RF TEST REPORT

Report No.: FCC_IC_RF_SL18050801-DME-001
Supersede Report No.:

Applicant	:	Digital Matter
Host Product Name	:	Oyster
Module Model No.	:	OYSTER-LWAN-915
Host Model No.	:	Oyster LoRaWAN 915
Test Standard	:	47 CFR 15.247 RSS 247 Issue 1: May 2015
Test Method	:	ANSI C63.10: 2013 RSS Gen Iss 4: Nov 2014 558074 D01 DTS Meas Guidance v04
FCC ID	:	POJOYSTERLWAN915
IC ID	:	23950-OYSTERLWAN
Dates of test	:	6/10/2018
Issue Date	:	6/13/2018
Test Result	:	☒ Pass ☐ Fail
Equipment complied with the specification [X] Equipment did not comply with the specification [ ]		

This Test Report is Issued Under the Authority of:	
George Hsu	Rachana Khanduri
Test Engineer	Engineer Reviewer

Issued By:
SIEMIC Laboratories
775 Montague Expressway, Milpitas, 95035 CA

ACCREDITED
TESTING CERT # 2742-01

Laboratory 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

Country/Region	Accreditation Body	Scope
USA	FCC, A2LA	EMC, RF/Wireless, Telecom
Canada	IC, A2LA, NIST	EMC, RF/Wireless, Telecom
Taiwan	BSMI, NCC, NIST	EMC, RF, Telecom, Safety
Hong Kong	OFTA, NIST	RF/Wireless, Telecom
Australia	NATA, NIST	EMC, RF, Telecom, Safety
Korea	KCC/RRA, NIST	EMI, EMS, RF, Telecom, Safety
Japan	VCCI, JATE, TELEC, RFT	EMI, RF/Wireless, Telecom
Mexico	NOM, COFETEL, Caniety	Safety, EMC, RF/Wireless, Telecom
Europe	A2LA, NIST	EMC, RF, Telecom, Safety
Israel	MOC, NIST	EMC, RF, Telecom, Safety

Accreditations for Product Certifications

Country	Accreditation Body	Scope
USA	FCC TCB, NIST	EMC, RF, Telecom
Canada	IC FCB, NIST	EMC, RF, Telecom
Singapore	iDA, NIST	EMC, RF, Telecom
EU	NB	EMC & Radio Equipment Directive (RED)
Japan	MIC (RCB 208)	RF, Telecom
Hong Kong	OFTA (US002)	RF, Telecom

CONTENTS

1 Report Revision History

Report No.	Report Version	Description	Issue Date
FCC_IC_RF_SL18050801-DME-001	None	Original	6/13/2018

2 Executive Summary

The purpose of this test program was to demonstrate compliance of following product

Company:	Digital Matter
Host Product:	Oyster
Host Model No.:	Oyster LoRaWAN 915
Module Model No.:	OYSTER-LWAN-915

against the current Stipulated Standards. The specified model product stated above has demonstrated compliance with the Stipulated Standard listed on 1st page.

3 Customer information

Applicant Name	Digital Matter
Applicant Address	Unit 9, 100 Railway Rd, Subiaco, 6008, Western Australia
Manufacturer Name	Digital Matter
Manufacturer Address	Unit 9, 100 Railway Rd, Subiaco, 6008, Western Australia

4 Test site information

Lab performing tests	SIEMIC Laboratories
Lab Address	775 Montague Expressway, Milpitas, CA 95035
FCC Test Site No.	881796
IC Test Site No.	4842D-2
VCCI Test Site No.	A0133

5 Modification

Index	Item	Description	Note
-	-	-	-

6 EUT Information

6.1 EUT Description

Host Product Name	Oyster
Host Model No.	Oyster LoRaWAN 915
Module Model No.	OYSTER-LWAN-915
Trade Name	Digital Matter
Serial No.	N/A
Input Power	4.5 Vdc (3x AA Batteries)
Power Adapter Manu/Model	N/A
Power Adapter SN	N/A
Product Hardware version	N/A
Product Software version	N/A
Radio Hardware version	N/A
Radio Software version	N/A
Date of EUT received	6/3/2018
Equipment Class/ Category	DTS
Port/Connectors	N/A
Remark	NONE

