

APPLICATION FOR CERTIFICATION

On Behalf of

Elitegroup Computer Systems Co., Ltd.

7" Pocketable Pad

Models No.: (1)MICA-07..... (2)TABLET TB71.....

FCC ID: WL6TB71A-W

Brand: (1)ADVANTECH (2)ECS

Prepared for : Elitegroup Computer Systems Co., Ltd.
No. 239, Sec. 2, Ti Ding Blvd.,
Taipei, Taiwan

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File Number : C1S1404136
Report Number : EM-F140299
Date of Test : 2014. 05. 03 ~ 21
Date of Report : 2014. 05. 23

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TEST REPORT CERTIFICATION

Applicant : Elitegroup Computer Systems Co., Ltd.
Manufacturer : Elitegroup Computer Systems Co., Ltd.
EUT Description : 7" Pocketable Pad
FCC ID : **WL6TB71A-W**
(A) Model No. : (1)MICA-07.....
(2)TABLET TB71.....
(B) Serial No. : N/A
(C) Brand : (1)ADVANTECH (2)ECS
(D) Power Supply : DC 3.7V (Battery) or DC 5V (USB)
(E) Test Voltage : DC 3.7V (Via Battery)

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C, Oct 2013
(FCC CFR 47 Part 15C, §15.207, §15.209, §15.215, and §15.225)
ANSI C63.4:2003

The device described above was tested by AUDIX Technology Corporation to determine the maximum emission levels emanating from the device. The maximum emission levels were compared to the FCC Part 15 Subpart C limit.

The measurement results are contained in this test report and AUDIX Technology Corporation is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the FCC Part 15 standard.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of AUDIX Technology Corporation.

Date of Test : 2014. 05. 03 ~ 21 ate of Report : 2014. 05. 23

Producer : Tina Huang
(Tina Huang/Administrator)

Signatory : Ben Cheng
(Ben Cheng/Manager)

1. DESCRIPTION OF REVISION HISTORY

Edition No.	Date of Revision	Revision Summary	Report Number
0	2014. 05. 23	Original Report.	EM-F140299

2. SUMMARY OF MEASUREMENTS AND RESULTS

FCC Part Section	Test description	Result
15.207	Powerline Conducted Emission 150kHz – 30MHz	PASS
15.225 (a)(b)(c)	In-Band Emission	PASS
15.225 (d) 15.209	Out-of-Band Emission	PASS
15.215	20dB Bandwidth	PASS
15.225 (e)	Frequency Stability Tolerance	PASS

3. GENERAL INFORMATION

3.1. Description of Device (EUT)

Product	7" Pocketable Pad
Model Number	(1)MICA-07..... (2)TABLET TB71..... (The "." in the model name can be 0 to 9, A to Z, a to z, "-", "_", "\", "/" or blank, for marketing use only.) Above two models difference in brand and model name, others are the same. The model TABLET TB71A-W is test in this report
Serial Number	N/A
Brand Name	(1)ADVANTECH (2)ECS
Applicant	Elitegroup Computer Systems Co., Ltd. No. 239, Sec. 2, Ti Ding Blvd., Taipei, Taiwan
Manufacturer	Elitegroup Computer Systems Co., Ltd. No. 239, Sec. 2, Ti Ding Blvd., Taipei, Taiwan
FCC ID	WL6TB71A-W
Fundamental Range	802.11b/g/n-HT20: 2412MHz ~ 2462MHz 802.11a: 5180MHz ~ 5240MHz (UNII Band I) and 5260MHz ~ 5320MHz (UNII Band II-2A) and 5500MHz ~ 5700MHz (UNII Band II-2C) and 5745MHz ~ 5825MHz (UNII Band III) UNII Band II (DFS Function, Slave/no In service monitor, no Ad-Hoc mode) 802.11n-HT20: 2412MHz ~ 2462MHz and 5180MHz ~ 5240MHz (UNII Band I) and 5260MHz ~ 5320MHz (UNII Band II-2A) and 5500MHz ~ 5700MHz (UNII Band II-2C) and 5745MHz ~ 5825MHz (UNII Band III) UNII Band II (DFS Function, Slave/no In service monitor, no Ad-Hoc mode) 802.11n-HT40: 5190MHz ~ 5230MHz (UNII Band I) and 5270MHz ~ 5310MHz (UNII Band II-2A) and 5510MHz ~ 5670MHz (UNII Band II-2C) and 5755MHz ~ 5795MHz (UNII Band III) UNII Band II (DFS Function, Slave/no In service monitor, no Ad-Hoc mode) Bluetooth and BLE: 2402MHz ~ 2480MHz NFC: 13.56MHz GPS: 1575.42MHz

Frequency Channel	802.11b/g: 11 channels 802.11a: UNII Band I: 4 channels UNII Band II-2A: 4 channels UNII Band II-2C: 8 channels UNII Band III: 5 channels 802.11n-HT20: 2.4GHz: 11 channels 2.4G UNI Band I: 4channels UNII Band II-2A: 4 channels UNII Band II-2C: 8 channels UNII Band III: 5 channels 802.11n-HT40: UNII Band I: 2 channels UNII Band II-2A: 2 channels UNII Band II-2C: 3 channels UNII Band III: 2 channels Bluetooth: 79 channels BLE: 40 channels NFC: 1 Channel
Radio Technology	802.11b: DSSS Modulation (DBPSK/DQPSK/CCK) 802.11g: OFDM Modulation (BPSK/QPSK/16QAM/64QAM) 802.11a: OFDM Modulation (BPSK/QPSK/16QAM/64QAM) 802.11n: OFDM Modulation (MIMO) (BPSK/QPSK/16QAM/64QAM) Bluetooth: FHSS (GFSK, π /4DQPSK, 8-DPSK) BLE: GFSK NFC: ASK
Data Transfer Rate	802.11b: 1/2/5.5/11Mbps 802.11a/g: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 270Mbps BT: 1/2/3Mbps BLE: 1Mbps
Date of Receipt of Sample	2014. 04. 21
<p>Note: This EUT has 2.4GHz (WLAN, Bluetooth and BLE), 5GHz and NFC function. See below for related test reports based on radio functionality.</p> <ol style="list-style-type: none"> 1. The 2.4GHz (WLAN and BLE) function has been test in other report of EM-F140296. 2. The 5GHz function has been test in other report of EM-F140297. 3. The Bluetooth function has been test in other report of EM-F140298. 4. The DFS function has been test in other report of EM-F140303. 5. The NFC function has been test in other report of EM-F140299. 	

