FCC PART 15 TEST REPORT

For

Trango Systems, Inc.

15070 Avenue of Science, Suite 200
San Diego, CA 92128

FCC ID: NCYM5830SAP60

January 13, 2003

This Report Concerns:	**Equipment Type:**
☒ Original Report	5GHz Wireless Access Point

Test Engineer:	Jeff Lee
Report No.:	R0211221
Test Date:	December 18, 2002
Reviewed By:	Hans Mellberg
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1 - GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

The *Trango Systems, Inc.'s*, model: *M5830S-AP-60*, or the "EUT" as referred to in this report is an 5GHz Wireless Access Point which measures approximately 12.3"L x 7.5"W x 4.2"H. The EUT communicates with subscriber unit (SU) using 5.3 and 5.8 GHz spread spectrum technology. The EUT accepts full or half duplex Ethernet IEEE 802.3 data packets from a 10/100BaseT port, encodes them, and transmits them at 11 Mbit/sec rate over the air.

** The test data gathered is from typical production samples provided by the manufacturer.*

1.2 Objective

This type approval report is prepared on behalf of. *Trango Systems, Inc.* in accordance with Part 2, Subpart J, Part 15, Subparts A , C, and E of the Federal Communication Commissions rules.

The objective of the manufacturer is to demonstrate compliance with FCC rules for Output Power, Antenna Requirements, 6 dB Bandwidth, power density, 100 kHz Bandwidth of Band Edges Measurement, Conducted and Spurious Radiated Emission, Peak Transmit Power, Power Spectral Density, Peak Excursion to Average Ratio.

1.3 Related Submittal(s)/Grant(s)

No Related Submittals.

1.4 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-1992, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

1.5 Test Facility

The Open Area Test site used by BACL to collect radiated and conducted emission measurement data is located in the back parking lot of the building at 230 Commercial Street, Sunnyvale, California, USA.

Test site at BACL has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-1992.

The Federal Communications Commission and Voluntary Control Council for Interference has the reports on file and is listed under FCC file 31040/SIT 1300F2 and VCCI Registration No.: C-1298 and R-1234. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The scope of the accreditation covers the FCC Method – 47 CFR Part – Digital Devices, CISPER 22: 1997: Electromagnetic Interference – Limits and Methods of Measurement of Information Technology Equipment test methods.

1.6 Test Equipment List

Manufacturer	Description	Model	Serial Number	Cal. Due Date
HP	Spectrum Analyzer	8568B	2610A02165	12/6/03
HP	Spectrum Analyzer	8593B	2919A00242	12/20/03
HP	Amplifier	8349B	2644A02662	12/20/03
HP	Quasi-Peak Adapter	85650A	917059	12/6/03
HP	Amplifier	8447E	1937A01046	12/6/03
A.H. System	Horn Antenna	SAS0200/571	261	12/27/03
Com-Power	Log Periodic Antenna	AL-100	16005	11/2/03
Com-Power	Biconical Antenna	AB-100	14012	11/2/03
Solar Electronics	LISN	8012-50-R-24-BNC	968447	12/28/03
Com-Power	LISN	LI-200	12208	12/20/03
Com-Power	LISN	LI-200	12005	12/20/03
BACL	Data Entry Software	DES1	0001	12/20/03

*** Statement of Traceability: Bay Area Compliance Laboratory Corp.** certifies that all calibration has been performed using suitable standards traceable to the NIST.

1.7 Host System Configuration List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
EMachine	PC System	Etower 266	GD38B-100-27852	DOC

1.8 Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
Microsoft	Keyboard	PCVA-KB1P/UA	0000348	DOC
Microsoft	Mouse	MUS3P	None	JKGMUS3P01
HP	Printer	2225C	2821S14783	DOC
View Sony	Monitor	EVOKD-1731	0891265478	DOC
eMACHINE	PC System	Etower 266	GD38B-100-27852	DOC

1.9 External I/O Cabling List and Details

Cable Description	Length (M)	Port/From	To
Shielded KB Cable	1.6	KB Serial Port/Host	Microsoft Keyboard
Unshielded Cable	1.5	Mouse Serial Port/Host	Microsoft Mouse
Shielded Printer Cable	2	Parallel Port/Host	HP Printer
Shielded RJ45 Cable	1.8	Adapter RJ45 Port	RJ45 Port /EUT
Unshielded RJ11 cable	1.0	RJ11 port/ Host	Serial port/ EUT
Unshielded power cord	1.0	Ac/dc adapter	Adapter RJ45 Port

2 - SYSTEM TEST CONFIGURATION

2.1 Justification

The host system was configured for testing in a typical fashion (as normally used by a typical user).

The EUT was tested in the normal (native) operating mode to represent *worst*-case results during the final qualification test.

2.2 EUT Exercise Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the system components in a manner similar to a typical use. The test software, Hyper terminal software, provided by the customer, is started the Windows terminal program under the Windows 98/2000/ME/XP operating system.

Once loaded, set the Tx channel to low, mid and high for testing.

2.3 Special Accessories

As shown in section 2.7, all interface cables used for compliance testing are shielded. The host pc and the peripherals featured shielded metal connectors.

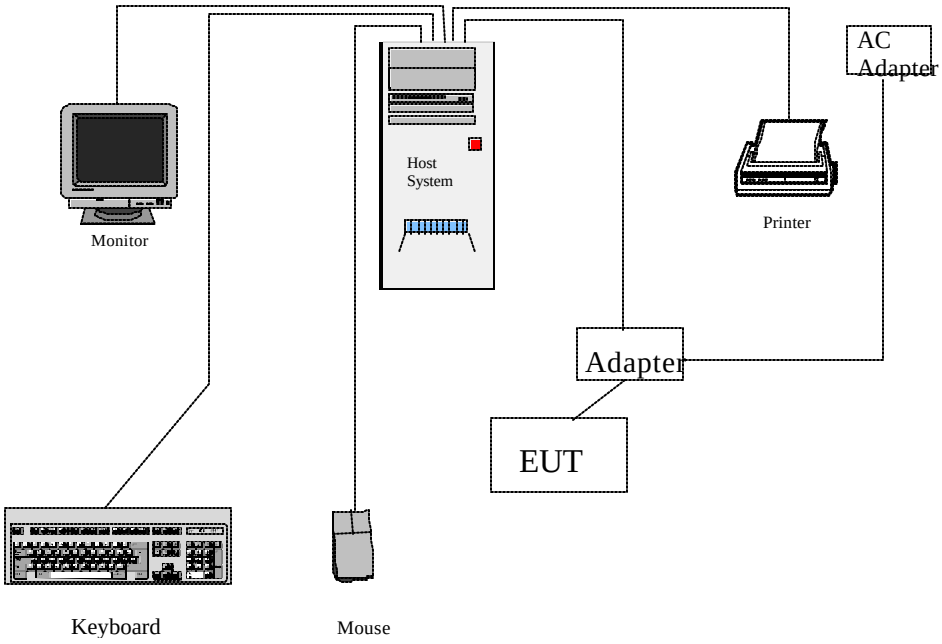
2.4 Schematics / Block Diagram

Please refer to Appendix A.

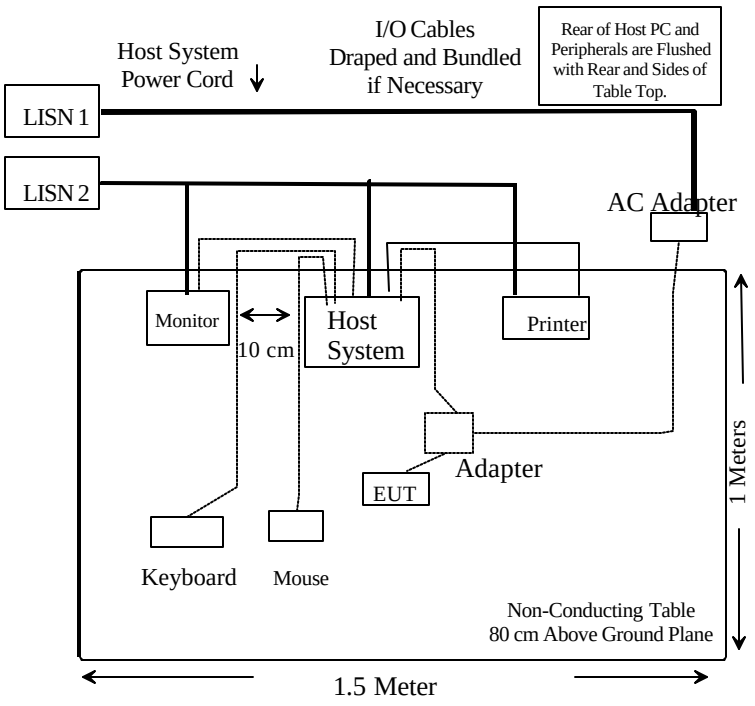
2.5 Equipment Modifications

No modifications were made by BACL to ensure the EUT to comply with the applicable limits and requirements.

2.6 Configuration of Test System



2.7 Test Setup Block Diagram



3 - SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT	REFERENCE
§15.203	Antenna Requirement	Compliant	Section 11
§ 15.205, §15.407(b)(6)	Restricted Bands	Compliant	Section 12
§15.209(a), §15.407(b)(5)	Radiated Emission	Compliant	Section 12
§15.209(f)	Spurious Emission	Compliant	Section 10
§15.247(a)(2)	6 dB Bandwidth	Compliant	Section 5
§15.247(b)(3), §15.407(a)(2)	Maximum Peak Output Power	Compliant	Section 4
§15.247(b)(4), §15.407(f)	RF Exposure Requirement	Compliant	Section 14
§ 15.247(c)	100 kHz Bandwidth of Frequency Band Edge	Compliant	Section 7
§15.247(d), § 15.407(a)(2)	Power Spectral Density	Compliant	Section 6
§ 15.207(a), §15.407(b)(5)	For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequency within the band 450 kHz to 30 MHz shall not exceed 250 micorvolts.	Compliant	Section 13
§ 15.407(a)(6)	The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified in this paragraph0 shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.	Compliant	Section 8
§ 15.407 (c)	The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the user of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application a description of how this requirement is met.	Compliant	See Provided Technical Manual
§ 15.407(g)	The responsibility for manufacturer to ensure U-NII device frequency stability	Compliant	Section 16

4 - PEAK OUTPUT POWER MEASUREMENT

4.1 Standard Applicable

According to §15.247(b) (3), for transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced as following: for frequency hopping systems in the 2400 – 2483.5 MHz band employing at least 75 hopping channels, all frequency hopping systems in the 5725 – 5850 Mhz band, and all direct sequence systems: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

According to §15.407(a) (2), for the band 5.25-5.35GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 250mW or 11dBm + 10logB, where B is the 26-dB emission bandwidth in MHz.

4.2 Measurement Procedure

1. Place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to a spectrum analyzer.
3. Add a correction factor to the display.

4.3 Measurement Result

4.3.1 Test Result for High Band (5736 ~ 5836 MHz) (15.247)

Frequency (MHz)	Peak Output Power (dBm)	Correction Factor (dBm)	Corrected Factor (dBm)	Output Power (mW)	Standard (W)	Result
5736	13.17	7.2	20.37	108.89	≤ 1W	Compliant
5776	12.83	7.2	20.03	100.69	≤ 1W	Compliant
5836	13.50	7.2	20.70	117.49	≤ 1W	Compliant

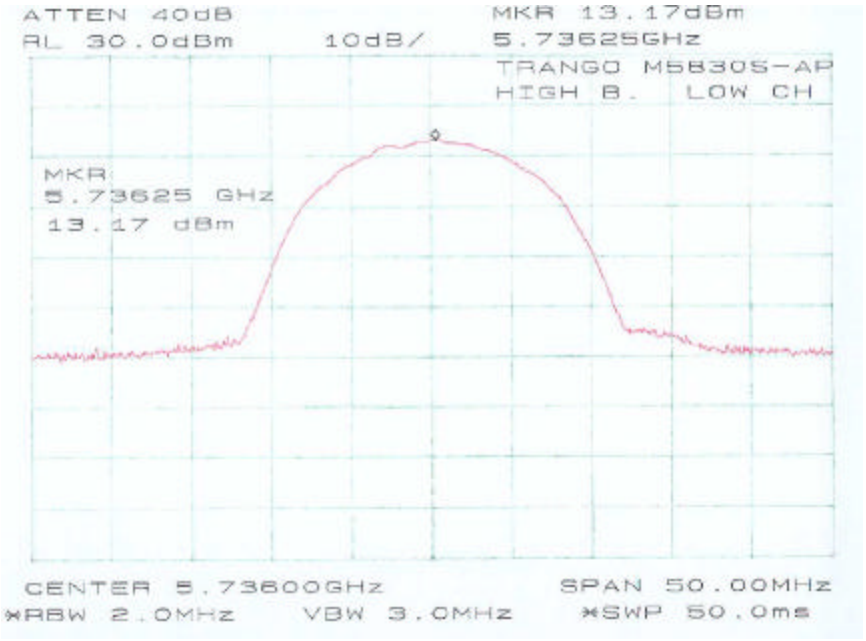
Note: Correction Factor = 10 log (BW6dB/RBW) = 10 log (10.5/2.0) = 7.2 dBm

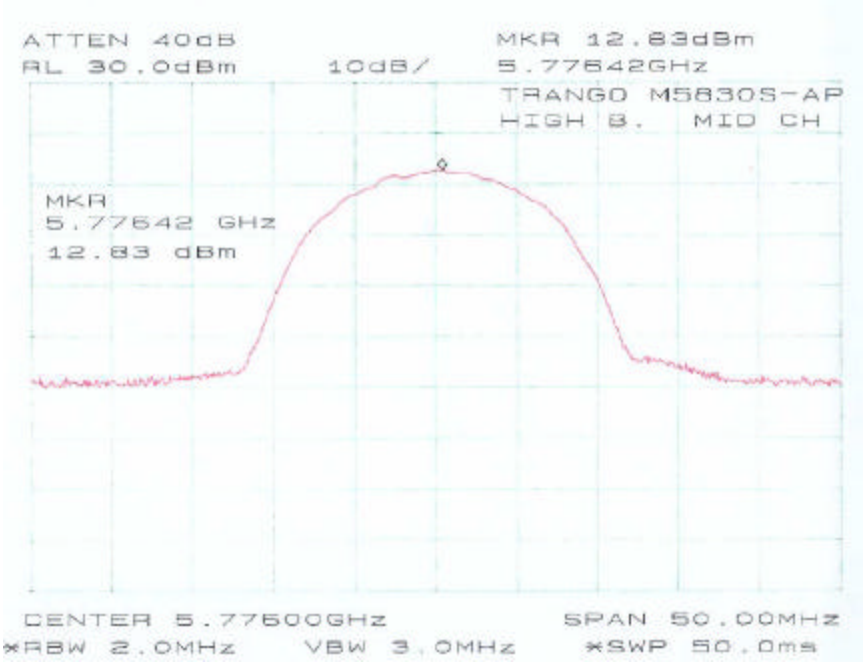
4.3.2 Test Result for Low Band (5260 ~ 5340 MHz) (15.407)

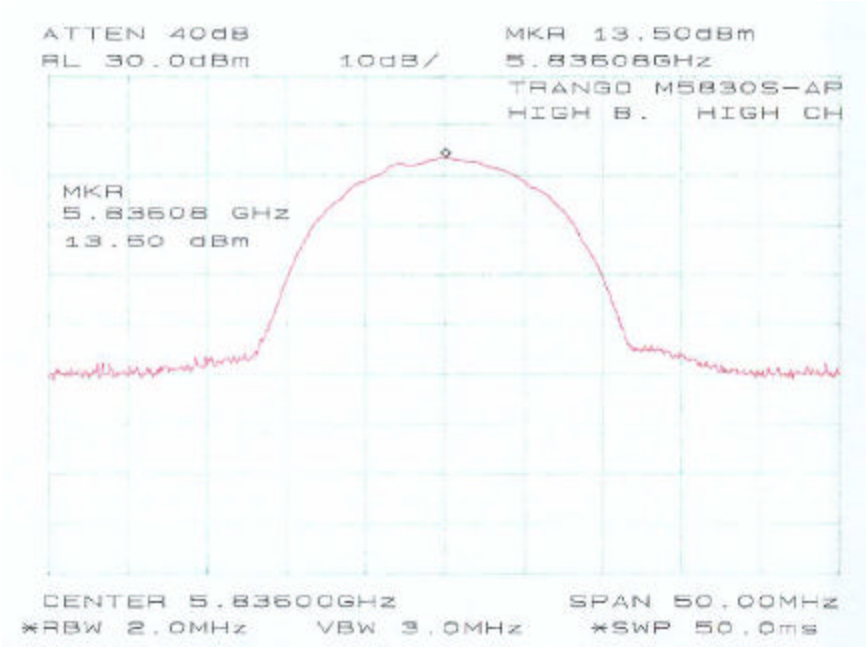
Frequency (MHz)	Peak Output Power (dBm)	Correction Factor (dBm)	Corrected Factor (dBm)	Output Power (mW)	Standard (W)	Result
5260	6.83	9.6	16.43	43.95	≤ 0.23W	Compliant
5299	6.17	9.6	15.77	37.76	≤ 0.23W	Compliant
5340	6.33	9.6	15.93	39.17	< 0.23W	Compliant

