

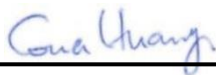
RF EXPOSURE EVALUATION REPORT

FCC ID : R17FN990A40HP
Equipment : 5G NR Module
Brand Name : 
Model Name : FN990A40-HP
Marketing Name : FN990A40-HP
Applicant : Telit Communications S.p.A.
Via Stazione Di Prosecco 5/B, Trieste 34010, Italy
Manufacturer : Telit Communications S.p.A.
Via Stazione Di Prosecco 5/B, Trieste 34010, Italy
Standard : 47 CFR Part 2.1091

We, SPORTON INTERNATIONAL INC has been evaluated this product in accordance with 47 CFR Part2.1091 and it complies with applicable limit.

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 1190) and the FCC designation No. TW1190 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC evaluation.

The results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. Laboratory, the test report shall not be reproduced except in full



Approved by: Cona Huang / Deputy Manager

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1. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	5G NR Module
Brand Name	
Model Name	FN990A40-HP
Marketing Name	FN990A40-HP
FCC ID	R17FN990A40HP
Wireless Technology and Frequency Range	WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band IV: 1710 MHz ~ 1755 MHz WCDMA Band V: 824 MHz ~ 849 MHz 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 ~ 3550 MHz, 3550 MHz ~ 3600 MHz LTE Band 43: 3600 MHz ~ 3700 MHz 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 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	RMC 12.2Kbps HSDPA HSUPA DC-HSDPA LTE: QPSK, 16QAM, 64QAM, 256QAM 5G NR: DFT-s-OFDM/CP-OFDM, Pi/2 BPSK/QPSK/16QAM/64QAM/256QAM
HW	1.00
SW	M0R.140005
EUT Stage	Identical Prototype
Remark:	1. When the uplink carrier aggregation active which the max power is equal to the non-CA max power, the device support UL MIMO on n38/41/48/77/78, when the UL uplink active the total power will not higher than non-UL MIMO max power.

Reviewed by: Jason Wang

Report Producer: Jasmine Ku



2. 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



3. Radio Frequency Radiation Exposure Evaluation

3.1. Standalone Power Density Calculation

<UMTS>

Band	Lowest Frequency (MHz)	Max Conducted output power (per Tune-up) (dBm)	Duty Cycle (%)	AVG Power with Duty Cycle (dBm)	MPE evaluation distance (m)	FCC MPE Limit (mW/cm ²)	IC MPE Limit (W/m ²)	IC MPE Limit (mW/cm ²)	FCC/IC MPE Limit (mW)/cm ²	FCC/IC MPE Result / FCC/IC MPE Limit Ratio	FCC EIRP/ERP limit (W)	FCC EIRP/ERP limit (dBm)	IC EIRP/ERP limit (W)	IC EIRP/ERP limit (dBm)	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)	Ant Gain to meet IC MPE limit (dBi)	Ant Gain to meet IC ERP/EIRP limit (dBi)	Max Gain to meet IC ERP/EIRP and MPE limit (dBi)	Max Gain to consider same Frequency with LTE	Max gain allowed (dBi)
2	1850	24.5	100	24.50	0.2	1.000	4.476	0.448	0.448	0.4876	2.00	33.0	2.00	33.0	12.5	8.5	8.5	9.0	8.5	8.5	5.9	5.9
4	1710	24.5	100	24.50	0.2	1.000	4.242	0.424	0.424	0.4692	1.00	30.0	1.00	30.0	12.5	5.5	5.5	8.8	5.5	5.5	5.5	5.5
5	824	24.5	100	24.50	0.2	0.549	2.576	0.258	0.258	0.4876	7.00	38.5	11.50	40.6	9.9	14.0	9.9	6.6	16.1	6.6	3.5	3.5

