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Test report No:
NIE: 56944RAN.001

Assessment report
RF EXPOSURE REPORT ACCORDING TO
FCC 47 CFR Part 2.1091
ISED RSS-102 Issue 5:2015

Identification of item tested	iMac with Retina 5K display
Trademark	Information not supplied by client
Model and /or type reference	A2115
Other identification of the product	FCC ID: BCGA2115 IC: 579C-A2115
Features	Information not supplied by client
Manufacturer	Information not supplied by client
Test method requested, standard	FCC 47 CFR Part 2.1091 Radiofrequency radiation exposure evaluation: mobile devices. ISED RSS-102 Issue 5 (2015-03) – Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Miguel Lacave Antennas Lab Manager  MIGUEL LACAVE GARCÍA 2019.03.08 11:01:34 +01'00'
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Index

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Document history

Report number	Date	Description
56944RAN.001	2019-03-08	First release

General description of the device under evaluation

The device under evaluation consists of a desktop computer that supports WLAN IEEE 802.11a/b/g/n/ac and Bluetooth EDR/LE.

The WLAN (Wi-Fi) radio is composed of three main cores (Core 0, 1 and 2) which support IEEE 802.11b/g/n standards in the 2.4GHz band and IEEE 802.11 a/n/ac in 5GHz band, in a MIMO 3x3 configuration.

The Wi-Fi radio supports an auxiliary core which provides the ability to have simultaneous Wi-Fi in both the 2.4GHz and 5GHz. This auxiliary core shares the third antenna from the main radio and cannot operate completely independently from the main radio.

Bluetooth can simultaneously transmit with Wi-Fi 2.4GHz and Wi-Fi 5GHz.

The simultaneous transmission capabilities available within the product are defined in the table below:

Wi-Fi main	Wi-Fi aux (SISO)	Bluetooth
2.4 GHz (Any: 1x1, 2x2, 3x3)	No	Yes
5 GHz (Any: 1x1, 2x2, 3x3)	2.4 GHz	Yes
5 GHz (1x1 or 2x2)	5 GHz	Yes

Table 1: Simultaneous transmission capabilities

According to the manufacturer, during its normal use, the separation distance between the device and the body of nearby users will be greater than 20 cm. In order to perform the assessment a conservative separation distance of 20 cm has been used.

As stated into DEKRA Testing and Certification, S.A.U. test reports num. 56944RRF001/002/003/004/005/006, the maximum measured output power levels for each supported technology, frequency range and mode are:

Technology	Frequency band (GHz)	Core	Max. conducted output power (dBm)	Max. antenna gain (dBi)	Max. E.I.R.P (dBm)	Max. E.I.R.P (mW)
Wi-Fi SISO	2.4	0	23.02	+5.9	28.92	779.83
		1	22.67	+5.33	28.00	630.96
		2	22.99	+3.38	26.37	433.51
		Aux	22.93	+3.38	26.31	427.56
	5.2	0	19.97	+3.08	23.05	201.84
		1	20.29	+3.19	23.48	222.84
		2	20.21	+4.15	24.36	272.90
		Aux	18.95	+4.15	23.10	204.17
	5.3	0	20.11	+3.48	23.59	228.56
		1	20.32	+2.55	22.87	193.64
		2	20.18	+3.91	24.09	256.45
		Aux	18.79	+3.91	22.70	186.21
	5.6	0	20.00	+3.17	23.17	207.49
		1	20.60	+1.88	22.48	177.01
		2	20.42	+4.56	24.98	314.77
		Aux	21.68	+4.56	26.24	420.73
	5.8	0	21.28	+2.68	23.96	248.89
		1	21.04	+0.42	21.46	139.96
		2	21.88	+4.42	26.30	426.58
		Aux	21.98	+4.42	26.40	436.52
Bluetooth EDR	2.4	-	13.29	+6.56	19.85	96.61
Bluetooth LE	2.4	-	2.16	+6.56	8.72	7.45

Table 2: Maximum transmitter power

Wi-Fi power levels shown in Table 2 correspond to 802.11b (2.4 GHz) and 802.11a (5GHz) modes, which present the highest measured output power levels for all Wi-Fi modes supported.

Power values corresponding to these Wi-Fi modes and Bluetooth EDR are considered as worst cases and therefore these values will be used for the RF Exposure assessment.

Assessment summary

Radiofrequency radiation exposure limits				
FCC 47 CFR § 2.1091 & ISED RSS-102 Issue 5 (2015-03)				
Assessment	**Band (GHz)**	**Technology**	**Core**	**VERDICT (Pass/Fail)**
1	2.4	Wi-Fi	0	Pass
2	2.4	Wi-Fi	1	Pass
3	2.4	Wi-Fi	2	Pass
4	2.4	Wi-Fi	Aux	Pass
5	5.2	Wi-Fi	0	Pass
6	5.2	Wi-Fi	1	Pass
7	5.2	Wi-Fi	2	Pass
8	5.2	Wi-Fi	Aux	Pass
9	5.3	Wi-Fi	0	Pass
10	5.3	Wi-Fi	1	Pass
11	5.3	Wi-Fi	2	Pass
12	5.3	Wi-Fi	Aux	Pass
13	5.6	Wi-Fi	0	Pass
14	5.6	Wi-Fi	1	Pass
15	5.6	Wi-Fi	2	Pass
16	5.6	Wi-Fi	Aux	Pass
17	5.8	Wi-Fi	0	Pass
18	5.8	Wi-Fi	1	Pass
19	5.8	Wi-Fi	2	Pass
20	5.8	Wi-Fi	Aux	Pass
21	2.4	Bluetooth EDR	-	Pass
22	2.4	Bluetooth LE	-	Pass
Multiple frequencies		Wi-Fi main + Wi-Fi aux + BT	-	Pass

Table 3: Assessment summary

Assessment details are documented in Appendix A and B for FCC and ISED respectively.

