

AT4 wireless S.A.U.TCB

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Date: **January 12th, 2017**

Subject: RF exposure analysis for the equipment with FCC ID: **VBO-LLC7262**; IC: **135Y-LLC7262**

The device model: **LLC 7262** (FCC ID: **VBO-LLC7262**; IC: **135Y-LLC7262**) is designed to be installed in and used in mobile exposure conditions.

The antennas used for this device must be installed to provide a separation distance of at least 20 cm from all the persons and must not be collocated or operating in conjunction with any other antenna or transmitter.

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 ²)	Averaging time (minutes)
300 – 1500	f (MHz) /1500	30
1500 – 100.000	1,0	30

The table below is excerpted from RSS-102, Issue 5, 4, titled “Table 4: RF Field Strength Limits for Devices Used by the General Public”:

Frequency Range (MHz)	Power density (W/m ²)	Averaging time (minutes)
300 – 6000	$0.02619 \cdot f^{0.6834}$	6

EIRP/ERP limits

Band	FCC EIRP limit per §22,913 & §24,232 (W)	ISED EIRP limit per RSS-132 & RSS-139 (W)
GSM850	11,48	11,50
GPRS850	11,48	11,50
EGPRS850	11,48	11,50
GSM1900	2,00	1,00
GPRS1900	2,00	1,00
EGPRS1900	2,00	1,00
WCDMA Band II	2,00	1,00
WCDMA Band V	11,48	11,50

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/cm²)
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/ISED MPE and EIRP limits is demonstrated following the calculations shown in the following table:

Band	Frequency (MHz) (Lowest Frequency)	Maximum conducted output power (per tune-up) (dBm)	Duty cycle (%)	Antenna gain (dBi)	FCC MPE limit (mW/cm ²)	ISED MPE limit (mW/cm ²)	FCC/ISED MPE limit (mW/cm ²)	FCC EIRP limit per §22.913 & §24.232 (W)	ISED EIRP limit per RSS 132 & RSS 139 (W)	FCC/ISED EIRP limit (W)	Evaluation distance for compliance with MPE limits (cm)	$S = \frac{PG}{4\pi R^2}$ (mW/cm ²)	MPE Ratio (S/MPE limit) (mW/cm ²)	COMPLIANT?
GSM850	836.4	33.00	50.0%	-3.76	0.558	0.260	0.26020	11.48	11.50	11.48	20	0.08350	0.32091	COMPLIANT
GPRS850	848.8	33.00	50.0%	-3.76	0.566	0.263	0.26283	11.48	11.50	11.48	20	0.08350	0.31770	COMPLIANT
EGPRS850	848.8	28.00	50.0%	-3.76	0.566	0.263	0.26283	11.48	11.50	11.48	20	0.02641	0.10047	COMPLIANT
GSM1900	1880.0	30.00	50.0%	-1.70	1.000	0.453	0.45258	2.00	1.00	1.00	20	0.06725	0.14860	COMPLIANT
GPRS1900	1850.2	30.00	50.0%	-1.70	1.000	0.448	0.44766	2.00	1.00	1.00	20	0.06725	0.15023	COMPLIANT
EGPRS1900	1850.2	27.00	50.0%	-1.70	1.000	0.448	0.44766	2.00	1.00	1.00	20	0.03371	0.07529	COMPLIANT
WCDMA Band II	1852.4	24.00	100.0%	-1.70	1.000	0.448	0.44803	2.00	1.00	1.00	20	0.03379	0.07541	COMPLIANT
WCDMA Band V	836.4	24.00	100.0%	-3.76	0.558	0.260	0.26020	11.48	11.50	11.48	20	0.02102	0.08080	COMPLIANT

Yours sincerely,

P.A.



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