<LTE>

Band	Frequency (MHz)	Max Conducted output power (per Tune-up) (dBm)	Duty Cycle (%)	AVG Power with Duty Cycle (dBm)	Distance (m)	FCC MPE Limit (mW/cm ²)	IC MPE Limit (W/m ²)	IC MPE Limit (mW/cm ²)	FCC/IC MPE Limit (mW)/cm ²	FCC/IC MPE Result / FCC/IC MPE Limit Ratio	FCC EIRP/ERP limit (W)	ERP limit (dBm)	IC EIRP/ERP limit (W)	IC EIRP/ERP limit (dBm)	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)	Ant Gain to meet IC MPE limit (dBi)	Ant Gain to meet IC ERP/EIRP limit (dBi)	Max Gain to meet IC ERP/EIRP and MPE limit (dBi)	Max Gain to consider EN-DC Active	Max gain allowed (dBi)
2	1850	24.0	100	24.00	0.2	1.000	4.476	0.448	0.448	0.4345	2.00	33.0	2.00	33.0	13.0	9.0	9.0	9.5	9.0	9.0	5.9	5.9
4	1710	24.0	100	24.00	0.2	1.000	4.242	0.424	0.424	0.4182	1.00	30.0	1.00	30.0	13.0	6.0	6.0	9.3	6.0	6.0	5.5	5.5
5	824	24.0	100	24.00	0.2	0.549	2.576	0.258	0.258	0.4346	7.00	38.5	11.50	40.6	10.4	14.5	10.4	7.1	16.6	7.1	3.5	3.5
7	2500	24.0	100	24.00	0.2	1.000	5.499	0.550	0.550	0.2181	2.00	33.0	2.00	33.0	13.0	9.0	9.0	10.4	9.0	9.0	3.8	3.8
12	699	24.0	100	24.00	0.2	0.466	2.302	0.230	0.230	0.4976	3.00	34.8	5.00	37.0	9.7	10.8	9.7	6.6	13.0	6.6	3.6	3.6
13	777	24.0	100	24.00	0.2	0.518	2.474	0.247	0.247	0.4960	3.00	34.8	5.00	37.0	10.2	10.8	10.2	6.9	13.0	6.9	3.9	3.9
14	788	24.0	100	24.00	0.2	0.525	2.498	0.250	0.250	0.4913	3.00	34.8	3.00	34.8	10.2	10.8	10.2	7.0	10.8	7.0	3.9	3.9
17	704	24.0	100	24.00	0.2	0.469	2.313	0.231	0.231	0.4952	3.00	34.8	5.00	37.0	9.7	10.8	9.7	6.7	13.0	6.7	3.6	3.6
25	1850	24.0	100	24.00	0.2	1.000	4.476	0.448	0.448	0.4345	2.00	33.0	2.00	33.0	13.0	9.0	9.0	9.5	9.0	9.0	5.9	5.9
26	814	24.0	100	24.00	0.2	0.543	2.554	0.255	0.255	0.4382	7.00	38.5	11.50	40.6	10.4	14.5	10.4	7.1	16.6	7.1	3.5	3.5
30	2305	23.0	100	23.00	0.2	1.000	5.202	0.520	0.520	0.0957	0.25	24.0	0.25	24.0	14.0	1.0	1.0	11.2	1.0	1.0	1.0	1.0
38	2570	24.0	100	24.00	0.2	1.000	5.604	0.560	0.560	0.2140	2.00	33.0	2.00	33.0	13.0	9.0	9.0	10.5	9.0	9.0	3.8	3.8
41	2496	26.5	100	26.50	0.2	1.000	5.493	0.549	0.549	0.3883	2.00	33.0	2.00	33.0	10.5	6.5	6.5	7.9	6.5	6.5	3.8	3.8
42 for FCC	3550	22.5	100	22.50	0.2	1.000	6.988	0.699	0.699	0.0568	0.20	23.0			14.5	0.5	0.5				0.5	0.5
43 for FCC	3600	22.5	100	22.50	0.2	1.000	7.055	0.706	0.706	0.0563	0.20	23.0			14.5	0.5	0.5				0.5	0.5
48 for FCC	3550	22.5	100	22.50	0.2	1.000	6.988	0.699	0.699	0.0568	0.20	23.0			14.5	0.5	0.5				0.5	0.5
42 for ISSED	3450	24.0	100	24.00	0.2	1.000	6.853	0.685	0.685	0.2904			1.00	30.0				11.4	6.0	6.0	6.0	6.0
43 for ISSED	3600	24.0	100	24.00	0.2	1.000	7.055	0.706	0.706	0.2821			1.00	30.0				11.5	6.0	6.0	6.0	6.0
48 for ISSED	3550	23.5	100	23.50	0.2	1.000	6.988	0.699	0.699	0.2848			1.00	30.0				12.0	6.5	6.5	6.5	6.5
66	1710	24.0	100	24.00	0.2	1.000	4.242	0.424	0.424	0.4182	1.00	30.0	1.00	30.0	13.0	6.0	6.0	9.3	6.0	6.0	5.5	5.5
71	663	24.0	100	24.00	0.2	0.442	2.220	0.222	0.222	0.4391	3.00	34.8	3.00	34.8	9.5	10.8	9.5	6.5	10.8	6.5	2.9	2.9



