



CERTIFICATION TEST REPORT

Report Number. : 11737160-E2V1

Applicant : DATECS Ltd.
DEPARTMENT OF INNOVATIVE TECHNOLOGIES
4 "Datecs" Str.
1592 SOFIA, BULGARIA

FCC ID : YRWBLUEPAD-50

EUT Description : Mobile Payment Terminal with Bluetooth connectivity, Magnetic Strip and Contactless reader

Test Standard(s) : FCC 47 CFR PART 15 SUBPART B

Date Of Issue:

June 02, 2017

Prepared by:

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	06/02/17	Initial Issue	B. Bayani

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: DATECS Ltd.

EUT DESCRIPTION: Mobile Payment Terminal with Bluetooth connectivity, Magnetic Strip and Contactless reader.

SERIAL NUMBER: 917900023

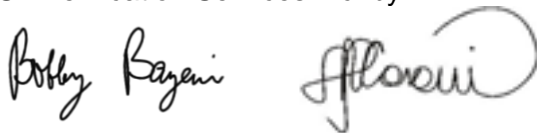
DATE TESTED: May 15, 2017

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC 47 CFR PART 15 SUBPART B	Pass

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

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UL VERIFICATION SERVICES INC

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2014.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street
<input type="checkbox"/> Chamber A	<input type="checkbox"/> Chamber D
<input checked="" type="checkbox"/> Chamber B	<input type="checkbox"/> Chamber E
<input type="checkbox"/> Chamber C	<input type="checkbox"/> Chamber F
	<input type="checkbox"/> Chamber G
	<input type="checkbox"/> Chamber H

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamp Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m} \end{aligned}$$

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Parameter	Uncertainty
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.84 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.65 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz	3.15 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	5.36 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.32 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.45 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.24 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

Mobile payment terminal with Bluetooth connectivity, magnetic strip, EMV chip & PIN and Contactless reader. Contains Bluetooth module FCC ID: GT3FC018.

GENERAL INFORMATION

Highest frequency generated or used by the EUT	2.4GHz
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5.2. TEST CONFIGURATIONS

The following configuration was tested:

EUT Configuration	Description
1	Charging - The EUT is installed in a typical configuration. The EUT is connected to an AC adapter for charging and is operating in a functional mode.

5.3. MODE(S) OF OPERATION

Mode	Description
Charging Mode	Charging with supplied USB charger. EUT and its charger shall be on back edge of table, with charger connected to extension cord. A credit card is placed in the magnetic strip and is exercising that function.

5.4. SOFTWARE AND FIRMWARE

Not applicable.

5.5. MODIFICATIONS

No modifications were made during testing.

5.6. DETAILS OF TESTED SYSTEM

SUPPORT EQUIPMENT & PERIPHERALS

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Lenovo	2349CW5	PB05HPL	DoC
AC Adapter	Lenovo	ADLX90NLT2A	11S45N0307ZLZ436RDM2	N/A
Mouse	Logitech	M-U0026	1304HS02AX68	N/A
Keyboard	Lenovo	KU-0225	54Y9400	N/A

