

## MAXIMUM PERMISSIBLE EXPOSURE (MPE)

### Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended to comply with Section Part 22, subpart H and Part 24, subpart E of the FCC CFR 47 Rules. And RSS-102 issue 4 For 47 CFR 1.1310 Radio frequency Radiation Exposure requirement.

### Special Accessories

Not available for this EUT intended for grant.

### Equipment Modifications

Not available for this EUT intended for grant.

### Limitation

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Averaging Time (minute)
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 <sup>2</sup> )	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	F/1500	30
1500-15000	/	/	1.0	30

F = frequency in MHz

\* = Plane-wave equipment power density

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m <sup>2</sup> )	Averaging Time (minutes)
0.003-1	280	2.19	-	6
1-10	280/f	2.19/f	-	6
10-30	28	2.19/f	-	6
30-300	28	0.073	2*	6
300-1500	1.585 f <sup>0.5</sup>	0.0042 f <sup>0.5</sup>	f/150	6
1500-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	616000/f <sup>1.2</sup>
150000-300000	0.158 f <sup>0.5</sup>	4.21 x 10 <sup>-4</sup> f <sup>0.5</sup>	6.67 x 10 <sup>-5</sup> f	616000/f <sup>1.2</sup>

Note: f is frequency in MHz.

\* Power density limit is applicable at frequencies greater than 100 MHz.

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## Maximum Permissible Exposure (MPE) Evaluation

In this application we seek approval to the VM2WG. Based on the FCC OET Bulletin 65 Supplement C and 47 CFR §2.1091, we have concluded VM2WG will comply with the FCC rules on RF exposure for mobile devices in cellular band and PCS band. The following analysis will demonstrate such compliance. The analysis will be done in two US bands.

### Operation in cellular band (824 – 849 MHz) (First Antenna)

The ERP of VM2WG in cellular band is 24.49dBm max at GPRS 850 mode. The resulted power density at a distance of 20 cm can be deducted as follows:

EUT				Measurement					
Operation Band	Pol.	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
		MHz		V/H	dBm	dBd	dB	dBm	dBm
GPRS 850	E2	824.20	128	V	24.74	3.96	-4.22	24.48	38.45
				H	21.62	3.96	-4.22	21.36	38.45
		836.60	190	V	24.69	4.00	-4.24	24.45	38.45
				H	22.04	4.00	-4.24	21.80	38.45
		848.80	251	V	24.79	4.03	-4.33	<b>24.49</b>	38.45
				H	21.89	4.03	-4.33	21.59	38.45

$$\text{ERP} = 24.49 \text{ dBm} = 281.190 \text{ mW}$$

$$\begin{aligned} \text{Power Density} &= \text{ERP} * \text{Duty Cycle} / (4 \pi R^2) \\ &= 28.190 * 0.25 / (4 * \pi * 20^2) = 0.0140 \text{ mW/cm}^2 \end{aligned}$$

where Duty Cycle is 0.25 for GPRS operation (class 10) and R is 20 cm.

The MPE limit for General Population/Uncontrolled Exposure is shown in the FCC OET Bulletin 65 Supplement C and can be calculated as follows:

$$\text{MPE limit} = 848.8 / 1500 = 0.56 \text{ mW/cm}^2$$

As we can see the resulted power density is below the MPE limit, therefore VM2WG in cellular band is compliant with the FCC rules on RF exposure

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Operation in PCS band (1850 – 1910 MHz) (First Antenna)

The EIRP of VM2WG in PCS band is 27.90dBm max at GPRS 1900 mode. The resulted power density at a distance of 20 cm can be deducted as follows:

EUT				Measurement					
Operation Band	Pol.	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
		MHz		V/H	dBm	dBi	dB	dBm	dBm
GPRS 1900	E2	1850.20	512	V	29.21	4.17	-5.49	<b>27.90</b>	33.00
				H	26.82	4.51	-5.49	25.85	33.00
		1880.00	661	V	28.96	4.13	-5.56	27.53	33.00
				H	28.15	4.44	-5.56	27.02	33.00
		1909.80	810	V	28.38	4.09	-5.56	26.91	33.00
				H	28.71	4.36	-5.56	27.52	33.00

$$\text{EIRP} = 27.90 \text{ dBm} = 616.595 \text{ mW}$$

$$\text{Power Density} = \text{EIRP} * \text{Duty Cycle} / (4 \pi R^2)$$

$$= 616.595 * 0.25 / (4 * \pi * 20^2) = 0.0307 \text{ mW/cm}^2$$

where Duty Cycle is 0.25 for GPRS operation (class 10) and R is 20 cm.

The MPE limit for General Population/Uncontrolled Exposure is shown in the FCC OET Bulletin 65 Supplement C and can be calculated as follows:

$$\text{MPE limit} = 1.0 \text{ mW/cm}^2$$

As we can see the resulted power density is below the MPE limit, therefore VM2WG in PCS band is compliant with the FCC rules on RF exposure.

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Operation in HSUPA band II (1850 – 1910 MHz) (First Antenna)

The EIRP of VM2WG in PCS band is 27.91dBm max at HSUPA II mode. The resulted power density at a distance of 20 cm can be deducted as follows:

EUT				Measurement					
Operation Band	Pol.	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
		MHz		V/H	dBm	dBi	dB	dBm	dBm
HSUPA Band II	E2	1852.4	9262	V	29.23	4.17	-5.49	<b>27.91</b>	33.00
				H	27.10	4.51	-5.49	26.12	33.00
		1880.0	9400	V	27.66	4.13	-5.56	26.23	33.00
				H	27.89	4.44	-5.56	26.77	33.00
		1907.6	9538	V	26.28	4.10	-5.62	24.76	33.00
				H	26.99	4.37	-5.56	25.80	33.00

$$\text{ERP} = 27.91 \text{ dBm} = 618.016 \text{ mW}$$

$$\text{Power Density} = \text{ERP} * \text{Duty Cycle} / (4 \pi R^2)$$

$$= 618.016 * 1 / (4 * \pi * 20^2) = 0.01230 \text{ mW/cm}^2$$

where Duty Cycle is 1 for HSUPA band II mode and R is 20 cm.

The MPE limit for General Population/Uncontrolled Exposure is shown in the FCC OET Bulletin 65 Supplement C and can be calculated as follows:

$$\text{MPE limit} = 1.0 \text{ mW/cm}^2$$

As we can see the resulted power density is below the MPE limit, therefore VM2WG in cellular band is compliant with the FCC rules on RF exposure.

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Operation in HSUPA band IV (1712.4 – 1752.6 MHz) (First Antenna)

The EIRP of VM2WG in PCS band is 26.87dBm max at HSUPA IV mode. The resulted power density at a distance of 20 cm can be deducted as follows:

EUT				Measurement					
Operation Band	Pol.	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
		MHz		V/H	dBm	dBi	dB	dBm	dBm
HSUPA Band IV	E2	1712.4	1312	V	27.29	4.40	-5.40	26.28	33.00
				H	27.48	4.79	-5.40	<b>26.87</b>	33.00
		1732.6	1413	V	26.50	4.35	-5.42	25.43	33.00
				H	26.17	4.78	-5.42	25.52	33.00
		1752.6	1513	V	26.44	4.31	-5.44	25.31	33.00
				H	24.35	4.77	-5.44	23.68	33.00

$$\text{EIRP} = 26.87 \text{ dBm} = 486.407 \text{ mW}$$

$$\text{Power Density} = \text{EIRP} * \text{Duty Cycle} / (4 \pi R^2)$$

$$= 486.407 * 1 / (4 * \pi * 20^2) = 0.0968 \text{ mW/cm}^2$$

where Duty Cycle is 1 for HSUPA band IV mode and R is 20 cm.