6.2 Spec for LoRaWan Radio

Radio Type	LoRaWAN
Operating Frequency	902.3-914.9 MHz
Modulation	FSK
Antenna Type	Patch Antenna
Antenna Gain	-1 dBi
Antenna Connector Type	N/A
Remarks	N/A

Type	Channel No.	Frequency (MHz)	Power Setting
LoRaWAN 125 KHz Bandwidth	01	902.3	20
	32	908.5	20
	64	914.9	20
LoRaWAN 500 KHz Bandwidth	65	903	20
	68	907.8	20
	72	914.2	20

6.3 EUT test modes/configuration Description

Mode	Note
LoRaWAN	LoRaWAN (FSK)

7 Supporting Equipment/Software and cabling Description

7.1 Supporting Equipment

Item	Supporting Equipment Description	Model	Serial Number	Manufacturer	Note
N/A	N/A	N/A	N/A	N/A	N/A

7.2 Cabling Description

Name	Connection Start		Connection Stop		Length / shielding Info		Note
	From	I/O Port	To	I/O Port	Length (m)	Shielding	
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

7.3 Test Software Description

Test Item	Software	Description
RF Testing	Oyster LoRaWAN Bootloader	Set the EUT to transmit continuously in diferent test mode

8 Test Summary

Test Item	Test standard		Test Method/Procedure		Pass / Fail
Restricted Band of Operation	FCC	15.205	FCC	ANSI C63.10:2013 558074 D01 DTS Meas Guidance v04	☒ Pass ☐ N/A
	IC	RSS Gen 8.10	IC		
AC Conducted Emissions	FCC	15.207(a)	FCC	ANSI C63.10:2013	☒ Pass** ☐ N/A*
	IC	RSS Gen 8.8	IC	RSS Gen Issue 4: 2014	

DTS Band Requirement

Test Item	Test standard		Test Method/Procedure		Pass / Fail
99% Occupied Bandwidth	-	-	-	-	☒ Pass** ☐ N/A*
	IC	RSS Gen 6.6	IC	RSS Gen Issue 4: 2014 -	
6dB Bandwidth	FCC	15.247(a)(2)	FCC	558074 D01 DTS Meas Guidance v04	☒ Pass** ☐ N/A*
	IC	RSS247 (5.2.1)	IC		
Band Edge and Radiated Spurious Emissions	FCC	15.247(d)	FCC	ANSI C63.10:2013 558074 D01 DTS Meas Guidance v04	☒ Pass ☐ N/A
	IC	RSS247 (5.5)	IC		
Output Power	FCC	15.247(b)	FCC	558074 D01 DTS Meas Guidance v04	☒ Pass** ☐ N/A*
	IC	RSS247 (5.4.4)	IC		
Receiver Spurious Emissions	IC	RSS Gen (4.8)	IC	RSS Gen Issue 4: 2014	☐ Pass ☒ N/A
Antenna Gain > 6 dBi	FCC	15.247(e)	FCC	-	☒ Pass ☐ N/A*
	IC	-	IC	-	
Power Spectral Density	FCC	15.247(e)	FCC	558074 D01 DTS Meas Guidance v04	☒ Pass** ☐ N/A*
	IC	RSS247 (5.2.2)	IC		
RF Exposure requirement	FCC	15.247(i)	FCC	-	☒ Pass ☐ N/A
	IC	RSS Gen(5.5)	IC	RSS Gen Issue 4: 2014	

Remark	1. All measurement uncertainties do not take into consideration for all presented test results. 2. The applicant shall ensure frequency stability by showing that an emission is maintained within the band of operation under all normal operating conditions as specified in the user's manual. 3. * : Not applicable the EUT does not plug into the AC Mains 4. **: Previously certified under limited modular certification (Certified under FCC ID: VPYCMABZ, IC ID: 772C-CMABZ, under SGS report SHEM160900621801)

9 Measurement Uncertainty

9.1 Conducted Emissions

The test is to measure the conducted emissions to the mains port of the EUT.

