FCC EMF Report
(Maximum Permissible Exposure)

Product Name: **END1CTLA**

Product Model: **END1CTLA**

Report Number: **SYBH(R-EMF)03690385EB-1**

FCC ID: **QISEND1CTLA**

Reliability Laboratory of Huawei Technologies Co., Ltd.

(Global Compliance and Testing Center of Huawei Technologies Co., Ltd.)

Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C
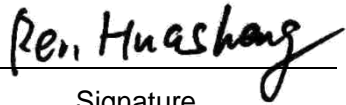Tel: +86 755 28780808   Fax: +86 755 89652518

NOTICE

1. The laboratory has passed the accreditation by China National Accreditation Service for Conformity Assessment (CNAS). The accreditation number is L0310.

2. The laboratory has passed the accreditation by The American Association for Laboratory Accreditation (A2LA). The accreditation number is 2174.01.

3. The laboratory has been recognized by the US Federal Communications Commission (FCC) to perform compliance testing subject to the Commission's Certification rules. The Designation Number is CN1173, and the Test Firm Registration Number is 294140.

4. The laboratory (Reliability Laboratory of Huawei Technologies Co., Ltd.) is also named as "Global Compliance and Testing Center of Huawei Technologies Co., Ltd."; the both names have coexisted since 2009.

5. The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.

6. The test report is invalid if there is any evidence of erasure and/or falsification.

7. The test report is only valid for the test samples.

8. Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.

9. All dates in the test report, including attachment document(s) (if applicable), have the format of "yyyy-MM-dd".

Applicant:	Huawei Technologies Co., Ltd.
Address:	Administration Building, Headquarters of Huawei Technologies Co.,
	Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C
Product Name:	END1CTLA
Product Model:	END1CTLA

Date of Receipt Sample:	2018-02-14
Start Date of Test:	2018-02-14
End Date of Test:	2018-02-14

Test Result: Pass

| **Approved by Senior** | 2018-02-14 | Ren Huasheng | _Ren Huasheng_ |
| **Engineer:** | Date | Name | Signature |

| **Prepared by:** | 2018-02-14 | Zhang Weimin | _Zhang Weimin_ |
| | Date | Name | Signature |

MODIFICATION RECORD

No.	Report No.	Modification Description
1	SYBH(R-EMF)03690385EB-1	First report.

CONTENT

1   General Information

1.1   Applied Standard

FCC Rules: 47CFR FCC Part 1

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Note: The most up to date FCC rules are applied.

Other References: FCC OET Bulletin 65

FCC KDB Publication 447498

IEEE C95.3

1.2   Test Location

Test Location 1 (TL1):   Global Compliance and Testing Center of Huawei Technologies Co., Ltd.

(Reliability Laboratory of Huawei Technologies Co., Ltd.)

Address: Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian,

Longgang District, Shenzhen, 518129, P.R.C

1.3   Test Environment Condition

Ambient Temperature: 15 to 30 °C

Ambient Relative Humidity: 20 to 85 %

Atmospheric Pressure: Not applicable

2 RF Exposure Requirements

NOTE: Unless stated otherwise, all evaluations in the report are for general public/uncontrolled exposure.

According to FCC Part §1.1310(e), the maximum permissible exposure (MPE) to radiofrequency electromagnetic fields are:

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3–3.0	614	1.63	* 100	6
3.0–30	1842/f	4.89/f	* 900/f^2	6
30–300	61.4	0.163	1.0	6
300–1,500			f/300	6
1,500–100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	* 100	30
1.34–30	824/f	2.19/f	* 180/f^2	30
30–300	27.5	0.073	0.2	30
300–1,500			f/1500	30
1,500–100,000			1.0	30

f = frequency in MHz * = Plane-wave equivalent power density

3   RF Exposure Evaluation

NOTE 1:   According to FCC Part §1.1310(d)(2), At operating frequencies less than or equal to 6 GHz, the limits for MPE, derived from whole-body SAR limits, may be used instead of whole-body SAR limits to evaluate the environmental impact of human exposure to RF radiation.

NOTE 2:   According to FCC Part §1.1310(d)(3), At operating frequencies above 6 GHz, the MPE limits shall be used in all cases to evaluate the environmental impact of human exposure to RF radiation.

NOTE 3:   According to FCC Part §1.1310(d)(4), Detailed information on our policies regarding procedures for evaluating compliance with all of these exposure limits can be found in the FCC's OET Bulletin 65.

