



CERTIFICATION TEST REPORT

Report Number : R11963121-E1

Applicant : Datecs Ltd
Datecs Street No. 4
Sofia, 1592, Bulgaria

Model : BLUEPAD-5000 v2

FCC ID : YRWBLUEPAD-5000

EUT Description : Payment Terminal

Test Standard(s) : FCC 47 CFR PART 15 SUBPART C
ISED CANADA RSS-210 ISSUE 9

Date Of Issue:
2019-12-09

Prepared by:
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REVISION HISTORY

Ver.	Issue Date	Revisions	Revised By
1	2019-06-12	Initial Issue	Brian T. Kiewra
1	2019-12-09	Revised OBW Section 7 to include 20dB BW plot. Removed test setup diagram and photos.	Brian T. Kiewra

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Datecs Ltd
Datecs Street No. 4
Sofia, 1592, Bulgaria

EUT DESCRIPTION: Payment Terminal

MODEL: BLUEPAD-5000 v2

SERIAL NUMBER: 1917900008

DATE TESTED: 2019-05-13 to 2019-05-14

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 15 SUBPART C §15.225 (e) and §15.207 ¹	Compliant
ISED RSS-210 Issue 9, Annex B.6 ¹	Compliant
ISED RSS-GEN Issue 5 Section 8.8 ¹	Compliant

Note 1: This report covers frequency stability, 99% BW, and AC Mains Line conducted only. All other testing covered in UL Basingstoke report UL-RPT-RP11963121-116A.

UL LLC tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

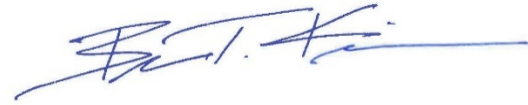
This document may not be altered or revised in any way unless done so by UL LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. government.

Approved & Released
For UL LLC By:



Jeffrey Moser
Operations Leader
UL – Consumer Technology Division

Prepared By:



Brian T. Kiewra
Project Engineer
UL – Consumer Technology Division

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2013, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 5, and RSS-210 Issue 9.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 12 Laboratory Drive, Research Triangle Park, NC 27709, USA and 2800 Perimeter Park Dr., Suite B, Morrisville, NC 27560, USA. 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.

12 Laboratory Dr.	2800 Perimeter Park Dr.
ISED Site Code: 2180C	
☐ Chamber A RTP	☒ North Chamber
☐ Chamber C RTP	☐ South Chamber

UL LLC (RTP) is accredited by NVLAP, Laboratory Code 200246-0

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

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:

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

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:

Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN Insertion Loss.
 $36.5 \text{ dBuV} + 0 \text{ dB} + 10.1 \text{ dB} + 0 \text{ dB} = 46.6 \text{ dBuV}$

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Radio Frequency (Spectrum Analyzer)	±141.2 Hz
Conducted Emissions (150kHz – 30MHz) – LISN	±3.65dB
Occupied Channel Bandwidth	±2.00%
Temperature	±2.26°C

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The BLUEPAD-5000 unit is a handheld PIN pad with an integrated smart, magnetic stripe, RFID card reader, and printer offering advanced security and payment processing capabilities to handle credit and PIN-based debit card transactions.

5.2. SOFTWARE AND FIRMWARE

The firmware installed on the EUT for testing was 03.01.19.87
The test utility software used during testing was RF Test 1.1.

5.3. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Power Supply	Datecs	LTE12WS-SY-T	184702643	NA

I/O CABLES

I/O Cable List						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	Mains	1	Barrel	Mains	<3m	Provides DC power.

