

# **Test Report**

**Report No.:** MTi240805031-22E1

**Date of issue:** 2024-08-30

**Applicant:** Shenzhen Yifeng Intelligent Technology Co., Ltd.

**Product name:** 3 in 1 Magnetic Wireless Charger

Model(s): M31

FCC ID: 2AXY5-M31

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



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Test Result Certification				
Applicant: Shenzhen Yifeng Intelligent Technology Co., Ltd.				
Address:	201, Building 4, Sanwei Chaxi Industrial Zone, Sanwei Community, Hang Cheng Street, Bao An District, Shenzhen.			
Manufacturer:	Shenzhen Yifeng Intelligent Technology Co., Ltd.			
Address:	201, Building 4, Sanwei Chaxi Industrial Zone, Sanwei Community, Hang Cheng Street, Bao An District, Shenzhen.			
Product description				
Product name:	3 in 1 Magnetic Wireless Charger			
Trademark:	YFZN			
Model name:	M31			
Series Model(s):	N/A			
Standards:	47 CFR Part 15C			
Test Method:	ANSI C63.10-2013			
Date of Test				
Date of test:	2024-08-20 to 2024-08-29			
Test result:	Pass			

Test Engineer	:	Marleon Davy	
		(Maleah Deng)	
Reviewed By	:	Dowid. Cee	
		(David Lee)	
Approved By	:	leon chen	
		(Leon Chen)	



# 1 General Description

# 1.1 Description of the EUT

Product name:	3 in 1 Magnetic Wireless Charger		
Model name:	M31		
Series Model(s):	N/A		
Model difference:	N/A		
Electrical rating:	Input: DC 9V 2.22A Wireless Output: Phone: 5W, 7.5W, 10W, 15W; Earphone: 5W; Watch: 3W		
Accessories:	N/A		
Hardware version:	V11		
Software version:	V52		
Test sample(s) number:	MTi240805031-10S1001		
RF specification			
Operating frequency range:	Coil 1(Phone):115-205kHz Coil 2(Earphone):115-205kHz Coil 3(Watch): 300-360kHz		
Modulation type:	ASK		
Antenna(s) type:	Coil Antenna		

## 1.2 Description of test modes

No.	Emission test modes
Mode1	Wireless output(5W)+Earphone(5W)+Watch(3W)
Mode2	Wireless output(7.5W)+Earphone(5W)+Watch(3W)
Mode3	Wireless output(10W)+Earphone(5W)+Watch(3W)
Mode4	Wireless output(5W)+Earphone(5W)
Mode5	Wireless output(7.5W)+Earphone(5W)
Mode6	Wireless output(10W)+Earphone(5W)
Mode7	Wireless output(5W)+Watch(3W)
Mode8	Wireless output(7.5W)+Watch(3W)
Mode9	Wireless output(10W)+Watch(3W)
Mode10	Wireless output(15W)+Watch(3W)
Mode11	Earphone(5W)+Watch(3W)
Mode12	Wireless output(5W)
Mode13	Wireless output(7.5W)
Mode14	Wireless output(10W)
Mode15	Wireless output(15W)
Mode16	Wireless Watch(3W)
Mode17	Wireless Earphone(5W)
Mode18	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			
iwatch	iwatch SE	/	Apple			
wireless charging load	YBZ1.1	/	YBZ			
Adapter	191106C	191106C0HT000498	Kunshan Liantao Electronics Co., LTD.			
airpods	airpods 3	/	apple			
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	2024-03-20	2025-03-19	
2	Artificial mains network	Schwarzbeck	NSLK 8127	183	2024-03-21	2025-03-20	
3	Artificial Mains Network	Rohde & Schwarz	ESH2-Z5	100263	2024-03-20	2025-03-19	
		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	low 30MHz)			
1	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2024-03-20	2025-03-19	
2	Active Loop Antenna	Schwarzbeck	FMZB 1519 B	00066	2024-03-23	2025-03-22	
3	Amplifier	Hewlett-Packard	8447F	3113A06184	2024-03-20	2025-03-19	
Emissions in frequency bands (30MHz - 1GHz)							
1	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2024-03-20	2025-03-19	
2	TRILOG Broadband Antenna	schwarabeck	VULB 9163	9163-1338	2023-06-11	2025-06-10	
3	Active Loop Antenna	Schwarzbeck	FMZB 1519 B	00066	2024-03-23	2025-03-22	
4	Amplifier	Hewlett-Packard	8447F	3113A06184	2024-03-20	2025-03-19	



