

SHANTOU CITY HENGDI INDUSTRY CO., LTD

Application For Certification

FCC ID: 2AALAHD17D24GR

DRONE LUNAR 14.4INCH WITH CAMERA HD

Model: DRO 004

2.4GHz Wi-Fi Transceiver

Report No.: GZHH00242764-002

We hereby certify that the sample of the above item is considered to comply with the requirements of FCC Part 15, Subpart C for Intentional Radiator, mention 47 CFR [10-1-15]

Prepared and Checked by:

Approved by:

Sign on file

Abel Zhou Senior Engineer Kidd Yang Senior Project Engineer Date: July 11, 2017

The test results reported in this test report shall refer only to the sample actually tested and shall not refer or be deemed to refer to bulk from which such a sample may be said to have been obtained.

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The evaluation data of the report will be kept for 3 years from the date of issuance.

TRF no.: FCC 15C_Tx_c

Intertek Testing Services Shenzhen Limited, Guangzhou E501, No.7-2, Caipin Road, Guangzhou Branch 深圳天祥质量技术服务有限公司广州分公司

Science City, GETDD Guangzhou. 广州经济技术开发区科学城彩频路7号之 _E501 (510663)

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MEASUREMENT/TECHNICAL REPORT

DRONE LUNAR 14.4INCH WITH CAMERA HD

Model: DRO 004

FCC ID: 2AALAHD17D24GR

This report concerns (check one)	Original Grant <u>X</u> Class II Change
Equipment Type: <u>DTS - Part 15 [</u> portion)	<u> Digital Transmission Systems (Wi-Fi transmitter</u>
Deferred grant requested per 47 CF	FR 0.457(d)(1)(ii)? Yes NoX
	If yes, defer until :
	date
Company Name agrees to notify the	e Commission by: date
Transition Rules Request per 15.37	ment of the product so that the grant can be ?? Yes NoX
	C for intentional radiator - the new 47 CFR
Report prepared by:	
	Abel Zhou Intertek Testing Services Shenzhen Ltd. Guangzhou Branch Block E, No.7-2 Guang Dong Software Science Park, Caipin Road, Guangzhou Science City, GETDD Guangzhou, China Phone: 86-20-8213 9688 Fax: 86-20-3205 7538

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List of attached file

Exhibit type	File Description	Filename
Test Report	Test Report	report.pdf
Test Setup Photo	Radiated Emission	radiated photos.pdf
External Photo	External Photo	external photos.pdf
Internal Photo	Internal Photo	internal photos.pdf
Block Diagram	Block Diagram	block.pdf
Schematics	Circuit Diagram	circuit.pdf
Operation Description	Technical Description	descri.pdf
ID Label/Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf
Cover Letter	Confidentiality Letter	request.pdf
Cover Letter	Letter of Agency	agency.pdf

EXHIBIT 1

SUMMARY OF TEST RESULTS

1.0 <u>Summary of Test results</u>

DRONE LUNAR 14.4INCH WITH CAMERA HD

Model: DRO 004

FCC ID: 2AALAHD17D24GR

TEST ITEM	REFERENCE	RESULTS
Max. Output power	15.247(b)(3)	Pass
6 dB Bandwidth	15.247(a)(2)	Pass
Max. Power Density	15.247(e)	Pass
Out of Band Antenna Conducted Emission	15.247(d)	Pass
Radiated Emission in Restricted Bands	15.247(d)	Pass
Antenna Requirement	15.203	Pass (See Notes)

Notes: The EUT uses an Integral Antenna which in accordance to Section 15.203 is considered sufficient to comply with the provisions of this section.

EXHIBIT 2

GENERAL DESCRIPTION

2.0 General Description

2.1 Product Description

The Equipment Under Test (EUT) is a DRONE LUNAR 14.4INCH WITH CAMERA HD with Wi-Fi function operating at 2412-2462MHz for 802.11b/g/n-HT20, 11 channels with 5MHz channel spacing. The EUT is powered by rechargeable battery (DC 3.7V) which can be charged by adaptor. For more detailed features description, please refer to the user's manual.

Type of Modulation: CCK, BPSK, QPSK, 16QAM, 64QAM

Antenna Type: Integral Antenna

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

2.2 Related Submittal(s) Grants

This is an application for certification of:

DTS- Part 15 Digital Transmission Systems (2.4GHz Wi-Fi transmitter portion).

2.3 Test Methodology

Radiated emission measurements was performed according to the procedures in ANSI C63.10: 2013 and KDB 558074 D01 v04. Radiated emission measurement was performed in semi-anechoic chamber. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application. All other measurements were made in accordance with the procedures in part 2 of CFR 47.

2.4 Test Facility

The Semi-anechoic chamber used to collect the radiated data is **Intertek Testing Services Shenzhen Ltd. Guangzhou Branch** and located at Block E, No.7-2 Guang Dong Software Science Park, Caipin Road, Guangzhou Science City, GETDD Guangzhou, China. This test facility and site measurement data have been fully placed on file with the FCC (Registration Number: 549654).

EXHIBIT 3

SYSTEM TEST CONFIGURATION

3.0 System Test Configuration

3.1 Justification

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables were manipulated to produce worst case emissions. The EUT was powered by one fully 3.7V rechargeable battery during the test.

On 802.11b/g/n-HT20 mode, only one antenna is used, and all data rate were tested and only the worst case data is shown in the report.

For maximizing emissions, the EUT was rotated through 360°, the EUT was placed on the styrene turntable with 0.8m up to 1GHz and 1.5 m above 1GHz. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The resolution is 1 MHz or greater for frequencies above 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

The unit was operated standalone and placed at the centre of turntable.

Radiated emission measurement were performed the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

3.2 EUT Exercising Software

The EUT exercise program (provided by client) used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The worst case configuration is used in all specified testing.

The parameters of test software setting:

During the test, Channel and power controlling software provided by the applicant was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the application and is going to be fixed on the firmware of the end product.

3.3 Special Accessories

N/A.

3.4 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

Uncertainty and Compliance - Unless the standard specifically states that measured values are to be extended by the measurement uncertainty in determining compliance, all compliance determinations are based on the actual measured value.

3.5 Equipment Modification

Any modifications installed previous to testing by SHANTOU CITY HENGDI INDUSTRY CO., LTD will be incorporated in each production model sold / leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd. Guangzhou Branch.

3.6 Support Equipment List and Description

This product was tested in the following configuration:

Refer List:

Description	Manufacturer	Model No.
iPod (Provided by Intertek)	Apple	A1421

EXHIBIT 4

MEASUREMENT RESULTS

Applicant: SHANTOU CITY HENGDI INDUSTRY CO., LTD Date of Test: July 5, 2017 Model: DRO 004

4.0 Measurement Results

4.1 Maximum Conducted Output Power at Antenna Terminals, FCC Rules 15.247(b)(3):

The antenna power of the EUT was connected to the input of a broadband peak RF power meter. The power meter have a video bandwidth that is greater than DTS bandwidth and utilize a fast-responding diode detector. Power was read directly at the EUT antenna terminals with cable loss added.

For antennas with gains of 6 dBi or less, maximum allowed Transmitter output is 1 watt (+30 dBm).

IEEE 802.11b (Antenna Gain = 0dBi) (CCK, 1Mbps)			
Frequency (MHz) Output in dBm Output in mWatt			
Low Channel: 2412	16.8	47.9	
Middle Channel: 2437 16.0 39.8			
High Channel: 2462	16.2	41.7	

IEEE 802.11g (Antenna Gain = 0dBi) (16QAM, 6Mbps)			
Frequency (MHz) Output in dBm Output in mWatt			
Low Channel: 2412	15.4	34.7	
Middle Channel: 2437 15.2 33.1			
High Channel: 2462	15.2	33.1	

IEEE 802.11n-HT20 (Antenna Gain = 0dBi) (64QAM, 6Mbps)			
Frequency (MHz)Output in dBmOutput in mWatt			
Low Channel: 2412	15.4	34.7	
Middle Channel: 2437	15.0	31.6	
High Channel: 2462	15.2	33.1	

Cable loss: <u>1.0</u> dB External Attenuation: 0 dB

Cable loss, external attenuation has been included in OFFSET function

EUT max. output level = 16.8dBm

For RF Exposure, the information is saved with filename: RF exposure.pdf.

Applicant: SHANTOU CITY HENGDI INDUSTRY CO., LTD Date of Test: July 5, 2017 Model: DRO 004

4.2 Minimum 6 dB RF Bandwidth, FCC Rule 15.247(a) (2):

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was set to 100 KHz according to FCC KDB 558074 D01 v04. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 6 dB lower than PEAK level. The 6dB bandwidth was determined from where the channel output spectrum intersected the display line.

Limit: The 6 dB Bandwidth is at least 500 kHz.

