# EMC TEST REPORT



Report No.: 18020209-FCC-E Supersede Report No.: N/A

| Applicant           | YMAX Communic       | cations Corp.                                   |                  |                |
|---------------------|---------------------|---|------------------|----------------|
| <b>Product Name</b> | magicJack           |   |                  |                |
| Main Model          | K1103R3             |   |                  |                |
| Test Standard       | FCC Part 15 Sub     | part B Class B:2017,                            | ANSI C63.4: 2014 |                |
| Test Date           | February 11 to Fe   | ebruary 23, 2018                                |                  |                |
| Issue Date          | February 23, 201    | 8   |                  |                |
| Test Result         | Pass F              | ail   |                  |                |
| Equipment complied  | d with the specific | ation   | <b>V</b>         |                |
| Equipment did not c | omply with the sp   | pecification                                    |                  |                |
| Louise              | ? Tu                | Deor  | l Dai'           |                |
| Louise<br>Test Engi | -                   | Deon<br>Engineer F                              | -                |                |
| Test resu           |                     | eport may be reprodu<br>is test report is appli |                  | ed sample only |

# Issued by: SIEMIC (Nanjing-China) Laboratories

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## **Laboratories Introduction**

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.



In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

**Accreditations for Conformity Assessment** 

| 710010411                            | ations for comorning recocomonic   |
|--------------------------------------|------------------------------------|
| Country/Region                       | Scope                              |
| USA                                  | EMC, RF/Wireless, SAR, Telecom     |
| Canada                               | EMC, RF/Wireless, SAR, Telecom     |
| Taiwan                               | EMC, RF, Telecom, SAR, Safety      |
| Hong Kong                            | RF/Wireless, SAR, Telecom          |
| Australia                            | EMC, RF, Telecom, SAR, Safety      |
| Korea                                | EMI, EMS, RF, SAR, Telecom, Safety |
| Japan                                | EMI, RF/Wireless, SAR, Telecom     |
| Singapore                            | EMC, RF, SAR, Telecom              |
| Europe EMC, RF, SAR, Telecom, Safety |                                    |



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## 1. Report Revision History

| Report No.     | Report Version | Description | Issue Date        |
|----------------|----------------|-------------|-------------------|
| 18020209-FCC-E | NONE           | Original    | February 23, 2018 |
|                |                |             |                   |
|                |                |             |                   |
|                |                |             |                   |
|                |                |             |                   |

## 2. Customer information

| Applicant Name   | YMAX Communications Corp.                          |
|------------------|--|
| Applicant Add    | 5700 Georgia Avenue, West Palm Beach, Florida, USA |
| Manufacturer     | YMAX Communications Corp.                          |
| Manufacturer Add | 5700 Georgia Avenue, West Palm Beach, Florida, USA |

## 3. Test site information

| Lab performing tests | SIEMIC (Nanjing-China) Laboratories  |
|----------------------|--|
| Lab Address          | 2-1 Longcang Avenue Yuhua Economic and Technology Development Park, Nanjing, China |
| FCC Test Site No.    | 694825   |
| IC Test Site No.     | 4842B-1  |
| Test Software        | EZ_EMC   |



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| Description of EUT: | magicJack                                     |  |
|---------------------|---|--|
| Main Model:         | K1103R3                                       |  |
| Serial Model:       | N/A   |  |
| Date EUT received:  | February 8, 2018                              |  |
| Test Date(s):       | February 11 to February 23, 2018              |  |
| Power:              | Input:100-240VAC 50/60Hz 0.2A<br>Output:5V 1A |  |
| Freq:               | 24MHz   |  |
| Port:               | USB Port、RJ45 Port、RJ11 Port                  |  |
| Trade Name:         | N/A   |  |
| FCC ID:             | Y79K1103                                      |  |
|                     |   |  |
|                     |   |  |
|                     |   |  |



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## 5. Test Summary

The product was tested in accordance with the following specifications. All testing has been performed according to below product classification:

| FCC Rules                 | Description of Test | Result     |
|---------------------------|---------------------|------------|
| §15.107; ANSI C63.4: 2014 | Conducted Emissions | Compliance |
| §15.109; ANSI C63.4: 2014 | Radiated Emissions  | Compliance |

**Measurement Uncertainty** 

| Test Item          | Description   | Uncertainty |
|--------------------|---|-------------|
| Radiated Emissions | Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m) | 3.952dB     |



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## 6. Measurements, Examination And Derived Results

#### 6.1 Conducted Emissions

| Temperature          | 23°C                             |
|----------------------|----------------------------------|
| Relative Humidity    | 51%                              |
| Atmospheric Pressure | 1022mbar                         |
| Test date :          | February 11 to February 14, 2018 |
| Tested By:           | Louise Tu                        |

Requirement(s):

| Spec             | Requirement Applicable   |   |   |          |  |  |  |
|------------------|--|---|---|----------|--|--|--|
| 47CFR<br>§15.107 | For Low-power radio-frequency of (AC) power line, the radio freque on any frequency or frequencies limits in the following table, as m stabilization network (LISN). The ranges.  Frequency ranges (MHz)   | ncy voltage that is conducted, within the band 150 kHz to easured using a 50 [mu]H/5 lower limit applies at the book Class A Limit Limit (QP) | d back onto the AC power line 30 MHz, shall not exceed the 0 ohms line impedance bundary between the frequencies  (dBµV)  Average |          |  |  |  |
| 313.107          | 0.15 ~ 0.5<br>0.5 ~ 30   | 79<br>73  | 66  |          |  |  |  |
|                  | 0.0 00   | Class B Limit   | 00  |          |  |  |  |
|                  | Frequency ranges   |   | (dBµV)  |          |  |  |  |
|                  | (MHz)  | QP  | Average   |          |  |  |  |
|                  | 0.15 ~ 0.5   | 66 – 56   | 56 – 46   |          |  |  |  |
|                  | 0.5 ~ 5  | 56  | 46  |          |  |  |  |
|                  | 5 ~ 30   | 60  | 50  | <u> </u> |  |  |  |
| Test Setup       | Reference Plane  But  Horizontal Ground Reference Plane  Note: 1.Support units were connected to second LISN.  2.Both of LISNs (AMN) are 80cm from EUT and at least 80cm   |   |   |          |  |  |  |
| Procedure        | <ol> <li>The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table.</li> <li>The power supply for the EUT was fed through a 50 [mu]H/50 EUT LISN, connected to filtered mains.</li> <li>The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable.</li> <li>All other supporting equipment were powered separately from another main supply.</li> <li>The EUT was switched on and allowed to warm up to its normal operating condition.</li> <li>A scan was made on the NEUTRAL line (for AC mains) or Earth line (for DC power) over the required frequency range using an EMI test receiver.</li> <li>High peaks, relative to the limit line, were then selected, The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10kHz.</li> <li>Steps 6-7 were repeated for the LIVE line (for AC mains) or DC line (for DC power).</li> </ol> |   |   |          |  |  |  |
| Remark           | o. Stops of word repeated i  |   | ind, or bo line (lot bo power).   |          |  |  |  |



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| Result    | Yes            | Fail             |
|-----------|----------------|------------------|
| Test Data | Yes            | □ <sub>N/A</sub> |
| Test Plot | Yes(See below) | □ <sub>N/A</sub> |