Appendix A: FCC RF Exposure

FCC RF Exposure evaluation

Devices operating in standalone mobile device exposure conditions may contain a single transmitter or multiple transmitters that do not transmit simultaneously. A minimum test separation distance ≥ 20 cm is required between the antenna and radiating structures of the device and nearby persons to apply mobile device exposure limits. The distance must be at least 20 cm and fully supported by the operating and installation configurations of the transmitter and its antenna(s), according to the source-based time-averaged maximum power requirements of § 2.1091(d)(2). In cases where cable losses or other attenuations are applied to determine compliance, the most conservative operating configurations and exposure conditions must be evaluated. The minimum test separation distance required for a device to comply with mobile device exposure conditions must be clearly identified in the installation and operating instructions, for all installation and exposure conditions, to enable users and installers to comply with RF exposure requirements. For mobile devices that have the potential to operate in portable device exposure conditions, similar to the configurations described in § 2.1091(d)(4), a KDB inquiry is required to determine the SAR test requirements for demonstrating compliance.

When a device qualifies for the categorical exclusion provision of § 2.1091(c), the minimum test separation distance may be estimated, when applicable, by simple calculations according to plane-wave equivalent conditions, to ensure the transmitter and its antenna(s) can operate in manners that meet or exceed the estimated distance. The source-based time-averaged maximum radiated power, according to the maximum antenna gain, must be applied to calculate the field strength and power density required to establish the minimum test separation distance. When the estimated test separation distance becomes overly conservative and does not support compliance, MPE measurement or computational modeling may be used to determine the required minimum separation distance.

According to §1.1310 Radiofrequency radiation exposure limits, paragraph (e), the limits for Maximum Permissible Exposure (MPE) to radiofrequency electromagnetic fields are:

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
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
300–1,500	.....	.....	f/300	6
1,500–100,000	.....	.....	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
300–1,500	.....	.....	f/1500	30
1,500–100,000	.....	.....	1.0	30

f = frequency in MHz * = Plane-wave equivalent power density

FCC MPE Evaluation Results

Each supported transmission technology will be evaluated to determine if it is in compliance with limits for Maximum Permissible Exposure (MPE) to radiofrequency electromagnetic fields.

In order to perform the assessment, the following equations have been used for the calculations; these equations are accurate in the far-field of an antenna and will over-predict power density in the near field, where they could be used for making a "worst case" or conservative prediction:

Power density: $S[mW/cm^2] = \frac{P_{E.I.R.P.}[mW]}{4\Pi R[cm]^2}$

Minimum compliance distance: $R_{\min}[cm] = \sqrt{\frac{P_{E.I.R.P.}[mW]}{4\Pi S[mW/cm^2]}}$

Where:

S = power density

$P_{E.I.R.P.}$ = Equivalent isotropically radiated power

R = distance to the center of radiation of the antenna (evaluation distance)

$R_{\min}$ = distance to the center of radiation of the antenna

Assessment 1 – Wi-Fi 2.45 GHz Band – Core 0

Maximum output power (dBm):	23.02
Maximum antenna Gain (dBi):	5.9
Minimum use distance (cm):	20.0
Worst Case Frequency (MHz):	2412.0
Maximum EIRP (dBm):	28.92
Maximum EIRP (mW):	779.83
General population - Power density limit (mW/cm^2):	1.0

Power density at minimum use distance:

Power density (mW/cm^2):	0.155
General population - Power density limit (mW/cm^2):	1.0
Verdict for general population:	PASS

The power density level for this transmission mode is below general population exposure power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general population (cm):	7.88
Minimum use distance (cm):	20.0
Verdict for general population:	PASS

The minimum use distance is greater than general population exposure minimum compliance distance.

Assessment 2 – Wi-Fi 2.45 GHz Band – Core 1

Maximum output power (dBm):	22.67
Maximum antenna Gain (dBi):	5.33
Minimum use distance (cm):	20.0
Worst Case Frequency (MHz):	2412.0
Maximum EIRP (dBm):	28.00
Maximum EIRP (mW):	630.96
General population - Power density limit (mW/cm^2):	1.0

Power density at minimum use distance:

Power density (mW/cm^2):	0.126
General population - Power density limit (mW/cm^2):	1.0
Verdict for general population:	PASS

The power density level for this transmission mode is below general population exposure power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general population (cm):	7.09
Minimum use distance (cm):	20.0
Verdict for general population:	PASS

The minimum use distance is greater than general population exposure minimum compliance distance.

Assessment 3 – Wi-Fi 2.45 GHz Band – Core 2

Maximum output power (dBm):	22.99
Maximum antenna Gain (dBi):	3.38
Minimum use distance (cm):	20.0
Worst Case Frequency (MHz):	2412.0
Maximum EIRP (dBm):	26.37
Maximum EIRP (mW):	433.51
General population - Power density limit (mW/cm^2):	1.0

Power density at minimum use distance:

Power density (mW/cm^2):	0.086
General population - Power density limit (mW/cm^2):	1.0
Verdict for general population:	PASS

The power density level for this transmission mode is below general population exposure power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general population (cm):	5.87
Minimum use distance (cm):	20.0
Verdict for general population:	PASS

The minimum use distance is greater than general population exposure minimum compliance distance.

Assessment 4 – Wi-Fi 2.45 GHz Band – Core Aux

Maximum output power (dBm):	22.93
Maximum antenna Gain (dBi):	3.38
Minimum use distance (cm):	20.0
Worst Case Frequency (MHz):	2412.0
Maximum EIRP (dBm):	26.31
Maximum EIRP (mW):	427.56
General population - Power density limit (mW/cm^2):	1.0

Power density at minimum use distance:

Power density (mW/cm^2):	0.085
General population - Power density limit (mW/cm^2):	1.0
Verdict for general population:	PASS

The power density level for this transmission mode is below general population exposure power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general population (cm):	5.83
Minimum use distance (cm):	20.0
Verdict for general population:	PASS

The minimum use distance is greater than general population exposure minimum compliance distance.

Assessment 5 – Wi-Fi 5.2 GHz Band – Core 0

Maximum output power (dBm):	19.97
Maximum antenna Gain (dBi):	3.08
Minimum use distance (cm):	20.0
Worst Case Frequency (MHz):	5180.0
Maximum EIRP (dBm):	23.05
Maximum EIRP (mW):	201.84
General population - Power density limit (mW/cm^2):	1.0

Power density at minimum use distance:

Power density (mW/cm^2):	0.04
General population - Power density limit (mW/cm^2):	1.0
Verdict for general population:	PASS

The power density level for this transmission mode is below general population exposure power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general population (cm):	4.01
Minimum use distance (cm):	20.0
Verdict for general population:	PASS

The minimum use distance is greater than general population exposure minimum compliance distance.