<5G NR>

Band	Frequency (MHz)	Max Conducted output power (per Tune-up) (dBm)	Duty Cycle (%)	AVG Power with Duty Cycle (dBm)	Distance (m)	FCC MPE Limit (mW/cm ²)	IC MPE Limit (W/m ²)	IC MPE Limit (mW/cm ²)	FCC/IC MPE Limit (mW/cm ²)	FCC/IC MPE Result / FCC/IC MPE Limit Ratio	FCC EIRP/ERP limit (W)	ERP limit (dBm)	IC EIRP/ERP limit (W)	IC EIRP/ERP limit (dBm)	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)	Ant Gain to meet IC MPE limit (dBi)	Ant Gain to meet IC ERP/EIRP limit (dBi)	Max Gain to meet IC ERP/EIRP and MPE limit (dBi)	Max Gain to consider EN-DC Active	Max gain allowed (dBi)
n2	1850	24.5	100	24.50	0.2	1.000	4.476	0.448	0.448	0.4876	2.00	33.0	2.00	33.0	12.5	8.5	8.5	9.0	8.5	8.5	5.9	5.9
n5	824	24.5	100	24.50	0.2	0.549	2.576	0.258	0.258	0.4876	7.00	38.5	11.50	40.6	9.9	14.0	9.9	6.6	16.1	6.6	3.5	3.5
n7	2500	24.5	100	24.50	0.2	1.000	5.499	0.550	0.550	0.2447	2.00	33.0	2.00	33.0	12.5	8.5	8.5	9.9	8.5	8.5	3.8	3.8
n12	699	24.0	100	24.00	0.2	0.466	2.302	0.230	0.230	0.4976	3.00	34.8	5.00	37.0	9.7	10.8	9.7	6.6	13.0	6.6	3.6	3.6
n13	777	24.0	100	24.00	0.2	0.518	2.474	0.247	0.247	0.4960	3.00	34.8	5.00	37.0	10.2	10.8	10.2	6.9	13.0	6.9	3.9	3.9
n14	788	24.0	100	24.00	0.2	0.525	2.498	0.250	0.250	0.4913	3.00	34.8	3.00	34.8	10.2	10.8	10.2	7.0	10.8	7.0	3.9	3.9
n25	1850	24.5	100	24.50	0.2	1.000	4.476	0.448	0.448	0.4876	2.00	33.0	2.00	33.0	12.5	8.5	8.5	9.0	8.5	8.5	5.9	5.9
n26	824	24.0	100	24.00	0.2	0.549	2.576	0.258	0.258	0.4346	7.00	38.5	11.50	40.6	10.4	14.5	10.4	7.1	16.6	7.1	3.5	3.5
n30	2305	23.0	100	23.00	0.2	1.000	5.202	0.520	0.520	0.0957	0.25	24.0	0.25	24.0	14.0	1.0	1.0	11.2	1.0	1.0	1.0	1.0
n38	2570	25.0	100	25.00	0.2	1.000	5.604	0.560	0.560	0.2694	2.00	33.0	2.00	33.0	12.0	8.0	8.0	9.5	8.0	8.0	3.8	3.8
n41	2496	27.5	100	27.50	0.2	1.000	5.493	0.549	0.549	0.4888	2.00	33.0	2.00	33.0	9.5	5.5	5.5	6.9	5.5	5.5	3.8	3.8
n41_pc1.5	2496	29.0	100	29.00	0.2	1.000	5.493	0.549	0.549	0.4888	2.00	33.0	2.00	33.0	8.0	4.0	4.0	5.4	4.0	4.0	2.3	2.3
n48 for FCC	3550	22.5	100	22.50	0.2	1.000	6.988	0.699	0.699	0.0568	0.20	23.0			14.5	0.5	0.5				0.5	0.5
n48 for ISED	3550	22.5	100	22.50	0.2	1.000	6.988	0.699	0.699	0.2848			1.00	30.0				13.0	7.5	7.5	7.5	7.5
n66	1710	24.5	100	24.50	0.2	1.000	4.242	0.424	0.424	0.4692	1.00	30.0	1.00	30.0	12.5	5.5	5.5	8.8	5.5	5.5	5.5	5.5
n71	663	24.5	100	24.50	0.2	0.442	2.220	0.222	0.222	0.4927	3.00	34.8	3.00	34.8	9.0	10.3	9.0	6.0	10.3	6.0	2.9	2.9
n77 for FCC	3450	27.5	100	27.50	0.2	1.000	6.853	0.685	0.685	0.2904	1.00	30.0			9.5	2.5	2.5				2.5	2.5
n77_pc1.5 for FCC	3450	29.0	100	29.00	0.2	1.000	6.853	0.685	0.685	0.2904	1.00	30.0			8.0	1.0	1.0				1.0	1.0
n78 for FCC	3450	27.5	100	27.50	0.2	1.000	6.853	0.685	0.685	0.2904	1.00	30.0			9.5	2.5	2.5				2.5	2.5
n78_pc1.5 for FCC	3450	29.0	100	29.00	0.2	1.000	6.853	0.685	0.685	0.2904	1.00	30.0			8.0	1.0	1.0				1.0	1.0
n77 for ISED	3450	27.0	100	27.00	0.2	1.000	6.853	0.685	0.685	0.2904			1.00	30.0				8.4	3.0	3.0	3.0	3.0
n77_pc1.5 for ISED	3450	29.0	100	29.00	0.2	1.000	6.853	0.685	0.685	0.2904			1.00	30.0				6.4	1.0	1.0	1.0	1.0
n78 for ISED	3450	27.0	100	27.00	0.2	1.000	6.853	0.685	0.685	0.2904			1.00	30.0				8.4	3.0	3.0	3.0	3.0
n78_pc1.5 for ISED	3450	29.0	100	29.00	0.2	1.000	6.853	0.685	0.685	0.2904			1.00	30.0				6.4	1.0	1.0	1.0	1.0

