Integrated Display Technology Ltd.

Application
For
Certification

2.4GHz Frequency Hopping Spread Spectrum Cordless Phone with Caller ID and Indoor/Outdoor Temperature

(FCC ID: KT5-TW339)

04232781(S1)
TL/Ann Choy
May 2, 2005

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LIST OF EXHIBITS

MEASUREMENT/TECHNICAL REPORT

Integrated Display Technology Ltd.- MODEL: TW339H, TW339
FCC ID: KT5-TW339

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

Equipment Type: DSS-Part 15 Spread Spectrum Transmitter
CYY-Communications Receiver and w/ pt 15 Transmitter

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

If yes, defer until : _____
date

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:

Tommy Leung
Intertek Testing Services
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Table of Contents

List of attached file

Exhibit type	File Description	filename
Test Report	Test Report	report.pdf
Test Report	Maximum Output Power Plot	bmaxop.pdf, hmaxop.pdf
Test Report	20 dB Bandwidth Plot	b20dB.pdf, h20dB.pdf
Test Report	Minimum Number of Hopping Frequencies	bchno.pdf, hchno.pdf
Test Report	Minimum Hopping Channel Carrier Frequency Separation	bfsepa.pdf, hfsepa.pdf
Test Report	Average Channel Occupancy Time	bavetime.pdf, havetime.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 Report	Conducted Emission Test Result	conduct.pdf
Test Setup Photo	Radiated Emission for Base	config photos.doc
Test Setup Photo	Radiated Emission for Handset	config photos.doc
Test Setup Photo	Conducted Emission	config photos.doc
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
RF Exposure Info	RF Safety	RF exposure info.pdf
Operation Description	Technical Description	descri.pdf
Operation Description	Security Code Information	security code information.pdf

EXHIBIT 1
SUMMARY OF TEST RESULTS

1.0 Summary of Test

Integrated Display Technology Ltd.- MODEL: TW339H, TW339
FCC ID: KT5-TW339

TEST	REFERENCE	RESULTS
Max. Output Power	15.247(b)	Pass
Min. No. of Hopping Frequencies	15.247(a)(1)	Pass
Min. Hopping Channel Carrier Frequency Separation	15.247(a)(1)	Pass
Average Time of Occupancy	15.247(a)(1)	Pass
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 and 433MHz Receiver	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

2.0 **General Description**

2.1 Product Description

The TW339H is a 2.4GHz Frequency Hopping Spread Spectrum Cordless Phone with Caller ID and Indoor/Outdoor Temperature. 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,*,#), six function keys (MENU, UP/DOWN, MUTE, INT, REDIAL/PAUSE, FLASH). 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. In addition, the base unit has a 433.92MHz receiver that receives temperature and humidity data from a remote outdoor sensor.

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

The Model: TW339 is a basic package that includes a handset, a base unit, and a thermo sensor. The Model: TW339H is sold with the TW339 basic package plus an additional identical handset and an extra charger in a package. The model numbers are identical in electrical, mechanical, and physical design. The difference in 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.

2.2 Related Submittal(s) Grants

This is an application for Certification of a DSS-Part 15 Spread Spectrum Cordless Telephone System. Two transmitters and a 433MHz receiver are included in this application. The transmitter, associated with this 433MHz receiver, has FCC ID: NMTTHR228N-01 and has been filed at the same time. The device is also subject to Part 68 Registration.

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

3.0 **System Test Configuration**

3.1 Justification

For emissions testing, the equipment under test (EUT) was setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables were manipulated to produce worst case emissions. The handset was powered by a fully charged battery.

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.

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 and a battery (provided with the unit) were used to power the device. Its description is listed below.

(1) Base Unit: An AC adaptor (120VAC to 9VDC 400mA and 9VAC 200mA, Model: PI-41-735US)
(2) Handset: A “Ni-MH” type rechargeable battery (3.6V 750mAh)
(3) Extra Charger: An AC Adaptor (120VAC to 12VDC 300mA, Model: AD-1230)

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)

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
Assistant Manager
Intertek Testing Services Hong Kong Ltd.
Agent for Integrated Display Technology Ltd.

