



FCC Radio Test Report

FCC ID: TE7T4UPLUS

This report concerns: Original Grant

Project No. : 2006C101

Equipment: AC1300 Dual Antennas High Gain Wireless USB Adapter

Brand Name : tp-link

Test Model : Archer T4U Plus

Series Model : N/A

Applicant: TP-Link Technologies Co., Ltd.

Address : Building 24(floors1,3,4,5) and 28(floors1-4) Central Science and

Technology Park, Shennan Rd, Nanshan, Shenzhen, China

Manufacturer: TP-Link Technologies Co., Ltd.

Address : Building 24(floors1,3,4,5) and 28(floors1-4) Central Science and

Technology Park, Shennan Rd, Nanshan, Shenzhen, China

Date of Receipt : Jun. 17, 2020

Date of Test : Jun. 18, 2020 ~ Aug. 11, 2020

Issued Date : Aug. 27, 2020

Report Version : R00

Test Sample: Engineering Sample No.: DG2020061794 for conducted,

DG2020061795 for radiated.

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

ANSI C63.10-2013

FCC KDB 558074 D01 15.247 Meas Guidance v05r02

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

Prepared by: Chella Zheng

Approved by: Ethan Ma

IIAC-MRA ACCI



Certificate #5123.02

Add: No.3, Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.

Tel: +86-769-8318-3000 Web: www.newbtl.com



Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

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.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, A2LA, or any agency of the U.S. Government.

This report is the confidential property of the client. As a mutual protection to the clients, the public and ourselves, the test report shall not be reproduced, except in full, without our written approval.

BTL's laboratory quality assurance procedures are in compliance with the **ISO/IEC 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

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.



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	9
2 . GENERAL INFORMATION	10
2.1 GENERAL DESCRIPTION OF EUT	10
2.2 DESCRIPTION OF TEST MODES	12
2.3 PARAMETERS OF TEST SOFTWARE	13
2.4 DUTY CYCLE	14
2.5 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	15
2.6 SUPPORT UNITS	15
3 . AC POWER LINE CONDUCTED EMISSIONS TEST	16
3.1 LIMIT	16
3.2 TEST PROCEDURE	16
3.3 DEVIATION FROM TEST STANDARD	16
3.4 TEST SETUP	17
3.5 EUT OPERATION CONDITIONS	17
3.6 TEST RESULTS	17
4 . RADIATED EMISSIONS TEST	18
4.1 LIMIT	18
4.2 TEST PROCEDURE	19
4.3 DEVIATION FROM TEST STANDARD	19
4.4 TEST SETUP	20
4.5 EUT OPERATION CONDITIONS	21
4.6 TEST RESULTS - 9 KHZ TO 30 MHZ	21
4.7 TEST RESULTS - 30 MHZ TO 1000 MHZ	21
4.8 TEST RESULTS - ABOVE 1000 MHZ	21
5 . BANDWIDTH TEST	22
5.1 LIMIT	22
5.2 TEST PROCEDURE	22
5.3 DEVIATION FROM STANDARD	22
5.4 TEST SETUP	22



Table of Contents	Page
5.5 EUT OPERATION CONDITIONS	22
5.6 TEST RESULTS	22
6 . MAXIMUM AVERAGE OUTPUT POWER TEST	23
6.1 LIMIT	23
6.2 TEST PROCEDURE	23
6.3 DEVIATION FROM STANDARD	23
6.4 TEST SETUP	23
6.5 EUT OPERATION CONDITIONS	23
6.6 TEST RESULTS	23
7 . CONDUCTED SPURIOUS EMISSIONS	24
7.1 LIMIT	24
7.2 TEST PROCEDURE	24
7.3 DEVIATION FROM STANDARD	24
7.4 TEST SETUP	24
7.5 EUT OPERATION CONDITIONS	24
7.6 TEST RESULTS	24
8 . POWER SPECTRAL DENSITY TEST	25
8.1 LIMIT	25
8.2 TEST PROCEDURE	25
8.3 DEVIATION FROM STANDARD	25
8.4 TEST SETUP	25
8.5 EUT OPERATION CONDITIONS	25
8.6 TEST RESULTS	25
9 . MEASUREMENT INSTRUMENTS LIST	26
10 . EUT TEST PHOTO	28
APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS	33
APPENDIX B - RADIATED EMISSION - 9 KHZ TO 30 MHZ	36
APPENDIX C - RADIATED EMISSION - 30 MHZ TO 1000 MHZ	41
APPENDIX D - RADIATED EMISSION- ABOVE 1000 MHZ	44
APPENDIX E - BANDWIDTH	85
APPENDIX F - MAXIMUM AVERAGE OUTPUT POWER	90
APPENDIX G - CONDUCTED SPURIOUS EMISSIONS	94



Table of Contents	Page
APPENDIX H - POWER SPECTRAL DENSITY	101



REPORT ISSUED HISTORY

Report Version	Description	Issued Date
R00	Original Issue.	Aug. 27, 2020



1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC Part15, Subpart C (15.247)							
Standard(s) Section	Test Item	Test Result	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 Average Output Power	APPENDIX F	PASS				
15.247(d)	Conducted Spurious Emissions	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 in this test report.
- (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 test:

Test Site	Method	Measurement Frequency Range	U, (dB)
DG-C02	CISPR	150kHz ~ 30MHz	2.60

B. Radiated emissions test:

Test Site	Method	Measurement Frequency Range	Ant. H / V	U, (dB)
		9kHz ~ 30MHz	V	3.79
		9kHz ~ 30MHz	Н	3.57
		30MHz ~ 200MHz	V	4.88
DG-CB03 CISPR		30MHz ~ 200MHz	Н	4.14
	CICDD	200MHz ~ 1,000MHz	V	4.62
	CIOPK	200MHz ~ 1,000MHz	Н	4.80
		1GHz ~ 6GHz	-	4.58
	18GHz ~ 26.	6GHz ~ 18GHz	-	5.18
		18GHz ~ 26.5GHz	-	3.62
		26.5GHz ~ 40GHz	-	4.00

C. Other Measurement:

Test Item	Uncertainty
Bandwidth	±3.8 %
Maximum Average Output Power	±0.95 dB
Conducted Spurious Emission	±2.71 dB
Power Spectral Density	±0.86 dB
Temperature	±0.08 °C
Time	±0.58 %
Supply voltages	±0.3 %

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 5V	Sheldon Ou
Radiated Emissions-9K-30MHz	25°C	60%	DC 5V	Sheldon Ou
Radiated Emissions-30 MHz to 1GHz	22°C	54%	DC 5V	Sheldon Ou
Radiated Emissions-Above 1000 MHz	24°C	60%	DC 5V	Sheldon Ou
Bandwidth	24°C	56%	DC 5V	Hayden Chen
Maximum Average Output Power	24°C	56%	DC 5V	Laughing Zhang
Conducted Spurious Emissions	24°C	56%	DC 5V	Hayden Chen
Power Spectral Density	24°C	56%	DC 5V	Hayden Chen



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	AC1300 Dual Antennas High Gain Wireless USB Adapter
Brand Name	tp-link
Test Model	Archer T4U Plus
Series Model	N/A
Model Difference(s)	N/A
Power Source	Supplied from PC USB port.
Power Rating	DC 5V
Operation Frequency	2412 MHz ~ 2462 MHz
Modulation Type	IEEE 802.11b: DSSS IEEE 802.11g: OFDM IEEE 802.11n: OFDM
Bit Rate of Transmitter	IEEE 802.11b: 11/5.5/2/1 Mbps IEEE 802.11g: 54/48/36/24/18/12/9/6 Mbps IEEE 802.11n: up to 300 Mbps
Maximum Average Output Power	IEEE 802.11b: 19.88 dBm (0.0973 W) IEEE 802.11g: 19.99 dBm (0.0998 W) IEEE 802.11n (HT20): 23.08 dBm (0.2032 W) IEEE 802.11n (HT40): 21.13 dBm (0.1297 W)

Note:

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

2. Channel List:

CHAINIOI LICE	•						
	CH01 - CH11 for IEEE 802.11b, IEEE 802.11g, IEEE 802.11n (HT20) CH03 - CH09 for IEEE 802.11n (HT40)						
Channel	Channel Frequency (MHz) Channel Frequency (MHz) Channel Frequency (MHz) Frequency (MHz)						
01	2412	04	2427	07	2442	10	2457
02	2417	05	2432	08	2447	11	2462
03	2422	06	2437	09	2452		

3. Table for Filed Antenna:

Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)
1	TP-LINK°	3101503200	Dipole	I-PEX	3
2	TP-LINK°	3101503200	Dipole	I-PEX	3

Note:

This EUT supports MIMO 2X2, any transmit signals are correlated with each other, so Directional gain= $G_{ANT}+10log(N)dBi$, that is Directional gain=3+10log(2)dBi=6.01. So, the output power limit is 30-(6.01-6)=29.99, the power spectral density limit is 8-(6.01-6)=7.99.



4. Table for Antenna Configuration:

Operating Mode TX Mode	1TX	2TX
IEEE 802.11b	V (Ant. 1)	-
IEEE 802.11g	V (Ant. 1)	-
IEEE 802.11n(HT20)	-	V (Ant. 1+ Ant. 2)
IEEE 802.11n(HT40)	-	V (Ant. 1+ Ant. 2)



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 B Mode Channel 01/06/11
Mode 2	TX G Mode Channel 01/06/11
Mode 3	TX N-20 MHz Mode Channel 01/06/11
Mode 4	TX N-40 MHz Mode Channel 03/06/09
Mode 5	TX N-20 MHz Mode Channel 06
Mode 6	TX B Mode Channel 01/02/06/10/11
Mode 7	TX G Mode Channel 01/02/06/10/11
Mode 8	TX N-20 MHz Mode Channel 01/02/06/10/11
Mode 9	TX N-40 MHz Mode Channel 03/04/06/08/09

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 5	TX N-20 MHz Mode Channel 06	

Radiated emissions test - Below 1GHz		
Final Test Mode	Description	
Mode 5	TX N-20 MHz Mode Channel 06	

Radiated emissions test- Above 1GHz		
Final Test Mode	Description	
Mode 6	TX B Mode Channel 01/02/06/10/11	
Mode 7	TX G Mode Channel 01/02/06/10/11	
Mode 8	TX N-20 MHz Mode Channel 01/02/06/10/11	
Mode 9	TX N-40 MHz Mode Channel 03/04/06/08/09	



Conducted test		
Final Test Mode	Description	
Mode 1	TX B Mode Channel 01/06/11	
Mode 2	TX G Mode Channel 01/06/11	
Mode 3	TX N-20 MHz Mode Channel 01/06/11	
Mode 4	TX N-40 MHz Mode Channel 03/06/09	

NOTE:

- (1) The measurements are performed at the high, middle, low available channels.
- (2) All the bit rate of transmitter have been tested and found the lowest rate is found to be the worst case and recorded.
- (3) For radiated emission below 1 GHz test, the IEEE 802.11n20 Channel 06 is found to be the worst case and recorded.
- (4) 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.
- (5) For Radiated emissions above 1GHz test, the vertical and horizontal polarities have tested, the worst case is vertical and recorded.

