TEST REPORT

Test Report No. : UL-EMC-RP12247063JD01B

Manufacturer	:	**Magicard Ltd**
Type of Equipment	:	**Information Technology Equipment**
Model No.	:	**3652-3001**
Test Standard	:	**47CFR15.107 and 47CFR15.109**
FCC ID Number	:	**XDW3652-3001**
Test Result	:	**Complied**

1. This report may not be reproduced other than in full, except with the prior written approval of UL VS Limited.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above standard(s).
4. The test results in this report are traceable to the national or international standards.

Date of issue: 06 June 2018

Checked by:

Adam Brown
Laboratory Engineer

Company Signatory :

Matthew Owen
EMC Service Lead

0644

This laboratory is accredited by UKAS.
The tests reported herein have been performed in accordance with its terms of accreditation.

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1. CUSTOMER DETAILS

Company Name:	Magicard Ltd
Address:	Waverley House Hampshire Road Weymouth Dorset DT5 9XD

2. SUMMARY OF TESTING

2.1. Test Specification

Reference:	47CFR15.107 and 47CFR15.109
Title:	Code of Federal Regulations - Title 47 (Telecommunication): Part 15 (Radio Frequency Devices) - Subpart B (Unintentional Radiators) – Sections 15.107 and 15.109
Title:	Information Technology Equipment (Including Digital Apparatus) – Limits and Methods of Measurement
Site Registration:	FCC: 209735

2.2. Summary of Test Results

FCC Reference	Measurement Type	Applicability	Result
15.107	Conducted Emissions (AC Mains Input / Output Ports)	Yes	✓
15.109	Radiated Emissions (Enclosure)	Yes	✓

KEY: ✓ = Complied ✗ = Did not comply

2.3. Location of Testing

All the measurements described in this report were performed at the premises of UL VS Ltd, Unit 3 Horizon, Wade Road, Kingsland Business Park, Basingstoke, Hampshire RG24 8AH.

2.4. Deviations from the Test Specification

For the measurements contained within this test report, there were no deviations from, additions to, or exclusions from the test specification identified above, nor from the requirements defined in the basic standards called up within it.

3. EQUIPMENT UNDER TEST (EUT)

3.1. Description of EUT

The EUT was a Card Printer incorporating an RFID Transmitter.

3.2. Identification of Equipment under Test (EUT)

ID#	Description	Brand Name	Model No	Serial No
E1	Rio Pro 360 Card Printer	Magicard	3652-3001	Sample A
E2	AC to DC Power Adapter	Sunpower	EA10952E-240	N/A

3.3. Port Identification

Port	Description	Possible Length (m)	Type	Connector
P1.1	Enclosure	Not Applicable	Enclosure	Not Applicable
P1.2	USB	< 3	Signal / DC Power	Type B
P1.3	Ethernet	10	Ethernet	RJ45

3.4. Operating Modes

Mode Reference	Definition
Normal Operation	The EUT was set to continuously print double-sided cards in colour. The EUT was hosted by a notebook PC, connected via a USB cable. Both the EUT and notebook PC had a wired (Ethernet) connection to a Local Area Network via a router.[1]

Note:

1. During the Radiated Emissions test, the notebook PC was used to send continuous ICMP Echo requests to the EUT.

3.5. Configuration and Peripherals

Description:	Please refer to the Test Configuration and Photograph section for schematic drawing(s) and/or photograph(s) of the test configuration(s) employed in the course of testing.

3.6. Modifications

NOTE: No modifications were made to the EUT during the course of testing.

3.7. Additional Information Related to Testing

Equipment Category:	Information Technology Equipment
Intended Operating Environment:	Residential / Commercial / Light Industrial
Intended Installation:	Table top
Cycle Time:	36 sec (for a complete double sided card)
Power Supply Requirement(s):	24 VDC from an AC to DC Power Adapter
Weight:	4.7 kg
Dimensions:	470 x 220 x 300 mm
Equipment Class:	B
Hardware Version Number:	1
Software Version Number:	V4.17
FCC ID Number:	XDW3652-3001
Highest Internally Generated Operating Frequency:	800 MHz

4. SUPPORT EQUIPMENT

4.1. Identification of Support Equipment

Description	Manufacturer	Model No	Serial No
Notebook PC	Dell	Latitude 3570	7JK3ZB2
AC to DC Power Adapter 1	Dell	DA65NM111-00	01XRN1-48661-66H-7TDC-A05
Dual Band Wireless Router	TP-LINK	Archer C2	2144593002095
AC to DC Power Adapter 2	TP-LINK	T120T50-2D1	None Stated

4.2. Interconnecting Cables

Cable Type	Shielded	Length (m)	Ferrite	Connection 1	Connection 2
USB	Yes	2.0	No	EUT 1	Notebook PC
Cat. 5e	No	2.0	No	EUT 1	Dual Band Wireless Router
Cat. 5e	No	1.0	No	Notebook PC	Dual Band Wireless Router
2-Core	Yes	1.0	Yes	Notebook PC	AC to DC Power Adapter 1
2 Core	No	1.4	No	Dual Band Wireless Router	AC to DC Power Adapter 2

5. MONITORING PERFORMANCE

5.1. Overview

No immunity testing was performed; therefore, performance criteria were not applicable.

