





# **TEST REPORT**

Applicant	The Cable Ferret Company				
Address	18 Kawerau Ave Devonport Auckland New Zealand				
Manufacturer or Supplier					
Address					
Product	Ferret WiFi camera				
Brand Name	N/A				
Model	CFWF50A				
Additional Model & Model Difference	N/A				
Date of tests	Dec. 22, 2017 ~ Jan. 22, 2018				
The tests have been	n carried out according to the requ	uirements of the following standard:			
	ubpart C, Section 15.247				
CONCLUSION: The	submitted sample was found f	to COMPLY with the test requirement			
Tested by Andy Zhu Approved by Glyn He Project Engineer / EMC Department Supervisor / EMC Department					
	Indy	CALL.			
	$\mathcal{O}$				

Date: Jan. 29, 2018

This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification



# **TABLE OF CONTENTS**

R	ELEA	ASE C	ONTROL RECORD	4
1	S	UMM	ARY OF TEST RESULTS	5
2	M	IEASU	JREMENT UNCERTAINTY	5
3	G	ENEF	RAL INFORMATION	6
	3.1	GEN	IERAL DESCRIPTION OF EUT	6
	3.2	DES	CRIPTION OF TEST MODES	7
	3.	.2.1	CONFIGURATION OF SYSTEM UNDER TEST	8
	3.	2.2	TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL	8
	3.3	GEN	IERAL DESCRIPTION OF APPLIED STANDARDS	11
	3.4	DES	CRIPTION OF SUPPORT UNITS	11
4	TI	EST T	TYPES AND RESULTS	12
	4.1	CON	IDUCTED EMISSION MEASUREMENT	12
	4.	1.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT	12
	4.	1.2	TEST INSTRUMENTS	12
	4.	1.3	TEST PROCEDURES	13
	4.	1.4	DEVIATION FROM TEST STANDARD	13
	4.	1.5	TEST SETUP	14
	4.	1.6	EUT OPERATING CONDITIONS	
	4.	1.7	TEST RESULTS	15
	4.2	RAD	IATED EMISSION MEASUREMENT	17
	4.	2.1	LIMITS OF RADIATED EMISSION MEASUREMENT	17
	4.	2.2	TEST INSTRUMENTS	18
	4.	.2.3	TEST PROCEDURES	19
	4.	2.4	DEVIATION FROM TEST STANDARD	19
	4.	.2.5	TEST SETUP	20
	4.	.2.6	EUT OPERATING CONDITIONS	21
	4.	.2.7	TEST RESULTS	22
	4.3	6DB	BANDWIDTH MEASUREMENT	30
	4.	.3.1	LIMITS OF 6DB BANDWIDTH MEASUREMENT	30
	4.	3.2	TEST INSTRUMENTS	30
	4.	3.3	TEST PROCEDURE	30
	4.	3.4	DEVIATION FROM TEST STANDARD	31
	4.	3.5	TEST SETUP	31
	4.	3.6	EUT OPERATING CONDITIONS	31
	4.	3.7	TEST RESULTS	32

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4.	4 CON	NDUCTED OUTPUT POWER	34
	4.4.1	LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT	34
	4.4.2	TEST SETUP	34
	4.4.3	TEST INSTRUMENTS	34
	4.4.4	TEST PROCEDURES	35
	4.4.5	DEVIATION FROM TEST STANDARD	35
	4.4.6	EUT OPERATING CONDITIONS	35
	4.4.7	TEST RESULTS	36
4.	5 POV	VER SPECTRAL DENSITY MEASUREMENT	38
	4.5.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT	38
	4.5.2	TEST SETUP	38
	4.5.3	TEST INSTRUMENTS	38
	4.5.4	TEST PROCEDURE	38
	4.5.5	DEVIATION FROM TEST STANDARD	38
	4.5.6	EUT OPERATING CONDITION	39
	4.5.7	TEST RESULTS	39
4.	6 OUT	OF BAND EMISSION MEASUREMENT	41
	4.6.1	LIMITS OF OUT OF BAND EMISSION MEASUREMENT	41
	4.6.2	TEST SETUP	41
	4.6.3	TEST INSTRUMENTS	41
	4.6.4	TEST PROCEDURE	41
	4.6.5	DEVIATION FROM TEST STANDARD	42
	4.6.6	EUT OPERATING CONDITION	42
	4.6.7	TEST RESULTS	43
5	РНОТО	OGRAPHS OF THE TEST CONFIGURATION	46
6	APPEN	NDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EL	JT
	BY TH	E LAB	47



# **RELEASE CONTROL RECORD**

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF171222N021	Original release	Jan. 29, 2018

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## 1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

AF	APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)							
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK					
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit.					
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit.					
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit.					
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.					
15.247(b)	Conducted Output power	PASS	Meet the requirement of limit.					
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.					
15.203	Antenna Requirement	PASS	No antenna connector is used					

## 2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.70dB
	9KHz ~ 30MHz	2.90dB
Radiated emissions	30MHz ~ 1GMHz 3.83	3.83dB
Nadiated emissions	1GHz ~ 18GHz	4.93dB
	18GHz ~ 40GHz	4.80dB

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



## 3 GENERAL INFORMATION

## 3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Ferret WiFi camera
MODEL NO.	CFWF50A
ADDITIONAL NO.	N/A
FCC ID	2ABPD-CFWF50A
NOMINAL VOLTAGE	DC 3.7V From Li-ion Battery or DC 5V From USB Host
NOMINAL VOLTAGE	Unit
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS
INODOLATION TITE	64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
OPERATING FREQUENCY RANG	2412-2462MHz for 11b/ n(HT20)
AVERAGE POWER	12.81 dBm(Maximum)
ANTENNA TYPE	Integral Antenna, with 2dBi gain
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	USB Cable: Unshielded, Detachable, 45cm

## NOTE:

1. The EUT provides completed transmitters and receivers:

MODULATION MODE	FUNCTION	
802.11b	1TX/1RX	
802.11n (HT20)	1TX/1RX	

- 2. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
- 3. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
- 4. Please refer to the EUT photo document (Reference No.: 171222N021) for detailed product photo.