Assessment 6 – Wi-Fi 5.2 GHz Band – Core 1

Maximum output power (dBm):	20.29
Maximum antenna Gain (dBi):	3.19
Minimum use distance (cm):	20.0
Worst Case Frequency (MHz):	5180.0
Maximum EIRP (dBm):	23.48
Maximum EIRP (mW):	222.84
General population - Power density limit (mW/cm^2):	1.0

Power density at minimum use distance:

Power density (mW/cm^2):	0.044
General population - Power density limit (mW/cm^2):	1.0
Verdict for general population:	PASS

The power density level for this transmission mode is below general population exposure power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general population (cm):	4.21
Minimum use distance (cm):	20.0
Verdict for general population:	PASS

The minimum use distance is greater than general population exposure minimum compliance distance.

Assessment 7 – Wi-Fi 5.2 GHz Band – Core 2

Maximum output power (dBm):	20.21
Maximum antenna Gain (dBi):	4.15
Minimum use distance (cm):	20.0
Worst Case Frequency (MHz):	5180.0
Maximum EIRP (dBm):	24.63
Maximum EIRP (mW):	272.90
General population - Power density limit (mW/cm^2):	1.0

Power density at minimum use distance:

Power density (mW/cm^2):	0.054
General population - Power density limit (mW/cm^2):	1.0
Verdict for general population:	PASS

The power density level for this transmission mode is below general population exposure power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general population (cm):	4.66
Minimum use distance (cm):	20.0
Verdict for general population:	PASS

The minimum use distance is greater than general population exposure minimum compliance distance.

Assessment 8 – Wi-Fi 5.2 GHz Band – Core Aux

Maximum output power (dBm):	19.95
Maximum antenna Gain (dBi):	4.15
Minimum use distance (cm):	20.0
Worst Case Frequency (MHz):	5180.0
Maximum EIRP (dBm):	24.10
Maximum EIRP (mW):	257.04
General population - Power density limit (mW/cm^2):	1.0

Power density at minimum use distance:

Power density (mW/cm^2):	0.051
General population - Power density limit (mW/cm^2):	1.0
Verdict for general population:	PASS

The power density level for this transmission mode is below general population exposure power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general population (cm):	4.52
Minimum use distance (cm):	20.0
Verdict for general population:	PASS

The minimum use distance is greater than general population exposure minimum compliance distance.

Assessment 9 – Wi-Fi 5.3 GHz Band – Core 0

Maximum output power (dBm):	20.11
Maximum antenna Gain (dBi):	3.48
Minimum use distance (cm):	20.0
Worst Case Frequency (MHz):	5260.0
Maximum EIRP (dBm):	23.59
Maximum EIRP (mW):	228.56
General population - Power density limit (mW/cm^2):	1.0

Power density at minimum use distance:

Power density (mW/cm^2):	0.045
General population - Power density limit (mW/cm^2):	1.0
Verdict for general population:	PASS

The power density level for this transmission mode is below general population exposure power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general population (cm):	4.26
Minimum use distance (cm):	20.0
Verdict for general population:	PASS

The minimum use distance is greater than general population exposure minimum compliance distance.

Assessment 10 – Wi-Fi 5.3 GHz Band – Core 1

Maximum output power (dBm):	20.32
Maximum antenna Gain (dBi):	2.55
Minimum use distance (cm):	20.0
Worst Case Frequency (MHz):	5260.0
Maximum EIRP (dBm):	0.039
Maximum EIRP (mW):	193.64
General population - Power density limit (mW/cm^2):	1.0

Power density at minimum use distance:

Power density (mW/cm^2):	0.039
General population - Power density limit (mW/cm^2):	1.0
Verdict for general population:	PASS

The power density level for this transmission mode is below general population exposure power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general population (cm):	3.93
Minimum use distance (cm):	20.0
Verdict for general population:	PASS

The minimum use distance is greater than general population exposure minimum compliance distance.

Assessment 11 – Wi-Fi 5.3 GHz Band – Core 2

Maximum output power (dBm):	20.18
Maximum antenna Gain (dBi):	3.91
Minimum use distance (cm):	20.0
Worst Case Frequency (MHz):	5260.0
Maximum EIRP (dBm):	24.09
Maximum EIRP (mW):	256.45
General population - Power density limit (mW/cm^2):	1.0

Power density at minimum use distance:

Power density (mW/cm^2):	0.051
General population - Power density limit (mW/cm^2):	1.0
Verdict for general population:	PASS

The power density level for this transmission mode is below general population exposure power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general population (cm):	4.52
Minimum use distance (cm):	20.0
Verdict for general population:	PASS

The minimum use distance is greater than general population exposure minimum compliance distance.

Assessment 12 – Wi-Fi 5.3 GHz Band – Core Aux

Maximum output power (dBm):	18.79
Maximum antenna Gain (dBi):	3.91
Minimum use distance (cm):	20.0
Worst Case Frequency (MHz):	5260.0
Maximum EIRP (dBm):	22.70
Maximum EIRP (mW):	186.21
General population - Power density limit (mW/cm^2):	1.0

Power density at minimum use distance:

Power density (mW/cm^2):	0.037
General population - Power density limit (mW/cm^2):	1.0
Verdict for general population:	PASS

The power density level for this transmission mode is below general population exposure power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general population (cm):	3.85
Minimum use distance (cm):	20.0
Verdict for general population:	PASS

The minimum use distance is greater than general population exposure minimum compliance distance.

Assessment 13 – Wi-Fi 5.6 GHz Band – Core 0

Maximum output power (dBm):	20.0
Maximum antenna Gain (dBi):	3.17
Minimum use distance (cm):	20.0
Worst Case Frequency (MHz):	5500.0
Maximum EIRP (dBm):	23.17
Maximum EIRP (mW):	207.49
General population - Power density limit (mW/cm^2):	1.0

Power density at minimum use distance:

Power density (mW/cm^2):	0.041
General population - Power density limit (mW/cm^2):	1.0
Verdict for general population:	PASS

The power density level for this transmission mode is below general population exposure power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general population (cm):	4.06
Minimum use distance (cm):	20.0
Verdict for general population:	PASS

The minimum use distance is greater than general population exposure minimum compliance distance.

