

Test Report

Report No.: MTi230713001-01E1

Date of issue: 2023-07-22

Applicant: Dongguan Budi Electronic Co.,ltd

Product: FOLDABLE MAGNETIC 3-IN-1 WIRELESS CHARGER

Model(s): WL4500, WL4500W, WL4500R, WL4500S, WL4500X, WL4500B

FCC ID: 2A2GO-WL4500W

Shenzhen Microtest Co., Ltd.

http://www.mtitest.com



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Test Result Certification					
Applicant:	Applicant: Dongguan Budi Electronic Co.,ltd				
Address:	No.3 Xingguang Road,Chongkou Village,Shijie Town,Dongguan ,Guangdong,523000 CHINA				
Manufacturer:	Dongguan Budi Electronic Co.,ltd				
Address:	No.3 Xingguang Road,Chongkou Village,Shijie Town,Dongguan ,Guangdong,523000 CHINA				
Product description					
Product name:	FOLDABLE MAGNETIC 3-IN-1 WIRELESS CHARGER				
Trademark:	budi				
Model name:	WL4500				
Series Model:	WL4500W, WL4500R, WL4500G, WL4500S, WL4500X, WL4500B				
Standards:	FCC 47 CFR Part 15 Subpart C				
Test method:	ANSI C63.10-2013				
Date of Test					
Date of test:	2023-07-21 to 2023-07-22				
Test result:	Pass				

Test Engineer :	:	Morlean Davy
		(Maleah Deng)
Reviewed By :	:	leon chen
		(Leon Chen)
Approved By :	:	Tom Xue
		(Tom Xue)



1 General Description

1.1 Description of the EUT

•			
Product name:	FOLDABLE MAGNETIC 3-IN-1 WIRELESS CHARGER		
Model name:	WL4500		
Series Model:	WL4500W, WL4500R, WL4500G, WL4500S, WL4500X, WL4500B		
Model difference:	All the models are the same circuit and module, except the model name and shell color.		
Electrical rating:	Input: DC12V 1.67A, DC9V 2.22A, DC5V 3A Output: Phone(Transmitter 1): 15W/10W/7.5W/5W; Earphone(Transmitter 2): 2.5W Watch(Transmitter 3): 2.5W; Total Output: 20W		
Accessories:	N/A		
Hardware version:	V1.0		
Software version:	V1.0		
Test sample(s) number:	MTi230713001-01S1001		
RF specification			
Operating frequency range:	Transmitter 1 (Phone): 115 kHz – 205 kHz Transmitter 2 (Earphone): 115 kHz – 205 kHz Transmitter 3 (Watch): 300-350KHz		
Modulation type:	ASK		
Antenna(s) type:	Coil Antenna		
4.0 December 1.11			

1.2 Description of test modes

No.	Emission test modes	
Mode1	Wireless output(5W)+Earphone(2.5W)+Watch(2.5W)	
Mode2	Wireless output(7.5W)+Earphone(2.5W)+Watch(2.5W)	
Mode3	Wireless output(10W)+Earphone(2.5W)+Watch(2.5W)	
Mode4	Wireless output(15W)+Earphone(2.5W)+Watch(2.5W)	
Mode5	Wireless output(5W)+Earphone(2.5W)	
Mode6	Wireless output(7.5W)+Earphone(2.5W)	
Mode7	Wireless output(10W)+Earphone(2.5W)	
Mode8	Wireless output(15W)+Earphone(2.5W)	
Mode9	Wireless output(5W)+Watch(2.5W)	
Mode10	Wireless output(7.5W)+Watch(2.5W)	
Mode11	Wireless output(10W)+Watch(2.5W)	
Mode12	Wireless output(15W)+Watch(2.5W)	
Mode13	Earphone(2.5W)+Watch(2.5W)	
Mode14	Wireless output(5W)	
Mode15	Wireless output(7.5W)	



