

Report No: CCISE171202001

FCC REPORT

Applicant:	Shenzhen Digitalor Technology Co., Ltd			
Address of Applicant:	Room 305-2, Shenzhen IC Design & Application Industrial Park, No.1089, Chaguang Rd, Nanshan District, Shenzhen, Guangdong,China			
Equipment Under Test (F	EUT)			
Product Name:	U-WEI Assets Intelligent Management Module			
Model No.:	UR2100MT-POE			
Trade Mark:	Digitalor			
FCC ID:	2AOFJUR2100MT-POE			
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.225			
Date of sample receipt:	05 Dec., 2017			
Date of Test:	06 Dec., 2017 to 15 Jun., 2018			
Date of report issue:	19 Jun., 2018			
Test Result:	PASS*			

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Bruce Zhang Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the CCISproduct certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery orfalsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



2 Version

Version No.	Date	Description
00	19 Jun., 2018	Original

Tested by:

Zora Lee

Date:

19 Jun., 2018

Test Engineer

Reviewed by:

' Man' ñ

Date:

19 Jun., 2018

Project Engineer



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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
Field strength of the fundamental signal	15.225 (a)	Pass
Spurious emissions	15.225(d)& 15.209	Pass
20dB Bandwidth	15.215(c)	Pass
Frequency tolerance	15.225 (e)	Pass
Conducted Emission	15.207	Pass

Remarks:

Pass: The EUT complies with the essential requirements in the standard.



5 General Information

5.1 Client Information

Applicant:	Shenzhen Digitalor Technology Co., Ltd
Address:	Room 305-2, Shenzhen IC Design & Application Industrial Park, No.1089, Chaguang Rd, Nanshan District, Shenzhen, Guangdong,China
Manufacturer/ Factory:	Shenzhen Digitalor Technology Co., Ltd
Address:	Room 305-2, Shenzhen IC Design & Application Industrial Park, No.1089, Chaguang Rd, Nanshan District, Shenzhen, Guangdong, China

5.2 General Description of E.U.T.

Product Name:	U-WEI Assets Intelligent Management Module
Model No.:	UR2100MT-POE
Operation Frequency:	13.56MHz
Channel numbers:	1
Modulation type:	ASK
Antenna Type:	PCB Antenna
Antenna gain:	1dBi
Power supply:	DC 48V



5.3 Test mode

Transmitting mode:	Keep the EUT in trai	Keep the EUT in transmitting mode with modulation				
Pre-Test Mode:						
CCIS has verified the construction and function in typical operation, The EUT was placed on three different polar directions; i.e. X axis, Y axis, Z axis. which was shown in this test report and defined as follows:						
Axis	Х	X Y Z				
Field Strength(dBuV/m)	47.46	47.46 46.58 46.32				
Final Test Mode:						
According to ANSI C63.4 standards, the test results are both the "worst case" and "worst setup": Y axis (see the test setup photo).						

5.4 Description of Support Units

N/A

5.5 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

• FCC - Registration No.: 727551

Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been accredited as a testing laboratory by FCC (Federal Communications Commission). The Registration No. is 727551.

IC - Registration No.: 10106A-1

The 3m Semi-anechoic chamber of Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

• CNAS - Registration No.: CNAS L6048

Shenzhen Zhongjian Nanfang Testing Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6048.

A2LA - Registration No.: 4346.01

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: <u>https://portal.a2la.org/scopepdf/4346-01.pdf</u>

5.6 Laboratory Location

Shenzhen Zhongjian Nanfang Testing Co., Ltd. Address: No. B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road, Bao'an District, Shenzhen, Guangdong, China Tel: +86-755-23118282, Fax: +86-755-23116366 Email: info@ccis-cb.com, Website: http://www.ccis-cb.com