Note: Correction Factor = 10 log (BW26dB/RBW) = 10 log (18.25/2.0) = 9.6 dBm

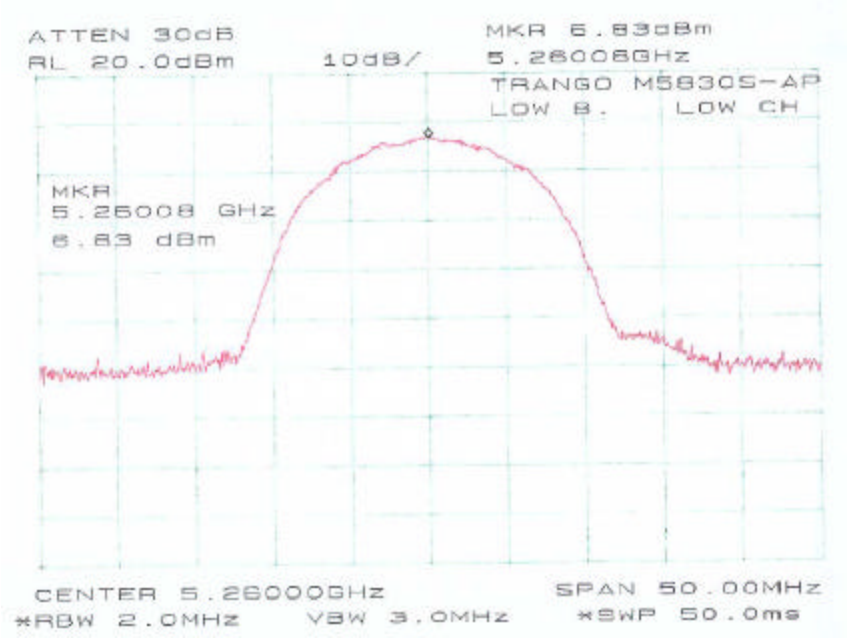
Plots of Peak Output Power for High Band (5736 ~ 5836 MHz) (15.247)

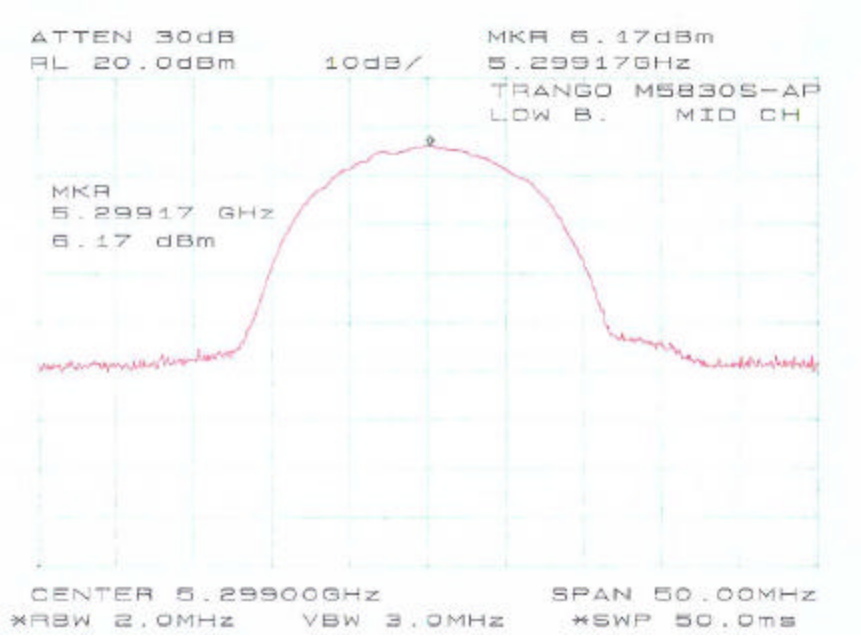


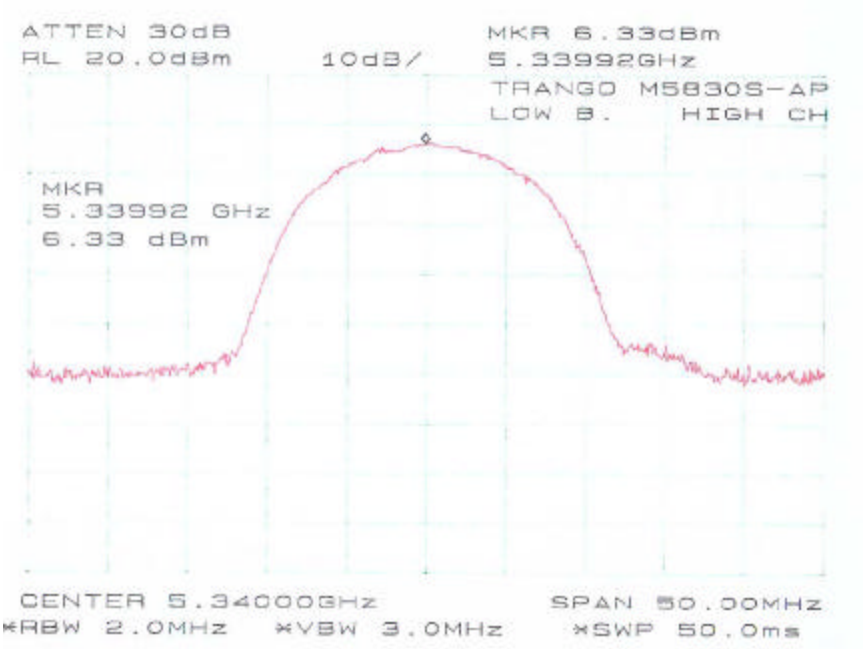




Plots of Peak Output Power for Low Band (5260 ~ 5340 MHz) (15.407)




ATTEN 30dB
RL 20.0dBm
10dB/
MKR 6.17dBm
5.299176Hz
TRANGO M5830S-AP
LOW B. MID CH
MKR
5.29917 GHz
6.17 dBm
CENTER 5.299000GHz
SPAN 50.00MHz
*RBW 2.0MHz
VBW 3.0MHz
*SWP 50.0ms


ATTEN 30dB
RL 20.0dBm
10dB/
MKR 6.33dBm
5.33992GHz
TRANGO M5830S-AP
LOW B. HIGH CH
MKR
5.33992 GHz
6.33 dBm
CENTER 5.340000GHz
SPAN 50.00MHz
*RBW 2.0MHz
*VBW 3.0MHz
*SWP 50.0ms

5 – 6 DB BANDWIDTH and 26 DB BANDWIDTH

5.1 Standard Applicable

According to §15.247(a)(2), systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6dB bandwidth shall be at least 500 kHz.

5.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 6 dB from the reference level. Record the frequency difference as the emission bandwidth. (6 dB bandwidth for DTS)
4. Same as (3) expect 26 dB. (26dB bandwidth for UNII)
5. Repeat above procedures until all frequencies measured were complete.

5.3 Measurement Result

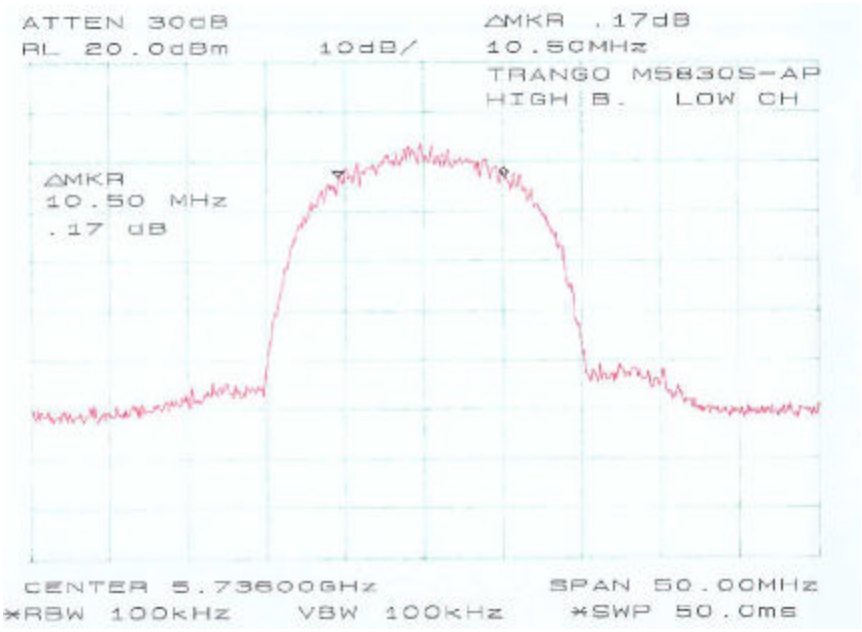
5.3.1 Test Result for High Band (5736 ~ 5836 MHz) (15.247)

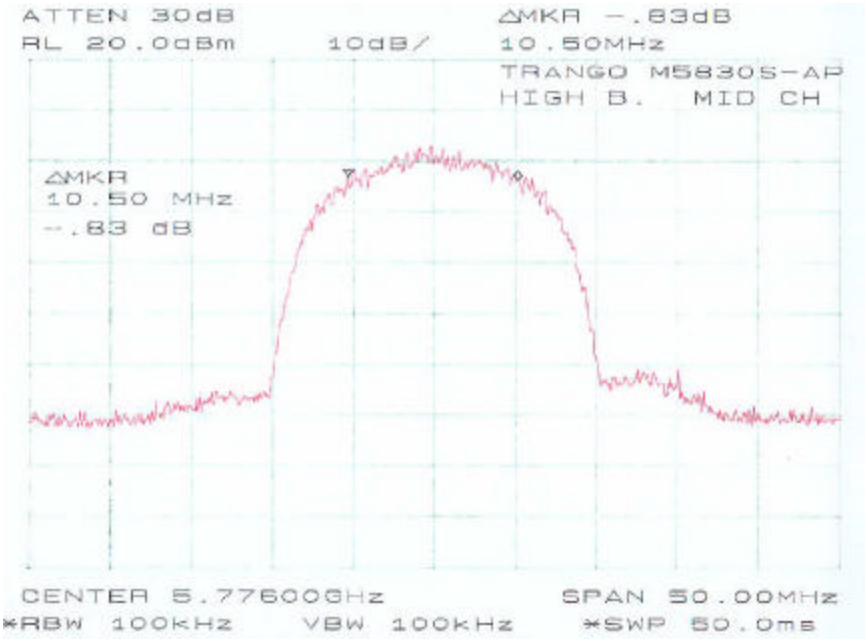
Frequency	Measured (MHz)	Standard (kHz)	Result
Low	10.50	≥ 500	Compliant
Mid	10.50	≥ 500	Compliant
High	10.17	≥ 500	Compliant

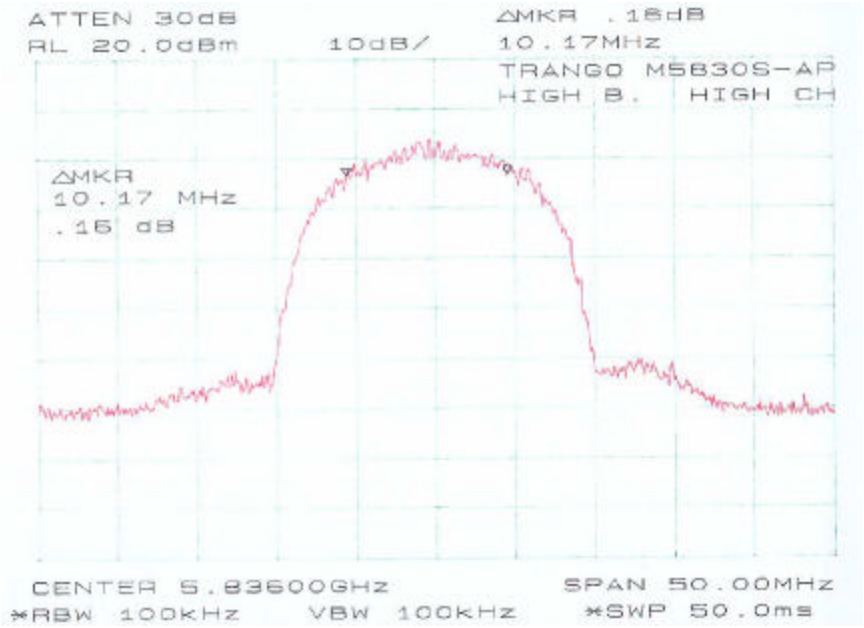
5.3.2 Test Result for Low Band (5260 ~ 5340 MHz) (15.407)

Frequency	Measured (MHz)
Low	18.17
Mid	18.25
High	18.08

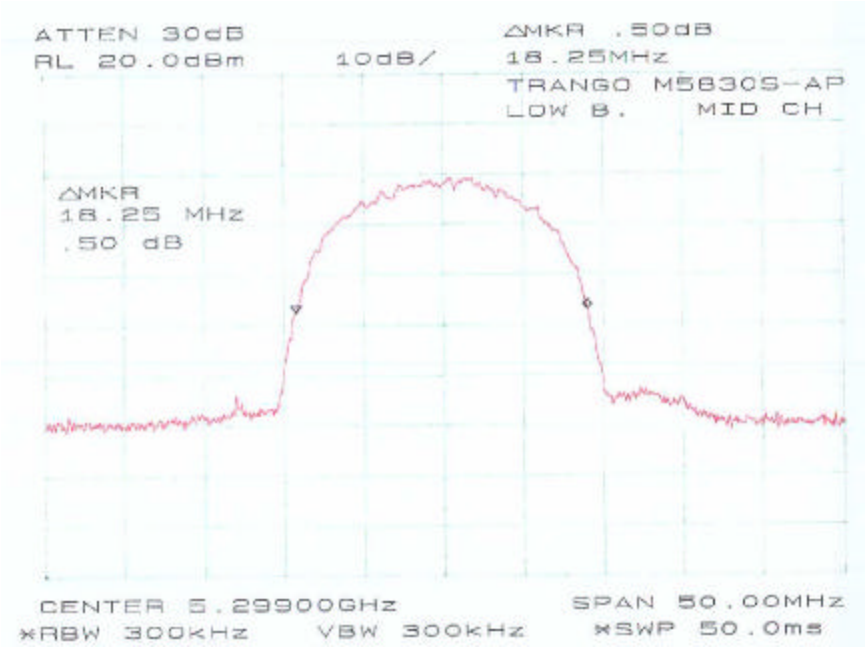
Plots of 6dB for High Band (5736 ~ 5836 MHz) (15.247)

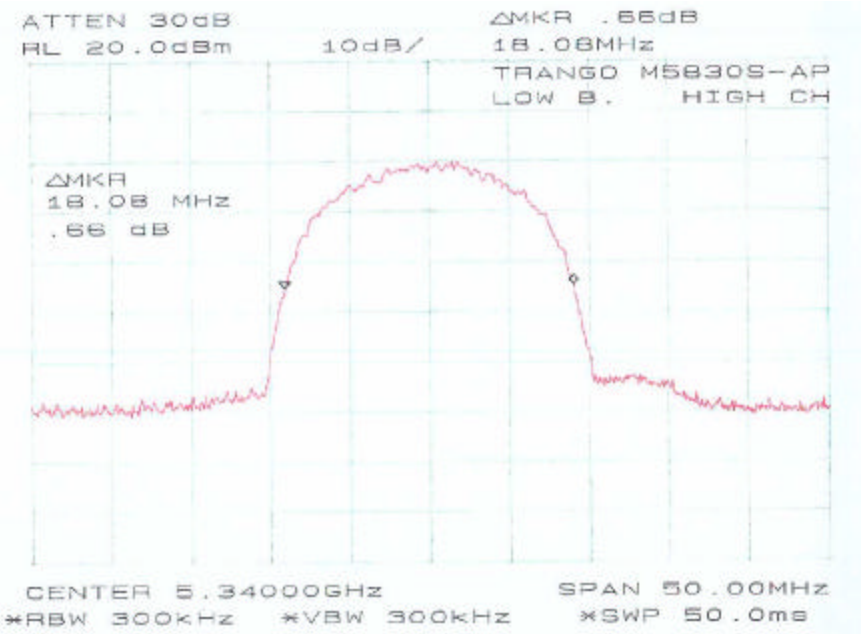






Plots of 26dB for Low Band (5260 ~ 5340 MHz) (15.407)


ATTEN 30dB
RL 20.0dBm
10dB/
ΔMKR .50dB
18.25MHz
TRANGO M5830S-AP
LOW B. MID CH
ΔMKR
18.25 MHz
.50 dB
CENTER 5.29900GHz
SPAN 50.00MHz
*RBW 300kHz
VBW 300kHz
*SWP 50.0ms


ATTEN 30dB
RL 20.0dBm
10dB/
ΔMKR .66dB
18.08MHz
TRANGO M5830S-AP
LOW B. HIGH CH
ΔMKR
18.08 MHz
.66 dB
CENTER 5.34000GHz
SPAN 50.00MHz
*RBW 300kHz
*VBW 300kHz
*SWP 50.0ms

6 - POWER SPECTRAL DENSITY

6.1 Standard Applicable

According to §15.247(d), for digitally modulated systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

According to §15.407(a) (2), the peak power spectral density shall not exceed 11 dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceed 6 dBi.

