


TEST REPORT

No. AR19-0034271-01

Information technology equipment – Safety – Part 1: General requirements

performed in accordance with
EN 60950-1:2006/A11:2009/A1:2010/A12:2011/A2:2013

PRODUCT	Bluetooth low Energy System
Model	BlueNRG-M2SP
TRADE MARK(s)	
RATINGS	1.7 to 3.6 V ---

APPLICANT	STMicroelectronics S.r.l. Via Camillo Olivetti, 2 I-20864 Agrate Brianza (MB)
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Tested by	M. Giacometti <i>[Laboratory Technician]</i>	
Approved by	S. Bilotta <i>[Laboratory Manager]</i>	

Revision Sheet

Release No.	Date	Revision Description
Rev. 0	18.04.2019	First edition

GENERAL DATA

SAMPLE		
Samples received on	17.12.2018	Item(s) sampled and sent by applicant
IMQ reference samples	BEM	93653
Samples tested No.	1	
Samples accepted on	17.12.2018	
Object under analysis recognition	Not carried out Except where stated, characteristics of products were taken from client description and were not verified by the laboratory	

TESTING LOCATION	
Testing dates	28.01.2019 ÷ 18.04.2019
Testing laboratory	IMQ S.p.A. Milano - Via Quintiliano, 43 – 20138 Milano
Testing site	IMQ S.p.A. Milano - Via Quintiliano, 43 – 20138 Milano

ENVIRONMENTAL CONDITION	
<i>Parameter</i>	<i>Measured</i>
Ambient Temperature	23 °C
Relative Humidity	46 %
Atmospheric Pressure	1010 mbar

REFERENCE DOCUMENT

	DOCUMENT	DATE	TITLE
<input checked="" type="checkbox"/>	EN 60950-1	2006	Information technology equipment – Safety – Part 1: General requirements
<input checked="" type="checkbox"/>	EN 60950-1/A11	2009	Information technology equipment – Safety – Part 1: General requirements
<input checked="" type="checkbox"/>	EN 60950-1/A1	2010	Information technology equipment – Safety – Part 1: General requirements
<input checked="" type="checkbox"/>	EN 60950-1/A12	2011	Information technology equipment – Safety – Part 1: General requirements
<input checked="" type="checkbox"/>	EN 60950-1/A2	2013	Information technology equipment – Safety – Part 1: General requirements

SUMMARY OF CONTENTS

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Note:

Attachments may include Schematics, Components information, Component test Reports, Particular Standard test Reports, Standard test Reports, Information from accompanying documents and similar.

EQUIPMENT UNDER TEST (EUT) DETAILS

MODEL (basic)	Description
BlueNRG-M2SP	Bluetooth low Energy System
VARIANTS (derived)	Description
/	/

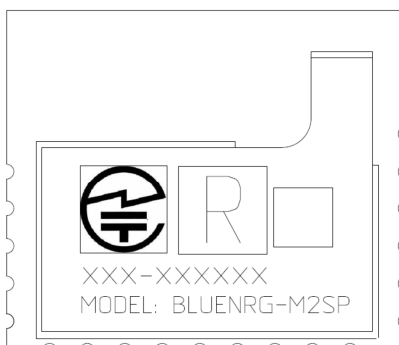
MANUFACTURER	STMicroelectronics
ASSEMBLY PLANT(s)	/

GENERAL PRODUCT INFORMATION:

The BlueNRG-M2SP is an open frame board.
The BlueNRG-M2SP is designed for a very low power application processor module for Bluetooth® low energy v5.0.

COPY OF MARKING PLATE:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.



PRODUCT DOCUMENTATION

Document	Reference
BLUENRG-M2SA, BLUENRG-M2SP Data Sheet	Draft

SUMMARY OF TEST

POSSIBLE TEST CASE VERDICTS:	
Test object does meet the requirement	P(ass)
Test object does not meet the requirement	F(ail)
Test case does not apply to the test object	N.A.
Test object has not been checked	N.C.

TEST PERFORMED	CLAUSE	ITEM NUMBER
Thermal requirements	4.5	1

GENERAL REMARKS:

Throughout this report a point (coma) is used as the decimal separator.

Unless otherwise stated the uncertainties for the tests and measurements are evaluated in according to IMQ Operational Instruction IO-LAB-001 and IO-LAB-004.

