

# **Test Report**

Report No.:	MTi240816006-01E1
Date of issue:	2024-10-14
Applicant:	Standard Technical Merchandise PTY LTD
Product name:	ChargeTree Mag Qi2
Model(s):	ChargeTree Mag, stm-931-463Z-01, stm-931-463Z-02, stm-931-464Z-01, stm-931-464Z-02
FCC ID:	2AXM2-CTM-QI2

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

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- 5. Any objection to this test report shall be submitted to the laboratory within 15 days from the date of receipt of the report.



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Test Result Certification			
Applicant:	Standard Technical Merchandise PTY LTD		
Address:	Unit 21, 34-36 Ralph st, Alexandria, NSW, Australia		
Manufacturer:	CYSPo Technology (Shenzhen) Co., LTD.		
Address:	6th Floor, Building 4, Unit A, Huafeng No.1 Science and Technology Park, Hangcheng Avenue, Gushu Bao'an, Shenzhen Guangdong China 518126		
Factory:	CYSPo Technology (Shenzhen) Co., LTD.		
Address:	6th Floor, Building 4, Unit A, Huafeng No.1 Science and Technology Park, Hangcheng Avenue, Gushu Bao'an, Shenzhen Guangdong China 518126		
Product description			
Product name:	ChargeTree Mag Qi2		
Trade mark:	N/A		
Model name:	ChargeTree Mag		
Series Model(s):	stm-931-463Z-01, stm-931-463Z-02, stm-931-464Z-01, stm-931-464Z-02		
Standards:	47 CFR Part 15C		
Test Method:	ANSI C63.10-2013		
Date of Test			
Date of test:	2024-08-27 to 2024-10-11		
Test result:	Pass		

Test Engineer	•	James Qun
		(James Qin)
Reviewed By	••	Dowid. Cee
		(David Lee)
Approved By	:	leon chen
		(Leon Chen)



## **1** General Description

#### 1.1 Description of the EUT

Product name:	ChargeTree Mag Qi2			
Model name:	ChargeTree Mag			
Series Model(s):	stm-931-463Z-01, stm-931-463Z-02, stm-931-464Z-01, stm-931-464Z-02			
Model difference:	All the models are the same circuit and module, except the model name and color.			
Electrical rating:	Input: DC 9V/3A Wireless Output: Phone: 5W/15W, Earphone: 5W, Watch: 3W			
Accessories:	N/A			
Hardware version:	V1.0			
Software version:	V1.0			
Test sample(s) number:	MTi240816006-01S1001			
RF specification				
Operating frequency range:	Coil 1(Phone): 115-205kHz(5W), 360kHz(15W) Coil 2(Earphone): 115-205kHz Coil 3(Watch): 300-350kHz			
Modulation type:	ASK			
Antenna(s) type:	Coil			

#### 1.2 Description of test modes

No.	Emission test modes
Mode1	Wireless output(5W)+Earphone(5W)+Watch(3W)
Mode2	Wireless output(15W)+Earphone(5W)+Watch(3W)
Mode3	Wireless output(5W)+Earphone(5W)
Mode4	Wireless output(15W)+Earphone(5W)
Mode5	Wireless output(5W)+Watch(3W)
Mode6	Wireless output(15W)+Watch(3W)
Mode7	Earphone(5W)+Watch(3W)
Mode8	Wireless output(5W)
Mode9	Wireless output(15W)
Mode10	Wireless Watch(3W)
Mode11	Wireless Earphone(5W)
Mode12	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			
wireless charging load	YBZ1.1	1	YBZ			
Air Pods	MQD83CH/A	/	Apple			
iWatch	iWatch S7	M0JVGQG1VP	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	ency bands (bel	ow 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

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)

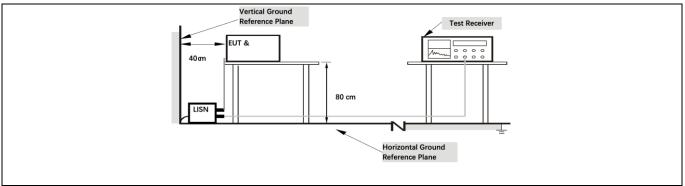
#### 6.1 Conducted Emission at AC power line