SETUP DIAGRAM

Please refer to R11963121-EP1 for setup diagrams

6. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (MOR - North Chamber) OBW

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
AT0079	Active Loop Antenna	ETS-Lindgren	6502	2019-01-24	2020-01-31
N-SAC01	Gain-loss string: 0.009-30MHz	Various	Various	2019-05-02	2020-05-02
SA0026	Spectrum Analyzer	Agilent	N9030A	2019-03-19	2020-03-19
181474341	Environmental Meter	Fisher Scientific	15-077-963	2018-07-27	2020-07-27

Test Equipment Used - Wireless Conducted Measurement Equipment (MOR- Conducted 2)

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
72822 (PRE0100902)	Spectrum Analyzer	Agilent Technologies	E4446A	2018-11-19	2019-11-19
76023 (EC0225)	Temp/Humid Chamber	Cincinnati Sub-Zero	ZPH-8-3.5-SCT/AC	2018-06-07	2019-06-07
SN 181474341	Environmental Meter	Fisher Scientific	15-077-963	2018-07-27	2020-07-27
76021	DC Regulated Power Supply	CircuitSpecialists.Com	CSI3005X5	N/A	N/A

Test Equipment Used - Line-Conducted Emissions – Voltage (MOR – Conducted 1)

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
CBL087	Coax cable, RG223, N-male to BNC-male, 20-ft.	Pasternack	PE3W06143-240	2018-06-19	2019-06-19
s/n 181562858	Environmental Meter	Fisher Scientific	14-650-118	2018-09-04	2020-09-04
LISN003	LISN, 50-ohm/50-uH, 2-conductor, 25A	Fischer Custom Com.	FCC-LISN-50-25-2-01-550V	2018-08-21	2019-08-21
75141 (PRE0101521)	EMI Test Receiver 9kHz-7GHz	Rohde & Schwarz	ESCI 7	2018-08-22	2019-08-22
TL001	Transient Limiter, 0.009-30MHz	Com-Power	LIT-930A	2018-06-13	2019-06-13
PS215	AC Power Source	Elgar	CW2501M (s/n 1523A02397)	NA	NA
CDECABLE001	ANSI C63.4 1m extension cable.	UL	Per Annex B of ANSI C63.4	2018-07-16	2019-07-16

UL SOFTWARE			
*Conducted Software	UL	UL EMC	Ver 2.2, March 31, 2015
*AC Line Conducted Software	UL	UL EMC	Ver 9.5, April 3, 2015

Note: * indicates automation software version used in the compliance certification testing

7. OCCUPIED BANDWIDTH

LIMITS

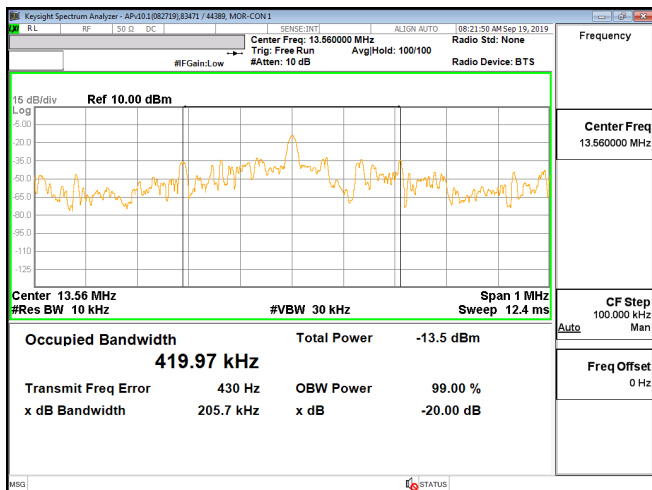
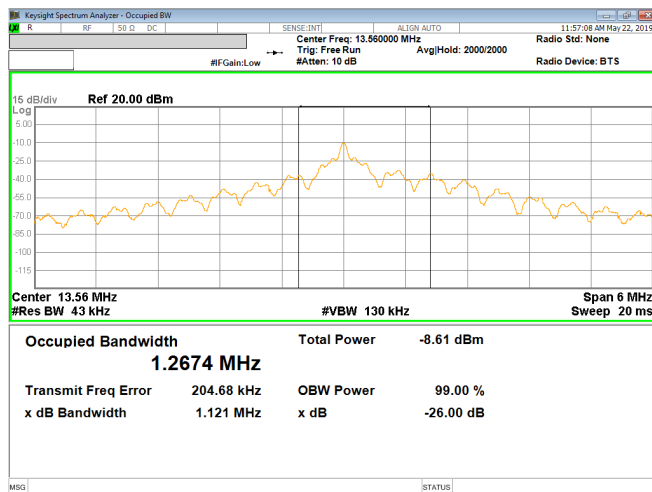
None; for reporting purposes only.