The MPE limit for General Population/Uncontrolled Exposure is shown in the FCC OET Bulletin 65 Supplement C and can be calculated as follows:

$$\text{MPE limit} = 1.0 \text{ mW/cm}^2$$

As we can see the resulted power density is below the MPE limit, therefore VM2WG in PCS band is compliant with the FCC rules on RF exposure.

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Operation in HSDPA band V (826 – 849 MHz) (First Antenna)

The EIRP of VM2WG in cellular band is 22.47dBm max at HSDPA V mode. The resulted power density at a distance of 20 cm can be deducted as follows:

EUT				Measurement					
Operation Band	Pol.	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
		MHz		V/H	dBm	dBi	dB	dBm	dBm
HSDPA Band V	E2	826.40	4132	V	22.62	3.97	-4.22	22.36	38.45
				H	16.86	3.97	-4.22	16.61	38.45
		836.60	4183	V	22.27	4.00	-4.24	22.03	38.45
				H	17.04	4.00	-4.24	16.80	38.45
		846.60	4233	V	22.69	4.02	-4.24	<b>22.47</b>	38.45
				H	19.07	4.02	-4.24	18.86	38.45

$$\text{EIRP} = 22.47 \text{ dBm} = 176.604 \text{ mW}$$

$$\text{Power Density} = \text{EIRP} * \text{Duty Cycle} / (4 \pi R^2)$$

$$= 176.604 * 1 / (4 * \pi * 20^2) = 0.0351 \text{ mW/cm}^2$$

where Duty Cycle is 1 for HSDPA band V mode and R is 20 cm.

The MPE limit for General Population/Uncontrolled Exposure is shown in the FCC OET Bulletin 65 Supplement C and can be calculated as follows:

$$\text{MPE limit} = 846.6 / 1500 = 0.56 \text{ mW/cm}^2$$

As we can see the resulted power density is below the MPE limit, therefore VM2WG in PCS band is compliant with the FCC rules on RF exposure.

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Operation in cellular band (824 – 849 MHz) (First Antenna)

The ERP of VM2WG in cellular band is 23.41dBm max at CDMA2000 Cellular mode. The resulted power density at a distance of 20 cm can be deducted as follows:

EUT				Measurement					
Operation Band	Pol.	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
		MHz		V/H	dBm	dBi	dB	dBm	dBm
CDMA 2000 Cellular	E2	824.70	1013	V	22.17	3.97	-2.80	23.34	38.45
				H	16.89	3.97	-2.80	18.05	38.45
		836.52	384	V	22.23	4.00	-2.82	<b>23.41</b>	38.45
				H	18.32	4.00	-2.82	19.50	38.45
		848.31	777	V	21.71	4.03	-2.84	22.90	38.45
				H	18.81	4.03	-2.84	19.99	38.45

$$\text{ERP} = 23.41\text{dBm} = 216.281 \text{ mW}$$

$$\text{Power Density} = \text{ERP} * \text{Duty Cycle} / (4 \pi R^2)$$

$$= 216.281 * 1 / (4 * \pi * 20^2) = 0.0436 \text{ mW/cm}^2$$

where Duty Cycle is 1 for CDMA operation and R is 20 cm.

The MPE limit for General Population/Uncontrolled Exposure is shown in the FCC OET Bulletin 65 Supplement C and can be calculated as follows:

$$\text{MPE limit} = 836.52 / 1500 = 0.56 \text{ mW/cm}^2$$

As we can see the resulted power density is below the MPE limit, therefore VM2WG in cellular band is compliant with the FCC rules on RF exposure.

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### Operation in PCS band (1850 – 1910 MHz) (First Antenna)

The EIRP of VM2WG in PCS band is 28.04dBm max at CDMA2000 PCS mode. The resulted power density at a distance of 20 cm can be deducted as follows:

EUT				Measurement					
Operation Band	Pol.	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
		MHz		V/H	dBm	dBi	dB	dBm	dBm
CDMA 2000 PCS	E2	1851.25	25	V	28.16	4.17	-4.29	<b>28.04</b>	33.00
				H	22.45	4.51	-4.29	22.66	33.00
		1880.00	600	V	27.33	4.13	-4.33	27.13	33.00
				H	23.58	4.44	-4.33	23.69	33.00
		1908.75	1175	V	26.27	4.10	-4.37	26.00	33.00
				H	23.81	4.37	-4.37	23.81	33.00

$$\text{EIRP} = 28.04 \text{ dBm} = 636.766 \text{ mW}$$

$$\text{Power Density} = \text{EIRP} * \text{Duty Cycle} / (4 \pi R^2)$$

$$= 636.766 * 1 / (4 * \pi * 20^2) = 0.1267 \text{ mW/cm}^2$$

where Duty Cycle is 1 for CDMA2000 operation and R is 20 cm.

The MPE limit for General Population/Uncontrolled Exposure is shown in the FCC OET Bulletin 65 Supplement C and can be calculated as follows:

$$\text{MPE limit} = 1.0 \text{ mW/cm}^2$$

As we can see the resulted power density is below the MPE limit, therefore VM2WG in PCS band is compliant with the FCC rules on RF exposure.

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Operation in cellular band (824 – 849 MHz) (Second Antenna)

The ERP of VM2WG in cellular band is 25.21dBm max at EDGE 850 mode. The resulted power density at a distance of 20 cm can be deducted as follows:

EUT				Measurement					
Operation Band	Pol.	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
		MHz		V/H	dBm	dBd	dB	dBm	dBm
EDGE 850	E2	824.20	128	V	25.33	3.96	-4.22	25.07	38.45
				H	24.55	3.96	-4.22	24.29	38.45
		836.60	190	V	25.25	4.00	-4.24	25.01	38.45
				H	24.29	4.00	-4.24	24.05	38.45
		848.80	251	V	25.51	4.03	-4.33	<b>25.21</b>	38.45
				H	24.11	4.03	-4.33	23.81	38.45

$$\text{ERP} = 25.21 \text{ dBm} = 331.895 \text{ mW}$$

$$\text{Power Density} = \text{ERP} * \text{Duty Cycle} / (4 \pi R^2)$$

$$= 331.895 * 0.25 / (4 * \pi * 20^2) = 0.0165 \text{ mW/cm}^2$$

where Duty Cycle is 0.25 for GPRS operation (class 10) and R is 20 cm.

