TEST REPORT

No. I22Z60667-EMC10

for

Honor Device Co., Ltd.

Smart Phone

Model Name: VNE-N41

With

FCC ID: 2AYGCVNE-N41

Hardware Version: HN2VNEM

Software Version: 4.2.0.55(C900E55R1P1)

Issued Date: 2022-06-15

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of CTTL.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S.Government.

Test Laboratory:

CTTL, Telecommunication Technology Labs, CAICT

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I22Z60667-EMC10	Rev.0	1st edition	2022-06-15

Note: the latest revision of the test report supersedes all previous version.

CONTENTS

1. Test Laboratory

1.1. Introduction & Accreditation

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2005 accredited test laboratory under NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM (NVLAP) with lab code 600118-0 and is also an FCC accredited test laboratory (CN5017), and ISED accredited test laboratory (CN0066). The detail accreditation scope can be found on NVLAP website.

1.2. Testing Location

CTTL(BDA)

Address: No.18A, Kangding Street, Beijing Economic-Technology Development Area, Beijing, P. R. China 100176

1.3. Testing Environment

Normal Temperature: 15-35℃

Relative Humidity: 20-75%

1.4. Project Data

Testing Start Date: 2022-04-27

Testing End Date: 2022-05-24

1.5. Signature

An Hui

(Prepared this test report)

Zhang Ying

(Reviewed this test report)

Zhang Xia

(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name:	Honor Device Co., Ltd.
Address /Post:	Suite 3401,Unit A,Building 6,Shum Yip Sky Park,No.8089,Hongli West Road,Xiangmihu Street,Futian District,Shenzhen,Guangdong 518040,People's Republic of China
Contact	/
Email:	/
Telephone:	/

2.2. Manufacturer Information

Company Name:	Honor Device Co., Ltd.
Address /Post:	Suite 3401,Unit A,Building 6,Shum Yip Sky Park,No.8089,Hongli West Road,Xiangmihu Street,Futian District,Shenzhen,Guangdong 518040,People's Republic of China
Contact	/
Email:	/
Telephone:	/

3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Description	Smart Phone
Model Name	VNE-N41
FCC ID	2AYGCVNE-N41

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of CTTL.

3.2. Internal Identification of EUT used during the test

EUT ID*	IMEI	HW Version	SW Version
EUT1	864258060052015/864258060066486	HN2VNEM	4.2.0.55(C900E55R1P1)
EUT2	864258060053864/864258060068334	HN2VNEM	4.2.0.55(C900E55R1P1)
EUT3	864258060054466/864258060068938	HN2VNEM	4.2.0.55(C900E55R1P1)
EUT4	864258060054391/864258060068862	HN2VNEM	4.2.0.55(C900E55R1P1)

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE used during the test

AE ID*	Description	Note
AE1-1	Adapter	HN-100225U00 (Salcomp)
AE1-2	Adapter	HN-100225E00 (Salcomp)
AE1-3	Adapter	HW-100225U00 (Huntkey)
AE1-4	Adapter	HW-100225E00 (Huntkey)
AE1-5	Adapter	HW-100225B00 (Huntkey)
AE2-1	USB Cable	CUDU01B-HC451 -EH (FF)
AE2-2	USB Cable	AU2-CRO013 HF (LJ)
AE2-3	USB Cable	L125UC007-CS-H (LX)
AE2-4	USB Cable	2120-00001-0 (MG)
AE2-5	USB Cable	RY0002 (NB)
AE3-1	Headset	1293-3283-3.5mm-339
AE3-2	Headset	EPAB542-2WH05-DH
AE3-3	Headset	MEND1532B528A11
AE4-1	Battery	HB496590EFW（SCUD）
AE4-2	Battery	HB496590EFW-F（SCUD）
AE4-3	Battery	HB496590EFW（NVT）
AE4-4	Battery	HB496590EFW-F（NVT）

*AE ID: is used to identify the test sample in the lab internally.

3.4. General Description

Test combination

EUT set-up No.	Combination of EUT and AE	Remarks
Set.1-1	EUT1 + AE1-2 + AE2-1+AE3-1	EUT1+CHANGING+Heaset1

4. Reference Documents

4.1. Documents supplied by applicant

EUT parameters, referring to Annex A for detailed information, is supplied by the client or manufacturer, which is the basis of testing.

