

Safety Human Exposure

1.1 Radio Frequency Exposure Compliance

1.1.1 Electromagnetic Fields

RESULT:

Pass

Test Specification

Test item	: AC Wallbox Charging Station
Identification / Type No.	: WPTAC-7KW-S18-TD, WPTAC-7KW-S24-TD, WPTAC-9KW-S18-TD, WPTAC-9KW-S24-TD, WPTAC-11KW-S18-TD, WPTAC-11KW-S24-TD
FCC ID	: 2A4EM-PTYGEVCHARGER
IC	: 28264-PTYG
Test standard	: CFR47 FCC Part 2: Section 2.1091 CFR47 FCC Part 1: Section 1.1310 FCC KDB Publication 447498 D01 General RF Exposure Guidance v06 FCC KDB Publication 865664 D02 v01r02

➤ Product Classification

This device defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at 20 cm is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons.

Max 6.00 dBi for RFID(13.56MHz), Max 2.00 dBi for 2.4GHz Wi-Fi mode, Max 2.00 dBi for BLE mode

➤ Radio Frequency Exposure Limit

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)
1.34-30	824/f	2.19/f	*(180/f ²)
30-300	27.5	0.073	0.2
300-1,500	--	--	f/1500
1,500-100,000	--	--	1.0

➤ Radio Frequency Exposure Calculation Formula

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

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) EUT RF Exposure Evaluation standalone operations

Mode	*Measured RF Output Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	FCC Limit (mW/cm ²)
Bluetooth	-0.658	2.0	20	0.0003	1.0
2.4G Wi-Fi	14.761	2.0	20	0.0094	1.0
RFID(13.56MHz)	-40.35	6.0	20	0	0.98

Note:

1. *The RF Output Power of 2.4GHz WiFi: Refer to CN22OAWT 001
2. *The RF Output Power of Bluetooth: Refer CN22OAWT 002
3. *The RF Output Power of RFID: Refer CN22OAWT 003, In addition, the power of RFID is very low and the calculated value is negligible.

b) Simultaneous transmission MPE:

Per KDB 447498 D01 v06, 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 calculated or measured field strengths or power density, is ≤ 1.0 .

Simultaneous transmission Scenarios

No.	Simultaneous transmission Scenarios
1	Bluetooth + 2.4GHz Wi-Fi + RFID

1) For Bluetooth + 2.4GHz Wi-Fi:

The MPE ratio for Bluetooth can be calculated as follow:

=The power density at 20cm distance/MPE limit

= $0.0003 \text{ mW/cm}^2 / 1 \text{ mW/cm}^2$

=0.0003

The MPE ratio for 2.4GHz Wi-Fi can be calculated as follow:

=The power density at 20cm distance/MPE limit

= $0.0094 \text{ mW/cm}^2 / 1 \text{ mW/cm}^2$

=0.0094

The sum of the MPE ratios for all simultaneous transmitting antennas:

= $0.0003 + 0.0094$

= $0.0097 < 1.0$

As the sum of MPE ratios for all simultaneous transmitting antennas is ≤ 1.0 , simultaneous transmission MPE test exclusion will be applied.

➤ Conclusion

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

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 $1.31 \times 10^{-2} f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;

The nominal maximum conducted output power specified:

The Max. e.i.r.p. for RFID: -40.35 dBm = 0.09uW

The Max. e.i.r.p. for BLE: 1.342 dBm = 0.001 W

The Max. e.i.r.p. for WIFI: 16.761 dBm = 0.047 W

Note: The power of RFID is very low and the calculated value is negligible.

RF exposure evaluation exempted power for 2.4GHz: 2.67 W

The Max. e.i.r.p. for BLE/WIFI are less than the RF exposure evaluation exempted power.

So RF exposure evaluation is not required

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