

Prüfbericht - Produkte Test Report - Products

Prüfbericht - Nr.: CN231H2K 004

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Pass

Test Report No.:

1 Safety Human Exposure

Radio Frequency Exposure Compliance 1.1

1.1.1 Electromagnetic Fields

RESULT:

Test Specification		
Report No.	: CN23	1H2K 004
Test item	: Wirele	ess Humidity Sensor
Identification / Type No.	: 5X11N	-XX-X-X1
FCC ID	: 2A85P	A5XX1N
IC:	29620-	A5XX1N
HVIN	: 5	
Test standard	: CFR47	FCC Part 2: Section 2.1091
	CFR47	FCC Part 1: Section 1.1310
	FCC K	DB Publication 447498 D01 v06
	FCC KDB Publication 865664 D02 v01r02	
	RSS-1	02 Issue 5 February 2021

1.1.1.1 RF Exposure Compliance Requirement for FCC

FCC requirement: Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 20cm normally can be maintained between the user and the device.

Max -1.29 dBi BLE, Max 0.02 dBi Lora

\geq Radio Frequency Exposure Limit

Frequency range Electric field strength (MHz) (V/m)		Magnetic field strength (A/m)	Power density (mW/cm²)	
300-1,500			f/1500	
1,500-100,000			1.0	

Radio Frequency Exposure Calculation Formula



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

where: S = power density (in appropriate units, e.g. mW/cm²)

P = power input to the antenna (in appropriate units, e.g., mW)

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 (appropriate units, e.g., cm)

or:

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

where: EIRP = equivalent (or effective) isotropically radiated power

a) RF Exposure Evaluation standalone operations (worse case)

Mode	*Measured RF Output Power (dBm)	EIRP (dBm)	Distance (cm)	Power Density (W/m²)	FCC Limit (W/m ²)
BLE*	5.98	4.69	20	0.006	10
Lora**	13.08	13.10	20	0.04	6

Note:

1. *BLE RF Output Power: Refer to CN231H2K 001.

2. **Lora RF Output Power: Refer to CN231H2K 002.

b) RF Exposure Evaluation simultaneous operations

N/A (Not supported)

> Conclusion

Therefore the maximum calculations result of above are meet the requirement of Radio Frequency Exposure (MPE) limit.



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1.1.1.2 RF Exposure Compliance Requirement for IC

The EUT shall comply with the requirement of RSS-102 section 2.5.2.

Exemption from Routine Evaluation Limits – RF Exposure Evaluation

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:

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 x $10^{-2} f^{0.6834}$ W (adjusted for tune-up tolerance), where *f* is in MHz;

- RF exposure evaluation exempted power for BLE: 2.67 W
- RF exposure evaluation exempted power for Lora: 1.37 W

The nominal maximum conducted output power specified:

a) Test Results of RF Exposure Calculations for ISED, Stand-alone mode

Mode	*Measured RF Output Power (dBm)	EIRP (dBm)	Distance (cm)	Maximum EIRP (W)	Threshold power (W)	Verdict
BLE*	5.98	4.69	20	0.0029	2.67	Pass
Lora**	13.08	13.10	20	0.020	1.37	Pass

Note:

*BLE RF Output Power: Refer to CN231H2K 001.

**Lora RF Output Power: Refer to CN231H2K 002.

b) RF Exposure Evaluation simultaneous operations

N/A (Not supported)

Table 1: Test Results of RF Exposure Calculations for ISED, Simultaneous mode

"RF Radiation Exposure Statement Caution: This Transmitter must be installed to provide a separation distance of at least 20 cm from all persons."