Signature

May 3, 2005 Date

EXHIBIT 4
MEASUREMENT RESULTS

Company: Integrated Display Technology Ltd. Date of Test: January 5-28, 2005
Model: TW339H

4.0 Measurement Results

4.1 Maximum Conducted Output Power at Antenna Terminals, FCC Rules 15.247(b) :

[ ] The antenna power of the EUT was connected to the input of a power meter. Power was read directly and cable loss correction was added to the reading to obtain power at the EUT antenna terminals.

[×] The antenna port of the EUT was connected to the input of a spectrum analyzer. The analyzer was set for RBW>20dB bandwidth and power was read directly in dBm. External attenuation and cable loss were compensated for using the OFFSET function of the analyser.

For antennas with gains of 6 dBi or less, maximum allowed transmitter output is 1 watt (+30 dBm).

(Base Unit) Antenna Gain = 1.5 dBi			
Frequency (MHz)		Output in dBm	Output in mWatt
Low Channel:	2401.016	25.07	321.37
Middle Channel:	2441.584	25.49	354.00
High Channel:	2482.216	26.20	416.87

Cable loss : 0.5 dB External Attenuation : N/A dB

Cable loss, external attenuation: [x] included in OFFSET function
[ ] added to SA raw reading

dBm max. output level = 26.20 dBm (30 dBm or less)

Please refer to the attached plots for details:

Plot B1a: Low Channel Output Power
Plot B1b: Middle Channel Output Power
Plot B1c: High Channel Output Power

Company: Integrated Display Technology Ltd. Date of Test: January 5-28, 2005
Model: TW339H

Maximum Conducted Output Power at Antenna Terminals, FCC Rules 15.247(b) - Continued:

(Handset Unit) Maximum Antenna Gain = 1.5 dBi			
Frequency (MHz)		Output in dBm	Output in mWatt
Low Channel:	2401.074	19.36	86.30
Middle Channel:	2441.652	19.29	84.92
High Channel:	2482.328	18.73	74.64

Cable loss : 0.5 dB External Attenuation : N/A dB

Cable loss, external attenuation: [x] included in OFFSET function
[ ] added to SA raw reading

dBm max. output level = 19.36 dBm (30 dBm or less)

Please refer to the attached plots for details:

Plot H1a: Low Channel Output Power
Plot H1b: Middle Channel Output Power
Plot H1c: High Channel output Power

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

For RF Safety, the information is saved with filename: RF exposure info.pdf.

Company: Integrated Display Technology Ltd. Date of Test: January 5-28, 2005
Model: TW339H

4.2 Maximum 20 dB RF Bandwidth, FCC Rule 15.247(a)(1):

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was chosen so that the display was a result of the hopping channel modulation. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 20 dB lower than PEAK level. The 20 dB bandwidth was determined from where the channel output spectrum intersected the display line.

(Base Unit)	
Frequency (MHz)	20 dB Bandwidth (kHz)
2441.652	708

Refer to the following plots for 20 dB bandwidth sharp:

Plot B2a: Low Channel 20 dB RF Bandwidth
Plot B2b: Middle Channel 20 dB RF Bandwidth
Plot B2c: High Channel 20 dB RF Bandwidth

For electronic filing, the above plots are saved with filename: b20dB.pdf

Company: Integrated Display Technology Ltd. Date of Test: January 5-28, 2005
Model: TW339H

4.2 Maximum 20 dB RF Bandwidth, FCC Rule 15.247(a)(1) - Continued:

(Handset Unit)	
Frequency (MHz)	20 dB Bandwidth (kHz)
2441.676 and 2482.272	708

Refer to the following plots for 20 dB bandwidth sharp:

Plot H2a: Low Channel 20 dB RF Bandwidth
Plot H2b: Middle Channel 20 dB RF Bandwidth
Plot H2c: High Channel 20 dB RF Bandwidth

For electronic filing, the above plots are saved with filename: h20dB.pdf

Company: Integrated Display Technology Ltd. Date of Test: January 5-28, 2005
Model: TW339H

4.3 Minimum Number of Hopping Frequencies, FCC Rule 15.247(a)(1)(iii) :

The RF passband of the EUT was divided into 5 approximately equal bands. With the analyzer set to MAX HOLD readings were taken for 2-3 minutes in each band. The channel peaks so recorded were added together, and the total number compared to the minimum number of channels required in the regulation.

Base Unit and Handset	
No. of hopping channels	95

Minimum Requirements: at least 15 non-overlapping channels for 2400MHz-2483.5MHz.

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

Company: Integrated Display Technology Ltd. Date of Test: January 5-28, 2005
Model: TW339H

4.4 Minimum Hopping Channel Carrier Frequency Separation, FCC Ref: 15.247(a)(1) :

Using the DELTA MARKER function of the analyzer, the frequency separation between two adjacent channels was measured and compared against the limit.

[ ] 25 kHz [x] 20 dB bandwidth of hopping channel: 708kHz

Base Unit	
Channel Separation	864 kHz

Plot B4: Channel 47 and Channel 48

Requirement: The frequency separation is more than 20dB bandwidth of hopping channel.

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

Company: Integrated Display Technology Ltd. Date of Test: January 5-28, 2005
Model: TW339H

4.4 Minimum Hopping Channel Carrier Frequency Separation, FCC Ref: 15.247(a)(1)(iii) - Continued:

Using the DELTA MARKER function of the analyzer, the frequency separation between two adjacent channels was measured and compared against the limit.

[ ] 25 kHz [x] 20 dB bandwidth of hopping channel: 708kHz

Handset	
Channel Separation	865 kHz

Plot H4: Channel 47 and Channel 48

Requirement: The frequency separation is more than 20dB bandwidth of hopping channel.

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

Company: Integrated Display Technology Ltd. Date of Test: January 5-28, 2005
Model: TW339H

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

The spectrum analyzer center frequency was set to one of the known hopping channels. The SWEEP was set to 10ms, 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 (20 seconds for 902-928 MHz devices, if the 20dB bandwidth is less than 250kHz, 10 seconds for 902-928 MHz if the 20dB bandwidth is or greater than 250kHz, "0.4 seconds x Number of hopping channels employed" seconds for 2400-2483.5 MHz, 30 seconds for 5725-5850 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 38 seconds, (0.4sec. x 95) for 2400MHz-2483.5MHz.

Base Unit (worst case 4 handsets operation)	
Average Occupancy Time = 820μs x 4 x 40	131.2 ms

Refer to attached spectrum analyzer plots B5a-e

Hanset Unit (worst case dual slot diversity operation)	
Average Occupancy Time = 820μs x 40 x 2	65.6 ms

Refer to attached spectrum analyzer plots H5a-c

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

Company: Integrated Display Technology Ltd. Date of Test: January 5-28, 2005
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4.6 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 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

Company: Integrated Display Technology Ltd. Date of Test: January 5-28, 2005
Model: TW339H

4.7 Out of Band Radiated Emissions (for emissions in 4.6 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

Company: Integrated Display Technology Ltd. Date of Test: January 5-28, 2005
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4.8 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.