The uncertainties evaluation has been carried out in accordance with IEC Guide 115 "Application of Uncertainty of measurement's to Conformity Assessment Activity in the Electrotechnical Sector" and IECCE OD 5014.

Internal Procedure PG-037 ensure that the requirements for traceability of calibrations, of all test equipment requiring calibration, and calibration intervals are met.

The ability or reliability of this product to perform its intended function in a particular application has not been investigated.

Unless otherwise specified, warnings, installation instruction and/or user manual provided with the sample have been checked in Italian or English version only.

IMQ declines any responsibility derived from missing or wrong information provided aside by the applicant.

Device tested in conditions of supply.

The control module is not included in this evaluation.

Conditions of acceptability:

- The equipment must be powered by a SELV circuit or the accessibility must be evaluated in the final installation.
- The interconnection of equipment must be evaluated in the final installation.
- The mechanical and fire enclosure must be evaluated in the final installation.
- Stability must be evaluated in the final installation.
- Temperature tests must be re-evaluated in the final installation.
- Fault must be evaluated in the final installation.
- Materials for components and other parts inside fire enclosures must be re-evaluated in the final installation.

REQUIREMENTS AND TESTS

1.5	Components		-
1.5.1	General		-
	Comply with IEC 60950-1 or relevant component standard	(see appended tables 1.5.1)	P
1.5.2	Evaluation and testing of components	PCB only.	P
1.6	Power interface		-
1.6.1	AC power distribution systems		N/A
1.6.2	Input current		N/A
1.6.3	Voltage limit of hand-held equipment		N/A
1.6.4	Neutral conductor		N/A
1.7	Marking and instructions		-
1.7.1	Power rating and identification markings	See Data Sheet -Draft.	P
1.7.1.1	Power rating marking		N/A
	Multiple mains supply connections.....:		N/A
	Rated voltage(s) or voltage range(s) (V)		N/A
	Symbol for nature of supply, for d.c. only		N/A
	Rated frequency or rated frequency range (Hz) ...		N/A
	Rated current (mA or A)		N/A
1.7.1.2	Identification markings		-
	Manufacturer's name or trade-mark or identification mark	See Pictures.	P
	Model identification or type reference		N/A
	Symbol for Class II equipment only		N/A
	Other markings and symbols :		N/A
1.7.1.3	Use of graphical symbols		N/A
1.7.2	Safety instructions and marking		--
1.7.2.1	General	See Data Sheet -Draft.	P
1.7.2.2	Disconnect devices		N/A
1.7.2.3	Overcurrent protective device		N/A
1.7.2.4	IT power distribution systems		N/A
1.7.2.5	Operator access with a tool		N/A
1.7.2.6	Ozone		N/A
1.7.3	Short duty cycles	Continuous operation.	N/A
1.7.4	Supply voltage adjustment		-
	Methods and means of adjustment; reference to installation instructions		N/A

1.7.5	Power outlets on the equipment		N/A
1.7.6	Fuse identification (marking, special fusing characteristics, cross-reference)		N/A
1.7.7	Wiring terminals		-
1.7.7.1	Protective earthing and bonding terminals		N/A
1.7.7.2	Terminals for a.c. mains supply conductors		N/A
1.7.7.3	Terminals for d.c. mains supply conductors		N/A
1.7.8	Controls and indicators		-
1.7.8.1	Identification, location and marking		N/A
1.7.8.2	Colours		N/A
1.7.8.3	Symbols according to IEC 60417		N/A
1.7.8.4	Markings using figures		N/A
1.7.9	Isolation of multiple power sources		N/A
1.7.10	Thermostats and other regulating devices		N/A
1.7.11	Durability		N/A
1.7.12	Removable parts		N/A
1.7.13	Replaceable batteries		N/A
	Language(s)		—
1.7.14	Equipment for restricted access locations		N/A
2	PROTECTION FROM HAZARDS		-
2.1	Protection from electric shock and energy hazards		N/A
2.2	SELV circuits	SELV powered.	P
2.3	TNV circuits	Not provided.	N/A
2.4	Limited current circuits		N/A
2.5	Limited power sources		N/A
2.6	Provisions for earthing and bonding		N/A
2.7	Overcurrent and earth fault protection in primary circuits		N/A
2.8	Safety interlocks		N/A
2.9	Electrical insulation		N/A
2.10	Clearances, creepage distances and distances through insulation		N/A
3	WIRING, CONNECTIONS AND SUPPLY		-
3.1	General		N/A

