

# **FCC&IC** Radio Test Report

FCC ID: TVE-24100012

IC: 7280B-24100012

This report concerns (check one): ⊠Original Grant □Class II Change

**Project No.** : 1504C174

**Equipment**: Wireless Access Point

Model Name for:FORTIAP-C220Cxxxxxx; FAP-C220Cxxxxxx;FCCFORTIAP-C225Cxxxxxx; FAP-C225CxxxxxxModel Name for:FORTIAP-C220C; FAP-C220C; FORTIAP-C225C;

IC FAP-C225C **Applicant**: Fortinet, Inc.

Address : 899 Kifer Road, Sunnyvale, CA 94086 USA

Date of Receipt : May 05. 2015

**Date of Test** : May 05. 2015~Jun.15.2015

Issued Date : Jun.16.2015 Tested by : BTL Inc.

Testing Engineer : Savid Mao

(David Mao)

Technical Manager :

(Leo Hung)

Authorized Signatory : Season In

(Steven Lu)

## BTL INC.

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

TEL: +86-769-8318-3000 FAX: +86-769-8319-6000

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### **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 the standards traceable to National Measurement Laboratory (NML) of R.O.C, or National Institute of Standards and Technology (NIST) of U.S.A.

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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.

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### **REPORT ISSUED HISTORY**

Issued No.	Description	Issued Date
BTL-FICP-1-1504C174	Original Issue.	Jun.16.2015

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### 1. CERTIFICATION

Equipment : Wireless Access Point

Brand Name : fortinet

Model Name for FCC: FORTIAP-C220Cxxxxxx; FAP-C220Cxxxxxx; FORTIAP-C225Cxxxxxx;

FAP-C225Cxxxxxx

Model Name for IC : FORTIAP-C220C; FAP-C220C; FORTIAP-C225C; FAP-C225C

Applicant : Fortinet, Inc.

Manufacturer : Shenzhen Netcore Industrial Ltd.

Address : 4F&5F R&D Building, Oriental Cyberport, High-Tech Industrial Park,

Nanshan, Shenzhen, China.

Factory : Dongguan City Netcore Network Technology Co.,Ltd.

Address : No.10-1, Sankeng Road, Qinghutou, Tangxia Town, Don guan City

Date of Test : May 05. 2015~Jun.15.2015 Test Sample : ENGINEERING SAMPLE

Standard(s) : FCC Part15, Subpart C: 2014 (15.247) / ANSI C63.10-2013

Canada RSS-247 Issue 1, May 2015

RSS-GEN Issue 4, Nov 2014

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

The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-FICP-1-1504C174) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).

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### 2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

Applied Standard(s): FCC Part15 (15.247), Subpart C: 2014 Canada RSS-247 Issue 1, May 2015, RSS-GEN Issue 4, Nov 2014							
Standard FCC	(s) Section IC	Test Item	Judgment	Remark			
15.207	RSS-GEN 8.8	Conducted Emission	PASS				
15.247(d)	RSS-247 5.5	Antenna conducted Spurious Emission	PASS				
15.247(a)(2)	RSS-247 5.2 (1)	6dB Bandwidth	PASS				
15.247(b)(3)	RSS-247 5.4 (4)	Peak Output Power	PASS				
15.247(e)	RSS-247 5.2 (2)	Power Spectral Density	PASS				
15.203	-	Antenna Requirement	PASS				

### NOTE:

15.209/15.205

(1)" N/A" denotes test is not applicable in this test report.

RSS-247 5.5

(2) The test follows FCC KDB Publication No. 558074 D01 DTS Meas Guidance v03r02 (Measurement Guidelines of DTS)

Transmitter Radiated

Emissions

PASS

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### 2.1 TEST FACILITY

The test facilities used to collect the test data in this report is **DG-C02/DG-CB03** at the location of No.3, Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.523792 BTL's test firm number for FCC: 319330

BTL's test firm number for IC: 4428B-1

### 2.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

The BTL measurement uncertainty is less than the CISPR 16-4-2  $U_{cispr}$  requirement. The reported uncertainty of measurement y  $\pm$  U, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %  $^{\circ}$ 

### A. Conducted Measurement:

Test Site	Method	Measurement Frequency Range	U, (dB)	NOTE
DG-C02	CISPR	150 KHz ~ 30MHz	1.94	

### B. Radiated Measurement:

Test Si e	Method	Measurement Frequency Range	Ant. H / V	U, (dB)	NOTE
		9 Hz~30MHz	V	3.79	
		9KHz~30MHz	Ι	3.57	
		30MHz ~ 200MHz	V	3.82	
		30MHz ~ 200MHz	Ι	3.60	
DG-CB03	CISPR	200MHz ~ 1,000MHz	V	3.86	
DG-CB03	CISER	200MHz ~ 1,000MHz	Ι	3.94	
		1GHz~18GHz	V	3.12	
		1GHz~18GHz	Ι	3.68	
		18GHz~40GHz	<b>V</b>	4.15	
		18GHz~40GHz	Ι	4.14	

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

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### 3. GENERAL INFORMATION

### 3.1 GENERAL DESCRIPTION OF EUT

Equipment	Wireless Access Point			
Brand Name	fortinet			
Model Name for FCC	FORTIAP-C220Cxxxxxx; FAP-C220Cxxxxxx; FORTIAP-C225Cxxxxxx; FAP-C225Cxxxxxx			
Model Name for IC	FORTIAP-C220C; FAP-C220C	C; FORTIAP-C225C; FAP-C225C		
Model Difference	<ul> <li>(1) where "x" can be "0-9", or "A-Z", or "-", or blank for marketing purposes or software changes only</li> <li>(2) The model FORTIAP-C220Cxxxxxx; FAP-C220Cxxxxxx with internal antenna, model FORTIAP-C225Cxxxxxx; FAP-C225Cxxxxxx with external antenna.</li> </ul>			
	Operation Frequency	2412~2462 MHz		
	Modulation Technology	802.11b:DSSS 802.11g:OFDM 802.11n:OFDM		
Product Description	Bit Rate of Transmitter	802.11b: 11/5.5/2/1 Mbps 802.11g: 54/48/36/24/18/12/9/6 Mbps 802.11n up to 300 Mbps		
	Output Power (Max.) for Internal antenna	802.11b: 17.99dBm 802.11g: 22.31dBm 802.11n(20MHz): 23.02dBm 802.11n(40MHz): 23.53dBm		
	802.11b: 17.97dBm Output Power (Max.) for External antenna 802.11g: 22.31dBm 802.11n(20MHz): 22.96dBm 802.11n(40MHz): 23.58dBm			
Power Source	#1 DC Voltage supplied from A #2 Supplied from PoE. (suppo			
Power Rating	#1 I/P: AC 100-240V O/P: DC 12V/2A #2 DC 48V			

### Note:

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

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### 2. Channel List:

	CH01 – CH11 for 802.11b, 802.11g, 802.11n(20MHz) CH03 – CH09 for 802.11n(40MHz)						
Channel	Channel Frequency (MHz) Channel Frequency (MHz) Channel Frequency (MHz) Frequency (MHz)						
01	01 2412 04 2427 07 2442 10 2457						
02	2417	05	2432	08	2447	11	2462
03	2422	06	2437	09	2452		

3.

### Internal antenna

Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)	Note
1	7	RFPCA3806	DCD	NI/A	3.00	2.40
Į.	PSA	17NNAB301	PCB	N/A	3.00	2.4G
2		RFPCA3806	PCB	N/A	4.16	2.4G
2	1	20NNAB301	PCB	IN/A	4.16	2.46

### Note:

- (1) The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and receivers (2T2R), all transmit signals are completely uncorrelated, then, **Direction gain = G**<sub>ANT</sub>, that is Directional gain=4.16
- (2) ANT 2 for 1TX is the worst case.

4.

### **External antenna**

External antenna						
Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)	Note
1	RFlink	RF21S00081A	Dipole	R-SMA	4.30	2.4G
2	RFlink	RF21S00081A	Dipole	R-SMA	4.30	2.4G

### Note

- (1) The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and receivers (2T2R), all transmit signals are completely uncorrelated, then, **Direction gain = G**<sub>ANT</sub>, that is Directional gain=4.30
- (2) ANT 1 for 1TX is the worst case.

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5.

### Internal antenna

Operating Mode  TX Mode	1TX	2TX
802.11b	V (ANT 2)	-
802.11g	V (ANT 2)	-
802.11n(20MHz)	-	V (ANT 1 + ANT 2)
802.11n(40MHz)	-	V (ANT 1 + ANT 2)

### External antenna

Operating Mode		2TX	
TX Mode	1TX		
802.11b	V (ANT 1)	-	
802.11g	V (ANT 1)	-	
802.11n(20MHz)	-	V (ANT 1 + ANT 2)	
802.11n(40MHz)	-	V (ANT 1 + ANT 2)	

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### 3.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

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-20MHZ MODE CHANNEL 01/06/11	
Mode 4	TX N-40MHZ MODE CHANNEL 03/06/09	
Mode 5	TX MODE	

The EUT system operated these modes were found to be the worst case during the pre-scanning test as following:

For Conducted Test	
Final Test Mode	Description
Mode 5	TX MODE

For Radiated 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-20MHZ MODE CHANNEL 01/06/11	
Mode 4	TX N-40MHZ MODE CHANNEL 03/06/09	

### Note:

- (1) The measurements are performed at the high, middle, low available channels.
- (2) 802.11b mode: DBPSK (1Mbps)

802.11g mode: OFDM (6Mbps)

802.11n HT20 mode : BPSK (13Mbps) 802.11n HT40 mode : BPSK (27Mbps)

For radiated emission tests, the highest output powers were set for final test.

- (3) For radiated below 1G test, the 802.11b is found to be the worst case and recorded.
- (4) The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%.

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### 3.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

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

### Internal antenna

Test software version		NA	
Frequency (MHz)	2412	2437	2462
802.11b	13	15	14
802.11g	25	25	25
802.11n (20MHz)	22,21	22,20	20,20
Frequency	2422	2437	2452
802.11n (40MHz)	25,25	24,24	23,24

### External antenna

Test software version		NA	
Frequency (MHz)	2412	2437	2462
802.11b	10	10	11
802.11g	21	21	22
802.11n (20MHz)	16,19	17,19	15,16
Frequency	2422	2437	2452
802.11n (40MHz)	19,23	20,23	20,23

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# 3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED EUT 3.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID/IC	Series No.	Note
-	-	-	-	-	-	

Item	Shielded Type	Ferrite Core	Length	Note
-	-	-	-	

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### 4. EMC EMISSION TEST

### 4.1 CONDUCTED EMISSION MEASUREMENT

### 4.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

Francisco (AUI)	Conducted Limit (dBµV)		
Frequency of Emission (MHz)	Quasi-peak	Average	
0 5-0.	66 to 56*	56 to 46*	
0.50 -5.0	56	46	
5.0 -30.0	60	50	

### Note

- (1) The limit of " \* " decreases with the logarithm of the frequency
- (2) The test result calculated as following: Measurement Value = Reading Level + Correct Factor Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor(if use) Margin Level = Measurement Value - Limit Value

The following table is the setting of the receiver

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

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

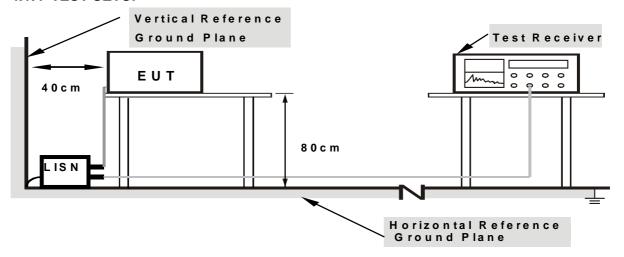
### 4.1.3 DEVIATION FROM TEST STANDARD

No deviation

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### 4.1.4 TEST SETUP



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

### 4.1.5 EUT OPERATING CONDITIONS

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

### **4.1.6 EUT TEST CONDITIONS**

Temperature: 25°C Relative Humidity: 55% Test Voltage: AC 120V/60Hz

### 4.1.7 TEST RESULTS

Please refer to the Attachment A.

