

TEST REPORT

Report No.: AZT032212260006C-010

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Applicant : SIMCcom Wireless Solutions Limited.
Address : SIMCom Headquarters Building, Building 3, No.289 Linhong Road,
Changning District, Shanghai, China.
Manufacturer's name : SIMCcom Wireless Solutions Limited.
Address : SIMCom Headquarters Building, Building 3, No.289 Linhong Road,
Changning District, Shanghai, China.

Report on the submitted samples said to be:

Sample Name : SIMCom Module
Trade Mark : N/A
Tested model : SIM8262A-M2
Series models : N/A
Testing Period : December 26, 2022 ~ December 30, 2022
Date of issue : January 06, 2023
Results : Please refer to next page(s).



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CONCLUSION

According to the customer's request, based on the performed tests on submitted sample, the result of Lead, Cadmium, Mercury, Hexavalent Chromium, PBBs, PBDEs, Dibutyl Phthalate (DBP), Benzyl butyl Phthalate (BBP), Bis(2-ethylhexyl) Phthalate (DEHP), Diisobutyl Phthalate (DIBP) content comply with the limit as set of RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

Pass

Signed for and on behalf of AZT


Suez Su
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Results:

A.EU RoHS Directive 2011/65/EU and its amendment directives on XRF

Test method: With reference to IEC 62321-3-1:2013, Screening by X-ray Fluorescence Spectroscopy (XRF)

Seq. No.	Tested Part(s)	Results					
		Cd	Pb	Hg	Cr▼	Br▼	
						PBBs	PBDEs
1	Silver sheet metal (optical module)	BL	BL	BL	X	/	/
2	Silver metal frame	BL	BL	BL	BL	/	/
3	Grey chip (Green PCB)	BL	BL	BL	BL	BL	BL
4	Gray IC (Green PCB)	BL	BL	BL	X	BL	BL
5	Patch capacitor (Green PCB)	BL	BL	BL	BL	BL	BL
6	Patch capacitor (Green PCB)	BL	BL	BL	BL	BL	BL
7	Gray IC (Green PCB)	BL	BL	BL	X	BL	BL
8	Silver Metal (Green PCB)	BL	BL	BL	BL	/	/
9	Grey chip (Green PCB)	BL	BL	BL	BL	BL	BL
10	Blue Chip (Green PCB)	BL	BL	BL	BL	BL	BL
11	IC (Green PCB)	BL	BL	BL	BL	BL	BL
12	Gray IC (Green PCB)	BL	BL	BL	X	BL	BL
13	IC (Green PCB)	BL	BL	BL	BL	BL	BL
14	IC (Green PCB)	BL	BL	BL	BL	BL	BL
15	IC (Green PCB)	BL	BL	BL	BL	BL	BL
16	Green PCB	BL	BL	BL	BL	BL	BL



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Note:

- (1) Results were obtained by XRF for primary screening, and further chemical testing by ICP (for Cd, Pb, Hg), UV-Vis (for Cr(VI)) and GC-MS (for PBBs, PBDEs) are recommended to be performed, if the concentration exceeds the below warning value according to IEC 62321-3-1:2013.

Element	Unit	Non-metal	Metal	Composite Material
Cd	mg/kg	$BL \leq 70-3\sigma < X < 130+3\sigma \leq OL$	$BL \leq 70-3\sigma < X < 130+3\sigma \leq OL$	$BL \leq 50-3\sigma < X < 150+3\sigma \leq OL$
Pb	mg/kg	$BL \leq 700-3\sigma < X < 1300+3\sigma \leq OL$	$BL \leq 700-3\sigma < X < 1300+3\sigma \leq OL$	$BL \leq 500-3\sigma < X < 1500+3\sigma \leq OL$
Hg	mg/kg	$BL \leq 700-3\sigma < X < 1300+3\sigma \leq OL$	$BL \leq 700-3\sigma < X < 1300+3\sigma \leq OL$	$BL \leq 500-3\sigma < X < 1500+3\sigma \leq OL$
Cr	mg/kg	$BL \leq 700-3\sigma < X$	$BL \leq 700-3\sigma < X$	$BL \leq 500-3\sigma < X$
Br	mg/kg	$BL \leq 300-3\sigma < X$	--	$BL \leq 250-3\sigma < X$