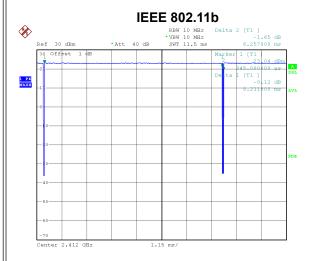
2.3 PARAMETERS OF TEST SOFTWARE

Test Software	MPTool		
Frequency (MHz)	2412	2437	2462
IEEE 802.11b	48	43	44
IEEE 802.11g	53	50	55
IEEE 802.11n (HT20)	52/55	50/50	49/50
Frequency (MHz)	2422	2437	2452
IEEE 802.11n (HT40)	49/53	53/55	48/50



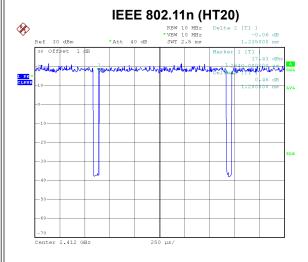
2.4 DUTY CYCLE

If duty cycle is \geq 98 %, duty factor is not required. If duty cycle is < 98 %, duty factor shall be considered. The output power = measured power + duty factor.



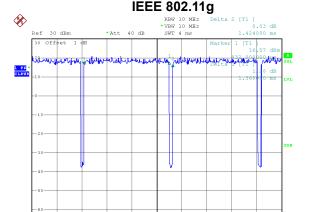
Date: 30.JUN.2020 15:57:28

Duty cycle = 8.211 ms / 8.257 ms = 99.44% Duty Factor = 10 log(1/Duty cycle) = 0.00



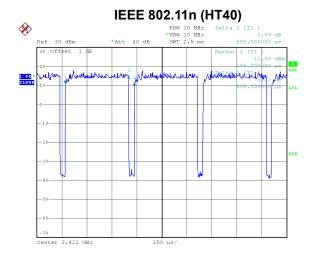
Date: 30.JUN.2020 15:59:18

Duty cycle = 1.280 ms / 1.335 ms = 95.88% Duty Factor = 10 log(1/Duty cycle) = 0.18



Date: 30.JUN.2020 15:57:50

Duty cycle = 1.368 ms / 1.424 ms = 96.07% Duty Factor = 10 log(1/Duty cycle) = 0.17



Date: 30.JUN.2020 15:58:46

Duty cycle = 0.635 ms / 0.690 ms = 92.03%Duty Factor = $10 \log(1/\text{Duty cycle}) = 0.36$

NOTE:

For IEEE 802.11b, IEEE 802.11g and IEEE 802.11n (HT20):

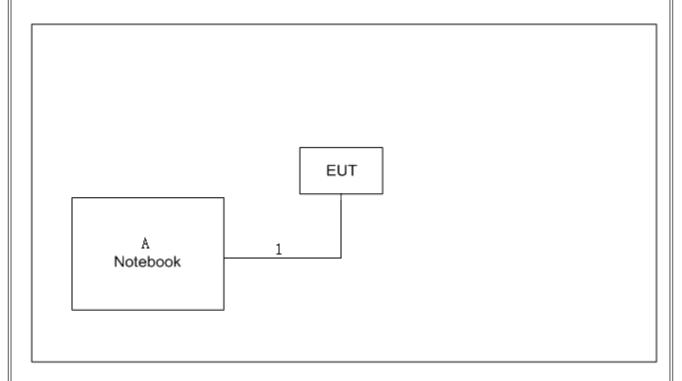
For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 1 kHz (Duty cycle < 98%).

For IEEE 802.11n (HT40):

For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 2 kHz (Duty cycle < 98%).



2.5 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



2.6 SUPPORT UNITS

Item	Equipment	Brand	Model No.	Series No.
А	Notebook	Dell	Inspiron 15-7559	N/A

Item	Cable Type	Shielded Type	Ferrite Core	Length
1	USB Cable	NO	NO	0.8m



3. AC POWER LINE CONDUCTED EMISSIONS TEST

3.1 LIMIT

Fraguency 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.

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

3.2 TEST PROCEDURE

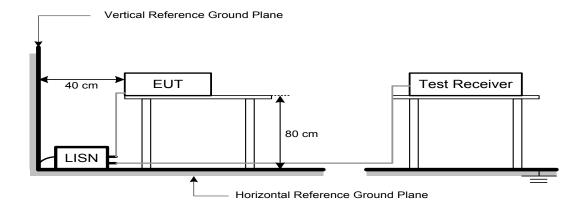
- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- 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.

3.3 DEVIATION FROM TEST STANDARD

No deviation



3.4 TEST SETUP



3.5 EUT OPERATION CONDITIONS

EUT was programmed to be in continuously transmitting mode.

3.6 TEST RESULTS

Please refer to the APPENDIX A.



4. RADIATED EMISSIONS TEST

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)

Frequency (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.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).



Spectrum Parameter	Setting	
Spectrum Farameter	Setting	
Attenuation	Auto	
Start Frequency	1000 MHz	
Stop Frequency	10th carrier harmonic	
RBW / VBW	1 MHz / 3 MHz for Peak,	
(Emission in restricted band)	1 MHz / 1/T for Average	

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 detector	

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.

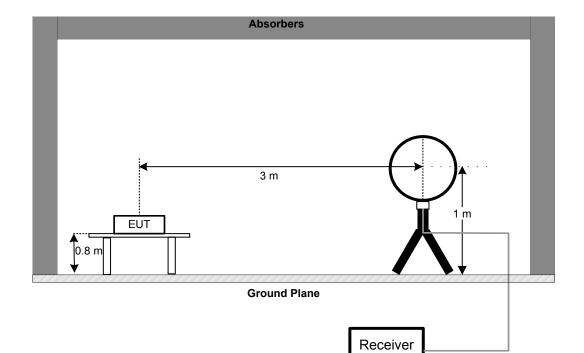
4.3 DEVIATION FROM TEST STANDARD

No deviation

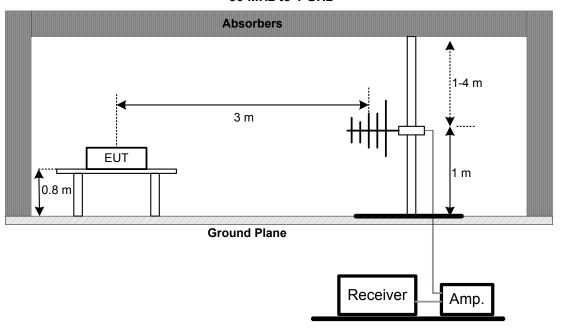


4.4 TEST SETUP

9 kHz-30 MHz

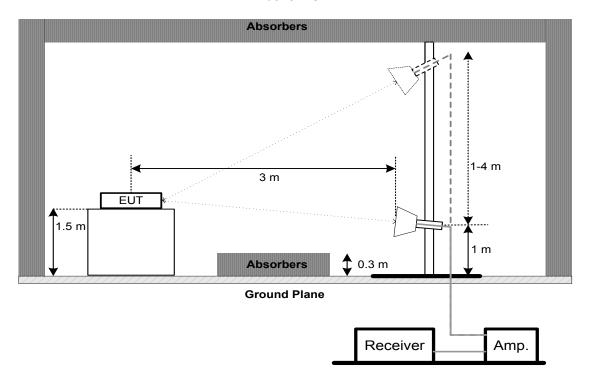


30 MHz to 1 GHz





Above 1 GHz



4.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

4.6 TEST RESULTS - 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 RESULTS - 30 MHZ TO 1000 MHZ

Please refer to the APPENDIX C.

4.8 TEST RESULTS - 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 TEST

5.1 LIMIT

FCC Part15, Subpart C (15.247)				
Section Test Item Limit				
45.047(-)(0)	6 dB Bandwidth	Minimum 500 kHz		
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. Spectrum Setting:

For 6 dB Bandwidth: RBW= 100 kHz, VBW=300 kHz, Sweep time = auto.

For 99% Emission Bandwidth B/G/N-20 Mode: RBW= 300 KHz, VBW=1 MHz, Sweep time = 2.5 ms.

For 99% Emission Bandwidth N-40 Mode: RBW= 1 MHz. VBW=3 MHz. Sweep time = 2.5 ms.

c. The bandwidth was performed in accordance with method 11.8.1 of ANSI C63.10-2013.

5.3 DEVIATION FROM STANDARD

No deviation.

5.4 TEST SETUP

EUT		SPECTRUM	
		ANALYZER	

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 AVERAGE OUTPUT POWER TEST

6.1 LIMIT

FCC Part15, Subpart C (15.247)				
Section Test Item Limit				
15.247(b)(3) Maximum Average Output Power 1 Watt or 30dBm				

6.2 TEST PROCEDURE

- a. The EUT was directly connected to the power meter and antenna output port as show in the block diagram below.
- b. The maximum conducted output power was performed in accordance with method 11.9.2.3.1 of ANSI C63.10-2013.

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 EMISSIONS

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. Spectrum Setting: RBW= 100 kHz, VBW=300 kHz, Sweep time = Auto.

7.3 DEVIATION FROM STANDARD

No deviation.

7.4 TEST SETUP

EUT	SPECTRUM	
	ANALYZER	

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 TEST

8.1 LIMIT

FCC Part15, Subpart C (15.247)				
Section Test Item Limit				
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. Spectrum Setting: RBW=3 kHz, VBW=10 kHz, Sweep time = Auto.
- c. The Power Spectral Density was performed in accordance with method 11.10.2 of ANSI C63.10-2013.

8.3 DEVIATION FROM STANDARD

No deviation.

