



Microtest
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Test Report

Report No.: MTi231127005-01E4

Date of issue: 2024-03-19

Applicant: C-NOVO Technology CO.,LTD.

Product: Portable Navigation Device

Model(s): RQ-G8, RQ-G10, RQ-G10W, HC-3566, DPLAY

Shenzhen Microtest Co., Ltd.

<http://www.mtitest.com>

Instructions

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3. This test report is invalid without the seal and signature of the laboratory.
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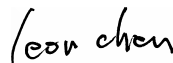
Test Result Certification	
Applicant:	C-NOVO Technology CO.,LTD.
Address:	F/4, Building A4, Xinjianxing Industrial Park, Fengxin Road, Guangming District, Shenzhen, China(518000)
Manufacturer:	C-NOVO Technology CO.,LTD.
Address:	F/4, Building A4, Xinjianxing Industrial Park, Fengxin Road, Guangming District, Shenzhen, China(518000)
Product description	
Product name:	Portable Navigation Device
Trademark:	RoadQuest,DreamMaker
Model name:	RQ-G8
Series Model:	RQ-G10, RQ-G10W, HC-3566, DPLAY
Standards:	Article 2, Paragraph 1, Item 78
Test Standards:	MIC Notice No.88 Appendix No.45.
Date of Test	
Date of test:	2024-01-05 to 2024-03-19
Test result:	Pass

Test Engineer :



(Yanice Xie)

Reviewed By :



(Leon Chen)

Approved By :



(Tom Xue)

1 General Description

1.1 Description of EUT

Product name:	Portable Navigation Device
Model name:	RQ-G8
Series Model:	RQ-G10, RQ-G10W, HC-3566, DPLAY
Model difference:	All the models are the same circuit and module, except the model name.
Accessories:	Input:DC 5V/2A
Electrical rating:	Car charger: Input:DC 12V/24V,2A Output:DC 5V/2A
Hardware version:	HC-3566-V1.2
Software version:	Android 13
Test sample(s) number:	MTi231127005-01S1001
RF specification	
Operating frequency range:	802.11a/ac20/n20/n40/ac40/ac80: 5180MHz~5240MHz
Modulation type:	OFDM
Antenna(s) information:	Antenna type: FPC Antenna Antenna gain: 1.81 dBi

1.2 Description of test modes

1.2.1 Operation channel list

Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220
38	5190	46	5230
40	5200	48	5240
42	5210		

Test Channel List

Operation Band: 1

Bandwidth (MHz)	Lowest Channel (LCH) (MHz)	Middle Channel (MCH) (MHz)	Highest Channel (HCH) (MHz)
20	5180	5200	5240
40	5190	/	5230
80	/	5210	/

Test Software:

For power setting, refer to below table.

Mode	5180 MHz	5200 MHz	5240 MHz
802.11a	60	61	60
802.11ac20	60	60	60
802.11n20	60	60	60
	5190 MHz	/	5230 MHz
802.11ac40	58	/	56
802.11n40	55	/	54
	/	5210 MHz	/
802.11ac80	/	51	/

```

ca 管理员: 命令提示符 - adb shell
rk3566_t:/data # ./rtwpriv wlan0 mp_bandwidth 40M=1,shortGI=0
ifname = wlan0
input = mp_bandwidth 40M=1,shortGI=0
wlan0 mp_bandwidth:No change current BW 1
rk3566_t:/data # ./rtwpriv wlan0 mp_ant_tx a
ifname = wlan0
input = mp_ant_tx a
wlan0 mp_ant_tx:switch Tx antenna to a
rk3566_t:/data # ./rtwpriv wlan0 mp_txpower patha=58,pathb=44
ifname = wlan0
input = mp_txpower patha=58,pathb=44
wlan0 mp_txpower:patha=58,pathb=44
rk3566_t:/data # ./rtwpriv wlan0 mp_rate 128
ifname = wlan0
input = mp_rate 128
wlan0 mp_rate:Set data rate to 128 index 12
rk3566_t:/data # ./rtwpriv wlan0 mp_get_txpower
ifname = wlan0
input = mp_get_txpower
wlan0 mp_get_txpower:patha=49
patha dBm=13
rk3566_t:/data # ./rtwpriv wlan0 mp_ctx background,stone
ifname = wlan0
input = mp_ctx background,stone
wlan0 mp_ctx:
Start continuous DA=fffffffffff len=1500
infinite=yes.
rk3566_t:/data #
rk3566_t:/data #
    
```

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

Power supply voltages:

Test Conditions		Power Supply (V_{DC} V_{AC})	Input Voltage to the circuit of RF unit (V_{DC})
NTNV (V_{normal})	/	5	3.3
NTHV ($V_{max.}$)	+10%	5.5	3.3
NTLV ($V_{min.}$)	-10%	4.5	3.3

Note: If the fluctuation of input voltage to the circuit of RF unit (except power supply) of test equipment is under $\pm 1\%$, when input voltage from external power supply to the test equipment is fluctuated by $\pm 10\%$: conduct the test with the rated voltage only

1.4 Description of support units

Support equipment list			
Description	Model	Serial No.	Manufacturer
Laptop	e485	/	Lenovo
Support cable list			
Description	Length (m)	From	To
/	/	/	/

2 Measurement uncertainty

Parameter	Measurement uncertainty
Occupied channel bandwidth	$\pm 3 \%$
RF output power, conducted	$\pm 1 \text{ dB}$
Unwanted Emissions, conducted	$\pm 1 \text{ dB}$
All emissions, radiated	$\pm 4.7 \text{ dB}$
Temperature	$\pm 1 \text{ }^{\circ}\text{C}$
Supply voltages	$\pm 1 \%$
Time	$\pm 1 \%$
Deviation of frequency	$\pm 0.05 \text{ ppm}$

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

3 Summary of Test Result

No.	Description of Test	Result
1	Interference prevention function	Pass
2	Deviation of frequency	Pass
3	Deviation of antenna power	Pass
4	Occupied bandwidth	Pass
5	Transmitter Spurious Emissions	Pass
6	Secondary radiated emissions	Pass
7	Burst Length	Pass
8	Adjacent Channel Power Tolerance	Pass
9	Carrier sense capability	Pass

4 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

5 List of Test Equipment

No.	Equipment	Manufacturer	Model	Serial No.	Cal. date	Cal. Due
MTi-E057	Wideband Radio Communication Tester	Rohde&schwarz	CMW500	149155	2023/04/26	2024/04/25
MTi-E058	ESG Series Analog Signal Generator	Agilent	E4421B	GB40051240	2023/04/25	2024/04/24
MTi-E059	Audio Analyzer	Agilent	U8903A	MY52140004	2023/04/26	2024/04/25
MTi-E062	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2023/04/25	2024/04/24
MTi-E063	Power Splitter	/	PD-4SF-206D	/	2023/05/04	2024/05/03
MTi-E064	Synthesized Sweeper	Agilent	83752A	3610A01957	2023/04/25	2024/04/24
MTi-E065	DC Power Supply	Agilent	E3632A	MY40027695	2023/05/04	2024/05/03
MTi-E066	MXA Signal Analyzer	Agilent	N9020A	MY50143483	2023/04/26	2024/04/25
MTi-E071	ESG Vector Signal Generator	Agilent	N5182A	MY50143762	2023/04/25	2024/04/24
MTi-E072	Thermometer Clock Humidity Monitor	-	HTC-1	/	2023/05/04	2024/05/03
MTi-E089	ESG Vector Signal Generator	Agilent	N5182A	MY49060455	2023/04/25	2024/04/24
MTi-E090	Test Loop Antenna	DATETEK	LA-001	771409634	/	/
MTi-E043	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2023/04/26	2024/04/25
MTi-E044	TRILOG Broadband Antenna	schwarabeck	VULB 9163	9163-1338	2021/05/30	2024/05/29
MTi-E045	Double Ridged Broadband Horn Antenna	schwarabeck	BBHA 9120 D	9120D-2278	2021/05/30	2024/05/29
MTi-E047	Amplifier	Hewlett-Packard	8447F	3113A06150	2023/04/26	2024/04/25
MTi-E053	Power Amplifier	micotop	MPA-80-1000-250	MPA1903081	2023/04/26	2024/04/25
MTi-E056	Thermometer Clock Humidity Monitor	-	HTC-1	/	2023/05/04	2024/05/03
MTi-E094	Power Sensor	Agilent	E9304A H18	MY41497225	2023/05/04	2024/05/03
MTi-E097	EPM Series Power Meter	Agilent	E4419B	MY45102877	2023/04/26	2024/04/25

Note: the calibration interval of the test equipment is 12 or 24 months and the calibrations are traceable to international system unit(SI)

6 Test Result

6.1 Interference prevention function

6.1.1 Requirement

Product shall have a function to transmit or receive identification code automatically.

6.1.2 Test Setup



6.1.3 Test Procedures

For the EUT has the function to transmit identification code automatically:

- A) Transmit the predetermined identification code from the EUT.
- B) Confirm the transmitted identification code by demodulator.

