RF EXPOSURE EVALUATION REPORT

FCC ID	: J9C-M2X75
Equipment	: Module
Brand Name	: Qualcomm
Model Name	: M2X75
Applicant	: Qualcomm Technologies, Inc. 5775 Morehouse Drive, San Diego, California 92121, United States
Manufacturer	: Qualcomm Technologies, Inc. 5775 Morehouse Drive, San Diego, California 92121, United States
Standard	: 47 CFR Part 2.1091

We, SPORTON INTERNATIONAL INC has been evaluated this product in accordance with 47 CFR Part2.1091 and it complies with applicable limit.

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 1190) and the FCC designation No. TW1190 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC evaluation.

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Approved by: Cona Huang / Deputy Manager

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History of this test report

Report No.	Version	Description	Issued Date
FA3D2703-02	Rev. 01	Initial issue of report	Jul. 31, 2024

1. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	Module
Brand Name	Qualcomm
Model Name	M2X75
FCC ID	J9C-M2X75
Wireless Technology and Frequency Range	WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band IV: 1710 MHz ~ 1755 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 42: 3450 MHz ~ 3550 MHz LTE Band 43: 3700 MHz ~ 3980 MHz LTE Band 48: 3550 MHz ~ 3700 MHz LTE Band 66: 1710 MHz ~ 1780 MHz LTE Band 70: 1695 MHz ~ 1710 MHz LTE Band 71: 663 MHz ~ 698 MHz 5G NR n2 : 1850 MHz ~ 1910 MHz 5G NR n5 : 824 MHz ~ 849 MHz 5G NR n7 : 2500 MHz ~ 2570 MHz 5G NR n12 : 699 MHz ~ 716 MHz 5G NR n13: 777 MHz ~ 787 MHz 5G NR n14 : 788 MHz ~ 798 MHz 5G NR n25 : 1850 MHz ~ 1915 MHz 5G NR n26 : 814 MHz ~ 849 MHz 5G NR n30 : 2305 MHz ~ 2315 MHz 5G NR n38 : 2570 MHz ~ 2620 MHz 5G NR n41 : 2496 MHz ~ 2690 MHz 5G NR n48 : 3550 MHz ~ 3700 MHz 5G NR n66 : 1710 MHz ~ 1780 MHz 5G NR n70 : 1695 MHz ~ 1710 MHz 5G NR n71 : 663 MHz ~ 698 MHz 5G NR n77: 3700 MHz ~ 3980 MHz, 3450MHz ~ 3550MHz 5G NR n78: 3700 MHz ~ 3800 MHz, 3450MHz ~ 3550MHz
Mode	RMC 12.2Kbps HSDPA HSUPA DC-HSDPA LTE: QPSK, 16QAM, 64QAM, 256QAM 5G NR: DFT-s-OFDM/CP-OFDM, Pi/2 BPSK/QPSK/16QAM/64QAM/256QAM
EUT Stage	Identical Prototype

Reviewed by: Jason Wang

Report Producer: Paula Chen

2. Maximum RF average output power among production units

Mode	Band Number	Maximum Average Power (dBm)
WCDMA	B2	24.5
WCDMA	B4	24.5
WCDMA	B5	24.5
LTE	B2	24.8
LTE	B4	24.5
LTE	B5	24.8
LTE	B7	24.8
LTE	B12	24.5
LTE	B13	24.5
LTE	B14	24.5
LTE	B17	24.5
LTE	B25	24.5
LTE	B26	24.5
LTE	B30	23.0
LTE	B38	24.5
LTE	B41_PC3	25.0
LTE	B41_PC2	27.0
LTE	B42	25.0
LTE	B43	24.5
LTE	B48	22.8
LTE	B66	24.8
LTE	B70	24.5
LTE	B71	24.5
FR1	n2	24.5
FR1	n5	24.5
FR1	n7	24.7
FR1	n12	24.5
FR1	n13	24.5
FR1	n14	24.5
FR1	n25	24.5
FR1	n26	24.5
FR1	n30	23.0
FR1	n38	25.0
FR1	n41_PC3	25.0
FR1	n41_PC2	27.0
FR1	n41_PC1.5	30.0
FR1	n48	22.8
FR1	n66	24.7
FR1	n70	24.5
FR1	n71	24.5
FR1	n77_PC3	25.1
FR1	n77_PC2	27.1
FR1	n77_PC1.5	30.1
FR1	n78_PC3	25.1
FR1	n78_PC2	27.1
FR1	n78_PC1.5	30.1

