

# **FCC** Radio Test Report

FCC ID: ZMOSU806EAU

This report concerns: Original Grant

Project No. : 2104C157
Equipment : LTE Module
Brand Name : Fibocom
Test Model : SU806-EAU

Series Model : N/A

**Applicant**: Fibocom Wireless Inc.

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Dashi 1st Rd, Nanshan, Shenzhen, China

Manufacturer : Fibocom Wireless Inc.

Address : 1101, Tower A, Building 6, Shenzhen International Innovation Valley,

Dashi 1st Rd, Nanshan, Shenzhen, China

**Factory** : Huizhou HYE Technology Co., Ltd.

Address : No. 237, Sanhe group, Sanhe village, Tonghu Town, Zhongkai hi tech

Zone, Huizhou

Date of Receipt : Apr. 21, 2021

Date of Test : Apr. 22, 2021 ~ May 28, 2021

**Issued Date** : Jun. 15, 2021

Report Version : R01

**Test Sample**: Engineering Sample No.: DG20210425109 for radiated,

DG20210425110 for conducted.

Standard(s) : FCC CFR Title 47, Part 15, Subpart C

FCC KDB 558074 D01 15.247 Meas Guidance v05r02

ANSI C63.10-2013

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

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Steven Lu

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#### Limitation

in determining the Pass/Fail results.

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

Do no 2 of 70



Table of Contents	Page
REPORT ISSUED HISTORY	6
1 . SUMMARY OF TEST RESULTS	7
1.1 TEST FACILITY	8
1.2 MEASUREMENT UNCERTAINTY	8
1.3 TEST ENVIRONMENT CONDITIONS	8
2. GENERAL INFORMATION	9
2.1 GENERAL DESCRIPTION OF EUT	9
2.2 DESCRIPTION OF TEST MODES	10
2.3 PARAMETERS OF TEST SOFTWARE	10
2.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	11
2.5 SUPPORT UNITS	11
3 . AC POWER LINE CONDUCTED EMISSIONS	12
3.1 LIMIT	12
3.2 TEST PROCEDURE	12
3.3 DEVIATION FROM TEST STANDARD	12
3.4 TEST SETUP	13
3.5 EUT OPERATING CONDITIONS	13
3.6 TEST RESULTS	13
4 . RADIATED EMISSIONS	14
4.1 LIMIT	14
4.2 TEST PROCEDURE	15
4.3 DEVIATION FROM TEST STANDARD	16
4.4 TEST SETUP	16
4.5 EUT OPERATING CONDITIONS	17
4.6 TEST RESULT - 9 KHZ TO 30 MHZ	17
4.7 TEST RESULT - 30 MHZ TO 1000 MHZ	17
4.8 TEST RESULT - ABOVE 1000 MHZ	17
5 . BANDWIDTH	18
5.1 LIMIT	18
5.2 TEST PROCEDURE	18
5.3 DEVIATION FROM STANDARD	18
5.4 TEST SETUP	18



Table of Contents	Page
5.5 EUT OPERATION CONDITIONS	18
5.6 TEST RESULTS	18
6 . MAXIMUM OUTPUT POWER	19
6.1 LIMIT	19
6.2 TEST PROCEDURE	19
6.3 DEVIATION FROM STANDARD	19
6.4 TEST SETUP	19
6.5 EUT OPERATION CONDITIONS	19
6.6 TEST RESULTS	19
7. CONDUCTED SPURIOUS EMISSION	20
7.1 LIMIT	20
7.2 TEST PROCEDURE	20
7.3 DEVIATION FROM STANDARD	20
7.4 TEST SETUP	20
7.5 EUT OPERATION CONDITIONS	20
7.6 TEST RESULTS	20
8 . POWER SPECTRAL DENSITY	21
8.1 LIMIT	21
8.2 TEST PROCEDURE	21
8.3 DEVIATION FROM STANDARD	21
8.4 TEST SETUP	21
8.5 EUT OPERATION CONDITIONS	21
8.6 TEST RESULTS	21
9 . MEASUREMENT INSTRUMENTS LIST	22
10 . EUT TEST PHOTO	24
APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS	28
APPENDIX B - RADIATED EMISSION - 9 KHZ TO 30 MHZ	31
APPENDIX C - RADIATED EMISSION - 30 MHZ TO 1000 MHZ	36
APPENDIX D - RADIATED EMISSION - ABOVE 1000 MHZ	39
APPENDIX E - BANDWIDTH	64
APPENDIX F - MAXIMUM OUTPUT POWER	67



Table of Contents	Page
APPENDIX G - CONDUCTED SPURIOUS EMISSION	69
APPENDIX H - POWER SPECTRAL DENSITY	72



# **REPORT ISSUED HISTORY**

Report Version	Description	Issued Date
R00	Original Issue.	Jun. 08, 2021
R01	Modified the comments of Timco.	Jun. 15, 2021



# 1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC CFR Title 47, Part 15, Subpart C				
Standard(s) Section Test Item Test Resu			Judgment	Remark
15.207	AC Power Line Conducted Emissions	APPENDIX A	PASS	
15.247(d) 15.205(a) 15.209(a)	Radiated Emissions	APPENDIX B APPENDIX C APPENDIX D	PASS	
15.247(a)(2)	Bandwidth	APPENDIX E	PASS	
15.247(b)(3)	Maximum Output Power	APPENDIX F	PASS	
15.247(d)	Conducted Spurious Emission	APPENDIX G	PASS	
15.247(e)	Power Spectral Density	APPENDIX H	PASS	
15.203	Antenna Requirement		PASS	Note(2)

## Note:

- (1) "N/A" denotes test is not applicable to this device.
- (2) The device what use a permanently attached antenna were considered sufficient to comply with the provisions of 15.203.



#### 1.1 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

#### 1.2 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	150kHz ~ 30MHz	2.68

#### B. Radiated emissions Measurement:

Test Site	Method	Measurement Frequency Range	Ant. H / V	U, (dB)
		9kHz ~ 30MHz	-	3.02
		30MHz ~ 200MHz	V	4.26
		30MHz ~ 200MHz	Н	3.38
DG-CB03	B03 CISPR	200MHz ~ 1,000MHz	V	3.98
		200MHz ~ 1,000MHz	Ι	3.94
		1GHz ~ 6GHz	•	3.96
		6GHz ~ 18GHz	•	5.24
		18GHz ~ 26.5GHz	-	3.62
		26.5GHz ~ 40GHz	-	4.00

#### C. Other Measurement:

Test Item	Uncertainty
Bandwidth	±3.8 %
Maximum Output Power	±0.95 dB
Conducted Spurious Emission	±2.71 dB
Power Spectral Density	±0.86 dB
Temperature	±0.08 °C
Humidity	±1.5%

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

#### 1.3 TEST ENVIRONMENT CONDITIONS

Test Item	Temperature	Humidity	Test Voltage	Tested By
AC Power Line Conducted Emissions	25°C	53%	DC 3.8V	Laughing Zhang
Radiated Emissions-9 kHz to 30 MHz	25°C	60%	DC 3.8V	Laughing Zhang
Radiated Emissions-30 MHz to 1000 MHz	26°C	52%	DC 3.8V	Laughing Zhang
Radiated Emissions-Above 1000 MHz	26°C	52%	DC 3.8V	Laughing Zhang
Bandwidth	23.3°C	52%	DC 3.8V	Jesse Wang
Maximum Output Power	23.3°C	52%	DC 3.8V	Jesse Wang
Conducted Spurious Emission	23.3°C	52%	DC 3.8V	Jesse Wang
Power Spectral Density	23.3°C	52%	DC 3.8V	Jesse Wang



## 2. GENERAL INFORMATION

## 2.1 GENERAL DESCRIPTION OF EUT

Equipment	LTE Module
Brand Name	Fibocom
Test Model	SU806-EAU
Series Model	N/A
Model Difference(s)	N/A
Hardware Version	V1.0
Software Version	SU806-EAU-Q31.00.104
Power Source	DC voltage supplied from external power supply.
Power Rating	DC 3.5V-4.2V
Operation Frequency	2402 MHz ~ 2480 MHz
Modulation Type	GFSK
Bit Rate of Transmitter	1Mbps, 2Mbps
Max. Output Power	2Mbps: 2.67 dBm (0.0018 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

## 3. Table for Filed Antenna:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	External	N/A	1

#### Note:

The antenna gain is provided by the manufacturer.



