



TEST REPORT

FCC Part 15 Subpart C & IC RSS-210

FCC ID: L5CEC-B130TX

IC ID: 7021A-ECB130TX

Report Reference No: WE09060002

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Date of issue: Jun 27, 2009

Testing Laboratory Name: Shenzhen Huatongwei International Inspection Co., Ltd

Address: Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China

Applicant's name: Ansen Electronics Company

Address: Room 73-78,2/F,Sino Industrial Plaza,9 Kai Cheung Road, Kowloon Bay,Kowloon,Hong Kong

Manufacturer's name: Ansen Electronics Company

Address: Chen Tung Industrial Zone,Ning Tau Administrative District,Qiao Tau Zhen,Dongguan,Guangdong

Test specification:

Standards: FCC Part Subpart 15C 2008 – Intentional Radiators

.....: RSS-210 – Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment

TRF Originator: Shenzhen Huatongwei International Inspection CO., Ltd

Master TRF: Dated 2006-06

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Equipment Under Test: Remote sensor for Butler for Butler for Butler

Trade Mark: THE SHARPER IMAGE

Model/Type reference: W239-D

Listed Models: PP-SIRMT1

Result: Positive

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SUMMARY OF STANDARDS AND RUSELT

No.	Test Item	Test Standards and Procedure	Result
1	Radiated Emission	FCC: FCC Subpart 15C § 15.231(e) ANSI C63.4-2003 section 13.1.4 IC: RSS-210 section 2.6 Table 5 RSS-Gen section 6	Complied
2	Deactivation Time	FCC: FCC Subpart 15C § 15.231(e) IC: RSS-210 section A1.1.5	Complied
3	20dB Bandwidth	FCC: FCC Subpart 15C § 15.231(c) ANSI C63.4-2003 section 13.1.7	Complied
4	99% Occupied Bandwidth	IC: RSS-210 section A1.1.3 RSS-Gen section 4.6.1	Complied

NOTE: 1),The detailed test result please see section 4.

2),The test report merely corresponds to the test sample.

3),It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Contents

<u>1.</u>	<u>TEST STANDARDS</u>	<u>4</u>
<u>2.</u>	<u>SUMMARY</u>	<u>5</u>
2.1.	General Remarks	5
2.2.	Equipment Under Test Power Supply	5
2.3.	Short description of the Equipment under Test (EUT)	5
2.4.	EUT operation mode	5
2.5.	EUT configuration	6
2.6.	Related Submittal(s) / Grant (s)	6
2.7.	Modifications	6
<u>3.</u>	<u>TEST ENVIRONMENT</u>	<u>7</u>
3.1.	Address of the test laboratory	7
3.2.	Test Facility	7
3.3.	Environmental conditions	8
3.4.	Configuration of Tested System	8
3.5.	Statement of the measurement uncertainty	9
3.6.	Equipments Used during the Test	9
<u>4.</u>	<u>TEST CONDITIONS AND RESULTS</u>	<u>10</u>
4.1.	Radiated Emission	10
4.2.	Deactivation Time	17
4.3.	20dB Bandwidth	19
4.4.	99% Occupied Bandwidth	21
<u>5.</u>	<u>TEST SETUP PHOTOS OF THE EUT</u>	<u>23</u>
<u>6.</u>	<u>EXTERNAL AND INTERNAL PHOTOS OF THE EUT</u>	<u>24</u>

1. TEST STANDARDS

The tests were performed according to following standards:

FOR FCC:

FCC Rules Part 15 Subpart C (2008) - Intentional Radiators

ANSI C63.4 (2003) – American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz

FOR IC:

RSS-210 Issue 7 June 2007 – Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment

RSS-Gen Issue 2 June 2007 – General Requirements and Information for the Certification of Radiocommunication Equipment

2. SUMMARY

2.1. General Remarks

Date of receipt of test sample : Jun 23, 2009

Testing commenced on : Jun 24, 2009

Testing concluded on : June 26, 2009

2.2. Equipment Under Test Power Supply

Power supply voltage : 120V / 60 Hz 115V / 60Hz
 12 V DC 24 V DC
 Other (specified in blank below)

DC 3V (2x1.5V AAA Battery)

2.3. Short description of the Equipment under Test (EUT)

Product Name : Remote sensor for Butler

Model Number : PP-SIRMT1

Operation Frequency : 433.92MHz

Modulation Technology : FSK

Transmitter Type : Periodic Transmitter

Sample Type : Prototype

Channel Number : 1

For more details, refer to the user's manual.

2.4. EUT operation mode

The EUT has been tested under typical operating mode.

Test Item	Test Mode	Note
Radiated Emission	Tx mode(433.92MHz)	X-axis
Deactivation Time	Tx mode(433.92MHz)	/
20dB Bandwidth	Tx mode(433.92MHz)	/
99% Occupied Bandwidth	Tx mode(433.92MHz)	/
Duty cycle	Tx mode(433.92MHz)	/

2.5. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

- supplied by the manufacturer
- supplied by the lab

AC Adaptor MODEL : /
INPUT : /
OUTPUT : /

Adaptor Cable Length : /
 Shield Unshield
 Detachable Undetachable

2.6. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **L5CEC-B130TX** filing to comply with the FCC Part 15 Subpart C 15.231(e) Rules 2008.

This submittal(s) (test report) is intended for IC: **7021A-ECB130TX** filing to comply with the RSS-210 and RSS-Gen correlative Rules.

2.7. Modifications

No modifications were implemented to meet testing criteria.

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Shenzhen Huatongwei International Inspection Co., Ltd
Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China
Phone: 86-755-26715686 Fax: 86-755-26748089

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 (2003) and CISPR Publication 22.

3.2. Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L1225

Shenzhen Huatongwei International Inspection Co., Ltd has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories, Date of Registration: August 02, 2007. Valid time is until March 29, 2012.

A2LA-Lab Cert. No. 2243.01

Shenzhen Huatongwei International Inspection Co., Ltd, EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing. Valid time is from Aug 24, 2005 to Sept 30, 2009.

FCC-Registration No.: 662850

Shenzhen Huatongwei International Inspection Co., Ltd, EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 662850, Renewal date Jul 1, 2009.

