



Test report No:

**NIE: 17C0375R-WLR001**

# Test Report

## LoRa Alliance End Device Requirements

Identification of item tested .....	: S76G
Trademark.....	: AcSip
Model or type reference.....	: S76G
Final HW version .....	: v1.0
Final FW version.....	: v2.0.0_SDK#2_AR.1
Features .....	: LoRa Alliance End Device Certification Requirements for US and Canada 915MHz ISM Band Devices
Manufacturer .....	: AcSip Technology Corp. 3F.-1, No.207, Fuxing Rd., Taoyuan District, Taoyuan City 33066, Taiwan
Test method requested.....	: LoRa Alliance Certification
Standard.....	: LoRa Alliance End Device Certification Requirements for US and Canada 915MHz ISM Band Devices Ver.1.3
Test procedure(s).....	: TERD-WTS-TP-02 – LORA_TSSTP_PART_1_v1.0
Summary .....	: IN COMPLIANCE
Approved by (name / position & signature) .....	: Michael Peng Project Manager <i>Michael Peng</i>
Date of issue.....	: 2018-02-08
Report template No.....	: FLO001_02_r1

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## Usage of samples

Samples undergoing test have been selected and supplied by: AcSiP Technology Corp.

Sample M/01 is composed of the following elements:

CONTROL N°	DESCRIPTION	MODEL	HW VERSION	SW VERSION	FW VERSION	SERIAL N°	DATE OF RECEPTION
17C0375R-01	SiP for LoRa + GPS	S76G	V1.0	N/A	v2.0.0_SD K#2_AR.1	N/A	2018/01/04

## Test sample description

The test sample consists on 17C0375R-01 programmed with FW labeled as:

v2.0.0\_SDK#2\_AR.1

AcSiP manufactures S76G, the world's smallest LoRa+GPS SiP (System in Package) 11x13x1.55mm. It integrates Semtech SX1276 RF Transceiver, a 32-bit ultra-low power STM32L073x MCU and highly efficient SONY CXD5603GF multi-GNSS receiver for GPS, GLONASS etc.

## Modifications to the reference test report

Report Template No.	Clauses / Sub-clauses Modification	Issue Date
FLO001_01	The Original Report without modifications.	2018-01-30
FLO001_02_r1	Correct the typo issue on “Usage of samples” part on page 3.	2018-02-08

## Identification of the client

AcSip Technology Corp.

3F.-1, No.207, Fuxing Rd., Taoyuan District, Taoyuan City 33066, Taiwan

## Testing period

The performed test started on 2018-01-24 and finished on 2018-01-25.

The tests have been performed at DEKRA Testing and Certification, Co., Ltd. (Taiwan)

## Environmental conditions

The testing has been performed within the following limits:

TEMPERATURE	Min. = 15 °C Max. = 35 °C
RELATIVE HUMIDITY	Min. = 20 % Max. = 80 %

## Remarks and comments

The tests have been performed by the technical personnel:

Gavin Yang

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## Testing verdicts

As detailed in Appendix A.

## Means of testing identification

Following equipment was used to perform the testing:

ITEM	US915 SETUP	
TEST SYSTEM	TACS4 LORA	
CONTROL NUMBER	QD070059	
HARDWARE	Equipment	Serial N°
	TEKTELIC USA 64Ch GATEWAY	1737D0001
SOFTWARE	Equipment	
	TACS4 LORA GUI v1.10.0	
	TACS4 LORA Reporting Module v1.5.0	
	TACS4 LORA Technology Package v4.7.0_R1	
TACS4 LORA ED Certification US & Canada v1.3		

# Appendix A – Test result

## Test campaign report

The abbreviations used in the header row of the test campaign report tables are:

- Test Case ID: Test case identifier, as it can be found on the referred standard.
- Sample: Sample details.
- Description: Test case description, as it can be found on the referred standard.
- Date: Date of the beginning of the execution.
- Conformance: YES/NO. If the test case has been executed in accordance to the standard.
- Verdict: Records the verdict assigned to each Test case run to completion. Following verdicts are possible:
  - PASS**: If the Test case passed.
  - FAIL**: If the Test case failed.
  - INCONC**: Inconclusive. The test case did not reach a PASS or FAIL verdict.
  - NA**: Not applicable.
  - NM**: Not measured.
- Observations: Provides a reference to additional information relevant to the test (when required).

0 test cases have been executed with SCR errors  
 21 test cases selected of 21 executed  
 21 test cases executed of 21 applicable

Test Case ID	Date	Conf	Verdict	Observations
TP_A_US915_ED_MAC_BV_000 Test mode activation	2018-01-24 2018-01-25	Yes	<b>PASS</b>	ABP OTAA
TP_A_US915_ED_MAC_BV_001 Over The Air activation	2018-01-25	Yes	<b>PASS</b>	OTAA
TP_A_US915_ED_MAC_BV_002 Test application functionality	2018-01-24 2018-01-25	Yes	<b>PASS</b>	ABP OTAA
TP_A_US915_ED_MAC_BV_003 AES encryption and message integrity	2018-01-24 2018-01-25	Yes	<b>PASS</b>	ABP OTAA
TP_A_US915_ED_MAC_BV_004 Downlink error rate	2018-01-24 2018-01-25	Yes	<b>PASS</b>	ABP OTAA
TP_A_US915_ED_MAC_BV_005 Downlink window timing	2018-01-24 2018-01-25	Yes	<b>PASS</b>	ABP OTAA
TP_A_US915_ED_MAC_BV_006_A Frame sequence number	2018-01-24 2018-01-25	Yes	<b>PASS</b>	ABP OTAA
TP_A_US915_ED_MAC_BV_006_B Downlink sequence number rollover	2018-01-24 2018-01-25	Yes	<b>PASS</b>	ABP OTAA
TP_A_US915_ED_MAC_BV_007 DevStatusReq MAC command	2018-01-24 2018-01-25	Yes	<b>PASS</b>	ABP OTAA
TP_A_US915_ED_MAC_BV_008_A MAC Commands	2018-01-24 2018-01-25	Yes	<b>PASS</b>	ABP OTAA