5.2. Monitoring EUT Performance during Testing

For the purposes of testing, the term "*operate as intended*" was defined as:	The EUT was continually printing double sided cards in colour. During Radiated Emissions testing, the EUT was additionally sent ICMP Echo requests from a notebook PC via a Local Area Network.
For the purposes of testing, an "*unintentional response*" was defined as:	Not Applicable
Method used to determine whether user control functions and stored data were lost after the EMC exposure:	Not Applicable
Method used to verify that a communications link was established and maintained (if appropriate):	Not Applicable
Method of assessment of level of performance or degradation of performance during and/or after EMC exposure:	Not Applicable

6. MEASUREMENT UNCERTAINTY

6.1. Overview

No measurement can ever be perfect and those imperfections give rise to error. Consequently, the result of a measurement is only an approximation to the value of the measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement regarding the uncertainty of approximation.

Note that compliance is determined solely upon the results of compliance measurements and does not take into account measurement uncertainties. The measurement uncertainty values quoted in this report are for information only as they do not influence the associated test results.

6.2. Method of calculation

The methods used to calculate the uncertainties included within this test report are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty, the published guidance of the United Kingdom Accreditation Service (UKAS) is followed.

7. MEASUREMENTS, EXAMINATIONS AND DERIVED RESULTS

7.1. General Comments

7.1.1. This section contains the test result sheets for the measurements listed in Section ***2.2. Summary of Test Results*** (above).

7.1.2. The measurement uncertainties stated in the test result sheets were calculated in accordance with documented best practice and represent a confidence level of 95%. Where only confidence level is given, it has been demonstrated that the relevant items of test equipment used meet the specified requirements in the standard with at least this level of confidence.

7.1.3. Please refer to Section ***6. Measurement Uncertainty*** on page 10 for details of our treatment of measurement uncertainty.

RADIATED EMISSIONS - TEST RESULTS

This test is covered by the scope of UL VS's UKAS Accreditation under ISO/IEC 17025: 2005.

GENERAL INFORMATION

JOB NUMBER:	12247063JD01	**TEST SITE ID:**	Site 1
EUT:	3652-3001	**TEMPERATURE:**	23 °C to 23 °C
TEST ENGINEER:	Nick Raptopoulos	**RELATIVE HUMIDITY:**	37 % to 37 %
DATE OF TEST:	05 Apr 2018	**ATMOSPHERIC PRESSURE:**	1017 mb to 1017 mb
FIELD TYPE:	Electric Field	**MEASUREMENT DISTANCE:**	3 Metres
UNCERTAINTY:	< 1 GHz: ± 4.65 dB > 1 GHz: ± 4.37 dB	**EQUIPMENT CLASS:**	Class B
MEASUREMENT UNITS:	dBµV/m	**TEST ENVIRONMENT:**	Test Site

TEST SPECIFICATION DETAILS

The EUT has been configured and tested in accordance with the methods and procedures detailed within the following basic standard:

REFERENCE:	ANSI C63.4: 2014
TITLE:	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

COMMENTS

Measurements were performed in a semi-anechoic chamber at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable.

Below 1 GHz, maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Above 1 GHz, the orientation of the EUT emanating the highest emission levels was determined using exploratory measurements with an antenna and spectrum analyser prior to the formal measurements. For the final test, emissions the EUT was rotated whilst positioned in the previously determined worst case orientation only.

DEVIATIONS FROM TEST SPECIFICATION

There were no deviations from the test configuration and measurement arrangements defined in the test specification (identified above).

EUT RELATED

OPERATING MODE:	Normal Operation
FUNCTION(S) MONITORED:	Not Applicable

MEASUREMENT RESULTS

No.	Frequency (MHz)	Polarisation	Detector	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Graph No.	Result
1	33.410	Vertical	Quasi-Peak	35.8	40.0	4.2	GPH\12247063JD01\003	Complied
2	33.628	Vertical	Quasi-Peak	32.6	40.0	7.4	GPH\12247063JD01\003	Complied
3	67.089	Vertical	Quasi-Peak	24.7	40.0	15.3	GPH\12247063JD01\003	Complied
4	70.310	Vertical	Quasi-Peak	28.5	40.0	11.5	GPH\12247063JD01\003	Complied
5	74.514	Vertical	Quasi-Peak	29.9	40.0	10.1	GPH\12247063JD01\003	Complied
6	77.019	Vertical	Quasi-Peak	27.0	40.0	13.0	GPH\12247063JD01\003	Complied
7	78.159	Vertical	Quasi-Peak	27.4	40.0	12.6	GPH\12247063JD01\003	Complied
8	119.034	Horizontal	Quasi-Peak	16.7	43.5	26.8	GPH\12247063JD01\003	Complied
9	268.018	Horizontal	Quasi-Peak	21.2	46.0	24.8	GPH\12247063JD01\003	Complied
10	336.591	Horizontal	Quasi-Peak	19.4	46.0	26.6	GPH\12247063JD01\003	Complied
11	453.377	Vertical	Quasi-Peak	19.9	46.0	26.1	GPH\12247063JD01\003	Complied
12	623.000	Horizontal	Quasi-Peak	24.2	46.0	21.8	GPH\12247063JD01\003	Complied
13	770.913	Horizontal	Quasi-Peak	26.4	46.0	19.6	GPH\12247063JD01\003	Complied
14	1337.756	Horizontal	Max-Peak	67.2	74.0	6.8	GPH\12247063JD01\004	Complied
15	2022.004	Vertical	Max-Peak	47.0	74.0	27.0	GPH\12247063JD01\004	Complied
16	2478.758	Vertical	Max-Peak	67.0	74.0	7.0	GPH\12247063JD01\004	Complied