8.4 TEST SETUP

EUT	SPECTRUM
	ANALYZER

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, 2021
2	LISN	EMCO	3816/2	52765	Mar. 01, 2021
3	TWO-LINE V-NETWORK	R&S	ENV216	101447	Feb. 28, 2021
4	50Ω Terminator	SHX	TF5-3	15041305	Mar. 01, 2021
5	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
6	Cable	N/A	RG223	12m	Mar. 10, 2021
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	Antenna	EM	EM-6876-1	230	Apr. 16, 2021
2	Cable	N/A	RG 213/U	N/A	May 29, 2021
3	EMI Test Receiver	R&S	ESCI	100895	Feb. 28, 2021
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. 09, 2021	
2*	Amplifier	HP	8447D	2944A09673	Aug. 11, 2021	
3	Receiver	Agilent	N9038A	MY52130039	Jul. 25, 2021	
4	Cable	emci	LMR-400(30MHz-1 GHz)(8m+5m)	N/A	May 22, 2021	
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	May 12, 2021			
2	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Jul. 07, 2021			
3	Amplifier	Agilent	8449B	3008A02333	Mar. 01, 2021			
4	Microwave Preamplifier With Adaptor	EMC INSTRUMENT	EMC2654045	980039 & HA01	Mar. 07, 2021			
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	May 09, 2021			
9	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A			
10	Filter	STI	STI15-9912	N/A	Jul. 25, 2021			
11	966 Chambe Room	66 Chambe Room RM		N/A	Jul. 25, 2021			



Bandwidth & Antenna Conducted Spurious Emissions & Power Spectral Density							
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until		
1	1 Spectrum Analyzer R&S		FSP40	100185	Jul. 25, 2021		
2	RF Cable	Tongkaichuan	N/A	N/A	N/A		
3	DC Block	Mini	N/A	N/A	N/A		

Maximum Average Output Power							
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until		
1	Peak Power Analyzer	Keysight	8990B	MY51000506	Aug. 07, 2021		
2	Wideband power sensor	Keysight	N1923A	MY58310004	Jul. 25, 2021		
3	Attenuator WOKEN		6SM3502	VAS1214NL	Feb. 11, 2021		
4	RF Cable Tongkaichuan		N/A	N/A	N/A		

Remark: "N/A" denotes no model name, serial no. or calibration specified.

Except * item, all calibration period of equipment list is one year.

[&]quot;*" calibration period of equipment list is three year.



10. EUT TEST PHOTO



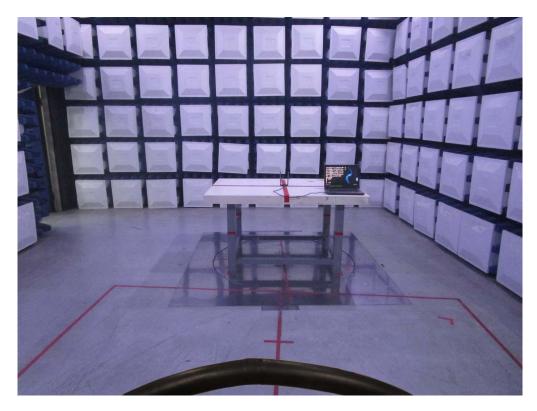


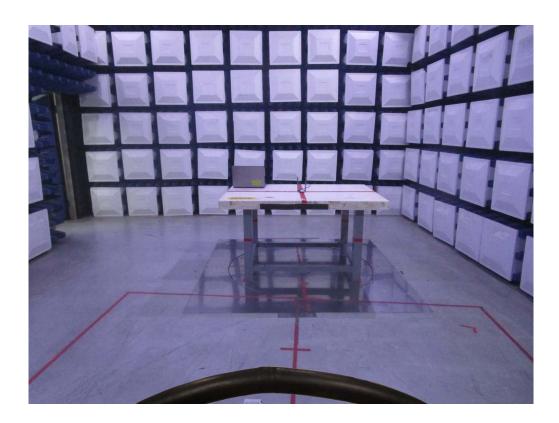




Radiated Emissions Test Photos

9 kHz to 30 MHz







Radiated Emissions Test Photos

30 MHz to 1 GHz

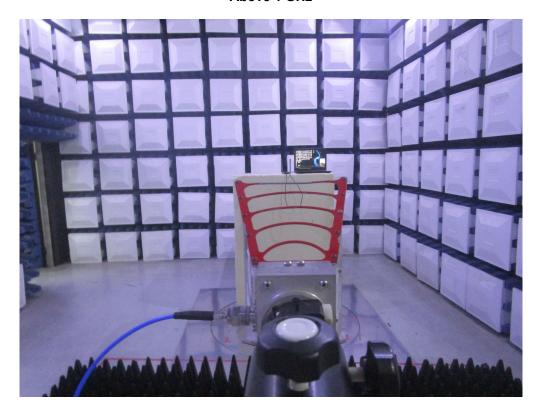


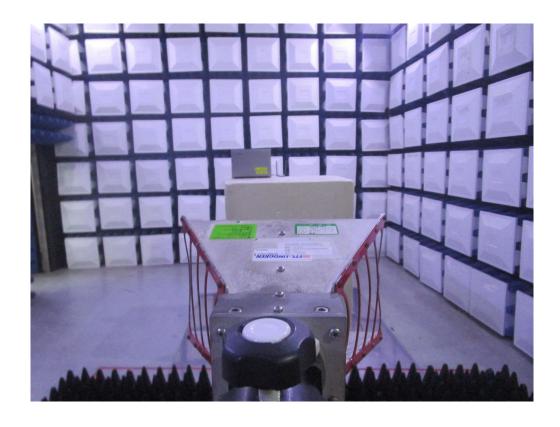




Radiated Emissions Test Photos

Above 1 GHz







Conducted Test Photos



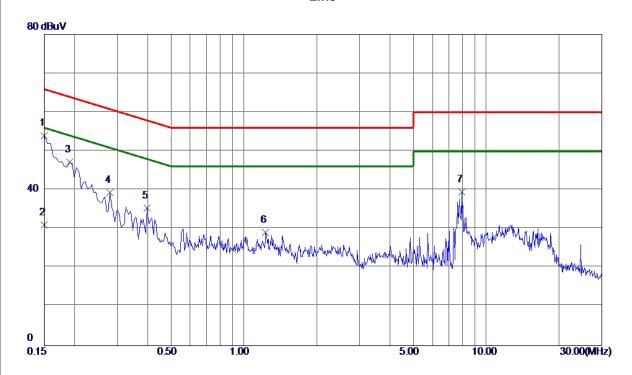


APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS



Test Mode: TX N-20 Mode Channel 06

Line



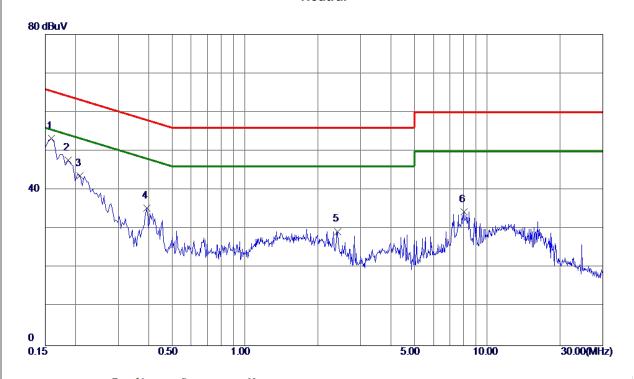
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1 *	0.1500	44.33	9. 67	54.00	66.00	-12.00	Peak	
2	0.1500	21.40	9. 67	31.07	56.00	-24.93	AVG	
3	0. 1905	37. 32	9.88	47. 20	64.01	-16.81	Peak	
4	0. 2805	29. 51	9.88	39. 39	60.80	-21.41	Peak	
5	0.3975	25. 50	9. 92	35. 42	57.91	-22.49	Peak	
6	1. 2300	19. 14	10. 03	29. 17	56.00	-26.83	Peak	
7	7.9080	28. 97	10. 55	39. 52	60.00	-20.48	Peak	

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



Test Mode: TX N-20 Mode Channel 06

Neutral



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1 *	0.1590	43.48	9.81	53. 29	65. 52	-12. 23	Peak	
2	0.1860	37.70	9. 96	47.66	64.21	-16. 55	Peak	
3	0.2085	33.61	10.00	43.61	63. 26	-19.65	Peak	
4	0.3930	25. 24	10.08	35. 32	58. 00	-22. 68	Peak	
5	2.4090	18. 90	10. 46	29. 36	56.00	-26. 64	Peak	
6	8.0160	23. 55	10. 91	34.46	60.00	-25. 54	Peak	

REMARKS:

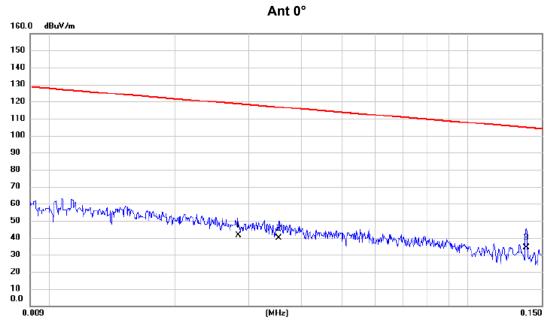
- (1) Measurement Value = Reading Level + Correct Factor.(2) Margin Level = Measurement Value Limit Value.



APPENDIX B - RADIATED EMISSION - 9 KHZ TO 30 MHZ



Test Mode: TX N-20 Mode Channel 06

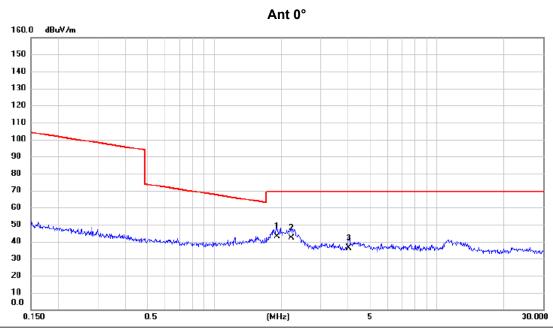


No. Mk.	Freq.			Measure- ment		Margin		Antenna Height		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	0.0283	28.33	12.91	41.24	118.57	-77.33	AVG			
2	0.0353	27.12	12.73	39.85	116.65	-76.80	AVG			
3 *	0.1380	21.62	12.65	34.27	104.81	-70.54	AVG			

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





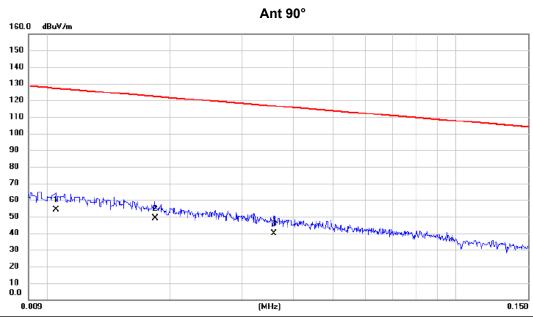


No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		Antenna Height		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1 *	1.9182	32.06	11.13	43.19	69.54	-26.35	QP			
2	2.2250	31.14	10.96	42.10	69.54	-27.44	QP			
3	4.0062	25.57	10.61	36.18	69.54	-33.36	QP			

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



Test Mode: TX N-20 Mode Channel 06



No. Mk.	Freq.	Reading Level		Measure- ment		Margin		Antenna Height		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1 *	0.0105	38.12	16.07	54.19	127.18	-72.99	AVG			
2	0.0184	35.45	13.63	49.08	122.31	-73.23	AVG			
3	0.0358	26.93	12.72	39.65	116.53	-76.88	AVG			