5.7 Test Instrumentslist

Radia	Radiated Emission:						
ltem	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)	
1	EMI Test Receiver	Rohde & Schwarz	ESCI	CCIS0002	02-25-2017	02-24-2018	
	EIVII Test Receiver	Ronde & Schwarz	ESCI	CCI30002	02-25-2018	02-24-2019	
2	Loon Antonno			00100100	02-25-2017	02-24-2018	
2	Loop Antenna	SCHWARZBECK	FMZB 1519 B	CCIS0188	02-25-2018	02-24-2019	
0	BiConiLog Antenna SCHWARZBECK VULB9163 CCIS000	00100005	02-25-2017	02-24-2018			
2		MESS-ELEKTRONIK	VULB9163	CC180005	02-25-2018	02-24-2019	
3	Double -ridged	SCHWARZBECK		BBHA9120D CCIS0006	02-25-2017	02-24-2018	
3	waveguide horn	MESS-ELEKTRONIK	BBHA9120D		02-25-2018	02-24-2019	
4	Amplifier		0447D	00100000	02-25-2017	02-24-2018	
4	(10kHz-1.3GHz)	HP	8447D	CCIS0003	02-25-2018	02-24-2019	
E	Amplifier	Amplifier Compliance	00100044	02-25-2017	02-24-2018		
5	(1GHz-18GHz)	Direction Systems Inc.	PAP-1G18	CCIS0011	02-25-2018	02-24-2019	
6	Creativer, analyzar	Dahda & Cabwarr	50500	CCIS0023	02-25-2017	02-24-2018	
6	Spectrum analyzer	Konde & Schwarz	nde & Schwarz FSP30		02-25-2018	02-24-2019	

Cond	Conducted Emission:						
ltem	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Date (mm-dd-yy)	
1	Shielding Room	ZhongShuo Electron	11.0(L)x4.0(W)x3.0(H)	CCIS0061	07-22-2017	07-21-2020	
0		Rohde & Schwarz	ESCI	CCIS0002	02-25-2017	02-24-2018	
2 EMI Test Receiver	EIVII Test Receiver				02-25-2018	02-24-2019	
0			02-25-2017	02-24-2018			
3	LISN	CHASE	MN2050D	CCIS0074	02-25-2018	02-24-2019	
4	EMI Test Software	AUDIX	E3	N/A	N/A	N/A	



6 Test results and Measurement Data

6.1 Antenna requirement

Standard requirement:	FCC Part15 C Section 15.203
15.203 requirement: An intentional radiator shall responsible party shall be us antenna that uses a unique	be designed to ensure that no antenna other than that furnished by the sed with the device. The use of a permanently attached antenna or of an coupling to the intentional radiator, the manufacturer may design the unit an be replaced by the user, but the use of a standard antenna jack or
E.U.T Antenna:	
The EUT make use of a PCB	3 antenna, The typical gain of the antenna is 1dBi.