# 5 Evaluation Results (Evaluation)

## 5.1 Antenna requirement

#### 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)

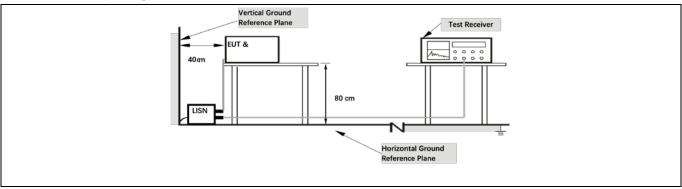
# 6.1 Conducted Emission at AC power line

Test Requirement:	Except as shown in paragraphs (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:	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:

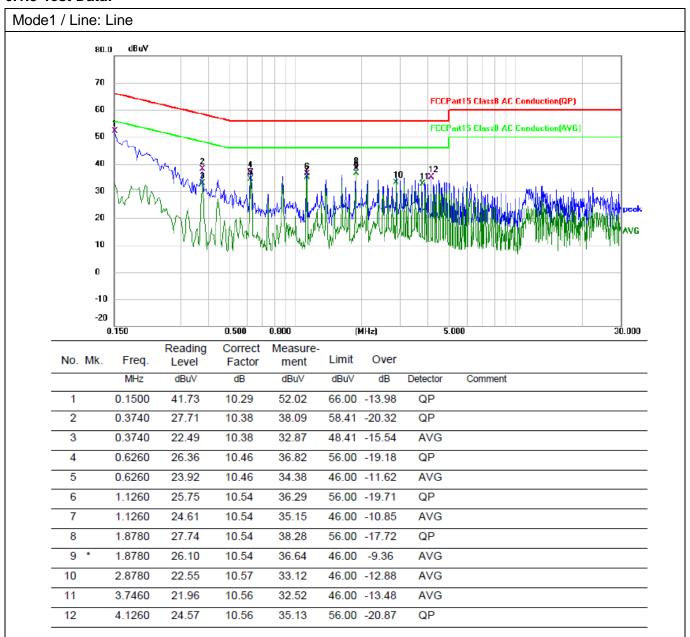
Operating Environment:							
Temperature:	25.9 °C		Humidity:	44 %		Atmospheric Pressure	101 kPa
Pre test mode:	Pre test mode:  Mode1, Mode2, Mode3, Mode4, Mode5, Mode6, Mode7, Mode8, Mode9, Mode10, Mode11, Mode12, Mode13, Mode14, Mode15, Mode16, Mode17, Mode18						
Final test mode:  All of the listed pre-test mode were tested, only the data of the worst mode (Mode1) is recorded in the report							

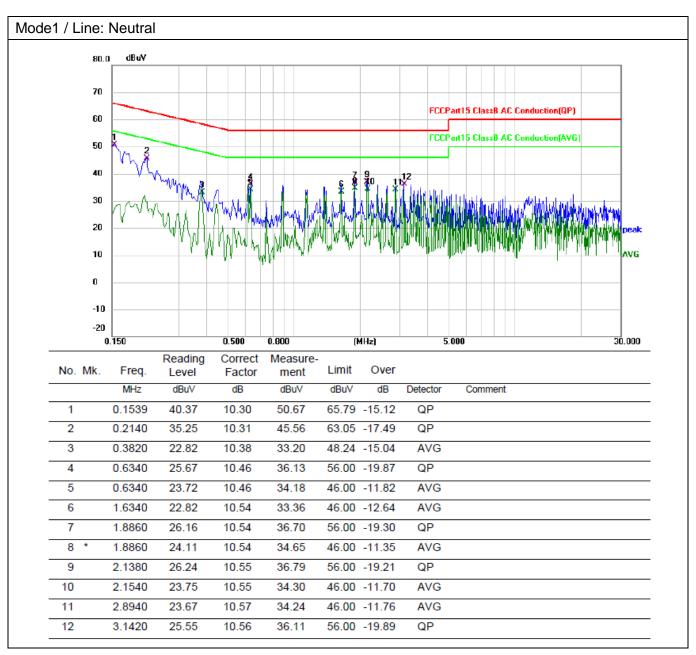
## 6.1.2 Test Setup Diagram:





#### 6.1.3 Test Data:







# 6.2 20dB Occupied Bandwidth

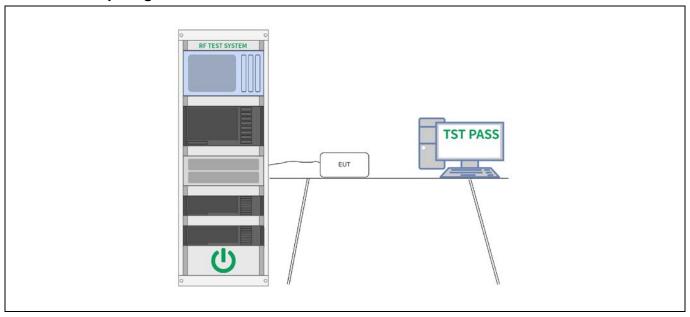
Test Requirement:	47 CFR Part 15.215(c)
Test Limit:	Refer to 47 CFR 15.215(c), intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of 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, 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 do



# 6.2.1 E.U.T. Operation:

Operating Environment:							
Temperature:	25 °C		Humidity:	56 %	Atmospheric Pressure:	100 kPa	
Pre test mode:	Mode1, Mode2, Mode3, Mode4, Mode5, Mode6, Mode7, Mode8, Mode9, Pre test mode:  Mode1, Mode2, Mode3, Mode4, Mode5, Mode6, Mode7, Mode8, Mode9, Mode10, Mode11, Mode12, Mode13, Mode14, Mode15, Mode16, Mode17, Mode18						
Final test mode:  All of the listed pre-test mode were tested, only the data of the worst mode (Mode15, Mode16, Mode17) is recorded in the report							

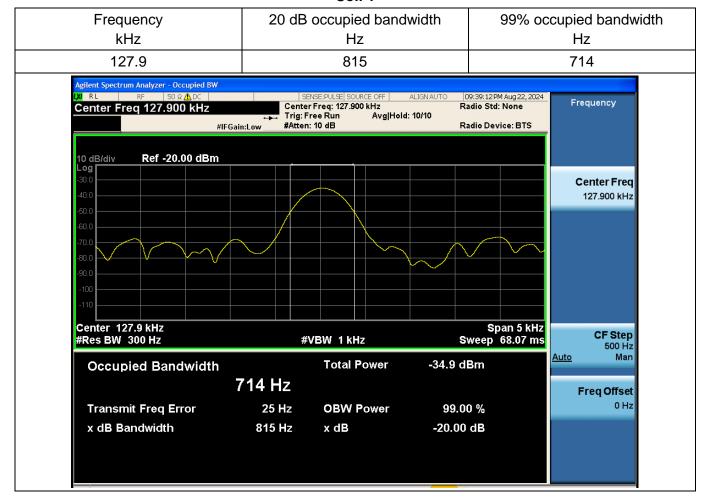
# 6.2.2 Test Setup Diagram:



#### 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.

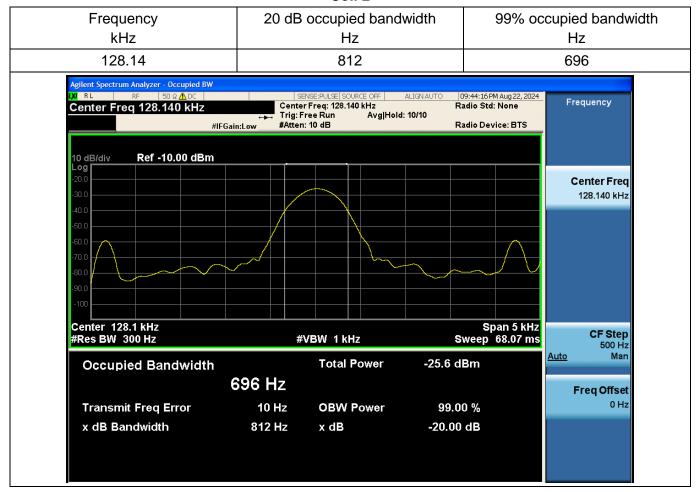
Coil 1





**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.

#### Coil 2



**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.

#### Coil 3





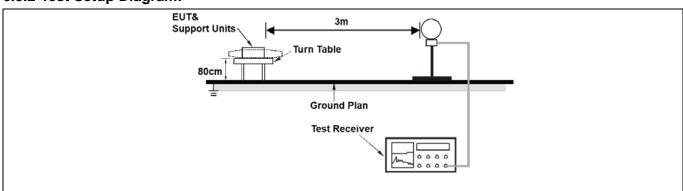
# 6.3 Emissions in frequency bands (below 30MHz)