IC-Registration No.: 5377

The 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 5377 on November Feb 13, 2009.

ACA

Shenzhen Huatongwei International Inspection Co., Ltd, EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

NEMKO-Aut. No.: ELA125

Shenzhen Huatongwei International Inspection Co., Ltd has been assessed the quality assurance system, the testing facilities, qualifications and testing practices of the relevant parts of the organization. The quality assurance system of the Laboratory has been validated against ISO/IEC 17025:2005 or equivalent. The laboratory also fulfils the conditions described in Nemko Document NLA-10, the Authorization is valid through April 25, 2009.

VCCI

The 3m Semi-anechoic chamber (12.2m×7.95m×6.7m) and Shielded Room (8m×4m×3m) of Shenzhen Huatongwei International Inspection Co., Ltd has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2484. Date of Registration: December 20, 2006. Valid time is until December 19, 2009.

Main Ports Conducted Interference Measurement of Shenzhen Huatongwei International Inspection Co., Ltd has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: C-2726. Date of Registration: December 20, 2006. Valid time is until December 19, 2009.

DNV

Shenzhen Huatongwei International Inspection Co Ltd has been found to comply with the requirements of DNV towards subcontractor of EMC and safety testing services in conjunction with the EMC and Low voltage Directives and in the voluntary field. The acceptance is based on a formal quality Audit and follow-ups according to relevant parts of ISO/IEC Guide 17025(2005), in accordance with the requirements of the DNV Laboratory Quality Manual towards subcontractors. Valid time is until 09 July, 2010.

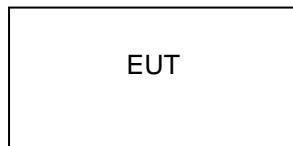
3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature: 22 ° C

Humidity: 65 %

Atmospheric pressure: 950-1050mbar

3.4. Configuration of Tested System

Equipment Used in Tested System

No.	Equipment	Manufacturer	Model No.	Serial No.	Note
1	-	-	-	-	-

Note: For actual sample please see test setup photos and EUT external photos.

3.5. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen Huatongwei laboratory is reported:

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.22dB	(1)
Radiated Emission	1~12.75GHz	4.35dB	(1)
20dB Bandwidth	/	0.25dB	(1)
99% Occupied Bandwidth	/	0.25dB	(1)
Deactivation Time	/	0.5ms	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3.6. Equipments Used during the Test

Radiated Emissions					
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ULTRA-BROADBAND ANTENNA	ROHDE & SCHWARZ	HL562	100015	2008/11
2	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESI 26	100009	2008/11
3	RF TEST PANEL	ROHDE & SCHWARZ	TS / RSP	335015/ 0017	2008/11
4	TURNTABLE	ETS	2088	2149	2008/11
5	ANTENNA MAST	ETS	2075	2346	2008/11
6	EMI TEST SOFTWARE	ROHDE & SCHWARZ	ESK1	N/A	2008/11
7	HORN ANTENNA	ROHDE & SCHWARZ	HF906	N/A	2008/06/

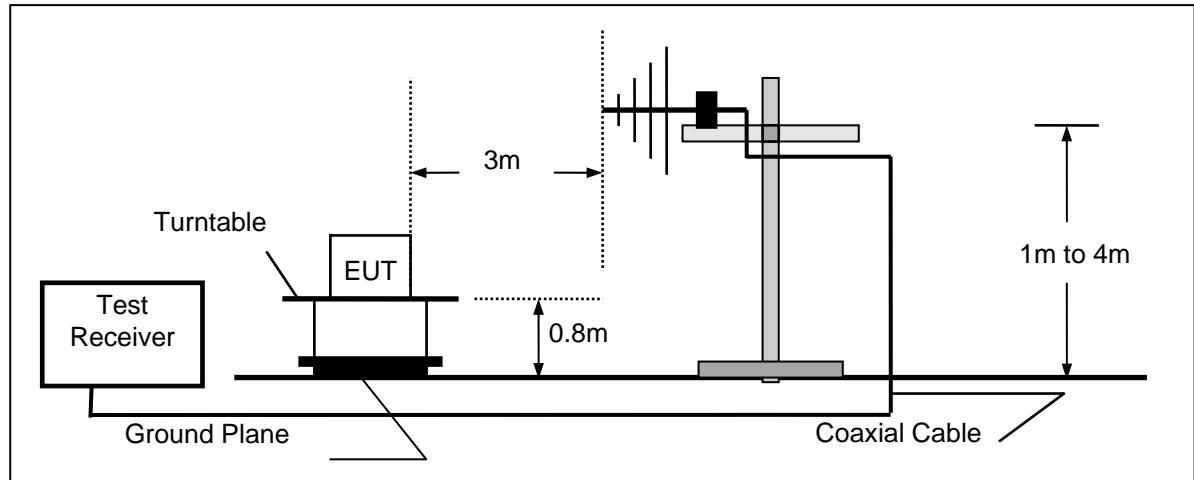
20dB Bandwidth & Deactivation Time & Duty Cycle & 99% Occupied Bandwidth					
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESCI	100106	2008/11
2	RECEIVER ANTENNA	/	/	/	/