## 2.2 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_1Mbps Channel 00/19/39	
Mode 2	TX Mode_2Mbps Channel 00/19/39	
Mode 3	TX Mode_2Mbps Channel 19	

Following mode(s) was (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 3	TX Mode_2Mbps Channel 19	

Radiated emissions test - Below 1GHz		
Final Test Mode	Description	
Mode 3	TX Mode_2Mbps Channel 19	

Radiated emissions test - Above 1GHz		
Final Test Mode	Description	
Mode 1	TX Mode_1Mbps Channel 00/19/39	
Mode 2	TX Mode_2Mbps Channel 00/19/39	

Conducted test		
Final Test Mode	Description	
Mode 1	TX Mode_1Mbps Channel 00/19/39	
Mode 2	TX Mode_2Mbps Channel 00/19/39	

#### Note:

- (1) For radiated emission above 1 GHz test, the spurious points of 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.
- (2) For AC power line conducted emissions and radiated emissions below 1 GHz test, the 2Mbps Channel 19 is found to be the worst case and recorded.

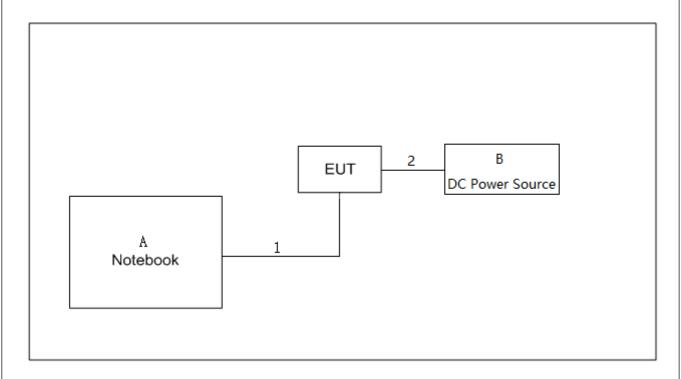
#### 2.3 PARAMETERS OF TEST SOFTWARE

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level.

Test Software Version	Pandora_R22.20.1701		
Frequency (MHz)	2402	2440	2480
1Mbps	Default	Default	Default
2Mbps	Default	Default	Default



# 2.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



## 2.5 SUPPORT UNITS

Item	Equipment	Brand	Model No.	Series No.
Α	Notebook	HONOR	NBLK-WAX9X	N/A
В	DC Power Source	TRUE-POWER	GPC30300N	N/A

Item	Cable Type	Shielded Type	Ferrite Core	Length
1	USB Cable	NO	NO	1m
2	DC Cable	NO	NO	1m



#### 3. AC POWER LINE CONDUCTED EMISSIONS

#### **3.1 LIMIT**

Frequency of Emission (MHz)	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.

#### 3.2 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.

The following table is the setting of the receiver:

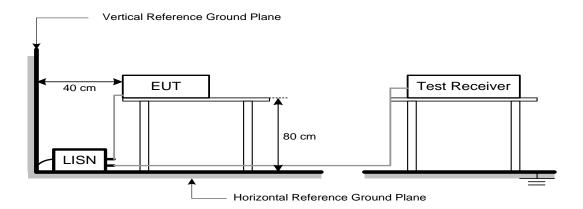
Receiver Parameters	Setting	
Start Frequency	0.15 MHz	
Stop Frequency	30 MHz	
IF Bandwidth	9 kHz	

## 3.3 DEVIATION FROM TEST STANDARD

No deviation.



#### 3.4 TEST SETUP



#### 3.5 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.

#### 3.6 TEST RESULTS

Please refer to the APPENDIX A.

#### Remark:

- (1) All readings are QP Mode value unless otherwise stated AVG in column of <code>Note</code>. 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.



## 4. RADIATED EMISSIONS

#### **4.1 LIMIT**

In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) 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 (Above 1000 MHz)

Fragues (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 CFR Title 47, Part 15, Subpart C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).



#### **4.2 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.

The following table is the setting of the receiver:

Spectrum Parameters	Setting	
Start ~ Stop Frequency	9 kHz~150 kHz for RBW 200 Hz	
Start ~ Stop Frequency	0.15 MHz~30 MHz for RBW 9 kHz	
Start ~ Stop Frequency	30 MHz~1000 MHz for RBW 100 kHz	

Spectrum Parameters	Setting	
Start Frequency	1000 MHz	
Stop Frequency	10th carrier harmonic	
RBW / VBW	1 MHz / 3 MHz for PK value	
(Emission in restricted band)	1 MHz / 1/T Hz for AVG value	

Spectrum Parameters	Setting	
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 detector	
Start ~ Stop Frequency	1 GHz~26.5 GHz for PK/AVG detector	

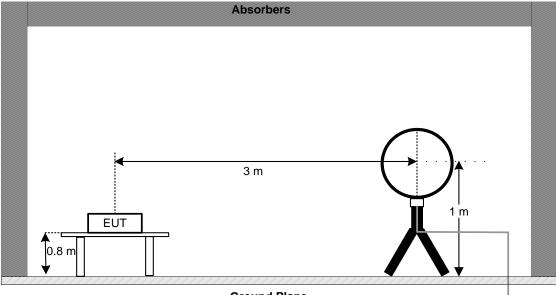


# 4.3 DEVIATION FROM TEST STANDARD

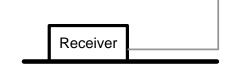
No deviation.

# 4.4 TEST SETUP

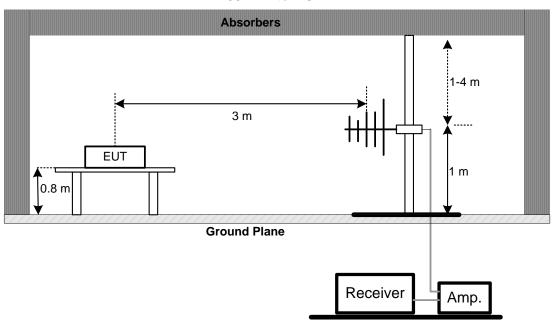
## 9 kHz to 30 MHz



**Ground Plane** 



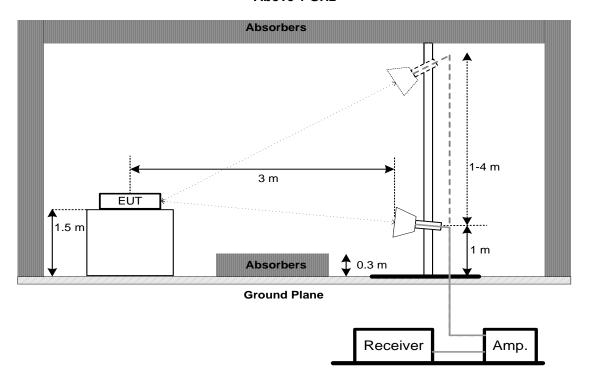
30 MHz to 1 GHz



Page 16 of 73







## 4.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

## 4.6 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.

## 4.7 TEST RESULT - 30 MHz TO 1000 MHz

Please refer to the Appendix C.

## 4.8 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.



## 5. BANDWIDTH

## **5.1 LIMIT**

Section	Test Item	Limit
	6 dB Bandwidth	>= 500 kHz
FCC 15.247(a)(2)	99% Emission Bandwidth	-

## **5.2 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 following table is the setting of the spectrum analyzer:

## For 6 dB Bandwidth:

Setting			
> Measurement Bandwidth			
100 kHz			
300 kHz			
Peak			
Max Hold			
Auto			

#### For 99% Emission Bandwidth:

1 01 33 /0 LITHSSIOTI Daridwidti	1.			
Spectrum Parameters	Setting			
Span Frequency	Between 1.5 times and 5.0 times the OBW			
RBW	30 kHz			
VBW	100 kHz			
Detector	Peak			
Trace	Max Hold			
Sweep Time	Auto			

#### 5.3 DEVIATION FROM STANDARD

No deviation.

## **5.4 TEST SETUP**



## 5.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

## **5.6 TEST RESULTS**

Please refer to the Appendix E.



## **6. MAXIMUM OUTPUT POWER**

## **6.1 LIMIT**

Section	Test Item	Limit
FCC 15.247(b)(3)	Maximum Output Power	1.0000 watt or 30.00 dBm

#### **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. The following table is the setting of the spectrum analyzer:

Spectrum Parameters	Setting
Span Frequency	≥ 3×RBW
RBW	3 MHz
VBW	3 MHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

## **6.3 DEVIATION FROM STANDARD**

No deviation.

