Report No.: 105/EMC/TA/2021

**ELECTROMAGNETIC COMPATIBILITY (EMC) TEST REPORT**

|  |  |  |
| --- | --- | --- |
| **Applicant’s Data** | **:** | **PT. GERBANG TEKNOLOGI INFORMASI**  SOHO Podomoro City (NEO SOHO) 40th Floor Unit 09, Jalan Letjen S Parman Kav 28, JAKARTA BARAT, 11470, Indonesia |
| **Equipment Data** | | |
| Equipment name | **:** | **GAS METER** |
| Brand | **:** | **CHINT** |
| Type/Model | **:** | ZG 1.6 IOT GAS METER |
| Capacity | **:** | **LoRa 920 – 923 MHz** |
| Serial number | **:** | **190000010072** |
| Made in | **:** | **SINGAPORE** |

**General Statement**

1. *This test report is only valid for the Equipment Data which is stated above.*
2. *Test reference****:* IEC CISPR 32:2015 (Electromagnetic Compatibility of Multimedia**

**Equipment – Emission Requirements)**

**Testing Information**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Start Date | : | 10 December 2021 | | |
| End Date | : | 15 December 2021 | | |
| Tested By | : | Infrastructure Quality Assurance Laboratory - Test Lab | | |
| Agreed by: | | |  | Reviewed by: |
|  | | |  |  |
| **I GEDE ASTAWA**  Senior Manager Infrastructure Assurance | | |  | **ADI PERMADI**  Manager Lab Infrastructure QA |

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# **TEST RESULT SUMMARY**

1. Emission Test Result

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Emission Tests** | | | | | |
| **No.** | **Standard** | **Item Test** | **Detector** | **Measurement Results (dBuV)** | **Suitability** |
| 1. | CISPR 32:2015, Class B  Radiated Emissions | 30 – 230 MHz | Quasi-Peak | 38,50\* | Pass |
| 230 – 1000 MHz | - | Pass |
| 1000 – 3000 MHz | Peak | - | Pass |
| 3000 – 6000 MHz | 46,40 | Pass |
| 1000 – 3000 MHz | Average | - | Pass |
| 3000 – 6000 MHz | 46,40 | Pass |
| Note: **\***) Using peak detector according to the procedure at point 3 (Peak value less than Quasi Limit) | | | | | |

# **GENERAL TEST INFORMATION**

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| --- |
|  |

1. Equipment Photo

### **FEATURE OF EUT**

1. Feature of EUT

|  |  |  |
| --- | --- | --- |
| **No.** | **Feature** | **Value** |
| 1. | LoRa | 920 - 923 MHz |

### **EUT COMPLIMENTARY ITEMS/EQUIPMENT/DEVICES**

1. EUT Complimentary Items/Equipment/Devices

|  |  |
| --- | --- |
| **No.** | **Item** |
| 1. | - |

### **LIST OF MEASURING EQUIPMENT**

1. List of Measuring Equipment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **No.** | **Name** | **Brand** | **Type/Model** | **Serial Number** | **Asset Number** |
| 1. | SIGNAL & SPECTRUM ANALYZER | ROHDE & SCHWARZ | FSW43 | 103952 | 134/TRA |
| 2. | EMC SOFTWARE MEASUREMENT | ROHDE & SCHWARZ | VERSION 10.50.40 | PRODUCT ID: 1040-0 | 156/TRA |
| 3. | SEMI ANECHOIC CHAMBER | MEASUREMENT ENGINEERING | 3 METER STANDARD CHAMBER | - | 148/TRA |
| 4. | CONTROLLER EM 1000 | EM ELECTRONICS | EM1000 | 060873 | 152/TRA |
| 5. | ANTENNA EMC (30 MHz - 6 GHz) | AARONIA | - | 201746 | 146/TRA |
| 6. | DRG HORN ANTENNA | AH SYSTEM, INC | SAS-571 | 756 | 150/TRA |

