

Integrated Display Technology Ltd.

Application
For
Permissive Change

2.4GHz 95 Channel Frequency Hopping Spread Spectrum Cordless Phone
with Caller ID

(FCC ID: KT5-WW338)

04178941
TL/Ann Choy
December 10, 2004

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FCC ID: KT5-WW338

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MEASUREMENT/TECHNICAL REPORT

Integrated Display Technology Ltd.- MODEL: WW338(XXX)
FCC ID: KT5-WW338

This report concerns (check one) Original Grant _____ Class II Change X

Equipment Type: DSS-Part 15 Spread Spectrum Transmitter

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes _____ No X

If yes, defer until : _____
dae

Company Name agrees to notify the Commission by: _____
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? Yes _____ No X

If no, assumed Part 15, Subpart C for intentional radiator - the new 47 CFR [12-08-03 Edition] provision.

Report prepared by:

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List of attached file

Exhibit type	File Description	filename
Test Report	Test Report	report.pdf
Operation Description	Technical Description	descri.pdf
Test Setup Photo	Radiated Emission for Base	config photos.doc
Test Setup Photo	Radiated Emission for Handset	config photos.doc
Test Report	Average Channel Occupancy Time	bavetime.pdf
Test Report	Out Band Antenna Conducted Emission Plot	bobantcon.pdf, hobantcon.pdf
Test Report	Duty Cycle Calculation and Measurement	bdcc.pdf, hdcc.pdf
Test Setup Photo	Conducted Emission	config photos.doc
Test Report	Conducted Emission Test Result	conduct.pdf
External Photo	External Photo	external photos.doc
Internal Photo	Internal Photo	internal photos.doc
Block Diagram	Block Diagram	block.pdf
Schematics	Circuit Diagram	circuit.pdf
ID Label/Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf
User Manual	FCC Information	FCC information.pdf
Operation Description	Security Code Information	security code information.pdf

EXHIBIT 1
SUMMARY OF TEST RESULTS

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1.0 Summary of Test

**Integrated Display Technology Ltd.- MODEL: WW338(XXX)
FCC ID: KT5-WW338**

TEST	REFERENCE	RESULTS
Out of Band Antenna Conducted Emission	15.247(c)	Pass
Radiated Emission in Restricted Bands	15.247(c)	Pass
AC Conducted Emission	15.207	Pass
Radiated Emission from Digital Part	15.109	Pass
Antenna Requirement	15.203	Pass (See Notes)

Notes: The EUT uses a permanently attached antenna which, in accordance to Section 15.203, is considered sufficient to comply with the provisions of this section.

EXHIBIT 2
GENERAL DESCRIPTION

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2.0 **General Description**

2.1 Product Description

The WW338 is a 2.4GHz 95 Channel Frequency Hopping Spread Spectrum Cordless Phone with Caller ID. It operates at frequency range of 2401.056MHz to 2482.272MHz with 95 hopping frequencies. The unit is capable of either tone or pulse dialing. The internal power supply's isolation is accomplished through a power transformer having an adequate dielectric rating. The circuit wiring is consistent under the requirement of part 68.

The handset unit consists of a keypad with twelve standard keys (0,...9,*,#), eight function keys (MUTE/FORMAT, REDIAL/DELETE, PHBK, MEM/FLASH, UP, DOWN, SPK, INT). A Talk key is provided to control pick/release telephone line in a toggle base.

The base unit has a page key, which is used to communicate with handset unit.

The antennas used in base unit and handset are integral, and the test sample is a prototype.

The model: WW338 is one of the model: WW338(XXX), the suffix, (XXX), followed by the model number is represented color code and different packaging. The model numbers with different suffix are identical in electrical, mechanical, and physical design. The difference in suffix of model number serves as marketing strategy.

The circuit description and frequency hopping algorithm is saved with filename: descri.pdf

Connection between the device and the telephone network is accomplished through the use of USOC RJ11C in the 2-wire loop calling central office line.