#### **DESCRIPTION OF TEST MODES** 3.2

11 channels are provided for 802.11b, 802.11n20:

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412 MHz	7	2442 MHz
2	2417 MHz	8	2447 MHz
3	2422 MHz	9	2452 MHz
4	2427 MHz	10	2457 MHz
5	2432 MHz	11	2462 MHz
6	2437 MHz		

**Dongguan Branch** 



## 3.2.1 CONFIGURATION OF SYSTEM UNDER TEST

Please see section 5 photographs of the test configuration for reference.

## 3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports.

The worst case was found when positioned on X axis for radiated emission. Following test modes were selected for the final test, and the final worst case is marked in boldface and recorded in the report:

EUT CONFIGURE		APPLIC	ABLE TO		MODE
MODE	RE<1G	RE≥1G	PLC		
-	<b>V</b>	<b>V</b>	-	<b>√</b>	Powered by Battery with WIFI link
-	-	-	$\checkmark$	-	Powered by Adapter with WIFI link

Where

**RE<1G:** Radiated Emission below 1GHz **PLC:** Power Line Conducted Emission

RE≥1G: Radiated Emission above 1GHz

**APCM:** Antenna Port Conducted Measurement

## **POWER LINE CONDUCTED EMISSION TEST:**

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	TESTED CONDITION
-	WIFI (2.4G) Link

#### **RADIATED EMISSION TEST (BELOW 1GHz):**

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11b	1 to 11	1	OFDM	DBPSK	1.0



#### RADIATED EMISSION TEST (ABOVE 1GHz):

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports (if EUT with antenna diversity architecture).

☑Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
-	802.11n HT20	1 to 11	1, 6, 11	OFDM	BPSK	6.5

#### **BANDEDGE MEASUREMENT:**

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11b	1 to 11	1, 11	DSSS	DBPSK	1.0
-	802.11n HT20	1 to 11	1, 11	OFDM	BPSK	6.5

## **ANTENNA PORT CONDUCTED MEASUREMENT:**

- This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
-	802.11n HT20	1 to 11	1, 6, 11	OFDM	BPSK	6.5



# **TEST CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	TEST VOLTAGE	TESTED BY
RE<1G	25deg. C, 53%RH	DC 3.7V from Battery	Arnold
RE≥1G	25deg. C, 53%RH	DC 3.7V from Battery	Arnold
PLC	25deg. C, 55%RH	DC 5V from Adapter	Sen He
APCM	20deg. C, 55%RH	DC 3.7V from Battery	Sen He

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## 3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C, Section 15.247 KDB 558074 D01 DTS Meas Guidance v04 ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

#### 3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	adapter	Lenovo	C-P30	N/A	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	N/A



## 4 TEST TYPES AND RESULTS

#### 4.1 CONDUCTED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED	LIMIT (dBµV)
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

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

- The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.
- 3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

## 4.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR7	101494	Apr. 05,17	Apr. 04,18
Artificial Mains Network	Rohde&Schwarz	ENV216	101173	Mar. 06,17	Mar. 05,18
Artificial Mains Network	Rohde&Schwarz	ESH3-Z5	100317	Apr. 05,17	Apr. 04,18
Voltage probe	SCHWARZBECK	TK 9421	TK 9421-176	Jan. 04,18	Jan. 03,19
Test software	ADT	ADT_Cond_V7.3.7	N/A	N/A	N/A

## NOTE:

- 1. The test was performed in shielded room 553.
- The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

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## 4.1.3 TEST PROCEDURES

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) were not recorded.

NOTE: All modes of operation were investigated and the worst-case emissions are reported.

## 4.1.4 DEVIATION FROM TEST STANDARD

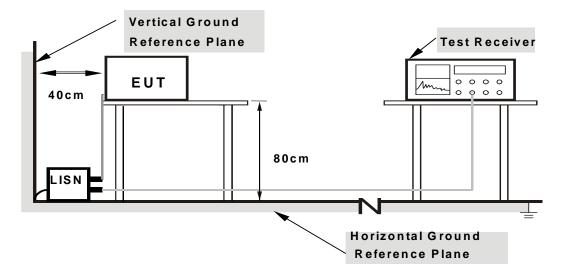
No deviation.

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## 4.1.5 TEST SETUP



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

For the actual test configuration, please refer to the attached file (Test Setup Photo).

#### 4.1.6 EUT OPERATING CONDITIONS

- a. Turned on the power and connected of all equipment.
- b. EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.