Data sample

| No. | Frequency | Reading             | Detector | Lisn/Isn | Ps_Lmt | Cab_L | Result              | Limit               | Margin |
|-----|-----------|---------------------|----------|----------|--------|-------|---------------------|---------------------|--------|
|     | (MHz)     | (dB <sub>µ</sub> V) |          | (dB)     | (dB)   | (dB)  | (dB <sub>µ</sub> V) | (dB <sub>µ</sub> V) | (dB)   |

Frequency (MHz) = Emission frequency in MHz

Reading  $(dB\mu V)$  = Receiver Reading Value

Detector=Quasi Peak Detector or Average Detector

Lisn/ISN= Insertion loss of LISN

Ps\_Lmt= Insertion loss of transient limiter (The transient limiter included 10dB attenuation)

Cab\_L= cable loss

Result ( $dB\mu V$ ) = Reading Value + Corrected Value

Limit ( $dB\mu V$ ) = Limit stated in standard

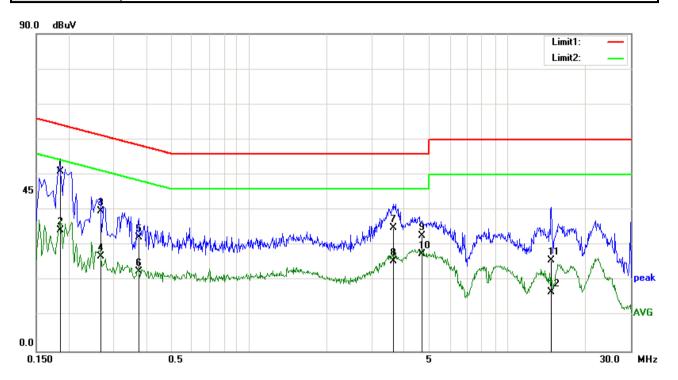
#### **Calculation Formula:**

Margin (dB) = Result (dB $\mu$ V) – limit (dB $\mu$ V)



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Test Mode: Normal Working (Notebook)



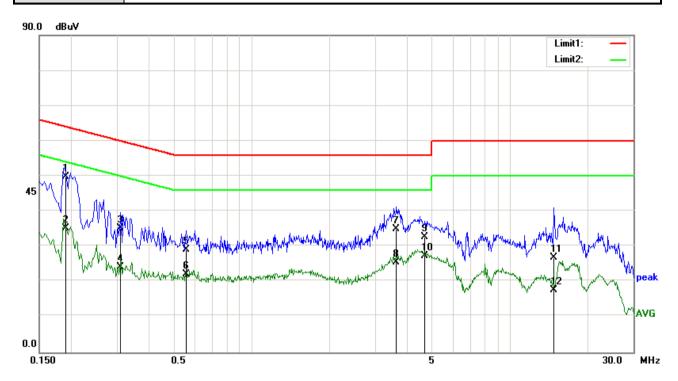
#### Phase Line Plot at 120V AC, 60Hz

| No. | Frequency | Reading | Detector | Lisn/Isn | Ps_Lmt | Cab_L | Result | Limit  | Margin |
|-----|-----------|---------|----------|----------|--------|-------|--------|--------|--------|
|     | (MHz)     | (dBµV)  |          | (dB)     | (dB)   | (dB)  | (dBµV) | (dBµV) | (dB)   |
| 1   | 0.1860    | 40.50   | QP       | 0.10     | -10.00 | 0.30  | 50.90  | 64.21  | -13.31 |
| 2   | 0.1860    | 23.81   | AVG      | 0.10     | -10.00 | 0.30  | 34.21  | 54.21  | -20.00 |
| 3   | 0.2660    | 29.37   | QP       | 0.10     | -10.00 | 0.20  | 39.67  | 61.24  | -21.57 |
| 4   | 0.2660    | 16.55   | AVG      | 0.10     | -10.00 | 0.20  | 26.85  | 51.24  | -24.39 |
| 5   | 0.3740    | 21.96   | QP       | 0.11     | -10.00 | 0.20  | 32.27  | 58.41  | -26.14 |
| 6   | 0.3740    | 12.27   | AVG      | 0.11     | -10.00 | 0.20  | 22.58  | 48.41  | -25.83 |
| 7   | 3.6100    | 24.53   | QP       | 0.22     | -10.00 | 0.25  | 35.00  | 56.00  | -21.00 |
| 8   | 3.6100    | 15.07   | AVG      | 0.22     | -10.00 | 0.25  | 25.54  | 46.00  | -20.46 |
| 9   | 4.6740    | 22.16   | QP       | 0.26     | -10.00 | 0.28  | 32.70  | 56.00  | -23.30 |
| 10  | 4.6740    | 16.94   | AVG      | 0.26     | -10.00 | 0.28  | 27.48  | 46.00  | -18.52 |
| 11  | 14.8180   | 14.46   | QP       | 0.85     | -10.00 | 0.47  | 25.78  | 60.00  | -34.22 |
| 12  | 14.8180   | 5.41    | AVG      | 0.85     | -10.00 | 0.47  | 16.73  | 50.00  | -33.27 |



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| Test Mode: | Normal Working (Notebook) |  |
|------------|---------------------------|--|
|------------|---------------------------|--|



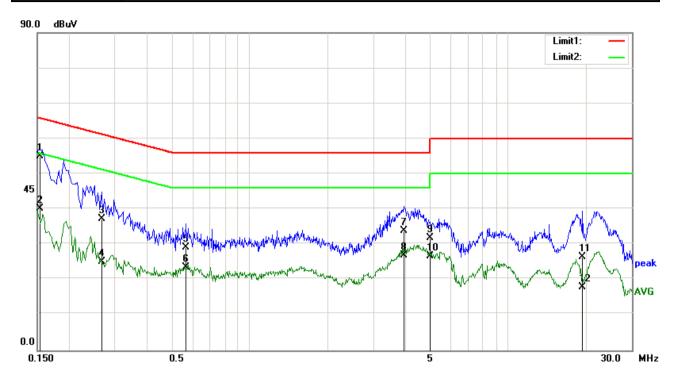
#### Phase Neutral Plot at 120V AC, 60Hz

| No. | Frequency | Reading             | Detector | Lisn/Isn | Ps_Lmt | Cab_L | Result | Limit  | Margin |
|-----|-----------|---------------------|----------|----------|--------|-------|--------|--------|--------|
|     | (MHz)     | (dB <sub>µ</sub> V) |          | (dB)     | (dB)   | (dB)  | (dBµV) | (dBµV) | (dB)   |
| 1   | 0.1900    | 39.36               | QP       | 0.10     | -10.00 | 0.30  | 49.76  | 64.04  | -14.28 |
| 2   | 0.1900    | 24.77               | AVG      | 0.10     | -10.00 | 0.30  | 35.17  | 54.04  | -18.87 |
| 3   | 0.3100    | 24.90               | QP       | 0.10     | -10.00 | 0.20  | 35.20  | 59.97  | -24.77 |
| 4   | 0.3100    | 13.91               | AVG      | 0.10     | -10.00 | 0.20  | 24.21  | 49.97  | -25.76 |
| 5   | 0.5580    | 18.84               | QP       | 0.11     | -10.00 | 0.21  | 29.16  | 56.00  | -26.84 |
| 6   | 0.5580    | 11.93               | AVG      | 0.11     | -10.00 | 0.21  | 22.25  | 46.00  | -23.75 |
| 7   | 3.6380    | 24.46               | QP       | 0.23     | -10.00 | 0.25  | 34.94  | 56.00  | -21.06 |
| 8   | 3.6380    | 15.05               | AVG      | 0.23     | -10.00 | 0.25  | 25.53  | 46.00  | -20.47 |
| 9   | 4.6780    | 22.26               | QP       | 0.27     | -10.00 | 0.28  | 32.81  | 56.00  | -23.19 |
| 10  | 4.6780    | 16.88               | AVG      | 0.27     | -10.00 | 0.28  | 27.43  | 46.00  | -18.57 |
| 11  | 14.7500   | 15.60               | QP       | 0.93     | -10.00 | 0.47  | 27.00  | 60.00  | -33.00 |
| 12  | 14.7500   | 6.23                | AVG      | 0.93     | -10.00 | 0.47  | 17.63  | 50.00  | -32.37 |