Assessment 14 – Wi-Fi 5.6 GHz Band – Core 1

Maximum output power (dBm):	20.6
Maximum antenna Gain (dBi):	1.88
Minimum use distance (cm):	20.0
Worst Case Frequency (MHz):	5500.0
Maximum EIRP (dBm):	22.48
Maximum EIRP (mW):	177.01
General population - Power density limit (mW/cm^2):	1.0

Power density at minimum use distance:

Power density (mW/cm^2):	0.035
General population - Power density limit (mW/cm^2):	1.0
Verdict for general population:	PASS

The power density level for this transmission mode is below general population exposure power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general population (cm):	3.75
Minimum use distance (cm):	20.0
Verdict for general population:	PASS

The minimum use distance is greater than general population exposure minimum compliance distance.

Assessment 15 – Wi-Fi 5.6 GHz Band – Core 2

Maximum output power (dBm):	20.42
Maximum antenna Gain (dBi):	4.56
Minimum use distance (cm):	20.0
Worst Case Frequency (MHz):	5500.0
Maximum EIRP (dBm):	24.98
Maximum EIRP (mW):	314.77
General population - Power density limit (mW/cm^2):	1.0

Power density at minimum use distance:

Power density (mW/cm^2):	0.063
General population - Power density limit (mW/cm^2):	1.0
Verdict for general population:	PASS

The power density level for this transmission mode is below general population exposure power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general population (cm):	5.00
Minimum use distance (cm):	20.0
Verdict for general population:	PASS

The minimum use distance is greater than general population exposure minimum compliance distance.

Assessment 16 – Wi-Fi 5.6 GHz Band – Core Aux

Maximum output power (dBm):	21.68
Maximum antenna Gain (dBi):	4.56
Minimum use distance (cm):	20.0
Worst Case Frequency (MHz):	5500.0
Maximum EIRP (dBm):	26.24
Maximum EIRP (mW):	420.73
General population - Power density limit (mW/cm^2):	1.0

Power density at minimum use distance:

Power density (mW/cm^2):	0.084
General population - Power density limit (mW/cm^2):	1.0
Verdict for general population:	PASS

The power density level for this transmission mode is below general population exposure power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general population (cm):	5.79
Minimum use distance (cm):	20.0
Verdict for general population:	PASS

The minimum use distance is greater than general population exposure minimum compliance distance.

Assessment 17 – Wi-Fi 5.8 GHz Band – Core 0

Maximum output power (dBm):	21.28
Maximum antenna Gain (dBi):	2.68
Minimum use distance (cm):	20.0
Worst Case Frequency (MHz):	5745.0
Maximum EIRP (dBm):	23.96
Maximum EIRP (mW):	248.89
General population - Power density limit (mW/cm^2):	1.0

Power density at minimum use distance:

Power density (mW/cm^2):	0.05
General population - Power density limit (mW/cm^2):	1.0
Verdict for general population:	PASS

The power density level for this transmission mode is below general population exposure power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general population (cm):	4.45
Minimum use distance (cm):	20.0
Verdict for general population:	PASS

The minimum use distance is greater than general population exposure minimum compliance distance.

Assessment 18 – Wi-Fi 5.8 GHz Band – Core 1

Maximum output power (dBm):	21.04
Maximum antenna Gain (dBi):	0.42
Minimum use distance (cm):	20.0
Worst Case Frequency (MHz):	5745.0
Maximum EIRP (dBm):	21.46
Maximum EIRP (mW):	139.96
General population - Power density limit (mW/cm^2):	1.0

Power density at minimum use distance:

Power density (mW/cm^2):	0.028
General population - Power density limit (mW/cm^2):	1.0
Verdict for general population:	PASS

The power density level for this transmission mode is below general population exposure power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general population (cm):	3.34
Minimum use distance (cm):	20.0
Verdict for general population:	PASS

The minimum use distance is greater than general population exposure minimum compliance distance.

Assessment 19 – Wi-Fi 5.8 GHz Band – Core 2

Maximum output power (dBm):	21.88
Maximum antenna Gain (dBi):	4.42
Minimum use distance (cm):	20.0
Worst Case Frequency (MHz):	5745.0
Maximum EIRP (dBm):	26.30
Maximum EIRP (mW):	426.58
General population - Power density limit (mW/cm^2):	1.0

Power density at minimum use distance:

Power density (mW/cm^2):	0.085
General population - Power density limit (mW/cm^2):	1.0
Verdict for general population:	PASS

The power density level for this transmission mode is below general population exposure power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general population (cm):	5.83
Minimum use distance (cm):	20.0
Verdict for general population:	PASS

The minimum use distance is greater than general population exposure minimum compliance distance.

Assessment 20 – Wi-Fi 5.8 GHz Band – Core Aux

Maximum output power (dBm):	21.98
Maximum antenna Gain (dBi):	4.42
Minimum use distance (cm):	20.0
Worst Case Frequency (MHz):	5745.0
Maximum EIRP (dBm):	26.40
Maximum EIRP (mW):	436.52
General population - Power density limit (mW/cm^2):	1.0

Power density at minimum use distance:

Power density (mW/cm^2):	0.087
General population - Power density limit (mW/cm^2):	1.0
Verdict for general population:	PASS

The power density level for this transmission mode is below general population exposure power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general population (cm):	5.89
Minimum use distance (cm):	20.0
Verdict for general population:	PASS

The minimum use distance is greater than general population exposure minimum compliance distance.

Assessment 21 – Bluetooth EDR 2.45 GHz Band

Maximum output power (dBm):	13.29
Maximum antenna Gain (dBi):	6.56
Minimum use distance (cm):	20.0
Worst Case Frequency (MHz):	2402.0
Maximum EIRP (dBm):	19.85
Maximum EIRP (mW):	96.61
General population - Power density limit (mW/cm^2):	1.0

Power density at minimum use distance:

Power density (mW/cm^2):	0.019
General population - Power density limit (mW/cm^2):	1.0
Verdict for general population:	PASS

The power density level for this transmission mode is below general population exposure power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general population (cm):	2.77
Minimum use distance (cm):	20.0
Verdict for general population:	PASS

The minimum use distance is greater than general population exposure minimum compliance distance.