Test Requirement:	Except as shown in paragraphs (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 $\mu$ H/50 ohms line impedance stabilization network (LISN).					
Test Limit:	Frequency of emission (MHz)	Conducted limit (dBµ'	lucted 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: Mode1, Mode2, Mode3, Mode4, Mode5, Mode6, Mode7, Mode8, Mode9, Mode10, Mode11, Mode12					Mode8, Mode9,	
Final test mode: All of the listed pre-test mode were tested, only the data of the worst mode (Mode2) is recorded in the report					of the worst mode	

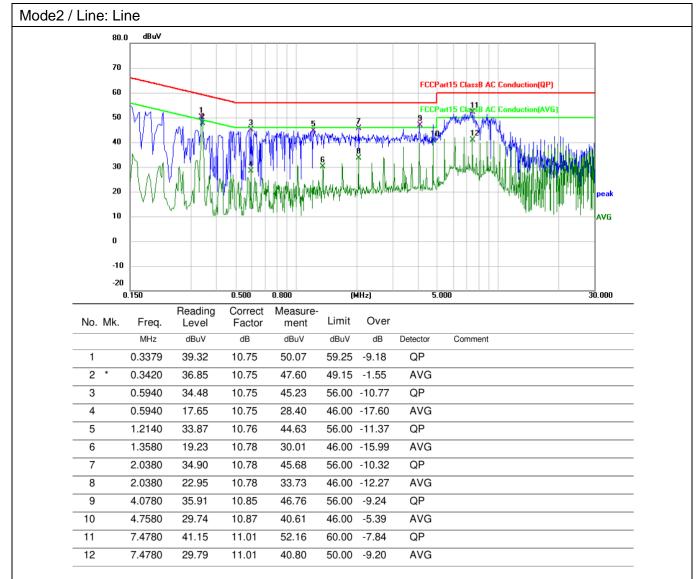
#### 6.1.2 Test Setup Diagram:



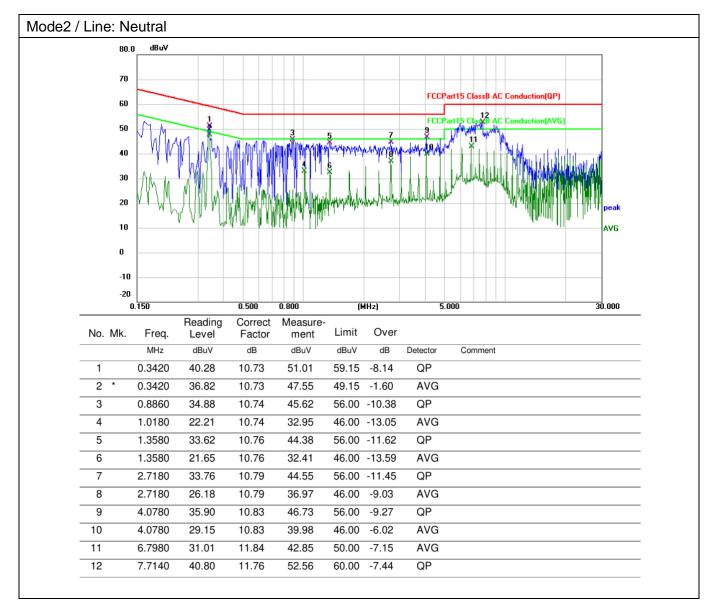




#### 6.1.3 Test Data:









#### 6.2 20dB Occupied Bandwidth

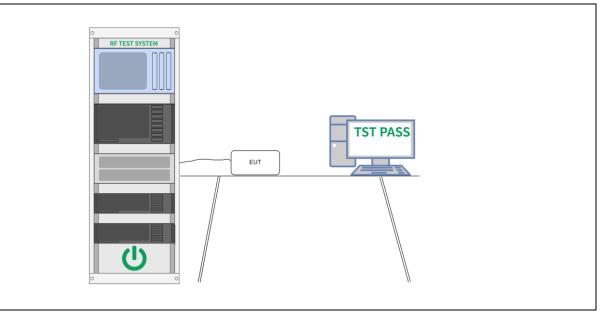
Test Requirement:	47 CFR Part 15.215(c)
Test Limit:	Refer to 47 CFR 15.215(c), intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of 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:	<ul> <li>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.</li> <li>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.</li> <li>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.</li> <li>d) Steps a) through c) might require iteration to adjust within the specified tolerances.</li> <li>e) The dynamic range of the instrument at the selected RBW shall be more than 10 a B 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.</li> <li>f) Set detection mode to peak and trace mode to max hold.</li> <li>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).</li> <li>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.</li> <li>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 mately by an applitude" value, then i shall be as lose as possible to this value. The occupied bandwidth is the frequency difference between the two markers. Alternatively, set a marker is at or slightly bel</li></ul>