IEEE 802.11b (CCK, 1Mbps)		
Frequency (MHz)6 dB Bandwidth (MHz)		
2412	9.942	
2437	10.420	
2462	9.551	

IEEE 802.11g (16QAM, 6Mbps)		
Frequency (MHz)6 dB Bandwidth (MHz)		
2412	16.541	
2437	16.368	
2462	16.445	

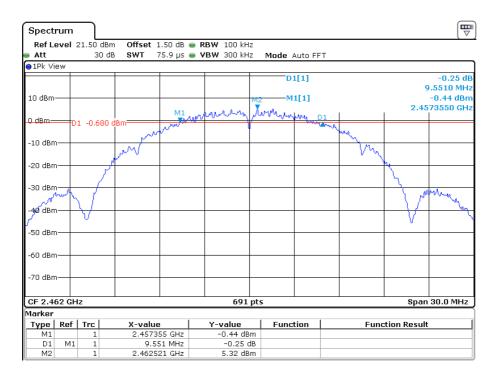
IEEE 802.11n-HT20 (64QAM, 6Mbps)		
Frequency (MHz)6 dB Bandwidth (MHz)		
2412	17.619	
2437	17.583	
2462	17.250	

The test plots are attached as below.

802.11b

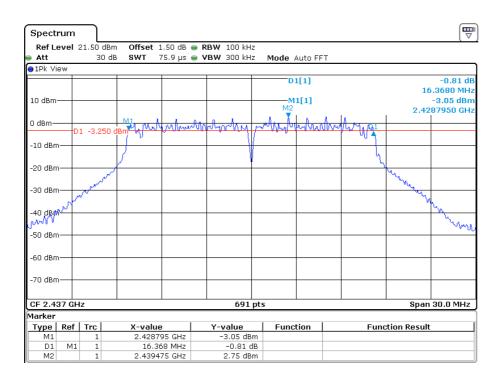
Spect	um									
Ref Le Att	evel :				RBW 100 kHz VBW 300 kHz		ito FFT			
😑 1Pk Vie	вw									
						D1[1]		9	0.14 dB 0.9420 MHz
10 dBm-	+				M2	M1				-1.33 dBm 68770 GHz
0 dBm—	— D	1 -0.9	60 dBm	M1	moure to too y	Monney				
-10 dBm	-		- pu	M1 WWW	_		- 1000	many		
-20 dBm								V V	~~~	
-30 dBm			~							~
-40 dBm		M							L'	- And
/ -50 dBm	-									۲
-60 dBm	-									
-70 dBm	-									
CF 2.41	 12 GH	Iz			691	pts			Span	30.0 MHz
Marker										
Туре	Ref		X-valu		Y-value	Functi	on	Func	tion Result	
M1 D1	M1	1		377 GHz	-1.33 dBr 0.14 d					
M2	TIM	1		392 GHz	5.04 dBr					

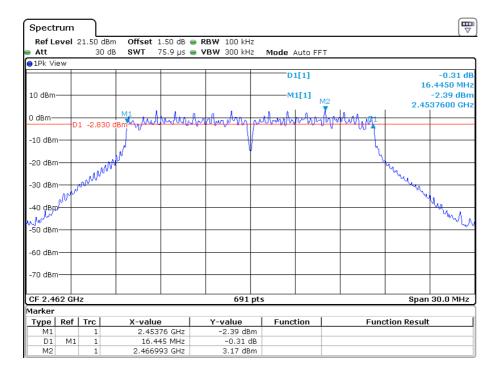
Spectru	ım								
Ref Lev Att	vel (21.50 d 30			RBW 100 kHz VBW 300 kHz	Mode Auto FF	T		· · · ·
⊖1Pk Viev	¥								
						D1[1]			0.08 dB
								10	0.4200 MHz
10 dBm—	+				M2	M1[1]		0.40	-2.49 dBm 18770 GHz
				M1	mouting	mon when	- 1	2.43	18770 GH2
0 dBm	D	1 -2.32) dBm	mont	A A A A A A A A A A A A A A A A A A A		D1		
			يلونهم	MI			Mr.		
-10 dBm-			A				m		
00 ID			NV V				1 1 2		
-20 dBm-			آ م					7	
-30 dBm-		5						1	
-30 aBm-	A.	7						2 1	my
-40 dBm-	1	\mathcal{N}						- W	Nr.
-40°08m-									- A
, -50 dBm-									
-30 ubiii-									
-60 dBm-									
-00 uBIII-									
-70 dBm-									
-70 ubm-									
CF 2.437		-			691 p	+c		Enan	30.0 MHz
Marker	ап	12			031 1			əhan	30.0 MHZ
	Ref	Trc	X-valu	e	Y-value	Function	Fund	tion Result	
M1		1		77 GHz	-2.49 dBn				
D1	Μ1	1		42 MHz	0.08 dB				
M2		1	2.4351	33 GHz	3.68 dBn	ı			



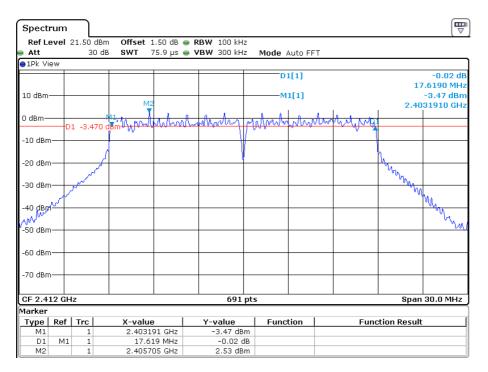
802.11g

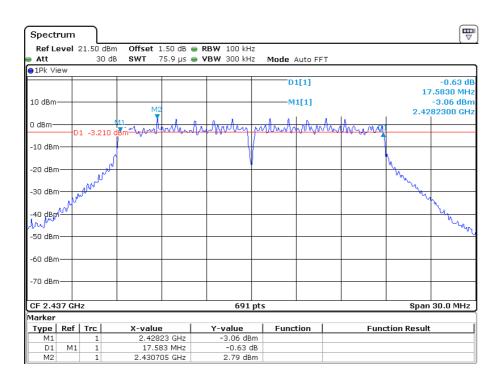
Spectr	um									
Ref Le Att	vel 3	21.50 dE 30			RBW 100 kH VBW 300 kH		Auto FF	т		
●1Pk Vie	w									
						D	1[1]			-1.78 dB
10 dBm—	_					M2 M	1[1]			5.5410 MHz -2.95 dBm
0 dBm—		1 -3.390		MMMM	MANNAM	-	hulum	Am Anna	2.4	137080 GHz
-10 dBm-	_	1 -0.090				ľ		·		
-20 dBm-		- ⁰	- M					\	Mr.	
-30 dBm-		and a second							WWW WAR	
-40 dB/01	4									The second
-50 dBm-										mm
-60 dBm-										
-70 dBm-	_									
CF 2.41	2 GH	z			691	pts			Span	30.0 MHz
Marker										
	Ref	Trc	X-value		Y-value	Func	tion	Fund	tion Result	t
M1		1		08 GHz	-2.95 dE					
D1 M2	M1	1	16.5 2.4132	41 MHz 16 GHz	-1.78 2.61 dB					

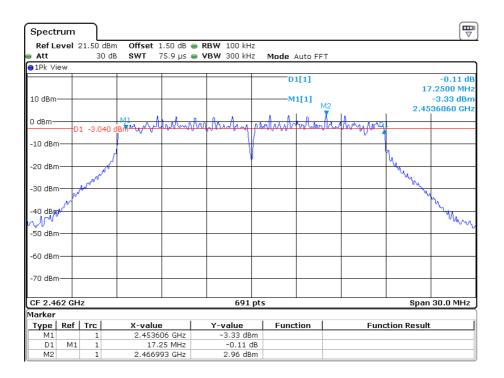




802.11n-HT20







Applicant: SHANTOU CITY HENGDI INDUSTRY CO., LTD Date of Test: July 5, 2017 Model: DRO 004

4.3 Maximum Power Density Reading, FCC Rule 15.247(e):

The Measurement Procedure PKPSD was set according to the FCC KDB 558074 D01 v04.

Antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

Limit: The Power Density does not exceed 8dBm/3 kHz.

IEEE 802.11b (IEEE 802.11b (CCK, 1Mbps)							
Frequency (MHz)	Power Density with RBW 100KHz							
2412	3.71							
2437	4.72							
2462	4.29							

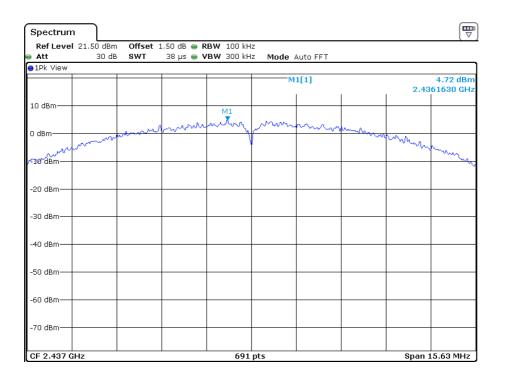
IEEE 802.11g (16QAM, 6Mbps)							
Frequency (MHz)	Power Density with RBW 100KHz						
2412	2.59						
2437	3.01						
2462	3.26						

IEEE 802.11n-HT20 (64QAM, 6Mbps)							
Frequency (MHz)	Power Density with RBW 100KHz						
2412	2.42						
2437	2.98						
2462	3.22						

The test plots are attached as below.