Assessment 22 – Bluetooth LE 2.45 GHz Band

Maximum output power (dBm):	2.16
Maximum antenna Gain (dBi):	6.56
Minimum use distance (cm):	20.0
Worst Case Frequency (MHz):	2402.0
Maximum EIRP (dBm):	8.72
Maximum EIRP (mW):	7.45
General population - Power density limit (mW/cm^2):	1.0

Power density at minimum use distance:

Power density (mW/cm^2):	0.0015
General population - Power density limit (mW/cm^2):	1.0
Verdict for general population:	PASS

The power density level for this transmission mode is below general population exposure power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general population (cm):	0.77
Minimum use distance (cm):	20.0
Verdict for general population:	PASS

The minimum use distance is greater than general population exposure minimum compliance distance.

Multiple frequencies assessment

When multiple sources are introduced into an environment, it becomes necessary to address the sources interdependently, since each source will contribute some percentage of the maximum exposure toward the total exposure at a fixed location. The sum of the ratios of the exposure from each source to the corresponding maximum exposure for the frequency of each source must be evaluated.

The exposure complies with the maximum permissible exposure if the sum of the ratios is less than unity:

$$\sum_{i=1}^{n} \frac{S_i}{MPE_i} < 1$$

Where
S_i is the power flux density of each source;
MPE_i is the power flux density basic restriction of each source.

The device under evaluation is able to transmit simultaneously using Wi-Fi 2.4 GHz, Wi-Fi 5GHz and Bluetooth transmitters according to the following simultaneous transmission combinations table:

Wi-Fi main	Wi-Fi aux (SISO)	Bluetooth
2.4 GHz (Any: 1x1, 2x2, 3x3)	No	Yes
5 GHz (Any: 1x1, 2x2, 3x3)	2.4 GHz	Yes
5 GHz (1x1 or 2x2)	5 GHz	Yes

Table 4: Simultaneous transmission capabilities

The multiple frequencies calculation is evaluated for the three different cases shown in table 4, taking Wi-Fi main MIMO and Bluetooth EDR modes as worst cases in terms of power density values.
For Wi-Fi main and aux radios, the highest power density value from all supported sub-bands (5.2, 5.3, 5.6 or 5.8) has been taken.
The multiple frequencies calculation is therefore evaluated as follow:

Wi-Fi main 2.4GHz (3x3) + Bluetooth EDR:

$$\frac{S_{WiFi\,2.4\_core0} + S_{WiFi\,2.4\_core1} + S_{WiFi\,2.4\_core2}}{MPE} + \frac{S_{BT\_EDR}}{MPE} = \frac{0.155. + 0.126 + 0.086}{1} + \frac{0.019}{1} = 0.386 < Limit$$

Wi-Fi main 5GHz (3x3) + Wi-Fi aux 2.4GHz (SISO) + Bluetooth EDR:

$$\frac{S_{WiFi\,5.8\_core0} + S_{WiFi\,5.8\_core1} + S_{WiFi\,5.8\_core2}}{MPE} + \frac{S_{WiFi\,2.4\_aux}}{MPE} + \frac{S_{BT\_EDR}}{MPE} = \frac{0.05. + 0.028 + 0.085}{1} + \frac{0.085}{1} + \frac{0.019}{1} = 0.267 < Limit$$

Wi-Fi main 5GHz (2x2) + Wi-Fi aux 5GHz (SISO) + Bluetooth EDR:

$$\frac{S_{WiFi\,5.8\_core0} + S_{WiFi\,5.8\_core1}}{MPE} + \frac{S_{WiFi\,5.8\_aux}}{MPE} + \frac{S_{BT\_EDR}}{MPE} = \frac{0.05. + 0.028}{1} + \frac{0.087}{1} + \frac{0.019}{1} = 0.184 < Limit$$

Appendix B: ISED RF Exposure

ISED RF Exposure evaluation

According to RSS-102 Issue 5, Paragraph “4. Exposure Limits”, Industry of Canada has adopted the RF field strength limits established in Health Canada’s RF exposure guideline, Safety code 6:

Table 4: RF Field Strength Limits for Devices Used by the General Public (Uncontrolled Environment)

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m^2)	Reference Period (minutes)
$0.003\text{-}10^{21}$	83	90	-	Instantaneous*
0.1-10	-	$0.73/f$	-	6**
1.1-10	$87/f^{0.5}$	-	-	6**
10-20	27.46	0.0728	2	6
20-48	$58.07/f^{0.25}$	$0.1540/f^{0.25}$	$8.944/f^{0.5}$	6
48-300	22.06	0.05852	1.291	6
300-6000	$3.142f^{0.3417}$	$0.008335f^{0.3417}$	$0.02619f^{0.6834}$	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	$616000/f^{1.2}$
150000-300000	$0.158f^{0.5}$	$4.21 \times 10^{-4} f^{0.5}$	$6.67 \times 10^{-5} f$	$616000/f^{1.2}$

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

ISED MPE Evaluation Results

Each supported transmission technology will be evaluated to determine if it is in compliance with RSS-102 Issue 5, RF Field Strength Limits for devices used by the General Public.

In order to perform the assessment, the following equations have been used for the calculations; these equations are accurate in the far-field of an antenna and will over-predict power density in the near field, where they could be used for making a "worst case" or conservative prediction:

Power density: $S[W/m^2] = \frac{P_{E.I.R.P.}[W]}{4\Pi R[m]^2}$

Minimum compliance distance: $R_{\min}[m] = \sqrt{\frac{P_{E.I.R.P.}[W]}{4\Pi S[W/m^2]}}$

Where:

S = power density

$P_{E.I.R.P.}$ = Equivalent isotropically radiated power

R = distance to the center of radiation of the antenna (evaluation distance)

$R_{\min}$ = distance to the center of radiation of the antenna

Assessment 1 – Wi-Fi 2.45 GHz Band – Core 0

Maximum output power (dBm):	23.02
Maximum antenna Gain (dBi):	5.9
Minimum use distance (m):	0.2
Worst Case Frequency (MHz):	2412.0
Maximum EIRP (dBm):	28.92
Maximum EIRP (W):	0.78
General public - Power density limit (W/m^2):	5.366

Power density at minimum use distance:

Power density (W/m^2):	1.551
General public - Power density limit (W/m^2):	5.366
Verdict for general public:	PASS

The power density level for this transmission mode is below general public power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general public (m):	0.1
Minimum use distance (m):	0.2
Verdict for general public:	PASS

The minimum use distance is greater than general public minimum compliance distance.