Company: Integrated Display Technology Ltd. Date of Test: January 5-28, 2005
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4.9 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 dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
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 dBμV 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 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 62.0 dBμV
AF = 7.4 dB
CF = 1.6 dB
AG = 29.0 dB
PD = 0 dB
AV = -10 dB
FS = 62 + 7.4 + 1.6 - 29 + 0 + (-10) = 32 dBμV/m

Level in mV/m = Common Antilogarithm [(32 dBμV/m)/20] = 39.8 μV/m

Company: Integrated Display Technology Ltd. Date of Test: January 5-28, 2005
Model: TW339H

4.10 Radiated Emission Configuration Photograph - Base Unit

Worst Case Radiated Emission
at
12208.320 MHz

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

Company: Integrated Display Technology Ltd. Date of Test: January 5-28, 2005
Model: TW339H

4.11 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 13.0 dB margin compare with the peak limit

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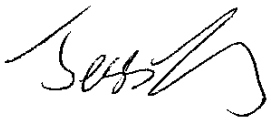
TEST PERSONNEL:



Tester Signature

Jess Tang, Engineer
Typed/Printed Name

May 2, 2005
Date

Company: Integrated Display Technology Ltd. Date of Test: January 5-28, 2005
Model: TW339H
Mode : TX-Channel 0

Table 1, Base Unit

Radiated Emissions

Polari-zation	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBμV/m)	Average Factor (-dB)	Calculated at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
H	*1200.528	50.4	34	25.5	41.9	29.6	12.3	54	-41.7
H	*3601.584	44.6	34	32.8	43.4	29.6	13.8	54	-40.2
H	*4802.112	51.7	34	34.0	51.7	29.6	22.1	54	-31.9
H	*8403.696	50.1	34	38.1	54.2	29.6	24.6	54	-29.4
H	*10804.752	48.8	34	40.0	54.8	29.6	25.2	54	-28.8
H	*12005.280	53.6	34	40.2	59.8	29.6	30.2	54	-23.8
H	*19208.448	43.0	34	45.3	54.3	29.6	24.7	54	-29.3

NOTES: 1. Peak detector is used for the emission measurement.

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 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: Jess Tang

Company: Integrated Display Technology Ltd. Date of Test: January 5-28, 2005
Model: TW339H
Mode : TX-Channel 47

Table 2, Base unit

Radiated Emissions

Polari-zation	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBμV/m)	Average Factor (-dB)	Calculated at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
H	*1220.832	50.8	34	25.5	42.3	29.6	12.7	54	-41.3
H	*3662.496	44.8	34	32.8	43.6	29.6	14.0	54	-40.0
H	*4883.328	56.3	34	34.0	56.3	29.6	26.7	54	-27.3
V	*7324.992	57.8	34	37.0	60.8	29.6	31.2	54	-22.8
H	*10987.488	49.3	34	40.0	55.3	29.6	25.7	54	-28.3
H	*12208.320	54.8	34	40.2	61.0	29.6	31.4	54	-22.6
H	*19533.312	43.4	34	45.3	54.7	29.6	25.1	54	-28.9

NOTES: 1. Peak detector is used for the emission measurement.

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 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 13.0dB margin at 12208.320MHz.

Test Engineer: Jess Tang

Company: Integrated Display Technology Ltd. Date of Test: January 5-28, 2005
Model: TW339H
Mode : TX-Channel 94

Table 3, Base unit

Radiated Emissions

Polari-zation	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBμV/m)	Average Factor (-dB)	Calculated at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
H	**2482.272	121.2	34	29.1	116.3	29.6	86.7	---	---
H	*3723.408	44.9	34	32.8	43.7	29.6	14.1	54	-39.9
H	*4964.544	55.1	34	34.0	55.1	29.6	25.5	54	-28.5
V	*7446.816	57.4	34	37.0	60.4	29.6	30.8	54	-23.2
H	*11170.224	49.1	34	40.2	55.3	29.6	25.7	54	-28.3
H	*12411.360	51.4	34	40.2	57.6	29.6	28.0	54	-26.0
H	*19858.176	43.6	34	45.3	54.9	29.6	25.3	54	-28.7
H	*22340.448	43.9	34	45.3	55.2	29.6	25.6	54	-28.4

NOTES: 1. Peak detector is used for the emission measurement.

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 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.