3.2	Connection to a mains supply		N/A
3.3	Wiring terminals for connection of external conductors		N/A
3.4	Disconnection from the mains supply		N/A
3.5	Interconnection of equipment		N/A
4	PHYSICAL REQUIREMENTS		-
4.1	Stability		N/A
4.2	Mechanical strength		-
4.2.1	General		N/A
4.2.10	Wall or ceiling mounted equipment; force (N)		N/A
4.3	Design and construction		N/A
4.3.13	Radiation		-
4.3.13.5	Lasers (including laser diodes) and LEDs		N/A
4.3.13.5.1	Lasers (including laser diodes)		N/A
	Laser class		—
4.4	Protection against hazardous moving parts		N/A
4.5	Thermal requirements		-
4.5.1	General	Considered.	P
4.5.2	Temperature tests	Considered.	P
	Normal load condition per Annex L		—
4.5.3	Temperature limits for materials	(see appended table 4.5)	P
4.5.4	Touch temperature limits	(see appended table 4.5)	N/A
4.5.5	Resistance to abnormal heat	(see appended table 4.5.5)	N/A
4.6	Openings in enclosures		N/A
4.7	Resistance to fire		-
4.7.1	Reducing the risk of ignition and spread of flame		P
	Method 1, selection and application of components wiring and materials	Method 1	P
	Method 2, application of all of simulated fault condition tests		N/A
4.7.2	Conditions for a fire enclosure	See “Conditions of acceptability”.	N/A
4.7.2.1	Parts requiring a fire enclosure		N/A
4.7.2.2	Parts not requiring a fire enclosure	See Table 1.5.1 and Conditions of acceptability.	P
4.7.3	Materials		-
4.7.3.1	General		N/A
4.7.3.2	Materials for fire enclosures		N/A
4.7.3.3	Materials for components and other parts outside fire enclosures		N/A

4.7.3.4	Materials for components and other parts inside fire enclosures	See Table 1.5.1 and Conditions of acceptability.	N/A
4.7.3.5	Materials for air filter assemblies		N/A
4.7.3.6	Materials used in high-voltage components		N/A
5	ELECTRICAL REQUIREMENTS AND SIMULATED ABNORMAL CONDITIONS		-
5.1	Touch current and protective conductor current		N/A
5.2	Electric strength		N/A
5.3	Abnormal operating and fault conditions	EUT powered by SELV. See also Conditions of acceptability.	N/A
6	CONNECTION TO TELECOMMUNICATION NETWORKS		N/A
7	CONNECTION TO CABLE DISTRIBUTION SYSTEMS		N/A

TABLES

1.5.1	TABLE: List of critical components					
Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Standard (Edition / year)	Mark(s) of conformity ¹⁾	
PCB boards	Various	Various	Flame class UL94V-0, min. 105°C, Thk 1.6mm	/	/	
/	/	/	/	/	/	
1) Components used as alternative.						

4.5	TABLE: Thermal requirements						
	Supply voltage (V)	3.6V	/	/	/	/	—
Maximum measured temperature T of part/at.....:		T (°C)					Allowed T _{max} (80°C)
BlueNRG-M2SP (PCB)		28	/	/	/	/	50
Supplementary information: limits recalculated for an ambient temperature of 80°C. Ambient temperature 23°C. control module powered with 3.6V.							
Temperature T of winding:		t ₁ (°C)	R ₁ (Ω)	t ₂ (°C)	R ₂ (Ω)	T (°C)	Allowed T _{max} (°C)
/		/	/	/	/	/	/

4.5.5	TABLE: Ball pressure test of thermoplastic parts			N/A
	Allowed impression diameter (mm):	≤ 2 mm		—
Part		Test temperature (°C)	Impression diameter (mm)	
/		/	/	
Supplementary information: /				

5.3	TABLE: Fault condition tests					
Component No.	Fault	Supply voltage (V)	Test time	Fuse #	Fuse current (A)	Observation
/	/	/	/	/	/	/
Supplementary information: /						