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					
		n paragraph (g), fundamental						
		erating under this section sha						
		MHz, 76-88 MHz, 174-216 M						
		nin these frequency bands is	permitted under other					
		g., §§ 15.231 and 15.241. pove, the tighter limit applies a	at the band added					
		ove, the lighter limit applies a wn in the above table are bas						
		asi-peak detector except for the						
		above 1000 MHz. Radiated e						
	three bands are based	on measurements employing	an average detector.					
	As shown in § 15.35(b)	, for frequencies above 1000	MHz, the field strength					
	limits in paragraphs (a)	and (b)of this section are base	ed on average limits.					
	However, the peak field	strength of any emission sha	all not exceed the					
		erage limits specified above b						
		ation. For point-to-point opera						
	(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 6.4							
Procedure:	ANSI C63.10-2013 sec	tion 6.4						

## 6.3.1 E.U.T. Operation:

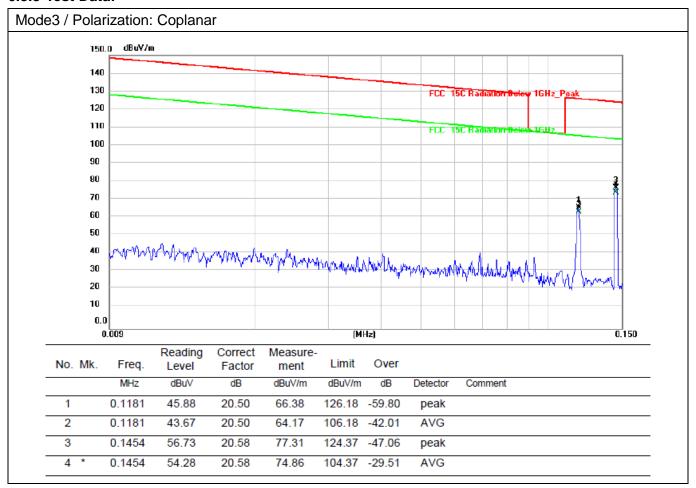
Operating Environment:							
Temperature:	22.5 °C Humidity: 43 % Atmospheric Pressure: 101 kPa						101 kPa
Pre test mode:	Pre test mode:  Mode1, Mode2, Mode3, Mode4, Mode5, Mode6, Mode7, Mode8, Mode9, Mode10, Mode11, Mode12, Mode13, Mode14, Mode15, Mode16, Mode17, Mode18						
Final test mode:  All of the listed pre-test mode were tested, only the data of the worst mode (Mode3) is recorded in the report							

## 6.3.2 Test Setup Diagram:





#### 6.3.3 Test Data:



7

8

1.1233

1.4485

24.65

19.06

22.85

23.52

47.50

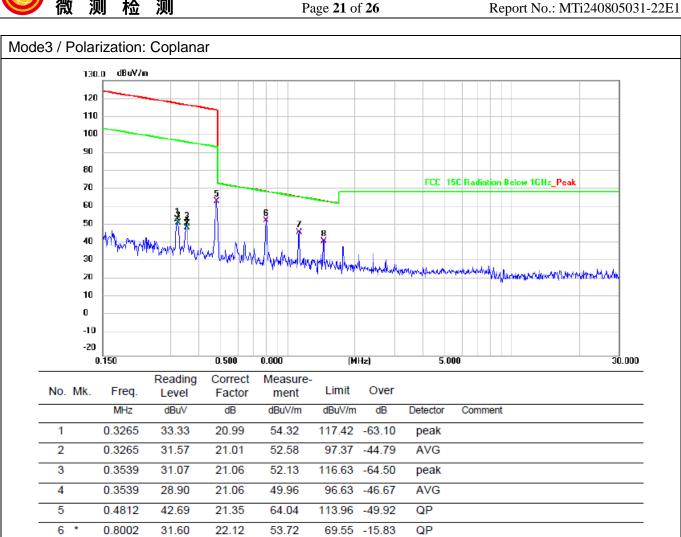
42.58

66.61 -19.11

64.41 -21.83

QΡ

QP





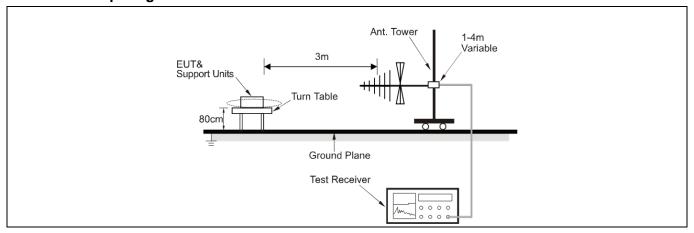
## 6.4 Emissions in frequency bands (30MHz - 1GHz)