## **6.4 TEST SETUP**



## **6.5 EUT OPERATION CONDITIONS**

The EUT was programmed to be in continuously transmitting mode.

## **6.6 TEST RESULTS**

Please refer to the Appendix F.



#### 7. CONDUCTED SPURIOUS EMISSION

#### **7.1 LIMIT**

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.

#### 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 following table is the setting of the spectrum analyzer:

Spectrum Parameters	Setting	
Start Frequency	30 MHz	
Stop Frequency	26.5 GHz	
RBW	100 kHz	
VBW	300 kHz	
Detector	Peak	
Trace	Max Hold	
Sweep Time	Auto	

#### 7.3 DEVIATION FROM STANDARD

No deviation.

#### 7.4 TEST SETUP



## 7.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

## 7.6 TEST RESULTS

Please refer to the Appendix G.



## 8. POWER SPECTRAL DENSITY

#### **8.1 LIMIT**

Section	Test Item	Limit
FCC 15.247(e)	Power Spectral Density	8 dBm (in any 3 kHz)

# **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. The following table is the setting of the spectrum analyzer:

Spectrum Parameters	Setting			
Span Frequency	2 MHz (1 Mbps) / 4 MHz (2 Mbps)			
RBW	3 kHz			
VBW	10 kHz			
Detector	Peak			
Trace	Max Hold			
Sweep Time	Auto			

#### 8.3 DEVIATION FROM STANDARD

No deviation.

#### 8.4 TEST SETUP



## **8.5 EUT OPERATION CONDITIONS**

The EUT was programmed to be in continuously transmitting mode.

## **8.6 TEST RESULTS**

Please refer to the Appendix H.



# 9. 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	Feb. 28, 2022	
2	LISN	EMCO	3816/2	52765	Feb. 27, 2022	
3	TWO-LINE V-NETWORK	R&S	ENV216	101447	Feb. 27, 2022	
4	50Ω Terminator	SHX	TF5-3	15041305	Feb. 27, 2022	
5	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A	
6	Cable	N/A	RG223	12m	Mar. 09, 2022	
7	643 Shield Room	ETS	6*4*3m	N/A	N/A	

	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	Apr. 28, 2022				
2	Cable	N/A	RG 213/U	N/A	May 28, 2022				
3	EMI Test Receiver	R&S	ESCI	100895	Feb. 27, 2022				
4	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A				
5	966 Chambe Room	RM	9*6*6m	N/A	Jul. 25, 2021				

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. 15, 2022		
2	Amplifier	HP	8447D	2944A08742	Feb. 28, 2022		
3	Receiver	Agilent	N9038A	MY52130039	Jul. 25, 2021		
4	Cable	emci	LMR-400(30MHz-1 GHz)(8m+5m)	N/A	May 20, 2022		
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		
8	966 Chambe Room	RM	9*6*6m	N/A	Jul. 25, 2021		

	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. 17, 2022			
2	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Jul. 07, 2021			
3	Amplifier	Agilent	8449B	3008A02584	Jul. 25, 2021			
4	Microwave Preamplifier With Adaptor	EMC INSTRUMENT	EMC2654045	980039 & HA01	Feb. 28, 2022			
5	Receiver	Agilent	N9038A	MY52130039	Jul. 25, 2021			
6	Controller	CT	SC100	N/A	N/A			
7	Controller	MF	MF-7802	MF780208416	N/A			
8	Cable	N/A	EMC104-SM-SM-6 000	N/A	Oct. 16, 2021			
9	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N//				
10	Filter	STI	STI15-9912	N/A	Jul. 25, 2021			
11	966 Chambe Room	RM	9*6*6m	N/A	Jul. 25, 2021			



Bandwidth &  Maximum Output Power &  Power Spectral Density &  Conducted Spurious Emission								
Item	tem Kind of Equipment Manufacturer Type No. Serial No. Calib							
1	Spectrum Analyzer	R&S	FSP40	100185	Jul. 25, 2021			
2	Attenuator	WOKEN	6SM3502	VAS1214NL	Feb. 07, 2022			
3	RF Cable	Tongkaichuan	N/A	N/A	N/A			
4	DC Block	Mini	N/A	N/A	N/A			

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



# 10. EUT TEST PHOTO





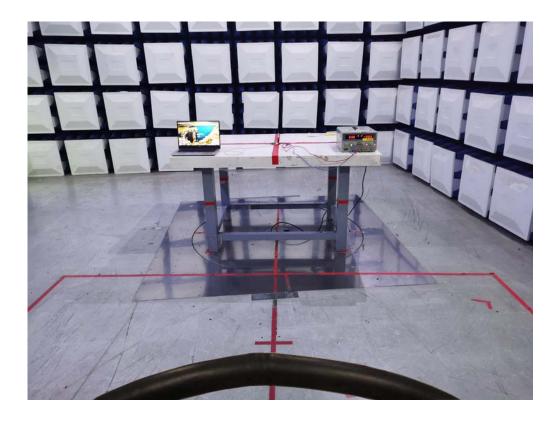




# **Radiated Emissions Test Photos**

9 kHz to 30 MHz







# **Radiated Emissions Test Photos**

30 MHz to 1000 MHz



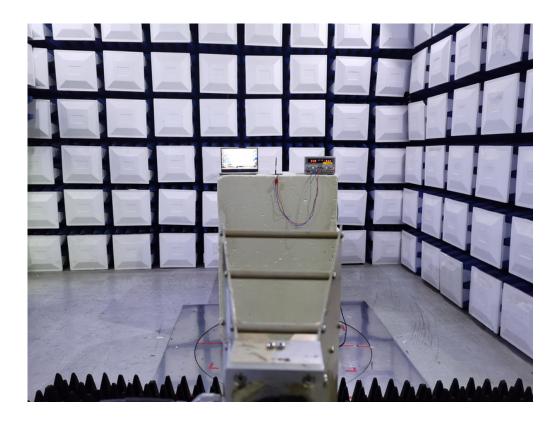




# **Radiated Emissions Test Photos**

# Above 1 GHz

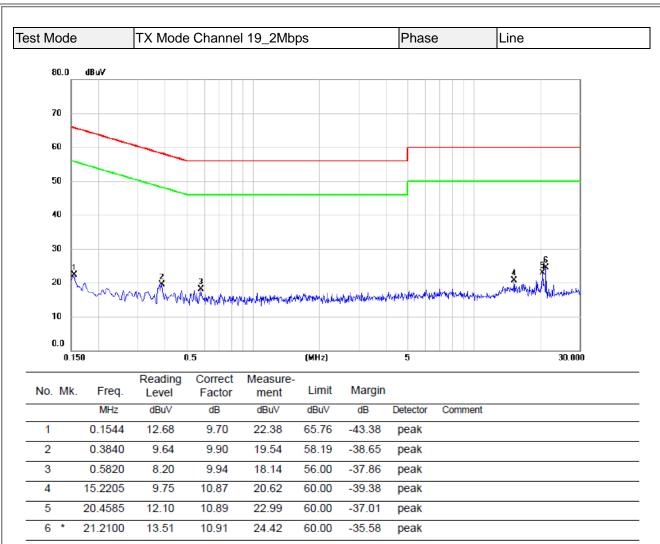






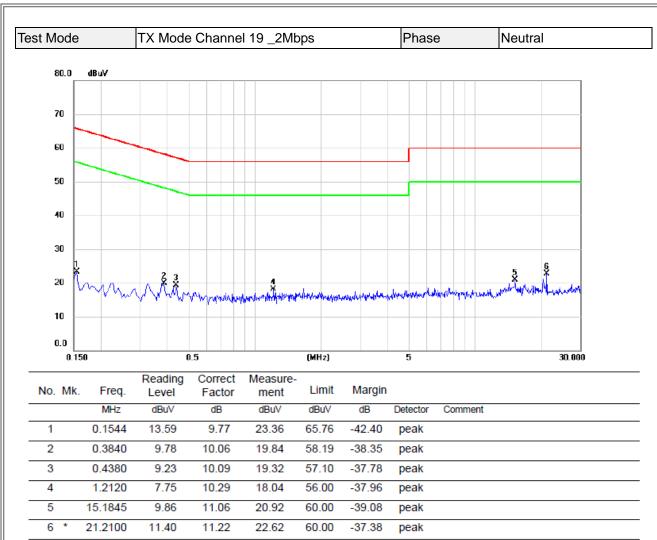
	APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS
L	





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





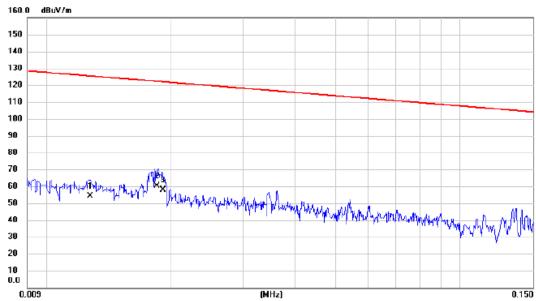
- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.