TP_A_US915_ED_MAC_BV_008_B MAC Commands in App-Payload & Fopts	2018-01-24 2018-01-25	Yes	PASS	ABP OTAA
TP_A_US915_ED_MAC_BV_009 NewChannelReq MAC command	2018-01-24 2018-01-25	Yes	PASS	ABP OTAA
TP_A_US915_ED_MAC_BV_010 Confirmed packets	2018-01-24 2018-01-25	Yes	PASS	ABP OTAA
TP_A_US915_ED_MAC_BV_011 RXParamSetupReq MAC command	2018-01-24 2018-01-25	Yes	PASS	ABP OTAA
TP_A_US915_ED_MAC_BV_012 RX1 Receive window test	2018-01-24	Yes	PASS	ABP OTAA
TP_A_US915_ED_MAC_BV_013 RX2 Receive window test	2018-01-24 2018-01-25	Yes	PASS	ABP OTAA
TP_A_US915_ED_MAC_BV_014 RXTimingSetupReq MAC command	2018-01-24 2018-01-25	Yes	PASS	ABP OTAA
TP_A_US915_ED_MAC_BV_015_A LinkADRReq MAC command	2018-01-24	Yes	PASS	ABP OTAA
TP_A_US915_ED_MAC_BV_015_B LinkADRReq MAC command	2018-01-24 2018-01-25	Yes	PASS	ABP OTAA
TP_A_US915_ED_MAC_BV_016 RX Oversized payload	2018-01-24 2018-01-25	Yes	PASS	ABP OTAA
TP_A_US915_ED_MAC_BV_017 Maximum allowed payload	2018-01-24 2018-01-25	Yes	PASS	ABP OTAA

## Appendix B – ICS

NAME	VALUE
DUT supports Trigger Join Request command in Test Mode	TRUE
DUT needs a reset after deactivating Test Mode	TRUE
DUT supports LinkADRReq block	TRUE
DUT implements LoRaWAN v1.0.2rB certification requirements	TRUE
DUT is a Class A Device (All End Devices)	TRUE
DUT works in USA 915MHz ISM Band	TRUE
DUT supports Over-The-Air Activation (OTAA) mechanism	TRUE
DUT supports Adaptive Data Rate (ADR) feature	TRUE



## Appendix C – IXIT

NAME	VALUE
Minimum transmission power	0
Maximum transmission power	0
Application session key (AppSKey)	'112233445566778899AABBCCDDEEFF'0
Network session key (NwkSKey)	'112233445566778899AABBCCDDEEFF'0
Application key (AppKey)	'11223344556677889911223344556677'0
Application identifier (AppEUI)	'70b3d57ed0009010'0
End-device Address (DevAddr)	'21436587'0

## Appendix D – General Parameters

NAME	VALUE
Default Tx Antenna	0
EU868 RECEIVE_DELAY1 (s)	1.0
EU868 RECEIVE_DELAY2 (s)	2.0
EU868 JOIN_ACCEPT_DELAY1 (s)	5.0
EU868 JOIN_ACCEPT_DELAY2(s)	6.0
EU868 RX2 Receive window frequency	869.525
EU868 RX2 Receive window DR	SF12BW125
US915 RECEIVE_DELAY1 (s)	1.0
US915 RECEIVE_DELAY2 (s)	2.0
US915 JOIN_ACCEPT_DELAY1(s)	5.0
US915 JOIN_ACCEPT_DELAY2(s)	6.0
US915 RX2 Receive window frequency	923.3
EU868 RF Continuous Wave timer	3600
EU868 RF frequency	868.3
Gateway model	Tektelic
US915 RX2 Receive window DR	SF12BW500
General Timer	60
KR920 RECEIVE_DELAY1 (s)	1.0
KR920 RECEIVE_DELAY2 (s)	2.0
KR920 JOIN_ACCEPT_DELAY1(s)	5.0
KR920 JOIN_ACCEPT_DELAY2(s)	6.0
KR920 RX2 Receive window frequency	921.9
KR920 RX2 Receive window DR	SF12BW125
AS923 RECEIVE_DELAY1 (s)	1.0
AS923 RECEIVE_DELAY2 (s)	2.0
AS923 JOIN_ACCEPT_DELAY1 (s)	5.0
AS923 JOIN_ACCEPT_DELAY2 (s)	6.0
AS923 RX2 Receive window DR	SF10BW125
AS923 RX2 Receive window frequency	923.2
Gateway IP Address	192.168.32.3
Gateway socket port	1780
Default Tx Power (dBm)	14

# Appendix E – Photographs

