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# **MEASUREMENT REPORT**

# FCC PART 15.247 Bluetooth v4.0

FCC ID: WL6-TE69SA3

**APPLICANT:** ELITEGROUP COMPUTER SYSTEMS CO., LTD

**Application Type:** Certification

Product: Tablet PC

Model No.: TE69SA3

**Brand Name:** ECS ELITEGROUP

FCC Classification: Digital Transmission System (DTS)

FCC Rule Part(s): Part 15.247

**Test Procedure(s):** ANSI C63.10-2013, KDB 558074 D01v03r03

**Test Date:** Mar. 26 ~ Apr. 02, 2015

Reviewed By : Residual

(Robin Wu)

Approved By : Marlinchen

(Marlin Chen)





The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in KDB 558074 D01v03r03. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

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# **Revision History**

Report No.	Version	Description	Issue Date
1503RSU01802	Rev. 01	Initial report	09-18-2015

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### §2.1033 General Information

Applicant:	ELITEGROUP COMPUTER SYSTEMS CO., LTD			
Applicant Address:	No.239, Sec. 2, Tiding Blvd., Neihu Dist, Taipei City 14, Taiwan (R.O.C)			
Manufacturer:	ELITEGROUP COMPUTER SYSTEMS CO., LTD			
Manufacturer Address:	No.239, Sec. 2, Tiding Blvd., Neihu Dist, Taipei City 14, Taiwan (R.O.C)			
Test Site:	MRT Technology (Suzhou) Co., Ltd			
Test Site Address:	D8 Building, Youxin Industrial Park, No.2 Tian'edang Rd., Wuzhong			
	Economic Development Zone, Suzhou, China			
MRT Registration No.:	809388			
FCC Rule Part(s):	Part 15.247			
Model No.:	TE69SA3			
FCC ID: WL6-TE69SA3				
Test Device Serial No.:	N/A ☐ Production ☐ Pre-Production ☐ Engineering			
FCC Classification:	Digital Transmission System (DTS)			

#### **Test Facility / Accreditations**

Measurements were performed at MRT Laboratory located in Tian'edang Rd., Suzhou, China.

- MRT facility is a FCC registered (MRT Reg. No. 809388) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules.
- MRT facility is an IC registered (MRT Reg. No. 11384A-1) test laboratory with the site description on file at Industry Canada.
- MRT facility is a VCCI registered (R-4179, G-814, C-4664, T-2206) test laboratory with the site description on file at VCCI Council.
- MRT Lab is accredited to ISO 17025 by the American Association for Laboratory Accreditation (A2LA) under the American Association for Laboratory Accreditation Program (A2LA Cert. No. 3628.01) in EMC, Telecommunications and Radio testing for FCC, Industry Canada, EU and TELEC Rules.



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#### 1. INTRODUCTION

#### 1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Industry Canada Certification and Engineering Bureau.

#### 1.2. MRT Test Location

The map below shows the location of the MRT LABORATORY, its proximity to the Taihu Lake. These measurement tests were conducted at the MRT Technology (Suzhou) Co., Ltd. Facility located at D8 Building, Youxin Industrial Park, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2009 on September 30, 2013.



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# 2. PRODUCT INFORMATION

# 2.1. Equipment Description

Product Name	Tablet PC
Model No.	TE69SA3
Antenna Type	Internal
Wi-Fi Specification	802.11b/g/n-HT20
Bluetooth Version	v3.0 + HS / v4.0 LE
GPS Frequency	1575.42MHz
GSM Operation Band (s)	GSM850 / PCS1900
UMTS Operation Band (s)	WCDMA Band II / WCDMA Band V
Release Version	Rel-7
Component	
Adapter #1	Model No.: W12-010N3A
	Output Power: 5VDC/2A
	Input Power: 100 - 240V ~ 50/60Hz, 0.3A
Adapter #2	Model No.: WB-10G05FU
	Output Power: 5VDC/2A
	Input Power: 100 - 240V ~ 50/60Hz, 0.4A

# 2.2. Product Specification Subjective to this Report

Bluetooth Specification				
Frequency Range	2400 ~ 2483.5MHz			
Number of Channels	Bluetooth v4.0 LE: 40			
Channel Spacing	Bluetooth v4.0 LE: 2MHz			
Antenna Type / Gain	Internal Antenna / 2.0dBi			
Type of Modulation	Bluetooth v4.0 LE: GFSK			

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### **Channel List for BLE**

Channel	Frequency	Channel	Frequency	Channel	Frequency
00	2402 MHz	01	2404 MHz	02	2406 MHz
03	2408 MHz	04	2410 MHz	05	2412 MHz
06	2414 MHz	07	2416 MHz	08	2418 MHz
09	2420 MHz	10	2422 MHz	11	2424 MHz
12	2426 MHz	13	2428 MHz	14	2430 MHz
15	2432 MHz	16	2434 MHz	17	2436 MHz
18	2438 MHz	19	2440 MHz	20	2442 MHz
21	2444 MHz	22	2446 MHz	23	2448 MHz
24	2450 MHz	25	2452 MHz	26	2454 MHz
27	2456 MHz	28	2458 MHz	29	2460 MHz
30	2462 MHz	31	2464 MHz	32	2466 MHz
33	2468 MHz	34	2470 MHz	35	2472 MHz
36	2474 MHz	37	2476 MHz	38	2478 MHz
39	2480 MHz	N/A	N/A	N/A	N/A

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### 2.3. Device Capabilities

This device contains the following capabilities: 850/1900 GSM/GPRS/EDGE, 850/1900 WCDMA/HSDPA/HSUPA/HSPA+, 802.11b/g/n WLAN (DTS), Bluetooth (1x, EDR, BLE)

### 2.4. Test Configuration

The **Tablet PC FCC ID: WL6-TE69SA3** was tested per the guidance of KDB 558074 D01v03r03. ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing.

### 2.5. EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

### 2.6. Labeling Requirements

Per 2.1074 & 15.19; Docket 95-19

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practical, only the trade name and FCC ID must be displayed on the device per Section 15.19(a)(5). Please see attachment for FCC ID label and label location.

#### 2.7. Test Software

The test utility software used during testing was "PhoneTool".

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#### 3. DESCRIPTION OF TEST

#### 3.1. Evaluation Procedure

The measurement procedures described in the American National Standard for Testing Unlicensed Wireless Devices (ANSI C63.10-2013), and the guidance provided in KDB 558074 D01v03r03 were used in the measurement of the **Tablet PC FCC ID: WL6-TE69SA3**.

Deviation from measurement procedure......None

### 3.2. AC Line Conducted Emissions

The line-conducted facility is located inside an 8'x4'x4' shielded enclosure. A 1m x 2m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz,  $50\Omega/50$ uH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.

The EUT is powered from one LISN and the support equipment is powered from the second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference ground-plane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the receiver and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The receiver was scanned from 150kHz to 30MHz. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 9kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Each emission was also maximized by varying: power lines, the mode of operation or data exchange speed, or support equipment whichever determined the worst-case emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions were used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz resolution bandwidth for final measurements.

An extension cord was used to connect to a single LISN which powered by EUT. The extension cord was calibrated with LISN, the impedance and insertion loss are compliance with the requirements as stated in ANSI C63.10-2013.