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### 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 RADIATED EMISSION LIMITS

20dB in any 100 KHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a) & RSS-247 5.5, then the 15.209(a)& RSS-Gen limit in the table below has to be followed.

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

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
960~1000	500	3

### LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

Frequency (MHz)	(dBuV/m) (at 3 meters)	
r requericy (ivil 12)	PEAK	AVERAGE
Above 1000	74	54

### Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C& RSS-247.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).
- (4) The test result calculated as following: Measurement Value = Reading Level + Correct Factor Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use) Margin Level = Measurement Value - Limit Value

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

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

### 4.2.2 TEST PROCEDURE

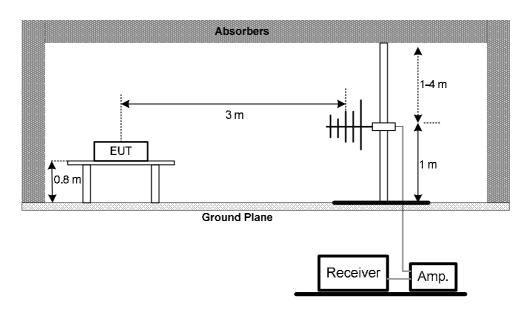
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- b. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)
- c. The height of the equipment or of the substitution antenna shall be 1.5 m; 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. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 4.2.3 DEVIATION FROM TEST STANDARD

No deviation

### 4.2.4 TEST SETUP

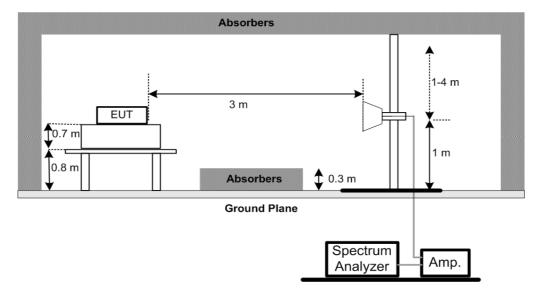
(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



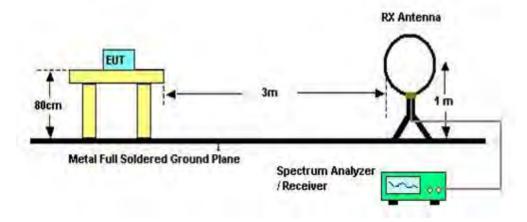
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### (B) Radiated Emission Test Set-Up Frequency Above 1 GHz



### (C) For radiated emissions below 30MHz



### **4.2.5 EUT OPERATING CONDITIONS**

The EUT tested system was configured as the statements of **4.1.5 Unless** otherwise a special operating condition is specified in the follows during the testing.

### **4.2.6 EUT TEST CONDITIONS**

Temperature: 25°C Relative Humidity: 55% Test Voltage: AC 120V/60Hz

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### 4.2.7 TEST RESULTS (9KHZ TO 30MHZ)

Please refer to the Attachment B

### Remark:

- (1) The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.
- (2) Distance extrapolation factor = 40 log (specific distance / test distance) (dB).
- (3) Limit line = specific limits (dBuV) + distance extrapolation factor.

### 4.2.8 TEST RESULTS (BETWEEN 30MHZ TO 1000 MHZ)

Please refer to the Attachment C.

### 4.2.9 TEST RESULTS (ABOVE 1000 MHZ)

Please refer to the Attachment D.

### Remark:

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

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### **5. BANDWIDTH TEST**

### **5.1 APPLIED PROCEDURES**

FCC Part15 (15.247), Subpart C/ RSS-GEN and RSS-247					
Section Test Item Frequency Range (MHz) Result					
15.247(a)(2)					
RSS-GEN section 6.6	Bandwidth	2400-2483.5	PASS		
RSS-247 5.2 (1)					

### **5.1.1 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= 100KHz, VBW=300KHz, Sweep time = 2.5 ms.

### **5.1.2 DEVIATION FROM STANDARD**

No deviation.

### 5.1.3 TEST SETUP

EUT	SPECTRUM
	ANALYZER

### **5.1.4 EUT OPERATION CONDITIONS**

The EUT tested system was configured as the statements of 4.1.5 Unless otherwise a special operating condition is specified in the follows during the testing.

### **5.1.5 EUT TEST CONDITIONS**

Temperature: 25°C Relative Humidity: 55% Test Voltage: AC 120V/60Hz

### **5.1.6 TEST RESULTS**

Please refer to the Attachment E.

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### 6. MAXIMUM PEAK CONDUCTED OUTPUT POWER TEST

### **6.1 APPLIED PROCEDURES / LIMIT**

FCC Part15 (15.247) , Subpart C/ RSS-247						
Section	Test Item	Limit	Frequency Range (MHz)	Result		
15.247(b)(3) RSS-247 5.4 (4)	Maximum Output Power	1 Watt or 30dBm	2400-2483.5	PASS		

### **6.1.1 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 peak conducted output power was performed in accordance with method 9.1.2 of FCC KDB 558074 D01 DTS Meas Guidance v03r02.

### **6.1.2 DEVIATION FROM STANDARD**

No deviation.

### 6.1.3 TEST SETUP

EUT	Power Meter
	i on on motor

### **6.1.4 EUT OPERATION CONDITIONS**

The EUT tested system was configured as the statements of 4.1.5 Unless otherwise a special operating condition is specified in the follows during the testing.

Transmit output power was measured while the host equipment supply voltage was varied from 85 % to 115 % of the nominal rated supply voltage. No change in transmit output power was observed.

### 6.1.5 EUT TEST CONDITIONS

Temperature: 25°C Relative Humidity: 55% Test Voltage: AC 120V/60Hz

### 6.1.6 TEST RESULTS

Please refer to the Attachment F.

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### 7. ANTENNA CONDUCTED SPURIOUS EMISSION

### 7.1 APPLIED PROCEDURES / LIMIT

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits.

### 7.1.1 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= 100KHz, VBW=300KHz, Sweep time = Auto.

### 7.1.2 DEVIATION FROM STANDARD

No deviation.

### 7.1.3 TEST SETUP

EUT	SPECTRUM
	ANALYZER

### 7.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 Unless otherwise a special operating condition is specified in the follows during the testing.

### 7.1.5 EUT TEST CONDITIONS

Temperature: 25°C Relative Humidity: 55% Test Voltage: AC 120V/60Hz

### 7.1.6 TEST RESULTS

Please refer to the Attachment G.

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### 8. POWER SPECTRAL DENSITY TEST

### 8.1 APPLIED PROCEDURES / LIMIT

	FCC Part15 (15.247) , Subpart C / RSS-247						
Section Test Item Limit Frequency Range (MHz) Result							
	15.247(e) RSS-247 5.2 (2)	Power Spectral Density	8 dBm (in any 3KHz)	2400-2483.5	PASS		

### **8.1.1 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=3KHz, VBW=10KHz, Sweep time = Auto.

### **8.1.2 DEVIATION FROM STANDARD**

No deviation.

### 8.1.3 TEST SETUP

EUT	SPECTRUM
	ANALYZER

### **8.1.4 EUT OPERATION CONDITIONS**

The EUT tested system was configured as the statements of 4.1.5 Unless otherwise a special operating condition is specified in the follows during the testing.

### **8.1.5 EUT TEST CONDITIONS**

Temperature: 25°C Relative Humidity: 55% Test Voltage: AC 120V/60Hz

### 8.1.6 TEST RESULTS

Please refer to the Attachment H.

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### 9. MEASUREMENT INSTRUMENTS LIST

	Conducted Emission Measurement						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until		
1	LISN	EMCO	3816/2	00052765	Mar. 28, 2016		
2	LISN	R&S	ENV216	101447	Mar. 28, 2016		
3	Test Cable	N/A	C_17	N/A	Mar.13, 2016		
4	EMI TEST RECEIVER	R&S	ESCS30	833364/017	Mar. 28, 2016		
5	50Ω Terminator	SHX	TF2-3G-A	08122902	Mar. 28, 2016		
6	Measurement Software	Farad	EZ-EMC Ver.NB-03A1 -01	N/A	N/A		

	Radiated Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until	
1	Antenna	Schwarbeck	VULB9160	9160-3232	Mar. 28, 2016	
2	Amplifier	HP	8447D	2944A09673	Nov. 17, 2015	
3	Receiver	AGILENT	N9038A	MY5213003 9	Sep. 30, 2015	
4	Test Cable	N/A	C-01_CB03	N/A	Jul. 01, 2015	
5	Controller	СТ	SC100	N/A	N/A	
6	Antenna	ETS	3115	00075789	Mar. 28, 2016	
7	Amplifier	Agilent	8449B	3008A02274	Nov. 02, 2015	
8	Receiver	AGILENT	N9038A	MY5213003 9	Sep. 30, 2015	
9	Test Cable	N/A	C-68	N/A	Jul. 01, 2015	
10	Controller	СТ	SC100	N/A	N/A	
11	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Mar. 28, 2016	
12	Microwave Preamplifier With Adaptor	EMC INSTRUMENT	EMC2654045	980039 & HA01	Mar. 28, 2016	
13	Active Loop Antenna	R&S	HFH2-Z2	830749/020	Aug. 16, 2015	
14	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A	

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	6dB Bandwidth Measurement					
Item	Item Kind of Equipment Manufacturer Type No. Serial No. Calibrated until					
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov. 02, 2015	

Peak Output Power Measurement						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until	
1	power Meter	ANRITSU	ML2495A	1128009	Mar. 28, 2016	
2	Pulse Power Sensor	ANRITSU	MA 2411B	1027500	Mar. 28, 2016	

Antenna Conducted Spurious Emission Measurement								
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until			
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov. 02, 2015			

		Power Spectral De	ensity Measur	ement	
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov. 02, 2015

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

All calibration period of equipment list is one year.

