



## RF Exposure Evaluation Declaration

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**FCC ID:** O3YARF

**APPLICANT:** DewertOkin GmbH

**Application Type:** Certification

**Product:** Okin Commander


**Model No.:** P1215

**Brand Name:** Okin

**FCC Classification:** Digital Transmission System (DTS)

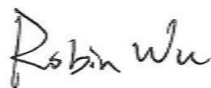
**Test Date:** September 27, 2018

Reviewed By:



( Kevin Guo )

Approved By:



( Robin Wu )



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standards through the calibration of the equipment and evaluated measurement uncertainty herein.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

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### Revision History

Report No.	Version	Description	Issue Date	Note
1806RSU033-U2	Rev. 01	Initial report	09-30-2018	Valid

## 1. PRODUCT INFORMATION

### 1.1. Equipment Description

Product Name:	Okin Commander
Model No.:	P1215
Brand Name:	Okin
Wi-Fi Specification:	802.11 b/g/n
Bluetooth Specification:	Bluetooth v4.0 LE
Other RF Specification:	OKIN 2.4G
Working Voltage	AC 100-240V~50/60Hz

### 1.2. Antenna Description

Antenna Type	Frequency Band (GHz)	TX Paths	Max Peak Gain (dBi)
PCB Antenna	Wi-Fi & Bluetooth	1	2
PCB Antenna	OKIN	1	3.3

Note: PCB antenna of Wi-Fi & Bluetooth is from report of Wi-Fi & Bluetooth module (FCC ID: 2AC7Z-ESPWROOM32).

### 1.3. RF Output Power

Frequency Band (GHz)	Max. Conducted Power (dBm)	Target Power (dBm)	Max. EIRP (dBm)	Max. EIRP (mW)
802.11b	16.62	17.0	19.0	79.4328
802.11g	16.01	17.0	19.0	79.4328
802.11n	15.79	17.0	19.0	79.4328
BLE	6.07	8.0	10.0	10.0
OKIN 2.4	-4.34	-4.0	-0.7	0.8511

Note 1: Conducted power of Wi-Fi & Bluetooth is from report of Wi-Fi & Bluetooth module (FCC ID: 2AC7Z-ESPWROOM32).

Note 2: Target Power is declared by manufacturer.

## 2. RF Exposure Evaluation

### 2.1. Limits

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

#### LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Average Time (Minutes)
(A) Limits for Occupational/ Control Exposures				
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6
(B) Limits for General Population/ Uncontrolled Exposures				
300-1500	--	--	f/1500	6
1500-100,000	--	--	1	30

f= Frequency in MHz

Calculation Formula:  $P_d = (P_{out} * G) / (4 * \pi * r^2)$

Where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

G = gain of antenna in linear scale

$\pi$  = 3.1416

r = distance between observation point and center of the radiator in cm

$P_d$  is the limit of MPE, 1mW/cm<sup>2</sup>. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

## 2.2. Test Result of RF Exposure Evaluation

Product	Okin Commander
Test Item	RF Exposure Evaluation

Test Mode	Frequency Band (MHz)	Maximum EIRP (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
Bluetooth	2402 ~ 2480	10.0	0.0020	1
802.11b/g/n	2412 ~ 2462	79.4328	0.0158	1
OKIN 2.4G	2402 ~ 2480	0.8511	0.0002	1

### CONCULISON:

Due to OKIN 2.4G and Bluetooth or OKIN 2.4G and Wi-Fi can transmit simultaneously, so  
Max Power Density (R = 20 cm) =  $0.0002 + 0.0158 = 0.0160 \text{ mW/cm}^2$ .

Therefore, the Min Safety Distance is 20cm.

\_\_\_\_\_ The End \_\_\_\_\_

## **Appendix A – Test Setup Photograph**

Refer to “1806RSU033-UT” file.

## **Appendix B – EUT Photograph**

Refer to “1806RSU033-UE” file.