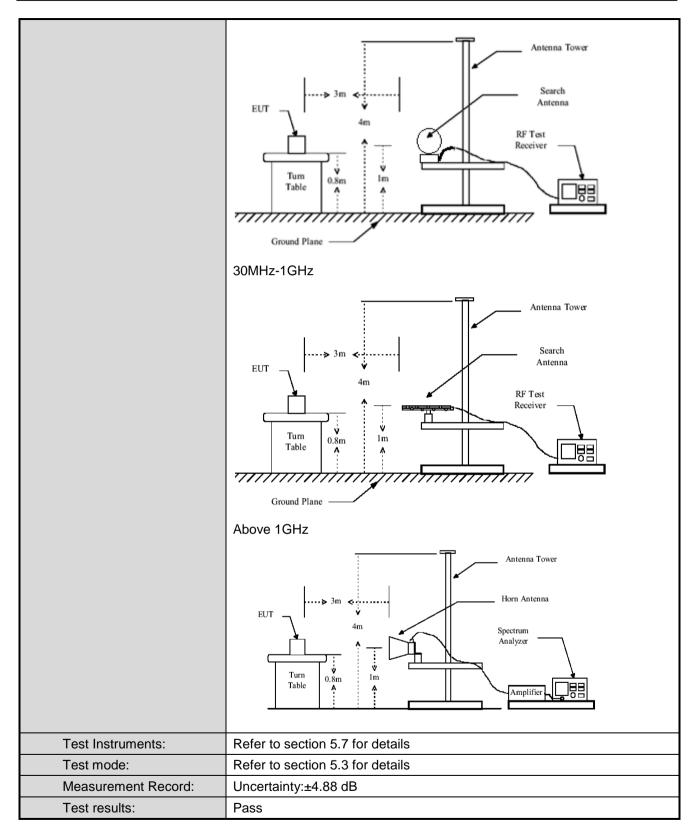




6.2 Radiated Emission

Test Method: ANSI C63.10: 2013 TestFrequencyRange: 9 kHz to 1000MHz Test site: Measurement Distance: 3m(Semi-Anechoic Chamber) Receiver setup: Frequency Detector RBW VBW Remark 9kHz-150kHz Quasi-peak 200Hz 600Hz Quasi-peak Value 30MHz-1GHz Quasi-peak 120kHz 300KHz Quasi-peak Value Above 1GHz Peak 11MHz 30Hz Peak Value Above 1GHz Peak 113.553MHz-13.553MHz 834 90.5 13.410MHz-13.553MHz & 334 90.5 13.110MHz-13.573MHz & 134 13.553MHz-13.3710MHz 106 80.5 13.553MHz-13.573MHz & 334 90.5 13.110MHz-13.0410MHz & 106 80.5 13.110MHz-13.573MHz & 334 90.5 13.110MHz-13.537MHz & 334 90.5 13.110MHz-13.573MHz & 334 90.5 13.110MHz-13.5373MHz & 334 90.5 13.110MHz-13.573MHz & 30 30 30 13.553MHz & 324	Test Requirement:	FCC Part15 C Section 15.225(a) and 15.209					
Test site: Measurement Distance: 3m(Semi-Anechoic Chamber) Receiver setup: Frequency Detector RBW VBW Remark. 9kHz:150kHz Ouasi-peak 9kHz 30kHz Ouasi-peak Value 150kHz:30MHz Ouasi-peak 9kHz 30kHz Ouasi-peak Value 30MHz:1GHz Ouasi-peak 9kHz 30kHz Ouasi-peak Value 30MHz:1GHz Ouasi-peak 9kHz 30kHz Ouasi-peak Value 13.553MHz:13.567MHz 15848 124.0 13.543MHz:13.567MHz 1344 90.5 13.110MHz:13.310MHz.4 106 80.5 13.110MHz:13.710MHz 334 90.5 13.110MHz:13.310MHz.8 106 80.5 13.110MHz:13.300MHz 106 80.5 13.110MHz:13.410MHz 304 90.5 13.110MHz:13.300MHz 106 80.5 13.110MHz:13.210MHz 106 80.5 13.70MHz 30 30 13.0507MHz 10.01MHz 106 80.5 13.70MHz 30 30	Test Method:						
Test site: Measurement Distance: 3m(Semi-Anechoic Chamber) Receiver setup: Frequency Detector RBW VBW Remark. 9kHz:150kHz Ouasi-peak 9kHz 30kHz Ouasi-peak Value 150kHz:30MHz Ouasi-peak 9kHz 30kHz Ouasi-peak Value 30MHz:1GHz Ouasi-peak 9kHz 30kHz Ouasi-peak Value 30MHz:1GHz Ouasi-peak 9kHz 30kHz Ouasi-peak Value 13.553MHz:13.567MHz 15848 124.0 13.543MHz:13.567MHz 1344 90.5 13.110MHz:13.310MHz.4 106 80.5 13.110MHz:13.710MHz 334 90.5 13.110MHz:13.310MHz.8 106 80.5 13.110MHz:13.300MHz 106 80.5 13.110MHz:13.410MHz 304 90.5 13.110MHz:13.300MHz 106 80.5 13.110MHz:13.210MHz 106 80.5 13.70MHz 30 30 13.0507MHz 10.01MHz 106 80.5 13.70MHz 30 30	TestFrequencyRange:						
