

Report No.: 48254680a8 001

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Client: Raytac Corporation
8F., No.788-1, Zhongzheng Road, Zhonghe District, New Taipei City 235601,
Taiwan, R.O.C.

Test item(s): Bluetooth Low Energy Module

Identification/Model No(s): MDBT42Q, MDBT42Q-P, MDBT42Q-U

Sample obtaining method: Sending by customer

Condition at delivery: Test item complete and undamaged.

Sample receiving date: 2024-11-19

Testing period: 2024-11-19 – 2024-12-12

Place of testing: TÜV Rheinland Hong Kong Ltd.

Test specification:

According to RoHS (recast): Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment, 2011/65/EU Annex II and its amendment Directive (EU) 2015/863: Total Content of Lead, Cadmium, Mercury, Chromium VI, Polybrominated Biphenyls, Polybrominated Diphenyl Ethers; and Benzyl butyl phthalate (BBP), Dibutyl phthalate (DBP), Bis(2-ethylhexyl) phthalate (DEHP), Diisobutyl phthalate (DIBP)

Test result:

Pass

Other information: All the above models are the same materials according to client's declaration dated on 2024-07-10.

For and on behalf of
TÜV Rheinland Taiwan Ltd.

Arthur Cheng

2024-12-12
Date

Arthur Cheng/Project Manager
Name/Position



Sample information is provided by customer. Test result is drawn according to the kind and extent of tests performed.
This test report relates to the above mentioned test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.
"Decision Rule" document announced in our website (<https://www.tuv.com/landingpage/en/qm-gcn/>) describes the statement of conformity and its rule of enforcement for test results are applicable throughout this test report.

Material List:

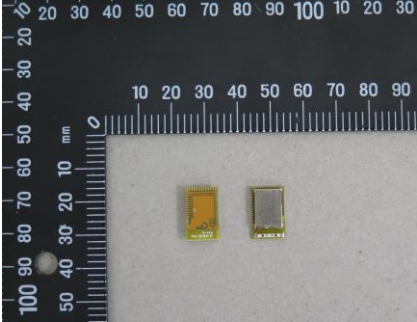
Lab no.: TCL241119-08

Mat. no.	Part No.	Material	Color	Location
1	A	Ceramic	Black/White	Photo1 (Refer to report no. 48254680a6 001, mat.1)
2	A	Metal	Metallic	Photo1 (Refer to report no. 48254680a1 001, mat.8)
3	A	Electronic components	Black	Photo1 (Refer to report no. 48254680a1 001, mat.6)
4	A	PCB board	Yellow	Photo1
5	C	Metal	Golden	Photo2 (Refer to report no. 48254680a7 001, mat.5)

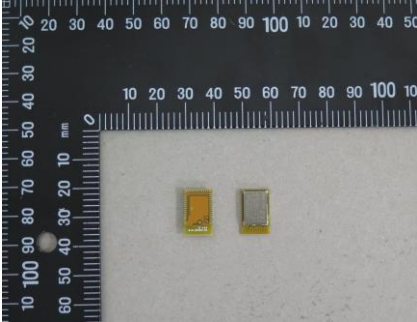
Remark:

1. Component(s)/ materials(s) with an area of less than 2mm x 2mm or insufficient weight will not be selected for testing according to RoHS Directive 2011/65/EU due to technical reason.
2. For the test sample does not have detail materials information provided by client, visually identical materials (e.g. wire insulation, solder points, etc.) will be considered as the same material.
3. Solder points on a printing circuit board will be examined several times based on optical anomalies or discoloration of the solder point(s) unless the solder point(s) is obviously generated automatically during production.
4. All other materials will be sampled and tested at one test point representatively.

