

Test Report

Report No.:	MTi240125015-02E1
Date of issue:	2024-04-30
Applicant:	Shenzhen Huiying Electronics Co., Ltd.
Product:	Floating Light Bulb
Model(s):	VA1213-1, HY20001-1, HY22001-1, EKM-MFB-A1-1, UVEHAS23-1, XR-3-FLBA5-1
FCC ID:	2BE7G-VA12131

Shenzhen Microtest Co., Ltd. http://www.mtitest.cn

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Table of contents

1	Gene	eral Description	5
	1.1 1.2 1.3 1.4 1.5	Description of the EUT Description of test modes Environmental Conditions Description of support units Measurement uncertainty	5 6 6
2	Sum	mary of Test Result	7
3	Test	Facilities and accreditations	8
	3.1	Test laboratory	8
4	List	of test equipment	9
5	Evalu	uation Results (Evaluation)	10
	5.1	Antenna requirement	10
6	Radi	o Spectrum Matter Test Results (RF)	11
	6.1 6.2 6.3 6.4	Conducted Emission at AC power line 20dB Occupied Bandwidth Emissions in frequency bands (below 30MHz) Emissions in frequency bands (30MHz - 1GHz)	14 18
Ph	otogra	aphs of the test setup	24
Ph	otogra	aphs of the EUT	25



Test Result Certification			
Applicant:	Shenzhen Huiying Electronics Co., Ltd.		
Address:	R.201, Building 1, Dadiyuan, Jinbi Road, Cuizhu Street, Luohu District, Shenzhen, China 51810		
Manufacturer:	Shenzhen Huiying Electronics Co., Ltd.		
Address: R.201, Building 1, Dadiyuan, Jinbi Road, Cuizhu Street, Luohu District, Shenzhen, China 51810			
Product description			
Product name:	Floating Light Bulb		
Trademark:	VGAzer, exekoml, UVEHAS,DIDWI		
Model name:	VA1213-1		
Series Model(s):	HY20001-1, HY22001-1, EKM-MFB-A1-1, UVEHAS23-1, XR-3-FLBA5-1		
Standards:	47 CFR Part 15C		
Test Method:	ANSI C63.10-2013		
Date of Test			
Date of test:	2024-03-07 to 2024-04-10		
Test result:	Pass		

Test Engineer	:	Letter. Lan.
		(Letter Lan)
Reviewed By	Dowid. Cee	
		(David Lee)
Approved By	:	(cov chen
		(Leon Chen)



1 General Description

1.1 Description of the EUT

Product name:	Floating Light Bulb			
Model name:	VA1213-1			
Series Model(s): HY20001-1, HY22001-1, EKM-MFB-A1-1, UVEHAS23-1, XR-3-FLBA5				
Model difference: All the models are the same circuit and module, except the model name colour.				
Electrical rating:	Input: DC 12V/ 2A Output: DC 5V/ 100mAh Wireless output: 5W, 7.5W, 10W			
Accessories:	Adaptor: Model: HP24L-1202000-AVU-S Input: 100-240V - 50/60Hz 0.8A Output; 12V 2A			
Hardware version:	V-R1			
Software version:	V-R1			
Test sample(s) number:	MTi240125015-02S1001			
RF specification				
Operating frequency range:	115-205kHz			
Modulation type:	ASK			
Antenna(s) type:	Coil			

1.2 Description of test modes

No.	Emission test modes			
Mode1	Wireless Output (5W)			
Mode2	Wireless Output (7.5W)			
Mode3	Wireless Output (10W)			
Mode4	stand by			



1.3 Environmental Conditions

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

Temperature:	15°C ~ 35°C
Humidity:	20% RH ~ 75% RH
Atmospheric pressure:	98 kPa ~ 101 kPa

1.4 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.

