

FCC Test Report

Product Name	ROG BALTEUS Qi
Model No.	NH01
FCC ID.	EMJMNH01

Applicant	Primax Electronics Ltd
Address	669 Ruey Kuang Road Neihu 114, Taipei, Taiwan

Date of Receipt	Aug. 16, 2018
Issued Date	Oct. 05, 2018
Report No.	1880235R-RFUSP20V00
Report Version	V1.0



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.

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Test Report

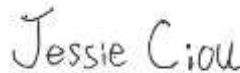
Issued Date: Oct. 05, 2018

Report No.: 1880235R-RFUSP20V00



Product Name	ROG BALTEUS Qi
Applicant	Primax Electronics Ltd
Address	669 Ruey Kuang Road Neihu 114, Taipei, Taiwan
Manufacturer	Primax Electronics Ltd
Model No.	NH01
FCC ID.	EMJMNH01
EUT Rated Voltage	DC 5V
EUT Test Voltage	DC 5V
Trade Name	ASUS
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2017 ANSI C63.4: 2014, ANSI C63.10: 2013
Test Result	Complied

Documented By :



(Adm. Assistant / Jessie Ciou)

Tested By :



(Engineer / Anson lu)

Approved By :



(Director / Vincent Lin)

TABLE OF CONTENTS

Description	Page
1. GENERAL INFORMATION.....	4
1.1. EUT Description	4
1.2. Test System Details	5
1.3. Configuration of Test System	5
1.4. EUT Exercise Software	5
1.5. Test Facility.....	6
1.6. List of Test Equipment.....	7
2. Conducted Emission	8
2.1. Test Setup.....	8
2.2. Limits.....	8
2.3. Test Procedure.....	8
2.4. Uncertainty.....	8
2.5. Test Result of Conducted Emission.....	9
3. Radiated Emission	11
3.1. Test Setup.....	11
3.2. Limits.....	12
3.3. Test Procedure.....	13
3.4. Uncertainty.....	13
3.5. Test Result of Radiated Emission.....	14
4. EMI Reduction Method During Compliance Testing	17
Attachment 1: EUT Test Photographs	
Attachment 2: EUT Detailed Photographs	

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	ROG BALTEUS Qi
Trade Name	ASUS
Model No.	NH01
FCC ID.	EMJMNH01
Frequency Range	110~190KHz
Type of Modulation	ASK Modulation
Type of antenna	Coil Antenna
USB Cable	Non-shielded, 1.85m
USB Cable	Non-shielded, 1.00m

Frequency of Channel:

Channel	Frequency
Channel 1:	142KHz

Note:

1. The EUT is a ROG BALTEUS Qi with a built-in 110~190kHz transceiver.
2. These tests were radiated on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.209
3. Only the higher Fundamental Radiated Emission channel was tested and recorded in this report.

Test Mode	Mode 1: Transmit
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1.2. Test System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