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 ERP Limit (W)	Maximum EIRP Limit (W)	Time Average EIRP (mW)	Power Density at 20cm (mW/cm^2)	Limit (mW/cm^2)
WCDMA Band 2	8.00	24.50	30.350	1.084	32.500	1.778		2.000	1778.279	0.354	1.000
WCDMA Band 4	5.00	24.50	27.350	0.543	29.500	0.891		1.000	891.251	0.177	1.000
WCDMA Band 5	6.00	24.50	28.350	0.684	30.500	1.122	7.000		1122.018	0.223	0.549
LTE Band 2	8.00	24.80	30.650	1.161	32.800	1.905		2.000	1905.461	0.379	1.000
LTE Band 4	5.00	24.50	27.350	0.543	29.500	0.891		1.000	891.251	0.177	1.000
LTE Band 5	6.00	24.80	28.650	0.733	30.800	1.202	7.000		1202.264	0.239	0.549
LTE Band 7	8.00	24.80	30.650	1.161	32.800	1.905		2.000	1905.461	0.379	1.000
LTE Band 12	6.00	24.50	28.350	0.684	30.500	1.122	3.000		1122.018	0.223	0.466
LTE Band 13	6.00	24.50	28.350	0.684	30.500	1.122	3.000		1122.018	0.223	0.518
LTE Band 14	6.00	24.50	28.350	0.684	30.500	1.122	3.000		1122.018	0.223	0.525
LTE Band 17	6.00	24.50	28.350	0.684	30.500	1.122	3.000		1122.018	0.223	0.469
LTE Band 25	8.00	24.50	30.350	1.084	32.500	1.778		2.000	1778.279	0.354	1.000
LTE Band 26	6.00	24.50	28.350	0.684	30.500	1.122	7.000		1122.018	0.223	0.543
LTE Band 30	0.98	23.00	21.830	0.152	23.980	0.250		0.250	250.035	0.050	1.000
LTE Band 38	8.00	24.50	30.350	1.084	32.500	1.778		2.000	1778.279	0.354	1.000
LTE Band 41_PC3	8.00	25.00	30.850	1.216	33.000	1.995		2.000	1995.262	0.397	1.000
LTE Band 41_PC2	6.00	27.00	30.850	1.216	33.000	1.995		2.000	1995.262	0.397	1.000
LTE Band 42	5.00	25.00	27.850	0.610	30.000	1.000		1.000	1000.000	0.199	1.000
LTE Band 43	5.50	24.50	27.850	0.610	30.000	1.000		1.000	1000.000	0.199	1.000
LTE Band 48	0.20	22.80	20.850	0.122	23.000	0.200		0.200	199.526	0.040	1.000
LTE Band 66	5.00	24.80	27.650	0.582	29.800	0.955		1.000	954.993	0.190	1.000
LTE Band 70	5.50	24.50	27.850	0.610	30.000	1.000		1.000	1000.000	0.199	1.000