MEASUREMENT RESULTS

No.	Frequency (MHz)	Polarisation	Detector	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Graph No.	Result
17	2531.583	Horizontal	Max-Peak	70.9	74.0	3.1	GPH\12247063JD01\004	Complied
18	2567.174	Vertical	Max-Peak	69.6	74.0	4.4	GPH\12247063JD01\004	Complied
19	2737.756	Vertical	Max-Peak	64.7	74.0	9.3	GPH\12247063JD01\004	Complied
20	2868.337	Vertical	Max-Peak	68.1	74.0	5.9	GPH\12247063JD01\004	Complied
21	2992.013	Horizontal	Max-Peak	63.3	74.0	10.7	GPH\12247063JD01\004	Complied
22	1349.299	Vertical	Average (CISPR)	29.9	54.0	24.1	GPH\12247063JD01\004	Complied
23	2000.120	Vertical	Average (CISPR)	33.9	54.0	20.1	GPH\12247063JD01\004	Complied
24	2451.583	Vertical	Average (CISPR)	34.9	54.0	19.2	GPH\12247063JD01\004	Complied
25	2545.932	Vertical	Average (CISPR)	35.2	54.0	18.8	GPH\12247063JD01\004	Complied
26	2546.493	Horizontal	Average (CISPR)	35.2	54.0	18.8	GPH\12247063JD01\004	Complied
27	2723.888	Vertical	Average (CISPR)	35.6	54.0	18.4	GPH\12247063JD01\004	Complied
28	2876.192	Vertical	Average (CISPR)	36.4	54.0	17.6	GPH\12247063JD01\004	Complied
29	2995.814	Horizontal	Average (CISPR)	37.2	54.0	16.8	GPH\12247063JD01\004	Complied
30	3000 to 6000	Refer to Note 1					GPH\12247063JD01\005	Complied

NOTES

1	No emissions were noted above the noise floor of the measurement system; therefore, no further measurements were made.

TEST EQUIPMENT USED

UL ID	INSTRUMENT DESCRIPTION	MODEL NUMBER	CALIBRATION DUE	INTERVAL
K0001	5 m Semi-Anechoic Chamber	N/A	12 Mar 2019	12
M2009	Thermo-Hygrometer	608-H1	20 Jun 2018	12
M1273	20 Hz to 26.5 GHz EMI Test Receiver	ESIB 26	08 May 2018	12
G0543	Amplifier 9kHz - 1GHz	310N	15 Jun 2018	12
N0610	Site 1 Test PC	Motherboard: Asus P8Z68-V Pro Gen3	Calibration not required	N/A
A2699	1 to 18 GHz Double Ridged Guide Antenna	3115	25 Oct 2018	12
A2959	Trilog Broadband Antenna	VULB 9163	16 Nov 2018	12
A3047	5 dB Attenuator	BW-N5W5+	Calibrated as part of system	N/A
C1502	8 m RF Cable	104A	14 Mar 2019	12
A2936	Maturo 3 metre turntable	TT1.5WF	Calibration not required	N/A
C1419	3 m RF Cable	239-0088-3000	14 Mar 2019	12
C1407	15 m RF Cable	262-0941-15M0	14 Mar 2019	12
A2935	Maturo 30 MHz to 1 GHz Mast	AM4.0	Calibration not required	N/A
A2959	Trilog Broadband Antenna	VULB 9163	16 Nov 2018	12
C1411	1 metre RF cable	239-0088-1000	14 Mar 2019	12
A2706	Wireless Dual Band Gigabit Router	Archer C2	Calibration not required	N/A
C1409	5 m RF Cable	239-0088-5000	14 Mar 2019	12
C1408	5 m RF cable	239-0088-5000	14 Mar 2019	12
A3047	5 dB Attenuator	BW-N5W5+	Calibrated as part of system	N/A
A2102	1+ GHz Mast Controller	Controller NCD	Calibration not required	N/A
A1227	1 to 26.5 GHz Amplifier	8449B	15 Jun 2018	12
A2706	Wireless Dual Band Gigabit Router	Archer C2	Calibration not required	N/A

CONDUCTED EMISSIONS - TEST RESULTS

This test is covered by the scope of UL VS's UKAS Accreditation under ISO/IEC 17025: 2005.

