



**BUREAU
VERITAS**

Module Integration Report on
Brand: Particle Industries, Inc
Model: E402
HW: V007
SW: V0.8.0
Module Brand: u-blox
Module Model: SARA-R410M-02B
Module HW: 306A05
Module SW: L0.0.00.00.05.06
SVN: 02

Report Reference: Project NO: 180528C07
Report NO: GC180528C07
Date: June 27, 2018

Test Laboratory:

Bureau Veritas ADT

Hwa Ya Lab & Head Office

No. 19, Hwa Ya 2nd Rd., Wen Hwa ViJ Kwei Shan Dist, Taoyuan, 33383, Taiwan (R. O.C)



GCF
Global Certification Forum



Testing Laboratory
2770

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1 Administrative Data

1.1 Project Data

Project Responsible: Han Shih
Date Of Test Report: 2018/06/27
Date of first test: 2018/06/08
Date of last test: 2018/06/19

1.2 Applicant Data

Company Name: Particle Industries, Inc
Street: 126 Post St, 4th floor, San Francisco
City: CA 94108
Country: USA

Contact Person: Yuan Eric
Phone: 18682301202
E-Mail: eric@particle.io

1.3 Test Laboratory Data

The following list shows all places and laboratories involved for test result generation:

Bureau Veritas ADT

Company Name : Bureau Veritas Consumer Products Services (H.K.) Ltd.,
Taoyuan Branch
Mobile Communications Laboratory
Street : No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil,
Kwei Shan Dist.,
33383 Taoyuan
City : Taiwan (R.O.C)
Country : Taiwan (R.O.C)
Contact Person : Mr. Elio Sun
Phone : 886-3-318-3232 ext. 1880
Fax : 886-3-211-5834
E Mail : elio.sun@tw.bureauveritas.com

Laboratory Details

<i>Lab ID</i>	<i>Identification</i>	<i>Responsible</i>	<i>Accreditation Info</i>
Lab 1	TP001 - IOP Environment	Eric SW Chiu	TAF Accreditation No.: 2770
Lab 2	TP013 - USIM - COMPRION IT3 USIM Simulator	Bell Lin	TAF Accreditation No.: 2770
Lab 3	TP113 - Protocol - Anite Conformance Toolset	Aeson Tsai	TAF Accreditation No.: 2770
Lab 4	TP118 - COMPRION UT3 Platform	Cara Huang	TAF Accreditation No.: 2770

1.4 Signature of the Testing Responsible



Nilson She
responsible for tests performed in: Lab 1, Lab 2, Lab 3, Lab 4

2 Test Object Data

2.1 General OUT Description

The following section lists all OUTs (Object's Under Test) involved during testing.

OUT: E402

Type / Model / Family:

Brand: Particle Industries,Inc
Model: E402
HW: V007
SW: V0.8.0
Module Brand: u-blox
Module Model: SARA-R410M-02B
Module HW: 306A05
Module SW: L0.0.00.00.05.06
SVN: 02

Manufacturer:

Company Name:

Particle Industries,Inc

Street:

126 Post St,4th floor, San Francisco

City:

CA 94108

Country:

USA

Contact Person:

Yuan Eric

Phone:

18682301202

E-Mail:

eric@particle.io

2.2 Detailed Description of OUT Samples

Sample : EUT 01

<i>OUT Identifier</i>	E402
<i>Sample Description</i>	
<i>HW Status</i>	V007
<i>SW Status</i>	V0.8.0
<i>Low Voltage</i>	3.6 V
<i>High Voltage</i>	4.4 V
<i>Nominal Voltage</i>	3.7 V

Parameter List:

<i>Parameter Description</i>	<i>Value</i>
Parameter for Scope LTE_v1	
IMEISV	3527530900875002
Official IMEI	352753090087501
Parameter for Scope UTRA_v2	
IMEISV	3527530900875002
Official IMEI	352753090087501