LTE Band 71	5.50	24.50	27.850	0.610	30.000	1.000	3.000		1000.000	0.199	0.442
5G NR n2	8.00	24.50	30.350	1.084	32.500	1.778		2.000	1778.279	0.354	1.000
5G NR n5	6.00	24.50	28.350	0.684	30.500	1.122	7.000		1122.018	0.223	0.549
5G NR n7	8.00	24.70	30.550	1.135	32.700	1.862		2.000	1862.087	0.371	1.000
5G NR n12	6.00	24.50	28.350	0.684	30.500	1.122	3.000		1122.018	0.223	0.466
5G NR n13	6.00	24.50	28.350	0.684	30.500	1.122	3.000		1122.018	0.223	0.518
5G NR n14	6.00	24.50	28.350	0.684	30.500	1.122	3.000		1122.018	0.223	0.525
5G NR n25	8.00	24.50	30.350	1.084	32.500	1.778		2.000	1778.279	0.354	1.000
5G NR n26	6.00	24.50	28.350	0.684	30.500	1.122	7.000		1122.018	0.223	0.543
5G NR n30	0.98	23.00	21.830	0.152	23.980	0.250		0.250	250.035	0.050	1.000
5G NR n38	8.00	25.00	30.850	1.216	33.000	1.995		2.000	1995.262	0.397	1.000
5G NR n41_PC3	8.00	25.00	30.850	1.216	33.000	1.995		2.000	1995.262	0.397	1.000
5G NR n41_PC2	6.00	27.00	30.850	1.216	33.000	1.995		2.000	1995.262	0.397	1.000
5G NR n41_PC1.5	3.00	30.00	30.850	1.216	33.000	1.995		2.000	1995.262	0.397	1.000
5G NR n48	0.20	22.80	20.850	0.122	23.000	0.200		0.200	199.526	0.040	1.000
5G NR n66	5.00	24.70	27.550	0.569	29.700	0.933		1.000	933.254	0.186	1.000
5G NR n70	5.50	24.50	27.850	0.610	30.000	1.000		1.000	1000.000	0.199	1.000
5G NR n71	5.50	24.50	27.850	0.610	30.000	1.000	3.000		1000.000	0.199	0.442
5G NR n77_PC3	4.90	25.10	27.850	0.610	30.000	1.000		1.000	1000.000	0.199	1.000
5G NR n77_PC2	2.90	27.10	27.850	0.610	30.000	1.000		1.000	1000.000	0.199	1.000
5G NR n77_PC1.5	-0.10	30.10	27.850	0.610	30.000	1.000		1.000	1000.000	0.199	1.000
5G NR n78_PC3	4.90	25.10	27.850	0.610	30.000	1.000		1.000	1000.000	0.199	1.000
5G NR n78_PC2	2.90	27.10	27.850	0.610	30.000	1.000		1.000	1000.000	0.199	1.000
5G NR n78_PC1.5	-0.10	30.10	27.850	0.610	30.000	1.000		1.000	1000.000	0.199	1.000