RSS-GEN and ANSI C63.10 Section 6.9.3 were used for the measurement procedure.

TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1-5% of the OBW. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

99% AND 20dB BW



8. FREQUENCY STABILITY

LIMIT

§15.225 (e)

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency, over a temperature variation of -20° to $+50^{\circ}\text{C}$ at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20°C . For battery operated equipment, the equipment tests shall be performed using a new battery.

IC RSS-210, Annex B.6

Carrier frequency stability shall be maintained to $\pm 0.01\%$ (± 100 ppm).

TEST PROCEDURE

ANSI C63.10-2013 Clause 6.8.1 and 6.8.2

RESULTS

Reference Frequency: EUT Channel 13.56 MHz @ 20°C Limit: ± 100 ppm = 13.560 kHz										
Power Supply	Envir. Temp	Frequency Deviation Measured with Time Elapse								
(VAC or VDC)	($^{\circ}\text{C}$)	Startup (MHz)	Delta (ppm)	@ 2 mins (MHz)	Delta (ppm)	@ 5 mins (MHz)	Delta (ppm)	@ 10 mins (MHz)	Delta (ppm)	Limit (ppm)
9.00	50	13.5608200	0.066	13.5608190	0.074	13.5608190	0.074	13.5608210	0.059	± 100
9.00	40	13.5608260	0.022	13.5608240	0.037	13.5608220	0.052	13.5608200	0.066	± 100
9.00	30	13.5608640	-0.258	13.5608480	-0.140	13.5608420	-0.096	13.5608360	-0.052	± 100
9.00	20	13.5608290	0.000	13.5608290	0.000	13.5608280	0.007	13.5608280	0.007	± 100
9.00	10	13.5608760	-0.347	13.5608720	-0.317	13.5608700	-0.302	13.5608660	-0.273	± 100
9.00	0	13.5608800	-0.376	13.5608800	-0.376	13.5608789	-0.368	13.5608770	-0.354	± 100
9.00	-10	13.5608770	-0.354	13.5608780	-0.361	13.5608790	-0.369	13.5608800	-0.376	± 100
9.00	-20	13.5608440	-0.111	13.5608590	-0.221	13.5608730	-0.324	13.5608780	-0.361	± 100
7.35	20	13.5608370	-0.059	13.5608350	-0.044	13.5608330	-0.029	13.5608330	-0.029	± 100
10.35	20	13.5608330	-0.029	13.5608320	-0.022	13.5608310	-0.015	13.5608310	-0.015	± 100

TEST INFORMATION

Date: 2019-05-14
Project No: 11963121
Tester: 40882

9. AC MAINS LINE CONDUCTED EMISSIONS

LIMITS

§15.207

IC RSS-GEN, Section 8.8

(a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator 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.		

