



NVLAP LAB CODE 200707-0



FCC PART 22 H/24 E

MEASUREMENT AND TEST REPORT

For

DEKAI TELECOM CO., LIMITED

Flat 7A, 7/F, Kimley Commercial Bldg., 142-146 Queen's Road Central, Hong Kong

FCC ID: W76FCT-18832

Report Type: Original Report	Product Type: GSM Fixed Wireless Terminal
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Report Number: RSZ09030404	
Report Date: 2009-06-01	
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Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP*, NIST, or any agency of the Federal Government.

* This report may contain data that are not covered by the NVLAP accreditation and are marked with an asterisk “*” (Rev.2)

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *DEKAI TELECOM CO., LIMITED*'s product, model number: *FCT-18832* (FCC ID: *W76FCT-18832*) or the "EUT" as referred to in this report is a *GSM Fixed Wireless Terminal*, which measures approximately: 22.0cm L x 13.8 cm W x 3.8 cm H, rated input voltage: DC 7.2V battery or DC 12V adapter.

Adapter Information:

Manufacture: GREAT WELL

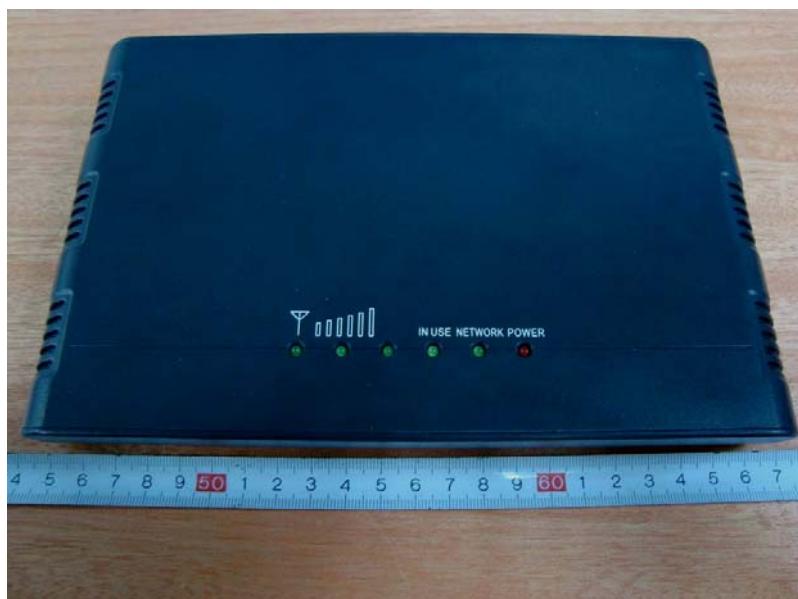
Model: GW181201500WUS

Input: 100-240VAC 50/60Hz 0.7A

Output: 12V 1.5A

** All measurement and test data in this report was gathered from production sample serial number: S/N: 0903014 (Assigned by the applicant). The EUT was received on 2009-03-04.*

EUT Photo



Please see additional photos in Exhibit B&C

Objective

This type approval report is prepared on behalf of *DEKAI TELECOM CO., LIMITED* in accordance with Part 2, Subpart J, Part 22 Subpart H, and Part 24 Subpart E of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC rules for output power, modulation characteristic, occupied bandwidth, and spurious emission at antenna terminal, spurious radiated emission, frequency stability, band edge and radiated margin.

Related Submittal(s)/Grant(s)

The GSM module RF was test in Shenzhen Electronic Product Quality Testing Center with FCC ID: UDV-0606020060002.

Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2, Sub-part J as well as the following parts:

Part 22 Subpart H - Public Mobile Services

Part 24 Subpart E - Personal Communication Services

Applicable Standards: TIA/EIA 603-C, ANSI C63.4-2003.

All radiated and conducted emissions measurements were performed at Bay Area Compliance Laboratories Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp.(Shenzhen) to collect test data is located in the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 21, 2007. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratories Corp. (Shenzhen) is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200707-0).