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				
Test Method:	frequency bands 54-72 However, operation wit sections of this part, e.g. In the emission table all The emission limits sho employing a CISPR qu kHz, 110–490 kHz and three bands are based As shown in § 15.35(b) limits in paragraphs (a) However, the peak field maximum permitted avany condition of modula (b) of this section, the p	erating under this section shall MHz, 76-88 MHz, 174-216 Me hin these frequency bands is g., §§ 15.231 and 15.241. Showe, the tighter limit applies own in the above table are basi-peak detector except for above 1000 MHz. Radiated on measurements employing, for frequencies above 1000 and (b) of this section are basily strength of any emission sherage limits specified above ation. For point-to-point operation. For point-to-point operation 6.5	MHz or 470-806 MHz. s permitted under other at the band edges. sed on measurements the frequency bands 9–90 emission limits in these g an average detector. MHz, the field strength sed on average limits. all not exceed the by more than 20 dB under ation under paragraph sceed 2500				
Procedure:	ANSI C63.10-2013 section 6.5						
	ANDI 000.10-2013 Sec	dion 0.0					

#### 6.4.1 E.U.T. Operation:

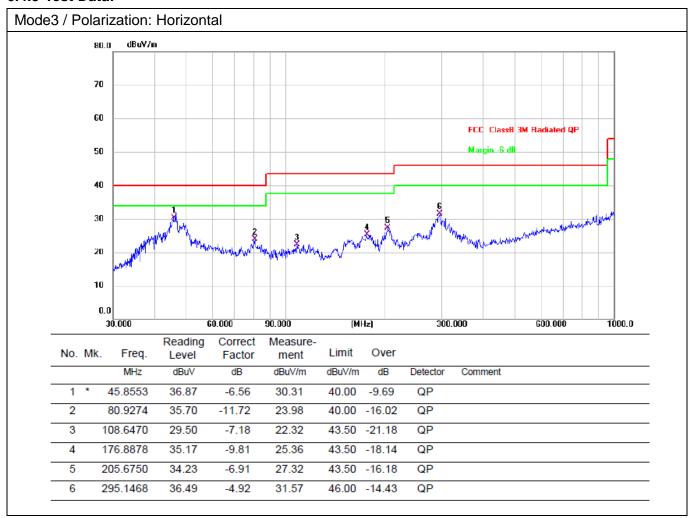
Operating Environment:							
Temperature:	22.5 °C	22.5 °C Humidity: 43 % Atmospheric Pressure: 101 kPa					
Pre test mode:	Mode1, Mode2, Mode3, Mode4, Mode5, Mode6, Mode7, Mode8, Mode9, Pre test mode:  Mode1, Mode2, Mode3, Mode4, Mode5, Mode6, Mode7, Mode8, Mode9, Mode10, Mode11, Mode12, Mode13, Mode14, Mode15, Mode16, Mode17, Mode18						
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							

## 6.4.2 Test Setup Diagram:





#### 6.4.3 Test Data:



3

4 5

6

54.2610

153.2004

174.4241

205.6751

39.72

40.49

39.50

34.66

-6.80

-9.71

-10.01

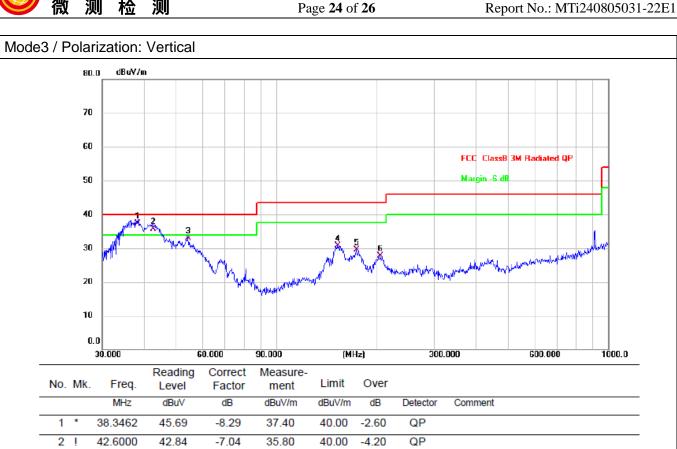
-6.91

32.92

30.78

29.49

27.75



40.00

-7.08

43.50 -12.72

43.50 -14.01

43.50 -15.75

QP QP

QP

QP



# Photographs of the test setup

Refer to Appendix - Test Setup Photos



# Photographs of the EUT

Refer to Appendix - EUT Photos

----End of Report----