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

30.000



0.150

Test Mode: TX N-20 Mode Channel 06

Ant 90° 160.0 dBuV/m 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0.0

No. Mk.	Freq.	Reading Level		Measure- ment		Margin		Antenna Height		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1 *	2.1898	27.24	10.98	38.22	69.54	-31.32	QP			
2	2.5535	25.86	10.78	36.64	69.54	-32.90	QP			
3	2.9935	25.91	10.52	36.43	69.54	-33.11	QP			

(MHz)

REMARKS:

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

0.5

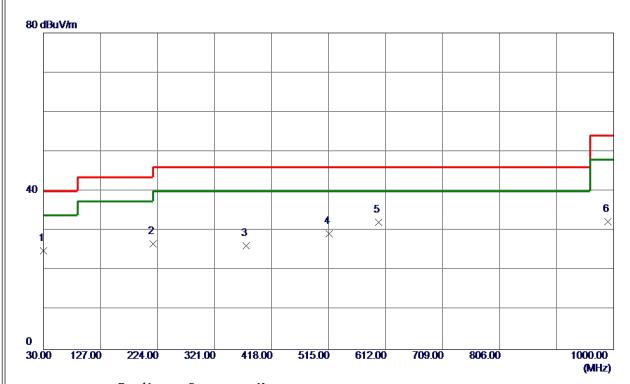


APPENDIX C - RADIATED EMISSION - 30 MHZ TO 1000 MHZ



Test Mode: TX N-20 Mode Channel 06

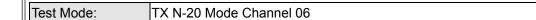
Vertical



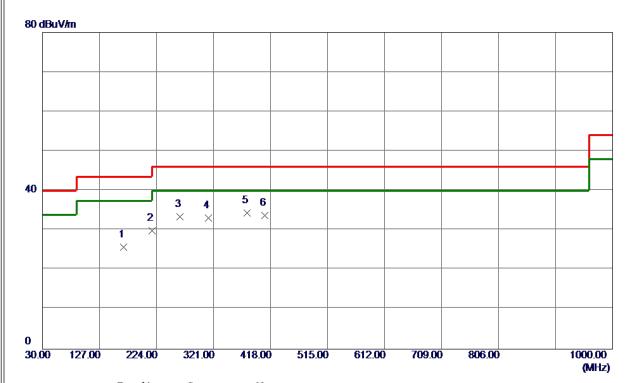
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	30.0000	39. 58	-14.66	24.92	40.00	−15. 08	Peak	
2	216. 2400	41.37	-14.61	26. 76	46.00	-19.24	Peak	
3	374. 3500	35. 92	-9. 62	26. 30	46.00	-19.70	Peak	
4	515. 9699	36. 35	-7. 12	29. 23	46.00	-16.77	Peak	
5 *	600. 3600	37. 57	-5. 34	32. 23	46.00	-13.77	Peak	
6	990. 3000	31. 42	0. 93	32. 35	54.00	-21.65	Peak	

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





Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	167.7400	37. 58	-11.76	25.82	43.50	-17. 68	Peak	
2	216. 2400	44. 59	-14.61	29. 98	46.00	-16.02	Peak	
3	263.7700	45.83	-12. 38	33. 45	46.00	-12. 55	Peak	
4	312. 2700	43.91	-10.80	33. 11	46.00	-12.89	QP	
5 *	378. 2300	43.88	-9. 53	34. 35	46.00	-11.65	QP	
6	408. 3000	42. 53	-8. 78	33. 75	46.00	-12. 25	Peak	

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

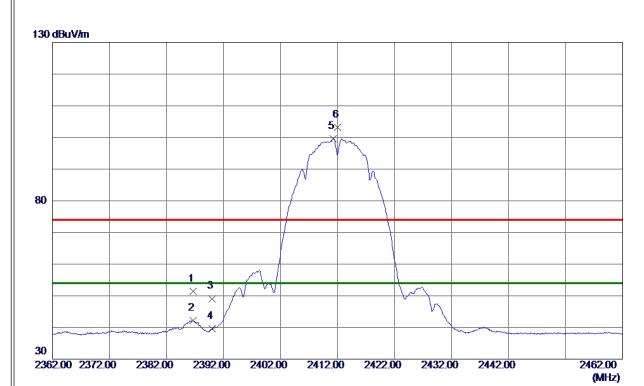


APPENDIX D - RADIATED EMISSION- ABOVE 1000 MHZ



Test Mode: TX B Mode 2412 MHz

Vertical



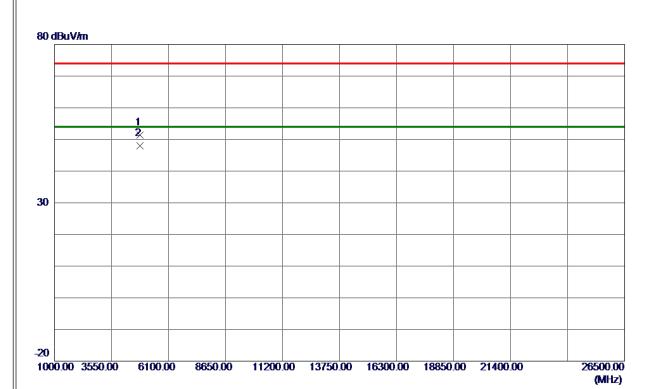
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2386.6500	40.81	10.61	51.42	74.00	-22. 58	Peak	
2	2386.6500	31.61	10.61	42. 22	54.00	-11.78	AVG	
3	2390.0000	38. 48	10.62	49. 10	74.00	-24.90	Peak	
4	2390.0000	28.89	10.62	39. 51	54.00	-14.49	AVG	
5 *	2411. 2500	88. 85	10.69	99. 54	54.00	45. 54	AVG	No Limit
6	2411. 9500	92. 59	10. 69	103. 28	74.00	29. 28	Peak	No Limit

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



Test Mode: TX B Mode 2412 MHz

Vertical



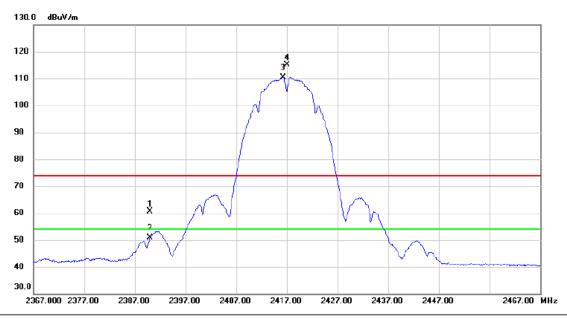
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4823.9850	44.88	6. 53	51.41	74.00	-22.59	Peak	
2 *	4824. 0150	41.40	6. 53	47. 93	54.00	-6. 07	AVG	

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



Test Mode: TX B Mode 2417 MHz

Vertical



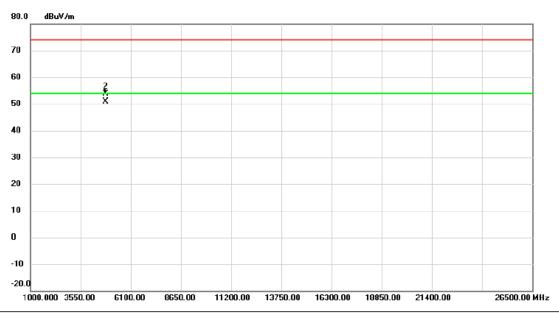
	No. M	1k.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
-			MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
-	1	23	390.000	50.16	10.50	60.66	74.00	-13.34	peak	
-	2	23	390.000	40.44	10.50	50.94	54.00	-3.06	AVG	
Ī	3 *	24	116.300	99.91	10.57	110.48	54.00	56.48	AVG	No Limit
	4 X	24	117.000	104.45	10.57	115.02	74.00	41.02	peak	No Limit

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



Test Mode: TX B Mode 2417 MHz

Vertical



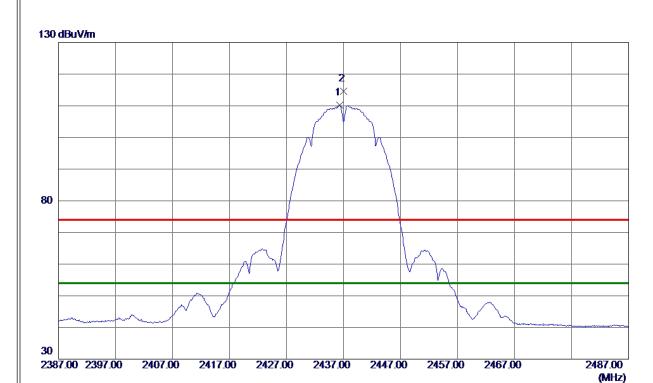
No. I	Mk.	Freq.			Measure- ment		Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4	833.945	44.45	6.54	50.99	54.00	-3.01	AVG	
2	4	833.980	47.26	6.54	53.80	74.00	-20.20	peak	

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



Test Mode: TX B Mode 2437 MHz

Vertical



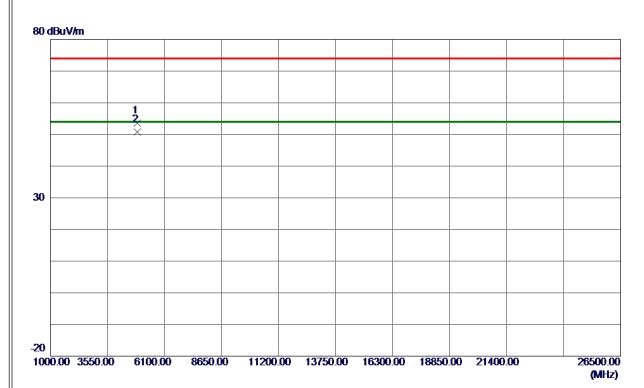
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2436. 3000	99. 54	10.63	110. 17	54.00	56. 17	AVG	No Limit
2	2437.0000	103. 97	10.63	114.60	74.00	40.60	Peak	No Limit

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



Test Mode: TX B Mode 2437 MHz

Vertical



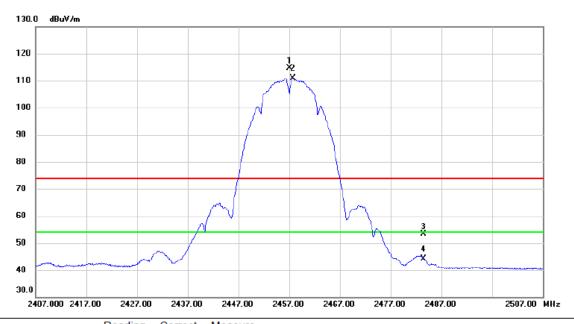
	No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
l		MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
l	1	4873.7000	46. 94	6. 65	53. 59	74.00	-20.41	Peak	
ı	2 *	4873.9950	44.11	6. 65	50. 76	54.00	-3. 24	AVG	
ı		10.0.000	11111	0.00	00	011.00	0.51	11.0	