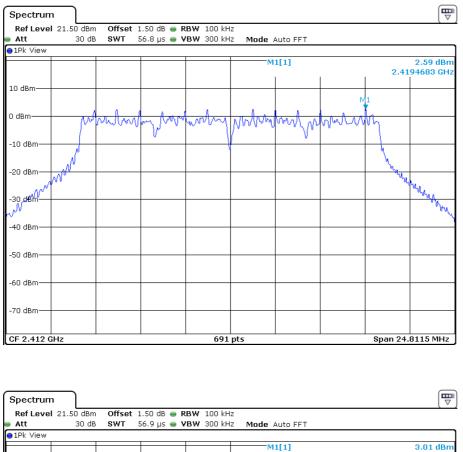
802.11b

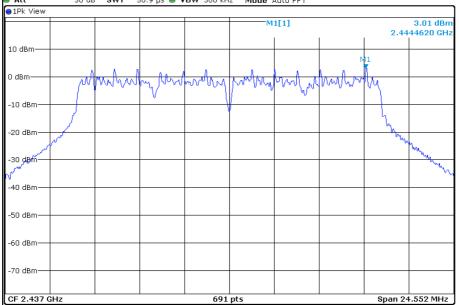
Spectrum				
	Offset 1.50 dB 👄 RBV			
	SWT 38 µs 👄 VBV	V 300 kHz Mode /	Auto FFT	
●1Pk View				
		M	1[1]	3.71 dBm 2.4135105 GHz
			I I I	2.4135105 GHZ
10 dBm				
		M		
0 dBm	mound	many pohon	mmmmm	
man man	~~~	V		mona
0 dBm				monteres
'≟⊉Ő dBm				~ m
-20 dBm				
-30 dBm				
-40 dBm				
-50 dBm				
-30 ubiii				
-60 dBm				
-70 dBm				
CF 2.412 GHz		691 pts		Span 14.913 MHz

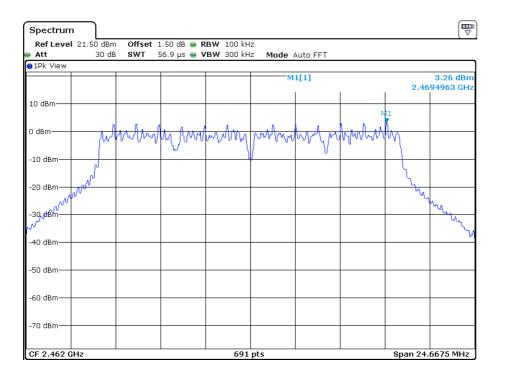


Spectrum				
RefLevel 21.50 dBm Att 30 dB	Offset 1.50 dB ● F SWT 37.9 µs ● V		Auto FFT	
●1Pk View				
		M	11[1]	4.29 dBm 2.4638658 GHz
10 dBm			M1	
0 dBm	mon	mon mon	Munn	
man		ľ		man
-10 dBm				
-20 dBm				
-30 dBm				
-40 dBm				
-50 dBm				
-60 dBm				
-70 dBm				
CF 2.462 GHz		691 pts		Span 14.3265 MHz

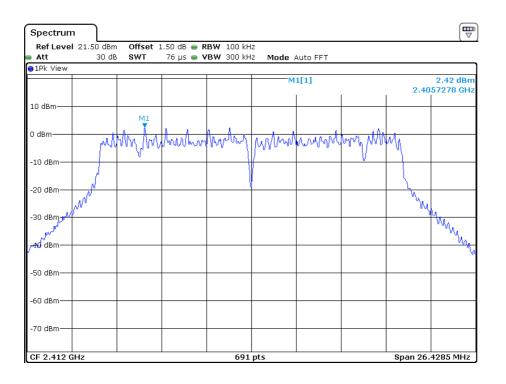
802.11g

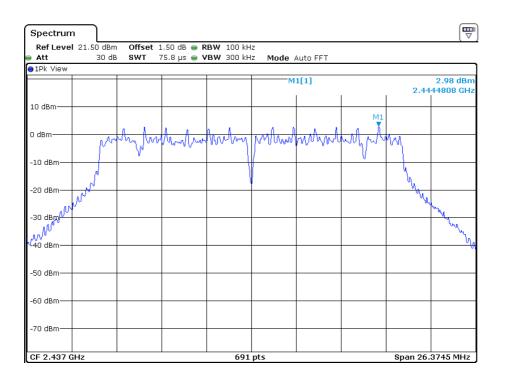


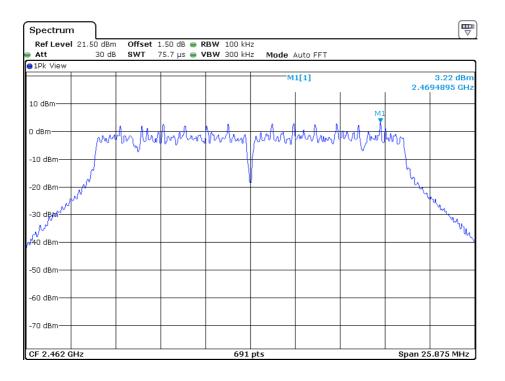




802.11n-HT20







Applicant: SHANTOU CITY HENGDI INDUSTRY CO., LTD Date of Test: July 5, 2017 Model: DRO 004

4.4 Out of Band Conducted Emissions, FCC Rule 15.247(d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. The Measurement Procedure was set according to the FCC KDB 558074 D01 v04.

All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the passband.

Refer to the attached test plots for out of band conducted emissions data with rate of 1Mbps for 802.11b and 6Mbps for 802.11g and 6Mbps for 802.11n-HT20.

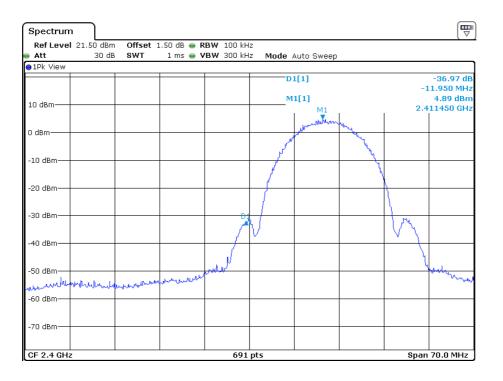
The test plots showed all spurious emission up to the tenth harmonic were measured and they were found to be at least 20 dB below the highest level of the desired power in the passband.

The test plots are attached as below.

802.11b

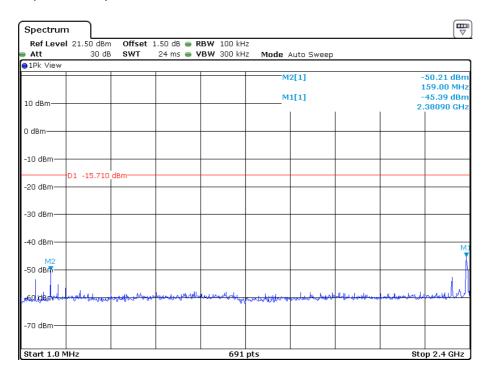
Channel 01 (2412MHz) Reference Level: 3.71dBm

	21.50 dBm		1.50 dB 👄 R						
Att 1Pk View	30 dB	SWT	24 ms 👄 V	' BW 300 kH	z Mode /	Auto Sweep			
					M	1[1]			34.11 dBn
						I	1	2.	.39830 GH:
.0 dBm									
ı dBm									
abiii									
10 dBm—									
	D1 -16.290	dBm							
20 dBm—									
30 dBm									
30 UBIII—									
40 dBm									
									1
50 dBm									
			and a sub-up to	hallen.				hat and the sta	Lahklu
59.dBd#%**	⁴ Mahalero Ma^janga ka l	harmalandyany ingiliki	and the second	CONCOUNT OF	- affer the grade free for the second	- Hat of a told	appy the second of the second	ويتواكده والمحافظ والمحاط	hiterate -fr - it -
70 dBm									
Start 1.0 M				691	pts			Sto	pp 2.4 GHz
Spectrur Ref Leve	n		1.50 dB • R 226 ms • V	BW 100 kH	z			Sto	
Spectrur Ref Leve Att	n		1.50 dB 🖷 R 226 ms 🖷 V	BW 100 kH	z	Auto Sweep		Sto	
Spectrur Ref Leve Att	n			BW 100 kH	z z Mode /	Auto Sweep			43.37 dBn
Spectrun Ref Leve Att 1Pk View	n			BW 100 kH	z z Mode /				43.37 dBn
Spectrun Ref Leve Att 1Pk View	n			BW 100 kH	z z Mode /		 		
Spectrur Ref Leve Att 1Pk View 0 dBm	n			BW 100 kH	z z Mode /				
Spectrur Ref Leve Att 1Pk View 0 dBm	n			BW 100 kH	z z Mode /				
Spectrur Ref Leve Att 1Pk View 0 dBm	n			BW 100 kH	z z Mode /				
Spectrur Ref Leve Att 1Pk View 0 dBm dBm 10 dBm	n	SWT		BW 100 kH	z z Mode /				43.37 dBn
Spectrur Ref Leve Att 1Pk View 0 dBm dBm 10 dBm	n I 21.50 dBm 30 dB	SWT		BW 100 kH	z z Mode /				43.37 dBn
Spectrur Ref Leve Att 1Pk View 0 dBm	n I 21.50 dBm 30 dB	SWT		BW 100 kH	z z Mode /				
Spectrur Ref Leve Att 1Pk View 0 dBm	n I 21.50 dBm 30 dB	SWT		BW 100 kH	z z Mode /				
Spectrur Ref Leve Att 1Pk View 0 dBm	n I 21.50 dBm 30 dB	SWT		BW 100 kH	z z Mode /				
Spectrur Ref Leve Att 11Pk View 0 dBm 0 dBm 10 dBm 20 dBm 30 dBm 40 dBm	n I 21.50 dBm 30 dB	SWT		BW 100 kH	z z Mode /				
Spectrur Ref Leve Att 1Pk View 0 dBm dBm dBm 10 dBm 20 dBm 30 dBm 40 dBm	n I 21.50 dBm 30 dB	SWT	226 ms V	BW 100 kH	Z Mode /				(43.37 dBn 2.4995 GH
Spectrur Ref Leve Att 1Pk View 0 dBm dBm dBm 10 dBm 20 dBm 30 dBm 40 dBm	n I 21.50 dBm 30 dB	SWT		BW 100 kH	Z Mode /				(43.37 dBn 2.4995 GH
Spectrur	n I 21.50 dBm 30 dB	SWT	226 ms V	BW 100 kH	Z Mode /				ຊ3.37 dBn 2.4995 GH