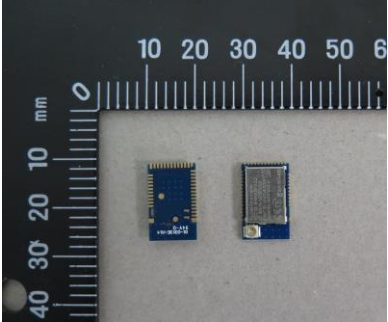
Test sample



A. MDBT42Q



B. MDBT42Q-P



C. MDBT42Q-U

Material Photo

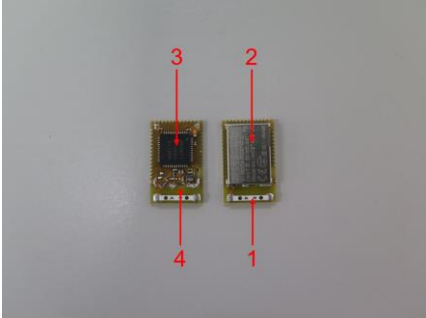


Photo1

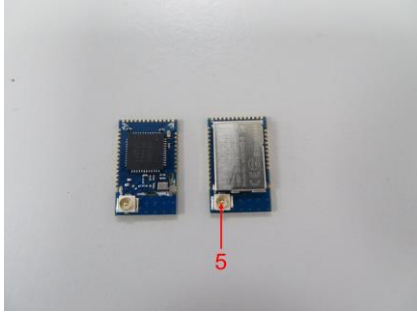
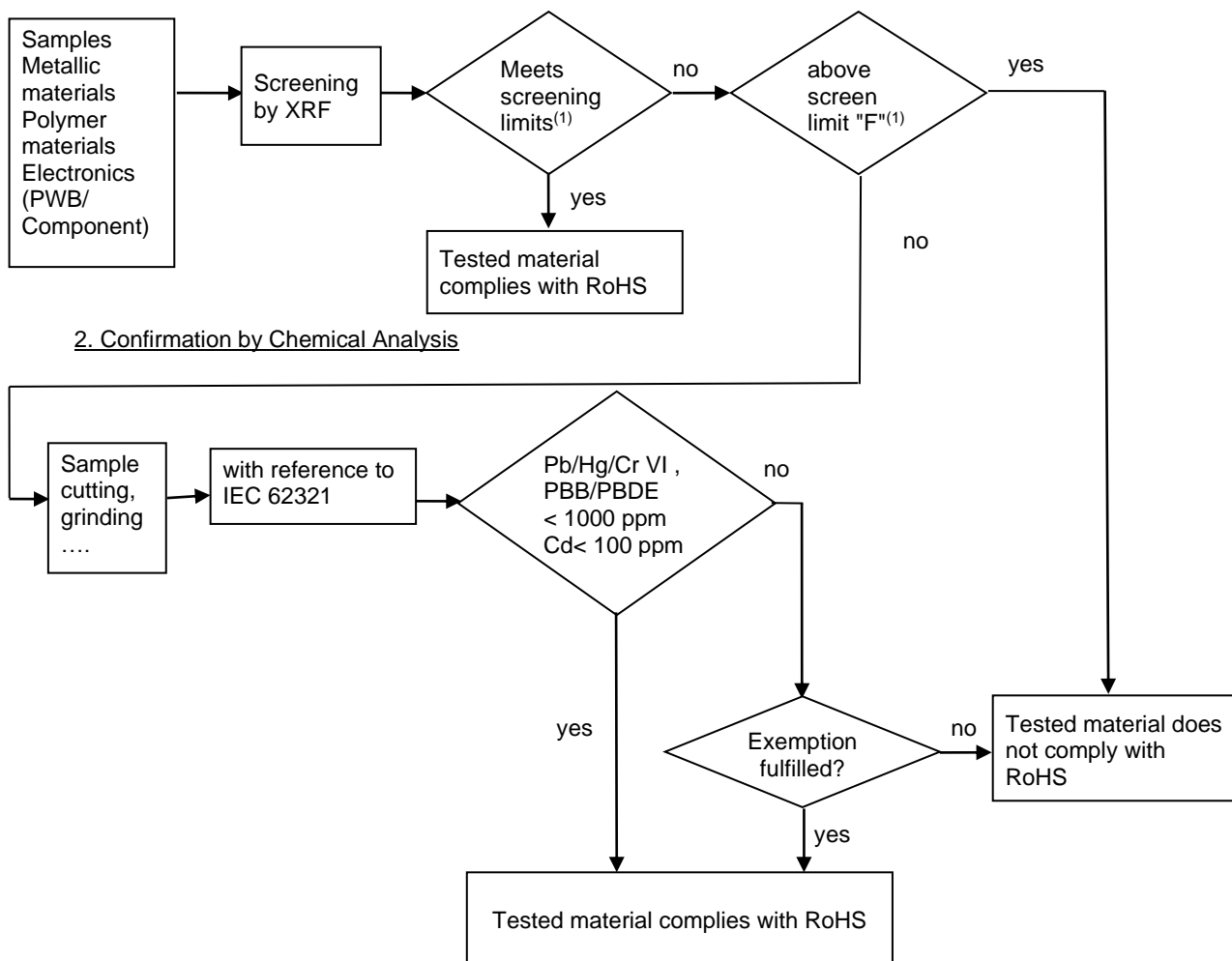


