

RF Exposure Evaluation Declaration

Product Name : Android Based UI
Trade Name : PCI
Model No. : CSD-ELINK2
FCC ID : LY5-PCIABUI

Applicant : PCI Private Limited

Address : 35 Pioneer Road North, Singapore 628475 Singapore

Date of Receipt : Feb. 03, 2020

Date of Declaration : Mar. 17, 2020

Report No. : 2020009R-RFUSP02V00-A

Report Version : V1.0



The declaration results relate only to the samples calculated.

The declaration shall not be reproduced except in full without the written approval of DEKRA Testing and Certification Co., Ltd..

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Issued Date : Mar. 17, 2020

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Product Name : Android Based UI
Applicant : PCI Private Limited
Address : 35 Pioneer Road North, Singapore 628475 Singapore
Manufacturer : PCI Private Limited
Address : 35 Pioneer Road North, Singapore 628475 Singapore
Trade Name : PCI
Model No. : CSD-ELINK2
FCC ID : LY5-PCIABUI
Applicable Standard : FCC 47 CFR Part 2.1091 Radiofrequency radiation exposure evaluation: mobile devices.
Test Lab : Hsin Chu Laboratory
Address : No.372-2, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 310, Taiwan, R.O.C.
TEL: +886-3-582-8001 / FAX: +886-3-582-8958
Test Result : Complied

Tested By

:



(Rueyyan Lin / Senior Engineer)

Approved By

:



(Louis Hsu / Deputy Manager)

Revision History

Report No.	Version	Description	Issued Date
2020009R-RFUSP02V00-A	V1.0	Initial issue of report	Mar. 17, 2020

1.1. Test Facility

Ambient conditions in the laboratory:

Items	Test Item	Required (IEC 68-1)	Actual	Test Site
Temperature (°C)	Peak Output Power	15 - 35	20	3
Humidity (%RH)		25 - 75	50	

Note: Test site information refers to Laboratory Information.

Laboratory Information

The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our Web site: <http://www.dekra.com.tw>

If you have any comments, please don't hesitate to contact us. Our test sites as below:

Test Laboratory	DEKRA Testing and Certification Co., Ltd.
Address	<ol style="list-style-type: none"> No. 75-2, 3rd Lin, WangYe Keng, Yonghxing Tsuen, Qionglin Shiang, Hsinchu County 307, Taiwan, R.O.C. No.372, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 31061, Taiwan, R.O.C. No.372-2, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 31061, Taiwan, R.O.C.
Phone number	<ol style="list-style-type: none"> +886-3-592-8858 +886-3-582-8001 +886-3-582-8001
Fax number	<ol style="list-style-type: none"> +886-3-592-8859 +886-3-582-8958 +886-3-582-8958
Email address	info.tw@dekra.com
Website	http://www.dekra.com.tw

1.2. List of Test Equipment

Peak Output Power / SR10-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
High Speed Peak Power Meter Dual Input	Anritsu	ML2496A	1602004	2019/12/02	2020/12/01
Pulse Power Sensor	Anritsu	MA2411B	1531043	2019/12/02	2020/12/01
Pulse Power Sensor	Anritsu	MA2411B	1531044	2019/12/02	2020/12/01
Power Meter	Keysight	8990B	MY51000248	2019/05/21	2020/05/20
Power Sensor	Keysight	N1923A	MY57240005	2019/05/21	2020/05/20

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

1.3. Uncertainty

Test item	Uncertainty
Peak Output Power	± 2.26 dB

Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

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 ²)	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

RF Field Strength Limits for Controlled Use Devices (Controlled Environment)

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m ²)	Reference Period (minutes)
0.003-1023	170	180	-	Instantaneous*
0.1-10	-	1.6/ <i>f</i>	-	6**
1.29-10	193/ <i>f</i> 0.5	-	-	6**
10-20	61.4	0.163	10	6
20-48	129.8/ <i>f</i> 0.25	0.3444/ <i>f</i> 0.25	44.72/ <i>f</i> 0.5	6
48-100	49.33	0.1309	6.455	6
100-6000	15.60 <i>f</i> 0.25	0.04138 <i>f</i> 0.25	0.6455 <i>f</i> 0.5	6
6000-15000	137	0.364	50	6
15000-150000	137	0.364	50	616000/ <i>f</i> 1.2
150000-300000	0.354 <i>f</i> 0.5	9.40 x 10 ⁻⁴ <i>f</i> 0.5	3.33 x 10 ⁻⁴ <i>f</i>	616000/ <i>f</i> 1.2

Note: *f* is frequency in MHz. *Based on nerve stimulation (NS). ** Based on specific absorption rate (SAR).

Friis Formula

Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * r^2)$

Where

P_d = power density in mW/cm^2

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

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

P_d is the limit of MPE, $1 mW/cm^2$. 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 Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

2.3. Test Result of RF Exposure Evaluation

Product	Android Based UI
Test Mode	Transmit Mode
Test Condition	RF Exposure Evaluation

Antenna Gain: The maximum antenna gain is 3.59dBi.

