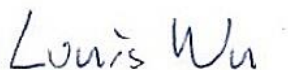


FCC Test Report

APPLICANT : Maestro Wireless Holdings Limited
EQUIPMENT : 4G WIFI Router
BRAND NAME : Maestro
MODEL NAME : E228VZ
MARKETING NAME : E228 VZ
FCC ID : WN6-E228VZ
STANDARD : FCC 47 CFR FCC Part 15 Subpart B
CLASSIFICATION : Certification

The product was received on Aug. 17, 2015 and testing was completed on Sep. 07, 2015. We, SPORTON INTERNATIONAL (SHENZHEN) INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI C63.4-2009 and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (SHENZHEN) INC., the test report shall not be reproduced except in full.



Reviewed by: Louis Wu / Manager



Approved by: Jones Tsai / Manager



SPORTON INTERNATIONAL (SHENZHEN) INC.

**1F & 2F, Building A, Morning Business Center, No. 4003 ShiGu Rd., Xili Town,
Nanshan District, Shenzhen, Guangdong, P. R. China**



TABLE OF CONTENTS

REVISION HISTORY.....	3
SUMMARY OF TEST RESULT	4
1. GENERAL DESCRIPTION	5
1.1. Applicant.....	5
1.2. Manufacturer	5
1.3. Product Feature of Equipment Under Test	5
1.4. Product Specification subjective to this standard.....	5
1.5. Modification of EUT	6
1.6. Test Location.....	6
1.7. Applicable Standards	6
2. TEST CONFIGURATION OF EQUIPMENT UNDER TEST	7
2.1. Test Mode	7
2.2. Connection Diagram of Test System	8
2.3. Support Unit used in test configuration and system.....	9
2.4. EUT Operation Test Setup.....	9
3. TEST RESULT	10
3.1. Test of Radiated Emission Measurement	10
4. LIST OF MEASURING EQUIPMENT	14
5. UNCERTAINTY OF EVALUATION	15
APPENDIX A. SETUP PHOTOGRAPHS	



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FC581706	Rev. 01	Initial issue of report	Sep. 22, 2015



SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.109	Radiated Emission	< 15.109 limits	PASS	Under limit 3.44 dB at 143.940 MHz for Quasi-Peak

1. General Description

1.1. Applicant

Maestro Wireless Holdings Limited

FLAT A & B, 9/F, WING CHEONG FACTORY BUILDING, 121 KING LAM STREET, CHEUNG SHA WAN, HONG KONG

1.2. Manufacturer

Maestro Wireless Holdings Limited

FLAT A & B, 9/F, WING CHEONG FACTORY BUILDING, 121 KING LAM STREET, CHEUNG SHA WAN, HONG KONG

1.3. Product Feature of Equipment Under Test

Product Feature	
Equipment	4G WIFI Router
Brand Name	Maestro
Model Name	E228VZ
Marketing Name	E228 VZ
FCC ID	WN6-E228VZ
EUT supports Radios application	LTE/WLAN 2.4GHz 802.11b/g/n HT20/HT40
HW Version	V05
SW Version	V1.0.0
EUT Stage	Pre-Production

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4. Product Specification subjective to this standard

Product Specification subjective to this standard	
Tx Frequency	LTE Band 4 : 1711.5 MHz ~ 1753.5 MHz LTE Band 13 : 779.5 MHz ~ 784.5 MHz 802.11b/g/n: 2412 MHz ~ 2462 MHz
Rx Frequency	LTE Band 4 : 2111.5 MHz ~ 2153.5 MHz LTE Band 13 : 748.5 MHz ~ 753.5 MHz 802.11b/g/n: 2412 MHz ~ 2462 MHz
Antenna Type	WWAN : Dipole Antenna WLAN : Dipole Antenna
Type of Modulation	LTE: QPSK / 16QAM 802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)



1.5. Modification of EUT

No modifications are made to the EUT during all test items.

1.6. Test Location

Test Site	SPORTON INTERNATIONAL (SHENZHEN) INC.	
Test Site Location	No. 3 Building, the third floor of south, Shahe River west, Fengzeyuan warehouse, Nanshan District, Shenzhen, Guangdong, P. R. China TEL: +86-755- 3320-2398	
Test Site No.	Sporton Site No.	FCC Registration No.
	03CH01-SZ	831040

1.7. Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ FCC 47 CFR FCC Part 15 Subpart B
- ♦ ANSI C63.4-2009

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.