NOTE 4:   Unless stated otherwise, all requirements in the report are for the separation distance between the user and/or bystander and the product's radiating element is greater than 20 cm, or for non-portable devices.

The compliance is demonstrated based on the following calculation model assessment:

1.   The power density according to far-field model is:

$$S = \frac{P \times G_{(\theta,\phi)}}{4 \times \pi \times R^2}$$

Where:

P = input power of the antenna.

G = antenna gain relative to an isotropic antenna.

θ, ϕ = elevation and azimuth angles.

R = distance from the antenna to the point of investigation.

2.   For single or multiple RF sources, the calculated power density should comply with following:

$$\sum_i \frac{S_i}{S_{Limit,i}} \leq 1$$

Where:

S_i = the power density when the f is i .

$S_{Limit,i}$ = the reference level requirement for power density when f is i .

f = operating frequency.

3.   The calculation of the power density or safe distance is:

Note 1):   The RF exposure evaluation is based on the far-field and the radiation exposure is over-estimated.

Note 2):   The maximum output power level is taken into account as a worst case for the purpose of the calculation of power density or safe distance.

Note 3):   The minimum antenna feed cable loss (assumed no cable loss) is taken into account as a worst case for the purpose of the calculation of power density or safe distance.

Note 4):   The maximum antenna radiation exposure orientation and maximum antenna gain is taken into account as a worst case for the purpose of the calculation of power density or safe distance.

(1) For individual RF exposure source:

RF Source	f	$S_{Limit,i}$	Tune-up power	$G_{(\theta,\phi)}$	EIRP	S_i	$\dfrac{S_i}{S_{Limit,i}}$
	MHz	W/m^2	dBm	dBi	W	W/m^2 / R^2	/ R^2
#1 – UMTS band II	1850	10	24.5	2.5	0.501187234	0.039883213	0.003988321
#2 – UMTS band IV	1710	10	24.5	2.5	0.501187234	0.039883213	0.003988321
#3 – UMTS band V	824	5.4933	24.5	2.5	0.501187234	0.039883213	0.007260338
#4 – LTE band II	1850	10	24	2.5	0.446683592	0.035545951	0.003554595
#5 – LTE band IV	1710	10	24	2.5	0.446683592	0.035545951	0.003554595
#6 – LTE band V	824	5.4933	24	2.5	0.446683592	0.035545951	0.006470783
#7 – LTE band XIII	777	5.18	24	2.5	0.446683592	0.035545951	0.006862153
#8 – LTE band XVII	704	4.6933	24	2.5	0.446683592	0.035545951	0.007573765
#9 – LTE band XXV	1850	10	24	2.5	0.446683592	0.035545951	0.003554595
#10 – LTE band XXVI	814	5.4267	24	2.5	0.446683592	0.035545951	0.006550196
#11 – WLAN 2.4G	2400	10	19	4.5	0.223872114	0.017815177	0.001781518
Note 1: The tune-up power is based on the maximum tune-up upper power limit declared by manufacturer.							
Note 2: The RF source for cellular function is based on the LTE module ME909u-523 (FCC ID: QISME909U-523).							

(2) For simultaneous transmission, if applicable:

Note 1): Only the supported simultaneous transmission mode(s) are listed. For some products, the simultaneous transmission mode(s) may not be supported.

RF Sources	$\displaystyle\sum_i \frac{S_i}{S_{Limit,i}} / R^2$
#1+11	0.0058
#2+11	0.0058
#3+11	0.0091
#4+11	0.0053
#5+11	0.0053

RF Sources	$\sum_i \dfrac{S_i}{S_{Limit,i}} / R^2$
#6+11	0.0083
#7+11	0.0087
#8+11	0.0094
#9+11	0.0053
#10+11	0.0084

(3)   For the whole product:

Note 1):   The result in this step is the worst case between evaluation results from steps (1) and (2).

Considering that,

$$\frac{S}{S_{Limit}} = \underline{0.0094} / R^2 \leq 1 \text{, and}$$

R is more than 20 cm as an industry consensus for non-SAR evaluation

So,

R ≥ 0.2 m   (the minimum Safe Distance / Compliance Boundary)

4   Conclusion

Based on the specified distance or calculated safe distance, or exempted RF exposure evaluation, as showed above, considering the lower RF field exposure levels and relevant research results collected to date by international organizations, there is no convincing scientific evidence that the RF signals from this product cause adverse effects on human health.

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