TEST PROCEDURE

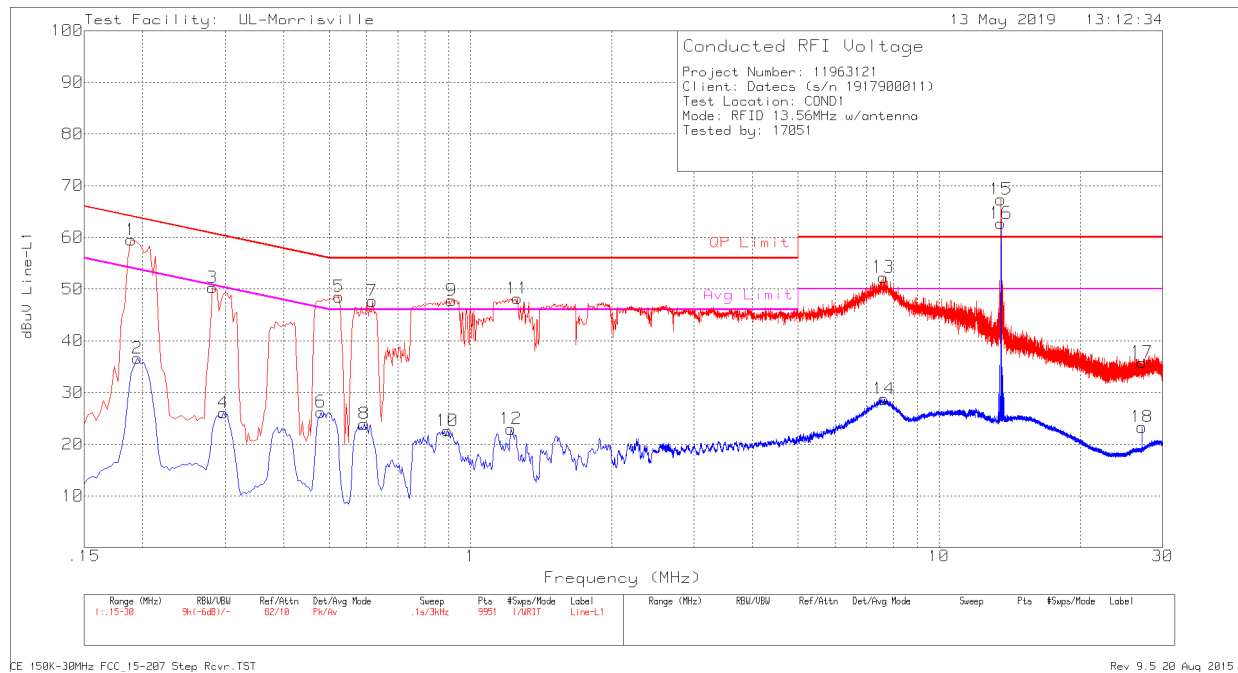
ANSI C63.10:2013

RESULTS

No non-compliance noted:

9.1.1. NORMAL OPERATION

LINE 1 RESULTS

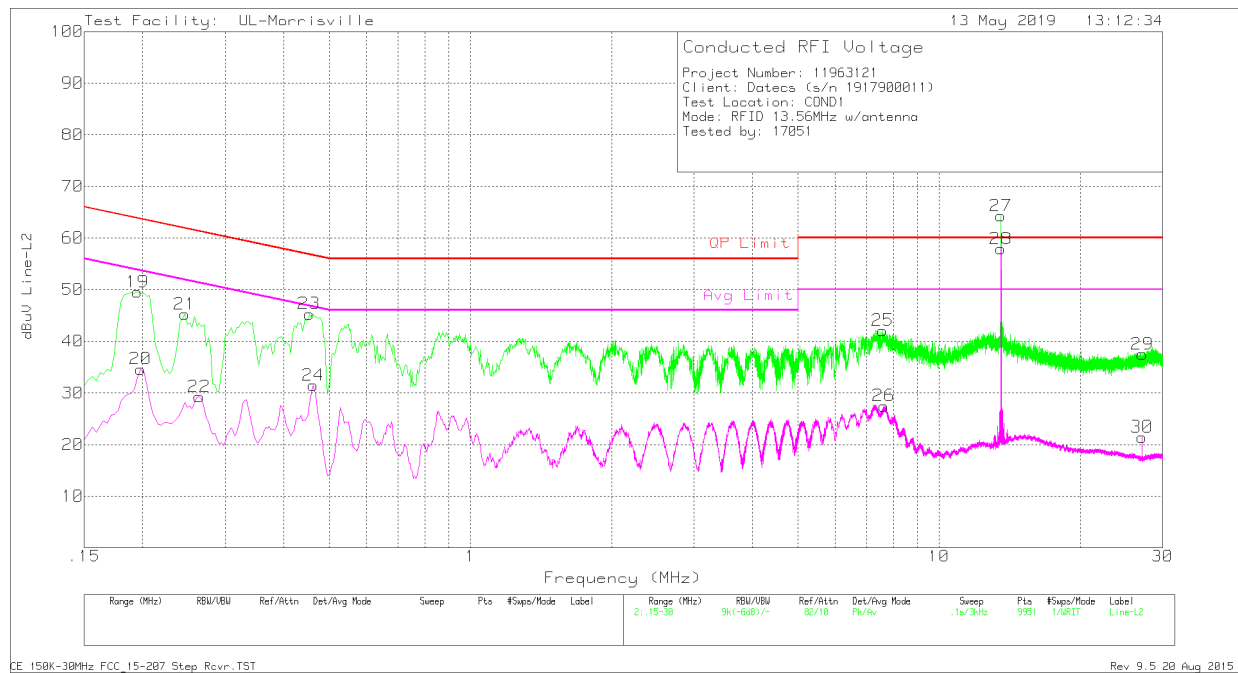


Line-L1: .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VCF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit	Margin (dB)	Avg Limit	Margin (dB)
1	.195	23.83	Qp	.1	10	33.93	63.82	-29.89	-	-
2	.195	11.11	Av	.1	10	21.21	-	-	53.82	-32.61
3	.282	40.21	Pk	.1	10	50.31	60.76	-10.45	-	-
4	.297	15.99	Av	.1	10	26.09	-	-	50.33	-24.24
5	.525	38.53	Pk	0	10	48.53	56	-7.47	-	-
6	.48	16.26	Av	0	10	26.26	-	-	46.34	-20.08
7	.618	37.67	Pk	0	10	47.67	56	-8.33	-	-
8	.594	13.94	Av	0	10	23.94	-	-	46	-22.06
9	.912	37.83	Pk	0	10	47.83	56	-8.17	-	-
10	.894	12.65	Av	0	10	22.65	-	-	46	-23.35
11	1.26	38.17	Pk	0	10	48.17	56	-7.83	-	-
12	1.221	12.96	Av	0	10	22.96	-	-	46	-23.04
13	7.608	42.01	Pk	.1	10.2	52.31	60	-7.69	-	-
14	7.635	18.43	Av	.1	10.2	28.73	-	-	50	-21.27
15	13.56	56.83	Pk	.1	10.4	67.33	-	-	-	-
16	13.56	52.24	Av	.1	10.4	62.74	-	-	-	-
17	27.12	24.84	Pk	.3	10.7	35.84	60	-24.16	-	-
18	27.123	12.32	Av	.3	10.7	23.32	-	-	50	-26.68

Pk - Peak detector
Qp - Quasi-Peak detector
Av - Average detection

Note: 13.56MHz is a fundamental frequency of the EUT. Data under the following section indicate that when the antenna terminal is terminated, the fundamental amplitude is lowered below the limit line.

LINE 2 RESULTS



Line-L2: .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VCF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit	Margin (dB)	Avg Limit	Margin (dB)
19	.195	39.36	Pk	.2	10	49.56	63.82	-14.26	-	-
20	.198	24.42	Av	.2	10	34.62	-	-	53.69	-19.07
21	.246	35.15	Pk	.1	10	45.25	61.89	-16.64	-	-
22	.264	19.2	Av	.1	10	29.3	-	-	51.3	-22
23	.453	35.22	Pk	.1	10	45.32	56.82	-11.5	-	-
24	.462	21.41	Av	.1	10	31.51	-	-	46.66	-15.15
25	7.578	31.79	Pk	.1	10.2	42.09	60	-17.91	-	-
26	7.62	17.19	Av	.1	10.2	27.49	-	-	50	-22.51
27	13.56	53.82	Pk	.1	10.4	64.32	-	-	-	-
28	13.56	47.42	Av	.1	10.4	57.92	-	-	-	-
29	27.153	26.64	Pk	.2	10.7	37.54	60	-22.46	-	-
30	27.123	10.55	Av	.2	10.7	21.45	-	-	50	-28.55