Output Power into Antenna & RF Exposure Evaluation Distance:

WLAN Function					
2.4GHz Band					
Mode	Frequency (MHz)	Conducted Output Power		Power Density at R = 20cm (mW/cm ²)	Limit (mW/cm ²)
		dBm	mW		
802.11b	2412	12.290	16.943	0.008	1
	2437	14.350	27.227	0.012	1
	2462	16.360	43.251	0.020	1
802.11g	2412	15.060	32.063	0.015	1
	2437	20.740	118.577	0.054	1
	2462	13.200	20.893	0.010	1
802.11n (20MHz)	2412	15.840	38.371	0.017	1
	2437	20.340	108.143	0.049	1
	2462	13.180	20.797	0.009	1

Note:

1. The antenna information is from the customer declaration.
2. The results are evaluated using the maximum power.

Product	Android Based UI
Test Mode	Transmit Mode
Test Condition	RF Exposure Evaluation

Antenna Gain: The maximum antenna gain is 3.44dBi.

Output Power into Antenna & RF Exposure Evaluation Distance:

WLAN Function					
5GHz Band					
Mode	Frequency (MHz)	Conducted Output Power		Power Density at R = 20cm (mW/cm ²)	Limit (mW/cm ²)
		dBm	mW		
802.11a	5180	14.440	27.797	0.006	1
	5220	19.360	86.298	0.017	1
	5240	19.340	85.901	0.017	1
	5260	19.190	82.985	0.017	1
	5300	19.110	81.470	0.016	1
	5320	13.810	24.044	0.005	1
	5500	15.700	37.154	0.007	1
	5580	20.410	109.901	0.022	1
	5700	11.810	15.171	0.003	1
	5745	14.990	31.550	0.006	1
	5785	14.070	25.527	0.005	1
	5825	13.380	21.777	0.004	1
802.11ac (20MHz)	5180	13.050	20.184	0.004	1
	5220	19.330	85.704	0.017	1
	5240	19.290	84.918	0.017	1
	5260	18.980	79.068	0.016	1
	5300	19.080	80.910	0.016	1
	5320	13.660	23.227	0.005	1
	5500	16.380	43.451	0.009	1
	5580	20.460	111.173	0.022	1
	5700	10.160	10.375	0.002	1
	5745	15.290	33.806	0.007	1
	5785	14.310	26.977	0.005	1
	5825	13.590	22.856	0.005	1

WLAN Function					
5GHz Band					
Mode	Frequency (MHz)	Conducted Output Power		Power Density at R = 20cm (mW/cm ²)	Limit (mW/cm ²)
		dBm	mW		
802.11ac (40MHz)	5190	10.680	11.695	0.002	1
	5230	16.270	42.364	0.008	1
	5270	13.630	23.067	0.005	1
	5310	11.230	13.274	0.003	1
	5510	12.010	15.885	0.003	1
	5550	18.540	71.450	0.014	1
	5670	12.550	17.989	0.004	1
	5755	14.830	30.409	0.006	1
	5795	13.940	24.774	0.005	1
802.11ac (80MHz)	5210	7.190	5.236	0.001	1
	5290	8.710	7.430	0.001	1
	5530	8.180	6.577	0.001	1
	5610	10.200	10.471	0.002	1
	5775	6.040	4.018	0.001	1

Note:

1. The antenna information is from the customer declaration.
2. The results are evaluated using the maximum power.

Product	Android Based UI
Test Mode	Transmit Mode
Test Condition	RF Exposure Evaluation

Antenna Gain: The maximum antenna gain is 3.59dBi.

Output Power into Antenna & RF Exposure Evaluation Distance:

Bluetooth Function					
BT 2.0					
Mode	Frequency (MHz)	Conducted Output Power		Power Density at R = 20cm (mW/cm ²)	Limit (mW/cm ²)
		dBm	mW		
GFSK	2402	7.820	6.053	0.002	1
	2441	9.470	8.851	0.004	1
	2480	8.550	7.161	0.003	1
π/4 DQPSK	2402	6.840	4.831	0.002	1
	2441	8.590	7.228	0.003	1
	2480	7.650	5.821	0.002	1
8DQPSK	2402	6.830	4.819	0.002	1
	2441	8.570	7.194	0.003	1
	2480	7.650	5.821	0.002	1
BT 4.0					
Mode	Frequency (MHz)	Conducted Output Power		Power Density at R = 20cm (mW/cm ²)	Limit (mW/cm ²)
		dBm	mW		
GFSK	2402	3.560	2.270	0.001	1
	2440	5.890	3.882	0.002	1
	2480	5.100	3.236	0.001	1

Note:

1. The antenna information is from the customer declaration.
2. The results are evaluated using the maximum power.