



A Test Lab Techno Corp.

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MPE Report

Test Report No.	: 1510FS17-01
Applicant	: Coretex Ltd
Manufacturer	: Coretex Ltd
Product Type	: M2M Advanced Industrial Gateway
Trade Name	: ibright
Model Number	: TMU-1500
Date of Received	: Oct. 05, 2015
Test Period	: Oct. 12, 2015
Date of Issued	: Dec. 29, 2015
Test Specification	: 47 CFR § 2.1091 47 CFR §1.1310 ANSI / IEEE Std.C95.1-1992
Location of Test Lab.	: Chang-an Lab.

1. The test operations have to be performed with cautious behavior, the test results are as attached.
2. The test results are under chamber environment of A Test Lab Techno Corp. A Test Lab Techno Corp. does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples.
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Approved By : Bill Hu
(Bill Hu)

Tested By : Sky Chou
(Sky Chou)



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1. Description of Equipment under Test (EUT)

Applicant	Coretex Ltd
Applicant Address	Level 2, 135 Broadway, Newmarket, Auckland, New Zealand, 1023
Manufacturer	Coretex Ltd
Manufacturer Address	Level 2, 135 Broadway, Newmarket, Auckland, New Zealand, 1023
Product Type	M2M Advanced Industrial Gateway
Trade Name	ibright
Model Number	TMU-1500
FCC ID	2AGNLTMU1500
IMEI No.	357164045288860
Frequency Range	1852.4 - 1907.6 MHz WCDMA(RMC 12.2K)/HSDPA/HSUPA/HSPA+ Band II 1712.4 - 1752.6 MHz WCDMA(RMC 12.2K)/HSDPA/HSUPA/HSPA+ Band IV 826.4 - 846.6 MHz WCDMA(RMC 12.2K)/HSDPA/HSUPA/HSPA+ Band V
Transmit Power (Avg. conducted power)	WCDMA(RMC 12.2K)/HSDPA/HSUPA/HSPA+ Band II: 0.218 W / 23.39 dBm WCDMA(RMC 12.2K)/HSDPA/HSUPA/HSPA+ Band IV: 0.225 W / 23.52 dBm WCDMA(RMC 12.2K)/HSDPA/HSUPA/HSPA+ Band V: 0.227 W / 23.56 dBm
Antenna Specification	WCDMA Band II: 3.3 dBi WCDMA Band IV: 3.3 dBi WCDMA Band V: 2 dBi
Antenna Designation	Super Combo Antenna
Temperature Range	-20 ~ +85°C
RF Evaluation	1.07 W/m ²

The above equipment was tested by A Test Lab Techno Corp. For compliance with the requirements set forth in 47 CFR § 2.1091 & 47 CFR § 1.1310. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties



2. Human Exposure Assessment

Due to the design and installation of this product, it is not possible to conduct SAR evaluation. This is because client either manufactures or supplies the antenna(s) that will be used in the installation of this product. Therefore, this product will be evaluated as a mobile device per 47 CFR §1.1310 titled "Radiofrequency radiation exposure limits", generally referred to as MPE limits.

In 47 CFR § 2.1091, paragraph (b) defines a mobile device as "a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 cm is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. " This product is intended to be installed into a vehicle such that the unit is physically secured at one location. In the installation guide supplied with the product,

Client has made the following statement: "IMPORTANT: To meet the FCC's RF Exposure Guidelines, the antenna should be installed so there is at least 20 cm of separation between the body of the user and nearby persons and the antenna". Based on the installation of the transceiver and the antenna, the transmitters radiating structure is more than 20 cm from the user. Thus, this product is a "mobile device" as defined in section § 2.1091 paragraph (b).

Exposure evaluation
$S = \frac{PG}{4\pi R^2}$ <p>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 center of radiation of the antenna.</p>

