

Manufacturer: 2hire s.r.l.

Name: Oscar Frau

Product: ESP32-C3-MINI-1

Title: Project Handler

FCC ID: 2BDMD-2HBM2

Signature: 

MPE limits (§1.1310)

Mode	Frequency MHz	Duty Cycle %	Power dBm	Antenna		EIRP ¹ dBm	EIRP mW	Distance cm	PD ² mW/cm ²	PD Limit ³ mW/cm ²	Margin dB	2.1091 EIRP	2.1091 EIRP	Worst PD/PD values to be considered
				Gain ⁵ dBi	EIRP ¹ dBm							Limit mW	Margin dB	
BLE ⁴	2402,0	100	7,0	3,96	10,96	12,5	22	0,002	1,000	26,88	1524	20,87	0,00205	0,00205
GSM 850 ⁵	824,2	100	25,81	2,8	28,61	726,1	22	0,119	0,549	6,63	837	0,62	0,21727	
DCS 1900 ⁵	1850,2	100	22,81	4	26,81	479,7	22	0,079	1,000	11,03	1524	5,02	0,07888	
WCDMA B2 ⁵	1852,4	100	25,00	4	29,00	794,3	22	0,131	1,000	8,84	1524	2,83	0,13060	
WCDMA B4 ⁵	1712,4	100	25,00	4,5	29,50	891,3	22	0,147	1,000	8,34	1524	2,33	0,14654	
WCDMA B5 ⁵	826,4	100	25,00	2,8	27,80	602,6	22	0,099	0,551	7,45	837	1,43	0,17982	
LTE B2 ⁵	1850,7	100	25,00	4	29,00	794,3	22	0,131	1,000	8,84	1524	2,83	0,13060	
LTE B4 ⁵	1710,7	100	25,00	4,5	29,50	891,3	22	0,147	1,000	8,34	1524	2,33	0,14654	
LTE B5 ⁵	824,7	100	25,00	2,8	27,80	602,6	22	0,099	0,550	7,44	837	1,43	0,18019	0,21727
LTE B7 ⁵	2502,5	100	25,00	2,8	27,80	602,6	22	0,099	1,000	10,04	1524	4,03	0,09907	
LTE B12 ⁵	699,7	100	25,00	1,6	26,60	457,1	22	0,075	0,466	7,93	837	2,63	0,16111	
LTE B13 ⁵	779,5	100	25,00	3	28,00	631,0	22	0,104	0,520	7,00	837	1,23	0,19963	
LTE B25 ⁵	1850,7	100	25,00	4	29,00	794,3	22	0,131	1,000	8,84	1524	2,83	0,13060	
LTE B26 (814-824) ⁵	814,7	100	25,00	3,5	28,50	707,9	22	0,116	0,543	6,69	837	0,73	0,21431	
LTE B26 (824-849) ⁵	824,7	100	25,00	3,5	28,50	707,9	22	0,116	0,550	6,74	837	0,73	0,21171	
LTE B38 ⁵	2572,5	100	25,00	3,5	28,50	707,9	22	0,116	1,000	9,34	1524	3,33	0,11640	
LTE TDD B41 ⁵	2498,5	100	25,00	5,3	30,30	1071,5	22	0,176	1,000	7,54	1524	1,53	0,17618	

FCC Co-Location = 0,21932 < 1

¹EIRP = (Power dBm + Antenna Gain dBi) + 10 x Log (Duty Cycle % / 100)

²PD = EIRP / (4xπxR²)

³CFR 47 Part 1, §1.1310(e), table 1

⁴See the original radio module FCC ID: 2AC7Z-ESPC3MINI1

⁵See the original radio module FCC ID: XMR201906EG21G

⁶For the 2G/3G/4G radio module see the Quectel type YF0022AA antenna datasheet; the antenna gain for the WiFi/BLE radio module is as per the original filing.

2.1091 EIRP Limit

1.1307 (b)(3)(i)(C) exemption limit

RF Source Frequency	f	R	λ	λ/2π	R/(λ/2π)	Threshold ERP	Threshold EIRP	Threshold EIRP	EIRP	Margin
	MHz	m	m	m		W	W	mW	mW	dB
300-1500										
GSM 850	824,2	0,22	0,364	0,0579	3,80	0,511	0,837	837	726,1	0,62
1500-100000										
BLE	2402,0	0,22	0,125	0,0199	11,1	0,929	1,524	1524	12,5	20,87
LTE TDD B41	2498,5	0,22	0,120	0,0191	11,51	0,929	1,524	1524	1071,5	1,53