** Fundamental emission was measured for determining band-edge compliance of using delta measurement technique.

Test Engineer: Jess Tang

Company: Integrated Display Technology Ltd. Date of Test: January 5-28, 2005
Model: TW339H

4.12 Radiated Emission Configuration Photograph - Handset

Worst Case Radiated Emission
at
3662.496 MHz

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

Company: Integrated Display Technology Ltd. Date of Test: January 5-28, 2005
Model: TW339H

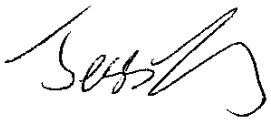
4.13 Radiated Emission Data - Handset

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

Judgement : Passed by 3.2 dB margin compare with the peak limit

****

TEST PERSONNEL:



Tester Signature

Jess Tang, Engineer
Typed/Printed Name

May 2, 2005
Date

Company: Integrated Display Technology Ltd. Date of Test: January 5-28, 2005
Model: TW339H
Mode : TX-Channel 0

Table 4, Handset

Radiated Emissions

Polari-zation	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBμV/m)	Average Factor (-dB)	Calculated at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
H	*1200.528	50.3	34	25.5	41.8	35.7	6.1	54	-47.9
H	*3601.584	71.8	34	32.8	70.6	35.7	34.9	54	-19.1
H	*4802.112	61.1	34	34.0	61.1	35.7	25.4	54	-28.6
H	*8403.696	49.9	34	38.1	54.0	35.7	18.3	54	-35.7
H	*10804.752	48.1	34	40.0	54.1	35.7	18.4	54	-35.6
H	*12005.280	54.1	34	40.2	60.3	35.7	24.6	54	-29.4
H	*19208.448	42.8	34	45.3	54.1	35.7	18.4	54	-35.6

NOTES: 1. Peak detector is used for the emission measurement.

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 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: Jess Tang

Company: Integrated Display Technology Ltd. Date of Test: January 5-28, 2005
Model: TW339H
Mode : TX-Channel 47

Table 5, Handset

Radiated Emissions

Polari-zation	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBμV/m)	Average Factor (-dB)	Calculated at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
H	*1220.832	50.4	34	25.5	41.9	35.7	6.2	54	-47.8
V	*3662.496	72.0	34	32.8	70.8	35.7	35.1	54	-18.9
H	*4883.328	62.1	34	34.0	62.1	35.7	26.4	54	-27.6
H	*7324.992	59.7	34	37.0	62.7	35.7	27.0	54	-27.0
H	*10987.488	48.2	34	40.0	54.2	35.7	18.5	54	-35.5
H	*12208.320	55.8	34	40.2	62.0	35.7	26.3	54	-27.7
H	*19533.312	43.3	34	45.3	54.6	35.7	18.9	54	-35.1

NOTES: 1. Peak detector is used for the emission measurement.

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 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 3.2dB margin at 3662.496MHz.

Test Engineer: Jess Tang

Company: Integrated Display Technology Ltd. Date of Test: January 5-28, 2005
Model: TW339H
Mode : TX-Channel 94

Table 6, Handset

Radiated Emissions

Polari-zation	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBμV/m)	Average Factor (-dB)	Calculated at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
H	**2482.272	120.0	34	29.1	115.1	35.7	79.4	---	---
V	*3723.408	71.7	34	32.8	70.5	35.7	34.8	54	-19.2
H	*4964.544	64.0	34	34.0	64.0	35.7	28.3	54	-25.7
H	*7446.816	60.0	34	37.0	63.0	35.7	27.3	54	-26.7
H	*11170.224	48.4	34	40.2	54.6	35.7	18.9	54	-35.1
H	*12411.360	55.5	34	40.2	61.7	35.7	26.0	54	-28.0
H	*19858.176	43.5	34	45.3	54.8	35.7	19.1	54	-34.9
H	*22340.448	43.8	34	45.3	55.1	35.7	19.4	54	-34.6

NOTES: 1. Peak detector is used for the emission measurement.

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 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.

