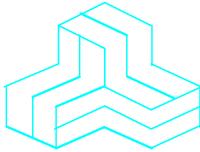


ENGINEERING TEST REPORT



WCS Transceiver Model No.: WCS-TX100

FCC ID: W3A0018423541

Applicant:

Dragonfire Group Holdings LTD.
2/F, Starlight House, #34 Leighton Road
Causeway Bay
Hong Kong

Tested in Accordance With

**FCC Part 15, Subpart C, Section 15.249
Low Power Transmitters
Operating in the Frequency Band 902 - 928 MHz**

UltraTech's File No.: DGH-003F15C249

This Test report is Issued under the Authority of
Tri M. Luu, Professional Engineer,
Vice President of Engineering
UltraTech Group of Labs

Date: January 22, 2009



Report Prepared by: Dharmajit Solanki

Tested by: Mr. Hung Trinh, EMC/RFI Technician

Issued Date: January 22, 2009

Test Dates: Oct. 31 & Dec. 21, 2008

- The results in this Test Report apply only to the sample(s) tested, and the sample tested is randomly selected.*
- This report must not be used by the client to claim product endorsement by NVLAP or any agency of the US Government.*

UltraTech

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 American National Standards Institute

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31040/SIT



C-1376



Industry Canada
Industrie Canada

Approved Test Facility
46390-2049



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**Korea
MIC-RRL**

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EXHIBIT 1. INTRODUCTION

1.1. SCOPE

Reference:	FCC Part 15, Subpart C, Section 15.249
Title:	Code of Federal Regulations (CFR), Title 47 – Telecommunication, Part 15
Purpose of Test:	To gain FCC Certification Authorization for Low Power Licensed-Exempt Transmitters operating in the Frequency Band 902 - 928 MHz.
Test Procedures:	Both conducted and radiated emissions measurements were conducted in accordance with American National Standards Institute ANSI C63.4 - American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.
Environmental Classification:	Residential

1.2. RELATED SUBMITTAL(S)/GRANT(S)

None.

1.3. NORMATIVE REFERENCES

Publication	Year	Title
FCC CFR Parts 0-19	2008	Code of Federal Regulations – Telecommunication
ANSI C63.4	2003	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
CISPR 22 EN 55022	2006 2006	Limits and Methods of Measurements of Radio Disturbance Characteristics of Information Technology Equipment
CISPR 16-1-1	2003	Specification for radio disturbance and immunity measuring apparatus and methods. Part 1-1: Measuring Apparatus
CISPR 16-2-1	2003	Specification for radio disturbance and immunity measuring apparatus and methods. Part 2-1: Conducted disturbance measurement
CISPR 16-2-3	2003	Specification for radio disturbance and immunity measuring apparatus and methods. Part 2-3: Radiated disturbance measurement

EXHIBIT 2. PERFORMANCE ASSESSMENT

2.1. CLIENT INFORMATION

APPLICANT	
Name:	Dragonfire Group Holdings LTD.
Address:	2/F, Starlight House, #34 Leighton Road Causeway Bay Hong Kong
Contact Person:	Gary Moran Phone #: +852 8107 6997 Fax #: +852 3010 0696 Email Address: garymoran@dragonfiregroup.com

MANUFACTURER	
Name:	Dragonfire Group Holdings LTD.
Address:	2/F, Starlight House, #34 Leighton Road Causeway Bay Hong Kong
Contact Person:	Gary Moran Phone #: +852 8107 6997 Fax #: +852 3010 0696 Email Address: garymoran@dragonfiregroup.com

2.2. EQUIPMENT UNDER TEST (EUT) INFORMATION

The following information (with the exception of the Date of Receipt) has been supplied by the applicant.

Brand Name:	Dragonfire Group Holdings LTD.
Product Name:	WCS Transceiver
Model Name or Number:	WCS-TX100
Serial Number:	Test Sample
Type of Equipment:	Low Power Transceiver
Input Power Supply Type:	5V, 500mA from 100-240 VAC Switching Adaptor
Primary User Functions of EUT:	Will Call System (WCS) for locating product inventory

2.3. EUT'S TECHNICAL SPECIFICATIONS

TRANSMITTER	
Equipment Type:	Base Station
Intended Operating Environment:	Commercial
Power Supply Requirement:	5 VDC, 500 mA via 100-240 VAC 50/60 Hz AC Switching Adaptor
RF Output Power Rating:	83.02 dB μ V/m Peak at 3m distance
Operating Frequency:	905.5 to 905.8 MHz
RF Output Impedance:	50 Ohms
20 dB Bandwidth:	212.42 kHz
Modulation Type:	FSK
Emission Designation:	F1D
Oscillator Frequencies:	14.1509 MHz
Antenna Type:	Integral (Permanently mounted on the PCB)
Antenna Description:	Manufacturer: Dragonfire Group Holdings LTD. Type: Inverted F PCB Antenna Model: IFA Transceiver 20080901A (WCS-TX100) Frequency Range: 902 – 920 MHz In/Out Impedance: 50 Ohms