For the EUT has the function to receive identification code automatically:

- A) Transmit the predetermined identification code from facing device.
- B) Confirm that normal communication is performed.
- C) Transmit the different code from the predetermined identification code from facing device.
- D) Confirm the EUT stop the transmission or confirm that it shows the indication that the code is wrong.

6.1.4 Test Result

EUT MAC addresses:14:85:54:bf:fb:b3

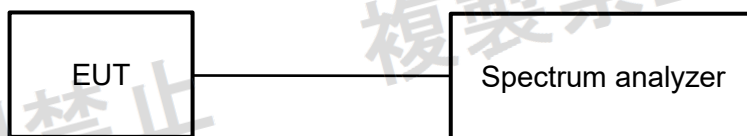
The EUT complies with the requirement.

6.2 Deviation of frequency

6.2.1 Limits

Tolerance of frequency: $\pm 20\text{ppm}$.

6.2.2 Test Setup



6.2.3 Test Procedures

Spectrum analyzer setting for unmodulated wave:

Center frequency: test frequency

Span: 1MHz

RBW: 10kHz

VBW: 30kHz

Sweep time: Auto

Detector: Peak

Trace mode: Max hold

6.2.4 Test Result

Note: see the Appendix A

6.3 Deviation of antenna power

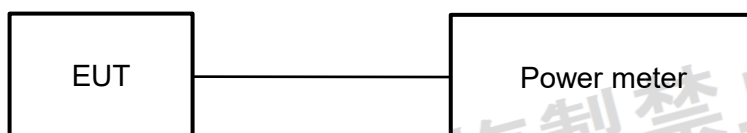
6.3.1 Limits

5.2GHz in-vehicle:

Test Mode	Limits (E.I.R.P)		
	OFDM		
	20 MHz	40 MHz	80 MHz
5150-5250MHz	2 mW/MHz or less	1 mW/MHz or less	0.5 mW/MHz or less

Tolerance of antenna power and the rated power: +20% ~ -80%

6.3.2 Test Setup



6.3.3 Test Procedures

Connect high frequency power meter to the RF output of the EUT with a suitable attenuator and measure the total electric power.

$EIRP = \text{antenna power} + \text{antenna gain}$

6.3.4 Test Result

Note: see the Appendix B

6.4 Occupied bandwidth

6.4.1 Limits

The occupancy bandwidth: 20MHz, 40MHz, 80MHz

6.4.2 Test Setup



6.4.3 Test Procedures

Spectrum analyzer setting:

Center frequency: test frequency

Span: <200MHz

RBW: 300kHz

VBW: 300kHz

Sweep time: Auto

Detector: Peak

Trace mode: Max hold

6.4.4 Test Result

Note: see the Appendix C

6.5 Transmitter Spurious Emissions

6.5.1 Limits

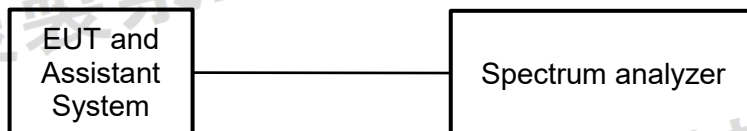
*Attachment (Unwanted Emission Strength)

20MHz system	40MHz system	80MHz system
5,142 MHz or less : 0.5 μ W/MHz	5,141.6 MHz or less : 0.5 μ W/MHz	5,123.2 MHz or less : 0.5 μ W/MHz
5,142 - 5,150 MHz : 3 μ W/MHz	5,141.6 - 5,150 MHz : 3 μ W/MHz	5,123.2 - 5,150 MHz : 3 μ W/MHz
5,250 - 5,250.2 MHz : $0.2 \times 10^{1-(8/3)(f-9.75)}$ mW/MHz		
5,250.2 - 5,251 MHz : $0.2 \times 10^{1-(f-9)}$ mW/MHz	5,250 - 5,251 MHz : $0.2 \times 10^{-(f-20)+\log(1/2)}$ mW/MHz	5,250 - 5,251 MHz : $0.2 \times 10^{-(f-40)+\log(1/4)}$ mW/MHz
5,251 - 5,260 MHz : $0.2 \times 10^{1-(8/90)(f-11)}$ mW/MHz	5,251 - 5,270 MHz : $0.2 \times 10^{-(8/190)(f-21)-1+\log(1/2)}$ mW/MHz	5,251 - 5,290 MHz : $0.2 \times 10^{-(8/390)(f-41)-1+\log(1/4)}$ mW/MHz
5,260 - 5,266.7 MHz : $0.2 \times 10^{1-(8/50)(f-20)}$ mW/MHz	5,270 - 5,278.4 MHz : $0.2 \times 10^{-(3/50)(f-40)-1.8+\log(1/2)}$ mW/MHz	5,290 - 5,296.7 MHz : $0.2 \times 10^{-(3/100)(f-80)-1.8+\log(1/4)}$ mW/MHz
5,266.7 - 5,365 MHz : 0.5 μ W/MHz	5,278.4 - 5,400 MHz : 0.5 μ W/MHz	5,296.7 - 5,480 MHz : 0.5 μ W/MHz
*5,365 MHz or more : 0.5 μ W/MHz	*5,400 MHz or more : 0.5 μ W/MHz	*5,480 MHz or more : 0.5 μ W/MHz
f = MHz, Difference from 5240 (MHz)	f = MHz, Difference from 5230 (MHz)	f = MHz, Difference from 5210 (MHz)