Support equipment list						
Description Model Serial No. Manu						
wireless charging load	YBZ1.1	/ YBZ				
Support cable list						
Description Length (m)		From	То			
/	/	/	/			

1.5 Measurement uncertainty

Measurement	Uncertainty
Conducted emissions (AMN 150kHz~30MHz)	±3.1dB
Occupied channel bandwidth	±3 %
Radiated spurious emissions (9kHz~30MHz)	±4.3dB
Radiated spurious emissions (30MHz~1GHz)	±4.7dB
Temperature	±1 °C
Humidity	± 5 %

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



2 Summary of Test Result

No.	Item	Standard	Requirement	Result
1	Antenna requirement	47 CFR Part 15C	47 CFR Part 15.203	Pass
2	Conducted Emission at AC power line	47 CFR Part 15C	47 CFR Part 15.207(a)	Pass
3	20dB Occupied Bandwidth	47 CFR Part 15C	47 CFR Part 15.215(c)	Pass
4	Emissions in frequency bands (below 30MHz)	47 CFR Part 15C	47 CFR Part 15.209	Pass
5	Emissions in frequency bands (30MHz - 1GHz)	47 CFR Part 15C	47 CFR Part 15.209	Pass



3 Test Facilities and accreditations

3.1 Test laboratory

Test laboratory:	Shenzhen Microtest Co., Ltd.			
Test site location:	101, No.7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China			
Telephone:	(86-755)88850135			
Fax:	(86-755)88850136			
CNAS Registration No.:	CNAS L5868			
FCC Registration No.:	448573			
IC Registration No.:	21760			
CABID:	CN0093			



4 List of test equipment

No.	Equipment	Manufacturer	Model	Serial No.	Cal. date	Cal. Due
Conducted Emission at AC power line						
1	EMI Test Receiver	Rohde&schwarz	ESCI3	101368	2023-04-26	2024-04-25
2	Artificial mains network	Schwarzbeck	NSLK 8127	183	2023-05-05	2024-05-04
3	Artificial Mains Network	Rohde & Schwarz	ESH2-Z5	100263	2023-06-03	2024-06-02
		20dB Oc	cupied Bandwid	th		
1	Wideband Radio Communication Tester	Rohde&schwarz	CMW500	149155	2024-03-20	2025-03-19
2	ESG Series Analog Ssignal Generator	Agilent	E4421B	GB40051240	2024-03-21	2025-03-20
3	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2024-03-21	2025-03-20
4	Synthesized Sweeper	Agilent	83752A	3610A01957	2024-03-21	2025-03-20
5	MXA Signal Analyzer	Agilent	N9020A	MY50143483	2024-03-21	2025-03-20
6	RF Control Unit	Tonscend	JS0806-1	19D8060152	2024-03-21	2025-03-20
7	Band Reject Filter Group	Tonscend	JS0806-F	19D8060160	2024-03-21	2025-03-20
8	ESG Vector Signal Generator	Agilent	N5182A	MY50143762	2024-03-20	2025-03-19
9	DC Power Supply	Agilent	E3632A	MY40027695	2024-03-21	2025-03-20
		Emissions in frequ	iency bands (bel	ow 30MHz)		
1	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2023-04-26	2024-04-25
2	Active Loop Antenna	Schwarzbeck	FMZB 1519 B	00066	2023-06-11	2025-06-10
3	Amplifier	Hewlett-Packard	8447F	3113A06184	2023-04-25	2024-04-24
		Emissions in freque	ency bands (30N	/Hz - 1GHz)	•	
1	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2023-04-26	2024-04-25
2	TRILOG Broadband Antenna	schwarabeck	VULB 9163	9163-1338	2023-06-11	2025-06-10
3	Active Loop Antenna	Schwarzbeck	FMZB 1519 B	00066	2023-06-11	2025-06-10
4	Amplifier	Hewlett-Packard	8447F	3113A06184	2023-04-25	2024-04-24
5	Multi-device Controller	TuoPu	TPMDC	/	2023-05-04	2024-05-03



5 Evaluation Results (Evaluation)

5.1 Antenna requirement

Test Requirement:	Refer to 47 CFR Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be
	considered sufficient to comply with the provisions of this section.