Line conducted emissions test results are shown in Section 7.8.

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#### 3.3. Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. A MF Model 210SS turntable is used for radiated measurement. It is a continuously rotatable, remote controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm high PVC support structure is placed on top of the turntable. For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up for frequencies below 1GHz was placed on top of the 0.8 meter high, 1 x 1.5 meter table; and test set-up for frequencies 1-40GHz was placed on top of the 1.5 meter high, 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, if applicable, turntable azimuth, and receive antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, whichever produced the worst-case emissions. According to 3dB BeamWidth of horn antenna, the horn antenna should be always directed to the EUT when rising height.

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### 4. ANTENNA REQUIREMENTS

### Excerpt from §15.203 of the FCC Rules/Regulations:

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section."

- The antenna of the Tablet PC is permanently attached.
- There are no provisions for connection to an external antenna.

#### **Conclusion:**

The Tablet PC FCC ID: WL6-TE69SA3 unit complies with the requirement of §15.203.

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# 5. TEST EQUIPMENT CALIBRATION DATE

### **Conducted Emissions**

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2015/11/07
Two-Line V-Network	R&S	ENV216	MRTSUE06002	1 year	2015/11/07
Two-Line V-Network	R&S	ENV216	MRTSUE06003	1 year	2015/11/07
Temperature/Humidity Meter	Ouleinuo	N/A	MRTSUE06114	1 year	2015/11/20

### Radiated Emissions

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Agilent	E4447A	MRTSUE06028	1 year	2015/10/09
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2015/11/07
Preamplifier	Agilent	83017A	MRTSUE06020	1 year	2015/12/13
Preamplifier	Schwarzbeck	BBV9721	MRTSUE06121	1 year	2016/04/15
Loop Antenna	Schwarzbeck	FMZB1519	MRTSUE06025	1 year	2015/11/08
TRILOG Antenna	Schwarzbeck	VULB9162	MRTSUE06022	1 year	2015/11/08
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	MRTSUE06023	1 year	2015/11/08
Broadband Horn Antenna	Schwarzbeck	BBHA9170	MRTSUE06024	1 year	2016/01/05
Temperature/Humidity Meter	Ouleinuo	N/A	MRTSUE06115	1 year	2015/11/20

# Conducted Test Equipment

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Agilent	N9020A	MRTSUE06106	1 year	2016/04/23
USB Wideband Power Sensor	Boonton	55006	MRTSUE06109	1 year	2015/10/15
Temperature/Humidity Meter	Ouleinuo	N/A	MRTSUE06112	1 year	2015/11/20

Software	Version	Function	
e3	V8.3.5	EMI Test Software	

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### 6. MEASUREMENT UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k = 2.

#### **AC Conducted Emission Measurement**

Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)):

150kHz~30MHz: 3.46dB

#### Radiated Emission Measurement

Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)):

9kHz ~ 1GHz: 4.18dB 1GHz ~ 25GHz: 4.76dB

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#### 7. TEST RESULT

### 7.1. Summary

Company Name: <u>ELITEGROUP COMPUTER SYSTEMS CO., LTD</u>

FCC ID: WL6-TE69SA3

FCC Classification: <u>Digital Transmission System (DTS)</u>

Data Rate(s) Tested: 1Mbps(GFSK) (BLE)

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.247(a)(2)	6dB Bandwidth	≥ 500kHz	Pass		Section 7.2
15.247(b)(3)	Output Power	≤ 1Watt			Section 7.3
15.247(e)	Power Spectral Density	≤ 8dBm / 3kHz Band	Conducted	Pass	Section 7.4
15.247(d)	Band Edge / Out-of-Band Emissions	≥ 20dBc(Peak)		Pass	Section 7.5
15.205 15.209	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209	Radiated	Pass	Section 7.6 & 7.7
15.207	AC Conducted Emissions 150kHz - 30MHz	< FCC 15.207 limits	Line Conducted	Pass	Section 7.8

#### Notes:

- 1) All modes of operation and data rates were investigated. For radiated emission test, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables and attenuators.

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#### 7.2. 6dB Bandwidth Measurement

#### 7.2.1. Test Limit

The minimum 6dB bandwidth shall be at least 500 kHz.

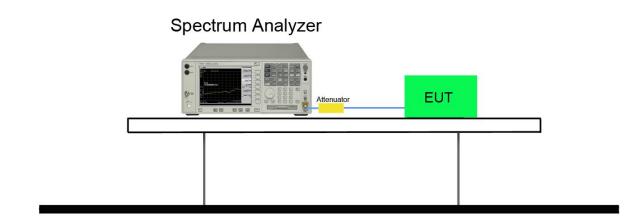
#### 7.2.2. Test Procedure used

KDB 558074 D01v03r03 - Section 8.2 Option 2

#### 7.2.3. Test Setting

- The Spectrum's automatic bandwidth measurement capability was used to perform the 6dB bandwidth measurement. The "X" dB bandwidth parameter was set to X = 6. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
- 2. Set RBW = 100 kHz
- 3. VBW ≥ 3 × RBW
- 4. Detector = Peak
- 5. Trace mode = max hold
- 6. Sweep = auto couple
- 7. Allow the trace was allowed to stabilize

#### 7.2.4. Test Setup

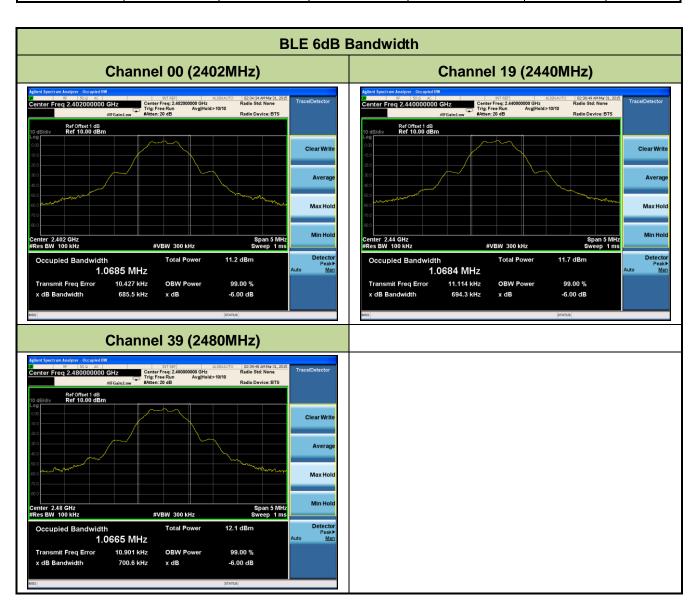


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### 7.2.5. Test Result

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Result
BLE	1	00	2402	0.686	≥ 0.5	Pass
BLE	1	19	2440	0.694	≥ 0.5	Pass
BLE	1	39	2480	0.701	≥ 0.5	Pass



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### 7.3. Output Power Measurement

#### 7.3.1. Test Limit

The maximum out power shall be less 1 Watt (30dBm).