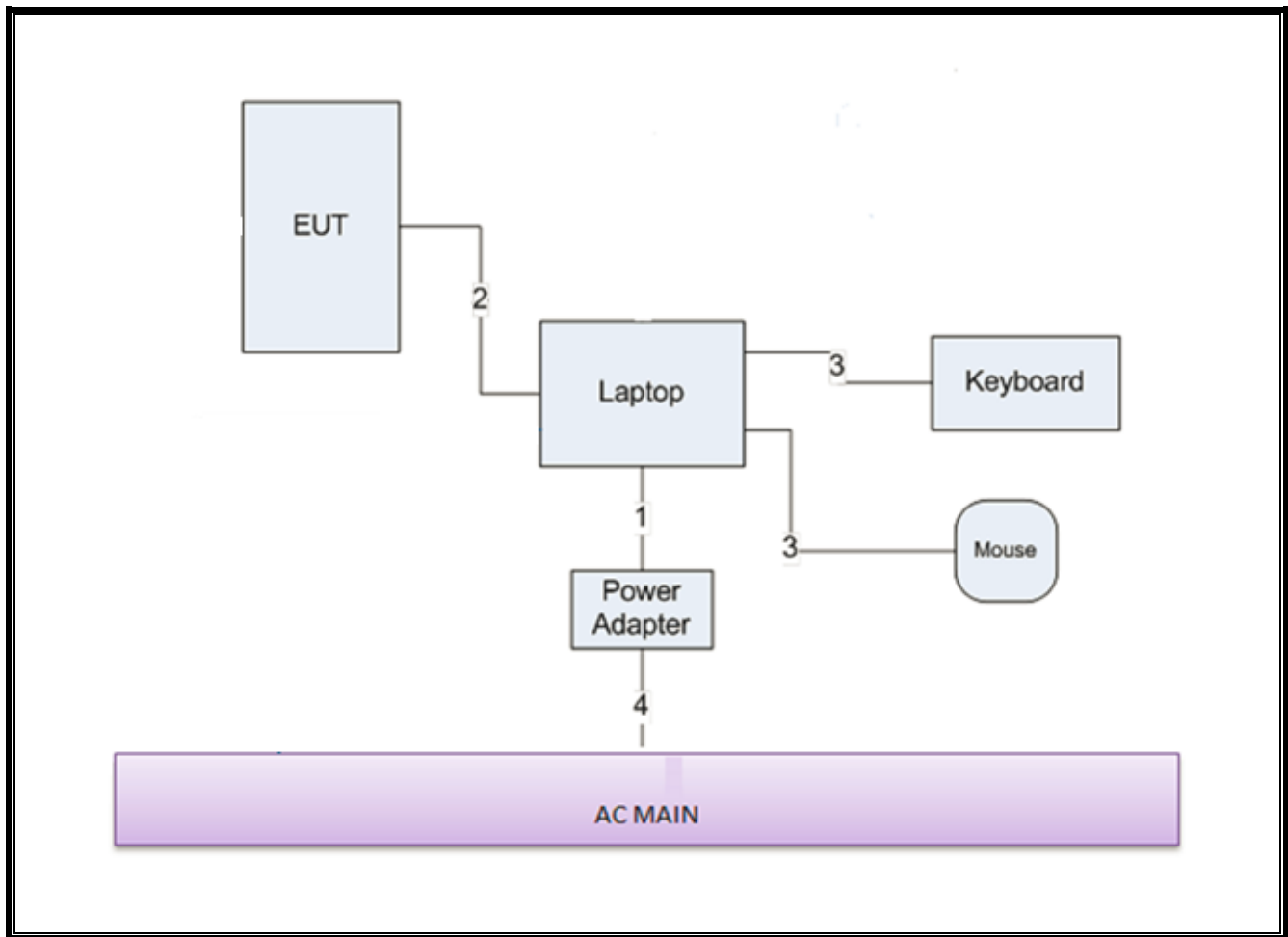
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC Power	1	Power	Shielded	1.2m	N/A
2	micro-USB	1	micro-USB	Unshielded	1m	From EUT (micro-USB) to USB to RS232 to Ethernet.
3	USB	2	USB	Shielded	2m	From laptop to keyboard & laptop to mouse
4	AC Power	1	IEC	Unshielded	1m	N/A

TEST SETUP

The EUT is connected to the laptop from micro-USB to RS232 to Ethernet connection. Test software exercised the EUT.

SETUP DIAGRAM



6. APPLICABLE EMISSIONS LIMITS AND TEST RESULTS

6.1. EMISSIONS TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Asset	Cal Due
Antenna, Broadband Hybrid, 30MHz to 2000MHz w/4dB Pad	Sunol Sciences Corp.	JB3	T477	06/22/2017
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T345	03/07/2018
Amplifier, 1-26.5GHz	Agilent (Keysight) Technologies	8449B	T404	07/05/2017
Amplifier, 10kHz-1GHz	Agilent (Keysight) Technologies	8447D	T15	08/26/2017
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T907	01/23/2018
EMI Test Receiver	Rohde & Schwarz	ESR	T1436	01/18/2018
LISN	FISCHER	FCC-LISN-50/250-25-2-01	T1310	06/08/2017
Transient Limiter	COM-POWER	LIT-930	T1457	02/24/18

6.2. RADIATED EMISSIONS LIMITS AND RESULTS

LIMIT

FCC Part 15 Subpart B

§15.109 (a) Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Limits for radiated disturbance of Class B ITE at measuring distance of 3 m	
Frequency range (MHz)	Quasi-peak limits (dBμV/m)
30 to 88	40
88 to 216	43.5
216 to 960	46
Above 960 MHz	54
Note: The lower limit shall apply at the transition frequency.	