The MPE limit for General Population/Uncontrolled Exposure is shown in the FCC OET Bulletin 65 Supplement C and can be calculated as follows:

$$\text{MPE limit} = 848.8 / 1500 = 0.57 \text{ mW/cm}^2$$

As we can see the resulted power density is below the MPE limit, therefore VM2WG in cellular band is compliant with the FCC rules on RF exposure

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Operation in PCS band (1850 – 1910 MHz) (Second Antenna)

The EIRP of VM2WG in PCS band is 28.53dBm max at GPRS 1900 mode. The resulted power density at a distance of 20 cm can be deducted as follows:

EUT				Measurement					
Operation Band	Pol.	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
		MHz		V/H	dBm	dBi	dB	dBm	dBm
GPRS 1900	E2	1850.20	512	V	28.44	4.17	-5.49	27.13	33.00
				H	20.54	4.51	-5.49	19.56	33.00
		1880.00	661	V	29.06	4.13	-5.56	27.64	33.00
				H	20.17	4.44	-5.56	19.05	33.00
		1909.80	810	V	29.99	4.09	-5.56	<b>28.53</b>	33.00
				H	20.12	4.36	-5.56	18.93	33.00

$$\text{EIRP} = 28.53 \text{ dBm} = 712.853 \text{ mW}$$

$$\text{Power Density} = \text{EIRP} * \text{Duty Cycle} / (4 \pi R^2)$$

$$= 712.853 * 0.25 / (4 * \pi * 20^2) = 0.0355 \text{ mW/cm}^2$$

where Duty Cycle is 0.25 for GPRS operation (class 10) and R is 20 cm.

The MPE limit for General Population/Uncontrolled Exposure is shown in the FCC OET Bulletin 65 Supplement C and can be calculated as follows:

$$\text{MPE limit} = 1.0 \text{ mW/cm}^2$$

As we can see the resulted power density is below the MPE limit, therefore VM2WG in PCS band is compliant with the FCC rules on RF exposure.

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Operation in HSDPA band II (1850 – 1910 MHz) (Second Antenna)

The EIRP of VM2WG in PCS band is 26.10dBm max at HSDPA II mode. The resulted power density at a distance of 20 cm can be deducted as follows:

EUT				Measurement					
Operation Band	Pol.	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
		MHz		V/H	dBm	dBi	dB	dBm	dBm
HSDPA Band II	E2	1852.4	9262	V	26.09	4.17	-5.49	24.77	33.00
				H	16.90	4.51	-5.49	15.92	33.00
		1880.0	9400	V	25.44	4.13	-5.56	24.01	33.00
				H	15.45	4.44	-5.56	14.32	33.00
		1907.6	9538	V	27.56	4.10	-5.56	<b>26.10</b>	33.00
				H	16.68	4.37	-5.62	15.43	33.00

$$\text{EIRP} = 26.10 \text{ dBm} = 407.380 \text{ mW}$$

$$\text{Power Density} = \text{ERP} * \text{Duty Cycle} / (4 \pi R^2)$$

$$= 407.380 * 1 / (4 * \pi * 20^2) = 0.0810 \text{ mW/cm}^2$$

where Duty Cycle is 1 for HSDPA band II mode and R is 20 cm.

The MPE limit for General Population/Uncontrolled Exposure is shown in the FCC OET Bulletin 65 Supplement C and can be calculated as follows:

$$\text{MPE limit} = 1.0 \text{ mW/cm}^2$$

As we can see the resulted power density is below the MPE limit, therefore VM2WG in cellular band is compliant with the FCC rules on RF exposure.

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Operation in HSDPA band IV (1712.4 – 1752.6 MHz) (Second Antenna)

The EIRP of VM2WG in PCS band is 24.60dBm max at HSUPA IV mode. The resulted power density at a distance of 20 cm can be deducted as follows:

EUT				Measurement					
Operation Band	Pol.	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
		MHz		V/H	dBm	dBi	dB	dBm	dBm
HSDPA Band IV	E2	1712.4	1312	V	24.48	4.40	-5.40	23.47	33.00
				H	23.49	4.79	-5.40	22.88	33.00
		1732.6	1413	V	24.91	4.35	-5.42	23.84	33.00
				H	23.68	4.78	-5.42	23.04	33.00
		1752.6	1513	V	25.72	4.31	-5.44	<b>24.60</b>	33.00
				H	21.56	4.76	-5.44	20.89	33.00

$$\text{EIRP} = 24.60 \text{ dBm} = 288.403 \text{ mW}$$

$$\text{Power Density} = \text{EIRP} * \text{Duty Cycle} / (4 \pi R^2)$$

$$= 288.403 * 1 / (4 * \pi * 20^2) = 0.0574 \text{ mW/cm}^2$$

where Duty Cycle is 1 for HSDPA band IV mode and R is 20 cm.

The MPE limit for General Population/Uncontrolled Exposure is shown in the FCC OET Bulletin 65 Supplement C and can be calculated as follows:

$$\text{MPE limit} = 1.0 \text{ mW/cm}^2$$

As we can see the resulted power density is below the MPE limit, therefore VM2WG in PCS band is compliant with the FCC rules on RF exposure.

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Operation in HSUPA band V (826 – 849 MHz) (Second Antenna)

The EIRP of VM2WG in cellular band is 22.86dBm max at HSUPA V mode. The resulted power density at a distance of 20 cm can be deducted as follows:

EUT				Measurement					
Operation Band	Pol.	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
		MHz		V/H	dBm	dBi	dB	dBm	dBm
HSUPA Band V	E2	826.40	4132	V	22.48	3.97	-4.22	22.23	38.45
				H	21.41	3.97	-4.22	21.15	38.45
		836.60	4183	V	23.10	3.99	-4.24	<b>22.86</b>	38.45
				H	21.14	4.00	-4.24	20.90	38.45
		846.60	4233	V	22.46	4.02	-4.24	22.24	38.45
				H	20.95	4.02	-4.24	20.74	38.45

$$\text{EIRP} = 22.86 \text{ dBm} = 193.197 \text{ mW}$$

$$\text{Power Density} = \text{EIRP} * \text{Duty Cycle} / (4 \pi R^2)$$

$$= 193.197 * 1 / (4 * \pi * 20^2) = 0.0384 \text{ mW/cm}^2$$

where Duty Cycle is 1 for HSUPA band V mode and R is 20 cm.

The MPE limit for General Population/Uncontrolled Exposure is shown in the FCC OET Bulletin 65 Supplement C and can be calculated as follows:

$$\text{MPE limit} = 836.6 / 1500 = 0.56 \text{ mW/cm}^2$$

As we can see the resulted power density is below the MPE limit, therefore VM2WG in PCS band is compliant with the FCC rules on RF exposure.

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Operation in cellular band (824 – 849 MHz) (Second Antenna)

The EIRP of VM2WG in cellular band is 24.81dBm max at CDMA2000 Cellular mode. The resulted power density at a distance of 20 cm can be deducted as follows:

EUT				Measurement					
Operation Band	Pol.	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
		MHz		V/H	dBm	dBi	dB	dBm	dBm
CDMA 2000 Cellular	E2	824.70	1013	V	21.04	3.97	-2.80	22.20	38.45
				H	23.16	3.96	-2.80	24.32	38.45
		836.52	384	V	21.76	4.00	-2.82	22.94	38.45
				H	23.63	4.00	-2.82	<b>24.81</b>	38.45
		848.31	777	V	20.59	4.03	-2.84	21.78	38.45
				H	23.54	4.02	-2.84	24.72	38.45

$$\text{EIRP} = 24.81\text{dBm} = 302.691 \text{ mW}$$

$$\text{Power Density} = \text{ERP} * \text{Duty Cycle} / (4 \pi R^2)$$

$$= 302.691 * 1 / (4 * \pi * 20^2) = 0.0602 \text{ mW/cm}^2$$

where Duty Cycle is 1 for CDMA operation and R is 20 cm.