#### 7.3.2. Test Procedure Used

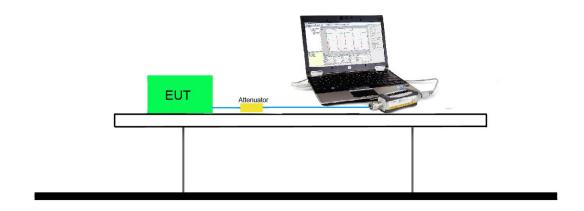
KDB 558074 D01v03r03 - Section 9.1.2 PKPM1 Peak Power Method (for signals with BW ≤ 50MHz)

#### 7.3.3. Test Setting

### Method PKPM1 (Peak Power Measurement of Signals with DTS BW ≤ 50MHz)

Peak power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The pulse sensor employs a VBW = 50MHz so this method was only used for signals whose DTS bandwidth was less than or equal to 50MHz.

#### 7.3.4. Test Setup



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# 7.3.5. Test Result of Output Power

# **Test Result of Peak Output Power**

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Result
BLE	1	00	2402	3.26	≤ 30	Pass
BLE	1	19	2440	3.52	≤ 30	Pass
BLE	1	39	2480	4.05	≤ 30	Pass

# **Test Result of Average Output Power (Reporting Only)**

Test Mode	Data Rate	Channel No.	Frequency	Average	Limit	Result
	(Mbps)		(MHz)	Power (dBm)	(dBm)	
BLE	1	00	2402	-5.06	≤ 30	Pass
BLE	1	19	2440	-4.77	≤ 30	Pass
BLE	1	39	2480	-4.27	≤ 30	Pass

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### 7.4. Power Spectral Density Measurement

#### 7.4.1. Test Limit

The maximum permissible power spectral density is 8dBm in any 3 kHz band.

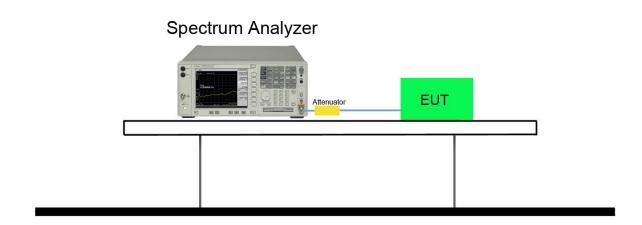
#### 7.4.2. Test Procedure Used

KDB 558074 D01v03r03 - Section 10.2 Method PKPSD

### 7.4.3. Test Setting

- 1. Analyzer was set to the center frequency of the DTS channel under investigation
- 2. Span = 1.5 times the DTS channel bandwidth
- 3. RBW = 3kHz
- 4. VBW = 10kHz
- 5. Detector = peak
- 6. Sweep time = auto couple
- 7. Trace mode = max hold
- 8. Trace was allowed to stabilize

# 7.4.4. Test Setup

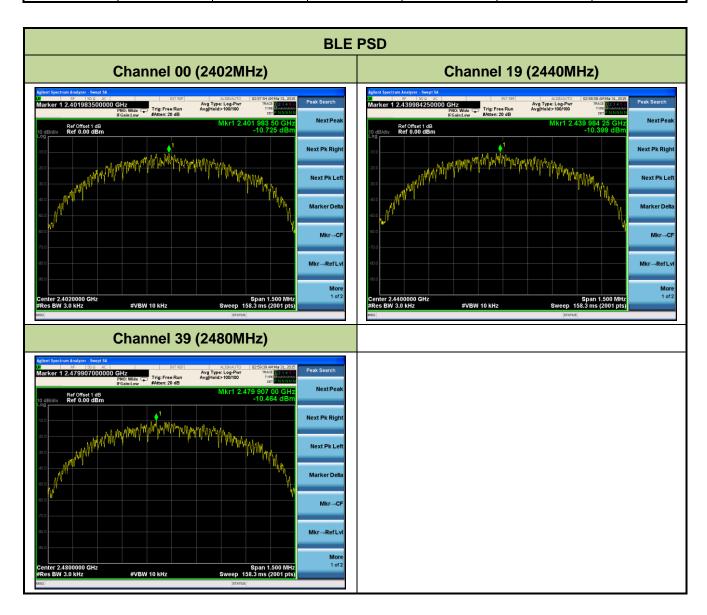


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### 7.4.5. Test Result

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	PSD Result (dBm / 3kHz)	Limit (dBm / 3kHz)	Result
BLE	1	00	2402	-10.725	≤ 8	Pass
BLE	1	19	2440	-10.399	≤ 8	Pass
BLE	1	39	2480	-10.464	≤ 8	Pass



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### 7.5. Conducted Band Edge and Out-of-Band Emissions

#### 7.5.1. Test Limit

The limit for out-of-band spurious emissions at the band edge is 20dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100kHz bandwidth per the PSD procedure (Section 9.1).

#### 7.5.2. Test Procedure Used

KDB 558074 D01v03r03 - Section 11.2 & Section 11.3

#### 7.5.3. Test Settitng

#### 1. Reference level measurement

- (a) Set instrument center frequency to DTS channel center frequency
- (b) Set the span to ≥ 1.5 times the DTS bandwidth
- (c) Set the RBW = 100 kHz
- (d) Set the VBW  $\geq$  3 x RBW
- (e) Detector = peak
- (f) Sweep time = auto couple
- (g) Trace mode = max hold
- (h) Allow trace to fully stabilize

#### 2. Emission level measurement

- (a) Set the center frequency and span to encompass frequency range to be measured
- (b) RBW = 100kHz
- (c) VBW = 300kHz
- (d) Detector = Peak
- (e) Number of sweep points ≥ 2 x Span/RBW
- (f) Trace mode = max hold
- (g) Sweep time = auto couple

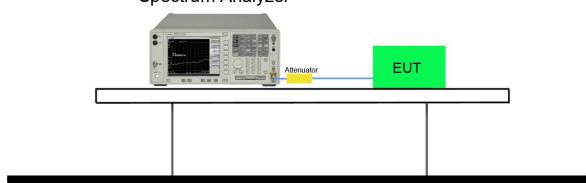
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(h) The trace was allowed to stabilize