6.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT was set without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Adjust the center frequency of SA on any frequency be measured and set SA to 6MHz span mode. And then, set RBW and VBW of spectrum analyzer to proper value. (DTS)
4. Adjust the center frequency of SA on any frequency be measured and set SA to 50MHz span mode. And then, set RBW and VBW of spectrum analyzer to proper value. (UNII)
5. Repeat above procedures until all frequencies measured were complete.

6.3 Measurement Results

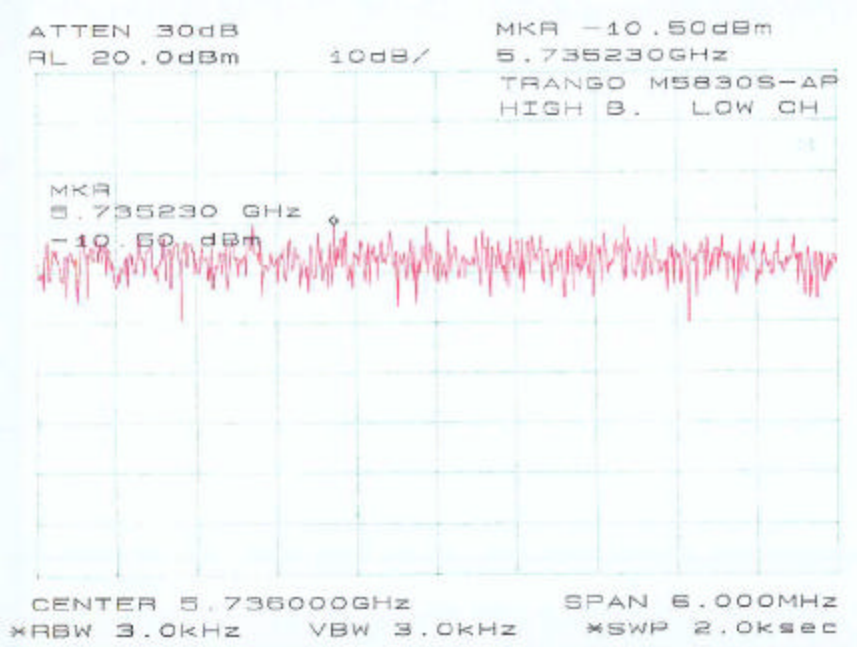
6.3.1Test Result for High Band (5736 ~ 5836 MHz) (15.247)

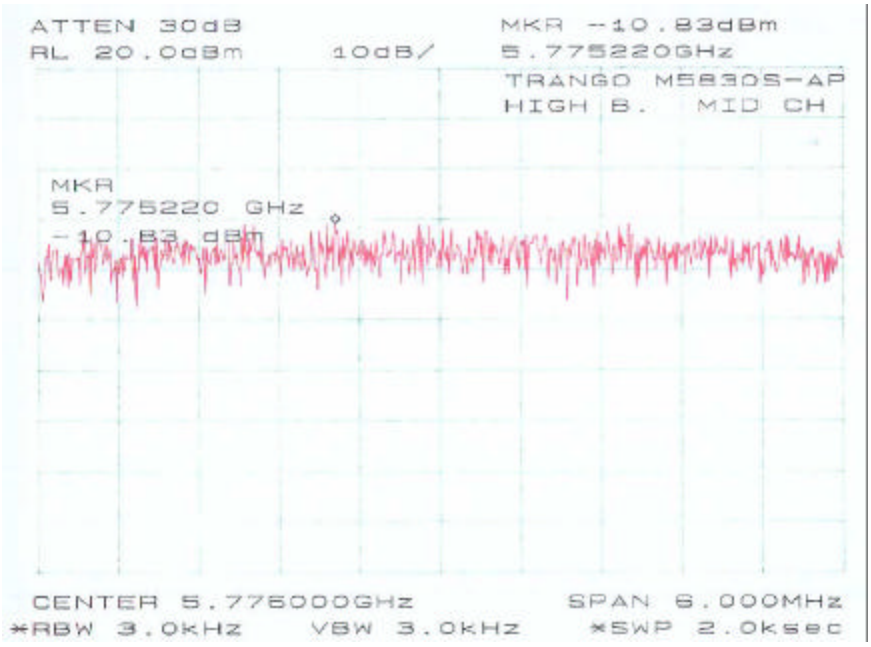
Frequency	Peak Power Spectral Density (dBm)	Standard (dBm)	Result
Low	-10.50	≤ 8	Compliant
Mid	-10.83	≤ 8	Compliant
High	-10.33	≤ 8	Compliant

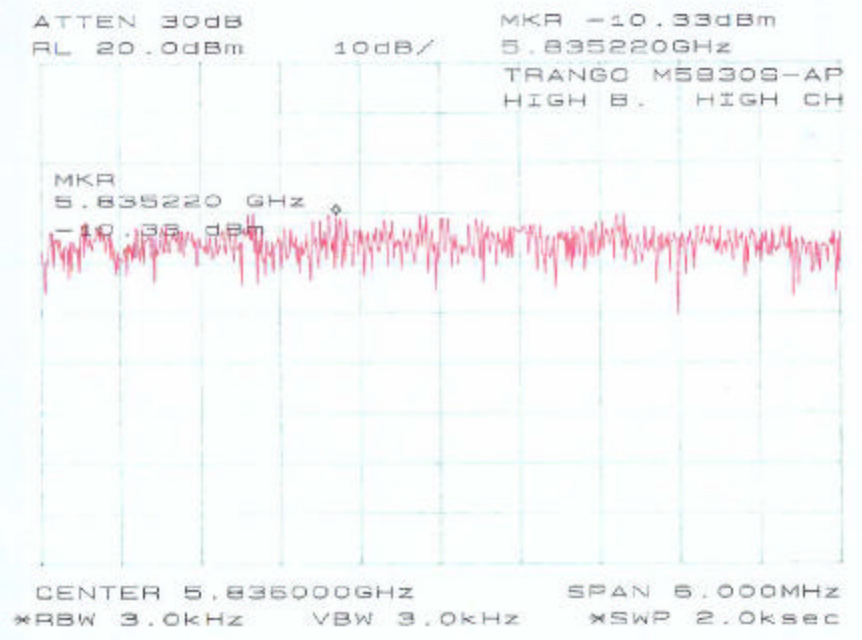
6.3.2Test Result for Low Band (5260 ~ 5340 MHz) (15.407)

Frequency	Peak Power Spectral Density (dBm)	Standard (dBm)	Result
Low	1.83	≤ 4	Compliant
Mid	2.17	≤ 4	Compliant
High	2.17	≤ 4	Compliant

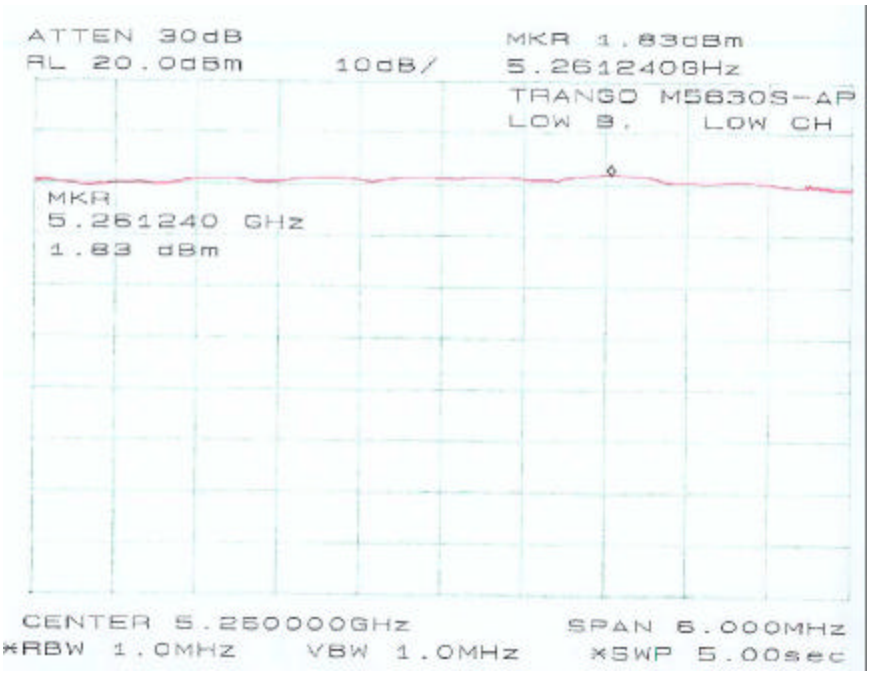
Plots of Spectral Density for High Band (5736 ~ 5836 MHz) (15.247)

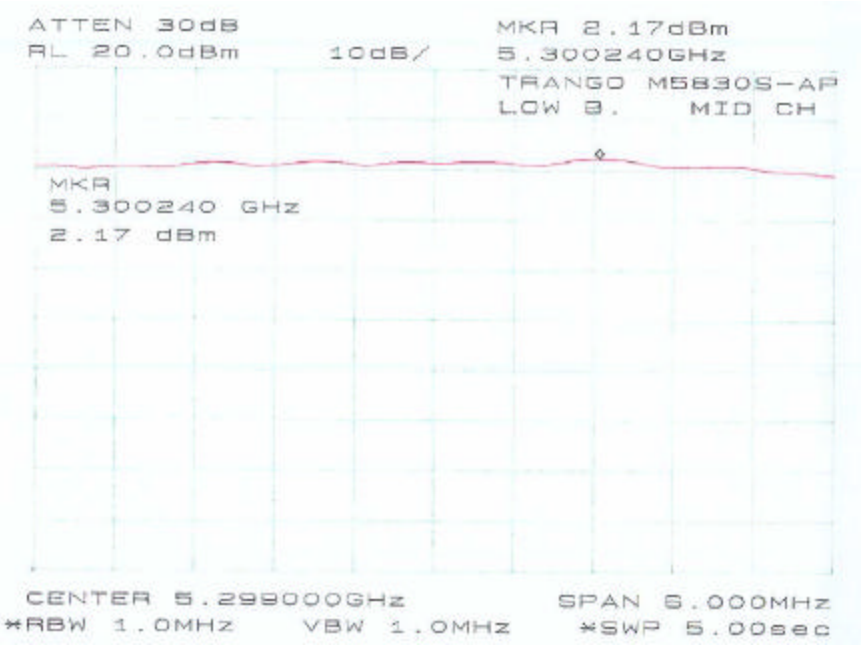


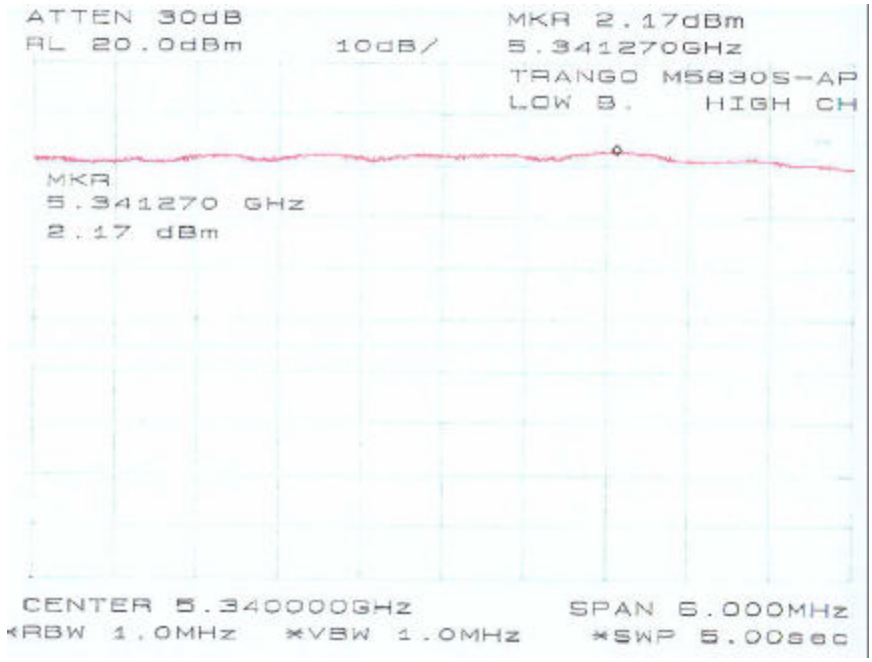




Plots of Spectral Density for Low Band (5260 ~ 5340 MHz) (15.407)




ATTEN 30dB
RL 20.0dBm
10dB/
MKR 2.17dBm
5.300240GHz
TRANGO M5830S-AP
LOW B. MID CH
MKR
5.300240 GHz
2.17 dBm
CENTER 5.299000GHz
SPAN 6.000MHz
*RBW 1.0MHz
VBW 1.0MHz
*SWP 5.00sec


ATTEN 30dB
RL 20.0dBm
10dB/
MKR 2.17dBm
5.341270GHz
TRANGO M5830S-AP
LOW B. HIGH CH
MKR
5.341270 GHz
2.17 dBm
CENTER 5.340000GHz
SPAN 6.000MHz
*RBW 1.0MHz
*VBW 1.0MHz
*SWP 5.00sec

7 - 100 KHZ BANDWIDTH OF BAND EDGES

7.1 Standard Applicable

According to §15.247(c), in *any* 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) see §15.205(c)).

