

Prüfbericht-Nr.: Test report no.:	CN256HRY 001	Auftrags-Nr.: Order no.:	168552957	Seite 1 von 17 Page 1 of 17
Kunden-Referenz-Nr.: Client reference no.:	N/A	Auftragsdatum: Order date:	2025-05-08	
Auftraggeber: Client:	Shining 3D Tech Co., Ltd. No. 1398, Xiangbin Road, Wenyan, Xiaoshan, Hangzhou, Zhejiang, P.R. China			
Prüfgegenstand: Test item:	Smart Dock			
Bezeichnung / Typ-Nr.: Identification / Type no.:	FreeScan Omni Dock			
Auftrags-Inhalt: Order content:	Test Report			
Prüfgrundlage: Test specification:	CFR Title 47 FCC Part 15: Subpart E Section 15.407			
Wareneingangsdatum: Date of sample receipt:	2025-05-23	Please refer to Photo Document		
Prüfmuster-Nr.: Test sample no.:	A003996693-001-006 A003981962-001			
Prüfzeitraum: Testing period:	2025-06-17 - 2025-06-29			
Ort der Prüfung: Place of testing:	Shenzhen PSI Testing Co., Ltd.			
Prüflaboratorium: Testing laboratory:	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüfergebnis*: Test result*:	Pass			
geprüft von: tested by:			genehmigt von: authorized by:	
Datum: Date:	2025-11-09	Ausstellungsdatum: Issue date:		2025-11-09
	Signed by: Bell Hu			Signed by: Jonathan Li
Stellung / Position:	Sachverständige(r)/Expert		Stellung / Position:	Sachverständige(r)/Expert
Sonstiges / Other:	FCC ID: 2AMG4-FS7SD This device contains certificated Wi-Fi module (Mode: HLK-RM65, FCC ID: 2AD56HLK-RM65). It's under a new Certification application and the test data for conducted antenna port in this report is cited from the originally granted module, according to KDB 996369 D02 (b).			
Zustand des Prüfgegenstandes bei Anlieferung: Condition of the test item at delivery:	Prüfmuster vollständig und unbeschädigt Test item complete and undamaged			
* Legende:	P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet			
* Legend:	P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested			
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the above mentioned test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

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Anmerkungen
Remarks

1	Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben. Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden. <i>The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.</i>
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3	Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt. <i>Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report.</i> <i>Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</i>
4	Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnissen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2023, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezüglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019. <i>The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance with ILAC G8:2019 and IEC Guide 115:2023, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019.</i>

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Test Summary

5.1.1 ANTENNA REQUIREMENT

RESULT: Pass

5.1.2 RADIATED SPURIOUS EMISSION

RESULT: Pass

5.1.3 CONDUCTED EMISSION ON AC MAINS

RESULT: Pass

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1 General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A: Test Results

Appendix B: Photographs of the Test Set-up

2 Test Sites

2.1 Test Facilities

Shenzhen PSI Testing Co., Ltd.

1-2F, Building 5, Yudafu Industrial Park, No.10, Xingye West Road, Shajing Street, Bao'an District, Shenzhen, Guangdong, China 518104

Registration number: CNAS L19010

A2LA CAB identifier: CN0158

Note: TÜV Rheinland (Shenzhen) Co., Ltd. subcontracts the whole test to Shenzhen PSI Testing Co., Ltd., the tests at the test sites have been conducted under the supervision of a TÜV engineer.

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Firmware Version	Last Cal.	Cal. Interval
1.	9*6*6 anechoic chamber	SKET	9*6*6	N/A	/	2023.12.20	3 Year
2.	Test Receiver	Rohde&Schwarz	ESCI 7	101032/003	4.42 SP3	2024.12.18	1 Year
3.	L.I.S.N.#1	Rohde&Schwarz	ENV216	102282	/	2024.12.18	1 Year
4.	L.I.S.N.#2	RFT	NNB111	13835240	/	2024.12.18	1 Year
5.	Loop Antenna	Schwarz beck	FMZB 1519B	00128	/	2025.01.02	2 Year
6.	Bilog Antenna	Schwarz beck	VULB 9168	01448	/	2025.01.02	2 Year
7.	Spectrum Analyzer	Rohde&Schwarz	FSV-40N	101648	3.70	2024.12.18	1 Year
8.	Horn Antenna	Schwarz beck	BBHA 9120 D	02706	/	2025.01.02	2 Year
9.	Amplifier	SKET	LAPA_01G18G-45dB	SK2022032901	/	2024.12.18	1 Year
10.	Horn Antenna	Schwarz beck	BBHA 9170	00946	/	2024.12.31	2 Year
11.	Amplifier	SKET	LNPA_0118G-45	SK2020010801	/	2024.12.18	1 Year
12.	RF Power Probe	Rohde&Schwarz	NRP-Z11	1138.3004.02-117725-vh	/	2024.12.18	1 Year
13.	RF Power Probe	Rohde&Schwarz	NRP-Z11	1138.3004.02-1111533-Fz	/	2024.12.18	1 Year
14.	Vector Signal Generator	Agilent	N5182A	MY47420724	/	2024.12.18	1 Year
15.	Analog signal generator	Agilent	N5181A	MY50145363	/	2024.12.18	1 Year
16.	Comprehensive Test Instrument	Rohde&Schwarz	CMW 500	145266	/	2024.12.18	1 Year
17.	Spectrum Analyzer	Agilent	N9020A	MY51281067	A.14.03	2024.12.18	1 Year
18.	Temp. & Humid Chamber	Auchno	9606	/	/	2024.12.18	1 Year
19.	Regulated DC Power Supply	Xinouhua	ADC120V10A	202211251638		2024.12.18	1 Year

