Test Report on

Globalsat
LM-130H1

Test Report Reference: MDE_BVADT_1705_01

Date: 2017-12-07

Test Laboratory:
7layers GmbH
Borsigstraße 11
40880 Ratingen
Germany

Table of Contents

1 Administrative Data

1.1 Project Information

Project Name	MDE_BVADT_1705
Responsible for Testing and Report	Abdellah Ahakki
Date of Report	2017-12-07
Testing Time Frame	2017-11-07 to 2017-11-07

Note: All date and time information is reported in UTC.

1.2 Applicant Information

Company	Globalsat
Address	16F.,No 186, Jian lst Rd., Zhonghe Dist. New Taipei City Taiwan
Contact Person	Claire Wang
Phone	+886282263799
Fax	+886282263899
Email	claire.wang@globalsat.com.tw

1.3 Test Laboratory Information

The following list shows all Locations and Test Resources involved in the generation of test results:

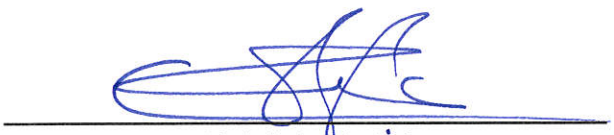
7layers DE, Ratingen, Germany

Company Name	7layers GmbH
Address	Borsigstr. 11 40880 Ratingen NRW Germany
Contact	Michael Albert
Phone	+49 2102 749 201
Email	Michael.Albert@7layers.com
Laboratory accreditation no.	DAkkS D-PL-12140-01-00

List of Test Resources

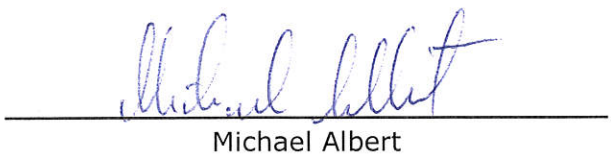
ID	Name	Responsible	Accreditation Info
1	7layers LoRa Compliance Test Environment	Constantine Nfor	-

1.4 Signature of responsible for testing and report



Abdellah Ahakki

1.5 Signature of responsible(s) for accreditation scope



Michael Albert

2 Test Object Data

2.1 Object Under Test (OUT) Description(s)

The following section lists all Objects Under Test (OUTs) involved during testing.

Object Under Test: LM-130H1

Type / Model	LM-130H1
Description	Module

Manufacturer:

Company Name	Globalsat
Address	16F.,No 186, Jian lst Rd., Zhonghe Dist. New Taipei City Taiwan
Contact Person	Claire Wang
Phone	+886282263799
Fax	+886282263899
Email	claire.wang@globalsat.com.tw

3 Results

3.1 General

Documentation of tested devices	Available at the test laboratory.
Interpretation of the test results	The results of the inspection are described on the following pages, where 'Conformity' or 'Passed' means that the certification criteria were verified and that the tested device is conform to the applied standard. In cases where 'Declaration' is stated, the required documents are available in the manufacturer's product documentation. In cases where 'not applicable' is stated, the test case requirements are not relevant to the specific equipment implementation.
Notes	This report contains the abbreviated information content pertaining to services rendered. Supporting documentation not included herein is maintained and available at the test laboratory. All tests are performed under environmental conditions within the requirements of the specifications. Environmental condition records are available at the test laboratory.

3.2 Applicable Test Specification(s)

Test Specification	LoRa End Device Certification US v1.1
Date / Version	Jun 2, 2017 / v1.1
Description	LoRa alliance End Device Certification Requirements for North America 902-928 MHz ISM Band devices, v1.1

3.3 Result Statistics

Test Specification	Total	Result Verdict				Pass ratio
		Pass	Fail	Declaration	Performed	
LoRa End Device Certification US v1.1	16	16	0	0	0	100.00 %

Note: Pass, Declaration, Performed, Fail and Inconclusive results are regarded for the pass ratio calculation.
Pass, Performed and Declaration are summarized as Pass results. Fail and Inconclusive are summarized as Fail results.
All are summarized as total count (Pass + Declaration + Performed + Fail + Inconclusive).
The pass ratio is calculated by the number of Pass results divided by the number of total results.
All other results like Error or Not Tested are not regarded for the calculation.