The current scope of accreditations can be found at
<http://ts.nist.gov/Standards/scopes/2007070.htm>

SYSTEM TEST CONFIGURATION

Justification

The EUT was configured for testing according to TIA/EIA-603-C.

The final qualification test was performed with the EUT operating at normal mode.

Equipment Modifications

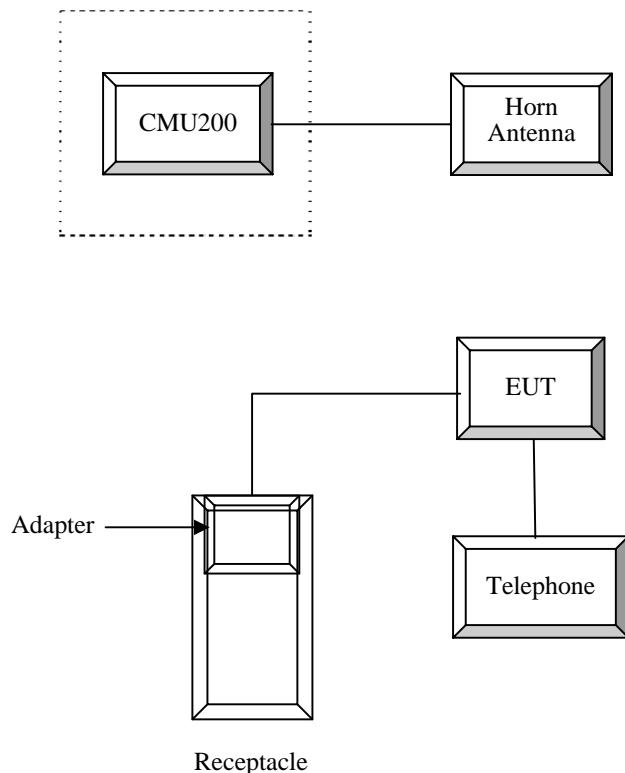
No modifications were made to the EUT.

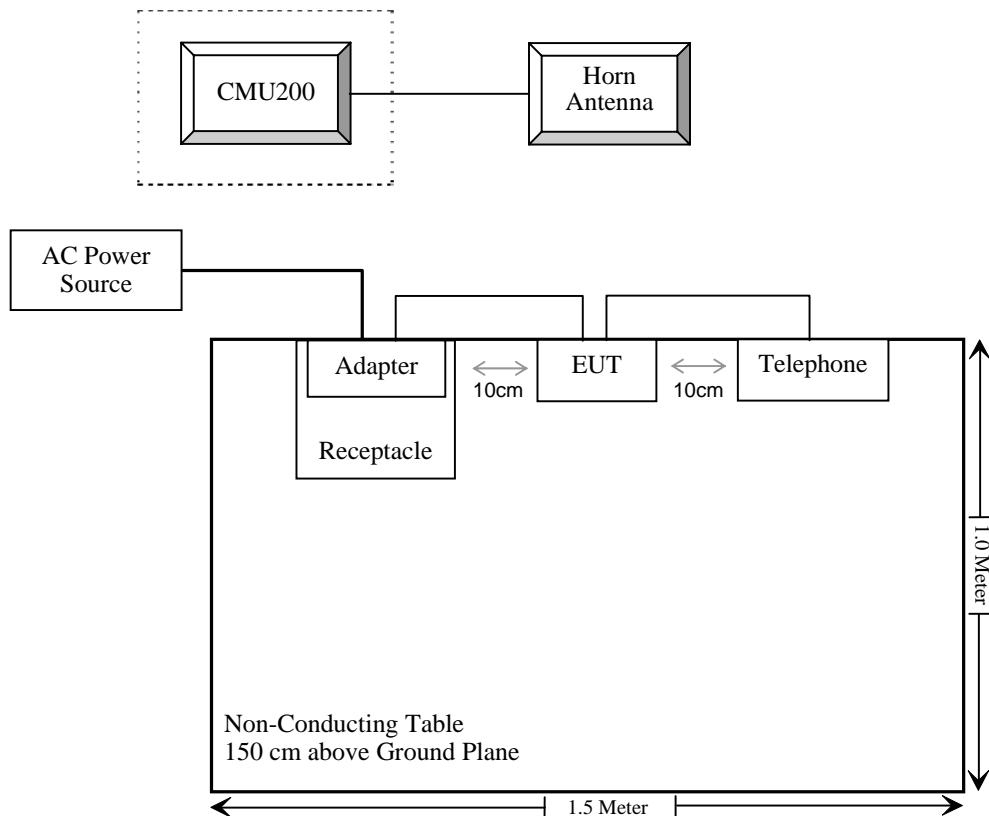
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
R/S	Universal Radio Communication Tester	CMU200	109038	DoC