5.1.1 Conclusion:

The antenna of the EUT is permanently attached. The EUT complies with the requirement of FCC PART 15.203.



6 Radio Spectrum Matter Test Results (RF)

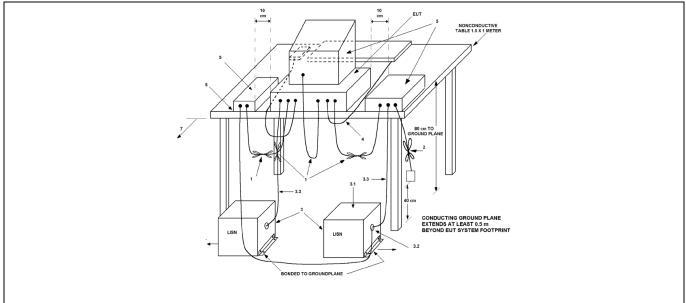
6.1 Conducted Emission at AC power line

Test Requirement:	Except as shown in paragraphs radiator that is designed to be co the radio frequency voltage that any frequency or frequencies, wi exceed the limits in the following line impedance stabilization network	onnected to the public units conducted back onto thin the band 150 kHz table, as measured us	utility (AC) power I the AC power line to 30 MHz, shall r	ine, e on not		
Test Limit:	Frequency of emission (MHz)	Conducted limit (dBp	IV)			
		Quasi-peak	Average			
	0.15-0.5	66 to 56*	56 to 46*			
	0.5-5	56	46			
	5-30	60	50			
	*Decreases with the logarithm of the frequency.					
Test Method:	ANSI C63.10-2013 section 6.2					
Procedure:		Refer to ANSI C63.10-2013 section 6.2, standard test method for ac power- line conducted emissions from unlicensed wireless devices				

6.1.1 E.U.T. Operation:

Operating Environment:						
Temperature:	25.9 °C	9 °C Humidity: 44 % Atmospheric Pressure: 101 kPa				101 kPa
Pre test mode: Mode1, Mode2, Mode3, Mode4						
Final test mode:All of the listed pre-test mode were tested, only the data of the worst mode (Mode3) is recorded in the report					of the worst mode	

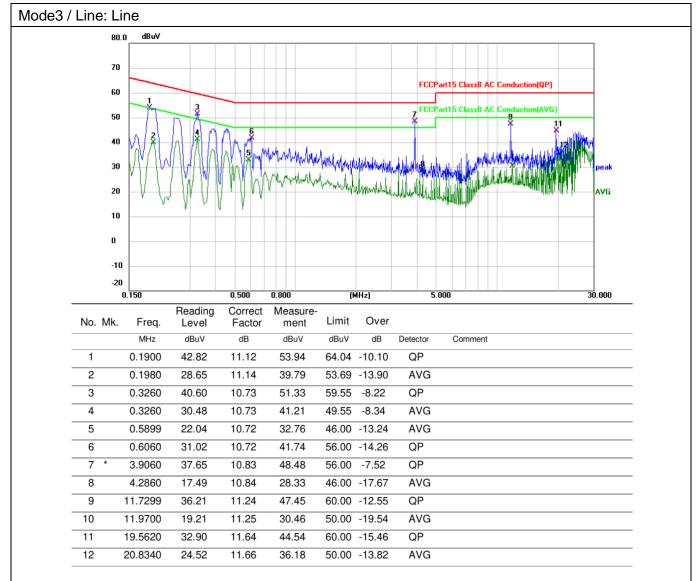
6.1.2 Test Setup Diagram:



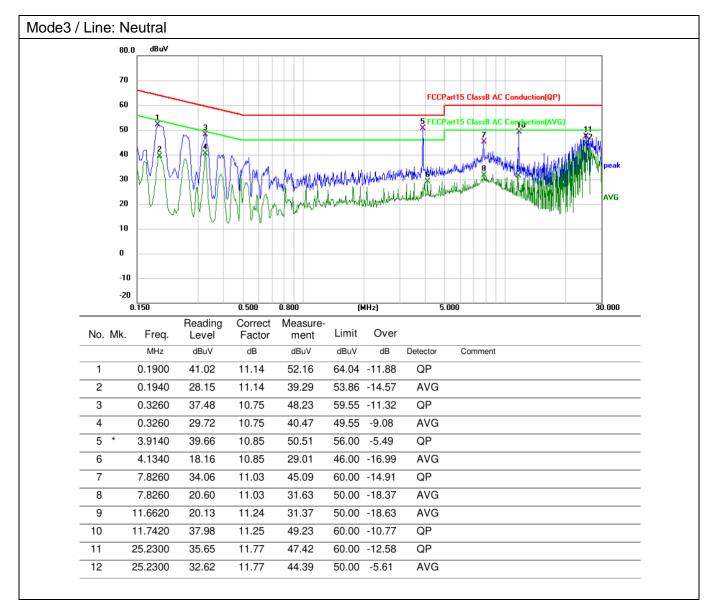




6.1.3 Test Data:









6.2 20dB Occupied Bandwidth

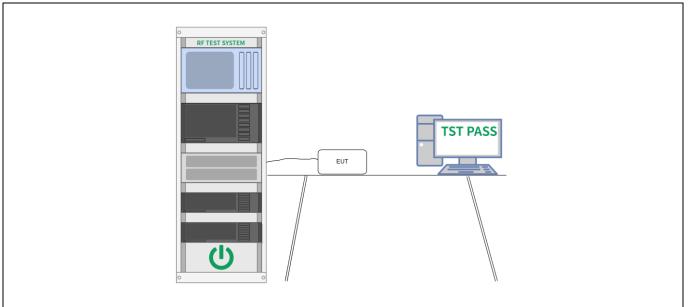
Test Limit:	47 CFR Part 15.215(c) Refer to 47 CFR 15.215(c), intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may
	otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.
Test Method:	ANSI C63.10-2013, section 6.9.2
Procedure:	 a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the EMI receiver or spectrum analyzer shall be between two times and five times the OBW. b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW, unless otherwise specified by the applicable requirement. c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.5.2. d) Steps a) through c) might require iteration to adjust within the specified tolerances. e) The dynamic range of the instrument at the selected RBW shall be more than 10 dB below the target "-xx dB down" requirement; that is, if the requirement calls for measuring the -20 dB OBW, the instrument noise floor at the selected RBW shall be at least 30 dB below the reference value. f) Set detection mode to peak and trace mode to max hold. g) Determine the reference value: Set the EUT to transmit an unmodulated carrier or modulated signal, as applicable. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value). h) Determine the "-xx dB down amplitude" using [(reference value) - xx]. Alternatively, this calculation may be made by using the marker-delta function of the instrument. i) If the reference value is determined by an unmodulated carrier, then turn the EUT modulation ON, and either clear the existing trace or start a new trace on the spectrum analyzer and allow the new trace to stabilize. Otherwise, the trace from step g) shall be used for step j). j) Place two markers. Alternatively, set a marker at the lowest frequency of the envelope o



6.2.1 E.U.T. Operation:

Operating Environment:							
Temperature:	rature: 24.4 °C Humidity: 22.7 % Atmospheric Pressure: 100 kPa						
Pre test mode: Mode1, Mode2, Mode3, Mode4							
Final test mode:All of the listed pre-test mode were tested, only the data of the worst mode (Mode3) is recorded in the report					of the worst mode		

6.2.2 Test Setup Diagram:





6.2.3 Test Data:

Note: Because the measured signal is CW-like, adjusting the RBW per C63.10 would not be practical since measurement bandwidth will always follow the RBW. The RBW is set to 300 Hz to perform the occupied bandwidth test.

