

14. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

14.1. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended to comply with § 2.1091 radiofrequency radiation exposure evaluation: mobile devices of the FCC CFR 47 Rules, CFR 1.1310 (b) Radio frequency Radiation Exposure Requirement.

14.2. Special Accessories

Not available for this EUT intended for grant.

14.3. Equipment Modifications

Not available for this EUT intended for grant.

14.4. Limitation

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
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
1500-15000	/	/	1.0	30

F = frequency in MHz

* = Plane-wave equipment power density

s otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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14.5. Maximum Permissible Exposure (MPE) Evaluation

The evaluation and calculation as deduces below presents only worst-case that produces highest value of the result:

Operation Configuration of the Worst-Case picked up to evaluate: **HSDPA IV**

Operation in HSDPA IV band (1712.4 – 1752.6 MHz)

The EIRP of NB106-N NGFF WWAN MODULE in HSDPA IV band is 24.47dBm max. The resulted power density at a distance of 20 cm can be deducted as follows:

EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
	MHz		V/H	dBm	dBi	dB	dBm	dBm
HSDPA Band IV	1712.4	1312	V	20.77	5.46	-4.5	21.72	33.00
			H	23.51	5.46	-4.5	24.47	33.00
	1732.6	1413	V	21.10	5.40	-4.53	21.97	33.00
			H	22.87	5.40	-4.53	23.74	33.00
	1752.6	1513	V	23.16	5.34	-4.55	23.95	33.00
			H	22.55	5.34	-4.55	23.34	33.00

$$\text{EIRP} = 24.47\text{dBm} = 279.898\text{mW}$$

$$\begin{aligned} \text{Power Density} &= \text{EIRP} \times \text{Duty Cycle} / (4 \pi R^2) \\ &= 279.898 \times 1 / (4 \times \pi \times 20^2) = 0.05571\text{mW/cm}^2 \end{aligned}$$

where Duty Cycle is 1 for HSDPA IV band operation and R is 20 cm.

The MPE limit for General Population/Uncontrolled Exposure is referred to in section 14.4, and it is,

$$\text{MPE limit} = 1.0\text{mW/cm}^2$$

The resulted power density is below the limit of MPE, and therefore NB106-N NGFF WWAN MODULE in HSDPA IV band is compliant with the FCC rules on RF exposure.

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