

Test report No:
 NIE: 60088RAN.001

Assessment report

RF EXPOSURE REPORT ACCORDING TO IEEE Std C95.3™ -2002 (R2008) FCC 47 CFR Part 2.1091 ISED RSS-102 Issue 5:2015

Identification of item tested	Wireless Module
Trademark	Cinterios ALAS5-W
Model and /or type reference	ALAS5-W
Other identification of the product	FCC IS: QIPALAS5-W IC: 7830A-ALAS5W HW version: Rev. 2.1.4a SW version: Rev. 00.030
Features	2G, 3G and 4G
Manufacturer	GEMALTO M2M GMBH Werinherstr. 81 81541 Munich, Germany
Test method requested, standard	IEEE Std C95.3™ -2002 (R2008). IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields With Respect to Human Exposure to Such Fields, 100 kHz–300 GHz 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	See Appendix A and B
Approved by (name / position & signature)	Miguel Lacave Antennas Lab Manager
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Competences and guarantees

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Data provided by the client

The device under evaluation consists of a Cinterion ALAS5-W wireless module supporting 2G, 3G and 4G cellular technologies.

DEKRA declines any responsibility with respect to the information provided by the client and that may affect the validity of results.

Identification of the client

GEMALTO M2M GMBH
Werinherstr. 81
81541 Munich, Germany

Document history

Report number	Date	Description
60088RAN.001	2019-04-10	First release

General description of the device under evaluation

The device under evaluation consists of a Cinterion ALAS5-W wireless module supporting 2G, 3G and 4G cellular technologies.

The equipment specifications declared by the manufacturer for each supported feature are:

Band (MHz)	Technology	Band	Maximum RF output power (incl. tune-up) (dBm)	Duty cycle (%)	Maximum Average RF output power (dBm)
850	GSM/GPRS	850	35.0*	50.0	32.0
850	E-GPRS	850	29.0*	50.0	26.0
1900	GSM/GPRS	1900	32.0*	50.0	29.0
1900	E-GPRS	1900	28.0*	50.0	25.0
850	WCDMA/HSPA	V	26.0	100	26.0
850	LTE	5	25.0	100	25.0
2600	LTE	7	25.0	100	25.0
850	LTE	26	25.0	100	25.0
2600	LTE	38	25.0	62.9	22.92

Table 1: Equipment specifications

*Note: Only the maximum output power mode has been taken into account as a worst case mode for technologies with different transmission modes that use the same module and antenna at the same transmission frequency range.

For the GSM/GPRS modes, the maximum average RF output power has been calculated according to the supported GPRS slots configuration. The module supports up to 4 uplink time slots available for transmission, with its respective average output power for each configuration.

Duty cycle for uplink time slots:

1 Uplink: Duty cycle =1/8 → 12.5%

2 Uplink: Duty cycle =2/8 → 25.0%

3 Uplink: Duty cycle =3/8 → 37.5%

4 Uplink: Duty cycle =4/8 → 50.0%

Transmission Mode	Maximum RF Output Power (dBm)				Average Output Power (dBm)			
	1 Slot	2 Slots	3 Slots	4 Slots	1 Slot	2 Slots	3 Slots	4 Slots
GSM 850	35.0	-	-	-	25.97	-	-	-
GPRS 850	35.0	35.0	35.0	35.0	25,97	28,98	30,74	31,99
E-GPRS 850	29.0	29.0	29.0	29.0	19.97	22.98	24.74	25.99
GSM 1900	32.0	-	-	-	22.97	-	-	-
GPRS 1900	32.0	32.0	32.0	32.0	22.97	25.98	27.74	28.99
E-GPRS 1900	28.0	28.0	28.0	28.0	18.97	21.98	23.74	24.99