Receiver setup: Frequency Detector RBW VBW Remark 9KH2-150KHz Quasi-peak 200Hz 600Hz Quasi-peak Value 30MHz-16Hz Quasi-peak 9kHz 300KHz Quasi-peak Value 30MHz-16Hz Quasi-peak 10KHz Quasi-peak Value Above 16Hz Peak 11KHz 30KHz Quasi-peak Value Above 16Hz Peak 11KHz 30KHz Peak 124.0 13.553MH2-13.567MHz 15848 124.0 13.410MHz-13.410MHz & 334 90.5 13.110MHz-14.010MHz 106 80.5 13.710MHz-14.010MHz & 106 80.5 Remark: Per FCC part 15.31, when performingmeasurements at a closer distanceby either making measurements at a minimum of two distances on atleast one radial to determine the proprextrapolation factor of 40 distanceb and attracte wither making measurements at minimum of two distances on atleast one radial to determine the proprextrapolation factor of 40 distance (m) 0.000-0.490 2400/F(kHz) 300 10.009-0.490 2400/F(kHz) 30 30 30 30 30 11.705-30 30 30 30 30 30 <td< th=""><th></th><th colspan="6"></th></td<>							
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Test Procedure: a. The EUT was placed on the top of a rotating table 0.8 meters above the groundat a 3 meter semi-anechoic camber. The table was rotated 360 degrees todetermine the position of the highest radiation. b. The EUT was set 3 meters away from the interference-receiving antenna, whichwas mounted on the top of a variable-height antenna tower. c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatabletable was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and SpecifiedBandwidth with Maximum Hold Mode. f. If the emission level of the EUT in peak mode was 10dB lower than the limitspecified, then testing could be stopped and the peak values of the EUT wouldbe reported. Otherwise the emissions that did not have 10dB margin would bere-tested one by one using peak, quasi-peak or average method as specified andthen reported in a data sheet.		216-96					3
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	Test setup:						