Mode16	Wireless output(10W)	
Mode17	Wireless output(15W)	
Mode18	Watch(2.5W)	
Mode19	Earphone(2.5W)	
Mode20	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.	Manufacturer				
HUAWEI QUICK CHARGE(65W)	HW-200200ZP1	JN67LSN7N03451	HUAWEI				
Watch	1	1	Apple				
Earphone	/	1	Apple				
wireless charging load	YBZ1.1	1	YBZ				
Adapter	/	1	Lenovo				
Support cable list							
Description	Length (m)	From	То				
1	1	/	1				

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 15.209	Part 15.203	Pass
2	Conducted Emission at AC power line	47 CFR Part 15.209	47 CFR 15.207(a)	Pass
3	20dB Occupied Bandwidth	47 CFR Part 15.209	47 CFR 15.215(c)	Pass
4	Emissions in frequency bands (below 30MHz)	47 CFR Part 15.209	47 CFR 15.209	Pass
5	Emissions in frequency bands (30MHz - 1GHz)	47 CFR Part 15.209	47 CFR 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				



4 List of test equipment

<u> </u>						
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	Schwarzbeck	NSLK 8127	1001	2023-05-06	2024-05-05
		20dB Oc	cupied Bandwid	th		
1	Wideband Radio Communication Tester	Rohde&schwarz	CMW500	149155	2023-04-26	2024-04-25
2	ESG Series Analog Ssignal Generator	Agilent	E4421B	GB40051240	2023-04-25	2024-04-24
3	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2023-04-25	2024-04-24
4	Synthesized Sweeper	Agilent	83752A	3610A01957	2023-04-25	2024-04-24
5	MXA Signal Analyzer	Agilent	N9020A	MY50143483	2023-04-26	2024-04-25
6	RF Control Unit	Tonscend	JS0806-1	19D8060152	2023-04-26	2024-04-25
7	Band Reject Filter Group	Tonscend	JS0806-F	19D8060160	2023-05-05	2024-05-04
8	ESG Vector Signal Generator	Agilent	N5182A	MY50143762	2023-04-25	2024-04-24
9	DC Power Supply	Agilent	E3632A	MY40027695	2023-05-05	2024-05-04
		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	2023-04-26	2024-04-25
Emissions in frequency bands (30MHz - 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	Amplifier	Hewlett-Packard	8447F	3113A06184	2023-04-26	2024-04-25
4	Multi-device Controller	TuoPu	TPMDC	1	1	1
_						



5 Evaluation Results (Evaluation)

5.1 Antenna requirement

Test Requirement:	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.
Description of the antenna of EUT:	The antenna of the EUT is permanently attached.
Conclusion:	The EUT complies with the requirement of FCC PART 15.203.

6 Radio Spectrum Matter Test Results (RF)

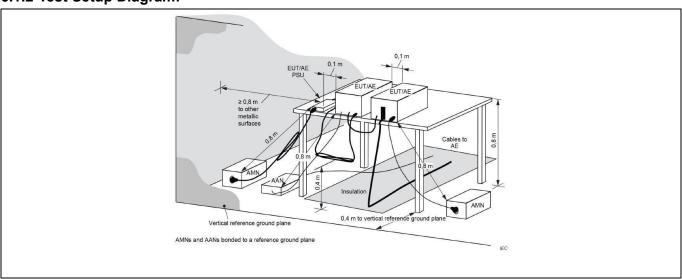
6.1 Conducted Emission at AC power line

Test Requirement:	Except as shown in paragraphs (b)and (c)of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 µH/50 ohms line impedance stabilization network (LISN).					
Test Limit:	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					
	*Decreases with the logarithm of the frequency.					
Test Method:	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:

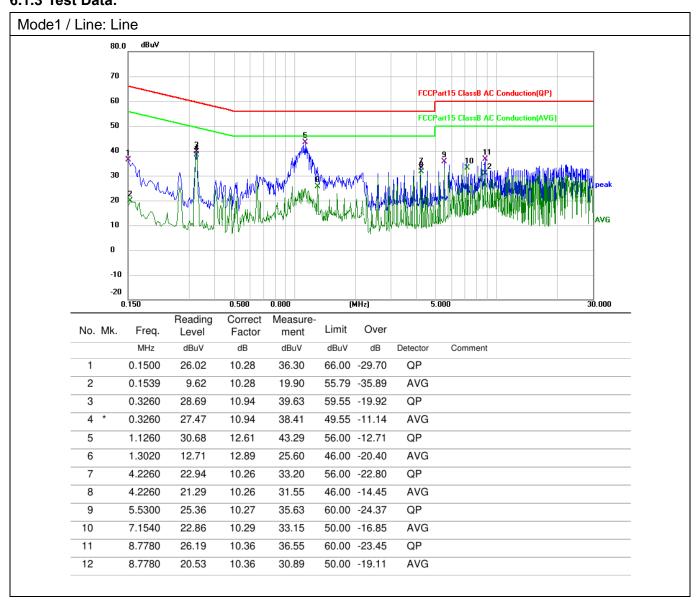
Operating Environment:						
Temperature:	16.2 °C		Humidity:	46.7 %	Atmospheric Pressure:	100 kPa
Pre test mode:	Mode1, Mode2, Mode3, Mode4, Mode5, Mode6, Mode7, Mode8, Mode9, Pre test mode: Mode10, Mode11, Mode12, Mode13, Mode14, Mode15, Mode16, Mode17, Mode18, Mode19, Mode20					
Final test mode: All of the listed pre-test mode were tested, only the data of the worst mode (Mode1) is recorded in the report				of the worst mode		
		(IVIOC	e i) is recor	ueu in ine repo	IL	

6.1.2 Test Setup Diagram:

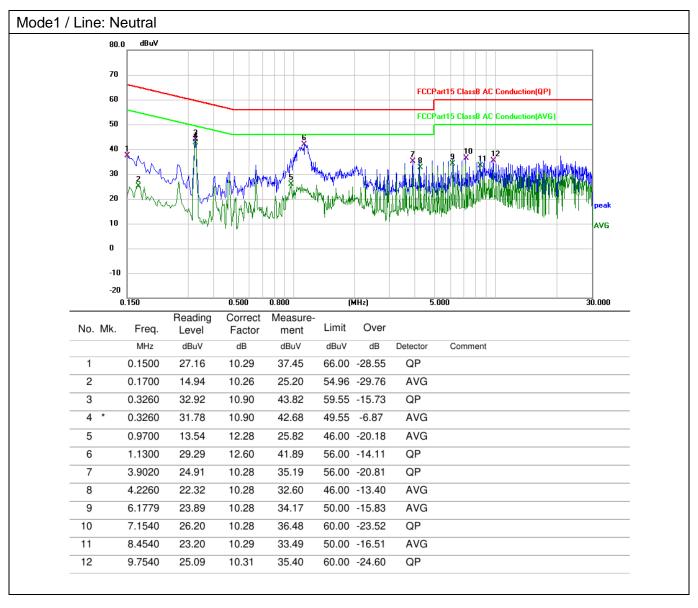


Address: 101, No. 7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China Tel: (86-755)88850135 Fax: (86-755) 88850136 Web: www.mtitest.com E-mail: mti@51mti.com

6.1.3 Test Data:









6.2 20dB Occupied Bandwidth

	Intentional radiators operating under the alternative provisions to the general
Test Requirement:	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 Limit:	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:	Occupied bandwidth—relative measurement procedure
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, one at the lowest frequency and the other at the highest frequency of the envelope of the spectral display, such that each marker is at or slightly below the "-xx dB d

