

Issuing Laboratory:
Intertek Testing Services Hong Kong Limited

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TEST REPORT

Report Number: 13121190HKG-002

Application
for
Original Grant of 47 CFR Part 15 Certification

Intelligent Executive Business SIP Phone

FCC ID: MZVIPX-500

Prepared and Checked by:

A handwritten signature in black ink, appearing to read 'James'.

Yeung Yung Fai, James
Engineer

Approved by:

A handwritten signature in black ink, appearing to read 'Melvin'.

Nip Ming Fung, Melvin
Assistant Manager
March 17, 2014

- The test report only allows to be revised within the retention period unless further standard or the requirement was noticed.
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Intertek Testing Services Hong Kong Ltd.

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GENERAL INFORMATION

Applicant Name:	Telefield Ltd.
Applicant Address:	Flat D, 2/F., Valiant Industrial Centre, 2-12 Au Pui Wan Street, Fo Tan, New Territories, Hong Kong.
FCC Specification Standard:	FCC Part 15, October 1, 2012 Edition
FCC ID:	MZVIPX-500
Brand:	RCA, TELEFIELD
FCC Model(s):	IPX500, IPX500X, IPX500XX, IPX500XXX, IPX500XXX-X, IPX500TC, IPX500TCX, IPX500TCXX, IPX500TCXXX, IPX500TCXXX-X
Type of EUT:	Class B Personal Computers and Peripherals
Description of EUT:	Intelligent Executive Business SIP Phone
Serial Number:	N/A
Sample Receipt Date:	December 31, 2013
Date of Test:	March 05-13, 2014
Report Date:	March 17, 2014
Environmental Conditions:	Temperature: +10 to 40°C Humidity: 10 to 90%

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EXHIBIT 1
TEST RESULTS SUMMARY & STATEMENT OF COMPLIANCE

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1.0 Test Results Summary & Statement of Compliance

1.1 Summary of Test Results

Test Items	FCC Part 15 Section	Results	Details see section
Radiated Emission from Class B Personal Computers and Peripherals	15.109	Pass	4.2
AC Power Line Conducted Emission	15.107	Pass	4.3

1.2 Statement of Compliance

The equipment under test is found to be complying with the following standard:

FCC Part 15, October 1, 2012 Edition

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EXHIBIT 2 GENERAL DESCRIPTION

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2.0 General Description

2.1 Product Description

The IPX500 is a intelligent executive business SIP phone. The EUT is powered by an adaptor 100-240VAC 50/60Hz 0.4A to 5.5VDC 2000mA.

For FCC, The Model(s): IPX500X, IPX500XX, IPX500XXX, IPX500XXX-X, IPX500TC, IPX500TCX, IPX500TCXX, IPX500TCXXX and IPX500TCXXX-X are the same as the Model: IPX500 in electronics/electrical designs including software & firmware, PCB layout and construction design/physical design/enclosure. The only differences between these models are model number, cosmetic details and packing configuration to be sold for marketing purpose. 1st Suffix (X) indicates different brand and color, 2nd suffix (X) indicate different package type, 3rd suffix (X) indicate different number of corded handsets and 4th suffix (X) indicate different version of models.

The circuit description is saved with filename: descri.pdf.

2.2 Test Methodology

Both AC power line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2009). Preliminary radiated scans and all radiated measurements were performed in Open Area Test Sites. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

2.3 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data and conducted data are at Roof Top and 2nd Floor respectively of Intertek Testing Services Hong Kong Ltd., which 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.

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EXHIBIT 3
SYSTEM TEST CONFIGURATION

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3.0 **System Test Configuration**

3.1 Justification

For radiated emissions testing, the equipment under test (EUT) was setup to normal mode to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables (if any) were manipulated to produce worst case emissions.

The EUT was powered by a 100-240VAC 50/60Hz 0.4A to 5.5VDC 2000mA adaptor.

If the EUT attached to peripherals, they were connected and operational to simulate typical use. For the measurements, the EUT was attached to a plastic stand if necessary and placed on the wooden turntable.