3.2. Antenna Information

Antenna Part Number	Manufacture	Antenna Type	Peak Gain W/ Cable loss (dBi)			
			Frequency (MHz)		Max Gain (Peak) (dBi)	
WLAN/BT Antenna: E22-003-007-037 -8014b (Main)	INNETECH (Tianjin) Electronics Co. Ltd.	PCB Antenna	2400	5180	1.33	-1.53
			2412	5190	1.92	-1.53
			2417	5310	2.07	0.66
			2422	5320	2.19	0.05
			2427	5500	2.44	-0.19
			2432	5510	2.59	-0.41
			2437	5670	2.78	-1.57
			2442	5700	2.83	-3.16
			2447	5745	2.87	-3.55
			2450	5765	2.78	-2.70
			2452	5785	2.76	-2.93
			2457	5805	2.68	-3.46
			2462	5825	2.47	-3.15
			2467		2.38	
			2472		2.52	
2500		2.17				
WLAN Antenna: E22-003-007-037 -8014b (AUX)	INNETECH (Tianjin) Electronics Co. Ltd.	PCB Antenna	2400	5180	3.08	0.61
			2412	5190	3.43	0.39
			2417	5310	3.10	0.91
			2422	5320	3.07	0.14
			2427	5500	2.78	-0.35
			2432	5510	2.68	-0.40
			2437	5670	2.63	-0.62
			2442	5700	2.49	-1.25
			2447	5745	2.68	-1.02
			2450	5765	2.60	0.06
			2452	5785	2.77	-0.30
			2457	5805	2.75	-0.23
			2462	5825	2.82	-0.09
			2467		2.77	
			2472		2.68	
2500		2.58				
GPS Antenna	INNETECH (Tianjin) Electronics Co. Ltd.	PCB Antenna	1565		-3.38	
			1575		-2.87	
			1585		-3.25	
			1597		-2.42	
			1602		-2.22	
			1606		-1.98	
			1616		-1.37	

3.3. Description of Key Component Lists

Item		Supplier	Description	Character
System		Microsoft	Windows 8	---
Main Board		ECS	TB71A-W	
LCD Module		CPTF	CLAT070WP0D	7 inch CPT 800x1280 -10 point touch
CPU		Intel	Intel® Atom™ Processor Bay Trail	T Z3770, 1.46GHz Burst frequency 2.39GHz (Intel, BGA1380 pin)
GPU		Intel	---	HD Graphics
Memory		Hynix	H9CCNNN8KTMLBR-N TM	LP DDR3 2GB (up to 4G)
SSD		Sandisk	SDIN8DE4-32G	eMMC 32GB
Battery Pack		Sunwoda	MICA-071	3.7V / 4100 mAh /15.17Wh
Front Camera		LiteON	NL89A141	sensor Sony IMX175 .8MP
Rear Camera		LiteON	13P2SF206	sensor OV2722, 2MP
Barcode Scanner		Itermec	ED30	Decode Board + EA31 Imager
Touch Pad		CPTF	CLAA070WP03	--
WLAN+BT Combo Module		MITSUMI	DWM-W095A	WLAN: 2.412GHz to 2.472GHz 5.18GHz to 5.85GHz BT4.0+BLE: 2.402GHz to 2.480GHz
NFC		NXP	PN544PC	13.56MHz
GNSS		MITSUMI	SPG-SF102	GPS: 1575.42MHz GLONASS: 1598.0625 to 1605.375 MHz
WLAN/ BT Antenna	Main	INNETECH ELECTRONICS	e22-003-007-037-8014b	Laser Direct Structuring (LDS) Antenna on frame
	AUX	INNETECH ELECTRONICS	e22-003-007-037-8014b	Laser Direct Structuring (LDS) Antenna on frame
Stylus Pen		FO	BLACK/#8513.	CAPACITIVE TOUCH PEN
USB Charger		Chicony	W12-010N3A	I/P: 100-240V~, 50-60Hz, 0.3A O/P: 5V, 2A
Docking		AdvanTech	MICA-071-DCRE	DC 5V
		ECS	DOCKING TB71A-W	DC 5V
Docking Power Adapter		Asian	WA-20A05FU	I/P: 100-240V~, 0.6A, 50-60Hz O/P: 5V, 4A
		Power Cord: Non-Shielded, Undetached, 1.8m, Bonded a ferrite core		
USB Charge Docking Cable		Shielded, Detachable, 1.2m		
HDMI Docking Cable		Shielded, Detachable, 0.17m		
USB3.0 Docking Cable		Shielded, Detachable, 0.23m		

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

3.4. Tested Supporting System Details

3.4.1. Support Peripheral Unit

No.	Product	Brand	Model No.	Serial No.	FCC ID
1.	LCD Monitor	PHILIPS	273P3L	AU5A1222002498	FCC DoC Approved
2.	USB Keyboard	LENOVO	SK-8825	0056462	FCC DoC Approved
3.	USB Mouse	LENOVO	M-U0025-0	N/A	FCC DoC Approved
4.	USB 3.0 Hard Drive	BUFFALO	HD-HX1.0TU3-AP	15564891205965	FCC DoC Approved
5.	I-POD Earphone	APPLE	N/A	N/A	N/A
6.	Power Socket	AUDIX	N/A	N/A	N/A
7.	Micro SD Card	Kingston	NSDC4/8GB	N/A	N/A

3.4.2. Cable Lists

No.	Signal Cable Description Of The Above Support Units
1.	HDMI Cable: Shielded, Detachable, 1.8m
2.	USB Cable: Shielded, Detachable, 1.8m
3.	USB Cable: Shielded, Detachable, 1.8m
4.	USB Cable: Shielded, Detachable, 1.0m
5.	Earphone Cable: Non-Shielded, Detachable, 0.9m
6.	N/A
7.	N/A

Note : 1. Support Unit 1 & 6: Power Cord: Non-Shielded, Detachable, 1.8m

2. Support Unit 4 AC Adapter: BUFFALO, M/N: WA-18H12, S/N: 219019279;
Cord: Non-Shielded, Undetachable, 1.5m

3.5. Description of Test Facility

Name of Firm : **AUDIX Technology Corporation**
EMC Department
 No. 53-11, Dingfu, Linkou Dist.,
 New Taipei City 244, Taiwan, R.O.C.