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Test Mode: Normal Working (Notebook)



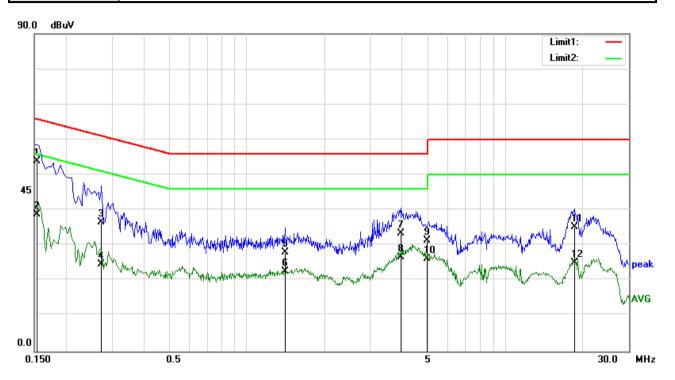
#### Phase Line Plot at 240V AC, 50Hz

| No. | Frequency | Reading | Detector | Lisn/Isn | Ps_Lmt | Cab_L | Result | Limit  | Margin |
|-----|-----------|---------|----------|----------|--------|-------|--------|--------|--------|
|     | (MHz)     | (dBµV)  |          | (dB)     | (dB)   | (dB)  | (dBµV) | (dBµV) | (dB)   |
| 1   | 0.1540    | 44.48   | QP       | 0.10     | -10.00 | 0.35  | 54.93  | 65.78  | -10.85 |
| 2   | 0.1540    | 29.74   | AVG      | 0.10     | -10.00 | 0.35  | 40.19  | 55.78  | -15.59 |
| 3   | 0.2660    | 26.87   | QP       | 0.10     | -10.00 | 0.20  | 37.17  | 61.24  | -24.07 |
| 4   | 0.2660    | 14.87   | AVG      | 0.10     | -10.00 | 0.20  | 25.17  | 51.24  | -26.07 |
| 5   | 0.5660    | 18.71   | QP       | 0.12     | -10.00 | 0.21  | 29.04  | 56.00  | -26.96 |
| 6   | 0.5660    | 13.14   | AVG      | 0.12     | -10.00 | 0.21  | 23.47  | 46.00  | -22.53 |
| 7   | 3.9300    | 23.43   | QP       | 0.23     | -10.00 | 0.26  | 33.92  | 56.00  | -22.08 |
| 8   | 3.9300    | 16.51   | AVG      | 0.23     | -10.00 | 0.26  | 27.00  | 46.00  | -19.00 |
| 9   | 4.9940    | 21.36   | QP       | 0.27     | -10.00 | 0.30  | 31.93  | 56.00  | -24.07 |
| 10  | 4.9940    | 16.15   | AVG      | 0.27     | -10.00 | 0.30  | 26.72  | 46.00  | -19.28 |
| 11  | 19.4260   | 14.92   | QP       | 1.05     | -10.00 | 0.57  | 26.54  | 60.00  | -33.46 |
| 12  | 19.4260   | 6.17    | AVG      | 1.05     | -10.00 | 0.57  | 17.79  | 50.00  | -32.21 |



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| Test Mode: |
|------------|
|------------|

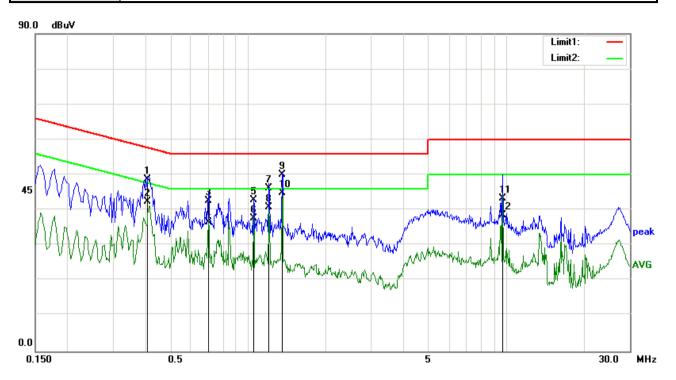


#### Phase Neutral Plot at 240V AC, 50Hz

| No. | Frequency | Reading | Detector | Lisn/Isn | Ps_Lmt | Cab_L | Result | Limit  | Margin |
|-----|-----------|---------|----------|----------|--------|-------|--------|--------|--------|
|     | (MHz)     | (dBμV)  |          | (dB)     | (dB)   | (dB)  | (dBµV) | (dBµV) | (dB)   |
| 1   | 0.1540    | 43.44   | QP       | 0.11     | -10.00 | 0.35  | 53.90  | 65.78  | -11.88 |
| 2   | 0.1540    | 28.38   | AVG      | 0.11     | -10.00 | 0.35  | 38.84  | 55.78  | -16.94 |
| 3   | 0.2740    | 26.20   | QP       | 0.10     | -10.00 | 0.20  | 36.50  | 61.00  | -24.50 |
| 4   | 0.2740    | 14.29   | AVG      | 0.10     | -10.00 | 0.20  | 24.59  | 51.00  | -26.41 |
| 5   | 1.4060    | 17.58   | QP       | 0.15     | -10.00 | 0.20  | 27.93  | 56.00  | -28.07 |
| 6   | 1.4060    | 12.31   | AVG      | 0.15     | -10.00 | 0.20  | 22.66  | 46.00  | -23.34 |
| 7   | 3.9260    | 22.90   | QP       | 0.24     | -10.00 | 0.26  | 33.40  | 56.00  | -22.60 |
| 8   | 3.9260    | 16.11   | AVG      | 0.24     | -10.00 | 0.26  | 26.61  | 46.00  | -19.39 |
| 9   | 4.9740    | 20.92   | QP       | 0.28     | -10.00 | 0.30  | 31.50  | 56.00  | -24.50 |
| 10  | 4.9740    | 15.65   | AVG      | 0.28     | -10.00 | 0.30  | 26.23  | 46.00  | -19.77 |
| 11  | 18.4700   | 23.57   | QP       | 1.12     | -10.00 | 0.52  | 35.21  | 60.00  | -24.79 |
| 12  | 18.4700   | 13.36   | AVG      | 1.12     | -10.00 | 0.52  | 25.00  | 50.00  | -25.00 |



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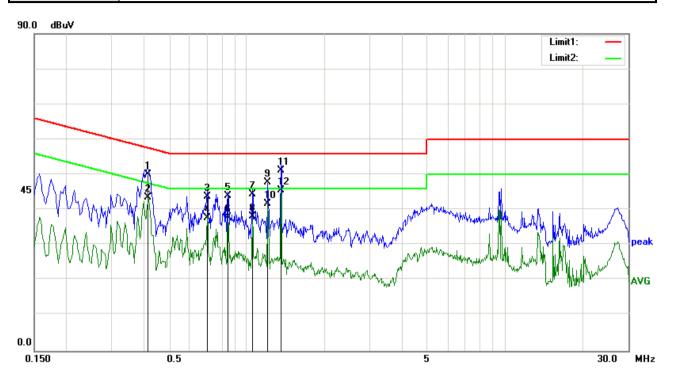