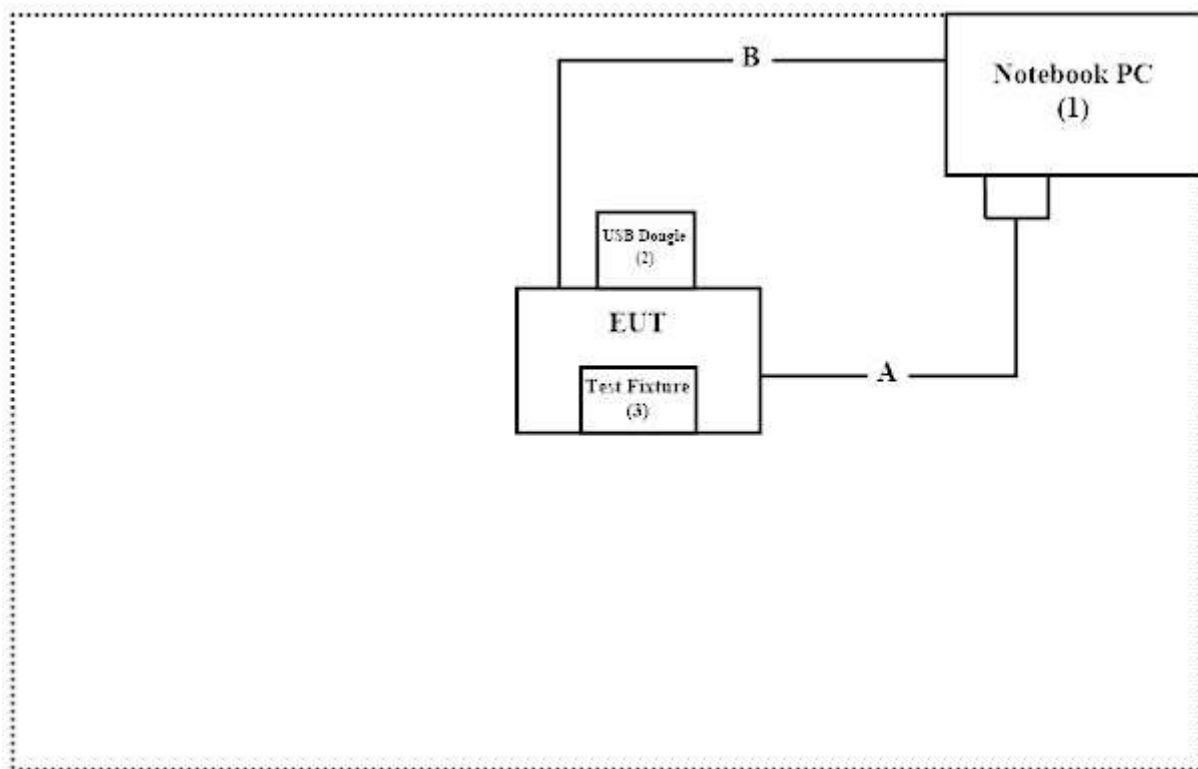
Product	Manufacturer	Model No.	Serial No.	Power Cord
1 Notebook PC	DELL	Latitude E5440	HG26TZ1	Non-Shielded, 0.8m
2 USB Dongle	SanDisk	CZ33	N/A	N/A
3 Test Fixture	ASUS	N/A	N/A	N/A

Note:

1. The Test Fixture is a cement resistor(30W5Ω).
2. The USB Dongle is a Flash Disk.

Signal Cable Type	Signal cable Description
A USB Cable	Non-shielded, 1.00m
B USB Cable	Non-shielded, 1.85m

1.3. Configuration of Test System



1.4. EUT Exercise Software

- (1) Setup the EUT as shown in Section 1.4
- (2) Turn on the power of all equipment.
- (3) Start the continuous transmitter.
- (4) Verify that the EUT works properly.

1.5. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

The related certificate for our laboratories about the test site and management system can be downloaded from DEKRA Testing and Certification Co., Ltd. Web Site:

<http://www.dekra.com.tw/english/about/certificates.aspx?bval=5>

The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our Web site: http://www.dekra.com.tw/index_en

Site Description: Accredited by TAF
Accredited Number: 3023

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E-Mail : info.tw@dekra.com

FCC Accreditation Number: TW3023

1.6. List of Test Equipment

For Conducted measurements /CB3/SR8

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
	Temperature Chamber	WIT GROUP	TH-1S-B	EQ-201-00146	2018/02/12	2019/02/11
X	Spectrum Analyzer	Agilent	N9010A	MY48030495	2017/10/13	2018/10/12
	Peak Power Analyzer	Keysight	8990B	MY51000410	2018/08/01	2019/07/31
	Wideband Power Sensor	Keysight	N1923A	MY56080003	2018/07/25	2019/07/24
	Wideband Power Sensor	Keysight	N1923A	MY56080004	2018/07/25	2019/07/24
X	EMI Test Receiver	R&S	ESCS 30	100369	2017/11/07	2018/11/06
X	LISN	R&S	ESH3-Z5	836679/017	2018/02/09	2019/02/08
X	LISN	R&S	ENV216	100097	2018/02/09	2019/02/08
X	Coaxial Cable	DEKRA	RG 400	LC018-RG	2018/06/21	2019/06/20