Test Location & Facility : **No. 5 Shielded Room**
 (C5/Semi-AC) No. 67-4, Dingfu, Linkou Dist.,
 New Taipei City 244, Taiwan, R.O.C.

Semi-Anechoic Chamber
 No. 53-11, Dingfu, Linkou Dist.,
 New Taipei City 244, Taiwan, R.O.C.
 May 11, 2012 Renewal on
 Federal Communication Commission
 Registration Number: 90993

NVLAP Lab. Code : 200077-0

TAF Accreditation No : 1724

3.6. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty
Conduction Test	150kHz~30MHz	±3.43dB
Radiation Test (Distance: 3m)	9kHz~300MHz	±2.91dB
	30MHz~300MHz	±2.91dB
	300MHz~1000MHz	±2.94dB

Remark : Uncertainty = $ku_c(y)$

Test Item	Uncertainty
20dB Bandwidth	± 0.2kHz
Frequency Stability	±0.78ppm

4. POWERLINE CONDUCTED EMISSION

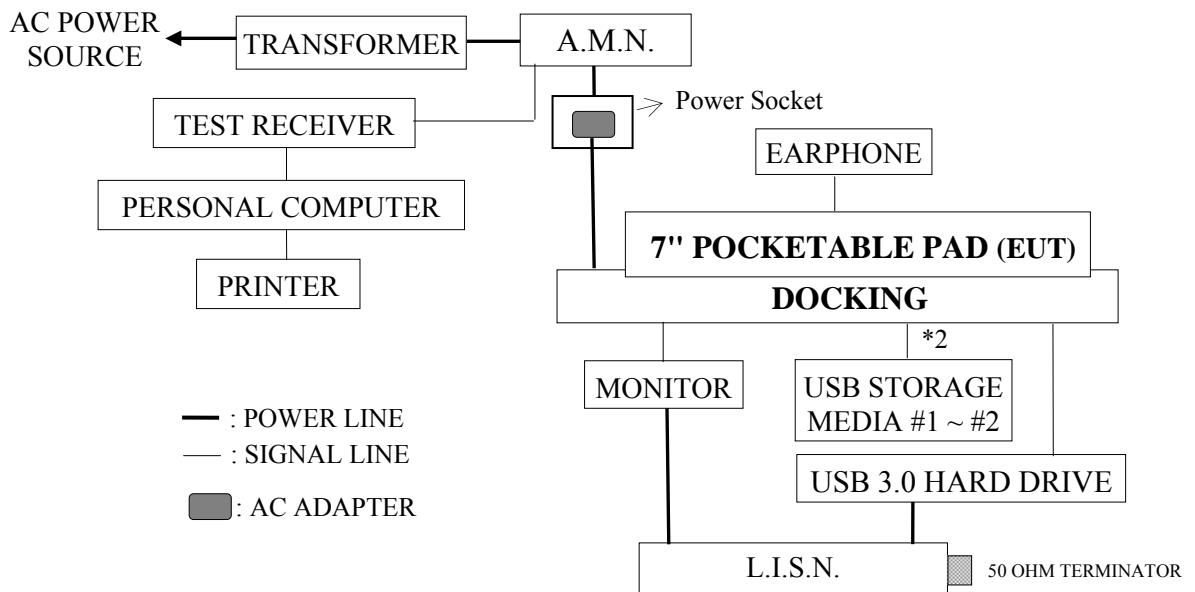
MEASUREMENT

4.1. Test Equipment

The following test equipment was used during the powerline conducted emission measurement: (No. 5 Shielded Room)

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Due Date
1.	Test Receiver	R&S	ESCS30	100039	2014. 06. 18
2.	A.M.N.	R&S	ENV4200	100003	2014. 05. 30
3.	L.I.S.N.	Kyoritsu	KNW-407	8-1539-2	2015. 01. 07
4.	Pulse Limiter	R&S	ESH3-Z2	100355	2015. 01. 17

4.2. Block Diagram of Test Setup



4.3. Powerline Conducted Emission Limit (§15.207)

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level	Average Level
150kHz ~ 500kHz	66 ~ 56 dB μ V	56 ~ 46 dB μ V
500kHz ~ 5MHz	56 dB μ V	46 dB μ V
5MHz ~ 30MHz	60 dB μ V	50 dB μ V

Remark1.: If the average limit is met when using a Quasi-Peak detector, the EUT shall be deemed to meet both limits and measurement with the average detector is unnecessary.

2.: The lower limit applies at the band edges.

4.4. Operating Condition of EUT

- 4.4.1. Setup the EUT and simulator as shown on 3.2.
- 4.4.2. Turn on the power of all equipment.
- 4.4.3. Set to EUT (7" Pocketable Pad) on transmitting and receiving during all testing.

4.5. Test Procedure

The EUT link to docking power adapter through docking was placed on the table which was above the ground by 80cm and adapter's power cord connected to the AC mains through an Artificial Mains Network (A.M.N.). This provided a 50 ohm coupling impedance for the measuring equipment. (Please refer to the block diagram of the test setup and photographs.) Both sides of A.C. line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions simulators of the interface cables should be manipulated according to FCC ANSI C63.4-2003 during conducted measurement.

The bandwidth of the R & S Test Receiver ESCS30 was set at 9kHz.

The frequency range from 150kHz to 30MHz was checked.

All the final readings from Test Receiver were measured with the Quasi-Peak detector and Average detector. (Remark: If the Average limit is met when using a Quasi-Peak detector, the Average detector is unnecessary)

4.6. Powerline Conducted Emission Measurement Results

PASSED. All emissions not reported below are too low against the prescribed limits.

