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

Dresden, 08 September 2011

RF Exposure Calculation

agent: dresden elektronik ingenieurtechnik gmbh
client: Atmel Automotive GmbH
FCC ID: VNR-E32ED-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.

For portable applications OEM integrators need no SAR evaluation. The max source-based time-averaged output of 4.27 mW is below the low threshold of 24 mW for distance < 2.5 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 < 2.5cm.

name	value	log value		
maximum conducted power	2.14 mW	3.30 dBm		
maximum antenna gain	2.00	3.00 dBi		
calculated radiated power	4.27 mW	6.30 dBm		
duty cycle factor				
frequency	2400 MHz			
dwell time	100 ms			
time of occupancy / pulse-train time	100 ms			
duty cycle factor	100 %	0.00 dB		
maximum source-based time-averaged power				
conducted power	2.14 mW	3.30 dB		
calculated radiated power	4.27 mW	6.30 dB		
Specific power				
calculated with max source-based time-averaged power				
measured conducted 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	0.58
S [mW/cm ²]	0.0008	0.0543	0.1509	1.0
limit general population [mW/cm ²]	1.0			
limit occupational population [mW/cm ²]	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/cm ²]	n.a.	n.a.	n.a.	1.0

Sincerely,

Andreas Palm

Signature
 Name Andreas Palm
 Title Development Engineer
 Company dresden elektronik ingenieurtechnik gmbh