.08.14
EXA Spectrum Analyzer	Keysight	N9010A	MY55370495	2020.04.17	2021.04.16
MXA Signal Analyzer	Keysight	N9020A	MY56060147	2020.08.15	2021.08.14
Power Meter	Keysight	N1912A	MY60300004	2020.11.14	2021.11.13
Power Sensor	Keysight	N1921A	MY60350003	2020.11.14	2021.11.13
Temperature/Humidity Meter	RTS	RTS-8S	RF08	2020.08.13	2021.08.12
DEKRA test software	N/A	N/A	N/A	N/A	N/A

Radiated Emission(30MHz-1GHz) / AC2(Chamber details)

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
EMI Test Receiver	R&S	ESCI	100573	2019.12.28	2020.12.27
Bilog Antenna	Teseq GmbH	CBL6112D	27611	2020.09.11	2021.09.10
Temperature/Humidity Meter	RTS	RTS-8S	AC2-TH	2020.08.13	2021.08.12
Coaxial Cable	Huber+Suhner	RG 214	AC2-C	2020.04.05	2021.04.04
DEKRA test software	N/A	N/A	N/A	N/A	N/A

Radiated Emission / AC5(1GHz-40GHz)(Chamber details)

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
EMI Receiver	Agilent	N9038A	MY51210196	2020.04.18	2021.04.17
DRG Horn	ETS-Lindgren	3117	00123988	2020.09.21	2021.09.20
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170D	750	2019.01.05	2021.01.04
Pre-Amplifier	Schwarzbeck	BBV 9721	9721-024	2019.07.17	2021.07.16
Temperature/Humidity Meter	RTS	RTS-8S	AC5-TH	2020.08.13	2021.08.12
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2020.04.05	2021.04.04
DEKRA test software	N/A	N/A	N/A	N/A	N/A

UNCERTAINTY

Uncertainties have been calculated according to the DEKRA internal document. The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

Test item	Uncertainty
AC Power Line Conducted Emission	± 2.92 dB
Peak Power Output	± 1.13 dB
Radiated Emission(30MHz~1GHz)	Horizontal: 30MHz~200MHz: 4.60 dB 200MHz~1GHz: 4.10 dB Vertical: 30MHz~200MHz: 4.80 dB 200MHz~1GHz: 4.10 dB
Radiated Emission(1GHz~26.5GHz)	Horizontal: 1GHz~18GHz: 5.00 dB Vertical: 1GHz~18GHz: 4.80 dB Horizontal: 18GHz~40GHz: 4.70 dB Vertical: 18GHz~40GHz: 4.60 dB
RF antenna conducted test	± 1.13 dB
Radiated Emission Band Edge	± 5.00 dB
DTS Bandwidth	± 279 Hz
Occupied Bandwidth	± 279 Hz
Power Density	± 1.13 dB

1 GENERAL INFORMATION

1.1 General Description of the Item(s)

Model / Type number	5C28S8
Trademark.....	Ring
PMN	5C28S8-A
HVIN.....	5C28S8-A
Firmware Version.....	0.7.5-33
Manufacturer	Ring, LLC.
Manufacturer Address.....	1523 26th St, Santa Monica, CA 90404

Wireless specification	LoRa
Operating frequency range(s) :	LoRa(DTS) : 902.5MHz~926.5MHz :500KH
Modulation	LoRa
Data Rate.....	LoRa: DR0/1/2/3/4/5/6/7
Number of channel.....	LoRa(DTS): 31
Device category	<input type="checkbox"/> Fixed point-to-point
	<input type="checkbox"/> Emit multiple directional beams, simultaneously or sequentially
	<input checked="" type="checkbox"/> Other cases

Rated power supply	Voltage and Frequency	
	<input type="checkbox"/>	AC: 220 - 240 V, 50/60 Hz
	<input type="checkbox"/>	AC: 100 - 240 V, 50/60 Hz
	<input type="checkbox"/>	DC: 12 - 24 Vdc
	<input type="checkbox"/>	Battery:
	<input checked="" type="checkbox"/>	Adapter: 5V
Brand of adapter	SUNUN	
Adapter model.....	SA68-050100U	
Mounting position.....	<input type="checkbox"/>	Table top equipment
	<input checked="" type="checkbox"/>	Wall/Ceiling mounted equipment
	<input type="checkbox"/>	Floor standing equipment
	<input type="checkbox"/>	Hand-held equipment
	<input type="checkbox"/>	Other:

Note: This device does not belong to the HYBRID SYSTEM EQUIPMENT

1.2 Antenna Information

Antenna model / type number..... :	N/A		
Antenna serial number..... :	N/A		
Antenna Delivery	<input checked="" type="checkbox"/>	1TX + 1RX	
	<input type="checkbox"/>	2TX + 2RX	
	<input type="checkbox"/>	Others:.....	
Antenna technology	<input checked="" type="checkbox"/>	SISO	
	<input type="checkbox"/>	MIMO	<input type="checkbox"/> Basic
			<input type="checkbox"/> CDD
			<input type="checkbox"/> Sectorized
			<input type="checkbox"/> Beam-forming
Antenna Type..... :	<input type="checkbox"/>	External	<input type="checkbox"/> Dipole
			<input type="checkbox"/> Sectorized
			<input checked="" type="checkbox"/>
	<input type="checkbox"/>	PCB	
	<input type="checkbox"/>	Metal Antenna	
	Antenna Gain	-1.0 dBi	

Note: The General Description of the Item and antenna information in clause 1 are provided and confirmed by the client.

2 DESCRIPTION OF TEST SETUP

2.1 Operating mode(s) used for tests

During the tests the following operating mode(s) has(have) been used.

Test Mode	Mode 1: Transmit by Lora with DTS 500K bandwidth(902.5-926.5)
	Mode 2: Simultaneous transmission

2.2 Support / Auxiliary equipment / unit / Test software for the EUT

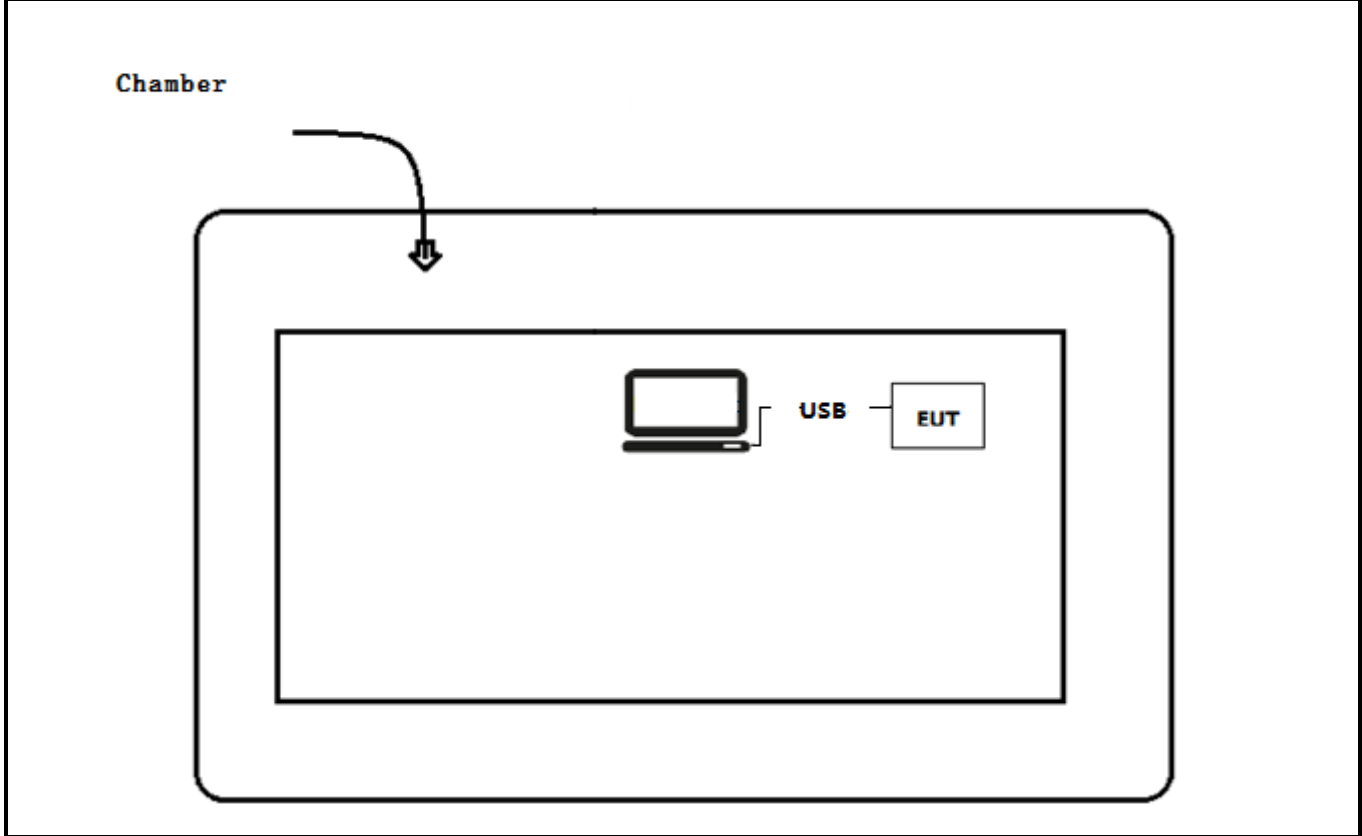
The EUT has been tested with the following auxiliary equipment / unit / software:

Auxiliary equipment	Type / Version	Manufacturer	Supplied by
Notebook	Think pad x220	Lenovo	Adapter
USB Control Cable	Serial to USB	N/A	N/A
software	Type / Version	Manufacturer	Supplied by
IPOP	V4.1	N/A	N/A