Table 2: GSM/GPRS/E-GPRS output power values

Assessment summary

Radiofrequency radiation exposure limits							
FCC 47 CFR § 2.1091 & ISED RSS-102 Issue 5 (2015-03)							
Assessment	Band (MHz)	Technology	Band	Maximum gain to meet FCC MPE limits (dBi)	Maximum gain to meet FCC ISED limits (dBi)	Maximum gain to meet FCC/ISED EIRP limits (dBi)	Maximum gain to be in compliance with the limits (dBi)
1	850	GSM/GPRS	850	2.4	-0.9	8.6	-0.9
2	1900	GSM/GPRS	1900	8.0	4.5	4.0	4.0
3	850	WCDMA/HSPA	V	8.4	5.1	14.6	5.1
4	850	LTE	5	9.4	6.1	15.6	6.1
5	2600	LTE	7	12.0	9.4	8.0	8.0
6	850	LTE	26	9.3	6.0	15.6	6.0
7	2500	LTE	38	14.0	11.5	10.1	10.1

Table 3: Assessment summary

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/cm ²)	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/f ²	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/f ²	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 EIRP Limits

Maximum FCC EIRP limits are stated into FCC 47 CFR §22.913, FCC 47 CFR §24.232 and FCC 47 CFR §22.50 standards, these limits are frequency-dependent and are shown in the following table:

Standard	Frequency Band	Technology & Band	EIRP limit (W)	EIRP limit (dBm)
FCC 47 CFR §22.913	850	GSM 850, UMTS V, LTE 5/26	11.48	40.6
FCC 47 CFR §24.232	1900	GSM 1900	2.0	33.0
FCC 47 CFR §27.50 (a)	2300	LTE 40	0.25 (average EIRP)	23.9
FCC 47 CFR §27.50 (h) (2)	2600	LTE 7 / 41	2.0	33.0

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:

$$\text{Power density: } S[mW/cm^2] = \frac{P_{\max}[mW]}{4\pi R^2[cm]^2}$$

$$\text{Minimum compliance distance: } R_{\min}[cm] = \sqrt{\frac{P_{\max}[mW]}{4\pi S[mW/cm^2]}}$$

$$\text{Maximum gain to meet the MPE limit: } G_{\max}[dBi] = (10 * \log[S[mW/cm^2] * 4\pi R^2[cm]^2]) - P_{\max}[dBm]$$

S = power density

P_{\max} = power input to the antenna

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

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

G_{\max} = power gain of the antenna in the direction of interest relative to an isotropic radiator

Assessment 1 - GPRS 4 Slots 850 MHz Band

MPE Evaluation

Maximum output power (dBm):	32.0
Maximum output power (mW):	1584.89
Minimum use distance (cm):	20.0
Worst Case Frequency (MHz):	824
General population - Power density limit (mW/cm ²):	0.549

Power density at minimum use distance:

Power density (mW/cm ²):	0.315
General population - Power density limit (mW/cm ²):	0.549

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):	15.15
Minimum use distance (cm):	20.0

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

Maximum gain to meet the §1.1310 Radiofrequency radiation exposure limits:

Maximum antenna gain to meet reference level (dBi):	2.4
Power density using max antenna gain (mW/cm ²):	0.548

The power density level using the maximum antenna gain for this transmission mode will be below power density reference level.

EIRP Evaluation

Maximum output power (dBm):	EIRP limit (dBm)	Maximum antenna gain to meet EIRP level (dBi)
32.0	40.6	8.6

Maximum antenna gain to meet power density reference limit / EIRP limit

Maximum antenna gain (dBi):	2.4
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Assessment 2 - GPRS 4 Slots1900 MHz Band

MPE Evaluation

Maximum output power (dBm):	29.0
Maximum output power (mW):	794.33
Minimum use distance (cm):	20.0
Worst Case Frequency (MHz):	1850
General population - Power density limit (mW/cm ²):	1.0

Power density at minimum use distance:

Power density (mW/cm ²):	0.158
General population - Power density limit (mW/cm ²):	1.0

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):	7.95
Minimum use distance (cm):	20.0

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

Maximum gain to meet the §1.1310 Radiofrequency radiation exposure limits:

Maximum antenna gain to meet reference level (dBi):	8.0
Power density using max antenna gain (mW/cm ²):	0.997

The power density level using the maximum antenna gain for this transmission mode will be below power density reference level.

