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**RF exposure analysis for the equipment GE910-GNSS / GE910-QUAD (FCC ID: R17GE910G; IC: 5131A-GE910)**

The device (FCC ID: R17GE910G; IC: 5131A-GE910) is a module designed to be installed in other devices. This device is to be used only for fixed and mobile applications. If the final product after integration is intended for portable use, new applications and FCC and IC are required.

The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all the persons and must not be co-located or operating in conjunction with any other antenna or transmitter except as under the conditions described KDB 447498 D01 General RF Exposure Guidance.

**MPE exposure limits**

The table below is excerpted from Table 1B of 47 CFR 1.1310 titled Limits for Maximum Permissible Exposure (MPE), Limits for General Population/Uncontrolled Exposure:

Frequency Range (MHz)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
300 – 1500	f (MHz) /1500	30
1500 – 100.000	1,0	30

The table below is excerpted from RSS-102, Issue 4, 4.2, titled "RF Limits for Devices used by the General Public":

Frequency Range (MHz)	Power density (W/m <sup>2</sup> )	Averaging time (minutes)
300 – 1500	f (MHz) /150	6
1500 – 100.000	10	6

**EIRP/ERP limits**

For 850 MHz frequency band and according to FCC §22.913 the maximum ERP of the device is 7 W (equivalent to 11,48 W EIRP) while IC SRSP-503 defines an EIRP limit of 11,5 W.

For 1900 MHz frequency band and according to FCC §24.232 and IC SRSP-510, the maximum EIRP of the device should be lower than 2 W.

Using the equation  $S = \frac{PG}{4\pi R^2}$  to calculate the exposure to electromagnetic fields

- where: S = power density (in appropriate units, e.g. mW/cm<sup>2</sup>)
- P = power input to the antenna (in appropriate units, e.g., mW)
- G = power gain of the antenna in the direction of interest relative to an isotropic radiator
- R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

compliance with FCC/IC MPE and EIRP limits is demonstrated following the calculations shown in the following page.

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Band	Modulation	Test Mode	Channel	Frequency (MHz)	Avg burst Conducted power (dBm)	Duty cycle (%)	FCC/IC MPE limit (mW/cm <sup>2</sup> )	FCC EIRP limit per §22.813 and §24.232 (W)	IC EIRP limit per SRSP-503 and SRSP-510 (W)	Evaluation distance for compliance with MPE limits (cm)	Antenna gain to meet FCC/IC MPE limit (dBi)	Antenna gain to meet FCC EIRP limit (dBi)	Antenna gain to meet IC EIRP limit (dBi)	Maximum antenna gain to meet all the limits (dBi)	Maximum antenna gain to meet all the limits per frequency band (dBi)
GPRS 850	GMSK	4 Down 1 Up (Duty Factor 1/8)	Lowest	824,2	32,46	12,5%	0,55	11,48	11,50	20	10,98	8,13	8,14	8,13	850 MHz frequency band:
			Middle	836,6	32,50	12,5%	0,56	11,48	11,50	20	11,00	8,09	8,10	8,09	
			Highest	848,8	32,37	12,5%	0,57	11,48	11,50	20	11,20	8,22	8,23	8,22	
GPRS 850	GMSK	3 Down 2 Up (Duty Factor 2/8)	Lowest	824,2	32,38	25,0%	0,55	11,48	11,50	20	8,05	8,21	8,22	8,05	8,02
			Middle	836,6	32,47	25,0%	0,56	11,48	11,50	20	8,02	8,12	8,13	8,02	
			Highest	848,8	32,22	25,0%	0,57	11,48	11,50	20	8,34	8,37	8,38	8,34	
GPRS 1900	GMSK	4 Down 1 Up (Duty Factor 1/8)	Lowest	1850,2	30,26	12,5%	1,00	2,00	2,00	20	15,78	2,75	2,75	2,75	1900 MHz frequency band:
			Highest	1880,0	29,81	12,5%	1,00	2,00	2,00	20	16,23	3,20	3,20	3,20	
			Highest	1909,8	29,63	12,5%	1,00	2,00	2,00	20	16,41	3,38	3,38	3,38	
GPRS 1900	GMSK	3 Down 2 Up (Duty Factor 2/8)	Lowest	1850,2	30,03	25,0%	1,00	2,00	2,00	20	13,00	2,98	2,98	2,98	2,75
			Highest	1880,0	29,64	25,0%	1,00	2,00	2,00	20	13,39	3,37	3,37	3,37	
			Highest	1909,8	29,42	25,0%	1,00	2,00	2,00	20	13,61	3,59	3,59	3,59	

Yours sincerely,



EMEA R&D Manager  
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