2.4. LIST OF EUT'S PORTS

Port Number	EUT's Port Description	Number of Identical Ports	Connector Type	Cable Type (Shielded/Non-shielded)
1	Ethernet Cable	1	RJ 45	Shielded
2	DC Power (base station)	1	Power Jack	Non-shielded

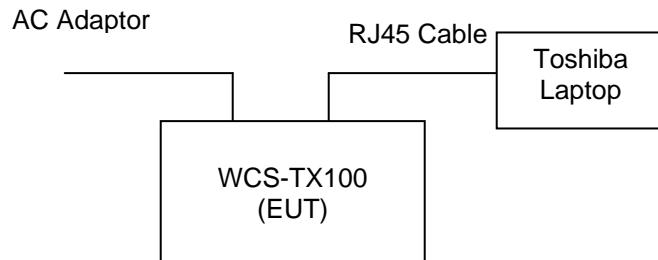
2.5. ANCILLARY EQUIPMENT

Ancillary Equipment # 1	
Brand name:	Toshiba
Model Name or Number:	1605CDS
Serial Number:	1027387CU
Connected to EUT's Port:	RJ 45

Ancillary Equipment # 2	
Brand name:	Switching Adaptor
Model Name or Number:	FJ-SW1280D004
Connected to EUT's Port:	Power Jack

2.6. GENERAL TEST SETUP

Transmitter Tests



Power Line Conducted Emissions

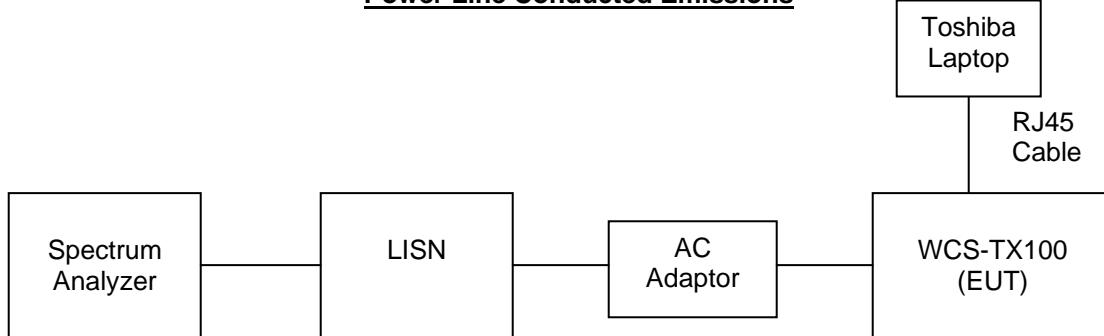


EXHIBIT 3. EUT OPERATING CONDITIONS AND CONFIGURATIONS DURING TESTS

3.1. CLIMATE TEST CONDITIONS

The climate conditions of the test environment are as follows:

Temperature:	21°C
Humidity:	51%
Pressure:	102 kPa
Power input source:	5 VDC, 500 mA via 100-240 VAC 50/60 Hz AC Switching Adaptor

3.2. OPERATIONAL TEST CONDITIONS & ARRANGEMENT FOR TESTS

Operating Modes:	EUT was configured to transmit continuously for emissions measurements.
Special Test Software:	Test software to transmit continuously
Special Hardware Used:	Toshiba Laptop
Transmitter Test Antenna:	The EUT is tested with the antenna fitted in a manner typical of normal intended use as integral antenna equipment.

Transmitter Test Signals:	
Frequency Band(s):	905.5 to 905.8 MHz
Test Frequency(ies):	905.64 MHz
Transmitter Wanted Output Test Signals:	
• RF Power Output (measured maximum output power):	83.02 dB μ V/m Peak at 3m distance
• Normal Test Modulation:	FSK
• Modulating signal source:	Internal

EXHIBIT 4. SUMMARY OF TEST RESULTS

4.1. LOCATION OF TESTS

All of the measurements described in this report were performed at Ultratech Group of Labs located in the city of Oakville, Province of Ontario, Canada.

- AC Power Line Conducted Emissions were performed in UltraTech's shielded room, 24'(L) by 16'(W) by 8'(H).
- Radiated Emissions were performed at the Ultratech's 3-10 Meter Open Field Test Site (OFTS) situated in the Town of Oakville, province of Ontario. This test site has been calibrated in accordance with ANSI C63.4, and found to be in compliance with the requirements of Sec. 2.948 of the FCC Rules. The descriptions and site measurement data of the Oakville Open Field Test Site has been filed with FCC office (FCC File No.: 31040/SIT 1300B3) and Industry Canada office (Industry Canada File No.: IC2049). Last Date of Site Calibration: May 17, 2007.