4. TEST CONDITIONS AND RESULTS

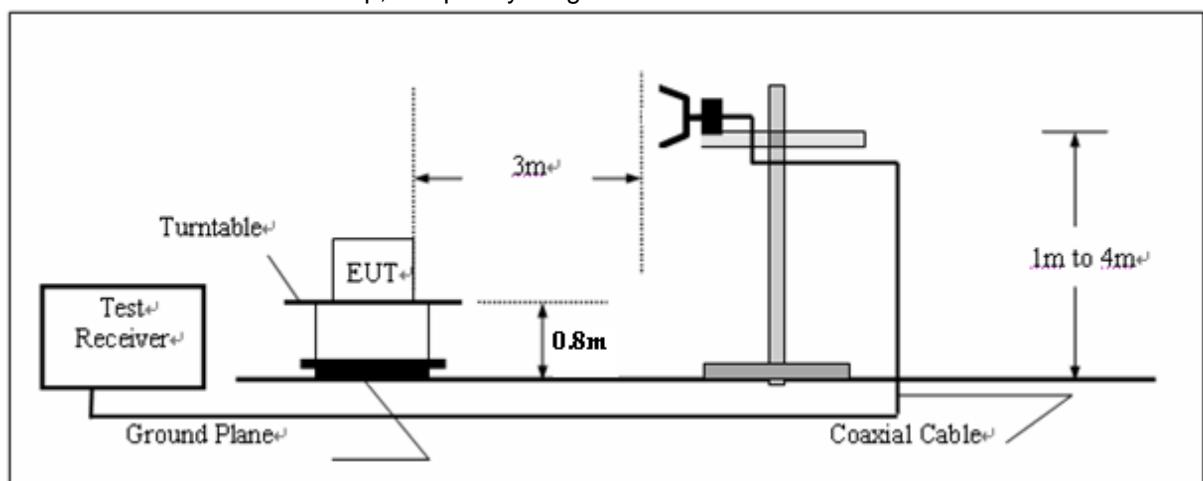
4.1. Radiated Emission

TEST CONFIGURATION

Radiated Emission Test Set-Up, Frequency range 30 - 1000MHz



Radiated Emission Test Set-Up, Frequency range 1GHz - 5GHz



TEST PROCEDURE

- 1 The EUT was placed on a turn table which is 0.8m above ground plane.
- 2 The test was beforehand scan carried out with EUT placement X-axis, Y-axis and Z-axis. X-axis was the worst status. So finally test was be carried out under this Y-axis.
- 3 Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0°C to 360°C to acquire the highest emissions from EUT.
- 4 And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 5 Repeat above procedures until all frequency measurements have been completed.

RADIATION LIMIT

For periodic transmitter, according to § 15.231(e) and RSS-210 section 2.6 table 5, the field strength of fundamental from device at a distance of 3 meters shall not exceed the following values:

Fundamental frequency (MHz)	Distance (Meters)	Field strength of fundamental (dB μ V/m)	
		AV	Peak
433.92	3	72.87	92.87

Note: For the band 260-470MHz, μ V/m at 3 meters = $16.67(F) - 2833.33$
Where F is fundamental frequency 433.92MHz

For periodic transmitter, according to § 15.231(e) and RSS-210 section 2.6 table 5, the field strength radiated emissions from device at a distance of 3 meters shall not exceed the following values:

Fundamental frequency (MHz)	Distance (Meters)	Field strength of spurious emission	
		(microvolts/meter)	(dB μ V/m)
40.66-40.70	3	100	40
70-130	3	50	34
130-174	3	50 to 150	34 to 43.5
174-260	3	150	43.5
260-470	3	150 to 500	43.5 to 54
Above 470	3	500	54

Note: 1, For other bands limit pls refer 15.209 and RSS-210 section 6
2, The limit below 1GHz based CISPR quasi-peak detector, the limit above 1GHz based average detector and peak limit is 74dB μ V/m.

TEST RESULTS

The emissions from 1GHz to 5GHz are peak measured and comply with average limit, detailed test data please see the following pages.