Note:

BL = Below Limit
OL = Over Limit
X = Inconclusive



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- (2) The XRF screening test for RoHS elements – The reading may be different to the actual content in the sample be of non-uniformity composition.
- (3) The maximum permissible limit is quoted from the document 2015/863/EC amending RoHS directive 2011/65/EU:
- (4) ▼ =For restricted substances PBBs and PBDEs, the results show the total Br content; The restricted substance was Cr (VI), and the results showed the total Cr content

RoHS Restricted Substances	Maximum Concentration Value (mg/kg) (by weight in homogenous materials)
Cadmium (Cd)	100
Lead (Pb)	1000
Mercury (Hg)	1000
Hexavalent Chromium (Cr(VI))	1000
Polybrominated biphenyls (PBBs)	1000
Polybrominated diphenyl ethers (PBDEs)	1000
Dibutyl Phthalate (DBP)	1000
Benzyl butyl Phthalate (BBP)	1000
Bis(2-ethylhexyl) Phthalate (DEHP)	1000
Diisobutyl Phthalate (DIBP)	1000

Disclaimers:

This XRF Screening report is for reference purposes only. The applicant shall make its/his/her own judgment as to whether the information provided in this XRF screening report is sufficient for its/his/her purposes.

The result shown in this XRF screening report will differ based on various factors, including but not limited to, the sample size, thickness, area, surface flatness, equipment parameters and matrix effect (e.g. plastic, rubber, metal, glass, ceramic etc.). Further wet chemical pre-treatment with relevant chemical equipment analysis are required to obtain quantitative data.



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B. EU RoHS Directive 2011/65/EU and its amendment Directives 2015/863/EU on Lead, Cadmium, Mercury, Hexavalent Chromium, PBBs, PBDEs, DBP, BBP, DEHP, DIBP content.

Test method:

Lead (Pb) & Cadmium (Cd) Content:

With reference to IEC 62321-5:2013, by acid digestion and analysis was performed by inductively coupled plasma atomic emission spectrometer (ICP-OES)

Mercury (Hg) Content:

With reference to IEC 62321-4:2013+AMD1:2017 CSV, by acid digestion and analysis was performed by inductively coupled plasma atomic emission spectrometer (ICP-OES)

Hexavalent Chromium (Cr⁶⁺) Content:

With reference to IEC 62321-7-1:2015 or IEC 62321-7-2:2017, by alkaline digestion and analysis was performed by UV-visible spectrophotometer (UV-Vis)

PBBs & PBDEs Content:

With reference to IEC 62321-6:2015, by solvent extraction and analysis was performed by gas chromatographic-mass spectrometer (GC-MS)

BBP DBP DEHP & DIBP Content:

With reference to IEC 62321-8:2017, by solvent extraction and analysis was performed by gas chromatographic-mass spectrometer (GC-MS)

1) The test results of Hexavalent Chromium (Cr⁶⁺) (nonmetal)

Item	Unit	MDL	Results			Limit
			4	7	12	
Hexavalent Chromium(Cr(VI))	mg/kg	8	N.D.	N.D.	N.D.	1000

2) The test results of Hexavalent Chromium (Cr⁶⁺) (metal)

Item	Unit	MDL	Results	Limit
			1	
Hexavalent Chromium(Cr(VI))▼	ug/cm ²	0.10	N.D.	--



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Note:

- MDL = Method Detection Limit
- /= Not apply
- LOQ = Limit of Quantification, The LOQ of Hexavalent chromium is 0.10 $\mu\text{g}/\text{cm}^2$
- 0.1%=1000mg/kg
- N.D.=Not Detected (<MDL or LOQ)
- ▼ = a. The sample is positive for Cr (VI) if the Cr (VI) concentration is greater than 0.13 $\mu\text{g}/\text{cm}^2$. The sample coating is considered to contain Cr (VI)
b. The sample is negative for Cr (VI) if Cr (VI) is N.D. (concentration less than 0.10 $\mu\text{g}/\text{cm}^2$). The sample coating is considered a non- Cr (VI) based coating
c. The result between 0.10 $\mu\text{g}/\text{cm}^2$ and 0.13 $\mu\text{g}/\text{cm}^2$ is considered to be inconclusive, unavoidable coating variations may influence the determination
- #1 According to RoHS directive 2011/65/EU and its amendments, Lead is exempted in glass of cathode ray tubes, electronic components and fluorescent tubes.
- #2 According to RoHS directive 2011/65/EU and its amendments, Lead is exempted in electronic ceramic parts (e.g. piezo electronic devices).
- #3 According to RoHS directive 2011/65/EU and its amendments, Lead is exempted as an alloying element in Copper containing up to 4% (40000ppm) by weight.
- #4 According to RoHS directive 2011/65/EU and its amendments, Lead is exempted in high melting temperature type solders (i.e. lead-based alloys containing 85 % by weight or more lead).
- #5 According to the statement provided by the customer, according to RoHS directive 2011/65/EU and its amendments, Lead is exempted as an alloying element in Aluminum containing up to 0.4% (4000ppm) by weight.
- #6 According to the statement provided by the customer, according to RoHS directive 2011/65/EU and its amendments, Cadmium and its compounds in electrical contact is exempted.
- #7 According to the statement provided by the customer, according to RoHS directive 2011/65/EU and its Amendments, Lead is exempted in steel for machining purposes and in galvanized steel containing up to 0.35% (3500ppm) by weight.

3) The test results of DBP, BBP, DEHP & DIBP

Item	CAS No.	Unit	MDL	Results				Limit
				3	4	5	6	
Dibutyl Phthalate (DBP)	84-74-2	mg/kg	30	N.D.	N.D.	N.D.	N.D.	1000
Benzyl butyl Phthalate (BBP)	85-68-7	mg/kg	30	N.D.	N.D.	N.D.	N.D.	1000
Bis(2-ethylhexyl) Phthalate (DEHP)	117-81-7	mg/kg	30	N.D.	N.D.	N.D.	N.D.	1000
Diisobutyl Phthalate (DIBP)	84-69-5	mg/kg	30	N.D.	N.D.	N.D.	N.D.	1000



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Item	CAS No.	Unit	MDL	Results				Limit
				7	9	10	11	
Dibutyl Phthalate (DBP)	84-74-2	mg/kg	30	N.D.	N.D.	N.D.	N.D.	1000
Benzyl butyl Phthalate (BBP)	85-68-7	mg/kg	30	N.D.	N.D.	N.D.	N.D.	1000
Bis(2-ethylhexyl) Phthalate (DEHP)	117-81-7	mg/kg	30	N.D.	N.D.	N.D.	N.D.	1000
Diisobutyl Phthalate (DIBP)	84-69-5	mg/kg	30	N.D.	N.D.	N.D.	N.D.	1000

Item	CAS No.	Unit	MDL	Results				Limit
				12	13	14	15	
Dibutyl Phthalate (DBP)	84-74-2	mg/kg	30	N.D.	N.D.	N.D.	N.D.	1000
Benzyl butyl Phthalate (BBP)	85-68-7	mg/kg	30	N.D.	N.D.	N.D.	N.D.	1000
Bis(2-ethylhexyl) Phthalate (DEHP)	117-81-7	mg/kg	30	N.D.	N.D.	N.D.	N.D.	1000
Diisobutyl Phthalate (DIBP)	84-69-5	mg/kg	30	N.D.	N.D.	N.D.	N.D.	1000

Item	CAS No.	Unit	MDL	Results	Limit
				16	
Dibutyl Phthalate (DBP)	84-74-2	mg/kg	30	N.D.	1000
Benzyl butyl Phthalate (BBP)	85-68-7	mg/kg	30	N.D.	1000
Bis(2-ethylhexyl) Phthalate (DEHP)	117-81-7	mg/kg	30	N.D.	1000
Diisobutyl Phthalate (DIBP)	84-69-5	mg/kg	30	N.D.	1000

Remark:

- 0.1%=1000mg/kg
- N.D. = Not detected
- MDL= Method detected limited
- The samples were mixed for phthalic acid test
- Flow chart appendix is included
- Photo appendix is included.