4.2. APPLICABILITY & SUMMARY OF EMC EMISSION TEST RESULTS

FCC Section(s)	Test Requirements	Compliance (Yes/No)
15.107(a) & 15.207	Power Line Conducted Emissions	Yes
--	20 dB Bandwidth	Yes
15.203	Antenna Requirement	Yes (Permanently mounted on the PCB)
15.249(a), 15.209, 15.205	Transmitter Radiated Emissions, Harmonic Emissions	Yes

4.3. MODIFICATIONS INCORPORATED IN THE EUT FOR COMPLIANCE PURPOSES

None.

EXHIBIT 5. MEASUREMENTS, EXAMINATIONS & TEST DATA FOR EMC EMISSIONS

5.1. TEST PROCEDURES

This section contains test results only. Details of test methods and procedures can be found in ANSI C63.4 and ULTR-P001-2004.

5.2. MEASUREMENT UNCERTAINTIES

The measurement uncertainties stated were calculated in accordance with requirements of UKAS Document LAB 34 with a confidence level of 95%. Please refer to Exhibit 6 for Measurement Uncertainties.

5.3. MEASUREMENT EQUIPMENT USED

The measurement equipment used complied with the requirements of the Standards referenced in the Methods & Procedures ANSI C63.4 and CISPR 16-1.

5.4. ESSENTIAL/PRIMARY FUNCTIONS AS DECLARED BY THE MANUFACTURER

Will Call System (WCS) for locating product inventory.

5.5. POWER LINE CONDUCTED EMISSIONS [47 CFR 15.107(a) & 15.207]

5.5.1. Limits

The equipment shall meet the limits of the following table:

Test Frequency Range (MHz)	Class B Limits		Measuring Bandwidth
	Quasi-Peak (dB μ V)	Average (dB μ V)	
0.15 to 0.5	66 to 56*	56 to 46*	RBW = 9 kHz VBW \geq 9 kHz for QP VBW = 1 Hz for Average
0.5 to 5	56	46	RBW = 9 kHz VBW \geq 9 kHz for QP VBW = 1 Hz for Average
5 to 30	60	50	RBW = 9 kHz VBW \geq 9 kHz for QP VBW = 1 Hz for Average

* Decreasing linearly with logarithm of frequency.

5.5.2. Method of Measurements

Refer to Ultratech Test Procedures, File # ULTR P001-2004 and ANSI C63.4 for measurement methods

5.5.3. Test Equipment List

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range
Spectrum Analyzer/ EMI Receiver	Hewlett Packard	HP 8593EM	3412A00103	9 kHz – 26.5 GHz
Transient Limiter	Hewlett Packard	11947A	310701998	9 kHz – 200 MHz 10 dB attenuation
L.I.S.N.	EMCO	3825/2	89071531	9 kHz – 200 MHz 50 Ohms / 50 μ H
RF Shielded Chamber	RF Shielding	--	--	--

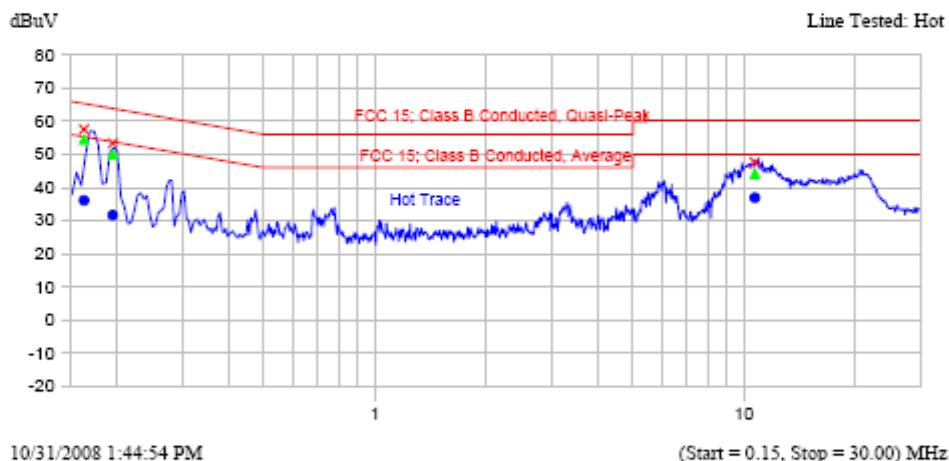
5.5.4. Test Data

See the following plots for detailed measurements.

Plot 5.5.4.1: Power Line Conducted Emissions
Line Tested: Line 1, Line Voltage: 120 VAC 60 Hz
Mode1: Transmitter & Receiver ON, No Transmission

Description: Supply Voltage 120 Vac
Transceiver - Transmitter and receiver ON, no transmission
Setup Name: FCC 15 Class B
Customer Name: DRAGONFIRE GROUP HOLDINGS LIMITED
Project Number: DGH-003Q
Operator Name: Nimisha
EUT Name: Will Call System
Date Created: 10/31/2008 1:30:20 PM
Date Modified: 10/31/2008 1:48:53 PM