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### **10. EUT TEST PHOTO**

### **Conducted Measurement Photos**

### Internal antenna





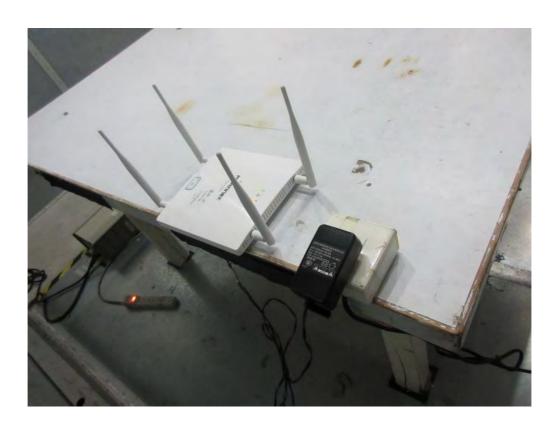
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### **Conducted Measurement Photos**

### **External antenna**





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# 9KHz to 30MHz Internal antenna





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# 9KHz to 30MHz External antenna





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### 30MHz to 1000MHz Internal antenna





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### 30MHz to 1000MHz External antenna





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# Above 1000MHz Internal antenna





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# Above 1000MHz External antenna





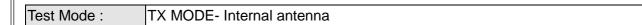
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ATTACHMENT A - CONDUCTED EMISSION

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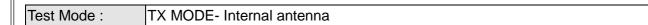


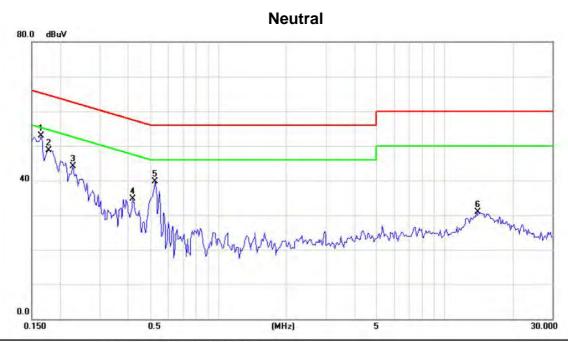
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No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1578	43.76	9.55	53.31	65.58	-12.27	peak	
2		0.1773	40.35	9.56	49.91	64.61	-14.70	peak	
3		0.2086	35.77	9.58	45.35	63.26	-17.91	peak	
4		0.2555	31.80	9.61	41.41	61.58	-20.17	peak	
5		0.5290	29.88	9.69	39.57	56.00	-16.43	peak	1
6		13.6602	20.20	9.83	30.03	60.00	-29.97	peak	

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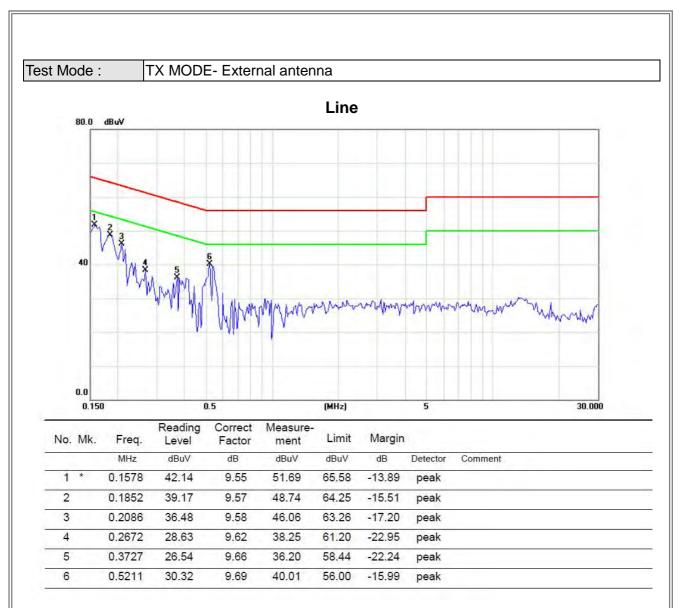




No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1655	43.44	9.48	52.92	65.18	-12.26	peak	
2		0.1777	39.24	9.49	48.73	64.59	-15.86	peak	
3		0.2281	34.65	9.51	44.16	62.52	-18.36	peak	
4		0.4195	25.17	9.54	34.71	57.46	-22.75	peak	
5		0.5290	30.22	9.56	39.78	56.00	-16.22	peak	
6		14.1094	21.04	9.91	30.95	60.00	-29.05	peak	

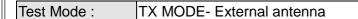
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30.000



0.5

0.0

# Neutral 80.0 dBuV 40

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1540	41.72	9.49	51.21	65.78	-14.57	peak	
2		0.1812	38.63	9.49	48.12	64.43	-16.31	peak	
3		0.2164	36.24	9.50	45.74	62.96	-17.22	peak	
4		0.4156	26.05	9.53	35.58	57.54	-21.96	peak	
5		0.5250	30.38	9.56	39.94	56.00	-16.06	peak	
6		14.2305	22.46	9.91	32.37	60.00	-27.63	peak	

(MHz)

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ATTACHMENT B - RADIATED EMISSION (9KHZ TO 30MHZ)

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Test Mode:	TX Mode 2412MHz- Internal antenna
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Frequency (MHz)	Ant 0°/90°	Read level dBuV/m	Factor (dB)	Measured(FS) (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Note
0.0106	0°	10.21	24.90	35.11	127.10	-91.99	AVG
0.0106	0°	13.58	24.90	38.48	147.10	-108.62	PEAK
0.0252	0°	7.23	23.97	31.20	119.58	-88.38	AVG
0.0252	0°	9.72	23.97	33.69	139.58	-105.89	PEAK
0.0367	0°	3.54	23.24	26.78	116.31	-89.53	AVG
0.0367	0°	5.18	23.24	28.42	136.31	-107.89	PEAK
0.0412	0°	1.27	22.96	24.23	115.31	-91.08	AVG
0.0412	0°	2.82	22.96	25.78	135.31	-109.53	PEAK
0.5104	0°	16.38	19.83	36.21	73.45	-37.23	QP
2.1168	0°	21.55	19.43	40.98	69.54	-28.56	QP

Frequency (MHz)	Ant 0°/90°	Read level dBuV/m	Factor (dB)	Measured(FS) (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Note
0.0085	90°	13.42	24.30	37.72	129.02	-91.30	AVG
0.0085	90°	15.19	24.30	39.49	149.02	-109.53	PEAK
0.0193	90°	8.25	24.30	32.55	121.89	-89.34	AVG
0.0193	90°	9.13	24.30	33.43	141.89	-108.46	PEAK
0.0281	90°	4.73	23.79	28.52	118.63	-90.11	AVG
0.0281	90°	6.18	23.79	29.97	138.63	-108.66	PEAK
0.0413	90°	1.57	22.95	24.52	115.29	-90.76	AVG
0.0413	90°	2.39	22.95	25.34	135.29	-109.94	PEAK
0.5317	90°	20.15	19.90	40.05	73.09	-33.04	QP
1.9135	90°	24.67	19.51	44.18	69.54	-25.36	QP

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Test Mode:	(T	K Mode 2412	MHz- External a	intenna			
Frequency	Ant	Read level	Factor	Measured(FS)	Limit	Margin	
(MHz)	0°/90°	dBuV/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	Note
0.0112	0°	8.52	24.86	33.38	126.62	-93.24	AVG
0.0112	0°	10.61	24.86	35.47	146.62	-111.15	PEAK
0.0207	0°	6.24	24.26	30.50	121.28	-90.79	AVG
0.0207	0°	7.48	24.26	31.74	141.28	-109.55	PEAK
0.0358	0°	3.29	23.30	26.59	116.53	-89.94	AVG
0.0358	0°	4.13	23.30	27.43	136.53	-109.10	PEAK
0.0411	0°	1.13	22.96	24.09	115.33	-91.23	AVG
0.0411	0°	1.68	22.96	24.64	135.33	-110.68	PEAK
0.5724	0°	18.74	20.03	38.77	72.45	-33.68	QP
2.1263	0°	21.52	19.42	40.94	69.54	-28.60	QP
Frequency	Ant	Read level	Factor	Measured(FS)	Limit	Margin	Note
(MHz)	0°/90°	dBuV/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	Note
0.0091	90°	12.68	24.30	36.98	128.42	-91.44	AVG
0.0091	90°	13.43	24.30	37.73	148.42	-110.69	PEAK
0.0142	90°	8.32	24.30	32.62	124.56	-91.94	AVG

34.05

27.30

28.63

24.58

25.66

38.70

42.27

144.56

120.45

140.45

116.65

136.65

71.75

69.54

-110.51

-93.14

-111.81

-92.07

-110.99

-33.05

-27.27

PEAK AVG

PEAK

AVG

PEAK

QP

QΡ

24.30

24.12

24.12

23.33

23.33

20.18

19.50

0.0142

0.0228

0.0228

0.0353

0.0353

0.6203

1.9572

90°

90°

90°

90°

90°

90°

90°

9.75

3.18

4.51

1.25

2.33

18.52

22.77

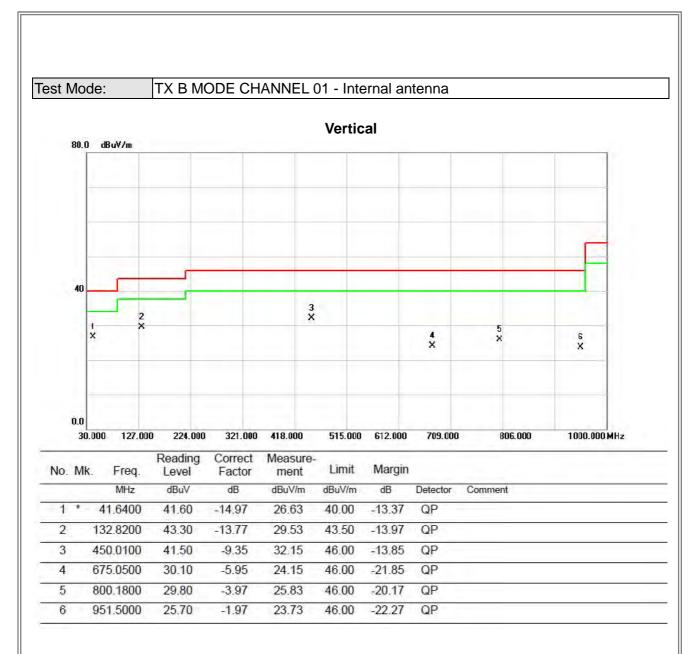
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ATTACHMENT C - RADIATED EMISSION (30MHZ TO 1000MHZ)

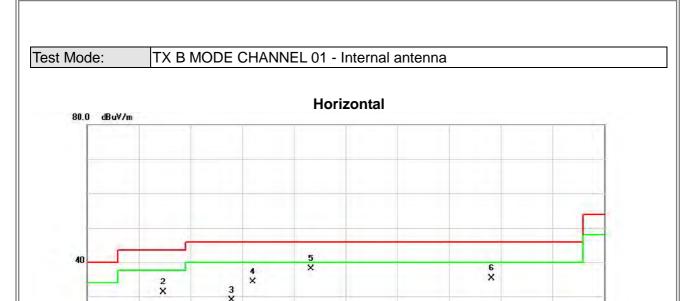
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No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		133.7900	37.50	-13.79	23.71	43.50	-19.79	QP	
2		172.5900	44.10	-12.85	31.25	43.50	-12.25	QP	
3		300.6300	39.70	-10.80	28.90	46.00	-17.10	QP	
4		341.3700	45.30	-10.92	34.38	46.00	-11.62	QP	
5	*	450.0100	47.50	-9.35	38.15	46.00	-7.85	QP	
6	- 1	788.5400	39.70	-4.32	35.38	46.00	-10.62	QP	