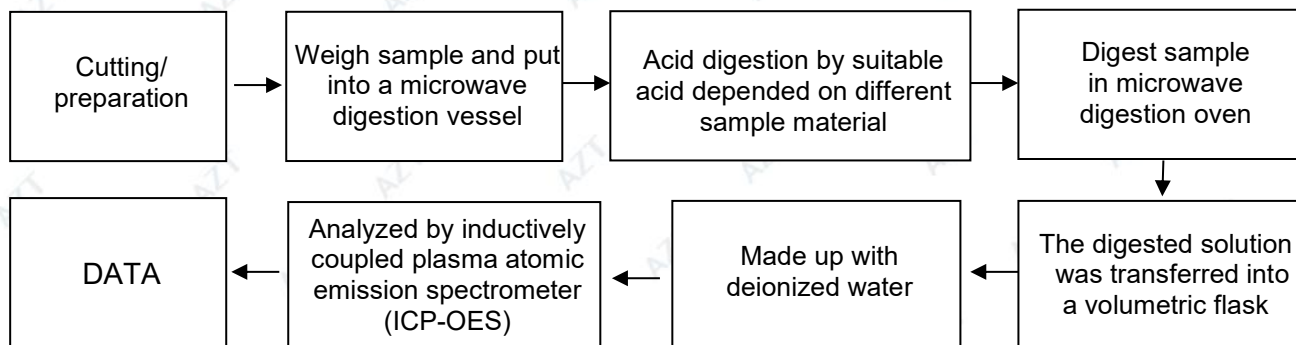
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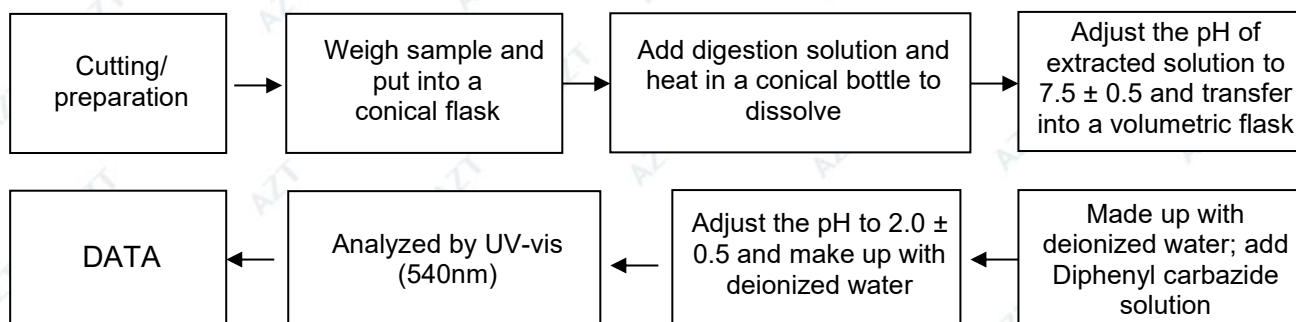
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Appendix

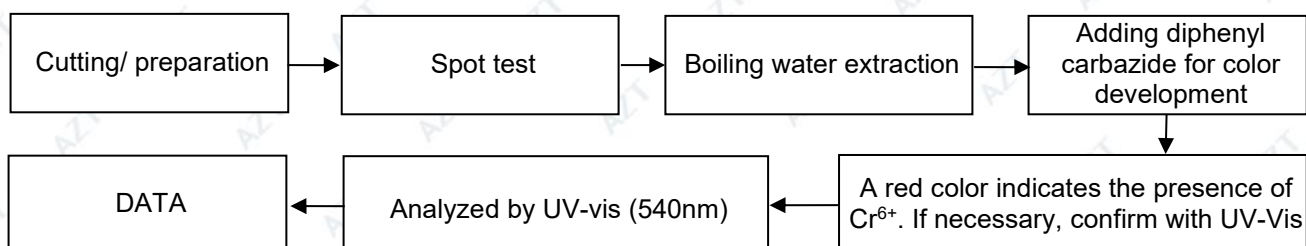
1. Test Flow chart for Cd/Pb /Hg content