2. Test Configuration of Equipment Under Test

2.1. Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2009 and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

Frequency range investigated: radiation (30MHz to the 5th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

The following tables are showing the test modes as the worst cases and recorded in this report.

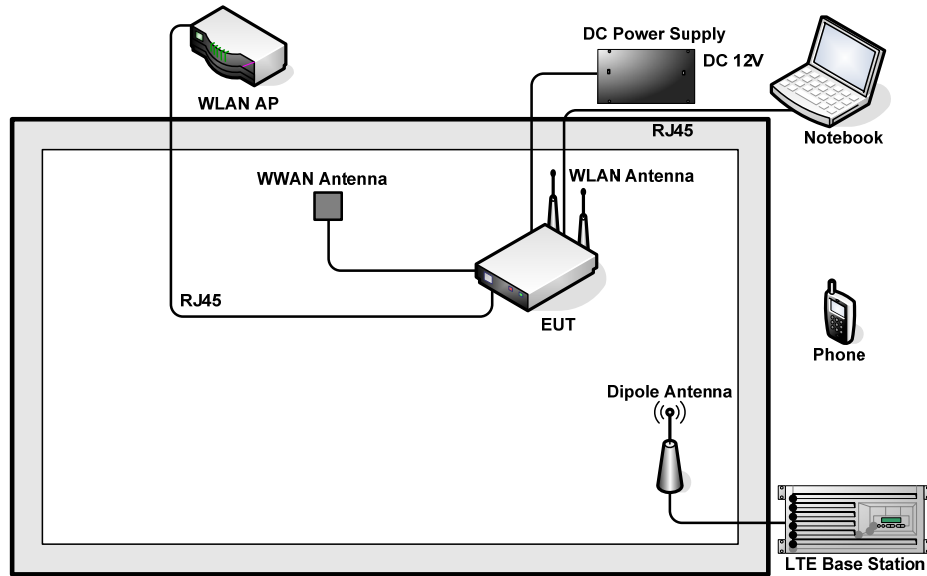
Item	EUT Configuration	Test Condition
		EMI RE
1.	Operating Mode	☒

Abbreviations:

- EMI RE: EUT radiated emissions

Test Items	EUT Configure Mode	Function Type
Radiated Emissions	1	Mode 1 : LTE Band 4 Idle + WLAN Idle + WAN Link + LAN Link + DC Power 12V

2.2. Connection Diagram of Test System



2.3. Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	LTE Base Station	Anritsu	M8820C	FCC DoC	N/A	Shielded, 1.5 m
2.	WLAN AP	D-Link	DIR-615	N/A	N/A	Unshielded, 1.8 m with Core
3.	WWAN Antenna	N/A	N/A	N/A	N/A	N/A
4.	WLAN Antenna	N/A	N/A	N/A	N/A	N/A
5.	Notebook	Lenovo	G480	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
6.	DC Power Supply	N/A	N/A	N/A	N/A	N/A
7.	Phone	BOSSINI	HDC133TSDL	FCC DoC	N/A	N/A

2.4. EUT Operation Test Setup

The EUT was in LTE idle mode during the testing. The EUT was synchronized to the BCCH, and is in continuous receiving mode by setting system simulator's paging reorganization.

The Notebook controls to data link with EUT and Router via RJ-45. Execute "Ping" and link with Notebook via RJ-45 Cable.

3. Test Result

3.1. Test of Radiated Emission Measurement

3.1.1. Limit of Radiated Emission

The emissions from an unintentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.1.2. Measuring Instruments

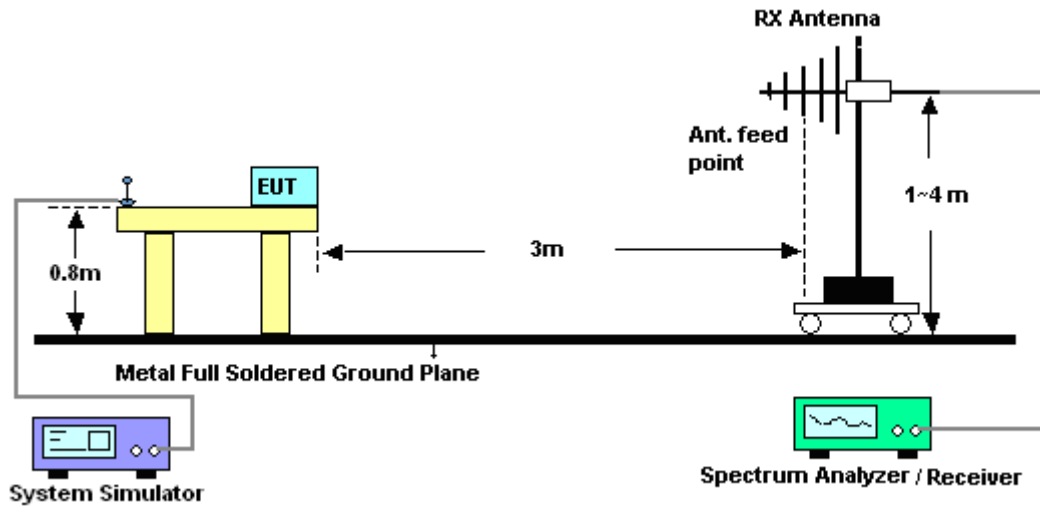
The measuring equipment is listed in the section 4 of this test report.

