



FCC&ISED Radio Test Report

FCC ID: 2AFZI-AVI1010B

IC: 20544-AVI1010B

This report concerns: \(\subseteq Class II Change \)

: 1711C205C Project No. Equipment : Avi-on 1010 Test Model : AVI1010-B

Series Model : N/A

: Avi-on Labs, Inc. Applicant

: 2700 Rasmussen Road Suite L-10 Park City, UT Address

84098-6454

Date of Receipt : May 27, 2019

Date of Test : May 28, 2019 ~ Jun. 06, 2019

Issued Date : Sep. 16, 2019 Tested by : BTL Inc.

Testing Engineer

Technical Manager

Authorized Signatory

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Certificate #5123.02

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Declaration

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BTL's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **BTL** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

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BTL is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective. Please note that the measurement uncertainty is provided for informational purpose only and are not use in determining the Pass/Fail results.

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REPORT ISSUED HISTORY

Report Version	Description	Issued Date
R00	 This is a supplementary report to the original test report (BTL-FICP-1-1711C205). Compared with original test report, 1. Changed the model name and applicant address which does not affect the test results. 2. The standard is updated to the RSS-Gen issue 5 from RSS-Gen issue 4 which does not affect the test results. 3. Implementation in new platform and changed the antenna, so all the test items had been retested and recorded in this report. 	Sep. 16, 2019

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1. GENERAL SUMMARY

: Avi-on 1010 Equipment Brand Name : Avi-ON Test Model : AVI1010-B

Series Model: N/A

Applicant : Avi-on Labs. Inc.

Manufacturer: Iton Technology Corp., Ltd

: Room 1302, Block A, Building 4, Tianan Cyber Park, Huangge Road, Address

Longgang District, Shenzhen, China

: Iton Technology Corp.,Ltd Factory

: Floor 3, Building E, Ainan Road, w\Weixinda Industrial Park, Longgang District, Address

Shenzhen, China

Date of Test : May 28, 2019 ~ Jun. 06, 2019

Test Sample: Engineering Sample No.: DG19052793-1

Standard(s): FCC Part15, Subpart C (15.247)

RSS-247 Issue 2, Feb. 2017 RSS-Gen Issue 5, Apr. 2018

ANSI C63.10-2013

FCC KDB 558074 D01 DTS Meas Guidance v05r02 FCC KDB 662911 D01 Multiple Transmitter Output v02r01

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-FICP-1-1711C205C) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of A2LA according to the ISO/IEC 17025 quality assessment standard and technical standard(s).

Test results included in this report are only for the Bluetooth LE part.

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2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC Part15, Subpart C (15.247) Canada RSS-247 Issue 2, Feb. 2017, RSS-Gen Issue 5, Apr. 2018					
Standard(s) Section		Test Item	Test Result	Judgment	Remark
15.207	RSS-Gen 8.8	AC Power Line Conducted	APPENDIX A	PASS	
15.247(d) 15.205(a)	RSS-247 5.5 RSS-Gen 8.9	Emissions Radiated Emissions	APPENDIX B APPENDIX C	PASS	
15.209(a) 15.247(a)(2)	RSS-Gen 8.10 RSS-247 5.2 (a) RSS-Gen 6.7	Bandwidth	APPENDIX D APPENDIX E	PASS	
15.247(b)(3)	RSS-247 5.4 (d)	Maximum Output Power & e.i.r.p.	APPENDIX F	PASS	
15.247(d)	RSS-247 5.5	Conducted Spurious Emission	APPENDIX G	PASS	
15.247(e)	RSS-247 5.2 (b)	Power Spectral Density	APPENDIX H	PASS	
15.203	-	Antenna Requirement		PASS	

NOTE:

- (1) "N/A" denotes test is not applicable to this device.
- (2) Implementation in new platform.

Model number/ Product name:

AVI-IFAC-5A / Internal Fixture Adapter (IFA) - Baseplate

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2.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No.3, Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.

BTL's Test Firm Registration Number for FCC: 357015

BTL's Designation Number for FCC: CN1240

BTL's Test Firm Registration Number for ISED: 4428B

2.2 MEASUREMENT UNCERTAINTY

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

The BTL measurement uncertainty as below table:

A. AC power line conducted emissions Measurement:

Test Site	Method	Measurement Frequency Range	U, (dB)
DG-C02	CISPR	150 kHz ~ 30 MHz	2.32

B. Radiated emissions Measurement:

Test Site	Method	Measurement Frequency Ant. Range H / V		U, (dB)	
		9 KHz~30 MHz	V	3.79	
		9 KHz~30 MHz	Ι	3.57	
		30 MHz~200 MHz	V	3.82	
	CISPR	30 MHz~200 MHz	Ι	3.78	
DG-CB03		CICDD	200 MHz~1,000 MHz	V	4.10
DG-CB03		200 MHz~1,000 MHz	Τ	4.06	
		1 GHz~18 GHz	V	3.12	
		1 GHz~18 GHz	Ι	3.68	
		18 GHz~40 GHz	V	4.15	
		18 GHz~40 GHz	Ι	4.14	

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

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3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	Avi-on 1010
Brand Name	Avi-ON
Test Model	AVI1010-B
Series Model	N/A
Model Difference(s)	N/A
Hardware Version	V1.1
Software Version	V1.1
Power Source	Supplied from host.
Power Rating	DC 3.3V
Operation Frequency	2402 MHz ~ 2480 MHz
Modulation Technology	GFSK
Bit Rate of Transmitter	1Mbps
Output Power (Max.)	9.28 dBm (0.0085 W)
e.i.r.p. (Max.)	14.78 dBm (0.0301 W)

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

2. Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	20	2442
01	2404	21	2444
02	2406	22	2446
03	2408	23	2448
04	2410	24	2450
05	2412	25	2452
06	2414	26	2454
07	2416	27	2456
08	2418	28	2458
09	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
19	2440	39	2480

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3. Table for Device and Filed Antenna:

Ant.	Brand	Device P/N	Antenna Type	Antenna P/N	Connector	Gain (dBi)
1	Avi-on	AVI-IFAC-5A	Dipole	6210ANT	N/A	5.5
2	Avi-on	AVI-IFAC-5A-OA	Monopole	6211ANT	N/A	1.6

Note:

There are 2 options for the antenna of product, only one antenna is used at a time. And in this report only recorded the worst case (Ant. 1).

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3.2 DESCRIPTION OF TEST MODES

The test system was pre-tested based on the consideration of all possible combinations of EUT operation mode.