<EN-DC Simtaneous Transmission analysis>

EN-DC		Σ (Power Density / Limit) of LTE + 5G NR
LTE Power Density / Limit	5G NR Power Density / Limit	
0.4976	0.4976	0.9952

General Note:

- The device support 5G FR1 NSA mode, consider colocation analysis to selected worst case LTE and 5G NR power density / limit to summation to show compliance.
- Σ (Power Density / Limit): This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for LTE + 5G NR.
- Considering the collocation with the four transmitters of the EIRP performance listed in the table above, the aggregated (power density /limit) is smaller than 1, and MPE of 2 collocated transmitters is compliant.



3.2. EN-DC active and transmit with WLAN/BT

<UMTS>

Band	Lowest Frequency (MHz)	Max Conducted output power (per Tune-up) (dBm)	Duty Cycle (%)	AVG Power with Duty Cycle (dBm)	MPE evaluation distance (m)	FCC MPE Limit (mW/cm ²)	IC MPE Limit (W/m ²)	IC MPE Limit (mW/cm ²)	FCC/IC MPE Limit (mW)/cm ²	FCC/IC MPE Result / FCC/IC MPE Limit Ratio	FCC EIRP/ERP limit (W)	FCC EIRP/ERP limit (dBm)	IC EIRP/ERP limit (W)	IC EIRP/ERP limit (dBm)	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)	Ant Gain to meet IC MPE limit (dBi)	Ant Gain to meet IC ERP/EIRP limit (dBi)	Max Gain to meet IC ERP/EIRP and MPE limit (dBi)	Max Gain to consider same Frequency with LTE	Max gain allowed (dBi)
2	1850	24.5	100	24.50	0.2	1.000	4.476	0.448	0.448	0.4345	2.00	33.0	2.00	33.0	12.5	8.5	8.5	9.0	8.5	8.5	5.4	5.4
4	1710	24.5	100	24.50	0.2	1.000	4.242	0.424	0.424	0.4379	1.00	30.0	1.00	30.0	12.5	5.5	5.5	8.8	5.5	5.5	5.2	5.2
5	824	24.5	100	24.50	0.2	0.549	2.576	0.258	0.258	0.4447	7.00	38.5	11.50	40.6	9.9	14.0	9.9	6.6	16.1	6.6	3.1	3.1