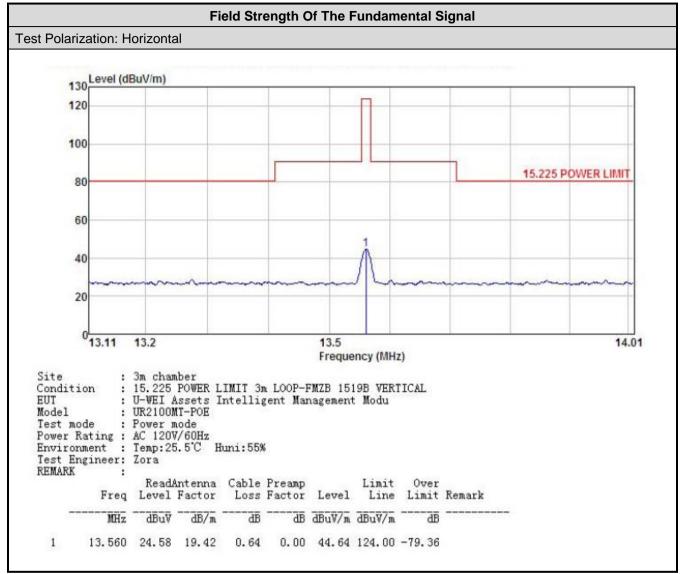
Report No: CCISE171202001



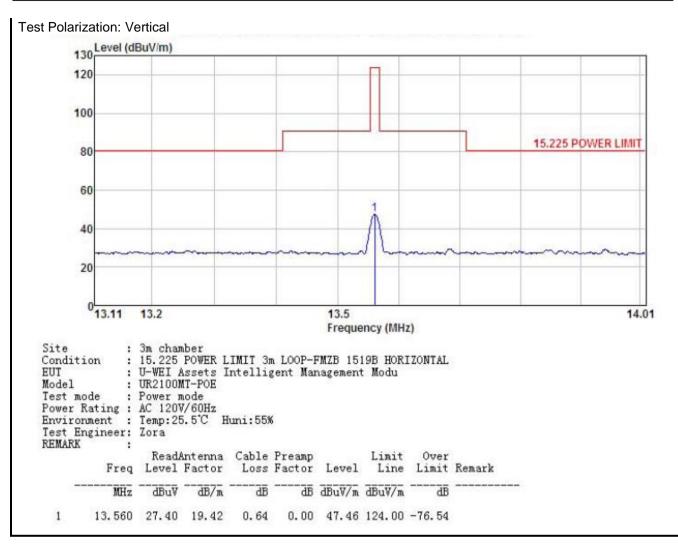
CCIS



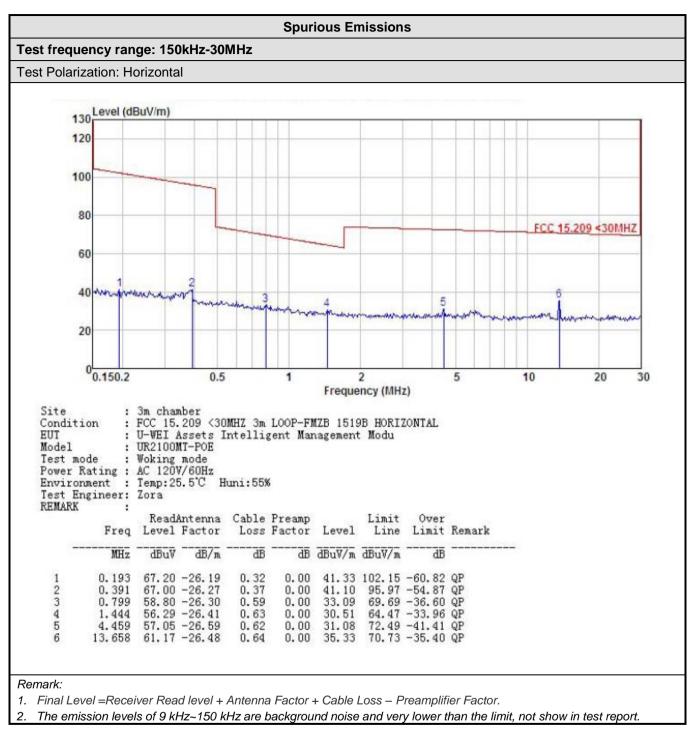