#### Phase Line Plot at 120V AC, 60Hz

| No. | Frequency | Reading | Detector | Lisn/Isn | Ps_Lmt | Cab_L | Result | Limit  | Margin |
|-----|-----------|---------|----------|----------|--------|-------|--------|--------|--------|
|     | (MHz)     | (dBµV)  |          | (dB)     | (dB)   | (dB)  | (dBµV) | (dBµV) | (dB)   |
| 1   | 0.4100    | 38.37   | QP       | 0.11     | -10.00 | 0.21  | 48.69  | 57.65  | -8.96  |
| 2   | 0.4100    | 32.10   | AVG      | 0.11     | -10.00 | 0.21  | 42.42  | 47.65  | -5.23  |
| 3   | 0.7020    | 32.30   | QP       | 0.13     | -10.00 | 0.20  | 42.63  | 56.00  | -13.37 |
| 4   | 0.7020    | 26.24   | AVG      | 0.13     | -10.00 | 0.20  | 36.57  | 46.00  | -9.43  |
| 5   | 1.0540    | 32.53   | QP       | 0.14     | -10.00 | 0.19  | 42.86  | 56.00  | -13.14 |
| 6   | 1.0540    | 27.26   | AVG      | 0.14     | -10.00 | 0.19  | 37.59  | 46.00  | -8.41  |
| 7   | 1.2060    | 35.90   | QP       | 0.14     | -10.00 | 0.21  | 46.25  | 56.00  | -9.75  |
| 8   | 1.2060    | 30.46   | AVG      | 0.14     | -10.00 | 0.21  | 40.81  | 46.00  | -5.19  |
| 9   | 1.3580    | 39.64   | QP       | 0.15     | -10.00 | 0.21  | 50.00  | 56.00  | -6.00  |
| 10  | 1.3580    | 34.64   | AVG      | 0.15     | -10.00 | 0.21  | 45.00  | 46.00  | -1.00  |
| 11  | 9.6860    | 32.44   | QP       | 0.48     | -10.00 | 0.39  | 43.31  | 60.00  | -16.69 |
| 12  | 9.6860    | 27.79   | AVG      | 0.48     | -10.00 | 0.39  | 38.66  | 50.00  | -11.34 |



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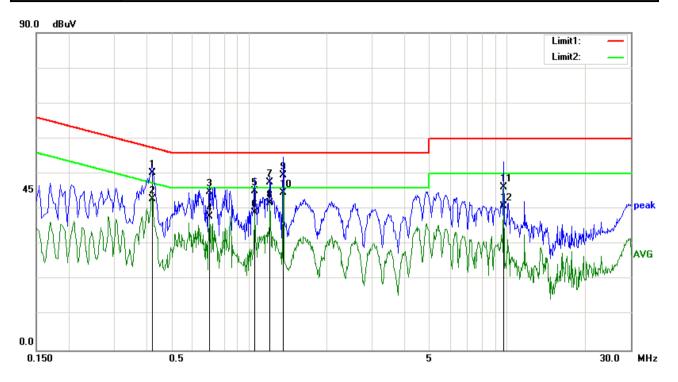


#### Phase Neutral Plot at 120V AC, 60Hz

| No. | Frequency | Reading | Detector | Lisn/Isn | Ps_Lmt | Cab_L | Result | Limit  | Margin |
|-----|-----------|---------|----------|----------|--------|-------|--------|--------|--------|
|     | (MHz)     | (dBμV)  |          | (dB)     | (dB)   | (dB)  | (dBµV) | (dBµV) | (dB)   |
| 1   | 0.4140    | 39.83   | QP       | 0.11     | -10.00 | 0.21  | 50.15  | 57.57  | -7.42  |
| 2   | 0.4140    | 33.16   | AVG      | 0.11     | -10.00 | 0.21  | 43.48  | 47.57  | -4.09  |
| 3   | 0.7020    | 33.37   | QP       | 0.12     | -10.00 | 0.20  | 43.69  | 56.00  | -12.31 |
| 4   | 0.7020    | 27.47   | AVG      | 0.12     | -10.00 | 0.20  | 37.79  | 46.00  | -8.21  |
| 5   | 0.8460    | 33.77   | QP       | 0.12     | -10.00 | 0.20  | 44.09  | 56.00  | -11.91 |
| 6   | 0.8460    | 27.63   | AVG      | 0.12     | -10.00 | 0.20  | 37.95  | 46.00  | -8.05  |
| 7   | 1.0540    | 34.02   | QP       | 0.13     | -10.00 | 0.19  | 44.34  | 56.00  | -11.66 |
| 8   | 1.0540    | 27.86   | AVG      | 0.13     | -10.00 | 0.19  | 38.18  | 46.00  | -7.82  |
| 9   | 1.2060    | 37.56   | QP       | 0.14     | -10.00 | 0.21  | 47.91  | 56.00  | -8.09  |
| 10  | 1.2060    | 31.38   | AVG      | 0.14     | -10.00 | 0.21  | 41.73  | 46.00  | -4.27  |
| 11  | 1.3580    | 40.74   | QP       | 0.14     | -10.00 | 0.21  | 51.09  | 56.00  | -4.91  |
| 12  | 1.3580    | 35.23   | AVG      | 0.14     | -10.00 | 0.21  | 45.58  | 46.00  | -0.42  |



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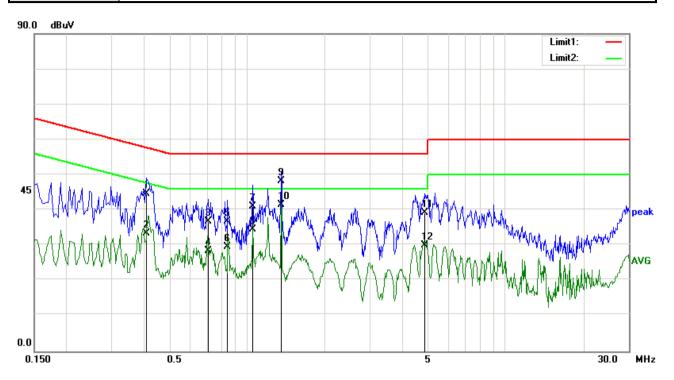


