

FCC&IC Radio Test Report

FCC ID: 2AACP-0BK1

IC: 11115A-0BK1

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

Project No. : 1408C163 Equipment : Transit XS

Model Name : BK1

Applicant : Strata Audio LLC

Address : 31368 Via Colinas, Suite 106, Westlake Village,

CA 91362, USA

Date of Receipt : Aug. 18, 2014

Date of Test : Aug. 18, 2014~ Aug. 26, 2014

Issued Date : Aug. 27, 2014 Tested by : BTL Inc.

Testing Engineer : Favid Man

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Declaration

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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-1-1408C163	Original Issue.	Aug. 27, 2014

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1. CERTIFICATION

Equipment : Transit XS
Brand Name : SOEN
Model Name : BK1

Applicant Strata Audio LLC Manufacturer : Strata Audio LLC

Address : 31368 Via Colinas, Suite 106, Westlake Village, CA 91362, USA

Factory : Shenzhen Synchron Electronics Co., Ltd.

Address : No. 9 Mei Li Road, Xia Mei Lin, Fu Tian Area, Shenzhen, Guangdong, China

Date of Test: Aug. 18, 2014~ Aug. 26, 2014 Test Sample: ENGINEERING SAMPLE

Standard(s): FCC Part15, Subpart C: 2013 (15.247) / ANSI C63.4: 2009 /

FCC Public Notice DA 00-705, March 30, 2000.

Canada RSS-210: 2010 RSS-GEN Issue 3, Dec 2010

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-1-1408C163) 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): 47 CFR Part 15, Subpart C: 2013; Canada RSS-210:2010; RSS-GEN Issue 3, Dec 2010				
Standa	rd(s) Section	To at Home	la deserva e e t	Damada
FCC	IC	Test Item	Judgment	Remark
15.207	RSS-GEN Issue 3, Dec 2010 7.2.4	Conducted Emission	PASS	
15.247(d)	RSS-210, Issue 8, Annex 8, A8.5	Antenna conducted Spurious Emission	PASS	
15.247 (a)(1)	RSS-210, Issue 8, Annex 8, A8.1(b)	Hopping Channel Separation	PASS	
15.247 (b)(1)	RSS-210, Issue 8, Annex 8, A8.1(b)	Peak Output Power	PASS	
15.247(d) 15.209	RSS-210, Issue 8, Annex 8, Section 8.5	Radiated Spurious Emission	PASS	
15.247 (a)(1)(iii)	RSS-210, Issue 8, Annex 8, A8.1(d)	Number of Hopping Frequency	PASS	
15.247 (a)(1)(iii)	RSS-210, Issue 8, Annex 8, A8.1(d)	Dwell Time	PASS	
15.205	RSS-GEN Issue 3, Dec 2010 7.2.2	Restricted Bands	PASS	
15.203	-	Antenna Requirement	PASS	

Note:

- (1)" N/A" denotes test is not applicable in this test report
- (2) According to FCC Public Notice DA 00-705, March 30, 2000.

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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, Dong Guan, 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 reported uncertainty of measurement $\mathbf{y} \pm \mathbf{U}$, where expended uncertainty \mathbf{U} is based on a standard uncertainty multiplied by a coverage factor of $\mathbf{k=2}$, providing a level of confidence of approximately 95 %.

A. Conducted Measurement:

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

B. Radiated Measurement:

Test Site	Method	Measurement Frequency Range	Ant. H / V	U , (dB)	Note
		9KHz~30MHz	V	3.79	
		9KHz~30MHz	Η	3.57	
		30MHz ~ 200MHz	V	3.82	
		30MHz ~ 200MHz	Н	3.60	
DG-CB03	CISPR	200MHz ~ 1,000MHz	V	3.86	
DG-CD03	DG-CB03 CISEK	200MHz ~ 1,000MHz	Н	3.94	
		1GHz~18GHz	V	3.12	
	<u> </u>	1GHz~18GHz	Н	3.68	
		18GHz~40GHz	V	4.15	
		18GHz~40GHz	Н	4.14	

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3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	Transit XS			
Brand Name	SOEN	SOEN		
Model Name	BK1			
Model Difference For FCC	N/A			
	Operation Frequency	2402~2480 MHz		
	Modulation Technology	GFSK(1Mbps)		
Output Power (Max.)	Bit Rate of Transmitter	π /4-DQPSK(2Mbps) 8-DPSK(3Mbps)		
	Output Power Max.	5.45 dBm(1Mbps) 5.22 dBm(3Mbps)		
Power Source	"#1 Supplied from USB Port #2 Supplied from Lithium Battery"			
Power Rating	"#1 DC 5V #2 DC 3.7V 1600mAh"			

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					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	27	2429	54	2456
01	2403	28	2430	55	2457
02	2404	29	2431	56	2458
03	2405	30	2432	57	2459
04	2406	31	2433	58	2460
05	2407	32	2434	59	2461
06	2408	33	2435	60	2462
07	2409	34	2436	61	2463
08	2410	35	2437	62	2464
09	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	78	2480
25	2427	52	2454		
26	2428	53	2455		

3 Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
1	N/A	N/A	printed	N/A	-1.72	

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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 Mode Note (1)
Mode 2	Bluetooth

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

For Conducted Emission		
Final Test Mode	Description	
Mode 2	Bluetooth	

For Radiated Emission		
Final Test Mode	Description	
Mode 1	TX Mode Note (1)	

Note:

- (1) The measurements are performed at the high, middle, low available channels.
- (2) The measurements for Hopping Channel Separation, Bandwidth and Peak Output Power were tested during 1Mbps, 2Mbps and 3Mbps, the worst case are 1Mbps and 3Mbps, only worst case was documented.