4.2. Collocated Power Density Calculation

Note:

1. This MPE analysis is applicable to any collocated transmitters, with the maximum EIRP for WLAN assumed to be 30 dBm and the maximum EIRP for BT assumed to be 20 dBm.

Band	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Maximum EIRP (W)	Time Average EIRP (mW)	Power Density at 20cm (mW/cm^2)	Limit (mW/cm^2)	Power Density / Limit
WCDMA Band 2	6.00	24.50	30.5	1.12	1122.02	0.223	1.000	0.223
WCDMA Band 4	5.00	24.50	29.5	0.89	891.25	0.177	1.000	0.177
WCDMA Band 5	4.00	24.50	28.5	0.71	707.95	0.141	0.549	0.257
LTE Band 2	6.00	24.80	30.8	1.20	1202.26	0.239	1.000	0.239
LTE Band 4	5.00	24.50	29.5	0.89	891.25	0.177	1.000	0.177
LTE Band 5	4.00	24.80	28.8	0.76	758.58	0.151	0.549	0.275
LTE Band 7	7.00	24.80	31.8	1.51	1513.56	0.301	1.000	0.301
LTE Band 12	3.50	24.50	28.0	0.63	630.96	0.126	0.466	0.270
LTE Band 13	4.00	24.50	28.5	0.71	707.95	0.141	0.518	0.272
LTE Band 14	4.00	24.50	28.5	0.71	707.95	0.141	0.525	0.268
LTE Band 17	3.50	24.50	28.0	0.63	630.96	0.126	0.469	0.268
LTE Band 25	6.00	24.50	30.5	1.12	1122.02	0.223	1.000	0.223
LTE Band 26	4.00	24.50	28.5	0.71	707.95	0.141	0.543	0.260
LTE Band 30	0.98	23.00	24.0	0.25	250.03	0.050	1.000	0.050
LTE Band 38	7.00	24.50	31.5	1.41	1412.54	0.281	1.000	0.281
LTE Band 41_PC3	7.00	25.00	32.0	1.58	1584.89	0.315	1.000	0.315
LTE Band 41_PC2	5.00	27.00	32.0	1.58	1584.89	0.315	1.000	0.315
LTE Band 42	5.00	25.00	30.0	1.00	1000.00	0.199	1.000	0.199
LTE Band 43	5.50	24.50	30.0	1.00	1000.00	0.199	1.000	0.199
LTE Band 48	0.20	22.80	23.0	0.20	199.53	0.040	1.000	0.040
LTE Band 66	5.00	24.80	29.8	0.95	954.99	0.190	1.000	0.190
LTE Band 70	5.50	24.50	30.0	1.00	1000.00	0.199	1.000	0.199
LTE Band 71	3.50	24.50	28.0	0.63	630.96	0.126	0.442	0.284
5G NR n2	6.00	24.50	30.5	1.12	1122.02	0.223	1.000	0.223
5G NR n5	4.00	24.50	28.5	0.71	707.95	0.141	0.549	0.257
5G NR n7	7.00	24.70	31.7	1.48	1479.11	0.294	1.000	0.294
5G NR n12	3.50	24.50	28.0	0.63	630.96	0.126	0.466	0.270
5G NR n13	4.00	24.50	28.5	0.71	707.95	0.141	0.518	0.272
5G NR n14	4.00	24.50	28.5	0.71	707.95	0.141	0.525	0.268
5G NR n25	6.00	24.50	30.5	1.12	1122.02	0.223	1.000	0.223
5G NR n26	4.00	24.50	28.5	0.71	707.95	0.141	0.543	0.260
5G NR n30	0.98	23.00	24.0	0.25	250.03	0.050	1.000	0.050
5G NR n38	7.00	25.00	32.0	1.58	1584.89	0.315	1.000	0.315
5G NR n41_PC3	7.00	25.00	32.0	1.58	1584.89	0.315	1.000	0.315
5G NR n41_PC2	5.00	27.00	32.0	1.58	1584.89	0.315	1.000	0.315
5G NR n41_PC1.5	2.00	30.00	32.0	1.58	1584.89	0.315	1.000	0.315
5G NR n48	0.20	22.80	23.0	0.20	199.53	0.040	1.000	0.040
5G NR n66	5.00	24.70	29.7	0.93	933.25	0.186	1.000	0.186
5G NR n70	5.50	24.50	30.0	1.00	1000.00	0.199	1.000	0.199
5G NR n71	3.50	24.50	28.0	0.63	630.96	0.126	0.442	0.284
5G NR n77_PC3	4.90	25.10	30.0	1.00	1000.00	0.199	1.000	0.199
5G NR n77_PC2	2.90	27.10	30.0	1.00	1000.00	0.199	1.000	0.199
5G NR n77_PC1.5	-0.10	30.10	30.0	1.00	1000.00	0.199	1.000	0.199
5G NR n78_PC3	4.90	25.10	30.0	1.00	1000.00	0.199	1.000	0.199
5G NR n78_PC2	2.90	27.10	30.0	1.00	1000.00	0.199	1.000	0.199
5G NR n78_PC1.5	-0.10	30.10	30.0	1.00	1000.00	0.199	1.000	0.199
WLAN2.4GHz Band			30.0	1.00	1000.00	0.199	1.000	0.199
WLAN5GHz Band			30.0	1.00	1000.00	0.199	1.000	0.199
Bluetooth			20.0	0.10	100.00	0.020	1.000	0.020