EUT was performed during this section testing and all the test results are attached in next pages.

EUT : 7" Pocketable Pad M/N : TABLET TB71A-W

Test Date : 2014. 05. 05 Temperature : 22 Humidity : 52%

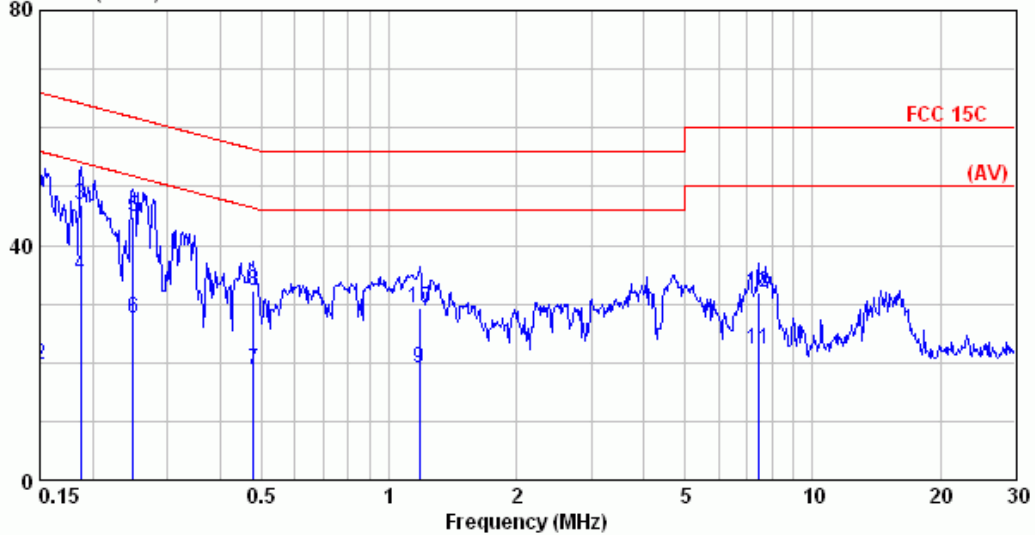
The details are as follows :

Mode	Reference Test Data	
	Neutral	Line
1.	# 2	# 1



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Data: 2 File: D:\test-data\Report\EM103\C1S1404XXX\C1S1404136-C-D.EMI (12) Date: 2014-05-05



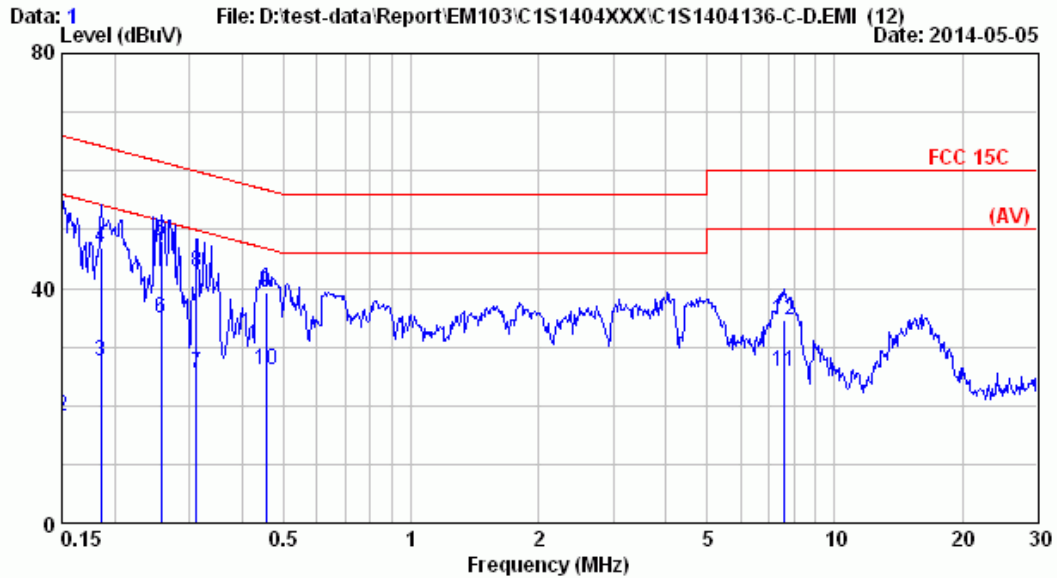
Site : No.5 Shielded Room Data : 2
 Condition : ENV 4200 Phase : NEUTRAL
 Limit : FCC 15C
 Env. / Ins. : 22°C / 52% ESCS 30 (039) Engineer: Gary-Tsai
 EUT : TB71A-W
 Power Rating : 120Vac / 60Hz
 Test Mode : Operating

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.150	10.10	0.20	33.47	43.77	66.00	22.23	QP
2	0.150	10.10	0.20	9.39	19.69	56.00	36.31	AVERAGE
3	0.187	10.05	0.20	36.61	46.86	64.15	17.29	QP
4	0.187	10.05	0.20	24.76	35.01	54.15	19.14	AVERAGE
5	0.249	9.98	0.20	34.78	44.96	61.78	16.81	QP
6	0.249	9.98	0.20	17.32	27.51	51.78	24.27	AVERAGE
7	0.479	9.88	0.20	8.53	18.62	46.36	27.75	AVERAGE
8	0.479	9.88	0.20	22.28	32.37	56.36	24.00	QP
9	1.178	9.80	0.40	8.76	18.96	46.00	27.04	AVERAGE
10	1.178	9.80	0.40	19.10	29.30	56.00	26.70	QP
11	7.446	9.91	0.60	11.74	22.25	50.00	27.75	AVERAGE
12	7.446	9.91	0.60	21.30	31.81	60.00	28.19	QP

Remarks: 1. Emission Level= AMN Factor + Cable Loss + Reading.
 2. If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.