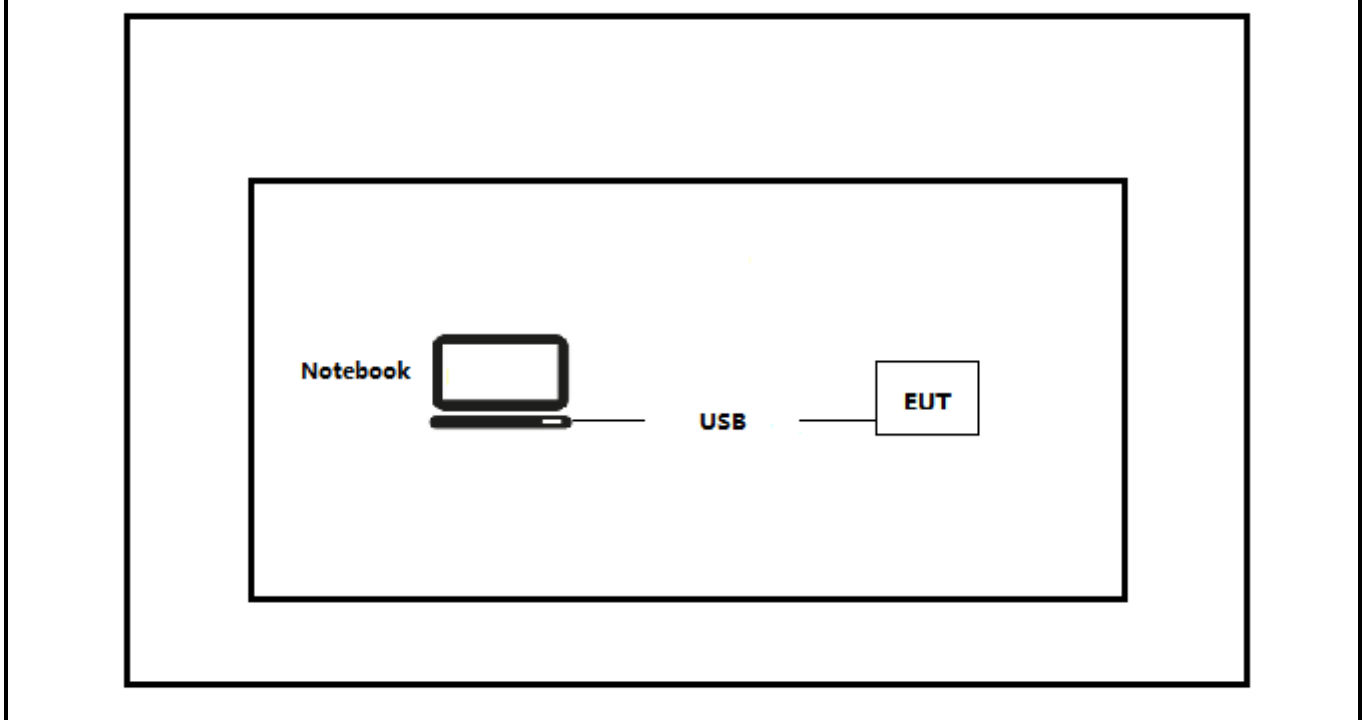
2.3 Test Configuration / Block diagram used for tests

The following test setup / configuration / block diagram has been used during the tests:

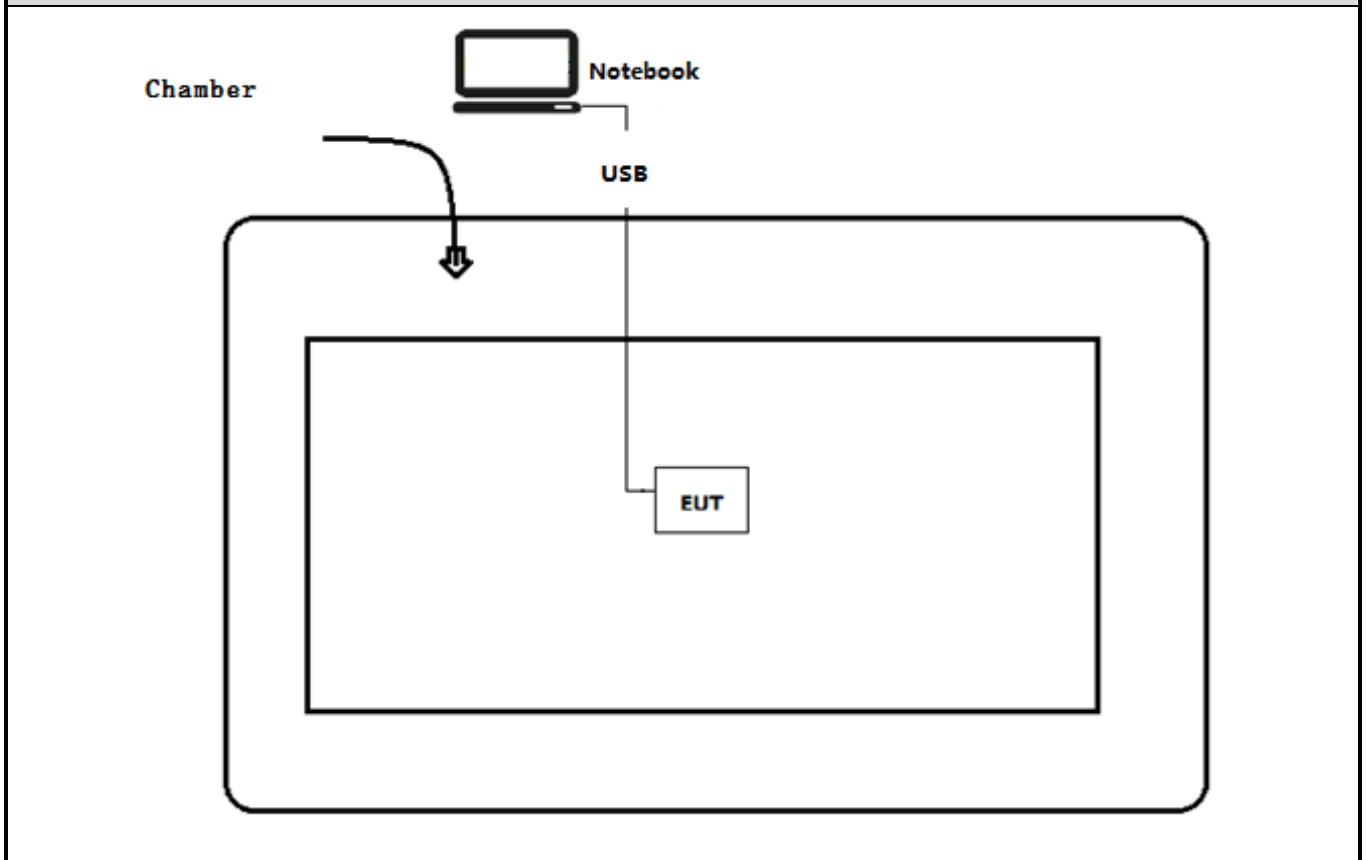
Test setup Diagram- AC Line Conducted Emission Test



Test setup Diagram- Conducted test



Test setup Diagram- Radiated test



2.4 Testing process

1	Setup the EUT as shown in Section 2.4.
2	Input the commands.
3	Configure the test mode, the test channel, and the data rate.
4	Start the continuous Transmitter.
5	Verify that the EUT works properly.

3 VERDICT SUMMARY SECTION

This chapter presents an overview of standards and results. Refer to the next chapters for details of measured test results and applied test levels.

3.1 Standards

Standard	Year	Description
FCC CFR Title 47 Part 15 Subpart C Section 15.247	2020	Operation within the bands 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz.
ANSI C63.10	2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
RSS-Gen Issue 5 Amendment 1	2019	General Requirements for Compliance of Radio Apparatus
RSS-247 Issue 2	2017	Digital Transmission Systems (DTSS), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

3.2 Overview of results

Requirement – Test case	Basic standard(s)	Verdict	Remark
Emissions in restricted frequency bands	FCC 15.247(d), 15.209	PASS	---
Radiated Emission Band Edge	FCC 15.247(d), 15.209	PASS	---
Fundamental emission output power	FCC 15.247(b)(3)	PASS	---

Note: This report is based on DEKRA report(NO.:2040170R-RF-US-P06V03), the Ring bridge LDO V2 is based on 5C28S8 and update PCB layout only, so we only test fundamental emission output power, radiated emission band edge and emissions in restricted frequency bands.