Current Graph



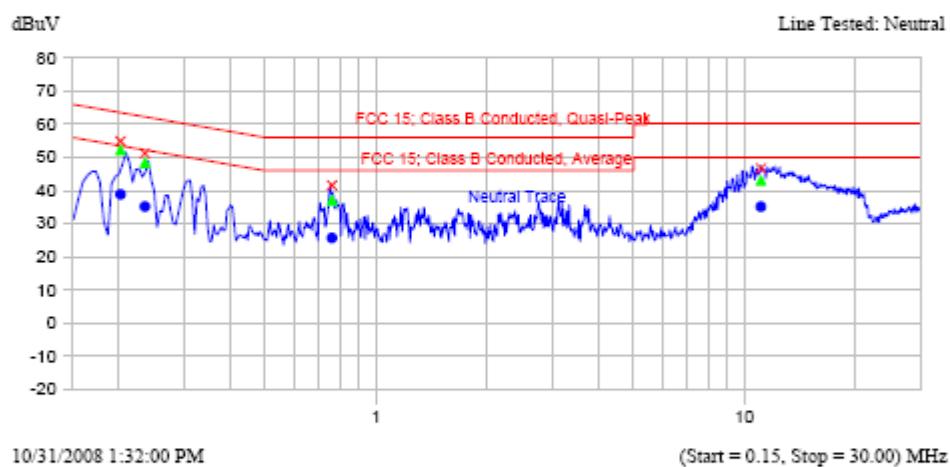
Current List

Frequency MHz	Peak dBuV	QP dBuV	Delta QP-QP Limit dB	Avg dBuV	Delta Avg-Avg Limit dB	Trace Name
0.163	57.6	54.5	-11.1	36.1	-19.5	Hot Trace
0.195	53.4	50.0	-14.7	31.6	-23.0	Hot Trace
10.711	47.6	44.2	-15.8	36.9	-13.1	Hot Trace

Plot 5.5.4.2: Power Line Conducted Emissions
Line Tested: Line 2, Line Voltage: 120 VAC 60 Hz
Mode1: Transmitter & Receiver ON, No Transmission

Description: Supply Voltage 120 Vac
Transceiver - Transmitter and receiver ON , no transmission
Setup Name: FCC 15 Class B
Customer Name: DRAGONFIRE GROUP HOLDINGS LIMITED
Project Number: DGH-003Q
Operator Name: Nimisha
EUT Name: Will Call System
Date Created: 10/31/2008 1:30:20 PM
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Current Graph



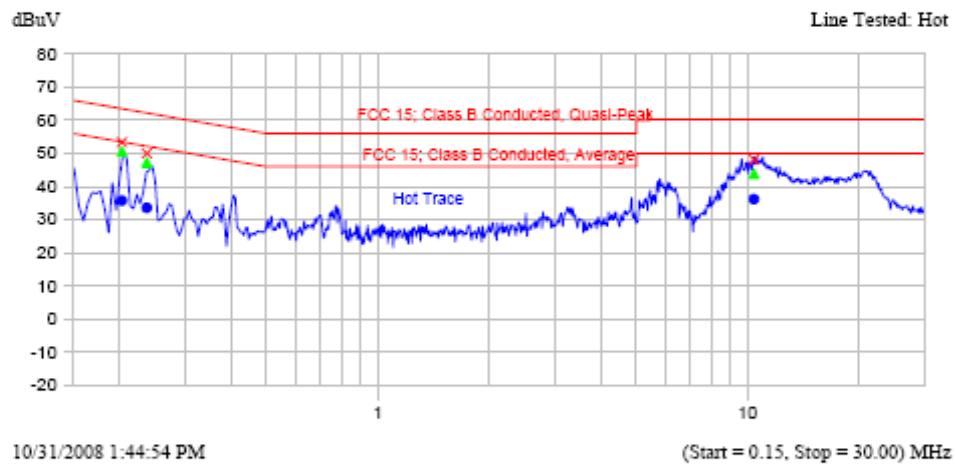
Current List

Frequency MHz	Peak dBuV	QP dBuV	Delta QP-QP Limit dB	Avg dBuV	Delta Avg-Avg Limit dB	Trace Name
0.202	54.8	52.2	-12.2	38.8	-15.6	Neutral Trace
0.236	51.2	48.4	-15.1	35.2	-18.3	Neutral Trace
0.759	41.6	37.1	-18.9	25.7	-20.3	Neutral Trace
11.082	46.7	43.1	-16.9	35.1	-14.9	Neutral Trace

Plot 5.5.4.3: Power Line Conducted Emissions
Line Tested: Line 1, Line Voltage: 120 VAC 60 Hz
Mode2: Transmitter & Receiver ON, Transmission ON

Description: Supply Voltage 120 Vac
Transceiver - Transmitter and receiver ON, transmission ON
Setup Name: FCC 15 Class B
Customer Name: DRAGONFIRE GROUP HOLDINGS LIMITED
Project Number: DGH-003Q
Operator Name: Nimisha
EUT Name: Will Call System
Date Created: 10/31/2008 1:30:20 PM
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Current Graph



