

RF Exposure Evaluation Report

APPLICANT : Ericsson Enterprise Wireless Solutions, Inc.
EQUIPMENT : 5G Sub-6 GHz LGA Module
BRAND NAME : Ericsson
MODEL NAME : RG650V-NA
FCC ID : UXX-2024RG650VNA
STANDARD : 47 CFR Part 2.1091
FCC KDB 447498 D01 v06

The product evaluation date was started from Jan. 26, 2025 and completed on Jan. 26, 2025. We, Sporton International Inc. (Shenzhen), would like to declare that the device has been evaluated in accordance with 47 CFR Part 2.1091 and FCC KDB 447498 D01 v06, and pass the limit. Without written approval of Sporton International Inc. (Shenzhen), the test report shall not be reproduced except in full.



Approved by: Si Zhang

Sporton International Inc. (Shenzhen)

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**Revision History**

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA460656	Rev. 01	Initial issue of report.	Feb. 17, 2025



1. Administration Data

1.1. Testing Laboratory

Sporton International Inc. (Shenzhen) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

Testing Laboratory			
Test Firm	Sporton International Inc. (Shenzhen)		
Test Site Location	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China TEL: +86-755-86379589 FAX: +86-755-86379595		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	SAR01-SZ	CN1256	421272

Applicant	
Company Name	Ericsson Enterprise Wireless Solutions, Inc.
Address	1100 W. Idaho St. Boise, ID 83702

Manufacturer	
Company Name	Ericsson Enterprise Wireless Solutions, Inc.
Address	1100 W. Idaho St. Boise, ID 83702



2. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	5G Sub-6 GHz LGA Module
Brand Name	Ericsson
Model Name	RG650V-NA
FCC ID	UXX-2024RG650VNA
Wireless Technology and Frequency Range	LTE Band 2 : 1850 MHz ~ 1910 MHz LTE Band 4 : 1710 MHz ~ 1755 MHz LTE Band 5 : 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12 : 699 MHz ~ 716 MHz LTE Band 13 : 777 MHz ~ 787 MHz LTE Band 14: 788 MHz ~ 798 MHz LTE Band 17: 704 MHz ~ 716 MHz LTE Band 25 : 1850 MHz ~ 1915 MHz LTE Band 26 : 814 MHz ~ 849 MHz LTE Band 30: 2305 MHz ~ 2315 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 42: 3450 MHz ~ 3600 MHz LTE Band 43: 3700 MHz ~ 3800MHz LTE Band 48: 3550 MHz ~ 3700 MHz LTE Band 66 : 1710 MHz ~ 1780 MHz LTE Band 71: 663 MHz ~ 698 MHz 5G NR n2 : 1850 MHz ~ 1910 MHz 5G NR n5 : 824 MHz ~ 849 MHz 5G NR n7 : 2500 MHz ~ 2570 MHz 5G NR n12 : 699 MHz ~ 716 MHz 5G NR n13 : 777 MHz ~ 787 MHz 5G NR n14 : 788 MHz ~ 798 MHz 5G NR n25 : 1850 MHz ~ 1915 MHz 5G NR n26 : 814 MHz ~ 849 MHz 5G NR n30 : 2305 MHz ~ 2315 MHz 5G NR n38 : 2570 MHz ~ 2620 MHz 5G NR n41 : 2496 MHz ~ 2690 MHz 5G NR n48 : 3550 MHz ~ 3700 MHz 5G NR n66 : 1710 MHz ~ 1780 MHz 5G NR n70 : 1695 MHz ~ 1710 MHz 5G NR n71 : 663 MHz ~ 698 MHz 5G NR n77: 3450 MHz ~ 3550 MHz, 3700 MHz ~ 3980 MHz 5G NR n78: 3450 MHz ~ 3550 MHz, 3700 MHz ~ 3800 MHz
Mode	LTE: QPSK, 16QAM, 64QAM, 256QAM 5G NR : CP-OFDM / DFT-s-OFDM, PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM
Antenna Type	Ant1: Dipole Antenna Ant7: Dipole Antenna
HW Version	RG650V-NA
SW Version	RG650VNA01AAR01A04G8G
EUT Stage	Production Unit

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. 5G NR n2/5/7/12/14/25/26/30/38/41/66/71/77/78 supports NSA mode.
3. 5G NR n2/5/7/12/13/14/25/26/30/38/41/48/66/70/71/77/78 supports SA mode.
4. The intra-band/inter-band ULCA, UL MIMO and EN-DC mode combination could be referred to the product spec.
5. This device supports intra-band ULCA, due to intra-band ULCA and non-CA power is same, so non-CA MPE analysis can represent ULCA MPE analysis.
6. This device supports HPUE mode for LTE Band 38/41/42/43 and 5G NR n2/5/7/25/66/71 with class 2, so HPUE mode has been performed to do MPE analysis.
7. The device supports HPUE (power class 2) under SISO mode and HPUE (power class 1.5) under UL MIMO mode for



5G NR n38/n41, so HPUE (power class 1.5) has been performed MPE calculation.