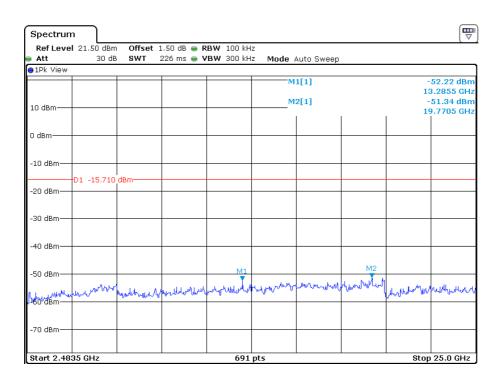


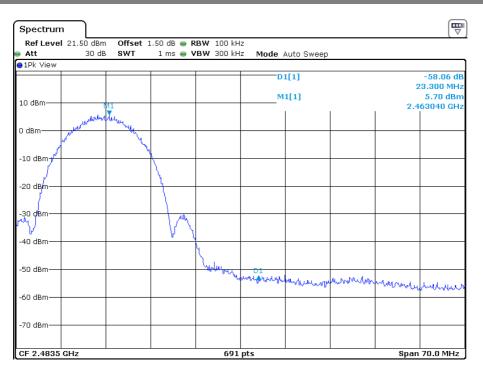
Channel 06 (2437MHz) Reference Level: 4.72dBm

Ref Leve	n el 21.50 dBm	Offset 1	L.50 dB 👄 R	BW 100 kH:	z				
Att	30 dB			' BW 300 kH:		Auto Sweep			
1Pk View					M	2[1]			46.19 dBm
						~[+]		2.	35660 GHz
10 dBm					M	1[1]			45.00 dBm 74900 GHz
								1.	74900 GH2
0 dBm									
-10 dBm—									
	D1 -15.280	dBm							
-20 dBm—									
-30 dBm—									
-40 dBm—							M1		M2
							I T		Ţ
-50 dBm									
. dan	- Mature mar	Munhad		myunun			all an older aller daller	de sule a temp	mannel
read Republic	Carol December 12 Lowe	And the second sec	population of the state of the		al and all and a second	Charles below the bolo of the		M MARINE MARINE O	000000
-70 dBm—									
~							-		0 1 011
Spectrur	n			691				Sto	p 2.4 GHz
Spectrur Ref Leve Att				691 BW 100 kH: BW 300 kH:	z	Auto Sweep		Sto	
Spectrur Ref Leve Att	n al 21.50 dBm			BW 100 kH:	z z Mode /				
	n al 21.50 dBm			BW 100 kH:	z z Mode /	Auto Sweep			(▼ 50.62 dBm
Spectrur Ref Leve Att 1Pk View	n al 21.50 dBm			BW 100 kH:	z z Mode /				p 2.4 GHz (□ ⊽ 50.62 dBm 0.7705 GHz
Spectrur Ref Leve Att 1Pk View	n al 21.50 dBm			BW 100 kH:	z z Mode /				(▼ 50.62 dBm
Spectrun Ref Leve Att 1Pk View	n al 21.50 dBm			BW 100 kH:	z z Mode /				(▼ 50.62 dBm
Spectrun Ref Leve Att 1Pk View	n al 21.50 dBm			BW 100 kH:	z z Mode /				(▼ 50.62 dBm
Spectrun Ref Leve Att 1Pk View 10 dBm	n al 21.50 dBm			BW 100 kH:	z z Mode /				(▼ 50.62 dBm
Spectrun Ref Leve Att 1Pk View 10 dBm	n al 21.50 dBm	SWT :		BW 100 kH:	z z Mode /				(▼ 50.62 dBm
Spectrur Ref Leve Att 1Pk View 10 dBm	n el 21.50 dBm 30 dE	SWT :		BW 100 kH:	z z Mode /				(▼ 50.62 dBm
Spectrur Ref Leve Att 1Pk View 10 dBm	n el 21.50 dBm 30 dE	SWT :		BW 100 kH:	z z Mode /				(▼ 50.62 dBm
Spectrur Ref Leve Att 1Pk View 10 dBm	n el 21.50 dBm 30 dE	SWT :		BW 100 kH:	z z Mode /				(▼ 50.62 dBm
Spectrur Ref Leve Att 10 dBm	n el 21.50 dBm 30 dE	SWT :		BW 100 kH:	z z Mode /				(▼ 50.62 dBm
Spectrur Ref Leve Att 10 dBm	n el 21.50 dBm 30 dE	SWT :		BW 100 kH:	z z Mode /				(▼ 50.62 dBm
Spectrur Ref Leve Att 1Pk View 10 dBm	n el 21.50 dBm 30 dE	SWT :		BW 100 kH:	z z Mode /				(▼ 50.62 dBm
Spectrur Ref Leve Att	n el 21.50 dBm 30 dE	SWT :	226 ms V	BW 100 kH BW 300 kH	Z Mode /				50.62 dBm .7705 GHz
Spectrur Ref Leve Att 10 dBm	n el 21.50 dBm 30 dE	SWT :		BW 100 kH:	z z Mode /		MI		(▼ 50.62 dBm
Spectrur Ref Leve Att 1Pk View 10 dBm	n el 21.50 dBm 30 dE	dBm	226 ms V	BW 100 kH BW 300 kH	Z Mode /				50.62 dBm .7705 GHz
Spectrur Ref Leve Att 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -50 dBm	n el 21.50 dBm 30 dE	dBm	226 ms V	BW 100 kH BW 300 kH	Z Mode /				50.62 dBm .7705 GHz
Spectrur Ref Leve Att 10 dBm	n el 21.50 dBm 30 dE	dBm	226 ms V	BW 100 kH BW 300 kH	Z Mode /				50.62 dBm .7705 GHz



Channel 11 (2462MHz) Reference Level: 4.29dBm



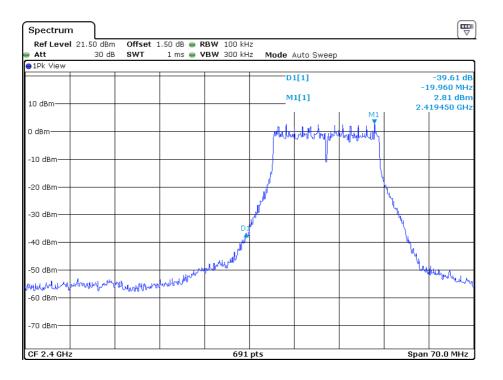


802.11g

Channel 01 (2412MHz) Reference Level: 2.59dBm

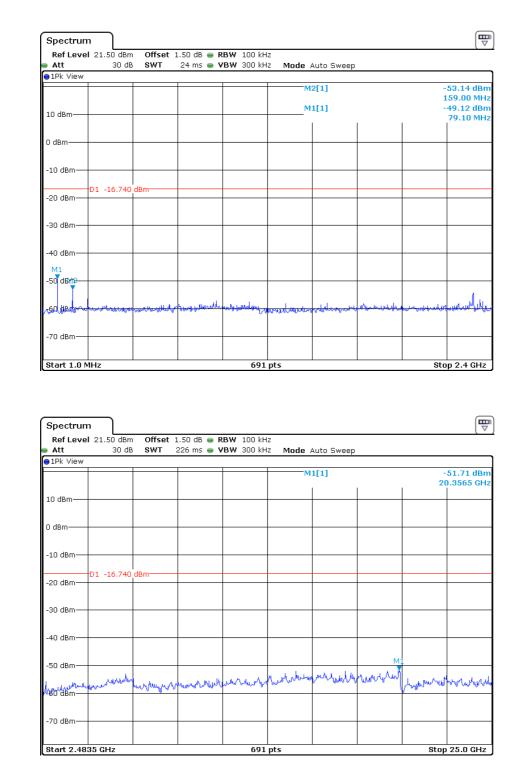
Spect	rum										
Ref Lo	evel	21.50	dBm Offset :	L.50 dB (RBW 100 kH;	2					
🕨 Att		3	D dB SWT	24 ms (🔵 VBW 300 kH:	Mode /	Auto Sw	/eep			
⊖1Pk Vi	e₩										
						M	3[1]			-	43.80 dBm
										1	58.97 MH
10 dBm·						M	1[1]			-	41.26 dBn
										2.	39830 GH:
0 dBm—											
-10 dBm	ι										
-20 dBm		1 -17.	410 dBm								
-20 0011	'										
-30 dBm											
-30 UBII											
											M2
-40 dBn											V 1012
-50 dBn	ד י										
											, M
-60 gbd	Josephiles	Hor Hila	the contraction of the second	the second	ulaurunter humadur.	mitherthe	abaddara	nh rowh	warah yaa kaade	ەلباھەلىرە مىرەمە ل	-Herlinston and the
-70 dBm	⊢ ⊢ι										
Start 1	.0 MH	Ηz	I	1	691	ots	1			Sto	p 2.4 GHz
Marker											
Type	Ref	Trc	X-value	. 1	Y-value	Func	tion		Eunr	tion Result	
нурс М1		1		B3 GHz	-41.26 dBi				- T une		
M2		1		54 GHz	-43.11 dB						
MЗ		1	158.	97 MHz	-43.80 dB	n					