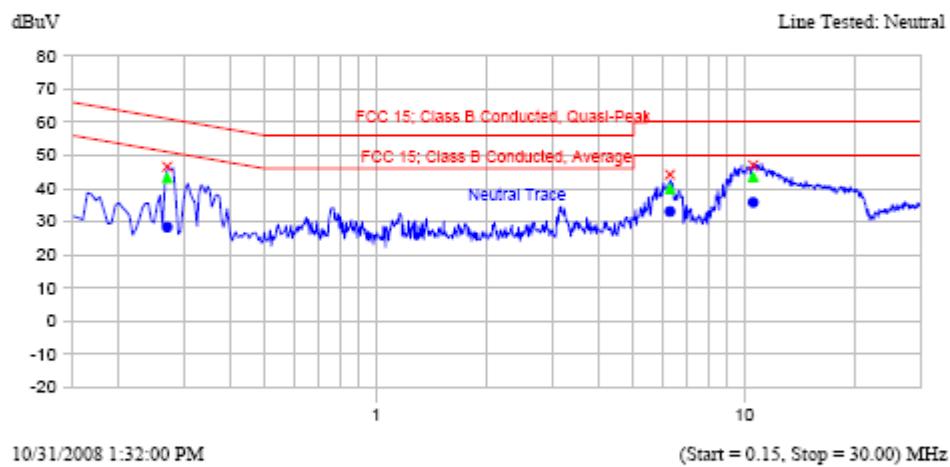
Current List

Frequency MHz	Peak dBuV	QP dBuV	Delta QP-QP Limit dB	Avg dBuV	Delta dB	Avg-Avg Limit dB	Trace Name
0.203	53.3	50.6	-13.8	35.7	-18.7		Hot Trace
0.237	50.0	47.2	-16.2	33.6	-19.9		Hot Trace
10.408	48.1	43.9	-16.1	36.2	-13.8		Hot Trace

Plot 5.5.4.4: Power Line Conducted Emissions
Line Tested: Line 2, Line Voltage: 120 VAC 60 Hz
Mode2: Transmitter & Receiver ON, Transmission ON

Description: Supply Voltage 120 Vac
Transceiver - Transmitter and receiver ON, transmission ON
Setup Name: FCC 15 Class B
Customer Name: DRAGONFIRE GROUP HOLDINGS LIMITED
Project Number: DGH-003Q
Operator Name: Nimisha
EUT Name: Will Call System
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Date Modified: 10/31/2008 2:05:40 PM

Current Graph



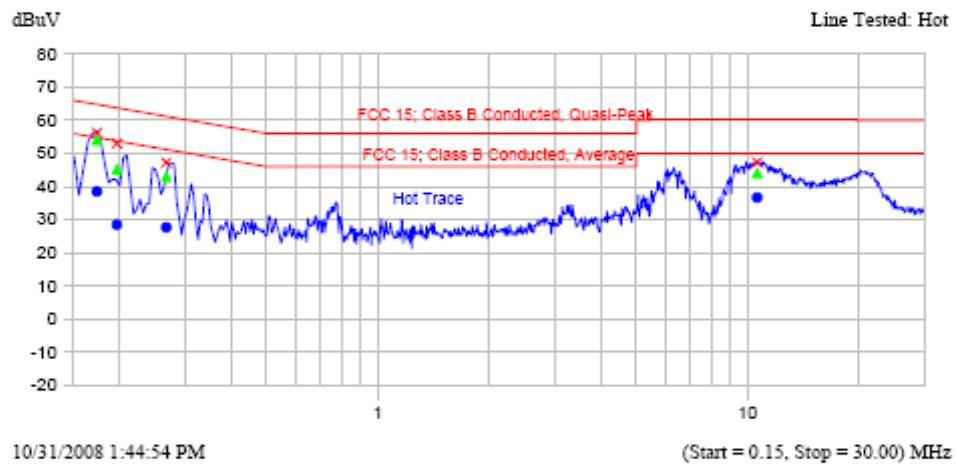
Current List

Frequency MHz	Peak dBuV	QP dBuV	Delta QP-QP Limit dB	Avg dBuV	Delta dB	Avg-Avg Limit dB	Trace Name
0.271	46.6	43.2	-19.3	28.3	-24.1		Neutral Trace
6.284	44.2	39.9	-20.1	33.1	-16.9		Neutral Trace
10.567	47.1	43.5	-16.5	35.8	-14.2		Neutral Trace

Plot 5.5.4.5: Power Line Conducted Emissions
Line Tested: Line 1, Line Voltage: 120 VAC 60 Hz
Mode3: Transmitter & Receiver ON, Transmission ON, Rx Receiving

Description: Supply Voltage 120 Vac
Transceiver - Transmitter and receiver ON, transmission ON, Receiver enabled
Setup Name: FCC 15 Class B
Customer Name: DRAGONFIRE GROUP HOLDINGS LIMITED
Project Number: DGH-003Q
Operator Name: Nimisha
EUT Name: Will Call System
Date Created: 10/31/2008 1:30:20 PM
Date Modified: 10/31/2008 2:25:24 PM