APPENDIX B - RADIATED EMISSION - 9 KHZ TO 30 MHZ



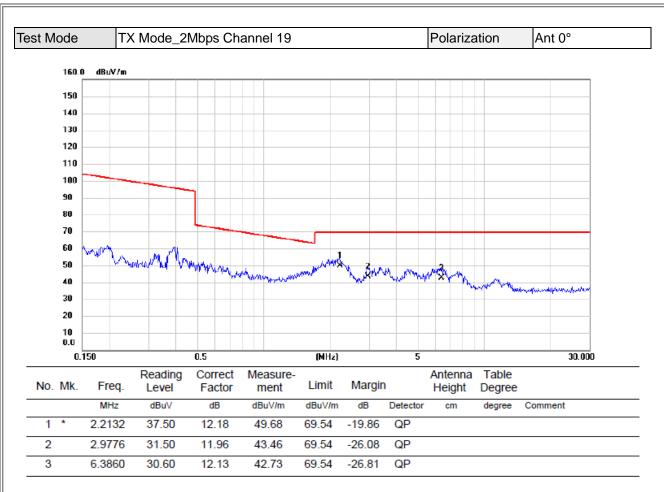




No. Mk.	Freq.		Correct Factor	Measure- ment		Margin	1	Antenna Height		
	MHz	dBu∀	dB	dBuV/m	dBu∀/m	dB	Detector	cm	degree	Comment
1	0.0128	37.60	16.67	54.27	125.46	-71.19	AVG			
2 *	0.0185	45.50	14.88	60.38	122.26	-61.88	AVG			
3	0.0192	43.20	14.66	57.86	121.94	-64.08	AVG			

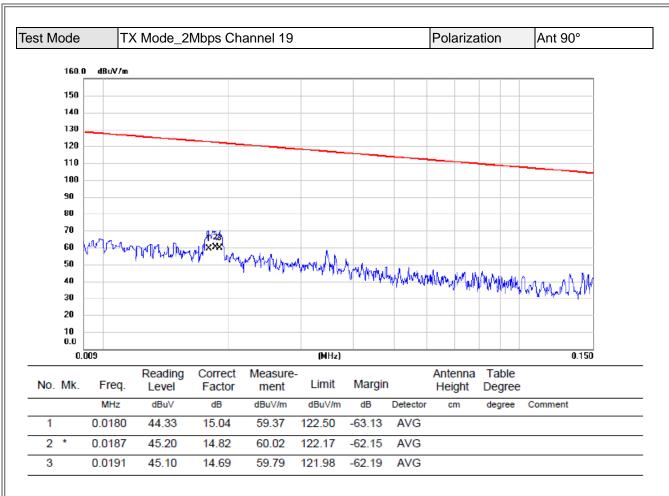
- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.





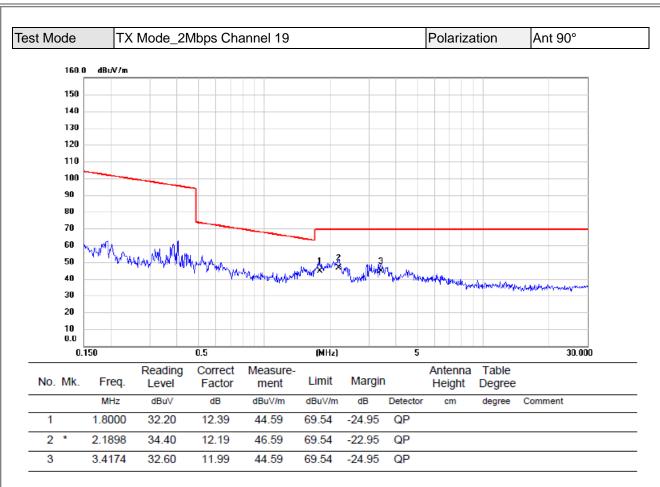
- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.





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



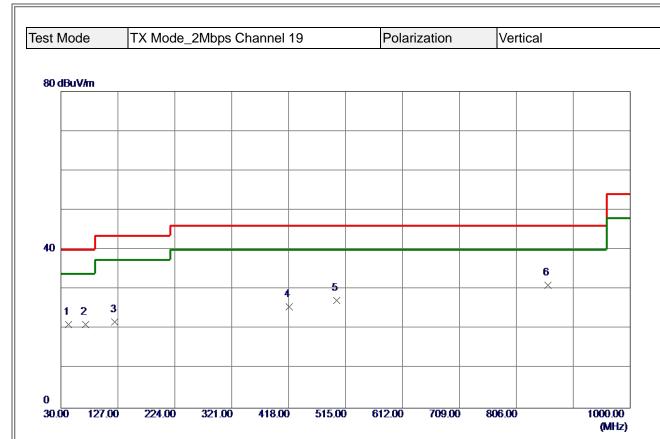


- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.



APPENDIX C - RADIATED EMISSION - 30 MHZ TO 1000 MH	łΖ





No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	42.6100	35. 13	-13. 95	21. 18	40.00	-18.82	Peak	
2	71. 7100	37. 70	-16. 59	21. 11	40.00	-18.89	Peak	
3	122. 1500	35. 77	-13. 99	21. 78	43. 50	-21.72	Peak	
4	418. 9700	33. 85	-8. 26	25. 59	46.00	-20. 41	Peak	
5	499. 4800	33. 74	-6. 55	27. 19	46.00	-18.81	Peak	
6 *	860. 3200	31. 47	-0. 45	31. 02	46. 00	-14. 98	Peak	

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







No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	47. 4600	31. 25	-13. 86	17. 39	40.00	-22. 61	Peak	
2	159. 9800	34. 35	-12. 37	21. 98	43. 50	-21. 52	Peak	
3	241. 4600	41. 42	-13. 32	28. 10	46.00	-17. 90	Peak	
4	385. 0200	34. 00	-9. 13	24. 87	46.00	-21. 13	Peak	
5	604. 2400	30. 27	- <b>4. 48</b>	25. 79	46. 00	-20. 21	Peak	
6 *	870. 9900	30. 49	-0. 26	30. 23	46.00	-15. 77	Peak	

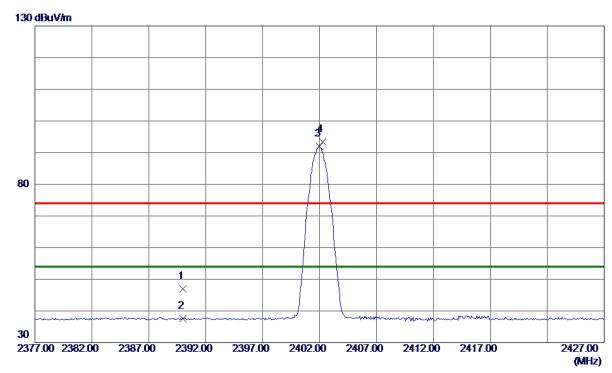
- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.