3.3 Test Facility

USA	:	FCC Designation Number: CN1199
Canada	:	CAB identifier Number: CN0040

4 TEST RESULTS

4.1 Emissions in restricted frequency bands	VERDICT: PASS
--	----------------------

4.1.1 Limit			
Standard		FCC Part 15 Subpart C Paragraph 15.205; 15.209	
Restricted Bands of operation for FCC			
Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.090 – 0.110	16.42 – 16.423	399.9 – 410	4.5 – 5.15
0.495 – 0.505	16.69475 – 16.69525	608 – 614	5.35 – 5.46
2.1735 – 2.1905	16.80425 – 16.80475	960 – 1240	7.25 – 7.75
4.125 – 4.128	25.5 – 25.67	1300 – 1427	8.025 – 8.5
4.17725 – 4.17775	37.5 – 38.25	1435 – 1626.5	9.0 – 9.2
4.20725 – 4.20775	73 – 74.6	1645.5 – 1646.5	9.3 – 9.5
6.215 – 6.218	74.8 – 75.2	1660 – 1710	10.6 – 12.7
6.26775 – 6.26825	108 – 121.94	1718.8 – 1722.2	13.25 – 13.4
6.31175 – 6.31225	123 – 138	2200 – 2300	14.47 – 14.5
8.291 – 8.294	149.9 – 150.05	2310 – 2390	15.35 – 16.2
8.362 – 8.366	156.52475 – 156.52525	2483.5 – 2500	17.7 – 21.4
8.37625 – 8.38675	156.7 – 156.9	2690 – 2900	22.01 – 23.12
8.81425 – 8.81475	162.0125 – 167.17	3260 – 3267	23.6 – 24.0
12.29 – 12.293	167.72 – 173.2	3332 – 3339	31.2 – 31.8
12.51975 – 12.52025	240 – 285	3345.8 – 3358	36.43 – 36.5
12.57675 – 12.57725	322 – 335.4	3600 – 4400	Above 38.6
13.36 – 13.41	--	--	--
Restricted Bands of operation for ISED			
0.090 - 0.110	13.36 - 13.41	960 - 1427	9.0 - 9.2
0.495 - 0.505	16.42 - 16.423	1435 - 1626.5	9.3 - 9.5
2.1735 - 2.1905	16.69475 - 16.69525	1645.5 - 1646.5	10.6 - 12.7
3.020 - 3.026	16.80425 - 16.80475	1660 - 1710	13.25 - 13.4
4.125 - 4.128	25.5 - 25.67	1718.8 - 1722.2	14.47 - 14.5
4.17725 - 4.17775	37.5 - 38.25	2200 - 2300	15.35 - 16.2
4.20725 - 4.20775	73 - 74.6	2310 - 2390	17.7 - 21.4
5.677 - 5.683	74.8 - 75.2	2483.5 - 2500	22.01 - 23.12
6.215 - 6.218	108 - 138	2655 - 2900	23.6 - 24.0
6.26775 - 6.26825	149.9 - 150.05	3260 - 3267	31.2 - 31.8
6.31175 - 6.31225	156.52475 - 156.52525	3332 - 3339	36.43 - 36.5
8.291 - 8.294	156.7 - 156.9	3345.8 - 3358	Above 38.6
8.362 - 8.366	162.0125 - 167.17	3500 - 4400	--
8.37625 - 8.38675	167.72 - 173.2	4500 - 5150	--
8.41425 - 8.41475	240 - 285	5350 - 5460	--
12.29 - 12.293	322 - 335.4	7250 - 7750	--
12.51975 - 12.52025	399.9 - 410	8025 - 8500	--
12.57675 - 12.57725	608 - 614	--	--

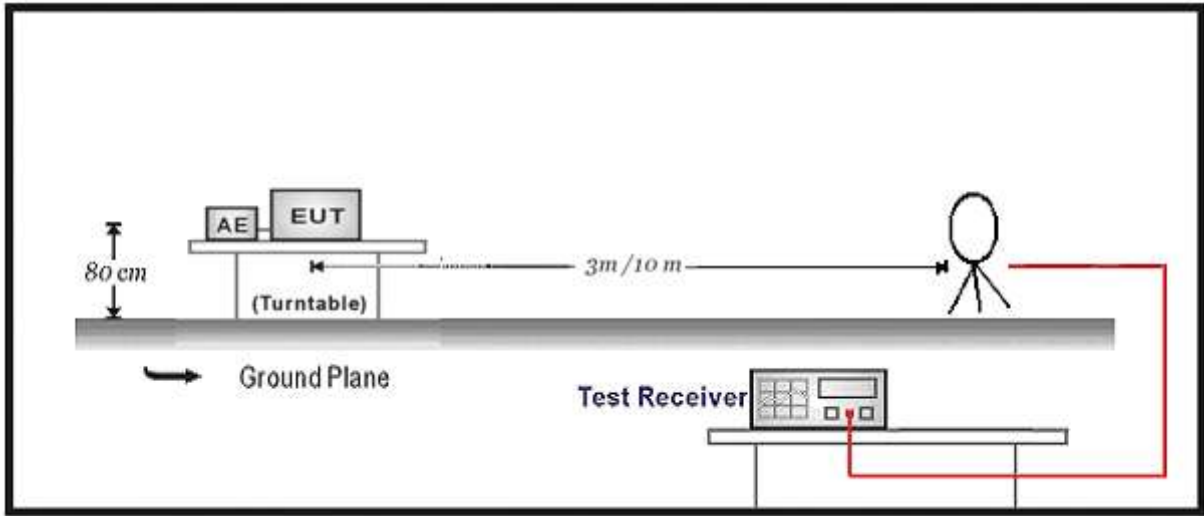
Restricted Band Emissions Limit			
Frequency (MHz)	Field strength (μV/m)	Field strength (dBμV/m)	Measurement distance (m)
0.009 - 0.49	2400/F(kHz)	48.5 – 13.8	300 _(Note 1)
0.49 - 1.705	24000/F(kHz)	33.8 - 23	30 _(Note 1)
1.705 - 30	30	29.5	30 _(Note 1)
30 - 88	100	40	3 _(Note 2)
88 - 216	150	43.5	3 _(Note 2)
216 - 960	200	46	3 _(Note 2)
Above 960	500	54	3 _(Note 2)

Note 1: At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade).

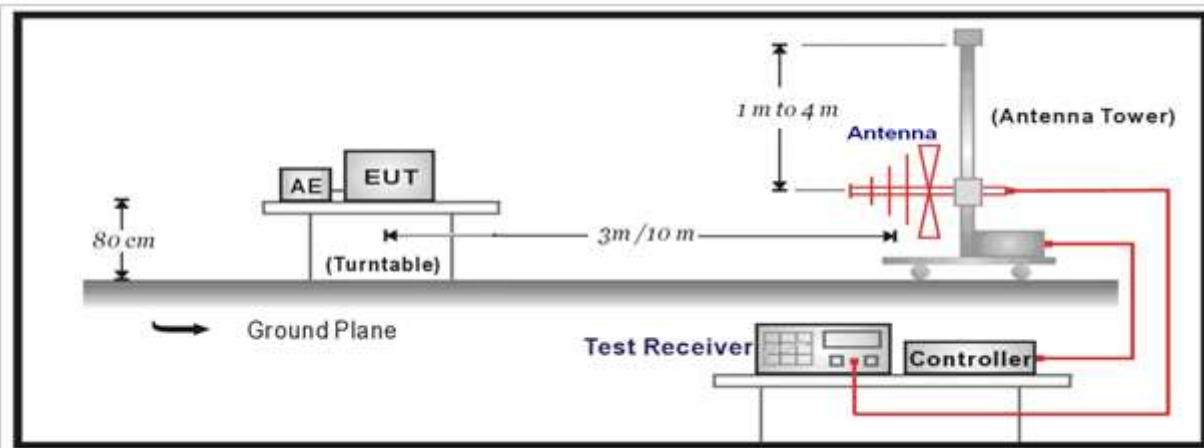
Note 2: At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

4.1.2 Test Setup

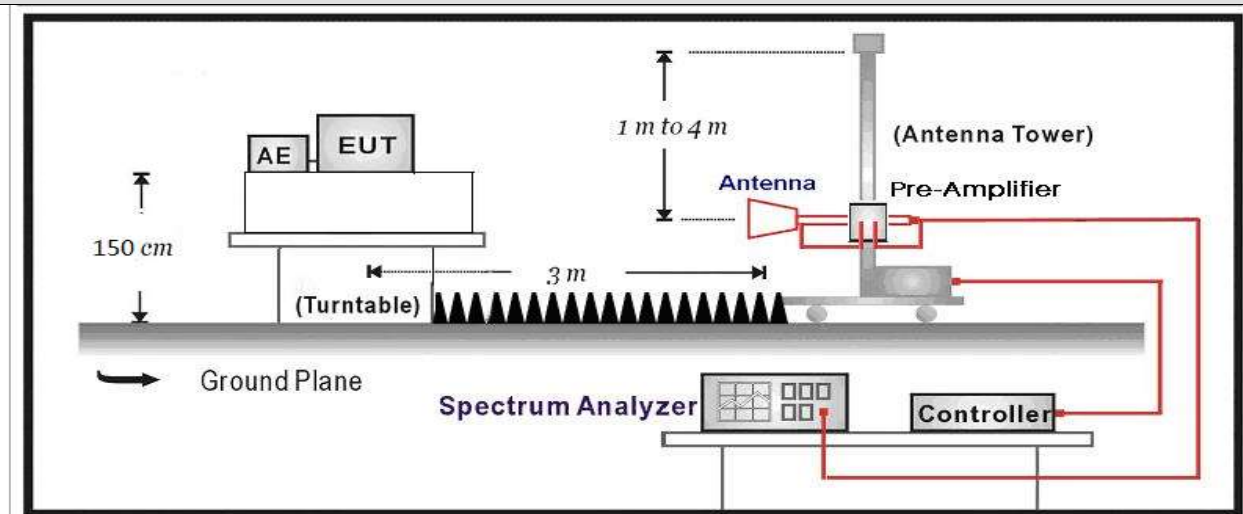
Below 30MHz Test Setup:



30MHz-1GHz Test Setup:



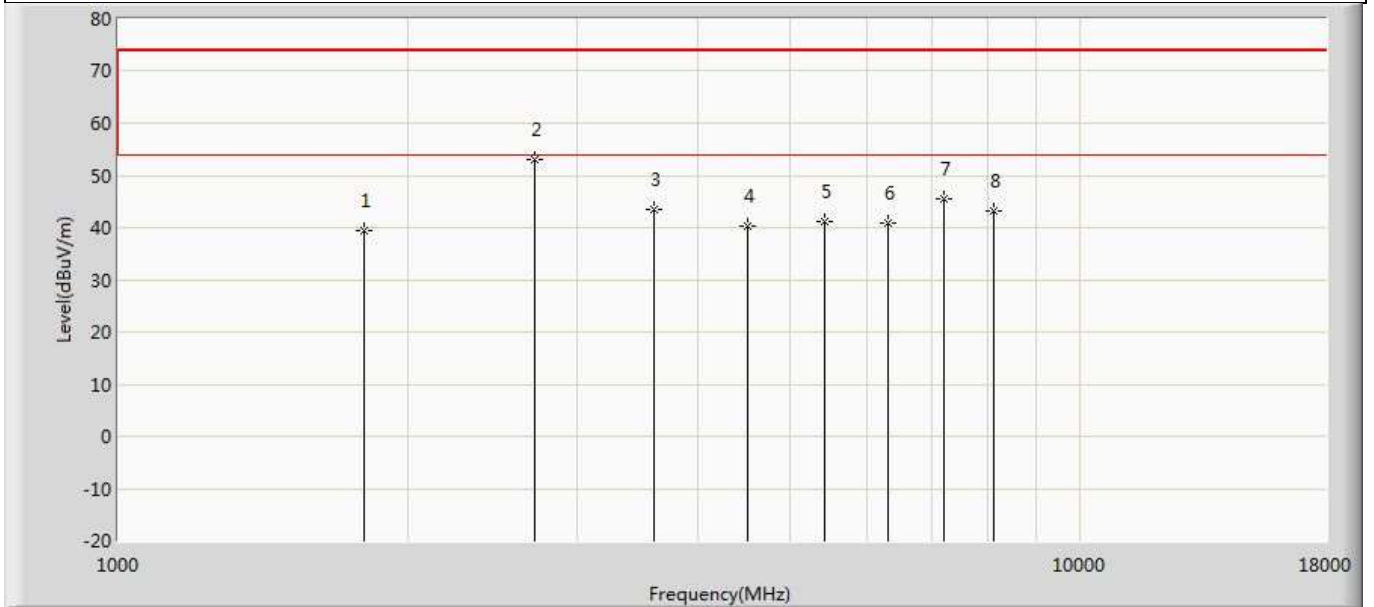
Above 1GHz Test Setup:



4.1.3 Test Procedure			
	References Rule	Chapter	Description
<input checked="" type="checkbox"/>	ANSI C63.10	11.12	Emissions in restricted frequency bands
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.1	Radiated emission measurements
	<input checked="" type="checkbox"/> ANSI C63.10	6.3	Radiated spurious emission test
	<input checked="" type="checkbox"/> ANSI C63.10	6.4	Radiated emissions from unlicensed wireless devices below 30 MHz
	<input checked="" type="checkbox"/> ANSI C63.10	6.5	Radiated emissions from unlicensed wireless devices in the frequency range of 30 MHz to 1000 MHz
	<input checked="" type="checkbox"/> ANSI C63.10	6.6	Radiated emissions from unlicensed wireless devices above 1 GHz
	<input type="checkbox"/> ANSI C63.10	11.12.2	Antenna-port conducted measurements
	<input type="checkbox"/> ANSI C63.10	11.12.2.3	Quasi-peak measurement procedure
	<input type="checkbox"/> ANSI C63.10	11.12.2.4	Peak power measurement procedure
	<input type="checkbox"/> ANSI C63.10	11.12.2.5	Average power measurement procedures
	<input type="checkbox"/> ANSI C63.10	11.12.2.5.1	Trace averaging with continuous EUT transmission at full power
	<input type="checkbox"/> ANSI C63.10	11.12.2.5.2	Trace averaging across ON and OFF times of the EUT transmissions followed by duty cycle correction
	<input type="checkbox"/> ANSI C63.10	11.12.2.5.3	Reduced VBW averaging across ON and OFF times of the EUT transmissions with max hold

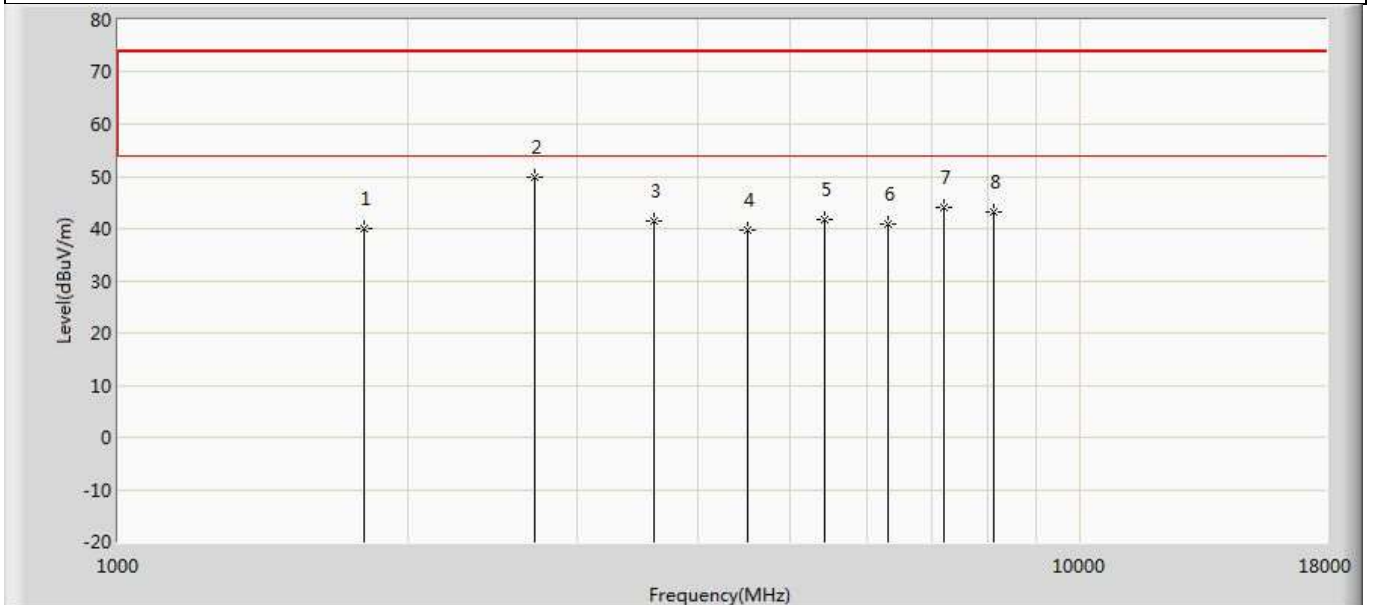
4.1.4 Test Data

Profile: 20B0050R	Page No.: 31
Engineer: Yingfeiwang	
Site: AC5	Time: 2020/11/26 - 19:34
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: Ring bridge LDO V2	Power: AC 120V/60Hz
Note: Mode 1: Transmit at 902.5MHz	



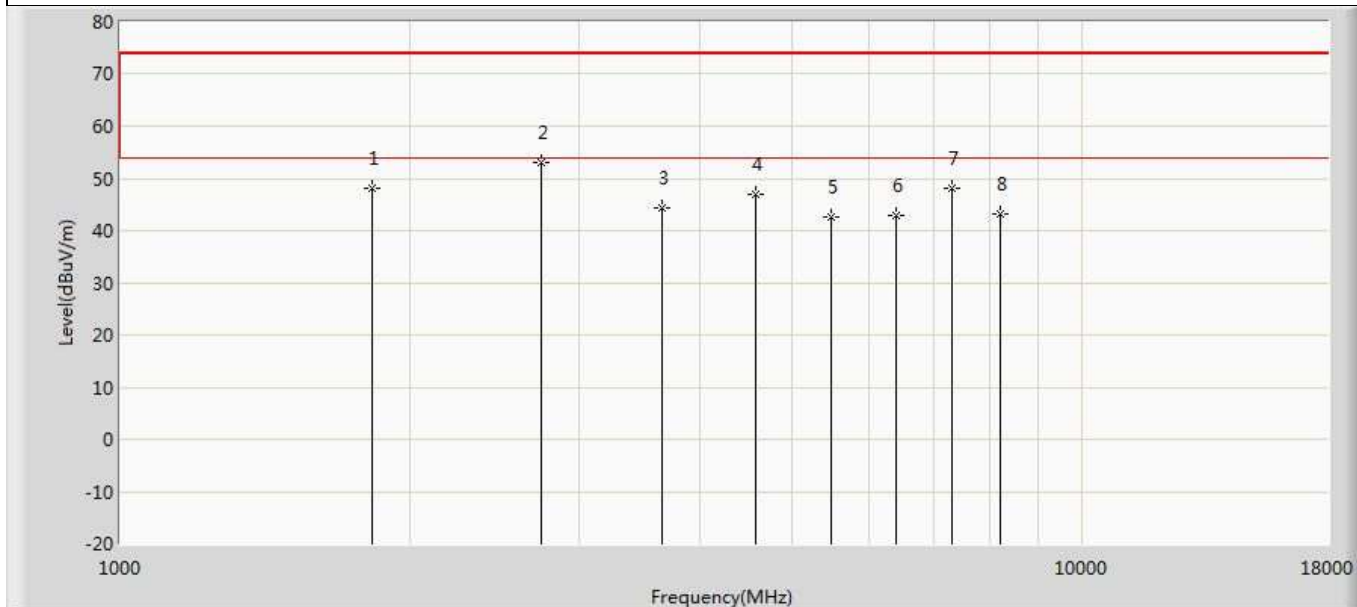
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		1805.000	39.395	50.785	-34.605	74.000	-11.391	PK
2	*	2707.500	53.012	61.779	-20.988	74.000	-8.766	PK
3		3610.000	43.393	50.244	-30.607	74.000	-6.851	PK
4		4512.500	40.292	45.720	-33.708	74.000	-5.428	PK
5		5415.000	41.184	45.038	-32.816	74.000	-3.854	PK
6		6317.500	40.922	43.464	-33.078	74.000	-2.543	PK
7		7220.000	45.410	47.359	-28.590	74.000	-1.949	PK
8		8122.500	43.183	44.950	-30.817	74.000	-1.767	PK