Frequency	20 dB	20 dB occupied bandwidth 99%			occupied bandwidt	
kHz		Hz			Hz	
147.795		811			689	
Agilent Spectrum Analyzer - Occupied BW XI RF 50 Ω AC		ENSE:INT SOURCE OFF		6 PM Mar 06, 2024 itd: None	Frequency	
Center Freq 147.795 kHz	ain:Low #Atten:	ee Run Avg Hold:	: 10/10	evice: BTS		
10 dB/div Ref 30.00 dBm					Center Freg	
10.0		+			147.795 kHz	
-10.0						
-20.0		+				
-30.0						
-50.0	~					
-60.0						
Center 147.8 kHz #Res BW 300 Hz	#\	/BW 1 kHz	Swee	Span 5 kHz p 68.07 ms	CF Step 500 Hz	
Occupied Bandwidth		Total Power	10.6 dBm	A	<u>uto</u> Man	
	689 Hz				Freq Offset	
Transmit Freq Error	-25 H z	OBW Power	99.00 %		0 Hz	
x dB Bandwidth	811 Hz	x dB	-20.00 dB			

Address: 101, No. 7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China.Tel: (86-755)88850135Fax: (86-755) 88850136Web: www.mtitest.cnE-mail: mti@51mti.com



Note: Because the measured signal is CW-like, adjusting the RBW per C63.10 would not be practical since measurement bandwidth will always follow the RBW. The RBW is set to 300 Hz to perform the occupied bandwidth test.

Frequency	20 dB	Coil 2: 20 dB occupied bandwidth			99% occupied bandwid	
kHz		Hz		=	łz	
163.060		814		6	91	
Agilent Spectrum Analyzer - Occupied BW	•					
<mark>020 RL RF 50Ω AC </mark> Center Freq 163.060 kHz		Freq: 163.060 kHz ee Run Avg Hold:	Radio S 10/10	+ PM Mar 06, 2024 td: None Fr evice: BTS	equency	
10 dB/div Ref 30.00 dBm						
20.0					Center Freq 163.060 kHz	
0.00						
-20.0	/	+				
-30.0						
-50.0						
Center 163.1 kHz				Span 5 kHz		
#Res BW 300 Hz	#\	/BW 1 kHz	Sweep	68.07 ms	CF Step 500 Hz	
Occupied Bandwidth		Total Power	7.61 dBm	Auto	Man	
	691 Hz				Freq Offset	
Transmit Freq Error	18 Hz	OBW Power	99.00 %		0 Hz	
x dB Bandwidth	814 Hz	x dB	-20.00 dB			



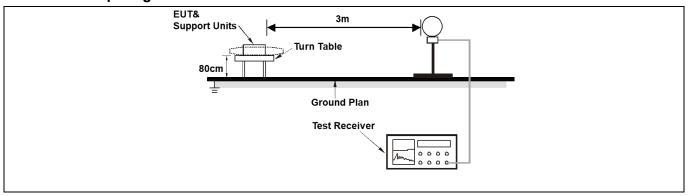
6.3 Emissions in frequency bands (below 30MHz)

Test Requirement:	47 CFR Part 15.209						
Test Limit:	Frequency (MHz)	Field strength	Measuremen				
		(microvolts/meter)	t 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				
	** Except as provided in	paragraph (g), fundamental em	issions from				
	intentional radiators oper	ating under this section shall no	ot be located in th	ne			
	frequency bands 54-72 N	/Hz, 76-88 MHz, 174-216 MHz	or 470-806 MHz	-			
		n these frequency bands is per	mitted under othe	ər			
	sections of this part, e.g.,						
		ove, the tighter limit applies at th	0				
		n in the above table are based					
		si-peak detector except for the f					
		bove 1000 MHz. Radiated emis					
	three bands are based on measurements employing an average detector.						
		for frequencies above 1000 MH					
		nd (b)of this section are based of					
		strength of any emission shall n					
	maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For point-to-point operation under paragraph						
	(b)of this section, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.						
Teat Mathad	ANSI C63.10-2013 section						
Test Method:							
Procedure:	ANSI C63.10-2013 section	on 6.4					