Spectrum									
	21.50 dBm		.50 dB 👄 R						
Att 1Pk View	30 dB	SWT 2	226 ms 👄 V	' BW 300 KH	z Mode /	Auto Sweep			
TEK VIEW					М	1[1]			-50.46 dBm 0.1615 GHz
10 dBm									
0 dBm									
-10 dBm									
-20 dBm	D1 -17.410	dBm							
-30 dBm									
-40 dBm									
-50 dBm						d in	M1		
-50 dBm 	nunder	homensty	www.m	mmmm		Jure Wellung	www.	phonewhear	Hrolinnork
-70 dBm									
Start 2.483	5 GHz			691	pts			Stop	25.0 GHz

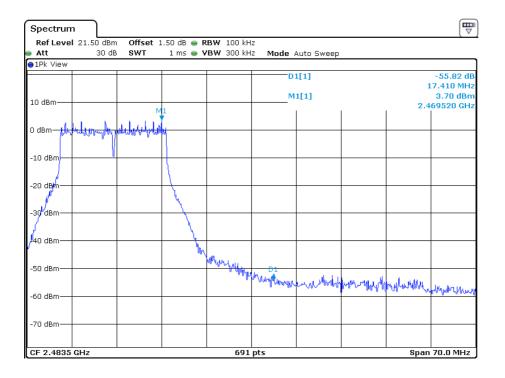


Channel 06 (2437MHz) Reference Level: 3.01dBm

	21.50 dBm			BW 100 kH					
Att 1Pk View	30 dB	SWT	24 ms 🖷 V	BW 300 kH	z Mode /	Auto Sweep			
TIK HOW					M	2[1]		-	47.66 dBn
									35660 GH
LO dBm					M	1[1]			45.54 dBn .59.00 MH
								Î	00.00
) dBm									
10 dBm									
	D1 10 000	dD							
20 dBm	D1 -16.990	dBm-							
30 dBm									
40 dBm									
M1									Ma
50 dBm —									- Ă
I.c.									1.
60 dentru	the settle sprace was	kht-wy	washandry	well advanced	http://www.	لعهماطورياطهما	مستحطيا فعتبسها	ليواطعه يعمينان	padana () () ()
70 dBm									
Start 1.0 M				691	pts			Sto	p 2.4 GHz
Spectrun	n	Offcot			<u>.</u>			Sto	
Spectrun			1.50 dB ● R 226 ms ● V	BW 100 kH	z	Luto Sweep		Sto	p 2.4 GHz
Spectrun Ref Leve Att	n			BW 100 kH	z	Auto Sweep		Sto	
Spectrun Ref Leve	n			BW 100 kH	z z Mode A	Auto Sweep			
Spectrun Ref Leve Att 1Pk View	n			BW 100 kH	z z Mode A				
Spectrun Ref Leve Att	n			BW 100 kH	z z Mode A				
Spectrun Ref Leve Att 11Pk View 0 dBm-	n			BW 100 kH	z z Mode A				
Spectrun Ref Leve Att 1Pk View	n			BW 100 kH	z z Mode A				
Spectrun Ref Leve Att 1Pk View 0 dBm	n			BW 100 kH	z z Mode A				
Spectrun Ref Leve Att 1Pk View 0 dBm	n			BW 100 kH	z z Mode A				
Spectrun Ref Leve Att 1Pk View 0 dBm	n	SWT		BW 100 kH	z z Mode A				
Spectrun Ref Leve Att 1Pk View 0 dBm	n 1 21.50 dBm 30 dB	SWT		BW 100 kH	z z Mode A				50.21 dBr
Spectrun Ref Leve Att 1Pk View 0 dBm	n 1 21.50 dBm 30 dB	SWT		BW 100 kH	z z Mode A				50.21 dBr
Spectrun Ref Leve Att 1Pk View 0 dBm	n 1 21.50 dBm 30 dB	SWT		BW 100 kH	z z Mode A				
Spectrun Ref Leve Att 1Pk View 0 dBm 10 dBm 20 dBm 20 dBm 30 dBm	n 1 21.50 dBm 30 dB	SWT		BW 100 kH	z z Mode A				
Spectrun Ref Leve Att 1Pk View 0 dBm 10 dBm 20 dBm 20 dBm 30 dBm	n 1 21.50 dBm 30 dB	SWT		BW 100 kH	z z Mode A				
Spectrun Ref Leve Att 1Pk View 0 dBm 0 dBm 10 dBm 20 dBm 30 dBm 40 dBm	n 1 21.50 dBm 30 dB	SWT		BW 100 kH	z z Mode A				
Spectrun Ref Leve Att 11Pk View 0 dBm 0 dBm 10 dBm 20 dBm 30 dBm 40 dBm	n d 21.50 dBm 30 dE	dBm-	226 ms • V	BW 100 kH BW 300 kH	Z Mode A	1[1]			
Spectrun Ref Leve Att 1Pk View 0 dBm dBm 10 dBm 20 dBm 30 dBm 40 dBm	n d 21.50 dBm 30 dE	SWT	226 ms • V	BW 100 kH BW 300 kH	z z Mode A	1[1]			
Spectrun Ref Leve Att 1Pk View 0 dBm	n d 21.50 dBm 30 dE	dBm-	226 ms • V	BW 100 kH BW 300 kH	Z Mode A	1[1]			
Spectrun Ref Leve Att 11Pk View 0 dBm 0 dBm 10 dBm 20 dBm 30 dBm 40 dBm	n d 21.50 dBm 30 dE	dBm-	226 ms • V	BW 100 kH BW 300 kH	Z Mode A	1[1]			

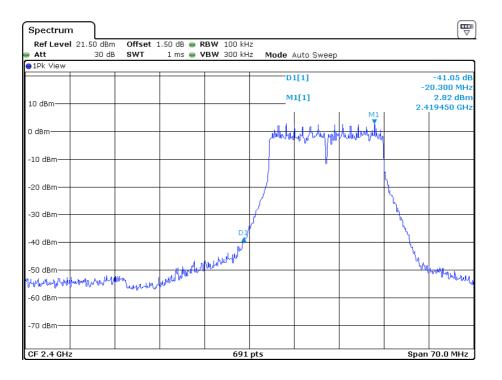


Channel 11 (2462MHz) Reference Level: 3.26dBm



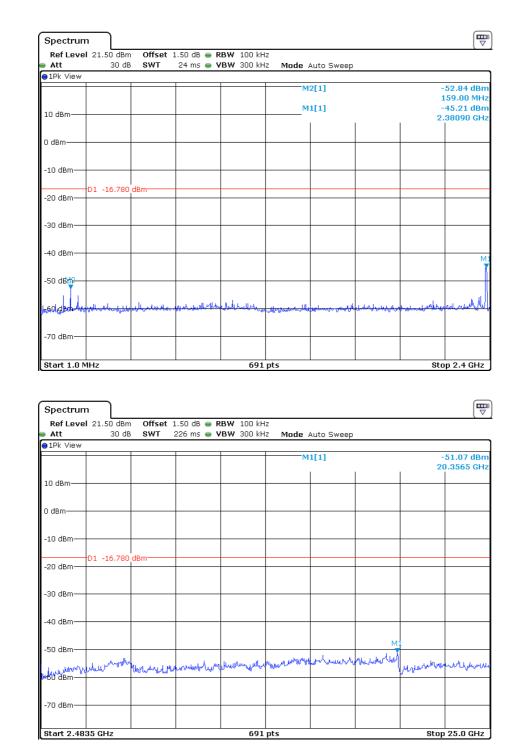
802.11n-HT20 Channel 01 (2412MHz) Reference Level: 2.42dBm

