CERTIFICATION TEST REPORT

Report Number : 4789864400-FR2V1

Applicant : AM TELECOM Co., Ltd.
608, Yatap Leaders Building, 42, Jangmi-ro, Bundang-gu,
Seongnam-si, Gyeonggi-do, 13496, South Korea

Model : AMM5500

FCC ID : 2AZDW-AML550
IC : 27086-AML550

EUT Description : Communication Module

Test Standard(s) : FCC 47 CFR PART 1 SUBPART I
FCC 47 CFR PART 2 SUBPART J
INDUSTRY CANADA RSS 102 ISSUE 5

Date Of Issue:
April 29, 2021

Prepared by:
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IAS ACCREDITED
TL-637

REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	04/20/21	Initial issue	Robby Lee
V2	04/29/21	Updated to change the target power	Robby Lee

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: AM TELECOM Co., Ltd.

EUT DESCRIPTION: Communication Module

MODEL: AMM5500

ADDITIONAL Model Number: AML550

Serial Number: #4

DATE TESTED: March 22, 2021 – April 13, 2021

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 1 SUBPART I	
FCC PART 2 SUBPART J	Complies
INDUSTRY CANADA RSS 102 ISSUE 5	

UL Korea, Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Korea, Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Korea, Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Korea, Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by IAS, any agency of the Federal Government, or any agency of any government.

Approved & Released For
UL Korea, Ltd. By:

CY Choi
Suwon Lab Engineer
UL Korea, Ltd.

Tested By:

Robby Lee
Suwon Lab Engineer
UL Korea, Ltd.

2. TEST METHODOLOGY

All calculations were made in accordance with FCC OET Bulletin 65 Edition 97-01 and IC Safety Code 6..

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea. Line conducted emissions are measured only at the 218 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

218 Maeyeong-ro
☒ Shield Room 5

UL Korea, Ltd. is accredited by IAS, Laboratory Code TL-637. The full scope of accreditation can be viewed at https://www.iasonline.org/wp-content/uploads/2017/05/TL-637-cert-New.pdf.

4. EQUIPMENT UNDER TEST

4.1. DESCRIPTION OF EUT

The EUT is a Communication Module.

4.2. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a internal antenna for the [List the bands supported] with a maximum peak gain as follow:

Frequency (MHz)	Allowed Max. Peak Gain (dBi)
GSM1900 / WCDMA Band 2 / LTE Band 2 1850 ~ 1910 MHz	3.5
WCDMA Band 4 / LTE Band 4 1710 ~ 1755 MHz	5.0
GSM850 / WCDMA Band 5 / LTE Band 5 / LTE Band 26 814 ~ 849 MHz	5.6
LTE Band 12 / LTE Band 17 699 ~ 716 MHz	6.6
LTE Band 7 2500 ~ 2570 MHz	9.0

5. MAXIMUM PERMISSIBLE RF EXPOSURE

5.1. FCC LIMITS

§1.1310 The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	$*900/f^2$	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	$*180/f^2$	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

Notes:

(1) Occupational/controlled exposure limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when a person is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

(2) General population/uncontrolled exposure limits apply in situations in which the general public may be exposed, or in which persons who are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure

5.2. IC RULES

IC Safety Code 6 (2015), Section 2.2.2: To ensure compliance with the basic restrictions outlined in Section 2.1, at frequencies between 10 MHz and 300 GHz, the reference levels for electric- and magnetic-field strength and power density must be complied with.

TABLE 5: Reference Levels for Electric Field Strength, Magnetic Field Strength and Power Density in Uncontrolled Environments

Frequency (MHz)	Electric Field Strength (E_{RL}), (V/m, RMS)	Magnetic Field Strength (H_{RL}), (A/m, RMS)	Power Density (S_{RL}), (W/m^2)	Reference Period (minutes)
10 - 20	27.46	0.0728	2	6
20 - 48	$58.07 / f^{0.25}$	$0.1540 / f^{0.25}$	$8.944 / f^{0.5}$	6
48 - 300	22.06	0.05852	1.291	6
300 - 6000	$3.142 f^{0.3417}$	$0.008335 f^{0.3417}$	$0.02619 f^{0.6834}$	6
6000 -15000	61.4	0.163	10	6
15000 - 150000	61.4	0.163	10	$616000 / f^{1.2}$
150000 - 300000	$0.158 f^{0.5}$	$4.21\times10^{-4} f^{0.5}$	$6.67\times10^{-5} f$	$616000 / f^{1.2}$

Frequency, *f*, is in MHz.

TABLE 6: Reference Levels for Electric Field Strength, Magnetic Field Strength and Power Density in Controlled Environments

Frequency (MHz)	Electric Field Strength (E_{RL}), (V/m, RMS)	Magnetic Field Strength (H_{RL}), (A/m, RMS)	Power Density (S_{RL}), (W/m^2)	Reference Period (minutes)
10 - 20	61.4	0.163	10	6
20 - 48	$129.8 / f^{0.25}$	$0.3444 / f^{0.25}$	$44.72 / f^{0.5}$	6
48 - 100	49.33	0.1309	6.455	6
100 - 6000	$15.60 f^{0.25}$	$0.04138 f^{0.25}$	$0.6455 f^{0.5}$	6
6000 - 15000	137	0.364	50	6
15000 - 150000	137	0.364	50	$616000 / f^{1.2}$
150000 - 300000	$0.354 f^{0.5}$	$9.40\times10^{-4} f^{0.5}$	$3.33\times10^{-4} f$	$616000 / f^{1.2}$

Frequency, *f*, is in MHz.