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



Test Mode: TX B Mode 2457 MHz

Vertical



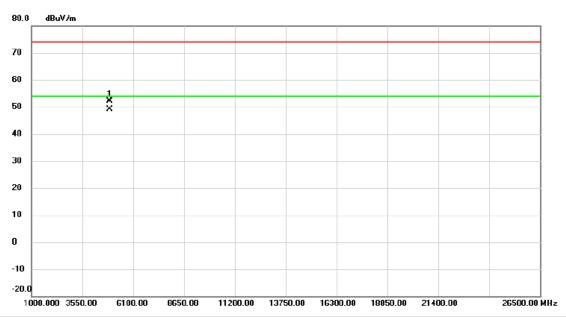
	No. M	c. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
·		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
	1 X	2457.000	103.97	10.69	114.66	74.00	40.66	peak	No Limit
	2 *	2457.700	100.09	10.69	110.78	54.00	56.78	AVG	No Limit
	3	2483.500	42.70	10.76	53.46	74.00	-20.54	peak	
	4	2483.500	33.48	10.76	44.24	54.00	-9.76	AVG	

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



Test Mode: TX B Mode 2457 MHz

Vertical



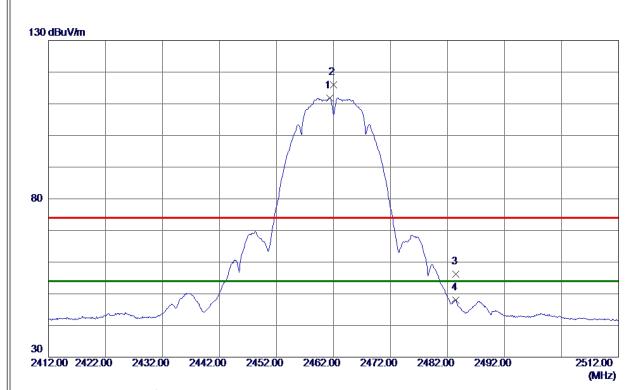
No.	Mk.	Freq.			Measure- ment		Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4913.950	45.26	6.75	52.01	74.00	-21.99	peak	
2	*	4913.970	42.38	6.75	49.13	54.00	-4.87	AVG	

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



Test Mode: TX B Mode 2462 MHz

Vertical



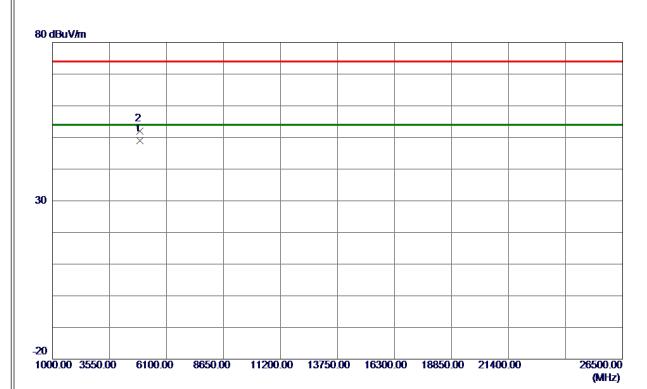
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2461. 3000	101. 16	10.70	111.86	54.00	57.86	AVG	No Limit
2	2462.0000	105. 36	10.70	116.06	74.00	42.06	Peak	No Limit
3	2483. 5000	45. 35	10.76	56. 11	74.00	-17.89	Peak	
4	2483. 5000	37. 15	10. 76	47.91	54.00	-6. 09	AVG	

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



Test Mode: TX B Mode 2462 MHz

Vertical



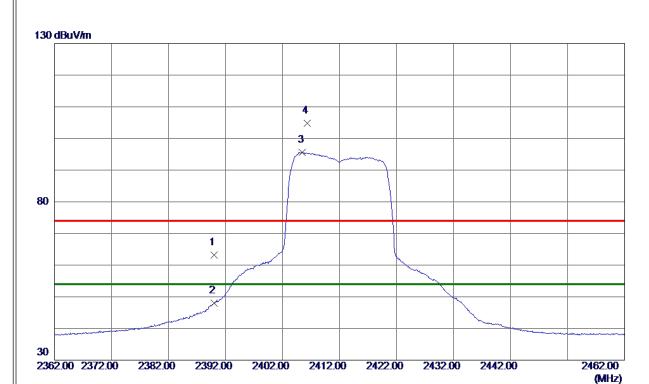
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4923.9100	42. 13	6. 77	48. 90	54.00	-5. 10	AVG	
2	4923. 9750	45. 26	6. 77	52. 03	74.00	-21. 97	Peak	

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



Test Mode: TX G Mode 2412 MHz

Vertical



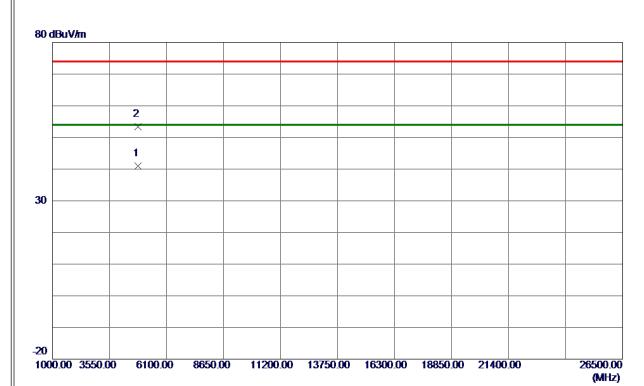
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	52.64	10.62	63. 26	74.00	-10.74	Peak	
2	2390.0000	37. 39	10.62	48. 01	54.00	-5. 99	AVG	
3 *	2405. 5000	84. 91	10.67	95. 58	54.00	41.58	AVG	No Limit
4	2406. 3000	94. 15	10.67	104.82	74.00	30.82	Peak	No Limit

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



Test Mode: TX G Mode 2412 MHz

Vertical



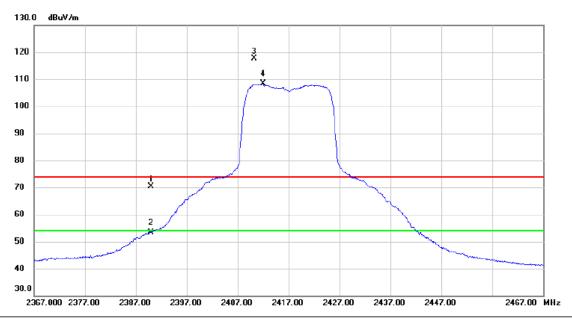
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4823. 9850	34. 54	6. 53	41.07	54.00	-12.93	AVG	
2	4825, 0550	46. 85	6. 53	53. 38	74.00	-20, 62	Peak	

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



Test Mode: TX G Mode 2417 MHz

Vertical



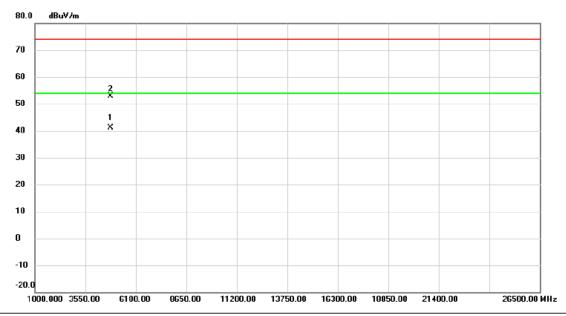
No.	Mk.	Freq.	Reading Level		Measure- ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	59.77	10.50	70.27	74.00	-3.73	peak	
2		2390.000	42.99	10.50	53.49	54.00	-0.51	AVG	
3	X :	2410.300	107.19	10.55	117.74	74.00	43.74	peak	No Limit
4	*	2412.000	97.72	10.56	108.28	54.00	54.28	AVG	No Limit

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



Test Mode: TX G Mode 2417 MHz

Vertical



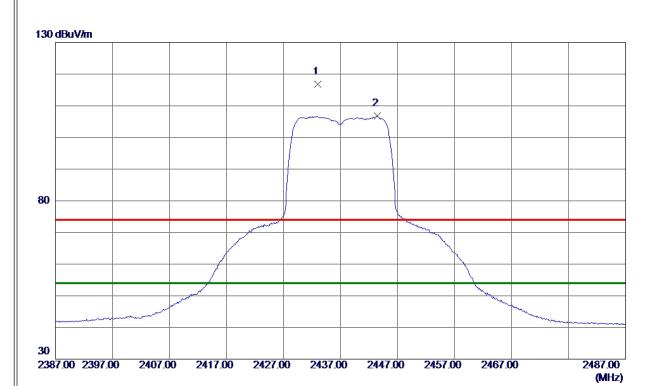
	No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
			MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
	1	* 4	1833.875	34.54	6.54	41.08	54.00	-12.92	AVG	
-	2	4	1835.105	46.31	6.55	52.86	74.00	-21.14	peak	

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



Test Mode: TX G Mode 2437 MHz

Vertical



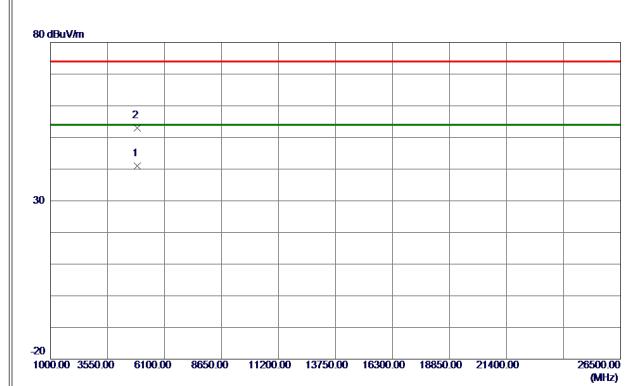
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2433.0000	106. 15	10.62	116.77	74.00	42.77	Peak	No Limit
2 *	2443. 4000	96. 07	10.65	106.72	54.00	52.72	AVG	No Limit

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



Test Mode: TX G Mode 2437 MHz

Vertical



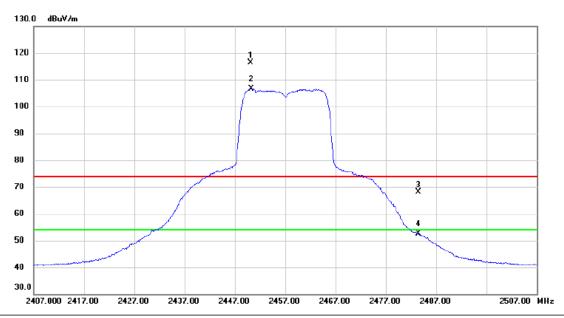
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4874.0600	34. 31	6.65	40.96	54.00	-13.04	AVG	
2	4875, 0400	46. 42	6. 65	53. 07	74.00	-20, 93	Peak	