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2.2 Purpose of Change

The handset and base RF modules of the Model: WW338 are identical in construction, dimensions and electrical circuits.

The main modification are as follows:

1. Change the melody chipset (U501) from OTP package to masking bonding in handset unit.
2. Change software to support four handsets.

All design including RF modules, FHSS algorithm, electronic, electrical, mechanical, PCB layout and cosmetics designs remain the same except are above-mentioned change. Hence, only the following test results are included in this report.

- i) Average Time of Occupancy
- ii) Out of Band Emission
- iii) AC Line Conducted Emission
- iv) Radiated Emission from Digital Section
- v) Transmitter Duty Cycle

2.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2001). All measurements were performed in Open Area Test Sites. Preliminary scans were performed in the Open Area Test Sites only to determine worst case modes. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application. All other measurements were made in accordance with the procedures in part 2 of CFR 47.

2.4 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located at Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong. This test facility and site measurement data have been fully placed on file with the FCC.

EXHIBIT 3
SYSTEM TEST CONFIGURATION

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3.0 **System Test Configuration**

3.1 Justification

For emission testing, the equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). During testing, all cables were manipulated to produce worst case emissions. The handset was powered by a fully charged battery. The base unit was powered by an AC adaptor.

For the measurements, the EUT is attached to a plastic stand if necessary and placed on the wooden turntable. If the base unit attaches to peripherals, they are connected and operational (as typical as possible). The handset is remotely located as far from the antenna and the base as possible to ensure full power transmission from the base. Else, the base is wired to transmit full power without modulation.

The signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Detector function is in peak mode. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000MHz. The resolution is 1MHz or greater for frequencies above 1000MHz.

Radiated emission measurement were performed from the lowest radio frequency signal generated in the device which is greater than 9kHz to 25GHz.

3.2 EUT Exercising Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use.

For emissions testing, the units were setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing.

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3.3 Support Equipment List and Description

The FCC ID's for all equipment, plus descriptions of all cables used in the tested system (included inserted cards, which have grants) are:

HARDWARE:

The unit was operated standalone. An AC adapter (provided with the unit, Model: A20940) was used to power the base unit. A rechargeable battery (provided with the unit, Model: 3SN-AAA-S-J1) was used to power the handset unit. Its description is listed below.

- (1) 1 x AC adapter for base unit (120VAC to 9VDC, 400mA) with two meter unshielded power cord permanently affixed.
- (2) 1 x 3.6VDC 750mAh Nickel Metal Hydride Rechargeable Battery.

CABLES:

- (1) Telecommunication cable with RJ11C connectors (1m, unshielded), terminated.

OTHERS:

- (1) A headset for telephone use with 1.2m unshielded cable permanently affixed. (Supplied by Intertek)

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3.4 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

3.5 Equipment Modification

Any modifications installed previous to testing by Integrated Display Technology Ltd. will be incorporated in each production model sold/leased in the United States.

No modifications were installed by ETL Division, Intertek Testing Services Hong Kong Ltd.

All the items listed under section 3.0 of this report are confirmed by:

Confirmed by:

*Tommy Leung
Supervisor
Intertek Testing Services Hong Kong Ltd.
Agent for Integrated Display Technology Ltd.*



Signature

December 12, 2004 Date

EXHIBIT 4
MEASUREMENT RESULTS

INTERTEK TESTING SERVICES

Company: Integrated Display Technology Ltd. Date of Test: October 4-November 22, 2004
Model: WW338

4.0 Measurement Results

4.1 Average Channel Occupancy Time, FCC Ref: 15.247(a)(1)

The spectrum analyzer center frequency was set to one of the known hopping channels. The SWEEP was set to 7,600ms for traffic channel with 19 element sequences and 38,000ms for dummy channel, the SPAN was set to ZERO SPAN, and the TRIGGER was set to VIDEO. The time duration of the transmission so captured was measured with the MARKER DELTA function.

The SWEEP was then set to the time required by the regulation "0.4 seconds x Number of hopping channels employed" seconds for 2400-2483.5 MHz. The analyzer was set to SINGLE SWEEP, the total ON time was added and compared against the limit (0.4 seconds).