3.1.3. Test Procedures

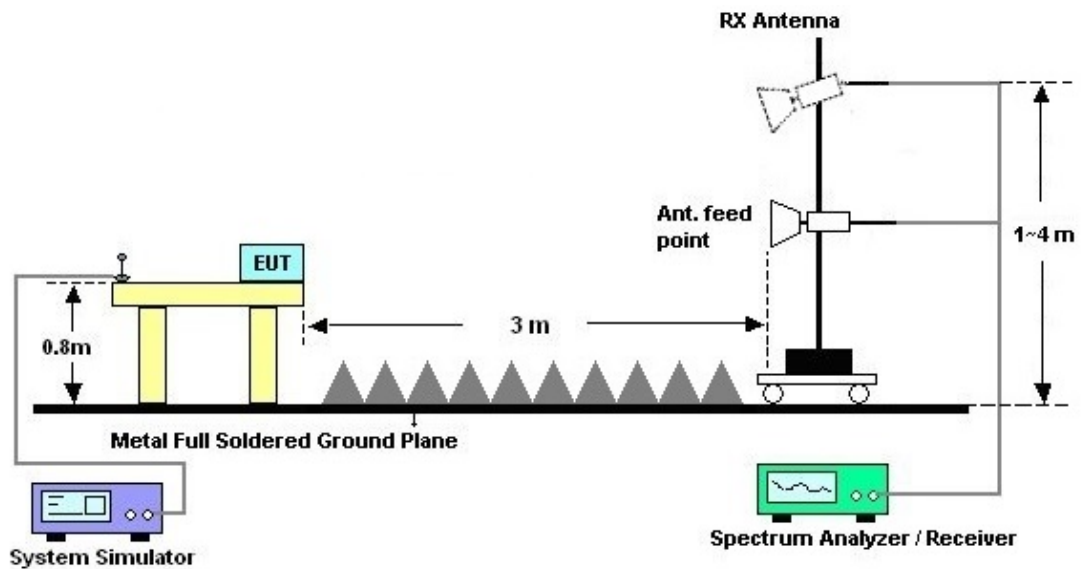
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna is a Bi-Log antenna and its height is adjusted between one to four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode (RBW=120kHz/VBW=300kHz for frequency below 1GHz; RBW=1MHz VBW=3MHz (Peak), RBW=1MHz/VBW=10Hz (Average) for frequency above 1GHz).
7. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, peak values of EUT will be reported. Otherwise, the emission will be repeated by using the quasi-peak method and reported.
8. Emission level (dBμV/m) = 20 log Emission level (μV/m)
9. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