The MPE limit for General Population/Uncontrolled Exposure is shown in the FCC OET Bulletin 65 Supplement C and can be calculated as follows:

$$\text{MPE limit} = 836.52 / 1500 = 0.56 \text{ mW/cm}^2$$

As we can see the resulted power density is below the MPE limit, therefore VM2WG in cellular band is compliant with the FCC rules on RF exposure.

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Operation in PCS band (1850 – 1910 MHz) (Second Antenna)

The EIRP of VM2WG in cellular band is 26.60dBm max at CDMA2000 PCS mode. The resulted power density at a distance of 20 cm can be deducted as follows:

EUT				Measurement					
Operation Band	Pol.	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
		MHz		V/H	dBm	dBi	dB	dBm	dBm
CDMA 2000 PCS	E2	1851.25	25	V	24.76	4.17	-4.29	24.64	33.00
				H	26.39	4.51	-4.29	26.60	33.00
		1880.00	600	V	26.10	4.13	-4.33	25.90	33.00
				H	24.01	4.44	-4.33	24.12	33.00
		1908.75	1175	V	25.72	4.10	-4.37	25.45	33.00
				H	23.90	4.37	-4.37	23.90	33.00

$$\text{EIRP} = 26.60 \text{ dBm} = 457.088 \text{ mW}$$

$$\text{Power Density} = \text{EIRP} * \text{Duty Cycle} / (4 \pi R^2)$$

$$= 457.088 * 1 / (4 * \pi * 20^2) = 0.0909 \text{ mW/cm}^2$$

where Duty Cycle is 1 for CDMA2000 operation and R is 20 cm.

The MPE limit for General Population/Uncontrolled Exposure is shown in the FCC OET Bulletin 65 Supplement C and can be calculated as follows:

$$\text{MPE limit} = 1.0 \text{ mW/cm}^2$$

As we can see the resulted power density is below the MPE limit, therefore VM2WG in cellular band is compliant with the FCC rules on RF exposure.

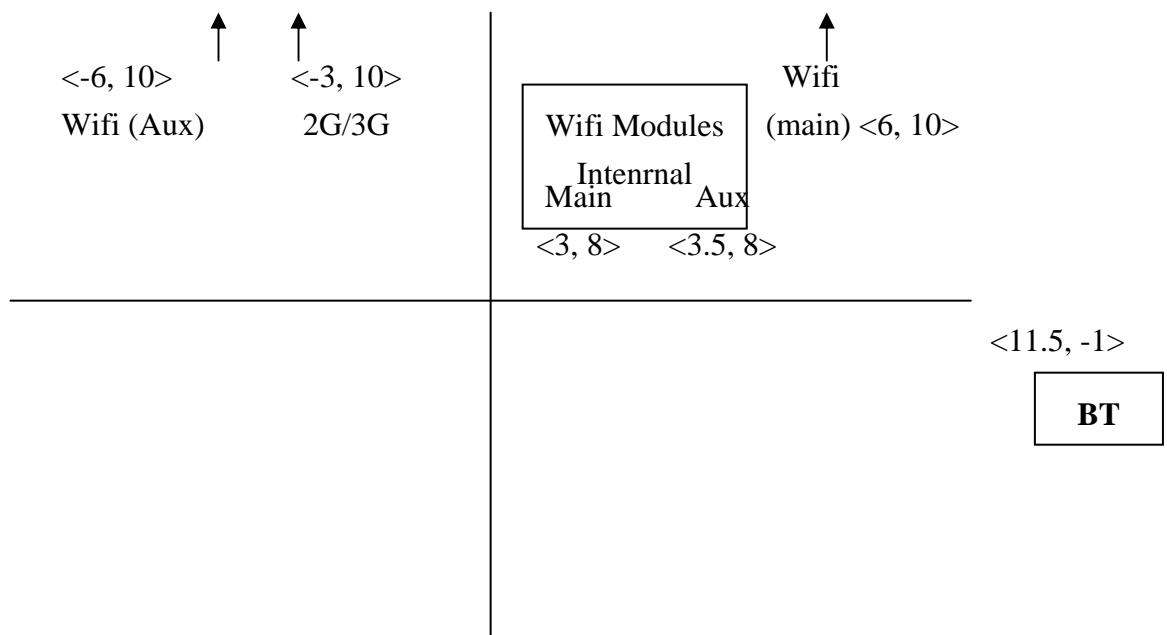
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Collocated MPE analysis:

As per KDB447498 D01, if the radio application is composed of the multiple transmitters confining in the host platform, and placing nearby, the simultaneous transmission due to impact of accumulation of individual MPE shall be evaluated if or not given application could conditionally qualify for MPE test exclusion.

**Location of the transmitting antennas where they distribute:**



Scenario of operation when simultaneous transmission occurs:

Scenario 1:

External Antenna:

Wifi b or g + Bluetooth + 2/3G (frequency band 850)

Scenario 2:

External Antenna:

Wifi n\_MIMO + Bluetooth + 2/3G (frequency band 850)

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Scenario 3:

External Antenna:

Wifi a + Bluetooth + 2/3G (frequency band 850)

Scenario 4:

External Antenna:

Wifi n\_5G (MIMO) + Bluetooth + 2/3G (frequency band 850)

Scenario 5:

Internal Antenna:

Wifi b or g + Bluetooth + 2/3G (frequency band 850)

Scenario 6:

Internal Antenna:

Wifi n\_MIMO + Bluetooth + 2/3G (frequency band 850)

Scenario 7:

Internal Antenna:

Wifi a + Bluetooth + 2/3G (frequency band 850)

Scenario 8:

Internal Antenna:

Wifi n 5G\_MIMO + Bluetooth + 2/3G (frequency band 850)

Scenario 9:

External Antenna:

Wifi b or g + Bluetooth + 2/3G (frequency band 1900)

Scenario 10:

External Antenna:

Wifi n\_MIMO + Bluetooth + 2/3G (frequency band 1900)

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Scenario 11:

External Antenna:

Wifi a + Bluetooth + 2/3G (frequency band 1900)

Scenario 12:

External Antenna:

Wifi n\_5G MIMO + Bluetooth + 2/3G (frequency band 1900)

Scenario 13:

Internal Antenna:

Wifi b or g + Bluetooth + 2/3G (frequency band 1900)

Scenario 14:

Internal Antenna:

Wifi n\_MIMO + Bluetooth + 2/3G (frequency band 1900)

Scenario 15:

Internal Antenna:

Wifi a + Bluetooth + 2/3G (frequency band 1900)

Scenario 16:

Internal Antenna:

Wifi n\_5G MIMO + Bluetooth + 2/3G (frequency band 1900)

Scenario 17:

External Antenna:

Wifi b or g + Bluetooth + 2/3G (frequency band 1700)

Scenario 18:

External Antenna:

Wifi n\_MIMO + Bluetooth + 2/3G (frequency band 1700)