Average 0.4 seconds maximum occupancy in 7.6 seconds, (0.4sec. x 19) for traffic channel with 19 element sequences in 2400MHz-2483.5MHz and 38 seconds, (0.4sec. x 95) for dummy channel in 2400MHz-2483.5MHz.

Base Unit	
Average Occupancy Time for Traffic Channel with 19 element sequences = $(820\mu\text{s} \times 40) \times 4$	131.2ms

Refer to attached spectrum analyzer plots B5a.1-4 and B5b.1

Remarks: Once all subscribed handsets obtained traffic channels, no dummy channel would present. This systems subscribed four handsets, so the average occupancy time would be $(820\mu\text{s} \times 40) \times 4 = 131.2\text{ms}$

For the worst case, two handsets were active in traffic channel with 95 element sequences, maybe due to interference. According to the technical specification, once all subscribed handsets were active, dummy carrier would no longer present.

In this system, four handsets were subscribed. The period for a transmission of a handset appear in a frequency channel would be $(95 \times 10\text{ms} = 950\text{ms})$, where 95 is the total number of hopping frequencies used at once in a cycle while 10ms is the length of a frame. Thus, the Average Occupancy Time for four handsets in traffic channel with 95 element sequences would be $(0.4\text{s} \times 95)$ divided by 950ms and then times 820 μs , the packet sizes, and finally multiplied by 4, i.e. $\{[(0.4\text{s} \times 95)/0.95\text{s}] \times 820\mu\text{s}\} \times 4 = 0.1312\text{s}$.

Base Unit	
Average Occupancy Time for Dummy Channel = $250\mu\text{s} \times 40$	10 ms

Refer to attached spectrum analyzer plots B5a.5 and B5b.2

Remarks: For the worst case, the basic unit would be active in dummy channel with 95 element sequences. The period for a transmission of the basic unit appear in a frequency channel would be $(95 \times 10\text{ms} = 950\text{ms})$, where 95 is the total number of hopping frequencies used at once in a cycle while 10ms is the length of a frame. Thus, the Average Occupancy Time for the base unit in dummy channel with 95 element sequences would be $(0.4\text{s} \times 95)$ divided by 950ms and then times 250 μs , the packet sizes. i.e. $[(0.4\text{s} \times 95)/0.95\text{s}] \times 250\mu\text{s} = 0.01\text{s}$

For electronic filing, the above plots are saved with filename: bavetime.pdf.

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Company: Integrated Display Technology Ltd. Date of Test: October 4-November 22, 2004
Model: WW338

4.2 Out of Band Radiated Emissions, FCC Rule 15.247(c):

In any 100 kHz bandwidth outside the EUT passband, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20 dB below that of the maximum in-band 100 kHz emission, or else shall meet the general limits for radiated emissions at frequencies outside the passband, whichever results in lower attenuation.

All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the passband.

Refer to the following plots for out of band conducted emissions data:

Plot B6a.1- B6a.2: Low Channel Emissions
Plot B6b.1- B6b.2: Middle Channel Emissions
Plot B6c.1- B6c.2: High Channel Emissions
Plot B6d.1- B6d.2: Modulation Products Emissions*
Plot H6a.1- H6a.2: Low Channel Emissions
Plot H6b.1- H6b.2: Middle Channel Emissions
Plot H6c.1- H6c.2: High Channel Emissions
Plot H6d.1- H6d.2: Modulation Products Emissions*

The plots showed the 2nd harmonic and modulation products at the band edges of 2400 MHz and 2483.5 MHz. In addition, all spurious emission and up to the tenth harmonic was measured and they were found to be at least 20 dB below the highest level of the desired power in the passband.

Furthermore, delta measurement technique for measuring bandedge emissions was incorporated in the test of the edge at 2483.5MHz.

*These 2 plots are shown the worst-case which has been already considered between enable and disable the hopping function of the EUT.