EIRP Evaluation

Maximum output power (dBm):	EIRP limit (dBm)	Maximum antenna gain to meet EIRP level (dBi)
29.0	33.0	4.0

Maximum antenna gain to meet power density reference limit / EIRP limit

Maximum antenna gain (dBi):	4.0
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Assessment 3 - WCDMA Band V

MPE Evaluation

Maximum output power (dBm):	26.0
Maximum output power (mW):	398.11
Minimum use distance (cm):	20.0
Worst Case Frequency (MHz):	824
General population - Power density limit (mW/cm ²):	0.549

Power density at minimum use distance:

Power density (mW/cm ²):	0.079
General population - Power density limit (mW/cm ²):	0.549

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):	7.59
Minimum use distance (cm):	20.0

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

Maximum gain to meet the §1.1310 Radiofrequency radiation exposure limits:

Maximum antenna gain to meet reference level (dBi):	8.4
Power density using max antenna gain (mW/cm ²):	0.548

The power density level using the maximum antenna gain for this transmission mode will be below power density reference level.

EIRP Evaluation

Maximum output power (dBm):	EIRP limit (dBm)	Maximum antenna gain to meet EIRP level (dBi)
26.0	40.6	14.6

Maximum antenna gain to meet power density reference limit / EIRP limit

Maximum antenna gain (dBi):	8.4
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Assessment 4 - LTE Band 5

MPE Evaluation

Maximum output power (dBm):	25.0
Maximum output power (mW):	316.23
Minimum use distance (cm):	20.0
Worst Case Frequency (MHz):	824
General population - Power density limit (mW/cm ²):	0.549

Power density at minimum use distance:

Power density (mW/cm ²):	0.063
General population - Power density limit (mW/cm ²):	0.549

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):	6.77
Minimum use distance (cm):	20.0

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

Maximum gain to meet the §1.1310 Radiofrequency radiation exposure limits:

Maximum antenna gain to meet reference level (dBi):	9.4
Power density using max antenna gain (mW/cm ²):	0.548

The power density level using the maximum antenna gain for this transmission mode will be below power density reference level.

EIRP Evaluation

Maximum output power (dBm):	EIRP limit (dBm)	Maximum antenna gain to meet EIRP level (dBi)
25.0	40.6	15.6

Maximum antenna gain to meet power density reference limit / EIRP limit

Maximum antenna gain (dBi):	9.4
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Assessment 5 - LTE Band 7

MPE Evaluation

Maximum output power (dBm):	25.0
Maximum output power (mW):	316.23
Minimum use distance (cm):	20.0
Worst Case Frequency (MHz):	2500
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

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):	5.02
Minimum use distance (cm):	20.0

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

Maximum gain to meet the §1.1310 Radiofrequency radiation exposure limits:

Maximum antenna gain to meet reference level (dBi):	12.0
Power density using max antenna gain (mW/cm ²):	0.997

The power density level using the maximum antenna gain for this transmission mode will be below power density reference level.

EIRP Evaluation

Maximum output power (dBm):	EIRP limit (dBm)	Maximum antenna gain to meet EIRP level (dBi)
25.0	33.0	8.0

Maximum antenna gain to meet power density reference limit / EIRP limit

Maximum antenna gain (dBi):	8.0
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Assessment 6 - LTE Band 26

MPE Evaluation

Maximum output power (dBm):	25.0
Maximum output power (mW):	316.23
Minimum use distance (cm):	20.0
Worst Case Frequency (MHz):	814
General population - Power density limit (mW/cm ²):	0.543

Power density at minimum use distance:

Power density (mW/cm ²):	0.063
General population - Power density limit (mW/cm ²):	0.543

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):	6.81
Minimum use distance (cm):	20.0

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

Maximum gain to meet the §1.1310 Radiofrequency radiation exposure limits:

Maximum antenna gain to meet reference level (dBi):	9.3
Power density using max antenna gain (mW/cm ²):	0.535

The power density level using the maximum antenna gain for this transmission mode will be below power density reference level.

