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APPLICANT: HC TELECOM CO., LTD.

FCC ID: ON7HD-950

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SECURITY CODING INFORMATION

APPLICANT: HC TELECOM CO., LTD.

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15.214(d) - THIS DEVICE COMPLIES WITH THE SECURITY CODE REQUIREMENTS OF 15.214(d)(1)(2) AND (3) BY MEANS OF THE FOLLOWING:

THE EPROM IS CAPABLE OF 16 MILLION DIGIT CODING AND THE FACTORY WRITES THE SERIES IN PRODUCTION. THIS MEANS THAT EACH OF 16 MILLION INDIVIDUAL SECURITY CODES ARE REPEATED ONLY ONCE IN ANY CONSECUTIVELY PRODUCED UNIT.

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TEST EQUIPMENT LIST

1. Spectrum Analyzer: Hewlett Packard 8566B - Opt 462, w/
preselector 85685A, & Quasi-Peak Adapter HP 85650A, & HP
8449B - OPT H02 Cal. 7/6/99
2. Signal Generator, Hewlett Packard 8640B, cal. 10/1/98
3. Signal Generator, HP 8614A Serial No.2015A07428 cal. 5/27/99
3. Eaton Biconnical Antenna Model 94455-1
20-200 MHz Serial No. 0997 Cal. 10/30/98
4. Electro-Metric Dipole Kit, 20-1000 MHz, Model TDA-30 10/31/98
5. Electro-Metric Horn 1-18 GHz, Model RGA-180, Cal. 10/30/98
6. Electro-Metric Antennas Model TDA-30/1-4, Cal. 10/15/98
7. Electro-Metric Line Impedance Stabilization Network Model
No. EM-7821, Serial No. 101; 100KHz-30MHz 50uH. Cal.11/19/98
8. Electro-Metric Line Impedance Stabilization Network Model
No. EM-7820, Serial No. 2682; 10KHz-30MHz 50uH. Cal. 11/19/98
9. Special low loss cable was used above 1 GHz
10. Tenney Temperature Chamber

TEST PROCEDURE

GENERAL: This report shall NOT be reproduced except in full without the written approval of TIMCO ENGINEERING, INC. Shielded interface cables were used in all cases except for cables connecting to the telephone line and the power cords. A test program was run which simulated a normal data transmission on a network.

POWER LINE CONDUCTED INTERFERENCE: The procedure used was ANSI STANDARD C63.4-1992 using a 50uH LISN. Both lines were observed. The bandwidth of the spectrum analyzer was 10kHz with an appropriate sweep speed. The ambient temperature of the UUT was 77.3oF with a humidity of 60%.

BANDWIDTH 6.0dB: The measurements were made with the spectrum analyzer's resolution bandwidth(RBW)=100KHz and the video bandwidth(VBW)=300KHz and the span set as shown on plot.

POWER OUTPUT: The RF power output was measured at the antenna feed point by removing the permanent antenna and connecting the UUT to a peak power meter, HP Model No. 8900C.

ANTENNA CONDUCTED EMISSIONS: The RBW=100KHz, VBW > or = RBW and the spectrum was scanned from 30MHz to the 10th Harmonic of the fundamental.

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TEST PROCEDURE (Continued)

RADIATION INTERFERENCE: The test procedure used was ANSI STANDARD C63.4-1992 using a HEWLETT PACKARD spectrum analyzer with a preselector. The bandwidth(RBW) of the spectrum analyzer was 100kHz up to 1GHz and 1.0MHz above 1GHz with an appropriate sweep speed. The VBW above 1.0GHz was = 1.0MHz. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The ambient temperature of the UUT was 77.3oF with a humidity of 60%.

15.247(d) POWER SPECTRAL DENSITY. The peak within the pass band was located with a RBW OF 3KHz and a span of 2.0MHz, slightly greater than the 6dB bandwidth, then span was centered on the display and the span is reduced to 900KHz and the sweep time set to 300 seconds. Since the spectral line spacing could not be resolved, the spectral density was measured using the noise power density and adding the correction of 35dB. This response is then plotted.

15.247(e): PROCESSING GAIN, This gain is supplied by the manufacturer of the UUT.