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

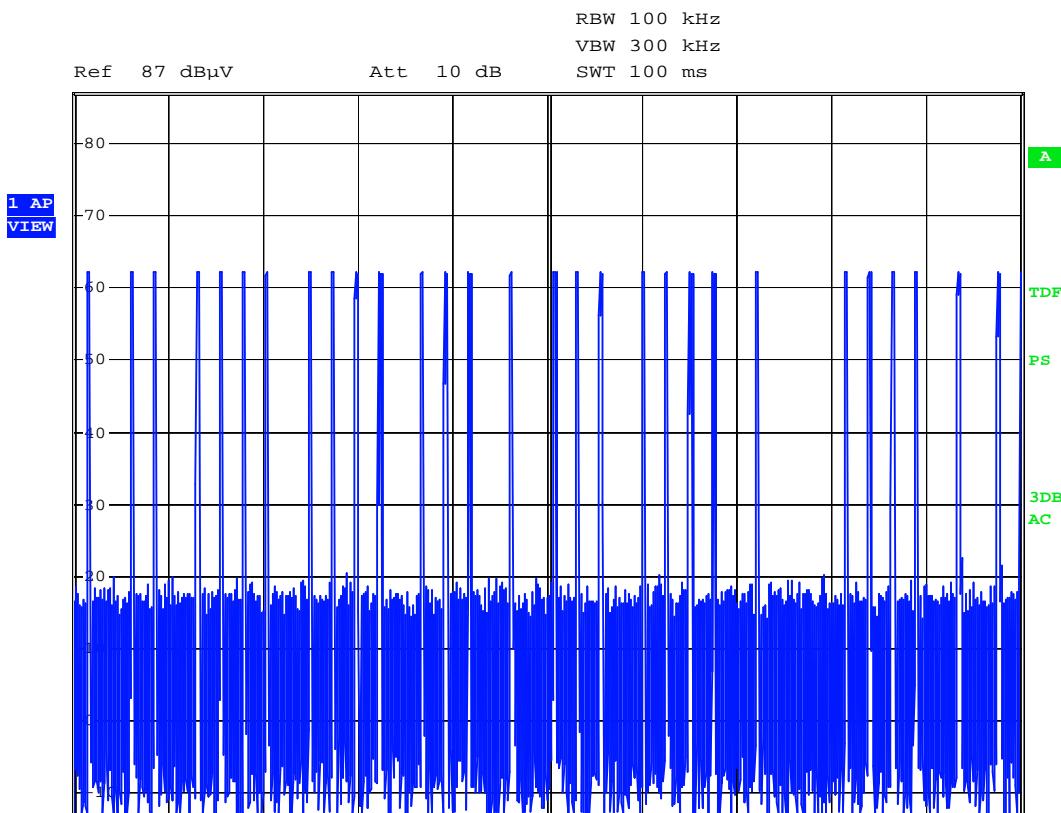
$$FS = RA + AF + CL - AG$$

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

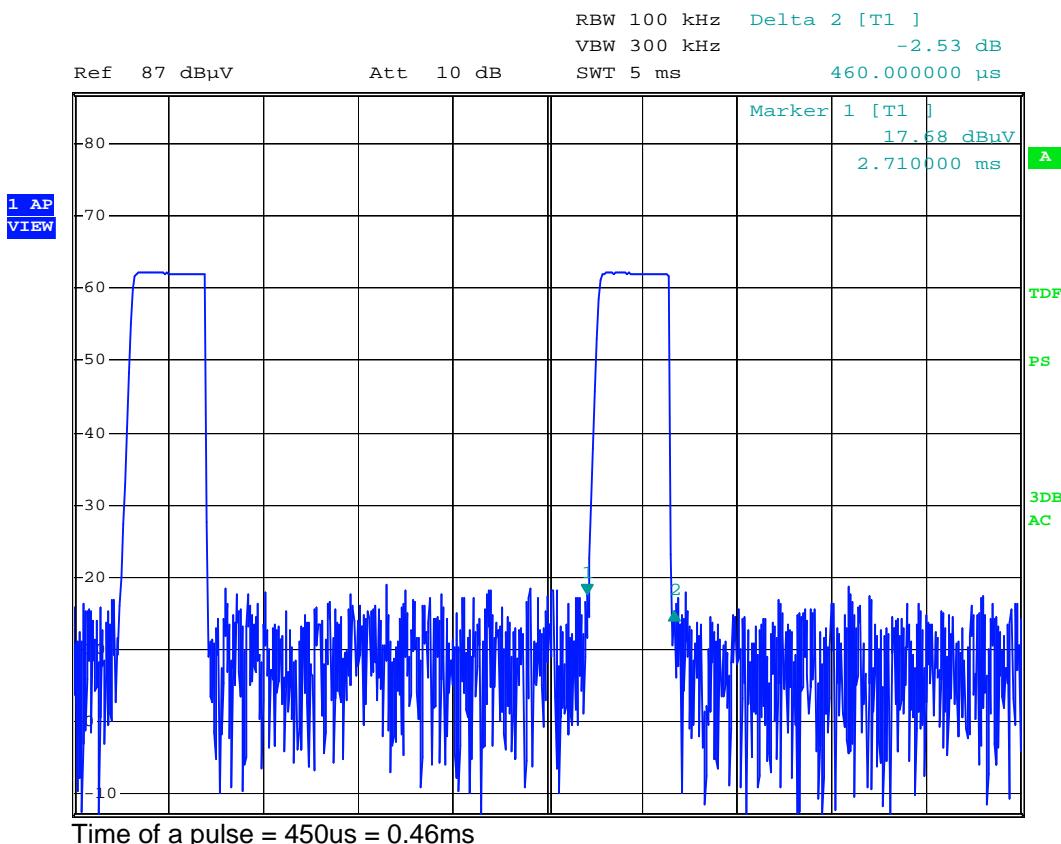
Duty Cycle Correction Factor

Duty Cycle = TX on/100ms X 100% = $29 \times 0.46\text{ms}/100\text{ms} \times 100\% = 13.34\%$

Duty Cycle Correction Factor = $20\log(\text{Duty Cycle}) = -17.5$



The pulses of 100ms = 29 times

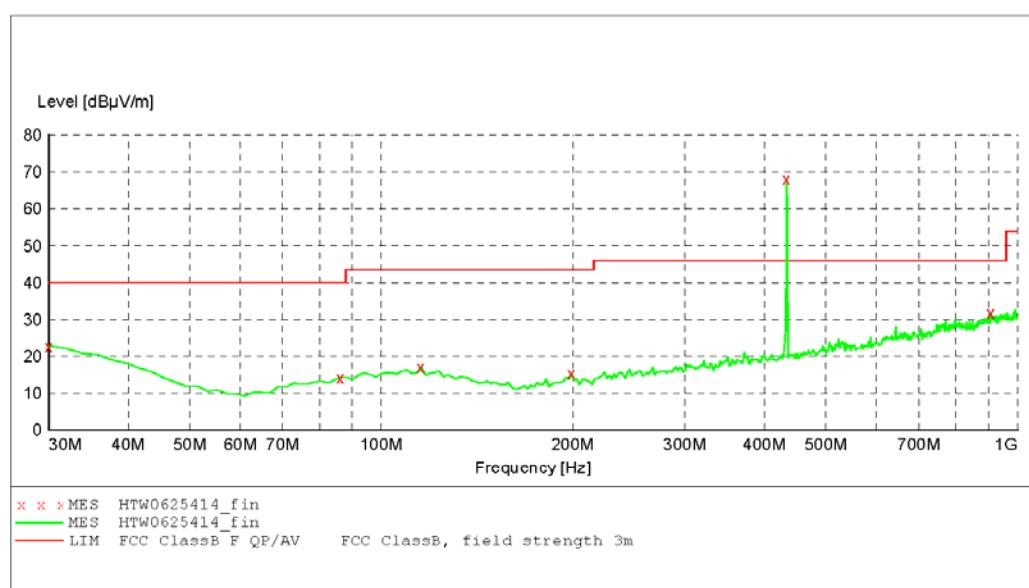


30MHz to 1GHz Test Data

EUT: Remote sensor for Butler M/N: PP-SIRMT1
 Manufacturer: Ansen
 Operating Condition: TX Mode
 Test Site: 3M CHAMBER
 Operator: Cary
 Test Specification: DC 3V
 Comment: Y-axis
 Start of Test: 6/25/2009 / 5:58:03PM

SWEET TABLE: "test (30M-1G)"

Short Description:		Field Strength			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency			Time	Bandw.
30.0 MHz	1.0 GHz	MaxPeak	Coupled	120 kHz	HL562 09



MEASUREMENT RESULT: "HTW0625414_fin"

Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	22.80	21.1	40.0	17.2	QP	100.0	5.00	VERTICAL
86.372745	14.30	11.2	40.0	25.7	QP	100.0	199.00	VERTICAL
115.531062	17.10	12.7	43.5	26.4	QP	100.0	327.00	VERTICAL
199.118236	15.40	10.6	43.5	28.1	QP	100.0	5.00	VERTICAL
433.928657	68.20	16.7	92.8	24.6	Peak	100.0	114.00	VERTICAL
908.637275	31.80	25.7	46.0	14.2	QP	100.0	284.00	VERTICAL