4.2. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part 27	MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES	10-1-20 Edition
ANSI/TIA-603-E	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards	2016
ANSI C63.26	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services	2015
KDB 971168 D01	MEASUREMENT GUIDANCE FOR CERTIFICATION OF LICENSED DIGITAL TRANSMITTERS	v03r01

5. Laboratory Environment

Semi-anechoic chamber (22.6 meters × 13.6 meters × 11.0 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ˚C, Max. = 35 ˚C
Relative humidity	Min. = 15 %, Max. = 75 %
Shielding effectiveness	0.014MHz - 1MHz, >60dB; 1MHz - 1000MHz, >90dB.
Electrical insulation	> 2 M
Ground system resistance	< 4 Ω
Site voltage standing-wave ratio (S_{VSWR})	Between 0 and 6 dB, from 1GHz to 18GHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 4000 MHz

6. Summary Of Test Result

5G NR n7

Items	Test Name	Clause in FCC rules	Verdict
1	Emission Limit	2.1051/27.53	P

5G NR n38

Items	Test Name	Clause in FCC rules	Verdict
1	Emission Limit	2.1051/27.53	P

5G NR n41

Items	Test Name	Clause in FCC rules	Verdict
1	Emission Limit	2.1051/27.53	P

Terms used in Verdict column

P	Pass. The EUT complies with the essential requirements in the standard.
NP	Not Performed. The test was not performed by CTTL.
NA	Not Applicable.The test was not applicable.
BR	Re-use test data from basic model report.
F	Fail. The EUT does not comply with the essential requirements in the standard.

Explanation of worst-case configuration
NR modulation: DFT-s-OFDM pi/2 BPSK; QPSK; 16QAM; 64QAM; 256QAM
CP-OFDM QPSK; 16QAM; 64QAM; 256QAM
NR BW: 5/20MHz/100MHz
The test results provided in this report represent the worst case configuration.

7. Test Equipment Utilized

Description	Type	Series Number	Manufacture	Cal Due Date	Calibration Interval
Universal Radio Communication Tester	MT8821C	6262257899	Anritsu	2023-05-15	1 year
Universal Radio Communication Tester	MT8000A	6262261933	Anritsu	2023-05-15	1 year
Spectrum Analyzer	E4440A	MY48250642	Agilent	2023-03-10	1 year
EMI Antenna	LB7180-NF	J203001300005	A-INFO	2023-02-23	1 year
Semi-anechoic chamber	FACT10-3.0	/	ETS	2024-03-25	3 years
EMI Antenna	VULB9163	9163-482	Schwarzbeck	2022-11-16	1 year
EMI Antenna	3117	00058889	ETS-Lindgren	2022-11-07	1 year
H-field Antenna	HFH2-Z2	829324/007	R&S	2022-12-23	1 year
Signal Generator	N5183A	MY49060052	Agilent	2022-07-11	1 year

Annex A: Measurement Results-Emission Limit

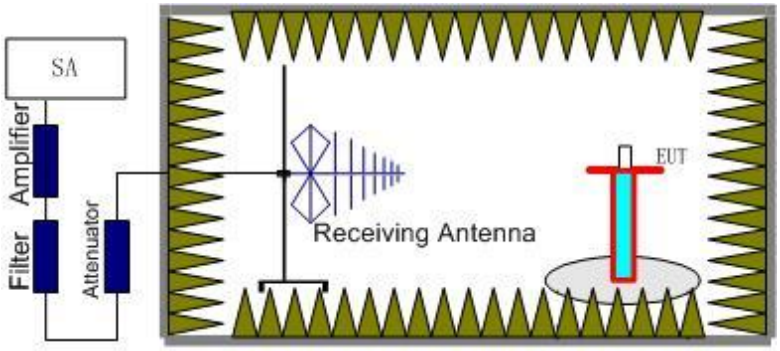
A.1 Measurement Method

The measurements procedures in TIA-603E-2016 are used. This measurement is carried out in fully anechoic chamber FAC-3.

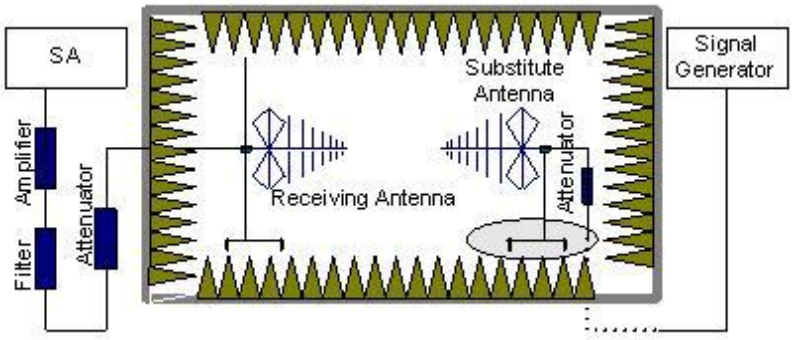
The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier. The spectrum was scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of each 5G NR Band.

