

RF EXPOSURE REPORT

CERTIFICATE OF CONFORMITY

FCC Rule Part: FCC Part 2 (Section 2.1091)

Report No.: MFBAMQ-WTW-P24050205

FCC ID: UXX-S5A435A

Product: Ruggedized 5G Router

Brand: Ericsson

Model No.: S5A435A

Received Date: 2024/5/9

Test Date: 2024/6/4

Issued Date: 2024/7/29

Applicant: Ericsson Enterprise Solutions, Inc.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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FCC Registration / 723255 / TW2022

Designation Number:

Approved by: _____

May Chen / Manager

Date: _____

2024/7/29

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Prepared by : Claire Kuan / Specialist

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Release Control Record

Issue No.	Description	Date Issued
MFBAMQ-WTW-P24050205	Original release.	2024/7/29

1 Certificate

Product: Ruggedized 5G Router

Brand: Ericsson

Test Model: S5A435A

Sample Status: Engineering sample

Applicant: Ericsson Enterprise Solutions, Inc.

Test Date: 2024/6/4

FCC Rule Part: FCC Part 2 (Section 2.1091)

Standard: KDB 447498 D04 Interim General RF Exposure Guidance v01

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

2 Applicable RF Exposure Limit

§ 1.1310 Radiofrequency radiation exposure limits.

(a) Specific absorption rate (SAR) shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in § 1.1307(b) of this part within the frequency range of 100 kHz to 6 GHz (inclusive).

(b) The SAR limits for occupational/controlled exposure are 0.4 W/kg, as averaged over the whole body, and a peak spatial-average SAR of 8 W/kg, averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the parts of the human body treated as extremities, such as hands, wrists, feet, ankles, and pinnae, where the peak spatial-average SAR limit for occupational/controlled exposure is 20 W/kg, averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). Exposure may be averaged over a time period not to exceed 6 minutes to determine compliance with occupational/controlled SAR limits.

(c) The SAR limits for general population/uncontrolled exposure are 0.08 W/kg, as averaged over the whole body, and a peak spatial-average SAR of 1.6 W/kg, averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the parts of the human body treated as extremities, such as hands, wrists, feet, ankles, and pinnae, where the peak spatial-average SAR limit is 4 W/kg, averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). Exposure may be averaged over a time period not to exceed 30 minutes to determine compliance with general population/uncontrolled SAR limits.

(e) Maximum Permissible Exposure (MPE) to radiofrequency electromagnetic fields

➤ Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (minutes)
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.

➤ Limits for Occupational/Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (minutes)
Limits For General Population / Uncontrolled 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

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

MPE-based Exemption – §1.1307(b)(3)(i)(B)

- For mobile devices that are not exempt per Table 1 of §1.1307(b)(1)(i)(C) and device at distances from 20 cm to 40 cm and in 0.3 GHz to 6 GHz. The MPE-based test exemption condition is in terms of ERP, defined as the product of the maximum antenna gain and the delivered maximum time-averaged power.

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

Fixed RF sources operating in the same time-averaging period – §1.1307(b)(3)(ii)(B)

- Either SAR-based or MPE-based exemption may be considered for test exemption for fixed, mobile, or portable device exposure conditions; therefore, the contributions from each exemption in conjunction with the measured SAR (Evaluated_k term) should be used to determine exemption for simultaneous transmission according to Formula below,

$$\sum_{i=1}^a \frac{P_i}{P_{th,i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^c \frac{Evaluated_k}{Exposure Limit_k} \leq 1$$

The sum of the ratios of the applicable terms for SAR-based, MPE-based and measured SAR or MPE should be less than 1, to determine simultaneous transmission exposure compliance.

Where:

a = number of fixed, mobile, or portable RF sources claiming exemption using [paragraph \(b\)\(3\)\(i\)\(B\)](#) of this section for P_{th} , including existing exempt transmitters and those being added.

c = number of existing fixed, mobile, or portable RF sources with known evaluation for the specified minimum distance including existing evaluated transmitters.

$P_{th,i}$ = the exemption threshold power (P_{th}) according to [paragraph \(b\)\(3\)\(i\)\(B\)](#) of this section for fixed, mobile, or portable RF source i .

$ERP_{th,j}$ = exemption threshold ERP for fixed, mobile, or portable RF source j , at a distance of at least $\lambda/2\pi$ according to the applicable formula of [paragraph \(b\)\(3\)\(i\)\(C\)](#) of this section.