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

For radiated measurement, the spectrum analyzer resolution bandwidth was 100 kHz for frequencies below 1000 MHz.

Radiated emission measurement was performed from the frequency 30MHz to 1GHz.

The EUT can be powered by Power adaptor and/or powered over Ethernet. Both cases have been checked, and the data in this report represented the worst-case.

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3.1 Justification - Cont'd

Detector function for radiated emissions is in peak mode.

For AC line conducted emission test, the EUT along with its peripherals were placed on a 1.0m(W)x1.5m(L) and 0.8m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane. The EUT power cord connected to one LISN (Line impedance stabilization network), which provided 50ohm coupling impedance for measuring instrument. Meanwhile, the peripheral or support equipment power cords connected to a separate LISN. The ac power for all LISNs were obtained from the same power source. The LISN housing, measuring instrument case, reference ground plane, and vertical ground plane were bounded together. The excess power cable between the EUT and the LISN was bundled. Power cords of non-EUT equipment (peripherals) were not bundled. AC power cords of peripheral equipments draped over the rear edge of the table, and routed them down onto the floor of the ac powerline conducted emission test site to the second LISN.

All connecting cables of EUT and peripherals were manipulated to find the maximum emission.

All relevant operation modes have been tested, and the worst case data was included in this report.

3.2 EUT Exercising Software

There was no special software to exercise the device.

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3.3 Details of EUT and Description of Accessories

Details of EUT:

An AC adaptor (provided with the unit) was used to power the device. Their description are listed below.

- (1) An AC adaptor (100-240VAC 50/60Hz 0.4A to 5.5VDC 2000mA, Model: SWB3-0171) (Supplied by Client)

Description of Peripherals:

- (1) Gateway, Model: OL801SP (Supplied by Client)
- (2) Smart-Drive External Hard Disk, Model: HD3-SU2FW, S/N: 0800261, DoC Product (Supplied by Intertek)
- (3) Buffalo Broad Band Router, Model: BBR-4HG, DoC Product (Supplied by Intertek)
- (4) Corded headset with 1 meter long cable (Supplied by Client)
- (5) Bluetooth Headset (Supplied by Intertek), FCC ID: QITBTG2
- (6) Lenovo Notebook, Model: T61, S/N: L3-CF468, DoC product (Supplied by Intertek)
- (7) HP Notebook, Model: 2540p, S/N: CND05104SY, DoC product (Supplied by Intertek)
- (8) 3 x CAT5 LAN unshielded cable with 2 meter long (Supplied by Intertek)
- (9) USB mouse (Supplied by Intertek)
- (10) USB cable with 1 meter long (Supplied by Intertek)

3.4 Measurement Uncertainty

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

Uncertainty and Compliance - Unless the standard specifically states that measured values are to be extended by the measurement uncertainty in determining compliance, all compliance determinations are based on the actual measured value.

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EXHIBIT 4
TEST RESULTS

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4.0 Test Results

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.

4.1 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.

$$\begin{aligned} RA &= 62.0 \text{ dB}\mu\text{V} \\ AF &= 7.4 \text{ dB} \\ CF &= 1.6 \text{ dB} \\ AG &= 29 \text{ dB} \\ PD &= 0 \text{ dB} \\ AV &= -10 \text{ dB} \\ FS &= 62 + 7.4 + 1.6 - 29 + 0 + (-10) = 32 \text{ dB}\mu\text{V/m} \end{aligned}$$

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

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4.2 Radiated Emissions

4.2.1 Radiated Emission Configuration Photograph

Worst Case Radiated Emission
at

216 MHz

The worst case radiated emission configuration photographs are attached in the Appendix and saved with filename: config photos.pdf

4.2.2 Radiated Emission Data

The data in tables 1 list the significant emission frequencies, the limit and the margin of compliance.