# 7.5.4. Test Setup



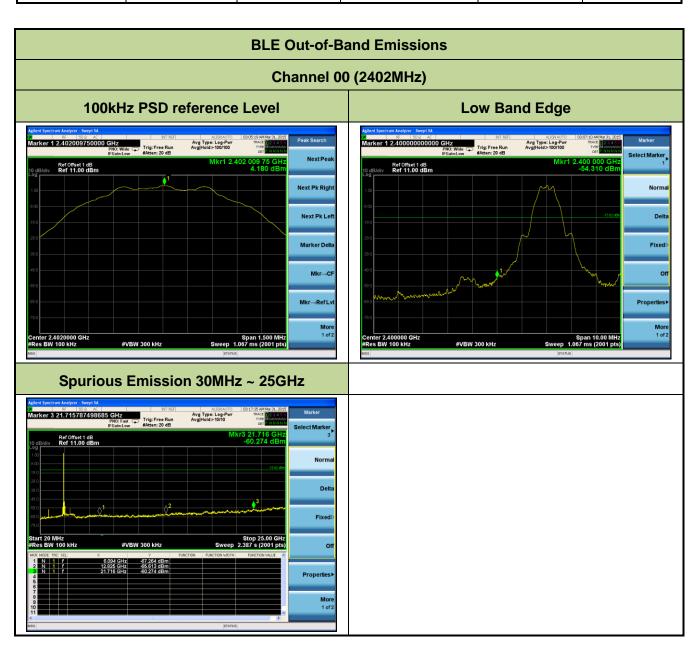


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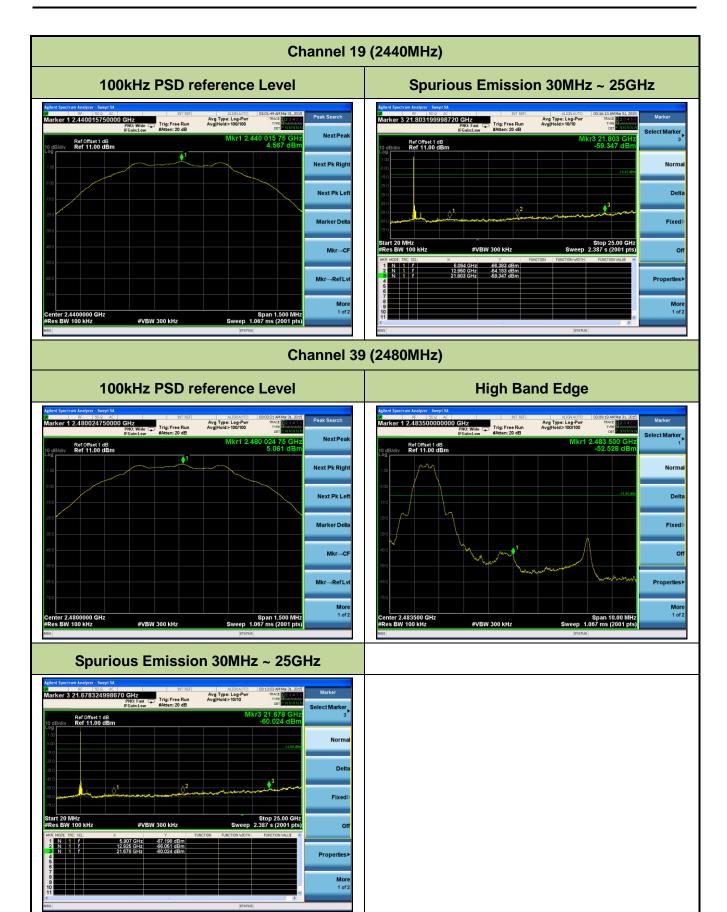
### 7.5.5. Test Result

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	Limit	Result
BLE	1	00	2402	20dBc	Pass
BLE	1	19	2440	20dBc	Pass
BLE	1	39	2480	20dBc	Pass



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### 7.6. Radiated Spurious Emission Measurement

#### 7.6.1. Test Limit

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209								
Frequency [MHz]	Field Strength [V/m]	Measured Distance [Meters]						
0.009 – 0.490	2400/F (kHz)	300						
0.490 – 1.705	24000/F (kHz)	30						
1.705 - 30	30	30						
30 - 88	100	3						
88 - 216	150	3						
216 - 960	200	3						
Above 960	500	3						

#### 7.6.2. Test Procedure Used

KDB 558074 D01v03r03 – Section 12.2.3 (quasi-peak measurements)

KDB 558074 D01v03r03 – Section 12.2.4 (peak power measurements)

KDB 558074 D01v03r03 – Section 12.2.5 (average power measurements)

### 7.6.3. Test Setting

### Peak Field Strength Measurements per Section 12.2.4 of KDB 558074 D01v03r03

- 1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
- 2. RBW = as specified in Table 1
- 3. VBW = 3MHz
- 4. Detector = peak
- 5. Sweep time = auto couple

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- 6. Trace mode = max hold
- 7. Trace was allowed to stabilize

Table 1 - RBW as a function of frequency

Frequency	RBW	
9 ~ 150 kHz	200 ~ 300 Hz	
0.15 ~ 30 MHz	9 ~ 10 kHz	
30 ~ 1000 MHz	100 ~ 120 kHz	
> 1000 MHz	1 MHz	

### Average Field Strength Measurements per Section 12.2.5.1 of KDB 558074 D01v03r03

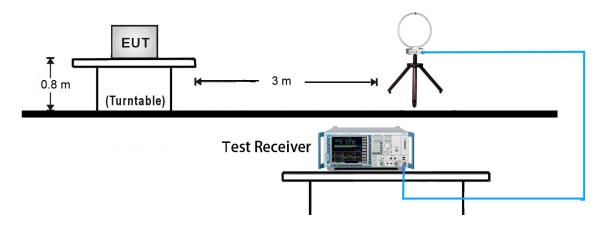
- 1. RBW = 1MHz.
- 2. VBW  $\geq$  3 x RBW.
- 3. Detector = RMS, if span/(# of points in sweep) ≤ (RBW/2). Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If this condition cannot be satisfied, then the detector mode shall be set to peak.
- 4. Averaging type = power (*i.e.*, RMS).
  - As an alternative, the detector and averaging type may be set for linear voltage averaging.
  - Some instruments require linear display mode in order to use linear voltage averaging. Log or dB averaging shall not be used.
- 5. Sweep time = auto.
- 6. Perform a trace average of at least 100 traces.

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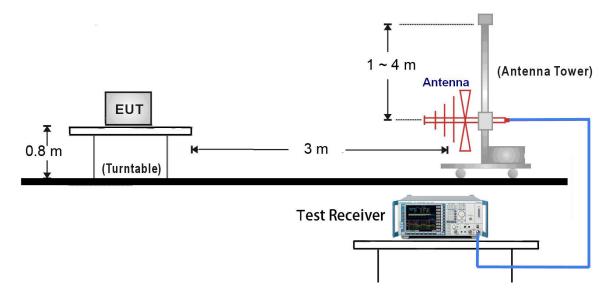


# 7.6.4. Test Setup

# 9kHz ~ 30MHz Test Setup:



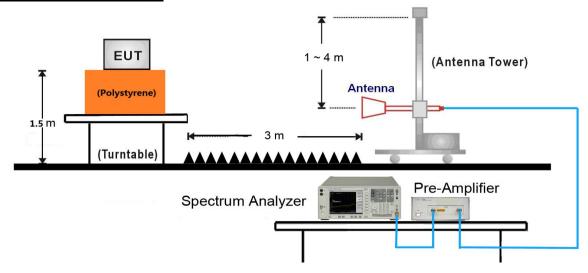
## 30MHz ~ 1GHz Test Setup:



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### 1GHz ~ 25GHz Test Setup:



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### 7.6.5. Test Result

Test Mode:	BLE	Test Site:	AC1				
Test Channel:	00	Test Engineer: Roy Cheng					
Remark:	Average measurement was not performed if peak level lower than average						
	limit.	limit.					
	2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in						
	the report.						