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Site : No.5 Shielded Room Data : 1
 Condition : ENV 4200 Phase : LINE
 Limit : FCC 15C
 Env. / Ins. : 22°C / 52% ESCS 30 (039) Engineer: Gary-Tsai
 EUT : TB71A-W
 Power Rating : 120Vac / 60Hz
 Test Mode : Operating

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.150	10.10	0.20	34.58	44.88	66.00	21.12	QP
2	0.150	10.10	0.20	7.99	18.29	56.00	37.71	AVERAGE
3	0.185	10.05	0.20	17.32	27.57	54.24	26.67	AVERAGE
4	0.185	10.05	0.20	36.49	46.74	64.24	17.50	QP
5	0.258	9.97	0.20	37.84	48.01	61.51	13.50	QP
6	0.258	9.97	0.20	24.68	34.85	51.51	16.66	AVERAGE
7	0.312	9.95	0.20	15.45	25.60	49.93	24.33	AVERAGE
8	0.312	9.95	0.20	32.77	42.92	59.93	17.01	QP
9	0.454	9.89	0.20	29.09	39.18	56.80	17.62	QP
10	0.454	9.89	0.20	16.11	26.20	46.80	20.60	AVERAGE
11	7.566	9.86	0.60	15.26	25.72	50.00	24.28	AVERAGE
12	7.566	9.86	0.60	24.11	34.57	60.00	25.43	QP

Remarks: 1. Emission Level= AMN Factor + Cable Loss + Reading.
 2. If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

5. RADIATED SPURIOUS EMISSION MEASUREMENT (IN-BAND)

5.1. Test Equipment

The following test equipment was used during the radiated emission measurement: (at Semi-Anechoic Chamber)

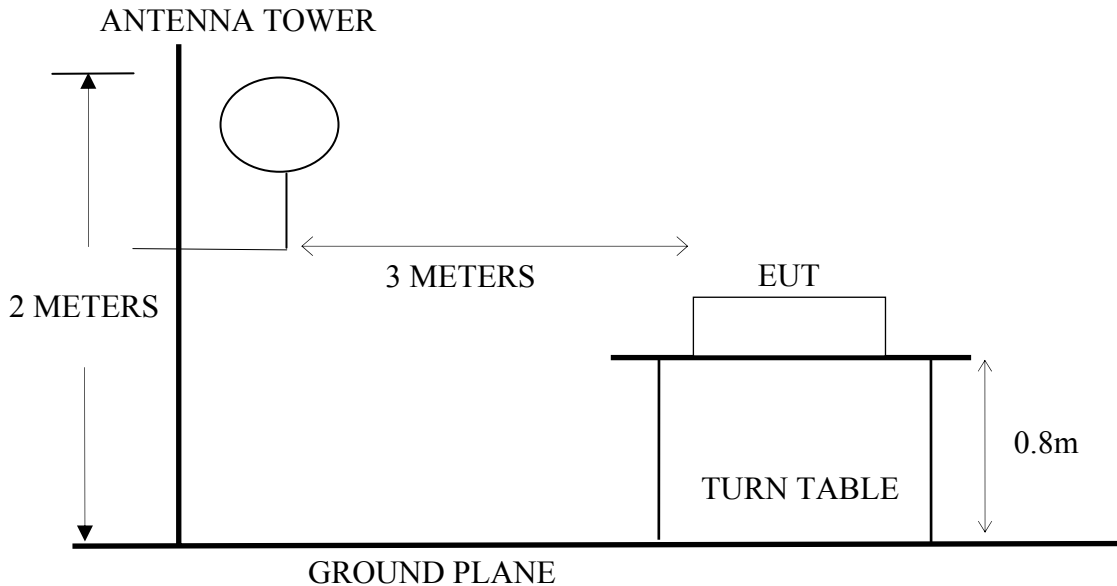
Item	Type	Manufacturer	Model No.	Serial No.	Cal. Due Date
1.	Spectrum Analyzer	Agilent	N9030A-544	US51350140	2014. 07. 29
2.	Test Receiver	R & S	ESCS30	100338	2014. 06. 30
3.	Loop Antenna	R&S	HFH2-Z2	891847/27	2014. 12. 13

5.2. Block Diagram of Test Setup

5.2.1. Block Diagram of connection between EUT and simulators



5.2.2. Semi-Anechoic Chamber (3m) Setup Diagram for 9kHz-30MHz



5.3. IN-Band Radiated Spurious Emission Limit [§15.225(a)(b)(c)]

Fundamental Frequency (MHz)	Distance meter (m)	Limit	
		$\mu\text{V}/\text{m}$	$\text{dB}\mu\text{V}/\text{m}$
13.553-13.567	30	15848	84
	3	1584893	124
13.410 -13.553 and 13.567-13.710	30	334	50.50
	3	33381	90.50
13.110 -13.410 and 13.710-14.010	30	106	40.5
	3	10592	80.5

Remark : (1) Emission level ($\text{dB}\mu\text{V}/\text{m}$) = $20 \log$ Emission level ($\mu\text{V}/\text{m}$)

(2) $15848\mu\text{V}/\text{m} = 84\text{dB}\mu\text{V}/\text{m} = 84 + 40\log(30\text{m}/3\text{m}) = 124\text{dB}\mu\text{V}/\text{m}$
 $334\mu\text{V}/\text{m} = 50.5\text{dB}\mu\text{V}/\text{m} = 50.5 + 40\log(30\text{m}/3\text{m}) = 90.5\text{dB}\mu\text{V}/\text{m}$
 $106\mu\text{V}/\text{m} = 40.5\text{dB}\mu\text{V}/\text{m} = 40.5 + 40\log(30\text{m}/3\text{m}) = 80.5\text{dB}\mu\text{V}/\text{m}$

5.4. Operating Condition of EUT

- 5.4.1. Set up the EUT (7" Pocketable Pad) and simulator as shown on 5.2.1.
- 5.4.2. To turn on the power of all equipments.
- 5.4.3. The EUT set to continuously transmit signals at 13.56MHz during all test time.