515.000 612.000

709.000

806.000

1000.000 MHz

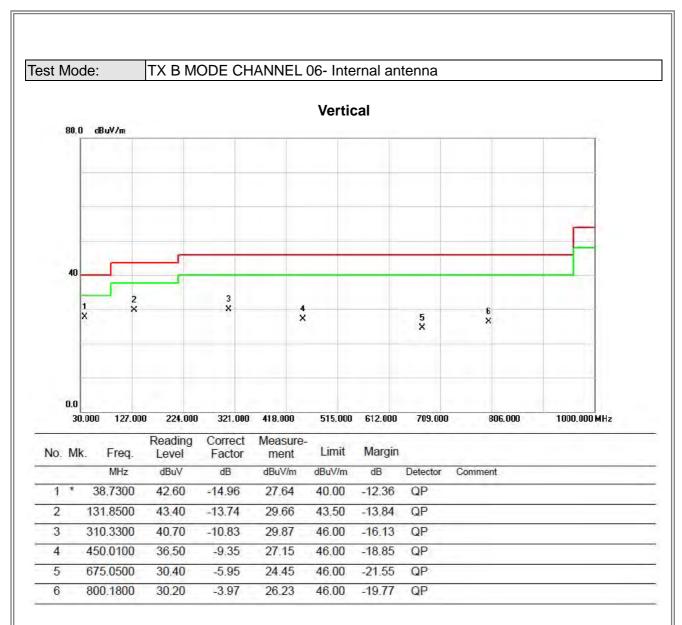
30.000

127.000

224.000

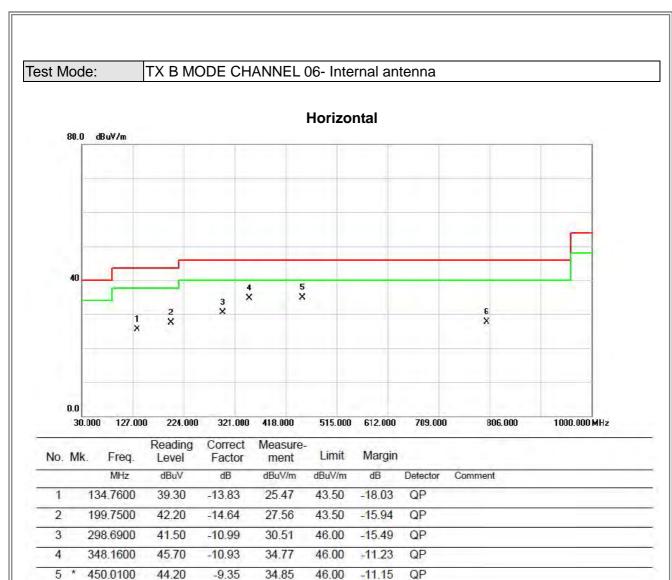
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6

800.1800

31.70

-3.97

27.73

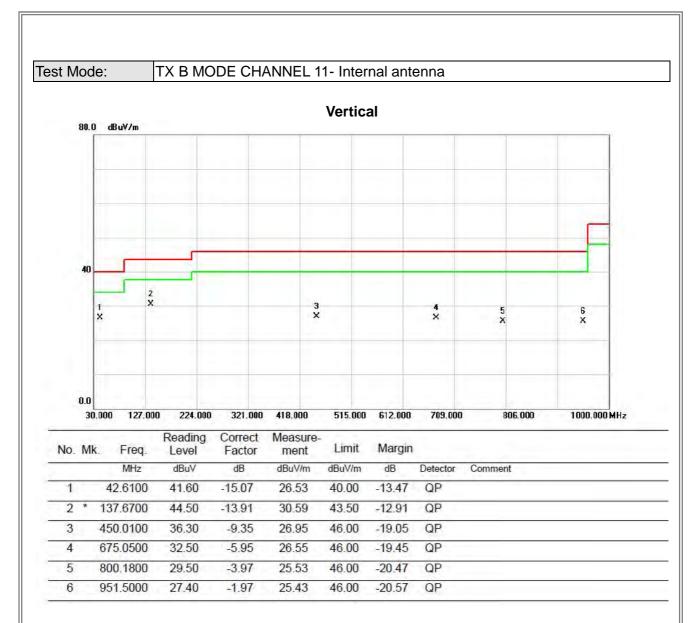
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-18.27

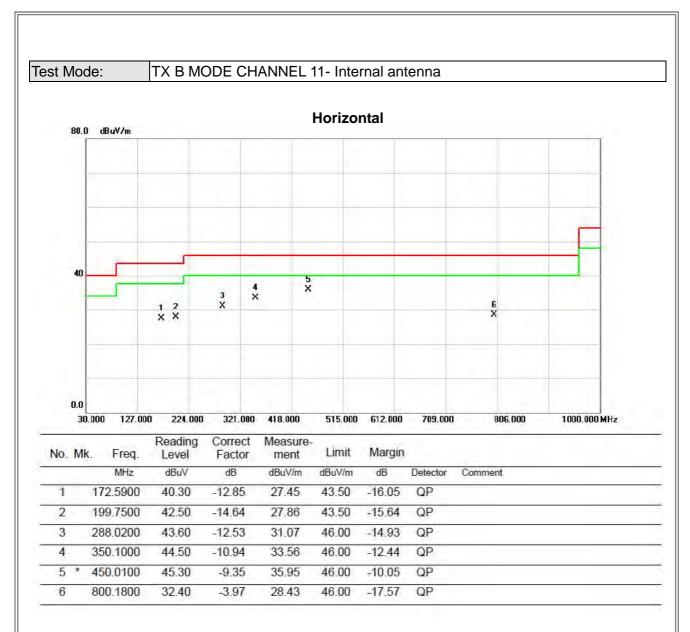
QP

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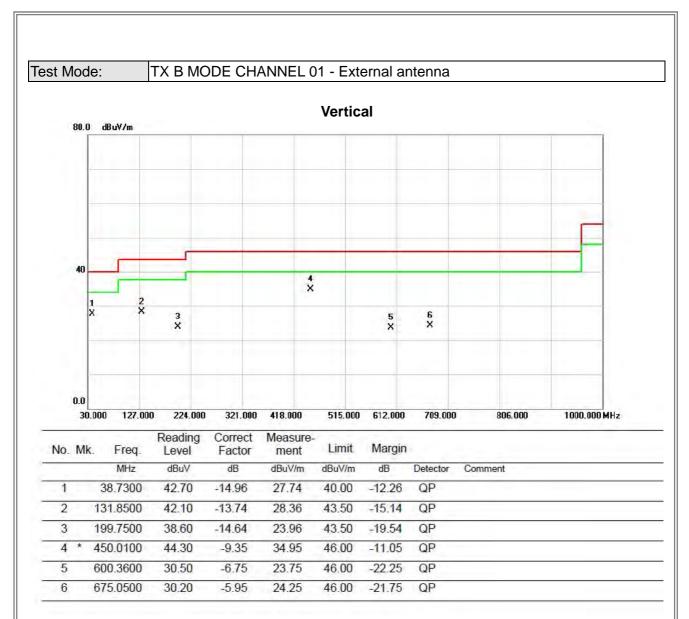






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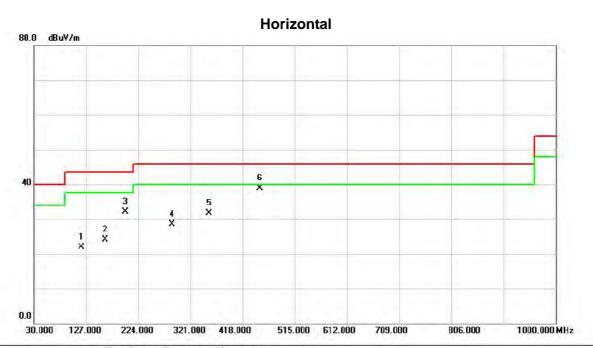




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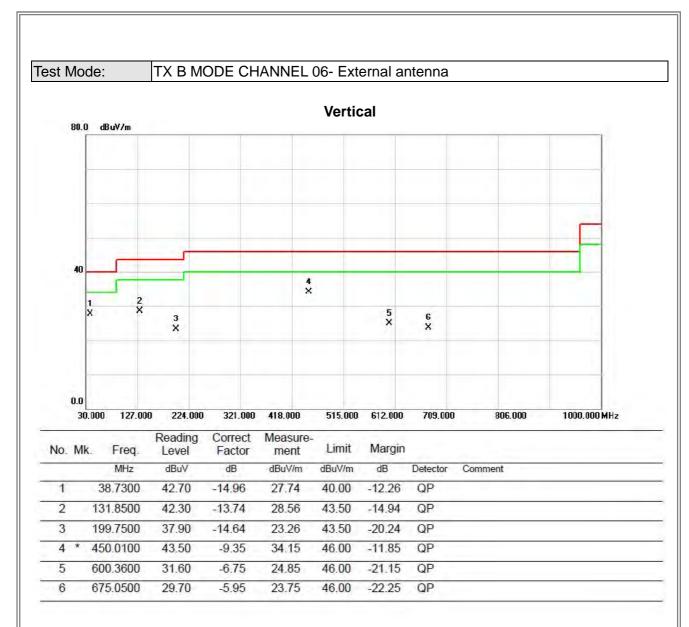




Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin			
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
5.16	118.2700	36.20	-14.39	21.81	43.50	-21.69	QP		
	162.8900	37.50	-13.48	24.02	43.50	-19.48	QP		_
	199.7500	46.70	-14.64	32.06	43.50	-11.44	QP		
- 1	286.0800	41.20	-12.75	28.45	46.00	-17.55	QP		
	354.9500	42.60	-10.92	31.68	46.00	-14.32	QP		
* 4	450.0100	48.20	-9.35	38.85	46.00	-7.15	QP	_	
		MHz 118.2700 162.8900 199.7500 286.0800 354.9500	Mk. Freq. Level  MHz dBuV  118.2700 36.20  162.8900 37.50  199.7500 46.70  286.0800 41.20  354.9500 42.60	Mk.         Freq.         Level         Factor           MHz         dBuV         dB           118.2700         36.20         -14.39           162.8900         37.50         -13.48           199.7500         46.70         -14.64           286.0800         41.20         -12.75           354.9500         42.60         -10.92	Mk.         Freq.         Level         Factor         ment           MHz         dBuV         dB         dBuV/m           118,2700         36,20         -14,39         21,81           162,8900         37,50         -13,48         24,02           199,7500         46,70         -14,64         32,06           286,0800         41,20         -12,75         28,45           354,9500         42,60         -10,92         31,68	Mk.         Freq.         Level         Factor         ment         Limit           MHz         dBuV         dB         dBuV/m         dBuV/m           118.2700         36.20         -14.39         21.81         43.50           162.8900         37.50         -13.48         24.02         43.50           199.7500         46.70         -14.64         32.06         43.50           286.0800         41.20         -12.75         28.45         46.00           354.9500         42.60         -10.92         31.68         46.00	Mk.         Freq.         Level         Factor         ment         Limit         Margin           MHz         dBuV         dB         dBuV/m         dBuV/m         dB           118.2700         36.20         -14.39         21.81         43.50         -21.69           162.8900         37.50         -13.48         24.02         43.50         -19.48           199.7500         46.70         -14.64         32.06         43.50         -11.44           286.0800         41.20         -12.75         28.45         46.00         -17.55           354.9500         42.60         -10.92         31.68         46.00         -14.32	Mk.         Freq.         Level         Factor         ment         Limit         Margin           MHz         dBuV         dB         dBuV/m         dBuV/m         dB         Detector           118,2700         36,20         -14,39         21,81         43,50         -21,69         QP           162,8900         37,50         -13,48         24,02         43,50         -19,48         QP           199,7500         46,70         -14,64         32,06         43,50         -11,44         QP           286,0800         41,20         -12,75         28,45         46,00         -17,55         QP           354,9500         42,60         -10,92         31,68         46,00         -14,32         QP	Mk.         Freq.         Level         Factor         ment         Limit         Margin           MHz         dBuV         dB         dBuV/m         dB         Detector         Comment           118,2700         36,20         -14,39         21,81         43,50         -21,69         QP           162,8900         37,50         -13,48         24,02         43,50         -19,48         QP           199,7500         46,70         -14,64         32,06         43,50         -11,44         QP           286,0800         41,20         -12,75         28,45         46,00         -17,55         QP           354,9500         42,60         -10,92         31,68         46,00         -14,32         QP

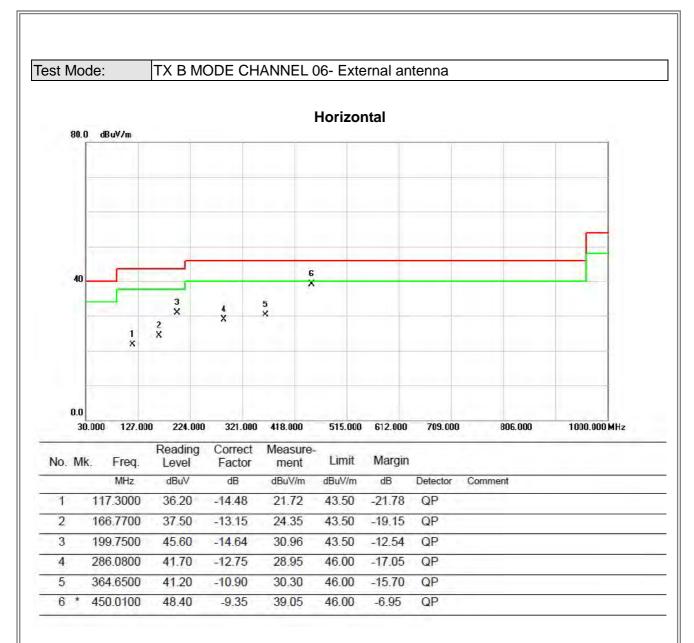
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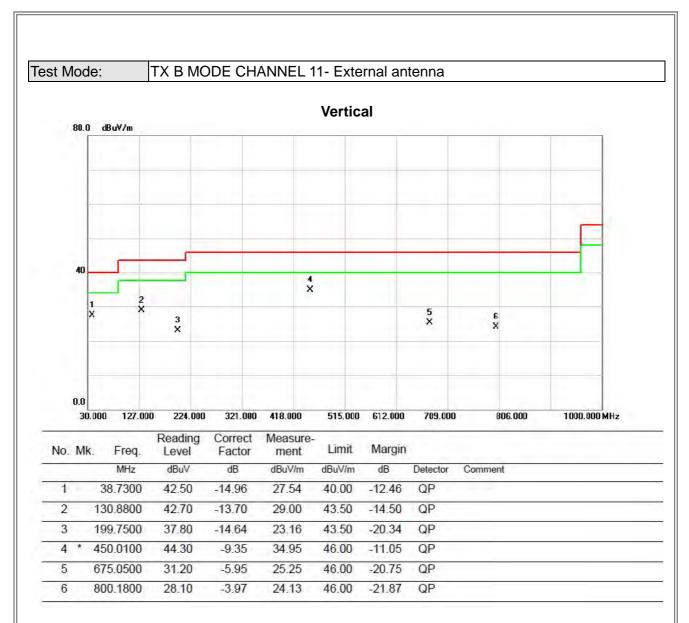
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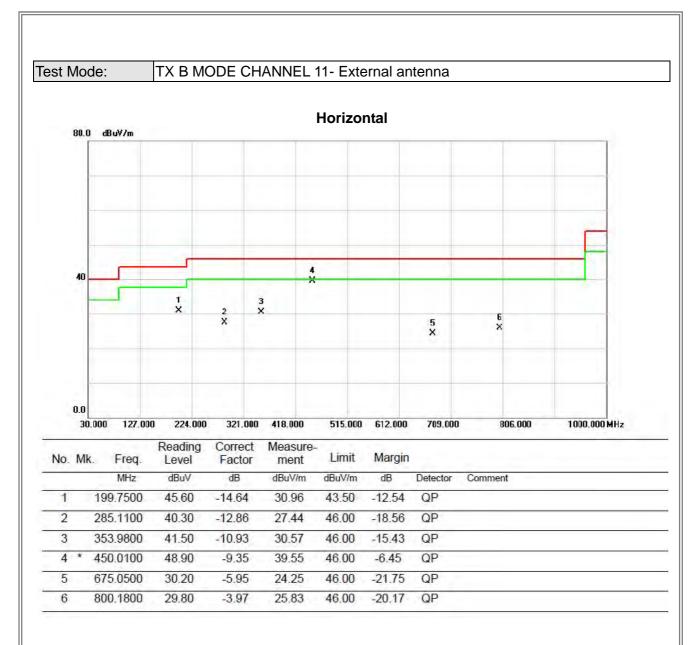
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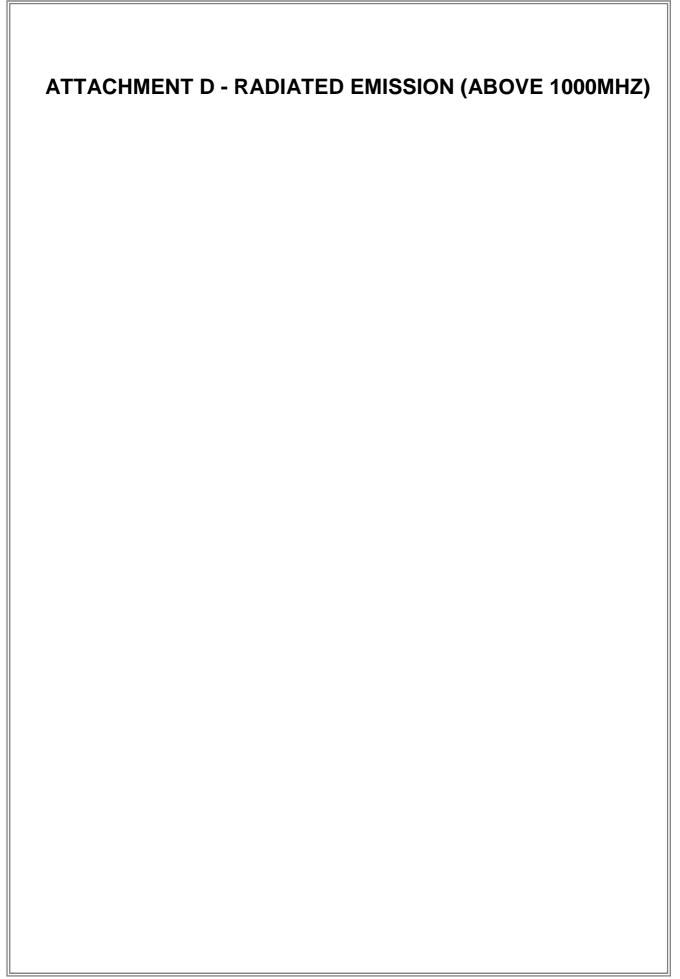
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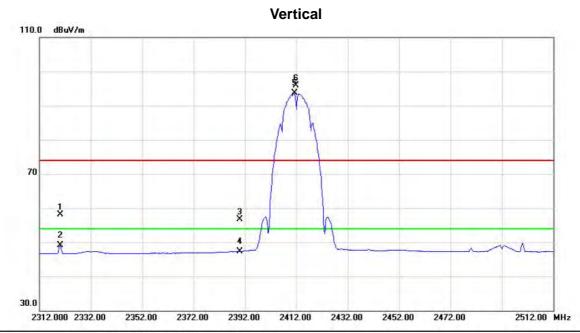
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No.	Mk	c. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2320.000	25.50	32.59	58.09	74.00	-15.91	peak	
2		2320.000	16.44	32.59	49.03	54.00	-4.97	AVG	
3		2390.000	24.02	32.68	56.70	74.00	-17.30	peak	
4		2390.000	14.71	32.68	47.39	54.00	-6.61	AVG	
5	*	2411.200	60.97	32.71	93.68	54.00	39.68	AVG	No Limit
6	X	2411.800	63.19	32.71	95.90	74.00	21.90	peak	No Limit

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## Vertical



No.	Mk.	. Freq.	Reading Level		Measure- ment		Margin			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		4823.915	45.71	5.87	51.58	74.00	-22.42	peak		
2	*	4824.005	39.57	5.87	45.44	54.00	-8.56	AVG		

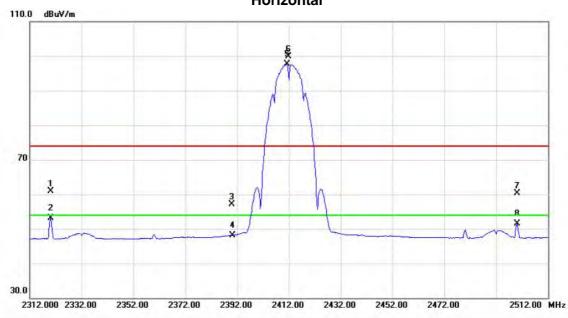
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Orthogonal Axis: X