Mark	Frequency	Reading	Factor	Measure	Limit	Margin	Detector	Polarization
	(MHz)	Level	(dB)	Level	(dBµV/m)	(dB)		
		(dBµV)		(dBµV/m)				
	4872.4	35.9	2.7	38.6	74.0	-35.4	Peak	Horizontal
*	6532.4	36.4	5.9	42.3	77.7	-35.4	Peak	Horizontal
	8470.3	36.0	8.2	44.2	74.0	-29.8	Peak	Horizontal
*	9653.3	34.9	11.0	45.9	77.7	-31.8	Peak	Horizontal
	4974.0	36.6	3.0	39.6	74.0	-34.4	Peak	Vertical
*	6474.9	35.9	5.8	41.7	77.7	-36.0	Peak	Vertical
	8258.1	37.4	8.1	45.5	74.0	-28.5	Peak	Vertical
*	9673.6	35.1	10.9	46.0	77.7	-31.7	Peak	Vertical

Note 1: "\*" is not in restricted band, its limit is 20dBc of the fundamental emission level (97.7dBµV/m).

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre\_Amplifier Gain (dB)

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Test Mode:	BLE	Test Site:	AC1				
Test Channel:	19	Test Engineer:	Roy Cheng				
Remark:	Average measurement was not performed if peak level lower than average						
	limit.						
	2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in						
	the report.						

Mark	Frequency	Reading	Factor	Measure	Limit	Margin	Detector	Polarization
	(MHz)	Level	(dB)	Level	(dBµV/m)	(dB)		
		(dBµV)		(dBµV/m)				
	4871.5	35.5	2.7	38.2	74.0	-35.8	Peak	Horizontal
*	6255.9	35.6	4.7	40.3	77.9	-37.6	Peak	Horizontal
	7548.9	36.6	8.3	44.9	74.0	-29.1	Peak	Horizontal
*	8659.4	36.2	8.8	45.0	77.9	-32.9	Peak	Horizontal
	4975.9	35.5	3.0	38.5	74.0	-35.5	Peak	Vertical
*	6587.9	35.8	6.0	41.8	77.9	-36.1	Peak	Vertical
	8494.0	36.3	8.3	44.6	74.0	-29.4	Peak	Vertical
*	9688.9	33.8	10.9	44.7	77.9	-33.2	Peak	Vertical

Note 1: "\*" is not in restricted band, its limit is 20dBc of the fundamental emission level (97.9dBµV/m).

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre\_Amplifier Gain (dB)

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Test Mode:	BLE	Test Site:	AC1					
Test Channel:	39	Test Engineer:	Roy Cheng					
Remark:	Average measurement was not performed if peak level lower than average							
	limit.	limit.						
	2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in							
	the report.							

Mark	Frequency (MHz)	Reading Level	Factor (dB)	Measure Level	Limit (dBµV/m)	Margin (dB)	Detector	Polarization
		(dBµV)		(dBµV/m)				
	4953.6	36.0	2.9	38.9	74.0	-35.1	Peak	Horizontal
*	6558.6	36.3	6.0	42.3	78.1	-35.8	Peak	Horizontal
	9152.5	36.1	9.8	45.9	74.0	-28.1	Peak	Horizontal
*	9625.9	35.2	10.9	46.1	78.1	-32.0	Peak	Horizontal
	4970.3	35.8	3.0	38.8	74.0	-35.2	Peak	Vertical
*	6074.1	36.4	4.2	40.6	78.1	-37.5	Peak	Vertical
	8147.2	35.8	8.5	44.3	74.0	-29.7	Peak	Vertical
*	9748.7	34.9	11.3	46.2	78.1	-31.9	Peak	Vertical

Note 1: "\*" is not in restricted band, its limit is 20dBc of the fundamental emission level (98.1dBµV/m).

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

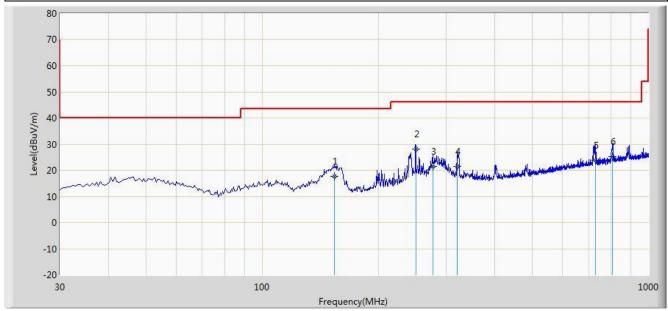
Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre\_Amplifier Gain (dB)

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### The worst case of Radiated Emission below 1GHz:

Site: AC1	Time: 2015/04/02 - 18:51				
Limit: FCC_Part15.209_RE(3m)	Engineer: Roy Cheng				
Probe: VULB9162_0.03-8GHz	Polarity: Horizontal				
EUT: Tablet PC	Power: AC 120V/60Hz				
Worse Case Mode: BLF at Channel 2440MHz					



No	Flag	Mark	Frequency	Measure	Reading	Over Limit	Limit	Factor	Туре
			(MHz)	Level	Level	(dB)	(dBuV/m)	(dB)	
				(dBuV/m)	(dBuV)				
1			154.160	17.750	8.154	-25.750	43.500	9.596	QP
2		*	250.020	28.148	14.520	-17.852	46.000	13.627	QP
3			276.350	21.326	7.240	-24.674	46.000	14.086	QP
4			320.515	21.390	6.355	-24.610	46.000	15.035	QP
5			727.920	23.825	1.980	-22.175	46.000	21.845	QP
6			808.426	25.209	2.355	-20.791	46.000	22.854	QP

Note: Measure Level ( $dB\mu V/m$ ) = Reading Level ( $dB\mu V$ ) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

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Worse Case Mode: BLF at Channel 2440MHz	Power: AC 120V/60Hz
CLIT: Tablet DC	Power: AC 1201//60Hz
Probe: VULB9162_0.03-8GHz	Polarity: Vertical
Limit: FCC_Part15.209_RE(3m)	Engineer: Roy Cheng
Site: AC1	Time: 2015/04/02 - 18:51

80 70 60 50 10 0 -10 -20 30 100 Frequency(MHz)

No	Flag	Mark	Frequency	Measure	Reading	Over Limit	Limit	Factor	Туре
			(MHz)	Level	Level	(dB)	(dBuV/m)	(dB)	
				(dBuV/m)	(dBuV)				
1		*	46.005	21.325	6.355	-18.675	40.000	14.970	QP
2			158.040	17.974	8.244	-25.526	43.500	9.730	QP
3			199.750	18.578	6.358	-24.922	43.500	12.220	QP
4			242.430	20.575	7.144	-25.425	46.000	13.431	QP
5			403.935	19.300	2.585	-26.700	46.000	16.715	QP
6			484.450	23.228	5.254	-22.772	46.000	17.974	QP

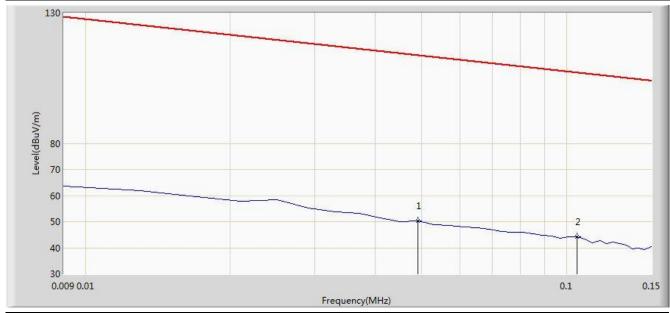
Note: Measure Level ( $dB\mu V/m$ ) = Reading Level ( $dB\mu V$ ) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

