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TEST REPORT

Report Number: 19061029HKG-007

Application For Original Grant of 47 CFR Part 15 Certification

This report contains the data of Computer Peripherals only.

FCC ID: M72-VVXD230

Prepared and Checked by:	**Approved by:**
Signed On File Leung Chiu Kuen, Stanley Engineer	Digitally signed by Jess Tang Location: Intertek Testing Services Hong Kong Limited Tang Kwan Mo, Jess Lead Engineer Date: August 12, 2019

TEST REPORT

GENERAL INFORMATION

Grantee:	Polycom Inc.
Grantee Address:	6001 America Center Drive, San Jose CA 95002, USA.
FCC Specification Standard:	FCC Part 15, October 1, 2017 Edition
FCC ID:	M72-VVXD230
FCC Model(s):	VVX D230
Type of EUT:	Class B Personal Computers and Peripherals
Description of EUT:	DECT IP Phone
Serial Number:	N/A
Sample Receipt Date:	June 20, 2019
Date of Test:	July 25, 2019 to August 06, 2019
Report Date:	August 12, 2019
Environmental Conditions:	Temperature: +10 to 40°C Humidity: 10 to 90%
Conclusion:	Test was conducted by client submitted sample. The submitted sample as received complied with the 47 CFR Part 15 Certification.

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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 standards:

FCC Part 15, October 1, 2017 Edition

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2.0 GENERAL DESCRIPTION

2.1 Product Description

The VVX D230 is a DECT IP Phone. It operates at frequency range of 1921.536MHz to 1928.448MHz with 5 channels (1921.536MHz, 1923.264MHz, 1924.992MHz, 1926.720MHz and 1928.448MHz). The Base Unit is powered by an adaptor 100-240VAC 50/60Hz 300mA to 5VDC 1200mA and/or powered by a PoE Injector.

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.

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 (2014). Preliminary radiated scans and all radiated measurements were performed in radiated emission test site. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "Justification Section" of this Application.

2.2 Test Facility

The radiated emission test site and AC power line conducted measurement facility used to collect the radiated data and AC Power Line conducted data are at Intertek Testing Services Hong Kong Ltd., which is located at Workshop No. 3, G/F., World-Wide Industrial Centre, 43-47 Shan Mei Street, Fo Tan, Sha Tin, N.T., Hong Kong. This test facility and site measurement data have been fully placed on file with FCC.

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3.0 SYSTEM TEST CONFIGURATION

3.1 Justification

For radiated emissions testing, the equipment under test (EUT) was setup 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 300mA to 5VDC 1200mA adaptor.

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

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.

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 was connected to power mains through a line impedance stabilization network (LISN), which provided 50ohm coupling impedance for measuring instrument. 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.

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.

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3.2 EUT Exercising Software

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

3.3 Details of EUT and Description of Accessories

Details of EUT:

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

(1) Base Unit: An AC adaptor with Ferrite Core (100-240VAC 50/60Hz 300mA to 5VDC 1200mA, Brand: Ten Pao, Model: S008ACM0500120) (Supplied by Client)

Description of Accessories:

(1) Polycom VVX Host Simulator, Model: VVX-310 FCC ID:2201-46161-001 (Supplied by client)
(2) HP Notebook, Model: 2540p, S/N: CND05104SY, DoC Product (Supplied by Intertek)
(3) 2 x CAT5 LAN cable with 1.5m long (Supplied by Intertek)
(4) 1 x CAT5 LAN cable with 0.17m long (Supplied by Intertek)
(5) 1 x USB to mini-USB cable with 0.28m long (Supplied by Intertek)
(6) TP-LINK PoE Injector Model: TL-POE150S, S/N: 12391001515, adaptor: MU24-1480050, DoC Product (Supplied by Intertek)
(7) Handset, Model: VVX D230, FCC: M72-VVXD230 (Supplied by client)

3.4 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test at a level of confidence of 95% has been considered. The values of the Measurement uncertainty for radiated emission test and RF conducted measurement test are ±5.3dB and ±0.99dB respectively. The value of the Measurement uncertainty for conducted emission test is ±4.2dB.

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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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 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 reflects 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 dB
PD = 0 dB
AV = -10 dB
FS = 62 + 7.4 +1.6 -29 +0 + (-10) = 32 dBμV/m
Level in μV/m = Common Antilogarithm [(32 dBμV/m)/20] = 39.8 μV/m

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4.2 Radiated Emissions

4.2.1 Radiated Emissions Configuration Photographs:

Worst Case Radiated Emission
at

30.204 MHz

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

4.2.2 Radiated Emissions Data:

The data in tables 1-2 list the significant emission frequencies, the limit and the margin of compliance.