3.1.4. Test Setup of Radiated Emission

For radiated emissions from 30MHz to 1GHz



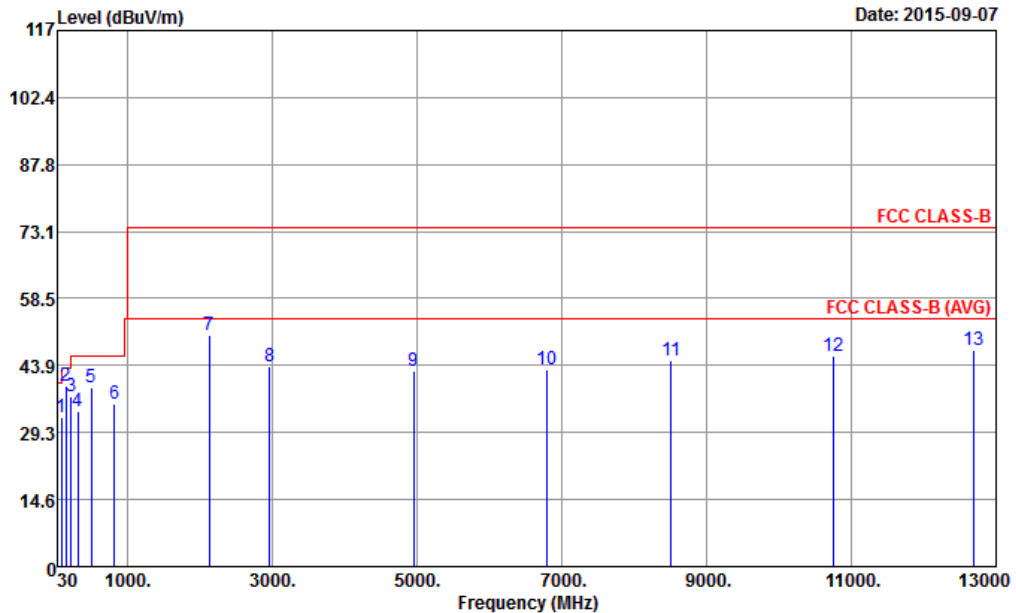
For radiated emissions above 1GHz





3.1.5. Test Result of Radiated Emission

Test Mode :	Mode 1	Temperature :	23~25°C
Test Engineer :	Leo Liao	Relative Humidity :	48~52%
Test Distance :	3m	Polarization :	Horizontal
Function Type :	LTE Band 4 Idle + WLAN Idle + WAN Link + LAN Link + DC Power 12V		
Remark :	#7 is system simulator signal which can be ignored.		

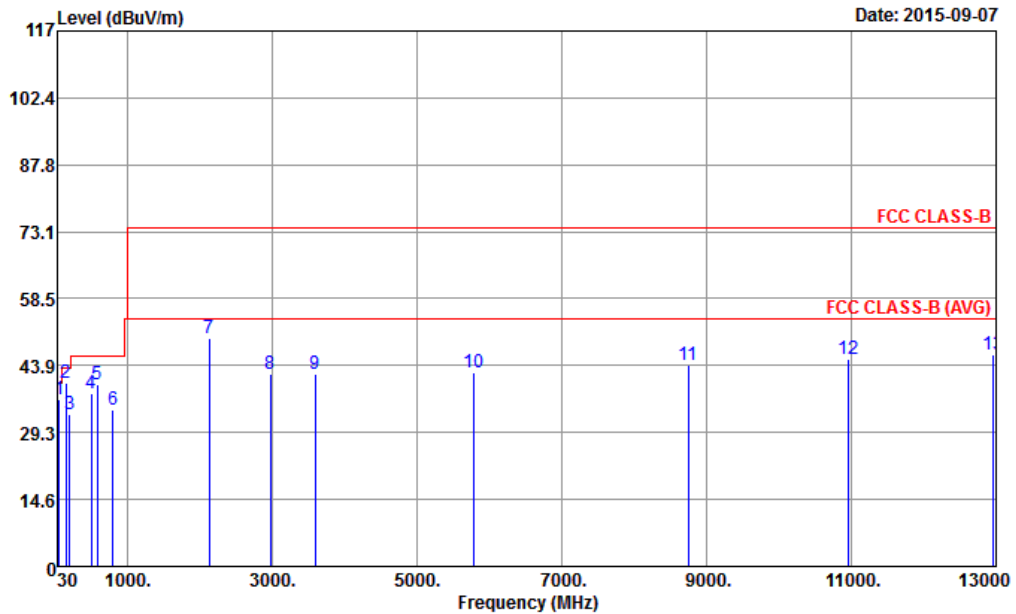


Site : 03CH01-SZ
Condition : FCC CLASS-B 3m LF_ANT_141107 HORIZONTAL
Project : (FC) 581706
Mode : Mode 1