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Note: There is the ambient noise within frequency range 9kHz~30MHz.					
EUT: Tablet PC	Power: AC 120V/60Hz				
Probe: FMZB1519_0.009-30MHz	Polarity: Face On				
Limit: FCC_Part15.209_RE(3m)	Engineer: Roy Cheng				
Site: AC1	Time: 2015/04/01 - 15:32				



No	Flag	Mark	Frequency	Measure	Reading	Over Limit	Limit	Factor	Туре
			(MHz)	Level	Level	(dB)	(dBuV/m)	(dB)	
				(dBuV/m)	(dBuV)				
1			0.049	50.367	29.861	-63.422	113.789	20.505	QP
2		*	0.105	44.143	23.996	-63.029	107.173	20.147	QP

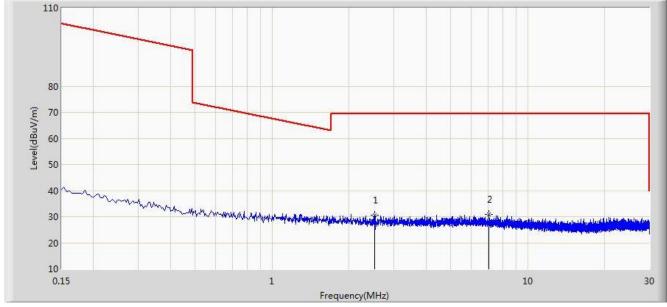
Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

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Note: There is the ambient noise within frequency range 9kHz~30MHz.						
EUT: Tablet PC	Power: AC 120V/60Hz					
Probe: FMZB1519_0.009-30MHz	Polarity: Face On					
Limit: FCC_Part15.209_RE(3m)	Engineer: Roy Cheng					
Site: AC1	Time: 2015/04/01 - 15:32					



No	Flag	Mark	Frequency	Measure	Reading	Over Limit	Limit	Factor	Туре
			(MHz)	Level	Level	(dB)	(dBuV/m)	(dB)	
				(dBuV/m)	(dBuV)				
1			2.513	30.495	10.336	-39.005	69.500	20.159	QP
2		*	7.041	30.974	10.579	-38.526	69.500	20.395	QP

Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

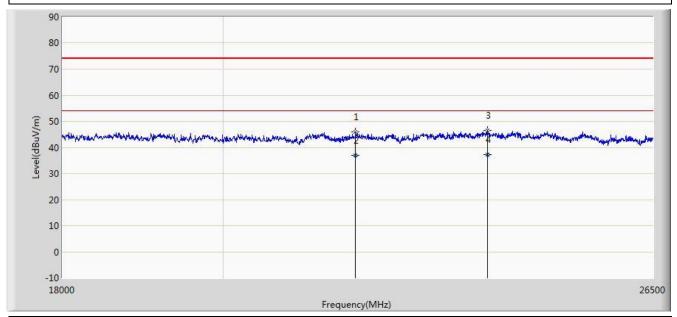
Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

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Note: There is the embient relies within framework and 0.000 In					
EUT: Tablet PC	Power: AC 120V/60Hz				
Probe: BBHA9170_18-40GHz	Polarity: Horizontal				
Limit: FCC_Part15.209_RE(3m)	Engineer: Roy Cheng				
Site: AC1	Time: 2015/03/27 - 15:45				

Note: There is the ambient noise within frequency range 18 ~ 25GHz.



No	Flag	Mark	Frequency	Measure	Reading	Over Limit	Limit	Factor	Туре
			(MHz)	Level	Level	(dB)	(dBuV/m)	(dB)	
				(dBuV/m)	(dBuV)				
1			21812.250	45.806	29.003	-28.194	74.000	16.803	PK
2			21812.325	36.857	20.054	-17.143	54.000	16.803	AV
3			23775.750	46.455	26.496	-27.545	74.000	19.958	PK
4		*	23775.850	37.113	17.154	-16.887	54.000	19.958	AV

Note: Measure Level  $(dB\mu V/m)$  = Reading Level  $(dB\mu V)$  + Factor (dB)

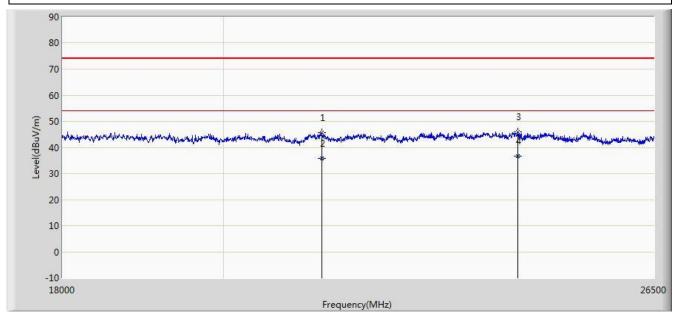
Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre\_Amplifier Gain (dB)

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Site: AC1	Time: 2015/03/27 - 15:59				
Limit: FCC_Part15.209_RE(3m)	Engineer: Roy Cheng				
Probe: BBHA9170_18-40GHz	Polarity: Vertical				
EUT: Tablet PC	Power: AC 120V/60Hz				
10.000					

Note: There is the ambient noise within frequency range 18 ~ 25GHz.



No	Flag	Mark	Frequency	Measure	Reading	Over Limit	Limit	Factor	Туре
			(MHz)	Level	Level	(dB)	(dBuV/m)	(dB)	
				(dBuV/m)	(dBuV)				
1			21332.000	45.658	28.830	-28.342	74.000	16.828	PK
2		*	21332.020	35.761	18.933	-18.239	54.000	16.828	AV
3			24239.000	46.056	25.484	-27.944	74.000	20.572	PK
4			24239.040	36.783	16.210	-17.217	54.000	20.572	AV

Note: Measure Level  $(dB\mu V/m)$  = Reading Level  $(dB\mu V)$  + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre\_Amplifier Gain (dB)

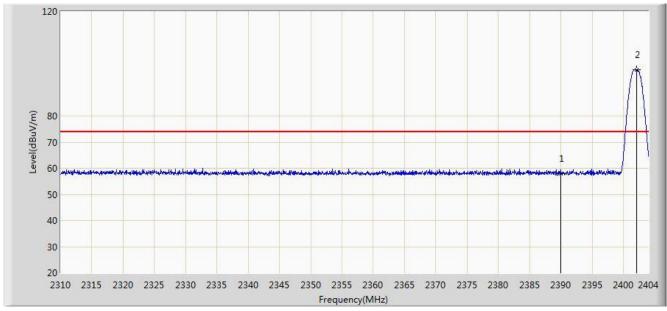
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## 7.7. Radiated Restricted Band Edge Measurement

#### 7.7.1. Test Result

Site: AC1	Time: 2015/03/31 - 19:37			
Limit: FCC_Part15.209_RE(3m)	Engineer: Roy Cheng			
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal			
EUT: Tablet PC	Power: AC 120V/60Hz			
Test Mode: Transmit at channel 2402MHz By BLE				