The procedure of radiated spurious emissions is as follows:

1. EUT was placed on a 1.5-meter-high non-conductive stand at a 3-meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.5m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT through 360 and adjusting the receiving antenna polarization. The radiated emission measurements of all non-harmonic and harmonics of the transmit frequency through the 10th harmonic were measured with peak detector.



2. The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded as (Pr).
3. The EUT shall be replaced by a substitution antenna. The test setup refers to figure below.



In the chamber, a substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (P_{Mea}) is applied to the input of the

substitution antenna. Adjust the level of the signal generator output until the value of the receiver reaches the previously recorded (P_r). The power of signal source (P_{Mea}) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

4. The Path loss (P_{pl}) between the Signal Source with the Substitution Antenna and the Substitution Antenna Gain (G_a) should be recorded after test.
   An amplifier should be connected in for the test.
   The Path loss (P_{pl}) is the summation of the cable loss and the gain of the amplifier.
   The measurement results are obtained as described below:
   Power (EIRP)=P_{Mea} + P_{pl} + G_a
5. This value is EIRP since the measurement is calibrated using an antenna of known gain (unit: dBi) and known input power.
6. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP - 2.15dB.

A.2 Measurement Limit

Part 24.238 specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

Part 27.53(h) specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

Part 22.917 specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

Part 27.53(m) specifies for mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

Part 27.53(g) states for operations in the 600 MHz band and the 698–746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

Part 90.691 states that out-of-band emission requirement shall apply only to the ''outer'' channels included in an EA license and to spectrum adjacent to interior channels used by incumbent

licensees. The emission limits are as follows:For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116\text{Log}_{10}(f/6.1)$ decibels or 50 + 10 $\text{Log}_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz. For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + $10\text{Log}_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

Part 22.917 specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

A.3 Sweep Table

Working Frequency	Subrange (GHz)	RBW	VBW
5G NR SA n7, 5G NR SA n38, 5G NR SA n41	0.0000009-0.000015	0.2kHz	0.6kHz
	0.000015-0.03	9kHz	27kHz
	0.03~1	100kHz	300kHz
	1-40	1 MHz	3 MHz

A.4 Measurement Results

Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of each 5G NR Band. It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of each 5G NR Band into any of the other blocks. The equipment must still, however, meet emissions requirements with the carrier at all frequencies over which it is capable of operating and it is the manufacturer's responsibility to verify this.

All mode of operation were investigated and the worst case configuration results are reported in this section.

The range of evaluated frequency is from 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz(chose the lower). Measurement value show only up to 6 maximum emissions noted.

Test combination

5G NR SA

5G NR Band	ANT NO.	**Result**
n7	ANT 1, ANT 2	Pass
n38	ANT 5, ANT 3, ANT 1, ANT 2	Pass
n41	ANT 5, ANT 3, ANT 1, ANT 2	Pass

*For the test results,the combination in the above table had been tested.But only the worst cases were shown in test report.

Set.1-1, ANT1

5G NR SA n7, 5MHz, DFT-QPSK, Channel 500500

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5033.01	-59.05	6.58	9.95	-55.68	-25.00	30.68	H
7487.01	-53.29	8.36	12.18	-49.47	-25.00	24.47	V
10012.01	-52.52	9.21	12.90	-48.83	-25.00	23.83	H
12486.00	-47.84	10.21	13.19	-44.86	-25.00	19.86	V
15006.00	-42.48	11.22	14.00	-39.70	-25.00	14.70	H
17521.00	-38.90	12.80	14.93	-36.77	-25.00	11.77	H

5G NR SA n7, 5MHz, DFT-QPSK, Channel 507000

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
4977.01	-58.82	6.64	9.88	-55.58	-25.00	30.58	V
7483.01	-53.80	8.35	12.18	-49.97	-25.00	24.97	V
10011.01	-52.24	9.21	12.90	-48.55	-25.00	23.55	V
12521.00	-48.30	10.23	13.21	-45.32	-25.00	20.32	H
15014.00	-43.02	11.23	13.99	-40.26	-25.00	15.26	H
17533.00	-39.74	12.85	14.95	-37.64	-25.00	12.64	H

5G NR SA n7, 5MHz, DFT-QPSK, Channel 513500

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5132.01	-58.65	6.85	10.08	-55.42	-25.00	30.42	V
7706.01	-54.05	8.42	12.36	-50.11	-25.00	25.11	V
10287.01	-50.13	9.60	13.01	-46.72	-25.00	21.72	V
12830.00	-46.99	10.69	13.40	-44.28	-25.00	19.28	H
15381.00	-43.75	11.37	13.77	-41.35	-25.00	16.35	V
17999.00	-40.99	12.90	15.60	-38.29	-25.00	13.29	H

Note:The measurement results showed here are worst cases.