Profile: 20B0050R	Page No.: 32
Engineer: Yingfeiwang	
Site: AC5	Time: 2020/11/26 - 19:34
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: Ring bridge LDO V2	Power: AC 120V/60Hz
Note: Mode 1: Transmit at 902.5MHz	



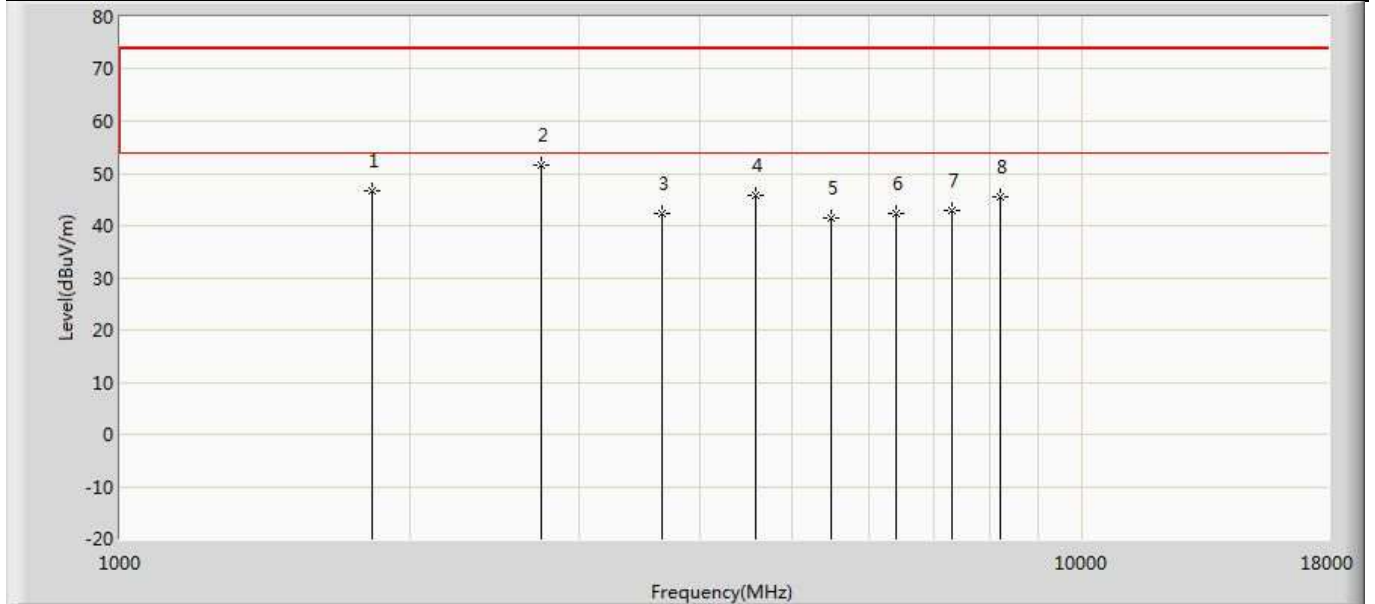
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		1805.000	39.942	51.332	-34.058	74.000	-11.391	PK
2	*	2707.500	49.915	58.682	-24.085	74.000	-8.766	PK
3		3610.000	41.392	48.243	-32.608	74.000	-6.851	PK
4		4512.500	39.697	45.125	-34.303	74.000	-5.428	PK
5		5415.000	41.793	45.647	-32.207	74.000	-3.854	PK
6		6317.500	40.754	43.296	-33.246	74.000	-2.543	PK
7		7220.000	44.146	46.095	-29.854	74.000	-1.949	PK
8		8122.500	43.213	44.980	-30.787	74.000	-1.767	PK

Profile: 20B0050R	Page No.: 33
Engineer: Yingfeiwang	
Site: AC5	Time: 2020/11/26 - 19:34
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: Ring bridge LDO V2	Power: AC 120V/60Hz
Note: Mode 1: Transmit at 914.5MHz	



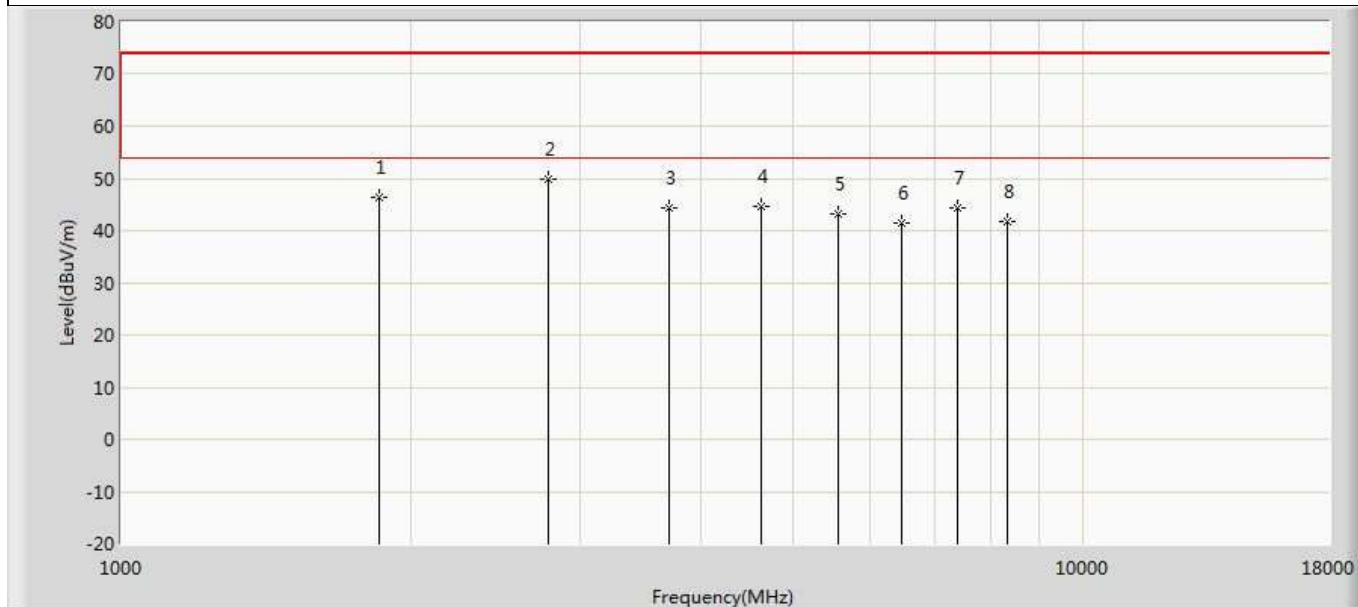
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		1829.000	48.196	58.679	-25.804	74.000	-10.483	PK
2	*	2743.500	53.123	62.719	-20.877	74.000	-9.596	PK
3		3658.000	44.362	50.830	-29.638	74.000	-6.468	PK
4		4572.500	47.067	51.239	-26.933	74.000	-4.173	PK
5		5487.000	42.470	45.205	-31.530	74.000	-2.735	PK
6		6401.500	42.846	44.986	-31.154	74.000	-2.140	PK
7		7316.000	47.984	50.076	-26.016	74.000	-2.092	PK
8		8230.500	43.063	44.776	-30.937	74.000	-1.713	PK

Profile: 20B0050R	Page No.: 34
Engineer: Yingfeiwang	
Site: AC5	Time: 2020/11/26 - 19:34
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: Ring bridge LDO V2	Power: AC 120V/60Hz
Note: Mode 1: Transmit at 914.5MHz	



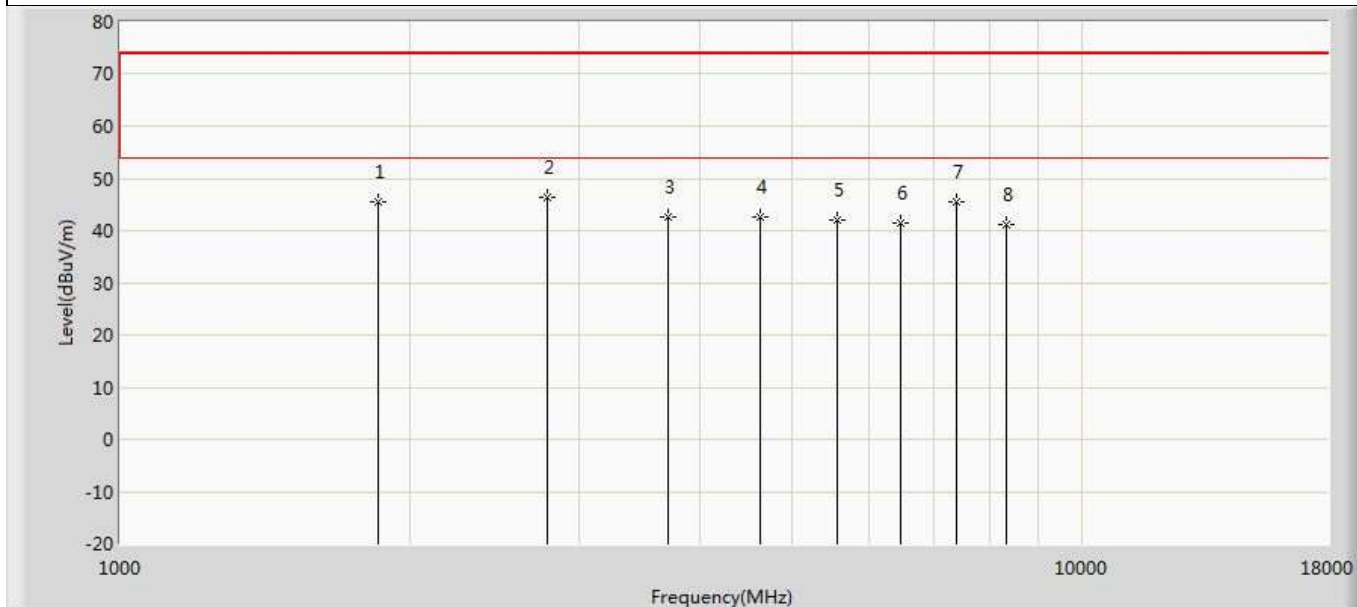
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		1829.000	46.733	57.216	-27.267	74.000	-10.483	PK
2	*	2743.500	51.623	61.219	-22.377	74.000	-9.596	PK
3		3658.000	42.453	48.921	-31.547	74.000	-6.468	PK
4		4572.500	45.703	49.875	-28.297	74.000	-4.173	PK
5		5487.000	41.518	44.253	-32.482	74.000	-2.735	PK
6		6401.500	42.249	44.389	-31.751	74.000	-2.140	PK
7		7316.000	42.996	45.088	-31.004	74.000	-2.092	PK
8		8230.500	45.547	47.260	-28.453	74.000	-1.713	PK