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	cm	deg
1	85.62	32.75	-7.25	40.00	46.90	10.35	1.34	25.84	---	Peak
2	147.99	39.59	-3.91	43.50	50.11	13.17	1.83	25.52	100	20 QP
3	216.03	37.00	-9.00	46.00	48.13	11.86	2.23	25.22	---	Peak
4	314.00	34.00	-12.00	46.00	42.14	14.29	2.72	25.15	---	Peak
5	500.20	39.27	-6.73	46.00	42.56	19.40	3.65	26.34	---	Peak
6	816.60	35.55	-10.45	46.00	34.26	22.35	5.06	26.12	---	Peak
7	2132.00	50.54			37.29	32.34	10.18	29.27	---	Peak
8	2964.00	43.73	-30.27	74.00	26.83	33.07	12.75	28.92	---	Peak
9	4948.00	42.84	-31.16	74.00	21.25	34.47	15.30	28.18	---	Peak
10	6794.00	43.16	-30.84	74.00	17.70	36.18	16.69	27.41	---	Peak
11	8512.00	44.90	-29.10	74.00	16.77	36.22	18.09	26.18	---	Peak
12	10754.00	45.95	-28.05	74.00	13.80	38.66	18.34	24.85	---	Peak
13	12700.00	47.35	-26.65	74.00	13.74	39.18	18.63	24.20	100	260 Peak



Test Mode :	Mode 1	Temperature :	23~25°C
Test Engineer :	Leo Liao	Relative Humidity :	48~52%
Test Distance :	3m	Polarization :	Vertical
Function Type :	LTE Band 4 Idle + WLAN Idle + WAN Link + LAN Link + DC Power 12V		
Remark :	#7 is system simulator signal which can be ignored.		



Site : 03CH01-SZ
Condition : FCC CLASS-B 3m LF_ANT_141107 VERTICAL
Project : (FC) 581706
Mode : Mode 1

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	cm	deg	
			dB	dBuV/m	dBuV	dB/m	dB	dB		
1	60.24	36.53	-3.47	40.00	52.87	8.50	1.10	25.94	100	20 QP
2	143.94	40.06	-3.44	43.50	50.23	13.58	1.80	25.55	125	80 QP
3	199.29	33.09	-10.41	43.50	44.60	11.60	2.14	25.25	---	Peak
4	500.20	37.65	-8.35	46.00	40.94	19.40	3.65	26.34	---	Peak
5	580.00	39.75	-6.25	46.00	42.48	19.64	4.05	26.42	---	Peak
6	796.30	34.23	-11.77	46.00	33.04	22.41	4.96	26.18	---	Peak
7	2132.00	49.72			36.47	32.34	10.18	29.27	---	Peak
8	2974.00	42.04	-31.96	74.00	25.02	33.07	12.87	28.92	---	Peak
9	3590.00	41.89	-32.11	74.00	23.00	33.49	13.76	28.36	---	Peak
10	5774.00	42.46	-31.54	74.00	19.09	35.49	16.08	28.20	---	Peak
11	8748.00	44.09	-29.91	74.00	15.69	36.50	17.93	26.03	---	Peak
12	10954.00	45.24	-28.76	74.00	12.81	38.78	18.40	24.75	---	Peak
13	12960.00	46.38	-27.62	74.00	12.67	39.02	18.81	24.12	150 200	Peak



4. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Test Receiver&SA	Agilent Technologies	N9038A	MY52260185	20Hz~26.5GHz	May 26, 2015	Sep. 07, 2015	May 25, 2016	Radiation (03CH01-SZ)
Spectrum Analyzer	R&S	FSV40	101041	10kHz~40GHz; Max 30dBm	Sep. 25, 2014	Sep. 07, 2015	Sep. 24, 2015	Radiation (03CH01-SZ)
Bilog Antenna	TeseQ	CBL6112D	23188	30MHz~2GHz	Nov. 07, 2014	Sep. 07, 2015	Nov. 06, 2015	Radiation (03CH01-SZ)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00119436	1GHz~18GHz	Oct. 15, 2014	Sep. 07, 2015	Oct. 14, 2015	Radiation (03CH01-SZ)
Amplifier	ADVANTEST	BB525C	E9007003	9kHz~3000MHz / 30 dB	Jan. 28, 2015	Sep. 07, 2015	Jan. 27, 2016	Radiation (03CH01-SZ)
Amplifier	Yiai	AV3860B	04030	2GHz~26.5GHz	May 05, 2015	Sep. 07, 2015	May 04, 2016	Radiation (03CH01-SZ)
Amplifier	Agilent Technologies	83017A	MY39501302	500MHz~26.5G Hz	Jan. 28, 2015	Sep. 07, 2015	Jan. 27, 2016	Radiation (03CH01-SZ)
AC Power Source	Chroma	61601	61601000198 5	N/A	NCR	Sep. 07, 2015	NCR	Radiation (03CH01-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Sep. 07, 2015	NCR	Radiation (03CH01-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Sep. 07, 2015	NCR	Radiation (03CH01-SZ)



5. Uncertainty of Evaluation

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$)	3.9dB
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