APPENDIX D - RADIATED EMISSION - ABOVE 1000 MHZ



Test Mode	TX 2402 MHz _CH00_1Mbps	Polarization	Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390. 0000	39. 83	7. 26	47. 09	74.00	-26. 91	Peak	
2	2390. 0000	30. 29	7. 26	37. 55	54.00	-16. 45	AVG	
3 *	2402. 0000	84. 76	7. 26	92. 02	54. 00	38. 02	AVG	No Limit
4	2402. 2500	86. 19	7. 26	93. 45	74. 00	19. 45	Peak	No Limit

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



Test Mode	TX 2402 MHz _CH00_1Mbps	Polarization	Vertical

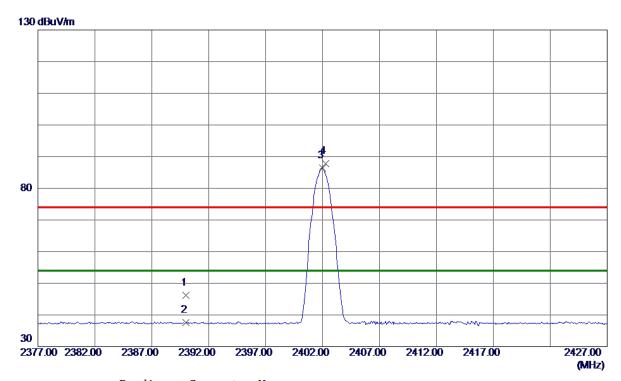


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4803. 9220	28. 44	4. 40	32. 84	54.00	-21. 16	AVG	
2	4804. 6820	39. 16	4. 40	43. 56	74. 00	-30. 44	Peak	

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



Test Mode	TX 2402 MHz _CH00_1M	bps Polarization	Horizontal	



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390. 0000	38. 85	7. 26	46. 11	74.00	-27. 89	Peak	
2	2390. 0000	30. 40	7. 26	37. 66	54.00	-16. 34	AVG	
3 *	2402. 0000	79. 06	7. 26	86. 32	54.00	32. 32	AVG	No Limit
4	2402. 2500	80. 57	7. 26	87. 83	74.00	13.83	Peak	No Limit

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



Test Mode	TX 2402 MHz _CH00_1Mbps	Polarization	Horizontal

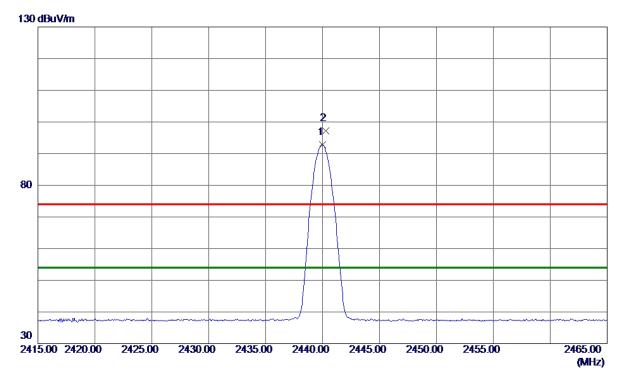


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4805. 2879	38. 82	4. 40	43. 22	74.00	-30. 78	Peak	
2 *	4805. 3980	28. 37	4. 40	32. 77	54.00	-21. 23	AVG	

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



Test Mode	TX 2440 MHz _CH19_1Mbps	Polarization	Vertical

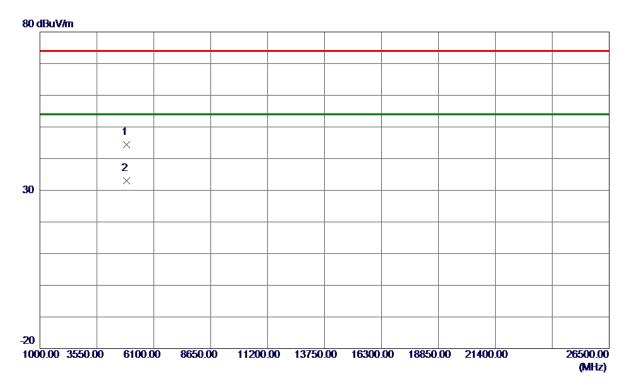


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2440. 0000	85. 56	7. 25	92. 81	<b>54.00</b>	38. 81	AVG	No Limit
2	2440. 2500	89. 89	7. 25	97. 14	74. 00	23. 14	Peak	No Limit

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



Test Mode	TX 2440 MHz _CH19_1Mbps	Polarization	Vertical

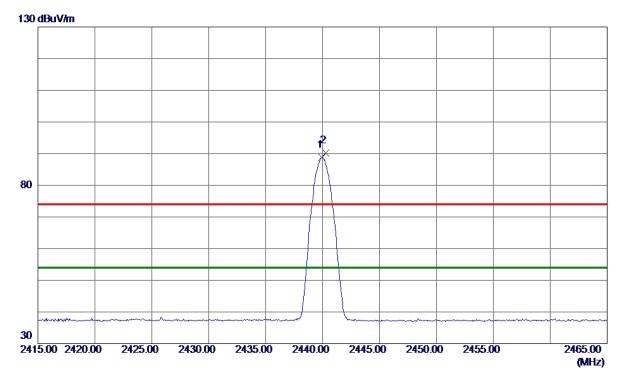


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4880. 8400	39. 79	4. 60	44. 39	74.00	-29. 61	Peak	
2 *	4881. 2270	28. 41	4. 60	33. 01	54.00	-20. 99	AVG	

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



Test Mode	TX 2440 MHz _CH19_1Mbps	Polarization	Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2439. 9500	81. 48	7. 25	88. 73	<b>54.00</b>	34. 73	AVG	No Limit
2	2440. 2500	82. 92	7. 25	90. 17	74. 00	16. 17	Peak	No Limit

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



Test Mode	TX 2440 MHz _CH19_1Mbps	Polarization Horizontal	

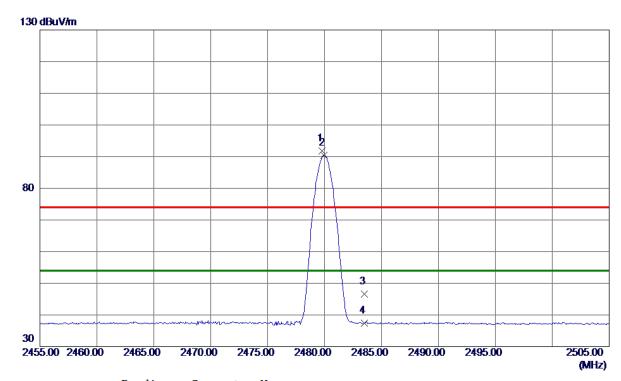


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4877. 7050	39. 56	4. 59	44. 15	74.00	-29.85	Peak	
2 *	4880. 5230	28. 54	4. 60	33. 14	54. 00	-20. 86	AVG	

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



Test Mode	TX 2480 MHz _CH39_1Mbps	Polarization	Vertical

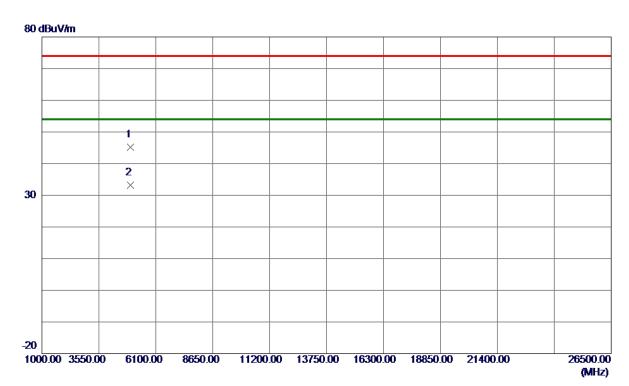


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2479. 8000	84. 62	7. 25	91.87	74.00	17. 87	Peak	No Limit
2 *	2479. 9500	83. 16	7. 25	90. 41	54.00	36. 41	AVG	No Limit
3	2483. 5000	39. 42	7. 25	46. 67	74.00	-27. 33	Peak	
4	2483. 5000	30. 09	7. 25	37. 34	54. 00	-16. 66	AVG	

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



Test Mode	TX 2480 MHz _CH39_1Mbps	Polarization	Vertical

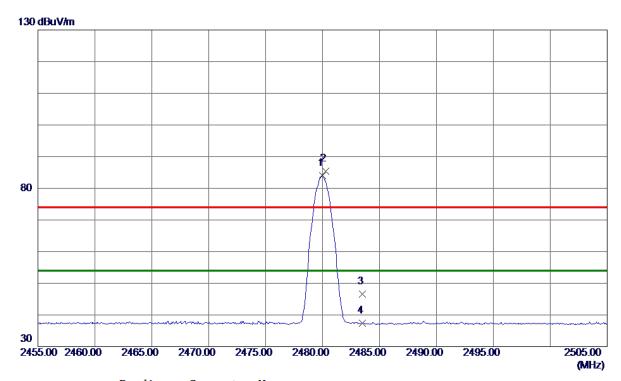


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4959. 1100	40. 42	4. 81	45. 23	74.00	-28. 77	Peak	
2 *	4961. 9700	28. 45	4. 82	33. 27	54.00	-20. 73	AVG	