Some error sources that can contribute to the total uncertainty:

- Uncertainty of the receiver
- Uncertainty of the LISN
- Uncertainty of cables
- Uncertainty due to the mismatches
- Etc, see the below table for details

Source of Uncertainty	Value (dB)	Probability Distribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Receiver Reading	0.12	Rectangular	1.732	1	0.069284
Cable Insertion Loss	0.21	Normal	2	1	0.105
Filter Insertion Loss	0.25	Normal	2	1	0.125
LISN Insertion Loss	0.40	Normal	2	1	0.20
Receiver CW accuracy	0.5	Rectangular	1.732	1	0.2886836
Pulse Amplitude Response	1.5	Rectangular	1.732	1	0.86605081
PRF Response	1.5	Rectangular	1.732	1	0.86605081
Mismatch LISN - Receiver	0.25	U-Shape	1.414	1	0.1768033
LISN Impedance	2.5	Triangular	2.449	1	1.0208248
Combined Standard Uncertainty					1.928133
Expanded Uncertainty (K=2)					3.856266

The total derived measurement uncertainty is +/- 3.86 dB.

9.2 Radiated Emissions (30MHz to 1GHz)

The test is to measure the radiated emissions of the EUT.

Some error sources that can contribute to the total uncertainty:

- Uncertainty of the receiver
- Uncertainty of the antenna
- Uncertainty of cables
- Uncertainty due to the mismatches
- NSA Calibration
- Etc., details see the below table

Source of Uncertainty	Value (dB)	Probability Distribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Receiver Reading	0.12	Rectangular	1.732	1	0.069284
Cable Insertion Loss	0.21	Normal	2	1	0.105
Filter Insertion Loss	0.25	Normal	2	1	0.125
Antenna Factor	0.65	Normal	2	1	0.325
Receiver CW accuracy	0.5	Rectangular	1.732	1	0.2886836
Pulse Amplitude Response	1.5	Rectangular	1.732	1	0.86605081
PRF Response	1.5	Rectangular	1.732	1	0.86605081
Mismatch Filter - Receiver	0.25	U-Shape	1.414	1	0.1768033
NSA Calibration	4.0	U-Shape	1.414	1	2.8288543
Combined Standard Uncertainty					3.0059131
Expanded Uncertainty (K=2)					6.0118262

The total derived measurement uncertainty is +/- 6.00 dB.

9.3 Radiated Emissions (1GHz to 40GHz)

The test is to measure the radiated emissions of the EUT.

Some error sources that can contribute to the total uncertainty:

- Uncertainty of the receiver
- Uncertainty of the antenna
- Uncertainty of cables
- Uncertainty due to the mismatches
- VSWR Calibration
- Etc., details see the below table

Source of Uncertainty	Value (dB)	Probability Distribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Receiver Reading	0.12	Rectangular	1.732	1	0.0692840
Cable Insertion Loss	0.21	Normal	2	1	0.1050000
Filter Insertion Loss	0.25	Normal	2	1	0.1250000
Antenna Factor	0.65	Normal	2	1	0.3250000
Receiver CW accuracy	0.5	Rectangular	1.732	1	0.2886836
Pulse Amplitude Response	1.5	Rectangular	1.732	1	0.8660508
PRF Response	1.5	Rectangular	1.732	1	0.8660508
Mismatch Filter - Receiver	0.25	U-Shape	1.414	1	0.1768033
VSWR Calibration	2.0	U-Shape	1.414	1	1.4144272
Combined Standard Uncertainty					4.2363
Expanded Uncertainty (K=2)					8.4726

The total derived measurement uncertainty is +/- 8.47 dB.

9.4 RF conducted measurement

The test is to measure the RF output power from the EUT.