Phase Line Plot at 240V AC, 50Hz

| No. | Frequency | Reading | Detector | Lisn/Isn | Ps_Lmt | Cab_L | Result | Limit  | Margin |
|-----|-----------|---------|----------|----------|--------|-------|--------|--------|--------|
|     | (MHz)     | (dBµV)  |          | (dB)     | (dB)   | (dB)  | (dBµV) | (dBµV) | (dB)   |
| 1   | 0.4220    | 39.86   | QP       | 0.11     | -10.00 | 0.21  | 50.18  | 57.41  | -7.23  |
| 2   | 0.4220    | 32.46   | AVG      | 0.11     | -10.00 | 0.21  | 42.78  | 47.41  | -4.63  |
| 3   | 0.7020    | 34.45   | QP       | 0.13     | -10.00 | 0.20  | 44.78  | 56.00  | -11.22 |
| 4   | 0.7020    | 27.60   | AVG      | 0.13     | -10.00 | 0.20  | 37.93  | 46.00  | -8.07  |
| 5   | 1.0540    | 34.79   | QP       | 0.14     | -10.00 | 0.19  | 45.12  | 56.00  | -10.88 |
| 6   | 1.0540    | 28.72   | AVG      | 0.14     | -10.00 | 0.19  | 39.05  | 46.00  | -6.95  |
| 7   | 1.2060    | 37.29   | QP       | 0.14     | -10.00 | 0.21  | 47.64  | 56.00  | -8.36  |
| 8   | 1.2060    | 31.32   | AVG      | 0.14     | -10.00 | 0.21  | 41.67  | 46.00  | -4.33  |
| 9   | 1.3580    | 39.30   | QP       | 0.15     | -10.00 | 0.21  | 49.66  | 56.00  | -6.34  |
| 10  | 1.3580    | 34.26   | AVG      | 0.15     | -10.00 | 0.21  | 44.62  | 46.00  | -1.38  |
| 11  | 9.6860    | 35.26   | QP       | 0.48     | -10.00 | 0.39  | 46.13  | 60.00  | -13.87 |
| 12  | 9.6860    | 29.90   | AVG      | 0.48     | -10.00 | 0.39  | 40.77  | 50.00  | -9.23  |



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#### Phase Neutral Plot at 240V AC, 50Hz

| No. | Frequency | Reading | Detector | Lisn/Isn | Ps_Lmt | Cab_L | Result | Limit  | Margin |
|-----|-----------|---------|----------|----------|--------|-------|--------|--------|--------|
|     | (MHz)     | (dBμV)  |          | (dB)     | (dB)   | (dB)  | (dBµV) | (dBµV) | (dB)   |
| 1   | 0.4100    | 34.37   | QP       | 0.11     | -10.00 | 0.21  | 44.69  | 57.65  | -12.96 |
| 2   | 0.4100    | 23.05   | AVG      | 0.11     | -10.00 | 0.21  | 33.37  | 47.65  | -14.28 |
| 3   | 0.7100    | 26.53   | QP       | 0.12     | -10.00 | 0.20  | 36.85  | 56.00  | -19.15 |
| 4   | 0.7100    | 18.06   | AVG      | 0.12     | -10.00 | 0.20  | 28.38  | 46.00  | -17.62 |
| 5   | 0.8420    | 26.48   | QP       | 0.12     | -10.00 | 0.20  | 36.80  | 56.00  | -19.20 |
| 6   | 0.8420    | 19.35   | AVG      | 0.12     | -10.00 | 0.20  | 29.67  | 46.00  | -16.33 |
| 7   | 1.0540    | 30.63   | QP       | 0.13     | -10.00 | 0.19  | 40.95  | 56.00  | -15.05 |
| 8   | 1.0540    | 24.23   | AVG      | 0.13     | -10.00 | 0.19  | 34.55  | 46.00  | -11.45 |
| 9   | 1.3580    | 37.84   | QP       | 0.14     | -10.00 | 0.21  | 48.19  | 56.00  | -7.81  |
| 10  | 1.3580    | 31.21   | AVG      | 0.14     | -10.00 | 0.21  | 41.56  | 46.00  | -4.44  |
| 11  | 4.8940    | 28.69   | QP       | 0.28     | -10.00 | 0.29  | 39.26  | 56.00  | -16.74 |
| 12  | 4.8940    | 19.54   | AVG      | 0.28     | -10.00 | 0.29  | 30.11  | 46.00  | -15.89 |



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## 6.2 Radiated Emissions

| Temperature          | 23°C                             |
|----------------------|----------------------------------|
| Relative Humidity    | 51%                              |
| Atmospheric Pressure | 1022mbar                         |
| Test date :          | February 14 to February 23, 2018 |
| Tested By:           | Louise Tu                        |

Requirement(s):

| Spec       | Requirement   | Applicable |  |  |  |  |  |  |
|------------|---|------------|--|--|--|--|--|--|
|            | Except higher limit as specified elsewhere in other section, the emissions from the low-power radio-frequency devices shall not exceed the field strength levels specified in the following table and the level of any unwanted emissions shall not exceed the level of the fundamental emission. The tighter limit applies at the band edges  Class A Limit  |            |  |  |  |  |  |  |
|            |   |            |  |  |  |  |  |  |
|            | Frequency range (MHz) Field Strength (µV/m)   |            |  |  |  |  |  |  |
| 47CFR      | 30 – 88<br>88 – 216<br>150  | _          |  |  |  |  |  |  |
|            | 216 – 960 210   | <b>~</b>   |  |  |  |  |  |  |
| §15.109    | Above 960 300   | _          |  |  |  |  |  |  |
|            | Class B Limit   |            |  |  |  |  |  |  |
|            | Frequency range (MHz)  Field Strength (µV/m)  |            |  |  |  |  |  |  |
|            | 30 – 88   |            |  |  |  |  |  |  |
|            | 88 – 216 150  |            |  |  |  |  |  |  |
|            | 216 – 960 200   |            |  |  |  |  |  |  |
|            | Above 960 500   |            |  |  |  |  |  |  |
| Test Setup | Support Units  Turn Table  Ground Plane  Test Receiver  | -          |  |  |  |  |  |  |
| Procedure  | <ol> <li>The EUT was switched on and allowed to warm up to its normal operating condition.</li> <li>The test was carried out at the selected frequency points obtained from the EUT characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner:         <ol> <li>Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen.</li> <li>The EUT was then rotated to the direction that gave the maximum emission.</li> <li>Finally, the antenna height was adjusted to the height that gave the maximum emission.</li> </ol> </li> <li>For emission frequencies measured below and above 1GHz, set the spectrum analyzer on a 100kHz and 1MHz resolution bandwidth respectively for each frequency measured.</li> <li>Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were</li> </ol> |            |  |  |  |  |  |  |
| Remark     | measured.   |            |  |  |  |  |  |  |



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| Result    | Pass            | Fail             |
|-----------|-----------------|------------------|
| Test Data | Yes             | □ <sub>N/A</sub> |
| Test Plot | Yes (See below) | □ <sub>N/A</sub> |

Data sample

| No. | Frequency | Reading  | Detector | Ant_F  | PA_G | Cab_L | Result   | Limit    | Margin | Height | Degree |
|-----|-----------|----------|----------|--------|------|-------|----------|----------|--------|--------|--------|
|     | (MHz)     | (dBµV/m) |          | (dB/m) | (dB) | (dB)  | (dBµV/m) | (dBµV/m) | (dB)   | (cm)   | (°)    |

Frequency (MHz) = Emission frequency in MHz

Reading  $(dB\mu V/m)$  = Receiver Reading Value

Detector= Peak Detector or Quasi Peak Detector

Ant\_F=Antenna Factor

PA\_G=Pre-Amplifier Gain

Cab\_L=Cable Loss

Result ( $dB\mu V/m$ ) = Read ing Value + Corrected Value

Limit ( $dB\mu V/m$ ) = Limit stated in standard

Height (cm) = Height of Receiver antenna

Degree = Turn table degree

#### **Calculation Formula:**

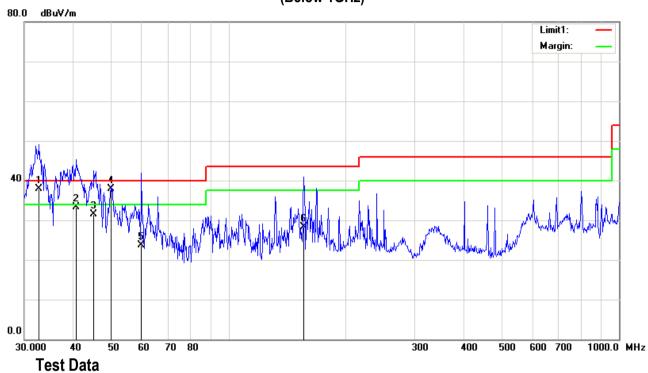
Margin (dB) = Result (dB $\mu$ V/m) – limit (dB $\mu$ V/m)