## 4.1.7 TEST RESULTS

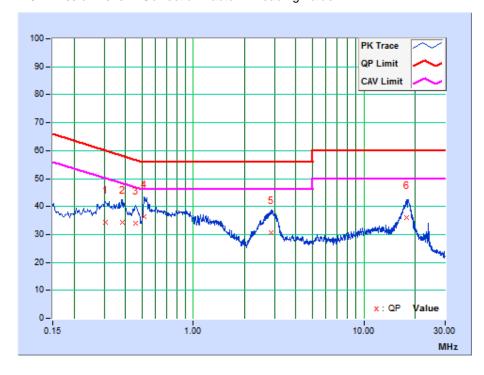
## **CONDUCTED WORST-CASE DATA: WIFI**

PHASE	Line	6dB BANDWIDTH	9kHz
-------	------	---------------	------

No	Freq. [MHz]	Corr. Factor		g Value (uV)]		n Level (uV)]		nit (uV)]	Maı (d	rgin B)
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.30488	10.22	24.29	8.10	34.51	18.32	60.11	50.11	-25.60	-31.79
2	0.38175	10.22	23.97	11.09	34.19	21.31	58.24	48.24	-24.05	-26.93
3	0.45785	10.23	23.73	11.40	33.96	21.63	56.73	46.73	-22.77	-25.10
4	0.51698	10.22	26.24	15.26	36.46	25.48	56.00	46.00	-19.54	-20.52
5	2.86102	10.22	20.45	13.69	30.67	23.91	56.00	46.00	-25.33	-22.09
6	17.77650	10.26	25.82	14.00	36.08	24.26	60.00	50.00	-23.92	-25.74

**REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.

- 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
- 3. The emission levels of other frequencies were very low against the limit.
- 4. Margin value = Emission level Limit value
- 5. Correction factor = Insertion loss + Cable loss
- 6. Emission Level = Correction Factor + Reading Value.



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Page 15 of 47

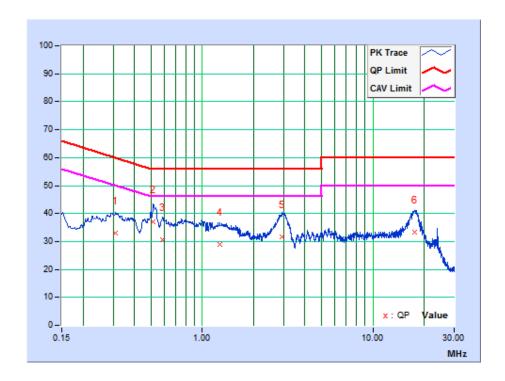


PHASE	Neutral	6dB BANDWIDTH	9kHz
-------	---------	---------------	------

No	Freq. [MHz]	Corr. Factor		g Value (uV)]		on Level (uV)]	Lir [dB (			gin B)
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.30975	10.01	23.11	8.17	33.12	18.18	59.98	49.98	-26.86	-31.80
2	0.51698	10.02	26.96	17.81	36.98	27.83	56.00	46.00	-19.02	-18.17
3	0.58374	10.02	20.73	10.24	30.75	20.26	56.00	46.00	-25.25	-25.74
4	1.27275	10.02	18.81	11.34	28.83	21.36	56.00	46.00	-27.17	-24.64
5	2.94675	10.03	21.64	13.98	31.67	24.01	56.00	46.00	-24.33	-21.99
6	17.53575	10.14	23.29	14.10	33.43	24.24	60.00	50.00	-26.57	-25.76

**REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.

- 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
- 3. The emission levels of other frequencies were very low against the limit.
- 4. Margin value = Emission level Limit value
- 5. Correction factor = Insertion loss + Cable loss
- 6. Emission Level = Correction Factor + Reading Value.





## 4.2 RADIATED EMISSION MEASUREMENT

## 4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

#### NOTE:

- 1. The lower limit shall apply at the transition frequencies.
- 2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
- 3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.



## 4.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESU40	100449	Mar. 11,17	Mar. 10,18
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV7	102331	Nov. 04,17	Nov. 03,18
Active Loop Antenna (9KHz -30MHz)	SCHWARZBECK	FMZB 1519B	1519B-045	May 31,17	May 30,18
Amplifier (9KHz -1GHz)	Burgeon	BPA-530	100210	Apr. 05,17	Apr. 04,18
Bilog Antenna (20MHz -2GHz)	Teseq	CBL 6111D	30643	Jul. 28, 17	Jul. 27, 18
Horn Antenna (1GHz -18GHz)	ETS -Lindgren	3117	00062558	May 19,17	May 18,18
Horn Antenna (18GHz -40GHz)	SCHWARZBECK	BBHA 9170	BBHA9170242	Mar. 15,17	Mar. 14,18
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	NSEMC003	Mar. 06,17	Mar. 05,18
Test Software	ADT	ADT_Radiated _V7.6.15.9.2	N/A	N/A	N/A
Broadband Preamplifier (1GHz~18GHz)	SCHWARZBECK	BBV9718	305	Mar. 06,17	Mar. 05,18
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Nov. 08,17	Nov. 07,18
Test Software	ADT	ADT_Radiated _V7.6.15.9.2	N/A	N/A	N/A

## NOTE:

- 1. The test was performed in 966 Chamber.
- 2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
- 3. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.
- 4. The FCC Site Registration No. is 749762.



#### 4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 1.5 meters (above 1GHz) and 0.8 meters (below 1GHz) above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, For battery operated equipment, the equipment tests shall be perform using fresh batteries. The turntable was rotated to maximize the emission level.

#### NOTE:

- 1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
- 2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
- 3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10Hz(Duty cycle > 98%) for Average detection (AV) at frequency above 1GHz.
- 4. All modes of operation were investigated and the worst-case emissions are reported.
- 5. The testing of the EUT was performed on all 3 orthogonal axes, the worst-case test configuration was reported on the file test setup photo.