Judgement:

Passed by 1.6 dB margin

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RADIATED EMISSIONS DATA

Mode: Data Transfer with PC - Powered by AC Adaptor

Table 1
Pursuant to FCC Part 15 Section 15.109 Emissions Requirements

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	101.450	34.0	16	13.0	31.0	43.5	-12.5
H	171.180	28.1	16	18.0	30.1	43.5	-13.4
V	287.021	38.2	16	22.0	44.2	46.0	-1.8
V	313.257	26.5	16	23.0	33.5	46.0	-12.5
V	396.780	22.2	16	25.0	31.2	46.0	-14.8
H	551.241	21.8	16	28.0	33.8	46.0	-12.2
V	558.289	27.5	16	28.0	39.5	46.0	-6.5
V	635.562	20.4	16	29.0	33.4	46.0	-12.6
V	716.432	18.9	16	30.0	32.9	46.0	-13.1
V	859.900	12.7	16	31.0	27.7	46.0	-18.3

NOTES:

1. Peak detector is used for the emission measurement.

2. All measurements were made at 3 meters.

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

4. Measurement Uncertainty is ±5.3dB at a level of confidence of 95%.

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RADIATED EMISSIONS DATA

Mode: Data Transfer with PC - Powered by PoE Injector

Table 2
Pursuant to FCC Part 15 Section 15.109 Emissions Requirements

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	30.240	44.4	16	10.0	38.4	40.0	-1.6
V	38.510	43.6	16	10.0	37.6	40.0	-2.4
V	98.921	39.1	16	12.0	35.1	43.5	-8.4
V	150.571	34.1	16	14.0	32.1	43.5	-11.4
V	173.246	29.4	16	19.0	32.4	43.5	-11.1
H	284.541	32.8	16	22.0	38.8	46.0	-7.2
V	352.435	32.9	16	24.0	40.9	46.0	-5.1
H	373.542	31.3	16	24.0	39.3	46.0	-6.7
H	476.863	21.2	16	26.0	31.2	46.0	-14.8
V	548.985	22.5	16	28.0	34.5	46.0	-11.5
H	807.526	13.0	16	31.0	28.0	46.0	-18.0

NOTES:

1. Peak detector is used for the emission measurement.

2. All measurements were made at 3 meters.

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

4. Measurement Uncertainty is ±5.3dB at a level of confidence of 95%.

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4.3 AC Power Line Conducted Emissions:

[ ] 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 (indirectly) but has no transmission. Emission Data of Base Unit is listed in following pages.

4.3.1 AC Power Line Conducted Emissions Configuration Photographs:

Worst Case AC Power Line Conducted Emission
at

1.212 MHz

The worst case AC power Line conducted emission configuration photographs are saved with filename: config photos.pdf

4.3.2 AC Power Line Conducted Emissions Data:

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

Judgment:

Passed by 2.34 dB margin compared with CISPR average limit

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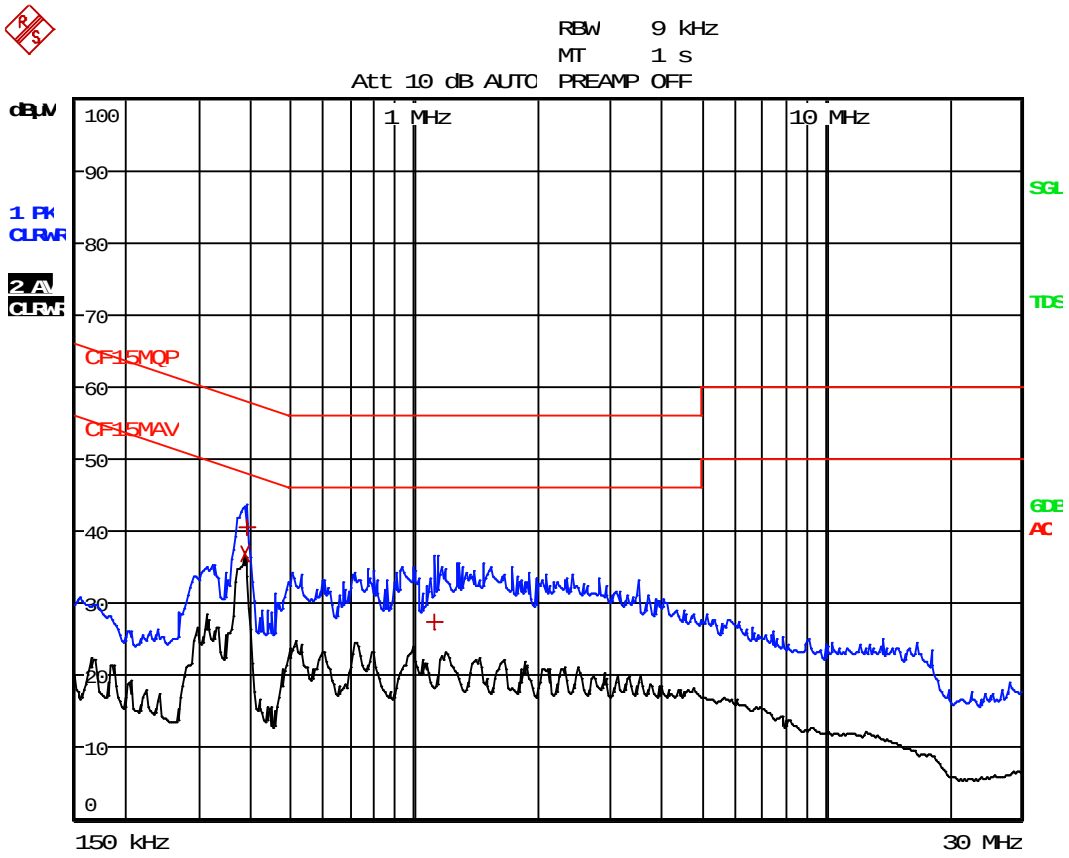
Worst Case: Data Transfer with PC - Powered by AC Adaptor