Test Mode: TX B MODE 2412MHz- Internal antenna

## Horizontal

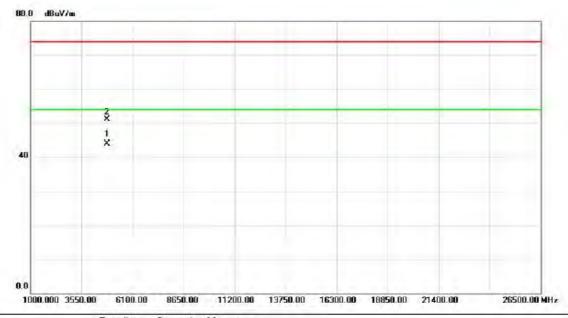


MHz 20.000	dBuV 28.31	dB	dBuV/m	1040 5 42			
20.000	29.31		aba viiii	dBuV/m	dB	Detector	Comment
	20.31	32.59	60.90	74.00	-13.10	peak	
20.000	20.60	32.59	53.19	54.00	-0.81	AVG	
90.000	24.40	32.68	57.08	74.00	-16.92	peak	
90.000	15.50	32.68	48.18	54.00	-5.82	AVG	
11.200	65.06	32.71	97.77	54.00	43.77	AVG	No Limit
11.800	67.23	32.71	99.94	74.00	25.94	peak	No Limit
00.000	27.51	32.83	60.34	74.00	-13.66	peak	
00 000	18.70	32.83	51.53	54.00	-2.47	AVG	
1	1.200	11.200 65.06 11.800 67.23 00.000 27.51	11.200     65.06     32.71       11.800     67.23     32.71       00.000     27.51     32.83	11.200     65.06     32.71     97.77       11.800     67.23     32.71     99.94       10.000     27.51     32.83     60.34	11.200     65.06     32.71     97.77     54.00       11.800     67.23     32.71     99.94     74.00       10.000     27.51     32.83     60.34     74.00	11.200     65.06     32.71     97.77     54.00     43.77       11.800     67.23     32.71     99.94     74.00     25.94       10.000     27.51     32.83     60.34     74.00     -13.66	11.200     65.06     32.71     97.77     54.00     43.77     AVG       11.800     67.23     32.71     99.94     74.00     25.94     peak       00.000     27.51     32.83     60.34     74.00     -13.66     peak

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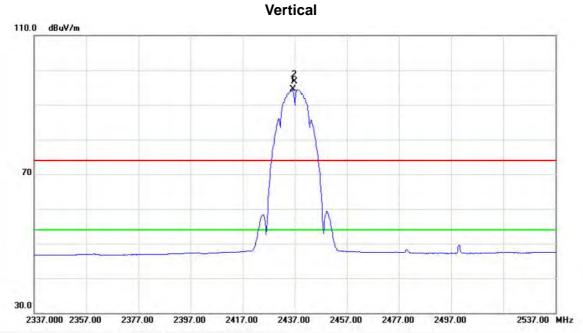
## Horizontal



No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment		Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	4824.015	38.03	5.87	43.90	54.00	-10.10	AVG	
2		4824.130	45.30	5.87	51.17	74.00	-22.83	peak	

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No.	M	k. Freq.	Reading Level		Measure- ment	Limit	Margin	i e	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2436.200	61.70	32.74	94.44	54.00	40.44	AVG	No Limit
2	X	2436.800	64.02	32.74	96.76	74.00	22.76	peak	No Limit

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## Vertical



MHz	dBuV	-					
	abuv	dB	dBuV/m	dBuV/m	dB	Detector	Comment
4873.960	47.67	6.01	53.68	74.00	-20.32	peak	
4874.030	43.06	6.01	49.07	54.00	-4.93	AVG	
1	874.030	874.030 43.06	874.030 43.06 6.01	874.030 43.06 6.01 49.07	874.030 43.06 6.01 49.07 54.00	874.030 43.06 6.01 49.07 54.00 -4.93	874.030 43.06 6.01 49.07 54.00 -4.93 AVG

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# Horizontal 110.0 dBuV/m 70 30.0 2337.000 2357.00 2377.00 2397.00 2417.00 2437.00 2457.00 2477.00 2497.00 2537.00 MHz

No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin	Q.		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		2357.800	27.34	32.64	59.98	74.00	-14.02	peak		
2		2357.800	17.53	32.64	50.17	54.00	-3.83	AVG		
3	*	2436.200	66.13	32.74	98.87	54.00	44.87	AVG	No Limit	
4	X	2436.800	68.30	32.74	101.04	74.00	27.04	peak	No Limit	
5		2500.000	25.94	32.83	58.77	74.00	-15.23	peak		
6		2500.000	18.74	32.83	51.57	54.00	-2.43	AVG		
7		2516.200	26.72	32.86	59.58	74.00	-14.42	peak		
8		2516.200	18.63	32.86	51.49	54.00	-2.51	AVG		

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## Horizontal



No.	Mk	. Freq.	Reading Level		Measure- ment		Margin			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		4873.915	47.40	6.01	53.41	74.00	-20.59	peak		
2	*	4874.040	42.24	6.01	48.25	54.00	-5.75	AVG		

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# Vertical 110.0 dBuV/m 70 30.0 2362.000 2382.00 2402.00 2422.00 2442.00 2462.00 2482.00 2502.00 2522.00 2562.00 MHz

No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1	*	2461.200	61.10	32.78	93.88	54.00	39.88	AVG	No Limit	
2	X	2462.000	63.32	32.78	96.10	74.00	22.10	peak	No Limit	
3		2483.500	25.92	32.81	58.73	74.00	-15.27	peak		
4		2483.500	14.72	32.81	47.53	54.00	-6.47	AVG		
5		2500.000	24.55	32.83	57.38	74.00	-16.62	peak		
6		2500.000	16.80	32.83	49.63	54.00	-4.37	AVG		

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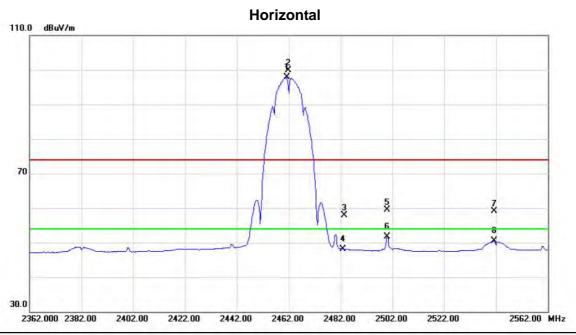
## Vertical



No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1	*	4924.015	41.71	6.14	47.85	54.00	-6.15	AVG		
2		4924.055	46.43	6.14	52.57	74.00	-21.43	peak		

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No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1	*	2461.200	65.12	32.78	97.90	54.00	43.90	AVG	No Limit	
2	Χ	2461.800	67.17	32.78	99.95	74.00	25.95	peak	No Limit	
3		2483.500	25.02	32.81	57.83	74.00	-16.17	peak		
4		2483.500	15.31	32.81	48.12	54.00	-5.88	AVG		
5		2500.000	26.77	32.83	59.60	74.00	-14.40	peak		
6	Н	2500.000	18.91	32.83	51.74	54.00	-2.26	AVG		
7		2541.200	26.13	32.90	59.03	74.00	-14.97	peak		
8		2541.200	17.61	32.90	50.51	54.00	-3.49	AVG		

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## Horizontal



No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	A	Margin			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		4923.985	46.43	6.14	52.57	74.00	-21.43	peak		
2	*	4924.030	40.37	6.14	46.51	54.00	-7.49	AVG		

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# Vertical 110.0 dBuV/m 70 11 X X X 5 X 10 30.0 2312.000 2332.00 2352.00 2512.00 MHz 2372.00 2392.00 2412.00 2432.00 2452.00 2472.00

No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	= 3	2320.000	25.47	32.59	58.06	74.00	-15.94	peak	
2		2320.000	15.57	32.59	48.16	54.00	-5.84	AVG	
3		2379.200	25.31	32.66	57.97	74.00	-16.03	peak	
4		2379.200	15.17	32.66	47.83	54.00	-6.17	AVG	
5		2390.000	24.31	32.68	56.99	74.00	-17.01	peak	
6		2390.000	14.65	32.68	47.33	54.00	-6.67	AVG	
7	*	2410.600	57.02	32.71	89.73	54.00	35.73	AVG	No Limit
8	Χ	2414.000	65.62	32.71	98.33	74.00	24.33	peak	No Limit
9		2450.800	25.77	32.76	58.53	74.00	-15.47	peak	
10		2450.800	16.06	32.76	48.82	54.00	-5.18	AVG	
11		2499.800	27.52	32.83	60.35	74.00	-13.65	peak	
12		2499.800	17.06	32.83	49.89	54.00	-4.11	AVG	

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## Vertical



No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4823.990	47.05	5.87	52.92	74.00	-21.08	peak	
2	*	4824.040	35.11	5.87	40.98	54.00	-13.02	AVG	

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# Horizontal 110.0 dBuV/m 9 X 10 70 X 5 X X 30.0 2312.000 2332.00 2352.00 2372.00 2392.00 2412.00 2432.00 2452.00 2472.00 2512.00 MHz

No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2320.000	28.91	32.59	61.50	74.00	-12.50	peak	
2		2320.000	21.07	32.59	53.66	54.00	-0.34	AVG	
3		2329.600	27.69	32.59	60.28	74.00	-13.72	peak	
4		2329.600	18.25	32.59	50.84	54.00	-3.16	AVG	
5		2368.800	26.24	32.65	58.89	74.00	-15.11	peak	
6		2368.800	17.17	32.65	49.82	54.00	-4.18	AVG	
7		2390.000	25.93	32.68	58.61	74.00	-15.39	peak	
8		2390.000	15.79	32.68	48.47	54.00	-5.53	AVG	
9	X	2414.000	70.38	32.71	103.09	74.00	29.09	peak	No Limit
10	*	2419.400	62.01	32.72	94.73	54.00	40.73	AVG	No Limit
11		2450.800	27.27	32.76	60.03	74.00	-13.97	peak	
12		2450.800	17.79	32.76	50.55	54.00	-3.45	AVG	La
13		2500.000	29.07	32.83	61.90	74.00	-12.10	peak	
4	2	500.000	19.96	32.83	52.79	54.00	-1.21	AVG	

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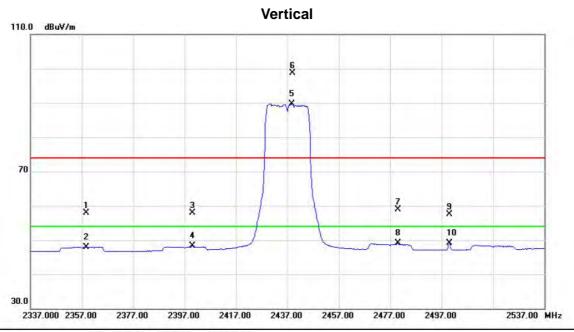
## Horizontal



No.	Mk	. Freq.		Correct Factor	Measure- ment dBuV/m	Limit	Margin			
		MHz					dB	Detector	Comment	
1		4823.970	42.44	5.87	48.31	74.00	-25.69	peak		
2	*	4824.060	30.78	5.87	36.65	54.00	-17.35	AVG		

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No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2358.800	25.36	32.64	58.00	74.00	-16.00	peak	
2		2358.800	15.33	32.64	47.97	54.00	-6.03	AVG	
3		2400.000	25.13	32.69	57.82	74.00	-16.18	peak	
4		2400.000	15.57	32.69	48.26	54.00	-5.74	AVG	
5	*	2438.800	57.03	32.74	89.77	54.00	35.77	AVG	No Limit
6	X	2439.000	65.90	32.74	98.64	74.00	24.64	peak	No Limit
7		2480.000	26.10	32.80	58.90	74.00	-15.10	peak	
8	Ħ	2480.000	16.28	32.80	49.08	54.00	-4.92	AVG	
9	117	2500.000	24.64	32.83	57.47	74.00	-16.53	peak	
10		2500.000	16.23	32.83	49.06	54.00	-4.94	AVG	