### 6.2.1 E.U.T. Operation:

Operating Environment:						
Temperature:	24 °C		Humidity:	54 %	Atmospheric Pressure:	101 kPa
Pre test mode: Mode1, Mode2, Mode3, Mode4, Mode5, Mode6, Mode7, Mode8, Mode9, Mode10, Mode11, Mode12						Mode8, Mode9,
Final test mode:All of the listed pre-test mode were tested, only the data of the worst mode (Mode8, Mode9, Mode10, Mode11) 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.

	1	Mode8	<b>_</b>		
Frequency	20 dB d	occupied bandw	dwidth 99% of		upied bandwidt
kHz		Hz			Hz
127.660		752			638
Agilent Spectrum Analyzer - Occupied BW (M RL RF 50 Ω DC C Center Freq 127.660 kHz #IFG		Freq: 127.660 kHz ee Run Avg Hold: 1	Radio 5	4PM Aug 27, 2024 Std: None Device: BTS	Frequency
10 dB/div Ref 20.00 dBm					Center Freq
0.00 -10.0 -20.0					127.660 kHz
-30.0 -40.0 -50.0					
-60.0			$\sim$		
Center 127.7 kHz #Res BW 300 Hz	#V	BW 1 kHz	Swee	Span 5 kHz p   68.07 ms	CF Step 500 Hz
Occupied Bandwidth	638 Hz	Total Power	1.15 dBm	A	<u>uto</u> Man
Transmit Freq Error	-2 Hz	OBW Power	99.00 %		Freq Offset 0 Hz
x dB Bandwidth	752 Hz	x dB	-20.00 dB		
MSG			STATUS		
Mod			STATUS		



**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				cupied bandwid	
kHz		Hz			Hz
360		755			645
10 dB/div Ref 10.00 dBm	Center	SENSE:INT Freq: 360.000 kHz ree Run Avg Hol 10 dB	Radi d: 10/10	13:49PM Aug 27, 2024 o Std: None o Device: BTS	Measurements Swept SA
Log 0.00 -10.0 -20.0 -30.0 -40.0					Channel Power Occupied BW
-50.0 -60.0 -70.0 -80.0 Center 360 kHz					ACP
#Res BW 300 Hz	#\	/BW 1 kHz	Swe	Span 5 kHz ep 68.07 ms	Power Stat
Occupied Bandwidth	645 Hz	Total Power	-7.54 dBr	n	CCDF BurstPower
Transmit Freq Error	1 Hz	OBW Power	99.00	%	Buistrower
x dB Bandwidth	755 Hz	x dB	-20.00 d	В	<b>More</b> 1 of 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.

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		Mode10:			
Frequency	20 dB d	20 dB occupied bandwidth 99% occ			cupied bandwidt
kHz	Hz			Hz	
319.485		775			661
Agilent Spectrum Analyzer - Occupied BW	•		•		
M RL RF 50Ω DC Center Freq 319.485 kHz	Center	ENSE:INT Freq: 319.485 kHz	Rad	10:00 PM Aug 27, 2024 io Std: None	Frequency
	ain:Low #Atten:			io Device: BTS	
10 dB/div Ref 0.00 dBm					
-20.0					Center Freq 319.485 kHz
-30.0		+			
-40.0					
-60.0					
-70.0				~~~~	
-80.0					
				On an 6 kills	
Center 319.5 kHz #Res BW 300 Hz	#V	'BW 1 kHz	Sw	Span 5 kHz eep 68.07 ms	CF Step 500 Hz
Occupied Bandwidth		Total Power	-19.8 dB	m	<u>Auto</u> Man
	661 Hz				Freq Offset
Transmit Freq Error	-13 Hz	OBW Power	99.00	%	0 Hz
x dB Bandwidth	775 Hz	x dB	-20.00 d		
MSG			STATUS		

Mode10:



**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.

		Mode11:			
Frequency	20 dB	20 dB occupied bandwidth 99% oc			cupied bandwidt
kHz		Hz			Hz
115.950		749			635
Agilent Spectrum Analyzer - Occupied BW	• •				
<mark>μα</mark> RL RF 50 Ω DC Center Freq 115.950 kHz		ENSE:INT Freq: 115.950 kHz ee Run Avg Holo	Ra	D:05:21 PM Aug 27, 2024 dio Std: None	Frequency
#IF0	Gain:Low #Atten:			dio Device: BTS	
10 dB/div Ref 20.00 dBm					
Log 10.0					Center Freq
-10.0					115.950 kHz
-20.0					
-30.0	/	<u></u>			
-40.0					
-60.0					
-70.0				$\sim\sim\sim$	
Center 116 kHz #Res BW 300 Hz	#\	/BW 1 kHz	Sv	Span 5 kHz veep 68.07 ms	CF Step
Occupied Bandwidth		Total Power	-7.40 de		500 Hz <u>Auto</u> Man
	635 Hz				Freq Offset
Transmit Freq Error	4 Hz	<b>OBW Power</b>	99.00	)%	0 Hz
x dB Bandwidth	749 Hz	x dB	-20.00	dB	
MSG			STATUS		

Mode11:



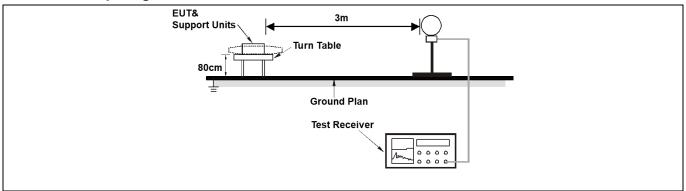
#### 6.3 Emissions in frequency bands (below 30MHz)

Test Requirement:	47 CFR Part 15.209					
Test Limit:	Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance			
			(meters)			
	0.009-0.490	2400/F(kHz)	300			
	0.490-1.705	24000/F(kHz)	30			
	1.705-30.0	30	30			
	30-88	100 **	3			
	88-216	150 **	3			
	216-960	200 **	3			
	Above 960	500	3			
Test Method:	** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 M However, operation within these frequency bands is permitted under sections of this part, e.g., §§ 15.231 and 15.241. In the emission table above, the tighter limit applies at the band edge The emission limits shown in the above table are based on measurer employing a CISPR quasi-peak detector except for the frequency bar kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in three bands are based on measurements employing an average dete As shown in § 15.35(b), for frequencies above 1000 MHz, the field stu limits in paragraphs (a)and (b)of this section are based on average lim However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 of any condition of modulation. For point-to-point operation under parag (b)of this section, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.					
Test Method: Procedure:	ANSI C63.10-2013 secti	-				
Procedure:	ANSI C63.10-2013 secti	on 6.4				

#### 6.3.1 E.U.T. Operation:

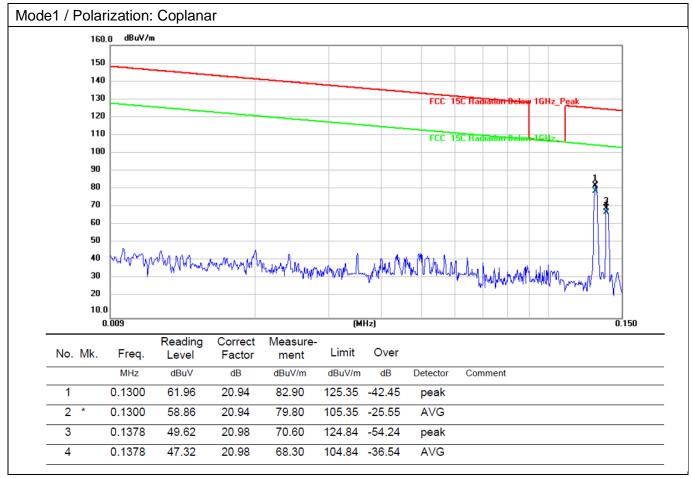
Operating Environment:						
Temperature: 22.5 °	C Humidity: 43 % Atmospheric Pressure: 101 kPa					
Pre test mode: Mode1, Mode2, Mode3, Mode4, Mode5, Mode6, Mode7, Mode8, Mode9 Mode10, Mode11, Mode12						
Final test mode: All of the listed pre-test mode were tested, only the data of the worst mo (Mode1,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