For Power Line Conducted Emission Test Equipment:

Item	Equipment	Manufacturer	Model No.	Serial No.	Firmware Version	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde&Schwarz	ESCI 7	101032/003	4.42 SP3	2024.12.18	1 Year
2.	L.I.S.N.	Rohde&Schwarz	ENV 216	102282	/	2024.12.18	1 Year

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3.	L.I.S.N.	RFT	NNB111	13835240	/	2024.12.18	1 Year
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For Test Software Information

Item	Software Name	Manufacturer	Version
RE	EMC-I	Farad	PSI-3A1
RF	RTS	TACHOY	V1.0.0
CE	EZ-EMC	Farad	PSI-3A1

2.3 Traceability

All measurement equipment calibrations are traceable to NIM (National Institute of Metrology) or where calibration is performed in other countries, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements as below table.

Table 2: Measurement Uncertainty

Test Item	Uncertainty
Uncertainty for Power point Conducted Emissions Test	2.17dB
Uncertainty for Radiation Emission test in 3m chamber (below 30MHz)	3.5dB
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	2.74dB(Polarize: V)
	2.76dB(Polarize: H)
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz)	4.29dB(Polarize: V)
	4.82dB(Polarize: H)
Uncertainty for radio frequency	48.24kHz
Uncertainty for conducted RF Power	0.41dB

2.6 Location of Original Data

The original copies of all test data taken during actual testing were attached at Appendix A & B of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) Co., Ltd. File for certification follow-up purposes.

2.7 Status of Facility Used for Testing

The Shenzhen PSI Testing Co., Ltd. Test facility located at 1-2F, Building 5, Yudafu Industrial Park, No.10, Xingye West Road, Shajing Street, Bao'an District, Shenzhen, Guangdong, China 518104 is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

3 General Product Information

3.1 Product Function and Intended Use

The Product is a Smart Dock which supports 5GHz Wi-Fi wireless technology.

This device contains certificated Wi-Fi module (Mode: HLK-RM65, FCC ID: 2AD56HLK-RM65). It's under a new Certification application and the test data for conducted antenna port in this report is cited from the originally granted module (FCC Test report: LGT25C210RF06), according to KDB 996369 D02 (b).

For details refer to the User Manual, Technical Description and Circuit Diagram.

The antenna changed to accommodate the module into the product, details as below

Items	Antenna information	Remark
Wi-Fi Module (HLK-RM65)	Antenna: (Refer to the module reports) 5150 MHz ~ 5250 MHz: 4.69 dBi 5725 MHz ~ 5850 MHz: 1.14 dBi	1. It verified that there are no evident variations on RF conducted signals for 5GHz Wi-Fi, the conducted power for each antenna port kept in matching with original module.
Smart Dock (The current product)	Antenna: (provided by the client) 5150 MHz ~ 5250 MHz: 2.3 dBi 5725 MHz ~ 5850 MHz: 2.3 dBi	2. Comparing with the module antennas, the maximum gains for all the antennas get lower. 3. To guarantee the compliance, the RSE were re-tested and reported, as for other test items, please refer the module report LGT25C210RF06. 4. The bands 2.4GHz Wi-Fi (2412-2462MHz) and 5GHz Wi-Fi (U-NII-2A and U-NII-2C) were blocked, not open to public when integrated into Smart Dock.