For Radiated measurements /Site3/CB8

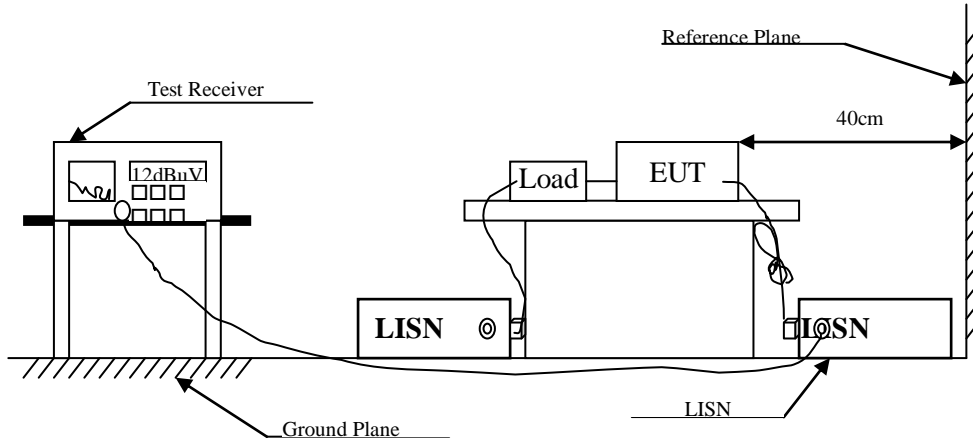
	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
X	Spectrum Analyzer	R&S	FSP40	100170	2018/03/12	2019/03/11
X	Loop Antenna	Teseq	HLA6121	37133	2017/10/13	2019/10/12
X	Bilog Antenna	Schaffner Chase	CBL6112B	2707	2018/06/24	2019/06/23
X	Coaxial Cable	DEKRA	RG 214	LC003-RG	2018/06/14	2019/06/13
X	Pre-Amplifier	Jet-Power	JPA-10M1G33	170101000330010	2018/06/14	2019/06/13
	Horn Antenna	ETS-Lindgren	3117	00135205	2018/05/03	2019/05/02
	Horn Antenna	SCHWARZBECK	9120D	576	2017/11/30	2018/11/29
	Pre-Amplifier	EMCI	EMC012630SE	980210	2018/04/10	2019/04/09
	Horn Antenna	Com-Power	AH-840	101043	2018/01/09	2019/01/08
	Amplifier + Cable	EMCI	EMC184045SE	980370	2018/03/21	2019/03/20
	Filter	MICRO-TRONICS	BRM50702	G270	2018/08/06	2019/08/05
	Filter	MICRO-TRONICS	BRM50716	G196	2018/08/06	2019/08/05

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with "X" are used to measure the final test results.
3. Test Software version :QuiTek EMI 2.0 V2.1.113.

2. Conducted Emission

2.1. Test Setup



2.2. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBuV) Limit		
Frequency MHz	Limits	
	QP	AV
0.15 - 0.50	66-56 ^(註)	56-46 ^(註)
0.50-5.0	56	46
5.0 - 30	60	50

2.3. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.

Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

2.4. Uncertainty

± 2.26 dB

2.5. Test Result of Conducted Emission

Product : ROG BALTEUS Qi
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Mode : Mode 1: Transmit
 Test Date : 2018/09/21

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
LINE 1					
Quasi-Peak					
0.162	9.745	44.100	53.845	-11.812	65.657
0.244	9.740	37.540	47.280	-16.034	63.314
0.330	9.743	33.980	43.723	-17.134	60.857
0.416	9.747	29.800	39.547	-18.853	58.400
0.478	9.749	30.680	40.429	-16.200	56.629
16.970	10.191	27.580	37.771	-22.229	60.000
Average					
0.162	9.745	34.910	44.655	-11.002	55.657
0.244	9.740	27.080	36.820	-16.494	53.314
0.330	9.743	20.740	30.483	-20.374	50.857
0.416	9.747	13.530	23.277	-25.123	48.400
0.478	9.749	17.860	27.609	-19.020	46.629
16.970	10.191	20.990	31.181	-18.819	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : ROG BALTEUS Qi
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Mode : Mode 1: Transmit
 Test Date : 2018/09/21

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
LINE 2					
Quasi-Peak					
0.166	9.736	41.980	51.716	-13.827	65.543
0.244	9.740	36.380	46.120	-17.194	63.314
0.326	9.733	33.840	43.573	-17.398	60.971
0.404	9.736	30.200	39.936	-18.807	58.743
0.470	9.739	28.740	38.479	-18.378	56.857
17.142	10.304	30.520	40.824	-19.176	60.000
Average					
0.166	9.736	29.860	39.596	-15.947	55.543
0.244	9.740	26.420	36.160	-17.154	53.314
0.326	9.733	21.180	30.913	-20.058	50.971
0.404	9.736	18.680	28.416	-20.327	48.743
0.470	9.739	14.650	24.389	-22.468	46.857
17.142	10.304	21.180	31.484	-18.516	50.000