MEASUREMENT EQUIPMENT AND INSTRUMENTATION

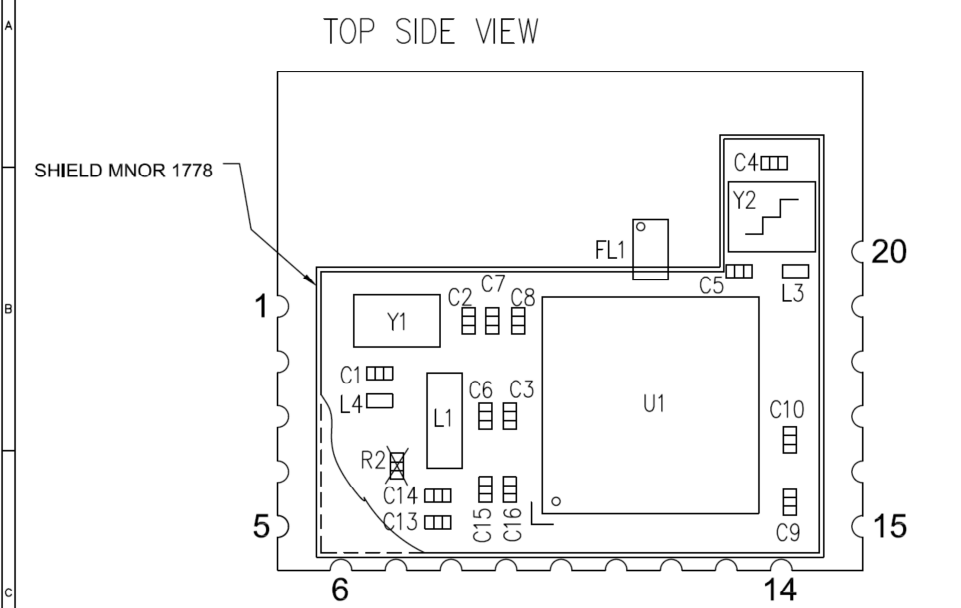
Measurement /testing	Testing / measuring equipment / material used/ IMQ ID	Range used	Calibration date
§4.5 Thermal requirements	Hybrid recorder/ Yokogawa, 3081-21/ S00590	0°C to 100°C	19-03-2018 31-03-2019
	Thermocouples/Tersid/ type T/S07663	0° to 400°C	15-09-2017 30-09-2020
	Multimeter/Fluke/45/S01861	30V; 10A	19-01-2018 31-01-2019
	Power Supply/ELIND/200 HS /P00323	200V; 2A	/


PICTURES

EUT IDENTIFICATION

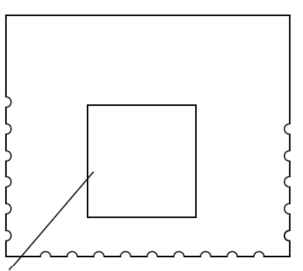
REV.	DATE	DESCRIPTION OF REVISION AND AUTHOR
V1	24.10.18	FIRST ISSUE Galli

TOP SIDE VIEW




1) Solder the components on p.c.b. using Nitrogen Atmosphere Furnace.
 2) Assemble the shield MNOR 1778.
 3) Execute the functional test.
 4) The assembling must be compliant with IPC norms, ref. to "IPC A 610 class".
 5) Component is  NOT MOUNTED.

BOTTOM SIDE VIEW
(NOT IN SCALE)