Test Summary

Items	Remark
Antenna Requirement	Refer to section 5.1.1
Maximum Conducted Output Power	Refer to the original module report LGT25C210RF06
Conducted Power Spectral Density	
26dB Bandwidth and 99% Bandwidth	
6% Bandwidth	
DYNAMIC FREQUENCY SELECTION (DFS)	N/A, this device has no DFS band
Radiated Spurious Emission	Refer to section 5.1.2
AC Conducted Emission	Refer to section 5.1.3

3.2 Ratings and System Details

Table 3: Technical Specification of EUT

General Information of EUT	Value
Kind of Equipment:	Smart Dock
Type Designation:	FreeScan Omni Dock
Operating Voltage:	DC 24V/4A from the Adapter
Test Voltage:	AC 120V, 60Hz
Operating Temperature Range:	-10 °C ~ +40 °C
FCC ID:	2AMG4-FS7SD
Technical Specification of 5GHz Wi-Fi	
Operating Frequency:	5180-5240MHz, 5745-5825MHz
Protocol:	802.11 a/n20/n40/ac20/ac40/ac80/ax20/ax40/ax80
Channel Number:	5180-5240MHz, 7CHs 5745-5825MHz, 8CHs
Type of Modulation:	OFDMA(BPSK/QPSK/16QAM/64QAM/256QAM/1024QAM)
Data Rate:	6/9/12/18/24/36/48/54 Mbps for 802.11a MCS0 ~ MCS7 for 802.11n MCS0 ~ MCS9 for 802.11ac MCS0 ~ MCS11 for 802.11ax* *Only Full RU mode supported for 802.11ax.
Channel Separation:	20MHz, 40MHz, 80MHz
TX Power Control (TPC):	Not Support
Antenna Type:	Integral Antennas
Antenna Systems:	2Tx2RX, No beamforming
Antenna Gain:	2.3 dBi for ANT1/ANT2 (Provided by the Client)

Note: The correctness of all data provided by customer in the test report is ensured and responsible of the customer. Any misjudgment of the test results caused by the use of incorrect data provided by customer shall be borne by the customer.

Table 4: RF Channel and Frequency of 5GHz Wi-Fi

U-NII-1					
20MHz Bandwidth		40MHz Bandwidth		80MHz Bandwidth	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	38	5190	42	5210
40	5200	46	5230		
44	5220				
48	5240				

U-NII-3					
20MHz Bandwidth		40MHz Bandwidth		80MHz Bandwidth	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	151	5755	155	5775
153	5765	159	5795		
157	5785				
161	5805				
165	5825				

3.3 Independent Operation Modes

The basic operation modes are:

- A. On, 5G Wi-Fi wireless transmitting mode
 - 1. Low channel
 - 2. Middle channel
 - 3. High channel
- B. On, Normal working
- C. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

- Application Form
- User Manual
- Operation Description
- ID Label and Location Info

4 Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

Radio Spectrum: The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5. All tests were performed according to the procedures in ANSI C63.10:2020.

4.3 Special Accessories and Auxiliary Equipment

Table 5: List of Accessories and Auxiliary Equipment

Description	Manufacturer	Model	Remark
Notebook PC(RF)	Dell	Latitude 3490	2TJSXR2
Notebook PC(EMC)	MSI	MS-1583	N/A
USB Disk	Netac	U280 32G	N/A
RJ 45 cable	N/A	N/A	N/A
USB cable	N/A	N/A	N/A
Switching Power Adapter	FSP GROUP INC.	FSP120-AAAN3	Output: DC 24.0V/5.0A

4.4 Countermeasures to Achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Technical Construction File (TCF).

No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

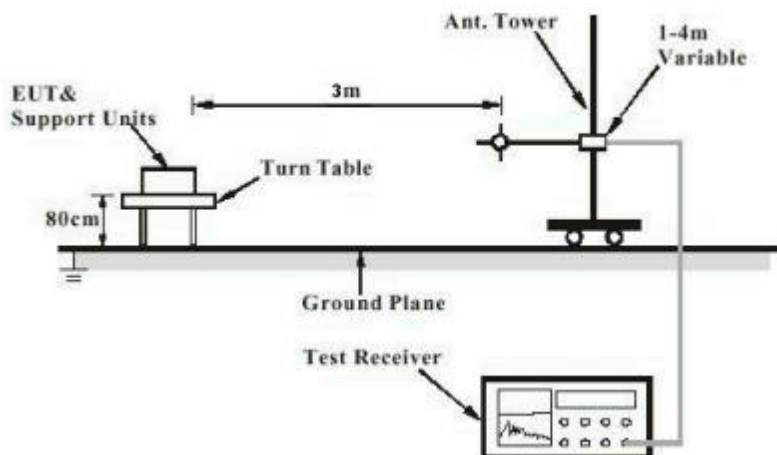


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)