2.3 OUT Features

Features for OUT: E402

<i>Designation</i>	<i>Description</i>	<i>Allowed Values</i>	<i>Supported Value(s)</i>
Features for scope: LTE_v1			
36521_A.4. 3-3/2	Frequency band: 1850-1910, 1930-1990 MHz		
36521_A.4. 3-3/3	Frequency band: 1710-1785, 1805-1880 MHz		
36521_A.4. 3-3/4	Frequency band: 1710-1755, 2110-2155 MHz		
36521_A.4. 3-3/5	Frequency band: 824-849, 869-894 MHz		
36521_A.4. 3-3/12	Frequency band: 698-716, 729-746 MHz		
36521_A.4. 3-3/13	Frequency band: 777-787, 746-756 MHz		
36521_A.4. 3-3/28	Frequency band: 703-748, 758-803 MHz		
36523_A.4. 3.1-1/3	Frequency band: 1710-1785, 1805-1880 MHz		
R	recommended - the test case is recommended		
Features for scope: UTRA_v2			
102230_A. 1/4	Class B		
102230_A. 1/5	Class C		
R	recommended - the test case is recommended		

2.4 Setups used for Testing

For each setup a relation is given to determine if and which samples and auxiliary equipment is used. The left side list all OUT samples and the right side lists all auxiliary equipment for the given setup.

Setup No.	List of OUT samples	List of auxiliary equipment
Sample No.	Sample Description	AE No. AE Description

**01.01.01 (HW: V007
SW: V0.8.0)**

Sample: EUT 01

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 printed, the required documents are available in the manufacturers product documentation.

In cases where 'not applicable' is printed, the test case requirements are not relevant to the specific equipment implementation.

Note:

1.Uncertainty for each test case and measurement were calculated implemented according to test equipment uncertainty document.

2.Test condition not required due to no practical connection made to the power supply, and then normal condition performed with standard battery. The standard battery would be measured prior to testing, and make sure the battery voltage was at full charge condition.

3.2 List of the Applicable Body

(Body for Scope: LTE_v1)

Designation	Description
NAPRD.03 v5.34 bis	Official PTCRB NAPRD.03 Version 5.34

(Body for Scope: UTRA_v2)

Designation	Description
NAPRD.03 v5.34 bis	Official PTCRB NAPRD.03 Version 5.34

3.3 List of Test Specification

Test Specification: **3GPP TS 36.124**
Date / Version 2017/09/28 Version: V15.0.0
Title: Technical Specification
3rd Generation Partnership Project;
Technical Specification Group Radio Access Network;
Evolved Universal Terrestrial Radio Access (E-UTRA);
ElectroMagnetic Compatibility (EMC) requirements
for mobile terminals and ancillary equipment
(Release 15)

Test Specification: **3GPP TS 36.523-1**
Date / Version 2018/04/03 Version: V15.1.0
Title: 3rd Generation Partnership Project;
Technical Specification Group Radio Access Network;
Evolved Universal Terrestrial Radio Access (E-UTRA)
and Evolved Packet Core (EPC);
User Equipment (UE) conformance specification;
Part 1: Protocol conformance specification
(Release 15)

Test Specification: **ETSI TS 102 230-1**
Date / Version 2016/06/01 Version: V11.0.0
Title: Smart Cards;
UICC-Terminal interface;
Physical, electrical and logical test specification;
Part 1: Terminal features (Release 11)



4 Test Equipment Details

4.1 List of Used Test Equipment

The calibration, hardware and software states are shown for the testing period.

Test Equipment Anite Conformance Toolset

Lab ID: Lab 3
Manufacturer: Anite
Description: Protocol conformance testing of LTE technologies
Type: Anite Conformance Toolset

Single Devices for Anite Conformance Toolset

Single Device Name	Type	Serial Number	Manufacturer	
Anite 9000Mobile test Accelerator#1	9000	TB24046	Anite	
	<i>HW/SW Status</i>		<i>Date of Start</i>	<i>Date of End</i>
	FW: Release40.0.0.0 V.45		2017/11/03	
Anite 9000Mobile test Accelerator#2	9000	TB24049	Anite	
	<i>Calibration Details</i>		<i>Last Execution</i>	<i>Next Exec.</i>
	Calibration		2017/12/21	2018/12/21
	<i>HW/SW Status</i>		<i>Date of Start</i>	<i>Date of End</i>
	FW: Release40.0.0.0 V.45		2017/11/03	
Control PC	OPTIPLEX 790	1QQMB5J	Dell	
	<i>HW/SW Status</i>		<i>Date of Start</i>	<i>Date of End</i>
	FW: Release40.0.0.0 V.45		2017/11/03	
Dual Antenna Combiner (for Anite LTE test system)	Combiner	TC11007	Anite	
	<i>Calibration Details</i>		<i>Last Execution</i>	<i>Next Exec.</i>
	Calibration		2017/12/07	2019/12/07
	<i>HW/SW Status</i>		<i>Date of Start</i>	<i>Date of End</i>
	FW: Release40.0.0.0 V.45		2017/11/03	
License Dongle	License Dongle	7361	Anite	
Monitor	VA2448M	SEM113201488	ViewSonic	

