



RF EXPOSURE REPORT

REPORT NO.: SA960910L04
MODEL NAME: TG585 v7
MODEL NO.: DSLWBC883EC

ACCORDING: FCC Guidelines for Human Exposure
IEEE C95.1
RSS-102

APPLICANT: Thomson Telecom Belgium

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ISSUED BY: Advance Data Technology Corporation

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R.O.C.



CERTIFICATION

PRODUCT: ADSL Modem
MODEL NAME: TG585 v7
MODEL NO.: DSLWBC883EC
BRAND: Thomson
APPLICANT: Thomson Telecom Belgium
TESTED: Sep. 06 ~ Nov. 07, 2007
TEST SAMPLE: ENGINEERING SAMPLE
STANDARDS: **FCC Guidelines for Human Exposure**
IEEE C95.1
RSS-102

The above equipment (Model name: TG585 v7) has been tested by **Advance Data Technology Corporation**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Rennie Wang , **DATE:** Nov. 12, 2007
Rennie Wang / Senior Specialist

TECHNICAL
ACCEPTANCE : Long Chen , **DATE:** Nov. 12, 2007
Responsible for RF Long Chen / Senior Engineer

APPROVED BY : Gary Chang , **DATE:** Nov. 12, 2007
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RF EXPOSURE MEASUREMENT (MOBILE DEVICE)

1. INTRODUCTION

In this document, we try to prove the safety of radiation harmfulness to the human body for our product. The limit for Maximum Permissible Exposure (MPE) specified in FCC 1.1310 is followed. The Gain of the antenna used in this product is measured in a Fully Anechoic Chamber (FAC) calibrated for antenna measurement in ADT, and also the maximum total power input to the antenna is measured. Through the Friis transmission formula and the maximum gain of the antenna, we can calculate the distance, away from the product, where the limit of MPE is reached.

Although the Friis transmission formula is a far field assumption, the calculated result of that is an over-prediction for near field power density. We will take that as the worst case to specify the safety range.

2. RF EXPOSURE LIMIT

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in 1.1307(b)

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

FREQUENCY RANGE (MHz)	ELECTRIC FIELD STRENGTH (V/m)	MAGNETIC FIELD STRENGTH (A/m)	POWER DENSITY (mW/cm ²)	AVERAGE TIME (minutes)
(A)LIMITS FOR OCCUPATIONAL / CONTROL EXPOSURES				
300-1500	F/300	6
1500-100,000	5	6
(B)LIMITS FOR GENERAL POPULATION / UNCONTROLLED EXPOSURE				
300-1500	F/1500	30
1500-100,000	1.0	30

F = Frequency in MHz



3. FRIIS FORMULA

Friis transmission formula : $P_d = (P_{out} * G) / (4 * \pi * r^2)$

where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

If we know the maximum Gain of the antenna and the total power input to the antenna, through the calculation, we will know the MPE value at distance r .

Ref.: David K. Cheng, *Field and Wave Electromagnetics*, Second Edition,

Page 640, Eq. (11-133).

4. EUT OPERATING CONDITION

The software provided by Manufacturer enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

5. CLASSIFICATION

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. Warning statement to the user for keeping at least 20cm or more separation distance with the antenna should be included in users manual. So, this device is classified as **Mobile Device**.



6. TEST RESULTS

6.1 ANTENNA GAIN

The maximum Gain measured in Fully Anechoic Chamber is 2.87dBi or 1.93642 (numeric).

6.2 OUTPUT POWER INTO ANTENNA & RF EXPOSURE VALUE AT DISTANCE 20cm:

802.11b DSSS MODULATION

FOR PRINTED ANTENNA WITH 2.87dBi GAIN:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	Power Density (mW/cm ²)	Limit of Power Density (mW/cm ²)
1	2412	50.119	17.00	0.019	1.000
6	2437	56.885	17.55	0.022	1.000
11	2462	56.754	17.54	0.022	1.000

FOR DIPOLE ANTENNA WITH 2.29dBi GAIN:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	Power Density (mW/cm ²)	Limit of Power Density (mW/cm ²)
1	2412	50.119	17.00	0.017	1.000
6	2437	56.885	17.55	0.019	1.000
11	2462	56.754	17.54	0.019	1.000



802.11g OFDM MODULATION

FOR PRINTED ANTENNA WITH 2.87dBi GAIN:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	Power Density (mW/cm ²)	Limit of Power Density (mW/cm ²)
1	2412	45.082	16.54	0.017	1.000
6	2437	44.875	16.52	0.017	1.000
11	2462	44.978	16.53	0.017	1.000

FOR DIPOLE ANTENNA WITH 2.29dBi GAIN:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	Power Density (mW/cm ²)	Limit of Power Density (mW/cm ²)
1	2412	45.082	16.54	0.015	1.000
6	2437	44.875	16.52	0.015	1.000
11	2462	44.978	16.53	0.015	1.000