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



Test Mode: TX G Mode 2457 MHz

Vertical



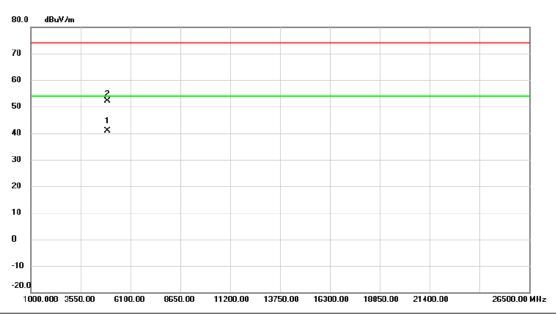
No. Mk	c. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 X	2450.100	105.71	10.66	116.37	74.00	42.37	peak	No Limit
2 *	2450.300	96.08	10.66	106.74	54.00	52.74	AVG	No Limit
3	2483.500	57.41	10.76	68.17	74.00	-5.83	peak	
4	2483.500	41.84	10.76	52.60	54.00	-1.40	AVG	

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



Test Mode: TX G Mode 2457 MHz

Vertical



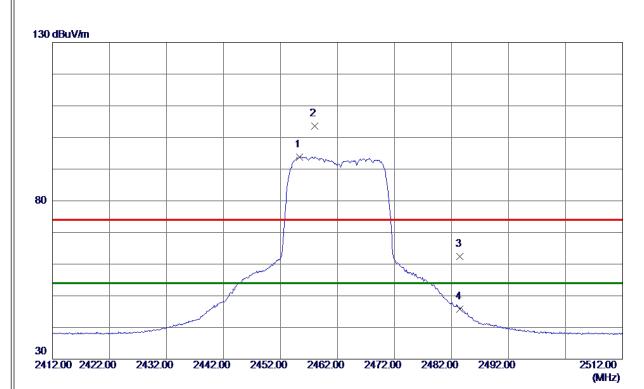
	No.	Mk.	Freq.		Correct Factor	Measure- ment	Limit	Margin		
-			MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
	1	* 4	1913.975	34.19	6.75	40.94	54.00	-13.06	AVG	
-	2	4	1914.865	45.49	6.75	52.24	74.00	-21.76	peak	

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



Test Mode: TX G Mode 2462 MHz

Vertical



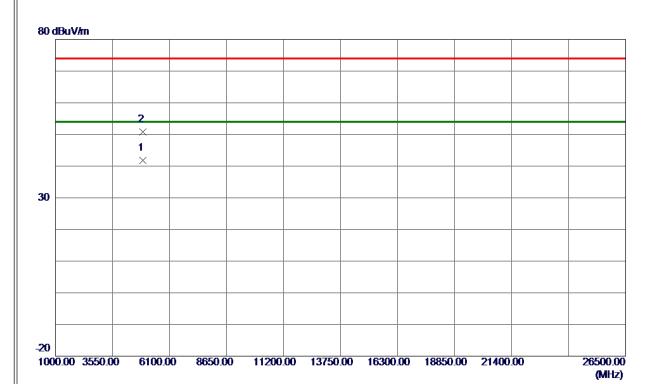
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2455. 3000	83. 07	10.82	93.89	54.00	39.89	AVG	No Limit
2	2458. 0000	92.71	10.82	103. 53	74.00	29. 53	Peak	No Limit
3	2483. 5000	51.44	10.90	62. 34	74.00	-11.66	Peak	
4	2483. 5000	34. 98	10.90	45.88	54.00	-8. 12	AVG	

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



Test Mode: TX G Mode 2462 MHz

Vertical



Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
4923.9950	34.98	6. 77	41.75	54.00	-12. 25	AVG	
4924.0750	44. 10	6. 77	50.87	74.00	-23. 13	Peak	
	MHz 4923. 9950	rreq. Level	Hz dBuV/m dB 4923.9950 34.98 6.77	MHz dBuV/m dB dBuV/m 4923.9950 34.98 6.77 41.75	MHz dBuV/m dB dBuV/m dBuV/m 4923.9950 34.98 6.77 41.75 54.00	MHz dBuV/m dB dBuV/m dB dBuV/m dB 4923.9950 34.98 6.77 41.75 54.00 -12.25	MHz dBuV/m dB dBuV/m dBuV/m dB Detector 4923.9950 34.98 6.77 41.75 54.00 -12.25 AVG

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

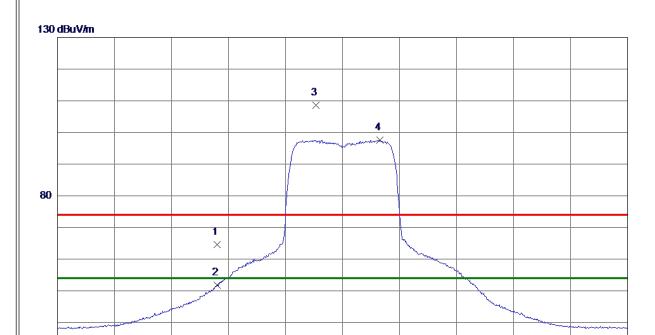
2462.00

(MHz)



Test Mode: TX N-20M Mode 2412 MHz

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	53. 95	10.62	64.57	74.00	-9.43	Peak	
2	2390.0000	41. 27	10.62	51.89	54.00	-2. 11	AVG	
3	2407.3000	97. 98	10.67	108.65	74.00	34.65	Peak	No Limit
4 *	2418. 5500	86. 89	10.71	97.60	54.00	43.60	AVG	No Limit

2412.00

2402.00

2392.00

2422.00

2432.00

2442.00

REMARKS:

30

2362.00 2372.00

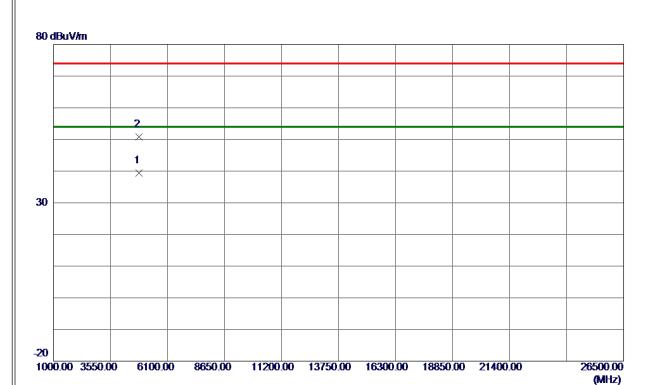
2382.00

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



Test Mode: TX N-20M Mode 2412 MHz

Vertical



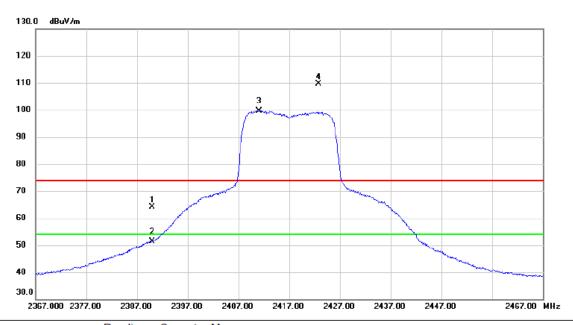
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4823.9700	32.88	6. 53	39. 41	54.00	-14.59	AVG	
2	4824.8600	44. 24	6. 53	50.77	74.00	-23, 23	Peak	

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



Test Mode: TX N-20M Mode 2417 MHz

Vertical



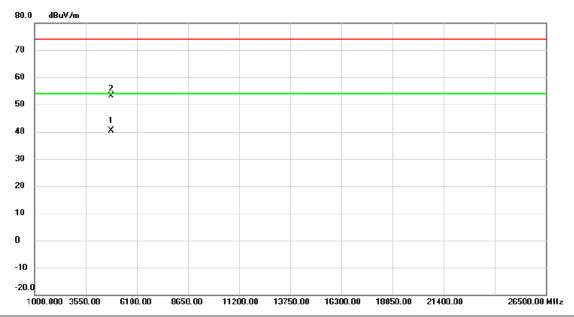
	No. N	Иk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
			MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
	1	2	390.000	53.52	10.63	64.15	74.00	-9.85	peak	
	2	2	390.000	40.86	10.63	51.49	54.00	-2.51	AVG	
-	3 *	24	411.050	88.97	10.68	99.65	54.00	45.65	AVG	No Limit
-	4 X	24	422.750	98.96	10.72	109.68	74.00	35.68	peak	No Limit

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



Test Mode: TX N-20M Mode 2417 MHz

Vertical



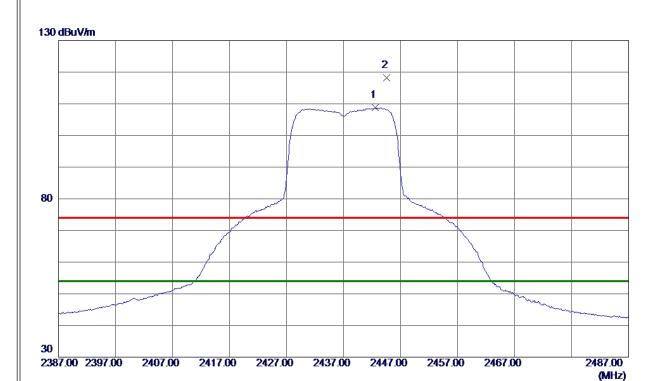
	No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
-			MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
	1	* 4	4833.885	33.90	6.54	40.44	54.00	-13.56	AVG	
_	2	4	4835.080	46.67	6.55	53.22	74.00	-20.78	peak	

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



Test Mode: TX N-20M Mode 2437 MHz

Vertical



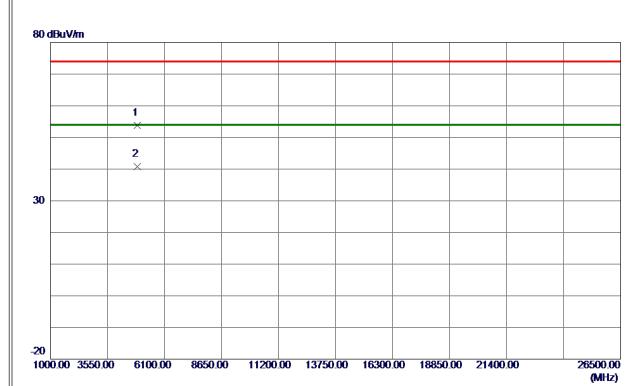
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2442.6000	98.06	10.65	108.71	54.00	54.71	AVG	No Limit
2	2444.6000	107.48	10.65	118. 13	74.00	44. 13	Peak	No Limit