7.2 Measurement Procedure

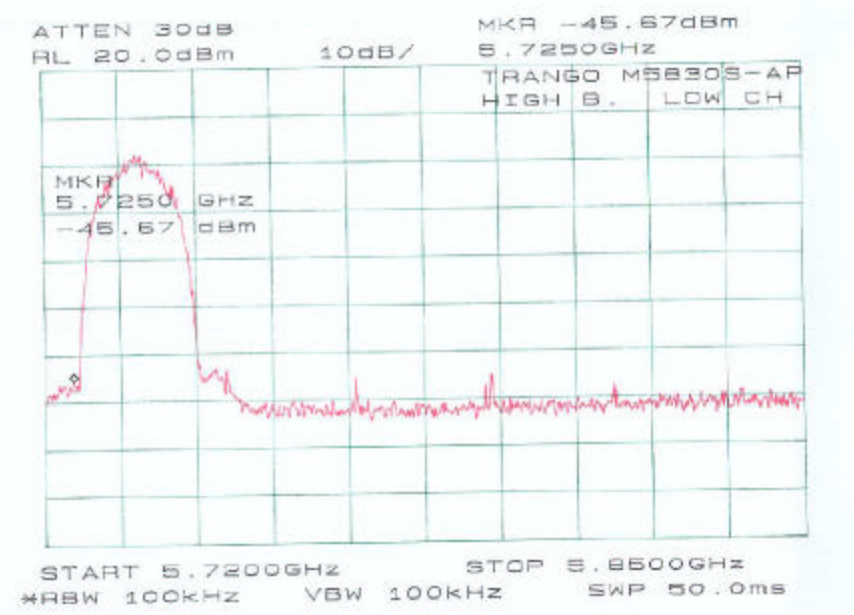
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

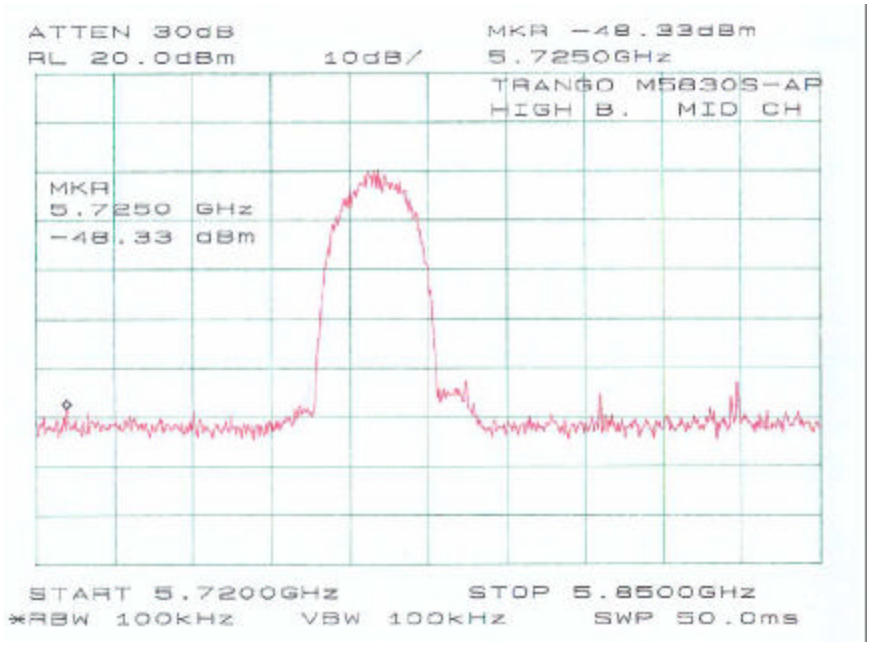
7.3 Measure Results

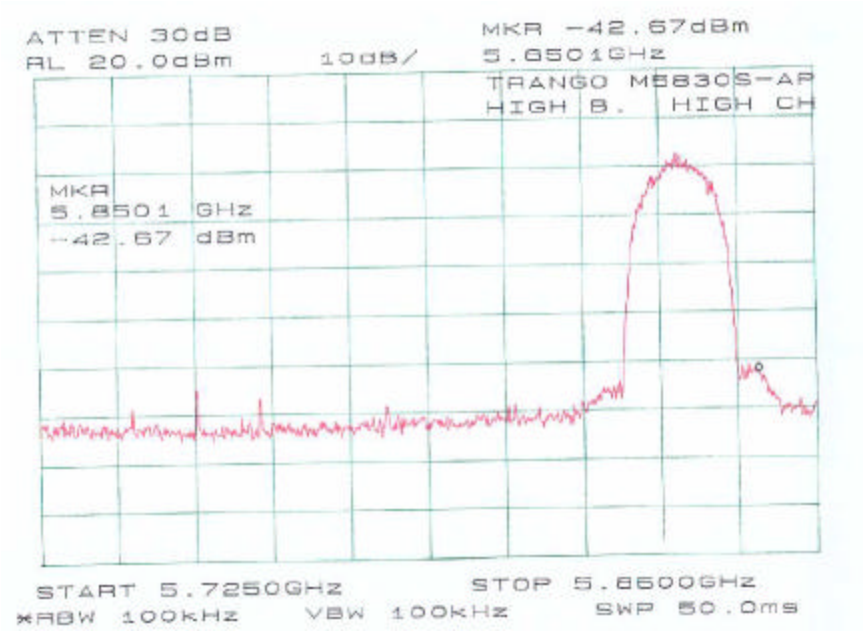
7.3.1Test Result for High Band (5736 ~ 5836 MHz) (15.247)

Frequency	Attended By (dBm)	Standard (dBm)	Result
Low	-45.67	≤ 20	Compliant
Mid	-48.33	≤ 20	Compliant
High	-42.67	≤ 20	Compliant

Please refer to following pages for plots of band edge.


ATTEN 30dB
RL 20.0dBm
10dB/
MKR -45.67dBm
5.7250GHz
TRANGO M5830S-AP
HIGH B. LOW CH
MKR
5.7250 GHz
-45.67 dBm
START 5.7200GHz
STOP 5.8500GHz
*RBW 100kHz
VBW 100kHz
SWP 50.0ms


ATTEN 30dB
RL 20.0dBm
10dB/
MKR -48.33dBm
5.7250GHz
TRANGO M5830S-AP
HIGH B. MID CH
MKR
5.7250 GHz
-48.33 dBm
START 5.7200GHz
STOP 5.8500GHz
*RBW 100kHz
VBW 100kHz
SWP 50.0ms


ATTEN 30dB
RL 20.0dBm
10dB/
MKR -42.67dBm
5.6501GHz
TRANGO M5830S-AP
HIGH B. HIGH CH
MKR
5.8501 GHz
-42.67 dBm
START 5.7250GHz
STOP 5.8500GHz
*RBW 100kHz
VBW 100kHz
SWP 50.0ms

8 - Peak Excursion To Average Ratio

8.1 Standard Applicable

According to §15.407(a)(6), the ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13dB across any 1MHz bandwidth or the emission bandwidth whichever is less.

8.2 Test Procedure

For this test, the EUT's antenna was removed and replaced with a SMA jack to UMP2.0 plug test cable, so output power levels were calculated from conducted emission levels.

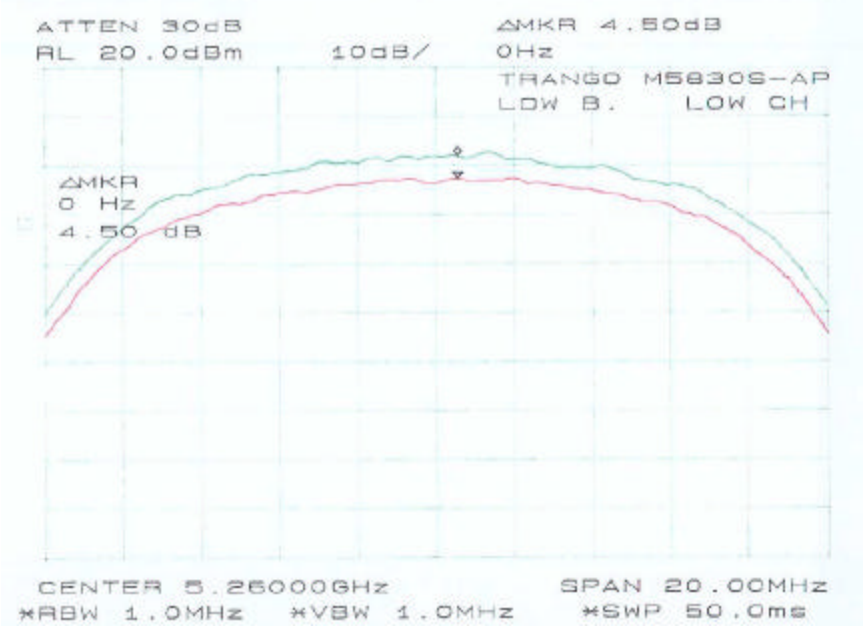
The analyzer center frequency was set to the EUT carrier frequency. For the peak value trace A, the analyzer resolution and video bandwidth were set to 1MHz. Do a MAX HOLD, then VIEW. For the average value trace B, the analyzer resolution bandwidth was set to 1MHz, the video bandwidth was set to 30kHz. MAX HOLD then VIEW trace B also.

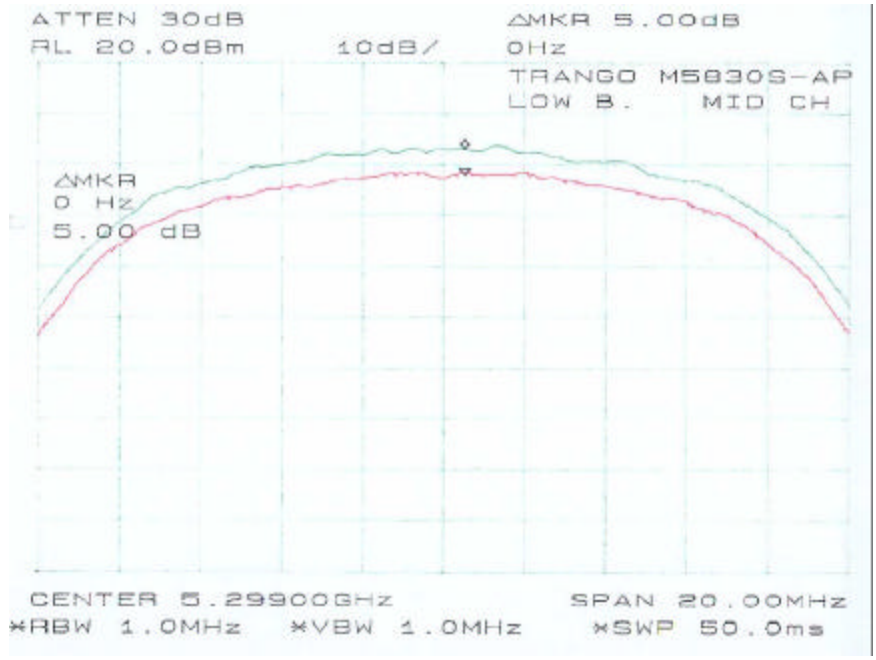
The delta from the peak value trace and the Average should not exceed 13dBm across any 1MHz bandwidth.

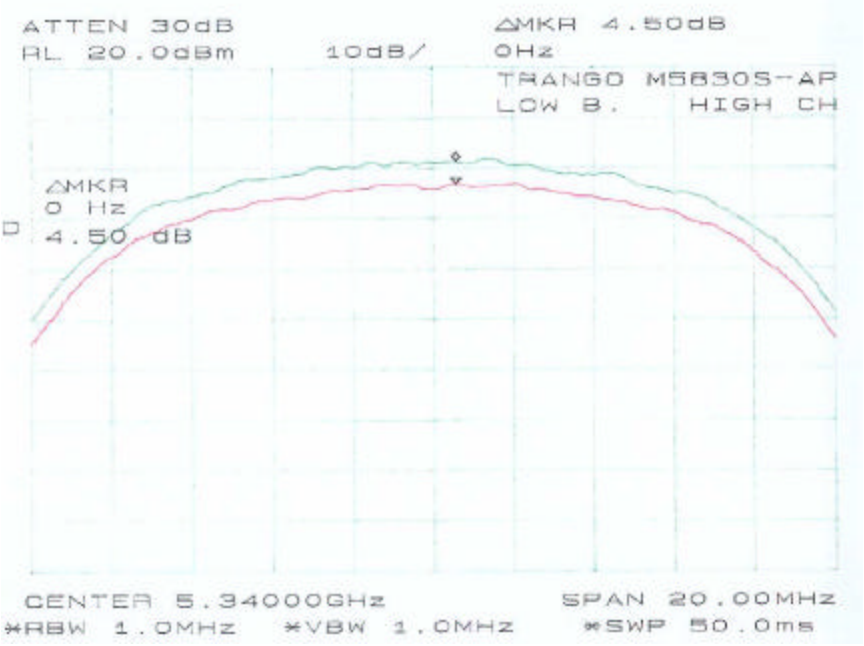
8.3 Test Result for 15.407

Channel	Frequency (MHz)	Reading (dB)	Limit (dBm)
Low	5260	4.50	13
Middle	5300	5.00	13
High	5340	4.50	13

Please see the hereinafter plots for more detail.


ATTEN 30dB
RL 20.0dBm
10dB/
ΔMKR 4.50dB
0Hz
TRANGO M5830S-AP
LOW B. LOW CH
ΔMKR
0 Hz
4.50 dB
CENTER 5.26000GHz
SPAN 20.00MHz
*RBW 1.0MHz
*VBW 1.0MHz
*SWP 50.0ms


ATTEN 30dB
RL 20.0dBm
10dB/
ΔMKR 5.00dB
0Hz
TRANGO M5830S-AP
LOW B. MID CH
ΔMKR
0 Hz
5.00 dB
CENTER 5.29900GHz
SPAN 20.00MHz
*RBW 1.0MHz
*VBW 1.0MHz
*SWP 50.0ms


ATTEN 30dB
RL 20.0dBm
10dB/
ΔMKR 4.50dB
0Hz
TRANGO M5830S-AP
LOW B. HIGH CH
ΔMKR
0 Hz
4.50 dB
CENTER 5.34000GHz
SPAN 20.00MHz
*RBW 1.0MHz
*VBW 1.0MHz
*SWP 50.0ms

9 - Out Of Band Emission for 15.407

9.1 Standard Applicable

§15.407 (b), undesirable emission limits: except as shown in paragraph (b)(6) of this section, the peak emission outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

§15.407 (b)(2), for transmitters operating in the 5.25 – 5.35 GHz band: all emissions outside of the 5.15 – 5.25 GHz band shall not exceed an EIRP of –27 dBm/MHz.

9.2 Test Procedure

For this test, the EUT's antenna was removed and replaced with a low loss cable, so output power levels were calculated from conducted emission levels.

The analyzer center frequency was set to the EUT carrier frequency. The analyzer resolution and video bandwidth were set to 1MHz. The entire band from 30kHz to 40GHz was investigated.

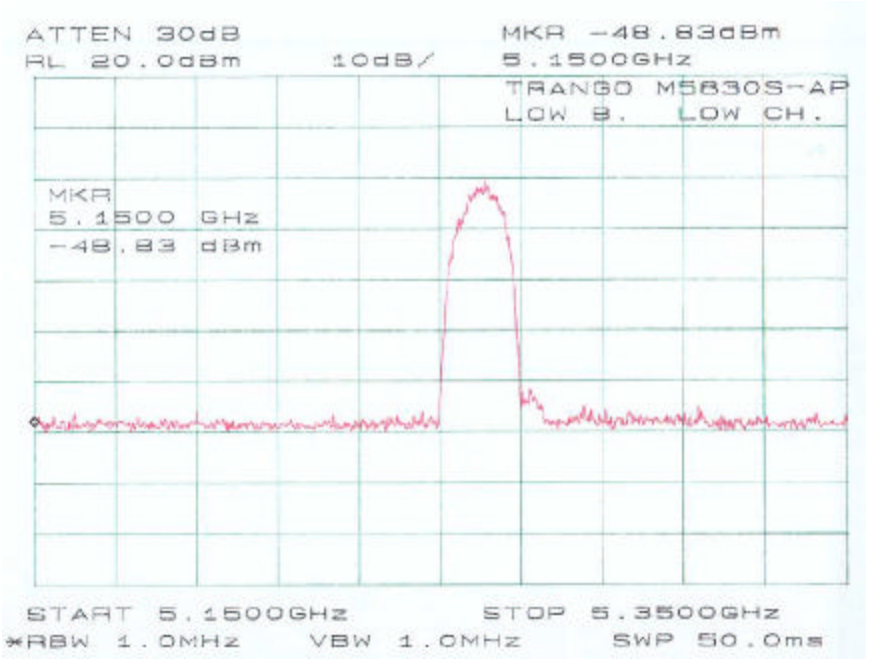
Every suspected signal was also investigated through radiated emission. Please refer to section 12.

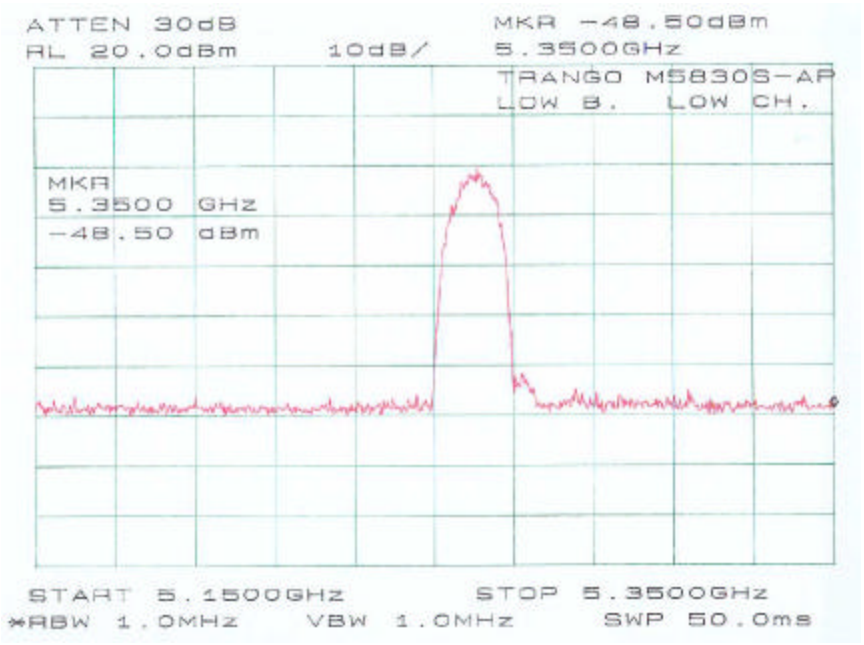
9.3 Test Result

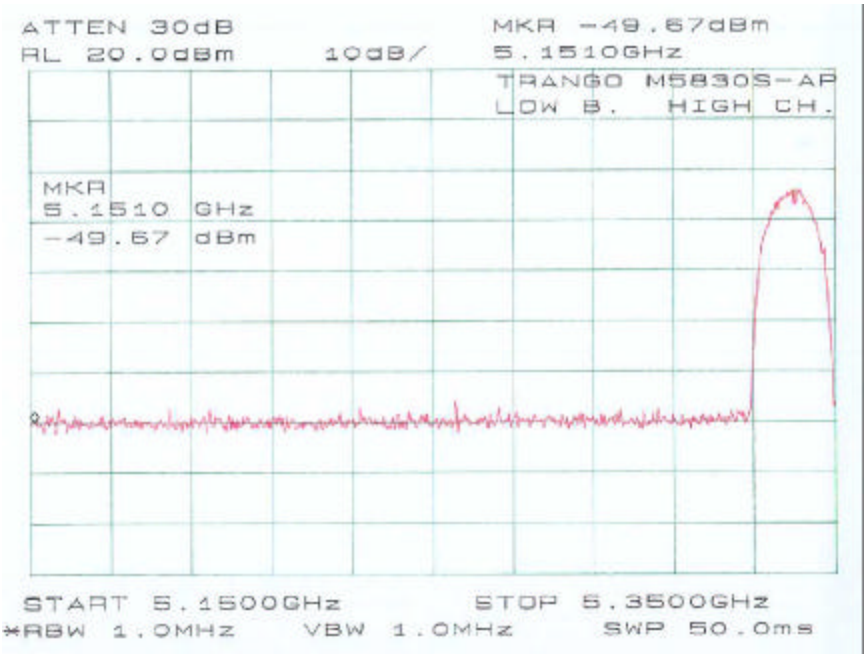
Please refer to the following plots.