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 FHSS

1Mbps

	IIIIDP3				
ĺ	Test	Bluetest 3			
l	Software	Diuetest 3			
ĺ	Frequency	2402	2441	2480	
ſ	Parameters	50	30	20	

3Mbps

Test Software	Bluetest 3		
Frequency	2402 MHz	2441 MHz	2480 MHz
Parameters	50	30	20

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3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED		
EUT		

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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)

Frequency of Emission (MHz)	Conducted Limit (dBµV)		
	Quasi-peak	Average	
0.15 -0.5	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

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.

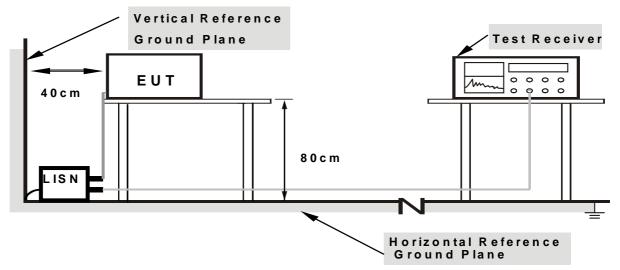
4.1.3 DEVIATION FROM TEST STANDARD

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 function (as a customer would normally use it), EUT was programmed to be in continuously transmitting/receiving data or hopping on mode.

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.

Remark:

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

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4.2 RADIATED EMISSION MEASUREMENT

4.2.1 RADIATED EMISSION LIMITS (Frequency Range 9KHz -1000MHz)

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-210 section 2.2& Annex 8 (A8.5), then the 15.209(a) & RSS-Gen limit in the table below has to be followed.

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)

Fragues ov (MHz)	dB(uV/m) (at 3 meters)	
Frequency (MHz)	Peak	Average
Above 1000	74	54

Notes:

- (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
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RBW / VBW	4 Mile / 4 Mile for Dool, 4 Mile / 401 le for Avenage
(emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Spectrum 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

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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 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.(above 1GHz)
- c. The height of the equipment or of the substitution antenna shall be 0.8 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

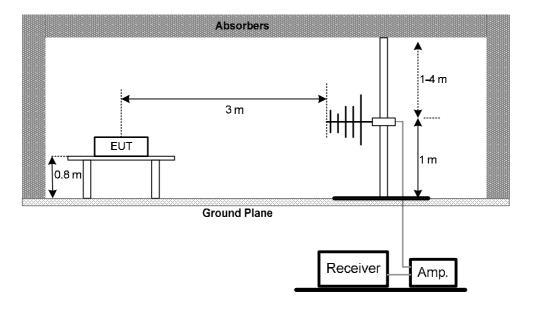
No deviation

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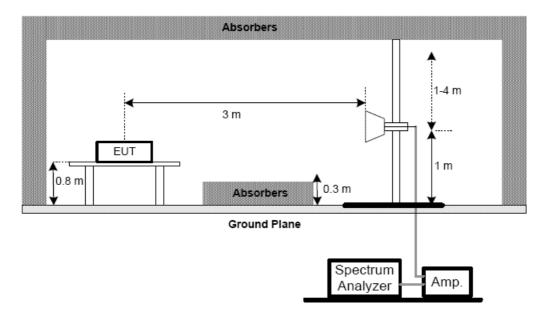


4.2.4 TEST SETUP

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



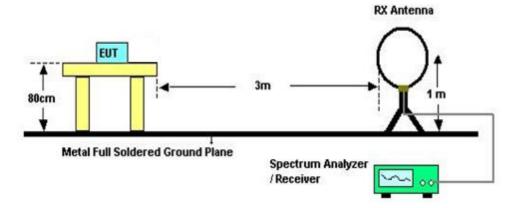
(B) Radiated Emission Test Set-Up Frequency Above 1 GHz



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(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

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.

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4.2.8 TEST RESULTS (BETWEEN 30MHZ TO 1000 MHZ)

Please refer to the Attachment C.

Remark:

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz; SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz.
- (2) 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.
- (3) Measuring frequency range from 30MHz to 1000MHz.
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table.

4.2.9 TEST RESULTS (ABOVE 1000 MHZ)

Please refer to the Attachment D.

Remark:

- (1) 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.
- (2) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission
- (3) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (4) EUT Orthogonal Axis:
 - "X" denotes Laid on Table; "Y" denotes Vertical Stand; "Z" denotes Side Stand
- (5) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna

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5. NUMBER OF HOPPING CHANNEL

5.1 APPLIED PROCEDURES

FCC Part15 (15.247) , Subpart C/ RSS-GEN and RSS-210					
Section Test Item Frequency Range (MHz) Result					
15.247(a)(1)(iii) -210, Issue 8, Annex 8, A8.1(d)	Number of Hopping Channel	2400-2483.5	PASS		

Spectrum Parameters	Setting	
Attenuation	Auto	
Span Frequency	> Operating Frequency Range	
RBW	100 KHz	
VBW	100 KHz	
Detector	Peak	
Trace	Max Hold	
Sweep Time	Auto	

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=100KHz, Sweep time = Auto.