Assessment 2 – Wi-Fi 2.45 GHz Band – Core 1

Maximum output power (dBm):	22.67
Maximum antenna Gain (dBi):	5.33
Minimum use distance (m):	0.2
Worst Case Frequency (MHz):	2412.0
Maximum EIRP (dBm):	28.00
Maximum EIRP (W):	0.63
General public - Power density limit (W/m^2):	5.366

Power density at minimum use distance:

Power density (W/m^2):	1.255
General public - Power density limit (W/m^2):	5.366
Verdict for general public:	PASS

The power density level for this transmission mode is below general public power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general public (m):	0.1
Minimum use distance (m):	0.2
Verdict for general public:	PASS

The minimum use distance is greater than general public minimum compliance distance.

Assessment 3 – Wi-Fi 2.45 GHz Band – Core 2

Maximum output power (dBm):	22.99
Maximum antenna Gain (dBi):	3.38
Minimum use distance (m):	0.2
Worst Case Frequency (MHz):	2412.0
Maximum EIRP (dBm):	26.37
Maximum EIRP (W):	0.43
General public - Power density limit (W/m^2):	5.366

Power density at minimum use distance:

Power density (W/m^2):	0.862
General public - Power density limit (W/m^2):	5.366
Verdict for general public:	PASS

The power density level for this transmission mode is below general public power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general public (m):	0.08
Minimum use distance (m):	0.2
Verdict for general public:	PASS

The minimum use distance is greater than general public minimum compliance distance.

Assessment 4 – Wi-Fi 2.45 GHz Band – Core Aux

Maximum output power (dBm):	22.93
Maximum antenna Gain (dBi):	3.38
Minimum use distance (m):	0.2
Worst Case Frequency (MHz):	2412.0
Maximum EIRP (dBm):	26.31
Maximum EIRP (W):	0.43
General public - Power density limit (W/m^2):	5.366

Power density at minimum use distance:

Power density (W/m^2):	0.851
General public - Power density limit (W/m^2):	5.366
Verdict for general public:	PASS

The power density level for this transmission mode is below general public power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general public (m):	0.08
Minimum use distance (m):	0.2
Verdict for general public:	PASS

The minimum use distance is greater than general public minimum compliance distance.

Assessment 5 – Wi-Fi 5.2 GHz Band – Core 0

Maximum output power (dBm):	19.97
Maximum antenna Gain (dBi):	3.08
Minimum use distance (m):	0.2
Worst Case Frequency (MHz):	5180.0
Maximum EIRP (dBm):	23.05
Maximum EIRP (W):	0.2
General public - Power density limit (W/m^2):	9.047

Power density at minimum use distance:

Power density (W/m^2):	0.402
General public - Power density limit (W/m^2):	9.047
Verdict for general public:	PASS

The power density level for this transmission mode is below general public power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general public (m):	0.04
Minimum use distance (m):	0.2
Verdict for general public:	PASS

The minimum use distance is greater than general public minimum compliance distance.

Assessment 6 – Wi-Fi 5.2 GHz Band – Core 1

Maximum output power (dBm):	20.29
Maximum antenna Gain (dBi):	3.19
Minimum use distance (m):	0.2
Worst Case Frequency (MHz):	5180.0
Maximum EIRP (dBm):	23.48
Maximum EIRP (W):	0.22
General public - Power density limit (W/m^2):	9.047

Power density at minimum use distance:

Power density (W/m^2):	0.443
General public - Power density limit (W/m^2):	9.047
Verdict for general public:	PASS

The power density level for this transmission mode is below general public power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general public (m):	0.04
Minimum use distance (m):	0.2
Verdict for general public:	PASS

The minimum use distance is greater than general public minimum compliance distance.

Assessment 7 – Wi-Fi 5.2 GHz Band – Core 2

Maximum output power (dBm):	20.21
Maximum antenna Gain (dBi):	4.15
Minimum use distance (m):	0.2
Worst Case Frequency (MHz):	5180.0
Maximum EIRP (dBm):	24.63
Maximum EIRP (W):	0.27
General public - Power density limit (W/m^2):	9.047

Power density at minimum use distance:

Power density (W/m^2):	0.543
General public - Power density limit (W/m^2):	9.047
Verdict for general public:	PASS

The power density level for this transmission mode is below general public power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general public (m):	0.049
Minimum use distance (m):	0.2
Verdict for general public:	PASS

The minimum use distance is greater than general public minimum compliance distance.

Assessment 8 – Wi-Fi 5.2 GHz Band – Core Aux

Maximum output power (dBm):	19.95
Maximum antenna Gain (dBi):	4.15
Minimum use distance (m):	0.2
Worst Case Frequency (MHz):	5180.0
Maximum EIRP (dBm):	24.10
Maximum EIRP (W):	0.26
General public - Power density limit (W/m^2):	9.047

Power density at minimum use distance:

Power density (W/m^2):	0.511
General public - Power density limit (W/m^2):	9.047
Verdict for general public:	PASS

The power density level for this transmission mode is below general public power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general public (m):	0.05
Minimum use distance (m):	0.2
Verdict for general public:	PASS

The minimum use distance is greater than general public minimum compliance distance.

Assessment 9 – Wi-Fi 5.3 GHz Band – Core 0

Maximum output power (dBm):	20.11
Maximum antenna Gain (dBi):	3.48
Minimum use distance (m):	0.2
Worst Case Frequency (MHz):	5260.0
Maximum EIRP (dBm):	23.59
Maximum EIRP (W):	0.23
General public - Power density limit (W/m^2):	9.142

Power density at minimum use distance:

Power density (W/m^2):	0.455
General public - Power density limit (W/m^2):	9.142
Verdict for general public:	PASS

The power density level for this transmission mode is below general public power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general public (m):	0.05
Minimum use distance (m):	0.2
Verdict for general public:	PASS

The minimum use distance is greater than general public minimum compliance distance.