8. 5GNR n2/n5/n7/n25/n38/n41/n48/n66/n70/n71/n77/n78 support SISO/MIMO mode, only MIMO tune up power was chosen to perform MPE calculation conservatively for MIMO power is higher.

Comments and Explanations:

1. The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.
2. The maximum RF output tune up power, antenna gain also the safe distance used for evaluate RF exposure were declared by manufacturer.

3. Maximum RF average output tune up power among production units

<LTE>

Mode		Maximum Average power(dBm)
LTE	Band 2	25.0
	Band 4	25.0
	Band 5	25.0
	Band 7	25.0
	Band 12	25.0
	Band 13	25.0
	Band 14	25.0
	Band 17	25.0
	Band 25	25.0
	Band 26	25.0
	Band 30	20.0
	Band 38 PC3	25.0
	Band 38 PC2	28.0
	Band 41 PC3	25.0
	Band 41 PC2	28.0
	Band 42 PC3	25.0
	Band 42 PC2	26.0
	Band 43 PC3	25.0
	Band 43 PC2	26.0
	Band 48	19.0
	Band 66	25.0
	Band 71	25.0

**<5G NR>**

Mode		Maximum Average power(dBm)
5G NR	n2 PC3	25.0
	n2 PC2	28.0
	n5 PC3	25.0
	n5 PC2	28.0
	n7 PC3	25.0
	n7 PC2	28.0
	n12	25.0
	n13	25.0
	n14	25.0
	n25 PC3	25.0
	n25 PC2	28.0
	n26	25.0
	n30	20.0
	n38	28.0
	n41 PC3	25.0
	n41 PC2	28.0
	n48	19.0
	n66 PC3	25.0
	n66 PC2	25.0
	n70	25.0
	n71 PC3	25.0
	n71 PC2	28.0
	n77 PC3	25.0
	n77 PC2	26.0
	n78 PC3	25.0
	n78 PC2	26.0

<MIMO>

Mode		Maximum Average power(dBm)
5G NR	n2	28.0
	n5	28.0
	n7	28.0
	n25	28.0
	n38	28.0
	n41	28.0
	n48	19.0
	n66	26.0
	n70	25.0
	n71	28.0
	n77	26.0
	n78	26.0

Note: WWAN support SISO/MIMO mode, only MIMO tune up power was chosen to perform MPE calculation conservatively for MIMO power is higher.



4. RF Exposure Limit Introduction

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

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 Exposures				
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
300-1500			f/300	6
1500-100,000			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
300-1500			f/1500	30
1500-100,000			1.0	30

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$S = \frac{PG}{4\pi R^2}$$

Where:

S = Power Density

P = Output Power at Antenna Terminals

G = Gain of Transmit Antenna (linear gain)