Scenario 19:

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External Antenna:

Wifi a + Bluetooth + 2/3G (frequency band 1700)

Scenario 20:

Internal Antenna:

Wifi n\_5G MIMO + Bluetooth + 2/3G (frequency band 1700)

Scenario 21:

Internal Antenna:

Wifi b or g + Bluetooth + 2/3G (frequency band 1700)

Scenario 22:

Internal Antenna:

Wifi n\_MIMO + Bluetooth + 2/3G (frequency band 1700)

Scenario 23:

Internal Antenna:

Wifi a + Bluetooth + 2/3G (frequency band 1700)

Scenario 24:

Internal Antenna:

Wifi n\_5G MIMO + Bluetooth + 2/3G (frequency band 1700)

Exclusion of test condition:

*Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on calculated or measured field strengths or power density, is  $\leq 1.0$ .*

$\Sigma MPE\ ratio1 + MPE\ ratio2 + MPE\ ratio3 \leq 1.0$

*The spreadsheet as FCC deduces, and releases is employed to conduct the measurement:*

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*Scenario 1:*

External Antenna:

Wifi b or g + Bluetooth + 2/3G (frequency band 850)

Antenna No.		Total	1	2	3
Tx Status			On	On	On
Frequency	MHz		2412	2402	836.6
MPE Limit	mW/cm <sup>2</sup>		1.00	1.00	0.56
Max % MPE	%	35.2	1.0	0.0	34.4
Power	(W)	0.274	0.024	0.002	0.248
Antenna Gain	dBi		2.98	1.20	5.90
EIRP	(W)	1.01	0.049	0.002	0.965
X	(cm)		6.0	11.5	-3.0
Y	(cm)		10.0	-1.0	10.0
Sector			FALSE	FALSE	FALSE
Arc			FALSE	FALSE	FALSE
θ <sub>1</sub>	degs	input	-120	-120	-120
θ <sub>2</sub>			60	60	60
θ <sub>1</sub>		actual	-120	-120	-120
θ <sub>2</sub>			60	60	60

MPE = 35.2/100 = 0.352 < 1.0, and therefore maximum MPE generated from individual transmitter can be excluded.

*Scenario 2:*

External Antenna:

Wifi n\_MIMO + Bluetooth + 2/3G (frequency band 850)

Antenna No.		Total	1	2	3	4
Tx Status			On	On	On	On
Frequency	MHz		2437	2402	836.6	2437
MPE Limit	mW/cm <sup>2</sup>		1.00	1.00	0.56	1.00
Max % MPE	%	35.5	0.6	0.0	34.4	0.6
Power	(W)	0.279	0.015	0.002	0.248	0.014
Antenna Gain	dBi		2.98	1.20	5.90	2.98
EIRP	(W)	1.02	0.030	0.002	0.965	0.028
X	(cm)		6.0	11.5	-3.0	-6.0
Y	(cm)		10.0	-1.0	10.0	10.0
Sector			FALSE	FALSE	FALSE	FALSE
Arc			FALSE	FALSE	FALSE	FALSE
θ <sub>1</sub>	degs	input	-120	-120	-120	-120
θ <sub>2</sub>			60	60	60	60
θ <sub>1</sub>		actual	-120	-120	-120	-120
θ <sub>2</sub>			60	60	60	60

MPE = 35.5/100 = 0.355 < 1.0, and therefore maximum MPE generated from individual transmitter can be excluded.

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*Scenario 3:*

External Antenna:

Wifi a + Bluetooth + 2/3G (frequency band 850)

Antenna No.		Total	1	2	3
Tx Status			On	On	On
Frequency	MHz		5260	2402	836.6
MPE Limit	mW/cm <sup>2</sup>		1.00	1.00	0.56
Max % MPE	%	35.4	1.1	0.0	34.4
Power	(W)	0.268	0.018	0.002	0.248
Antenna Gain	dBi		4.85	1.20	5.90
EIRP	(W)	1.02	0.056	0.002	0.965
X	(cm)		6.0	11.5	-3.0
Y	(cm)		10.0	-1.0	10.0
Sector			FALSE	FALSE	FALSE
Arc			FALSE	FALSE	FALSE
θ <sub>1</sub>	degs	input	-120	-120	-120
θ <sub>2</sub>			60	60	60
θ <sub>1</sub>		actual	-120	-120	-120
θ <sub>2</sub>			60	60	60

MPE = 35.4/100 = 0.354 < 1.0, and therefore maximum MPE generated from individual transmitter can be excluded.

*Scenario 4:*

External Antenna:

Wifi n\_MIMO 5G + Bluetooth + 2/3G (frequency band 850)

Antenna No.		Total	1	2	3	4
Tx Status			On	On	On	On
Frequency	MHz		5260	2402	836.6	5260
MPE Limit	mW/cm <sup>2</sup>		1.00	1.00	0.56	1.00
Max % MPE	%	36.3	1.1	0.0	34.4	1.0
Power	(W)	0.284	0.018	0.002	0.248	0.016
Antenna Gain	dBi		4.85	1.20	5.90	4.85
EIRP	(W)	1.07	0.054	0.002	0.965	0.049
X	(cm)		6.0	11.5	-3.0	-6.0
Y	(cm)		10.0	-1.0	10.0	10.0
Sector			FALSE	FALSE	FALSE	FALSE
Arc			FALSE	FALSE	FALSE	FALSE
θ <sub>1</sub>	degs	input	-120	-120	-120	-120
θ <sub>2</sub>			60	60	60	60
θ <sub>1</sub>		actual	-120	-120	-120	-120
θ <sub>2</sub>			60	60	60	60

MPE = 36.3/100 = 0.363 < 1.0, and therefore maximum MPE generated from individual transmitter can be excluded.

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Scenario 5:

Internal Antenna:

Wifi b or g + Bluetooth + 2/3G (frequency band 850)

Antenna No.		Total	1	2	3
Tx Status			On	On	On
Frequency	MHz		2412	2402	836.6
MPE Limit	mW/cm <sup>2</sup>		1.00	1.00	0.56
Max % MPE	%	35.0	0.7	0.0	34.4
Power	(W)	0.274	0.024	0.002	0.248
Antenna Gain	dBi		1.80	1.20	5.90
EIRP	(W)	1.00	0.037	0.002	0.965
X	(cm)		3.0	11.5	-3.0
Y	(cm)		8.0	-1.0	10.0
Sector			FALSE	FALSE	FALSE
Arc			FALSE	FALSE	FALSE
$\theta_1$	degs	input	-120	-120	-120
$\theta_2$			60	60	60
$\theta_1$		actual	-120	-120	-120
$\theta_2$			60	60	60

MPE = 35/100 = 0.350 < 1.0, and therefore maximum MPE generated from individual transmitter can be excluded.