GENERAL INFORMATION

JOB NUMBER:	12247063JD01	**TEST SITE ID:**	Site 8
EUT:	Rio Pro 360	**TEMPERATURE:**	22 °C To 23 °C
TEST ENGINEER:	Nigel Clift	**RELATIVE HUMIDITY:**	34 % To 36 %
DATE OF TEST:	05 Apr 2018	**ATMOSPHERIC PRESSURE:**	1017 mb To 1017 mb
UNCERTAINTY:	± 2.40 dB	**EQUIPMENT CLASS:**	Class B
EUT CATEGORY:	Not Applicable	**MEASUREMENT METHOD:**	LISN (AC)
PORT UNDER TEST:	AC Power Input	**EUT SUPPLY VOLTAGE:**	120 VAC

TEST SPECIFICATION DETAILS

The EUT has been configured and tested in accordance with the methods and procedures detailed within the following basic standard:

REFERENCE:	ANSI C63.4: 2014
TITLE:	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

COMMENTS

None

DEVIATIONS FROM TEST SPECIFICATION

There were no deviations from the test configuration and measurement arrangements defined in the test specification (identified above).

EUT RELATED

OPERATING MODE:	Normal Operation
FUNCTION(S) MONITORED:	Not Applicable

MEASUREMENT RESULTS

No.	Frequency (MHz)	Line	Detector	Level (dBµV)	Limit (dBµV)	Margin (dB)	Graph No.	Result
1	0.267	Live	Quasi-Peak	48.7	61.2	12.5	GPH\12247063JD01\001	Complied
2	0.470	Live	Quasi-Peak	44.6	56.5	11.9	GPH\12247063JD01\001	Complied
3	0.551	Live	Quasi-Peak	47.6	56.0	8.4	GPH\12247063JD01\001	Complied
4	0.695	Live	Quasi-Peak	39.7	56.0	16.3	GPH\12247063JD01\001	Complied
5	0.987	Live	Quasi-Peak	39.4	56.0	16.6	GPH\12247063JD01\001	Complied
6	1.968	Live	Quasi-Peak	38.6	56.0	17.4	GPH\12247063JD01\001	Complied
7	3.507	Live	Quasi-Peak	36.7	56.0	19.3	GPH\12247063JD01\001	Complied
8	0.398	Live	Average (CISPR)	28.0	47.9	19.9	GPH\12247063JD01\001	Complied
9	0.528	Live	Average (CISPR)	43.9	46.0	2.1	GPH\12247063JD01\001	Complied
10	0.704	Live	Average (CISPR)	32.5	46.0	13.5	GPH\12247063JD01\001	Complied
11	1.190	Live	Average (CISPR)	32.2	46.0	13.8	GPH\12247063JD01\001	Complied
12	1.311	Live	Average (CISPR)	31.6	46.0	14.4	GPH\12247063JD01\001	Complied
13	1.914	Live	Average (CISPR)	32.5	46.0	13.5	GPH\12247063JD01\001	Complied
14	2.580	Live	Average (CISPR)	31.1	46.0	14.9	GPH\12247063JD01\001	Complied
15	0.155	Neutral	Quasi-Peak	59.4	65.8	6.3	GPH\12247063JD01\002	Complied
16	0.200	Neutral	Quasi-Peak	54.5	63.6	9.1	GPH\12247063JD01\002	Complied
17	0.348	Neutral	Quasi-Peak	43.7	59.0	15.3	GPH\12247063JD01\002	Complied
18	0.515	Neutral	Quasi-Peak	49.0	56.0	7.0	GPH\12247063JD01\002	Complied
19	2.126	Neutral	Quasi-Peak	38.2	56.0	17.8	GPH\12247063JD01\002	Complied
20	5.550	Neutral	Quasi-Peak	35.7	60.0	24.3	GPH\12247063JD01\002	Complied

MEASUREMENT RESULTS

No.	Frequency (MHz)	Line	Detector	Level (dBµV)	Limit (dBµV)	Margin (dB)	Graph No.	Result
21	23.937	Neutral	Quasi-Peak	22.0	60.0	38.0	GPH\12247063JD01\002	Complied
22	0.177	Neutral	Average (CISPR)	31.6	54.6	23.0	GPH\12247063JD01\002	Complied
23	0.209	Neutral	Average (CISPR)	29.9	53.3	23.4	GPH\12247063JD01\002	Complied
24	0.537	Neutral	Average (CISPR)	42.8	46.0	3.2	GPH\12247063JD01\002	Complied
25	1.820	Neutral	Average (CISPR)	30.9	46.0	15.1	GPH\12247063JD01\002	Complied
26	25.058	Neutral	Average (CISPR)	22.8	50.0	27.2	GPH\12247063JD01\002	Complied
27	27.119	Neutral	Average (CISPR)	28.7	50.0	21.3	GPH\12247063JD01\002	Complied