5.5. Test Procedure

The EUT and its simulators were placed on a turn table which was 0.8 meter above the ground. The turn table rotated 360 degrees to determine the position of the maximum emission level. EUT was set 3 meters away from the receiving antenna which was mounted on an antenna tower. The antenna fixed to 2meters to find out the maximum emission level. Loop antenna was used as a receiving antenna. In order to find the maximum emission, all of the interface cables were manipulated according to FCC ANSI C63.4-2003 regulation.

The bandwidth of the R&S Test Receiver ESCS30 was set at 9kHz.

The frequency range from 9kHz to 30MHz was checked with Peak detector and all final readings of measurement were with Quasi-Peak detector.

5.6. Radiated Emission Measurement Results

EUT : 7" Pocketable Pad M/N : TABLET TB71A-W

Test Date: 2014. 05. 15 Temperature: 24 Humidity: 54%

The EUT emitted the fundamental frequency with data code at the stand, side and lying conditions.

The EUT select **worst position "lying"** was performed during this section testing and all the test results are listed in following page.

Test Mode: 0 Degree

Frequency (MHz)	Test Result (dBuV/m) (3m)	Limit (dBuV/m) (3m)	Margin (dB)	Detector
13.560	41.40	124.00	82.60	QP

Test Mode: 90 Degree

Frequency (MHz)	Test Result (dBuV/m) (3m)	Limit (dBuV/m) (3m)	Margin (dB)	Detector
13.560	38.20	124.00	85.8	QP

6. RADIATED SPURIOUS EMISSION MEASUREMENT (OUT-BAND)

6.1. Test Equipment

The following test equipment was used during the radiated emission measurement: (at Semi-Anechoic Chamber)

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Due Date
1.	Spectrum Analyzer	Agilent	N9030A-544	US51350140	2014. 07. 29
2.	Test Receiver	R & S	ESCS30	100338	2014. 06. 30
3.	Amplifier	HP	8447D	2944A06305	2015. 02. 17
4.	Bilog Antenna	TESEQ	CBL6112D	33821	2014. 08. 07

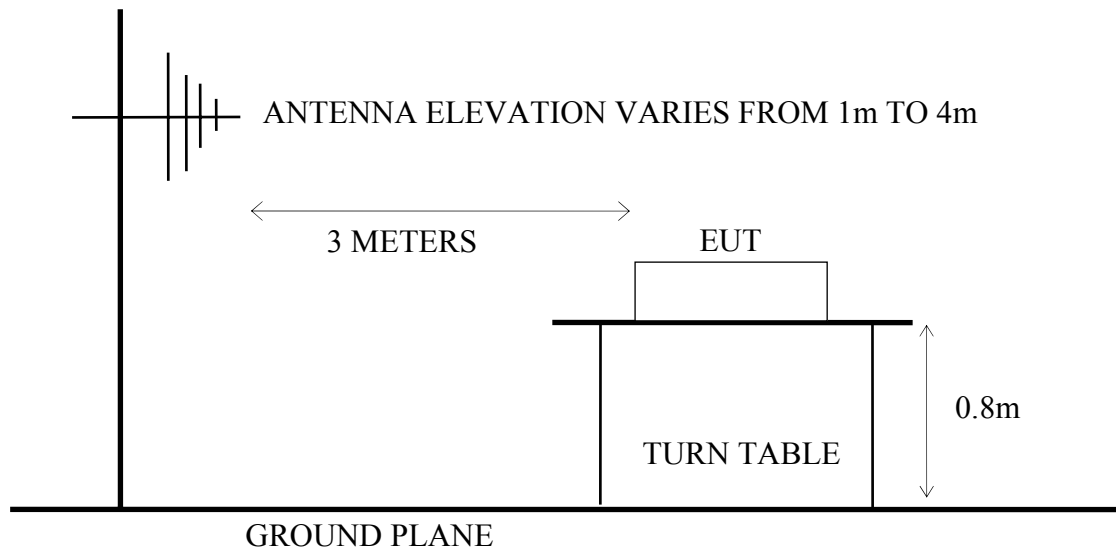
6.2. Block Diagram of Test Setup

6.2.1. Block Diagram of connection between EUT and simulators

Same as section 5.2.1.

6.2.2. Semi-Anechoic Chamber (3m) Setup Diagram for 30-1000MHz

ANTENNA TOWER



6.3. Radiated Emission Limits [§15.209, §15.209(d)]

Frequency MHz	Distance Meters	Field Strengths Limits	
		$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$
1.705 ~ 30.0	30 (3)	30 (2985)	29.5 (69.54)
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
Above 960	3	500	54.0
Above 1000	3	74.0 $\text{dB}\mu\text{V/m}$ (Peak) 54.0 $\text{dB}\mu\text{V/m}$ (Average)	

- Remark :
- (1) Emission level ($\text{dB}\mu\text{V/m}$) = 20 log Emission level ($\mu\text{V/m}$)
 - (2) The tighter limit applies at the edge between two frequency bands.
 - (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.
 - (4) The limits in this table are based on CFR 47 Part 15.205(a)(b) and Part 15.209 (a).
 - (5) The over 1GHz limit, FCC limit is used based on CFR 47 Part 15.35 (b) and Part 15.205(b) & Part 15.209(e) and Part 15.207(c).
 - (6) The 3m limit apply relation: $L2 = L1(d1/d2)$

6.4. Operating Condition of EUT

Same as powerline conducted emission measurement which is listed in 5.4. except the test set up replaced by section 6.2.

6.5. Test Procedure

The EUT and its simulators were placed on a turn table which was 0.8 meter above the ground. The turn table rotated 360 degrees to determine the position of the maximum emission level. EUT was set 3 meters away from the receiving antenna which was mounted on an antenna tower. The antenna moved up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna such as calibrated biconical and log-periodical antenna or horn antenna were used as a receiving antenna. Both horizontal and vertical polarization of the antenna were set on measurement. In order to find the maximum emission, all of the interface cables were manipulated according to FCC ANSI C63.4-2003 regulation.

The bandwidth of the R&S Test Receiver ESCS30 was set at 120kHz.

The frequency range from 9kHz to 1000MHz was checked with Peak detector and all final readings of measurement were with Quasi-Peak detector. Pursuant to ANSI 4.2.2, peak detector is an alternate option for frequency from 30MHz to 1000MHz.