* The limit value is defined by the E.I.R.P.

* Recommended measurement up to 26GHz

6.5.2 Test Setup



6.5.3 Test Procedures

- (1) Configure EUT and assistant system according clause 2.3 and 12.3
- (2) Set EUT work in test mode as described in clause 1.4
- (3) Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:

Step 1:

All spurious are measured from 30 MHz to 26 GHz by peak mode.

Step 2:

Frequency: Spurious Frequency

RBW: 100KHz(for frequency from 30MHz to 1GHz), 1MHz(for frequency above 1GHz)

VBW: 100KHz(for frequency from 30MHz to 1GHz), 1MHz(for frequency above 1GHz)

Sweep Time Auto

detector mode Sample

Indication mode Max hold

6.5.4 Test Result

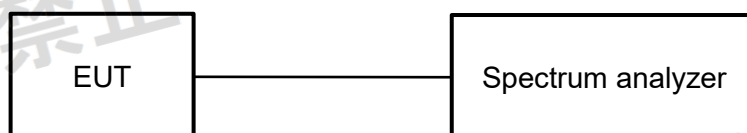
Note: see the Appendix D

6.6 Secondary radiated emissions

6.6.1 Limits

Frequency	Limit
Blew 1000MHz	4nW (-54dBm)
1000MHz ~ 12500MHz	20nW (-47dBm)

6.6.2 Test Setup



6.6.3 Test Procedures

Spectrum analyzer setting [step 1]:

Frequency range: 30MHz ~ 12500MHz
RBW: 100kHz (Blew 1000MHz) / 1MHz (Above 1000MHz)
VBW: = RBW
Sweep time: Auto
Detector: Peak
Trace mode: Max hold

Spectrum analyzer setting [step 2]:

Frequency range: Frequency of spurious emission found at [step 1]
RBW: 100kHz (Blew 1000MHz) / 1MHz (Above 1000MHz)
VBW: = RBW
Sweep time: Auto
Detector: Sample
Trace mode: Max hold

If the measured value is 1/10 limit or less at [step 1], the measured value is the result

If the measured value is greater than the 1/10 of limit at [step 1], then more detailed measurement are required, go to [step 2]

6.6.4 Test Result

Note: see the Appendix E

6.7 Burst Length

6.7.1 Limits

8ms or less

6.7.2 Test Setup



6.7.3 Test Procedures

- (1) Configure EUT and assistant system according clause 2.3 and 13.3
- (2) Set EUT work in test mode as described in clause 1.4
- (3) Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:

Frequency: Test Frequency

Span 0 MHz

RBW 1 MHz,

VBW 3 MHz,

Sweep Time: ≥ 4 ms

Detector mode Positive peak

Indication mode Max hold

6.7.4 Test Result

Note: see the Appendix F

6.8 Adjacent Channel Power Tolerance

6.8.1 Limits

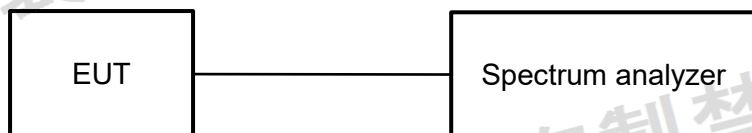
Adjacent Channel Emitted Power	$F_c \pm 20\text{MHz}$ $\pm 9\text{MHz BW} : -25\text{dBc}$	$F_c \pm 20\text{MHz}$ $\pm 10\text{MHz BW} : -25\text{dBc}$	$F_c \pm 40\text{MHz}$ $\pm 20\text{MHz BW} : -25\text{dBc}$	$F_c \pm 80\text{MHz}$ $\pm 40\text{MHz BW} : -25\text{dBc}$	$F_c \pm 80\text{MHz}$ $\pm 40\text{MHz BW} : -25\text{dBc}$
	$F_c \pm 40\text{MHz}$ $\pm 9\text{MHz BW} : -40\text{dBc}$	$F_c \pm 40\text{MHz}$ $\pm 10\text{MHz BW} : -40\text{dBc}$	$F_c \pm 80\text{MHz}$ $\pm 20\text{MHz BW} : -40\text{dBc}$		

According to item 19-3 of Article 2 Paragraph 1.