Assessment 10 – Wi-Fi 5.3 GHz Band – Core 1

Maximum output power (dBm):	20.32
Maximum antenna Gain (dBi):	2.55
Minimum use distance (m):	0.2
Worst Case Frequency (MHz):	5260.0
Maximum EIRP (dBm):	0.039
Maximum EIRP (W):	0.19
General public - Power density limit (W/m^2):	9.142

Power density at minimum use distance:

Power density (W/m^2):	0.385
General public - Power density limit (W/m^2):	9.142
Verdict for general public:	PASS

The power density level for this transmission mode is below general public power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general public (m):	0.04
Minimum use distance (m):	0.2
Verdict for general public:	PASS

The minimum use distance is greater than general public minimum compliance distance.

Assessment 11 – Wi-Fi 5.3 GHz Band – Core 2

Maximum output power (dBm):	20.18
Maximum antenna Gain (dBi):	3.91
Minimum use distance (m):	0.2
Worst Case Frequency (MHz):	5260.0
Maximum EIRP (dBm):	24.09
Maximum EIRP (W):	0.26
General public - Power density limit (W/m^2):	9.142

Power density at minimum use distance:

Power density (W/m^2):	0.510
General public - Power density limit (W/m^2):	9.142
Verdict for general public:	PASS

The power density level for this transmission mode is below general public power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general public (m):	0.05
Minimum use distance (m):	0.2
Verdict for general public:	PASS

The minimum use distance is greater than general public minimum compliance distance.

Assessment 12 – Wi-Fi 5.3 GHz Band – Core Aux

Maximum output power (dBm):	18.79
Maximum antenna Gain (dBi):	3.91
Minimum use distance (m):	0.2
Worst Case Frequency (MHz):	5260.0
Maximum EIRP (dBm):	22.70
Maximum EIRP (W):	0.19
General public - Power density limit (W/m^2):	9.142

Power density at minimum use distance:

Power density (W/m^2):	0.370
General public - Power density limit (W/m^2):	9.142
Verdict for general public:	PASS

The power density level for this transmission mode is below general public power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general public (m):	0.04
Minimum use distance (m):	0.2
Verdict for general public:	PASS

The minimum use distance is greater than general public minimum compliance distance.

Assessment 13 – Wi-Fi 5.6 GHz Band – Core 0

Maximum output power (dBm):	20.0
Maximum antenna Gain (dBi):	3.17
Minimum use distance (m):	0.2
Worst Case Frequency (MHz):	5500.0
Maximum EIRP (dBm):	23.17
Maximum EIRP (W):	0.21
General public - Power density limit (W/m^2):	9.425

Power density at minimum use distance:

Power density (W/m^2):	0.413
General public - Power density limit (W/m^2):	9.425
Verdict for general public:	PASS

The power density level for this transmission mode is below general public power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general public (m):	0.04
Minimum use distance (m):	0.2
Verdict for general public:	PASS

The minimum use distance is greater than general public minimum compliance distance.

Assessment 14 – Wi-Fi 5.6 GHz Band – Core 1

Maximum output power (dBm):	20.6
Maximum antenna Gain (dBi):	1.88
Minimum use distance (m):	0.2
Worst Case Frequency (MHz):	5500.0
Maximum EIRP (dBm):	22.48
Maximum EIRP (W):	0.18
General public - Power density limit (W/m^2):	9.425

Power density at minimum use distance:

Power density (W/m^2):	0.352
General public - Power density limit (W/m^2):	9.425
Verdict for general public:	PASS

The power density level for this transmission mode is below general public power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general public (m):	0.04
Minimum use distance (m):	0.2
Verdict for general public:	PASS

The minimum use distance is greater than general public minimum compliance distance.

Assessment 15 – Wi-Fi 5.6 GHz Band – Core 2

Maximum output power (dBm):	20.42
Maximum antenna Gain (dBi):	4.56
Minimum use distance (m):	0.2
Worst Case Frequency (MHz):	5500.0
Maximum EIRP (dBm):	24.98
Maximum EIRP (W):	0.31
General public - Power density limit (W/m^2):	9.425

Power density at minimum use distance:

Power density (W/m^2):	0.626
General public - Power density limit (W/m^2):	9.425
Verdict for general public:	PASS

The power density level for this transmission mode is below general public power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general public (m):	0.05
Minimum use distance (m):	0.2
Verdict for general public:	PASS

The minimum use distance is greater than general public minimum compliance distance.

Assessment 16 – Wi-Fi 5.6 GHz Band – Core Aux

Maximum output power (dBm):	21.68
Maximum antenna Gain (dBi):	4.56
Minimum use distance (m):	0.2
Worst Case Frequency (MHz):	5500.0
Maximum EIRP (dBm):	26.24
Maximum EIRP (W):	0.42
General public - Power density limit (W/m^2):	9.425

Power density at minimum use distance:

Power density (W/m^2):	0.837
General public - Power density limit (W/m^2):	9.425
Verdict for general public:	PASS

The power density level for this transmission mode is below general public power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general public (m):	0.06
Minimum use distance (m):	0.2
Verdict for general public:	PASS

The minimum use distance is greater than general public minimum compliance distance.

Assessment 17 – Wi-Fi 5.8 GHz Band – Core 0

Maximum output power (dBm):	21.28
Maximum antenna Gain (dBi):	2.68
Minimum use distance (m):	0.2
Worst Case Frequency (MHz):	5745.0
Maximum EIRP (dBm):	23.96
Maximum EIRP (W):	0.25
General public - Power density limit (W/m^2):	9.710

Power density at minimum use distance:

Power density (W/m^2):	0.495
General public - Power density limit (W/m^2):	9.710
Verdict for general public:	PASS

The power density level for this transmission mode is below general public power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general public (m):	0.05
Minimum use distance (m):	0.2
Verdict for general public:	PASS

The minimum use distance is greater than general public minimum compliance distance.

Assessment 18 – Wi-Fi 5.8 GHz Band – Core 1

Maximum output power (dBm):	21.04
Maximum antenna Gain (dBi):	0.42
Minimum use distance (m):	0.2
Worst Case Frequency (MHz):	5745.0
Maximum EIRP (dBm):	21.46
Maximum EIRP (W):	0.14
General public - Power density limit (W/m^2):	9.710

Power density at minimum use distance:

Power density (W/m^2):	0.278
General public - Power density limit (W/m^2):	9.710
Verdict for general public:	PASS

The power density level for this transmission mode is below general public power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general public (m):	0.03
Minimum use distance (m):	0.2
Verdict for general public:	PASS

The minimum use distance is greater than general public minimum compliance distance.