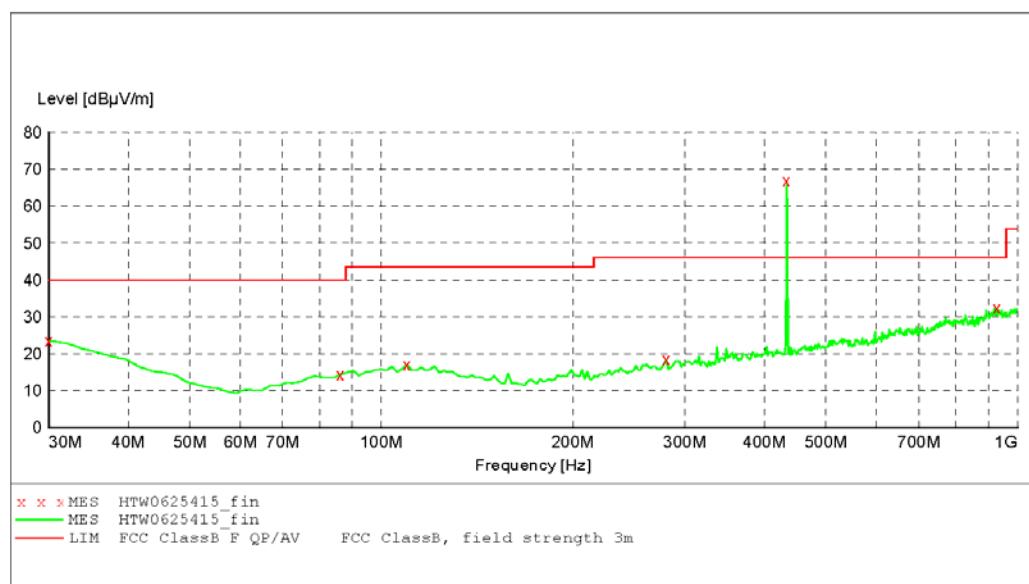
Frequency (MHz)	Field strength (dB μ V/m)	AV Limit (dB μ V/m)	Duty Cycle Correction Factor	Result (dB)	Margin (dB)	Det.
433.92	68.20	72.87	-17.4	50.84	22.03	AV

Note: Result = Field Strength + Duty Cycle Correction Factor

EUT: Remote sensor for Butler M/N: PP-SIRMT1
 Manufacturer: Ansen
 Operating Condition: TX Mode
 Test Site: 3M CHAMBER
 Operator: Cary
 Test Specification: DC 3V
 Comment: Y-axis
 Start of Test: 6/25/2009 / 6:00:15PM

SWEEP TABLE: "test (30M-1G)"

		Field Strength			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency			Time	Bandw.
30.0 MHz	1.0 GHz	MaxPeak	Coupled	120 kHz	HL562 09



MEASUREMENT RESULT: "HTW0625415_fin"

6/25/2009 6:02PM

Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	23.50	21.1	40.0	16.5	QP	300.0	232.00	HORIZONTAL
86.372745	14.40	11.2	40.0	25.6	QP	100.0	29.00	HORIZONTAL
109.699399	17.10	12.3	43.5	26.4	QP	300.0	83.00	HORIZONTAL
280.761523	18.50	13.6	46.0	27.5	QP	100.0	351.00	HORIZONTAL
433.928657	66.80	16.7	92.8	26.0	Peak	100.0	3.00	HORIZONTAL
928.076152	32.40	26.0	46.0	13.6	QP	100.0	74.00	HORIZONTAL

Frequency (MHz)	Field strength (dB μ V/m)	AV Limit (dB μ V/m)	Duty Cycle Correction Factor	Result (dB)	Margin (dB)	Det.
433.92	66.80	72.87	-17.4	49.40	23.47	AV

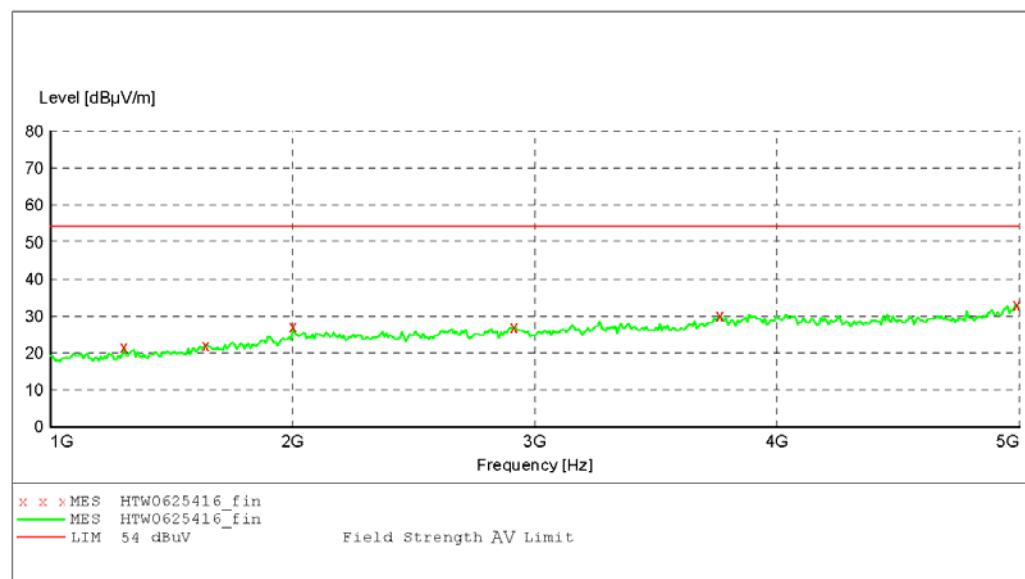
Note: Result = Field Strength + Duty Cycle Correction Factor

1GHz to 5GHz Test Data

EUT: Remote sensor for Butler M/N: PP-SIRMT1
 Manufacturer: Ansen
 Operating Condition: TX Mode
 Test Site: 3M CHAMBER
 Operator: Cary
 Test Specification: DC 3V
 Comment: Y-axis
 Start of Test: 6/25/2009 / 6:06:14PM