Scenario 6:

Internal Antenna:

Wifi n\_MIMO + Bluetooth + 2/3G (frequency band 850)

Antenna No.		Total	1	2	3	4
Tx Status			On	On	On	On
Frequency	MHz		2437	2402	836.6	2437
MPE Limit	mW/cm <sup>2</sup>		1.00	1.00	0.56	1.00
Max % MPE	%	36.2	1.0	0.0	34.4	1.0
Power	(W)	0.315	0.015	0.002	0.248	0.014
Antenna Gain	dBi		1.80	1.20	5.90	1.80
EIRP	(W)	1.06	0.050	0.002	0.965	0.048
X	(cm)		3.0	11.5	-3.0	3.5
Y	(cm)		8.0	-1.0	10.0	8.0
Sector			FALSE	FALSE	FALSE	FALSE
Arc			FALSE	FALSE	FALSE	FALSE
$\theta_1$	degs	input	-120	-120	-120	-120
$\theta_2$			60	60	60	60
$\theta_1$		actual	-120	-120	-120	-120
$\theta_2$			60	60	60	60

MPE = 36.2/100 = 0.362 < 1.0, and therefore maximum MPE generated from individual transmitter can be excluded.

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*Scenario 7:*

Internal Antenna:

Wifi a + Bluetooth + 2/3G (frequency band 850)

Antenna No.		Total	1	2	3
Tx Status			On	On	On
Frequency	MHz		5260	2402	836.6
MPE Limit	mW/cm <sup>2</sup>		1.00	1.00	0.56
Max % MPE	%	34.9	0.5	0.0	34.4
Power	(W)	0.268	0.018	0.002	0.248
Antenna Gain	dBi		1.80	1.20	5.90
EIRP	(W)	0.99	0.027	0.002	0.965
X	(cm)		3.0	11.5	-3.0
Y	(cm)		8.0	-1.0	10.0
Sector			FALSE	FALSE	FALSE
Arc			FALSE	FALSE	FALSE
$\theta_1$	degs	input	-120	-120	-120
$\theta_2$			60	60	60
$\theta_1$		actual	-120	-120	-120
$\theta_2$			60	60	60

MPE = 34.9/100 = 0.349 < 1.0, and therefore maximum MPE generated from individual transmitter can be excluded.

*Scenario 8:*

Internal Antenna:

Wifi n\_5G\_MIMO + Bluetooth + 2/3G (frequency band 850)

Antenna No.		Total	1	2	3	4
Tx Status			On	On	On	On
Frequency	MHz		5260	2402	836.6	5260
MPE Limit	mW/cm <sup>2</sup>		1.00	1.00	0.56	1.00
Max % MPE	%	35.3	0.5	0.0	34.4	0.5
Power	(W)	0.284	0.018	0.002	0.248	0.016
Antenna Gain	dBi		1.80	1.20	5.90	1.80
EIRP	(W)	1.02	0.027	0.002	0.965	0.024
X	(cm)		3.0	11.5	-3.0	3.5
Y	(cm)		8.0	-1.0	10.0	8.0
Sector			FALSE	FALSE	FALSE	FALSE
Arc			FALSE	FALSE	FALSE	FALSE
$\theta_1$	degs	input	-120	-120	-120	-120
$\theta_2$			60	60	60	60
$\theta_1$		actual	-120	-120	-120	-120
$\theta_2$			60	60	60	60

MPE = 35.3/100 = 0.353 < 1.0, and therefore maximum MPE generated from individual transmitter can be excluded.

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*Scenario 9:*

External Antenna:

Wifi b or g + Bluetooth + 2/3G (frequency band 1900)

Antenna No.		Total	1	2	3
Tx Status			On	On	On
Frequency	MHz		2412	2402	1880
MPE Limit	mW/cm <sup>2</sup>		1.00	1.00	1.00
Max % MPE	%	16.6	0.9	0.0	15.3
Power	(W)	0.321	0.024	0.002	0.279
Antenna Gain	dBi		2.98	1.20	4.40
EIRP	(W)	0.84	0.048	0.002	0.769
X	(cm)		6.0	11.5	-3.0
Y	(cm)		10.0	-1.0	10.0
Sector			FALSE	FALSE	FALSE
Arc			FALSE	FALSE	FALSE
θ <sub>1</sub>	degs	input	-120	-120	-120
θ <sub>2</sub>			60	60	60
θ <sub>1</sub>		actual	-120	-120	-120
θ <sub>2</sub>			60	60	60

MPE = 16.6/100 = 0.166 < 1.0, and therefore maximum MPE generated from individual transmitter can be excluded.

*Scenario 10:*

External Antenna:

Wifi n\_MIMO + Bluetooth + 2/3G (frequency band 1900)

Antenna No.		Total	1	2	3	4
Tx Status			On	On	On	On
Frequency	MHz		2437	2402	1880	2437
MPE Limit	mW/cm <sup>2</sup>		1.00	1.00	1.00	1.00
Max % MPE	%	16.3	0.6	0.0	15.3	0.6
Power	(W)	0.310	0.015	0.002	0.279	0.014
Antenna Gain	dBi		2.98	1.20	4.40	2.98
EIRP	(W)	0.83	0.030	0.002	0.769	0.028
X	(cm)		6.0	11.5	-3.0	-6.0
Y	(cm)		10.0	-1.0	10.0	10.0
Sector			FALSE	FALSE	FALSE	FALSE
Arc			FALSE	FALSE	FALSE	FALSE
θ <sub>1</sub>	degs	input	-120	-120	-120	-120
θ <sub>2</sub>			60	60	60	60
θ <sub>1</sub>		actual	-120	-120	-120	-120
θ <sub>2</sub>			60	60	60	60

MPE = 16.3/100 = 0.163 < 1.0, and therefore maximum MPE generated from individual transmitter can be excluded.

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*Scenario 11:*

External Antenna:

Wifi a + Bluetooth + 2/3G (frequency band 1900)

Antenna No.		Total	1	2	3
Tx Status			On	On	On
Frequency	MHz		5260	2402	1880
MPE Limit	mW/cm <sup>2</sup>		1.00	1.00	1.00
Max % MPE	%	16.2	1.1	0.0	15.3
Power	(W)	0.299	0.018	0.002	0.279
Antenna Gain	dBi		4.85	1.20	4.40
EIRP	(W)	0.83	0.055	0.002	0.769
X	(cm)		6.0	11.5	-3.0
Y	(cm)		10.0	-1.0	10.0
Sector			FALSE	FALSE	FALSE
Arc			FALSE	FALSE	FALSE
θ <sub>1</sub>	degs	input	-120	-120	-120
θ <sub>2</sub>			60	60	60
θ <sub>1</sub>		actual	-120	-120	-120
θ <sub>2</sub>			60	60	60

MPE = 16.2/100 = 0.162 < 1.0, and therefore maximum MPE generated from individual transmitter can be excluded.

*Scenario 12:*

External Antenna:

Wifi n\_5G MIMO + Bluetooth + 2/3G (frequency band 1900)

Antenna No.		Total	1	2	3	4
Tx Status			On	On	On	On
Frequency	MHz		5260	2402	1880	5260
MPE Limit	mW/cm <sup>2</sup>		1.00	1.00	1.00	1.00
Max % MPE	%	17.2	1.1	0.0	15.3	1.0
Power	(W)	0.315	0.018	0.002	0.279	0.016
Antenna Gain	dBi		4.85	1.20	4.40	4.85
EIRP	(W)	0.87	0.055	0.002	0.769	0.049
X	(cm)		6.0	11.5	-3.0	-6.0
Y	(cm)		10.0	-1.0	10.0	10.0
Sector			FALSE	FALSE	FALSE	FALSE
Arc			FALSE	FALSE	FALSE	FALSE
θ <sub>1</sub>	degs	input	-120	-120	-120	-120
θ <sub>2</sub>			60	60	60	60
θ <sub>1</sub>		actual	-120	-120	-120	-120
θ <sub>2</sub>			60	60	60	60

MPE = 17.2/100 = 0.172 < 1.0, and therefore maximum MPE generated from individual transmitter can be excluded.