Some error sources that can contribute to the total uncertainty:

- Uncertainty of the Reference Level Uncertainty
- Uncertainty of variable attenuators
- Uncertainty of cables
- Uncertainty due to the mismatches

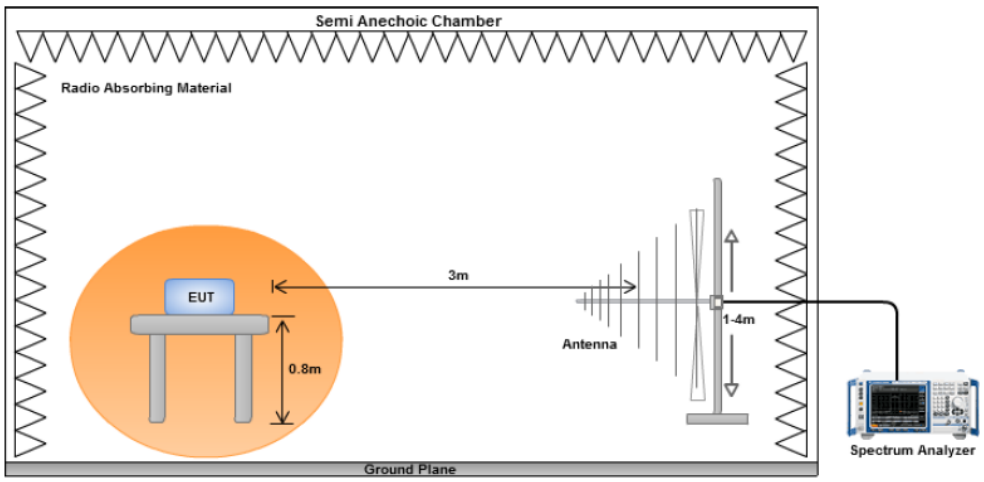
Source of Uncertainty	Value (dB)	Probability Distribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Reference Level	0.12	Rectangular	1.732	1	0.069284
Cable Insertion Loss	0.21	Normal	2	1	0.105
Attenuator	0.25	Normal	2	1	0.125
Mismatch	0.25	U-Shape	1.414	1	0.1768033
Combined Standard Uncertainty					0.476087
Expanded Uncertainty (K=2)					0.952174

The total derived measurement uncertainty is +/- 0.95 dB.

10 Measurements, Examination and Derived Results

10.1 Radiated Spurious Emissions below 1GHz

Requirement(s):

<table>
<tr><th>Spec</th><th>Item</th><th>Requirement</th><th>Applicable</th></tr>
<tr><td>47CFR§15.247(d)
RSS247 (5.5)</td><td>a)</td><td>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
<table>
<tr><th>Frequency range (MHz)</th><th>Field Strength (uV/m)</th></tr>
<tr><td>30 – 88</td><td>100</td></tr>
<tr><td>88 – 216</td><td>150</td></tr>
<tr><td>216 960</td><td>200</td></tr>
<tr><td>Above 960</td><td>500</td></tr>
</table></td><td>☒</td></tr>
<tr><td>Test Setup</td><td colspan="3"> 
</td></tr>
<tr><td>Procedure</td><td colspan="3">1. The EUT was switched on and allowed to warm up to its normal operating condition.
2. 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:
a. Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen.
b. The EUT was then rotated to the direction that gave the maximum emission.
c. Finally, the antenna height was adjusted to the height that gave the maximum emission.
3. A Quasi-peak measurement was then made for that frequency point.
4. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.</td></tr>
<tr><td>Remark</td><td colspan="3">The EUT was scanned up to 1GHz. Both horizontal and vertical polarities were investigated. The results show only the worst case.</td></tr>
<tr><td>Result</td><td colspan="3">☒ Pass ☐ Fail</td></tr>
</table>