For electronic filing, the above plots are saved with filenames: bobantcon.pdf, hobantcon.pdf

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Company: Integrated Display Technology Ltd. Date of Test: October 4-November 22, 2004
Model: WW338

4.3 Out of Band Radiated Emissions (for emissions in 4.2 above that are less than 20 dB below carrier), FCC Rule 15.247(c):

For out of band emissions that are close to or that exceed the 20dB attenuation requirement described in the specification, radiated measurements were performed at a 3m separation distance to determine whether these emissions complied with the general radiated emission requirement.

- ☒ Not required, all emissions more than 20dB below fundamental
- ☐ See attached data sheet

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Company: Integrated Display Technology Ltd. Date of Test: October 4-November 22, 2004
Model: WW338

4.4 Transmitter Radiated Emissions in Restricted Bands, FCC Rule 15.35(b), (c):

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included. All measurements were performed with peak detection unless otherwise specified.

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

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Company: Integrated Display Technology Ltd. Date of Test: October 4-November 22, 2004
Model: WW338

4.5 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

$$FS = RA + AF + CF - AG + PD + AV$$

where FS = Field Strength in dB μ V/m

RA = Receiver Amplitude (including preamplifier) in dB μ V

CF = Cable Attenuation Factor in dB

AF = Antenna Factor in dB

AG = Amplifier Gain in dB

PD = Pulse Desensitization in dB

AV = Average Factor in -dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

$$FS = RA + AF + CF - AG + PD + AV$$

Example

Assume a receiver reading of 62.0 dB μ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB, and the resultant average factor was -10 dB. The net field strength for comparison to the appropriate emission limit is 32 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

$$RA = 62.0 \text{ dB}\mu\text{V}$$

$$AF = 7.4 \text{ dB}$$

$$CF = 1.6 \text{ dB}$$

$$AG = 29.0 \text{ dB}$$

$$PD = 0 \text{ dB}$$

$$AV = -10 \text{ dB}$$

$$FS = 62 + 7.4 + 1.6 - 29 + 0 + (-10) = 32 \text{ dB}\mu\text{V/m}$$

$$\text{Level in mV/m} = \text{Common Antilogarithm } [(32 \text{ dB}\mu\text{V/m})/20] = 39.8 \mu\text{V/m}$$

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Company: Integrated Display Technology Ltd. Date of Test: October 4-November 22, 2004
Model: WW338

4.6 Radiated Emission Configuration Photograph - Base Unit

Worst Case Radiated Emission
at
12005.280 MHz

For electronic filing, the worst case radiated emission configuration photographs are saved with filename: config photos.doc

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Company: Integrated Display Technology Ltd. Date of Test: October 4-November 22, 2004
Model: WW338

4.7 Radiated Emission Data - Base Unit

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

Judgement : Passed by 1.0 dB margin compare with the peak limit

TEST PERSONNEL:



Tester Signature

Ken Sit, Lead Engineer
Typed/Printed Name

December 10, 2004
Date

INTERTEK TESTING SERVICES

Company: Integrated Display Technology Ltd. Date of Test: October 4-November 22, 2004
Model: WW338
Mode : TX-Channel 0

Table 1, Base Unit

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB μ V/m)	Average Factor (-dB)	Calculated at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
V	*4802.112	65.6	34	34.0	65.6	29.7	35.9	54	-18.1
H	*12005.280	66.8	34	40.2	73.0	29.7	43.3	54	-10.7
V	*19208.448	34.7	34	45.3	46.0	29.7	16.3	54	-37.7

NOTES: 1. Peak Detector data

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna is used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function, and this is the worst-case of 1.0dB margin at 12005.280MHz.