R = Distance from Transmitting Antenna



5. Radio Frequency Radiation Exposure Evaluation

5.1. Standalone Power Density Calculation

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	MPE evaluation distance (cm)	FCC ERP/EIRP Limit (W)	Power Density for Max Gain to meet FCC ERP/EIRP and MPE limit (mW/cm ²)	Power Density for Max gain allowed (mW/cm ²)	FCC MPE Limit (mW)/cm ²	FCC MPE Result/ FCC MPE Limit Ratio	Ant Gain to meet FCC MPE limit (dBi)	Ant Gain to meet FCC ERP/EIRP limit (dBi)	Max Gain to meet FCC ERP/EIRP and MPE limit (dBi)	Max Gain to consider same Frequency with LTE or EN-DC Active	Max gain allowed (dBi)
LTE Band 2	1850.0	2.63	25.00	20.00	2.000	0.397	0.199	1.000	0.199	12.0	8.0	8.0	5.0	5.0
LTE Band 4	1710.0	3.14	25.00	20.00	1.000	0.199	0.158	1.000	0.158	12.0	5.0	5.0	4.0	4.0
LTE Band 5	824.0	3.22	25.00	20.00	7.000	0.548	0.275	0.549	0.500	9.4	13.4	9.4	6.4	6.4
LTE Band 7	2500.0	2.90	25.00	20.00	2.000	0.397	0.199	1.000	0.199	12.0	8.0	8.0	5.0	5.0
LTE Band 12	699.0	3.17	25.00	20.00	3.000	0.456	0.218	0.466	0.468	8.6	9.7	8.6	5.4	5.4
LTE Band 13	777.0	3.06	25.00	20.00	3.000	0.512	0.512	0.518	0.988	9.1	9.7	9.1	9.1	9.1
LTE Band 14	788.0	3.16	25.00	20.00	3.000	0.524	0.512	0.525	0.974	9.2	9.7	9.2	9.1	9.1
LTE Band 17	704.0	3.17	25.00	20.00	3.000	0.467	0.218	0.469	0.465	8.7	9.7	8.7	5.4	5.4
LTE Band 25	1850.0	2.63	25.00	20.00	2.000	0.397	0.199	1.000	0.199	12.0	8.0	8.0	5.0	5.0
LTE Band 26	814.0	3.22	25.00	20.00	7.000	0.536	0.275	0.543	0.506	9.3	13.4	9.3	6.4	6.4
LTE Band 30	2305.0	2.89	20.00	20.00	0.250	0.049	0.049	1.000	0.049	17.0	3.9	3.9	3.9	3.9
LTE Band 38-HPUE	2570.0	2.90	28.00	20.00	2.000	0.397	0.397	1.000	0.397	9.0	5.0	5.0	5.0	5.0
LTE Band 41-HPUE	2496.0	3.10	28.00	20.00	2.000	0.397	0.397	1.000	0.397	9.0	5.0	5.0	5.0	5.0
LTE Band 42-HPUE	3450.0	3.48	26.00	20.00	1.000	0.199	0.199	1.000	0.199	11.0	4.0	4.0	4.0	4.0
LTE Band 43-HPUE	3700.0	3.12	26.00	20.00	1.000	0.199	0.199	1.000	0.199	11.0	4.0	4.0	4.0	4.0
LTE Band 48	3550.0	3.24	19.00	20.00	0.200	0.040	0.040	1.000	0.040	18.0	4.0	4.0	4.0	4.0
LTE Band 66	1710.0	3.14	25.00	20.00	1.000	0.199	0.158	1.000	0.158	12.0	5.0	5.0	4.0	4.0
LTE Band 71	663.0	2.94	25.00	20.00	3.000	0.435	0.218	0.442	0.494	8.4	9.7	8.4	5.4	5.4
5G NR n2-HPUE	1850.0	2.63	28.00	20.00	2.000	0.397	0.397	1.000	0.397	9.0	5.0	5.0	5.0	5.0
5G NR n5-HPUE	824.0	3.22	28.00	20.00	7.000	0.548	0.548	0.549	0.998	6.4	10.4	6.4	6.4	6.4
5G NR n7-HPUE	2500.0	2.90	28.00	20.00	2.000	0.397	0.397	1.000	0.397	9.0	5.0	5.0	5.0	5.0
5G NR n12	699	3.17	25.00	20.00	3.000	0.456	0.218	0.466	0.468	8.6	9.7	8.6	5.4	5.4
5G NR n13	777.0	3.06	25.00	20.00	3.000	0.512	0.512	0.518	0.988	9.1	9.7	9.1	9.1	9.1
5G NR n14	788.0	3.16	25.00	20.00	3.000	0.524	0.512	0.525	0.974	9.2	9.7	9.2	9.1	9.1
5G NR n25-HPUE	1850.0	2.63	28.00	20.00	2.000	0.397	0.397	1.000	0.397	9.0	5.0	5.0	5.0	5.0
5G NR n26	814.0	3.22	25.00	20.00	7.000	0.536	0.275	0.543	0.506	9.3	13.4	9.3	6.4	6.4
5G NR n30	2305.0	2.89	20.00	20.00	0.250	0.049	0.049	1.000	0.049	17.0	3.9	3.9	3.9	3.9
5G NR n38	2570.0	2.90	28.00	20.00	2.000	0.397	0.397	1.000	0.397	9.0	5.0	5.0	5.0	5.0
5G NR n41-HPUE	2496.00	3.10	28.00	20.00	2.000	0.397	0.397	1.000	0.397	9.0	5.0	5.0	5.0	5.0
5G NR n48	3550.0	3.24	19.00	20.00	0.200	0.040	0.040	1.000	0.040	18.0	4.0	4.0	4.0	4.0
5G NR n66-HPUE	1710.0	3.14	25.00	20.00	1.000	0.199	0.158	1.000	0.158	12.0	5.0	5.0	4.0	4.0
5G NR n70	1695.0	3.14	25.00	20.00	1.000	0.199	0.158	1.000	0.158	12.0	5.0	5.0	4.0	4.0
5G NR n71-HPUE	663.0	2.94	28.00	20.00	3.000	0.435	0.435	0.442	0.985	5.4	6.7	5.4	5.4	5.4
5G NR n77-HPUE	3450.0	3.48	26.00	20.00	1.000	0.199	0.199	1.000	0.199	11.0	4.0	4.0	4.0	4.0
5G NR n78-HPUE	3450.0	3.48	26.00	20.00	1.000	0.199	0.199	1.000	0.199	11.0	4.0	4.0	4.0	4.0
5G NR n2-MIMO	1850.0	2.63	28.00	20.00	2.000	0.397	0.397	1.000	0.397	9.0	5.0	5.0	5.0	5.0
5G NR n5-MIMO	824.0	3.22	28.00	20.00	7.000	0.548	0.548	0.549	0.998	6.4	10.4	6.4	6.4	6.4
5G NR n7-MIMO	2500.0	2.90	28.00	20.00	2.000	0.397	0.397	1.000	0.397	9.0	5.0	5.0	5.0	5.0
5G NR n25-MIMO	1850.0	2.63	28.00	20.00	2.000	0.397	0.397	1.000	0.397	9.0	5.0	5.0	5.0	5.0
5G NR n38-MIMO	2570.0	2.90	28.00	20.00	2.000	0.397	0.397	1.000	0.397	9.0	5.0	5.0	5.0	5.0
5G NR n41-MIMO	2496.00	3.10	28.00	20.00	2.000	0.397	0.397	1.000	0.397	9.0	5.0	5.0	5.0	5.0
5G NR n48-MIMO	3550.0	3.24	19.00	20.00	0.200	0.040	0.040	1.000	0.040	18.0	4.0	4.0	4.0	4.0
5G NR n66-MIMO	1710.0	3.14	26.00	20.00	1.000	0.199	0.199	1.000	0.199	11.0	4.0	4.0	4.0	4.0
5G NR n70-MIMO	1695.0	3.14	25.00	20.00	1.000	0.199	0.158	1.000	0.158	12.0	5.0	5.0	4.0	4.0
5G NR n71-MIMO	663.0	2.94	28.00	20.00	3.000	0.435	0.435	0.442	0.985	5.4	6.7	5.4	5.4	5.4
5G NR n77-MIMO	3450.0	3.48	26.00	20.00	1.000	0.199	0.199	1.000	0.199	11.0	4.0	4.0	4.0	4.0
5G NR n78-MIMO	3450.0	3.48	26.00	20.00	1.000	0.199	0.199	1.000	0.199	11.0	4.0	4.0	4.0	4.0