EIRP Evaluation

Maximum output power (dBm):	EIRP limit (dBm)	Maximum antenna gain to meet EIRP level (dBi)
25.0	40.6	15.6

Maximum antenna gain to meet power density reference limit / EIRP limit

Maximum antenna gain (dBi):	9.3
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Assessment 7 - LTE Band 38

MPE Evaluation

Maximum output power (dBm):	22.92
Maximum output power (mW):	195.88
Minimum use distance (cm):	20.0
Worst Case Frequency (MHz):	2570
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

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):	3.95
Minimum use distance (cm):	20.0

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

Maximum gain to meet the §1.1310 Radiofrequency radiation exposure limits:

Maximum antenna gain to meet reference level (dBi):	14
Power density using max antenna gain (mW/cm ²):	0.979

The power density level using the maximum antenna gain for this transmission mode will be below power density reference level.

EIRP Evaluation

Maximum output power (dBm):	EIRP limit (dBm)	Maximum antenna gain to meet EIRP level (dBi)
22.92	33.0	10.1

Maximum antenna gain to meet power density reference limit / EIRP limit

Maximum antenna gain (dBi):	10.1
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Appendix B: ISED RF Exposure

ISED RF Exposure evaluation for mobile devices

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)
0.003-10 ⁻²¹	83	90	-	Instantaneous*
0.1-10	-	0.73/ <i>f</i>	-	6**
1.1-10	87/ <i>f</i> ^{0.5}	-	-	6**
10-20	27.46	0.0728	2	6
20-48	58.07/ <i>f</i> ^{0.25}	0.1540/ <i>f</i> ^{0.25}	8.944/ <i>f</i> ^{0.5}	6
48-300	22.06	0.05852	1,291	6
300-6000	3.142 <i>f</i> ^{0.3417}	0.008335 <i>f</i> ^{0.3417}	0.02619 <i>f</i> ^{0.6834}	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	616000/ <i>f</i> ^{1.2}
150000-300000	0.158 <i>f</i> ^{0.5}	4.21 x 10 ⁻⁴ <i>f</i> ^{0.5}	6.67 x 10 ⁻⁵ <i>f</i>	616000/ <i>f</i> ^{1.2}
Note: <i>f</i> is frequency in MHz. *Based on nerve stimulation (NS). ** Based on specific absorption rate (SAR).				

Table 6: RF Field Strength Limits for Controlled Use Devices (Controlled Environment)

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m ²)	Reference Period (minutes)
0.003-10 ²³	170	180	-	Instantaneous*
0.1-10	-	1.6/ <i>f</i>	-	6**
1.29-10	193/ <i>f</i> ^{0.5}	-	-	6**
10-20	61.4	0.163	10	6
20-48	129.8/ <i>f</i> ^{0.25}	0.3444/ <i>f</i> ^{0.25}	44.72/ <i>f</i> ^{0.5}	6
48-100	49.33	0.1309	6.455	6
100-6000	15.60 <i>f</i> ^{0.25}	0.04138 <i>f</i> ^{0.25}	0.6455 <i>f</i> ^{0.5}	6
6000-15000	137	0.364	50	6
15000-150000	137	0.364	50	616000/ <i>f</i> ^{1.2}
150000-300000	0.354 <i>f</i> ^{0.5}	9.40 x 10 ⁻⁴ <i>f</i> ^{0.5}	3.33 x 10 ⁻⁴ <i>f</i>	616000/ <i>f</i> ^{1.2}
Note: <i>f</i> is frequency in MHz. *Based on nerve stimulation (NS). ** Based on specific absorption rate (SAR).				