<LTE>

Band	Frequency (MHz)	Max Conducted output power (per Tune-up) (dBm)	Duty Cycle (%)	AVG Power with Duty Cycle (dBm)	Distance (m)	FCC MPE Limit (mW/cm ²)	IC MPE Limit (W/m ²)	IC MPE Limit (mW)/cm ²	FCC/IC MPE Limit (mW)/cm ²	FCC/IC MPE Result / FCC/IC MPE Limit Ratio	FCC EIRP/ERP limit (W)	ERP limit (dBm)	IC EIRP/ERP limit (W)	IC EIRP/ERP limit (dBm)	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)	Ant Gain to meet IC MPE limit (dBi)	Ant Gain to meet IC ERP/EIRP limit (dBi)	Max Gain to meet IC ERP/EIRP and MPE limit (dBi)	Max Gain to consider EN-DC Active	Max gain allowed (dBi)
2	1850	24.0	100	24.00	0.2	1.000	4.476	0.448	0.448	0.3873	2.00	33.0	2.00	33.0	13.0	9.0	9.0	9.5	9.0	9.0	5.4	5.4
4	1710	24.0	100	24.00	0.2	1.000	4.242	0.424	0.424	0.3903	1.00	30.0	1.00	30.0	13.0	6.0	6.0	9.3	6.0	6.0	5.2	5.2
5	824	24.0	100	24.00	0.2	0.549	2.576	0.258	0.258	0.3963	7.00	38.5	11.50	40.6	10.4	14.5	10.4	7.1	16.6	7.1	3.1	3.1
7	2500	24.0	100	24.00	0.2	1.000	5.499	0.550	0.550	0.1989	2.00	33.0	2.00	33.0	13.0	9.0	9.0	10.4	9.0	9.0	3.4	3.4
12	699	24.0	100	24.00	0.2	0.466	2.302	0.230	0.230	0.4435	3.00	34.8	5.00	37.0	9.7	10.8	9.7	6.6	13.0	6.6	3.1	3.1
13	777	24.0	100	24.00	0.2	0.518	2.474	0.247	0.247	0.4421	3.00	34.8	5.00	37.0	10.2	10.8	10.2	6.9	13.0	6.9	3.4	3.4
14	788	24.0	100	24.00	0.2	0.525	2.498	0.250	0.250	0.4379	3.00	34.8	3.00	34.8	10.2	10.8	10.2	7.0	10.8	7.0	3.4	3.4
17	704	24.0	100	24.00	0.2	0.469	2.313	0.231	0.231	0.4414	3.00	34.8	5.00	37.0	9.7	10.8	9.7	6.7	13.0	6.7	3.1	3.1
25	1850	24.0	100	24.00	0.2	1.000	4.476	0.448	0.448	0.3873	2.00	33.0	2.00	33.0	13.0	9.0	9.0	9.5	9.0	9.0	5.4	5.4
26	814	24.0	100	24.00	0.2	0.543	2.554	0.255	0.255	0.3997	7.00	38.5	11.50	40.6	10.4	14.5	10.4	7.1	16.6	7.1	3.1	3.1
30	2305	23.0	100	23.00	0.2	1.000	5.202	0.520	0.520	0.0957	0.25	24.0	0.25	24.0	14.0	1.0	1.0	11.2	1.0	1.0	1.0	1.0
38	2570	24.0	100	24.00	0.2	1.000	5.604	0.560	0.560	0.1952	2.00	33.0	2.00	33.0	13.0	9.0	9.0	10.5	9.0	9.0	3.4	3.4
41	2496	26.5	100	26.50	0.2	1.000	5.493	0.549	0.549	0.3541	2.00	33.0	2.00	33.0	10.5	6.5	6.5	7.9	6.5	6.5	3.4	3.4
42 for FCC	3550	22.5	100	22.50	0.2	1.000	6.988	0.699	0.699	0.0568	0.20	23.0			14.5	0.5	0.5				0.5	0.5
43 for FCC	3600	22.5	100	22.50	0.2	1.000	7.055	0.706	0.706	0.0563	0.20	23.0			14.5	0.5	0.5				0.5	0.5
48 for FCC	3550	22.5	100	22.50	0.2	1.000	6.988	0.699	0.699	0.0568	0.20	23.0			14.5	0.5	0.5				0.5	0.5
42 for ISED	3450	24.0	100	24.00	0.2	1.000	6.853	0.685	0.685	0.2904			1.00	30.0				11.4	6.0	6.0	6.0	6.0
43 for ISED	3600	24.0	100	24.00	0.2	1.000	7.055	0.706	0.706	0.2821			1.00	30.0				11.5	6.0	6.0	6.0	6.0
48 for ISED	3550	23.5	100	23.50	0.2	1.000	6.988	0.699	0.699	0.2848			1.00	30.0				12.0	6.5	6.5	6.5	6.5
66	1710	24.0	100	24.00	0.2	1.000	4.242	0.424	0.424	0.3903	1.00	30.0	1.00	30.0	13.0	6.0	6.0	9.3	6.0	6.0	5.2	5.2
71	663	24.0	100	24.00	0.2	0.442	2.220	0.222	0.222	0.3914	3.00	34.8	3.00	34.8	9.5	10.8	9.5	6.5	10.8	6.5	2.4	2.4