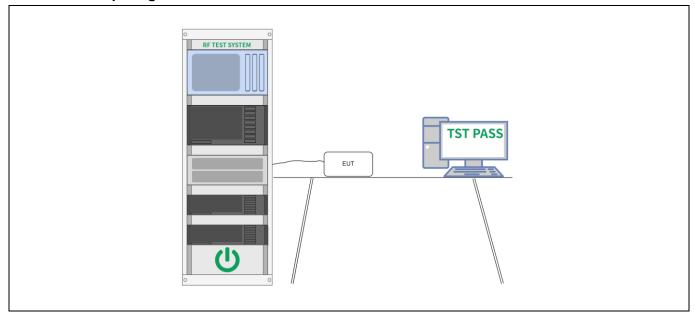


emission bandwidth.
k) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

6.2.1 E.U.T. Operation:

Operating Environment:						
Temperature:	Temperature: 23.9 °C Humidity: 68.3 % Atmospheric Pressure: 100 kPa					
Pre test mode:	Mode1, Mode2, Mode3, Mode4, Mode5, Mode6, Mode7, Mode8, Mode9, Pre test mode: Mode10, Mode11, Mode12, Mode13, Mode14, Mode15, Mode16, Mode17, Mode18, Mode19, Mode20					
Final test mode	Final test mode: All of the listed pre-test mode were tested, only the data of the worst mode (Mode17, Mode18, Mode19) is recorded in the report					

6.2.2 Test Setup Diagram:

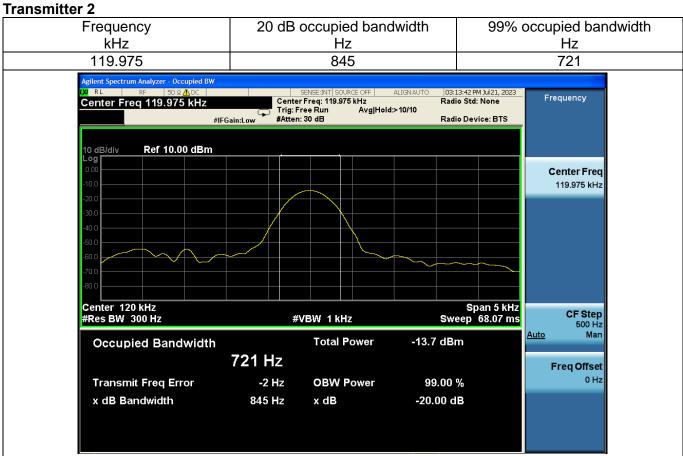




6.2.3 Test Data:

Transmitter 1:

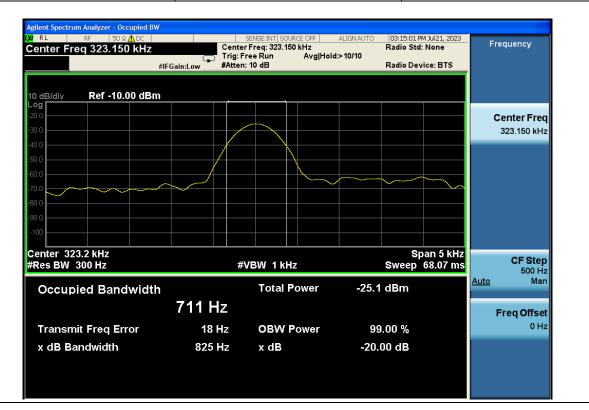






Transmitter 3

Frequency	20 dB occupied bandwidth	99% occupied bandwidth
kHz	Hz	Hz
323.150	825	711





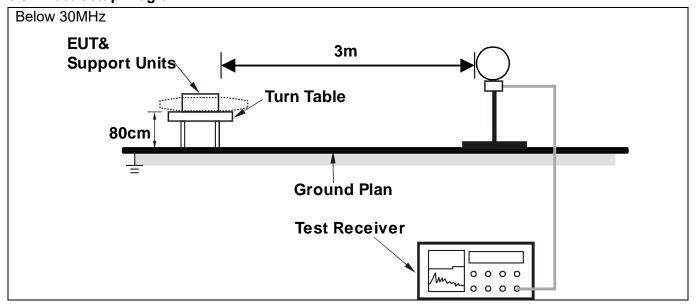
6.3 Emissions in frequency bands (below 30MHz)

Test Requirement:	47 CFR 15.209				
Test Limit:	Frequency (MHz)	Field strength (microvolts/meter)	Measuremen t distance		
	0.009-0.490	2400/F(kHz)	(meters)		
	0.490-1.705	, ,	30		
	1.705-30.0	24000/F(kHz) 30	30		
	30-88	100 **	3		
	88-216	150 **	3		
	216-960	200 **	3		
	Above 960	500	3		
	However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241. As shown in § 15.35(b), for frequencies above 1000 MHz, the field strength				
	limits in paragraphs (a)and (b)of this section are based on average limits. However, the peak field strength of any emission shall not exceed the 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.				
Test Method:	Radiated emissions tests				
Procedure:	ANSI C63.10-2013 section 6.6.4				