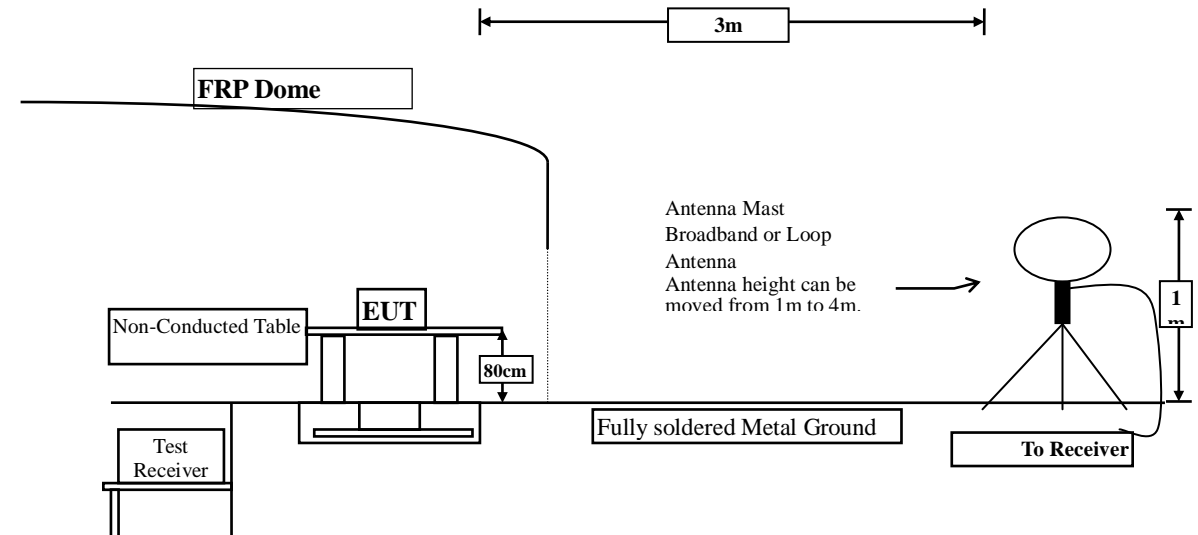
Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "█" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

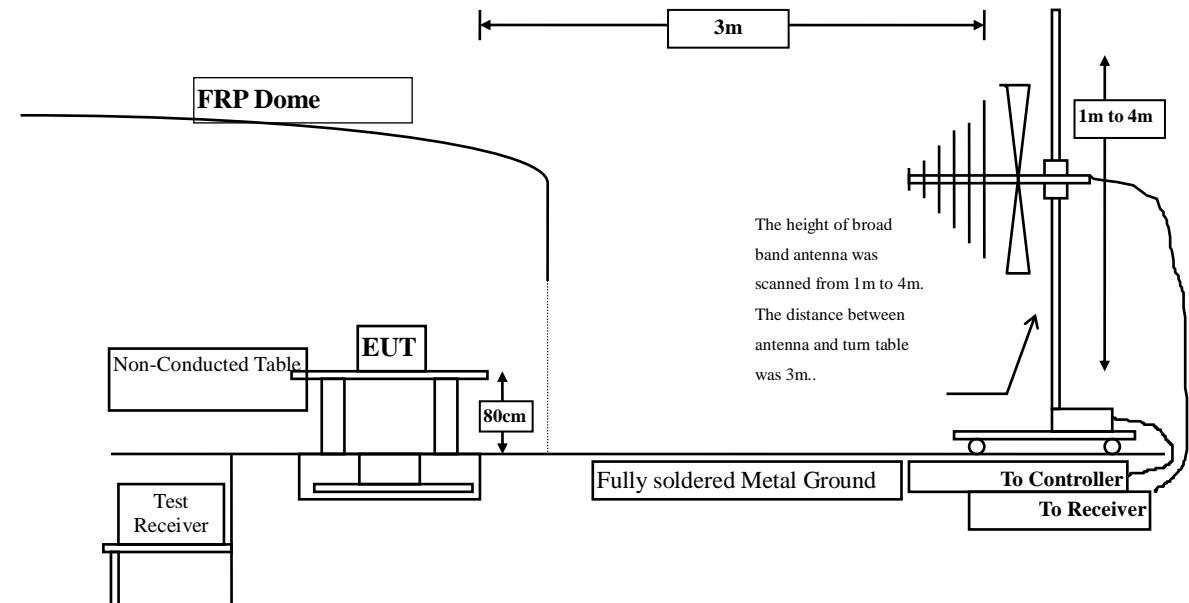
3. Radiated Emission

3.1. Test Setup

Under 30MHz Test Setup



Radiated Emission Below 1GHz



3.2. Limits

FCC Part 15 Subpart B Paragraph 15.209 Limits		
Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 - 0.490	2,400/F(kHz)	300
0.490– 1.705	24,000/F(kHz)	30
1.705 – 30	30	30
30 – 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