TEST EQUIPMENT USED

UL ID	INSTRUMENT DESCRIPTION	MODEL NUMBER	CALIBRATION DUE	INTERVAL
K0008	Conducted Emissions / RF Immunity Laboratory	N/A	Calibration not required	N/A
M2013	Thermo-Hygrometer	608-H1	20 Jun 2018	12
M1263	R&S ESIB7 Test Receiver	ESIB7	13 Nov 2018	12
A1830	Pulse Limiter	ESH3-Z2	09 May 2018	12
C455	3 m RF Cable	RG142XX-001-RFIB	08 May 2018	12
A1305	DC-18GHz Power 5W	370 BNM	Calibrated as part of system	N/A
A649	Single Phase LISN	ESH3-Z5	31 May 2018	12
A067	Line Impedance Stabilization Network	ESH3-Z5	07 Aug 2018	12

8. PHOTOGRAPHS OF EUT

8.1. The test configuration photographs have been removed from the report at the request of the customer.

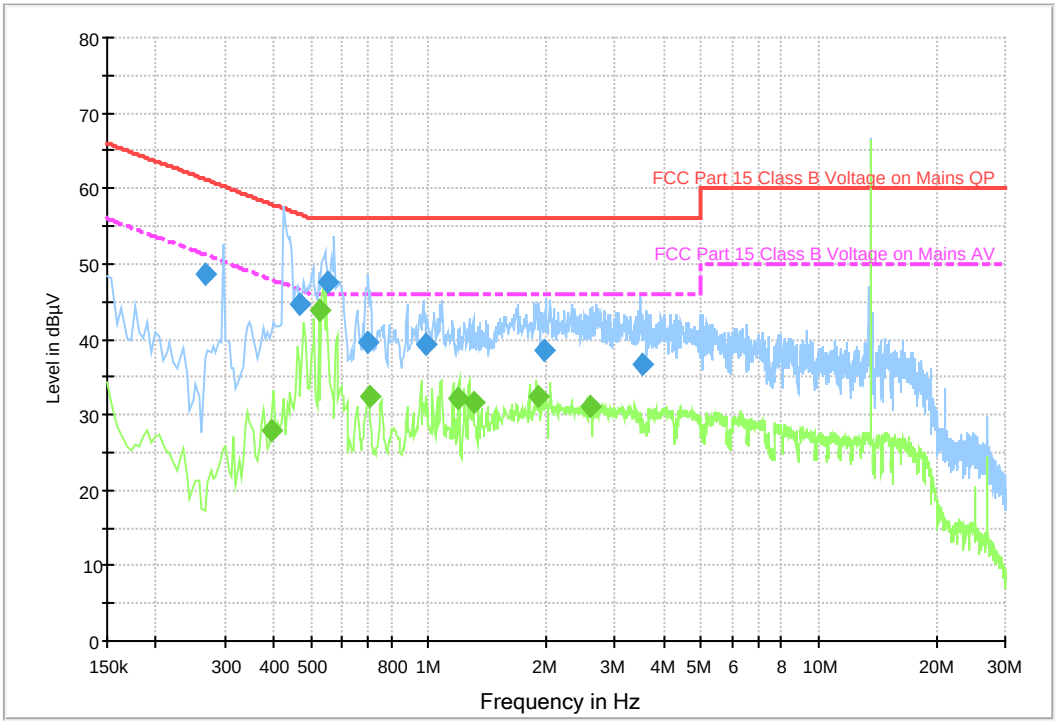
9. GRAPHICAL TEST RESULTS

9.1. This section contains the graphical results for the measurements listed in Section ***2.2. Summary of Test Results*** (above).

Graph Reference Number	Title
GPH\12247063JD01\001	Conducted Emissions (150 kHz to 30 MHz) - Live
GPH\12247063JD01\002	Conducted Emissions (150 kHz to 30 MHz) - Neutral
GPH\12247063JD01\003	Radiated Emissions (30 MHz to 1 GHz)
GPH\12247063JD01\004	Radiated Emissions (1 to 3 GHz)
GPH\12247063JD01\005	Radiated Emissions (3 to 6 GHz)