Judgement -

Passed by 2.3 dB margin

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Mode: Speakerphone online with data transfer

Table 1

Radiated Emission Data

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	30.883	42.3	16	10.0	36.3	40.0	-3.7
H	48.098	42.2	16	11.0	37.2	40.0	-2.8
H	144.000	36.1	16	14.0	34.1	43.5	-9.4
H	168.000	31.1	16	18.0	33.1	43.5	-10.4
H	192.000	34.4	16	16.0	34.4	43.5	-9.1
H	198.000	35.3	16	16.0	35.3	43.5	-8.2
H	216.000	40.2	16	17.0	41.2	43.5	-2.3
H	261.250	19.9	16	21.0	24.9	46.0	-21.1
H	264.000	25.9	16	21.0	30.9	46.0	-15.1
H	288.000	32.3	16	22.0	38.3	46.0	-7.7
H	312.000	27.2	16	23.0	34.2	46.0	-11.8
H	336.000	30.0	16	24.0	38.0	46.0	-8.0
H	360.000	27.9	16	24.0	35.9	46.0	-10.1
H	384.000	33.3	16	24.0	41.3	46.0	-4.7
H	408.000	24.2	16	24.0	32.2	46.0	-13.8
H	445.492	29.5	16	26.0	39.5	46.0	-6.5
H	497.150	26.5	16	26.0	36.5	46.0	-9.5
H	552.000	18.8	16	28.0	30.8	46.0	-15.2
H	630.000	18.7	16	29.0	31.7	46.0	-14.3
H	744.000	16.8	16	30.0	30.8	46.0	-15.2
H	912.000	17.3	16	33.0	34.3	46.0	-11.7

- NOTES: 1. Peak detector is used for the emission measurement.
2. All measurements were made at 3 meters. Radiated 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 radiated 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.

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4.3 AC Power Line Conducted Emission

- ☐ Not applicable – EUT is only powered by battery for operation.
- ☒ EUT connects to AC power line. Emission Data is listed in following pages.
- ☐ Base Unit connects to AC power line and has transmission. Handset connects to AC power line but has no transmission. Emission Data of Base Unit is listed in following pages.

4.3.1 AC Power Line Conducted Emission Configuration Photograph

Worst Case Line-Conducted Configuration
at

0.578 MHz

The worst case line conducted configuration photographs are saved with filename: config photos.pdf

4.3.2 AC Power Line Conducted Emission Data

The plot(s) and data in the following pages list the significant emission frequencies, the limit and the margin of compliance

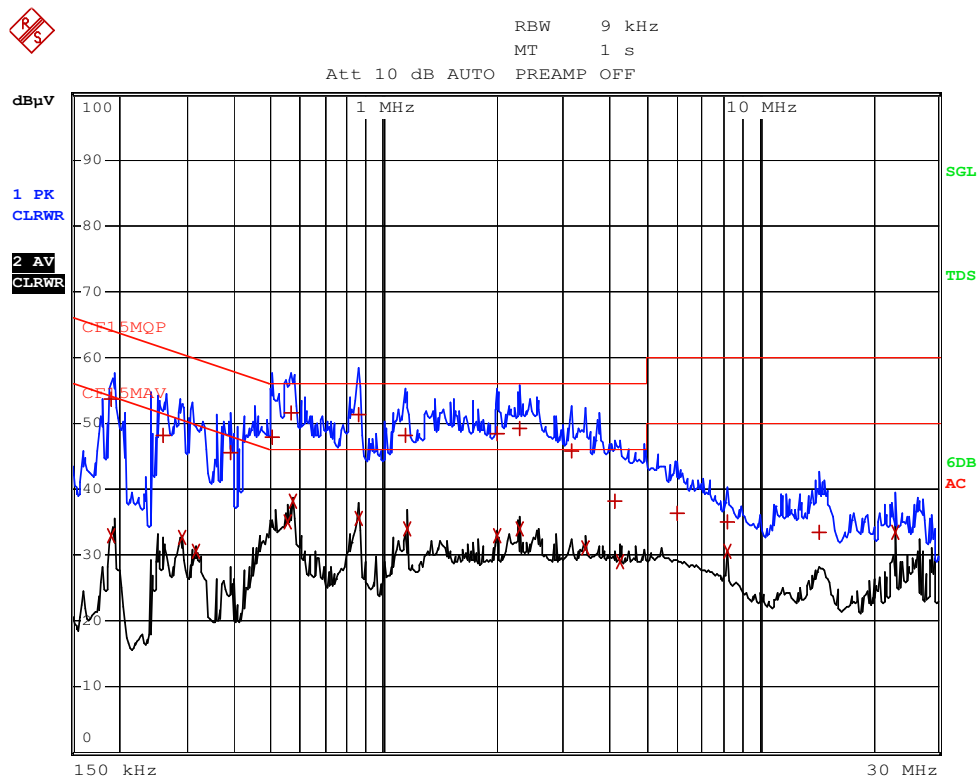
Passed by 3.65 dB margin compare with quasi-peak limit