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



Test Mode	TX 2480 MHz _CH39_1Mbps	Polarization	Horizontal

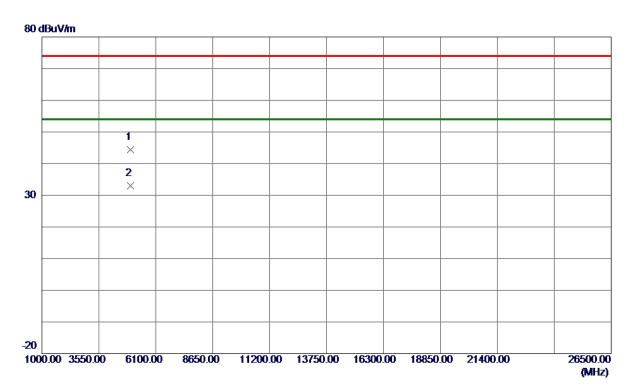


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2480. 0000	76. 70	7. 25	83. 95	54.00	29. 95	AVG	No Limit
2	2480. 2500	78. 08	7. 25	85. 33	74.00	11. 33	Peak	No Limit
3	2483. 5000	39. 41	7. 25	46. 66	74.00	-27. 34	Peak	
4	2483. 5000	30. 08	7. 25	37. 33	54. 00	-16. 67	AVG	

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



Test Mode	TX 2480 MHz	CH39_1Mbps	Polarization	Horizontal

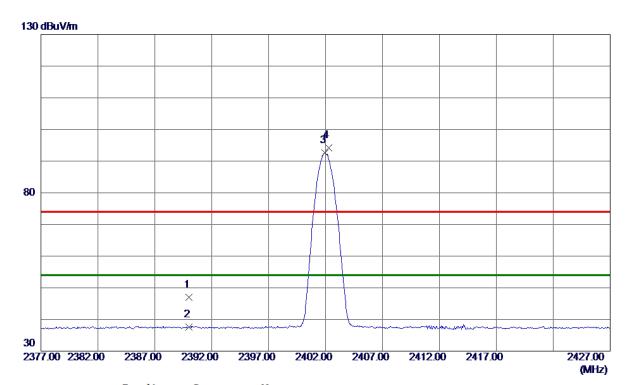


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4958. 6850	39. 63	4. 81	44. 44	74.00	-29. 56	Peak	
2 *	4958. 7380	28. 11	4. 81	32. 92	54.00	-21. 08	AVG	

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





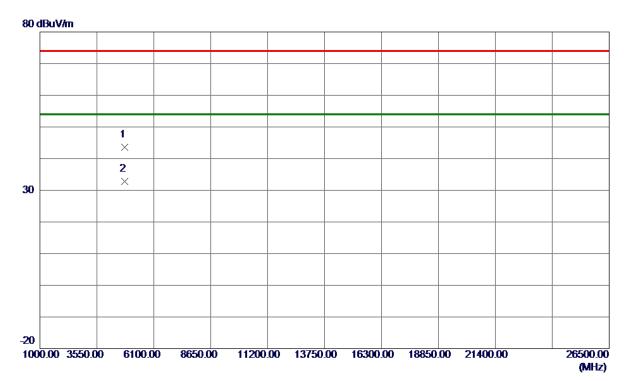


No	<b>).</b> ]	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
		MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2	2390. 0000	39. 77	7. 26	47. 03	74.00	-26. 97	Peak	
2	2	2390. 0000	30. 38	7. 26	37. 64	54.00	-16. 36	AVG	
3	* 2	2401. 9500	85. 36	7. 26	92. 62	54.00	38. 62	AVG	No Limit
4	2	2402. 2500	86. 86	7. 26	94. 12	74.00	20. 12	Peak	No Limit
	* 2	2390. 0000 2401. 9500	30. 38 85. 36	7. 26 7. 26	37. 64 92. 62	54. 00 54. 00	-16. 36 38. 62	AVG AVG	

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



Test Mode	TX 2402 MHz _CH00_2Mbps	Polarization	Vertical

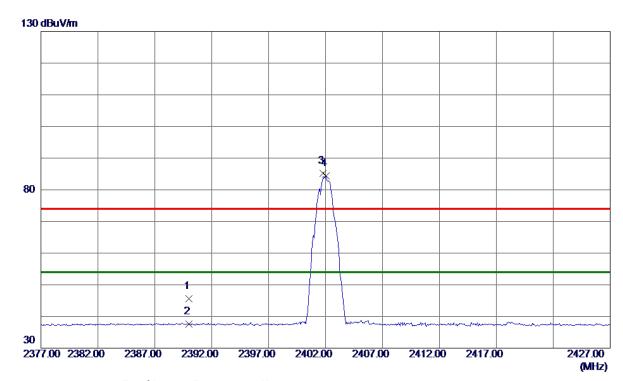


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4804. 7830	39. 22	4. 40	43. 62	74.00	-30. 38	Peak	
2 *	4805. 7000	28. 47	4. 40	32. 87	54. 00	-21. 13	AVG	

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



Test Mode	TX 2402 MHz	CH00 2Mbps	Polarization	Horizontal

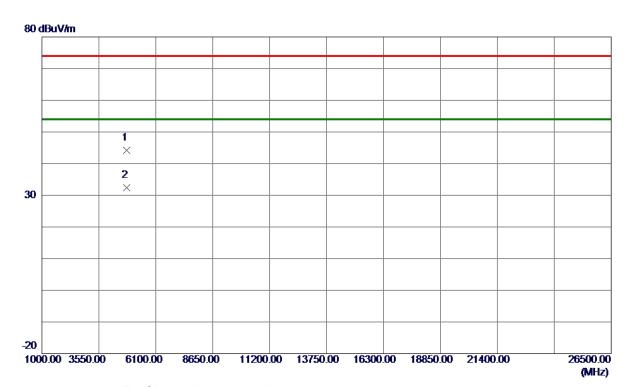


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390. 0000	38. 27	7. 26	45. 53	74.00	-28. 47	Peak	
2	2390. 0000	30. 34	7. 26	37. 60	54.00	-16. 40	AVG	
3	2401.8000	78. 01	7. 26	85. 27	74.00	11. 27	Peak	No Limit
4 *	2402. 0500	77. 14	7. 26	84. 40	54.00	30. 40	AVG	No Limit

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



Test Mode	TX 2402 MHz _CH00_2Mbps	Polarization	Horizontal

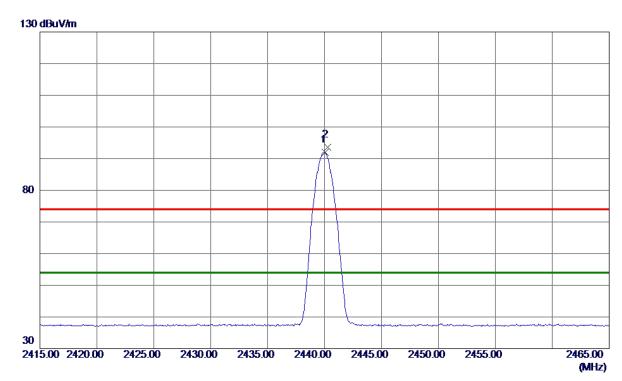


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4804. 2919	39. 72	4. 40	44. 12	74.00	-29. 88	Peak	
2 *	4806. 2850	27. 95	4. 40	32. 35	54.00	-21.65	AVG	

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



Test Mode	TX 2440 MHz _CH19_2Mbps	Polarization	Vertical

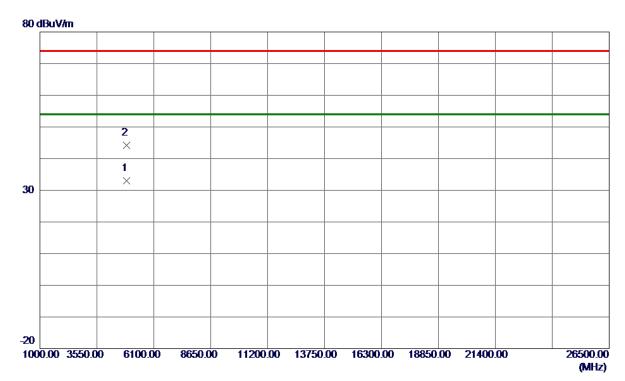


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2440. 0500	84. 79	7. 25	92. 04	54.00	38. 04	AVG	No Limit
2	2440. 2500	86. 30	7. 25	93. 55	74. 00	19. 55	Peak	No Limit