Notes for Tables 5 and 6:

1. For exposures shorter than the reference period, field strengths may exceed the reference levels, provided that the time average of the squared value of the electric or magnetic field strength over any time period equal to the reference period shall not exceed ERL2 or HRL2, respectively. For exposures longer than the reference period, including indefinite exposures, the time average of the squared value of the electric or magnetic field strength over any time period equal to the reference period shall not exceed ERL2 or HRL2, respectively.

5.3. EQUATIONS

POWER DENSITY

Power density is given by:

S = EIRP / (4 * Pi * D^2)

Where

S = Power density in mW/cm^2
EIRP = Equivalent Isotropic Radiated Power in mW
D = Separation distance in cm

Power density in units of mW/cm^2 is converted to units of W/m^2 by multiplying by 10.

DISTANCE

Distance is given by:

D = SQRT (EIRP / (4 * Pi * S))

Where

D = Separation distance in cm
EIRP = Equivalent Isotropic Radiated Power in mW
S = Power density in mW/cm^2

SOURCE-BASED DUTY CYCLE

Where applicable (for example, multi-slot cell phone applications) a duty cycle factor may be applied.

Source-based time-averaged EIRP = (DC / 100) * EIRP

Where

DC = Duty Cycle in %, as applicable
EIRP = Equivalent Isotropic Radiated Power in W

5.4. IC EXEMPTION

INDUSTRY CANADA EXEMPTION

RSS-102 Clause 2.5.2 RF exposure evaluation is required if the separation distance between the user and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 22.48/f0.5W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1.31 x 10-2 f0.6834 W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

6. TEST RESULTS

6.1. RF EXPOSURE

In the table(s) below, Power and Gain are entered in units of dBm and dBi respectively and conversions to linear forms are used for the calculations.

Band	Frequency range (MHz)			Max Target Power (dBm)	ANT Gain (dBi)	Calculated EIRP (dBm)	Maximum EIRP (dBm)	Maximum EIRP (mW)	Maximum power density (mW/cm^2)	FCC Requriment (mW/cm^2)	ISED Requriment (mW/cm^2)	Acceptable Maximum Antenna Gain (dBi)
LTE B12	699.7	~	715.3	24.00	6.60	30.60	30.60	1148.154	**0.228**	0.466	0.230	6.64
GPRS850	824.2	~	848.8	25.48	5.60	31.08	31.08	1282.331	**0.255**	0.549	0.258	5.64
WCDMA B5	826.4	~	846.6	25.00	5.60	30.60	30.60	1148.154	**0.228**	0.466	0.258	6.13
LTE B26	814.7	~	848.3	24.00	5.60	29.60	29.60	912.011	**0.181**	0.543	0.256	7.09
WCDMA B4	1712.4	~	1752.6	25.00	5.00	30.00	30.00	1000.000	**0.199**	1.000	0.425	8.29
LTE B4	1710.7	~	1754.3	24.00	5.00	29.00	29.00	794.328	**0.158**	1.000	0.424	9.29
GPRS1900	1850.2	~	1909.8	23.24	3.50	26.74	26.74	472.097	**0.094**	1.000	0.448	10.28
WCDMA B2	1852.4	~	1907.6	25.00	3.50	28.50	28.50	707.946	**0.141**	1.000	0.448	8.53
LTE B2	1850.7	~	1909.3	24.00	3.50	27.50	27.50	562.341	**0.112**	1.000	0.448	9.52
LTE B7	2502.5	~	2567.5	24.00	9.00	33.00	33.00	1995.262	**0.397**	1.000	0.550	10.42

Note 1: The EUT will only be used with a separation of 20 centimeters or greater between the antenna and the body of the user.

Note 2: Max. EIRP [dBm] = Max. Target Power [dBm] + Antenna Gain [dBi]

Note 3: Acceptable Maximum Antenna Gain (dBi) : Min value of 1) and 2)

1) Max Gain (dBi) to comply @20cm with MPE
   : 10*Log(FCC Requriment (mW/cm2) / Maximum power density (mW/cm2))
2) Max Gain (dBi) to comply @20cm with ISED MPE
   : 10*Log(ISED Requriment (mW/cm2) / Maximum power density (mW/cm2)))
3) Maximum power density (mW/cm2) is calculated by Max Target Power (dBm) (assumed to be ANT Gain 0 dBi.)

Note 4: The Acceptable Maximum Antenna Gain is a value to which only the RF exposure limit is applied.
Note 5: Max Target Power(dBm) for GSM is the value to which the duty cycle is considered.

END OF TEST REPORT