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Worst Case: Corded Handset Talk with Data Transfer



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Worst Case: Corded Handset Talk with Data Transfer

EDIT PEAK LIST (Final Measurement Results)					
Trace1:	CF15MQP				
Trace2:	CF15MAV				
Trace3:	---				
TRACE	FREQUENCY	LEVEL			DELTA LIMIT
1 Quasi Peak	190.5 kHz	53.60	N	gnd	-10.41
2 CISPR Average	190.5 kHz	32.93	N	gnd	-21.07
1 Quasi Peak	262.5 kHz	48.11	L1	gnd	-13.23
2 CISPR Average	262.5 kHz	32.67	N	gnd	-17.86
2 CISPR Average	316.5 kHz	30.70	N	gnd	-19.09
1 Quasi Peak	388.5 kHz	45.50	N	gnd	-12.59
1 Quasi Peak	505.5 kHz	47.91	L1	gnd	-8.08
2 CISPR Average	505.5 kHz	35.01	L1	gnd	-10.98
1 Quasi Peak	568.5 kHz	51.49	N	gnd	-4.50
2 CISPR Average	573 kHz	38.10	N	gnd	-7.89
1 Quasi Peak	861 kHz	51.25	L1	gnd	-4.74
2 CISPR Average	861 kHz	35.64	L1	gnd	-10.36
1 Quasi Peak	1.1445 MHz	48.28	N	gnd	-7.71
2 CISPR Average	1.149 MHz	33.88	L1	gnd	-12.11
1 Quasi Peak	2.013 MHz	48.54	N	gnd	-7.45
2 CISPR Average	2.013 MHz	32.95	L1	gnd	-13.04
2 CISPR Average	2.301 MHz	33.95	N	gnd	-12.04
1 Quasi Peak	2.31 MHz	49.16	N	gnd	-6.83
1 Quasi Peak	3.1785 MHz	45.87	N	gnd	-10.12
2 CISPR Average	3.4485 MHz	31.19	N	gnd	-14.80

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Worst Case: Corded Handset Talk with Data Transfer