3.4 Result Summary

Test Specification: LoRa End Device Certification US v1.1

Test Case Name / Description Test Condition	Category	Verdict	Date	Test Res. ID	Sample/Setup
TC_US_001 / Test Mode activation Band = Band 915 MHz		Passed	2017-11-07		Setup_AC04
TC_US_002 / Over the Air Activation Band = Band 915 MHz		Passed	2017-11-07		Setup_AC04
TC_US_003 / Test Application Functionality Band = Band 915 MHz		Passed	2017-11-07		Setup_AC04
TC_US_004 / Cryptography Band = Band 915 MHz		Passed	2017-11-07		Setup_AC04
TC_US_005 / Downlink Error Rate Band = Band 915 MHz		Passed	2017-11-07		Setup_AC04
TC_US_006 / Downlink Window Timing Band = Band 915 MHz		Passed	2017-11-07		Setup_AC04
TC_US_007 / Frame Sequence Number Band = Band 915 MHz		Passed	2017-11-07		Setup_AC04
TC_US_008 / Device Status Request Band = Band 915 MHz		Passed	2017-11-07		Setup_AC04
TC_US_009 / MAC Commands Band = Band 915 MHz		Passed	2017-11-07		Setup_AC04
TC_US_010 / New Channel Request Band = Band 915 MHz		Passed	2017-11-07		Setup_AC04
TC_US_011 / Confirmed packets Band = Band 915 MHz		Passed	2017-11-07		Setup_AC04
TC_US_012 / RX Parameter Setup Request Band = Band 915 MHz		Passed	2017-11-07		Setup_AC04
TC_US_013 / RX1 Receive Window Test Band = Band 915 MHz		Passed	2017-11-07		Setup_AC04
TC_US_014 / RX2 Receive Window Test Band = Band 915 MHz		Passed	2017-11-07		Setup_AC04
TC_US_015 / RX Timing Setup Request Band = Band 915 MHz		Passed	2017-11-07		Setup_AC04
TC_US_016 / Link ADR Request Band = Band 915 MHz		Passed	2017-11-07		Setup_AC04

4 Test Equipment Details

4.1 List of Test Equipment

The information shown below is valid for the testing time frame of this test report.

Test Resource 1: 7layers LoRa Compliance Test Environment
Description: for LoRaWAN Specification and LoRa Compliance Testspec

Test System 7layers LoRa Compliance Test Environment (#7LDE01) of Test Resource 7layers LoRa Compliance Test Environment

Description: Location: 7layers Conformance Lab
Manufacturer: 7layers GmbH
Serial Number: #7LDE01

Software Version	Start Date	End Date
Release 2.1	2017-05-01	
7Layers LoRa Compliance Test Suite v2.1 7Layers LoRa Gateway Server v2.0		
LoRa WAN core spec 1.0.1 End device Certification for US 915MHz v1.0 End device Certification for US 915MHz v1.1		
LoRa WAN core spec 1.0.2 End device Certification for EU 868MHz v1.2 please note that test cases 11 and test step h) of test case 15 are not applicable for EU v1.2 End device Certification for EU 868MHz v1.3		

Single Devices of Test System 7layers LoRa Compliance Test Environment (#7LDE01)

Name	Serial Number	Manufacturer	
7Layers LoRa Control PC	DSCK001853	HP	
Semtech SX1301 LoRa Gateway for EU 868MHz	IOTSX1301	Semtech	
	Software Version	*Start Date*	*End Date*
	Lora Gateway SW (Driver HAL) v3.2.0; Packet forwarder v2.2.0	2017-01-01	
Name	**Serial Number**	**Manufacturer**	
senet LoRa Gateway for US 915MHz (64-Channels)	not available	senet	
	Software Version	*Start Date*	*End Date*
	Packet forwarder v1.0.RC3	2017-01-01	

5 Annex

5.1 Object Under Test (OUT) Features

Supported Features for Object Under Test: DE1095007

Name	Short Description
LoRa End Device Certification US v1.1	
Band 915 MHz	Band 915 MHz
OTAA	Support of optional over-the-air activation feature

5.2 Sample DE1095007ac04 Extra Information Parameters

Sample Name: DE1095007ac04	
Object Under Test	LM-130H1
Identifier	-
Description	Module
Serial Number	000DB5390B5A365B
Hardware Version	V0.1
Software Version	N/A
Firmware Version	F-0LR-1E-1711061
Normal Voltage	3.3 Vdc
Low Voltage	6 Vdc
High Voltage	3 Vdc
Normal Temperature	+20 °C
Low Temperature	-40 °C
High Temperature	+85 °C

Parameter Name	Value
a) End Device Identifier (DevEUI)	-
b) Application Identifier (AppEUI)	0000000000010203
c) Application key (AppKey)	0123456789ABCDEFEFCDAB8967452301
d) End-device address (DevAddr)	-
e) Application session key (AppSKey)	1628AE2B7E15D2A6ABF7CF4F3C158809
f) Network session key (NwkSKey)	28AED22B7E1516A609CFABF715884F3C

5.3 Setup Description(s)

For each setup a relation is given to determine if and which samples and auxiliary equipment have been used as part of each respective setup.

Setup	Combination of samples and auxiliary equipment	Description
Setup_AC04	DE1095007ac04,	

5.4 Additional Documentation for Samples

The following documents have been attached to Sample definitions as supporting documentation.

Sample Name: DE1095007ac04

Object Under Test

End of Test Report