6.3.1 E.U.T. Operation:

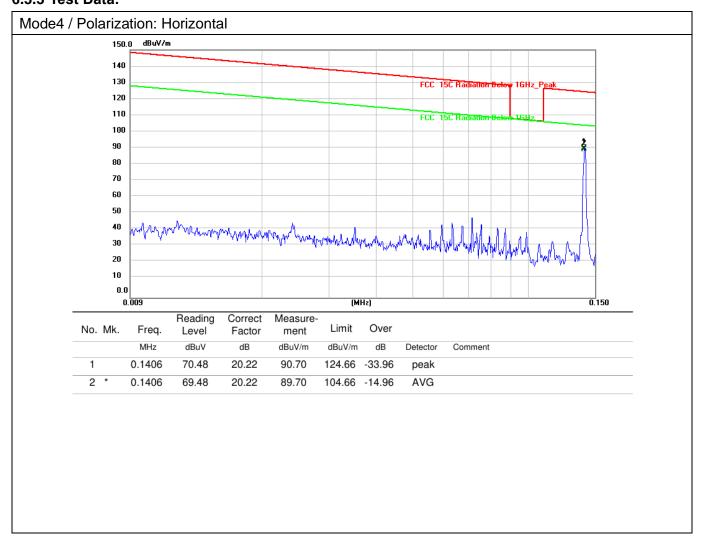
Operating Environment:						
Temperature:	32.3 °C		Humidity:	70.2 %	Atmospheric Pressure:	99 kPa
Pre test mode:	Mode1, Mode2, Mode3, Mode4, Mode5, Mode6, Mode7, Mode8, Mode9, Pre test mode: Mode10, Mode11, Mode12, Mode13, Mode14, Mode15, Mode16, Mode17, Mode18, Mode19, Mode20					
Final test mode: All of the listed pre-test mode were tested, only the data of the worst mode (Mode4) is recorded in the report						

6.3.2 Test Setup Diagram:



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

6.3.3 Test Data:



7 *

8

9

0.5611

0.7007

0.8393

36.48

31.45

30.19

20.39

20.45

20.51

56.87

51.90

50.70

72.63

70.70

69.14

-15.76

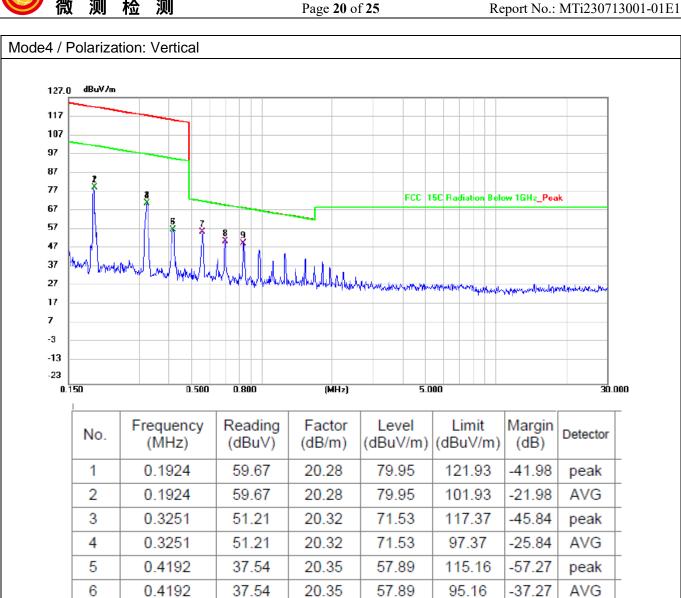
-18.80

-18.44

QP

QP

QP





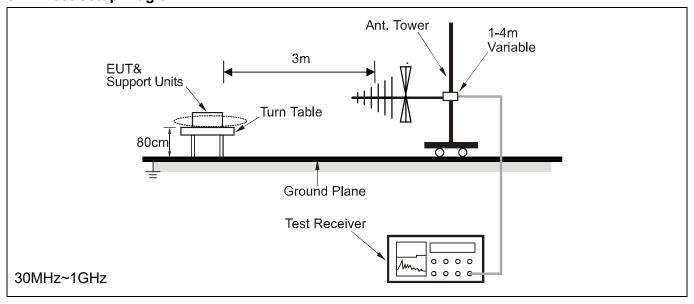
6.4 Emissions in frequency bands (30MHz - 1GHz)