#### 6.3.2 Test Setup Diagram:

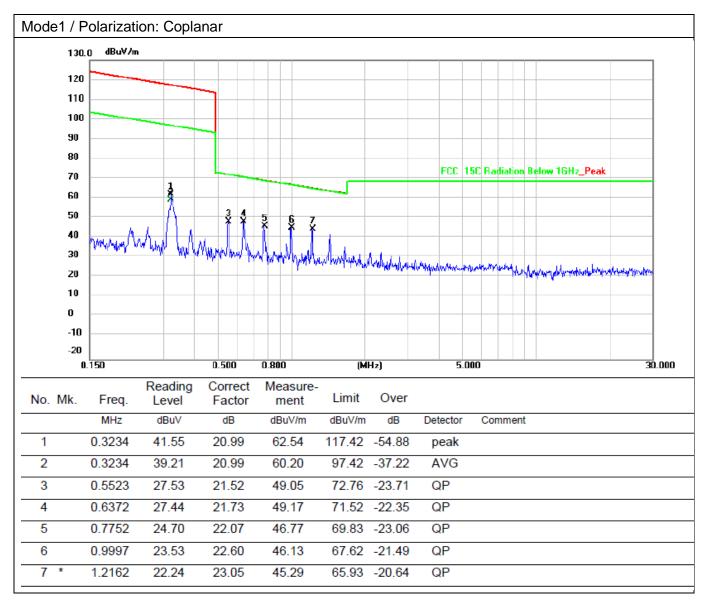




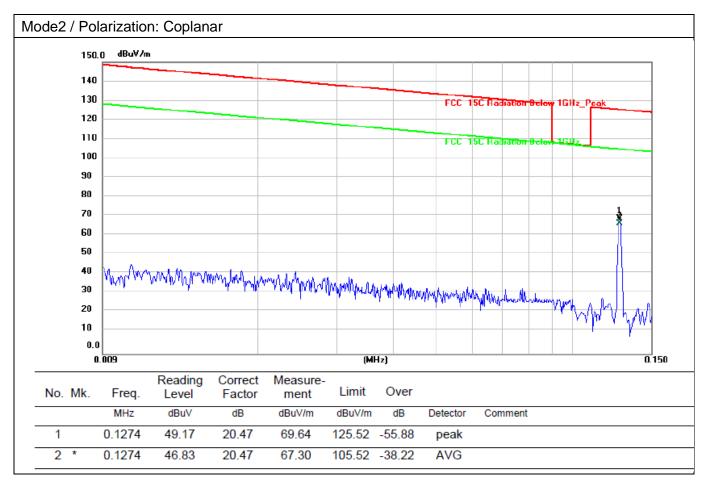
#### 6.3.3 Test Data:



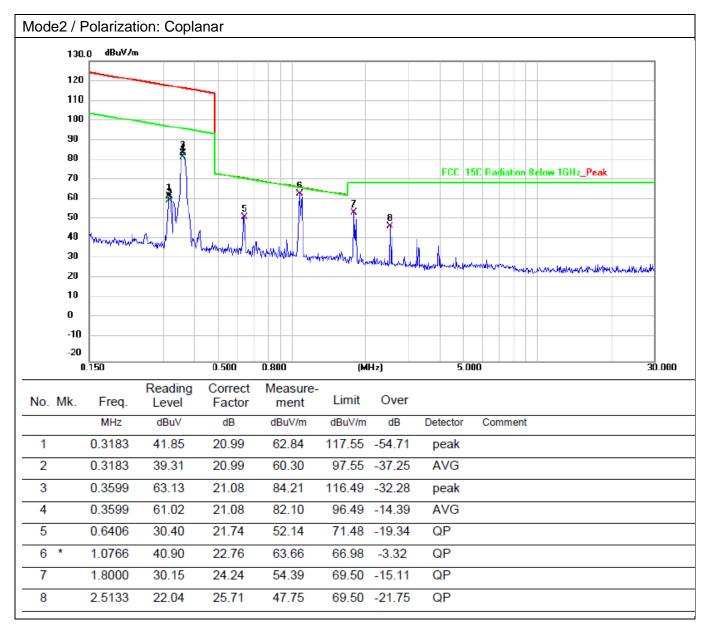














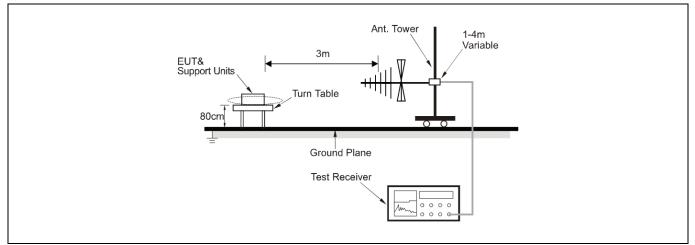
#### 6.4 Emissions in frequency bands (30MHz - 1GHz)