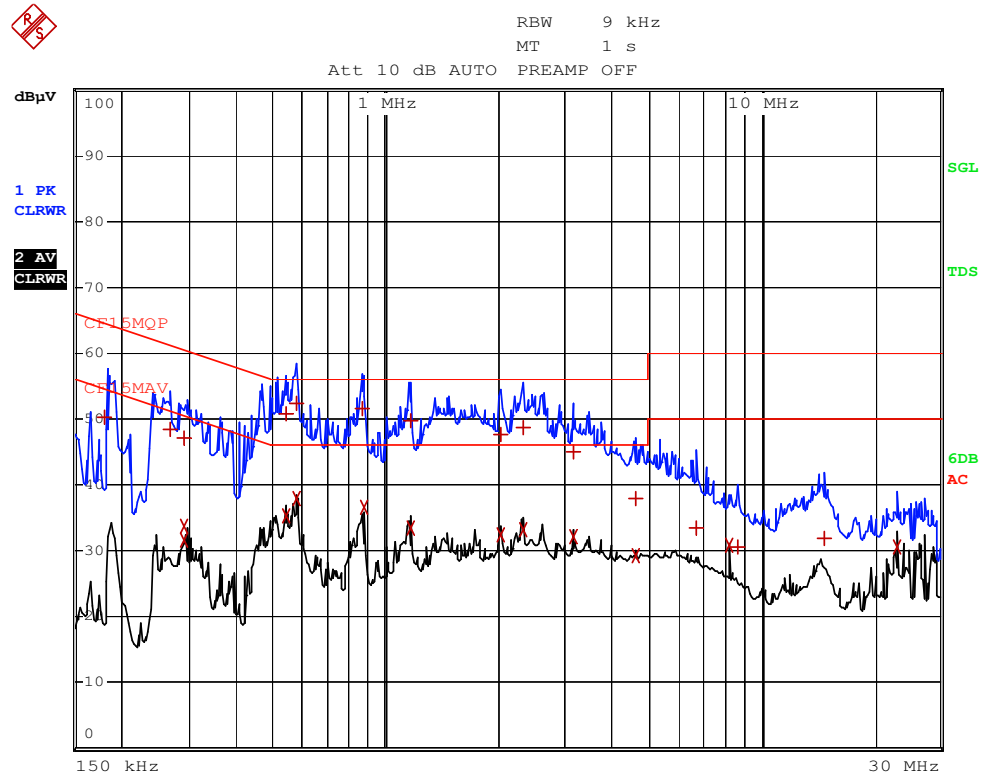
EDIT PEAK LIST (Final Measurement Results)					
Trace1:	CF15MQP				
Trace2:	CF15MAV				
Trace3:	---				
TRACE	FREQUENCY	LEVEL	dB μ V	DELTA	LIMIT dB
1 Quasi Peak	4.137 MHz	38.11	L1 gnd	-17.88	
2 CISPR Average	4.263 MHz	29.07	L1 gnd	-16.92	
1 Quasi Peak	6.0495 MHz	36.47	L1 gnd	-23.52	
1 Quasi Peak	8.1915 MHz	35.04	N gnd	-24.95	
2 CISPR Average	8.1915 MHz	30.56	N gnd	-19.43	
1 Quasi Peak	14.469 MHz	33.40	L1 gnd	-26.59	
2 CISPR Average	23.127 MHz	33.34	N gnd	-16.65	

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Worst Case: Speakerphone Talk with Data Transfer



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Worst Case: Speakerphone Talk with Data Transfer

EDIT PEAK LIST (Final Measurement Results)					
Trace1:		CF15MQP			
Trace2:		CF15MAV			
Trace3:		---			
	TRACE	FREQUENCY	LEVEL		DELTA LIMIT
1	Quasi Peak	181.5 kHz	50.33	L1 gnd	-14.08
1	Quasi Peak	267 kHz	48.54	N gnd	-12.66
2	CISPR Average	289.5 kHz	33.64	L1 gnd	-16.89
1	Quasi Peak	294 kHz	46.98	N gnd	-13.42
2	CISPR Average	294 kHz	31.69	L1 gnd	-18.71
1	Quasi Peak	541.5 kHz	50.80	L1 gnd	-5.19
2	CISPR Average	541.5 kHz	35.26	N gnd	-10.73
1	Quasi Peak	577.5 kHz	52.34	N gnd	-3.65
2	CISPR Average	577.5 kHz	37.91	N gnd	-8.08
1	Quasi Peak	870 kHz	51.69	L1 gnd	-4.30
2	CISPR Average	874.5 kHz	36.52	N gnd	-9.47
2	CISPR Average	1.1625 MHz	33.54	L1 gnd	-12.45
1	Quasi Peak	1.1715 MHz	49.61	N gnd	-6.38
1	Quasi Peak	2.022 MHz	47.60	N gnd	-8.39
2	CISPR Average	2.022 MHz	32.36	L1 gnd	-13.64
2	CISPR Average	2.3235 MHz	33.31	N gnd	-12.68
1	Quasi Peak	2.3325 MHz	48.75	N gnd	-7.24
1	Quasi Peak	3.1785 MHz	44.90	L1 gnd	-11.09
2	CISPR Average	3.183 MHz	32.13	L1 gnd	-13.86
1	Quasi Peak	4.65 MHz	38.02	N gnd	-17.97