$Exposure Limit_k$ = either the general population/uncontrolled maximum permissible exposure (MPE) or specific absorption rate (SAR) limit for each fixed, mobile, or portable RF source k , as applicable from [§ 1.1310 of this chapter](#).

b = number of fixed, mobile, or portable RF sources claiming exemption using [paragraph \(b\)\(3\)\(i\)\(C\)](#) of this section for Threshold ERP, including existing exempt transmitters and those being added.

P_i = the available maximum time-averaged power or the ERP, whichever is greater, for fixed, mobile, or portable RF source i at a distance between 0.5 cm and 40 cm (inclusive).

ERP_j = the ERP of fixed, mobile, or portable RF source j .

$Evaluated_k$ = the maximum reported SAR or MPE of fixed, mobile, or portable RF source k either in the device or at the transmitter site from an existing evaluation at the location of exposure.

3 Test Results

Environmental Conditions:	26°C, 63% RH	Tested By:	Katina Lu
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For Single RF Source

WLAN CDD

MPE-based Exemption §1.1307(b)(3)(i)(B)							
Operation Mode	Frequency Band (MHz)	Average Power (mW)	Antenna Gain (dBi)	Maximum ERP (mW)	Distance (cm)	Limit Threshold (mW)	Test Result
WLAN 2.4 GHz	2412-2462	232.3	5.74	530.945	20	3060	Pass
WLAN 5 GHz	5180-5320 5500-5825	205.972	5.19	414.771	20	3060	Pass
5G NR (n41)	2516.01-2670	562.341	4.5	966.05	20	3060	Pass

Note:

- Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

For Multiple RF Sources (Simultaneous Operations)

Multiple RF Sources (Simultaneous Operations)							
Exemption Evaluation					Sum of Ratios	Limit of Ratios	Test Result
Operation Mode	Frequency Band (MHz)	Maximum ERP (mW)	Limit Threshold (mW)	Ratio			
WLAN 2.4 GHz	2412-2462	530.945	3060	0.174	0.626	1	Pass
WLAN 5 GHz	5180-5320 5500-5825	414.771	3060	0.136			
5G NR (n41)	2516.01-2670	966.05	3060	0.316			

For Single RF Source

WLAN Beamforming

MPE-based Exemption §1.1307(b)(3)(i)(B)							
Operation Mode	Frequency Band (MHz)	Average Power (mW)	Antenna Gain (dBi)	Maximum ERP (mW)	Distance (cm)	Limit Threshold (mW)	Test Result
WLAN 2.4 GHz	2412-2462	198.411	8.75	906.913	20	3060	Pass
WLAN 5 GHz	5180-5320 5500-5825	199.437	8.2	803.167	20	3060	Pass
5G NR (n41)	2516.01-2670	562.341	4.5	966.05	20	3060	Pass

For Multiple RF Sources (Simultaneous Operations)

Multiple RF Sources (Simultaneous Operations)							
Exemption Evaluation					Sum of Ratios	Limit of Ratios	Test Result
Operation Mode	Frequency Band (MHz)	Maximum ERP (mW)	Limit Threshold (mW)	Ratio			
WLAN 2.4 GHz	2412-2462	906.913	3060	0.296	0.874	1	Pass
WLAN 5 GHz	5180-5320 5500-5825	803.167	3060	0.262			
5G NR (n41)	2516.01-2670	966.05	3060	0.316			