Current Graph



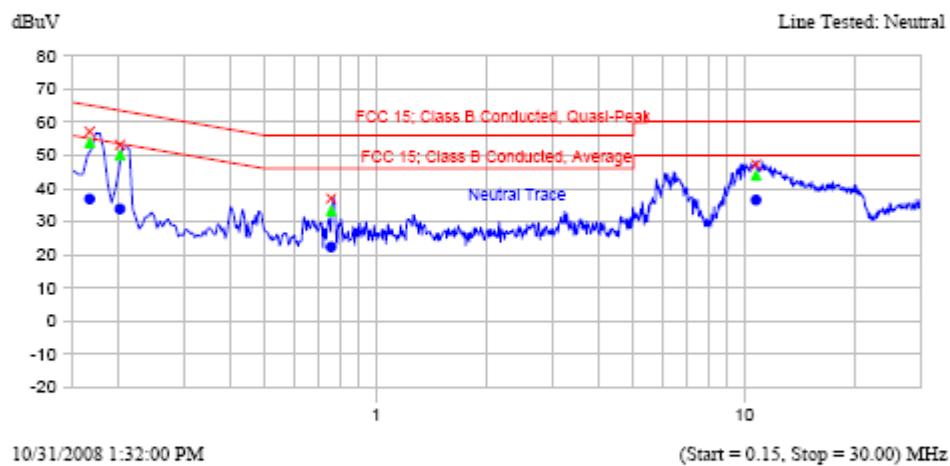
Current List

Frequency MHz	Peak dBuV	QP dBuV	Delta QP-QP Limit dB	Avg dBuV	Delta dB	Avg-Avg Limit dB	Trace Name
0.174	56.2	54.0	-11.3	38.5	-16.8		Hot Trace
0.197	53.1	45.2	-19.4	28.5	-26.1		Hot Trace
0.268	47.2	43.0	-19.5	27.7	-24.9		Hot Trace
10.624	47.3	44.0	-16.0	36.7	-13.3		Hot Trace

Plot 5.5.4.6: Power Line Conducted Emissions
Line Tested: Line 2, Line Voltage: 120 VAC 60 Hz
Mode3: Transmitter & Receiver ON, Transmission ON, Rx Receiving

Description: Supply Voltage 120 Vac
Transceiver - Transmitter and receiver ON, transmission ON, Receiver enabled
Setup Name: FCC 15 Class B
Customer Name: DRAGONFIRE GROUP HOLDINGS LIMITED
Project Number: DGH-003Q
Operator Name: Nimisha
EUT Name: Will Call System
Date Created: 10/31/2008 1:30:20 PM
Date Modified: 10/31/2008 2:16:26 PM

Current Graph



Current List

Frequency MHz	Peak dBuV	QP dBuV	Delta QP-QP Limit dB	Avg dBuV	Delta dB	Avg-Avg Limit dB	Trace Name
0.167	57.2	53.9	-11.7	36.8	-18.7		Neutral Trace
0.202	53.2	50.0	-14.4	33.9	-20.6		Neutral Trace
0.755	37.0	33.3	-22.7	22.3	-23.7		Neutral Trace
10.765	47.3	43.9	-16.1	36.5	-13.5		Neutral Trace

5.6. 20 dB BANDWIDTH

5.6.1. Limits

No limit. Test is performed for information only.

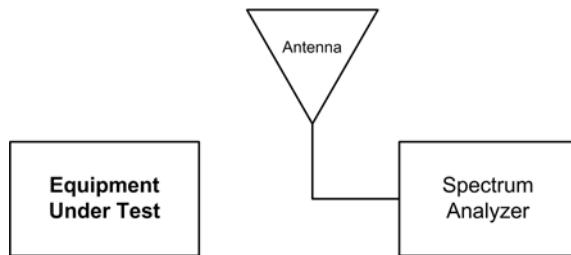
5.6.2. Method of Measurements

The transmitter output was loosely coupled to the spectrum analyzer through a receiving antenna and the bandwidth of the fundamental frequency was measured with the spectrum analyzer with the resolution bandwidth of the spectrum analyzer set per ANSI 63.4

5.6.3. Test Equipment List

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range
Spectrum Analyzer	Rohde & Schwarz	FSEK20/B4/B21	834157/005	9 kHz- 40 GHz
Log Periodic	EMCO	3148	23845	200 MHz – 2 GHz