SWEET TABLE: "test (1G-18G) P"

Short Description: EN 55022 Field Strength
 Start Stop Detector Meas. IF Transducer
 Frequency Frequency Time Bandw.
 1.0 GHz 18.0 GHz MaxPeak Coupled 1 MHz HF906(2008)

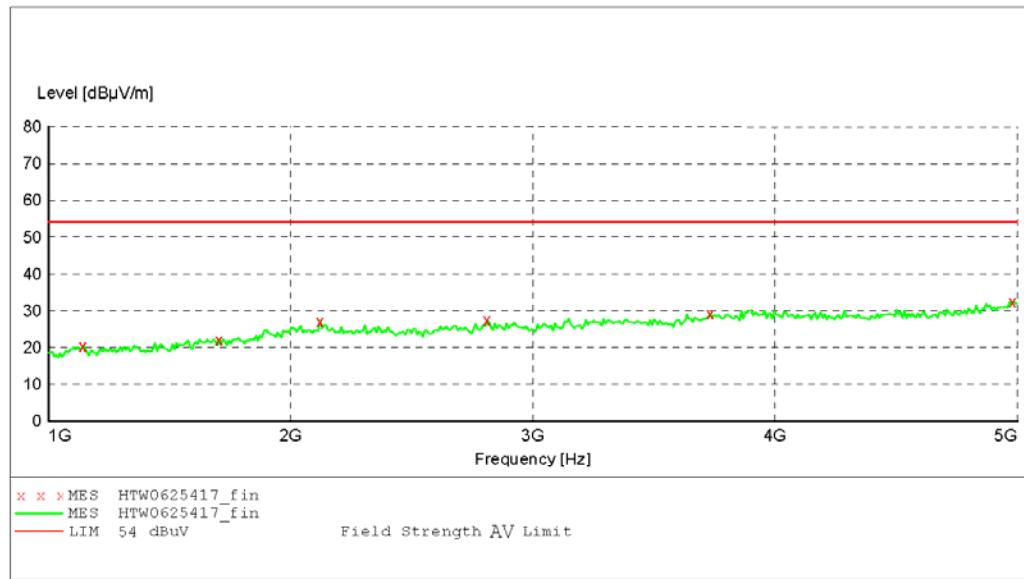
***MEASUREMENT RESULT: "HTW0625416_fin"***

6/25/2009 6:07PM									
Frequency	Level	Transd	Limit	Margin	Det.	Height	Azimuth	Polarization	
MHz	dB μ V/m	dB	dB μ V/m	dB		cm	deg		
1304.609218	21.70	-2.8	54.0	32.3	Peak	100.0	194.00	HORIZONTAL	
1641.282565	22.10	-2.3	54.0	31.9	Peak	100.0	36.00	HORIZONTAL	
2002.004008	27.30	-1.1	54.0	26.7	Peak	100.0	218.00	HORIZONTAL	
2915.831663	27.00	2.3	54.0	27.0	Peak	100.0	159.00	HORIZONTAL	
3765.531062	30.10	5.5	54.0	23.9	Peak	100.0	354.00	HORIZONTAL	
4991.983968	33.00	7.3	54.0	21.0	Peak	100.0	249.00	HORIZONTAL	

EUT: Remote sensor for Butler M/N: PP-SIRMT1
 Manufacturer: Ansen
 Operating Condition: TX Mode
 Test Site: 3M CHAMBER
 Operator: Cary
 Test Specification: DC 3V
 Comment: Y-axis
 Start of Test: 6/25/2009 / 6:08:24PM

SWEET TABLE: "test (1G-18G) P"

Short Description: EN 55022 Field Strength
 Start Stop Detector Meas. IF Transducer
 Frequency Frequency Time Bandw.
 1.0 GHz 18.0 GHz MaxPeak Coupled 1 MHz HF906(2008)

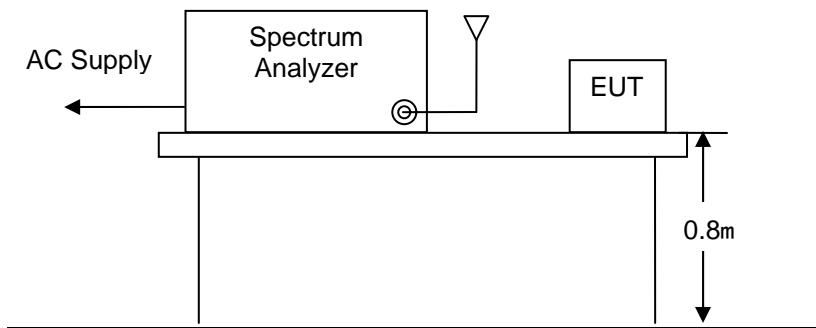


MEASUREMENT RESULT: "HTW0625417_fin"

6/25/2009 6:10PM								
Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1144.288577	20.40	-4.0	54.0	33.6	Peak	100.0	298.00	VERTICAL
1705.410822	22.10	-1.7	54.0	31.9	Peak	100.0	292.00	VERTICAL
2122.244489	27.10	-0.4	54.0	26.9	Peak	100.0	179.00	VERTICAL
2811.623246	27.40	1.5	54.0	26.6	Peak	100.0	114.00	VERTICAL
3733.466934	29.20	5.4	54.0	24.8	Peak	100.0	317.00	VERTICAL
4983.967936	32.50	7.3	54.0	21.5	Peak	100.0	352.00	VERTICAL

4.2. Deactivation Time

TEST CONFIGURATION



TEST PROCEDURE

- 1 The EUT was placed on a wooden table which is 0.8m height and close to receiver antenna of spectrum analyzer.
- 2 The spectrum analyzer resolution bandwidth was set to 100kHz and video bandwidth was set to 300kHz to encompass all significant spectral components during the test. The spectrum analyzer was operated in linear scale and zero span mode after tuning to the transmitter carrier frequency.