RF EXPOSURE EVALUATION REPORT

Report No. : FA270608-14

<5G FR1>

Band	Frequency (MHz)	Max Conducted output power (per Tune-up) (dBm)	Duty Cycle (%)	AVG Power with Duty Cycle (dBm)	Distance (m)	FCC MPE Limit (mW/cm ²)	IC MPE Limit (W/m ²)	IC MPE Limit (mW/cm ²)	FCC/IC MPE Limit (mW)/cm ²	FCC/IC MPE Result / FCC/IC MPE Limit Ratio	FCC EIRP/ERP limit (W)	ERP limit (dBm)	IC EIRP/ERP limit (W)	IC EIRP/ERP limit (dBm)	Ant Gain to meet FCC MPE limit (dBi)	Ant Gain to meet FCC ERP/ERP limit (dBi)	Max Gain to meet FCC ERP/ERP and MPE limit (dBi)	Ant Gain to meet IC MPE limit (dBi)	Ant Gain to meet IC ERP/ERP limit (dBi)	Max Gain to meet IC ERP/ERP and MPE limit (dBi)	Max Gain to consider EN-DC Active	Max gain allowed (dBi)
n2	1850	24.5	100	24.50	0.2	1.000	4.476	0.448	0.448	0.4345	2.00	33.0	2.00	33.0	12.5	8.5	8.5	9.0	8.5	8.5	5.4	5.4
n5	824	24.5	100	24.50	0.2	0.549	2.576	0.258	0.258	0.4447	7.00	38.5	11.50	40.6	9.9	14.0	9.9	6.6	16.1	6.6	3.1	3.1
n7	2500	24.5	100	24.50	0.2	1.000	5.499	0.550	0.550	0.2232	2.00	33.0	2.00	33.0	12.5	8.5	8.5	9.9	8.5	8.5	3.4	3.4
n12	699	24.0	100	24.00	0.2	0.466	2.302	0.230	0.230	0.4435	3.00	34.8	5.00	37.0	9.7	10.8	9.7	6.6	13.0	6.6	3.1	3.1
n13	777	24.0	100	24.00	0.2	0.518	2.474	0.247	0.247	0.4421	3.00	34.8	5.00	37.0	10.2	10.8	10.2	6.9	13.0	6.9	3.4	3.4
n14	788	24.0	100	24.00	0.2	0.525	2.498	0.250	0.250	0.4379	3.00	34.8	3.00	34.8	10.2	10.8	10.2	7.0	10.8	7.0	3.4	3.4
n25	1850	24.5	100	24.50	0.2	1.000	4.476	0.448	0.448	0.4345	2.00	33.0	2.00	33.0	12.5	8.5	8.5	9.0	8.5	8.5	5.4	5.4
n26	824	24.0	100	24.00	0.2	0.549	2.576	0.258	0.258	0.3963	7.00	38.5	11.50	40.6	10.4	14.5	10.4	7.1	16.6	7.1	3.1	3.1
n30	2305	23.0	100	23.00	0.2	1.000	5.202	0.520	0.520	0.0957	0.25	24.0	0.25	24.0	14.0	1.0	1.0	11.2	1.0	1.0	1.0	1.0
n38	2570	25.0	100	25.00	0.2	1.000	5.604	0.560	0.560	0.2457	2.00	33.0	2.00	33.0	12.0	8.0	8.0	9.5	8.0	8.0	3.4	3.4
n41	2496	27.5	100	27.50	0.2	1.000	5.493	0.549	0.549	0.4458	2.00	33.0	2.00	33.0	9.5	5.5	5.5	6.9	5.5	5.5	3.4	3.4
n41_pc1.5	2496	29.0	100	29.00	0.2	1.000	5.493	0.549	0.549	0.4458	2.00	33.0	2.00	33.0	8.0	4.0	4.0	5.4	4.0	4.0	1.9	1.9
n48 for FCC	3550	22.5	100	22.50	0.2	1.000	6.988	0.699	0.699	0.0568	0.20	23.0			14.5	0.5	0.5				0.5	0.5
n48 for ISED	3550	22.5	100	22.50	0.2	1.000	6.988	0.699	0.699	0.2848			1.00	30.0				13.0	7.5	7.5	7.5	7.5
n66	1710	24.5	100	24.50	0.2	1.000	4.242	0.424	0.424	0.4379	1.00	30.0	1.00	30.0	12.5	5.5	5.5	8.8	5.5	5.5	5.2	5.2
n71	663	24.5	100	24.50	0.2	0.442	2.220	0.222	0.222	0.4391	3.00	34.8	3.00	34.8	9.0	10.3	9.0	6.0	10.3	6.0	2.4	2.4
n77 for FCC	3450	27.5	100	27.50	0.2	1.000	6.853	0.685	0.685	0.2904	1.00	30.0			9.5	2.5	2.5				2.5	2.5
n77_pc1.5 for FCC	3450	29.0	100	29.00	0.2	1.000	6.853	0.685	0.685	0.2904	1.00	30.0			8.0	1.0	1.0				1.0	1.0
n78 for FCC	3450	27.5	100	27.50	0.2	1.000	6.853	0.685	0.685	0.2904	1.00	30.0			9.5	2.5	2.5				2.5	2.5
n78_pc1.5 for FCC	3450	29.0	100	29.00	0.2	1.000	6.853	0.685	0.685	0.2904	1.00	30.0			8.0	1.0	1.0				1.0	1.0
n77 for ISED	3450	27.0	100	27.00	0.2	1.000	6.853	0.685	0.685	0.2904			1.00	30.0				8.4	3.0	3.0	3.0	3.0
n77_pc1.5 for ISED	3450	29.0	100	29.00	0.2	1.000	6.853	0.685	0.685	0.2904			1.00	30.0				6.4	1.0	1.0	1.0	1.0
n78 for ISED	3450	27.0	100	27.00	0.2	1.000	6.853	0.685	0.685	0.2904			1.00	30.0				8.4	3.0	3.0	3.0	3.0
n78_pc1.5 for ISED	3450	29.0	100	29.00	0.2	1.000	6.853	0.685	0.685	0.2904			1.00	30.0				6.4	1.0	1.0	1.0	1.0