Pretest Mode	Description
Mode 1	TX Mode NOTE (1)
Mode 2	TX Mode Channel 19 _1Mbps

Following mode(s) as (were) found to be the worst case(s) and selected for the final test.

AC power line conducted emissions test		
Final Test Mode	Description	
Mode 2	TX Mode Channel 19 _1Mbps	

Radiated emissions test – below 1GHz		
Final Test Mode Description		
Mode 2	TX Mode Channel 19 _1Mbps	

Radiated emissions test – above 1GHz		
Final Test Mode Description		
Mode 1	TX Mode NOTE (1)	

Conducted test		
Final Test Mode Description		
Mode 1	TX Mode NOTE (1)	

Note:

- (1) The measurements are performed at the high, middle, low available channels.
- (2) For radiated emission above 1 GHz test, 1GHz~26.5GHz have been pre-tested and in this report only recorded the worst case. The remaining spurious points are all below the limit value of 20dB.

3.3 PARAMETERS OF TEST SOFTWARE

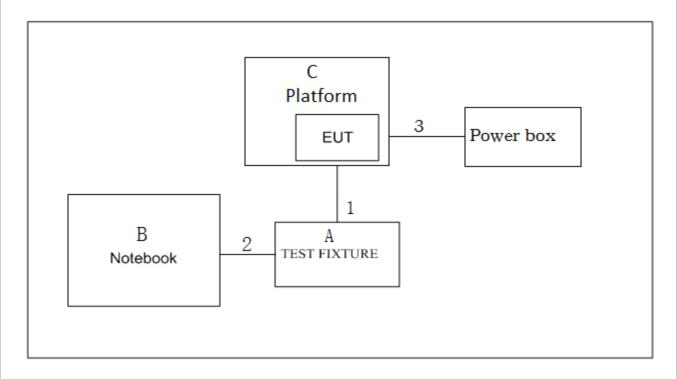
During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of BT LE

Test Software	CSR µEnergy Tools 2.4.3		
Frequency (MHz)	2402	2440	2480
Parameters	7	7	7





3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



3.5 SUPPORT UNITS

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.
Α	TEST FIXTURE	N/A	N/A	N/A
В	Notebook	DELL	N/A	N/A
С	Platform	N/A	N/A	N/A

Item	Shielded Type	Ferrite Core	Length	Note
1	NO	NO	0.3m	Data Cable
2	NO	NO	0.6m	USB Cable
3	NO	NO	1.2m	AC Power Cable

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4. AC POWER LINE CONDUCTED EMISSIONS TEST

4.1 LIMIT

Fraguency of Emission (MHT)	Limit (dBμV)		
Frequency of Emission (MHz)	Quasi-peak	Average	
0.15 - 0.5	66 to 56*	56 to 46*	
0.5 - 5.0	56	46	
5.0 - 30.0	60	50	

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting	
Attenuation	10 dB	
Start Frequency	0.15 MHz	
Stop Frequency	30 MHz	
IF Bandwidth	9 kHz	

4.2 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.3 DEVIATION FROM TEST STANDARD

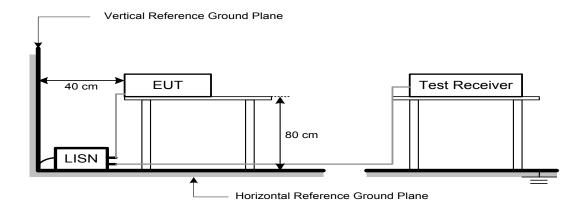
No deviation

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4.4 TEST SETUP



4.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

4.6 EUT TEST CONDITIONS

Temperature: 25°C Relative Humidity: 53% Test Voltage: AC 120V/60Hz

4.7 TEST RESULTS

Please refer to the APPENDIX A.

Remark:

- (1) All readings are QP Mode value unless otherwise stated AVG in column of Note . If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform. In this case, a " * " marked in AVG Mode column of Interference Voltage Measured.
- (2) Measuring frequency range from 150 kHz to 30 MHz.





5. RADIATED EMISSION TEST

5.1 LIMIT

In case the emission fall within the restricted band specified on 15.205(a) and RSS-Gen 8.10, then the 15.209(a) and RSS-Gen 8.9 limit in the table below has to be followed.

LIMITS OF RADIATED EMISSION MEASUREMENT (9 kHz-1000 MHz)

Frequency	Field Strength	Measurement Distance
(MHz)	(microvolts/meter)	(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (9 kHz-30 MHz)

Frequency	Magnetic field strength (H-Field)	Measurement Distance
(MHz)	(μA/m)	(meters)
0.009-0.490	6.37/F(kHz)	300
0.490-1.705	6.37/F(kHz)	30
1.705-30.0	0.08	30

LIMITS OF RADIATED EMISSION MEASUREMENT (30 MHz-1000 MHz)

Frequency	Field Strength	
(MHz)	(μV/m at 3m)	
30-88	100	
88-216	150	
216-960	200	
Above 960	500	

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000 MHz)

Fraguency (MHz)	(dBuV/m at 3 m)	
Frequency (MHz)	Peak	Average
Above 1000	74	54

Note:

- (1) The limit for radiated test was performed according to FCC PART 15C and RSS-247.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).





Spectrum Parameter	Setting	
Attenuation	Auto	
Start Frequency	1000 MHz	
Stop Frequency	10th carrier harmonic	
RBW / VBW	RBW 1 MHz VBW 3 MHz peak detector for Pk value	
(Emission in restricted band)	RMS detector for AV value	

Receiver Parameter	Setting	
Attenuation	Auto	
Start ~ Stop Frequency	9 kHz~90 kHz for PK/AVG detector	
Start ~ Stop Frequency	90 kHz~110 kHz for QP detector	
Start ~ Stop Frequency	110 kHz~490 kHz for PK/AVG detector	
Start ~ Stop Frequency	490 kHz~30 MHz for QP detector	
Start ~ Stop Frequency 30 MHz~1000 MHz for QP detecto		

5.2 TEST PROCEDURE

- a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1 GHz)
- b. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1 GHz)
- c. The height of the equipment or of the substitution antenna shall be 0.8m or 1.5m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights find the maximum reading (used Bore sight function).
- e. The receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.
- f. The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- g. All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform. (below 1 GHz)
- h. All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn't perform. (above 1 GHz)
- i. For the actual test configuration, please refer to the related Item –EUT Test Photos.