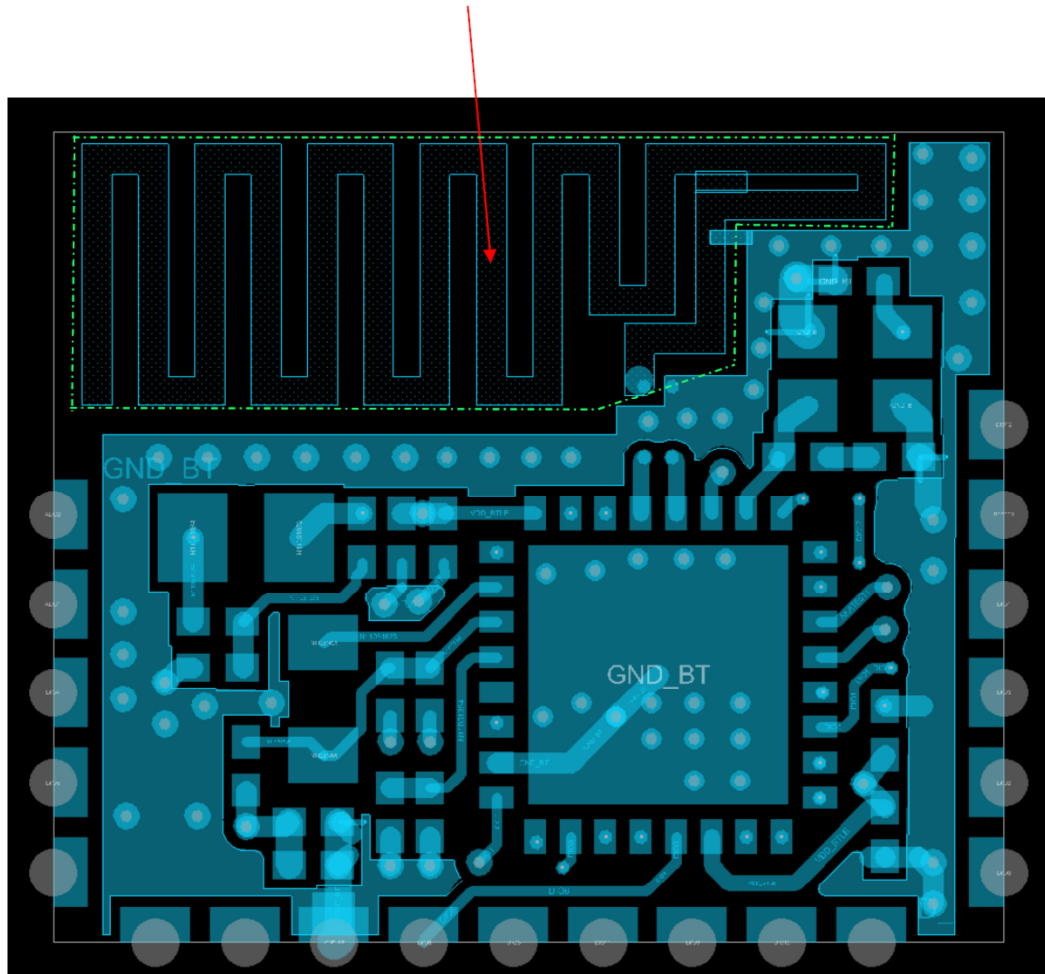


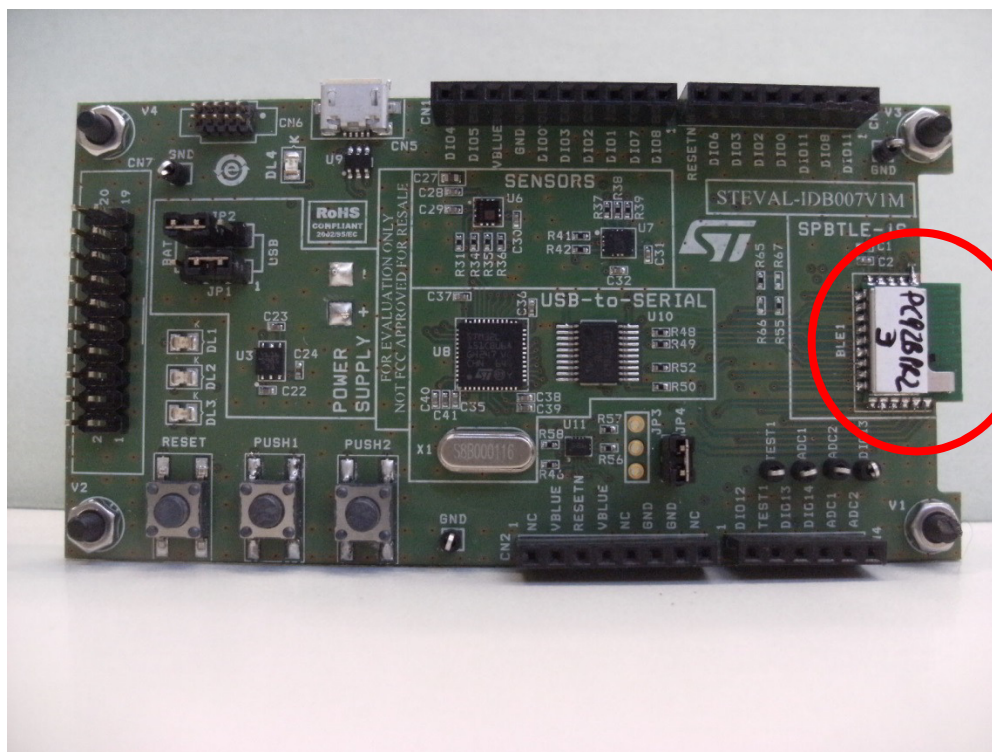
Free area No TEXT/LOGO

 Subsystem Product Group		COMPONENTS LAYOUT <PC92B>		Doc. ref. BLUENRG-M2SP	
Page size A4		Material		Drawing No. DM00548279	
Colour		Finish		Code	
ALL DIMENSIONS ARE IN mm (inch). REMOVE ALL BURRS AND SHARP EDGES.		ROUGHNESS (um) Machine finish √ 125 / 32 / 0.8 / 0.2 / <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		TOLERANCES (except where otherwise stated) LINEAL MEASURES