External I/O Cable

Cable Description	Length (m)	From Port	To
Unshielded Detachable DC Power Cable	1.5	EUT	AC Power Source
Unshielded Detachable RJ11 Cable	2.0	EUT	Telephone
Shielded Detachable RF cable	3.0	EUT	Antenna

Configuration of Test Setup

Block Diagram of Test Setup

SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§2.1091	RF Exposure	Compliant
§2.1046; § 22.913 (a), § 24.232 (c)	RF Output Power	Compliant
§ 2.1047	Modulation Characteristics	N/A
§ 2.1049 § 22.917, § 24.238	99% & -26 dB Occupied Bandwidth	Compliant*
§ 2.1051, § 22.917 (a), § 24.238 (a)	Spurious Emissions at Antenna Terminal	Compliant*
§ 2.1053 § 22.917 (a), § 24.238 (a)	Field Strength of Spurious Radiation	Compliant
§ 22.917 (a); § 24.238 (a)	Out of band emission, Band Edge	Compliant*
§ 2.1055 § 22.355, § 24.235	Frequency stability vs. temperature Frequency stability vs. voltage	Compliant*

Note: * The GSM RF module was test in Shenzhen Electronic Product Quality Testing Center with FCC ID: UDV-0606020060002 granted on 2006-08-01.

§2.1091 - RF EXPOSURE

Limit

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

According to §1.1310 and §2.1091 RF exposure is calculated.

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 (minute)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	842/f	2.19/f	*(180/f\2\)	30
30-300	27.5	0.073	0.2	30
300-1500.	/	/	f/1500	30
1500-100,000.	/	/	1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

Test Data

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

S = power density (in appropriate units, e.g. mW/cm²)

P = power input to the antenna (in appropriate units, e.g., mW).

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally **numeric** gain.

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

Cellular Band:

Maximum peak output power at antenna input terminal: 33.10 (dBm)

Maximum peak output power at antenna input terminal: 2041 (mW)

Prediction distance: 50 (cm)

Prediction frequency: 848.8 (MHz)

Antenna Gain, typical: 2.5 (dBi)

Maximum Antenna Gain 1.778 (numeric)

The worst case is power density at predication frequency at 50cm: 0.116 (mW/cm²)

MPE limit for general population exposure at prediction frequency: 0.566 (mW/cm²)

PCS Band:

Maximum peak output power at antenna input terminal: 29.78 (dBm)

Maximum peak output power at antenna input terminal: 950.6 (mW)

Prediction distance: 50 (cm)

Prediction frequency: 1909.8 (MHz)

Antenna Gain, typical: 2.5 (dBi)

Maximum Antenna Gain 1.778 (numeric)

The worst case is power density at predication frequency at 50 cm 0.0538 (mW/cm²)

MPE limit for general population exposure at prediction frequency: 1.0 (mW/cm²)

Result: This MPE level is below the MPE limits at 50 cm distance for General Population/Uncontrolled Exposure as stated in OET-65-C. The precautions are outlined in the User's Manual to prevent exposure to high levels of RF energy.