Limit

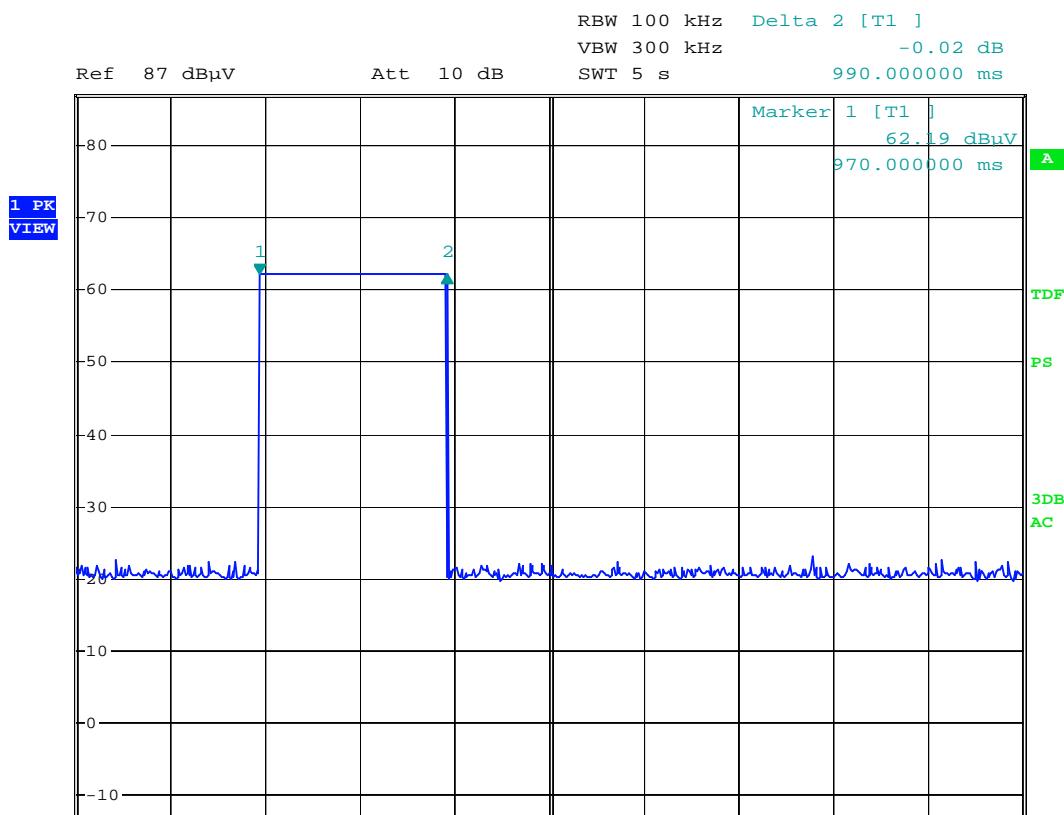
For periodic transmitter, according to FCC Part 15C § 15.231(e) and RSS-210 Annex A1.1.5

Item	Limit (second)
One transmission time	not greater than 1 second
Transmission period	at least 30 times the duration of the transmission but in no case less than 10 second

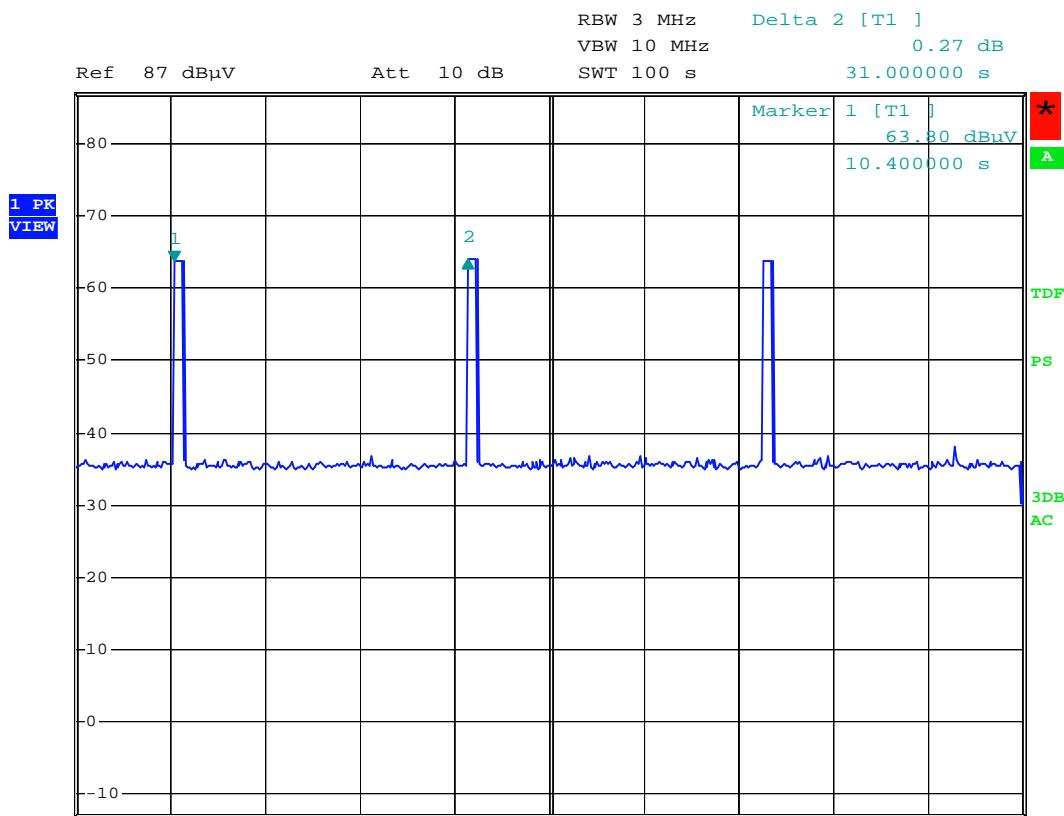
TEST RESULTS

EUT statement: The transmitter was automatically activated, and there was a carrier frequency 433.92MHz:

Frequency (MHz)	One transmission time (second)	Transmission period (second)	Result
433.92	0.99	31.0	Pass