- Remarks :
1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
 2. In the Above Table, the tighter limit applies at the band edges.
 3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

3.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested compliance to FCC 47CFR 15.209 requirements.

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10: 2013 on radiated measurement.

The resolution bandwidth below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz. Radiated emission measurements below 1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

The worst radiated emission is measured on the Final Measurement.

The measurement frequency range form 9kHz - 10th Harmonic of fundamental was investigated.

3.4. Uncertainty

± 4.08 dB above 1GHz

± 4.22 dB below 1GHz

3.5. Test Result of Radiated Emission

Product : ROG BALTEUS Qi
 Test Item : Fundamental Radiated Emission
 Test Site : No.3 OATS
 Test date : 2018/09/18
 Test Mode : Mode 1: Transmit

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
0.142	19.981	52.700	72.681	-31.877	104.558
Vertical					
0.142	19.981	38.500	58.481	-46.077	104.558

Note:

1. Limit=24.558 dBuV/300m + 40*Log (300(m)/3(m))= 104.558dBuV/3m (Quasi-Peak).
2. All Readings below 1GHz are Quasi-Peak, above are average value.
3. Measurement Level = Reading Level + Correct Factor.

Product : ROG BALTEUS Qi
 Test Item : Fundamental Radiated Emission
 Test Site : No.3 OATS
 Test date : 2018/09/21
 Test Mode : Mode 1: Transmit (9k-30M)

9kHz~30MHz

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Quasi-Peak					
Horizontal					
0.284	19.908	20.500	40.408	-68.261	108.670
0.426	19.900	31.200	51.100	-47.320	98.420
0.568	19.900	11.400	31.300	-41.805	73.105
0.710	19.900	18.700	38.600	-33.239	71.839
0.852	19.900	20.200	40.100	-30.473	70.573
0.994	19.900	13.400	33.300	-36.008	69.308
1.136	19.864	14.200	34.064	-33.978	68.042
1.420	19.800	12.870	32.670	-32.841	65.510
Vertical					
0.284	19.908	17.600	37.508	-71.161	108.670
0.426	19.900	16.800	36.700	-61.720	98.420
0.568	19.900	9.600	29.500	-43.605	73.105
0.710	19.900	11.400	31.300	-40.539	71.839
0.852	19.900	6.200	26.100	-44.473	70.573
0.994	19.900	9.900	29.800	-39.508	69.308
1.136	19.864	8.700	28.564	-39.478	68.042
1.420	19.800	7.800	27.600	-37.911	65.510

Note:

1. All Readings below 1GHz are Quasi-Peak.
2. Measurement Level = Reading Level + Correct Factor.
3. "█" means the worst emission level.
4. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : ROG BALTEUS Qi
 Test Item : Fundamental Radiated Emission
 Test Site : No.3 OATS
 Test date : 2018/09/21
 Test Mode : Mode 1: Transmit (30M-1G)

9kHz~30MHz

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Quasi-Peak					
Horizontal					
98.397	17.001	14.206	31.208	-12.292	43.500
250.737	14.902	18.267	33.170	-12.830	46.000
381.314	20.218	14.589	34.806	-11.194	46.000
633.141	26.214	10.811	37.025	-8.975	46.000
721.747	25.571	11.231	36.802	-9.198	46.000
989.119	27.372	10.351	37.723	-16.277	54.000
Vertical					
146.587	15.272	15.579	30.852	-12.648	43.500
249.183	19.869	13.680	33.549	-12.451	46.000
457.484	20.757	7.931	28.688	-17.312	46.000
603.606	23.348	7.339	30.687	-15.313	46.000
757.500	24.315	8.461	32.776	-13.224	46.000
981.346	27.918	8.026	35.944	-18.056	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak.
2. Measurement Level = Reading Level + Correct Factor.
3. “ ” means the worst emission level.
4. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

4. EMI Reduction Method During Compliance Testing

No modification was made during testing.