Measurement Data:



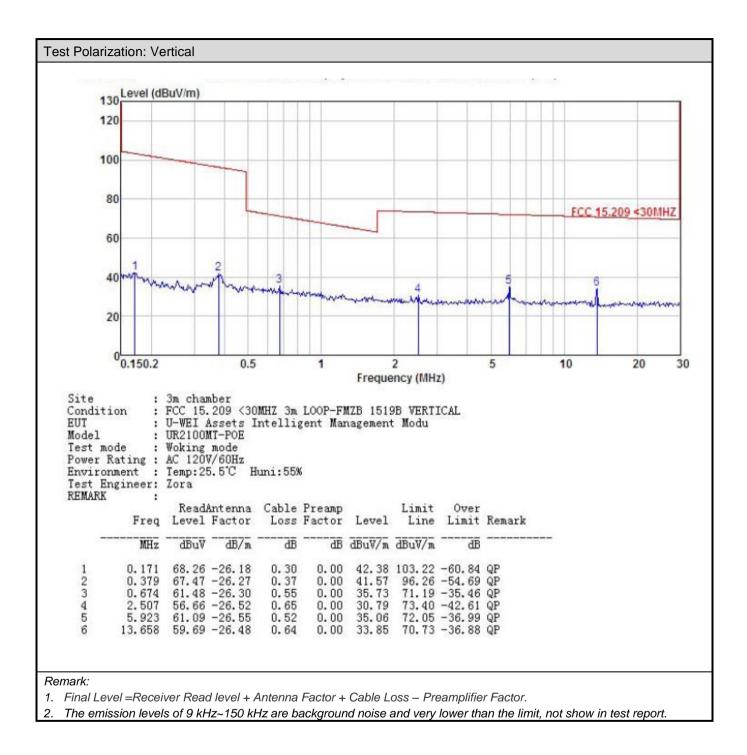
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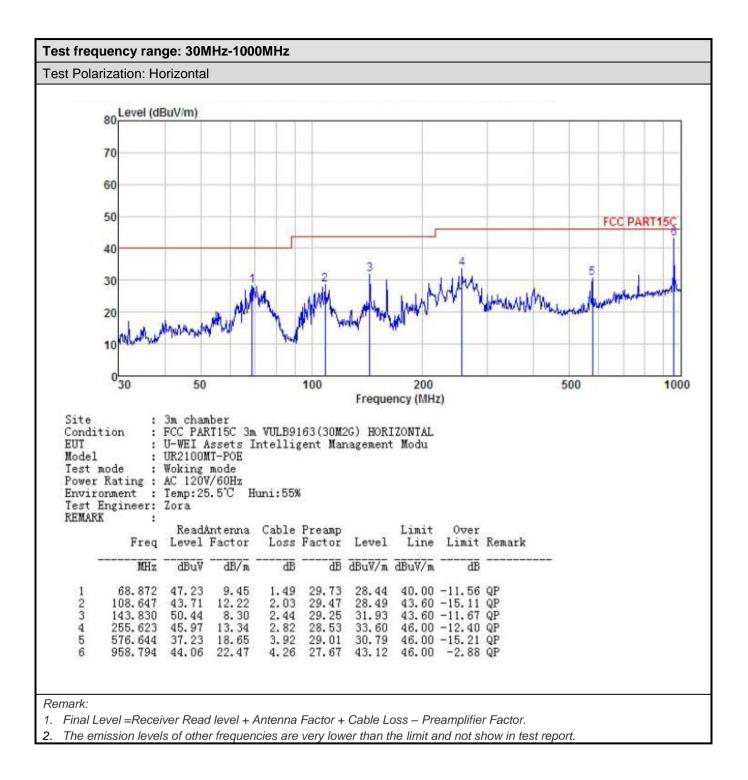