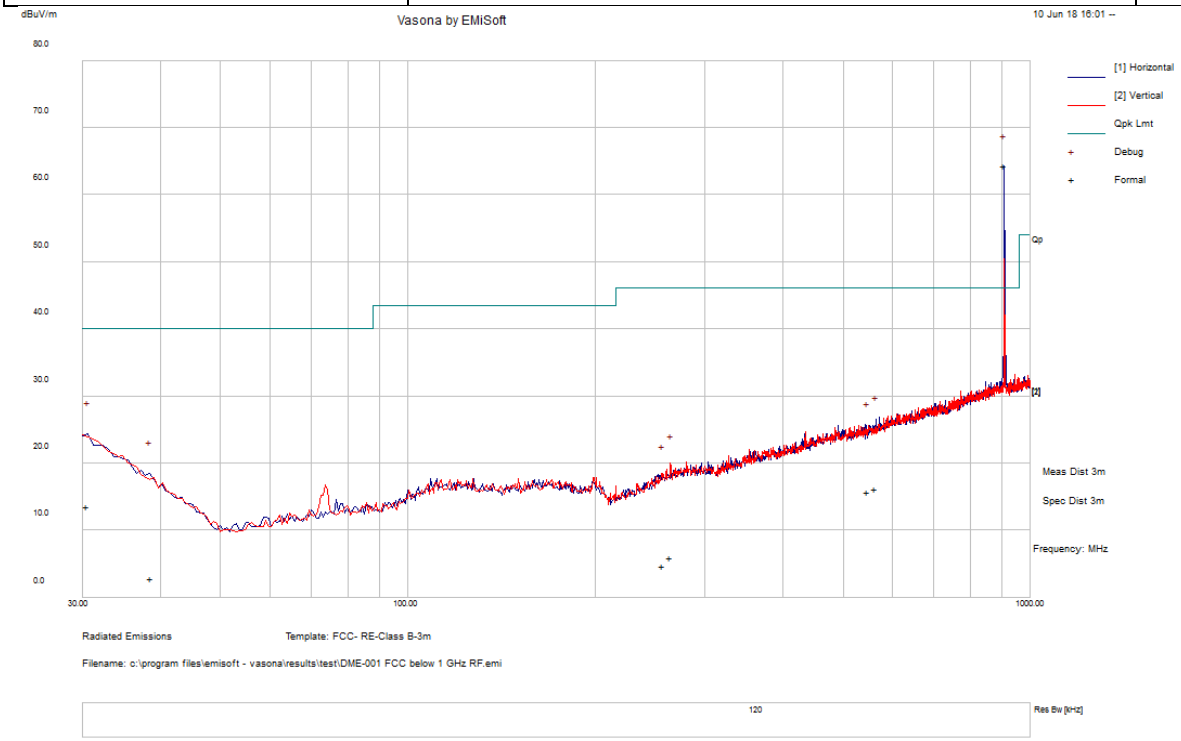
Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by George Hsu at 10m chamber.

Radiated Emission Test Results (Below 1GHz)

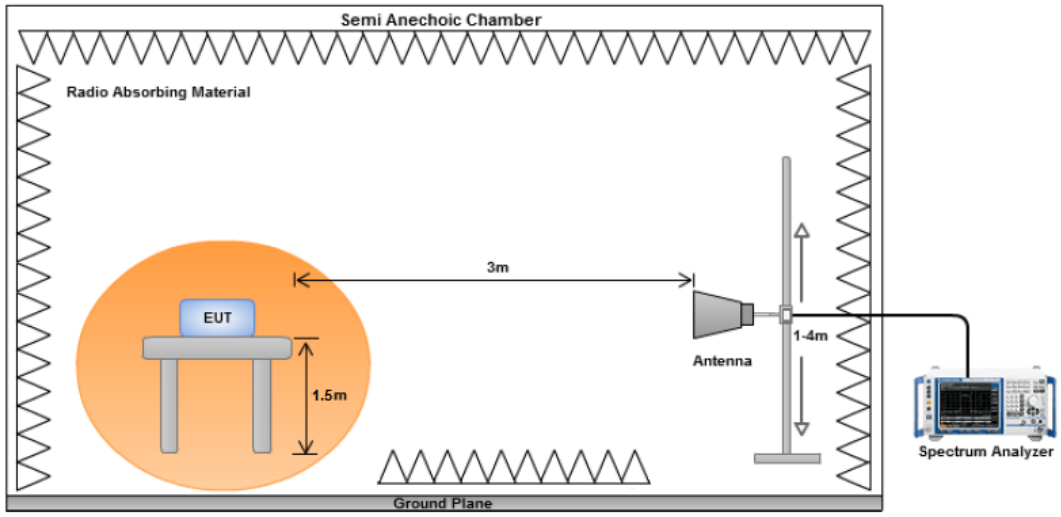
Test specification	below 1GHz			
Environmental Conditions:	Temp (°C):	22	Result	Pass
	Humidity (%)	47.5		
	Atmospheric (mbar):	1020		
Mains Power:	N/A Battery Powered			
Tested by:	George Hsu			
Test Date:	06/10/2018			
Remarks:	125KHz, 908.5 MHz tested, Please note the emission at 908.5 MHz is the fundmental emission.			