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



Test Mode: TX N-20M Mode 2437 MHz

Vertical



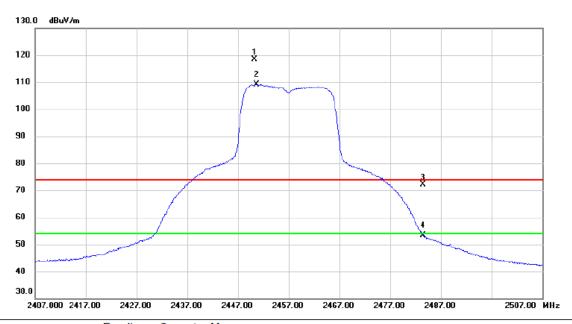
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4873.6650	47.07	6. 65	53.72	74.00	-20. 28	Peak	
2 *	4873, 7650	34. 23	6. 65	40.88	54.00	-13. 12	AVG	

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



Test Mode: TX N-20M Mode 2457 MHz

Vertical



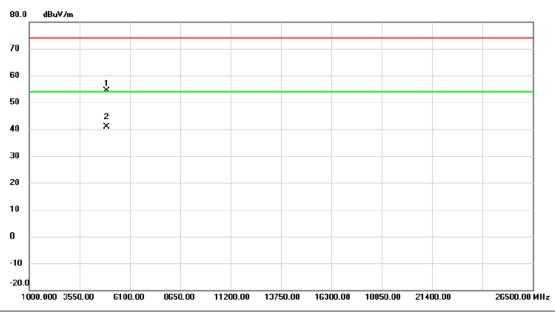
	No. Mk	c. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
	1 X	2450.300	107.81	10.66	118.47	74.00	44.47	peak	No Limit
	2 *	2450.700	98.50	10.66	109.16	54.00	55.16	AVG	No Limit
	3	2483.500	61.29	10.76	72.05	74.00	-1.95	peak	
-	4	2483.500	42.68	10.76	53.44	54.00	-0.56	AVG	

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



Test Mode: TX N-20M Mode 2457 MHz

Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4	1912.375	47.52	6.75	54.27	74.00	-19.73	peak	
2	* /	1913.855	34.04	6.75	40.79	54.00	-13.21	AVG	

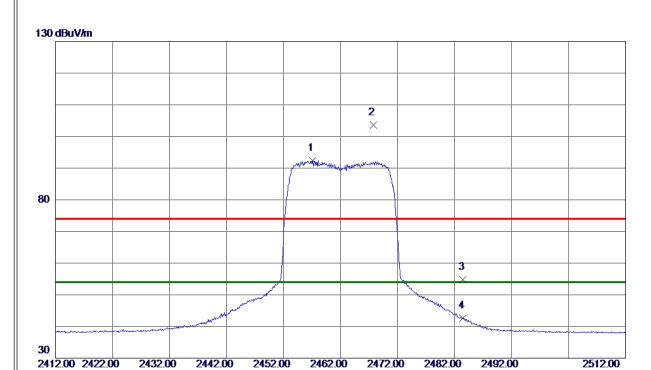
- (1) Measurement Value = Reading Level + Correct Factor.(2) Margin Level = Measurement Value Limit Value.

(MHz)



Test Mode: TX N-20M Mode 2462 MHz

Vertical



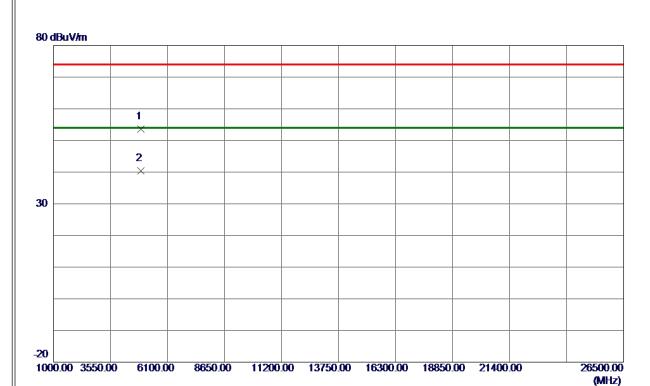
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2457. 1000	81.62	10.82	92.44	54.00	38. 44	AVG	No Limit
2	2467.7500	92.70	10.85	103. 55	74.00	29. 55	Peak	No Limit
3	2483. 5000	43.98	10.90	54.88	74.00	-19. 12	Peak	
4	2483. 5000	31.75	10. 90	42.65	54.00	-11. 35	AVG	

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



Test Mode: TX N-20M Mode 2462 MHz

Vertical



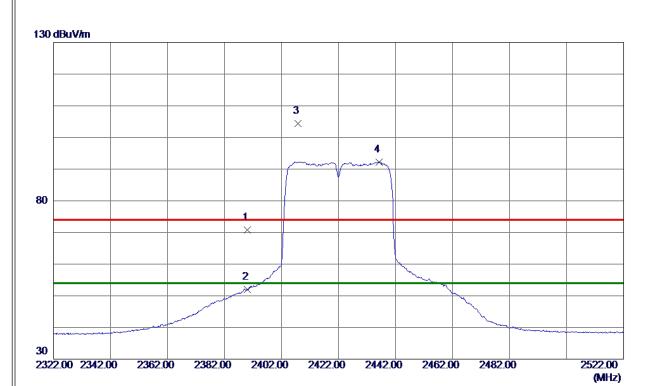
	No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
l		MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
l	1	4923.4700	46.85	6. 77	53.62	74.00	-20. 38	Peak	
ı	2 *	4923. 8849	33. 59	6. 77	40. 36	54.00	-13.64	AVG	
ı		1050.0010	00.00	0	10.00	01.00	10.01	11.0	

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



Test Mode: TX N-40M Mode 2422 MHz

Vertical



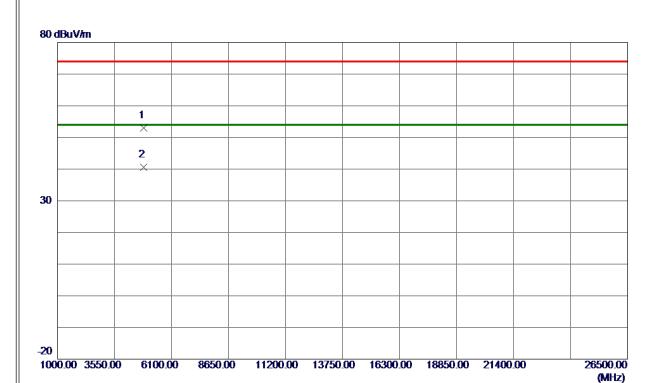
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	60. 10	10.62	70.72	74.00	-3. 28	Peak	
2	2390.0000	41.43	10.62	52.05	54.00	-1.95	AVG	
3	2407.8000	93.73	10.68	104.41	74.00	30.41	Peak	No Limit
4 *	2436. 3000	81. 52	10. 76	92. 28	54.00	38. 28	AVG	No Limit

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



Test Mode: TX N-40M Mode 2422 MHz

Vertical



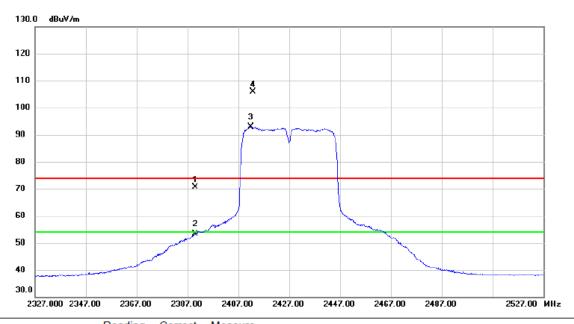
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4842.7050	46. 46	6. 57	53. 03	74.00	-20.97	Peak	
2 *	4843. 9900	34.01	6. 57	40. 58	54.00	-13.42	AVG	

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



Test Mode: TX N-40M Mode 2427 MHz

Vertical



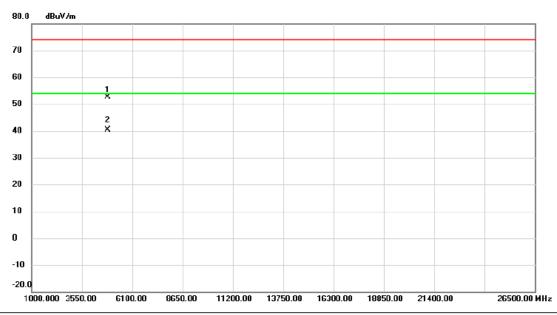
	No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
			MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
Ī	1	2	390.000	60.07	10.63	70.70	74.00	-3.30	peak	
	2	2	390.000	42.65	10.63	53.28	54.00	-0.72	AVG	
	3 '	* 2	411.800	82.24	10.69	92.93	54.00	38.93	AVG	No Limit
	4)	X 2	412.800	95.25	10.69	105.94	74.00	31.94	peak	No Limit

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



Test Mode: TX N-40M Mode 2427 MHz

Vertical



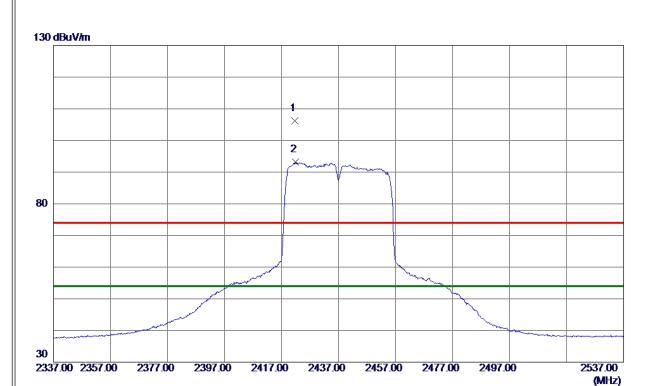
	No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
_			MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
_	1	4	1852.745	46.08	6.59	52.67	74.00	-21.33	peak	
_	2	* 4	1853.900	33.72	6.60	40.32	54.00	-13.68	AVG	

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



Test Mode: TX N-40M Mode 2437 MHz

Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2421.6000	95. 46	10.72	106. 18	74.00	32. 18	Peak	No Limit
2 *	2421.9000	82.47	10.72	93. 19	54.00	39. 19	AVG	No Limit

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



Test Mode: TX N-40M Mode 2437 MHz

Vertical



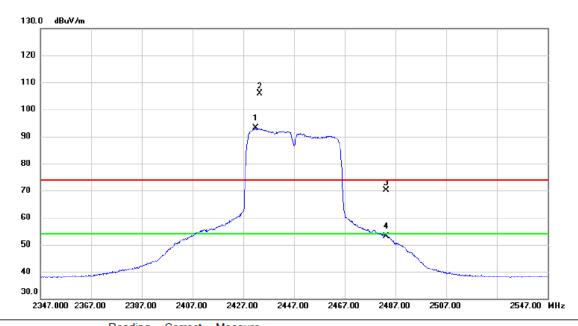
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4873.8650	33. 56	6. 65	40.21	54.00	-13.79	AVG	
2	4873.9750	46. 38	6. 65	53. 03	74.00	-20. 97	Peak	