5.3 DEVIATION FROM TEST STANDARD

No deviation

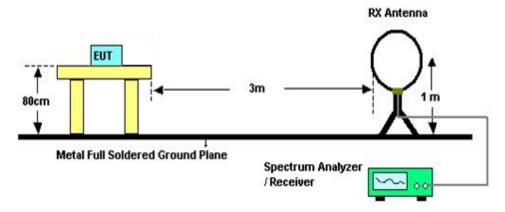
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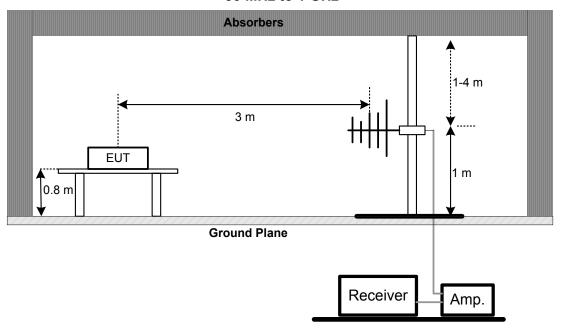


5.4 TEST SETUP

9 kHz-30 MHz



30 MHz to 1 GHz



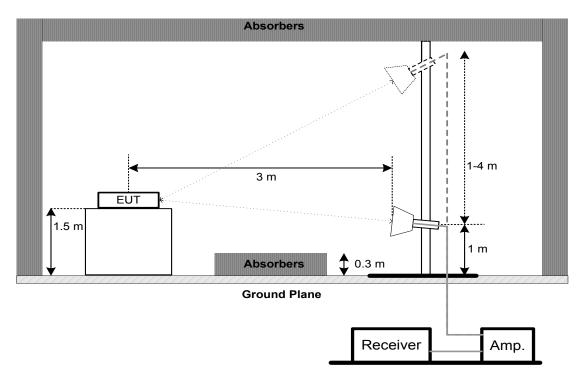
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Above 1 GHz



5.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

5.6 EUT TEST CONDITIONS

Temperature: 24°C Relative Humidity: 68% Test Voltage: AC 120V/60Hz

5.7 TEST RESULT - 9 kHz TO 30 MHz

Please refer to the APPENDIX B

Remark:

- (1) Distance extrapolation factor = 40 log (specific distance / test distance) (dB).
- (2) Limit line = specific limits (dBuV) + distance extrapolation factor.

5.8 TEST RESULT - 30 MHz TO 1000 MHz

Please refer to the APPENDIX C.

5.9 TEST RESULT - ABOVE 1000 MHz

Please refer to the APPENDIX D.

Remark:

(1) No limit: This is fundamental signal, the judgment is not applicable. For fundamental signal judgment was referred to Peak output test.





6. BANDWIDTH TEST

6.1 LIMIT

FCC Part15, Subpart C (15.247) / RSS-Gen and RSS-247				
Section Test Item Limit				
15.247(a)(2)		>= E00 kH=		
RSS-Gen 6.7	Bandwidth	>= 500 kHz		
RSS-247 5.2 (a)		(6 dB bandwidth)		

6.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- b. Spectrum Setting: RBW= 100 kHz, VBW=300 kHz, Sweep time = 2.5 ms.

6.3 DEVIATION FROM STANDARD

No deviation.

6.4 TEST SETUP

EUT	SPECTRUM	
	ANALYZER	

6.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.5 unless otherwise a special operating condition is specified in the follows during the testing.

6.6 EUT TEST CONDITIONS

Temperature: 25.3°C Relative Humidity: 64% Test Voltage: AC 120V/60Hz

6.7 TEST RESULTS

Please refer to the APPENDIX E.





7. MAXIMUM OUTPUT POWER & E.I.R.P. TEST

7.1 LIMIT

FCC Part15, Subpart C (15.247) / RSS-247				
Section Test Item Limit				
15.247(b)(3)	Maximum Output Power	1 watt or 30 dBm		
RSS-247 5.4 (d)	Maximum e.i.r.p.	4 watt or 36 dBm		

7.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- b. The maximum conducted output power was performed in accordance with method 11.9.1.1 of ANSI C63.10-2013.

7.3 DEVIATION FROM STANDARD

No deviation.

7.4 TEST SETUP

EUT	SPECTRUM	
	ANALYZER	

7.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.5 unless otherwise a special operating condition is specified in the follows during the testing.

7.6 EUT TEST CONDITIONS

Temperature: 25.3°C Relative Humidity: 64% Test Voltage: AC 120V/60Hz

7.7 TEST RESULTS

Please refer to the APPENDIX F.





8. CONDUCTED SPURIOUS EMISSION

8.1 LIMIT

For FCC

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 Output Power limits. If the transmitter complies with the Output Power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15,205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

For ISED

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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 that the transmitter demonstrates compliance with the peak Output Power limits. If the transmitter complies with the Output Power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

8.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- b. Spectrum Setting: RBW= 100 kHz, VBW=300 kHz, Sweep time = 10 ms.

8.3 DEVIATION FROM STANDARD

No deviation.

8.4 TEST SETUP

EUT	SPECTRUM	
	ANALYZER	

8.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.5 unless otherwise a special operating condition is specified in the follows during the testing.

8.6 EUT TEST CONDITIONS

Temperature: 25.3°C Relative Humidity: 64% Test Voltage: AC 120V/60Hz

8.7 TEST RESULTS

Please refer to the APPENDIX G.





9. POWER SPECTRAL DENSITY TEST

9.1 LIMIT

FCC Part15, Subpart C (15.247) / RSS-247				
Section Test Item Limit				
15.247(e) RSS-247 5.2 (b) Power Spectral Density		8 dBm (in any 3 kHz)		

9.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- b. Spectrum Setting: RBW=3 kHz, VBW=10 kHz, Sweep time = auto.

9.3 DEVIATION FROM STANDARD

No deviation.

9.4 TEST SETUP

EUT	SPECTRUM	
	ANALYZER	

9.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.5 unless otherwise a special operating condition is specified in the follows during the testing.

9.6 EUT TEST CONDITIONS

Temperature: 25.3°C Relative Humidity: 64% Test Voltage: AC 120V/60Hz

9.7 TEST RESULTS

Please refer to the APPENDIX H.