Limit

Item	Limits
Adjacent Channel Power	$\geq 25\text{dB}$ ($f_c \pm 80\text{MHz}$) Channel power bandwidth 80MHz
	$\geq 25\text{dB}$ ($f_c \pm 40\text{MHz}$) Channel power bandwidth 40MHz
	$\geq 40\text{dB}$ ($f_c \pm 80\text{MHz}$) Channel power bandwidth 40MHz
	$\geq 25\text{dB}$ ($f_c \pm 20\text{MHz}$) Channel power bandwidth 20MHz
	$\geq 40\text{dB}$ ($f_c \pm 40\text{MHz}$) Channel power bandwidth 20MHz

6.8.2 Test Setup



6.8.3 Test Procedures

- (1) Configure EUT and assistant system according clause 2.3 and 10.3
- (2) Set EUT work in test mode as described in clause 1.4
- (3) Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, use the adjacent channel power function of Spectrum Analyzer and set the Spectrum Analyzer as below:

Frequency: Test Frequency

Span 100 MHz, RBW 300 kHz, VBW 300 kHz

Tx bandwidth 18MHz

Adjacent channel bandwidth 1MHz, Channel spacing 9MHz

Alternate channel bandwidth 1MHz, Channel spacing 19MHz

2nd Alternate channel bandwidth 1MHz, Channel spacing 29MHz

Sweep Time Auto

detector mode Positive peak

Indication mode Max hold

6.8.4 Test Result

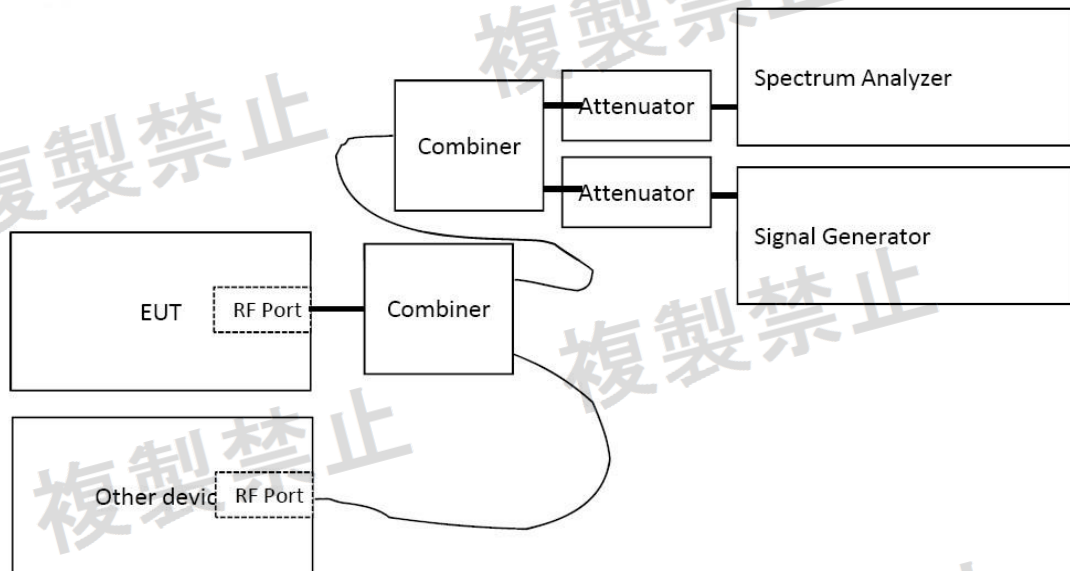
Note: see the Appendix G

6.9 Carrier sense capability

6.9.1 Limits

The device shall not transmit radio wave when receiving 100mW/m

6.9.2 Test Setup



6.9.3 Test Procedures

The device is configured to communicate with another device as shown below. Once the communications link is established the signal generator is configured to produce a CW signal at the center frequency of the operating channel. The level of the signal generator is increased from a level approximately 30dB lower then the required carrier sense detection threshold (calculated based on the **lowest** antenna gain to be used with the device) until the device stops transmitting. This level is recorded as the carrier sense detection threshold.

6.9.4 Test Result

Note: see the Appendix H

Photographs of the Test Setup

See the Appendix - Test Setup Photos

Photographs of the EUT

See the Appendix - EUT Photos

----End of Report----