Profile: 20B0050R	Page No.: 35
Engineer: Yingfeiwang	
Site: AC5	Time: 2020/11/26 - 19:34
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: Ring bridge LDO V2	Power: AC 120V/60Hz
Note: Mode 1: Transmit at 926.5MHz	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		1853.000	46.484	57.564	-27.516	74.000	-11.080	PK
2	*	2779.500	49.859	58.764	-24.141	74.000	-8.904	PK
3		3706.000	44.372	51.000	-29.628	74.000	-6.628	PK
4		4632.500	44.728	49.909	-29.272	74.000	-5.181	PK
5		5559.000	43.197	46.812	-30.803	74.000	-3.616	PK
6		6485.500	41.447	43.015	-32.553	74.000	-1.568	PK
7		7412.000	44.391	46.975	-29.609	74.000	-2.584	PK
8		8338.500	41.674	43.570	-32.326	74.000	-1.896	PK

Profile: 20B0050R	Page No.: 36
Engineer: Yingfeiwang	
Site: AC5	Time: 2020/11/26 - 19:34
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: Ring bridge LDO V2	Power: AC 120V/60Hz
Note: Mode 1: Transmit at 926.5MHz	

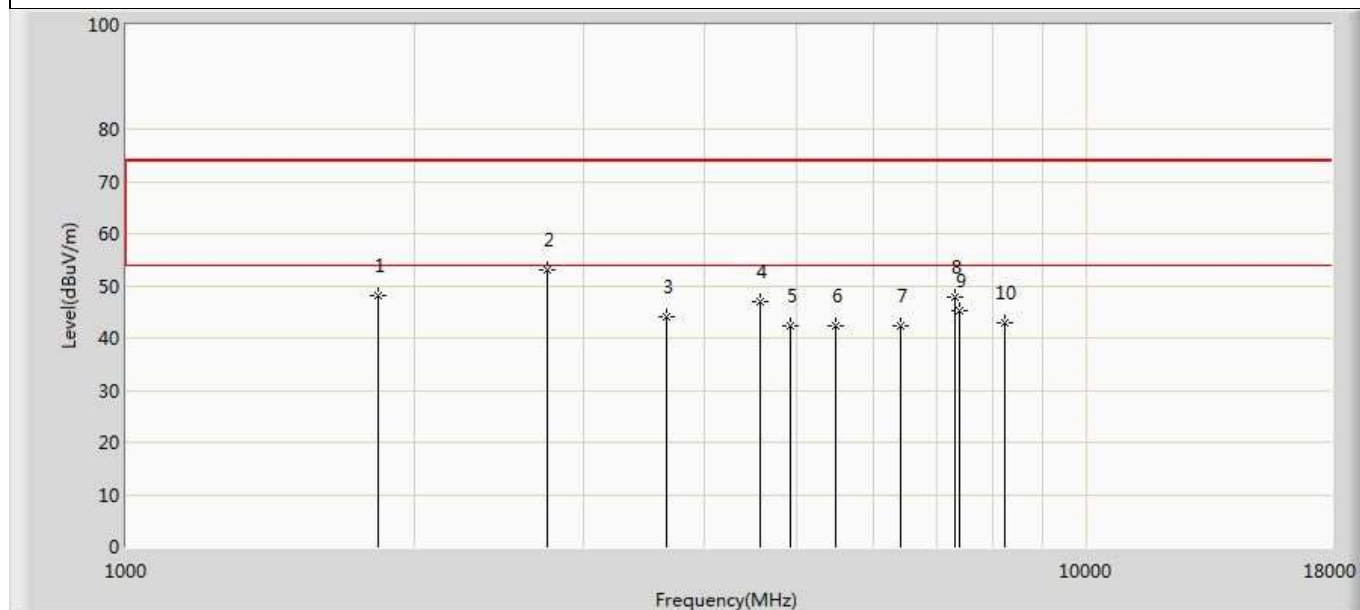


No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		1853.000	45.464	56.544	-28.536	74.000	-11.080	PK
2	*	2779.500	46.476	55.381	-27.524	74.000	-8.904	PK
3		3706.000	42.486	49.114	-31.514	74.000	-6.628	PK
4		4632.500	42.567	47.748	-31.433	74.000	-5.181	PK
5		5559.000	42.129	45.744	-31.871	74.000	-3.616	PK
6		6485.500	41.594	43.162	-32.406	74.000	-1.568	PK
7		7412.000	45.595	48.179	-28.405	74.000	-2.584	PK
8		8338.500	41.030	42.926	-32.970	74.000	-1.896	PK

Remark	<p>1. " * ", means this data is the worst emission level.</p> <p>2. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).</p> <p>3. The test frequency range, 9kHz~30MHz and Above 18GHz worst case are at least 6dB below the limits, therefore no data appear in the report.</p> <p>4. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.</p> <p>5. The No. 1 is non-restricted bands, so the limit is Fundamental emission down 20dB, and then we evaluated each channel, it is complies with the RSE requirements.</p>
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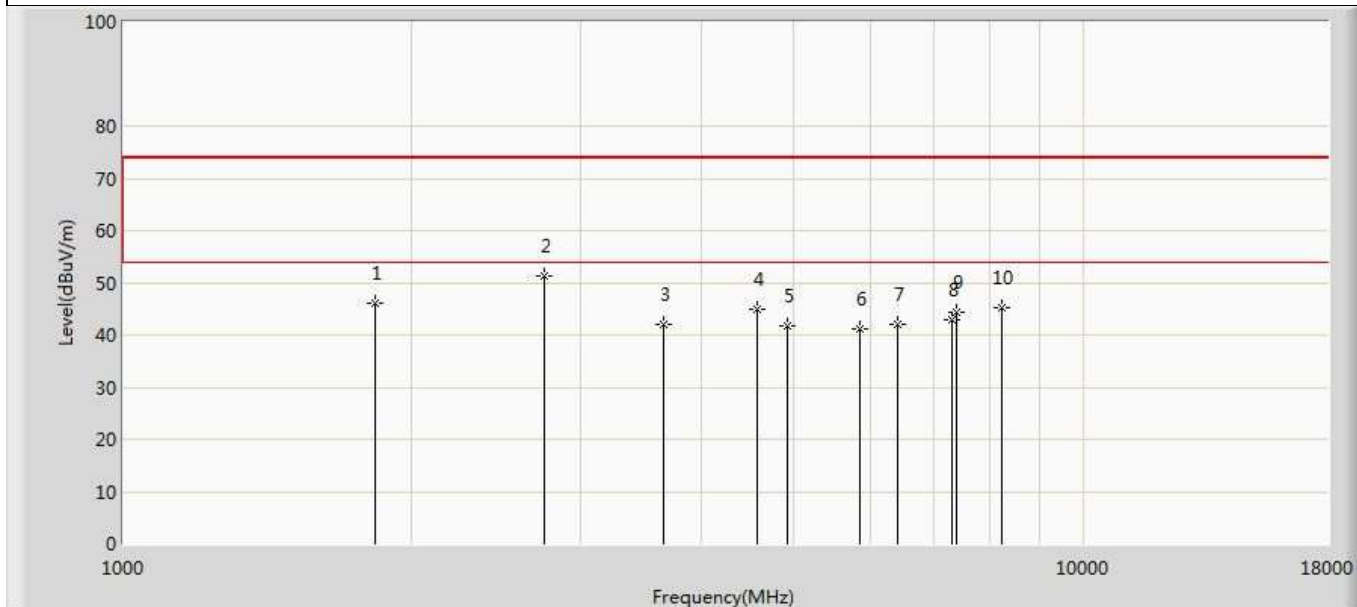
The worst case of simultaneous transmission:

Profile: 20B0050R	Page No.: 71
Engineer: Tim.Cao	
Site: AC5	Time: 2021/02/03 - 18:33
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: Ring bridge LDO V2	Power: AC 120V/60Hz
Note: Mode 2: Simultaneous transmission	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		1829.000	48.049	58.532	-25.951	74.000	-10.483	PK
2	*	2743.500	53.114	62.710	-20.886	74.000	-9.596	PK
3		3658.000	44.080	50.548	-29.920	74.000	-6.468	PK
4		4572.500	46.953	51.126	-27.047	74.000	-4.173	PK
5		4924.000	42.266	46.917	-31.734	74.000	-4.651	PK
6		5487.000	42.397	45.132	-31.603	74.000	-2.735	PK
7		6401.500	42.326	44.466	-31.674	74.000	-2.140	PK
8		7316.000	47.855	49.947	-26.145	74.000	-2.092	PK
9		7386.000	45.162	47.069	-28.838	74.000	-1.907	PK
10		8230.000	42.790	44.503	-31.210	74.000	-1.713	PK