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| Test Mode: No | ormal Working (Notebook) |
|---------------|--------------------------|
|---------------|--------------------------|

## (Below 1GHz)



## Vertical Polarity Plot @3m

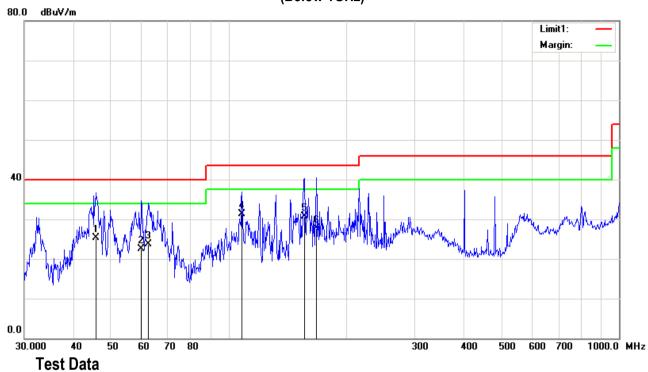
| No. | Frequency | Reading  | Detector | Ant_F  | PA_G  | Cab_L | Result   | Limit    | Margin | Height | Degree |
|-----|-----------|----------|----------|--------|-------|-------|----------|----------|--------|--------|--------|
|     | (MHz)     | (dBµV/m) |          | (dB/m) | (dB)  | (dB)  | (dBµV/m) | (dBµV/m) | (dB)   | (cm)   | (°)    |
| 1   | 32.7486   | 62.64    | QP       | 20.00  | 45.66 | 0.92  | 37.90    | 40.00    | -2.10  | 100    | 126    |
| 2   | 40.7016   | 62.77    | QP       | 15.31  | 45.74 | 1.06  | 33.40    | 40.00    | -6.60  | 100    | 294    |
| 3   | 45.2166   | 64.11    | QP       | 12.27  | 46.03 | 1.15  | 31.50    | 40.00    | -8.50  | 100    | 46     |
| 4   | 50.0566   | 74.16    | QP       | 9.04   | 46.45 | 1.25  | 38.00    | 40.00    | -2.00  | 100    | 248    |
| 5   | 59.8588   | 61.80    | QP       | 7.86   | 47.26 | 1.30  | 23.70    | 40.00    | -16.30 | 200    | 342    |
| 6   | 155.9101  | 60.29    | QP       | 13.60  | 47.57 | 2.08  | 28.40    | 43.50    | -15.10 | 100    | 359    |



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| Test Mode: N | lormal Working (Notebook) |
|--------------|---------------------------|
|--------------|---------------------------|

## (Below 1GHz)



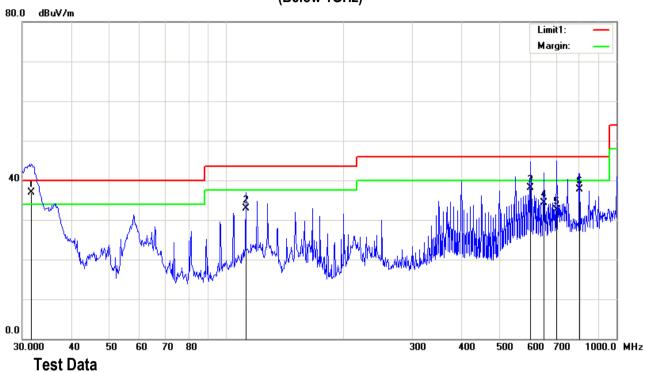
## Horizontal Polarity Plot @3m

| No. | Frequency | Reading  | Detector | Ant_F  | PA_G  | Cab_L | Result   | Limit    | Margin | Height | Degree |
|-----|-----------|----------|----------|--------|-------|-------|----------|----------|--------|--------|--------|
|     | (MHz)     | (dBµV/m) |          | (dB/m) | (dB)  | (dB)  | (dBµV/m) | (dBµV/m) | (dB)   | (cm)   | (°)    |
| 1   | 45.8553   | 59.90    | QP       | 10.33  | 46.09 | 1.17  | 25.31    | 40.00    | -14.69 | 300    | 175    |
| 2   | 59.8588   | 58.91    | QΡ       | 9.49   | 47.26 | 1.30  | 22.44    | 40.00    | -17.56 | 200    | 173    |
| 3   | 62.4314   | 60.11    | QP       | 9.78   | 47.46 | 1.33  | 23.76    | 40.00    | -16.24 | 300    | 188    |
| 4   | 108.2667  | 61.41    | QP       | 14.50  | 46.29 | 1.68  | 31.30    | 43.50    | -12.20 | 200    | 182    |
| 5   | 156.4578  | 63.50    | QP       | 12.68  | 47.53 | 2.08  | 30.73    | 43.50    | -12.77 | 200    | 200    |
| 6   | 167.8243  | 59.98    | QP       | 12.27  | 46.66 | 2.09  | 27.68    | 43.50    | -15.82 | 200    | 207    |



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## (Below 1GHz)



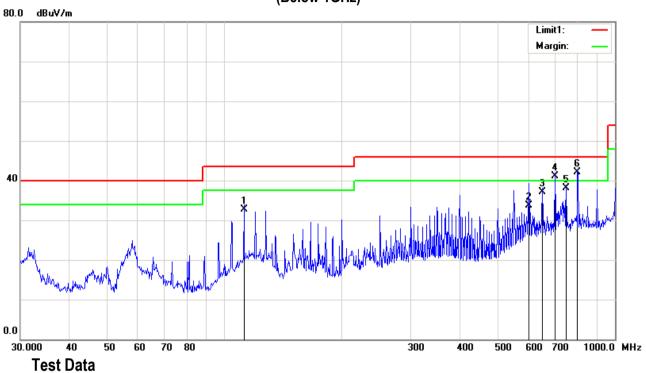
#### Vertical Polarity Plot @3m

| No. | Frequency | Reading  | Detector | Ant_F  | PA_G  | Cab_L | Result   | Limit    | Margin | Height | Degree |
|-----|-----------|----------|----------|--------|-------|-------|----------|----------|--------|--------|--------|
|     | (MHz)     | (dBµV/m) |          | (dB/m) | (dB)  | (dB)  | (dBµV/m) | (dBµV/m) | (dB)   | (cm)   | (°)    |
| 1   | 31.6202   | 61.11    | QP       | 20.66  | 45.67 | 0.90  | 37.00    | 40.00    | -3.00  | 200    | 198    |
| 2   | 112.1305  | 63.20    | QP       | 14.30  | 46.31 | 1.71  | 32.90    | 43.50    | -10.60 | 100    | 4      |
| 3   | 601.4265  | 62.55    | QP       | 20.29  | 48.58 | 3.94  | 38.20    | 46.00    | -7.80  | 200    | 6      |
| 4   | 651.9417  | 56.98    | QP       | 21.47  | 48.15 | 4.10  | 34.40    | 46.00    | -11.60 | 200    | 6      |
| 5   | 701.7610  | 51.06    | QP       | 22.57  | 45.39 | 4.26  | 32.50    | 46.00    | -13.50 | 200    | 199    |
| 6   | 804.6028  | 57.80    | QP       | 21.65  | 46.21 | 4.56  | 37.80    | 46.00    | -8.20  | 100    | 6      |