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. AVERAGE TIME OF OCCUPANCY

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247), Subpart C/ RSS-GEN and RSS-210							
Section	Test Item	Limit	Frequency Range (MHz)	Result			
15.247(a)(1)(iii) RSS-210, Issue 8, Annex 8, A8.1(d)	Average Time of Occupancy	0.4sec	2400-2483.5	PASS			

6.1.1 TEST PROCEDURE

- a. The transmitter output (antenna port) was connected to the spectrum analyzer
- b. Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
- c. Use a video trigger with the trigger level set to enable triggering only on full pulses.
- d. Sweep Time is more than once pulse time.
- e. Set the center frequency on any frequency would be measure and set the frequency span to zero span.
- f. Measure the maximum time duration of one single pulse.
- g. Set the EUT for DH5, DH3 and DH1 packet transmitting.
- h. Measure the maximum time duration of one single pulse.
- i. DH5 Packet permit maximum 1600/79/6 = 3.37 hops per second in each channel (5 time slots TX, 1 time slot RX). So, the dwell time is the time duration of the pulse times $3.37 \times 31.6 = 106.6$ within 31.6 seconds.
- j. DH3 Packet permit maximum 1600 / 79 / 4 = 5.06 hops per second in each channel (3 time slots TX, 1 time slot RX). So, the dwell time is the time duration of the pulse times $5.06 \times 31.6 = 160$ within 31.6 seconds.
- k. DH1 Packet permit maximum 1600 / 79 / 2 = 10.12 hops per second in each channel (1 time slot TX, 1 time slot RX). So, the dwell time is the time duration of the pulse times $10.12 \times 31.6 = 320$ within 31.6 seconds.

6.1.2 DEVIATION FROM STANDARD

No deviation.

6.1.3 TEST SETUP

EUT	SPECTRUM	
	ANALYZER	

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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.

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. HOPPING CHANNEL SEPARATION MEASUREMENT

7.1 APPLIED PROCEDURES / LIMIT

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 KHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

Spectrum Parameter	Setting	
Attenuation Auto		
Span Frequency > Measurement Bandwidth or Channel Separation		
RBW	30 KHz	
VBW	100 KHz	
Detector	Peak	
Trace	Max Hold	
Sweep Time	Auto	

7.1.1 TEST PROCEDURE

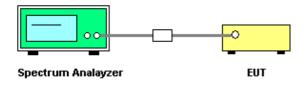
- a. The EUT must have its hopping function enabled
- b. Span = wide enough to capture the peaks of two adjacent channels Resolution (or IF) Bandwidth (RBW) ≥ 1% of the span Video (or Average) Bandwidth (VBW) ≥ RBW Sweep = Auto Detector function = Peak

Trace = Max Hold

7.1.2 DEVIATION FROM STANDARD

No deviation.

7.1.3 TEST SETUP



7.1.4 EUT TEST CONDITIONS

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

7.1.5 TEST RESULTS

Please refer to the Attachment G

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8. BANDWIDTH TEST

8.1 APPLIED PROCEDURES

FCC Part15 (15.247) , Subpart C/ RSS-GEN and RSS-210			
Section	Test Item	Frequency Range (MHz)	
15.247(a)(2)			
RSS-GEN section 4.6.1	Bandwidth	2400-2483.5	
RSS-210, Issue 8, Annex 8, A8.1(b)			

Spectrum Parameter	Setting			
Attenuation	Auto			
Span Frequency	> Measurement Bandwidth or Channel Separation			
RBW	30 KHz (20dB Bandwidth) / 30 KHz (Channel Separation)			
VBW	100 KHz (20dB Bandwidth) / 100 KHz (Channel Separation)			
Detector	Peak			
Trace	Max Hold			
Sweep Time	Auto			

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= 30KHz, VBW=100KHz, Sweep Time = Auto.

8.1.2 DEVIATION FROM STANDARD

No deviation.

8.1.3 TEST SETUP



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. PEAK OUTPUT POWER TEST

9.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247), Subpart C/ RSS-GEN and RSS-210						
Section Test Item Limit Frequency Range (MHz)						
15.247(b)(1) RSS-GEN section 4.8 RSS-210, Issue 8, Annex 8, A8.1(b)	Peak Output Power	0.125 Watt or 21dBm	2400-2483.5	PASS		

9.1.1 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= 1MHz/3MHz, VBW= 1MHz/3MHz, Sweep time = Auto.

9.1.2 DEVIATION FROM STANDARD

No deviation.

9.1.3 TEST SETUP

EUT	SPECTRUM	
	ANALYZER	

9.1.4 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.

9.1.5 EUT TEST CONDITIONS

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

9.1.6 TEST RESULTS

Please refer to the Attachment I

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10. ANTENNA CONDUCTED SPURIOUS EMISSION

10.1 APPLIED PROCEDURES / 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 measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

10.1.1 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=100KHz, Sweep time = Auto.

10.1.2 DEVIATION FROM STANDARD

No deviation.

10.1.3 TEST SETUP

EUT		SPECTRUM	
		ANALYZER	

10.1.4 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.

