



RF EXPOSURE EVALUATION REPORT

FCC ID : PY7-61352Q
Equipment : Observer
Brand Name : Sony Mobile
Applicant : Sony Mobile Communications Inc.
4-12-3 Higashi-shinagawa, Shinagawa-ku,
Tokyo, 140-0002, Japan
Manufacturer : Sony Mobile Communications Inc.
4-12-3 Higashi-shinagawa, Shinagawa-ku,
Tokyo, 140-0002, Japan
Standard : 47 CFR Part 2.1091

We, SPORTON INTERNATIONAL INC has been evaluated in accordance with 47 CFR Part 2.1091 for the device and pass the limit.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The results in this variant report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.



Approved by: Jones Tsai / Manager

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History of this test report

Report No.	Version	Description	Issued Date
FA6D2013-01	Rev. 01	Initial issue of report	Jun. 21, 2018
FA6D2013-01	Rev. 02	Revmoed Collocated Power Density Calculation section	Aug. 03, 2018
FA6D2013-01	Rev. 03	Revises section 1, 2 and 4.1.	Aug. 08, 2018

**1. Description of Equipment Under Test (EUT)**

Product Feature & Specification		
EUT Type		Observer
Brand Name		Sony Mobile
FCC ID		PY7-61352Q
Integrated Chip 1: ESP32	Wireless Technology and Frequency Range	WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz Bluetooth: 2402 MHz ~ 2480 MHz
	Mode	802.11b/g/n HT20/HT40 Bluetooth LE
Integrated Chip 2: nRF52832	Wireless Technology and Frequency Range	Bluetooth: 2402 MHz ~ 2480 MHz (Rx only)
	Mode	Bluetooth LE
HW Version		A
SW Version		1.0
EUT Stage		Production Unit
Remark:		
1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.		

Reviewed by: Eric Huang**Report Producer: Wan Liu**

2. Maximum RF average output power among production units

<For ESP32>

Band / Mode	Average Power (dBm)
	LE
Bluetooth	0.5

Band / Channel / Frequency (MHz)			IEEE 802.11 Average Power (dBm)			
			11b	11g	HT20	HT40
2.4GHz WLAN (DTS)	Ch 1	2412	12.5	13	12.5	
	Ch 3	2422				11.5
	Ch 6	2437	11.5	11.5	12	12
	Ch 9	2452				7.5
	Ch 11	2462	11	10.5	10	

3. RF Exposure Limit Introduction

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
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
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	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

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

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

Where:

S = Power Density

P = Output Power at Antenna Terminals

G = Gain of Transmit Antenna (linear gain)

R = Distance from Transmitting Antenna



4. Radio Frequency Radiation Exposure Evaluation

4.1. Standalone Power Density Calculation

<For ESP32>

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Maximum EIRP (W)	Average EIRP (mW)	Power Density at 20cm (mW/cm ²)	Limit (mW/cm ²)
Bluetooth	2402.0	2.5	0.5	3.000	0.002	1.995	0.0004	1.000
2.4GHz WLAN	2412.0	2.5	13.0	15.500	0.035	35.481	0.0071	1.000

Note: For conservativeness, the lowest frequency of each band is used to determine the MPE limit of that band.

Conclusion:

According to 47 CFR §2.1091, the RF exposure analysis concludes that the RF Exposure is FCC compliant.