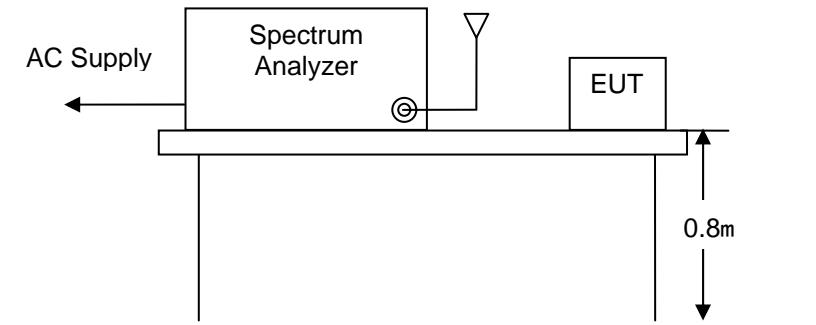
One transmission time = 0.99ms



Transmission period time = 31s

4.3. 20dB Bandwidth

TEST CONFIGURATION



TEST PROCEDURE

- 1 The EUT was placed on a wooden table which is 0.8m height and close to receiver antenna of spectrum analyzer.
- 2 The spectrum analyzer resolution bandwidth was set to 10kHz and video bandwidth was set to 30kHz to encompass all significant spectral components during the test. The detector was set to peak and hold mode to clearly observe the components.

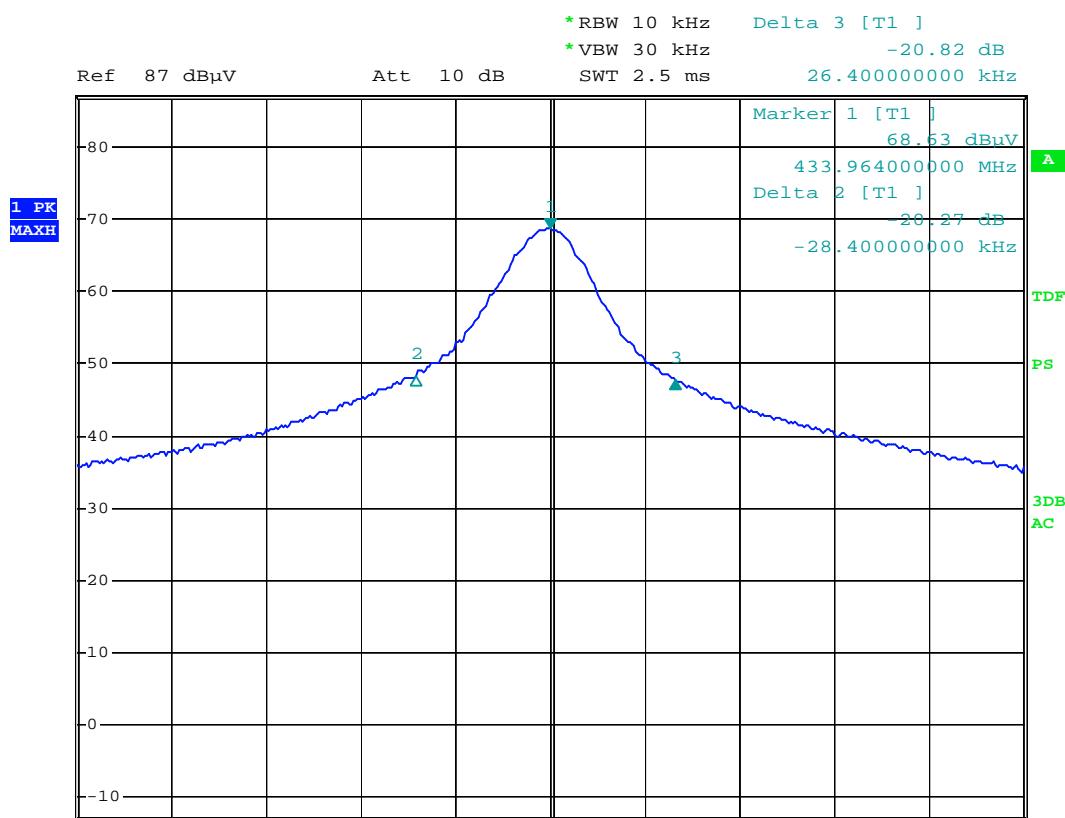
Limit

According to FCC Part 15C § 15.231(c)

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70MHz and below 900MHz.

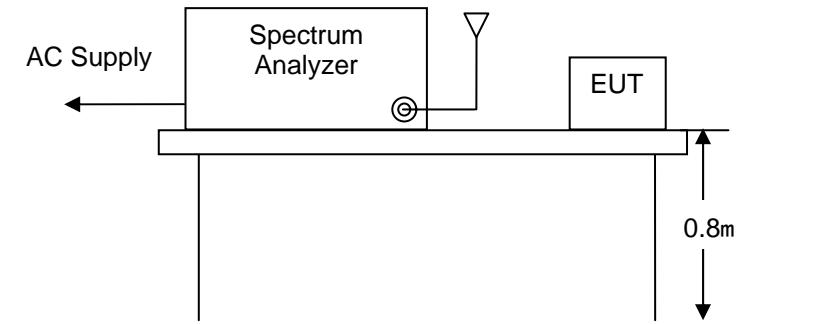
TEST RESULTS

Frequency (MHz)	Measurement Bandwidth (KHz)	Limit (kHz)	Result
433.92	54.0	1084.8	Pass



4.4. 99% Occupied Bandwidth

TEST CONFIGURATION



TEST PROCEDURE

- 1 The EUT was placed on a wooden table which is 0.8m height and close to receiver antenna of spectrum analyzer.
- 2 The spectrum analyzer resolution bandwidth was set to 10kHz and video bandwidth was set to 30kHz to encompass all significant spectral components during the test. The detector was set to peak and hold mode to clearly observe the components.
- 3 Use spectrum analyzer mark function measured the 26dB bandwidth at the points.

Limit

According to RSS-210 Annex A1.1.3 and RSS-Gen section 4.6.1

For the purpose of Section A1.1, the 99% bandwidth shall be no wider than 0.25% of the centre frequency for devices operating between 70-900 MHz.

TEST RESULTS

Frequency (MHz)	Measurement Bandwidth (KHz)	Limit (kHz)	Result
433.92	106.0	1084.8	Pass