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## (Below 1GHz)



#### Horizontal Polarity Plot @3m

| No. | Frequency | Reading  | Detector | Ant_F  | PA_G  | Cab_L | Result   | Limit    | Margin | Height | Degree |
|-----|-----------|----------|----------|--------|-------|-------|----------|----------|--------|--------|--------|
|     | (MHz)     | (dBµV/m) |          | (dB/m) | (dB)  | (dB)  | (dBµV/m) | (dBµV/m) | (dB)   | (cm)   | (°)    |
| 1   | 112.1305  | 62.08    | QP       | 15.22  | 46.31 | 1.71  | 32.70    | 43.50    | -10.80 | 300    | 150    |
| 2   | 601.4265  | 57.16    | QP       | 21.28  | 48.58 | 3.94  | 33.80    | 46.00    | -12.20 | 200    | 322    |
| 3   | 651.9417  | 59.40    | QP       | 21.85  | 48.15 | 4.10  | 37.20    | 46.00    | -8.80  | 300    | 92     |
| 4   | 701.7610  | 59.82    | QP       | 22.41  | 45.39 | 4.26  | 41.10    | 46.00    | -4.90  | 200    | 173    |
| 5   | 750.1083  | 56.02    | QP       | 22.70  | 45.02 | 4.40  | 38.10    | 46.00    | -7.90  | 200    | 356    |
| 6   | 801.7863  | 60.97    | QP       | 22.99  | 46.31 | 4.55  | 42.20    | 46.00    | -3.80  | 300    | 65     |



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## Annex A. TEST INSTRUMENT

| Instrument                                   | Model        | Serial #   | Cal Date   | Cal Due    | In use      |
|--|--------------|------------|------------|------------|-------------|
| AC Line Conducted Emissions                  | <b>.</b>     |            |            |            |             |
| R&S EMI Test Receiver                        | ESPI3        | 101216     | 05/03/2017 | 05/02/2018 | $\boxtimes$ |
| V-LISN                                       | ESH3-Z5      | 838979/005 | 05/15/2017 | 05/14/2018 | $\boxtimes$ |
| SIEMIC EZ_EMC Conducted Emissions software   | Ver.ICP-03A1 | N/A        | N/A        | N/A        | $\boxtimes$ |
| Radiated Emissions                           |              |            |            |            |             |
| Spectrum Analyzer                            | N9010A       | MY47191130 | 05/03/2017 | 05/02/2018 |             |
| R&S EMI Receiver                             | ESPI3        | 101216     | 05/03/2017 | 05/02/2018 |             |
| Antenna (30MHz~6GHz)                         | JB6          | A121411    | 04/15/2017 | 04/14/2018 | $\boxtimes$ |
| Agilent Pre-Amplifier                        | 8449B        | N/A        | 10/31/2017 | 10/30/2018 |             |
| Hp Agilent Pre-Amplifier                     | 8447F        | 1937A01160 | 10/26/2017 | 10/25/2018 | $\boxtimes$ |
| EMCO Horn Antenna<br>(1~18GHz)               | 3115         | N/A        | 10/08/2017 | 10/07/2018 |             |
| SIEMIC EZ_EMC Radiated<br>Emissions software | Ver.ICP-03A1 | N/A        | N/A        | N/A        | $\boxtimes$ |



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## Annex B. EUT And Test Setup Photographs

#### Annex B.i. Photograph EUT External Photo



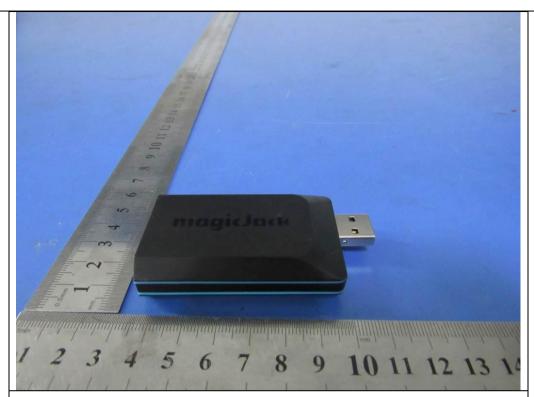
The Whole Package – Front View



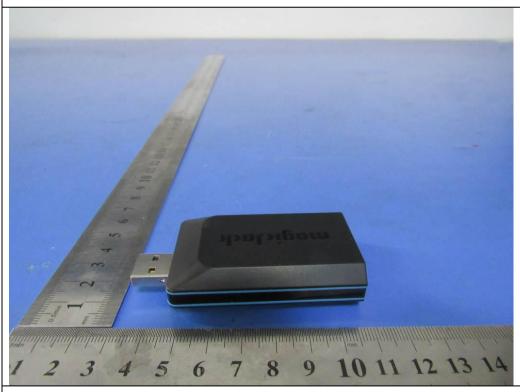
Adapter - Front View



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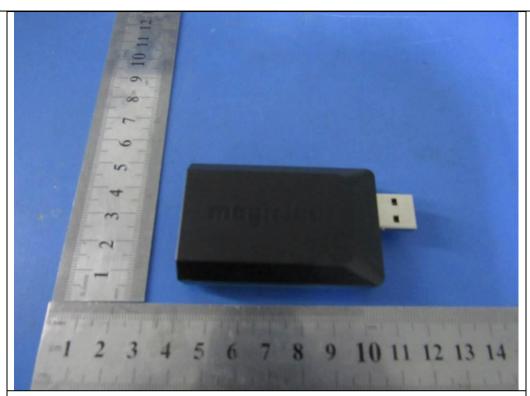
Front View of EUT



Rear View of EUT



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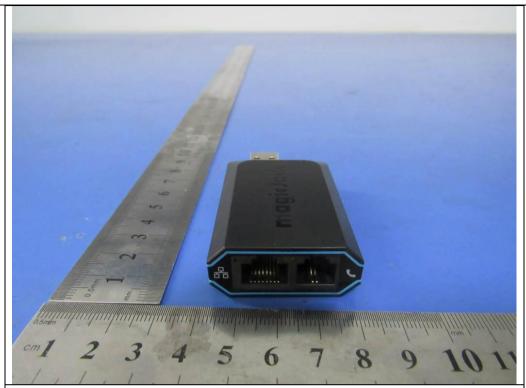
Top View of EUT



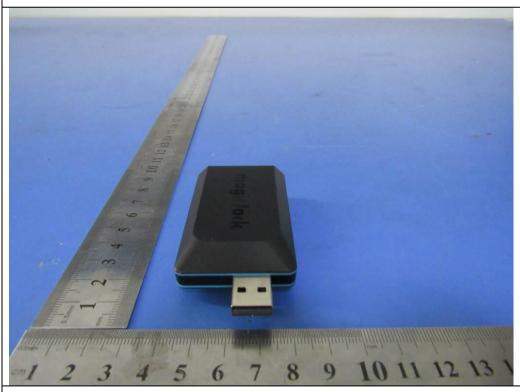
Bottom View of EUT



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Left View of EUT



Right View of EUT



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#### Annex B.ii. Photograph EUT Internal Photo



PCBA - Front View



PCBA – Rear View



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#### Annex B.iii. Photograph: Test Setup Photo



Conducted Emissions Test Setup Front View (Adapter)