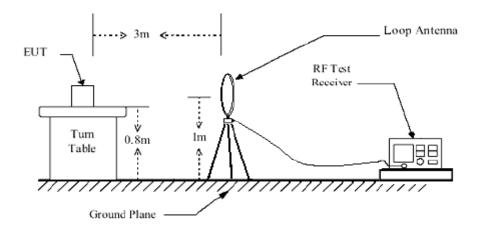
## 4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

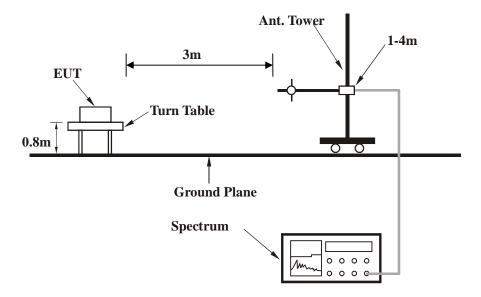


## 4.2.5 TEST SETUP

## **Below 30MHz test setup**



## **Below 1GHz test setup**

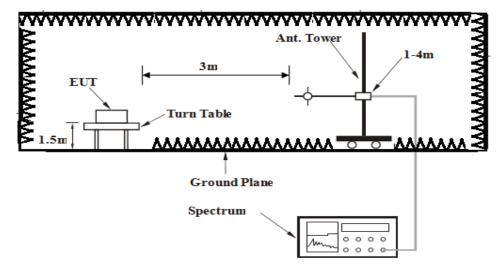


Note: For the actual test configuration, please refer to the attached file (Test Setup Photo).

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# **Above 1GHz test setup**



Note: For the actual test configuration, please refer to the attached file (Test Setup Photo).

## 4.2.6 EUT OPERATING CONDITIONS

- a. Placed the EUT on a testing table.
- b. Set the transmitter part of EUT under transmission condition continuously at specific channel frequency.
- c. The necessary accessories enable the EUT in full functions.



## 4.2.7 TEST RESULTS

## **BELOW 1GHz WORST-CASE DATA:**

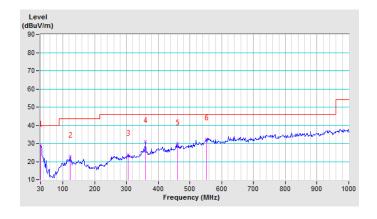
#### 802.11b

CHANNEL	TX Channel 1	DETECTOR	Ougai Pagis (OD)
FREQUENCY RANGE	9KHz ~ 1GHz	FUNCTION	Quasi-Peak (QP)

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M											
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)				
1	30.00	29.03 QP	40.00	-10.97	2.00 H	57	34.50	-5.47				
2	123.27	22.88 QP	43.50	-20.62	2.00 H	180	33.69	-10.81				
3	305.14	23.94 QP	46.00	-22.06	2.00 H	320	30.46	-6.52				
4	359.55	30.99 QP	46.00	-15.01	2.00 H	180	35.17	-4.18				
5	460.59	29.87 QP	46.00	-16.13	2.00 H	64	31.19	-1.32				
6	552.31	32.42 QP	46.00	-13.58	2.00 H	186	30.35	2.07				

## **REMARKS:**

- 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
- 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
- 3. The emission levels of other frequencies were less than 20dB margin against the limit.
- 4. Margin value = Emission level Limit value.



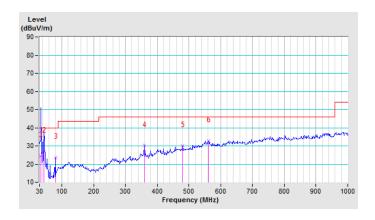


CHANNEL	TX Channel 1	DETECTOR	Ougai Pagis (OD)
FREQUENCY RANGE	9KHz ~ 1GHz	FUNCTION	Quasi-Peak (QP)

	ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M											
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)				
1	34.66	24.64 QP	40.00	-15.36	2.00 V	108	32.39	-7.75				
2	43.99	26.89 QP	40.00	-13.11	2.00 V	94	39.83	-12.94				
3	79.74	23.62 QP	40.00	-16.38	2.00 V	10	40.23	-16.61				
4	359.55	30.24 QP	46.00	-15.76	2.00 V	79	34.42	-4.18				
5	480.80	29.94 QP	46.00	-16.06	2.00 V	0	31.27	-1.33				
6	561.63	32.84 QP	46.00	-13.16	2.00 V	67	30.26	2.58				

## **REMARKS:**

- 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
- 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
- 3. The emission levels of other frequencies were less than 20dB margin against the limit.
- 4. Margin value = Emission level Limit value.





# ABOVE 1GHz DATA 802.11b

CHANNEL	TX Channel 1	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz	FUNCTION	Average (AV)

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M									
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)		
1	2390.00	73.36 PK	74.00	-0.64	2.01 H	18	70.26	3.10		
2	2390.00	48.65 AV	54.00	-5.35	2.01 H	18	45.55	3.10		
3	*2412.00	111.49 PK			1.00 H	23	108.32	3.17		
4	*2412.00	103.76 AV			1.00 H	23	100.59	3.17		
5	4824.00	52.77 PK	74.00	-21.23	3.50 H	268	46.67	6.10		
6	4824.00	44.67 AV	54.00	-9.33	3.50 H	268	38.57	6.10		
7	#7236.00	56.26 PK	74.00	-17.74	1.00 H	62	44.75	11.51		
8	#7236.00	43.16 AV	54.00	-10.84	1.00 H	62	31.65	11.51		
		ANTENNA	POLARITY	& TEST DI	STANCE: V	ERTICAL A	T 3 M	-		
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)		
1	2390.00	60.50 PK	74.00	-13.50	1.00 V	37	57.40	3.10		
2	2390.00	38.69 AV	54.00	-15.31	1.00 V	37	35.59	3.10		
3	*2412.00	102.03 PK			1.00 V	37	98.86	3.17		
4	*2412.00	94.13 AV			1.00 V	37	90.96	3.17		
5	4824.00	51.63 PK	74.00	-22.37	1.00 V	50	45.53	6.10		
6	4824.00	42.38 AV	54.00	-11.62	1.00 V	50	36.28	6.10		
7	#7236.00	55.26 PK	74.00	-18.74	3.02 V	166	43.75	11.51		
8	#7236.00	43.28 AV	54.00	-10.72	3.02 V	166	31.77	11.51		

## **REMARKS:**

- 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
- 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
- 3. The other emission levels were very low against the limit.
- 4. Margin value = Emission level Limit value.
- 5. " \* ": Fundamental frequency.
- 6. " # ": The radiated frequency is out of the restricted band.