10. MEASUREMENT INSTRUMENTS LIST

	AC Power Line Conducted Emissions					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until	
1	EMI Test Receiver	R&S	ESCI	100382	Mar. 10, 2020	
2	LISN	EMCO	3816/2	52765	Mar. 10, 2020	
3	50ohm Terminator	SHX	TF5-3	15041305	Mar. 10, 2020	
4	Artificial-Mains Network	SCHWARZBEC K	NSLK 8127	8127685	Mar. 10, 2020	
5	TRANSIENT LIMITER	EM	EM-7600	772	Mar. 10, 2020	
6	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A	
7	Cable	N/A	RG223	12m	Mar. 12, 2020	

	Radiated Emissions - 9 kHz to 30 MHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until	
1	Loop Antenna	EM	EM-6876-1	230	Jan. 15, 2020	
2	Cable	N/A	RG 213/U	C-102	May 31, 2020	
3	EMI Test Receiver	R&S	ESCI	100895	Mar. 10, 2020	
4	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A	

	Radiated Emissions - 30 MHz to 1 GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until	
1	Antenna	Schwarzbeck	VULB9160	9160-3232	Mar. 09, 2020	
2	Amplifier	HP	8447D	2944A09673	Aug. 11, 2019	
3	Receiver	Agilent	N9038A	MY52130039	Aug. 11, 2019	
4	Cable	emci	LMR-400(30MHz- 1GHz)(8m+5m)	N/A	May 24, 2020	
5	Controller	CT	SC100	N/A	N/A	
6	Controller	MF	MF-7802	MF780208416	N/A	
7	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A	

Radiated Emissions - Above 1 GHz											
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until						
1	Double Ridged Guide Antenna	ETS	3115	75789	Mar. 09, 2020						
2	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Jun. 30, 2019						
3	Amplifier	Agilent	8449B	3008A02333	Mar. 10, 2020						
4	Microwave Preamplifier With Adaptor	EMC INSTRUMENT	EMC2654045	980039 & HA01	Mar. 10, 2020						
5	Receiver	Agilent	N9038A	MY52130039	Aug. 11, 2019						
6	Controller	CT	SC100	N/A	N/A						
7	Controller	MF	MF-7802	MF780208416	N/A						
8	Cable	mitron	B10-01-01-12M	18072744	Jul. 30, 2019						
9	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A						

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Bandwidth									
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until				
1	Spectrum Analyzer	R&S	FSP40	100185	Aug. 11, 2019				

	Maximum Output Power										
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until						
1	Spectrum Analyzer	R&S	FSP40	100185	Aug. 11, 2019						

	Antenna Conducted Spurious Emissions									
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until					
1	Spectrum Analyzer	R&S	FSP40	100185	Aug. 11, 2019					

	Power Spectral Density										
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until						
1	Spectrum Analyzer	R&S	FSP40	100185	Aug. 11, 2019						

Remark: "N/A" denotes no model name, serial no. or calibration specified. All calibration period of equipment list is one year.

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11. EUT TEST PHOTO

AC Power Line Conducted Emissions Test Photos



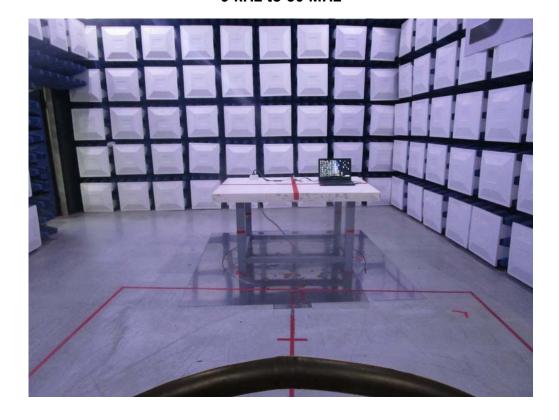


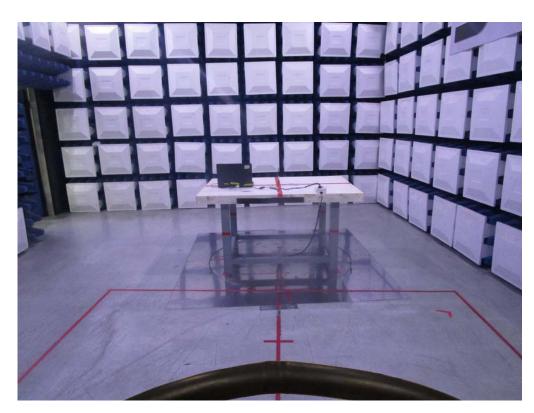
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Radiated Measurement Photos 9 kHz to 30 MHz



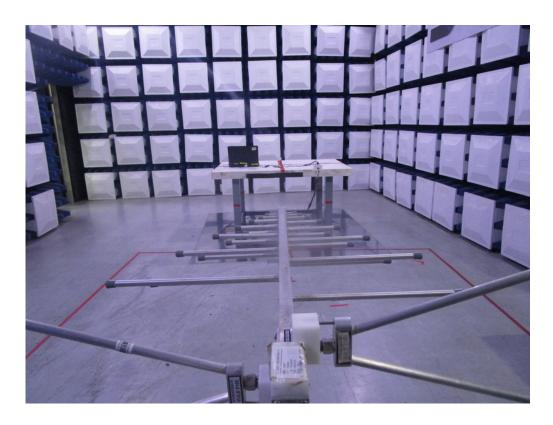






Radiated Emissions Test Photos 30 MHz to 1000 MHz





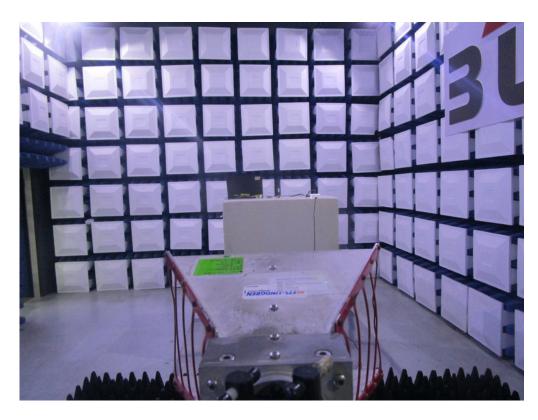




Radiated Emissions Test Photos

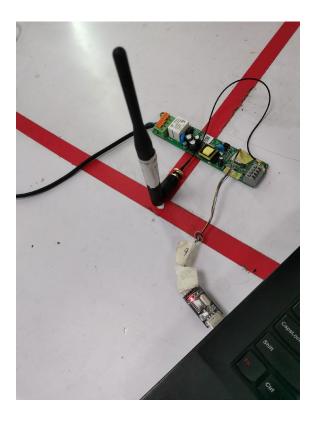
Above 1 GHz











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APPENDIX A - AC POWER	LINE CONDUCTED EMISSIONS

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Test Mode: TX Mode Channel 19 _1Mbps

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1545	44.91	9.82	54.73	65.75	-11.02	peak	
2		0.1545	17.90	9.82	27.72	55.75	-28.03	AVG	
3		0.3300	36.28	9.85	46.13	59.45	-13.32	peak	
4		0.4245	35.63	9.87	45.50	57.36	-11.86	peak	
5		0.4245	17.30	9.87	27.17	47.36	-20.19	AVG	
6		0.6810	32.10	9.90	42.00	56.00	-14.00	peak	
7		1.1580	26.77	9.93	36.70	56.00	-19.30	peak	
8		2.9400	25.60	10.06	35.66	56.00	-20.34	peak	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.