Photo2

Testing procedure:

1. Screening by X-RAY Fluorescence Spectrometry (XRF)

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 Test Method : Cadmium, Lead, Mercury, Chromium, Bromine
 With reference to IEC 62321-3-1:2013
1. Screening by X-Ray Fluorescence Spectrometry (XRF)

Sample No.		1	2	3	4
Cadmium (Cd)	[mg/kg]	BL	BL	BL	BL
Lead (Pb)	[mg/kg]	BL	BL	BL	BL
Mercury (Hg)	[mg/kg]	BL	BL	BL	BL
Chromium (Cr)	[mg/kg]	BL	BL	BL	BL
Bromine (Br)	[mg/kg]	BL	n.a.	BL	d(*1)

Sample No.		5
Cadmium (Cd)	[mg/kg]	BL
Lead (Pb)	[mg/kg]	BL
Mercury (Hg)	[mg/kg]	BL
Chromium (Cr)	[mg/kg]	BL
Bromine (Br)	[mg/kg]	n.a.

Notes:

- BL = Below limit
- OL = Over limit
- d. = detected
- n.a. = Not applicable
- mg/kg = milligram per kilogram
- ¹⁾ The screening result was detected in the inconclusive region or over limits, thus the further wet chemistry tests are suggested.

Remark:

XRF Screening limits for different matrices :

Materials	Concentration (mg/kg)				
	Cd	Cr	Pb	Hg	Br
Polymeric	BL≤60<X<140≤OL	BL≤640<X	BL≤670<X<1330≤OL	BL≤660<X<1340≤OL	BL≤290<X
Metallic	BL≤60<X<140≤OL	BL≤640<X	BL≤670<X<1330≤OL	BL≤660<X<1340≤OL	n.a.
Composite materials	BL≤40<X<160≤OL	BL≤440<X	BL≤470<X<1530≤OL	BL≤460<X<1540≤OL	BL≤240<X

* The symbol "X" marks the region where further investigation is necessary.

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Test Method : Total Cadmium, Lead, Chromium - Ref. to IEC 62321-5:2013
 Mercury - Ref. to IEC 62321-4:2013
 Chromium (VI)
 - For Metal material - Ref. to IEC 62321-7-1:2015
 - For Polymer, Electronic material or others materials - Ref. to IEC 62321-7-2:2017
 PBBs, PBDEs - Ref. to IEC 62321-6:2015

2. Confirmation by Chemical Analysis

Sample No.		RL	4
PBBs	[mg/kg]	5	< RL
PBDEs	[mg/kg]	5	< RL

Notes:

- < = less than
- RL = Reporting Limit
- mg/kg = milligram per kilogram
- * Once the total Cr content in metal/ plastic or electronic sample is found to be exceeded the limit, the Cr (VI) content will be confirmed with reference to IEC 62321-7-1:2015/ IEC 62321-7-2:2017

Chromium (VI) concentration	Qualitative result
<0.1µg/cm ²	The sample is negative (-ve) for Cr(VI). The Cr(VI) concentration is below the limit of quantification. The coating is considered a non-Cr(VI) based coating.
≥0.1µg/cm ² and ≤0.13 µg/cm ²	The result is considered to be inconclusive. Unavoidable coating variations may influence the determination. Recommendation: if additional samples are available, perform a total of 3 trials to increase sampling surface area. Use the averaged result of the 3 trials for the final determination.
>0.13 µg/cm ²	The sample is positive (+ve) for Cr(VI). Concentration is above the limit of quantification and the statistical margin of error. The sample coating is considered to contain Cr(VI).

	Cd	Cr(VI)	Pb	Hg	PBBs	PBDEs
Maximum permissible Limit acc. to 2011/65/EU (mg/kg)	100	1000	1000	1000	1000	1000

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Test Method : BBP/DBP/DEHP/DIBP - Ref. to IEC 62321-8:2017

Sample No.		RL	4
Benzyl butyl phthalate (BBP)	mg/kg	50	< RL
Dibutyl phthalate (DBP)	mg/kg	50	< RL
Diethylhexyl phthalate (DEHP)	mg/kg	50	< RL
Diisobutyl phthalate (DIBP)	mg/kg	50	< RL

Notes:

- < = less than
- RL = Reporting Limit
- mg/kg = milligram per kilogram

	BBP	DBP	DEHP	DIBP
Maximum permissible Limit acc. to (EU) 2015/863 (mg/kg)	1000	1000	1000	1000

--- End of Test-Report ---