	el 21.50 dBm		1.50 dB 👄 R	BW 100 kH:	2				(v
Att 1Pk View	30 dB	SWT	24 ms 😑 🖌	'BW 300 kH:	Z Mode A	uto Sweep.			
JIPK VIEW			-		M2	2[1]		-	43.83 dBm
								1	59.00 MHz
10 dBm					M1	[1]			40.00 dBm 39830 GHz
0 dBm——									
-10 dBm—									
00 d0m	D1 -17.580	dBm							
20 dBm—									
30 dBm—									
40 dBm2									1
Ť									
-50 dBm									
6Q, dBby	-	linadd Www.c	والمستعملية والمالية والمستعم	alunaarultuk MP	manu	Mulador	an and a second of the second of the second s	anterne all waters	الليالكلورا كلاهيتان
-70 dBm—									
				691					
Start 1.0	171112								
Spectrur	m								p 2.4 GHz
-	m el 21.50 dBm 30 dB		1.50 dB ● R 226 ms ● V	:BW 100 kH:	2	uto Sweep			<u> </u>
Ref Leve Att	el 21.50 dBm 30 dB			:BW 100 kH:	z z Mode A	uto Sweep			
Ref Leve Att	el 21.50 dBm 30 dB			:BW 100 kH:	z z Mode A	uto Sweep			(▼ 46.53 dBn
Ref Leve Att 1Pk View	el 21.50 dBm 30 dB			:BW 100 kH:	z z Mode A				(▼ 46.53 dBn
Ref Leve Att 1Pk View	el 21.50 dBm 30 dB			:BW 100 kH:	z z Mode A				(▼ 46.53 dBn
Ref Leve Att 1Pk View 10 dBm-	el 21.50 dBm 30 dB			:BW 100 kH:	z z Mode A				(▼ 46.53 dBn
Ref Leve Att 1Pk View 10 dBm-	el 21.50 dBm 30 dB			:BW 100 kH:	z z Mode A				(▼ 46.53 dBn
Ref Leve Att 1Pk View 10 dBm	el 21.50 dBm 30 dB			:BW 100 kH:	z z Mode A				(▼ 46.53 dBn
Ref Leve Att 1Pk View 10 dBm	el 21.50 dBm 30 dB	SWT		:BW 100 kH:	z z Mode A				(▼ 46.53 dBn
Ref Leve Att 10 dBm	el 21.50 dBm 30 dB	SWT		:BW 100 kH:	z z Mode A				(▼ 46.53 dBn
Ref Leve Att 11 / View 10 dBm	el 21.50 dBm 30 dB	SWT		:BW 100 kH:	z z Mode A				(▼ 46.53 dBn
Ref Leve Att 11 / View 10 dBm	el 21.50 dBm 30 dB	SWT		:BW 100 kH:	z z Mode A				(▼ 46.53 dBn
Ref Leve Att) IPk View 10 dBm -10 dBm -20 dBm -30 dBm	el 21.50 dBm 30 dB	SWT		:BW 100 kH:	z z Mode A				(▼ 46.53 dBn
Ref Leve Att) IPk View 10 dBm -10 dBm -20 dBm -30 dBm	el 21.50 dBm 30 dB	SWT		:BW 100 kH:	z z Mode A				(▼ 46.53 dBn
Ref Leve Att 1Pk View 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm	el 21.50 dBm 30 dB	dBm-	226 ms	BW 100 kH; BW 300 kH	2 Mode A MJ	[1]			(▼ 46.53 dBn
 Att 1Pk View 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm 	el 21.50 dBm 30 dB D1 -17.580	dBm-	226 ms	BW 100 kH; BW 300 kH	2 Mode A MJ	[1]			46.53 dBn .4995 GH;
Ref Leve Att 10 dBm 10 dBm -10 dBm -20 dBm -30 dBm -30 dBm -50 dBm	el 21.50 dBm 30 dB D1 -17.580	dBm-		BW 100 kH; BW 300 kH	2 Mode A MJ	[1]	Murtoward		46.53 dBn .4995 GH;
Ref Leve Att 1Pk View 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm	el 21.50 dBm 30 dB D1 -17.580	dBm-	226 ms	BW 100 kH; BW 300 kH	2 Mode A MJ	[1]			46.53 dBn .4995 GH;
Ref Leve Att) IPk View 10 dBm 0 dBm	el 21.50 dBm 30 dB D1 -17.580	dBm-	226 ms	BW 100 kH; BW 300 kH	2 Mode A MJ	[1]			(46.53 dBn .4995 GH;

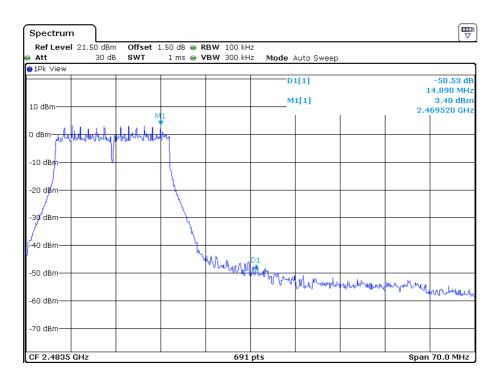


Channel 06 (2437MHz) Reference Level: 2.98dBm

	el 21.50 dBm			BW 100 kH					(·
Att 1Pk View	30 dB	SWT	24 ms 🖷 ۷	'BW 300 kH	z Mode /	Auto Sweep			
JIPK VIEW					M	1[1]		-	44.82 dBm
									35660 GHz
10 dBm									
0 dBm									
-10 dBm—									
	D1 -17.020	dBm							
-20 dBm—									
-30 dBm—									
-30 UBIII									
-40 dBm—									
io abiii									M1
-50 dBm									
1.1									
ga denhun	Julianter	Mary whether the	and the second	للاطعيم العطاميلي	amile the work the	اللعصب الملام	asusanday, a	ينها الاستهادين	anstrant
-70 dBm—									
				691	pts			<u>Sto</u>	p 2.4 GHz
Spectrur	n		1.50 dB 👄 R	691 BW 100 kH	<u>.</u>			Sto	
Spectrur Ref Leve Att	n				z	Auto Sweep		Sto	
	n			.BW 100 kH	z z Mode 4				
Spectrur Ref Leve Att	n			.BW 100 kH	z z Mode 4	Auto Sweep			
Spectrur Ref Leve Att	n			.BW 100 kH	z z Mode 4				
Spectrur Ref Leve Att 1Pk View	n			.BW 100 kH	z z Mode 4				
Spectrur Ref Leve Att 1Pk View 10 dBm	n			.BW 100 kH	z z Mode 4				
Spectrur Ref Leve Att 1Pk View 10 dBm	n			.BW 100 kH	z z Mode 4				
Spectrur Ref Leve Att 1Pk View 10 dBm	n			.BW 100 kH	z z Mode 4				
Spectrur Ref Leve Att 10 dBm	n	3 SWT :		.BW 100 kH	z z Mode 4				
Spectrur Ref Leve Att 10 dBm	n 1 21.50 dBm 30 dE	3 SWT :		.BW 100 kH	z z Mode 4				
Spectrur Ref Leve Att 10 dBm	n 1 21.50 dBm 30 dE	3 SWT :		.BW 100 kH	z z Mode 4				
Spectrur Ref Leve Att 10 dBm	n 1 21.50 dBm 30 dE	3 SWT :		.BW 100 kH	z z Mode 4				
Spectrur Ref Leve Att 1Pk View	n 1 21.50 dBm 30 dE	3 SWT :		.BW 100 kH	z z Mode 4				
Spectrur Ref Leve Att 10 dBm	n 1 21.50 dBm 30 dE	3 SWT :		.BW 100 kH	z z Mode 4			20	
Spectrur Ref Leve Att 10 dBm	n 30 dBm 30 dE	dBm		100 kH BW 300 kH	Z Mode /			20	(₩ ▼ 50.79 dBm).3895 GHz
Spectrur Ref Leve 110 dBm	n 30 dBm 30 dE	dBm		.BW 100 kH	z z Mode 4		1	20	(₩ ▼ 50.79 dBm).3895 GHz
Spectrur Ref Leve Att 10 dBm	n 1 21.50 dBm 30 dE	dBm		100 kH BW 300 kH	Z Mode /		-	20	(₩ ▼ 50.79 dBm).3895 GH2
Spectrur Ref Leve 110 dBm	n 30 dBm 30 dE	dBm		100 kH BW 300 kH	Z Mode /		-	20	(₩ ▼ 50.79 dBm).3895 GH2
Spectrur Ref Leve Att 10 dBm	n 30 dBm 30 dE	dBm		100 kH BW 300 kH	Z Mode /		-	20	50.79 dBn J.3895 GH2



Channel 11 (2462MHz) Reference Level: 3.22dBm



Applicant: SHANTOU CITY HENGDI INDUSTRY CO., LTD Date of Test: July 5, 2017 Model: DRO 004

4.5 Out of Band Radiated Emissions (for emissions in 4.4 above that are less than 20dB below carrier), FCC Rule 15.247(d):

For out of band emissions that are close to or that exceed the 20dB attenuation requirement described in the specification, radiated measurements were performed at a 3m separation distance to determine whether these emissions complied with the general radiated emission requirement.

- [X] Not required, since all emissions are more than 20dB below fundamental
- [] See attached data sheet

Applicant: SHANTOU CITY HENGDI INDUSTRY CO., LTD Date of Test: July 5, 2017 Model: DRO 004

4.6 Transmitter Radiated Emissions in Restricted Bands, FCC Rule 15.35(b) (c):

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included. All measurements were performed with peak detection unless otherwise specified.