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Worst Case: Speakerphone Talk with Data Transfer

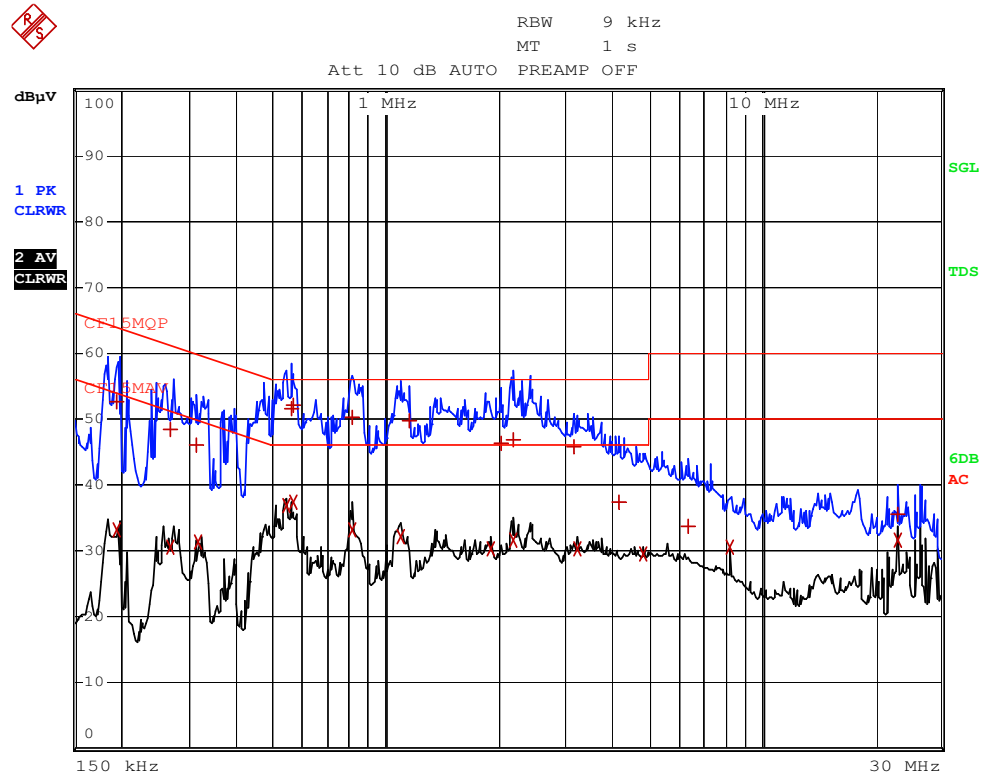
EDIT PEAK LIST (Final Measurement Results)					
Trace1:	CF15MQP				
Trace2:	CF15MAV				
Trace3:	---				
TRACE	FREQUENCY	LEVEL			DELTA LIMIT
2 CISPR Average	4.65 MHz	29.15	L1	gnd	-16.84
1 Quasi Peak	6.7425 MHz	33.48	L1	gnd	-26.51
2 CISPR Average	8.1915 MHz	30.75	L1	gnd	-19.25
1 Quasi Peak	8.6865 MHz	30.70	L1	gnd	-29.29
1 Quasi Peak	14.712 MHz	31.92	L1	gnd	-28.07
2 CISPR Average	23.1315 MHz	30.57	L1	gnd	-19.42

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Worst Case: Corded Headset Talk with Data Transfer



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Worst Case: Corded Headset Talk with Data Transfer