Test Equipment IT3

Lab ID: Lab 2
Manufacturer: COMPRION
Description: COMPRION SIM-/USIM-Simulator
Type: IT3
Serial Number: B4208-50217

Single Devices for IT3

<i>Single Device Name</i>	<i>Type</i>	<i>Serial Number</i>	<i>Manufacturer</i>	
COMPRION IT3 SIM-Simulator	IT3	B4208-50217	COMPRION	
	<i>HW/SW Status</i>		<i>Date of Start</i>	<i>Date of End</i>
	IT3 Test Platform R4.10.0		2012/07/11	
	IT3 Test Platform R6.0.0		2016/11/25	
IT3 Analog Probe	IT3-APR	50217	COMPRION	
	<i>Calibration Details</i>		<i>Last Execution</i>	<i>Next Exec.</i>
	Calibration		2017/06/01	2019/06/01
	<i>HW/SW Status</i>		<i>Date of Start</i>	<i>Date of End</i>
	Analog Probe Hardware 1.2		2010/02/01	
SIMfony (SW)		60036	COMPRION	
	<i>HW/SW Status</i>		<i>Date of Start</i>	<i>Date of End</i>
	SW: 6.0.0		2016/11/25	

Test Equipment RSE Test System 1

Lab ID: Lab 1
Manufacturer: Bureau Veritas ADT
Description: RSE Test System 1
Type: RSE Test System
Serial Number: n/a

Single Devices for RSE Test System 1

Single Device Name	Type	Serial Number	Manufacturer	
18GHz ~ 40GHz Amplifier	EMC 184045	980116		
	<i>Calibration Details</i>		<i>Last Execution</i>	<i>Next Exec.</i>
	Calibration		2017/10/20	2018/10/20
ADT_Radiated_V7.6.1 5.9.3	ADT_Radiated	n/a	Bureau Veritas ADT	
	<i>HW/SW Status</i>		<i>Date of Start</i>	<i>Date of End</i>
	SW: V7.6.15.9.3		2010/02/01	
Antenna Tower	MA 4000	MA 4000/012/615030 3/L	Inn-co GmbH	
BILOG Antenna	VULB 9168	9168-158	SCHWARZBECK	
	<i>Calibration Details</i>		<i>Last Execution</i>	<i>Next Exec.</i>
	Calibration		2017/12/11	2018/12/11
Controller	SI-300	130009	TDK RF.	
HORN Antenna	3117	00034126	ETS	
	<i>Calibration Details</i>		<i>Last Execution</i>	<i>Next Exec.</i>
	Calibration		2017/11/30	2018/11/30
HORN Antenna	BBHA 9170	BBHA9170243	SCHWARZBECK	
	<i>Calibration Details</i>		<i>Last Execution</i>	<i>Next Exec.</i>
	Calibration		2017/12/14	2018/12/14
Preamplifier	8447D	2944A10738	Agilent Technologies	
	<i>Calibration Details</i>		<i>Last Execution</i>	<i>Next Exec.</i>
	Calibration		2017/08/21	2018/08/21
Preamplifier	8449B	3008A01963	Agilent Technologies	
	<i>Calibration Details</i>		<i>Last Execution</i>	<i>Next Exec.</i>
	Calibration		2017/08/21	2018/08/21
Spectrum Analyzer	E4446A	MY51100056	Agilent Technologies	
Splitters/Combiners	ZN2PD-9G		Mini-Circuits	
	<i>Calibration Details</i>		<i>Last Execution</i>	<i>Next Exec.</i>
	Calibration		2016/06/13	2018/06/13
Turn Table		SN40303		



Test Equipment UT3

Lab ID: Lab 4
Manufacturer: COMPRION
Description: COMPRION UT3 Platform
Type: UT3
Serial Number: 40070-45013

Single Devices for UT3

<i>Single Device Name</i>	<i>Type</i>	<i>Serial Number</i>	<i>Manufacturer</i>	
UT3 Analog Probe	APR-TT	45013	COMPRION	
	<i>Calibration Details</i>		<i>Last Execution</i>	<i>Next Exec.</i>
	Calibration		2018/06/13	2019/06/13
	<i>HW/SW Status</i>		<i>Date of Start</i>	<i>Date of End</i>
	HW: 3.0		2016/11/16	
UT3 APR	UT3 APR	40070	COMPRION	
	<i>HW/SW Status</i>		<i>Date of Start</i>	<i>Date of End</i>
	HW: 3.0		2017/10/20	
	HCI Monitoring: 1.6			
	SWP Monitoring: 1.8			
	Device Test Center: R 7.4.6473.20589			