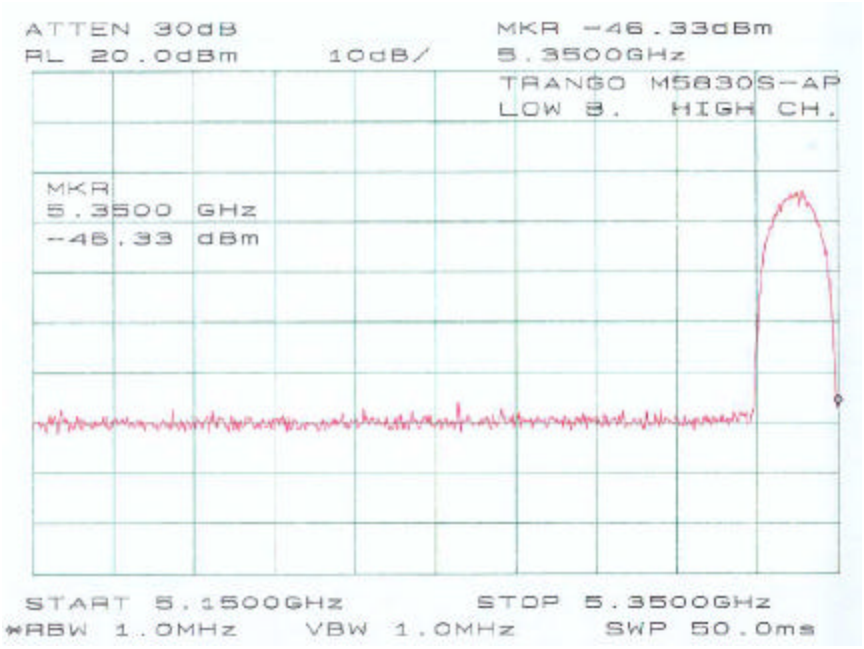
Low Channel	-48.83 + 13 = -35.83 dBm/MHz at 5.35 GHz -48.50 + 13 = -35.50 dBm/MHz at 5.15 GHz	Complies
High Channel	-46.33 + 13 = -33.33 dBm/MHz at 5.35 GHz -49.67 + 13 = -36.67 dBm/MHz at 5.15 GHz	Complies

Note: EIRP = Conducted Power + Antenna Gain


ATTEN 30dB
RL 20.0dBm
10dB/
MKR -48.83dBm
5.1500GHz
TRANGO M5830S-AP
LOW B. LOW CH.
MKR
5.1500 GHz
-48.83 dBm
START 5.1500GHz
STOP 5.3500GHz
*RBW 1.0MHz
VBW 1.0MHz
SWP 50.0ms


ATTEN 30dB
RL 20.0dBm
10dB/
MKR -48.50dBm
5.3500GHz
TRANGO M5830S-AP
LOW B. LOW CH.
MKR
5.3500 GHz
-48.50 dBm
START 5.1500GHz
STOP 5.3500GHz
*RBW 1.0MHz
VBW 1.0MHz
SWP 50.0ms


ATTEN 30dB
RL 20.0dBm
10dB/
MKR -49.67dBm
5.1510GHz
TRANGO M5830S-AP
LOW B. HIGH CH.
MKR
5.1510 GHz
-49.67 dBm
START 5.1500GHz
STOP 5.3500GHz
*RBW 1.0MHz
VBW 1.0MHz
SWP 50.0ms


ATTEN 30dB
RL 20.0dBm
10dB/
MKR -46.33dBm
5.3500GHz
TRANGO M5830S-AP
LOW B. HIGH CH.
MKR
5.3500 GHz
-46.33 dBm
START 5.1500GHz
STOP 5.3500GHz
*RBW 1.0MHz
VBW 1.0MHz
SWP 50.0ms

10 - SPURIOUS EMISSION AT ANTENNA PORT

10.1 Standard Applicable

According to §15.209 (f) and §15.33(a), in some cases the emissions from an intentional radiator must be measured to beyond the tenth harmonic of the highest fundamental frequency designed to be emitted by the intentional radiator because of the incorporation f a digital device. If measurements above the tenth harmonic are so required, the radiated emissions above the tenth harmonic shall comply with the general radiated emission limits applicable to the incorporated digital device, as shown in §15.109 and as based on the frequency of the emission being measured, or, except for emissions contained in the restricted frequency bands shown in §15.205, the limit on spurious emissions specified for the intentional radiator, whichever is the higher limit.

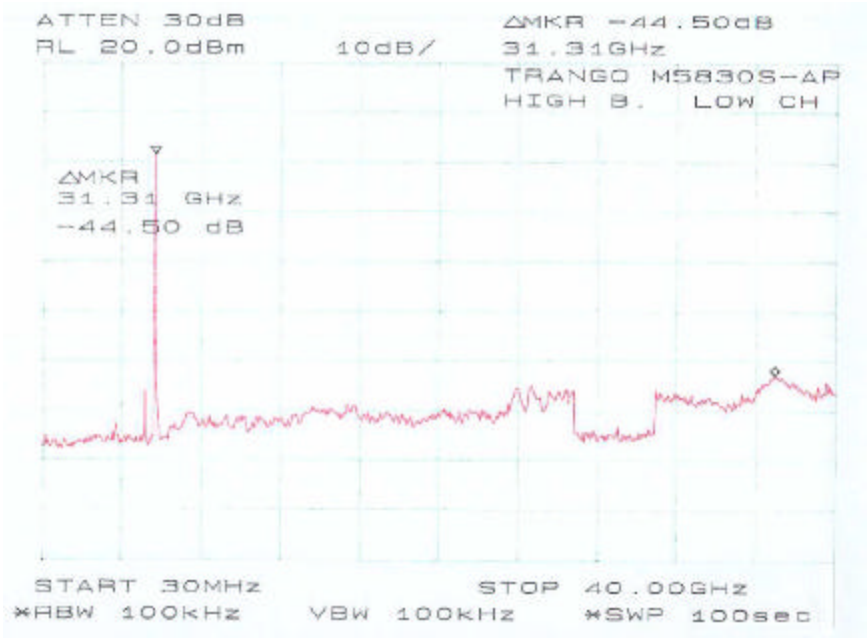
10.2 Measurement Procedure

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 4 without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set the SA on Max-Hold Mode, and then keep the EUT in transmitting mode. Record all the signals from each channel until each one has been recorded.
4. Set the SA on View mode and then plot the result on SA screen.
5. Repeat above procedures until all frequencies measured were complete.

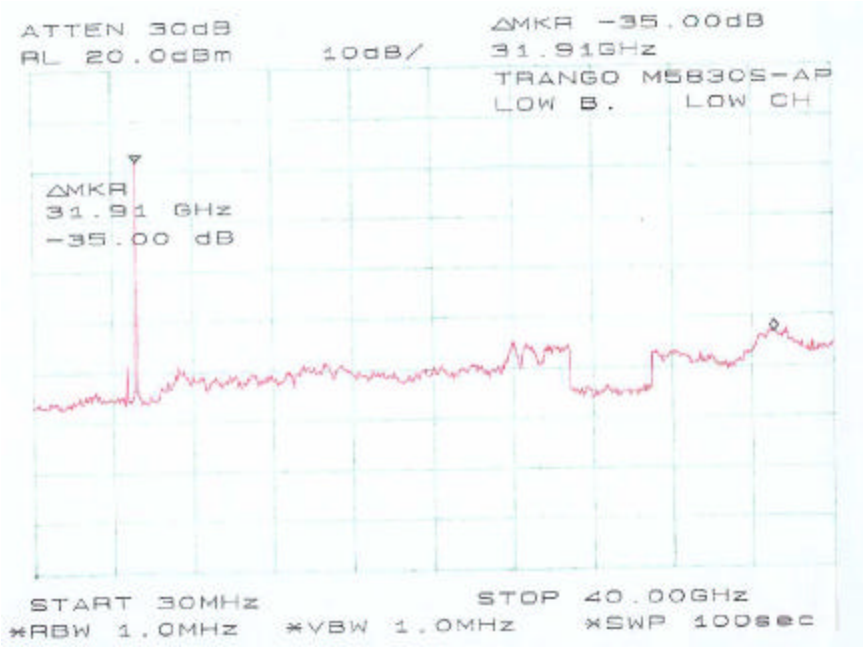
10.3 Measurement Result

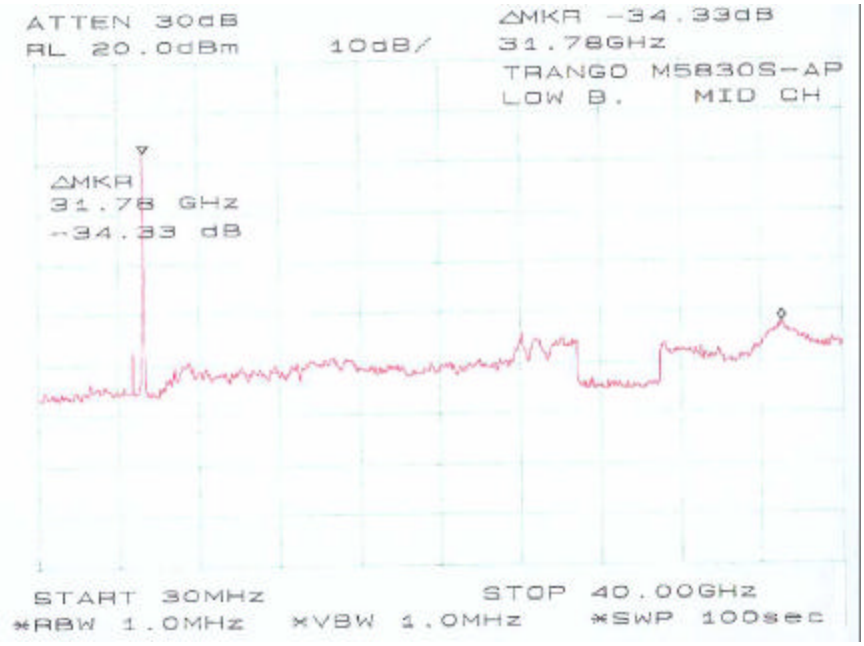
Please refer to following pages for plots of spurious emission.

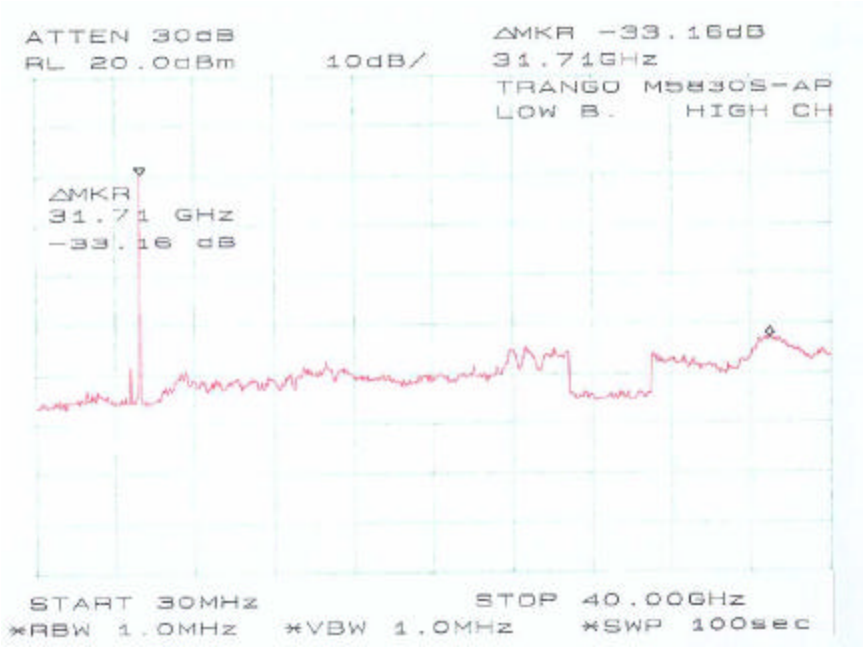
Plots of Spurious Emission for High Band (5736 ~ 5836 MHz) for 15.247



Plots of Spurious Emission for Low Band (5260 ~ 5340 MHz) for 15.407




ATTEN 30dB
RL 20.0dBm
10dB/
ΔMKR -34.33dB
31.78GHz
TRANGO M5830S-AP
LOW B. MID CH
ΔMKR
31.78 GHz
-34.33 dB
START 30MHz
STOP 40.00GHz
*RBW 1.0MHz
*VBW 1.0MHz
*SWP 100sec


ATTEN 30dB
RL 20.0dBm
10dB/
ΔMKR -33.16dB
31.71GHz
TRANGO M5830S-AP
LOW B. HIGH CH
ΔMKR
31.71 GHz
-33.16 dB
START 30MHz
STOP 40.00GHz
*RBW 1.0MHz
*VBW 1.0MHz
*SWP 100sec

11 - ANTENNA REQUIREMENT

11.1 Standard Applicable

For intentional device, according to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to § 15.247 (1), if transmitting antennas of directional gain greater than 6 dBi are used the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

According to § 15.407 (d), any U-NII device shall use a transmitting antenna that is an integral part of the device.

Refer to statement below for compliance.

"The antenna for the device is an integral antenna that the end user cannot access. Further the device is for outdoor use as detailed in the Users Manual and Operational Description, which are included in this application."

11.2 Antenna Connected Construction

The antenna gain used for transmitting is 14 dBi for High Band (5736 ~ 5836 MHz, DTS), 13 dBi for Low band (5260 ~ 5340 MHz, UNII), and the antenna connector is designed with permanent attachment and no consideration of replacement.

12 - SPURIOUS RADIATED EMISSION

12.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at BACL is ±4.0 dB.

According to §15.205, except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 – 0.110	16.42 – 16.423	399.9 – 410	4.5 – 5.15
[1]0.495 – 0.505	16.69475 – 16.69525	608 – 614	5.35 – 5.46
2.1735 – 2.1905	16.80425 – 16.80475	960 – 1240	7.25 – 7.75
4.125 – 4.128	25.5 – 25.67	1300 – 1427	8.025 – 8.5
4.17725 – 4.17775	37.5 – 38.25	1435 – 1626.5	9.0 – 9.2
4.20725 – 4.20775	73 – 74.6	1645.5 – 1646.5	9.3 – 9.5
6.215 – 6.218	74.8 – 75.2	1660 – 1710	10.6 – 12.7
6.26775 – 6.26825	108 – 121.94	1718.8 – 1722.2	13.25 – 13.4
6.31175 – 6.31225	123 – 138	2200 – 2300	14.47 – 14.5
8.291 – 8.294	149.9 – 150.05	2310 – 2390	15.35 – 16.2
8.362 – 8.366	156.52475 – 156.52525	2483.5 – 2500	17.7 – 21.4
8.37625 – 8.38675	156.7 – 156.9	2655 – 2900	22.01 – 23.12
8.41425 – 8.41475	162.0125 – 167.17	3260 – 3267	23.6 – 24.0
12.29 – 12.293	167.72 – 173.2	3332 – 3339	31.2 – 31.8
12.51975 – 12.57725	240 – 285	3345.8 – 3358	36.43 – 36.5
13.36 – 13.41	322 – 335.4	3600 – 4400	([2])

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510MHz
[2] Above 38.6

Except as provided in paragraph (d) and (e), the filed strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

According to §15.209, the device shall meet radiated emission general requirements.

