

InterLab[®]

RF Exposure

For

SmartStart

FCC ID: 2AIQR-SL301

IC: 21603-SL301

Assessment Reference: MDE_ADVANT_1602_MPEa

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0 Summary

0.1 Technical Report Summary

Type of Report

RF Exposure Assessment for a LTE/WiFi Router.

Applicable FCC Rules

For RF Exposure:

OET Bulletin 65 Edition 97-01 August 1997

FCC 47 CFR §1.1307

FCC 47 CFR §1.1310

Report version control			
Version	Release date	Changes	Version validity
000	2016-08-30	Initial version	Valid

Responsible
for Report:



1 Administrative Data

1.1 Project Data

Responsible for assessment and report: Mr. Dirk Bratsch

Date of Report: 2016-08-30

1.2 Applicant Data

Company Name: Advantech B+B SmartWorx s.r.o.

Address: 562 04 Usti nad Orlici III
Czech Republic

Contact Person: Mr. Eduard Dorskocil

1.3 Manufacturer Data

Company Name: please see applicant data

Address:

Contact Person:

2 Test object Data

2.1 General EUT Description

Equipment under Test: M2M Device & WiFi Router
Type Designation: SmartStart

Kind of Device:
(optional)

Voltage Type: DC

Voltage Level: DC 12.0 V

Tested Modulation Type: OFDM:64-QAM

General product description:

The EUT is a LTE / WiFi Router.

Specific product description for the EUT:

The EUT is a LTE / WiFi Router. It supports WiFi 2.4GHz b-/g-/n-mode, E-UTRA eFDD 3, 4 and 13.

3 Evaluation Results

3.1 RF Exposure Evaluation

Standards
OET Bulletin 65 Edition 97-01 August 1997
FCC 47 CFR §1.1307
FCC 47 CFR §1.1310

3.1.1 Test limits

As specified in Table 1B of 47 CFR 1.1310 – Limits for Maximum Permissible Exposure (MPE), Limits for General Population/Uncontrolled Exposure.

Frequency range (MHz)	Power density (mW/cm ²)
300 – 1,500	f/1500
1,500 – 100,000	1.0

Equation OET bulletin 65, page 18, edition 97-01:
$$S = \frac{PG}{4\pi R^2} = \frac{EIRP}{4\pi R^2}$$

Where:

S = power density

P = power input to the antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the centre of radiation of the antenna

3.1.2 Test Protocol

The table below shows the relative exposure for the cellular part.

Relative exposure for Primary Transmitter for FCC							
OP-Mode	Mode	Output Power	Frequency (MHZ)	S_{eq}	S_{lin} (mW/cm ²)	$\frac{S_{eq}}{S_{lin}}$	Verdict
eFDD 2	LTE	251.1886	1902.5	0.1119	1.0000	0.111874347	Pass
eFDD 4	LTE	251.1886	1732.5	0.1119	1.0000	0.111874347	Pass
eFDD13	LTE	251.1886	777.0	0.1119	0.5180	0.215973642	Pass

The table below shows the relative exposure for the WiFi part.

Relative exposure for Secondary transmitter				
Transmitter	Output power	S_{eq}	S_{lin} (mW/cm ²)	$\frac{S_{eq}}{S_{lin}}$
WLAN	69.66	0.0235	1.0000	0.023535884

The table below shows the margin to FCC limit.

Operational Bands	Margin to FCC Limit (mW/cm ²)
WLAN	0.9765
LTE FDD2	0.8881
LTE FDD 4	0.8881
LTE FDD 13	0.8881