§2.1047 - MODULATION CHARACTERISTIC

According to FCC § 2.1047 (d), Part 22H & 24E there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

§ 2.1046, § 22.913 (a) & § 24.232 (c) - RF OUTPUT POWER

Applicable Standard

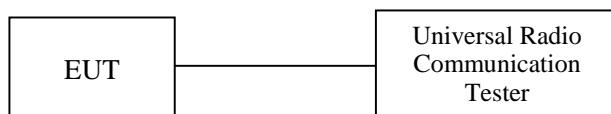
According to FCC §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

According to FCC §2.1046 and §24.232 (C), in no case may the peak output power of a base station transmitter exceed 2 watt EIRP.

Test Procedure

Conducted method:

The RF output of the transmitter was connected to the wireless test set and the Universal radio communication CMU200 through sufficient attenuation.



Radiated method:

TIA 603-C section 2.2.17

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Horn Antenna	DRH-118	A052604	2008-09-25	2009-09-25
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2009-03-11	2010-03-11
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2008-08-28	2009-08-27
HP	Preamplifier	8449B	3008A00277	2008-09-12	2009-09-11
HP	Signal Generator	HP8657A	2849U00982	2008-10-16	2009-10-16
HP	Amplifier	HP8447D	2944A09795	2008-08-02	2009-08-02
HP	Synthesized Sweeper	8341B	2624A00116	2008-11-07	2009-11-06
COM POWER	Dipole Antenna	AD-100	041000	2008-09-25	2009-09-25
A.H. System	Horn Antenna	SAS-200/571	135	2009-05-17	2010-05-17
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	1100.0008.02	2008-09-26	2009-09-25

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

The testing was performed by Phoenix Liu on 2009-05-31.

Test Result: Compliant

Conducted Power

Test data is referred to FCC ID: UDV-0606020060002 certified on 2006-08-01, test report No. FCC06-8038, which was tested in Shenzhen Electronic Product Quality Testing Center.

ERP and EIRP

GSM850 ERP:

Channel	Frequency (MHz)	Antenna Port Output Power (dBm)	Antenna Gain (dBi)	ERP (dBm)	Part 22H Limit (dBm)
128	824.2	32.82	2.5	33.17	38.45
190	836.6	32.99	2.5	33.34	38.45
251	848.8	33.10	2.5	33.45	38.45

Note: EIRP = ERP + 2.15 dB

PCS1900 EIRP:

Channel	Frequency (MHz)	Antenna Port Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Part 24E Limit (dBm)
512	1850.20	29.00	2.5	31.50	33
661	1880.00	29.51	2.5	32.01	33
810	1909.80	29.78	2.5	32.28	33

§2.1049, §22.917 & §24.238 - OCCUPIED BANDWIDTH

Applicable Standards

CFR 47 §2.1049, §22.917 and §24.238.

Test Result: Compliant

Please refer to FCC ID: UDV-0606020060002 certified on 2006-08-01, report No.: FCC06-8038, which was tested in Shenzhen Electronic Product Quality Testing Center.

§2.1051, §22.917(a) & §24.238(a) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Applicable Standards

CFR 47 §2.1051, §22.917(a) and §24.238(a).

The spectrum was to be investigated to the tenth harmonics of the highest fundamental frequency as specified in § 2.1051.

Test Result: Compliant

Please refer to FCC ID: UDV-0606020060002 certified on 2006-08-01, report No.: FCC06-8038, which was tested in Shenzhen Electronic Product Quality Testing Center.

§2.1053, §22.917& §24.238 - SPURIOUS RADIATED EMISSIONS

Applicable Standards

CFR 47 § 2.1053, §22.917 and § 24.238.

Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = $10 \lg (\text{TXpwr in Watts}/0.001)$ – the absolute level

Spurious attenuation limit in dB = $43 + 10 \log_{10} (\text{power out in Watts})$

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Horn Antenna	DRH-118	A052604	2008-09-25	2009-09-25
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2009-03-11	2010-03-11
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2008-08-28	2009-08-27
HP	Preamplifier	8449B	3008A00277	2008-09-12	2009-09-11
HP	Signal Generator	HP8657A	2849U00982	2008-10-16	2009-10-15
HP	Amplifier	HP8447D	2944A09795	2008-08-02	2009-08-02
HP	Synthesized Sweeper	8341B	2624A00116	2008-11-07	2009-11-06
COM POWER	Dipole Antenna	AD-100	041000	2008-09-25	2009-09-25
A.H. System	Horn Antenna	SAS-200/571	135	2008-05-17	2009-05-17
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	1100.0008.02	2008-09-26	2009-09-25

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	56%
ATM Pressure:	100.0kPa

The testing was performed by Phoenix Liu on 2009-03-25.

Test mode: Transmitting

Cellular Band (Part 22H)

30 MHz~10 GHz

Indicated		Table Angle Degree	Test Antenna		Substituted					Part 22H	
Frequency (MHz)	S.A. Reading (dB μ V)		Height (m)	Polar (H/V)	Frequency (MHz)	S.G. Level (dBm)	Ant. Gain Cord. (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Middle Channel											
1673.2	65.60	0	1.84	V	1673.2	-40.9	6.2	0.94	-35.64	-13	22.64
1673.2	55.84	80	1.9	H	1673.2	-49.2	6.2	0.94	-43.94	-13	30.94
2509.8	52.85	130	1.5	V	2509.8	-52.8	7.3	1.19	-46.69	-13	33.69
2509.8	49.39	210	1.8	H	2509.8	-56.4	7.3	1.19	-50.29	-13	37.29
3346.6	45.79	130	1.6	H	3346.6	-59.3	6.7	1.38	-53.98	-13	40.98
3346.6	45.38	150	1.4	V	3346.6	-60.0	6.7	1.38	-54.68	-13	41.68

PCS Band (Part 24E)

30 MHz~20 GHz

Indicated		Table Angle Degree	Test Antenna		Substituted					Part 24E	
Frequency (MHz)	S.A. Reading (dB μ V)		Height (m)	Polar (H/V)	Frequency (MHz)	S.G. Level (dBm)	Ant. Gain Cord. (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Middle Channel											
3760	44.96	184	1.9	H	3760	-54.2	6.9	1.47	-48.77	-13	35.77
3760	45.26	120	1.6	V	3760	-53.8	6.9	1.47	-48.37	-13	35.37
5640	44.76	150	1.6	H	5640	-54.3	8.3	1.76	-47.76	-13	34.76
5640	45.24	84	1.5	V	5640	-54.1	8.3	1.76	-47.56	-13	34.56
7520	42.13	90	1.5	H	7520	-57.5	7.6	2.09	-51.99	-13	38.99
7520	42.68	80	1.5	V	7520	-56.3	7.6	2.09	-50.79	-13	37.79

§22.917(a) & §24.238(a) - BAND EDGES**Applicable Standards**

According to § 22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

Test Result: Compliant

Please refer to FCC ID: UDV-0606020060002 certified on 2006-08-01, report No.: FCC06-8038, which was tested in Shenzhen Electronic Product Quality Testing Center.

§2.1055, §22.355 & §24.235 - FREQUENCY STABILITY

Applicable Standard

CFR47 § 2.1055 (a), § 2.1055 (d), §22.355, §24.235

According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:

Frequency Tolerance for Transmitters in the Public Mobile Services

Frequency Range (MHz)	Base, fixed (ppm)	Mobile ≤ 3 watts (ppm)	Mobile ≤ 3 watts (ppm)
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929.	5.0	N/A	N/A
929 to 960.	1.5	N/A	N/A
2110 to 2220	10.0	N/A	N/A

According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

Test Result: Compliant

Please refer to FCC ID: UDV-0606020060002 certified on 2006-08-01, report No.: FCC06-8038, which was tested in Shenzhen Electronic Product Quality Testing Center.

******* END OF REPORT *******