dresden elektronik ingenieurtechnik gmbh • Enno-Heidebroek-Str. 12 • D-01237 Dresden

Federal Communications Commission
Equipment Authorization Branch
7435 Oakland Mills Rd
Columbia MD 21046-1609

Dresden, 06th March 2012

RF Exposure Calculation

agent: dresden elektronik ingenieurtechnik gmbh
client: Atmel Automotive GmbH
FCC ID: VNR-E31F2-X5B-00
FCC Part 15 Certification

Dear Sir or Madam,

End-users may not be provided with the module installation instructions. OEM integrators and end users must be provided with transmitter operating conditions for satisfying RF exposure compliance.

Section 2.1091: Radiofrequency radiation exposure evaluation: mobile devices
Section 1.1310: Radiofrequency radiation exposure limits

The max source-based time-averaged power of 0.0659 mW/cm² is below the limit for general population of 1 mW/cm² for distances > 20 cm.

Section 15.203: Antenna requirement

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

The Following calculation is the reference data for distance > 20cm.

Name		**Value**	**log value**	
maximum conducted power		165.96 mW	22.20 dBm	
maximum antenna gain		2.00	3.00 dBi	
calculated radiated power		331.13 mW	25.20 dBm	
duty cycle factor				
Frequency		2400 MHz		
dwell time		100 ms		
time of occupacy / pulse-train time		100 ms		
duty cycle factor		100 %	0.00 dB	
maxium source-based time-averaged power				
conducted power		165.96 mW	22.20 dB	
calculated radiated power		331.13 mW	25.20 dB	
Specific power				
calculated with max source-based time-averaged power measured condacted power				
$S = \frac{P \cdot G}{4 \cdot \pi \cdot r^2} \left[\frac{mW}{cm^2} \right]$				
r [cm]	20.00	2.50	1.50	5.13
S [mW/cm²]	0.0659	4.2161	11.71	1.0
limit general population [mW/cm²]	1.0			
limit occupational population [mW/cm²]	5.0			
calculated with max source-based time-averaged power measured radiated power				
$S = \frac{EIRP}{4 \cdot \pi \cdot r^2} \left[\frac{mW}{cm^2} \right]$				
r [cm]	20.00	2.50	1.50	n.a.
S [mW/cm²]	n.a.	n.a.	n.a.	1.0

Sincerely,

Signature
Name Michael Fleischmann
Title Test Engineer
Company dresden elektronik ingenieurtechnik gmbh