

**Maximum Permissible Exposure Report****1. Product Information**

EUT	:	Cell Phone Signal booster
Equipment Type	:	Fixed Wideband Consumer Zone Enhancers
Test Model	:	N70AN-US59
Power Supply	:	For AC Adapter(model: SK03T1-1200200U): Input: 100-240V~50/60Hz 0.6A Output: 12V---2A
Hardware Version	:	N70AN-CA60 V1.0
Software Version	:	N70AN-CA60 V1.0
Frequency Range	:	Lower 700MHz Band (B12) Uplink: 698~716MHz, Downlink: 728~746MHz Upper 700MHz Band (B13) Uplink: 777~787MHz, Downlink: 747~757MHz Cellular Band (B5) Uplink: 824~849MHz, Downlink: 869~894MHz PCS Band (B2, B25) Uplink: 1850~1915MHz, Downlink: 1930~1995MHz AWS Band(B4, B66) Uplink: 1710~1780MHz, Downlink: 2110~2200MHz
Max Gain	:	Uplink: ≤67dB Downlink: ≤64dB
Mobile Antenna Gain	:	8dBi
Max Antenna Port Output Power	:	Uplink: ≤20dBm Downlink: ≤7dBm
Emission Designator	:	F9W, G7D, G7W, GXW, W7D
FCC Classification	:	B2W/Wideband Consumer Booster(CMRS)
Operating Temperature	:	-20°C~+65°C

2. Evaluation Method

Systems operating under the provisions of FCC 47 CFR section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as mobile device whereby a distance of 0.2m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.

In accordance with KDB447498D01 for Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modelled or measured field strengths or power density, is ≤ 1.0 . The MPE ratio of each antenna is determined at the minimum test separation distance required by the operating configurations and exposure conditions of the host device, according to the ratio of field strengths or power density to MPE limit, at the test frequency. Either the maximum peak or spatially averaged results from measurements or numerical simulations may be used to determine the MPE ratios. Spatial averaging does not apply when MPE is estimated using simple calculations based on far-field plane-wave equivalent



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conditions. The antenna installation and operating requirements for the host device must meet the minimum test separation distances required by all antennas, in both standalone and simultaneous transmission operations, to satisfy compliance.

3. Limit

3.1 Refer Evaluation Method

[ANSI C95.1–2019](#): IEEE Standard for Safety Levels with Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz to 300 GHz

[FCC KDB publication 447498 D01 General 1 RF Exposure Guidance v06](#): Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

[FCC CFR 47 part1 1.1310](#): Radiofrequency radiation exposure limits.

[FCC CFR 47 part2 2.1091](#): Radiofrequency radiation exposure evaluation: mobile devices.



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3.2 Limit

Limits for Maximum Permissible Exposure (MPE)/Controlled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
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 – 1500	/	/	f/300	6
1500 – 100,000	/	/	5	6

Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for Occupational/Uncontrolled Exposure				
0.3 – 3.0	614	1.63	(100) *	30
3.0 – 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

F=frequency in MHz

*=Plane-wave equivalent power density

4. MPE Calculation Method

Predication of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S=PG/4\pi R^2$$

Where: S=power density

P=power input to antenna

G=power gain of the antenna in the direction of interest relative to an isotropic radiator

R=distance to the center of radiation of the antenna

5. Antenna Information

EUT can only use antennas certificated as follows provided by manufacturer;

Mode	Frequency (MHz)	Outdoor Antenna Gain (dBi) (Log Periodic Antenna, Model: AN201)	Cable loss (dB)
Uplink	698-716	6	1.80
	777-787	6	1.80
	824-849	6	2.00
	1850-1915	8	2.95
	1710-1780	8	2.70
Mode	Frequency (MHz)	Indoor Antenna Gain (dBi) (Indoor Panel Antenna, Model: AN101)	Cable loss (dB)
Downlink	728-746	7	1.80
	747-757	7	1.80
	869-894	7	2.00
	1930-1995	7	2.95
	2110-2200	7	3.20



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6. Conducted Power

Operation Band		Frequency (MHz)	Max Output Power (dBm)	Antenna Gain (dBi)	Cable Loss	EIRP Power (dBm)
Uplink	Lower 700 Band (698-716)	707	17.75	6	1.80	21.95
	Upper 700 Band (777-787)	782	17.85	6	1.80	22.05
	Cellular Band (824-849)	836.5	17.66	6	2.00	21.66
	PCS Band (1850-1915)	1882.5	17.59	8	2.95	22.64
	AWS Band (1710-1780)	1732.5	17.82	8	2.70	23.12
Downlink	Lower 700 Band (728-746)	737	6.17	7	1.80	11.37
	Upper 700 Band (747-757)	752	6.88	7	1.80	12.08
	Cellular Band (869-894)	881.5	6.69	7	2.00	11.69
	PCS Band (1930-1995)	1962.5	5.97	7	2.95	10.02
	AWS Band (2110-2200)	2132.5	5.80	7	3.20	9.60





7. Manufacturing Tolerance

Operation Band		Frequency (MHz)	Max Output Power (dBm)	Target (dBm)	Tolerance ±(dB)
Uplink	Lower 700 Band (698-716)	707	17.75	17.5	1.0
	Upper 700 Band (777-787)	782	17.85	17.5	1.0
	Cellular Band (824-849)	836.5	17.66	17.5	1.0
	PCS Band (1850-1915)	1882.5	17.59	17.5	1.0
	AWS Band (1710-1780)	1732.5	17.82	17.5	1.0
Downlink	Lower 700 Band (728-746)	737	6.17	6.5	1.0
	Upper 700 Band (747-757)	752	6.88	6.5	1.0
	Cellular Band (869-894)	881.5	6.69	6.5	1.0
	PCS Band (1930-1995)	1962.5	5.97	6	1.0
	AWS Band (2110-2200)	2132.5	5.80	6	1.0





8. Measurement Results

8.1 Standalone MPE Evaluation

As declared by the Applicant, the EUT is a wireless device used in a fix application, at least 20 cm from any body part of the user or nearby persons; from the maximum EUT RF output power, the minimum separation distance, $r = 20\text{cm}$, as well as the gain of the used antenna refer to antenna information, the RF power density can be obtained.

Operation Band	Frequency (MHz)	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm ²)	MPE Limits (mW/cm ²)	
		dBm	mW					
Uplink	Lower 700 Band (698-716)	707	18.5	70.7946	6	3.9811	0.0561	1.0000
	BRS Band (2500-2570)	2535	18.5	70.7946	6	3.9811	0.0561	1.0000
	Cellular Band (824-849)	836.5	18.5	70.7946	6	3.9811	0.0561	1.0000
	PCS Band (1850-1915)	1882.5	18.5	70.7946	8	6.3096	0.0889	1.0000
	AWS Band (1710-1780)	1732.5	18.5	70.7946	8	6.3096	0.0889	1.0000
Downlink	Lower 700 Band (728-746)	737	7.5	5.6234	7	5.0119	0.0056	1.0000
	BRS Band (2620-2690)	2655	7.5	5.6234	7	5.0119	0.0056	1.0000
	Cellular Band (869-894)	881.5	7.5	5.6234	7	5.0119	0.0056	1.0000
	PCS Band (1930-1995)	1962.5	7	5.0119	7	5.0119	0.0050	1.0000
	AWS Band (2110-2200)	2132.5	7	5.0119	7	5.0119	0.0050	1.0000

8.2 Simultaneous Transmission MPE Evaluation

Not need consider simultaneous transmission

9. Conclusion

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.

-----THE END OF REPORT-----