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
30.52	15.82	11.12	-13.37	13.57	Quasi Max	H	300	339	40	-26.43	Pass
38.63375	11.86	11.28	-20.21	2.92	Quasi Max	V	204	327	40	-37.08	Pass
256.579438	16.47	12.98	-24.73	4.72	Quasi Max	V	176	6	46	-41.28	Pass
264.511625	16.79	13.04	-23.91	5.92	Quasi Max	H	181	11	46	-40.08	Pass
547.085188	19.25	14.46	-17.96	15.76	Quasi Max	H	146	323	46	-30.24	Pass
564.564938	19.34	14.5	-17.55	16.29	Quasi Max	H	180	320	46	-29.71	Pass

10.2 Radiated Spurious Emissions between 1GHz – 25GHz

Requirement(s):

Spec	Item	Requirement	Applicable
47CFR§15.247(d), RSS247(A8.5)	a)	For non-restricted band, In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB or 30dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, determined by the measurement method on output power to be used. Attenuation below the general limits specified in § 15.209(a) is not required ☐ 20 dB down ☒ 30 dB down	☒
	b)	or restricted band, emission must also comply with the radiated emission limits specified in 15.209	☒
Test Setup			
Procedure	1. The EUT was switched on and allowed to warm up to its normal operating condition. 2. 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: a. Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen. b. The EUT was then rotated to the direction that gave the maximum emission. c. Finally, the antenna height was adjusted to the height that gave the maximum emission. 3. An average measurement was then made for that frequency point. 4. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.		
Remark	The EUT was scanned up to 26GHz. Both horizontal and vertical polarities were investigated. The results show only the worst case.		
Result	☒ Pass ☐ Fail		

Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☐ Yes (See below) ☒ N/A

Test was done by George Hsu at 10m chamber.

Radiated Emission Test Results (Above 1GHz)

LoRaWAN 125KHz (902.3 MHz)

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	AF (dB)	Level (dBuV/m)	Measurement Type	Pol (V/H)	Hgt (cm)	Azt (Deg)	Limit (dBuV/m)	Margin (dB)	Pass /Fail
2706.663	48.38	3.13	-2.86	48.65	Peak Max	V	270	236	74	-25.35	Pass
2706.743	53.62	3.13	-2.86	53.89	Peak Max	H	101	249	74	-20.11	Pass
7219.09	49.33	5.15	-0.46	54.02	Peak Max	V	231	37	74	-19.98	Pass
2706.663	41.9	3.13	-2.86	42.16	Average Max	V	270	236	54	-11.84	Pass
2706.743	50.52	3.13	-2.86	50.79	Average Max	H	101	249	54	-3.21	Pass
7219.09	38.62	5.15	-0.46	43.31	Average Max	V	231	37	54	-10.69	Pass

LoRaWAN 125KHz (908.5 MHz)

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	AF (dB)	Level (dBuV/m)	Measurement Type	Pol (V/H)	Hgt (cm)	Azt (Deg)	Limit (dBuV/m)	Margin (dB)	Pass /Fail
2725.963	49.94	3.14	-2.76	50.32	Peak Max	H	206	330	74	-23.68	Pass
7268.24	48.68	5.16	-0.47	53.37	Peak Max	V	104	42	74	-20.63	Pass
7268.563	47.31	5.16	-0.47	51.99	Peak Max	H	136	103	74	-22.01	Pass
2725.963	45.68	3.14	-2.76	46.06	Average Max	H	206	330	54	-7.94	Pass
7268.24	39.45	5.16	-0.47	44.14	Average Max	V	104	42	54	-9.86	Pass
7268.563	40.48	5.16	-0.47	45.17	Average Max	H	136	103	54	-8.83	Pass

LoRaWAN 125KHz (914.9 MHz)