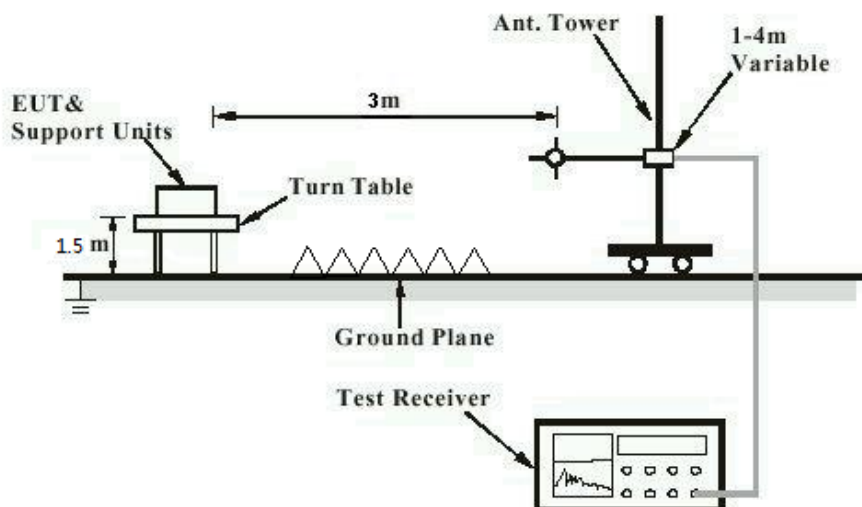


Diagram of Measurement Configuration for Mains Conduction Measurement

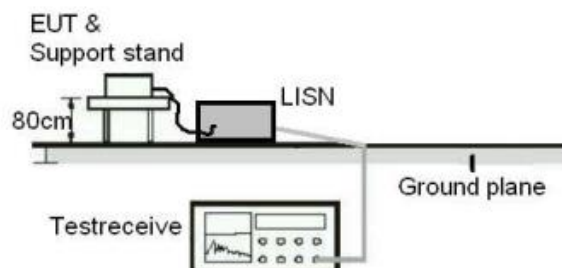
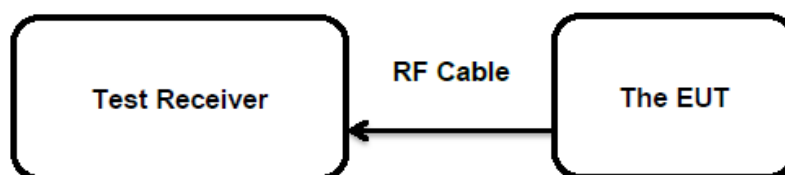


Diagram of Measurement Configuration for Conducted Transmitter Measurement



5 Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT:

Pass

Test Specification

Test standard : FCC Part 15.203

According to the manufacturer declared, the EUT has Integral Antennas, permanent attachment and no consideration of replacement, refer to section 3.2 for details.

Therefore, the EUT is considered sufficient to comply with the provision.

Refer to EUT Photo for further details.

5.1.2 Radiated Spurious Emission

RESULT:**Pass****Test Specification**

Test standard	: FCC Part 15.407(b) & FCC Part 15.205 & FCC Part 15.209
Basic standard	: ANSI C63.10:2020 KDB 789033 D02 v01r03
Limits	: • For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz. • For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz. • For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz. Emissions outside the band 5470-5600 MHz and 5650-5725 MHz shall not exceed -27 dBm/MHz e.i.r.p. • For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge. • Restricted Bands meet the requirement of 15.209 limit
Kind of test site	: 3m Semi-anechoic Chamber

Test Setup

Date of testing	: 2025-06-28 to 2025-06-29
Input voltage	: AC 120V, 60Hz
Operation mode	: A
Test channel	: Low / Middle / High
Ambient temperature	: Refer to test result
Relative humidity	: Refer to test result
Atmospheric pressure	: Refer to test result

Remark:

Testing was carried out within frequency range 9kHz to the tenth harmonics. Only the worst case spurious emissions configuration of the each mode were reported.

For the measurement records, refer to the appendix A.

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5.1.3 Conducted Emission on AC Mains

RESULT:

Pass

Test Specification

Test standard	: FCC Part 15.207(a)
Basic standard	: ANSI C63.10:2020
Frequency range	: 0.15 – 30MHz
Limits	: FCC Part 15.207(a)
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 2025-06-17
Input voltage	: AC 120V, 60Hz
Operation mode	: B
Ambient temperature	: Refer to test result
Relative humidity	: Refer to test result
Atmospheric pressure	: Refer to test result

For the measurement records, refer to the appendix A.

6 Photographs of the Test Set-Up

For photographs of the test set-up, refer to the appendix B.

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