Report No.: BTL-FICP-1-1711C205C

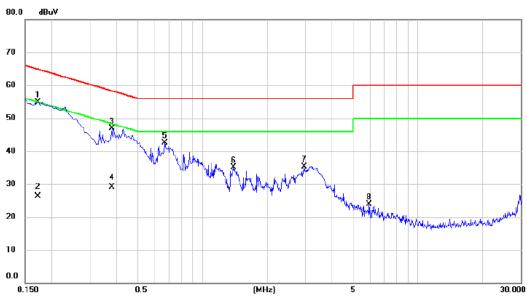
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Test Mode: TX Mode Channel 19 _1Mbps

Neutral



No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1 *	0.1725	45.05	9.91	54.96	64.84	-9.88	peak	
2	0.1725	16.40	9.91	26.31	54.84	-28.53	AVG	
3	0.3795	36.96	10.00	46.96	58.29	-11.33	peak	
4	0.3795	19.20	10.00	29.20	48.29	-19.09	AVG	
5	0.6675	32.48	10.06	42.54	56.00	-13.46	peak	
6	1.3920	25.04	10.15	35.19	56.00	-20.81	peak	
7	2.9625	25.15	10.25	35.40	56.00	-20.60	peak	
8	5.9460	13.37	10.49	23.86	60.00	-36.14	peak	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.

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APPENDIX B - RADIATED EMISSION - 9 KHZ TO 30 MHZ

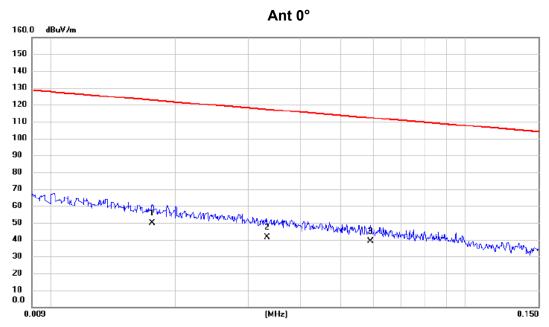
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Test Mode: TX Mode Channel 19 1Mbps



No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	0.0176	35.14	14.54	49.68	122.69	-73.01	AVG	
2	0.0333	27.46	13.87	41.33	117.16	-75.83	AVG	
3	0.0590	25.09	13.79	38.88	112.19	-73.31	AVG	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.(2) Margin Level = Measurement Value Limit Value.

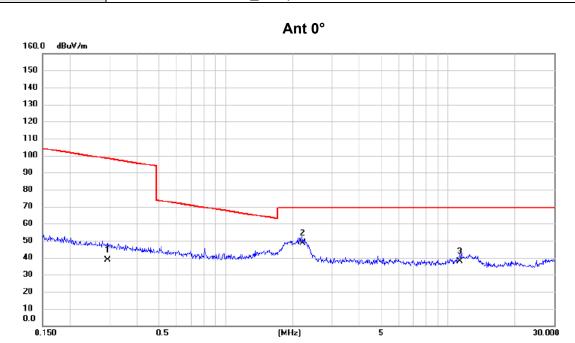
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Test Mode: TX Mode Channel 19 _1Mbps



	No. Mk	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
Ī		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
Ī	1	0.2955	24.87	13.55	38.42	98.19	-59.77	AVG	
	2 *	2.2132	36.97	11.69	48.66	69.54	-20.88	QP	
	3	11.3170	26.04	11.61	37.65	69.54	-31.89	QP	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.

Report No.: BTL-FICP-1-1711C205C

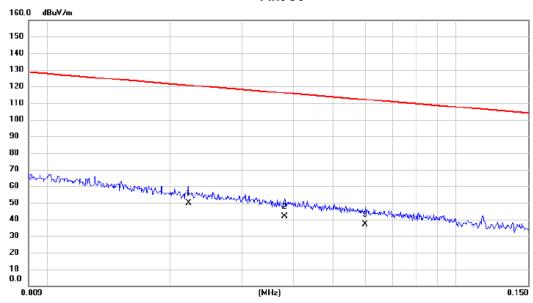
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Test Mode: TX Mode Channel 19 _1Mbps

Ant 90°



No. Mk.	Freq.	Reading Level		Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	0.0222	35.89	13.83	49.72	120.68	-70.96	AVG	
2	0.0381	27.87	13.89	41.76	115.99	-74.23	AVG	
3	0.0600	23.06	13.77	36.83	112.04	-75.21	AVG	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.

Report No.: BTL-FICP-1-1711C205C

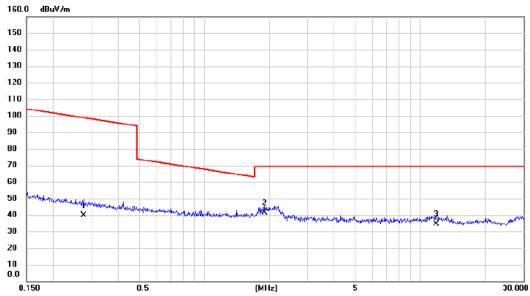
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Test Mode: TX Mode Channel 19 _1Mbps

Ant 90°



No. Mk.	Freq.	Reading Level		Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.2760	26.17	13.60	39.77	98.79	-59.02	AVG	
2 *	1.8980	29.48	11.88	41.36	69.54	-28.18	QP	
3	11.8697	22.97	11.61	34.58	69.54	-34.96	QP	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.(2) Margin Level = Measurement Value Limit Value.

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APPENDIX C - RADIATED EMISSION - 30 MHZ TO 1000 MHZ

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80.0

70

60

50

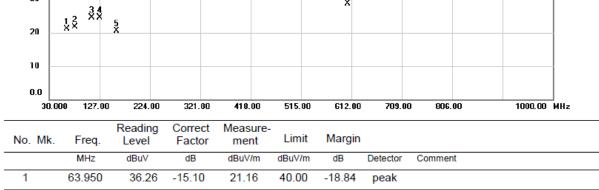
40

30



Test Mode: TX Mode Channel 19 _1Mbps

Vertical dBuV/m



2 79.955 39.79 -18.01 21.78 40.00 -18.22 peak 3 111.965 38.76 -14.22 24.54 43.50 -18.96 peak 4 127.970 37.48 -13.05 24.43 43.50 -19.07 peak 5 159.980 31.50 -11.00 20.50 43.50 -23.00 peak 604.240 34.38 -5.64 28.74 46.00 -17.26 6 peak

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.