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	AF (dB)	Level (dBuV/m)	Measurement Type	Pol (V/H)	Hgt (cm)	Azt (Deg)	Limit (dBuV/m)	Margin (dB)	Pass /Fail
2744.728	49.12	3.15	-2.65	49.61	Peak Max	H	207	328	74	-24.39	Pass
7318.678	49.91	5.15	-0.49	54.58	Peak Max	V	199	121	74	-19.43	Pass
7318.962	47	5.15	-0.49	51.66	Peak Max	H	150	106	74	-22.34	Pass
2744.728	45.37	3.15	-2.65	45.86	Average Max	H	207	328	54	-8.14	Pass
7318.678	40.58	5.15	-0.49	45.24	Average Max	V	199	121	54	-8.76	Pass
7318.962	39.3	5.15	-0.49	43.96	Average Max	H	150	106	54	-10.04	Pass

LoRaWAN 500KHz (903 MHz)

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	AF (dB)	Level (dBuV/m)	Measurement Type	Pol (V/H)	Hgt (cm)	Azt (Deg)	Limit (dBuV/m)	Margin (dB)	Pass /Fail
2706.454	52.79	3.13	-2.86	53.06	Peak Max	H	153	46	74	-20.95	Pass
7217.829	47.58	5.15	-0.46	52.28	Peak Max	V	103	49	74	-21.72	Pass
7217.304	47.17	5.15	-0.46	51.87	Peak Max	H	132	289	74	-22.13	Pass
2706.454	44.85	3.13	-2.86	45.11	Average Max	H	153	46	54	-8.89	Pass
7217.829	34.86	5.15	-0.46	39.56	Average Max	V	103	49	54	-14.44	Pass
7217.304	34.09	5.15	-0.46	38.79	Average Max	H	132	289	54	-15.21	Pass

LoRaWAN 500KHz (907.8 MHz)

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	AF (dB)	Level (dBuV/m)	Measurement Type	Pol (V/H)	Hgt (cm)	Azt (Deg)	Limit (dBuV/m)	Margin (dB)	Pass /Fail
2726.419	51.23	3.14	-2.75	51.62	Peak Max	H	111	38	74	-22.38	Pass
7269.247	49.09	5.16	-0.47	53.78	Peak Max	V	223	311	74	-20.23	Pass
7268.89	46.59	5.16	-0.47	51.28	Peak Max	H	119	289	74	-22.72	Pass
2726.419	41.97	3.14	-2.75	42.35	Average Max	H	111	38	54	-11.65	Pass
7269.247	36.29	5.16	-0.47	40.97	Average Max	V	223	311	54	-13.03	Pass
7268.89	34.22	5.16	-0.47	38.9	Average Max	H	119	289	54	-15.1	Pass

LoRaWAN 500KHz (914.2 MHz)

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	AF (dB)	Level (dBuV/m)	Measurement Type	Pol (V/H)	Hgt (cm)	Azt (Deg)	Limit (dBuV/m)	Margin (dB)	Pass /Fail
2744.892	50.06	3.15	-2.65	50.56	Peak Max	H	188	247	74	-23.44	Pass
7317.359	49.44	5.15	-0.49	54.1	Peak Max	V	174	100	74	-19.9	Pass
7317.746	46.17	5.15	-0.49	50.83	Peak Max	H	115	220	74	-23.17	Pass
2744.892	43.36	3.15	-2.65	43.85	Average Max	H	188	247	54	-10.15	Pass
7317.359	34.27	5.15	-0.49	38.93	Average Max	V	174	100	54	-15.07	Pass
7317.746	33.19	5.15	-0.49	37.85	Average Max	H	115	220	54	-16.15	Pass

Note: Both horizontal and vertical polarities were investigated. The results above show only the worst case.