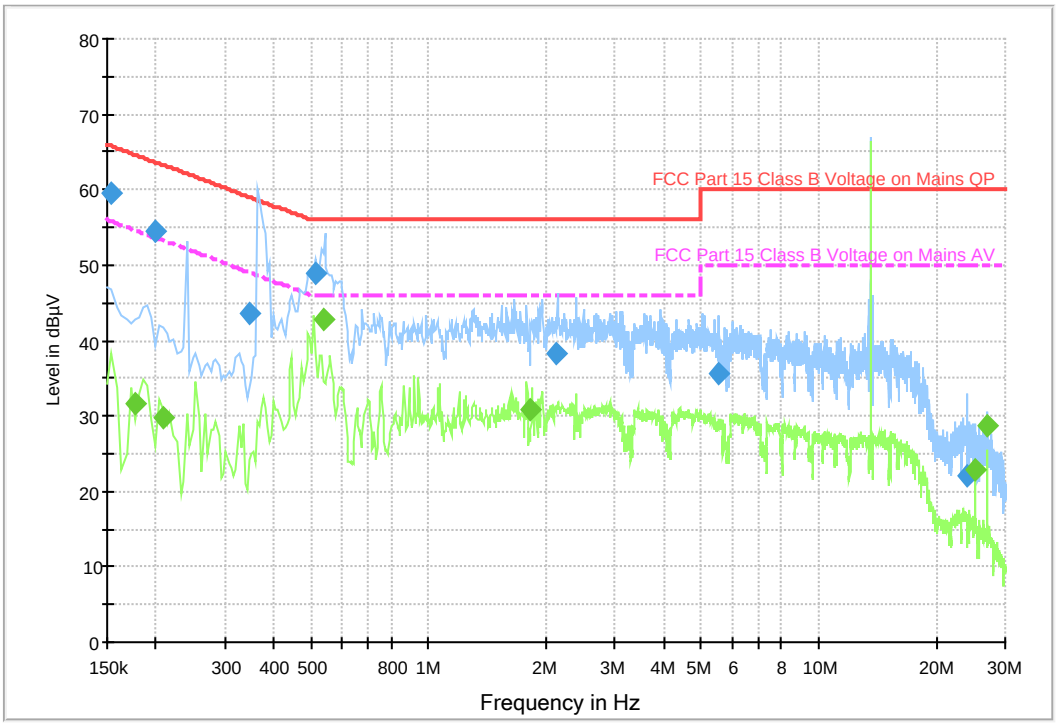
GPH\12247063JD01\001 - Conducted Emissions (150 kHz to 30 MHz) - Live