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

Applicant: SHANTOU CITY HENGDI INDUSTRY CO., LTD Date of Test: July 5, 2017 Model: DRO 004

4.7 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

FS = RA + AF + CF - AG + PD

Where
$$FS = Field$$
 Strength in $dB\mu V/m$
RA = Receiver Amplitude (including preamplifier) in $dB\mu V$
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB
PD = Pulse Desensitization in dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

FS = RA + AF + CF - AG + PD

Example

Assume a receiver reading of 62.0 dB μ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB. The net field strength for comparison to the appropriate emission limit is 42 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

RA = $62.0 \text{ dB}\mu\text{V}$ AF = 7.4 dB CF = 1.6 dB AG = 29.0 dB PD = 0 dB FS = $62 + 7.4 + 1.6 - 29 + 0 = 42 \text{ dB}\mu\text{V/m}$

Level in mV/m = Common Antilogarithm [(42 dB μ V/m)/20] = 125.9 μ V/m

Applicant: SHANTOU CITY HENGDI INDUSTRY CO., LTD Date of Test: July 5, 2017 Model: DRO 004

4.8 Radiated Spurious Emission

Worst Case Radiated Spurious Emission (802.11b-Channel 01) at 199.072MHz is passed by 10.4dB margin.

For the electronic filing, the worst case radiated emission configuration photographs are saved with filename: radiated photos.pdf.

Applicant: SHANTOU CITY HENGDI INDUSTRY CO., LTD Date of Test: July 5, 2017 Model: DRO 004 Worst Case Operating Mode: Transmitting (802.11b-Channel 01)

Radiated Emissions

Polarization	Frequency	Reading	Pre-	Antenna	Net	Limit	Margin
	(MHz)	(dBµV)	Amp	Factor	at 3m	at 3m	(dB)
			Gain	(dB)	(dBµV/m)	(dBµV/m)	
			(dB)				
Horizontal	325.140	37.2	20.0	13.3	30.5	46.0	-15.5
Horizontal	486.260	38.1	20.0	15.7	33.8	46.0	-12.2
Horizontal	756.400	35.4	20.0	19.3	34.7	46.0	-11.3
Vertical	199.072	39.6	20.0	13.5	33.1	43.5	-10.4
Vertical	280.200	38.7	20.0	15.8	34.5	46.0	-11.5
Vertical	845.300	33.2	20.0	20.3	33.5	46.0	-12.5

NOTES: 1. Quasi-Peak detector is used for frequency below 1GHz.

- 2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
- 3. Negative value in the margin column shows emission below limit.

Applicant: SHANTOU CITY HENGDI INDUSTRY CO., LTD Date of Test: July 5, 2017 Model: DRO 004 Worst Case Operating Mode: Transmitting (802.11b-Channel 01)

Polarization	Frequency	Reading	Pre-	Antenna	Net	Peak Limit	Margin
	(MHz)	(dBµV)	Amp	Factor	at 3m	at 3m	(dB)
			Gain	(dB)	(dBµV/m)	(dBµV/m)	
			(dB)				
Horizontal	*4824.000	64.7	41.3	33.5	56.9	74.0	-17.1
Horizontal	*2390.000	63.7	41.4	29.1	51.4	74.0	-22.6

Polarization	Frequency	Reading	Pre-	Antenna	Net	Average Limit	Margin
	(MHz)	(dBµV)	Amp	Factor	at 3m	at 3m	(dB)
			Gain	(dB)	(dBµV/m)	(dBµV/m)	
			(dB)				
Horizontal	*4824.000	46.4	41.3	33.5	38.6	54.0	-15.4
Horizontal	*2390.000	43.1	41.4	29.1	30.8	54.0	-23.2

- NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz/VBW=10Hz for average value.
 - 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
 - 3. Negative value in the margin column shows emission below limit.
 - 4. Horn antenna used for the emission over 1000MHz.
 - * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: SHANTOU CITY HENGDI INDUSTRY CO., LTD Date of Test: July 5, 2017 Model: DRO 004 Worst Case Operating Mode: Transmitting (802.11b-Channel 06)

Polarization	Frequency	Reading	Pre-	Antenna	Net	Peak Limit	Margin
	(MHz)	(dBµV)	Amp	Factor	at 3m	at 3m	(dB)
			Gain	(dB)	(dBµV/m)	(dBµV/m)	
			(dB)				
Horizontal	*4874.000	65.7	41.2	33.4	57.9	74.0	-16.1
Horizontal	*7311.000	60.4	40.5	35.8	55.7	74.0	-18.3

Polarization	Frequency	Reading	Pre-	Antenna	Net	Average Limit	Margin
	(MHz)	(dBµV)	Amp	Factor	at 3m	at 3m	(dB)
			Gain	(dB)	(dBµV/m)	(dBµV/m)	
			(dB)				
Horizontal	*4874.000	47.1	41.2	33.4	39.3	54.0	-14.7
Horizontal	*7311.000	47.0	40.5	35.8	42.3	54.0	-11.7

- NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
 - 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
 - 3. Negative value in the margin column shows emission below limit.
 - 4. Horn antenna used for the emission over 1000MHz.
 - * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: SHANTOU CITY HENGDI INDUSTRY CO., LTD Date of Test: July 5, 2017 Model: DRO 004 Worst Case Operating Mode: Transmitting (802.11b-Channel 11)

Polarization	Frequency	Reading	Pre-	Antenna	Net	Peak Limit	Margin			
	(MHz)	(dBµV)	Amp	Factor	at 3m	at 3m	(dB)			
			Gain	(dB)	(dBµV/m)	(dBµV/m)				
			(dB)							
Horizontal	*4924.000	61.8	41.2	33.3	53.9	74.0	-20.1			
Horizontal	*7386.000	60.3	40.3	36.1	56.1	74.0	-17.9			
Horizontal	*2483.500	63.5	41.4	29.3	51.4	74.0	-22.6			

Polarization	Frequency	Reading	Pre-	Antenna	Net	Average Limit	Margin
	(MHz)	(dBµV)	Amp	Factor	at 3m	at 3m	(dB)
			Gain	(dB)	(dBµV/m)	(dBµV/m)	
			(dB)				
Horizontal	*4924.000	45.0	41.2	33.3	37.1	54.0	-16.9
Horizontal	*7386.000	46.5	40.3	36.1	42.3	54.0	-11.7
Horizontal	*2483.500	42.5	41.4	29.3	30.4	54.0	-23.6

- NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
 - 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
 - 3. Negative value in the margin column shows emission below limit.
 - 4. Horn antenna used for the emission over 1000MHz.
 - * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: SHANTOU CITY HENGDI INDUSTRY CO., LTD Date of Test: July 5, 2017 Model: DRO 004 Worst Case Operating Mode: Transmitting (802.11g-Channel 01)

Polarization	Frequency	Reading	Pre-	Antenna	Net	Peak Limit	Margin				
	(MHz)	(dBµV)	Amp	Factor	at 3m	at 3m	(dB)				
			Gain	(dB)	(dBµV/m)	(dBµV/m)					
			(dB)								
Horizontal	*4824.000	61.0	41.3	33.5	53.2	74.0	-20.8				
Horizontal	*2390.000	64.4	41.4	29.1	52.1	74.0	-21.9				

Dedicted Emissions

TIONZONIA	2390.000	04.4	41.4	29.1	52.1	74.0	-21.9
Polarization	Frequency	Reading	Pre-	Antenna	Net	Average Limit	Margin
	(MHz)	(dBµV)	Amp	Factor	at 3m	at 3m	(dB)
			Gain	(dB)	(dBµV/m)	(dBµV/m)	
			(dB)				
Horizontal	*4824.000	45.2	41.3	33.5	37.4	54.0	-16.6

NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

Horizontal *2390.000 42.7 41.4 29.1 30.4

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

54.0

-23.6

- 3. Negative value in the margin column shows emission below limit.
- 4. Horn antenna used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: SHANTOU CITY HENGDI INDUSTRY CO., LTD Date of Test: July 5, 2017 Model: DRO 004 Worst Case Operating Mode: Transmitting (802.11g-Channel 06)

Radiated Emissions Net Peak Limit Polarization Frequency Reading Pre-Antenna Margin (MHz) (dBµV) Amp Factor at 3m at 3m (dB) Gain (dB) (dBµV/m) (dBµV/m) (dB) -19.4 Horizontal *4874.000 62.4 41.2 33.4 54.6 74.0 Horizontal *7311.000 61.7 40.5 35.8 57.0 74.0 -17.0

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	45.5	41.2	33.4	37.7	54.0	-16.3
Horizontal	*7311.000	46.5	40.5	35.8	41.8	54.0	-12.2

- NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
 - 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
 - 3. Negative value in the margin column shows emission below limit.
 - 4. Horn antenna used for the emission over 1000MHz.
 - * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: SHANTOU CITY HENGDI INDUSTRY CO., LTD Date of Test: July 5, 2017 Model: DRO 004 Worst Case Operating Mode: Transmitting (802.11g-Channel 11)

*2483.500

Horizontal

Radiated Emissions											
Polarization	Frequency	Reading	Pre-	Antenna	Net	Peak Limit	Margin				
	(MHz)	(dBµV)	Amp	Factor	at 3m	at 3m	(dB)				
	. ,		Gain	(dB)	(dBµV/m)	(dBµV/m)	. ,				
			(dB)								
Horizontal	*4924.000	59.0	41.2	33.3	51.1	74.0	-22.9				
Horizontal	*2483.500	62.3	41.4	29.3	50.2	74.0	-23.8				