6.3.1 E.U.T. Operation:

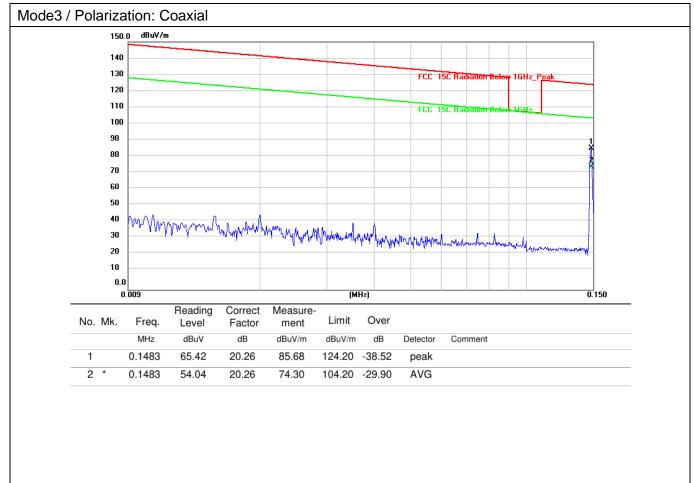
Operating Environment:						
Temperature:	22.5 °C	2.5 °C Humidity: 43 % Atmospheric Pressure: 101 kPa				
Pre test mode: Mode1, Mode2, Mode3, Mode4						
Final test mode:All of the listed pre-test mode were tested, only the data of the worst mod (Mode3) is recorded in the report					of the worst mode	

6.3.2 Test Setup Diagram:

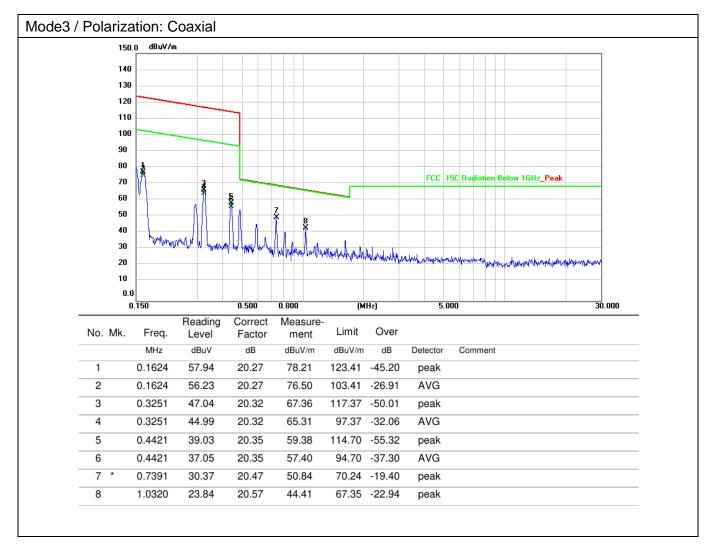




6.3.3 Test Data:









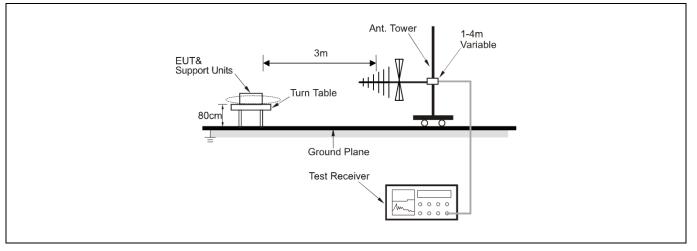
6.4 Emissions in frequency bands (30MHz - 1GHz)