Maximum WWAN Power Density / Limit	Maximum WLAN Power Density / Limit	Maximum Bluetooth Power Density / Limit	Σ(Power Density / Limit) of WWAN + WLAN + Bluetooth
0.315	0.199	0.020	0.534

Note:

1. The device implanted DPS (Dynamic Power Share) function to achieve higher uplink data rate keeping the total power unchanged in 5G NR NSA EN-DC mode according to 3GPP 38.213, when the equipment has a dynamic power sharing capability, it adjusts the LTE or NR transmission power so that the instantaneous total power does not exceed the specified value, when the maximum transmission power of NR (P LTE, P NR) and the specified total power (P total) have been set and the instantaneous calculated total transmission power exceeds P total, the NR transmission power is reduced so that the actual transmission power of the user equipment will not exceed Ptotal power.
2. ∑(Power Density / Limit): This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for WWAN + WLAN + Bluetooth.
3. 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 all collocated transmitters is compliant.

Conclusion:

Based on FCC 47 CFR §2.1901, 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)	Standalone Maximum Antenna Gain (dBi)	Collocated Maximum Antenna Gain (dBi)
SDX75	UMTS	WCDMA Band 2	24.5	8.00	6.00
		WCDMA Band 4	24.5	5.00	5.00
		WCDMA Band 5	24.5	6.00	4.00
	LTE	LTE Band 2	24.8	8.00	6.00
		LTE Band 4	24.5	5.00	5.00
		LTE Band 5	24.8	6.00	4.00
		LTE Band 7	24.8	8.00	7.00
		LTE Band 12	24.5	6.00	3.50
		LTE Band 13	24.5	6.00	4.00
		LTE Band 14	24.5	6.00	4.00
		LTE Band 17	24.5	6.00	3.50
		LTE Band 25	24.5	8.00	6.00
		LTE Band 26	24.5	6.00	4.00
		LTE Band 30	23.0	0.98	0.98
		LTE Band 38	24.5	8.00	7.00
		LTE Band 41_PC3	25.0	8.00	7.00
		LTE Band 41_PC2	27.0	6.00	5.00
		LTE Band 42	25.0	5.00	5.00
		LTE Band 43	24.5	5.50	5.50
		LTE Band 48	22.8	0.20	0.20
		LTE Band 66	24.8	5.00	5.00
		LTE Band 70	24.5	5.50	5.50
		LTE Band 71	24.5	5.50	3.50
	FR1	5G NR n2	24.5	8.00	6.00
		5G NR n5	24.5	6.00	4.00
		5G NR n7	24.7	8.00	7.00
		5G NR n12	24.5	6.00	3.50
		5G NR n13	24.5	6.00	4.00
		5G NR n14	24.5	6.00	4.00
		5G NR n25	24.5	8.00	6.00
		5G NR n26	24.5	6.00	4.00
		5G NR n30	23.0	0.98	0.98
		5G NR n38	25.0	8.00	7.00
		5G NR n41_PC3	25.0	8.00	7.00
		5G NR n41_PC2	27.0	6.00	5.00
		5G NR n41_PC1.5	30.0	3.00	2.00
		5G NR n48	22.8	0.20	0.20
		5G NR n66	24.7	5.00	5.00
		5G NR n70	24.5	5.50	5.50
		5G NR n71	24.5	5.50	3.50
		5G NR n77_PC3	25.1	4.90	4.90
		5G NR n77_PC2	27.1	2.90	2.90
		5G NR n77_PC1.5	30.1	-0.10	-0.10
		5G NR n78_PC3	25.1	4.90	4.90
		5G NR n78_PC2	27.1	2.90	2.90
		5G NR n78_PC1.5	30.1	-0.10	-0.10