Test Engineer: Ken Sit

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Company: Integrated Display Technology Ltd. Date of Test: October 4-November 22, 2004
Model: WW338
Mode : TX-Channel 47

Table 2, Base unit

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB μ V/m)	Average Factor (-dB)	Calculated at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
V	*4883.328	56.6	34	34.0	56.6	29.7	26.9	54	-27.1
H	*7324.992	67.0	34	37.0	70.0	29.7	40.3	54	-13.7
H	*12208.320	63.8	34	40.2	70.0	29.7	40.3	54	-13.7
V	*19533.312	34.8	34	45.3	46.1	29.7	16.4	54	-37.6

NOTES: 1. Peak Detector data

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna is used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Test Engineer: Ken Sit

INTERTEK TESTING SERVICES

Company: Integrated Display Technology Ltd. Date of Test: October 4-November 22, 2004
Model: WW338
Mode : TX-Channel 94

Table 3, Base unit

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB μ V/m)	Average Factor (-dB)	Calculated at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
V	*2482.272	110.7	34	29.1	105.8	29.7	76.1	---	---
H	*4964.544	56.1	34	34.0	56.1	29.7	26.4	54	-27.6
H	*7446.816	68.5	34	37.0	71.5	29.7	41.8	54	-12.2
H	*12411.360	61.8	34	40.2	68.0	29.7	38.3	54	-15.7
V	*19858.176	35.0	34	45.3	46.3	29.7	16.6	54	-37.4
V	*22340.448	35.5	34	45.3	46.8	29.7	17.1	54	-36.9

Result: ** Fundamental emission was measured for determining band-edge compliance of using delta measurement technique. The calculated worst-case field strength at 2483.5MHz is 21.5dB μ V/m and is passed by 32.5dB margin which in compliance with Part 15.205.

NOTES: 1. Peak Detector data

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna is used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Test Engineer: Ken Sit

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Company: Integrated Display Technology Ltd. Date of Test: October 4-November 22, 2004
Model: WW338

4.8 Radiated Emission Configuration Photograph - Handset

Worst Case Radiated Emission
at
4883.328 MHz

For electronic filing, the worst case radiated emission configuration photographs are saved with filename: config photos.doc

INTERTEK TESTING SERVICES

Company: Integrated Display Technology Ltd. Date of Test: October 4-November 22, 2004
Model: WW338

4.9 Radiated Emission Data - Handset

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

Judgement : Passed by 7.3 dB margin compare with the peak limit

TEST PERSONNEL:



Tester Signature

Ken Sit, Lead Engineer
Typed/Printed Name

December 10, 2004
Date

INTERTEK TESTING SERVICES

Company: Integrated Display Technology Ltd. Date of Test: October 4-November 22, 2004
Model: WW338
Mode : TX-Channel 0

Table 4, Handset

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB μ V/m)	Average Factor (-dB)	Calculated at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
V	*4802.112	61.0	34	34.0	61.0	41.7	19.3	54	-34.7
H	*12005.280	57.0	34	40.2	63.2	41.7	21.5	54	-32.5
V	*19208.448	34.1	34	45.3	45.4	41.7	3.7	54	-50.3

- NOTES: 1. Peak Detector data
2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna is used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Test Engineer: Ken Sit

INTERTEK TESTING SERVICES

Company: Integrated Display Technology Ltd. Date of Test: October 4-November 22, 2004
Model: WW338
Mode : TX-Channel 47

Table 5, Handset

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB μ V/m)	Average Factor (-dB)	Calculated at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	*4883.328	66.7	34	34.0	66.7	41.7	25.0	54	-29.0
H	*7324.992	62.7	34	37.0	65.7	41.7	24.0	54	-30.0
V	*12208.320	57.2	34	40.2	63.4	41.7	21.7	54	-32.3
V	*19533.312	34.4	34	45.3	45.7	41.7	4.0	54	-50.0

NOTES: 1. Peak Detector data

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna is used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function, and this is the worst-case of 7.3dB margin at 4883.328MHz.