Set.1-1, ANT5

5G NR SA n38, 20MHz, DFT-QPSK, Channel 516000

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5143.01	-55.38	6.87	10.10	-52.15	-25.00	27.15	V
7716.01	-54.84	8.40	12.37	-50.87	-25.00	25.87	V
10295.01	-50.11	9.63	13.02	-46.72	-25.00	21.72	V
12873.00	-47.16	10.58	13.42	-44.32	-25.00	19.32	V
15432.00	-43.67	11.44	13.74	-41.37	-25.00	16.37	V
17995.00	-40.41	12.90	15.59	-37.72	-25.00	12.72	H

5G NR SA n38, 20MHz, DFT-QPSK, Channel 519000

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5171.01	-53.47	6.91	10.14	-50.24	-25.00	25.24	V
7763.01	-54.89	8.34	12.41	-50.82	-25.00	25.82	V
10342.01	-49.99	9.71	13.04	-46.66	-25.00	21.66	V
12957.00	-47.15	10.48	13.47	-44.16	-25.00	19.16	H
15538.00	-43.73	11.52	13.70	-41.55	-25.00	16.55	V
16863.00	-39.85	12.04	13.75	-38.14	-25.00	13.14	V

5G NR SA n38 20MHz, DFT-QPSK, Channel 522000

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5202.01	-49.83	6.96	10.18	-46.61	-25.00	21.61	H
7806.01	-44.53	8.30	12.44	-40.39	-25.00	15.39	H
10355.01	-49.65	9.73	13.04	-46.34	-25.00	21.34	H
12944.00	-47.01	10.49	13.47	-44.03	-25.00	19.03	H
15536.00	-43.83	11.52	13.70	-41.65	-25.00	16.65	H
16871.00	-38.94	12.03	13.75	-37.22	-25.00	12.22	H

Note:The measurement results showed here are worst cases.

Set.1-1, ANT3

5G NR SA n41, 20MHz, DFT-QPSK, Channel 501204

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
4994.01	-51.19	6.61	9.89	-47.91	-25.00	22.91	V
7458.01	-52.92	8.28	12.15	-49.05	-25.00	24.05	V
9990.01	-53.13	9.17	12.91	-49.39	-25.00	24.39	V
12476.00	-48.23	10.24	13.19	-45.28	-25.00	20.28	V
14992.00	-43.51	11.21	14.01	-40.71	-25.00	15.71	H
17446.00	-38.87	12.60	14.78	-36.69	-25.00	11.69	H

5G NR SA n41, 20MHz, DFT-QPSK, Channel 518598

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5169.01	-50.18	6.91	10.14	-46.95	-25.00	21.95	V
7802.01	-54.87	8.29	12.44	-50.72	-25.00	25.72	V
10357.01	-50.05	9.73	13.04	-46.74	-25.00	21.74	V
12982.00	-47.32	10.47	13.49	-44.30	-25.00	19.30	H
15543.00	-43.50	11.51	13.70	-41.31	-25.00	16.31	H
16843.00	-40.08	12.06	13.74	-38.40	-25.00	13.40	V

5G NR SA n41, 20MHz, DFT-QPSK, Channel 5235998

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5343.01	-48.62	6.95	10.38	-45.19	-25.00	20.19	V
8001.01	-53.81	8.32	12.60	-49.53	-25.00	24.53	V
10703.00	-50.40	9.31	13.14	-46.57	-25.00	21.57	H
13365.00	-44.18	10.57	14.01	-40.74	-25.00	15.74	V
16049.00	-43.06	11.84	13.69	-41.21	-25.00	16.21	H
17383.00	-38.89	12.48	14.64	-36.73	-25.00	11.73	H

Note:The measurement results showed here are worst cases.

Annex B: Accreditation Certificate

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

ilac-MRA

Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 600118-0

Telecommunication Technology Labs, CAICT
Beijing
China

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Electromagnetic Compatibility & Telecommunications

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2020-09-29 through 2021-09-30
Effective Dates

DEPARTMENT OF COMMERCE · UNITED STATES OF AMERICA

For the National Voluntary Laboratory Accreditation Program

*****END OF REPORT*****