10.1.5 EUT TEST CONDITIONS

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

10.1.6 TEST RESULTS

Please refer to the Attachment J

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11. MEASUREMENT INSTRUMENTS LIST

	Conducted Emission Measurement						
Item	em Kind of Equipment Manufacturer Type No. Serial No. Calibrated un						
1	LISN	EMCO	3816/2	00052765	Mar. 29, 2015		
2	LISN	R&S	ENV216	101447	Mar. 29, 2015		
3	Test Cable	N/A	C_17	N/A	Mar. 14, 2015		
4	EMI TEST RECEIVER	R&S	ESCS30	833364/017	Mar. 29, 2015		
5	50Ω Terminator	SHX	TF2-3G-A	08122902	Mar. 29, 2015		

	Radiated Emission Measurement								
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until				
1	Antenna	Schwarbeck	VULB9160	9160-3232	Mar. 29, 2015				
2	Amplifier	HP	8447D	2944A09673	Mar. 29, 2015				
3	Test Receiver	ver R&S ESCI 100382 Mar. 29, 20		Mar. 29, 2015					
4	Test Cable	N/A	C-01_CB03	N/A	Jul. 01, 2015				
5	Antenna	ETS	3115 00075789		Mar. 29, 2015				
6	Amplifier	Agilent	8449B	3008A02274	Mar. 29, 2015				
7	Spectrum	Agilent	E4408B	US39240143	Nov. 09, 2014				
8	Test Cable	HUBER+SUHNER	C-45	N/A	Mar. 29, 2015				
9	Controller	СТ	SC100	N/A	N/A				
10	Horn Antenna	EMCO	3115	9605-4803	Mar. 29, 2015				
11	Active Loop Antenna	R&S	HFH2-Z2	830749/020	Mar. 29, 2015				

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	Number of Hopping Channel							
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until			
1	Spectrum Analyzer	100185	Nov. 11, 2014					

	Average Time of Occupancy						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until		
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov. 11, 2014		

	Hopping Channel Separation Measurement								
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until				
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov. 11, 2014				

	Bandwidth							
Item	Item Kind of Equipment Manufacturer Type No. Serial No. Calibrated							
1 Spectrum Analyzer R&S FSP 40 100185 Nov. 11, 20								

		Peak O	utput Power		
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov. 11, 2014

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

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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12. EUT TEST PHOTO

Conducted Measurement Photos





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Radiated Measurement Photos

9KHz to 30MHz





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Radiated Measurement Photos

30MHz to 1000MHz





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Radiated Measurement Photos

Above 1000MHz





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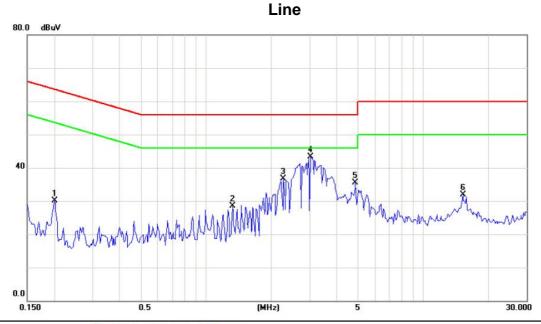


ATTACHMENT A - CONDUCTED EMISSION

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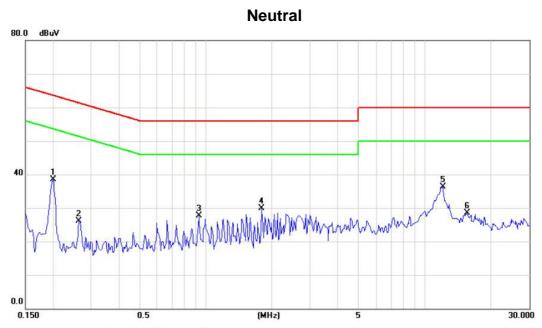


Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment	
	0.2008	20.64	9.54	30.18	63.58	-33.40	peak		
	1.3258	18.72	9.70	28.42	56.00	-27.58	peak		
	2.2750	27.06	9.72	36.78	56.00	-19.22	peak		
*	3.0313	33.51	9.77	43.28	56.00	-12.72	peak		
	4.8750	25.74	9.86	35.60	56.00	-20.40	peak		
	15.2344	21.63	10.24	31.87	60.00	-28.13	peak		
		MHz 0.2008 1.3258 2.2750 * 3.0313 4.8750	Mk. Freq. Level MHz dBuV 0.2008 20.64 1.3258 18.72 2.2750 27.06 * 3.0313 33.51 4.8750 25.74	Mk. Freq. Level Factor MHz dBuV dB 0.2008 20.64 9.54 1.3258 18.72 9.70 2.2750 27.06 9.72 * 3.0313 33.51 9.77 4.8750 25.74 9.86	Mk. Freq. Level Factor ment MHz dBuV dB dBuV 0.2008 20.64 9.54 30.18 1.3258 18.72 9.70 28.42 2.2750 27.06 9.72 36.78 * 3.0313 33.51 9.77 43.28 4.8750 25.74 9.86 35.60	Mk. Freq. Level Factor ment Limit MHz dBuV dB dBuV dBuV dBuV 0.2008 20.64 9.54 30.18 63.58 1.3258 18.72 9.70 28.42 56.00 2.2750 27.06 9.72 36.78 56.00 * 3.0313 33.51 9.77 43.28 56.00 4.8750 25.74 9.86 35.60 56.00	Mk. Freq. Level Factor ment Limit Over MHz dBuV dB dBuV dBuV dB 0.2008 20.64 9.54 30.18 63.58 -33.40 1.3258 18.72 9.70 28.42 56.00 -27.58 2.2750 27.06 9.72 36.78 56.00 -19.22 * 3.0313 33.51 9.77 43.28 56.00 -12.72 4.8750 25.74 9.86 35.60 56.00 -20.40	Mk. Freq. Level Factor ment Limit Over MHz dBuV dB dBuV dBuV dB Detector 0.2008 20.64 9.54 30.18 63.58 -33.40 peak 1.3258 18.72 9.70 28.42 56.00 -27.58 peak 2.2750 27.06 9.72 36.78 56.00 -19.22 peak * 3.0313 33.51 9.77 43.28 56.00 -12.72 peak 4.8750 25.74 9.86 35.60 56.00 -20.40 peak	Mk. Freq. Level Factor ment Limit Over MHz dBuV dB dBuV dB Detector Comment 0.2008 20.64 9.54 30.18 63.58 -33.40 peak 1.3258 18.72 9.70 28.42 56.00 -27.58 peak 2.2750 27.06 9.72 36.78 56.00 -19.22 peak * 3.0313 33.51 9.77 43.28 56.00 -12.72 peak 4.8750 25.74 9.86 35.60 56.00 -20.40 peak