EDIT PEAK LIST (Final Measurement Results)					
Trace1:		CF15MQP			
Trace2:		CF15MAV			
Trace3:		---			
	TRACE	FREQUENCY	LEVEL		DELTA LIMIT
1	Quasi Peak	195 kHz	52.50	L1 gnd	-11.31
2	CISPR Average	195 kHz	33.14	L1 gnd	-20.67
1	Quasi Peak	271.5 kHz	48.34	L1 gnd	-12.72
2	CISPR Average	271.5 kHz	30.58	N gnd	-20.49
1	Quasi Peak	312 kHz	46.12	L1 gnd	-13.79
2	CISPR Average	321 kHz	31.33	N gnd	-18.34
2	CISPR Average	541.5 kHz	36.77	L1 gnd	-9.22
1	Quasi Peak	559.5 kHz	51.58	N gnd	-4.41
1	Quasi Peak	568.5 kHz	52.09	N gnd	-3.90
2	CISPR Average	568.5 kHz	37.47	N gnd	-8.53
1	Quasi Peak	816 kHz	50.18	L1 gnd	-5.81
2	CISPR Average	816 kHz	33.26	N gnd	-12.73
2	CISPR Average	1.095 MHz	32.09	N gnd	-13.90
1	Quasi Peak	1.149 MHz	49.86	L1 gnd	-6.14
2	CISPR Average	1.896 MHz	30.36	L1 gnd	-15.63
1	Quasi Peak	2.0265 MHz	46.32	N gnd	-9.67
1	Quasi Peak	2.1795 MHz	46.86	N gnd	-9.13
2	CISPR Average	2.1795 MHz	31.68	N gnd	-14.31
1	Quasi Peak	3.174 MHz	45.90	L1 gnd	-10.09
2	CISPR Average	3.2415 MHz	30.27	N gnd	-15.72

Issuing Laboratory:
Intertek Testing Services Hong Kong Limited

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Worst Case: Corded Headset Talk with Data Transfer

EDIT PEAK LIST (Final Measurement Results)					
Trace1:	CF15MQP				
Trace2:	CF15MAV				
Trace3:	---				
	TRACE	FREQUENCY	LEVEL dBµV		DELTA LIMIT dB
1	Quasi Peak	4.155 MHz	37.34	N gnd	-18.65
2	CISPR Average	4.83 MHz	29.40	N gnd	-16.59
1	Quasi Peak	6.378 MHz	33.61	L1 gnd	-26.38
2	CISPR Average	8.1915 MHz	30.67	L1 gnd	-19.33
1	Quasi Peak	23.1315 MHz	35.52	L1 gnd	-24.47
2	CISPR Average	23.1315 MHz	31.52	N gnd	-18.47

Issuing Laboratory:
Intertek Testing Services Hong Kong Limited

Hong Kong Accreditation Service (HKAS) has accredited this laboratory under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this report were determined by this laboratory in accordance with its terms of accreditation.



EXHIBIT 5
EQUIPMENT LIST

Issuing Laboratory:
Intertek Testing Services Hong Kong Limited

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5.0 Equipment List

1) Radiated Emissions Test

Equipment	Biconical Antenna	Log Periodic Antenna	Spectrum Analyzer
Registration No.	EW-0954	EW-0446	EW-2253
Manufacturer	EMCO	EMCO	ROHDESCHWARZ
Model No.	3104C	3146	FSP40
Calibration Date	Apr. 30, 2013	Apr. 30, 2013	Apr. 24, 2013
Calibration Due Date	Oct. 30, 2014	Oct. 30, 2014	Apr. 24, 2014

Equipment	EMI Test Receiver
Registration No.	EW-2666
Manufacturer	R&S
Model No.	ESCI7
Calibration Date	Jun. 20, 2013
Calibration Due Date	Jun. 20, 2014

2) Conducted Emissions Test

Equipment	Artificial Mains	Pulse Limiter	EMI Test Receiver
Registration No.	EW-0192	EW-700	EW-2666
Manufacturer	R&S	R&S	R&S
Model No.	ESH3-Z5	ESH3-Z2	ESCI7
Calibration Date	May 15, 2013	Jan. 15, 2014	Jun. 20, 2013
Calibration Due Date	Apr. 15, 2014	July. 15, 2015	Jun. 20, 2014

Equipment	Artificial Mains
Registration No.	EW-2501
Manufacturer	R&S
Model No.	ENV-216
Calibration Date	Dec 25, 2013
Calibration Due Date	Nov. 30, 2014

END OF TEST REPORT