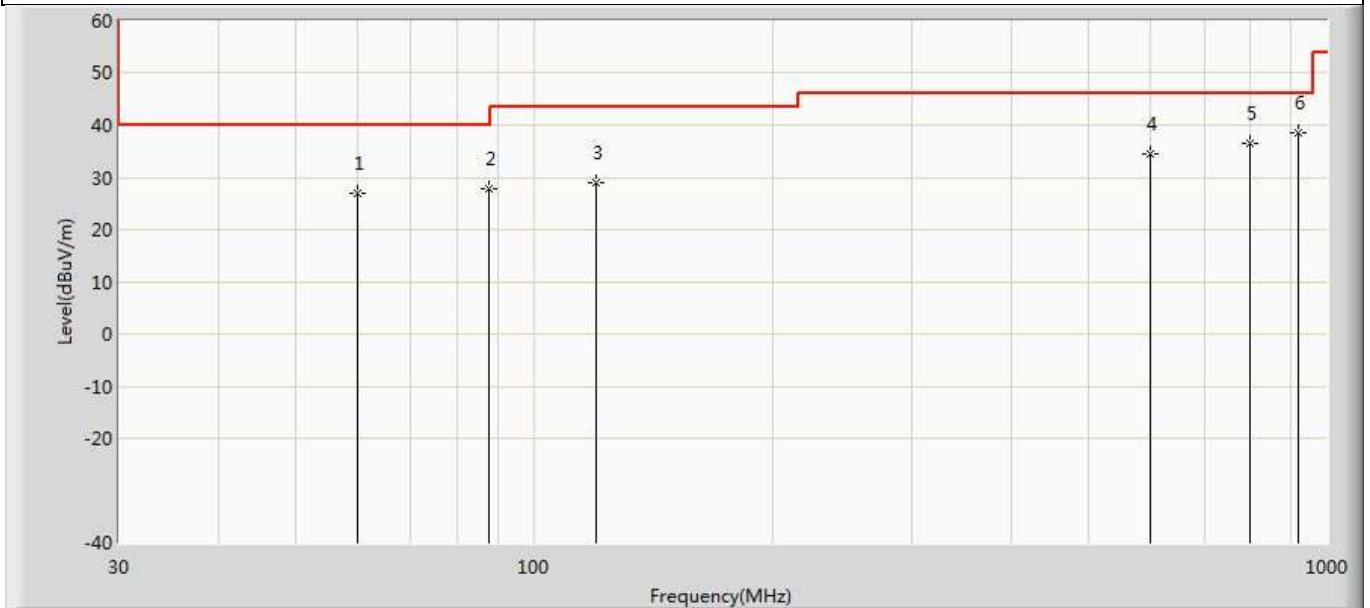
Profile: 20B0050R	Page No.: 72
Engineer: Tim.Cao	
Site: AC5	Time: 2021/02/03 - 18:37
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: Ring bridge LDO V2	Power: AC 120V/60Hz
Note: Mode 2: Simultaneous transmission	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		1829.000	46.156	56.639	-27.844	74.000	-10.483	PK
2	*	2743.500	51.326	60.922	-22.674	74.000	-9.596	PK
3		3658.000	42.139	48.607	-31.861	74.000	-6.468	PK
4		4572.500	44.973	49.146	-29.027	74.000	-4.173	PK
5		4926.000	41.859	46.453	-32.141	74.000	-4.594	PK
6		5847.000	41.072	43.807	-32.928	74.000	-2.735	PK
7		6401.500	42.080	44.220	-31.920	74.000	-2.140	PK
8		7316.000	42.867	44.959	-31.133	74.000	-2.092	PK
9		7386.000	44.466	46.373	-29.534	74.000	-1.907	PK
10		8230.500	45.157	46.870	-28.843	74.000	-1.713	PK

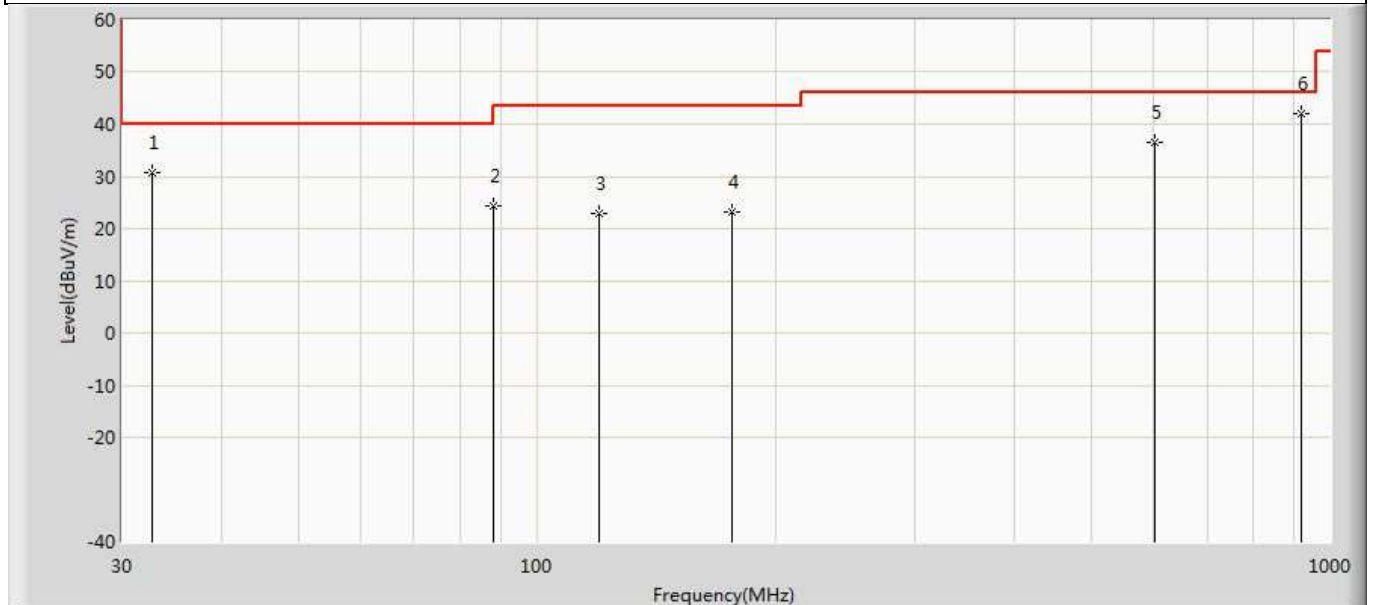
The worst case of Radiated Emission below 1GHz:

Profile: 20B0050R	Page No.: 11
Engineer: Neil	
Site: AC2	Time: 2020/11/27 - 09:10
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: AC2_3M(30-1000M)	Polarity: Vertical
EUT: Ring bridge LDO V2	Power: AC 120V/60Hz
Note: Mode 1	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		60.070	26.935	10.745	-13.065	40.000	16.190	QP
2		87.957	27.920	11.281	-12.080	40.000	16.638	QP
3		119.967	29.027	8.339	-14.473	43.500	20.687	QP
4		599.996	34.369	6.770	-11.631	46.000	27.599	QP
5		800.059	36.654	5.515	-9.346	46.000	31.139	QP
6	*	920.096	38.419	6.682	-7.581	46.000	31.737	QP

Profile: 20B0050R	Page No.: 12
Engineer: Neil	
Site: AC2	Time: 2020/11/27 - 09:10
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: AC2_3M(30-1000M)	Polarity: Horizontal
EUT: Ring bridge LDO V2	Power: AC 120V/60Hz
Note: Mode 1	

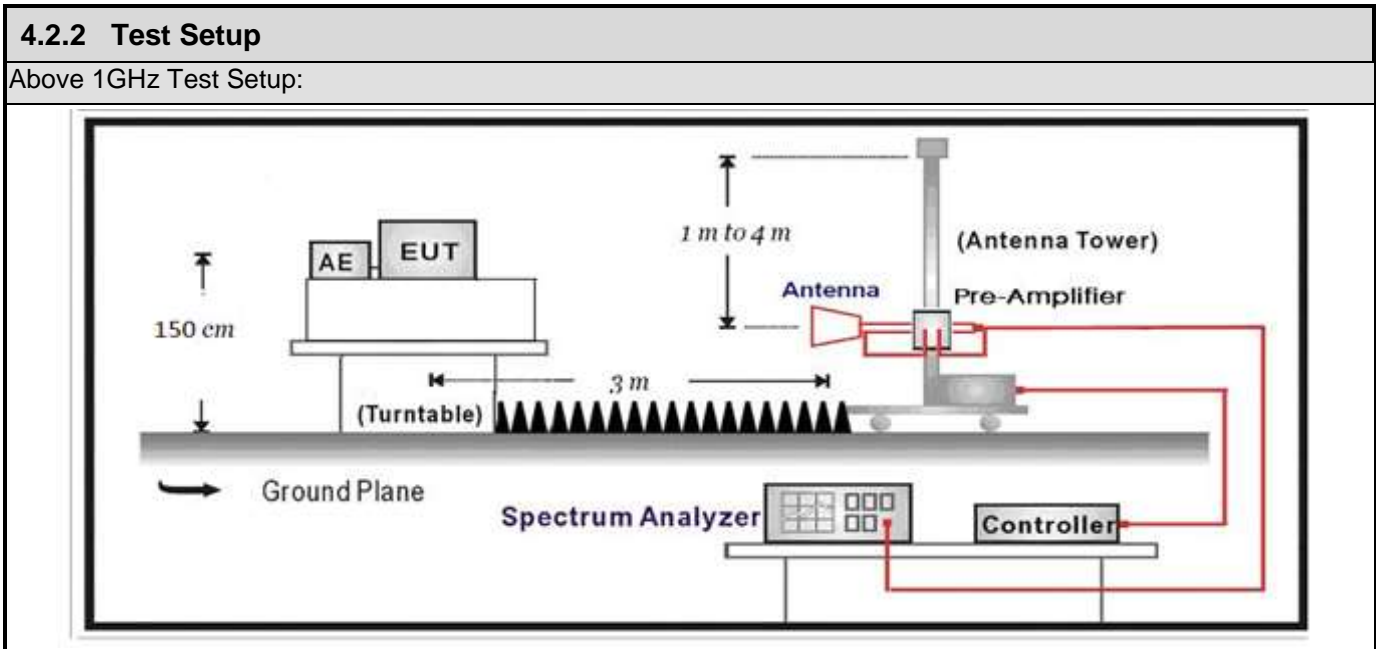


No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		32.789	30.816	3.774	-9.184	40.000	27.042	QP
2		88.200	24.454	10.620	-19.046	43.500	13.834	QP
3		119.967	22.897	6.346	-20.603	43.500	16.550	QP
4		175.985	23.309	6.351	-20.191	43.500	16.958	QP
5		600.117	36.625	7.694	-9.375	46.000	28.931	QP
6	*	919.975	41.962	9.443	-4.038	46.000	32.519	QP