Assessment 19 – Wi-Fi 5.8 GHz Band – Core 2

Maximum output power (dBm):	21.88
Maximum antenna Gain (dBi):	4.42
Minimum use distance (m):	0.2
Worst Case Frequency (MHz):	5745.0
Maximum EIRP (dBm):	26.30
Maximum EIRP (W):	0.43
General public - Power density limit (W/m^2):	9.710

Power density at minimum use distance:

Power density (W/m^2):	0.849
General public - Power density limit (W/m^2):	9.710
Verdict for general public:	PASS

The power density level for this transmission mode is below general public power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general public (m):	0.06
Minimum use distance (m):	0.2
Verdict for general public:	PASS

The minimum use distance is greater than general public minimum compliance distance.

Assessment 20 – Wi-Fi 5.8 GHz Band – Core Aux

Maximum output power (dBm):	21.98
Maximum antenna Gain (dBi):	4.42
Minimum use distance (m):	0.2
Worst Case Frequency (MHz):	5745.0
Maximum EIRP (dBm):	26.40
Maximum EIRP (W):	0.44
General public - Power density limit (W/m^2):	9.710

Power density at minimum use distance:

Power density (W/m^2):	0.868
General public - Power density limit (W/m^2):	9.710
Verdict for general public:	PASS

The power density level for this transmission mode is below general public power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general public (m):	0.06
Minimum use distance (m):	0.2
Verdict for general public:	PASS

The minimum use distance is greater than general public minimum compliance distance.

Assessment 21 – Bluetooth EDR 2.45 GHz Band

Maximum output power (dBm):	13.29
Maximum antenna Gain (dBi):	6.56
Minimum use distance (m):	0.2
Worst Case Frequency (MHz):	2402.0
Maximum EIRP (dBm):	19.85
Maximum EIRP (W):	0.10
General public - Power density limit (W/m^2):	5.351

Power density at minimum use distance:

Power density (W/m^2):	0.192
General public - Power density limit (W/m^2):	5.351
Verdict for general public:	PASS

The power density level for this transmission mode is below general public power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general public (m):	0.04
Minimum use distance (m):	0.2
Verdict for general public:	PASS

The minimum use distance is greater than general public minimum compliance distance.

Assessment 22 – Bluetooth LE 2.45 GHz Band

Maximum output power (dBm):	2.16
Maximum antenna Gain (dBi):	6.56
Minimum use distance (m):	0.2
Worst Case Frequency (MHz):	2402.0
Maximum EIRP (dBm):	8.72
Maximum EIRP (W):	0.01
General public - Power density limit (W/m^2):	5.351

Power density at minimum use distance:

Power density (W/m^2):	0.015
General public - Power density limit (W/m^2):	5.351
Verdict for general public:	PASS

The power density level for this transmission mode is below general public power density limit.

Minimum compliance distance for this technology:

Minimum compliance distance for general public (m):	0.01
Minimum use distance (m):	0.2
Verdict for general public:	PASS

The minimum use distance is greater than general public minimum compliance distance.

Multiple frequencies assessment

When multiple sources are introduced into an environment, it becomes necessary to address the sources interdependently, since each source will contribute some percentage of the maximum exposure toward the total exposure at a fixed location. The sum of the ratios of the exposure from each source to the corresponding maximum exposure for the frequency of each source must be evaluated.

The exposure complies with the maximum permissible exposure if the sum of the ratios is less than unity:

$$\sum_{i=1}^{n} \frac{S_i}{MPE_i} < 1$$

Where
S_i is the power flux density of each source;
MPE_i is the power flux density basic restriction of each source.

The device under evaluation is able to transmit simultaneously using Wi-Fi 2.4 GHz, Wi-Fi 5GHz and Bluetooth transmitters according to the following simultaneous transmission combinations table:

Wi-Fi main	Wi-Fi aux (SISO)	Bluetooth
2.4 GHz (Any: 1x1, 2x2, 3x3)	No	Yes
5 GHz (Any: 1x1, 2x2, 3x3)	2.4 GHz	Yes
5 GHz (1x1 or 2x2)	5 GHz	Yes

Table 5: Simultaneous transmission capabilities

The multiple frequencies calculation is evaluated for the three different cases shown in table 4, taking Wi-Fi main MIMO and Bluetooth EDR modes as worst cases in terms of power density values.
For Wi-Fi main and aux radios, the highest power density value of all supported sub-bands (5.2, 5.3, 5.6 and 5.8) has been taken.
The multiple frequencies calculation is therefore evaluated as follow:

Wi-Fi main 2.4GHz (3x3) + Bluetooth EDR:

$$\frac{S_{WiFi\,2.4\_core0} + S_{WiFi\,2.4\_core1} + S_{WiFi\,2.4\_core2}}{MPE} + \frac{S_{BT\_EDR}}{MPE} = \frac{1.551 + 1.255 + 0.862}{5.366} + \frac{0.192}{5.351} = 0.719 < Limit$$

Wi-Fi main 5GHz (3x3) + Wi-Fi aux 2.4GHz (SISO) + Bluetooth EDR:

$$\frac{S_{WiFi\,5.8\_core0} + S_{WiFi\,5.8\_core1} + S_{WiFi\,5.8\_core2}}{MPE} + \frac{S_{WiFi\,2.4\_aux}}{MPE} + \frac{S_{BT\_EDR}}{MPE} = \frac{0.495 + 0.278 + 0.849}{9.710} + \frac{0.851}{5.366} + \frac{0.192}{5.351} = 0.203 < Limit$$

Wi-Fi main 5GHz (2x2) + Wi-Fi aux 5GHz (SISO) + Bluetooth EDR:

$$\frac{S_{WiFi\,5.2\_core0} + S_{WiFi\,5.2\_core1}}{MPE} + \frac{S_{WiFi\,5.8\_aux}}{MPE} + \frac{S_{BT\_EDR}}{MPE} = \frac{0.402 + 0.443}{9.047} + \frac{0.868}{9.710} + \frac{0.192}{5.351} = 0.219 < Limit$$