Test Engineer: Ken Sit

INTERTEK TESTING SERVICES

Company: Integrated Display Technology Ltd. Date of Test: October 4-November 22, 2004
Model: WW338
Mode : TX-Channel 94

Table 6, Handset

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB μ V/m)	Average Factor (-dB)	Calculated at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	**2482.272	115.6	34	29.1	110.7	41.7	69.0	---	---
H	*4964.544	62.6	34	34.0	62.6	41.7	20.9	54	-33.1
H	*7446.816	60.0	34	37.0	63.0	41.7	21.3	54	-32.7
V	*12411.360	57.0	34	40.2	63.2	41.7	21.5	54	-32.5
V	*19858.176	34.6	34	45.3	45.9	41.7	4.2	54	-49.8
V	*22340.448	34.5	34	45.3	45.8	41.7	4.1	54	-49.9

Result: ** Fundamental emission was measured for determining band-edge compliance of using delta measurement technique. The calculated worst-case field strength at 2483.5MHz is 21.4dB μ V/m and is passed by 32.6dB margin which in compliance with Part 15.205.

NOTES: 1. Peak Detector data

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna is used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Test Engineer: Ken Sit

INTERTEK TESTING SERVICES

Company: Integrated Display Technology Ltd. Date of Test: October 4-November 22, 2004
Model: WW338

4.10 AC Line Conducted Emission, FCC Rule 15.207:

☐ Not required; battery operation only

☒ Test data attached

INTERTEK TESTING SERVICES

Company: Integrated Display Technology Ltd. Date of Test: October 4-November 22, 2004
Model: WW338

4.11 Line Conducted Configuration Photograph - Base

Worst Case Line-Conducted Configuration

For electronic filing, the worst case line conducted configuration photographs are saved with filename: config photos.doc

INTERTEK TESTING SERVICES

Company: Integrated Display Technology Ltd. Date of Test: October 4-November 22, 2004
Model: WW338

4.12 Line Conducted Emission Data

The data on the following pages list the significant emission frequencies, the limit, and the margin of compliance.

Judgement : Passed by more than 20 dB margin

For electronic filing, the worst case line conducted emission data are saved with filename: conduct.pdf

TEST PERSONNEL:



Tester Signature

Ken Sit, Lead Engineer

Typed/Printed Name

December 10, 2004

Date

INTERTEK TESTING SERVICES

Company: Integrated Display Technology Ltd. Date of Test: October 4-November 22, 2004
Model: WW338

4.13 Radiated Emissions from Digital Section of Transceiver (Transmitter), FCC Ref: 15.109

- ☐ Not required - No digital part
- ☒ Test results are attached
- ☐ Included in the separated DOC report.

INTERTEK TESTING SERVICES

Company: Integrated Display Technology Ltd. Date of Test: October 4-November 22, 2004
Model: WW338

Table 7, Base Unit

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
H	110.587	43.0	16	12.6	39.6	43.5	-3.9
H	124.411	44.6	16	12.8	41.4	43.5	-2.1
H	138.235	30.4	16	11.9	26.3	43.5	-17.2
H	152.059	32.1	16	11.9	28.0	43.5	-15.5
H	165.883	41.0	16	13.8	38.8	43.5	-4.7
H	179.707	32.5	16	15.5	32.0	43.5	-11.5
H	193.531	27.5	16	17.1	28.6	43.5	-14.9
H	207.373	36.8	16	11.8	32.6	43.5	-10.9
H	235.008	39.9	16	11.4	35.3	46.0	-10.7
H	248.828	39.9	16	11.4	35.3	46.0	-10.7
H	262.651	35.6	16	12.4	32.0	46.0	-14.0
H	276.476	37.9	16	13.3	35.2	46.0	-10.8
H	290.299	29.0	16	13.3	26.3	46.0	-19.7
H	331.779	31.4	16	14.6	30.0	46.0	-16.0
H	359.424	31.7	16	14.9	30.6	46.0	-15.4

- NOTES: 1. Quasi-peak detector is used for the emission below or equal to 1000 MHz.
2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna and average detector are used for the emission over 1000MHz.