TEST REPORT

Worst Case: Data Transfer with PC - Powered by AC Adaptor

EDIT PEAK LIST (Final Measurement Results)

Trace1:	CF15MQP
Trace2:	CF15MAV
Trace3:	---

TRACE	FREQUENCY	LEVEL dBµV		DELTA LIMIT dB
2 CISPR Average	384 kHz	36.93	N	-11.25
1 Quasi Peak	388.5 kHz	40.47	N	-17.62
1 Quasi Peak	1.122 MHz	27.29	L1	-28.70

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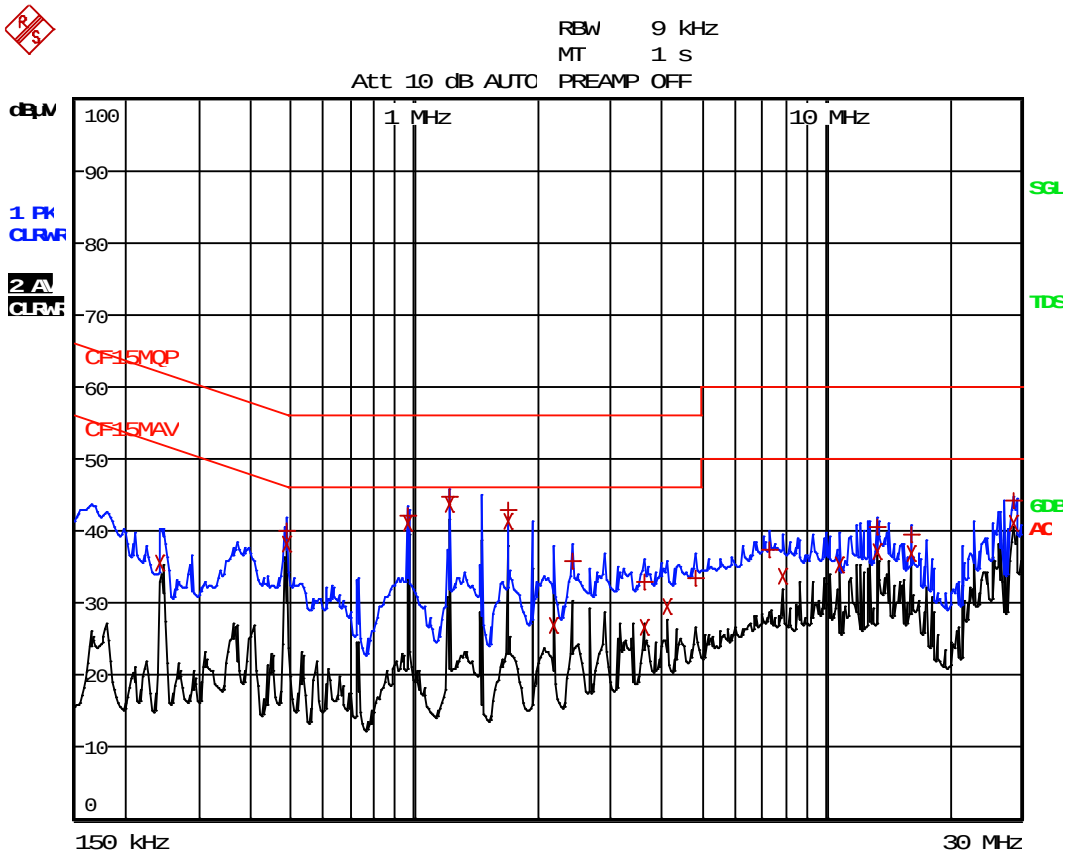
Worst Case: Data Transfer with PC - Powered by PoE Injector