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No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.2008	28.87	9.61	38.48	63.58	-25.10	peak	
2	0.2633	16.57	9.62	26.19	61.33	-35.14	peak	
3	0.9313	18.00	9.67	27.67	56.00	-28.33	peak	
4	1.7984	20.11	9.73	29.84	56.00	-26.16	peak	
5 *	12.0702	26.10	10.18	36.28	60.00	-23.72	peak	
6	15.5547	18.28	10.30	28.58	60.00	-31.42	peak	

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

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Test Mode: TX Mode

Frequency (MHz)	Ant 0°/90°	Read level dBuV/m	Factor (dB)	Measured(FS) (dBuV/m)	Limit(QP) (dBuV/m)	Margin (dB)	Note
0.0093	0°	10.26	24.98	35.24	108.23	-73.00	AVG
0.0093	0°	12.68	24.98	37.66	128.23	-90.58	PEAK
0.0235	0°	14.66	24.08	38.74	100.18	-61.44	AVG
0.0235	0°	18.17	24.08	42.25	120.18	-77.93	PEAK
0.0314	0°	18.46	23.58	42.04	97.67	-55.63	AVG
0.0314	0°	22.41	23.58	45.99	117.67	-71.68	PEAK
0.0429	0°	21.47	22.85	44.32	94.96	-50.64	AVG
0.0429	0°	23.65	22.85	46.50	114.96	-68.46	PEAK
0.4912	0°	18.45	19.82	38.27	73.78	-35.51	QP
1.7156	0°	20.63	19.53	40.16	69.54	-29.38	QP

Frequency (MHz)	Ant 0°/90°	Read level dBuV/m	Factor (dB)	Measured(FS) (dBuV/m)	Limit(QP) (dBuV/m)	Margin (dB)	Note
0.0091	90°	12.14	24.30	36.44	128.42	-91.98	AVG
0.0091	90°	13.88	24.30	38.18	148.42	-110.24	PEAK
0.0226	90°	10.61	24.14	34.75	120.52	-85.78	AVG
0.0226	90°	23.87	24.14	48.01	140.52	-92.52	PEAK
0.0347	90°	17.35	23.37	40.72	116.80	-76.08	AVG
0.0347	90°	20.35	23.37	43.72	136.80	-93.08	PEAK
0.0425	90°	19.31	22.88	42.19	115.04	-72.85	AVG
0.0425	90°	23.35	22.88	46.23	135.04	-88.81	PEAK
0.4917	90°	24.36	19.82	44.18	73.77	-29.59	QP
1.7125	90°	18.96	19.53	38.49	69.54	-31.05	QP

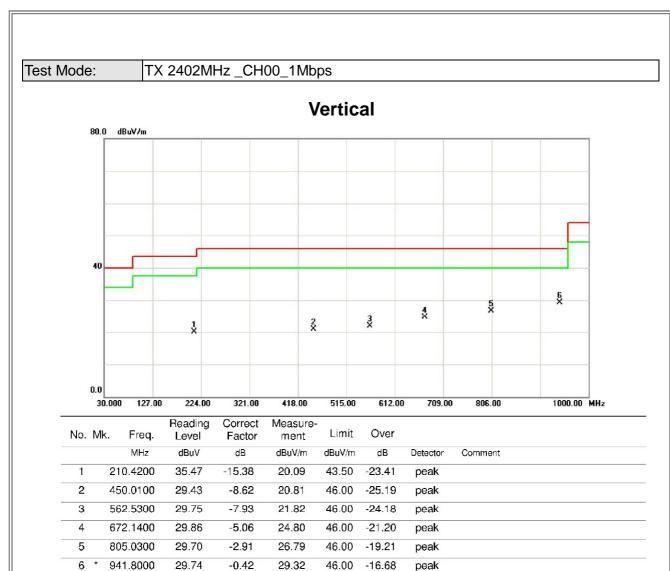
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ATTACHMENT C - RADIATED EMISSION (30MHZ TO 1000MHZ)