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Scenario 13:

Internal Antenna:

Wifi b or g + Bluetooth + 2/3G (frequency band 1900)

Antenna No.		Total	1	2	3
Tx Status			On	On	On
Frequency	MHz		2412	2402	1880
MPE Limit	mW/cm <sup>2</sup>		1.00	1.00	1.00
Max % MPE	%	15.9	0.7	0.0	15.3
Power	(W)	0.305	0.024	0.002	0.279
Antenna Gain	dBi		1.80	1.20	4.40
EIRP	(W)	0.81	0.036	0.002	0.769
X	(cm)		3.0	11.5	-3.0
Y	(cm)		8.0	-1.0	10.0
Sector			FALSE	FALSE	FALSE
Arc			FALSE	FALSE	FALSE
$\theta_1$	degs	input	-120	-120	-120
$\theta_2$			60	60	60
$\theta_1$		actual	-120	-120	-120
$\theta_2$			60	60	60

MPE = 15.9/100 = 0.159 < 1.0, and therefore maximum MPE generated from individual transmitter can be excluded.

Scenario 14:

Internal Antenna:

Wifi n\_MIMO 2.4G+ Bluetooth + 2/3G (frequency band 1900)

Antenna No.		Total	1	2	3	4
Tx Status			On	On	On	On
Frequency	MHz		2437	2402	1880	2437
MPE Limit	mW/cm <sup>2</sup>		1.00	1.00	1.00	1.00
Max % MPE	%	16.1	0.5	0.0	15.3	0.4
Power	(W)	0.310	0.015	0.002	0.279	0.014
Antenna Gain	dBi		1.80	1.20	4.40	1.80
EIRP	(W)	0.81	0.023	0.002	0.769	0.021
X	(cm)		3.0	11.5	-3.0	3.5
Y	(cm)		8.0	-1.0	10.0	8.0
Sector			FALSE	FALSE	FALSE	FALSE
Arc			FALSE	FALSE	FALSE	FALSE
$\theta_1$	degs	input	-120	-120	-120	-120
$\theta_2$			60	60	60	60
$\theta_1$		actual	-120	-120	-120	-120
$\theta_2$			60	60	60	60

MPE = 16.1/100 = 0.161 < 1.0, and therefore maximum MPE generated from individual transmitter can be excluded.

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*Scenario 15:*

Internal Antenna:

Wifi a + Bluetooth + 2/3G (frequency band 1900)

Antenna No.		Total	1	2	3
Tx Status			On	On	On
Frequency	MHz		5260	2402	1880
MPE Limit	mW/cm <sup>2</sup>		1.00	1.00	1.00
Max % MPE	%	16.2	1.1	0.0	15.3
Power	(W)	0.299	0.018	0.002	0.279
Antenna Gain	dBi		4.97	1.20	4.40
EIRP	(W)	0.83	0.057	0.002	0.769
X	(cm)		3.0	11.5	-3.0
Y	(cm)		8.0	-1.0	10.0
Sector			FALSE	FALSE	FALSE
Arc			FALSE	FALSE	FALSE
θ <sub>1</sub>	degs	input	-120	-120	-120
θ <sub>2</sub>			60	60	60
θ <sub>1</sub>		actual	-120	-120	-120
θ <sub>2</sub>			60	60	60

MPE = 16.2/100 = 0.162 < 1.0, and therefore maximum MPE generated from individual transmitter can be excluded.

*Scenario 16:*

Internal Antenna:

Wifi n\_5G MIMO + Bluetooth + 2/3G (frequency band 1900)

Antenna No.		Total	1	2	3	4
Tx Status			On	On	On	On
Frequency	MHz		5260	2402	1880	5260
MPE Limit	mW/cm <sup>2</sup>		1.00	1.00	1.00	1.00
Max % MPE	%	17.2	1.1	0.0	15.3	1.0
Power	(W)	0.315	0.018	0.002	0.279	0.016
Antenna Gain	dBi		4.97	1.20	4.40	4.97
EIRP	(W)	0.88	0.057	0.002	0.769	0.050
X	(cm)		3.0	11.5	-3.0	3.5
Y	(cm)		8.0	-1.0	10.0	8.0
Sector			FALSE	FALSE	FALSE	FALSE
Arc			FALSE	FALSE	FALSE	FALSE
θ <sub>1</sub>	degs	input	-120	-120	-120	-120
θ <sub>2</sub>			60	60	60	60
θ <sub>1</sub>		actual	-120	-120	-120	-120
θ <sub>2</sub>			60	60	60	60

MPE = 17.2/100 = 0.172 < 1.0, and therefore maximum MPE generated from individual transmitter can be excluded.

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*Scenario 17:*

External Antenna:

Wifi b or g + Bluetooth + 2/3G (frequency band 1700)

Antenna No.		Total	1	2	3
Tx Status			On	On	On
Frequency	MHz		2412	2402	1732.6
MPE Limit	mW/cm <sup>2</sup>		1.00	1.00	1.00
Max % MPE	%	14.5	0.9	0.0	13.7
Power	(W)	0.287	0.024	0.002	0.261
Antenna Gain	dBi		2.98	1.20	4.20
EIRP	(W)	0.74	0.048	0.002	0.687
X	(cm)		6.0	11.5	-3.0
Y	(cm)		10.0	-1.0	10.0
Sector			FALSE	FALSE	FALSE
Arc			FALSE	FALSE	FALSE
$\theta_1$	degs	input	-120	-120	-120
$\theta_2$			60	60	60
$\theta_1$		actual	-120	-120	-120
$\theta_2$			60	60	60

MPE = 14.5/100 = 0.145 < 1.0, and therefore maximum MPE generated from individual transmitter can be excluded.

*Scenario 18:*

External Antenna:

Wifi n\_MIMO + Bluetooth + 2/3G (frequency band 1900)

Antenna No.		Total	1	2	3	4
Tx Status			On	On	On	On
Frequency	MHz		2437	2402	1732.6	2437
MPE Limit	mW/cm <sup>2</sup>		1.00	1.00	1.00	1.00
Max % MPE	%	14.7	0.6	0.0	13.7	0.6
Power	(W)	0.292	0.015	0.002	0.261	0.014
Antenna Gain	dBi		2.98	1.20	4.20	2.98
EIRP	(W)	0.75	0.030	0.002	0.687	0.028
X	(cm)		6.0	11.5	-3.0	-6.0
Y	(cm)		10.0	-1.0	10.0	10.0
Sector			FALSE	FALSE	FALSE	FALSE
Arc			FALSE	FALSE	FALSE	FALSE
$\theta_1$	degs	input	-120	-120	-120	-120
$\theta_2$			60	60	60	60
$\theta_1$		actual	-120	-120	-120	-120
$\theta_2$			60	60	60	60

MPE = 14.7/100 = 0.147 < 1.0, and therefore maximum MPE generated from individual transmitter can be excluded.