6.6. Radiated Emission Measurement Results

PASSED.

All emissions not reported below are too low against the prescribed limits.

EUT : 7" Pocketable Pad

M/N : TABLET TB71A-W

The EUT emitted the fundamental frequency with data code at the stand, side and lying conditions.

The EUT select **worst position "lying"** was performed during this section testing and all the test results are listed in following page.

For Frequency Range 9kHz~30MHz:

Test Date: 2014. 05. 15 Temperature: 24 Humidity: 54 %

Test Mode: 0 Degree

Frequency (MHz)	Test Result (dBuV/m) (3m)	Limit (dBuV/m) (3m)	Margin (dB)	Detector
27.12	-- (Note 1)	69.54	--	QP

Note: 1. All emissions are lower than the ambient level cannot be measured.

Test Mode: 90 Degree

Frequency (MHz)	Test Result (dBuV/m) (3m)	Limit (dBuV/m) (3m)	Margin (dB)	Detector
27.12	-- (Note 1)	69.54	--	QP

Note: 1. All emissions are lower than the ambient level cannot be measured.

For Frequency Range 30MHz~1000MHz:

Test Date: 2014. 05. 03 Temperature: 24 Humidity: 48 %

The details are as follows :

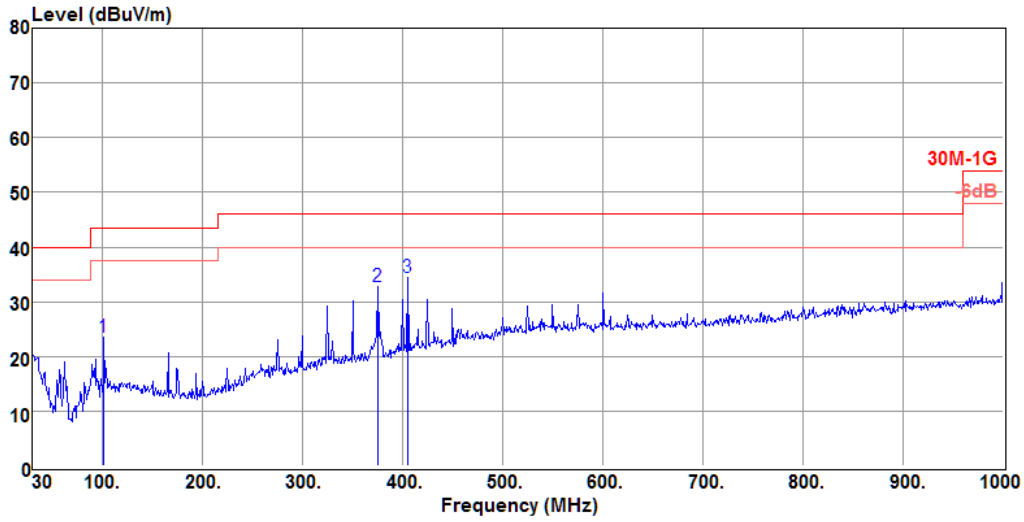
Mode	Reference Test Data	
	Horizontal	Vertical
1.	# 2	# 1

* Above all final readings were measured with Peak detector.



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Data: 2 File: D:\share DOC\johnny-e3\C1S1404136-NFC\tx.em6 (8)



Site no. : Audix NO.1 Chamber Data no. : 2
 Dis. / Ant. : 3m CBL6112D 33821 Ant. pol. : HORIZONTAL
 Limit : 30M-1G
 Env. / Ins. : 24°C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : TB71A-W
 Power Rating : DC 3.7V
 Test Mode : Tx 13.56MHz

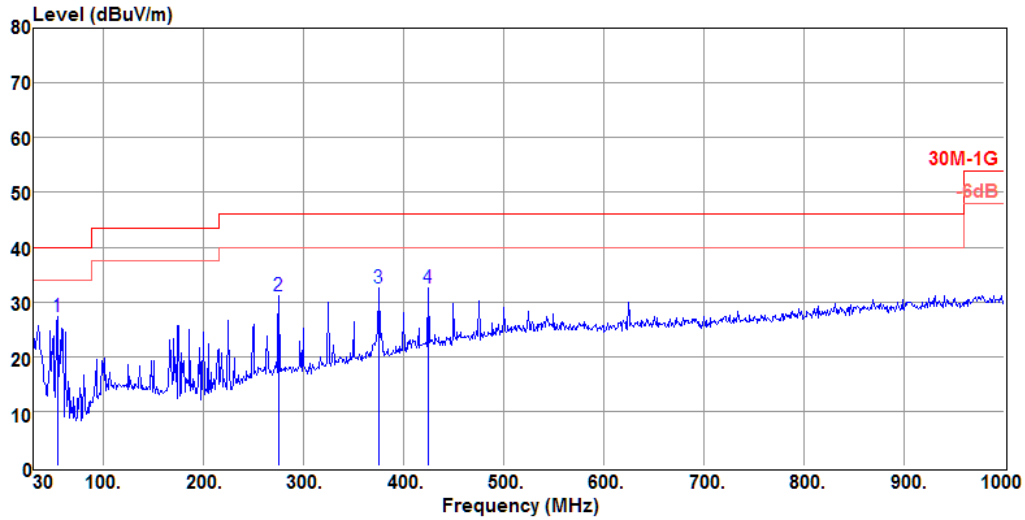
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μV)	Emission Level (dB μV/m)	Limits (dB μV/m)	Margin (dB)	Remark
1	101.78	11.48	2.10	9.98	23.54	43.50	19.96	Peak
2	375.32	15.91	4.60	12.25	32.76	46.00	13.24	Peak
3	405.39	16.57	4.90	13.07	34.54	46.00	11.46	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 2. The emission levels that are 20dB below the official limit are not reported.