FCC Part 15 Class B Voltage with 2-Line-LISN Live with A3019 cable

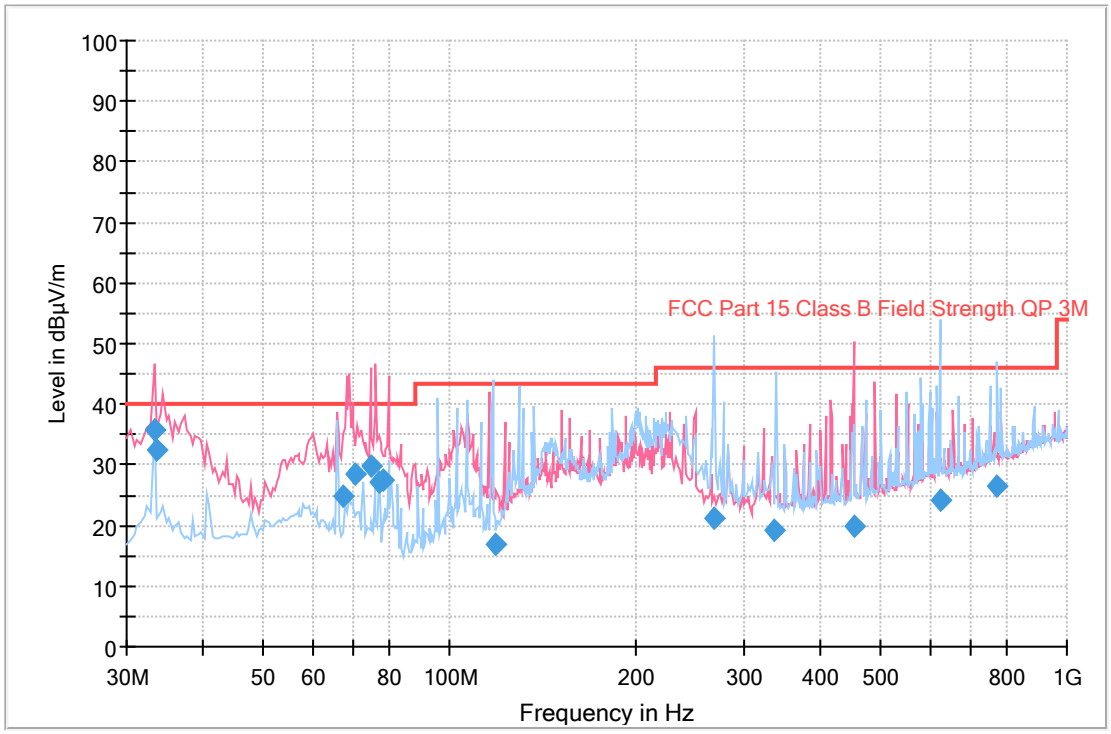


GPH\12247063JD01\002 - Conducted Emissions (150 kHz to 30 MHz) - Neutral

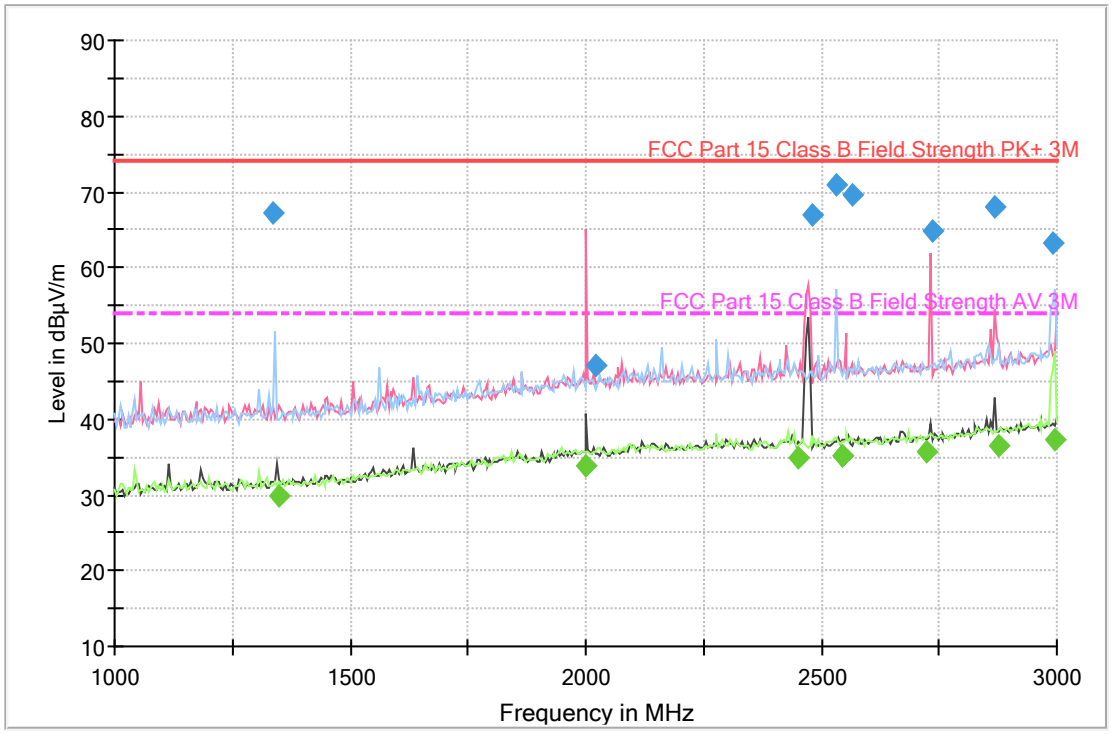
FCC Part 15 Class B Voltage with 2-Line-LISN Neutral with A3019 cable



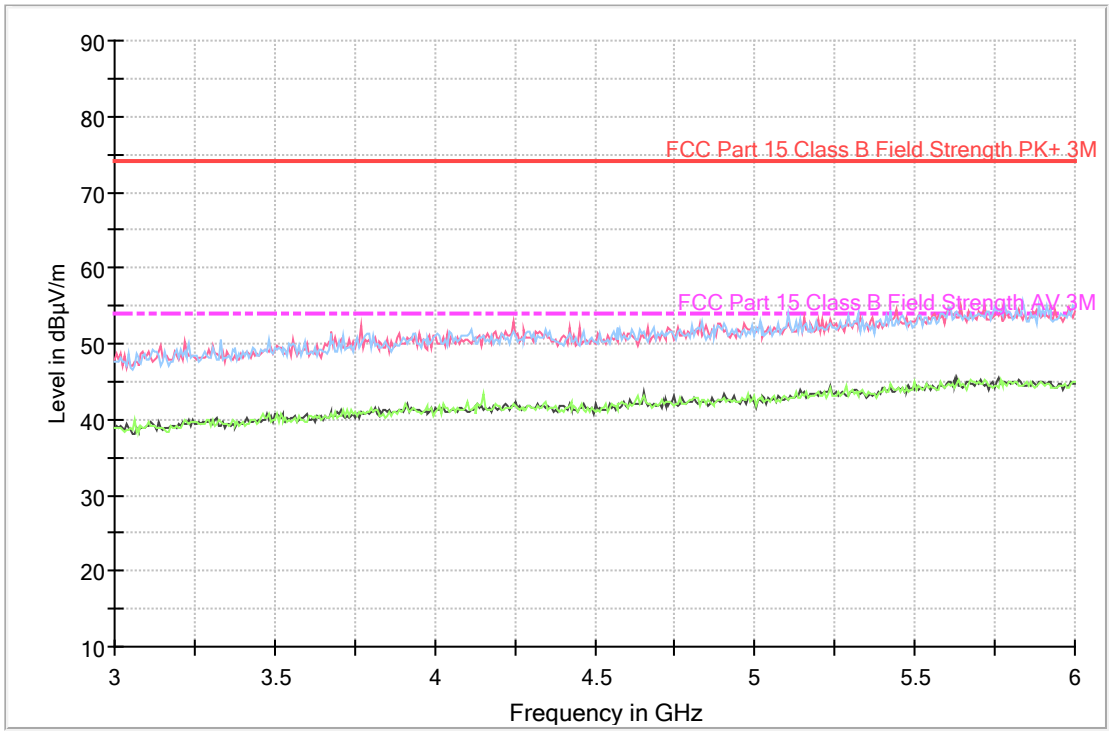
GPH\12247063JD01\003 - Radiated Emissions (30 MHz to 1 GHz)