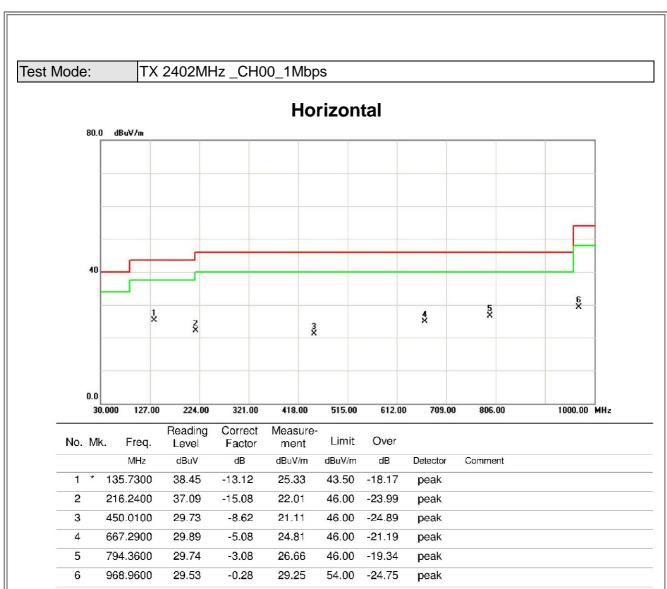
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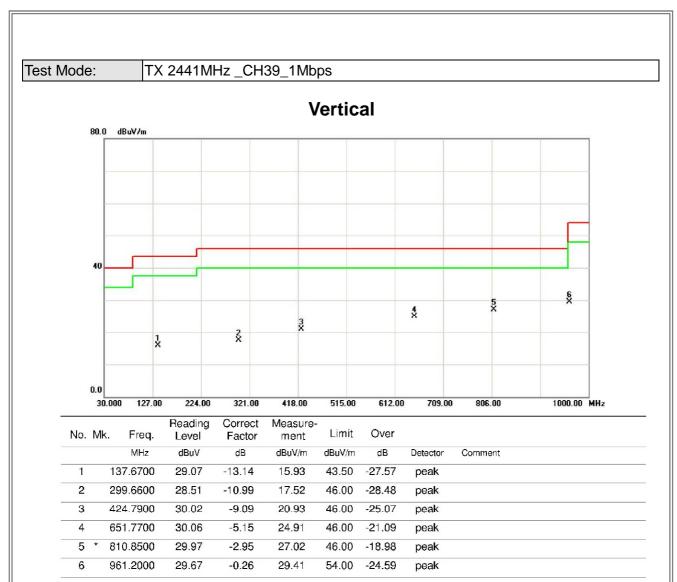
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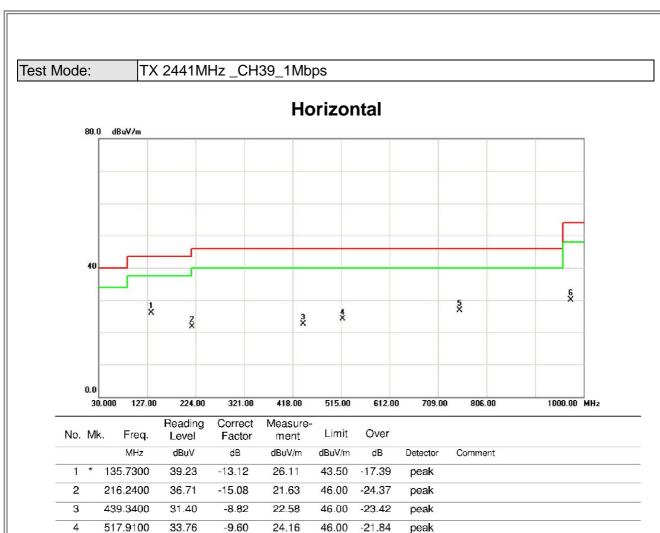
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46.00

54.00

-19.04

-23.87

peak

peak

26.96

30.13

752.6500

974.7800

5

6

31.50

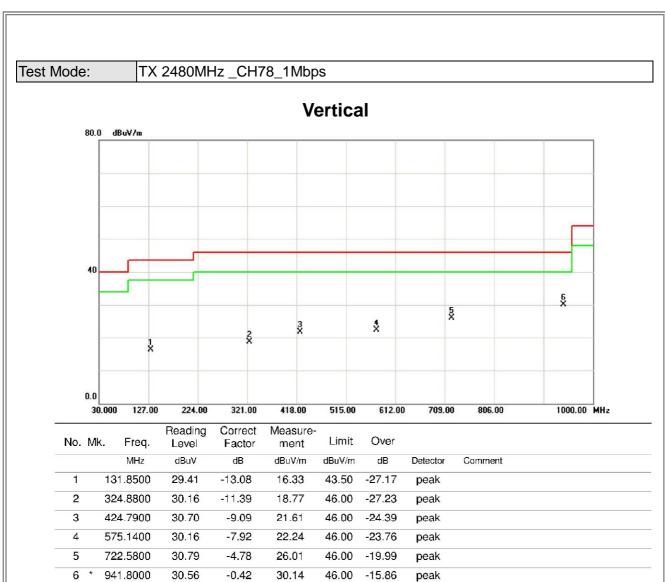
30.44

-4.54

-0.31

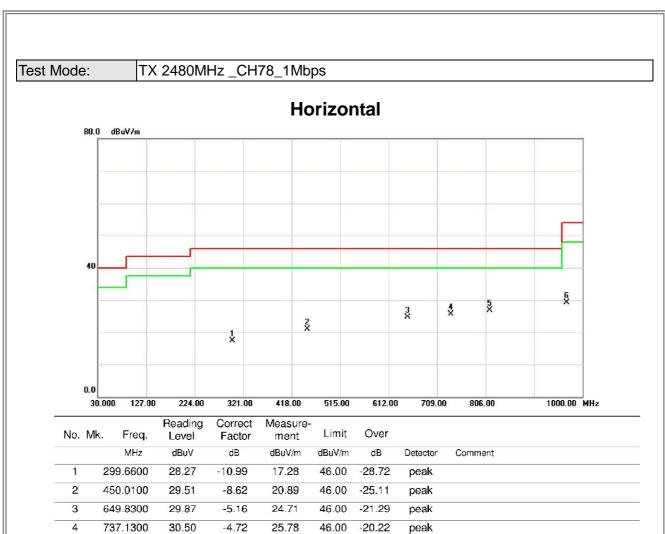
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814.7300

