



Maximum Permissible Exposure (MPE) & Exposure evaluation

Report identification number: 1-5326/17-01-04-A

Certification numbers and labeling requirements	
FCC ID	YG3-SXPCEAN2
IC number	4720B-SXPCEAN2
HVIN (Hardware Version Identification Number)	SX-PCEAN2
PMN (Product Marketing Name)	SX-PCEAN2
FVIN (Firmware Version Identification Number)	1.0.3.0.2
HMN (Host Marketing Name)	-/-

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Document authorized:



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EUT technologies:

The EUT can transmit the following technologies via two antenna ports

Technologies:	Max. power conducted: (AVG)	Max. antenna gain:	Min. pathloss:
WLAN 5 GHz	Declared 13.5 dBm	9 dBi)**	-- (if applicable)
WLAN 2.4 GHz	Declared 14.5 dBm	9 dBi)*	-- (if applicable)

)* Worst case of several omnidirectional and directional antennas.
Details see section 5.1 of RF test report 1-5326-01-02-A

)** Worst case of several omnidirectional and directional antennas.
Details see section 5.1 of RF test report 1-5326-01-03-A

Prediction of MPE limit at given distance - FCC

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 the antenna
G = Antenna gain
R = Distance to the center of radiation of the antenna

The table below is excerpted from Table 1B of 47 CFR 1.1310 titled "Limits for Maximum Permissible Exposure (MPE), Limits for General Population/Uncontrolled Exposure"

Frequency Range (MHz)	Power Density (mW/cm ²)	Averaging Time (minutes)
300 -1500	f/1500	30
1500 - 100000	1.0	30

where f = Frequency (MHz)

Prediction: worst case

		> 1500 MHz	> 1500 MHz
	Technology	WLAN @ 2450 MHz	WLAN @ 5 GHz
P	Max power input to the antenna	14.5 dBm	13.5 dBm
R	Distance	20 cm	20 cm
G	Antenna gain	9 dBi	9 dBi
S	MPE limit for uncontrolled exposure	1 mW/cm ²	1 mW/cm ²
	Calculated Power density:	0.0446 mW/cm ²	0.0354 mW/cm ²
	Collocation WLAN 2.4 + 5 GHz	0.0800 mW/cm ²	
	Collocation WLAN 5 + 5 GHz		0.0708 mW/cm ²

This prediction demonstrates the following:

The power density levels for FCC at a distance of 20 cm are below the maximum levels allowed by regulations.

Prediction of MPE limit at given distance - IC

RSS-102, Issue 5, 2.5.2

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $4.49/f^{0.5}W$ (adjusted for tune-up tolerance), where f is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834} W$ (adjusted for tune-up tolerance), where f is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

Prediction: worst case

		0.3 - 6 GHz	0.3 - 6 GHz
	Technology	WLAN 2.4 Ghz	WLAN 5 GHz
	Frequency	2450 MHz	5180 MHz
P	Max power input to the antenna	14.5 dBm	13.5 dBm
R	Distance	20 cm	20 cm
G	Antenna gain	9 dBi	9 dBi
	Maximum EIRP	223.9 mW	177.8 mW
	Collocation WLAN 2.4 + 5 GHz	401.7 mW	
	Collocation WLAN 5 + 5 GHz		355.7 mW
	Exclusion Limit from above:	2.71 W	4.53 W

Conclusion: RF exposure evaluation is not required.

For applications where minimum distance to radiating element is 20cm Annex C of RSS-102 should be filled out.

Annex A: Document History

Version	Applied Changes	Date of Release
	Initial Release	05.07.2018
-A	Changed HVIN on page 1.	24.08.2018