RF EXPOSURE EVALUATION REPORT

FCC ID	:	**J9CQSIP7180**
Equipment	:	**7c Modular Platform**
Brand Name	:	**Qualcomm**
Model Name	:	**QSIP7180**
Applicant	:	**Qualcomm Technologies, Inc. 5775 Morehouse Dr.San Diego, CA 92121-1714 (USA)**
Manufacturer	:	**Qualcomm Technologies, Inc. 5775 Morehouse Dr.San Diego, CA 92121-1714 (USA)**
Standard	:	**47 CFR Part 2.1091**

We, SPORTON INTERNATIONAL INC has been evaluated this product in accordance with 47 CFR Part 2.1091 and it complies with applicable limit.

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Cona Huang

Approved by: Cona Huang / Deputy Manager

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

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History of this test report

Report No.	Version	Description	Issued Date
FA042002	Rev. 01	Initial issue of report	Sep. 23, 2020

1. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	7c Modular Platform
Brand Name	Qualcomm
Model Name	QSIP7180
FCC ID	J9CQSIP7180
Wireless Technology and Frequency Range	WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band V: 824 MHz ~ 849 MHz LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 14: 788 MHz ~ 798 MHz LTE Band 17: 704 MHz ~ 716 MHz LTE Band 25: 1850 MHz ~ 1915 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 30: 2305 MHz ~ 2315 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 66: 1710 MHz ~ 1780 MHz LTE Band 71: 663 MHz ~ 698 MHz WLAN 2.4GHz Band: 2400 MHz ~ 2483.5 MHz WLAN 5.2GHz Band: 5150 MHz ~ 5250 MHz WLAN 5.3GHz Band: 5250 MHz ~ 5350 MHz WLAN 5.6GHz Band: 5470 MHz ~ 5725 MHz WLAN 5.8GHz Band: 5725 MHz ~ 5825 MHz Bluetooth: 2400 MHz ~ 2483.5 MHz
Mode	RMC 12.2Kbps HSDPA HSUPA LTE: QPSK, 16QAM, 64QAM WLAN: 802.11a/b/g/n/ac HT20/HT40/VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

Reviewed by: Jason Wang

Report Producer: Wan Liu

2. Maximum RF average output power among production units

Mode		Maximum Average power(dBm)
WCDMA	Band II	25.70
	Band V	25.20
LTE	Band 2	25.70
	Band 4	25.70
	Band 5	25.20
	Band 7	25.20
	Band 12	25.20
	Band 13	25.20
	Band 14	25.20
	Band 17	25.20
	Band 25	25.70
	Band 26	25.20
	Band 30	24.00
	Band 38	25.20
	Band 41	27.20
	Band 66	25.20
	Band 71	25.20

Mode		Maximum Average power(dBm)
2.4GHz WLAN	2Tx Total Power	22.50
5GHz WLAN	2Tx Total Power	22.50
Bluetooth		12.00

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/f2)	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/f2)	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

Band	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum ERP (dBm)	Maximum ERP (W)	Maximum EIRP (dBm)	Maximum EIRP (W)	Maximum Output Power Limit (W)	Average EIRP (mW)	Power Density at 20cm (mW/cm^2)	Limit (mW/cm^2)
WCDMA Band 2	7.00	25.70	30.550	1.135	32.700	1.862	2.000	1862.087	0.371	1.000
WCDMA Band 5	9.00	25.20	32.050	1.603	34.200	2.630	7.000	2630.268	0.524	0.549
LTE Band 2	7.00	25.70	30.550	1.135	32.700	1.862	2.000	1862.087	0.371	1.000
LTE Band 4	4.00	25.70	27.550	0.569	29.700	0.933	1.000	933.254	0.186	1.000
LTE Band 5	9.00	25.20	32.050	1.603	34.200	2.630	7.000	2630.268	0.524	0.549
LTE Band 7	7.50	25.20	30.550	1.135	32.700	1.862	2.000	1862.087	0.371	1.000
LTE Band 12	8.00	25.20	31.050	1.274	33.200	2.089	3.000	2089.296	0.416	0.466
LTE Band 13	8.50	25.20	31.550	1.429	33.700	2.344	3.000	2344.229	0.467	0.518
LTE Band 14	9.00	25.20	32.050	1.603	34.200	2.630	3.000	2630.268	0.524	0.525
LTE Band 17	8.50	25.20	31.550	1.429	33.700	2.344	3.000	2344.229	0.467	0.469
LTE Band 25	7.00	25.70	30.550	1.135	32.700	1.862	2.000	1862.087	0.371	1.000
LTE Band 26	9.00	25.20	32.050	1.603	34.200	2.630	7.000	2630.268	0.524	0.543
LTE Band 30	0.00	24.00	21.850	0.153	24.000	0.250	0.250	250.000	0.050	1.000
LTE Band 38	7.50	25.20	30.550	1.135	32.700	1.862	2.000	1862.087	0.371	1.000
LTE Band 41	5.50	27.20	30.550	1.135	32.700	1.862	2.000	1862.087	0.371	1.000
LTE Band 66	4.00	25.20	27.050	0.507	29.200	0.832	1.000	831.764	0.166	1.000
LTE Band 71	8.00	25.20	31.050	1.274	33.200	2.089	3.000	2089.296	0.416	0.442
WLAN 2.4GHz MIMO	10.00	22.50	30.350	1.084	32.500	1.778	3.980	1778.279	0.354	1.000
WLAN 5GHz MIMO	7.50	22.50	27.850	0.610	30.000	1.000	1.000	1000.000	0.199	1.000
Bluetooth	10.00	12.00	19.850	0.097	22.000	0.158	3.980	158.489	0.032	1.000