ISED EIRP Limits

Maximum ISED EIRP limits are stated into RSS-130 Issue 1, RSS-132 Issue 3, RSS-133 Issue 6, RSS-139 Issue 3, RSS-195 Issue 2 and RSS-199 Issue 3. These limits are frequency-dependent and are shown in the following table:

Standard	Frequency Band	Technology & Band	EIRP limit (W)	EIRP limit (dBm)
RSS-132 Issue 3	850	GSM 850, UMTS V, LTE 5/26	11.5	40.6
RSS-133 Issue 6	1900	GSM 1900	2.0	33.0
RSS-195 Issue 2	2300	LTE 40	0.250 (average EIRP)	23.9
RSS-199 Issue 3	2600	LTE 7 / 41	2.0	33.0

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:

$$\text{Power density: } S[W/m^2] = \frac{P_{\max}[W]}{4\pi R[m]^2}$$

$$\text{Minimum compliance distance: } R_{\min}[m] = \sqrt{\frac{P_{\max}[W]}{4\pi S[W/m^2]}}$$

$$\text{Maximum gain to meet the RSS -102 limit: } G_{\max}[dBi] = (10 * \log[S[W/m^2] * 4\pi R[m]^2] + 30 - P_{\max}[dBm])$$

S = power density

P_{\max} = power input to the antenna

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

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

G_{\max} = power gain of the antenna in the direction of interest relative to an isotropic radiator

Assessment 1 - GPRS 4 Slots 850 MHz Band

MPE Evaluation

Maximum output power (dBm):	32.0
Maximum output power (W):	1.58
Minimum use distance (m):	0.2
Worst Case Frequency (MHz):	824
General public - Power density limit (W/m ²):	2.576

Power density at minimum use distance:

Power density (W/m ²):	3.153
General public - Power density limit (W/m ²):	2.576

The power density level for this transmission mode is not below general public power density limit at 20cm distance.

Minimum compliance distance for this technology:

Minimum compliance distance for general public (m):	0.221
Minimum use distance (m):	0.2

Maximum gain to meet the RSS-102 limits:

Maximum antenna gain to meet reference level (dBi):	-0.9
Power density using max antenna gain (W/m ²):	2.563

The power density level using the maximum antenna gain for this transmission mode will be below power density reference level.

EIRP Evaluation

Maximum output power (dBm):	EIRP limit (dBm)	Maximum antenna gain to meet EIRP level (dBi)
32.0	40.6	8.6

Maximum antenna gain to meet power density reference limit / EIRP limit

Maximum antenna gain (dBi):	-0.9
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Assessment 2 - GPRS 4 Slots1900 MHz Band

MPE Evaluation

Maximum output power (dBm):	29.0
Maximum output power (W):	0.79
Minimum use distance (m):	0.2
Worst Case Frequency (MHz):	1850
General public - Power density limit (W/m ²):	4.476

Power density at minimum use distance:

Power density (W/m ²):	1.580
General public - Power density limit (W/m ²):	4.476

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):	0.119
Minimum use distance (m):	0.2

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

Maximum gain to meet the RSS-102 limits:

Maximum antenna gain to meet reference level (dBi):	4.5
Power density using max antenna gain (W/m ²):	4.45

The power density level using the maximum antenna gain for this transmission mode will be below power density reference level.

EIRP Evaluation

Maximum output power (dBm):	EIRP limit (dBm)	Maximum antenna gain to meet EIRP level (dBi)
29.0	33.0	4.0

Maximum antenna gain to meet power density reference limit / EIRP limit

Maximum antenna gain (dBi):	4.0
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Assessment 3 - WCDMA Band V

MPE Evaluation

Maximum output power (dBm):	26.0
Maximum output power (W):	0.4
Minimum use distance (m):	0.2
Worst Case Frequency (MHz):	824
General public - Power density limit (W/m ²):	2.576

Power density at minimum use distance:

Power density (W/m ²):	0.792
General public - Power density limit (W/m ²):	2.576

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):	0.111
Minimum use distance (m):	0.2

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

Maximum gain to meet the RSS-102 limits:

Maximum antenna gain to meet reference level (dBi):	5.1
Power density using max antenna gain (W/m ²):	2.56

The power density level using the maximum antenna gain for this transmission mode will be below power density reference level.