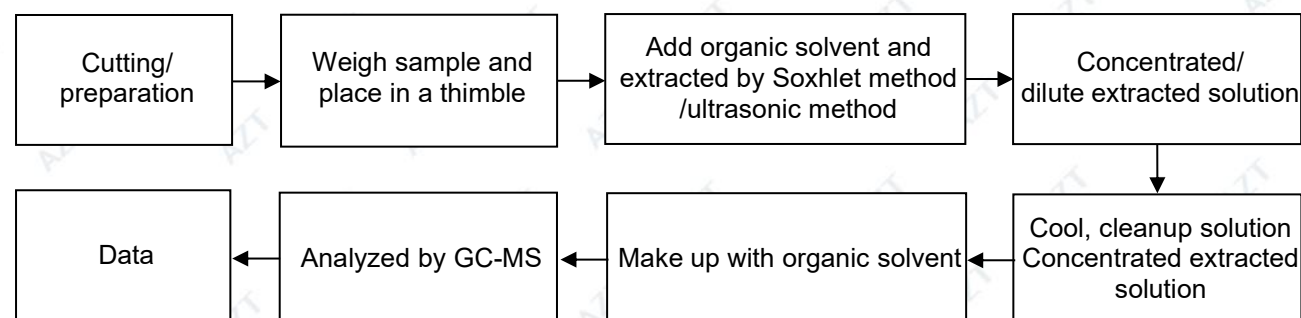
2. Test Flowchart for Cr⁶⁺ content (For non-metal material)



Test Flowchart for Cr⁶⁺ content (For metal material)