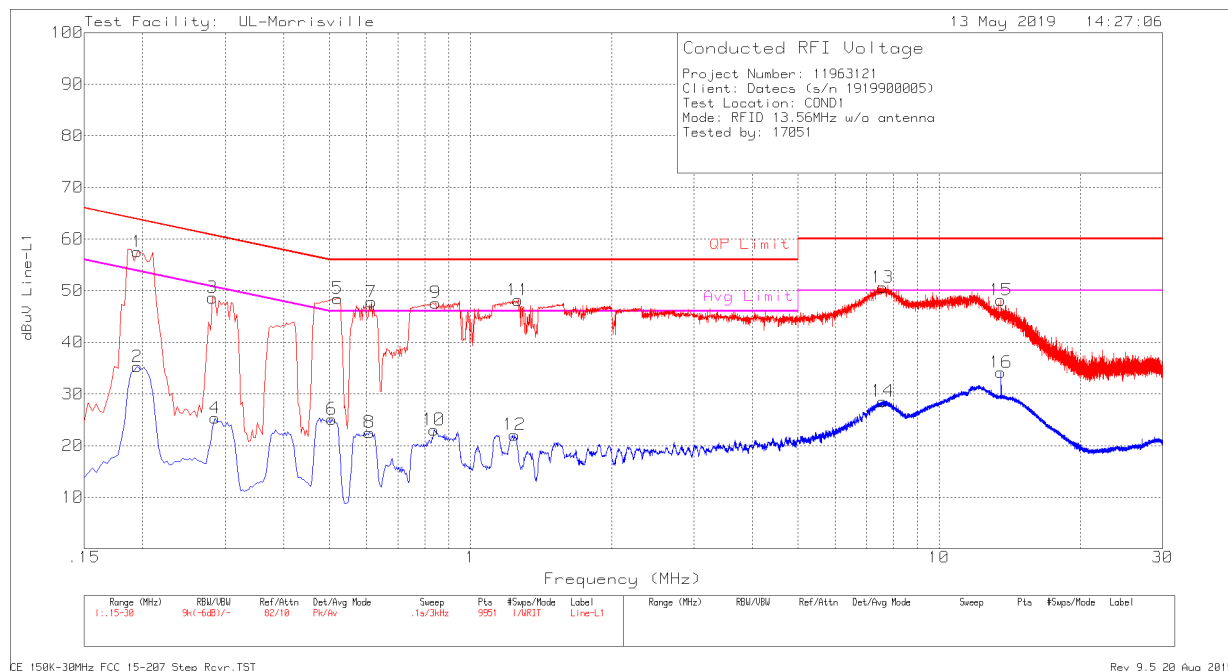
Pk - Peak detector

Av - Average detection

Note: 13.56MHz is a fundamental frequency of the EUT. Data under the following section indicate that when the antenna terminal is terminated, the fundamental amplitude is lowered below the limit line.