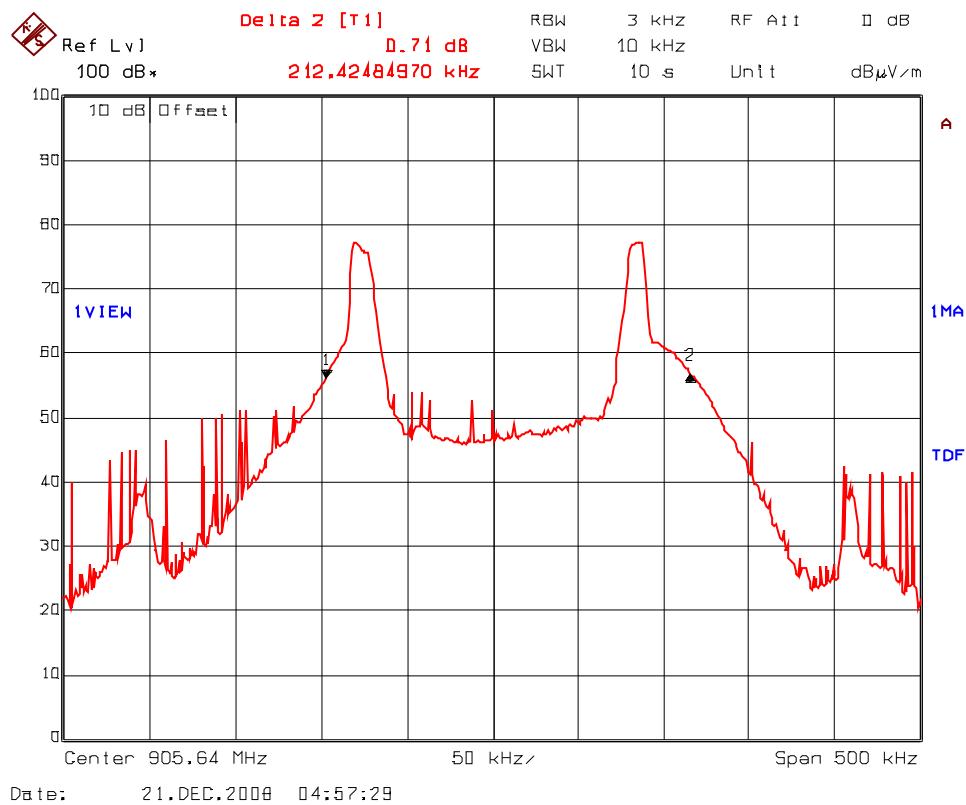
5.6.4. Test Arrangement



5.6.5. Test Data

Frequency (MHz)	20 dB Bandwidth (kHz)
905.64	212.42

Plot 5.6.5.1: 20 dB Bandwidth
Test Frequency: 905.64 MHz



Note: This transmitter has two carriers continuously transmitting at 905.5 & 905.8 MHz as shown in the above plot.

5.7. FUNDAMENTAL FIELD STRENGTH AND HARMONIC EMISSIONS (RADIATED @ 3 METERS) [47 CFR 15.249(a), 15.209 & 15.205]

5.7.1. Limits

- The Field Strength of emissions from intentional radiators operated within this frequency band shall comply with the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental (mV/m)	Field Strength of Harmonics (μV/m)
902 - 928	50	500

- The fundamental frequency shall not fall within any restricted frequency band specified in 15.205. All rf other emissions that fall in the restricted bands shall not exceed the general radiated emission limits specified in 15.209(a).

FCC 47 CFR 15.205(a)
 -- Restricted Frequency Bands --

MHz	MHz	MHz	GHz
0.090 - 0.110	162.0125 - 167.17	2310 - 2390	9.3 - 9.5
0.49 – 0.51	167.72 - 173.2	2483.5 - 2500	10.6 - 12.7
2.1735 - 2.1905	240 - 285	2655 - 2900	13.25 - 13.4
8.362 - 8.366	322 - 335.4	3260 - 3267	14.47 - 14.5
13.36 - 13.41	399.9 - 410	3332 - 3339	14.35 - 16.2
25.5 – 25.67	608 - 614	3345.8 - 3358	17.7 - 21.4
37.5 – 38.25	960 - 1240	3600 - 4400	22.01 - 23.12
73 - 75.4	1300 - 1427	4500 - 5250	23.6 - 24.0
108 – 121.94	1435 - 1626.5	5350 - 5460	31.2 - 31.8
123 – 138	1660 - 1710	7250 - 7750	36.43 - 36.5
149.9 – 150.05	1718.8 - 1722.2	8025 - 8500	Above 38.6
156.7 – 156.9	2200 – 2300	9000 - 9200	

FCC 47 CFR 15.209(a)
 -- Field Strength Limits within Restricted Frequency Bands --

Frequency (MHz)	Field Strength Limits (μV/m)	Distance (Meters)
0.009 - 0.490	2,400 / F (KHz)	300
0.490 - 1.705	24,000 / F (KHz)	30
1.705 - 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 – 960	200	3
Above 960	500	3

5.7.2. Method of Measurements

Refer to Ultratech Test Procedures, File # ULTR P001-2004 and ANSI C63.4 for measurement methods

5.7.3. Test Equipment List

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range
Spectrum Analyzer/ EMI Receiver	Rohde & Schwarz	FSEK20/B4/B21	834157/005	9 kHz – 40 GHz with external mixer
Microwave Amplifier	Hewlett Packard	HP 83017A		1 GHz to 26.5 GHz
Biconilog Antenna	EMCO	3143	1029	20 MHz to 2 GHz
Horn Antenna	EMCO	3155	9701-5061	1 GHz – 18 GHz

5.7.4. Test Data

The emissions were scanned from 30 MHz to 10 GHz and all emissions within 20 dB below the limits were recorded.