Test Requirement:	47 CFR Part 15.209						
Test Limit:	Frequency (MHz)	Field strength	Measurement				
		(microvolts/meter)	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 ope	rating under this section shall ne	ot be located in the				
		MHz, 76-88 MHz, 174-216 MHz					
		in these frequency bands is per	mitted under other				
	sections of this part, e.g.						
		ove, the tighter limit applies at th	<b>U</b>				
		vn in the above table are based					
	employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these						
	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 based on average limits						
	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:	ANSI C63.10-2013 secti	•					
Procedure:	ANSI C63.10-2013 secti	on 6.5					

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

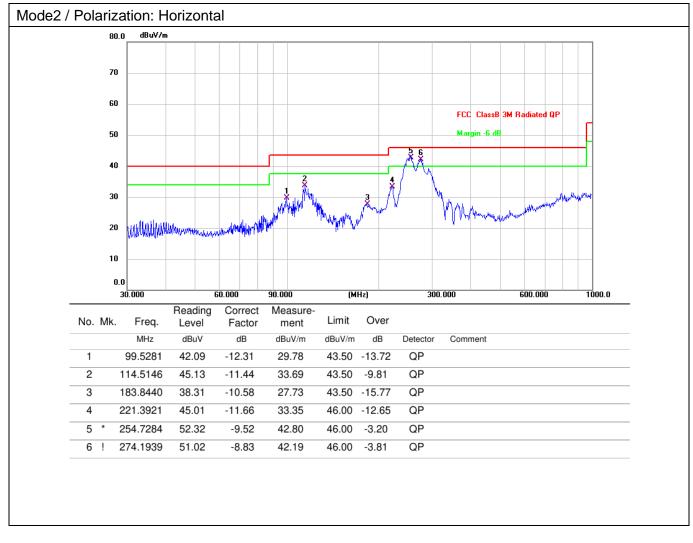
Operating Environment:	
Temperature: 26 °C	Humidity: 54 % Atmospheric Pressure: 98.3 kPa
Pre test mode:	Mode1, Mode2, Mode3, Mode4, Mode5, Mode6, Mode7, Mode8, Mode9, Mode10, Mode11, Mode12
Final test mode:	All of the listed pre-test mode were tested, only the data of the worst mode (Mode2) is recorded in the report

#### 6.4.2 Test Setup Diagram:

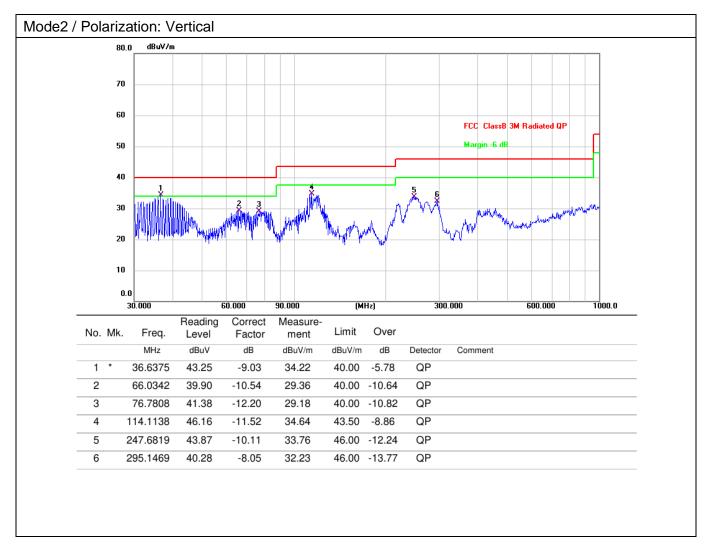




#### 6.4.3 Test Data:









# Photographs of the test setup

Refer to Appendix - Test Setup Photos



# Photographs of the EUT

Refer to Appendix - EUT Photos

----End of Report----