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CHANNEL	TX Channel 6	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz	FUNCTION	Average (AV)

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M									
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)		
1	*2437.00	110.98 PK			1.20 H	26	107.71	3.27		
2	*2437.00	103.02 AV			1.20 H	26	99.75	3.27		
3	4874.00	53.83 PK	74.00	-20.17	2.10 H	205	47.63	6.20		
4	4874.00	45.90 AV	54.00	-8.10	2.10 H	205	39.70	6.20		
5	7311.00	55.15 PK	74.00	-18.85	3.02 H	199	43.43	11.72		
6	7311.00	43.19 AV	54.00	-10.81	3.02 H	199	31.47	11.72		
		ANTENNA	POLARITY	& TEST DI	STANCE: V	ERTICAL A	T 3 M			
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)		
1	*2437.00	102.68 PK			1.30 V	28	99.41	3.27		
2	*2437.00	94.33 AV			1.30 V	28	91.06	3.27		
3	4874.00	53.26 PK	74.00	-20.74	2.01 V	54	47.06	6.20		
4	4874.00	43.01 AV	54.00	-10.99	2.01 V	54	36.81	6.20		
5	7311.00	56.26 PK	74.00	-17.74	3.02 V	166	44.54	11.72		
6	7311.00	43.13 AV	54.00	-10.87	3.02 V	166	31.41	11.72		

## **REMARKS:**

- 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
- 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
- 3. The emission levels of other frequencies were less than 20dB margin against the limit.
- 4. Margin value = Emission level Limit value.
- 5. " \* ": Fundamental frequency.



CHANNEL	TX Channel 11	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz	FUNCTION	Average (AV)

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)			
1	*2462.00	110.89 PK			1.73 H	23	107.53	3.36			
2	*2462.00	102.59 AV			1.73 H	23	99.23	3.36			
3	2483.50	73.17 PK	74.00	-0.83	1.73 H	23	69.73	3.44			
4	2483.50	42.46 AV	54.00	-11.54	1.73 H	23	39.02	3.44			
5	4924.00	55.12 PK	74.00	-18.88	1.00 H	315	48.81	6.31			
6	4924.00	44.62 AV	54.00	-9.38	1.00 H	315	38.31	6.31			
7	7386.00	56.26 PK	74.00	-17.74	1.00 H	219	44.33	11.93			
8	7386.00	43.62 AV	54.00	-10.38	1.00 H	219	31.69	11.93			
		ANTENNA	POLARITY	/ & TEST DI	STANCE: V	ERTICAL A	T 3 M				
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)			
1	*2462.00	102.16 PK			1.00 V	10	98.80	3.36			
2	*2462.00	94.13 AV			1.00 V	10	90.77	3.36			
3	2483.50	62.24 PK	74.00	-11.76	1.00 V	10	58.80	3.44			
4	2483.50	40.36 AV	54.00	-13.64	1.00 V	10	36.92	3.44			
5	4924.00	54.26 PK	74.00	-19.74	3.02 V	155	47.95	6.31			
6	4924.00	43.26 AV	54.00	-10.74	3.02 V	155	36.95	6.31			
7	7386.00	56.26 PK	74.00	-17.74	3.02 V	19	44.33	11.93			
8	7386.00	43.18 AV	54.00	-10.82	3.02 V	19	31.25	11.93			

## **REMARKS:**

- 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
- 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
- 3. The emission levels of other frequencies were less than 20dB margin against the limit.
- 4. Margin value = Emission level Limit value.
- 5. " \* ": Fundamental frequency.



#### 802.11n HT20

CHANNEL	TX Channel 1	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz	FUNCTION	Average (AV)

							.=			
	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M									
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)		
1	2390.00	70.49 PK	74.00	-3.51	1.00 H	180	67.39	3.10		
2	2390.00	50.94 AV	54.00	-3.06	1.00 H	180	47.84	3.10		
3	*2412.00	106.29 PK			1.20 H	180	103.12	3.17		
4	*2412.00	95.16 AV			1.20 H	180	91.99	3.17		
5	4824.00	51.26 PK	74.00	-22.74	1.00 H	205	45.16	6.10		
6	4824.00	39.36 AV	54.00	-14.64	1.00 H	205	33.26	6.10		
7	#7236.00	55.27 PK	74.00	-18.73	1.00 H	208	43.76	11.51		
8	#7236.00	43.26 AV	54.00	-10.74	1.00 H	208	31.75	11.51		
		ANTENNA	POLARITY	& TEST DI	STANCE: V	ERTICAL A	T 3 M	•		
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)		
1	2390.00	60.45 PK	74.00	-13.55	1.00 V	120	57.35	3.10		
2	2390.00	41.12 AV	54.00	-12.88	1.00 V	120	38.02	3.10		
3	*2412.00	97.24 PK			3.02 V	166	94.07	3.17		
4	*2412.00	86.06 AV			3.02 V	166	82.89	3.17		
5	4824.00	51.02 PK	74.00	-22.98	3.02 V	166	44.92	6.10		
6	4824.00	40.26 AV	54.00	-13.74	3.02 V	166	34.16	6.10		
7	#7236.00	57.15 PK	74.00	-16.85	1.60 V	49	45.64	11.51		
8	#7236.00	43.29 AV	54.00	-10.71	1.60 V	49	31.78	11.51		

## **REMARKS:**

- 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
- 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
- 3. The emission levels of other frequencies were less than 20dB margin against the limit.
- 4. Margin value = Emission level Limit value.
- 5. " \* ": Fundamental frequency.
- 6. " # ": The radiated frequency is out of the restricted band.