Frequency (MHz)	Peak E-Field @3m (dB μ V/m)	Average E-Field @3m (dB μ V/m)	Antenna Plane (H/V)	Field Strength Limit of Fundamental/Harmonic (dB μ V/m)	Field Strength Limit of § 15.209 (dB μ V/m)	Margin (dB)
905.64*	78.75	--	V	94.00	--	-15.25
905.64*	83.02	--	H	94.00	--	-10.97
1811.28	48.96	36.71	V	54.00	54.00	-17.29
1811.28	51.60	47.90	H	54.00	54.00	-6.10
2716.92	46.58	34.54	V	54.00	54.00	-19.46
2716.92	47.41	41.48	H	54.00	54.00	-12.52
3622.56	56.26	52.45	V	54.00	54.00	-1.55
3622.56	57.21	53.19	H	54.00	54.00	-0.81
4528.20	49.41	39.65	V	54.00	54.00	-14.35
4528.20	48.75	39.13	H	54.00	54.00	-14.87

* Note: This transmitter has two carriers continuously transmitting at 905.5 & 905.8 MHz, i.e. 300 kHz bandwidth, hence we have measured the combined field strength of both signal to show compliance with 15.249 limits as worst case by using RBW equal to 1MHz.

EXHIBIT 6. MEASUREMENT UNCERTAINTY

The measurement uncertainties stated were calculated in accordance with the requirements of NIST Technical Note 1297 and LAB 34

6.1. LINE CONDUCTED EMISSION MEASUREMENT UNCERTAINTY

CONTRIBUTION (Line Conducted)	PROBABILITY DISTRIBUTION	UNCERTAINTY (dB)	
		9-150 kHz	0.15-30 MHz
EMI Receiver specification	Rectangular	± 1.5	± 1.5
LISN coupling specification	Rectangular	± 1.5	± 1.5
Cable and Input Transient Limiter calibration	Normal (k=2)	± 0.3	± 0.5
Mismatch: Receiver VRC $\Gamma_1 = 0.03$ LISN VRC $\Gamma_R = 0.8(9 \text{ kHz}) 0.2 (30 \text{ MHz})$ Uncertainty limits $20\text{Log}(1+\Gamma_1\Gamma_R)$	U-Shaped	± 0.2	± 0.3
System repeatability	Std. deviation	± 0.2	± 0.05
Repeatability of EUT	--	--	--
Combined standard uncertainty	Normal	± 1.25	± 1.30
Expanded uncertainty U	Normal (k=2)	± 2.50	± 2.60

Sample Calculation for Measurement Accuracy in 450 kHz to 30 MHz Band:

$$u_c(y) = \sqrt{\sum_{i=1}^m u_i^2(y)} = \pm \sqrt{(1.5^2 + 1.5^2)/3 + (0.5/2)^2 + (0.05/2)^2 + 0.35^2} = \pm 1.30 \text{ dB}$$

$$U = 2u_c(y) = \pm 2.6 \text{ dB}$$

6.2. RADIATED EMISSION MEASUREMENT UNCERTAINTY

CONTRIBUTION (Radiated Emissions)	PROBABILITY DISTRIBUTION	UNCERTAINTY (\pm dB)	
		3 m	10 m
Antenna Factor Calibration	Normal (k=2)	± 1.0	± 1.0
Cable Loss Calibration	Normal (k=2)	± 0.3	± 0.5
EMI Receiver specification	Rectangular	± 1.5	± 1.5
Antenna Directivity	Rectangular	± 0.5	± 0.5
Antenna factor variation with height	Rectangular	± 2.0	± 0.5
Antenna phase center variation	Rectangular	0.0	± 0.2
Antenna factor frequency interpolation	Rectangular	± 0.25	± 0.25
Measurement distance variation	Rectangular	± 0.6	± 0.4
Site imperfections	Rectangular	± 2.0	± 2.0
Mismatch: Receiver VRC $\Gamma_1 = 0.2$ Antenna VRC $\Gamma_R = 0.67(Bi)$ 0.3 (Lp) Uncertainty limits $20\log(1+\Gamma_1\Gamma_R)$	U-Shaped	± 1.1 -1.25	± 0.5
System repeatability	Std. Deviation	± 0.5	± 0.5
Repeatability of EUT		-	-
Combined standard uncertainty	Normal	+2.19 / -2.21	+1.74 / -1.72
Expanded uncertainty U	Normal (k=2)	+4.38 / -4.42	+3.48 / -3.44

Calculation for maximum uncertainty when 3m biconical antenna including a factor of k = 2 is used:

$$U = 2u_c(y) = 2x(+2.19) = +4.38 \text{ dB} \quad \text{And} \quad U = 2u_c(y) = 2x(-2.21) = -4.42 \text{ dB}$$