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*Scenario 19:*

External Antenna:

Wifi a + Bluetooth + 2/3G (frequency band 1700)

Antenna No.		Total	1	2	3
Tx Status			On	On	On
Frequency	MHz		5260	2402	1732.6
MPE Limit	mW/cm <sup>2</sup>		1.00	1.00	1.00
Max % MPE	%	14.6	1.1	0.0	13.7
Power	(W)	0.281	0.018	0.002	0.261
Antenna Gain	dBi		4.85	1.20	4.20
EIRP	(W)	0.74	0.055	0.002	0.687
X	(cm)		6.0	11.5	-3.0
Y	(cm)		10.0	-1.0	10.0
Sector			FALSE	FALSE	FALSE
Arc			FALSE	FALSE	FALSE
θ <sub>1</sub>	degs	input	-120	-120	-120
θ <sub>2</sub>			60	60	60
θ <sub>1</sub>		actual	-120	-120	-120
θ <sub>2</sub>			60	60	60

MPE = 14.6/100 = 0.146 < 1.0, and therefore maximum MPE generated from individual transmitter can be excluded.

*Scenario 20:*

External Antenna:

Wifi n\_5G MIMO + Bluetooth + 2/3G (frequency band 1700)

Antenna No.		Total	1	2	3	4
Tx Status			On	On	On	On
Frequency	MHz		5260	2402	1732.6	5260
MPE Limit	mW/cm <sup>2</sup>		1.00	1.00	1.00	1.00
Max % MPE	%	15.5	1.1	0.0	13.7	1.0
Power	(W)	0.297	0.018	0.002	0.261	0.016
Antenna Gain	dBi		4.85	1.20	4.20	4.85
EIRP	(W)	0.79	0.055	0.002	0.687	0.049
X	(cm)		6.0	11.5	-3.0	-6.0
Y	(cm)		10.0	-1.0	10.0	10.0
Sector			FALSE	FALSE	FALSE	FALSE
Arc			FALSE	FALSE	FALSE	FALSE
θ <sub>1</sub>	degs	input	-120	-120	-120	-120
θ <sub>2</sub>			60	60	60	60
θ <sub>1</sub>		actual	-120	-120	-120	-120
θ <sub>2</sub>			60	60	60	60

MPE = 15.5/100 = 0.155 < 1.0, and therefore maximum MPE generated from individual transmitter can be excluded.

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Scenario 21:

Internal Antenna:

Wifi b or g + Bluetooth + 2/3G (frequency band 1700)

Antenna No.		Total	1	2	3
Tx Status			On	On	On
Frequency	MHz		2412	2402	1732.5
MPE Limit	mW/cm <sup>2</sup>		1.00	1.00	1.00
Max % MPE	%	14.1	0.5	0.0	13.7
Power	(W)	0.281	0.018	0.002	0.261
Antenna Gain	dBi		1.80	1.20	4.20
EIRP	(W)	0.72	0.027	0.002	0.687
X	(cm)		6.0	11.5	-3.0
Y	(cm)		10.0	-1.0	10.0
Sector			FALSE	FALSE	FALSE
Arc			FALSE	FALSE	FALSE
θ <sub>1</sub>	degs	input	-120	-120	-120
θ <sub>2</sub>			60	60	60
θ <sub>1</sub>		actual	-120	-120	-120
θ <sub>2</sub>			60	60	60

MPE = 14.1/100 = 0.141 < 1.0, and therefore maximum MPE generated from individual transmitter can be excluded.

Scenario 22:

Internal Antenna:

Wifi n\_MIMO 2.4G+ Bluetooth + 2/3G (frequency band 1700)

Antenna No.		Total	1	2	3	4
Tx Status			On	On	On	On
Frequency	MHz		2437	2402	1732.5	2437
MPE Limit	mW/cm <sup>2</sup>		1.00	1.00	1.00	1.00
Max % MPE	%	14.5	0.5	0.0	13.7	0.4
Power	(W)	0.292	0.015	0.002	0.261	0.014
Antenna Gain	dBi		1.80	1.20	4.20	1.80
EIRP	(W)	0.73	0.023	0.002	0.687	0.021
X	(cm)		3.0	11.5	-3.0	3.5
Y	(cm)		8.0	-1.0	10.0	8.0
Sector			FALSE	FALSE	FALSE	FALSE
Arc			FALSE	FALSE	FALSE	FALSE
θ <sub>1</sub>	degs	input	-120	-120	-120	-120
θ <sub>2</sub>			60	60	60	60
θ <sub>1</sub>		actual	-120	-120	-120	-120
θ <sub>2</sub>			60	60	60	60

MPE = 14.5/100 = 0.145 < 1.0, and therefore maximum MPE generated from individual transmitter can be excluded.

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*Scenario 23:*

Internal Antenna:

Wifi a + Bluetooth + 2/3G (frequency band 1900)

Antenna No.		Total	1	2	3
Tx Status			On	On	On
Frequency	MHz		5260	2402	1732.5
MPE Limit	mW/cm <sup>2</sup>		1.00	1.00	1.00
Max % MPE	%	14.6	1.1	0.0	13.7
Power	(W)	0.281	0.018	0.002	0.261
Antenna Gain	dBi		4.97	1.20	4.20
EIRP	(W)	0.75	0.057	0.002	0.687
X	(cm)		3.0	11.5	-3.0
Y	(cm)		8.0	-1.0	10.0
Sector			FALSE	FALSE	FALSE
Arc			FALSE	FALSE	FALSE
θ <sub>1</sub>	degs	input	-120	-120	-120
θ <sub>2</sub>			60	60	60
θ <sub>1</sub>		actual	-120	-120	-120
θ <sub>2</sub>			60	60	60

MPE = 14.6/100 = 0.146 < 1.0, and therefore maximum MPE generated from individual transmitter can be excluded.

*Scenario 24:*

Internal Antenna:

Wifi n\_5G MIMO + Bluetooth + 2/3G (frequency band 1700)

Antenna No.		Total	1	2	3	4
Tx Status			On	On	On	On
Frequency	MHz		5260	2402	1732.5	5260
MPE Limit	mW/cm <sup>2</sup>		1.00	1.00	1.00	1.00
Max % MPE	%	15.6	1.1	0.0	13.7	1.0
Power	(W)	0.297	0.018	0.002	0.261	0.016
Antenna Gain	dBi		4.97	1.20	4.20	4.97
EIRP	(W)	0.80	0.057	0.002	0.687	0.050
X	(cm)		3.0	11.5	-3.0	3.5
Y	(cm)		8.0	-1.0	10.0	8.0
Sector			FALSE	FALSE	FALSE	FALSE
Arc			FALSE	FALSE	FALSE	FALSE
θ <sub>1</sub>	degs	input	-120	-120	-120	-120
θ <sub>2</sub>			60	60	60	60
θ <sub>1</sub>		actual	-120	-120	-120	-120
θ <sub>2</sub>			60	60	60	60

MPE = 15.6/100 = 0.156 < 1.0, and therefore maximum MPE generated from individual transmitter can be excluded.

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