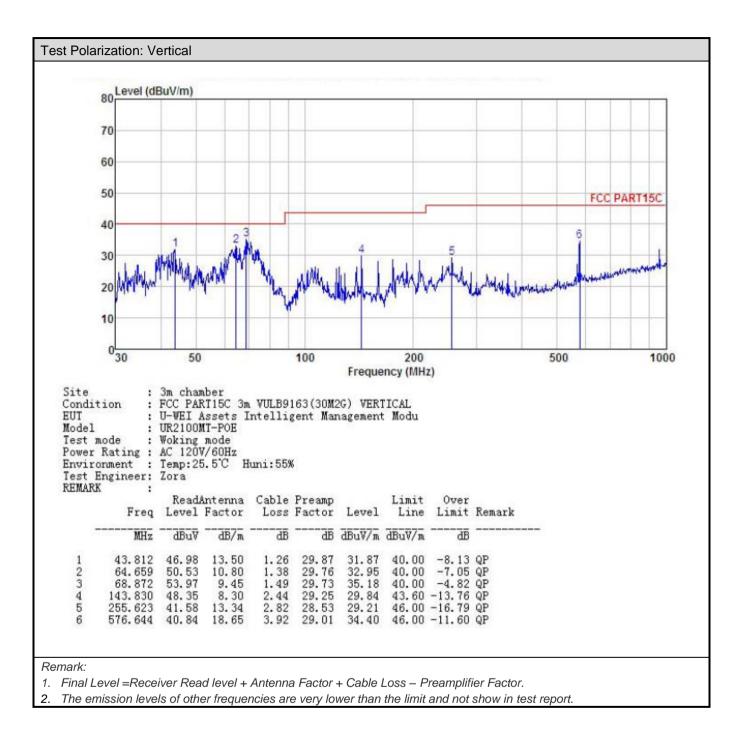














6.3 20dB Bandwidth

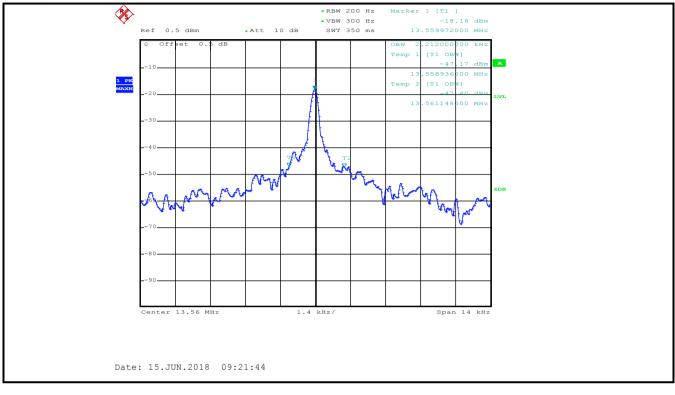
Test Requirement:	FCC Part15 C Section 15.215 (c)		
Test Method:	ANSI C63.4:2014		
Receiver setup:	RBW=200Hz, VBW=300Hz, detector: Peak		
Limit:	he fundamental emission be kept within atleast the central 80% of the ermitted band		
Test Procedure:	 According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT. Set the EUT to proper test channel. Max hold the radiated emissions, mark the peak power frequency point and the -20dB upper and lower frequency points. Read 20dB bandwidth. 		
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane		
Test Instruments:	Refer to section 5.7 for details		
Test mode:	Refer to section 5.3 for details		
Test results:	Passed		

Measurement Data

20dB bandwidth (kHz)	Limit (kHz)	Results			
2.212	11.2	Passed			
Note: For 13.56MHz, permitted Band is 14 kHz, so the Limit is 11.2 kHz.					



Test plot as follows:





6.4 Frequency Tolerance

Test Requirement:	FCC Part15 C Section 15.225 (e)		
Test Method:	ANSI C63.10: 2013		
Receiver setup:	RBW=200Hz, VBW=300Hz, span=14kHz, detector: Peak		
Limit:	±0.01% of the operating frequency		
Test mode:	Transmitting mode		
Test Procedure:	Frequency stability V.S. Temperature measurement		
	 The equipment under test was connected to an external DC power supply and input rated voltage. RF output was connected to spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as 		
	 reference frequency. 5. Turn EUT off and set the chamber temperature to -20°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. 6. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached Frequency stability V.S. Voltage measurement 1. Set chamber temperature to 25°C. Use a variable DC power source to power the EUT and set the voltage to rated voltage. 		
	 Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency. Reduce the input voltage to specify extreme voltage variation (+/-15%) and endpoint, record the maximum frequency change. 		
Test setup:	Spectrum Analyzer E-U.T Non-Conducted Table Ground Reference Plane		
Test Instruments:	Refer to section 5.7 for details		
Test mode:	Refer to section 5.3 for details		
Test results:	Passed		



Measurement Data:

a) Frequency stability V.S. Temperature measurement

Voltage (Vdc)	Temperature (℃)	Frequency Tolerance (MHz)	Frequency Error (%)	Limit (%)
48	-20	13.559972	0.00021	±0.01
	-10	13.559970	0.00022	±0.01
	0	13.559974	0.00019	±0.01
	10	13.559972	0.00021	±0.01
	20	13.559972	0.00021	±0.01
	30	13.559970	0.00022	±0.01
	40	13.559976	0.00018	±0.01
	50	13.559976	0.00018	±0.01

b) Frequency stability V.S. Voltage measurement

Temperature (℃)	Voltage (Vdc)	Frequency Tolerance (MHz)	Frequency Error (%)	Limit (%)
25	40.8	13.559972	0.00021	±0.01
	48.0	13.559976	0.00018	±0.01
	55.2	13.559974	0.00019	±0.01