Test Requirement:	47 CFR Part 15.209						
Test Limit:	Frequency (MHz)	Field strength	Measuremen				
		(microvolts/meter)	t 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				
		paragraph (g), fundamental em					
		ating under this section shall no		е			
		1Hz, 76-88 MHz, 174-216 MHz					
		n these frequency bands is per	mitted under other	r			
	sections of this part, e.g.,						
		ve, the tighter limit applies at th	0				
		n in the above table are based					
		si-peak detector except for the f					
	kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these						
	three bands are based on measurements employing an average detector.						
		or frequencies above 1000 MH		เท			
		nd (b)of this section are based of					
		strength of any emission shall n		مامہ			
	maximum permitted average limits specified above by more than 20 dB und						
	any condition of modulation. For point-to-point operation under paragrap						
	(b)of this section, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.						
Test Method:	ANSI C63.10-2013 section	•					
Procedure:	ANSI C63.10-2013 section						
	ANSI 603.10-2013 SECIO	כ.ס ווכ					

6.4.1 E.U.T. Operation:

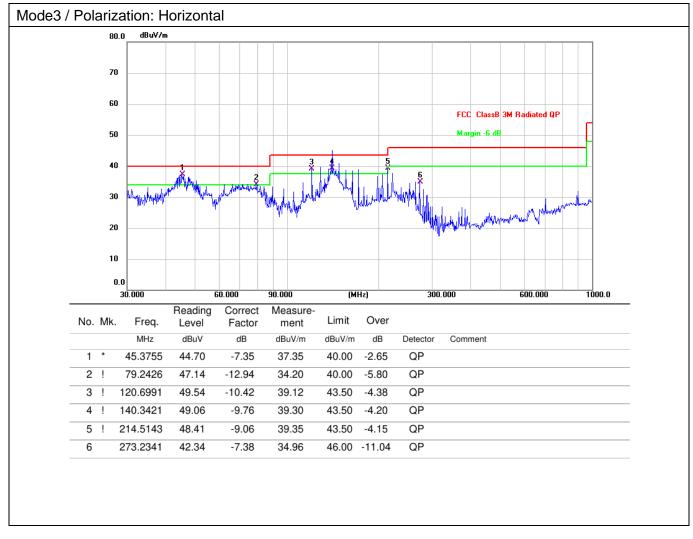
Operating Environment:						
Temperature:	22.5 °C	2.5 °C Humidity: 43 % Atmospheric Pressure: 101 kPa				
Pre test mode: Mode1, Mode2, Mode3, Mode4						
Final test mode:All of the listed pre-test mode were tested, only the data of the worst mod (Mode3) is recorded in the report					of the worst mode	

6.4.2 Test Setup Diagram:

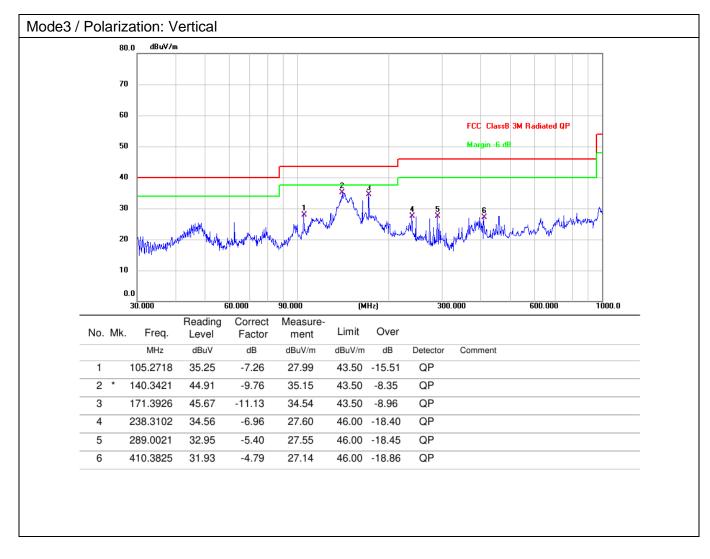




6.4.3 Test Data:









Photographs of the test setup

Refer to Appendix - Test Setup Photos



Photographs of the EUT

Refer to Appendix - EUT Photos

----End of Report----