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Test Mode: TX Mode Channel 19 _1Mbps

Horizontal 80.0 dBuV/m 70 60 50 40 5 X 30 6 X 2 X 20 10 0.0 1000.00 MHz 30.000 127.00 224.00 321.00 418.00 515.00 612.00 709.00 806.00

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		42.610	29.59	-14.49	15.10	40.00	-24.90	peak	
2		111.965	35.62	-14.22	21.40	43.50	-22.10	peak	
3		127.970	36.37	-13.05	23.32	43.50	-20.18	peak	
4		159.980	31.12	-11.00	20.12	43.50	-23.38	peak	
5	*	368.045	39.26	-10.23	29.03	46.00	-16.97	peak	
6		432.065	35.45	-8.58	26.87	46.00	-19.13	peak	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.

Report No.: BTL-FICP-1-1711C205C

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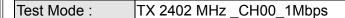


APPENDIX D - RADIATED EMISSION - ABOVE 1000 MHZ

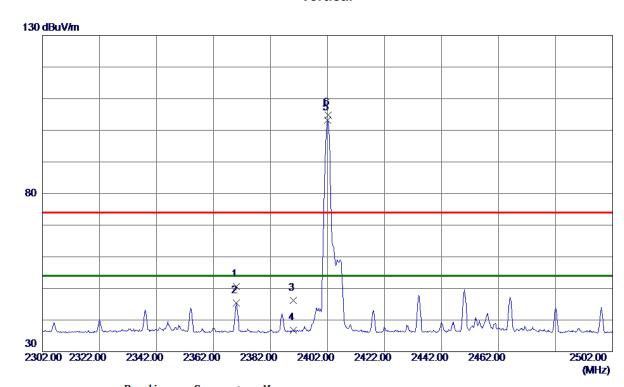
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Vertical



No.	Freq.	Keading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2370.0000	44.02	6. 55	50. 57	74.00	-23.43	Peak	
2	2370.0000	38. 76	6. 55	45. 31	54.00	-8. 69	AVG	
3	2390.0000	39. 70	6. 53	46. 23	74.00	-27.77	Peak	
4	2390.0000	30. 29	6. 53	36. 82	54.00	-17. 18	AVG	
5 *	2402.0000	96. 77	6. 52	103. 29	54.00	49. 29	AVG	No Limit
6	2402. 3000	98. 31	6. 52	104.83	74.00	30.83	Peak	No Limit

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.

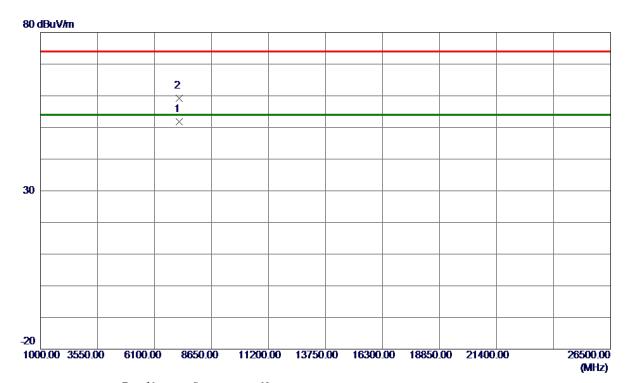
Report No.: BTL-FICP-1-1711C205C





Test Mode: TX 2402 MHz _CH00_1Mbps

Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	7206. 5420	42.80	9. 08	51.88	54.00	-2. 12	AVG	
2	7206. 8820	50. 03	9. 08	59. 11	74.00	-14.89	Peak	

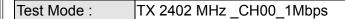
REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.

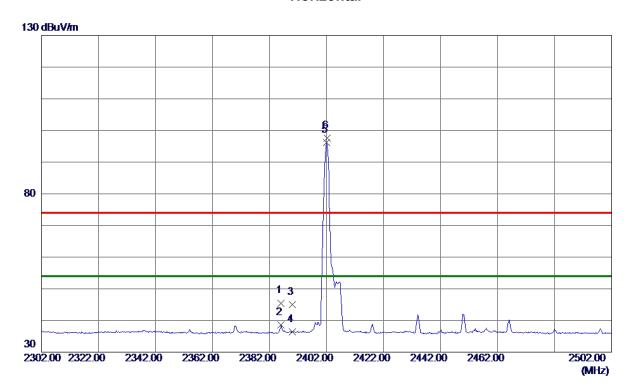
Report No.: BTL-FICP-1-1711C205C







Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2386. 1000	38. 96	6. 54	45. 50	74.00	-28.50	Peak	
2	2386. 1000	32. 03	6. 54	38. 57	54.00	-15. 43	AVG	
3	2390.0000	38. 51	6. 53	45.04	74.00	-28.96	Peak	
4	2390.0000	29.82	6. 53	36. 35	54.00	-17.65	AVG	
5 *	2402.0000	89. 62	6. 52	96. 14	54.00	42.14	AVG	No Limit
6	2402. 3000	91. 17	6. 52	97.69	74.00	23.69	Peak	No Limit

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.

Report No.: BTL-FICP-1-1711C205C

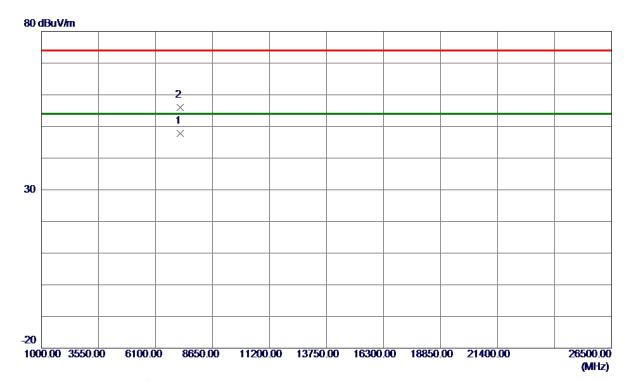
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TX 2402 MHz _CH00_1Mbps Test Mode:

Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	7206. 5900	38. 75	9. 08	47.83	54.00	-6. 17	AVG	
2	7206. 8150	47.01	9. 08	56. 09	74.00	-17. 91	Peak	

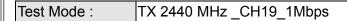
REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.