Except for Class A device, the filed strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency of Emission (MHz)	Field Strength (Microvolts/meter)	dB (dBmV/meter)
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

12.2 EUT Setup

The radiated emission tests were performed in the open area 3-meter test site, using the setup in accordance with the ANSI C63.4-1992. The specification used was the FCC 15 Subpart C limits.

The spacing between the peripherals was 10 centimeters.

External I/O cables were draped along the edge of the test table and bundle when necessary.

The host PC system was connected with 110Vac/60Hz power source.

12.3 Spectrum Analyzer Setup

According to FCC CFR 47, Section 15.31, the EUT was tested to 60GHz. During the radiated emission test, the spectrum analyzer was set with the following configurations:

Start Frequency .....30 MHz
Stop Frequency 60GHz
Sweep Speed.....Auto
IF Bandwidth.....1 MHz
Video Bandwidth.....1 MHz
Quasi-Peak Adapter Bandwidth.....120 kHz
Quasi-Peak Adapter Mode .....Normal
Resolution Bandwidth.....1MHz

12.4 Test Procedure

For the radiated emissions test, the Host PC system power cord was connected to the AC floor outlet since the power supply used in the EUT did not provide an accessory power outlet.

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dBµV of specification limits), and are distinguished with a "**Qp**" in the data table.

12.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dBµV means the emission is 7dBµV below the maximum limit for Subpart C. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – Subpart C Limit

12.6 Summary of Test Results

According to the data in section 11.7, the EUT complied with the FCC Title 47, Part 15, Subpart C, section 15.205, 15.207 and 15.247, and had the worst margin of:

-0.7 dB at **11472.00 MHz** in the **Vertical** polarization, Low Channel, High Band, Antenna in left antenna port

-1.5 dB at **11552.00 MHz** in the **Vertical** polarization, Middle Channel, High Band, Antenna in left antenna port

-4.4 dB at **11672.00 MHz** in the **Horizontal** polarization, High Channel, High Band, Antenna in left antenna port

-9.1 dB at **11472.00 MHz** in the **Vertical** polarization, Low Channel, High Band, Antenna in right antenna port

-2.4 dB at **11552.00 MHz** in the **Vertical** polarization, Middle Channel, High Band, Antenna in right antenna port

-5.4 dB at **11672.00 MHz** in the **Horizontal** polarization, High Channel, High Band, Antenna in right antenna port

-3.3 dB at **10520.00 MHz** in the **Horizontal** polarization, Low Channel, Low Band, Antenna in left antenna port

-1.3 dB at **10600.00 MHz** in the **Horizontal** polarization, Middle Channel, Low Band, Antenna in left antenna port

-2.8 dB at **10680.00 MHz** in the **Vertical** polarization, High Channel, Low Band, Antenna in left antenna port

-2.3 dB at **10520.00 MHz** in the **Horizontal** polarization, Low Channel, Low Band, Antenna in right antenna port

-1.3 dB at **10600.00 MHz** in the **Horizontal** polarization, Middle Channel, Low Band, Antenna in right antenna port

-2.0 dB at **10680.00 MHz** in the **Horizontal** polarization, High Channel, Low Band, Antenna in right antenna port

-2.8 dB at **899.99 MHz** in the **Horizontal** polarization, Unintentional Emission

12.7.1 Final test data, 5GHz – 40GHz, High Band, Antenna Left Antenna Port, 15.247

Indicated			Table	Antenna		Correction Factor			Corrected Amplitude	FCC 15 Subpart C	
Frequency MHz	Ampl. dBµV/m	Comments	Angle Degree	Height Meter	Polar H/ V	Antenna dBµV/m	Cable DB	Amp. DB	Corr. Ampl. dBµV/m	Limit dBµV/m	Margin dB
Low Channel, High Band, antenna in left antenna port											
5736.00	107.3	AVE.	360	2.2	V	34.1	5.4	30.0	116.8		
5736.00	94.2	AVE.	270	1.0	H	34.1	5.4	30.0	103.7		
11472.00	62.6	PEAK, RB	360	2.2	V	35.1	5.6	30.0	73.3	74.0	-0.7
11472.00	61.0	PEAK, RB	270	1.0	H	35.1	5.6	30.0	71.7	74.0	-2.3
17208.00	57.0	PEAK	360	2.2	V	35.1	5.6	30.0	67.7	74.0	-6.3
28680.00	36.3	AVE.	270	1.0	H	35.1	5.6	30.0	47.0	54.0	-7.0
28680.00	35.7	AVE.	360	2.2	V	35.1	5.6	30.0	46.4	54.0	-7.6
22944.00	35.5	AVE.	270	1.0	H	35.1	5.6	30.0	46.2	54.0	-7.8
17208.00	55.3	PEAK	270	1.0	H	35.1	5.6	30.0	66.0	74.0	-8.0
11472.00	34.5	AVE., RB	270	1.0	H	35.1	5.6	30.0	45.2	54.0	-8.8
17208.00	34.2	AVE.	270	1.0	H	35.1	5.6	30.0	44.9	54.0	-9.1
11472.00	32.7	AVE., RB	360	2.2	V	35.1	5.6	30.0	43.4	54.0	-10.6
17208.00	30.0	AVE.	360	2.2	V	35.1	5.6	30.0	40.7	54.0	-13.3
22944.00	30.0	AVE.	360	2.2	V	35.1	5.6	30.0	40.7	54.0	-13.3
5256.00	31.3	AVE., LO	225	1.5	H	33.9	5.2	30.0	40.4	54.0	-13.6
28680.00	47.5	PEAK	360	2.2	V	35.1	5.6	30.0	58.2	74.0	-15.8
28680.00	46.0	PEAK	270	1.0	H	35.1	5.6	30.0	56.7	74.0	-17.3
5256.00	26.3	AVE., LO	360	1.7	V	33.9	5.2	30.0	35.4	54.0	-18.6
22944.00	42.5	PEAK	270	1.0	H	35.1	5.6	30.0	53.2	74.0	-20.8
22944.00	41.8	PEAK	360	2.2	V	35.1	5.6	30.0	52.6	74.0	-21.4
5256.00	40.3	PEAK, LO	360	1.7	V	33.9	5.2	30.0	49.4	74.0	-24.6
5256.00	38.5	PEAK, LO	225	1.5	H	33.9	5.2	30.0	47.6	74.0	-26.4

Middle Channel, High Band, antenna in left antenna port											
5776.00	107.0	AVE.	360	1.7	V	34.1	5.4	30.0	116.5		
5776.00	104.5	AVE.	135	1.0	H	34.1	5.4	30.0	114.0		
11552.00	41.8	AVE., RB	360	1.7	V	35.1	5.6	30.0	52.5	54.0	-1.5
28880.00	37.5	AVE.	360	1.7	V	35.1	5.6	30.0	48.2	54.0	-5.8
11552.00	37.4	AVE., RB	135	1.0	H	35.1	5.6	30.0	48.1	54.0	-5.9
23104.00	35.8	AVE.	360	1.7	V	35.1	5.6	30.0	46.5	54.0	-7.5
28880.00	34.3	AVE.	135	1.0	H	35.1	5.6	30.0	45.0	54.0	-9.0
5296.00	35.8	AVE., LO	360	1.5	V	33.9	5.2	30.0	44.9	54.0	-9.1
17328.00	33.5	AVE.	360	1.7	V	35.1	5.6	30.0	44.2	54.0	-9.8
23104.00	30.0	AVE.	135	1.0	H	35.1	5.6	30.0	40.7	54.0	-13.3
5296.00	30.4	AVE., LO	0	1.3	H	33.9	5.2	30.0	39.5	54.0	-14.5
17328.00	26.2	AVE.	135	1.0	H	35.1	5.6	30.0	36.9	54.0	-17.1
11552.00	44.5	PEAK, RB	360	1.7	V	35.1	5.6	30.0	55.2	74.0	-18.8
28880.00	43.5	PEAK	135	1.0	H	35.1	5.6	30.0	54.2	74.0	-19.8
28880.00	43.3	PEAK	360	1.7	V	35.1	5.6	30.0	54.0	74.0	-20.0
5296.00	42.7	PEAK, LO	360	1.5	V	33.9	5.2	30.0	51.8	74.0	-22.2
23104.00	40.2	PEAK	360	1.7	V	35.1	5.6	30.0	50.9	74.0	-23.1
11552.00	40.0	PEAK, RB	135	1.0	H	35.1	5.6	30.0	50.7	74.0	-23.3
17328.00	39.8	PEAK	360	1.7	V	35.1	5.6	30.0	50.5	74.0	-23.5
23104.00	38.5	PEAK	135	1.0	H	35.1	5.6	30.0	49.2	74.0	-24.8
5296.00	37.2	PEAK, LO	0	1.3	H	33.9	5.2	30.0	46.3	74.0	-27.7
17328.00	34.5	PEAK	135	1.0	H	35.1	5.6	30.0	45.2	74.0	-28.8

High Channel, High Band, antenna in left antenna port											
5836.00	106.8	AVE.	360	1.6	V	34.1	5.4	30.0	116.3		
5836.00	102.0	AVE.	45	1.0	H	34.1	5.4	30.0	111.5		
11672.00	38.8	AVE., RB	45	1.0	H	35.1	5.6	30.0	49.6	54.0	-4.4
23344.00	36.8	AVE.	45	1.0	H	35.1	5.6	30.0	47.5	54.0	-6.5
29180.00	34.3	AVE.	360	1.6	V	35.1	5.6	30.0	45.0	54.0	-9.0
29180.00	33.8	AVE.	45	1.0	H	35.1	5.6	30.0	44.5	54.0	-9.5
11672.00	32.3	AVE., RB	360	1.6	V	35.1	5.6	30.0	43.1	54.0	-10.9
17508.00	32.3	AVE.	45	1.0	H	35.1	5.6	30.0	43.1	54.0	-10.9
5356.00	33.6	AVE., LO	0	1.0	V	33.9	5.2	30.0	42.7	54.0	-11.3
17508.00	30.3	AVE.	360	1.6	V	35.1	5.6	30.0	41.0	54.0	-13.0
23344.00	30.0	AVE.	360	1.6	V	35.1	5.6	30.0	40.7	54.0	-13.3
5356.00	29.3	AVE., LO	360	1.4	H	33.9	5.2	30.0	38.4	54.0	-15.6
11672.00	46.8	PEAK, RB	360	1.6	V	35.1	5.6	30.0	57.6	74.0	-16.4
29180.00	45.2	PEAK	360	1.6	V	35.1	5.6	30.0	55.9	74.0	-18.1
29180.00	44.2	PEAK	45	1.0	H	35.1	5.6	30.0	54.9	74.0	-19.1
5356.00	44.8	PEAK, LO	0	1.0	V	33.9	5.2	30.0	53.9	74.0	-20.1
11672.00	42.2	PEAK, RB	45	1.0	H	35.1	5.6	30.0	52.9	74.0	-21.1
23344.00	41.2	PEAK	360	1.6	V	35.1	5.6	30.0	51.9	74.0	-22.1
23344.00	40.0	PEAK	45	1.0	H	35.1	5.6	30.0	50.7	74.0	-23.3
5356.00	40.8	PEAK, LO	360	1.4	H	33.9	5.2	30.0	49.9	74.0	-24.1
17508.00	36.0	PEAK	360	1.6	V	35.1	5.6	30.0	46.7	74.0	-27.3
17508.00	35.9	PEAK	45	1.0	H	35.1	5.6	30.0	46.6	74.0	-27.4

12.7.2 Final test data, 5GHz – 40GHz, High Band, Antenna in Right Antenna Port, 15.247

Indicated			Table	Antenna		Correction Factor			Corrected Amplitude	FCC 15 Subpart C	
Frequency MHz	Ampl. dBµV/m	Comments	Angle Degree	Height Meter	Polar H/ V	Antenna dBµV/m	Cable DB	Amp. DB	Corr. Ampl. dBµV/m	Limit dBµ V/m	Margin dB
Low Channel, High Band, antenna in right antenna port											
5736.00	107.0	AVE.	360	1.5	V	34.1	5.4	30.0	116.5		
5736.00	94.2	AVE.	225	1.2	H	34.1	5.4	30.0	103.7		
11472.00	61.4	PEAK, RB	225	1.2	H	35.1	5.6	30.0	72.1	74.0	-1.9
11472.00	60.3	PEAK, RB	360	1.5	V	35.1	5.6	30.0	71.0	74.0	-3.0
17208.00	56.5	PEAK	360	1.5	V	35.1	5.6	30.0	67.2	74.0	-6.8
22944.00	36.0	AVE.	225	1.2	H	35.1	5.6	30.0	46.7	54.0	-7.3
28680.00	35.1	AVE.	225	1.2	H	35.1	5.6	30.0	45.8	54.0	-8.2
11472.00	35.0	AVE., RB	225	1.2	H	35.1	5.6	30.0	45.7	54.0	-8.3
17208.00	54.9	PEAK	225	1.2	H	35.1	5.6	30.0	65.6	74.0	-8.4
11472.00	34.2	AVE., RB	360	1.5	V	35.1	5.6	30.0	44.9	54.0	-9.1
28680.00	34.2	AVE.	360	1.5	V	35.1	5.6	30.0	44.9	54.0	-9.1
17208.00	33.7	AVE.	225	1.2	H	35.1	5.6	30.0	44.4	54.0	-9.6
17208.00	31.2	AVE.	360	1.5	V	35.1	5.6	30.0	41.9	54.0	-12.1
5256.00	32.4	AVE., LO	180	1.0	H	33.9	5.2	30.0	41.5	54.0	-12.5
22944.00	29.9	AVE.	360	1.5	V	35.1	5.6	30.0	40.6	54.0	-13.4
28680.00	46.8	PEAK	360	1.5	V	35.1	5.6	30.0	57.5	74.0	-16.5
5256.00	28.0	AVE., LO	360	1.7	V	33.9	5.2	30.0	37.1	54.0	-16.9
28680.00	45.3	PEAK	225	1.2	H	35.1	5.6	30.0	56.0	74.0	-18.0
22944.00	41.9	PEAK	225	1.2	H	35.1	5.6	30.0	52.6	74.0	-21.4
22944.00	40.6	PEAK	360	1.5	V	35.1	5.6	30.0	51.3	74.0	-22.7
5256.00	39.9	PEAK, LO	360	1.7	V	33.9	5.2	30.0	49.0	74.0	-25.0
5256.00	38.1	PEAK, LO	180	1.5	H	33.9	5.2	30.0	47.2	74.0	-26.8

Middle Channel, High Band, antenna in right antenna port											
5776.00	106.5	AVE.	360	1.5	V	34.1	5.4	30.0	116.0		
5776.00	103.2	AVE.	90	1.0	H	34.1	5.4	30.0	112.7		
11552.00	40.9	AVE., RB	360	1.5	V	35.1	5.6	30.0	51.6	54.0	-2.4
11552.00	39.1	AVE., RB	90	1.0	H	35.1	5.6	30.0	49.8	54.0	-4.2
28880.00	36.3	AVE.	360	1.5	V	35.1	5.6	30.0	47.0	54.0	-7.0
23104.00	36.1	AVE.	360	1.5	V	35.1	5.6	30.0	46.8	54.0	-7.2
28880.00	34.1	AVE.	90	1.0	H	35.1	5.6	30.0	44.8	54.0	-9.2
17328.00	32.5	AVE.	360	1.5	V	35.1	5.6	30.0	43.2	54.0	-10.8
5296.00	33.2	AVE., LO	360	1.5	V	33.9	5.2	30.0	42.3	54.0	-11.7
23104.00	31.0	AVE.	90	1.0	H	35.1	5.6	30.0	41.7	54.0	-12.3
5296.00	30.9	AVE., LO	135	1.3	H	33.9	5.2	30.0	40.0	54.0	-14.0
17328.00	27.8	AVE.	90	1.0	H	35.1	5.6	30.0	38.5	54.0	-15.5
28880.00	45.6	PEAK	90	1.0	H	35.1	5.6	30.0	56.3	74.0	-17.7
11552.00	45.3	PEAK, RB	360	1.5	V	35.1	5.6	30.0	56.0	74.0	-18.0
28880.00	42.5	PEAK	360	1.5	V	35.1	5.6	30.0	53.2	74.0	-20.8
11552.00	41.2	PEAK, RB	90	1.0	H	35.1	5.6	30.0	51.9	74.0	-22.1
5296.00	41.8	PEAK, LO	360	1.5	V	33.9	5.2	30.0	50.9	74.0	-23.1
23104.00	39.4	PEAK	360	1.5	V	35.1	5.6	30.0	50.1	74.0	-23.9
17328.00	39.2	PEAK	360	1.5	V	35.1	5.6	30.0	49.9	74.0	-24.1
23104.00	37.6	PEAK	90	1.0	H	35.1	5.6	30.0	48.3	74.0	-25.7
5296.00	36.9	PEAK, LO	135	1.3	H	33.9	5.2	30.0	46.0	74.0	-28.0
17328.00	33.7	PEAK	90	1.0	H	35.1	5.6	30.0	44.4	74.0	-29.6