4.2. Collocated Power Density Calculation

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)	Power Density / Limit
WCDMA Band 2	1850	7.0	25.70	32.7	1.86	1862.09	0.371	1.000	0.371
WCDMA Band 5	824	8.5	25.20	33.7	2.34	2344.23	0.467	0.549	0.849
LTE Band 2	1850	7.0	25.70	32.7	1.86	1862.09	0.371	1.000	0.371
LTE Band 4	1710	4.0	25.70	29.7	0.93	933.25	0.186	1.000	0.186
LTE Band 5	824	8.5	25.20	33.7	2.34	2344.23	0.467	0.549	0.849
LTE Band 7	2500	7.5	25.20	32.7	1.86	1862.09	0.371	1.000	0.371
LTE Band 12	699.0	7.5	25.20	32.7	1.86	1862.09	0.371	0.466	0.795
LTE Band 13	777.0	8.0	25.20	33.2	2.09	2089.30	0.416	0.518	0.803
LTE Band 14	788.0	8.0	25.20	33.2	2.09	2089.30	0.416	0.525	0.792
LTE Band 17	704.0	7.5	25.20	32.7	1.86	1862.09	0.371	0.469	0.790
LTE Band 25	1850	7.0	25.70	32.7	1.86	1862.09	0.371	1.000	0.371
LTE Band 26	814	8.5	25.20	33.7	2.34	2344.23	0.467	0.543	0.860
LTE Band 30	2305	0.0	24.00	24.0	0.25	250.00	0.050	1.000	0.050
LTE Band 38	2570	7.5	25.20	32.7	1.86	1862.09	0.371	1.000	0.371
LTE Band 41	2496	5.5	27.20	32.7	1.86	1862.09	0.371	1.000	0.371
LTE Band 66	1710	4.0	25.20	29.2	0.83	831.76	0.166	1.000	0.166
LTE Band 71	663	7.5	25.20	32.7	1.86	1862.09	0.371	0.442	0.839
WLAN 2.4GHz MIMO	2400	5.5	22.5	28.0	0.63	630.96	0.126	1.000	0.126
WLAN 5GHz MIMO	5150	5.5	22.5	28.0	0.63	630.96	0.126	1.000	0.126
Bluetooth	2400	5.5	12.0	17.5	0.06	56.23	0.011	1.000	0.011

WWAN Power Density / Limit	2.4GHz WLAN Ant1 Power Density / Limit	Σ(Power Density / Limit) of WWAN+2.4GHz WLAN
0.860	0.126	0.986

WWAN Power Density / Limit	5GHz WLAN Ant2 Power Density / Limit	Bluetooth Power Density / Limit	Σ(Power Density / Limit) of WWAN+5GHz WLAN+Bluetooth
0.860	0.126	0.011	0.997

Note:

1. Σ(Power Density / Limit): This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for WWAN + 2.4GHz WLAN / WWAN + 5GHz WLAN + Bluetooth.
2. Considering the WWAN module collocation with the WLAN and Bluetooth transmitter of the EIRP performance listed in the table above, the aggregated (power density /limit) is smaller than 1, and MPE of 3 collocated transmitters is compliant

Conclusion:

Based on FCC OET Bulletin 65 Supplement C and 47 CFR §2.1091, the analysis concludes that this product when transmitting in standalone within a host device, is compliant with the FCC RF exposure requirements in mobile exposure condition, provided the conducted power and antenna gain do not exceed the limits for each given frequency band per wireless technology as follow table:

Device	Technology	Band	Maximum Conducted Power (dBm)	Stanalone Maximum Antenna Gain (dBi)	Collocated Maximum Antenna Gain (dBi)
QSIP7180	WCDMA	Band II	25.70	7.00	7.0
		Band V	25.20	9.00	8.5
	LTE	LTE Band 2	25.70	7.00	7.0
		LTE Band 4	25.70	4.00	4.0
		LTE Band 5	25.20	9.00	8.5
		LTE Band 7	25.20	7.50	7.5
		LTE Band 12	25.20	8.00	7.5
		LTE Band 13	25.20	8.50	8.0
		LTE Band 14	25.20	9.00	8.0
		LTE Band 17	25.20	8.50	7.5
		LTE Band 25	25.70	7.00	7.0
		LTE Band 26	25.20	9.00	8.5
		LTE Band 30	24.00	0.00	0.0
		LTE Band 38	25.20	7.50	7.5
		LTE Band 41	27.20	5.50	5.5
		LTE Band 66	25.20	4.00	4.0
		LTE Band 71	25.20	8.00	7.5

Device	Technology	Frequency (MHz)	Maximum Conducted Power (dBm)	Stanalone Maximum Antenna Gain (dBi)	Collocated Maximum Antenna Gain (dBi)
QSIP7180	2.4GHz WLAN	2400~2483.5	22.50	10.00	5.50
	5GHz WLAN	5150~5825	22.50	7.50	5.50
	Bluetooth	2400~2483.5	12.00	10.00	5.50