3. RF Output Power

Band	Sub-Test	Channel	Frequency (MHz)	Average Conducted power (dBm)
WCDMA Band II	RMC12.2K	9262	1852.4	23.16
		9400	1880.0	23.39
		9538	1907.6	23.21
HSDPA Band II	1	9262	1852.4	22.15
		9400	1880.0	22.35
		9538	1907.6	22.19
	2	9262	1852.4	21.64
		9400	1880.0	21.84
		9538	1907.6	21.68
	3	9262	1852.4	21.61
		9400	1880.0	21.82
		9538	1907.6	21.65
	4	9262	1852.4	22.07
		9400	1880.0	22.27
		9538	1907.6	22.11
HSUPA/HSPA+ Band II	1	9262	1852.4	21.51
		9400	1880.0	21.70
		9538	1907.6	21.53
	2	9262	1852.4	19.50
		9400	1880.0	19.69
		9538	1907.6	19.52
	3	9262	1852.4	20.48
		9400	1880.0	20.67
		9538	1907.6	20.50
	4	9262	1852.4	19.48
		9400	1880.0	19.67
		9538	1907.6	19.50
	5	9262	1852.4	21.43
		9400	1880.0	21.62
		9538	1907.6	21.45

Band	Sub-Test	Channel	Frequency (MHz)	Average Conducted power (dBm)
WCDMA Band IV	RMC12.2K	1312	1712.4	23.28
		1413	1732.6	23.52
		1513	1752.6	23.43
HSDPA Band IV	1	1312	1712.4	22.27
		1413	1732.6	22.49
		1513	1752.6	22.39
	2	1312	1712.4	21.75
		1413	1732.6	21.97
		1513	1752.6	21.87
	3	1312	1712.4	21.73
		1413	1732.6	21.95
		1513	1752.6	21.85
	4	1312	1712.4	22.18
		1413	1732.6	22.40
		1513	1752.6	22.30
HSUPA/HSPA+ Band IV	1	1312	1712.4	21.65
		1413	1732.6	21.84
		1513	1752.6	21.78
	2	1312	1712.4	19.64
		1413	1732.6	19.83
		1513	1752.6	19.77
	3	1312	1712.4	20.60
		1413	1732.6	20.79
		1513	1752.6	20.73
	4	1312	1712.4	19.62
		1413	1732.6	19.81
		1513	1752.6	19.75
	5	1312	1712.4	21.54
		1413	1732.6	21.73
		1513	1752.6	21.67

Band	Sub-Test	Channel	Frequency (MHz)	Average Conducted power (dBm)
WCDMA Band V	RMC12.2K	4132	826.4	23.44
		4183	836.6	23.56
		4233	846.4	23.38
HSDPA Band V	1	4132	826.4	22.42
		4183	836.6	22.52
		4233	846.4	22.37
	2	4132	826.4	21.89
		4183	836.6	21.99
		4233	846.4	21.84
	3	4132	826.4	21.86
		4183	836.6	21.96
		4233	846.4	21.81
	4	4132	826.4	22.30
		4183	836.6	22.40
		4233	846.4	22.25
HSUPA/HSPA+ Band V	1	4132	826.4	21.80
		4183	836.6	21.89
		4233	846.4	21.73
	2	4132	826.4	19.77
		4183	836.6	19.86
		4233	846.4	19.70
	3	4132	826.4	20.75
		4183	836.6	20.84
		4233	846.4	20.68
	4	4132	826.4	19.74
		4183	836.6	19.83
		4233	846.4	19.67
	5	4132	826.4	21.69
		4183	836.6	21.78
		4233	846.4	21.62

4. Test Result

Band	Sub-Test	Frequency (MHz)	Limit (mw/cm ²)	Distance [R] (cm)	Power [P] (dBm)	ANT Gain (dBi)	Numeric Gain [G] (dBi)	Duty Cycle	[P] x [G] with Duty cycle [TP] (mW)	Power Density [S] (mw/cm ²)
WCDMA Band II	RMC12.2K	1852.4	1.000	20	24	3.3	2.14	1	537.54	0.107
		1880.0	1.000	20	24	3.3	2.14	1	537.54	0.107
		1907.6	1.000	20	24	3.3	2.14	1	537.54	0.107
WCDMA Band IV	RMC12.2K	1712.4	1.000	20	24	3.3	2.14	1	537.54	0.107
		1732.6	1.000	20	24	3.3	2.14	1	537.54	0.107
		1752.6	1.000	20	24	3.3	2.14	1	537.54	0.107
WCDMA Band V	RMC12.2K	826.4	0.551	20	24	2	1.58	1	396.88	0.079
		836.6	0.558	20	24	2	1.58	1	396.88	0.079
		846.6	0.564	20	24	2	1.58	1	396.88	0.079

Note: 1. The Power [P] is max tune-up power (upper limit).
 2. The Numeric Gain calculated by $10^{(\text{ANT Gain(dBi)} / 10)}$.