High Channel, High Band, antenna in right antenna port											
5836.00	105.9	AVE.	0	1.8	V	34.1	5.4	30.0	115.4		
5836.00	101.5	AVE.	45	1.2	H	34.1	5.4	30.0	111.0		
11672.00	37.9	AVE., RB	45	1.2	H	35.1	5.6	30.0	48.6	54.0	-5.4
23344.00	34.7	AVE.	45	1.2	H	35.1	5.6	30.0	45.4	54.0	-8.6
17508.00	34.3	AVE.	0	1.8	V	35.1	5.6	30.0	45.0	54.0	-9.0
29180.00	34.0	AVE.	45	1.2	H	35.1	5.6	30.0	44.7	54.0	-9.3
29180.00	33.8	AVE.	0	1.8	V	35.1	5.6	30.0	44.5	54.0	-9.5
17508.00	31.6	AVE.	45	1.2	H	35.1	5.6	30.0	42.3	54.0	-11.7
11672.00	31.3	AVE., RB	0	1.8	V	35.1	5.6	30.0	42.0	54.0	-12.0
5356.00	31.8	AVE., LO	45	1.0	V	33.9	5.2	30.0	40.9	54.0	-13.1
23344.00	29.9	AVE.	0	1.8	V	35.1	5.6	30.0	40.6	54.0	-13.4
5356.00	30.0	AVE., LO	360	1.4	H	33.9	5.2	30.0	39.1	54.0	-14.9
11672.00	45.0	PEAK, RB	0	1.8	V	35.1	5.6	30.0	55.7	74.0	-18.3
29180.00	44.9	PEAK	0	1.8	V	35.1	5.6	30.0	55.6	74.0	-18.4
29180.00	43.6	PEAK	45	1.2	H	35.1	5.6	30.0	54.3	74.0	-19.7
11672.00	43.3	PEAK, RB	45	1.2	H	35.1	5.6	30.0	54.0	74.0	-20.0
5356.00	43.9	PEAK, LO	45	1.0	V	33.9	5.2	30.0	53.0	74.0	-21.0
23344.00	42.0	PEAK	0	1.8	V	35.1	5.6	30.0	52.7	74.0	-21.3
23344.00	41.2	PEAK	45	1.2	H	35.1	5.6	30.0	51.9	74.0	-22.1
5356.00	40.0	PEAK, LO	360	1.4	H	33.9	5.2	30.0	49.1	74.0	-24.9
17508.00	36.0	PEAK	45	1.2	H	35.1	5.6	30.0	46.7	74.0	-27.3
17508.00	35.4	PEAK	0	1.8	V	35.1	5.6	30.0	46.1	74.0	-27.9

12.7.3 Final test data, 5GHz – 40GHz, Low Band, Antenna in Left Antenna Port, 15.407

INDICATED			TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC 15 SUBPART E	
Frequency MHz	Ampl. dBµV/m	Comments	Angle Degree	Height Meter	Polar H/ V	Antenna dBµV/m	Cable DB	Amp. DB	Corr. Ampl. dBµV/m	Limit dBµV/m	Margin dB
Low Channel, Low Band, antenna in left antenna port											
5260.00	95.2	AVE.	360	1.7	V	33.9	5.2	30.0	104.3		
5260.00	102.3	AVE.	180	1.0	H	33.9	5.2	30.0	111.4		
10520.00	40.0	AVE., RB	180	1.0	H	35.1	5.6	30.0	50.7	54.0	-3.3
10520.00	38.0	AVE., RB	360	1.7	V	35.1	5.6	30.0	48.7	54.0	-5.3
10520.00	57.4	PEAK, RB	180	1.0	H	35.1	5.6	30.0	68.1	74.0	-5.9
15780.00	56.3	PEAK, RB	360	1.7	V	35.1	5.6	30.0	67.0	74.0	-7.0
26300.00	36.2	AVE.	180	1.0	H	35.1	5.6	30.0	46.9	54.0	-7.1
21040.00	35.6	AVE.	180	1.0	H	35.1	5.6	30.0	46.3	54.0	-7.7
10520.00	55.6	PEAK	360	1.7	V	35.1	5.6	30.0	66.3	74.0	-7.7
15780.00	35.5	AVE.	360	1.7	V	35.1	5.6	30.0	46.2	54.0	-7.8
15780.00	34.7	AVE.	180	1.0	H	35.1	5.6	30.0	45.4	54.0	-8.6
26300.00	33.8	AVE.	360	1.7	V	35.1	5.6	30.0	44.5	54.0	-9.5
15780.00	53.6	PEAK	180	1.0	H	35.1	5.6	30.0	64.3	74.0	-9.7
21040.00	32.3	AVE.	360	1.7	V	35.1	5.6	30.0	43.0	54.0	-11.0
4780.00	32.5	AVE., LO	90	1.8	H	32.5	4.9	30.0	39.9	54.0	-14.1
4780.00	31.4	AVE.,LO	0	1.0	V	32.5	4.9	30.0	38.8	54.0	-15.2
26300.00	44.6	PEAK	180	1.0	H	35.1	5.6	30.0	55.3	74.0	-18.7
26300.00	43.2	PEAK	360	1.7	V	35.1	5.6	30.0	53.9	74.0	-20.1
21040.00	42.3	PEAK	360	1.7	V	35.1	5.6	30.0	53.0	74.0	-21.0
21040.00	41.6	PEAK	180	1.0	H	35.1	5.6	30.0	52.3	74.0	-21.7
4780.00	38.9	PEAK, LO	90	1.8	H	32.5	4.9	30.0	46.3	74.0	-27.7
4780.00	35.7	PEAK, LO	0	1.0	V	32.5	4.9	30.0	43.1	74.0	-30.9

Middle Channel, Low Band, antenna in left antenna port											
5300.00	101.3	AVE.	0	1.2	V	33.9	5.2	30.0	110.4		
5300.00	103.4	AVE.	45	1.0	H	33.9	5.2	30.0	112.5		
10600.00	42.0	AVE., RB	45	1.0	H	35.1	5.6	30.0	52.7	54.0	-1.3
10600.00	41.3	AVE., RB	0	1.2	V	35.1	5.6	30.0	52.0	54.0	-2.0
10600.00	57.4	PEAK, RB	0	1.2	V	35.1	5.6	30.0	68.1	74.0	-5.9
15900.00	36.4	AVE.	0	1.2	V	35.1	5.6	30.0	47.1	54.0	-6.9
10600.00	55.8	PEAK, RB	45	1.0	H	35.1	5.6	30.0	66.5	74.0	-7.5
21200.00	34.9	AVE.	45	1.0	H	35.1	5.6	30.0	45.6	54.0	-8.4
26500.00	34.8	AVE.	45	1.0	H	35.1	5.6	30.0	45.5	54.0	-8.5
15900.00	53.7	PEAK	0	1.2	V	35.1	5.6	30.0	64.4	74.0	-9.6
21200.00	33.4	AVE.	0	1.2	V	35.1	5.6	30.0	44.1	54.0	-9.9
15900.00	53.1	PEAK	45	1.0	H	35.1	5.6	30.0	63.8	74.0	-10.2
15900.00	32.8	AVE.	45	1.0	H	35.1	5.6	30.0	43.5	54.0	-10.5
26500.00	31.4	AVE.	0	1.2	V	35.1	5.6	30.0	42.1	54.0	-11.9
4820.00	31.6	AVE., LO	180	1.0	H	32.5	4.9	30.0	39.0	54.0	-15.0
26500.00	47.0	PEAK	45	1.0	H	35.1	5.6	30.0	57.7	74.0	-16.3
4820.00	30.0	AVE., LO	45	1.2	V	32.5	4.9	30.0	37.4	54.0	-16.6
26500.00	44.7	PEAK	0	1.2	V	35.1	5.6	30.0	55.4	74.0	-18.6
21200.00	43.7	PEAK	45	1.0	H	35.1	5.6	30.0	54.4	74.0	-19.6
21200.00	42.0	PEAK	0	1.2	V	35.1	5.6	30.0	52.7	74.0	-21.3
4820.00	39.2	PEAK, LO	45	1.2	V	32.5	4.9	30.0	46.6	74.0	-27.4
4820.00	37.3	PEAK, LO	180	1.0	H	32.5	4.9	30.0	44.7	74.0	-29.3

High Channel, Low Band, antenna in left antenna port											
5340.00	100.2	AVE.	360	1.5	V	33.9	5.2	30.0	109.3		
5340.00	103.6	AVE.	45	1.0	H	33.9	5.2	30.0	112.7		
10680.00	60.5	PEAK, RB	360	1.5	V	35.1	5.6	30.0	71.2	74.0	-2.8
10680.00	40.2	AVE., RB	45	1.0	H	35.1	5.6	30.0	50.9	54.0	-3.1
10680.00	58.7	PEAK, RB	45	1.0	H	35.1	5.6	30.0	69.4	74.0	-4.6
10680.00	38.2	AVE., RB	360	1.5	V	35.1	5.6	30.0	48.9	54.0	-5.1
16020.00	37.0	AVE., RB	360	1.5	V	35.1	5.6	30.0	47.7	54.0	-6.3
21360.00	36.1	AVE.	45	1.0	H	35.1	5.6	30.0	46.8	54.0	-7.2
26700.00	35.9	AVE.	45	1.0	H	35.1	5.6	30.0	46.6	54.0	-7.4
16020.00	55.4	PEAK	45	1.0	H	35.1	5.6	30.0	66.1	74.0	-7.9
16020.00	54.3	PEAK	360	1.5	V	35.1	5.6	30.0	65.0	74.0	-9.0
21360.00	32.8	AVE.	360	1.5	V	35.1	5.6	30.0	43.5	54.0	-10.5
26700.00	32.3	AVE.	360	1.5	V	35.1	5.6	30.0	43.0	54.0	-11.0
16020.00	32.1	AVE.	45	1.0	H	35.1	5.6	30.0	42.8	54.0	-11.2
4860.00	34.2	AVE., LO	360	1.0	V	32.5	4.9	30.0	41.6	54.0	-12.4
4860.00	33.8	AVE., LO	45	1.2	H	32.5	4.9	30.0	41.2	54.0	-12.8
26700.00	45.0	PEAK	45	1.0	H	35.1	5.6	30.0	55.7	74.0	-18.3
21360.00	44.7	PEAK	45	1.0	H	35.1	5.6	30.0	55.4	74.0	-18.6
21360.00	43.2	PEAK	360	1.5	V	35.1	5.6	30.0	53.9	74.0	-20.1
26700.00	41.2	PEAK	360	1.5	V	35.1	5.6	30.0	51.9	74.0	-22.1
4860.00	38.0	PEAK, LO	360	1.0	V	32.5	4.9	30.0	45.4	74.0	-28.6
4860.00	37.9	PEAK, LO	45	1.2	H	32.5	4.9	30.0	45.3	74.0	-28.7

12.4 Final test data, 5GHz – 40GHz, Low Band, Antenna in Right Antenna Port, 15.407

Indicated			Table	Antenna		Correction Factor			Corrected Amplitude	FCC 15 Subpart E	
Frequency MHz	Ampl. dBµV/m	Comments	Angle Degree	Height Meter	Polar H/ V	Antenna dBµV/m	Cable DB	Amp. DB	Corr. Ampl. dBµV/m	Limit dBµ V/m	Margin dB
Low Channel, Low Band, antenna in right antenna port											
5260.00	101.2	AVE.	360	1.7	V	33.9	5.2	30.0	110.3		
5260.00	98.9	AVE.	45	1.2	H	33.9	5.2	30.0	108.0		
10520.00	61.0	PEAK, RB	45	1.2	H	35.1	5.6	30.0	71.7	74.0	-2.3
10520.00	59.4	PEAK, RB	360	1.7	V	35.1	5.6	30.0	70.1	74.0	-3.9
10520.00	38.5	AVE., RB	360	1.7	V	35.1	5.6	30.0	49.2	54.0	-4.8
15780.00	57.1	PEAK	360	1.7	V	35.1	5.6	30.0	67.8	74.0	-6.2
10520.00	36.2	AVE., RB	45	1.2	H	35.1	5.6	30.0	46.9	54.0	-7.1
26300.00	35.0	AVE.	45	1.2	H	35.1	5.6	30.0	45.7	54.0	-8.3
21040.00	34.6	AVE.	45	1.2	H	35.1	5.6	30.0	45.3	54.0	-8.7
15780.00	34.0	AVE.	360	1.7	V	35.1	5.6	30.0	44.7	54.0	-9.3
26300.00	32.7	AVE.	360	1.7	V	35.1	5.6	30.0	43.4	54.0	-10.6
15780.00	32.5	AVE.	45	1.2	H	35.1	5.6	30.0	43.2	54.0	-10.8
15780.00	52.3	PEAK	45	1.2	H	35.1	5.6	30.0	63.0	74.0	-11.0
21040.00	31.2	AVE.	360	1.7	V	35.1	5.6	30.0	41.9	54.0	-12.1
4780.00	31.9	AVE., LO	270	1.0	H	32.5	4.9	30.0	39.3	54.0	-14.7
4780.00	30.0	AVE., LO	360	1.2	V	32.5	4.9	30.0	37.4	54.0	-16.6
26300.00	46.0	PEAK	45	1.2	H	35.1	5.6	30.0	56.7	74.0	-17.3
26300.00	44.5	PEAK	360	1.7	V	35.1	5.6	30.0	55.2	74.0	-18.8
21040.00	42.0	PEAK	45	1.2	H	35.1	5.6	30.0	52.7	74.0	-21.3
21040.00	40.1	PEAK	360	1.7	V	35.1	5.6	30.0	50.8	74.0	-23.2
4780.00	38.9	PEAK, LO	270	1.0	H	32.5	4.9	30.0	46.3	74.0	-27.7
4780.00	38.8	PEAK, LO	360	1.2	V	32.5	4.9	30.0	46.2	74.0	-27.8

Middle Channel, Low Band, antenna in right antenna port											
5300.00	102.0	AVE.	360	1.4	V	33.9	5.2	30.0	111.1		
5300.00	95.6	AVE.	45	1.2	H	33.9	5.2	30.0	104.7		
10600.00	62.0	PEAK, RB	45	1.2	H	35.1	5.6	30.0	72.7	74.0	-1.3
10600.00	60.2	PEAK, RB	360	1.7	V	35.1	5.6	30.0	70.9	74.0	-3.1
10600.00	39.6	AVE., RB	360	1.4	V	35.1	5.6	30.0	50.3	54.0	-3.7
10600.00	37.2	AVE., RB	45	1.2	H	35.1	5.6	30.0	47.9	54.0	-6.1
26500.00	36.8	AVE.	45	1.2	H	35.1	5.6	30.0	47.5	54.0	-6.5
15900.00	56.8	PEAK	360	1.7	V	35.1	5.6	30.0	67.5	74.0	-6.5
15900.00	35.8	AVE.	360	1.4	V	35.1	5.6	30.0	46.5	54.0	-7.5
21200.00	35.3	AVE.	45	1.2	H	35.1	5.6	30.0	46.0	54.0	-8.0
15900.00	53.2	PEAK	45	1.2	H	35.1	5.6	30.0	63.9	74.0	-10.1
15900.00	31.9	AVE.	45	1.2	H	35.1	5.6	30.0	42.6	54.0	-11.4
26500.00	31.8	AVE.	360	1.4	V	35.1	5.6	30.0	42.5	54.0	-11.5
21200.00	31.3	AVE.	360	1.4	V	35.1	5.6	30.0	42.0	54.0	-12.0
26500.00	47.4	PEAK	45	1.2	H	35.1	5.6	30.0	58.1	74.0	-15.9
4820.00	30.6	AVE., LO	180	1.0	H	32.5	4.9	30.0	38.0	54.0	-16.0
4820.00	29.4	AVE., LO	360	1.0	V	32.5	4.9	30.0	36.8	54.0	-17.2
26500.00	45.0	PEAK	360	1.7	V	35.1	5.6	30.0	55.7	74.0	-18.3
21200.00	42.0	PEAK	45	1.2	H	35.1	5.6	30.0	52.7	74.0	-21.3
21200.00	41.2	PEAK	360	1.7	V	35.1	5.6	30.0	51.9	74.0	-22.1
4820.00	39.9	PEAK, LO	360	1.0	V	32.5	4.9	30.0	47.3	74.0	-26.7
4820.00	37.0	PEAK, LO	180	1.0	H	32.5	4.9	30.0	44.4	74.0	-29.6