EIRP Evaluation

Maximum output power (dBm):	EIRP limit (dBm)	Maximum antenna gain to meet EIRP level (dBi)
26.0	40.6	14.6

Maximum antenna gain to meet power density reference limit / EIRP limit

Maximum antenna gain (dBi):	5.1
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Assessment 4 - LTE Band 5

MPE Evaluation

Maximum output power (dBm):	25.0
Maximum output power (W):	0.32
Minimum use distance (m):	0.2
Worst Case Frequency (MHz):	824
General public - Power density limit (W/m ²):	2.576

Power density at minimum use distance:

Power density (W/m ²):	0.629
General public - Power density limit (W/m ²):	2.576

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):	0.099
Minimum use distance (m):	0.2

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

Maximum gain to meet the RSS-102 limits:

Maximum antenna gain to meet reference level (dBi):	6.1
Power density using max antenna gain (W/m ²):	2.56

The power density level using the maximum antenna gain for this transmission mode will be below power density reference level.

EIRP Evaluation

Maximum output power (dBm):	EIRP limit (dBm)	Maximum antenna gain to meet EIRP level (dBi)
25.0	40.6	15.6

Maximum antenna gain to meet power density reference limit / EIRP limit

Maximum antenna gain (dBi):	6.1
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Assessment 5 - LTE Band 7

MPE Evaluation

Maximum output power (dBm):	25.0
Maximum output power (W):	0.32
Minimum use distance (m):	0.2
Worst Case Frequency (MHz):	2500
General public - Power density limit (W/m ²):	5.50

Power density at minimum use distance:

Power density (W/m ²):	0.629
General public - Power density limit (W/m ²):	5.50
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):	0.068
Minimum use distance (m):	0.2
Verdict for general public:	PASS

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

Maximum gain to meet the RSS-102 limits:

Maximum antenna gain to meet reference level (dBi):	9.4
Power density using max antenna gain (W/m ²):	5.48

The power density level using the maximum antenna gain for this transmission mode will be below power density reference level.

EIRP Evaluation

Maximum output power (dBm):	EIRP limit (dBm)	Maximum antenna gain to meet EIRP level (dBi)
25.0	33.0	8.0

Maximum antenna gain to meet power density reference limit / EIRP limit

Maximum antenna gain (dBi):	9.4
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Assessment 6 - LTE Band 26

MPE Evaluation

Maximum output power (dBm):	25.0
Maximum output power (W):	0.32
Minimum use distance (m):	0.2
Worst Case Frequency (MHz):	814
General public - Power density limit (W/m ²):	2.554

Power density at minimum use distance:

Power density (W/m ²):	0.629
General public - Power density limit (W/m ²):	2.554
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):	0.099
Minimum use distance (m):	0.2
Verdict for general public:	PASS

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

Maximum gain to meet the RSS-102 limits:

Maximum antenna gain to meet reference level (dBi):	6.0
Power density using max antenna gain (W/m ²):	2.5

The power density level using the maximum antenna gain for this transmission mode will be below power density reference level.

EIRP Evaluation

Maximum output power (dBm):	EIRP limit (dBm)	Maximum antenna gain to meet EIRP level (dBi)
25.0	40.6	15.6

Maximum antenna gain to meet power density reference limit / EIRP limit

Maximum antenna gain (dBi):	6.0
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Assessment 7 - LTE Band 38

MPE Evaluation

Maximum output power (dBm):	22.92
Maximum output power (W):	0.2
Minimum use distance (m):	0.2
Worst Case Frequency (MHz):	2570
General public - Power density limit (W/m ²):	5.603

Power density at minimum use distance:

Power density (W/m ²):	0.390
General public - Power density limit (W/m ²):	5.603
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):	0.053
Minimum use distance (m):	0.2
Verdict for general public:	PASS

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

Maximum gain to meet the RSS-102 limits:

Maximum antenna gain to meet reference level (dBi):	11.5
Power density using max antenna gain (W/m ²):	5.38

The power density level using the maximum antenna gain for this transmission mode will be below power density reference level.

EIRP Evaluation

Maximum output power (dBm):	EIRP limit (dBm)	Maximum antenna gain to meet EIRP level (dBi)
22.92	33.0	10.1

Maximum antenna gain to meet power density reference limit / EIRP limit

Maximum antenna gain (dBi):	10.1
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