No	Flag	Mark	Frequency	Measure	Reading	Over Limit	Limit	Factor	Туре
			(MHz)	Level	Level	(dB)	(dBuV/m)	(dB)	
				(dBuV/m)	(dBuV)				
1			2390.000	57.990	26.787	-16.010	74.000	31.203	PK
2		*	2402.073	97.727	66.543	N/A	N/A	31.184	PK

Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

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Site: AC1	Time: 2015/03/31 - 19:39
Limit: FCC_Part15.209_RE(3m)	Engineer: Roy Cheng
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Tablet PC	Power: AC 120V/60Hz
Test Mode: Transmit at channel 2402MHz Bv BLE	

120 2 2 30 20 2310 2315 2320 2325 2330 2335 2340 2345 2350 2355 2360 2365 2370 2375 2380 2385 2390 2395 2400 2404 Frequency(MHz)

No	Flag	Mark	Frequency	Measure	Reading	Over Limit	Limit	Factor	Туре
			(MHz)	Level	Level	(dB)	(dBuV/m)	(dB)	
				(dBuV/m)	(dBuV)				
1			2390.000	46.258	15.055	-7.742	54.000	31.203	AV
2		*	2401.885	87.436	56.252	N/A	N/A	31.184	AV

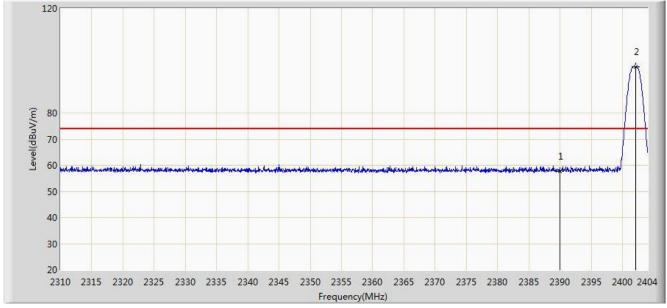
Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

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Site: AC1	Time: 2015/03/31 - 19:40				
Limit: FCC_Part15.209_RE(3m)	Engineer: Roy Cheng				
Probe: BBHA9120D_1-18GHz	Polarity: Vertical				
EUT: Tablet PC	Power: AC 120V/60Hz				
Test Mode: Transmit at channel 2402MHz By BLE					



No	Flag	Mark	Frequency	Measure	Reading	Over Limit	Limit	Factor	Туре
			(MHz)	Level	Level	(dB)	(dBuV/m)	(dB)	
				(dBuV/m)	(dBuV)				
1			2390.000	57.788	26.585	-16.212	74.000	31.203	PK
2		*	2402.073	97.705	66.521	N/A	N/A	31.184	PK

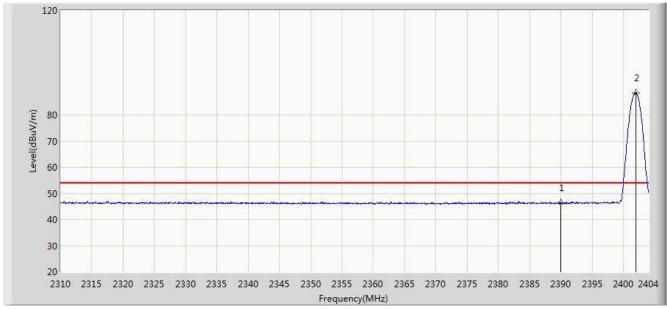
Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

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Site: AC1	Time: 2015/03/31 - 19:41
Limit: FCC_Part15.209_RE(3m)	Engineer: Roy Cheng
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Tablet PC	Power: AC 120V/60Hz
Test Mode: Transmit at channel 2402MHz Bv BLE	•



No	Flag	Mark	Frequency	Measure	Reading	Over Limit	Limit	Factor	Туре
			(MHz)	Level	Level	(dB)	(dBuV/m)	(dB)	
				(dBuV/m)	(dBuV)				
1			2390.000	46.326	15.123	-7.674	54.000	31.203	AV
2		*	2401.979	88.511	57.327	N/A	N/A	31.184	AV

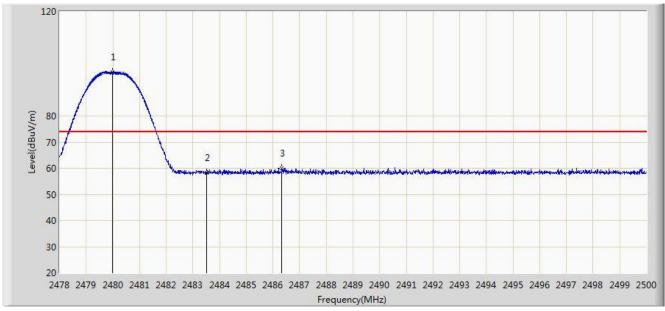
Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

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Site: AC1	Time: 2015/03/31 - 19:42				
Limit: FCC_Part15.209_RE(3m)	Engineer: Roy Cheng				
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal				
EUT: Tablet PC	Power: AC 120V/60Hz				
Test Mode: Transmit at channel 2480MHz By BLE					



No	Flag	Mark	Frequency	Measure	Reading	Over Limit	Limit	Factor	Туре
			(MHz)	Level	Level	(dB)	(dBuV/m)	(dB)	
				(dBuV/m)	(dBuV)				
1		*	2479.980	96.905	65.721	N/A	N/A	31.184	PK
2			2483.500	58.351	27.158	-15.649	74.000	31.194	PK
3			2486.338	60.071	28.870	-13.929	74.000	31.201	PK

Note: Measure Level ( $dB\mu V/m$ ) = Reading Level ( $dB\mu V$ ) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

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Site: AC1	Time: 2015/03/31 - 19:45				
Limit: FCC_Part15.209_RE(3m)	Engineer: Roy Cheng				
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal				
EUT: Tablet PC	Power: AC 120V/60Hz				
Test Mode: Transmit at channel 2480MHz Bv BLE					

No	Flag	Mark	Frequency	Measure	Reading	Over Limit	Limit	Factor	Туре
			(MHz)	Level	Level	(dB)	(dBuV/m)	(dB)	
				(dBuV/m)	(dBuV)				
1		*	2479.980	86.992	55.808	N/A	N/A	31.184	AV
2			2483.500	46.640	15.447	-7.360	54.000	31.194	AV

Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

FCC ID: WL6-TE69SA3 Page Number: 44 of 50



Site: AC1	Time: 2015/03/31 - 19:46				
Limit: FCC_Part15.209_RE(3m)	Engineer: Roy Cheng				
Probe: BBHA9120D_1-18GHz	Polarity: Vertical				
EUT: Tablet PC	Power: AC 120V/60Hz				
Test Mode: Transmit at channel 2480MHz By BLE					

No	Flag	Mark	Frequency	Measure	Reading	Over Limit	Limit	Factor	Туре
			(MHz)	Level	Level	(dB)	(dBuV/m)	(dB)	
				(dBuV/m)	(dBuV)				
1		*	2479.815	98.108	66.924	N/A	N/A	31.184	PK
2			2483.500	57.549	26.356	-16.451	74.000	31.194	PK
3			2486.206	60.626	29.426	-13.374	74.000	31.201	PK