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



Test Mode	TX 2440 MHz _CH19_2Mbps	Polarization	Vertical

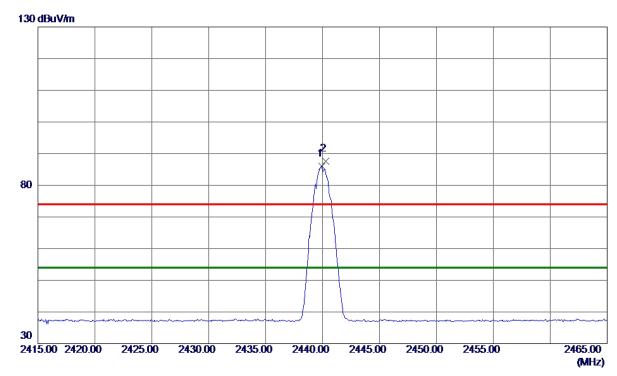


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4879. 2150	28. 41	4. 60	33. 01	54.00	-20. 99	AVG	
2	4879. 6020	39. 66	4. 60	44. 26	74.00	-29. 74	Peak	

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



Test Mode	TX 2440 MHz _CH19_2Mbps	Polarization	Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2439. 9500	78. 84	7. 25	86. 09	54.00	32. 09	AVG	No Limit
2	2440. 2500	80. 37	7. 25	87. 62	74. 00	13. 62	Peak	No Limit

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



Test Mode	TX 2440 MHz _CH19_2Mbps	Polarization	Horizontal

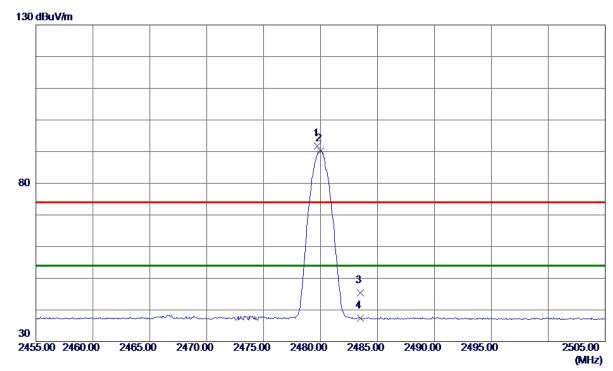


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4880. 1480	28. 50	4. 60	33. 10	54.00	-20. 90	AVG	
2	4881. 9430	39. 70	4. 60	44. 30	74. 00	-29. 70	Peak	

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



Test Mode	TX 2480 MHz _CH39_2Mbps	Polarization	Vertical

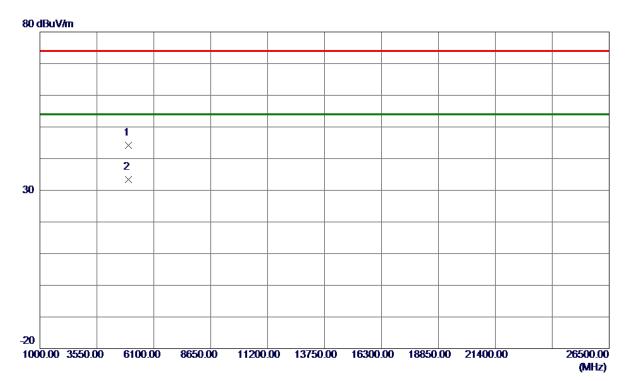


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2479. 7500	84. 54	7. 25	91. 79	74.00	17. 79	Peak	No Limit
2 *	2480. 0000	83. 04	7. 25	90. 29	54.00	36. 29	AVG	No Limit
3	2483. 5000	38. 18	7. 25	45. 43	74.00	-28. 57	Peak	
4	2483. 5000	30. 11	7. 25	37. 36	54. 00	-16. 64	AVG	

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



Test Mode	TX 2480 MHz _CH39_2Mbps	Polarization	Vertical

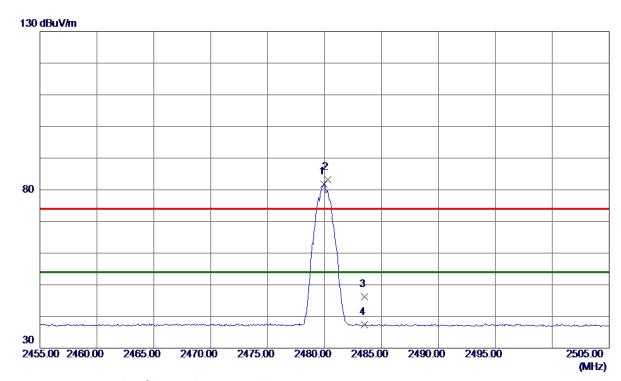


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4958. 4670	39. 35	4. 81	44. 16	74.00	-29. 84	Peak	
2 *	4959. 5400	28. 67	4. 81	33. 48	<b>54.00</b>	-20. 52	AVG	

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



Test Mode	TX 2480 MHz	CH39 2Mbps	Polarization	Horizontal

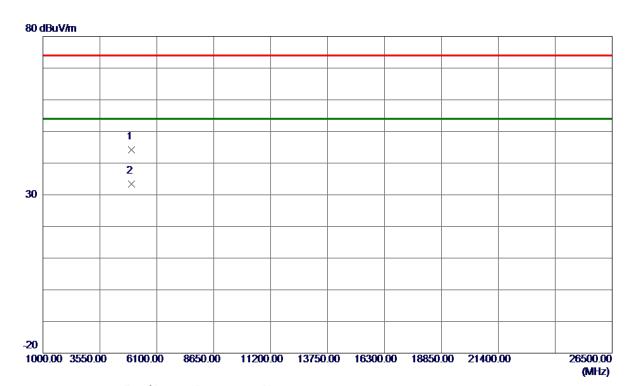


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2479. 9500	74. 48	7. 25	81. 73	54.00	27. 73	AVG	No Limit
2	2480. 2500	75. 90	7. 25	83. 15	74.00	9. 15	Peak	No Limit
3	2483. 5000	39. 03	7. 25	46. 28	74.00	-27. 72	Peak	
4	2483. 5000	30. 14	7. 25	37. 39	54.00	-16. 61	AVG	

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



Test Mode	TX 2480 MHz	CH39 2Mbps	Polarization	Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4958. 9250	39. 49	4. 81	44. 30	74.00	-29. 70	Peak	
2 *	4959. 3900	28. 69	4. 81	33. 50	54.00	-20. 50	AVG	

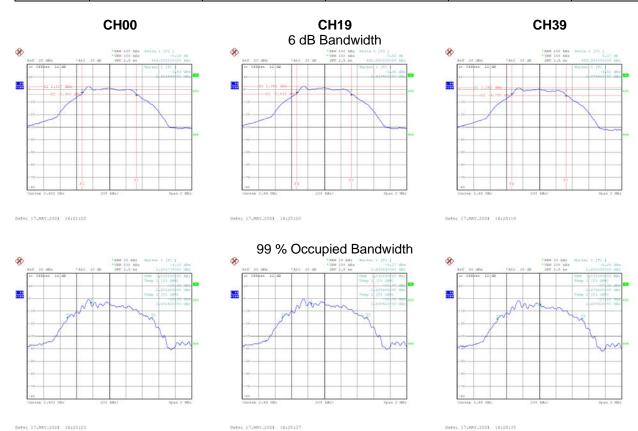
- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.