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CHANNEL	TX Channel 6	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz	FUNCTION	Average (AV)

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M									
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)		
1	*2437.00	104.66 PK			1.00 H	27	101.39	3.27		
2	*2437.00	95.18 AV			1.00 H	27	91.91	3.27		
3	4874.00	50.16 PK	74.00	-23.84	2.00 H	162	43.96	6.20		
4	4874.00	39.49 AV	54.00	-14.51	2.00 H	162	33.29	6.20		
5	7311.00	57.16 PK	74.00	-16.84	1.00 H	360	45.44	11.72		
6	7311.00	42.17 AV	54.00	-11.83	1.00 H	360	30.45	11.72		
		ANTENNA	POLARITY	/ & TEST DI	STANCE: V	ERTICAL A	T 3 M			
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)		
1	*2437.00	96.71 PK			1.00 V	250	93.44	3.27		
2	*2437.00	85.95 AV			1.00 V	250	82.68	3.27		
3	4874.00	50.26 PK	74.00	-23.74	3.02 V	193	44.06	6.20		
4	4874.00	38.67 AV	54.00	-15.33	3.02 V	193	32.47	6.20		
5	7311.00	56.26 PK	74.00	-17.74	1.00 V	302	44.54	11.72		
6	7311.00	42.15 AV	54.00	-11.85	1.00 V	302	30.43	11.72		

#### **REMARKS:**

- 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
- 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
- 3. The emission levels of other frequencies were less than 20dB margin against the limit.
- 4. Margin value = Emission level Limit value.
- 5. " \* ": Fundamental frequency.



CHANNEL	TX Channel 11	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz	FUNCTION	Average (AV)

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M									
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)		
1	*2462.00	105.11 PK			1.00 H	29	101.75	3.36		
2	*2462.00	94.45 AV			1.00 H	29	91.09	3.36		
3	2483.50	65.25 PK	74.00	-8.75	1.00 H	92	61.81	3.44		
4	2483.50	46.75 AV	54.00	-7.25	1.00 H	92	43.31	3.44		
5	4924.00	52.26 PK	74.00	-21.74	1.00 H	206	45.95	6.31		
6	4924.00	38.16 AV	54.00	-15.84	1.00 H	206	31.85	6.31		
7	7386.00	57.49 PK	74.00	-16.51	1.00 H	205	45.56	11.93		
8	7386.00	43.26 AV	54.00	-10.74	1.00 H	205	31.33	11.93		
		ANTENNA	POLARITY	/ & TEST DI	STANCE: V	ERTICAL A	T 3 M			
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)		
1	*2462.00	97.13 PK			1.00 V	205	93.77	3.36		
2	*2462.00	86.04 AV			1.00 V	205	82.68	3.36		
3	2483.50	60.69 PK	74.00	-13.31	1.00 V	201	57.25	3.44		
4	2483.50	39.02 AV	54.00	-14.98	1.00 V	201	35.58	3.44		
5	4924.00	51.26 PK	74.00	-22.74	1.20 V	99	44.95	6.31		
6	4924.00	39.46 AV	54.00	-14.54	1.20 V	99	33.15	6.31		
7	7386.00	57.26 PK	74.00	-16.74	1.00 V	46	45.33	11.93		
8	7386.00	43.15 AV	54.00	-10.85	1.00 V	46	31.22	11.93		

## **REMARKS:**

- 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
- 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
- 3. The emission levels of other frequencies were less than 20dB margin against the limit.
- 4. Margin value = Emission level Limit value.
- 5. " \* ": Fundamental frequency.



#### 4.3 6dB BANDWIDTH MEASUREMENT

## 4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

## 4.3.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Power Sensor	Keysight	U2021XA	MY55060016	May 19,17	May 18,18
Power Sensor	Keysight	U2021XA	MY55060018	May 19,17	May 18,18
Power Meter	Anritsu	ML2495A	1139001	Nov. 04,17	Nov. 03,18
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 21, 17	Oct.20, 18
Humid & Temp Programmable Tester	Haida	HD-2257	110807201	Sep.05,17	Sep. 04,18
Oscilloscope	Agilent	DSO9254A	MY51260160	Nov. 08,17	Nov. 07,18
Signal Analyzer	Rohde & Schwarz	FSV7	102331	Nov. 04,17	Nov. 03,18
Signal Generator	Agilent	N5183A	MY50140980	Nov. 04,17	Nov. 03,18
Agile Signal Generator	Agilent	8645A	Agilent	Sep.01, 17	Aug.31, 18
Spectrum Analyzer	Keysight	N9020A	MY55400499	Apr. 10,17	Apr. 09,18
MXG-B RF Vector Signal Generator	Keysight	N5182B	MY56200288	Dec.05, 17	Dec. 04, 18
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	Aug.10, 17	Aug.09, 18
Attenuator	MINI	BW-S10W2+	S130129FGE2	N/A	N/A
DC Source	Keysight	E3642A	MY56146098	N/A	N/A

## NOTE:

**Dongguan Branch** 

- 1. The test was performed in RF Oven room.
- 2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

#### 4.3.3 TEST PROCEDURE

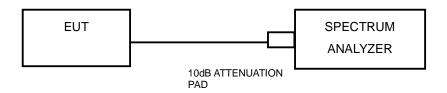
- 1. Set resolution bandwidth (RBW) = 100KHz
- 2. Set the video bandwidth (VBW)  $\geq$  3 x RBW, Detector = Peak.
- 3. Trace mode = max hold.
- 4. Sweep = auto couple.
- 5. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.