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### Vertical

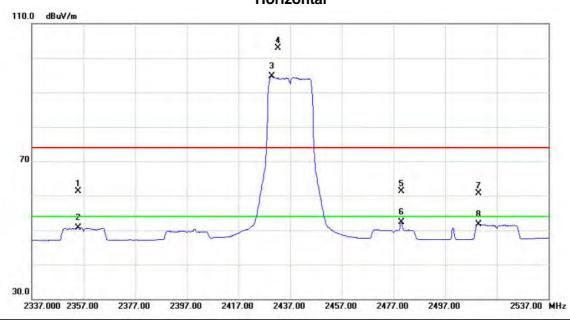


No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		4874.000	47.54	6.01	53.55	74.00	-20.45	peak		
2	*	4874.000	36.36	6.01	42,37	54.00	-11.63	AVG		

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### Horizontal



No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2355.000	28.58	32.63	61.21	74.00	-12.79	peak	
2		2355.000	18.10	32.63	50.73	54.00	-3.27	AVG	La
3	*	2429.800	61.95	32.73	94.68	54.00	40.68	AVG	No Limit
4	X	2432.200	70.13	32.74	102.87	74.00	28.87	peak	No Limit
5		2480.000	28.49	32.80	61.29	74.00	-12.71	peak	
6		2480.000	19.59	32.80	52.39	54.00	-1.61	AVG	
7	-	2509.800	27.84	32.85	60.69	74.00	-13.31	peak	
8		2509.800	18.89	32.85	51.74	54.00	-2.26	AVG	
		THE RESERVE							

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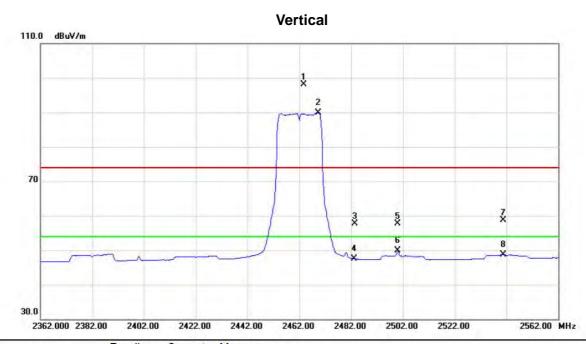
### Horizontal



No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	4874.090	31.66	6.01	37.67	54.00	-16.33	AVG	
2		4874.140	42.55	6.01	48.56	74.00	-25.44	peak	

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No.	Mk	c. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1	X	2463.800	65.37	32.78	98.15	74.00	24.15	peak	No Limit	
2	*	2469.400	57.10	32.79	89.89	54.00	35.89	AVG	No Limit	
3		2483.500	24.83	32.81	57.64	74.00	-16.36	peak		
4		2483.500	14.73	32.81	47.54	54.00	-6.46	AVG		
5		2500.000	24.80	32.83	57.63	74.00	-16.37	peak		
6		2500.000	17.03	32.83	49.86	54.00	-4.14	AVG		
7	13	2540.800	25.72	32.90	58.62	74.00	-15.38	peak		
8		2540.800	15.80	32.90	48.70	54.00	-5.30	AVG		

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# Vertical



No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		4924.000	43.72	6.14	49.86	74.00	-24.14	peak		
2	*	4924.000	33.88	6.14	40.02	54.00	-13.98	AVG		

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### Horizontal 110.0 dBuV/m 4 × 70 9 X X 30.0 2362.000 2382.00 2562.00 MHz 2402.00 2422.00 2442.00 2462.00 2482.00 2502.00 2522.00

No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2375.000	27.05	32.66	59.71	74.00	-14.29	peak	
2		2375.000	18.15	32.66	50.81	54.00	-3.19	AVG	
3	*	2455.200	61.21	32.76	93.97	54.00	39.97	AVG	No Limit
4	Χ	2464.000	69.66	32.78	102.44	74.00	28.44	peak	No Limit
5		2483.500	25.93	32.81	58.74	74.00	-15.26	peak	
6		2483.500	15.47	32.81	48.28	54.00	-5.72	AVG	
7		2500.000	29.47	32.83	62.30	74.00	-11.70	peak	
8		2500.000	19.21	32.83	52.04	54.00	-1.96	AVG	
9		2535.200	28.45	32.89	61.34	74.00	-12.66	peak	
10		2535.200	18.30	32.89	51.19	54.00	-2.81	AVG	

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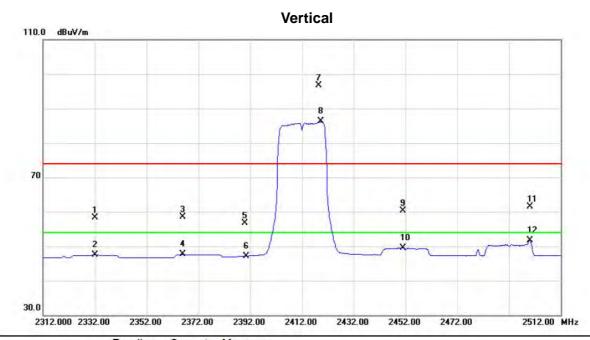
### Horizontal



No.	Mk	. Freq.		Correct Factor	Measure- ment	Limit	Margin			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1	*	4924.050	30.34	6.14	36.48	54.00	-17.52	AVG		
2		4924.140	41.18	6.14	47.32	74.00	-26.68	peak		

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No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2332.000	25.70	32.60	58.30	74.00	-15.70	peak	
2		2332.000	14.98	32.60	47.58	54.00	-6.42	AVG	
3		2366.000	25.91	32.64	58.55	74.00	-15.45	peak	
4		2366.000	14.97	32.64	47.61	54.00	-6.39	AVG	
5		2390.000	24.05	32.68	56.73	74.00	-17.27	peak	
6		2390.000	14.44	32.68	47.12	54.00	-6.88	AVG	
7	X	2418.600	63.93	32.71	96.64	74.00	22.64	peak	No Limit
8	*	2419.400	53.56	32.72	86.28	54.00	32.28	AVG	No Limit
9		2451.000	27.55	32.76	60.31	74.00	-13.69	peak	
10	1.39	2451.000	16.76	32.76	49.52	54.00	-4.48	AVG	
11	5,11	2500.000	28.60	32.83	61.43	74.00	-12.57	peak	
12	7.51	2500.000	18.86	32.83	51.69	54.00	-2.31	AVG	

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### Vertical



No.	Mk.	Freq.	Level	Level	Factor	Measure- ment		Margin			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment		
1		4823.940	42.26	5.87	48.13	74.00	-25.87	peak			
2	*	4823.940	31.70	5.87	37.57	54.00	-16.43	AVG			

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### Horizontal 110.0 dBuV/m 8 8 70 11 X 5 X 12 10 30.0 2312.000 2332.00 2352.00 2372.00 2392.00 2412.00 2432.00 2452.00 2472.00 2512.00 MHz

No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin	- 1	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2332.000	27.20	32.60	59.80	74.00	-14.20	peak	
2		2332.000	18.30	32.60	50.90	54.00	-3.10	AVG	
3		2372.000	29.49	32.66	62.15	74.00	-11.85	peak	
4		2372.000	18.80	32.66	51.46	54.00	-2.54	AVG	
5	6	2390.000	27.02	32.68	59.70	74.00	-14.30	peak	
6		2390.000	16.43	32.68	49.11	54.00	-4.89	AVG	
7	*	2410.800	62.72	32.71	95.43	54.00	41.43	AVG	No Limit
8	X	2419.800	73.60	32.72	106.32	74.00	32.32	peak	No Limit
9		2450.800	31.79	32.76	64.55	74.00	-9.45	peak	
10		2450.800	20.40	32.76	53.16	54.00	-0.84	AVG	
11		2499.800	32.12	32.83	64.95	74.00	-9.05	peak	
12		2499.800	20.65	32.83	53.48	54.00	-0.52	AVG	
			77.000				- 10 1000	4.4.7.	

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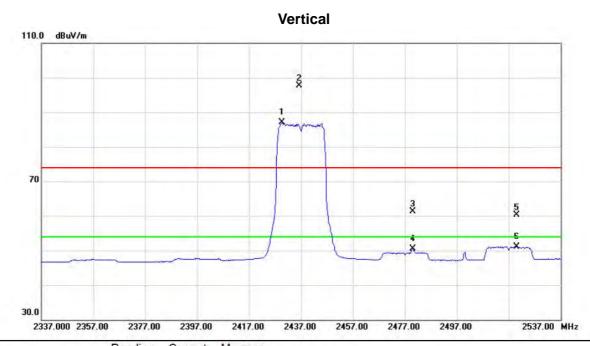
### Horizontal



No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	4823.750	30.88	5.87	36.75	54.00	-17.25	AVG	
2		4823.960	41.23	5.87	47.10	74.00	-26.90	peak	

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No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1	*	2429.600	54.36	32.73	87.09	54.00	33.09	AVG	No Limit	
2	Χ	2436.200	64.94	32.74	97.68	74.00	23.68	peak	No Limit	
3		2480.000	28.46	32.80	61.26	74.00	-12.74	peak		
4		2480.000	17.71	32.80	50.51	54.00	-3.49	AVG		
5		2520.000	27.35	32.86	60.21	74.00	-13.79	peak		
6		2520.000	18.34	32.86	51.20	54.00	-2.80	AVG		

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# Vertical



No.	Mk	. Freq.		Factor	Measure- ment	Limit	Margin			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		4874.020	43.46	6.01	49.47	74.00	-24.53	peak		
2	*	4873.640	32.53	6.01	38.54	54.00	-15.46	AVG		

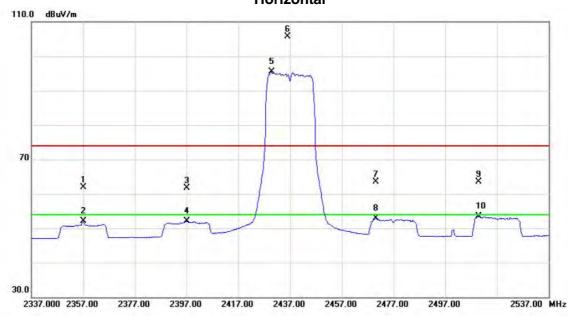
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Orthogonal Axis: X

Test Mode: TX N-20M MODE 2437MHz- Internal antenna

### Horizontal



No.	Mk	. Free	q.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	Z	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2357.00	00	29.21	32.64	61.85	74.00	-12.15	peak	
2	11	2357.00	00	19.49	32.64	52.13	54.00	-1.87	AVG	
3		2397.00	00	29.04	32.69	61.73	74.00	-12.27	peak	
4		2397.00	00	19.41	32.69	52.10	54.00	-1.90	AVG	1 - 200
5	*	2429.80	00	62.85	32.73	95.58	54.00	41.58	AVG	No Limit
6	Χ	2436.00	00	72.96	32.74	105.70	74.00	31.70	peak	No Limit
7		2470.20	00	30.63	32.79	63.42	74.00	-10.58	peak	7 _
8		2470.20	00	20.08	32.79	52.87	54.00	-1.13	AVG	
9		2509.80	00	30.59	32.85	63.44	74.00	-10.56	peak	
10		2509.80	00	20.58	32.85	53.43	54.00	-0.57	AVG	