TEST PROCEDURE

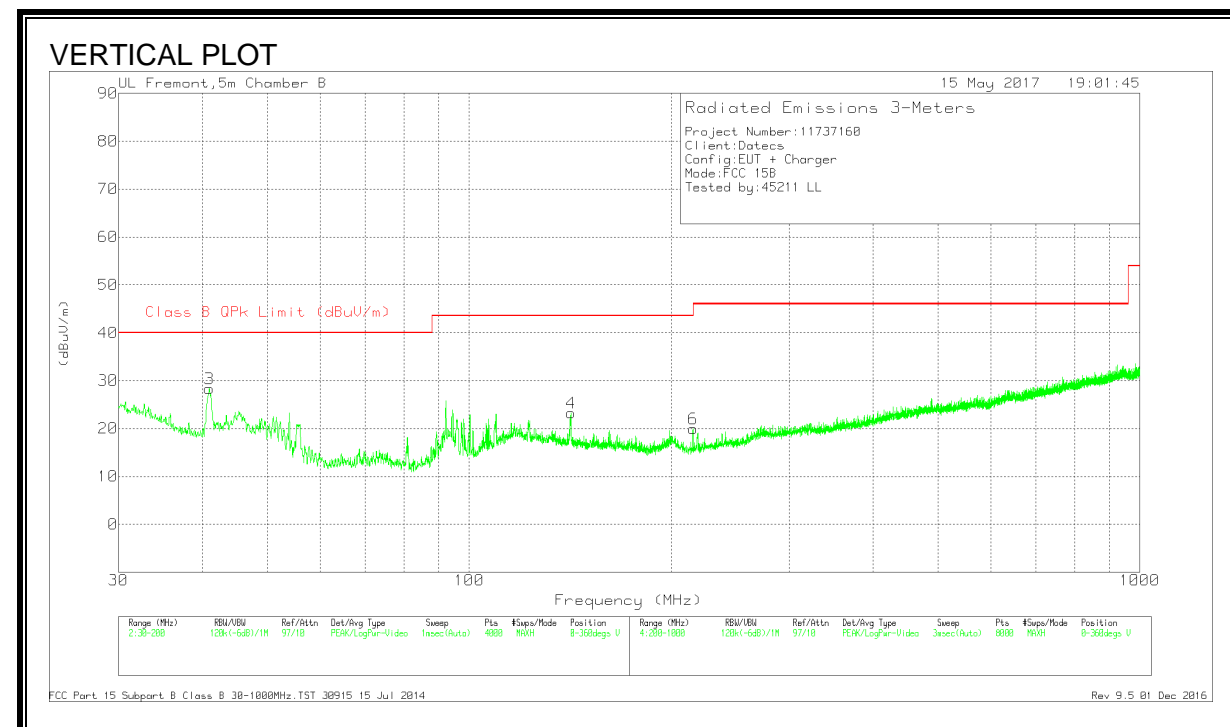
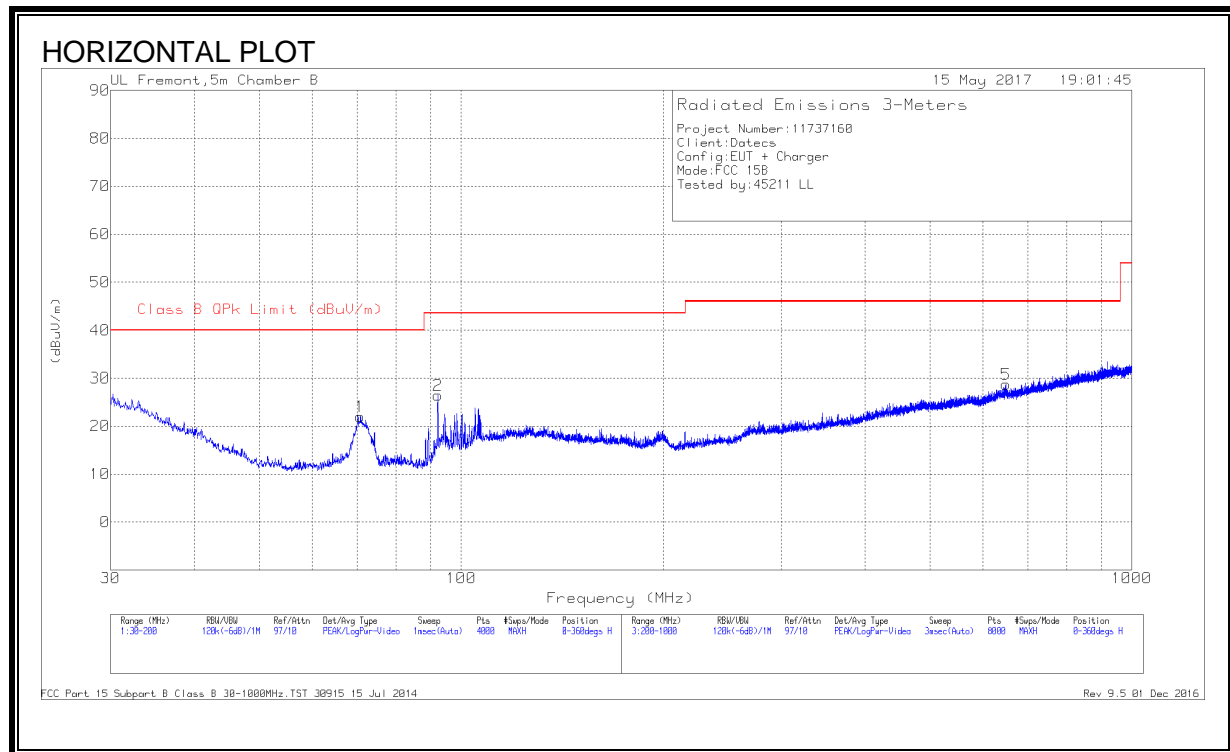
ANSI C63.4: 2014