3. Test Flow chart for PBBs & PBDEs & DBP & BBP & DEHP & DIBP content



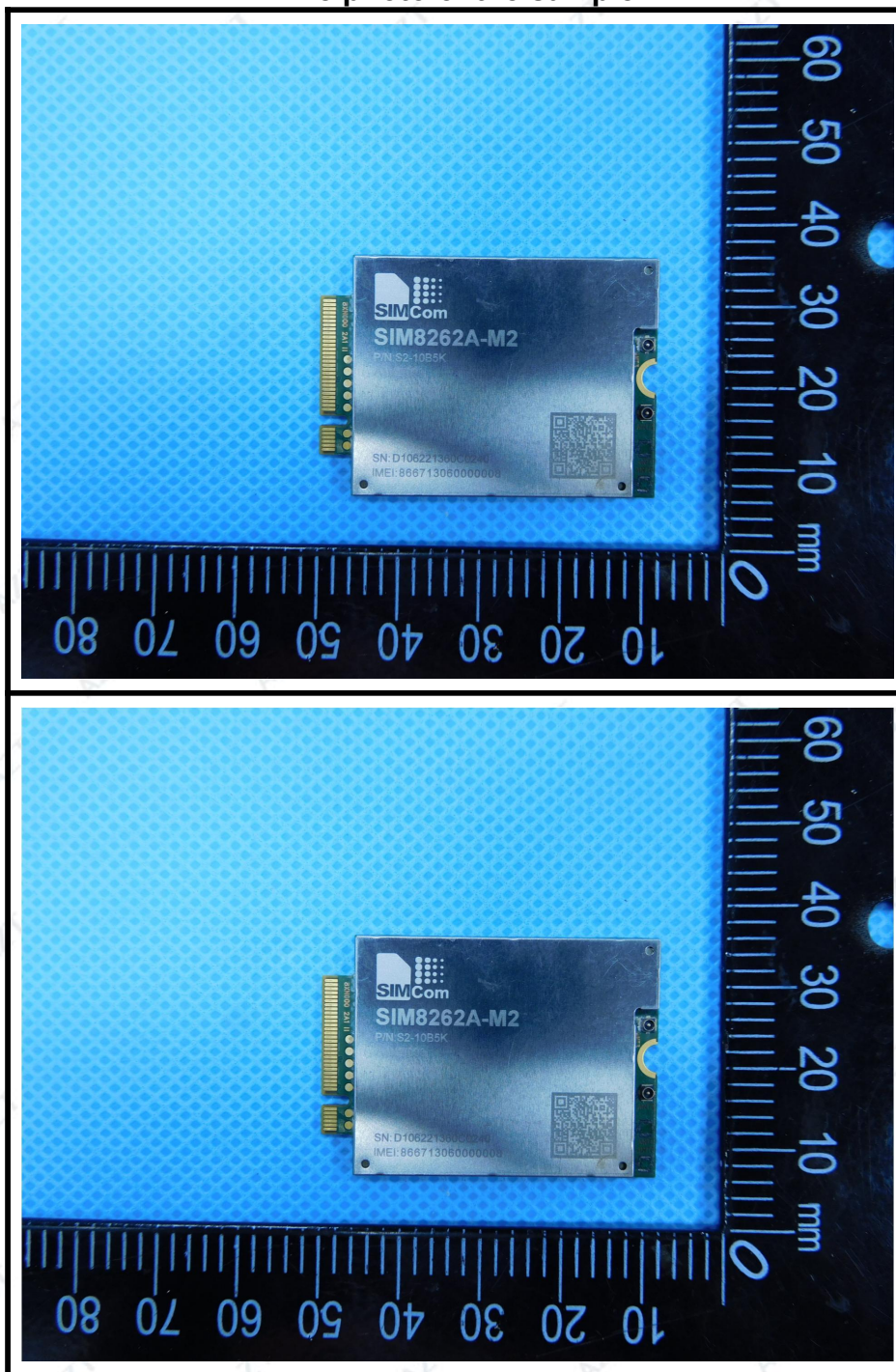