Environmental Conditions:	26°C, 63% RH	Tested By:	Katina Lu
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MPE-based Exemption §1.1307(b)(3)(i)(B)								
Operation Mode	Frequency Band (MHz)	Average Power (mW)	Antenna Gain (dBi)	Maximum ERP (mW)	Distance (cm)	Limit Threshold (mW)	Test Result	Ratio
WCDMA (Band 2)	1852.4-1907.6	281.838	2.9	334.965	20	3060	Pass	0.109
WCDMA (Band 4)	1712.4-1752.6	281.838	2.7	319.889	20	3060	Pass	0.105
WCDMA (Band 5)	826.4-846.6	281.838	1.8	260.016	20	1685.856	Pass	0.154
LTE (Band 2)	1860-1905	251.189	2.9	298.539	20	3060	Pass	0.098
LTE (Band 4)	1720-1745	251.189	2.7	285.102	20	3060	Pass	0.093
LTE (Band 5)	825.5-847.5	251.189	1.8	231.74	20	1684.02	Pass	0.138
LTE (Band 7)	2510-2560	251.189	4.5	431.52	20	3060	Pass	0.141
LTE (Band 12)	699.7-715.3	251.189	1.42	212.325	20	1427.388	Pass	0.149
LTE (Band 13)	782-782	251.189	1.42	212.325	20	1595.28	Pass	0.133
LTE (Band 14)	793-793	251.189	-1.6	105.926	20	1617.72	Pass	0.065
LTE (Band 17)	704-711	251.189	1.42	212.325	20	1436.16	Pass	0.148
LTE (Band 25)	1850.7-1914.3	251.189	2.9	298.539	20	3060	Pass	0.098
LTE (Band 26)	824-824	251.189	1.8	231.74	20	1680.96	Pass	0.138
LTE (Band 26)	825.5-847.5	251.189	1.8	231.74	20	1684.02	Pass	0.138
LTE (Band 30)	2310-2310	199.526	4.5	342.767	20	3060	Pass	0.112
LTE (Band 38)	2580-2610	251.189	4.5	431.52	20	3060	Pass	0.141
LTE (Band 41)	2506-2680	446.684	4.5	767.362	20	3060	Pass	0.251
LTE (Band 42)	3452.5-3540	177.828	4.13	280.543	20	3060	Pass	0.092
LTE (Band 43)	3605-3695	177.828	1.6	156.675	20	3060	Pass	0.051
5GNR (n2)	1855-1905	281.838	2.9	334.965	20	3060	Pass	0.109
5GNR (n5)	834-839	281.838	1.8	260.016	20	1701.36	Pass	0.153
5GNR (n7)	2510-2562.2	281.838	4.5	484.172	20	3060	Pass	0.158
5GNR (n12)	706.5-708.5	251.189	1.42	212.325	20	1441.26	Pass	0.147
5GNR (n13)	779.5-784.5	251.189	1.42	212.325	20	1590.18	Pass	0.134
5GNR (n14)	793-793	251.189	-1.6	105.926	20	1617.72	Pass	0.065
5GNR (n25)	1857.5-1907.5	281.838	2.9	334.965	20	3060	Pass	0.109
5GNR (n26)	824-824	251.189	-1.6	105.926	20	1680.96	Pass	0.063
5GNR (n26)	831.5-841.5	251.189	1.8	231.74	20	1696.26	Pass	0.137
5GNR (n30)	2307.5-2312.5	199.526	4.5	342.767	20	3060	Pass	0.112
5GNR (n41)	2516.01-2670	562.341	4.5	966.05	20	3060	Pass	0.316

Note:

1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. The above output power levels refer to the certified WWAN module (FCC ID: RI7FN990A28HP) and the power evaluation condition was based on Maximum tune-up power.

MPE-based Exemption §1.1307(b)(3)(i)(C)								
Operation Mode	Frequency Band (MHz)	Average Power (mW)	Antenna Gain (dBi)	Maximum ERP (mW)	Distance (cm)	Limit Threshold (mW)	Test Result	Ratio
LTE (Band 48)	3557.52-3692.49	177.828	4.13	280.543	20	768	Pass	0.365
LTE (Band 66)	1720-1770	251.189	2.7	285.102	20	768	Pass	0.371
LTE (Band 71)	673-688	251.189	1.42	212.325	20	344.576	Pass	0.616
5GNR (n38)	2580-2610	316.228	4.5	543.251	20	768	Pass	0.707
5GNR (n48)	3570-3679.98	177.828	4.13	280.543	20	768	Pass	0.365
5GNR (n66)	1715.5-1770	281.838	2.7	319.889	20	768	Pass	0.417
5GNR (n71)	673-688	281.838	1.42	238.232	20	344.576	Pass	0.691
5GNR (n77)	3720-3960	562.341	1.6	495.45	20	768	Pass	0.645
5GNR (n78)	3470.01-3529.98	562.341	1.6	495.45	20	768	Pass	0.645

Note:

1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. The above output power levels refer to the certified WWAN module (FCC ID: RI7FN990A28HP) and the power evaluation condition was based on Maximum tune-up power.

4 Conclusion

Source-base time average power is below Exemption Criteria and/or Routine Evaluation MPE thresholds, therefore the device is compliant FCC RF exposure requirement.

5 Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also.

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