The highest frequency generated or used in the EUT is 2.4 GHz therefore the frequency range was investigated from 30 MHz to 18 GHz.

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 108	1000
108-500	2000
500-1000	5000
Above 1000	5 th harmonic of the highest frequency or 40 GHz, whichever is lower

RESULTS

6.2.1. RADIATED EMISSIONS 30 TO 1000 MHz



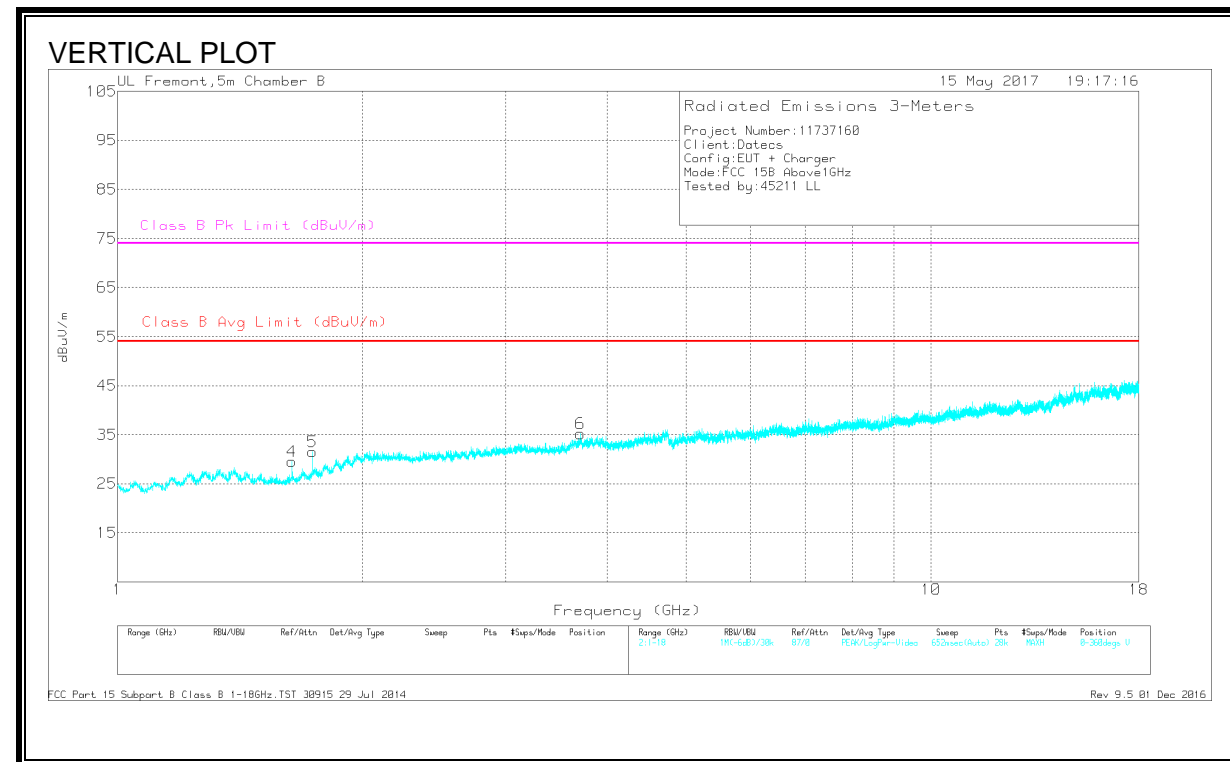
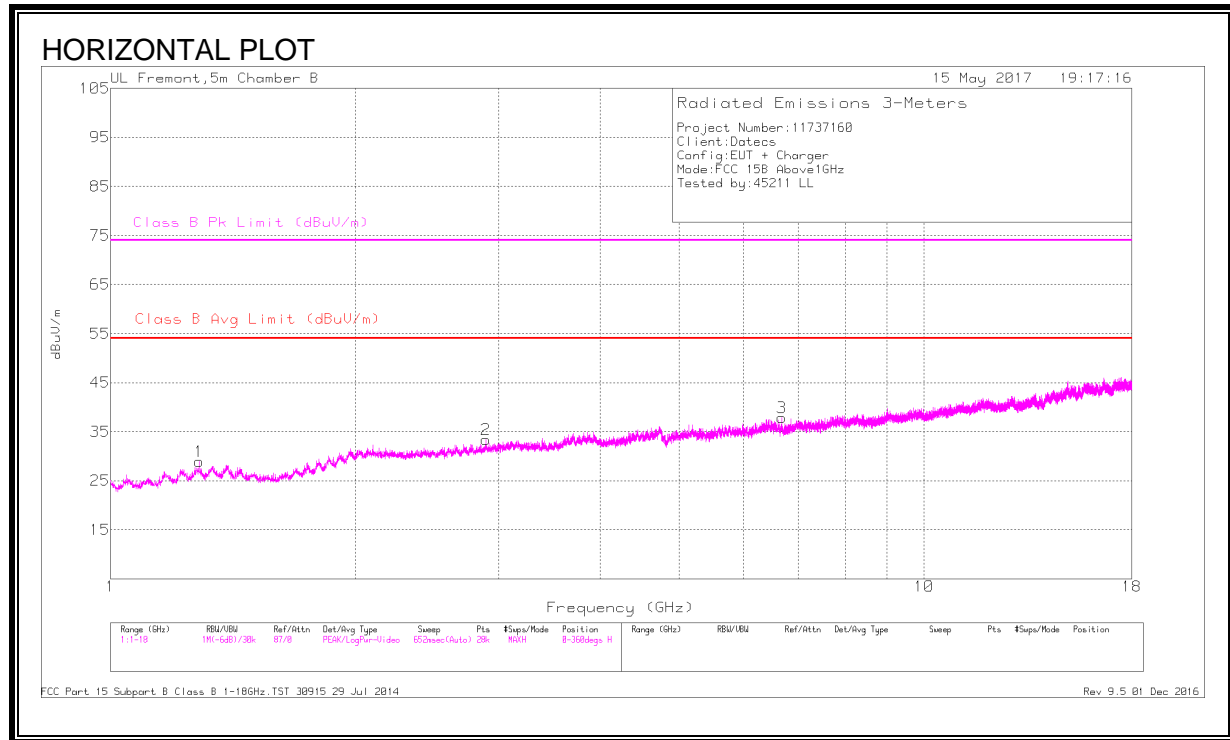
HORIZONTAL AND VERTICAL DATA