TEST REPORT

Worst Case: Data Transfer with PC - Powered by PoE Injector

EDIT PEAK LIST (Final Measurement Results)

Trace1: CF15MQP
Trace2: CF15MAV
Trace3: ---

TRACE	FREQUENCY	LEVEL dBµV		DELTA LIMIT dB
2 CISPR Average	244.5 kHz	35.66	N	-16.27
1 Quasi Peak	487.5 kHz	40.08	L1	-16.12
2 CISPR Average	487.5 kHz	38.29	N	-7.91
1 Quasi Peak	969 kHz	42.22	N	-13.77
2 CISPR Average	969 kHz	40.99	N	-5.00
2 CISPR Average	1.212 MHz	43.65	N	-2.34
1 Quasi Peak	1.2165 MHz	44.72	N	-11.27
1 Quasi Peak	1.698 MHz	42.94	N	-13.05
2 CISPR Average	1.698 MHz	41.33	N	-4.66
2 CISPR Average	2.184 MHz	26.79	L1	-19.20
1 Quasi Peak	2.427 MHz	35.87	L1	-20.12
1 Quasi Peak	3.642 MHz	33.03	L1	-22.96
2 CISPR Average	3.642 MHz	26.59	N	-19.40
2 CISPR Average	4.128 MHz	29.46	N	-16.53
1 Quasi Peak	4.857 MHz	33.42	N	-22.57
1 Quasi Peak	7.314 MHz	37.43	N	-22.56
2 CISPR Average	7.9215 MHz	33.68	N	-16.31
2 CISPR Average	10.7925 MHz	35.34	N	-14.65
1 Quasi Peak	13.3575 MHz	40.67	N	-19.32
2 CISPR Average	13.3575 MHz	37.05	N	-12.94

TEST REPORT

Worst Case: Data Transfer with PC - Powered by PoE Injector

EDIT PEAK LIST (Final Measurement Results)

Trace1:	CF15MQP
Trace2:	CF15MAV
Trace3:	---

TRACE		FREQUENCY	LEVEL dBµV		DELTA LIMIT dB
1	Quasi Peak	16.2285 MHz	39.58	N	-20.41
2	CISPR Average	16.2285 MHz	36.78	L1	-13.21
1	Quasi Peak	28.6845 MHz	44.30	N	-15.69
2	CISPR Average	28.6845 MHz	41.03	N	-8.96

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5.0 EQUIPMENT LIST

1) Radiated Emissions Test

Equipment	BiConiLog Antenna (30MHz - 6GHz)	Double Ridged Guide Antenna	Broad-Band Horn Antenna
Registration No.	EW-3408	EW-0194	EW-1679
Manufacturer	EMCO	EMCO	SCHWARZBECK
Model No.	3142E	3115	BBHA9170
Calibration Date	April 25, 2019	March 14, 2018	September 25, 2018
Calibration Due Date	October 25, 2020	September 14, 2019	September 25, 2019

Equipment	EMI Test Receiver	Spectrum Analyzer	12m Double Shield RF Cable (20MHz to 6GHz)
Registration No.	EW-3156	EW-2253	EW-1852
Manufacturer	R&S	R&S	RADIALL
Model No.	ESR26	FSP40	N(m)-RG142 - N(m)
Calibration Date	November 19, 2018	November 27, 2018	March 04, 2019
Calibration Due Date	November 19, 2019	November 27, 2019	March 04, 2020

2) Conducted Emissions Test

Equipment	EMI Test Receiver	Artificial Mains Network	RF Cable 9kHz to 1000MHz
Registration No.	EW-2500	EW-2501	EW-3170
Manufacturer	R&S	R&S	N/A
Model No.	ESCI	ENV-216	9kHz to 1000MHz
Calibration Date	November 28, 2018	May 10, 2019	May 28, 2019
Calibration Due Date	November 28, 2019	May 10, 2020	May 28, 2020

END OF TEST REPORT