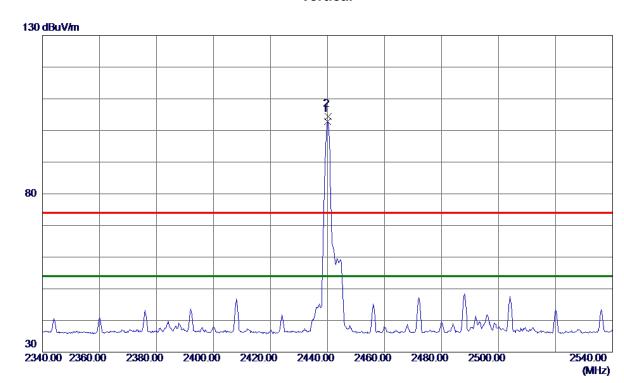
Report No.: BTL-FICP-1-1711C205C







Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2440.0000	96. 27	6. 47	102.74	54.00	48.74	AVG	No Limit
2	2440. 3000	97.87	6. 47	104.34	74.00	30. 34	Peak	No Limit

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.

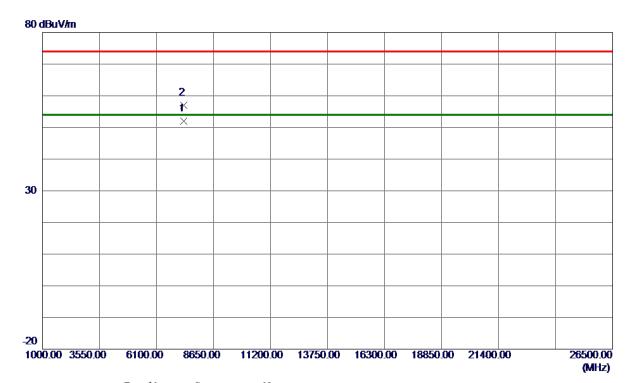
Report No.: BTL-FICP-1-1711C205C





TX 2440 MHz _CH19_1Mbps Test Mode:

Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	7320.6400	42.84	9. 24	52. 0 8	54.00	-1.92	AVG	
2	7320. 7050	47.84	9. 24	57.08	74.00	-16.92	Peak	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.

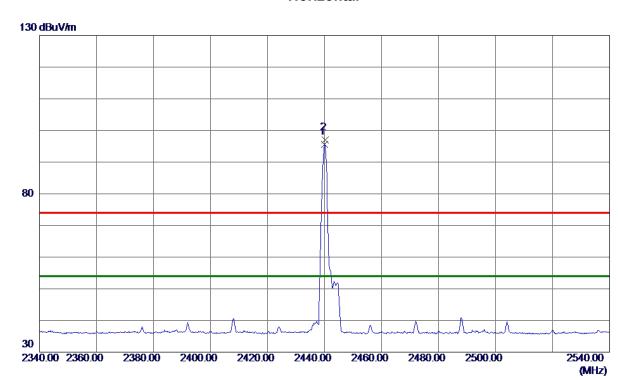
Report No.: BTL-FICP-1-1711C205C





TX 2440 MHz _CH19_1Mbps Test Mode:

Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2440.0000	89. 11	6. 47	95. 58	54.00	41.58	AVG	No Limit
2	2440. 3000	90.61	6. 47	97. 08	74.00	23. 0 8	Peak	No Limit

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.

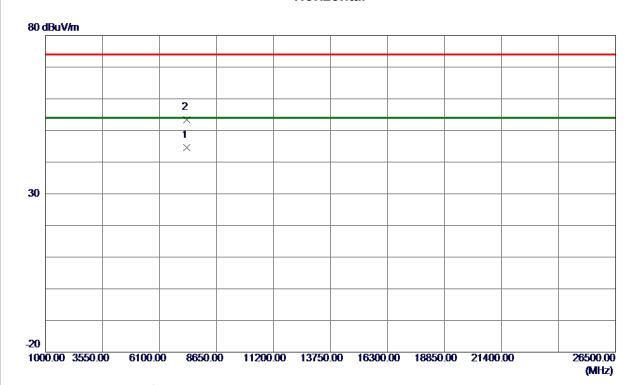
Report No.: BTL-FICP-1-1711C205C





TX 2440 MHz _CH19_1Mbps Test Mode:

Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	7320. 4900	35. 29	9. 24	44. 53	54.00	-9.47	AVG	
2	7320. 8280	44. 20	9. 24	53.44	74.00	-20. 56	Peak	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.

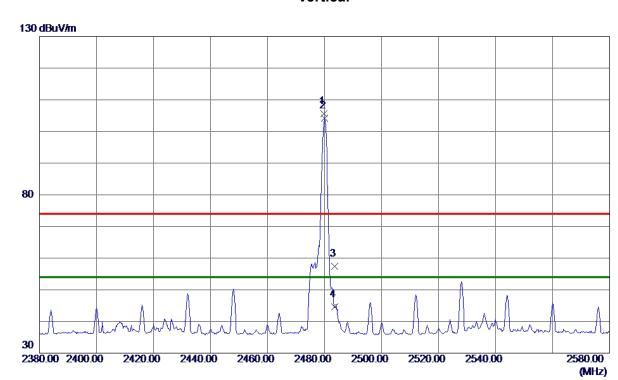
Report No.: BTL-FICP-1-1711C205C





Test Mode: TX 2480 MHz _CH39_1Mbps

Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2479.8000	99. 16	6.43	105. 59	74.00	31. 59	Peak	No Limit
2 *	2480.0000	97.69	6.43	104. 12	54.00	50. 12	AVG	No Limit
3	2483.5000	50.99	6.42	57.41	74.00	-16. 59	Peak	
4	2483. 5000	38. 24	6. 42	44.66	54.00	-9. 34	AVG	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.

Report No.: BTL-FICP-1-1711C205C





TX 2480 MHz _CH39_1Mbps Test Mode:

Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	7439. 3000	49. 26	9.42	58. 68	74.00	-15. 32	Peak	
2 *	7439. 4600	41.34	9.42	50.76	54.00	-3. 24	AVG	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.