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	Class B QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	40.9678	39.75	Pk	17.3	-28.7	28.35	40	-11.65	0-360	100	V
1	70.7468	38.14	Pk	12	-28.2	21.94	40	-18.06	0-360	400	H
2	92.3211	42.35	Pk	12.1	-28	26.45	43.52	-17.07	0-360	200	H
4	141.8039	33.88	Pk	16.8	-27.4	23.28	43.52	-20.24	0-360	100	V
6	215.602	32.1	Pk	14.5	-26.6	20	43.52	-23.52	0-360	100	V
5	649.2584	30.37	Pk	23.7	-25.3	28.77	46.02	-17.25	0-360	200	H

Pk - Peak detector

6.2.2. RADIATED EMISSIONS 1GHz to 18GHz



HORIZONTAL AND VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl (dB)	Corrected Reading dBuV/m	Class B Avg Limit (dBuV/m)	Margin (dB)	Class B Pk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.285	34.26	Avg	28.8	-34.1	28.96	54	-25.04	-	-	0-360	199	H
4	1.638	35.35	Avg	27.6	-33.4	29.55	54	-24.45	-	-	0-360	102	V
5	1.736	36.09	Avg	28.7	-33.3	31.49	54	-22.51	-	-	0-360	102	V
2	2.891	32.58	Avg	32.8	-32	33.38	54	-20.62	-	-	0-360	199	H
6	3.707	32.5	Avg	33.5	-30.8	35.2	54	-18.8	-	-	0-360	102	V
3	6.684	30.41	Avg	35.9	-28.4	37.91	54	-16.09	-	-	0-360	100	H

Avg - Video bandwidth < Resolution bandwidth

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl (dB)	Corrected Reading dBuV/m	Class B Avg Limit (dBuV/m)	Margin (dB)	Class B Pk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1.283	41.61	Pk	28.8	-34.1	36.31	-	-	74	-37.69	167	173	H
1.283	28.33	Av	28.8	-34.1	23.03	54	-30.97	-	-	167	173	H
1.638	41.07	Pk	27.6	-33.4	35.27	-	-	74	-38.73	213	147	V
1.638	27.59	Av	27.6	-33.4	21.79	54	-32.21	-	-	213	147	V
1.737	40.43	Pk	28.7	-33.3	35.83	-	-	74	-38.17	360	164	V
1.737	27.53	Av	28.7	-33.3	22.93	54	-31.07	-	-	360	164	V
2.891	40.28	Pk	32.8	-32	41.08	-	-	74	-32.92	325	350	H
2.891	26.67	Av	32.8	-32	27.47	54	-26.53	-	-	325	350	H
3.709	39.16	Pk	33.5	-30.8	41.86	-	-	74	-32.14	119	330	V
3.709	25.92	Av	33.5	-30.8	28.62	54	-25.38	-	-	119	330	V
6.683	36.13	Pk	35.9	-28.4	43.63	-	-	74	-30.37	252	244	H
6.683	23.92	Av	35.9	-28.4	31.42	54	-22.58	-	-	252	244	H

Pk - Peak detector

Av - Average detection

6.3. AC MAINS LINE CONDUCTED EMISSIONS

TEST PROCEDURE

ANSI C63.4: 2014

LIMIT

§15.107 (a) Except for Class A digital devices, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the band edges.