**Note:**

1. For conservativeness, the lowest frequency of each band is used to determine the MPE limit of that band.
2. Chose the maximum RF output tune up power and the maximum antenna gain of all antennas among same frequency WWAN bands to perform MPE calculation conservatively.

5.2. Collocated Power Density Calculation**General Note:**

1. The device implanted DPS (Dynamic Power Share) function to achieve higher uplink data rate keeping the total power unchanged in 5G NR EN-DC mode according to 3GPP 38.213, when the equipment has a dynamic power sharing capability, it adjusts the LTE or NR transmission power so that the instantaneous total power does not exceed the specified value, when the maximum transmission power of NR (P_{LTE}, P_{NR}) and the specified total power (P_{total}) have been set and the instantaneous calculated total transmission power exceeds P_{total}, the NR transmission power is reduced so that the actual transmission power of the user equipment will not exceed P_{total} power. So if the LTE and NR standalone MPE was Evaluated at total power level, the EN-DC combine MPE(LTE+NR) will not higher than the each standalone LTE and NR MPE, therefore, the simultaneous transmission analysis is used standalone MPE at total power level to show compliance. And inter-band ULCA is based on the same principle.
2. $\Sigma(\text{Power Density} / \text{Limit})$: This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for LTE + 5GNR/ LTE inter-band ULCA /5GNR inter-band ULCA.
3. Considering all transmitter of the EIRP performance listed in the table above, the aggregated (power density /limit) is smaller than 1, and collocated transmitters is compliant.

Conclusion:

According to 47 CFR §2.1091, the equipment at least 20 cm to show compliance with the power density limit, the RF exposure analysis concludes that the RF Exposure is FCC compliant.

-----THE END-----