Test Engineer: Ken Sit

INTERTEK TESTING SERVICES

Company: Integrated Display Technology Ltd. Date of Test: October 4-November 22, 2004
Model: WW338

Table 8, Handset

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Limit (dBμV/m)	Margin (dB)
H	55.296	28.9	16	11.0	23.9	40.0	-16.1
H	110.592	27.5	16	12.6	24.1	43.5	-19.4
H	165.888	28.5	16	13.8	26.3	43.5	-17.2
H	207.360	30.9	16	11.8	26.7	43.5	-16.8
H	235.008	32.0	16	11.4	27.4	46.0	-18.6
H	262.656	31.7	16	12.4	28.1	46.0	-17.9
H	290.304	34.0	16	13.3	31.3	46.0	-14.7
H	331.776	30.3	16	14.6	28.9	46.0	-17.1
H	373.248	30.5	16	14.9	29.4	46.0	-16.6
V	387.072	29.6	16	15.4	29.0	46.0	-17.0

- NOTES: 1. Quasi-peak detector is used for the emission below or equal to 1000 MHz
2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna and average detector are used for the emission over 1000MHz.

Test Engineer: Ken Sit

INTERTEK TESTING SERVICES

Company: Integrated Display Technology Ltd. Date of Test: October 4-November 22, 2004
Model: WW338

4.14 Transmitter Duty Cycle Calculation and Measurements, FCC Rule 15.35(b), (c)

The EUT antenna output port was connected to the input of the spectrum analyzer. The analyzer center frequency was set to EUT RF channel carrier. The SWEPT function on the analyzer was set to ZERO SPAN. The transmitter ON time was determined from the resultant time-amplitude display:

Base Unit:

$$\begin{aligned}\text{Duty cycle (DC)} &= \text{Maximum ON time in 100ms/100ms} \\ &= (820\mu\text{s} \times 4)/100\text{ms} \\ &= 0.0328\end{aligned}$$

$$\begin{aligned}\text{Duty cycle correction, dB} &= 20 * \log (\text{DC}) \\ &= 20 * \log (0.0328) \\ &= -29.7 \text{ dB}\end{aligned}$$

Remarks: Once all the subscribed handset are involved in active connections, dummy bearer would no longer exist. In this system, only four handsets would be subscribed.

Handset:

$$\begin{aligned}\text{Duty cycle (DC)} &= \text{Maximum ON time in 100ms/100ms} \\ &= 820\mu\text{s}/100\text{ms} \\ &= 0.0082\end{aligned}$$

$$\begin{aligned}\text{Duty cycle correction, dB} &= 20 * \log (\text{DC}) \\ &= 20 * \log (0.0082) \\ &= -41.7\text{dB}\end{aligned}$$

X	See attached spectrum analyzer chart (s) for transmitter timing Base Unit: Plot B7, Handset: Plot H7
	See transmitter timing diagram provided by manufacturer
	Not applicable, duty cycle was not used.

For electronic filing, the above plots are saved with filenames: bdcc.pdf, hdcc.pdf.

EXHIBIT 5
EQUIPMENT PHOTOGRAPHS

5.0 **Equipment Photographs**

For electronic filing, the photographs are saved with filename: external photos.doc & internal photos.doc

EXHIBIT 6
PRODUCT LABELLING

6.0 **Product Labelling**

For electronic filing, the FCC ID label artwork and location is saved with filename:
label.pdf

EXHIBIT 7
TECHNICAL SPECIFICATIONS

7.0 **Technical Specifications**

For electronic filing, the block diagram and circuit diagram are saved with filename: block.pdf and circuit.pdf respectively.

EXHIBIT 8
INSTRUCTION MANUAL

INTERTEK TESTING SERVICES

8.0 **Instruction Manual**

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

Please note that the required FCC Information to the User is saved with filename: FCC information.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States.

EXHIBIT 9
SECURITY CODE INFORMATION

9.0 **Security code information**

Each base and handset unit of the cordless telephone has a unique 32 bit ID code to protect against unintentional access. Those ID's are defined, controlled and programmed by the manufacturer to include date code, control code and serial number.

For electronic filing, security code information is saved with filename: security code information.pdf.