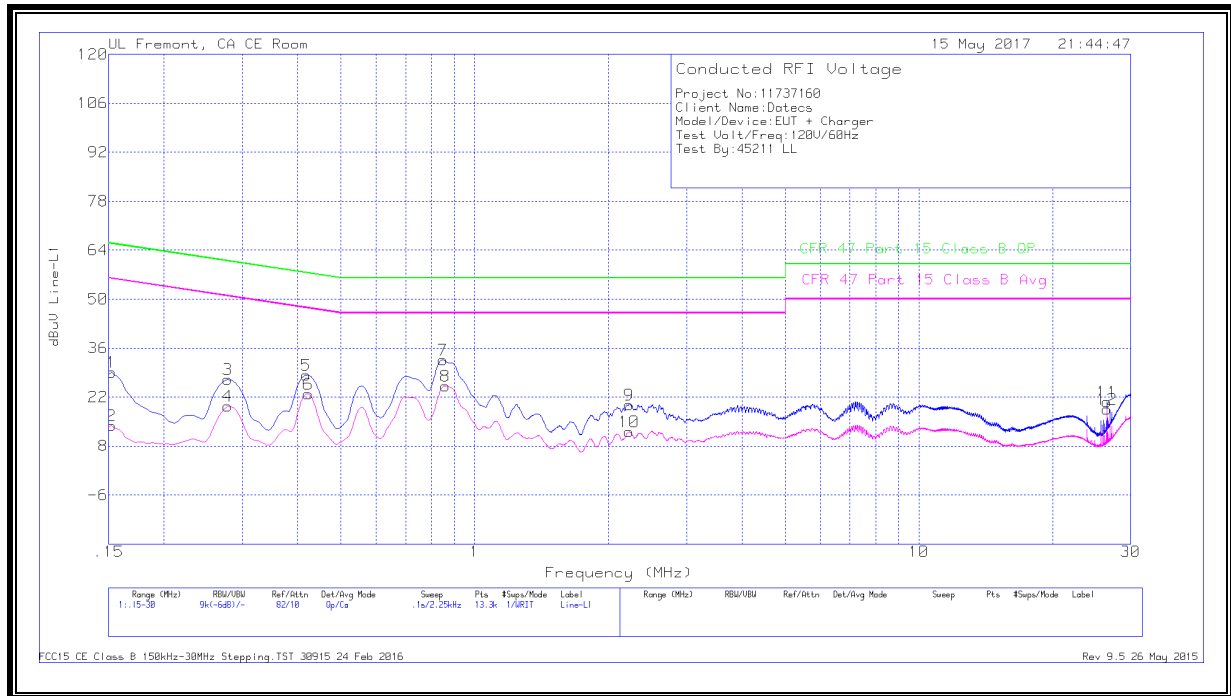
Frequency range (MHz)	Limits (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
Notes: 1. The lower limit shall apply at the transition frequencies 2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		