GPH\12247063JD01\004 - Radiated Emissions (1 to 3 GHz)



GPH\12247063JD01\005 - Radiated Emissions (3 to 6 GHz)

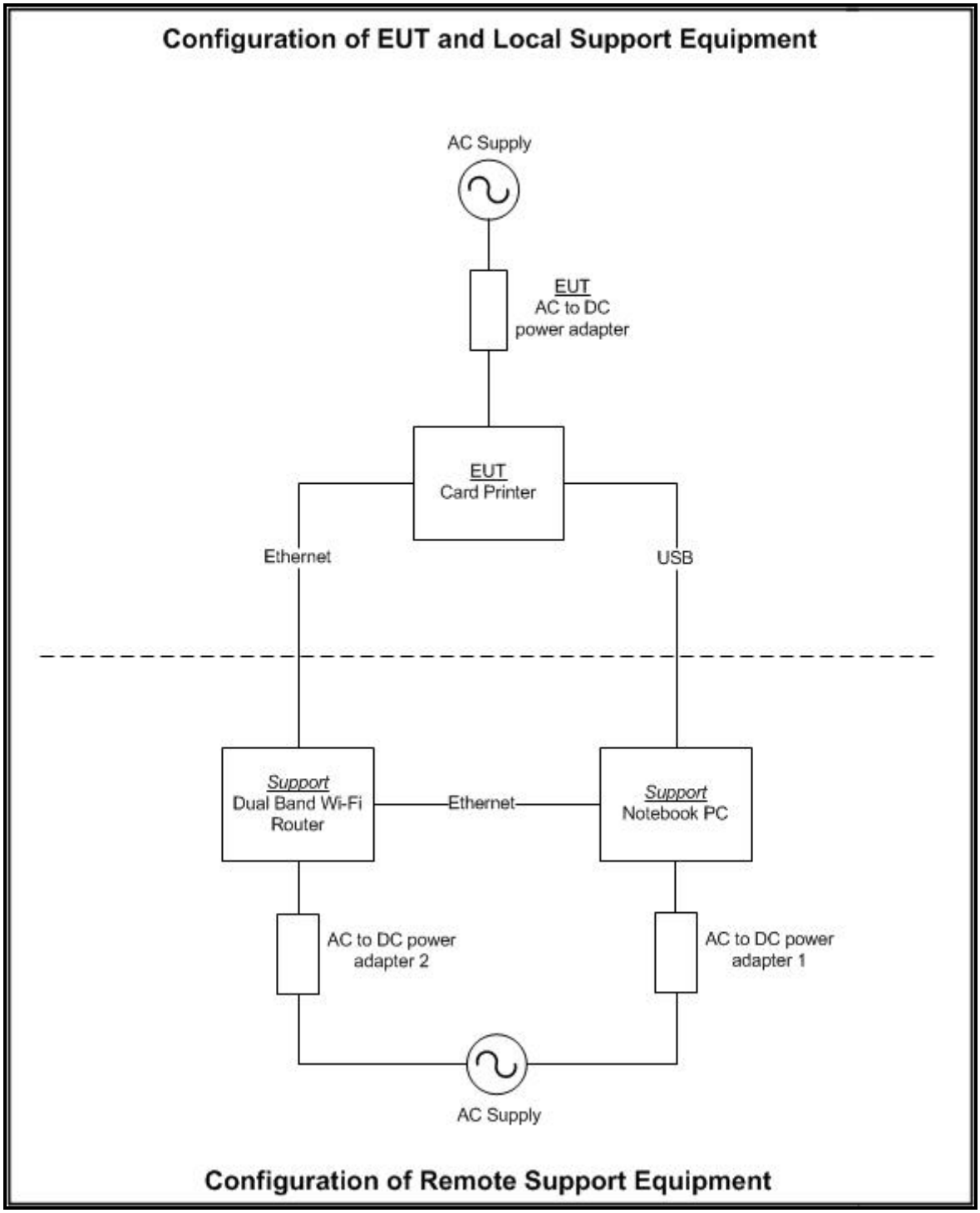


10. TEST CONFIGURATION DRAWING

10.1. This section contains the Test Configuration Drawings for the measurements listed in Section 7: Measurements, Examinations and Derived Results.

Test Configuration Reference Number	Title
DRG\12247063JD01\001	Schematic Diagram of the EUT and Support Equipment used during Radiated Emissions

DRG\12247063JD01\001 - Schematic Diagram of the EUT, Interconnecting Cables and Support Equipment used during Radiated Emissions



11. REPORT REVISION HISTORY

11.1. This section contains the report revision history.

Version Number	Revision Details		
	Page No(s)	Clause	Details
1.0	-	-	Initial Version.