## 4.3.4 DEVIATION FROM TEST STANDARD

No deviation.

## 4.3.5 TEST SETUP



## 4.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

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# 4.3.7 TEST RESULTS

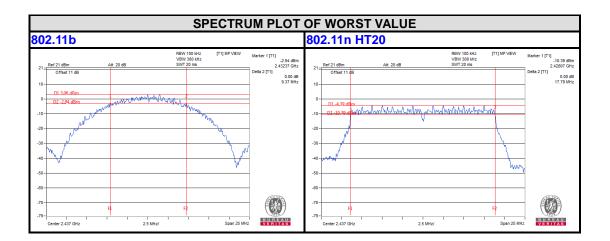
## 802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	9.39	0.5	PASS
6	2437	9.37	0.5	PASS
11	2462	9.35	0.5	PASS

## 802.11n HT20

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	17.81	0.5	PASS
6	2437	17.79	0.5	PASS
11	2462	17.79	0.5	PASS





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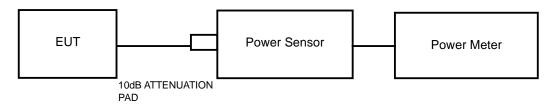


## 4.4 CONDUCTED OUTPUT POWER

## 4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

For systems using digital modulation in the 2400–2483.5 MHz band: 1 Watt (30dBm).

## 4.4.2 TEST SETUP



## 4.4.3 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Power Sensor	Keysight	U2021XA	MY55060016	May 19,17	May 18,18
Power Sensor	Keysight	U2021XA	MY55060018	May 19,17	May 18,18
Power Meter	Anritsu	ML2495A	1139001	Nov. 04,17	Nov. 03,18
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 21, 17	Oct.20, 18
Humid & Temp Programmable Tester	Haida	HD-2257	110807201	Sep.05,17	Sep. 04,18
Oscilloscope	Agilent	DSO9254A	MY51260160	Nov. 08,17	Nov. 07,18
Signal Analyzer	Rohde & Schwarz	FSV7	102331	Nov. 04,17	Nov. 03,18
Signal Generator	Agilent	N5183A	MY50140980	Nov. 04,17	Nov. 03,18
Agile Signal Generator	Agilent	8645A	Agilent	Sep.01, 17	Aug.31, 18
Spectrum Analyzer	Keysight	N9020A	MY55400499	Apr. 10,17	Apr. 09,18
MXG-B RF Vector Signal Generator	Keysight	N5182B	MY56200288	Dec.05, 17	Dec. 04, 18
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	Aug.10, 17	Aug.09, 18
Attenuator	MINI	BW-S10W2+	S130129FGE2	N/A	N/A
DC Source	Keysight	E3642A	MY56146098	N/A	N/A

## NOTE:

- 1. The test was performed in RF Oven room.
- 2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.



## 4.4.4 TEST PROCEDURES

A peak power sensor was used on the output port of the EUT. A peak power meter was used to read the response of the peak power sensor. Record the peak power level.

## 4.4.5 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.4.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.



# 4.4.7 TEST RESULTS

## **MAXIMUM PEAK OUTPUT POWER**

## 802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT (W)	PASS/FAIL
1	2412	18.48	70.469	1	PASS
6	2437	18.26	66.988	1	PASS
11	2462	18.09	64.417	1	PASS

## 802.11n HT20

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT (W)	PASS/FAIL
1	2412	15.53	35.727	1	PASS
6	2437	15.38	34.514	1	PASS
11	2462	15.26	33.574	1	PASS



# AVERAGE OUTPUT POWER(FOR REFERENCE)

## 802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	AVG. POWER (mW)	PEAK POWER LIMIT (W)	PASS / FAIL
1	2412	12.81	19.099	1	PASS
6	2437	12.43	17.498	1	PASS
11	2462	12.36	17.219	1	PASS

#### 802.11n HT20

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	AVG. POWER (mW)	POWER LIMIT (W)	PASS / FAIL
1	2412	7.81	6.039	1	PASS
6	2437	7.42	5.521	1	PASS
11	2462	7.33	5.408	1	PASS

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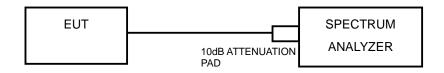


#### 4.5 POWER SPECTRAL DENSITY MEASUREMENT

## 4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm/3KHz.

## 4.5.2 TEST SETUP



## 4.5.3 TEST INSTRUMENTS

Refer to section 4.3.2 to get information of above instrument.

## 4.5.4 TEST PROCEDURE

- a) Set instrument center frequency to DTS channel center frequency.
- b) Set span to at least 1.5 times the OBW.
- c) Set RBW to: 3KHz
- d) Set VBW ≥3 x RBW.
- e) Detector = peak
- f) Ensure that the number of measurement points in the sweep  $\geq 2 \times \text{span/RBW}$ .
- g) Sweep time = auto couple.
- h) Use the peak marker function to determine the maximum amplitude level.

## 4.5.5 DEVIATION FROM TEST STANDARD

No deviation.



## 4.5.6 EUT OPERATING CONDITION

Same as item 4.3.6.