6.3.1. RESULTS

6 WORST EMISSIONS

Line-L1 .15 - 30MHz

PLOT



DATA

Trace Markers

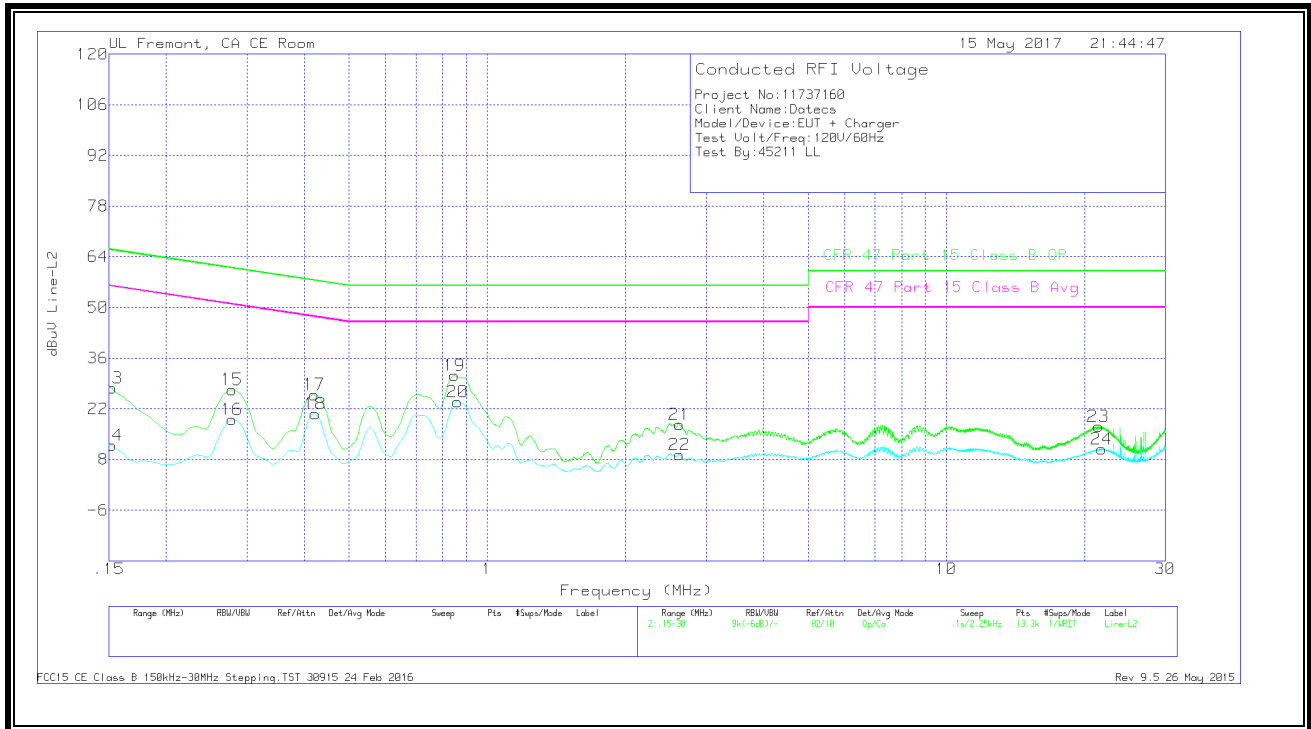
Range 1: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L1	LC Cables C1&C3	Limiter (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR) Margin (dB)
1	.15225	18.76	Qp	.1	.1	10.1	29.06	65.88	-36.82	-	-
2	.15225	3.57	Ca	.1	.1	10.1	13.87	-	-	55.88	-42.01
3	.27825	16.85	Qp	0	.1	10.1	27.05	60.87	-33.82	-	-
4	.27825	9.13	Ca	0	.1	10.1	19.33	-	-	50.87	-31.54
5	.41775	18.05	Qp	0	.1	10.1	28.25	57.49	-29.24	-	-
6	.42225	12.7	Ca	0	.1	10.1	22.9	-	-	47.4	-24.5
7	.8475	22.44	Qp	0	.1	10.1	32.64	56	-23.36	-	-
8	.85987	15	Ca	0	.1	10.1	25.2	-	-	46	-20.8
9	2.2245	9.53	Qp	0	.1	10.1	19.73	56	-36.27	-	-
10	2.2245	1.83	Ca	0	.1	10.1	12.03	-	-	46	-33.97
11	26.49075	9.72	Qp	.1	.3	10.5	20.62	60	-39.38	-	-
12	26.49075	7.57	Ca	.1	.3	10.5	18.47	-	-	50	-31.53

Qp - Quasi-Peak detector

Ca - CISPR average detection

Line-L2 .15 - 30MHz

PLOT



DATA

Trace Markers

Range 2: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L2	LC Cables C2&C3	Limiter (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR) Margin (dB)
13	.15225	17.6	Qp	0	0	10.1	27.7	65.88	-38.18	-	-
14	.15225	1.81	Ca	0	0	10.1	11.91	-	-	55.88	-43.97
15	.27825	17.11	Qp	0	.1	10.1	27.31	60.87	-33.56	-	-
16	.27825	8.82	Ca	0	.1	10.1	19.02	-	-	50.87	-31.85
17	.42	15.72	Qp	0	.1	10.1	25.92	57.45	-31.53	-	-
18	.42225	10.38	Ca	0	.1	10.1	20.58	-	-	47.4	-26.82
19	.84975	21.01	Qp	0	.1	10.1	31.21	56	-24.79	-	-
20	.86212	13.67	Ca	0	.1	10.1	23.87	-	-	46	-22.13
21	2.6205	7.44	Qp	0	.1	10.1	17.64	56	-38.36	-	-
22	2.6205	-95	Ca	0	.1	10.1	9.25	-	-	46	-36.75
23	21.43725	6.38	Qp	0	.3	10.4	17.08	60	-42.92	-	-
24	21.83775	.17	Ca	0	.3	10.4	10.87	-	-	50	-39.13

Qp - Quasi-Peak detector

Ca - CISPR average detection