High Channel, Low Band, antenna in right antenna port											
5340.00	99.4	AVE.	360	1.5	V	33.9	5.2	30.0	108.5		
5340.00	101.8	AVE.	0	1.2	H	33.9	5.2	30.0	110.9		
10680.00	41.3	AVE., RB	0	1.2	H	35.1	5.6	30.0	52.0	54.0	-2.0
10680.00	40.2	AVE., RB	360	1.5	V	35.1	5.6	30.0	50.9	54.0	-3.1
26700.00	37.8	AVE.	0	1.2	H	35.1	5.6	30.0	48.5	54.0	-5.5
16020.00	36.2	AVE.	360	1.5	V	35.1	5.6	30.0	46.9	54.0	-7.1
10680.00	56.2	PEAK, RB	0	1.2	H	35.1	5.6	30.0	66.9	74.0	-7.1
10680.00	55.8	PEAK, RB	360	1.5	V	35.1	5.6	30.0	66.5	74.0	-7.5
21360.00	35.2	AVE.	0	1.2	H	35.1	5.6	30.0	45.9	54.0	-8.1
21360.00	34.7	AVE.	360	1.5	V	35.1	5.6	30.0	45.4	54.0	-8.6
16020.00	54.3	PEAK	0	1.2	H	35.1	5.6	30.0	65.0	74.0	-9.0
16020.00	32.8	AVE.	0	1.2	H	35.1	5.6	30.0	43.5	54.0	-10.5
26700.00	30.8	AVE.	360	1.5	V	35.1	5.6	30.0	41.5	54.0	-12.5
16020.00	50.8	PEAK	360	1.5	V	35.1	5.6	30.0	61.5	74.0	-12.5
4860.00	33.7	AVE., LO	90	1.6	H	32.5	4.9	30.0	41.1	54.0	-12.9
4860.00	32.5	AVE., LO	360	1.0	V	32.5	4.9	30.0	39.9	54.0	-14.1
26700.00	47.0	PEAK	0	1.2	H	35.1	5.6	30.0	57.7	74.0	-16.3
26700.00	43.9	PEAK	360	1.5	V	35.1	5.6	30.0	54.6	74.0	-19.4
21360.00	43.2	PEAK	0	1.2	H	35.1	5.6	30.0	53.9	74.0	-20.1
21360.00	40.2	PEAK	360	1.5	V	35.1	5.6	30.0	50.9	74.0	-23.1
4860.00	39.1	PEAK, LO	360	1.0	V	32.5	4.9	30.0	46.5	74.0	-27.5
4860.00	38.4	PEAK, LO	90	1.6	H	32.5	4.9	30.0	45.8	74.0	-28.2

12.7.5 Final test data for unwanted emission

Indicated			Table	Antenna		Correction Factor			FCC 15 Subpart B	
Frequency MHz	Ampl. dBµV/m	Direction Degree	Height Meter	Polar H/V	Antenna dBµV/m	Cable Loss dBµV/m	Amp. dB	Corr. Ampl. dBµV/m	Limit dBµV/m	Margin dB
899.99	39.7	90	1.5	H	23.1	8.9	28.5	43.2	46	-2.8
76.54	51.9	135	1.2	V	9.5	2.8	27.5	36.7	40	-3.3
408.95	47.9	315	1	H	15.8	5.8	28.0	41.5	46	-4.5
75.01	49.3	135	1.2	V	9.5	2.8	27.5	34.1	40	-5.9
372.9	47.0	270	2	H	14.9	5.7	27.7	39.9	46	-6.1
957.43	33.9	180	1.5	H	23.7	9.8	28.3	39.1	46	-6.9
85.26	47.7	90	1	V	9.7	2.9	27.5	32.8	40	-7.2
47.99	45.9	225	1	V	11.3	2.2	26.9	32.5	40	-7.5
735.23	35.6	180	1	H	22.2	8.1	28.7	37.2	46	-8.8
119.99	44.8	45	1.5	V	11.9	3.5	27.7	32.5	43.5	-11.0
634.74	35.0	180	1.2	H	20.1	7.4	29.0	33.5	46	-12.5
144.01	40.8	90	1	V	13.2	3.6	27.5	30.1	43.5	-13.4
323.94	39.5	315	1.2	H	13.9	5.4	27.3	31.5	46	-14.5

Note:

AVE: Average
RB: Restricted Band
LO: Local Oscillator

13 - CONDUCTED EMISSIONS

13.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at BACL is $\pm$2.4 dB.

13.2 EUT Setup

The measurement was performed at the **O**pen **A**rea **T**est **S**ite, using the same setup per ANSI C63.4-1992 measurement procedure. The specification used was FCC 15 Subpart B limits.

The spacing between the peripherals was 10 centimeters.

External I/O cables were draped along the edge of the test table and bundle when necessary.

The host PC system was connected with 110Vac/60Hz power source.

13.3 Spectrum Analyzer Setup

The spectrum analyzer was set with the following configurations during the conduction test:

Start Frequency	450 kHz
Stop Frequency	30 MHz
Sweep Speed	Auto
IF Bandwidth	10 kHz
Video Bandwidth	10 kHz
Quasi-Peak Adapter Bandwidth	9 kHz
Quasi-Peak Adapter Mode	Normal

13.4 Test Procedure

During the conducted emission test, the power cord of the host system was connected to the auxiliary outlet of the first LISN.

Maximizing procedure was performed on the six (6) highest emissions of each modes tested to ensure EUT is compliant with all installation combination.

All data was recorded in the peak detection mode. Quasi-peak readings were only performed when an emission was found to be marginal (within -4 dBµV of specification limits). Quasi-peak readings are distinguished with a "**Qp**".

13.5 Summary of Test Results

According to the data in section 11.6, the EUT complies with the FCC Conducted margin for a Class B device, with the *worst* margin reading of:

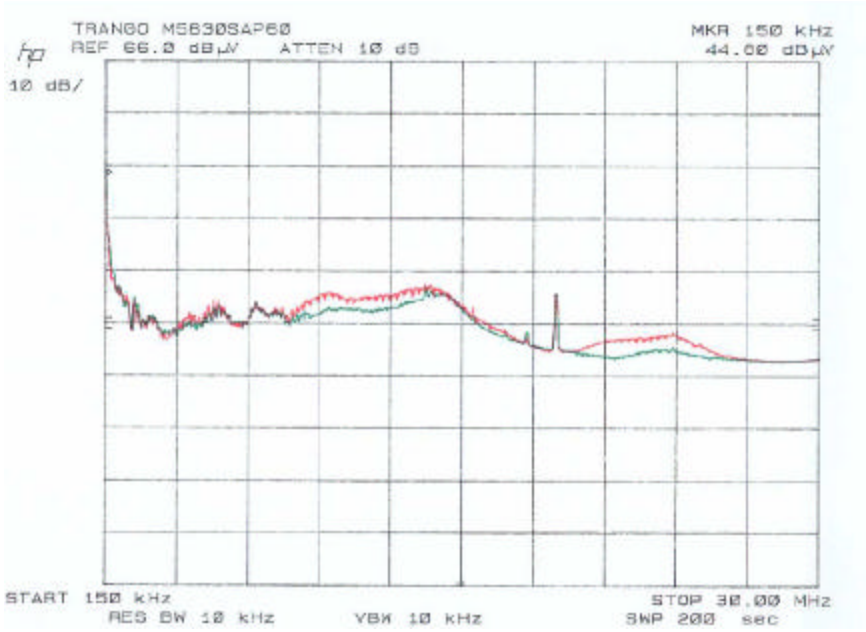
-20.5 dBµV at 19.820MHz in the Line mode

13.6 Conducted Emissions Test Data

LINE CONDUCTED EMISSIONS				FCC PART 15 CLASS B	
Frequency MHz	Amplitude dBµV	Detector Qp/Ave/Peak	Phase Line/Neutral	Limit dBµV	Margin dB
19.820	20.5	Ave	Line	50.0	-20.5
13.820	21.0	Ave	Line	50.0	-21.0
13.500	21.0	Ave	Neutral	50.0	-21.0
19.820	21.8	QP	Line	60.0	-21.8
13.500	22.7	QP	Neutral	60.0	-22.7
13.820	23.4	QP	Line	60.0	-23.4
0.300	31.4	Ave	Neutral	50.2	-31.4
0.300	32.3	QP	Neutral	60.2	-32.3
0.150	42.0	Ave	Line	56.0	-42.0
0.150	43.5	Ave	Neutral	56.0	-43.5
0.150	44.0	QP	Line	66.0	-44.0
0.150	44.8	QP	Neutral	66.0	-44.8

13.7 Plot of Conducted Emissions Test Data

Plot(s) of Conducted Emissions Test Data is presented hereinafter as reference.



14 - RF EXPOSURE

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

According to §1.1310 and §2.1093 RF exposure is calculated.

Limits for Maximum Permissive Exposure (MPE)

(A) Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minute)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

(B) Limits for Occupational/Controlled Exposures

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*($900/f^2$)	6
30-300	61.4	0.163	1.0	6
300-1500	/	/	f/300	6
1500-100,000	/	/	5	6

f = frequency in MHz
* = Plane-wave equivalent power density

MPE Prediction

Predication of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$S = PG/4\pi R^2$

Where: S = power density
P = power input to antenna
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna

Test Result

Maximum Peak Output (dBm)	Antenna Gain (dBi)	Uncontrolled Exposure MPE Minimum Distance (cm)
20.70 (High Band, 5736~5836MHz)	14	15.3 cm
16.43 (Low Band, 5260~5340MHz)	13	8.4 cm

Note: The EUT is defined to be a mobile device. The user manual states that the minimum distance is 20 cm in order to accommodate all various antenna gains available for this device.

15 - Discontinue Transmitting With Absence Of Data Or Operational Failure

According to § 15.407 (c), the device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the user of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application a description of how this requirement is met.

Please refer to respective technical description.

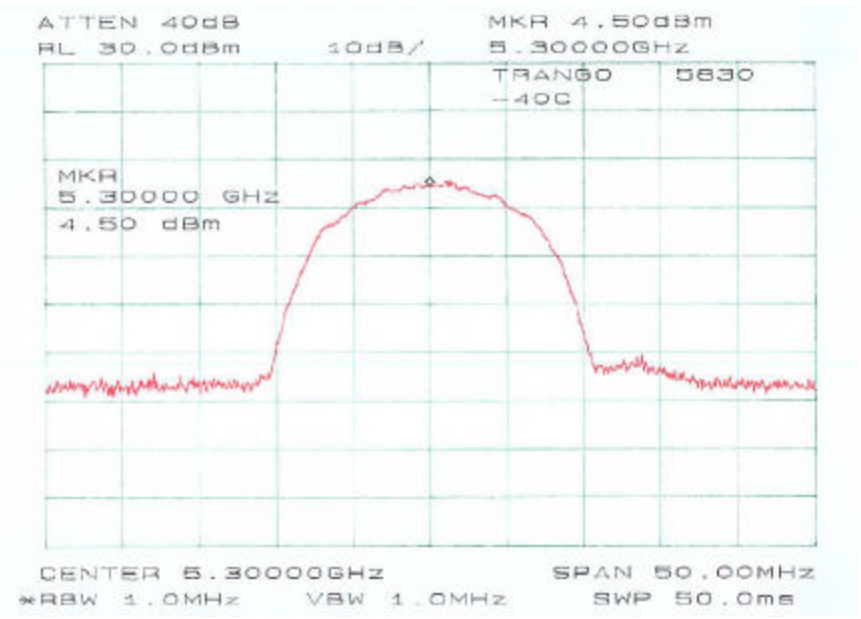
16 - Frequency Stability

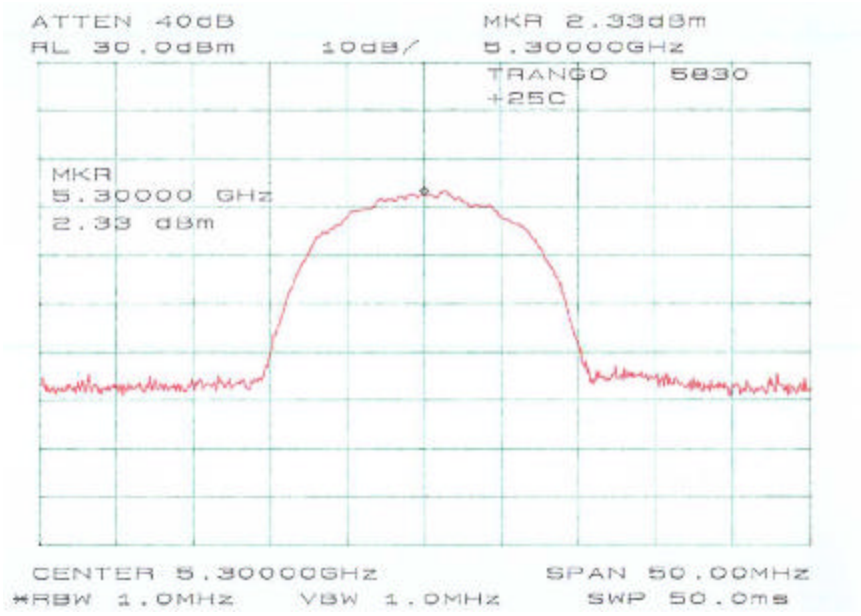
16.1 Standard Applicable

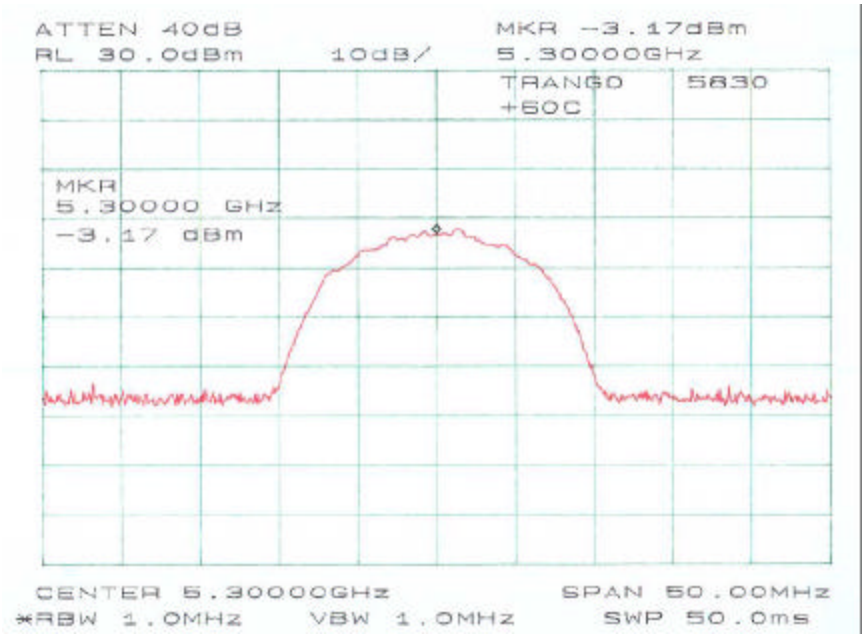
According to §15.407 (g), manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation .

16.2 Measurement Result

Please refer to following pages for plots of spurious emission.


ATTEN 40dB
RL 30.0dBm
10dB/
MKR 4.50dBm
5.30000GHz
TRANGO 5830
-40C
MKR
5.30000 GHz
4.50 dBm
CENTER 5.30000GHz
SPAN 50.00MHz
*RBW 1.0MHz
VBW 1.0MHz
SWP 50.0ms


ATTEN 40dB
RL 30.0dBm
10dB/
MKR 2.33dBm
5.30000GHz
TRANGO 5830
+25C
MKR
5.30000 GHz
2.33 dBm
CENTER 5.30000GHz
SPAN 50.00MHz
*RBW 1.0MHz
VBW 1.0MHz
SWP 50.0ms


ATTEN 40dB
RL 30.0dBm
10dB/
MKR -3.17dBm
5.30000GHz
TRANGO 5830
+60C
MKR
5.30000 GHz
-3.17 dBm
CENTER 5.30000GHz
SPAN 50.00MHz
*RBW 1.0MHz
VBW 1.0MHz
SWP 50.0ms