Horizontal	*2483.500	62.3	41.4	29.3	50.2	74.0	-23.8
Polarization	Frequency	Reading	Pre-	Antenna	Net	Average Limit	Margin
	(MHz)	(dBµV)	Amp	Factor	at 3m	at 3m	(dB)
			Gain	(dB)	(dBµV/m)	(dBµV/m)	
			(dB)				
Horizontal	*4924.000	44.2	41.2	33.3	36.3	54.0	-17.7

NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

41.4

42.5

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

29.3

30.4

- 3. Negative value in the margin column shows emission below limit.
- 4. Horn antenna used for the emission over 1000MHz.
- Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

-23.6

54.0

Applicant: SHANTOU CITY HENGDI INDUSTRY CO., LTD Date of Test: July 5, 2017 Model: DRO 004 Worst Case Operating Mode: Transmitting (802.11n-HT20)-Channel 01

_											
	Polarization	Frequency	Reading	Pre-	Antenna	Net	Peak Limit	Margin			
		(MHz)	(dBµV)	Amp	Factor	at 3m	at 3m	(dB)			
				Gain	(dB)	(dBµV/m)	(dBµV/m)				
				(dB)							
	Horizontal	*4824.000	61.4	41.3	33.5	53.6	74.0	-20.4			
	Horizontal	*2390.000	63.7	41.4	29.1	51.4	74.0	-22.6			

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	44.0	41.3	33.5	36.2	54.0	-17.8
Horizontal	*2390.000	43.7	41.4	29.1	31.4	54.0	-22.6

- NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
 - 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
 - 3. Negative value in the margin column shows emission below limit.
 - 4. Horn antenna used for the emission over 1000MHz.
 - * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: SHANTOU CITY HENGDI INDUSTRY CO., LTD Date of Test: July 5, 2017 Model: DRO 004 Worst Case Operating Mode: Transmitting (802.11n-HT20)-Channel 06

Frequency	Reading	Pre-	Antenna	Net	Peak Limit	Margin				
(MHz)	(dBµV)	Amp	Factor	at 3m	at 3m	(dB)				
		Gain	(dB)	(dBµV/m)	(dBµV/m)					
		(dB)								
*4874.000	61.0	41.2	33.4	53.2	74.0	-20.8				
*7311.000	60.9	40.5	35.8	56.2	74.0	-17.8				
	(MHz) *4874.000	Frequency Reading (MHz) (dBµV) *4874.000 61.0	FrequencyReadingPre-(MHz)(dBµV)AmpGain(dB)*4874.00061.041.2	Frequency (MHz)Reading (dBµV)Pre- AmpAntenna 	(MHz) (dBµV) Amp Factor at 3m Gain (dB) (dB) (dB) *4874.000 61.0 41.2 33.4 53.2	Frequency (MHz)Reading (dBµV)Pre- AmpAntennaNetPeak Limit(MHz)(dBµV)AmpFactor (dB)at 3m (dBµV/m)at 3m (dBµV/m)(dB)(dB)(dB)(dBµV/m)*4874.00061.041.233.453.274.0				

Rad	iated	Em	issio	ons	

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	44.0	41.2	33.4	36.2	54.0	-17.8
Horizontal	*7311.000	46.3	40.5	35.8	41.6	54.0	-12.4

- NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
 - 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
 - 3. Negative value in the margin column shows emission below limit.
 - 4. Horn antenna used for the emission over 1000MHz.
 - * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: SHANTOU CITY HENGDI INDUSTRY CO., LTD Date of Test: July 5, 2017 Model: DRO 004 Worst Case Operating Mode: Transmitting (802.11n-HT20)-Channel 11

	Radiated Emissions										
Polarization	Frequency	Reading	Pre-	Antenna	Net	Peak Limit	Margin				
	(MHz)	(dBµV)	Amp	Factor	at 3m	at 3m	(dB)				
			Gain	(dB)	(dBµV/m)	(dBµV/m)					
			(dB)								
Horizontal	*4924.000	60.2	41.2	33.3	52.3	74.0	-21.7				
Horizontal	*2483.500	62.5	41.4	29.3	50.4	74.0	-23.6				

Polarization	Frequency	Reading	Pre-	Antenna	Net	Average Limit	Margin
	(MHz)	(dBµV)	Amp	Factor	at 3m	at 3m	(dB)
			Gain	(dB)	(dBµV/m)	(dBµV/m)	
			(dB)				
Horizontal	*4924.000	44.1	41.2	33.3	36.2	54.0	-17.8
Horizontal	*2483.500	44.2	41.4	29.3	32.1	54.0	-21.9

- NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
 - 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
 - 3. Negative value in the margin column shows emission below limit.
 - 4. Horn antenna used for the emission over 1000MHz.
 - * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: SHANTOU CITY HENGDI INDUSTRY CO., LTD Date of Test: July 5, 2017 Model: DRO 004

- 4.9 Radiated Emissions from Digital Section of Transceiver, FCC Ref: 15.109
- [] Not required No digital part
- [] Test results are attached
- [x] Included in the separated report.

Applicant: SHANTOU CITY HENGDI INDUSTRY CO., LTD Date of Test: July 5, 2017 Model: DRO 004

4.10 Transmitter Duty Cycle Calculation and Measurements, FCC Rule 15.35(b), (c)

The EUT antenna output port was connected to the input of the spectrum analyzer. The analyzer center frequency was set to EUT RF channel carrier. The SWEP function on the analyzer was set to ZERO SPAN. The Transmitter ON time was determined from the resultant time-amplitude display:

	See attached spectrum analyzer chart (s) for Transmitter timing
	See Transmitter timing diagram provided by manufacturer
х	Not applicable, duty cycle was not used.

EXHIBIT 5

EQUIPMENT PHOTOGRAPHS

5.0 Equipment Photographs

For electronic filing, the photographs are saved with filename: external photos.pdf & internal photos.pdf.

EXHIBIT 6

PRODUCT LABELLING

6.0 Product Labeling

For electronic filing, the FCC ID label artwork and location is saved with filename: label.pdf.

EXHIBIT 7

TECHNICAL SPECIFICATIONS

7.0 <u>Technical Specifications</u>

For electronic filing, the block diagram and circuit diagram are saved with filename: block.pdf and circuit.pdf respectively.

EXHIBIT 8

INSTRUCTION MANUAL

8.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States.

EXHIBIT 9

CONFIDENTIALITY REQUEST

9.0 <u>Confidentiality Request</u>

For electronic filing, the confidentiality request of the tested EUT is saved with filename: request.pdf.

EXHIBIT 10

MISCELLANEOUS INFORMATION

10.0 Discussion of Pulse Desensitization

The determination of pulse desensitivity was made in accordance with Hewlett Packard Application Note 150-2, *Spectrum Analysis ... Pulsed RF.*

Pulse desensitivity is not applicable for this device since the transmitter transmits the RF signal continuously.

EXHIBIT 11

TEST EQUIPMENT LIST

11.0 Test Equipment List

				Cal. Due date	Calibration
Equipment No.	Equipment	Model	Manufacturer	(MM-DD- YYYY)	Interval
EM030-04	3m Semi-Anechoic Chamber	9×6×6 m ³	ETS·LINDGREN	9/9/2017	1Y
EM031-02	EMI Test Receiver (9 kHz~7 GHz)	R&S ESR7	R&S	9/7/2017	1Y
EM031-03	Signal and Spectrum Analyzer (10 Hz~40 GHz)	R&S FSV40	R&S	9/3/2017	1 Y
EM011-04	Loop antenna (9 kHz-30 MHz)	HFH2-Z2	R&S	9/6/2017	1 Y
EM061-03	TRILOG Super Broadband test Antenna (30 MHz-1.5 GHz) (TX)	VULB 9161	SCHWARZBECK	9/6/2017	1Y
EM033-01	TRILOG Super Broadband test Antenna(30 MHz-3 GHz) (RX)	VULB 9163	SCHWARZBECK	9/8/2017	1Y
EM033-02	Bouble-Ridged Waveguide Horn Antenna (800 MHz-18 GHz)(RX)	R&S HF907	R&S	9/6/2017	1Y
EM033-03	High Frequency Antenna & preamplifier(18 GHz~26.5 GHz) (RX)	R&S SCU-26	R&S	4/1/2018	1Y
EM033-04	High Frequency Antenna & preamplifier (26 GHz-40 GHz)	R&S SCU-40	R&S	4/1/2018	1Y
EM031-02-01	Coaxial cable(9 kHz-1 GHz)	N/A	R&S	9/30/2017	1Y
EM033-02-02	Coaxial cable(1 GHz-18 GHz)	N/A	R&S	9/30/2017	1Y
EM033-04-02	Coaxial cable(18 GHz~40 GHz)	N/A	R&S	4/1/2018	1Y
EM022-03	2.45 GHz Filter	BRM50702	Micro-Tronics	9/9/2017	1Y
EM086-11	Power Meter	NRP2	R&S	1/5/2018	1Y
EM086-11-01	Power Sensor	NRP-Z91	R&S	1/5/2018	1Y