Conducted Emissions Test Setup Side View (Adapter)



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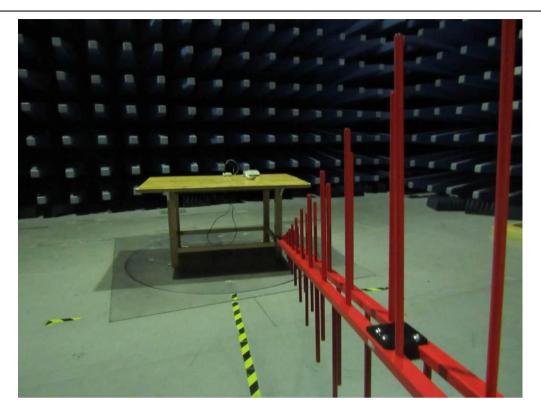
Conducted Emissions Test Setup Front View (Notebook)



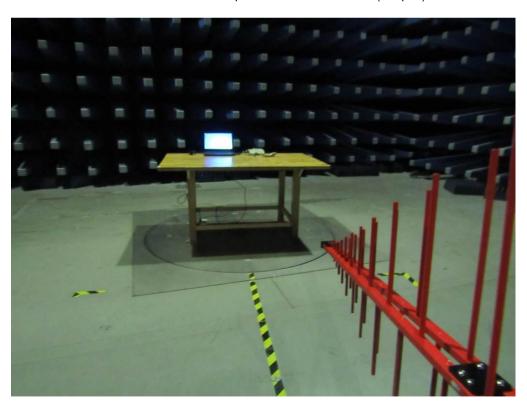
Conducted Emissions Test Setup Side View (Notebook)



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Radiated Emissions Setup Below 1GHz Front View (Adapter)



Radiated Emissions Setup Below 1GHz Front View (Notebook)



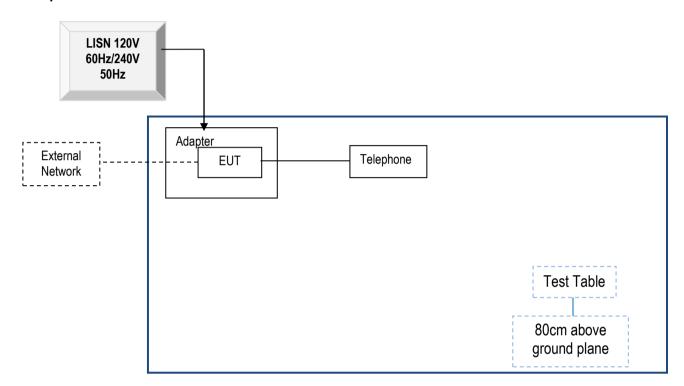
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## Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

#### Annex C.i. TEST SET UP BLOCK

**Block Configuration Diagram for Conducted Emissions** 

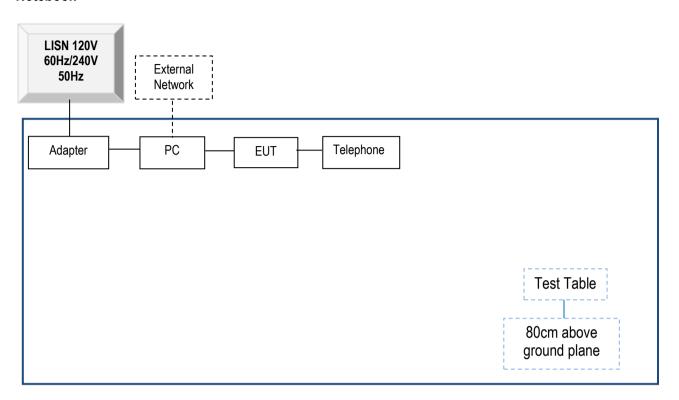
#### Adapter





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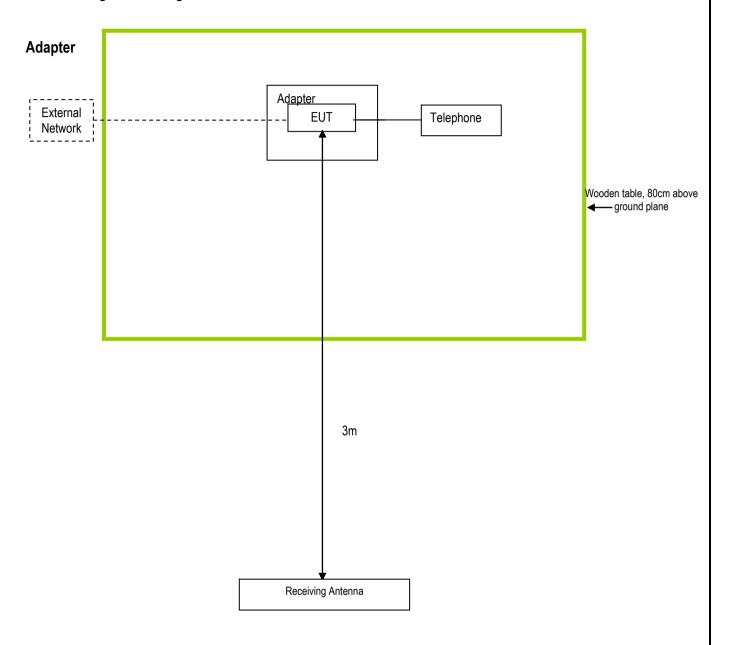
#### Notebook





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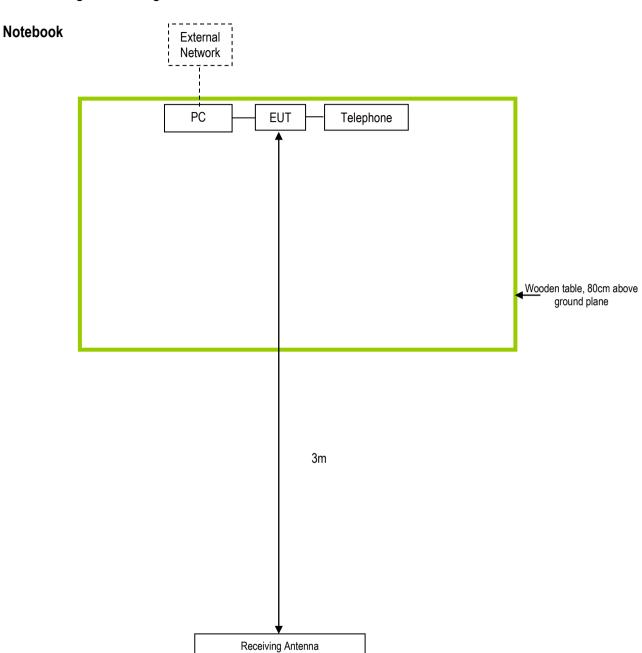
#### **Block Configuration Diagram for Radiated Emissions**





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#### **Block Configuration Diagram for Radiated Emissions**





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#### Annex C. ii. SUPPORTING EQUIPMENT DESCRIPTION

The following is a description of supporting equipment and details of cables used with the EUT.

| Manufacturer | Equipment Description | Model                  | Calibration Date |
|--------------|-----------------------|------------------------|------------------|
| Dell         | Notebook              | inspiron14-3443        | N/A              |
| TCL          | Telephone             | TCL HCD868 ( 17B ) TSD | N/A              |



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## Annex D. User Manual / Block Diagram / Schematics / Partlist

Please see Attachment



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## Annex E. DECLARATION OF SIMILARITY

N/A