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



Test Mode: TX N-40M Mode 2447 MHz

Vertical



No. Mi	c. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2431.900	82.44	10.74	93.18	54.00	39.18	AVG	No Limit
2 X	2433.500	95.17	10.74	105.91	74.00	31.91	peak	No Limit
3	2483.500	59.17	10.90	70.07	74.00	-3.93	peak	
4	2483.500	42.25	10.90	53.15	54.00	-0.85	AVG	

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



Test Mode: TX N-40M Mode 2447 MHz

Vertical



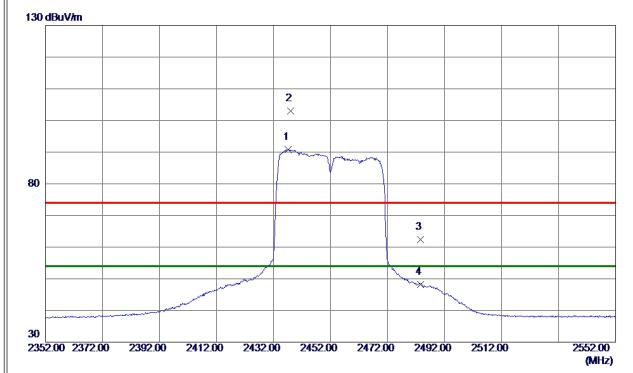
	No.	Mk.	Freq.			Measure- ment		Margin		
_			MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
_	1	4	1892.985	46.26	6.69	52.95	74.00	-21.05	peak	
_	2	* 4	1893.960	33.56	6.69	40.25	54.00	-13.75	AVG	

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



Test Mode: TX N-40M Mode 2452 MHz

Vertical



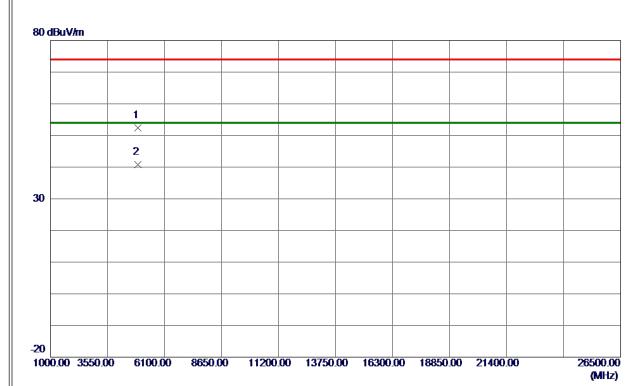
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2437. 1000	80.05	10.76	90.81	54.00	36.81	AVG	No Limit
2	2438. 1000	92. 18	10.77	102. 95	74.00	28. 95	Peak	No Limit
3	2483. 5000	51. 52	10.90	62. 42	74.00	-11. 58	Peak	
4	2483. 5000	37. 39	10. 90	48. 29	54.00	-5.71	AVG	

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



Test Mode: TX N-40M Mode 2452 MHz

Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4902.6750	45. 76	6. 72	52.48	74.00	-21. 52	Peak	
2 *	4903, 9750	34. 04	6. 72	40. 76	54.00	-13, 24	AVG	

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

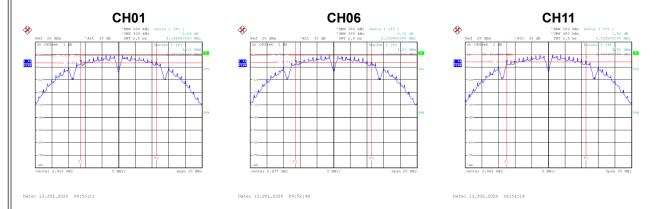


APPENDIX E - BANDWIDTH	



Test Mode	TX B Mode

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	6 dB Bandwidth Min. Limit (kHz)	Result
01	2412	9.15	500	Complies
06	2437	9.16	500	Complies
11	2462	9.56	500	Complies



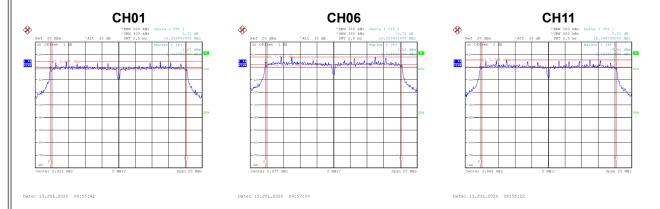
Channel	Frequency (MHz)	99 % Emission Bandwidth (MHz)	Result
01	2412	13.92	Complies
06	2437	14.00	Complies
11	2462	14.00	Complies



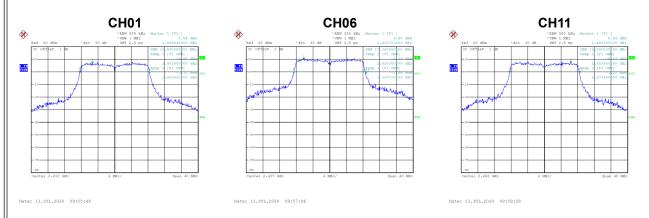


Test Mode	TX G Mode

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	6 dB Bandwidth Min. Limit (kHz)	Result
01	2412	16.36	500	Complies
06	2437	16.34	500	Complies
11	2462	16.35	500	Complies



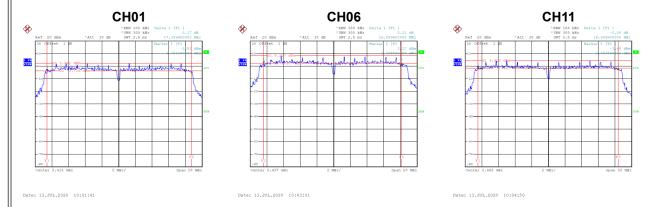
Channel	Frequency (MHz)	99 % Emission Bandwidth (MHz)	Result
01	2412	16.80	Complies
06	2437	17.36	Complies
11	2462	16.88	Complies





Test Mode TX N-20M Mode

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	6 dB Bandwidth Min. Limit (kHz)	Result
01	2412	17.40	500	Complies
06	2437	16.60	500	Complies
11	2462	16.91	500	Complies



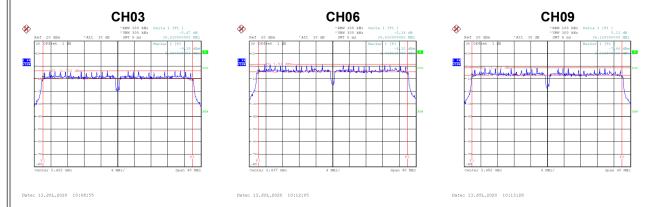
Channel	Frequency (MHz)	99 % Emission Bandwidth (MHz)	Result
01	2412	17.76	Complies
06	2437	18.64	Complies
11	2462	17.76	Complies





Test Mode	TX N-40M Mode
1000 111000	117111 10111 111040

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	6 dB Bandwidth Min. Limit (kHz)	Result
03	2422	35.91	500	Complies
06	2437	35.83	500	Complies
09	2452	36.12	500	Complies



Channel	Frequency (MHz)	99 % Emission Bandwidth (MHz)	Result
03	2422	37.12	Complies
06	2437	37.44	Complies
09	2452	37.12	Complies





APPENDIX F - MAXIMUM AVERAGE OUTPUT POWER



Test Mode	TX B Mode

Channel	Frequency (MHz)	Average Output Power (dBm)	-	Average Output Power + Duty Factor (dBm)	Max. Limit (dBm)	Max. Limit (W)	Result
01	2412	19.88	0.00	19.88	30.00	1.0000	Complies
06	2437	19.56	0.00	19.56	30.00	1.0000	Complies
11	2462	19.77	0.00	19.77	30.00	1.0000	Complies

Test Mode	TX G Mode

Channel	Frequency (MHz)	Average Output Power (dBm)		Average Output Power + Duty Factor (dBm)	Max. Limit (dBm)	Max. Limit (W)	Result
01	2412	19.82	0.17	19.99	30.00	1.0000	Complies
06	2437	19.68	0.17	19.85	30.00	1.0000	Complies
11	2462	19.79	0.17	19.96	30.00	1.0000	Complies



Test Mode	TX N-20M Mode	Ant 1
163t Mode	I A IN-ZUIVI IVIUUC_	_/\III. I

Channel	Frequency (MHz)	Average Output Power (dBm)	Duty Factor	Average Output Power + Duty Factor (dBm)		Max. Limit (W)	Result
01	2412	17.81	0.18	17.99	30.00	1.0000	Complies
06	2437	19.89	0.18	20.07	30.00	1.0000	Complies
11	2462	15.98	0.18	16.16	30.00	1.0000	Complies

Test Mode	TX N-20M Mode	Ant. 2

Channel	Frequency (MHz)	Average Output Power (dBm)	Duty Factor	Average Output Power + Duty Factor (dBm)		Max. Limit (W)	Result
01	2412	17.69	0.18	17.87	30.00	1.0000	Complies
06	2437	19.88	0.18	20.06	30.00	1.0000	Complies
11	2462	15.88	0.18	16.06	30.00	1.0000	Complies

Test Mode TX N-20M Mode_Total

Channel	Frequency (MHz)	Average Output Power (dBm)	Max. Limit (dBm)	Max. Limit (W)	Result
01	2412	20.94	29.99	0.9977	Complies
06	2437	23.08	29.99	0.9977	Complies
11	2462	19.12	29.99	0.9977	Complies



Test Mode	TX N-40M Mode_An	t. 1
100t Wiodo	I I A TO WI WOOD AND	ι. ι

Channel	Frequency (MHz)	Average Output Power (dBm)	Duty Factor	Average Output Power + Duty Factor (dBm)		Max. Limit (W)	Result
03	2422	16.61	0.36	16.97	30.00	1.0000	Complies
06	2437	17.78	0.36	18.14	30.00	1.0000	Complies
09	2452	15.83	0.36	16.19	30.00	1.0000	Complies

Test Mode T	TX N-40M Mode Ant. 2
-------------	----------------------

Channel	Frequency (MHz)	Average Output Power (dBm)	Duty Factor	Average Output Power + Duty Factor (dBm)		Max. Limit (W)	Result
03	2422	16.93	0.36	17.29	30.00	1.0000	Complies
06	2437	17.73	0.36	18.09	30.00	1.0000	Complies
09	2452	15.96	0.36	16.32	30.00	1.0000	Complies

Test Mode TX N-40M Mode_Total

Channel	Frequency (MHz)	Average Output Power (dBm)	Max. Limit (dBm)	Max. Limit (W)	Result
03	2422	20.14	29.99	0.9977	Complies
06	2437	21.13	29.99	0.9977	Complies
09	2452	19.27	29.99	0.9977	Complies



APPENDIX G - CONDUCTED SPURIOUS EMISSIONS