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Cycle	Cal Due	In use
Radiated Emissions						
50GHz Spectrum Analyzer	N9030B (PXA)	MY57140597	09/06/2017	1 Year	10/2/2018	☑
Antenna -- Biconilog (30MHz - 6GHz)	JB6	A111717	12/5/2017	1 Year	12/5/2018	☑
Double Ridged Waveguide Horn Antenna (1 - 18 GHz)	3117	218554	8/11/2017	1 Year	8/11/2018	☑
RF Pre-Amplifier (9kHz - 6.5GHz)	LPA-6-30	11170601	7/21/2017	1 Year	7/21/2018	☑
Pre-Amplifier (1-26.5GHz)	8449B	3008A00715	08/16/2017	1 Year	8/16/2018	☑

Annex B. SIEMIC Accreditation

Accreditations	Document	Scope / Remark
ISO 17025 (A2LA)		Please see the documents for the detailed scope
ISO Guide 65 (A2LA)		Please see the documents for the detailed scope
TCB Designation		A1, A2, A3, A4, B1, B2, B3, B4, C
FCC DoC Accreditation		FCC Declaration of Conformity Accreditation
FCC Site Registration		3 meter site
FCC Site Registration		10 meter site
IC Site Registration		3 meter site
IC Site Registration		10 meter site
EU NB		Radio & Telecommunications Terminal Equipment: EN45001 – EN ISO/IEC 17025
		Electromagnetic Compatibility: EN45001 – EN ISO/IEC 17025
Singapore iDA CB(Certification Body)		Phase I, Phase II
Vietnam MIC CAB Accreditation		Please see the document for the detailed scope
Hong Kong OFCA		(Phase II) OFCA Foreign Certification Body for Radio and Telecom
		(Phase I) Conformity Assessment Body for Radio and Telecom
Industry Canada CAB		Radio: Scope A – All Radio Standard Specification in Category I
		Telecom: CS-03 Part I, II, V, VI, VII, VIII

Japan Recognized Certification Body Designation		Radio: A1. Terminal equipment for purpose of calling Telecom: B1. Specified radio equipment specified in Article 38-2, Paragraph 1, Item 1 of the Radio Law
Korea CAB Accreditation		EMI: KCC Notice 2008-39, RRL Notice 2008-3: CA Procedures for EMI KN22: Test Method for EMI EMS: KCC Notice 2008-38, RRL Notice 2008-4: CA Procedures for EMS KN24, KN61000-4-2, -4-3, -4-4, -4-5, -4-6, -4-8, -4-11: Test Method for EMS
		Radio: RRL Notice 2008-26, RRL Notice 2008-2, RRL Notice 2008-10, RRL Notice 2007-49, RRL Notice 2007-20, RRL Notice 2007-21, RRL Notice 2007-80, RRL Notice 2004-68
		Telecom: President Notice 20664, RRL Notice 2007-30, RRL Notice 2008-7 with attachments 1, 3, 5, 6; President Notice 20664, RRL Notice 2008-7 with attachment 4
Taiwan NCC CAB Recognition		LP0002, PSTN01, ADSL01, ID0002, IS6100, CNS14336, PLMN07, PLMN01, PLMN08
Taiwan BSMI CAB Recognition		CNS 13438
Japan VCCI		R-3083: Radiation 3 meter site C-3421: Main Ports Conducted Interference Measurement T-1597: Telecommunication Ports Conducted Interference Measurement
Australia CAB Recognition		EMC: AS/NZS CISPR 11, AS/NZS CISPR 14.1, AS/NZS CISPR22, AS/NZS 61000.6.3, AS/NZS 61000.6.4
		Radio communications: AS/NZS 4281, AS/NZS 4268, AS/NZS 4280.1, AS/NZS 4280.2, AS/NZS 4295, AS/NZS 4582, AS/NZS 4583, AS/NZS 4769.1, AS/NZS 4769.2, AS/NZS 4770, AS/NZS 4771
		Telecommunications: AS/ACIF S002:05, AS/ACIF S003:06, AS/ACIF S004:06 AS/ACIF S006:01, AS/ACIF S016:01, AS/ACIF S031:01, AS/ACIF S038:01, AS/ACIF S040:01, AS/ACIF S041:05, AS/ACIF S043.2:06, AS/ACIF S60950.1
Australia NATA Recognition		AS/ACIF S002, AS/ACIF S003, AS/ACIF S004, AS/ACIF S006, AS/ACIF S016,AS/ACIF S031, AS/ACIF S038, AS/ACIF S040, AS/ACIF S041, AS/ACIF S043.2