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Data: 1 File: D:\share DOC\johnny-e3\C1S1404136-NFC\tx.em6 (8)



Site no. : Audix NO.1 Chamber Data no. : 1
 Dis. / Ant. : 3m CBL6112D 33821 Ant. pol. : VERTICAL
 Limit : 30M-1G
 Env. / Ins. : 24*C / 48% N9030A(140) Engineer : Johnny_Hsueh
 EUT : TB71A-W
 Power Rating : DC 3.7V
 Test Mode : Tx 13.56MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μV)	Emission Level (dB μV/m)	Limits (dB μV/m)	Margin (dB)	Remark
1	54.25	8.38	1.50	17.51	27.39	40.00	12.61	Peak
2	275.41	13.50	3.70	13.95	31.15	46.00	14.85	Peak
3	375.32	15.91	4.60	12.13	32.64	46.00	13.36	Peak
4	424.79	16.80	5.10	10.72	32.62	46.00	13.38	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 2. The emission levels that are 20dB below the official limit are not reported.

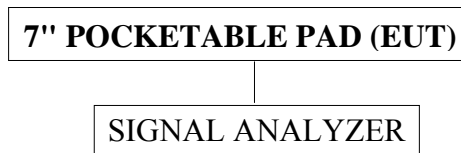
7. 20dB BANDWIDTH MEASUREMENT

7.1. Test Equipment

The following test equipment was used during the 20dB bandwidth measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Due Date
1.	Spectrum Analyzer	Agilent	N9030A-544	US51350140	2014. 07. 30

7.2. Block Diagram of Test Setup



7.3. Specification Limits [§15.215(c)]

The 20dB bandwidth shall be specified in operating frequency band.

7.4. Operating Condition of EUT

Same as powerline conducted emission measurement which is listed in 5.4. except the test set up replaced by section 7.2.

7.5. Test Procedure

The 20dB bandwidth is measured with a spectrum analyzer connected via receiver antenna placed near the EUT while the EUT is operating in transmission mode.

7.6. Test Results

PASSED. All the test results are attached in next pages.

Test Date: 2014. 05. 21 Temperature: 25 Humidity: 66 %

No.	Test Frequency	20dB Bandwidth
1.	13.56MHz	470kHz



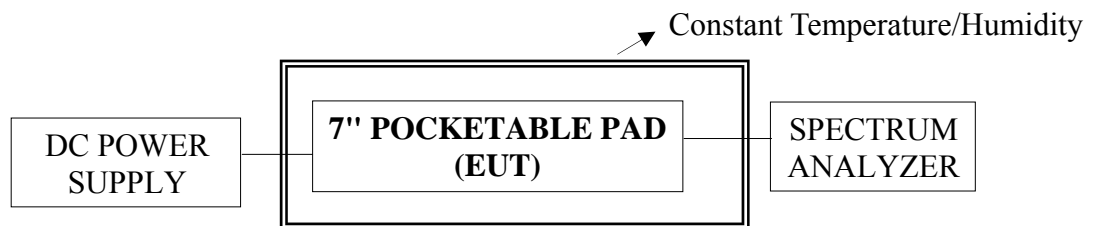
8. FREQUENCY STABILITY MEASUREMENT

8.1. Test Equipment

The following test equipment was used during the carrier frequency separation measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Due Date
1.	Spectrum Analyzer	Agilent	N9030A-544	US51350140	2014. 07. 29
2.	Constant Temperature/ Humidity	Taichy	MHG-120LF	920538	2014. 06. 30
3.	DC Power Supply	TOP WARD	3303A	N/A	N.C.R.

8.2. Block Diagram of Test Setup



8.3. Specification Limits [§15.225(c)]

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency over a temperature variation of -20degrees to 50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degree C.

8.4. Operating Condition of EUT

Same as powerline conducted emission measurement which is listed in 5.4. except the test set up replaced by section 8.2.

8.5. Test Procedure

The device operating in the 13.553-13.567MHz shall maintain the carrier frequency within 0.01% of the operating frequency over the temperature variation of -20 degrees to +50 degrees C at normal supply voltage.

8.6. Test Results

PASSED. All the test results are attached in next pages.

Test Date: 2014. 05. 03 Temperature: 24 Humidity: 48 %

Test Mode: 2 Minute

Temperature()	-20	-10	0	10	20
Voltage	DC 3.7V	DC 3.7V	DC 3.7V	DC 3.7V	DC 4.255V
Frequency(MHz)	13.55960	13.55980	13.55970	13.55990	13.55990
Error (%)	-0.00295	0.00147	-0.00221	-0.00074	-0.00074

Temperature()	20	30	40	50	20
Voltage	DC 3.145V	DC 3.7V	DC 3.7V	DC 3.7V	DC 3.7V
Frequency(MHz)	13.55990	13.55980	13.55960	13.55970	13.55990
Error (%)	-0.00074	-0.00147	-0.00295	-0.00221	-0.00074

Test Mode: 5 Minute

Temperature()	-20	-10	0	10	20
Voltage	DC 3.7V	DC 3.7V	DC 3.7V	DC 3.7V	DC 4.255V
Frequency(MHz)	13.56010	13.56020	13.56010	13.56000	13.56000
Error (%)	0.00074	0.00147	0.00074	0.00000	0.00000

Temperature()	20	30	40	50	20
Voltage	DC 3.145V	DC 3.7V	DC 3.7V	DC 3.7V	DC 3.7V
Frequency(MHz)	13.56000	13.55930	13.55940	13.55500	13.55700
Error (%)	0.00000	-0.00516	-0.00442	-0.03687	-0.02212

Test Mode: 10 Minute

Temperature()	-20	-10	0	10	20
Voltage	DC 3.7V	DC 3.7V	DC 3.7V	DC 3.7V	DC 4.255V
Frequency(MHz)	13.55980	13.55980	13.55960	13.55990	13.55990
Error (%)	-0.00147	-0.00147	-0.00295	-0.00074	-0.00074

Temperature()	20	30	40	50	20
Voltage	DC 3.145V	DC 3.7V	DC 3.7V	DC 3.7V	DC 3.7V
Frequency(MHz)	13.55990	13.55930	13.55910	13.55920	13.55990
Error (%)	-0.00074	-0.00516	-0.00664	-0.00590	-0.00074

9. DEVIATION TO TEST SPECIFICATIONS

【NONE】