2478 2479 2480 2481 2482 2483 2484 2485 2486 2487 2488 2489 2490 2491 2492 2493 2494 2495 2496 2497 2498 2499 2500 Frequency(MHz)

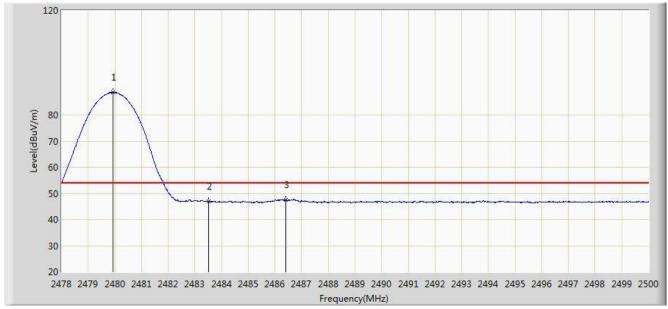
Note: Measure Level ( $dB\mu V/m$ ) = Reading Level ( $dB\mu V$ ) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

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Site: AC1	Time: 2015/03/31 - 19:48				
Limit: FCC_Part15.209_RE(3m)	Engineer: Roy Cheng				
Probe: BBHA9120D_1-18GHz	Polarity: Vertical				
EUT: Tablet PC	Power: AC 120V/60Hz				
Test Mode: Transmit at channel 2480MHz By BLE					



No	Flag	Mark	Frequency	Measure	Reading	Over Limit	Limit	Factor	Туре
			(MHz)	Level	Level	(dB)	(dBuV/m)		
				(dBuV/m)	(dBuV)				
1		*	2479.936	88.629	57.445	N/A	N/A	31.184	AV
2			2483.500	46.984	15.791	-7.016	54.000	31.194	AV
3			2486.404	47.516	16.315	-6.484	54.000	31.201	AV

Note: Measure Level ( $dB\mu V/m$ ) = Reading Level ( $dB\mu V$ ) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

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### 7.8. AC Conducted Emissions Measurement

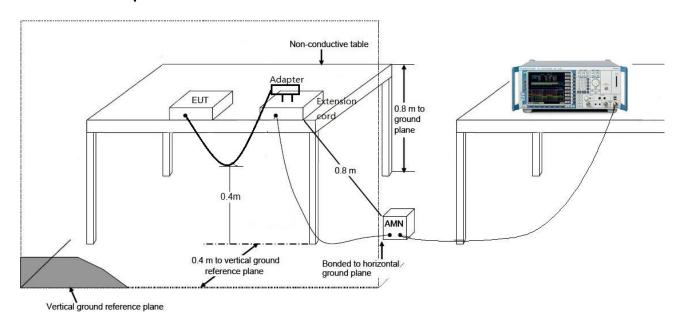
#### 7.8.1. Test Limit

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

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

#### 7.8.2. Test Setup



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#### 7.8.3. Test Result

Site: SR2	Time: 2015/04/02 - 17:53				
Limit: FCC_Part15.207_CE_AC Power	Engineer: Roy Cheng				
Probe: ENV216_101683_Filter On	Polarity: Line				
EUT: Tablet PC	Power: AC 120V/60Hz				
Test Mode: BLF at Channel 2480MHz					

80 70 60 50 30 40 20 10 0 -10 -20 0.15 1 Frequency(MHz)

No	Flag	Mark	Frequency	Measure	Reading	Over Limit	Limit	Factor	Туре
			(MHz)	Level	Level	(dB)	(dBuV)	(dB)	
				(dBuV)	(dBuV)				
1			0.150	45.818	34.650	-20.182	66.000	11.168	QP
2			0.150	30.220	19.052	-25.780	56.000	11.168	AV
3			0.194	40.311	30.295	-23.552	63.864	10.017	QP
4			0.194	25.906	15.889	-27.958	53.864	10.017	AV
5			0.514	43.881	33.724	-12.119	56.000	10.156	QP
6		*	0.514	39.192	29.036	-6.808	46.000	10.156	AV
7			0.834	32.797	22.804	-23.203	56.000	9.994	QP
8			0.834	23.961	13.967	-22.039	46.000	9.994	AV
9			1.206	31.893	21.992	-24.107	56.000	9.901	QP
10			1.206	22.701	12.800	-23.299	46.000	9.901	AV
11			2.286	31.210	21.347	-24.790	56.000	9.863	QP
12			2.286	22.853	12.990	-23.147	46.000	9.863	AV

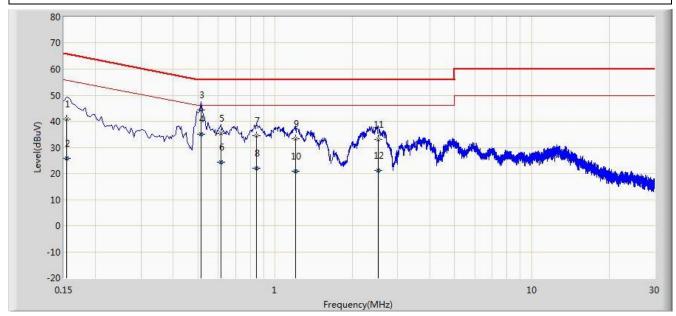
Note: Measure Level (dB $\mu$ V) = Reading Level (dB $\mu$ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB)

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Site: SR2	Time: 2015/04/02 - 17:59				
Limit: FCC_Part15.207_CE_AC Power	Engineer: Roy Cheng				
Probe: ENV216_101683_Filter On	Polarity: Neutral				
EUT: Tablet PC	Power: AC 120V/60Hz				
Test Mode: BLF at Channel 2480MHz					



No	Flag	Mark	Frequency	Measure	Reading	Over Limit	Limit	Factor	Туре
			(MHz)	Level	Level	(dB)	(dBuV)	(dB)	
				(dBuV)	(dBuV)				
1			0.154	40.885	30.169	-24.896	65.781	10.716	QP
2			0.154	25.763	15.047	-30.018	55.781	10.716	AV
3			0.514	44.276	34.100	-11.724	56.000	10.176	QP
4		*	0.514	35.134	24.958	-10.866	46.000	10.176	AV
5			0.614	35.369	25.246	-20.631	56.000	10.124	QP
6			0.614	24.462	14.338	-21.538	46.000	10.124	AV
7			0.846	34.382	24.388	-21.618	56.000	9.994	QP
8			0.846	22.124	12.130	-23.876	46.000	9.994	AV
9			1.198	33.437	23.534	-22.563	56.000	9.902	QP
10			1.198	20.925	11.022	-25.075	46.000	9.902	AV
11			2.518	32.974	23.114	-23.026	56.000	9.860	QP
12			2.518	21.203	11.342	-24.797	46.000	9.860	AV

Note: Measure Level (dB $\mu$ V) = Reading Level (dB $\mu$ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB)

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# 8. CONCLUSION

The data collected relate only the item(s) tested and show that the	Tablet PC FCC ID.

WL6-TE69SA3 is in compliance with Part 15C of the FCC Rules.

——— The End