967.9900

5 *

29.90

29.49

-2.97

-0.28

26.93

29.21

46.00

54.00

-19.07

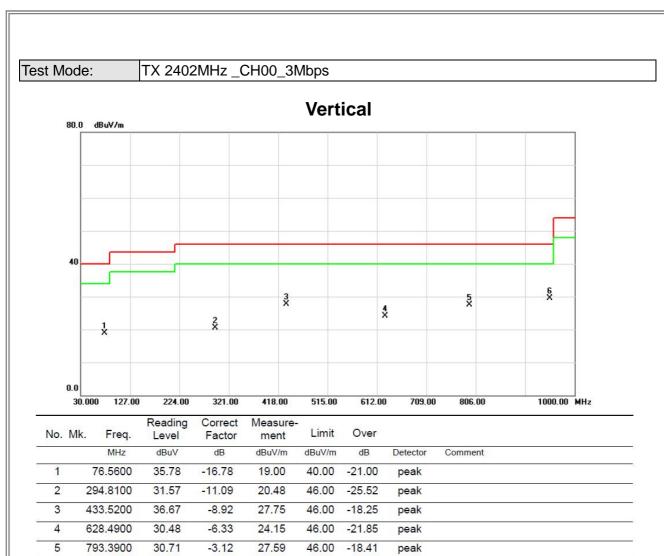
-24.79

peak

peak

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46.00 -16.47

peak

951.5000

6

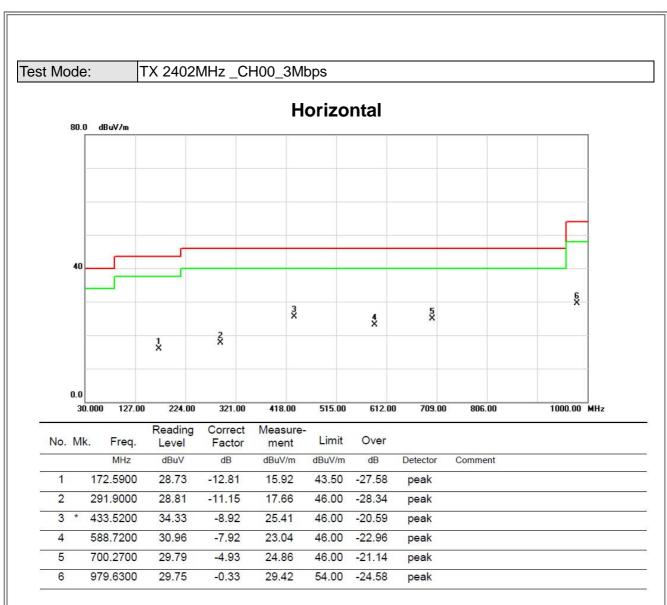
29.74

-0.21

29.53

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No.	Mk.	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		76.5600	35.62	-16.78	18.84	40.00	-21.16	peak		
2		342.3400	31.04	-11.67	19.37	46.00	-26.63	peak		
3	*	433.5200	37.07	-8.92	28.15	46.00	-17.85	peak		
4	- 1	688.6300	29.89	-4.98	24.91	46.00	-21.09	peak		
5		794.3600	30.26	-3.08	27.18	46.00	-18.82	peak		
6		981.5700	29.86	-0.33	29.53	54.00	-24.47	peak		

515.00

612.00

709.00

806.00

1000.00 MHz

30.000

127.00

224.00

321.00

418.00

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No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Lim <mark>i</mark> t	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		139.6100	29.11	-13.15	15.96	43.50	-27.54	peak	
2		288.9900	28.70	-11.29	17.41	46.00	-28.59	peak	
3		433.5200	35.99	-8.92	27.07	46.00	-18.93	peak	
4		631.4000	30.59	-6.18	24.41	46.00	-21.59	peak	
5		787.5700	30.01	-3.32	26.69	46.00	-19.31	peak	
6	*	958.2900	29.62	-0.25	29.37	46.00	-16.63	peak	