Test Requirement:	47 CFR 15.209				
Test Limit:	Frequency (MHz)	Field strength (microvolts/meter)	Measuremen 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		
	However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241. As shown in § 15.35(b), for frequencies above 1000 MHz, the field strength limits in paragraphs (a)and (b)of this section are based on average limits. However, the peak field strength of any emission shall not exceed the 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.				
Test Method:	Radiated emissions tests				
Procedure:	ANSI C63.10-2013 section 6.6.4				

6.4.1 E.U.T. Operation:

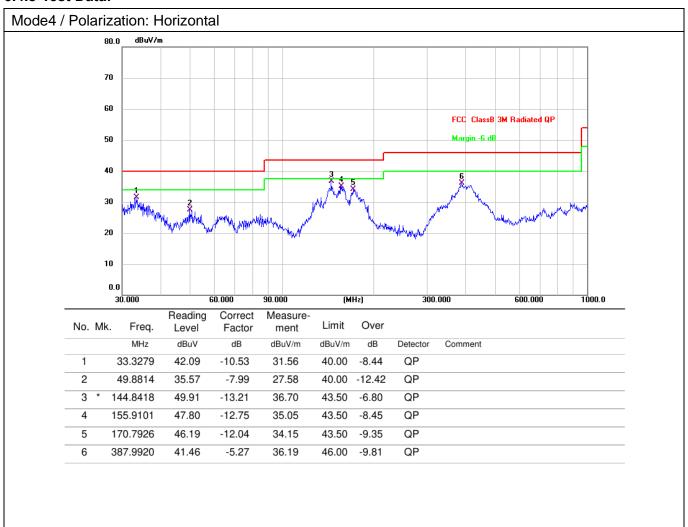
Operating Environment:						
Temperature:	31.6 °C		Humidity:	71.5 %	Atmospheric Pressure:	99 kPa
Pre test mode:	Mode1, Mode2, Mode3, Mode4, Mode5, Mode6, Mode7, Mode8, Mode9, Pre test mode: Mode10, Mode11, Mode12, Mode13, Mode14, Mode15, Mode16, Mode17, Mode18, Mode19, Mode20					
Final test mode: All of the listed pre-test mode were tested, only the data of the worst mode (Mode4) is recorded in the report						

6.4.2 Test Setup Diagram:





6.4.3 Test Data:



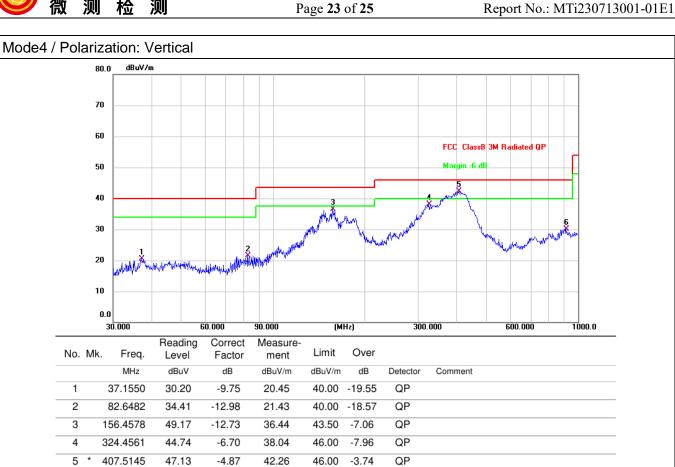
6

912.8620

26.25

3.93

30.18



46.00 -15.82

QP



Photographs of the test setup

Refer to Appendix - Test Setup Photos



Photographs of the EUT

Refer to Appendix - EUT Photos

----End of Report----