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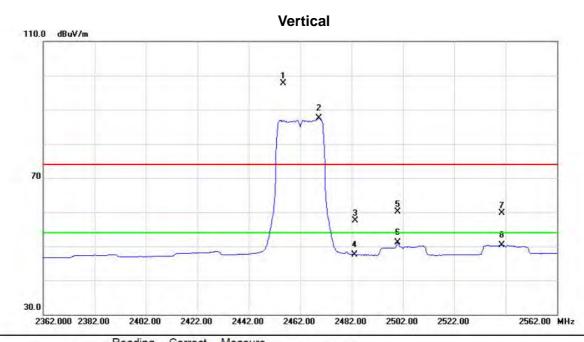
### Horizontal



No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1	*	4873.680	30.23	6.01	36.24	54.00	-17.76	AVG		
2		4874.180	40.94	6.01	46.95	74.00	-27.05	peak		

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No.	Mk	. Freq.	Level	Factor	Measure- ment	Limit	Margin			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1	X	2455.400	64.99	32.76	97.75	74.00	23.75	peak	No Limit	
2	*	2469.400	54.72	32.79	87.51	54.00	33.51	AVG	No Limit	
3		2483.500	24.65	32.81	57.46	74.00	-16.54	peak		
4		2483.500	14.72	32.81	47.53	54.00	-6.47	AVG		
5		2500.000	27.34	32.83	60.17	74.00	-13.83	peak		
6		2500.000	18.30	32.83	51.13	54.00	-2.87	AVG		
7		2540.600	26.88	32.89	59.77	74.00	-14.23	peak		
8		2540.600	17.47	32.89	50.36	54.00	-3.64	AVG		

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26500.00 MHz

Orthogonal Axis: X
Test Mode: TX N-20M MODE 2462MHz- Internal antenna

# Vertical BO.0 dBoV/m X I X

No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin	h.	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	4923.930	30.83	6.14	36.97	54.00	-17.03	AVG	
2		4923.960	41.52	6.14	47.66	74.00	-26.34	peak	

8650.00 11200.00 13750.00 16300.00 18850.00 21400.00

0.0

1000.000 3550.00

6100.00

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### Horizontal 110.0 dBuV/m 6 X 70 11 X X 10 30.0 2362.000 2382.00 2562.00 MHz 2402.00 2422.00 2442.00 2462.00 2482.00 2502.00 2522.00

No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	-3	2382.000	28.96	32.67	61.63	74.00	-12.37	peak	
2	123	2382.000	19.11	32.67	51.78	54.00	-2.22	AVG	
3		2429.600	28.00	32.73	60.73	74.00	-13.27	peak	
4	11	2429.600	19.07	32.73	51.80	54.00	-2.20	AVG	
5	*	2454.600	61.34	32.76	94.10	54.00	40.10	AVG	No Limit
6	X	2455.400	72.15	32.76	104.91	74.00	30.91	peak	No Limit
7		2483.500	26.07	32.81	58.88	74.00	-15.12	peak	
8		2483.500	16.22	32.81	49.03	54.00	-4.97	AVG	
9		2500.000	30.67	32.83	63.50	74.00	-10.50	peak	
10		2500.000	20.15	32.83	52.98	54.00	-1.02	AVG	
11		2543.200	29.91	32.90	62.81	74.00	-11.19	peak	
12		2543.200	19.90	32.90	52.80	54.00	-1.20	AVG	

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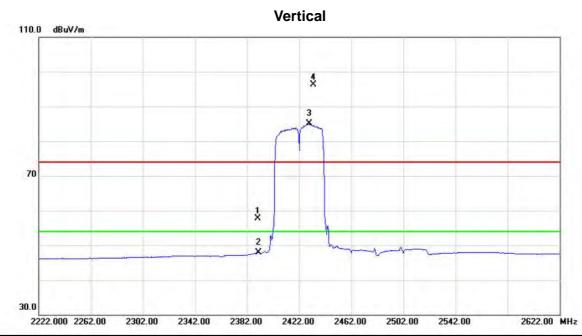
### Horizontal



No.	Mk	Freq.	Reading Level	Correct Factor	Measure- ment		Margin			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1	*	4923.990	29.04	6.14	35.18	54.00	-18.82	AVG		
2		4924.120	38.89	6.14	45.03	74.00	-28.97	peak		

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Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin	ń	
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
	2390.000	24.95	32.68	57.63	74.00	-16.37	peak	
	2390.000	15.16	32.68	47.84	54.00	-6.16	AVG	
*	2429.600	52.44	32.73	85.17	54.00	31.17	AVG	No Limit
X	2432.800	63.63	32.74	96.37	74.00	22.37	peak	No Limit
	*	MHz 2390.000 2390.000	Mk. Freq. Level  MHz dBuV  2390.000 24.95  2390.000 15.16  * 2429.600 52.44	Mk.         Freq.         Level         Factor           MHz         dBuV         dB           2390.000         24.95         32.68           2390.000         15.16         32.68           * 2429.600         52.44         32.73	Mk.         Freq.         Level         Factor         ment           MHz         dBuV         dB         dBuV/m           2390.000         24.95         32.68         57.63           2390.000         15.16         32.68         47.84           * 2429.600         52.44         32.73         85.17	Mk.         Freq.         Level         Factor         ment         Limit           MHz         dBuV         dB         dBuV/m         dBuV/m           2390.000         24.95         32.68         57.63         74.00           2390.000         15.16         32.68         47.84         54.00           * 2429.600         52.44         32.73         85.17         54.00	Mk.         Freq.         Level         Factor         ment         Limit         Margin           MHz         dBuV         dB         dBuV/m         dBuV/m         dB           2390.000         24.95         32.68         57.63         74.00         -16.37           2390.000         15.16         32.68         47.84         54.00         -6.16           *         2429.600         52.44         32.73         85.17         54.00         31.17	Mk.         Freq.         Level         Factor         ment         Limit         Margin           MHz         dBuV         dB         dBuV/m         dBuV/m         dB         Detector           2390.000         24.95         32.68         57.63         74.00         -16.37         peak           2390.000         15.16         32.68         47.84         54.00         -6.16         AVG           * 2429.600         52.44         32.73         85.17         54.00         31.17         AVG

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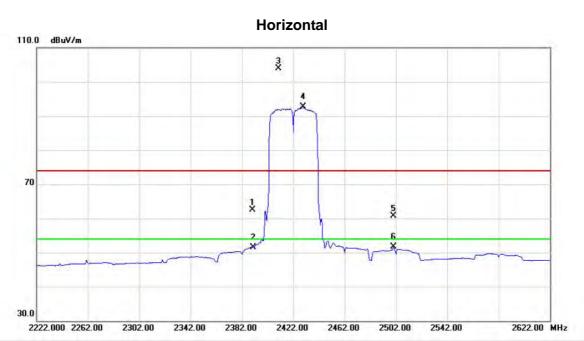
### Vertical



No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin			
		MHz	dBuV	ď₿	dBuV/m	dBuV/m	dB	Detector	Comment	
1	*	4843.970	31.26	5.93	37.19	54.00	-16.81	AVG		
2		4844.100	42.31	5.93	48.24	74.00	-25.76	peak		

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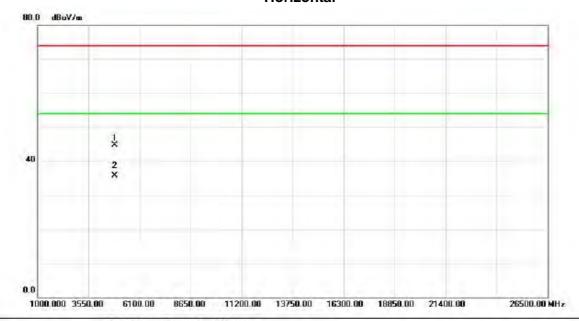


No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		2390.000	29.87	32.68	62.55	74.00	-11.45	peak		
2		2390.000	18.92	32.68	51.60	54.00	-2.40	AVG		
3	Χ	2410.400	71.16	32.71	103.87	74.00	29.87	peak	No Limit	
4	*	2429.600	59.89	32.73	92.62	54.00	38.62	AVG	No Limit	
5		2500.000	27.90	32.83	60.73	74.00	-13.27	peak		
6		2500,000	18.79	32.83	51.62	54.00	-2.38	AVG		

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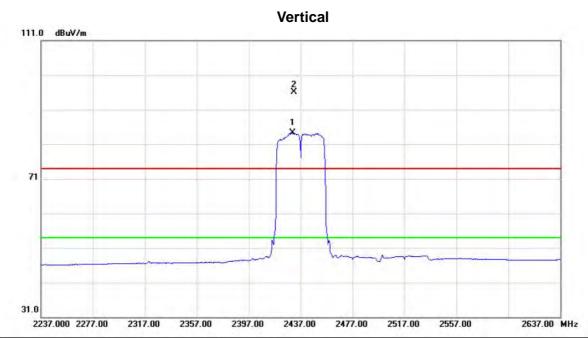
### Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		4843.940	38.80	5.93	44.73	74.00	-29.27	peak		
2	*	4843.940	29.86	5.93	35.79	54.00	-18.21	AVG		

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No.	Mk	c. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2430.600	51.67	32.73	84.40	54.00	30.40	AVG	No Limit
2	X	2431.800	63.43	32.74	96.17	74.00	22.17	peak	No Limit

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## Vertical



No.	Mk	. Freq.	Reading Level	Factor Factor	Measure- ment	Limit	Margin			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		4873.950	41.39	6.01	47.40	74.00	-26.60	peak		
2	*	4873.950	31.06	6.01	37.07	54.00	-16.93	AVG		

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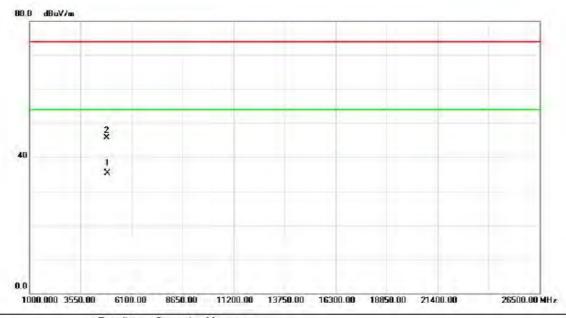
# Horizontal 110.0 dBuV/m X X 30.0 2237.000 2277.00 2317.00 2357.00 2397.00 2437.00 2477.00 2517.00 2557.00 2637.00 MHz

No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2431.000	59.40	32.73	92.13	54.00	38.13	AVG	No Limit
2	X	2431.800	71.26	32.74	104.00	74.00	30.00	peak	No Limit
3		2499.800	29.33	32.83	62.16	74.00	-11.84	peak	
4		2499.800	19.01	32.83	51.84	54.00	-2.16	AVG	

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### Horizontal



No. N	Mk	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1	*	4874.010	29.39	6.01	35.40	54.00	-18.60	AVG		
2		4874.060	39.79	6.01	45.80	74.00	-28.20	peak		

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