515.00

612.00

709.00

806.00

1000.00 MHz

321.00

418.00

224.00

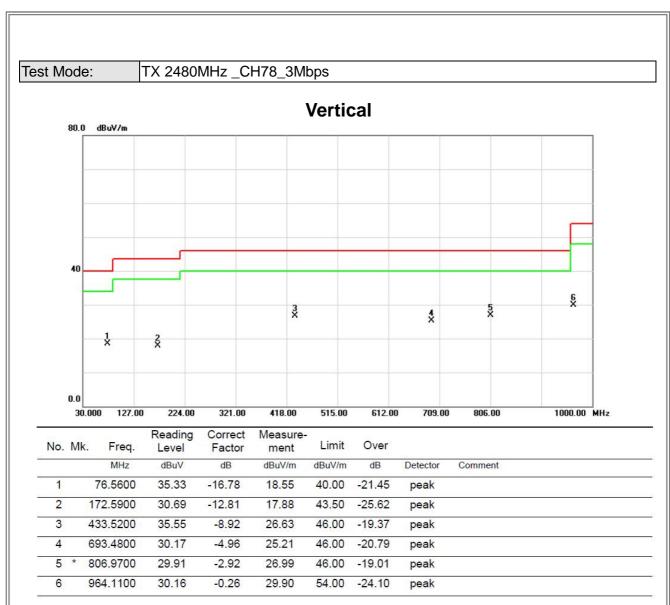
0.0

30.000

127.00

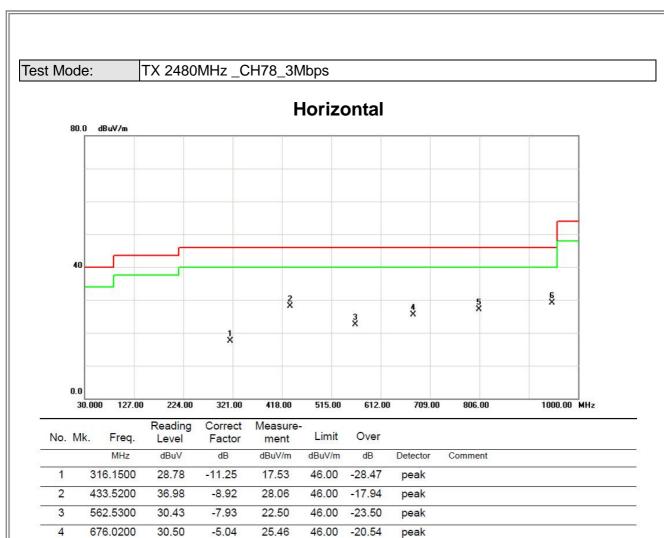
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5

6

805.0300

948.5900

29.94

29.36

-2.91

-0.25

27.03

29.11

46.00

46.00 -16.89

-18.97

peak

peak

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ATTACHMENT D - RADIATED EMISSION (ABOVE 1000MHZ)	

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Orthogonal Axis: X
Test Mode: TX 2402MHz _CH00_1Mbps

Vertical 110.0 dBuV/m 70 1 2 2 2 30.0 2397.000 2382.00 2387.00 2392.00 2397.00 2402.00 2407.00 2412.00 2417.00 2427.00 MHz

No.	Mk	k. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	23.48	31.88	55.36	74.00	-18.64	peak	
2		2390.000	13.61	31.88	45.49	54.00	-8.51	AVG	
3	*	2402.000	53.02	31.89	84.91	54.00	30.91	AVG	no limit
4	Χ	2402.200	63.11	31.89	95.00	74.00	21.00	peak	no limit

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Test Mode: TX 2402MHz _CH00_1Mbps

Vertical



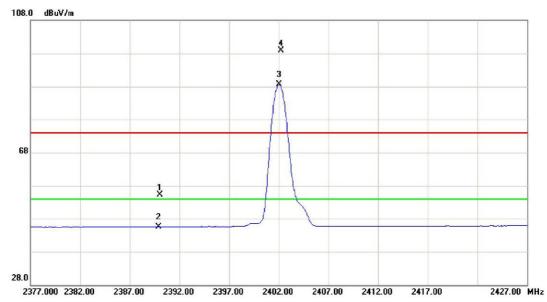
No.	Mk	. Frec	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	4804.06	30.40	3.58	33.98	54.00	-20.02	AVG	
2		4804.49) 43.71	3.58	47.29	74.00	-26.71	peak	

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Test Mode: TX 2402MHz _CH00_1Mbps

Horizontal



No.	Mk	k. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	23.51	31.88	55.39	74.00	-18.61	peak	
2		2390.000	13.64	31.88	45.52	54.00	-8.48	AVG	
3	*	2402.050	56.74	31.89	88.63	54.00	34.63	AVG	no limit
4	Χ	2402.200	66.92	31.89	98.81	74.00	24.81	peak	no limit

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Test Mode: TX 2402MHz _CH00_1Mbps

Horizontal



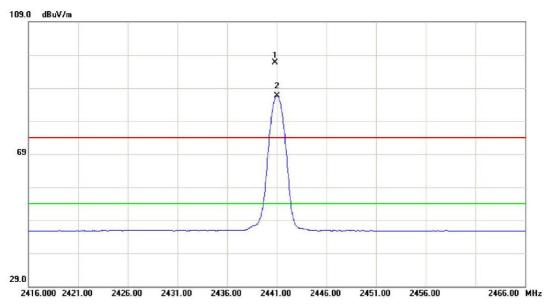
No.	Mk	c. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4803.865	45.89	3.58	49.47	74.00	-24.53	peak	
2	*	4804.045	31.72	3.58	35.30	54.00	-18.70	AVG	

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Test Mode: TX 2441MHz _CH39_1Mbps

Vertical



No	э.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
			MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
	1	Χ	2440.850	64.77	31.95	96.72	74.00	22.72	peak	no limit
	2	*	2441.000	54.68	31.95	86.63	54.00	32.63	AVG	no limit

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Test Mode: TX 2441MHz _CH39_1Mbps

Vertical



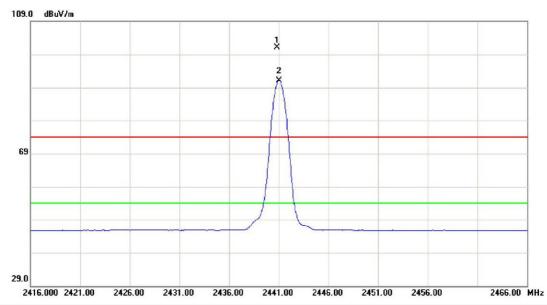
No.	MŁ	k. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4881.895	43.88	3.73	47.61	74.00	-26.39	peak	
2	*	4882.010	30.43	3.73	34.16	54.00	-19.84	AVG	

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Test Mode: TX 2441MHz _CH39_1Mbps

Horizontal



No.	M	∕lk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
			MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	Х	X 2	2440.850	69.14	31.95	101.09	74.00	27.09	peak	no limit
2	*	2	2441.000	59.15	31.95	91.10	54.00	37.10	AVG	no limit

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