5 Annex
5.1 Additional Information for Sample Description



Photographs for the EUT

5.2 Additional Information for Report

Test Case	Description	Test Spec	Category	Band	Verdict	Sample	Test Platform
5.1.1	Phase preceding Terminal power on	ETSI TS 102 230	A	Single	Passed	01.01.01	118
5.1.2.2	Phase during UICC power on: 1.8 V - 3 V	ETSI TS 102 230	A	Single	Passed	01.01.01	118
5.1.3.2	Phase during Terminal power off: 1.8 V - 3 V	ETSI TS 102 230	A	Single	Passed	01.01.01	13
5.1.5.3	Reaction of 1.8 V technology Terminals on type recognition of 1.8 V technology UICCs	ETSI TS 102 230	A	Single	Passed	01.01.01	118
5.1.5.4	Reaction of 1.8 V technology Terminals on type recognition of 3V technology UICCs	ETSI TS 102 230	A	Single	Passed	01.01.01	118
5.1.5.6	Reaction of a Terminals receiving no ATR	ETSI TS 102 230	A	Single	Passed	01.01.01	118
5.2.2.3	Electrical tests on contact C1, Test 1: 1.8 V - 3 V	ETSI TS 102 230	A	Single	Passed	01.01.01	118
5.2.2.4	Electrical tests on contact C1, Test 2: 1.8 V - 3 V	ETSI TS 102 230	A	Single	Passed	01.01.01	13
5.2.3.2	Electrical tests on contact C2: 1.8 V - 3 V	ETSI TS 102 230	A	Single	Passed	01.01.01	118
5.2.4.2	Electrical tests on contact C3: 1.8 V - 3 V	ETSI TS 102 230	A	Single	Passed	01.01.01	118
5.2.5.3	Electrical tests on contact C7, Test 1: 1.8 V - 3 V	ETSI TS 102 230	A	Single	Passed	01.01.01	118
8.2; Frequency Band = FDD2	Radiated spurious emissions, MS allocated a channel	36.124	A	Single	Passed	01.01.01	1
8.2; Frequency Band = FDD2	Radiated spurious emissions, MS in idle mode	36.124	A	Single	Passed	01.01.01	1
8.2; Frequency Band = FDD3	Radiated spurious emissions, MS allocated a channel	36.124	A	Single	Passed	01.01.01	1
8.2; Frequency Band = FDD3	Radiated spurious emissions, MS in idle mode	36.124	A	Single	Passed	01.01.01	1
8.2; Frequency Band = FDD4	Radiated spurious emissions, MS allocated a channel	36.124	A	Single	Passed	01.01.01	1
8.2; Frequency Band = FDD4	Radiated spurious emissions, MS in idle mode	36.124	A	Single	Passed	01.01.01	1
8.2; Frequency Band = FDD5	Radiated spurious emissions, MS allocated a channel	36.124	A	Single	Passed	01.01.01	1
8.2; Frequency Band = FDD5	Radiated spurious emissions, MS in idle mode	36.124	A	Single	Passed	01.01.01	1
8.2; Frequency Band = FDD12	Radiated spurious emissions, MS allocated a channel	36.124	A	Single	Passed	01.01.01	1
8.2; Frequency Band = FDD12	Radiated spurious emissions, MS in idle mode	36.124	A	Single	Passed	01.01.01	1
8.2; Frequency Band = FDD13	Radiated spurious emissions, MS allocated a channel	36.124	A	Single	Passed	01.01.01	1
8.2; Frequency Band = FDD13	Radiated spurious emissions, MS in idle mode	36.124	A	Single	Passed	01.01.01	1
8.2; Frequency Band = FDD28	Radiated spurious emissions, MS allocated a channel	36.124	A	Single	Passed	01.01.01	1
8.2; Frequency Band = FDD28	Radiated spurious emissions, MS in idle mode	36.124	A	Single	Passed	01.01.01	1
9.1.4.2; Frequency Band = FDD3	Identification procedure / IMEI / IMEISV requested	36.523-1	A	Single	Passed	01.01.01	113

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