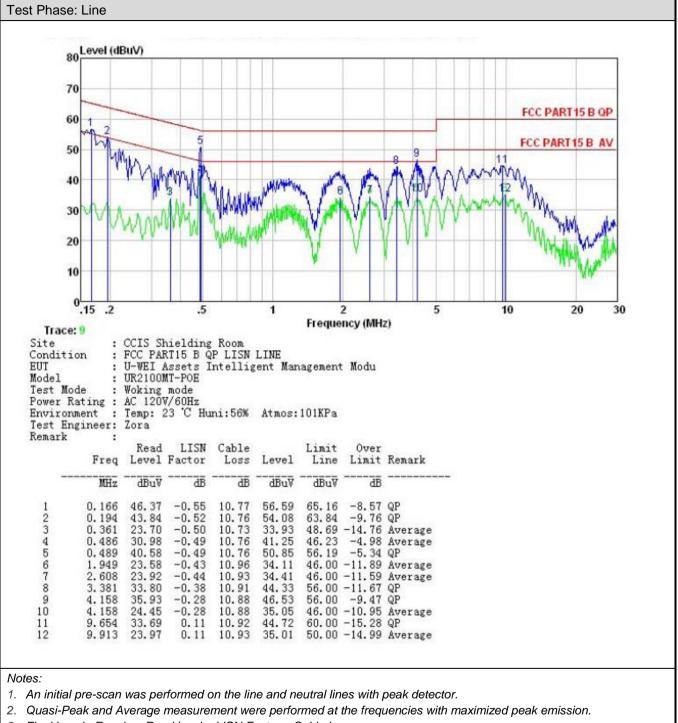


6.5 Conducted Emission

Test Requirement:	FCC Part15 B Section 15.207					
Test Method:	ANSI C63.4:2014					
TestFrequencyRange:	150kHz to 30MHz					
Class / Severity:	Class B					
Receiver setup:	RBW=9kHz	, VBW=30kHz				
Limit:	Limit (dBu\/)					
	Frequency range (MHz)		Qu	Quasi-peak		Average
		15-0.5	6	6 to 56*	5	56 to 46*
).5-5		56		46
		.5-30		60		50
Test setup:	* Decreases	s with the loga	r <u>ithm of the fi</u> ce Plane	requency.		
Test procedure	LISN 40cm 80cm Filter AC power Full Filter AC power Equipment E.U.T EMI Test table/Insulation plane EMI Remark E.U.T Equipment Under Test LISN: Line impedence Stabilization Network Test table height=0.8m					
	 The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). It provide a 50ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2003 on conducted measurement. 					
Test environment:	Temp.:	23°C	Humid.:	56%	Press.:	101kPa
Measurement Record:		I			Uncert	ainty: 3.28dB
Test Instruments:	Refer to section 5.7 for details					
Test mode:	Refer to section 5.3 for details					
Test results:	Pass					

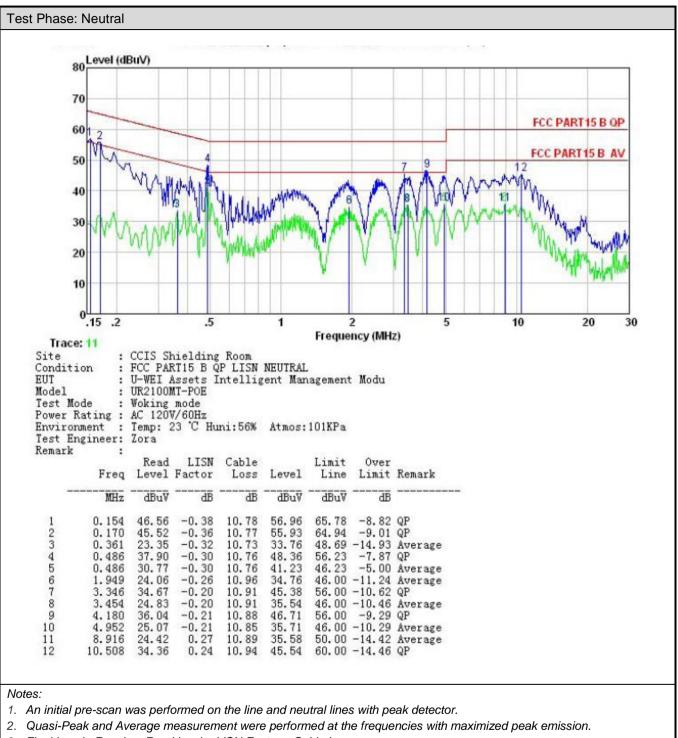


Measurement Data:



3. Final Level =Receiver Read level + LISN Factor + Cable Loss.





3. Final Level =Receiver Read level + LISN Factor + Cable Loss.