## 4.5.7 TEST RESULTS

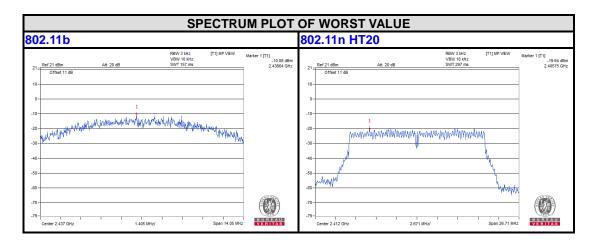
## 802.11b

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-10.63	8.00	PASS
6	2437	-10.08	8.00	PASS
11	2462	-10.16	8.00	PASS

#### 802.11n HT20

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-19.64	8.00	PASS
6	2437	-20.15	8.00	PASS
11	2462	-19.82	8.00	PASS





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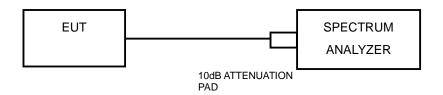


#### 4.6 OUT OF BAND EMISSION MEASUREMENT

## 4.6.1 LIMITS OF OUT OF BAND EMISSION MEASUREMENT

Below –20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

## 4.6.2 TEST SETUP



## 4.6.3 TEST INSTRUMENTS

Refer to section 4.3.2 to get information of above instrument.

## 4.6.4 TEST PROCEDURE

## **Measurement Procedure - Reference Level**

- 1. Set the RBW = 100 kHz.
- 2. Set the VBW ≥ 300 kHz.
- 3. Detector = peak.
- 4. Sweep time = auto couple.
- 5. Trace mode = max hold.
- 6. Allow trace to fully stabilize.
- 7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.



## Measurement Procedure - Unwanted Emission Level

- 1. Set RBW = 100 kHz.
- 2. Set VBW ≥ 300 kHz.
- 3. Set span to encompass the spectrum to be examined
- 4. Detector = peak.
- 5. Trace Mode = max hold.
- 6. Sweep = auto couple.

## 4.6.5 DEVIATION FROM TEST STANDARD

No deviation.

## 4.6.6 EUT OPERATING CONDITION

Same as item 4.3.6

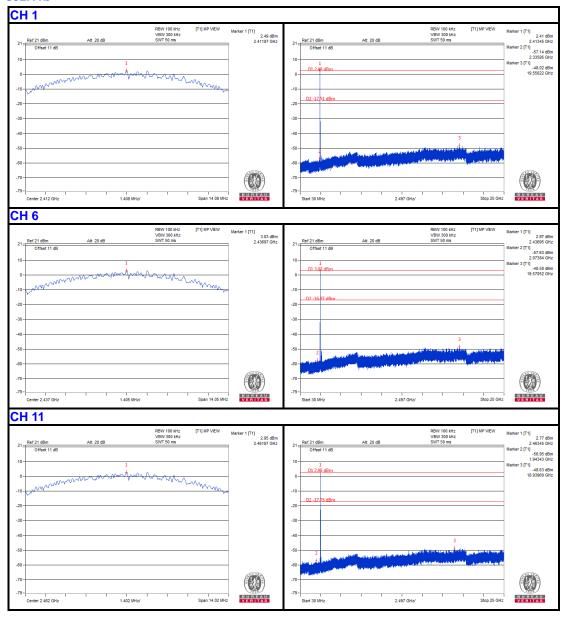
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## 4.6.7 TEST RESULTS

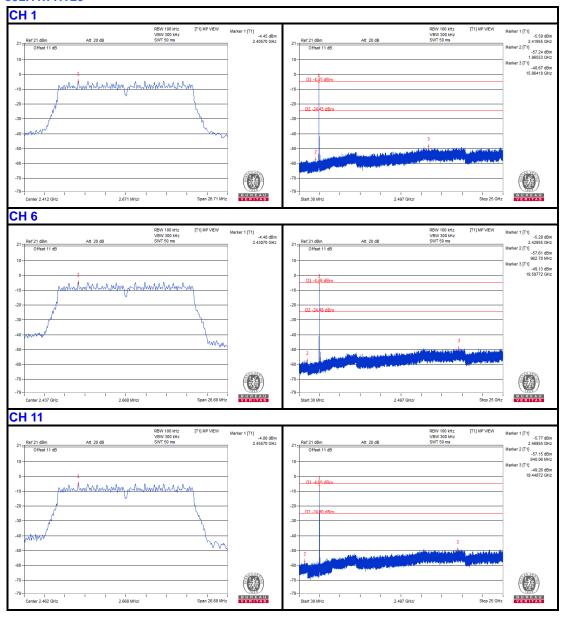
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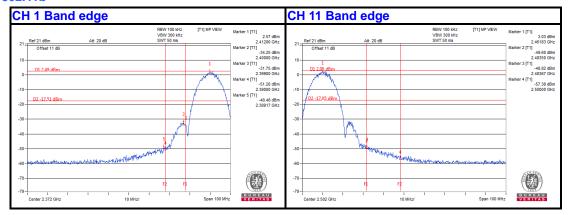
## 802.11n HT20



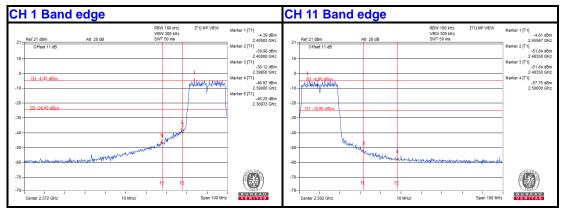
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## 802.11b



## 802.11n HT20





# 5 PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).

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# 6 APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

---END---

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Page 47 of 47