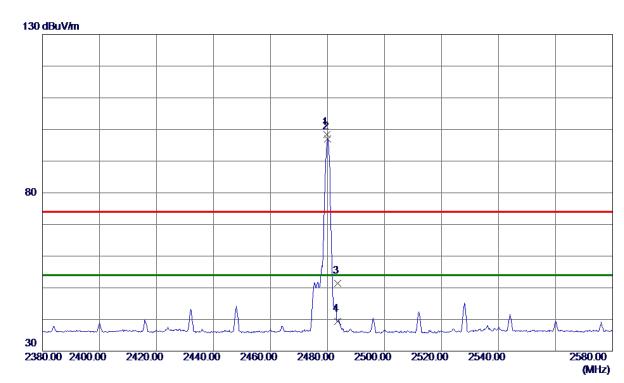
Report No.: BTL-FICP-1-1711C205C





TX 2480 MHz _CH39_1Mbps Test Mode:

Horizontal



MHz dBuV/m dB dBuV/m dBuV/m dB Detector Comment 1 2479.8000 91.98 6.43 98.41 74.00 24.41 Peak No Limit	
1 2479.8000 91.98 6.43 98.41 74.00 24.41 Peak No Limit	
2 * 2480.0000 90.55 6.43 96.98 54.00 42.98 AVG No Limit	
3 2483.5000 44.90 6.42 51.32 74.00 -22.68 Peak	
4 2483. 5000 33. 03 6. 42 39. 45 54. 00 -14. 55 AVG	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.

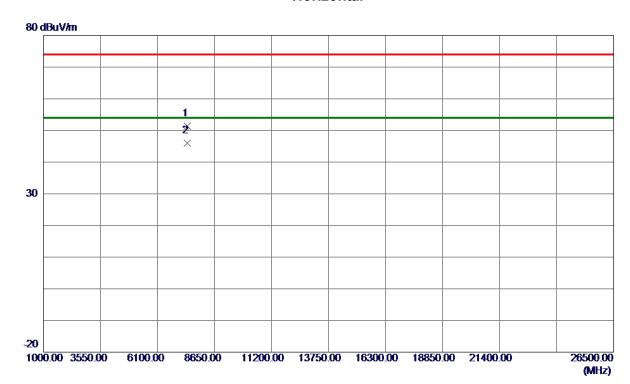
Report No.: BTL-FICP-1-1711C205C







Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	7439. 1850	41.93	9.42	51. 35	74.00	-22.65	Peak	
2 *	7439. 4550	36. 51	9.42	45. 93	54.00	-8. 07	AVG	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.

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APPENDIX E - BANDWIDTH

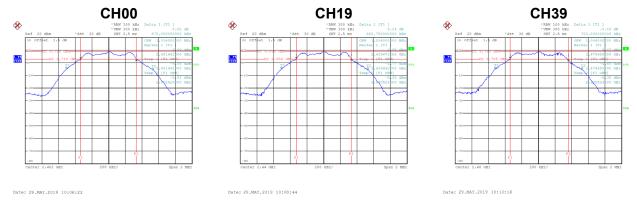
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Test Mode: CH00, CH19, CH39 - 1Mbps

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	99 % Emission Bandwidth (MHz)	6 dB Bandwidth Min. Limit (kHz)	Test Result
00	2402	0.670	1.036	500	Pass
19	2440	0.661	1.036	500	Pass
39	2480	0.702	1.044	500	Pass







APPENDIX F - MAXIMUM OUTPUT POWER & E.I.R.P.

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Test Mode: CH00, CH19, CH39 - 1Mbps

Frequency (MHz)	Output Power (dBm)	Output Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
2402	9.12	0.0082	30.00	1.00	Pass
2440	9.28	0.0085	30.00	1.00	Pass
2480	9.23	0.0084	30.00	1.00	Pass

Test Mode: CH00, CH19, CH39 - 1Mbps

Frequency	e.i.r.p.	e.i.r.p.	Max. Limit	Max. Limit	Test Result
(MHz)	(dBm)	(W)	(dBm)	(W)	restresait
2402	14.62	0.0290	36.00	4.00	Pass
2440	14.78	0.0301	36.00	4.00	Pass
2480	14.73	0.0297	36.00	4.00	Pass

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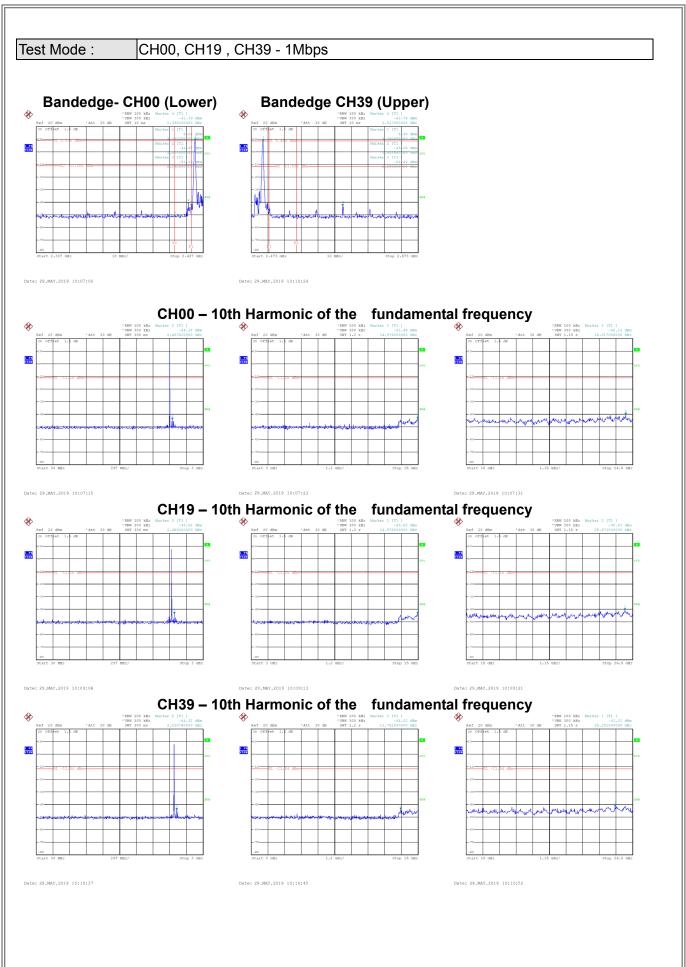


APPENDIX G - CONDUCTED SPURIOUS EMISSION

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APPENDIX H - POWER SPECTRAL DENSITY

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Test Mode: CH00, CH19, CH39 - 1Mbps

Channel	Frequency (MHz)	Power Spectral Density (dBm/3 kHz)	Max. Limit (dBm/3 kHz)	Test Result
00	2402	-7.160	8.00	Pass
19	2440	-7.080	8.00	Pass
39	2480	-6.860	8.00	Pass