** Fundamental emission was measured for determining band-edge compliance of using delta measurement technique.

Test Engineer: Jess Tang

Company: Integrated Display Technology Ltd. Date of Test: January 5-28, 2005
Model: TW339H

4.14 AC Line Conducted Emission, FCC Rule 15.207:

[ ] Not required; battery operation only

[×] Test data attached

Company: Integrated Display Technology Ltd. Date of Test: January 5-28, 2005
Model: TW339H

4.15 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

Company: Integrated Display Technology Ltd. Date of Test: January 5-28, 2005
Model: TW339H

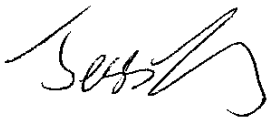
4.16 Line Conducted Emission Data

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

Jess Tang, Engineer
Typed/Printed Name

May 2, 2005
Date

Company: Integrated Display Technology Ltd. Date of Test: January 5-28, 2005
Model: TW339H

4.17 Radiated Emissions from Digital Section of Transceiver (Transmitter) and 433MHz Receiver, FCC Ref: 15.109

[ ] Not required - No digital part

[×] Test results are attached

[ ] Included in the separated DOC report.

Company: Integrated Display Technology Ltd. Date of Test: January 5-28, 2005
Model: TW339H
Mode: Talk

Table 7, Base Unit

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	33.545	29.2	16	11.6	24.8	40.0	-15.2
V	37.738	30.0	16	11.2	25.2	40.0	-14.8
V	41.931	30.4	16	11.7	26.1	40.0	-13.9
V	46.124	30.9	16	11.9	26.8	40.0	-13.2
V	50.317	32.2	16	11.7	27.9	40.0	-12.1
V	54.510	32.2	16	11.0	27.2	40.0	-12.8

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.

Test Engineer: Jess Tang

Company: Integrated Display Technology Ltd. Date of Test: January 5-28, 2005
Model: TW339H
Mode: Rx

Table 8, Base Unit

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
H	429.601	33.8	16	16.3	34.1	46.0	-11.9
H	433.236	34.3	16	16.3	34.6	46.0	-11.4
H	435.718	35.5	16	16.3	35.8	46.0	-10.2
H	438.771	34.8	16	16.3	35.1	46.0	-10.9
H	863.697	30.5	16	22.2	36.7	46.0	-9.3
H	866.114	30.3	16	22.2	36.5	46.0	-9.5

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.

Test Engineer: Jess Tang

Company: Integrated Display Technology Ltd. Date of Test: January 5-28, 2005
Model: TW339H
Mode: Talk

Table 9, Handset

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	34.641	28.5	16	11.6	24.1	40.0	-15.9
V	38.731	30.4	16	11.2	25.6	40.0	-14.4
V	43.362	31.0	16	11.7	26.7	40.0	-13.3
V	47.524	31.4	16	11.9	27.3	40.0	-12.7
V	54.148	32.1	16	11.7	27.8	40.0	-12.2
V	59.462	32.4	16	11.0	27.4	40.0	-12.6

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.

Test Engineer: Jess Tang

Company: Integrated Display Technology Ltd. Date of Test: January 5-28, 2005
Model: TW339H

4.18 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 SWEP function on the analyzer was set to ZERO SPAN. The transmitter ON time was determined from the resultant time-amplitude display:

Base Unit:

Duty cycle (DC) = Maximum ON time in 100ms/100ms
= (0.820 x 4)ms/100ms for 4 handsets operation

Duty cycle correction, dB = 20* log (DC)
= 20* log (0.328)
= -29.6 dB

Handset:

Duty cycle (DC) = Maximum ON time in 100ms/100ms
= (0.820 x 2)ms/100ms for worst case dual slot diversity operation

Duty cycle correction, dB = 20* log (DC)
= 20* log (0.0164)
= -35.7 dB

X	See attached spectrum analyzer chart (s) for transmitter timing Base Unit: Plot B7a-b, Handset: Plot H7a
	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

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 17 bits ID code (FPN) to protect against unintentional access. The FPN ID code is generated randomly in manufacturing.

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