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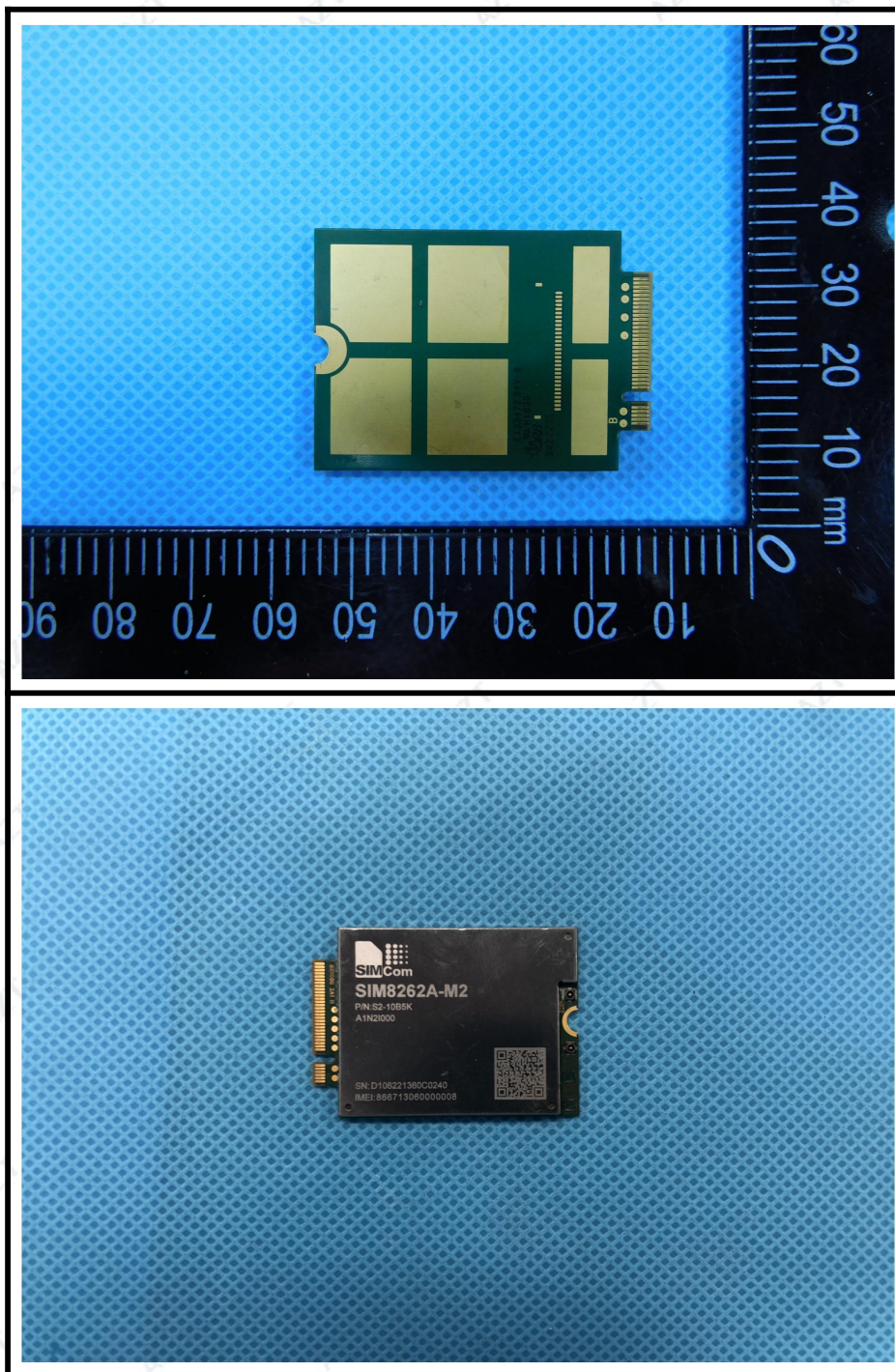
The photo of the sample