Remark	<p>1. " * ", means this data is the worst emission level.</p> <p>2. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).</p> <p>3. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.</p>
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4.2 Radiated Emission Band Edge	VERDICT: PASS
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4.2.1 Limit				
Standard		FCC Part 15 Subpart C Paragraph 15.247(d) , 15.205, 15.209		
Frequency bands (MHz)	Detector	Limit (dB μ V/m)	RBW (MHz)	Distance (m)
2310-2390	PK	74	1	3
2483.5-2500	AV	54	1	3
Note: The field strength of emissions appearing within these frequency bands shall not exceed the limits.				



4.2.3 Test Procedure			
	References Rule	Chapter	Description
<input checked="" type="checkbox"/>	ANSI C63.10	6.10	Band-edge testing
	<input checked="" type="checkbox"/> ANSI C63.10	6.10.5	Restricted-band band-edge measurements
	<input type="checkbox"/> ANSI C63.10	6.10.6	Marker-delta method
<input checked="" type="checkbox"/>	ANSI C63.10	11.12	Emissions in restricted frequency bands
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.1	Radiated emission measurements
	<input checked="" type="checkbox"/> ANSI C63.10	6.3	Radiated spurious emission test
<input type="checkbox"/>	ANSI C63.10	6.4	Radiated emissions from unlicensed wireless devices below 30 MHz
<input type="checkbox"/>	ANSI C63.10	6.5	Radiated emissions from unlicensed wireless devices in the frequency range of 30 MHz to 1000 MHz
<input checked="" type="checkbox"/>	ANSI C63.10	6.6	Radiated emissions from unlicensed wireless devices above 1 GHz
	<input type="checkbox"/> ANSI C63.10	11.12.2	Antenna-port conducted measurements
	<input type="checkbox"/> ANSI C63.10	11.12.2.3	Quasi-peak measurement procedure
	<input type="checkbox"/> ANSI C63.10	11.12.2.4	Peak power measurement procedure
	<input type="checkbox"/> ANSI C63.10	11.12.2.5	Average power measurement procedures
	<input type="checkbox"/> ANSI C63.10	11.12.2.5.1	Trace averaging with continuous EUT transmission at full power
	<input type="checkbox"/> ANSI C63.10	11.12.2.5.2	Trace averaging across ON and OFF times of the EUT transmissions followed by duty cycle correction
	<input type="checkbox"/> ANSI C63.10	11.12.2.5.3	Reduced VBW averaging across ON and OFF times of the EUT transmissions with max hold

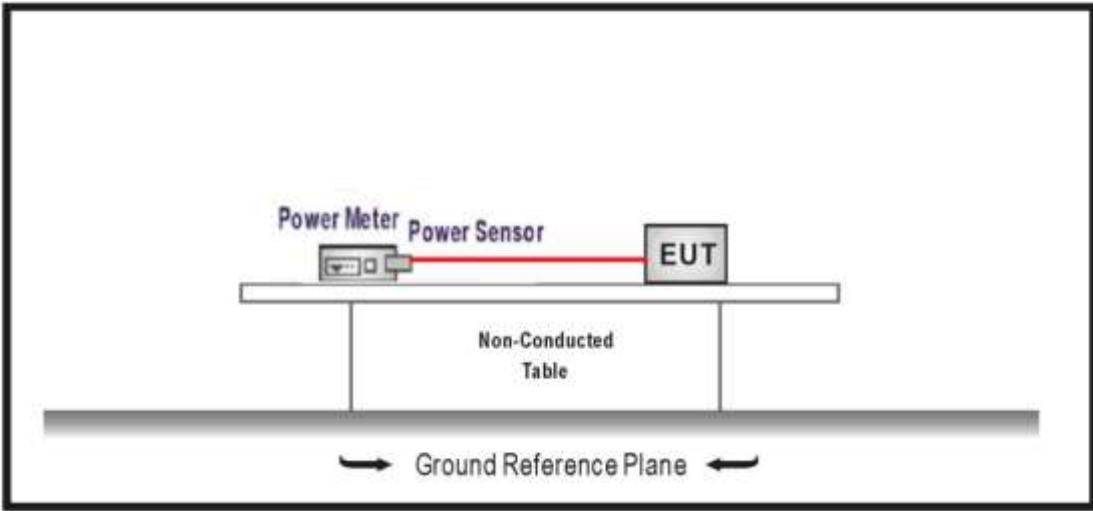
4.2.4 Test Data

Remark	No restricted band in the range ± 2 channel bandwidths of the Band-edges of the specified emission band! (608 MHz – 614 MHz and 960 MHz – 1240 MHz).
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4.3 Fundamental emission output power	VERDICT: PASS
--	----------------------

4.3.1 Limit		
Standard	FCC Part 15 Subpart C Paragraph 15.247 (b)(3)	
<input checked="" type="checkbox"/>	GTX < 6dBi	Pout ≤ 30dBm
<input type="checkbox"/>	GTX > 6dBi	
<input type="checkbox"/>	Non-Fix point-point	$P_{out} \leq 30 - (GTX - 6)$
<input type="checkbox"/>	Fix point-point	$P_{out} \leq 30 - [(GTX - 6)]/3$
<input type="checkbox"/>	Point-to-multipoint	$P_{out} \leq 30 - (GTX - 6)$
<input type="checkbox"/>	Overlap Beams	$P_{out} \leq 30 - [(GTX - 6)]/3$
<input type="checkbox"/>	Aggregate power transmitted simultaneously on all beams	$P_{out} \leq 30 - [(GTX - 6)]/3$
<input type="checkbox"/>	single directional beam	$P_{out} \leq 30 - [(GTX - 6)]/3 + 8dB$
<input checked="" type="checkbox"/>	For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels	
Note 1 : GTX directional gain of transmitting antennas.		
Note 2 : Pout is maximum peak conducted output power .		

4.3.2 Test Setup



4.3.3 Test Procedure						
	References Rule		Chapter	Description		
<input checked="" type="checkbox"/>	ANSI C63.10		11.9	Fundamental emission output power		
	<input type="checkbox"/>	ANSI C63.10		11.9.1	Maximum peak conducted output power	
		<input type="checkbox"/>	ANSI C63.10	11.9.1.1	RBW ≥ DTS bandwidth	
		<input type="checkbox"/>	ANSI C63.10	11.9.1.2	Integrated band power method	
		<input type="checkbox"/>	ANSI C63.10	11.9.1.3	PKPM1 Peak power meter method	
	<input checked="" type="checkbox"/>	ANSI C63.10		11.9.2	Maximum conducted (average) output power	
		<input checked="" type="checkbox"/>	ANSI C63.10		11.9.2.2	Measurement using a spectrum analyzer (SA)
			<input checked="" type="checkbox"/>	ANSI C63.10	11.9.2.2.2	Method AVGSA-1(Duty cycle≥98%)
			<input type="checkbox"/>	ANSI C63.10	11.9.2.2.3	Method AVGSA-1A(Duty cycle≥98%)
			<input checked="" type="checkbox"/>	ANSI C63.10	11.9.2.2.4	Method AVGSA-2(Duty cycle≤98%)
			<input type="checkbox"/>	ANSI C63.10	11.9.2.2.5	Method AVGSA-2A(Duty cycle≤98%)
			<input type="checkbox"/>	ANSI C63.10	11.9.2.2.4	Method AVGSA-3
			<input type="checkbox"/>	ANSI C63.10	11.9.2.2.5	Method AVGSA-3A
		<input checked="" type="checkbox"/>	ANSI C63.10		11.9.2.3	Measurement using a power meter (PM)
	<input checked="" type="checkbox"/>	ANSI C63.10	11.9.2.3.1	Method AVGPM		
	<input type="checkbox"/>	ANSI C63.10	11.9.2.3.2	Method AVGPM-G		
<input checked="" type="checkbox"/>	ANSI C63.10		7.8.5	Output power test procedure for frequency-hopping spread-spectrum (FHSS) devices		

4.3.4 Test Data							
Mode	Channel	Test Frequency (MHz)	Power Output (dBm)	E.I.R.P (dBm)	Conducted Limit (dBm)	E.I.R.P Limit (dBm)	Result
1	1	902.5	17.13	16.13	30.00	36.00	Pass
	16	914.5	19.09	18.09	30.00	36.00	Pass
	31	926.5	19.19	18.19	30.00	36.00	Pass

4.4 Test setup photo and EUT Photo	VERDICT: PASS
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Remark: The test setup photo and EUT Photo please see appendix.

_____ The End _____