2.1033(b)(4)

ANTENNA AND GROUND SYSTEM:

This unit uses a short, inductively loaded, antenna element for the base unit and the handset. The antenna is permanently attached to the unit and no provision is made for connection to an external antenna.

No ground connection is provided. The only ground in use is the ground plane on the printed circuit board.

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NAME OF TEST: POWER LINE CONDUCTED INTERFERENCE

RULES PART NUMBER: 15.207

MINIMUM REQUIREMENTS:	FREQUENCY ____MHz____	LEVEL ____dBuV__
	0.450-30	48 dBuV

TEST PROCEDURE: ANSI STANDARD C63.4-1992

THE HIGHEST EMISSION READ FOR LINE 1 WAS 21.6 uV @ 800kHz.

THE HIGHEST EMISSION READ FOR LINE 2 WAS 29.47 uV @ 17.55MHz.

THE ATTACHED GRAPHS REPRESENT THE EMISSIONS READ FOR POWERLINE CONDUCTED FOR THIS DEVICE.

TEST RESULTS: Both lines were observed with the UUT transmitting. The measurements indicate that the unit DOES appear to meet the FCC requirements for this class of equipment.

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APPLICANT: HC TELECOM CO., LTD.

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NAME OF TEST: OCCUPIED BANDWIDTH

RULES PART NUMBER: 15.247

15.247(a)(2)

6dB bandwidth shall be at least 500 kHz. The 6dB points for both the base is 1.48MHz and handset is 1.64MHz. As shown in the accompanying plots. The bandwidth was measured at three places in the band and the narrowest is reported below.

Base 6dB Bandwidth = 1.48MHz

Handset 6 dB Bandwidth = 1.64MHz

15.247(B) PEAK POWER OUTPUT

The maximum peak output power shall not exceed 1 watt (30 dBm). If directional transmitting antennas with a gain of more than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Both the base and handsets have a maximum power output of less than 10 mW. Power was measured by disconnecting the antennas and measuring across a 50 ohm load as recommended by the manufacturer into a HP peak power meter Model 8900C. The antennas are non directional and do not exceed 6 dBi gain. The power output was measured at three places in the band highest is reported below.

POWER OUTPUT - LIMIT 30 dBm

BASE PEAK POWER OUTPUT = 10.0dBm

HANDSET PEAK POWER OUTPUT = 10.0dBm

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APPLICANT: HC TELECOM CO., LTD.
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NAME OF TEST: ANTENNA CONDUCTED SPURIOUS EMISSIONS
RULES PART NUMBER: 15.247(c) Spurious Emissions must be 20dBc.

FREQUENCY MHz	ATTENUATION dBc
BASE	
904.67	00.00
1809.20	-54.70
2713.88	-60.80
3618.56	-68.20
4523.22	-72.90

HANDSET	
920.00	00.00
1840.00	-54.80
2760.00	-54.50
3680.00	-57.20
5520.00	-72.30

The searchs were made to the tenth harmonic.

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APPLICANT: HC TELECOM CO., LTD.

FCC ID: ON7HD-950

NAME OF TEST: RADIATED SPURIOUS EMISSIONS - BASE

RULES PART NUMBER: 15.247(c)

REQUIREMENTS: Emissions that fall in the restricted bands (15.205). These emissions must be less than or equal to 500 uV/m (54 dBuV/m). Spurious not in a restricted band must be 20dBc.

TEST DATA:

EMISSION FREQUENCY MHz	METER READING AT 3 METERS dBuV	COAX LOSS dB	ANTENNA CORRECTION FACTOR dB	FIELD STRENGTH dBuV/m@3m	MARGIN dB	ANT. POL.
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BASE

904.67	70.60	2.90	24.18	97.68	29.70	H
1809.20	22.40	1.00	27.24	50.64	3.36	V
2713.88	19.90	1.14	29.78	50.82	3.18	V
3618.56	4.50	1.27	32.05	37.82	16.18	V
4523.22	0.30	1.41	33.59	35.30	18.70	V

SAMPLE CALCULATION: $FS_{dBuV/m} = MR_{dBuV} + ACF_{dB} + COAX$.