No decimal = ±1mm .X = ±0.2mm .XXX = ±0.05mm .XX = ±0.1mm .XXXX = ±0.025mm	
		ANG. MEASURES No decimal = ±1° .X = ±0°30'		Scale 8 : 1	
				Drawn by	
				Passed by	
				Date	
				Sheet 1 of 1	

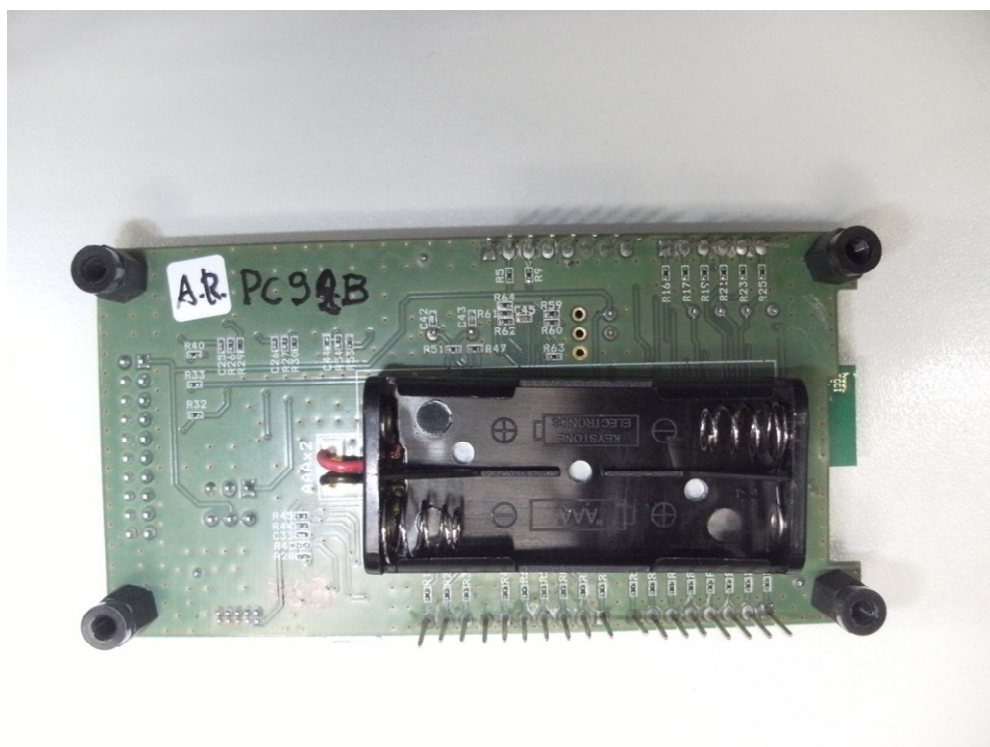
PC92B – Note for Antenna_pcb:

Pay attention to the dimensions & thickness of Antenna Tracks referring to the gerber file.





Module BlueNRG-M2SP mounted on control module (Front)



Module BlueNRG-M2SP mounted on control module (Rear)

END OF TEST REPORT