<WLAN/BT>

Band	Frequency (MHz)	Max EIRP (dBm)	Duty Cycle (%)	AVG EIRP with Duty Cycle (dBm)	Distance (m)	FCC MPE Limit (mW/cm ²)	IC MPE Limit (W/m ²)	IC MPE Limit (mW/cm ²)	FCC/IC MPE Limit (mW/cm ²)	FCC/IC MPE Result / FCC/IC MPE Limit (mW/cm ²)
2.4GHz WLAN	2402	24.0	100	24.00	0.2	1.000	5.351	0.535	0.535	0.0934
5GHz WLAN	5150	24.0	100	24.00	0.2	1.000	9.011	0.901	0.901	0.0555
Bluetooth	2402	15.0	100	15.00	0.2	1.000	5.351	0.535	0.535	0.0118

General Note:

- This MPE analysis is applicable to any collocated transmitters with transmit power for WLAN ERIP is estimated 24dBm and for Bluetooth EIRP is estimated 15dBm.

<EN-DC Simtaneous Transmission analysis with WLAN/BT>

EN-DC		WLAN Power Density / Limit	Bluetooth Power Density / Limit	Σ (Power Density / Limit) of LTE + 5G NR + WLAN + Bluetooth
LTE Power Density / Limit	5G NR Power Density / Limit			
0.4435	0.4458	0.0934	0.0118	0.9945

General Note:

- The device support 5G FR1 NSA mode, consider collocation analysis to selected worst case LTE and 5G NR power density / limit to summation to show compliance.
- Σ (Power Density / Limit): This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for LTE + 5G NR + WLAN + Bluetooth when EN-DC is active.
- Considering the collocation with the four transmitters of the EIRP performance listed in the table above, the aggregated (power density /limit) is smaller than 1, and MPE of 4 collocated transmitters is compliant.

Conclusion:

According to 47 CFR §2.1091, the RF exposure analysis concludes that the RF Exposure is FCC compliant.