METHOD OF MEASUREMENT: The procedure used was ANSI STANDARD C63.4-1992. When an emission was found, the table was rotated to produce the maximum signal strength. The antenna was placed in both the horizontal and vertical planes and the worse case emissions were reported. The spectrum was scanned from 30 MHz to 10 GHz using a Hewlett Packard Model 8566B spectrum analyzer, a Hewlett Packard Model 85685A Preselector, a Hewlett Packard model 85650A Quasi-Peak Adaptor, an Eaton model 94455-1 Biconical Antenna, and an Electrometrics RGA-180 Horn Antenna. Low loss coax was used above 1 GHz, At the higher frequencies, the measuring antenna was moved to within 1m of the UUT to search for emissions. Measurements were made at Timco Engineering, Inc. 6051 NW 19TH Lane Gainesville, Fl.

TEST RESULTS: The unit DOES meet the FCC requirements.

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APPLICANT: HC TELECOM CO., LTD.

FCC ID: ON7HD-950

NAME OF TEST: RADIATED SPURIOUS EMISSIONS - HANDSET

RULES PART NUMBER: 15.247(c)

REQUIREMENTS: Emissions that fall in the restricted bands (15.205). These emissions must be less than or equal to 500 uV/m (54 dBuV/m). For a direct sequence spread spectrum device the limit for the fundamental is 127.38dBuV/m

TEST DATA:

EMISSION FREQUENCY MHz	METER READING AT 3 METERS dBuV	COAX LOSS dB	ANTENNA CORRECTION FACTOR dB	FIELD STRENGTH dBuV/m@3m	MARGIN dB	ANT. POL.
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HANDSET

920.00	71.30	2.90	24.12	98.32	29.70	V
1840.34	16.10	1.01	27.36	44.47	9.53	V
2761.01	14.20	1.14	29.90	45.25	8.75	V
3681.67	2.10	1.28	32.20	35.59	18.41	V
4600.80	6.30	1.42	33.68	41.40	12.60	H
5522.01	2.60	1.56	34.71	38.87	15.13	H

SAMPLE CALCULATION: $FS_{dBuV/m} = MR_{dBuV} + ACF_{dB} + COAX$.

METHOD OF MEASUREMENT: The procedure used was ANSI STANDARD C63.4-1992. When an emission was found, the table was rotated to produce the maximum signal strength. The antenna was placed in both the horizontal and vertical planes and the worse case emissions were reported. The spectrum was scanned from 30 MHz to 10 GHz using a Hewlett Packard Model 8566B spectrum analyzer, a Hewlett Packard Model 85685A Preselector, a Hewlett Packard model 85650A Quasi-Peak Adaptor, an Eaton model 94455-1 Biconical Antenna, and an Electrometrics RGA-180 Horn Antenna. Low loss coax was used above 1 GHz, At the higher frequencies, the measuring antenna was moved to within 1m of the UUT to search for emissions. Measurements were made at Timco Engineering, Inc. 6051 NW 19th Lane Gainesville, FL.

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APPLICANT: HC TELECOM CO., LTD.

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NAME OF TEST: TRANSMITTED POWER DENSITY

RULES PART NUMBER: 15.247(d)

REQUIREMENTS: The transmitted power density averaged over any 1 second interval shall not be greater than 8 dBm in any 3 kHz bandwidth within these bands.

TEST DATA:

The spectrum line spacing could not be resolved so the noise power density was measured;

	FREQUENCY	METER READING
BASE :	914.72MHz	-27.90dBm
HANDSET:	914.035MHz	-26.20dBm

Measurement Method:

Starting from the settings that were used for the 6Db bandwidth the peak signal was located and the span was reduced and the sweep time increased in a manner to maintain calibration and to keep the peak emission in the display, then once the sweep time reached 300seconds at 900KHz span the spectrum analyzer was put into the noise power mode and the plots made.

SEE ATTACHED PLOTS

NAME OF TEST: PROCESSING GAIN

RULES PART NUMBER: 15.247(e)

REQUIREMENTS: The processing gain shall be at least 10 dB.

TEST DATA:

The processing gain of this unit is 10.0dB . This information was provided by the manufacturer.

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