9.1.2. NORMAL OPERATION WITH ANTENNA PORT TERMINATED

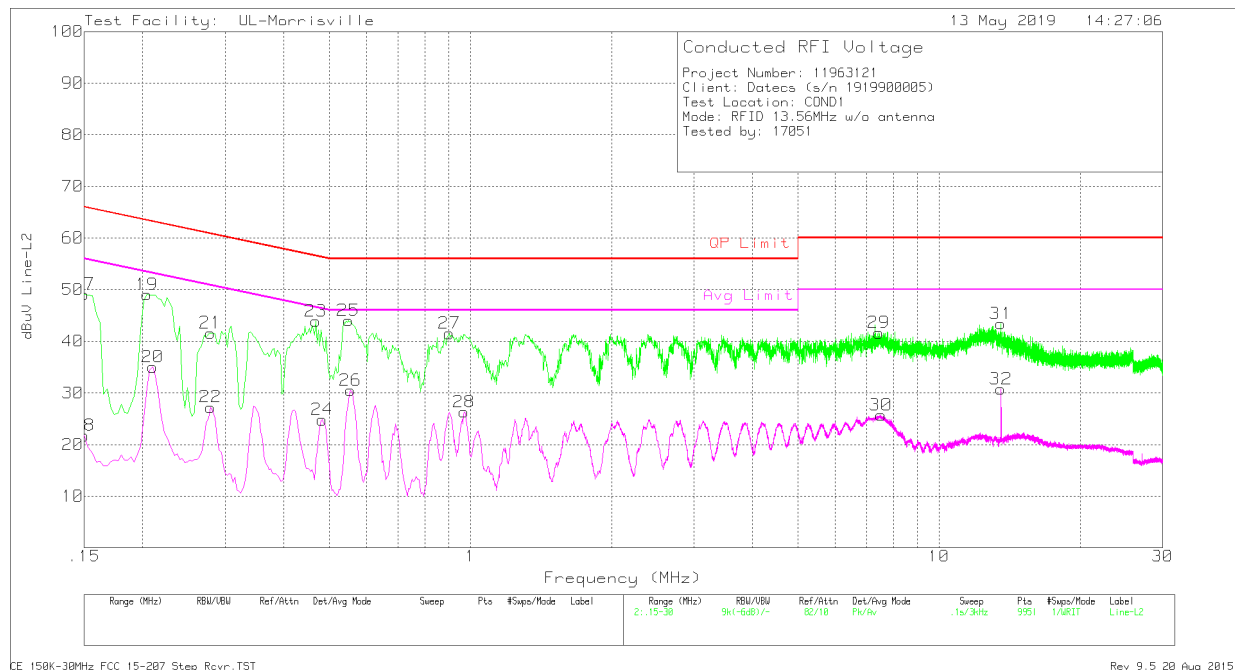
LINE 1 RESULTS



Line-L1: .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VCF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit	Margin (dB)	Avg Limit	Margin (dB)
1	.195	29.57	Qp	.1	10	39.67	63.82	-24.15	-	-
2	.195	19.82	Av	.1	10	29.92	-	-	53.82	-23.9
3	.282	38.55	Pk	.1	10	48.65	60.76	-12.11	-	-
4	.285	15.24	Av	.1	10	25.34	-	-	50.67	-25.33
5	.5205	38.5	Pk	0	10	48.5	56	-7.5	-	-
6	.507	15.13	Av	0	10	25.13	-	-	46	-20.87
7	.615	37.81	Pk	0	10	47.81	56	-8.19	-	-
8	.609	12.57	Av	0	10	22.57	-	-	46	-23.43
9	.843	37.65	Pk	0	10	47.65	56	-8.35	-	-
10	.837	13.05	Av	0	10	23.05	-	-	46	-22.95
11	1.2645	38.16	Pk	0	10	48.16	56	-7.84	-	-
12	1.242	12.09	Av	0	10	22.09	-	-	46	-23.91
13	7.578	40.37	Pk	.1	10.2	50.67	60	-9.33	-	-
14	7.59	18.29	Av	.1	10.2	28.59	-	-	50	-21.41
15	13.56	37.66	Pk	.1	10.4	48.16	60	-11.84	-	-
16	13.56	23.72	Av	.1	10.4	34.22	-	-	50	-15.78

Pk - Peak detector
Av - Average detection

LINE 2 RESULTS



Line-L2: .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VCF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit	Margin (dB)	Avg Limit	Margin (dB)
17	.15	38.91	Pk	.2	10	49.11	66	-16.89	-	-
18	.15	11.53	Av	.2	10	21.73	-	-	56	-34.27
19	.204	38.94	Pk	.1	10	49.04	63.45	-14.41	-	-
20	.21	24.91	Av	.1	10	35.01	-	-	53.21	-18.2
21	.279	31.51	Pk	.1	10	41.61	60.85	-19.24	-	-
22	.279	17.15	Av	.1	10	27.25	-	-	50.85	-23.6
23	.468	33.83	Pk	.1	10	43.93	56.55	-12.62	-	-
24	.483	14.7	Av	.1	10	24.8	-	-	46.29	-21.49
25	.549	34.04	Pk	0	10	44.04	56	-11.96	-	-
26	.555	20.52	Av	0	10	30.52	-	-	46	-15.48
27	.903	31.52	Pk	0	10	41.52	56	-14.48	-	-
28	.969	16.32	Av	0	10	26.32	-	-	46	-19.68
29	7.446	31.34	Pk	.1	10.2	41.64	60	-18.36	-	-
30	7.521	15.38	Av	.1	10.2	25.68	-	-	50	-24.32
31	13.563	32.91	Pk	.1	10.4	43.41	60	-16.59	-	-
32	13.56	20.28	Av	.1	10.4	30.78	-	-	50	-19.22

Pk - Peak detector
Av - Average detection

10. SETUP PHOTOS

Please refer to R11963121-EP1 for setup photos

END OF TEST REPORT