### **MEASUREMENT UNCERTAINTIES**

1. Measurement Uncertainties

|  |  |  |
| --- | --- | --- |
| **Measurement Uncertainties** | | |
| **Test Item** | **Frequency** | **Uncertainty** |
| Radiated Emission | 30-1000 MHz | 1.05 dB |
| 1000-6000 MHz | 1.05 dB |
| Note:  *ISO/IEC 17025:2015 requires that an estimate of the measurement uncertainties associated with emissions and immunities test results are included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on coverage factor K=2).* | | |

### **ENVIRONMENTAL CONDITION**

1. Environmental Condition

|  |  |
| --- | --- |
| **Metrics** | **Value** |
| Temperature | 22 °C |
| Relative Humidity | 60 % |
| Voltage | 219 V |

### **ADDITIONAL STATEMENT**

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| - |

**EUT TESTING DIAGRAM**

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| --- |
| LoRa Gas Meter |

1. EUT Testing Diagram

# **EMISIONS TEST RESULTS**

### **RADIATED EMISSION**

1. LIMIT
2. Requirement Limit for Class B Radiated Emission up to 1 GHz

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **No** | **Frequency Range**  **MHz** | **Measurement** | | | **Class B limits**  **dB(μV/m)** |
| **Facility** | **Distance**  **M** | **Detector Type / Bandwidth** |
| 1. | 30 to 230 | OATS/SAC | 3 | Quasi Peak / 120 kHz | 40 |
| 2. | 230 to 1000 | OATS/SAC | 3 | Quasi Peak / 120 kHz | 47 |

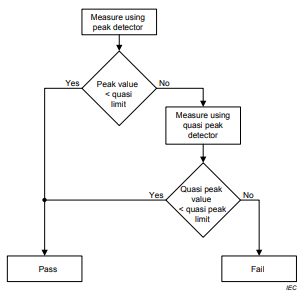
1. Requirement Limit for Class B Radiated Emission Above 1 GHz

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **No** | **Frequency Range**  **MHz** | **Measurement** | | | **Class B limits**  **dB(μV/m)** |
| **Facility** | **Distance**  **M** | **Detector Type / Bandwidth** |
| 1. | 1000 to 3000 | FSOATS | 3 | Average / 1 MHz | 50 |
| 2. | 3000 to 6000 | Average / 1 MHz | 54 |
| 3. | 1000 to 3000 | FSOATS | 3 | Peak / 1 MHz | 70 |
| 4. | 3000 to 6000 | Peak / 1 MHz | 74 |

1. CONFIGURATION TEST

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| --- |
|  |

1. Configuration Test
2. PROCEDURE



1. Test Procedure for Radiated Emission

1. RESULTS
   1. Test Result Up to 1 GHz

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. Radiated Emission Up to 1 GHz   Resume   1. Resume Result Radiated Emission Up to 1 GHz  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | Detector | Frequency (MHz) | Peak Level (dBuV) | Class B QP Limit (dBuV) | Margin (dB) | Polarization | Remark | | Peak | 30.431111 | 34,30 | 40 | 5,70 | H | - | | Peak | 130.287222 | 38,50 | 40 | 1,50 | V | - | | Peak | 225.670556 | 35,70 | 40 | 4,30 | H | - | | Peak | 921.106667 | 92,70 | 47 | -45,70 | V | Work Operation | |

* 1. Test Resul Above 1 GHz

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. Radiated Emission Above 1 GHz   Resume   1. Resume Result Radiated Emission Above 1 GHz Detector Peak  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | Detector | Frequency (MHz) | Peak Level (dBuV) | Class B PK Limit (dBuV) | Margin (dB) | Polarization | Remark | | Peak | 4.926.000.000 | 46,40 | 74 | 27,60 | H | - |   Resume   1. Resume Result Radiated Emission Above 1 GHz Detector Average  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | Detector | Frequency (MHz) | AV Level (dBuV) | Class B AV Limit (dBuV) | Margin (dB) | Polarization | Remark | | Average | 4.926.000.000 | 46,40 | 54 | 7,60 | H | - | |

1. FIGURE TEST

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| --- |
| Antenna Above 1 GHz    Antenna Below 1 GHz |

1. Figure Test of Radiated Emission
2. **Figure of Device Under Test**

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|  |

1. Figure of Device Under Test