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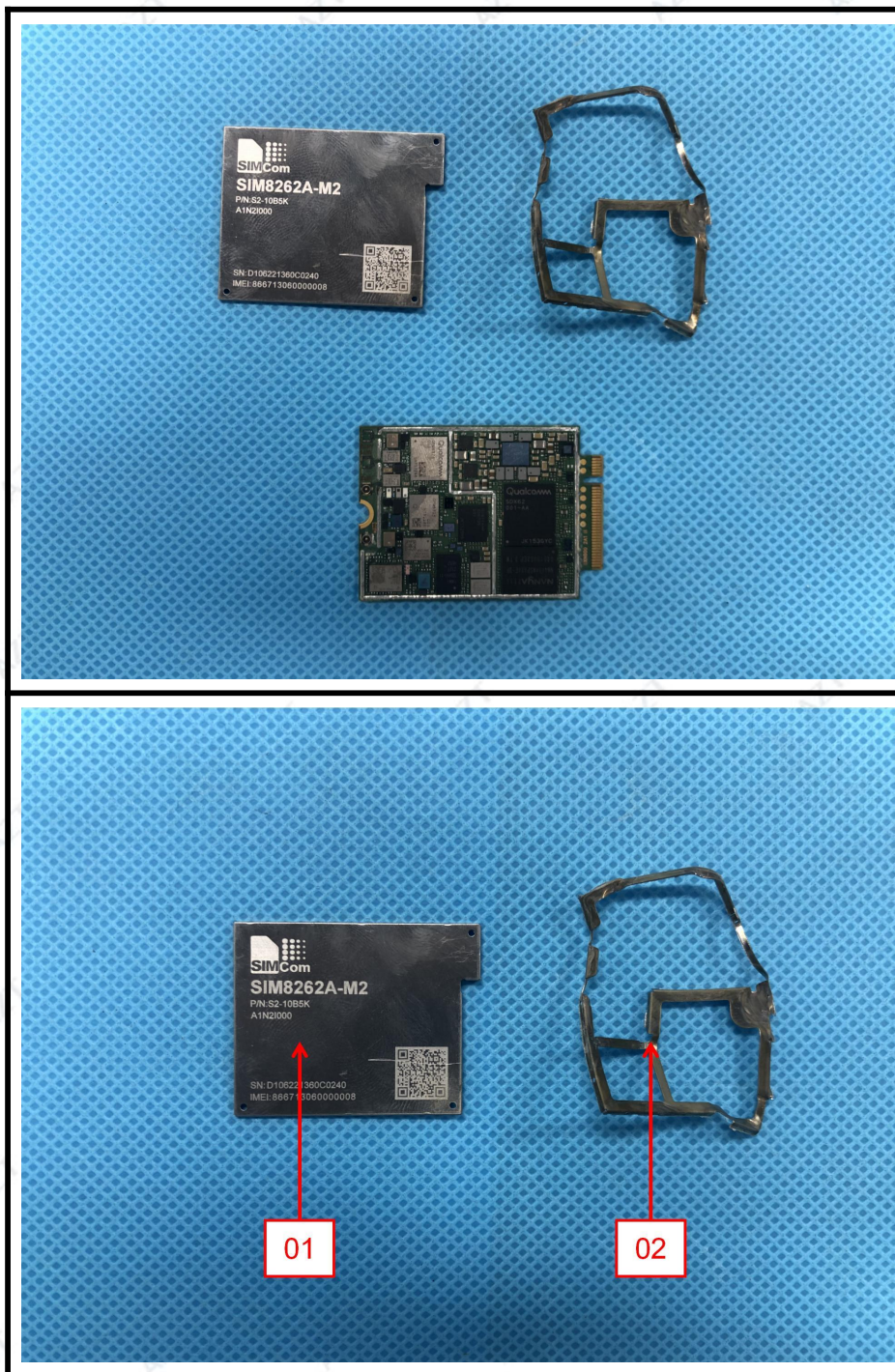
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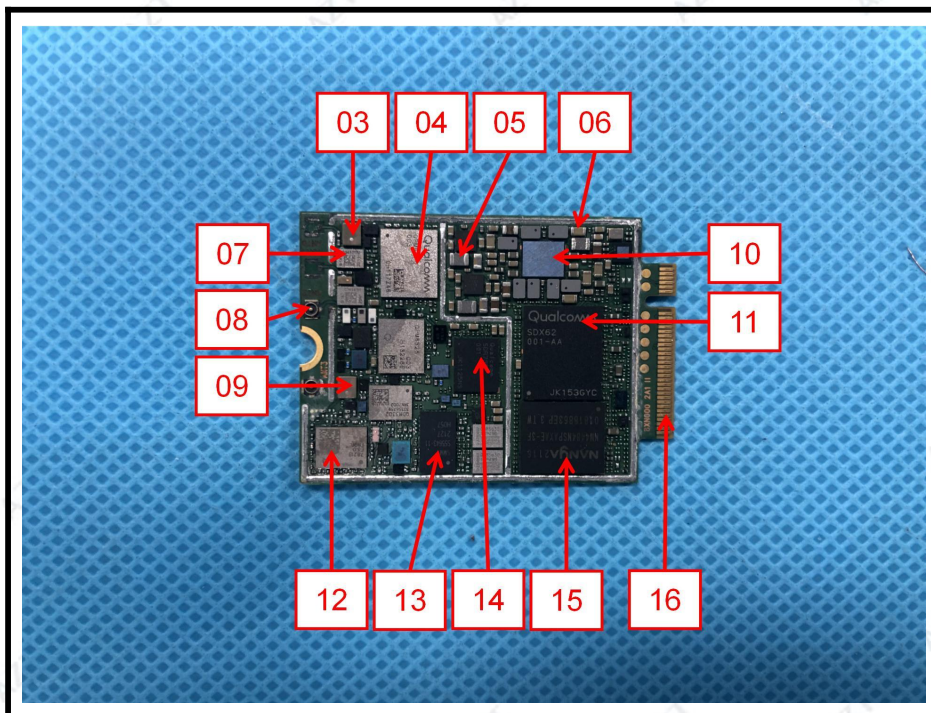
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***** End of Report *****

Statement:

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2. The result(s) shown in this report refer only to the sample(s) tested.
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