APPENDIX E - BANDWIDTH

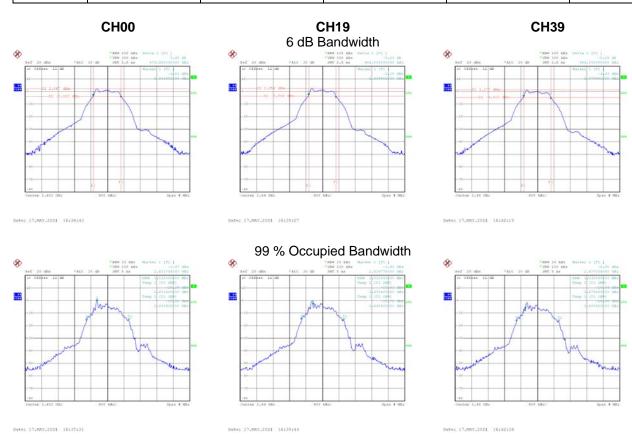


Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)	6 dB Bandwidth Min. Limit (MHz)	Test Result
00	2402	0.658	1.032	0.5	Pass
19	2440	0.663	1.032	0.5	Pass
39	2480	0.659	1.032	0.5	Pass





Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)	6 dB Bandwidth Min. Limit (MHz)	Test Result
00	2402	0.680	1.032	0.5	Pass
19	2440	0.664	1.032	0.5	Pass
39	2480	0.664	1.032	0.5	Pass



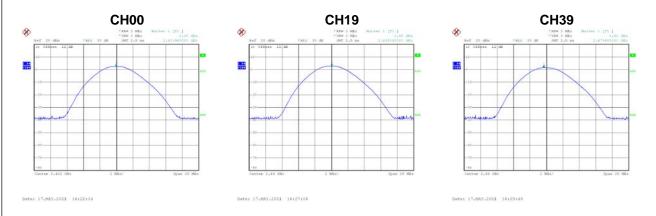


APPENDIX F - MAXIMUM OUTPUT POWER



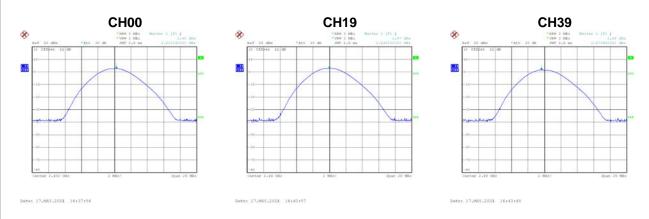
	Test Mode	TX Mode _1N	/lbps
ı	1000 111000	1174 1110 40 _ 111	

Frequency (MHz)	Output Power (dBm)	Output Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
2402	2.40	0.0017	30.00	1.0000	Pass
2440	2.65	0.0018	30.00	1.0000	Pass
2480	1.51	0.0014	30.00	1.0000	Pass



Test Mode   TX Mode _2Mbps	Test Mode
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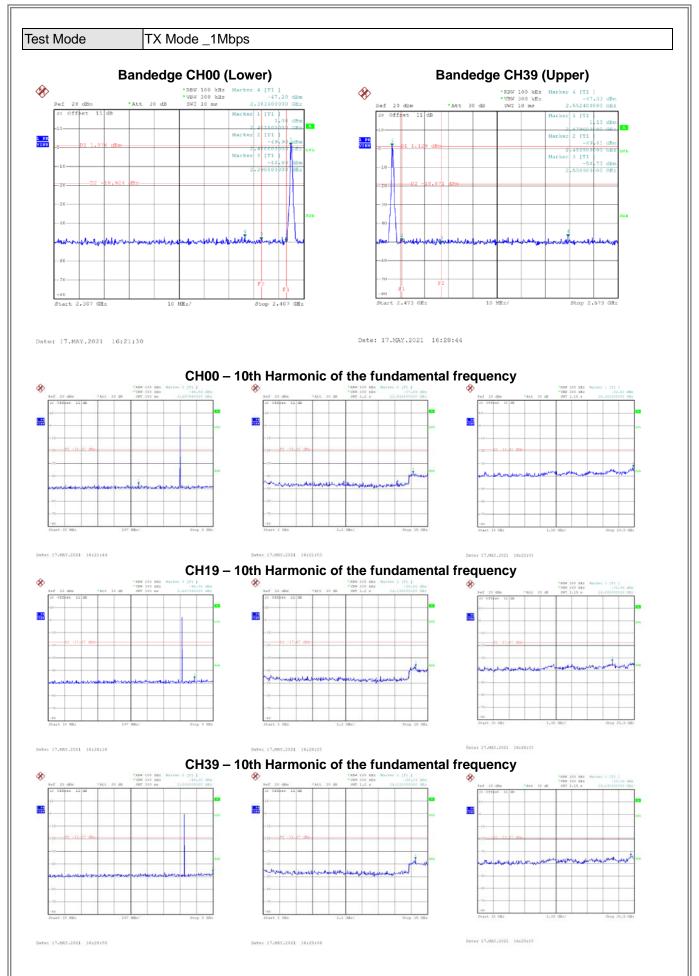
Frequency (MHz)	Output Power (dBm)	Output Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
2402	2.45	0.0018	30.00	1.0000	Pass
2440	2.67	0.0018	30.00	1.0000	Pass
2480	1.49	0.0014	30.00	1.0000	Pass



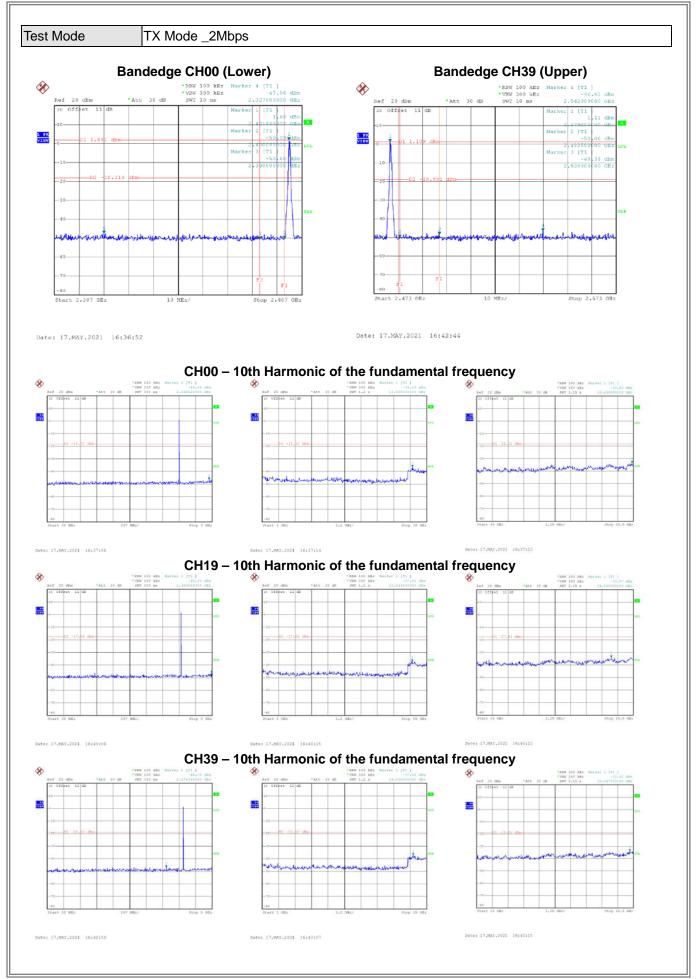


APPENDIX G - CONDUCTED SPURIOUS EMISSION		









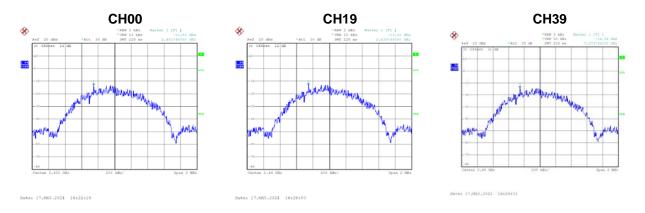


# **APPENDIX H - POWER SPECTRAL DENSITY**



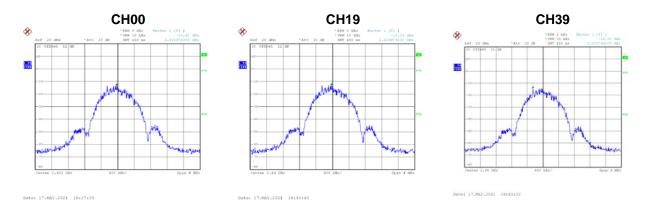
Test Mode	TX Mode _	1Mb	กร
103t Wood	I I N IVIOGO _	_ 1 1 1 1 1 1	ρJ

Channel	Frequency (MHz)	Power Spectral Density (dBm/3 kHz)	Max. Limit (dBm/3 kHz)	Test Result
00	2402	-13.53	8.00	Pass
19	2440	-13.16	8.00	Pass
39	2480	-14.34	8.00	Pass



Test Mode	TX Mode 2Mbps
	· · · · · · · · · · - · · ·

Channel	Frequency (MHz)	Power Spectral Density (dBm/3 kHz)	Max. Limit (dBm/3 kHz)	Test Result
00	2402	-13.41	8.00	Pass
19	2440	-13.14	8.00	Pass
39	2480	-14.38	8.00	Pass



**End of Test Report**