



Test Report

Report No: CX/2018/40057

Date: 2018/05/08

RAYTAC CORPORATION
5F, NO. 3, JIANKANG ROAD, ZHONGHE DISTRICT, NEW TAIPEI CITY 23586, TAIWAN

The following sample(s) was/were submitted and identified by/on behalf of the applicant as :

Sample Submitted By : RAYTAC CORPORATION
 Sample Description : Bluetooth Module
 Style/Item No. : MDBT40-P Series
 Sample Receiving Date : 2018/04/18
 Testing Period : 2018/04/18 to 2018/05/07

Test Result(s) : Please refer to next page(s).

Conclusion : Based on the performed tests on submitted samples, the test results comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.



 Wendy Wei / Supervisor
 Signed for and on behalf of
 SGS TAIWAN LTD.
 Chemical Laboratory - Taipei



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1. Material Fraction Composition

Table 1 The results of XRF screening and chemical test


| No. | Type of Components | Description | Figure | MDL Category | X-ray Screening | | UV | ICP-AES | GC-MS | Other Chemical Test | Note |
|------|--------------------|-------------|-----------------------------------------------------------------------------------|--------------------|-----------------|------|---------|----------|----------|---------------------|------------------|
| | | | | | Element | Data | Cr (VI) | Pb/Cd/Hg | PBB/PBDE | | |
| 1 | PCBA | 1.1 |  | Composite Material | Pb | --- | | 13.7 | | Refer to Table 4 | Refer to Table 2 |
| | | | | | Cd | --- | | n.d. | | | |
| | | | | | Hg | --- | | n.d. | | | |
| | | | | | Cr | --- | n.d. | | | | |
| | | | | | Br | --- | | | | | |
| | | | | | Cr(VI) | | | | | | |
| | | | | | PBB | | | n.d. | | | |
| PBDE | | n.d. | | | | | | | | | |

Table 2 The test results on the PCBA (CX/2018/40057-1.1) by point analysis (Unit: mg/kg)

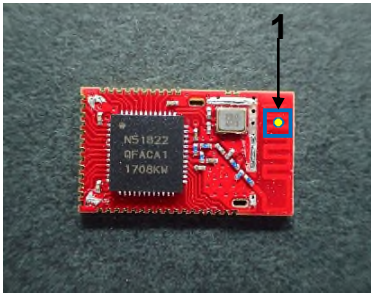
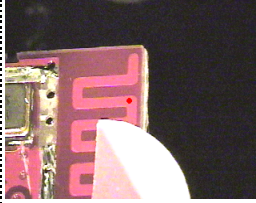

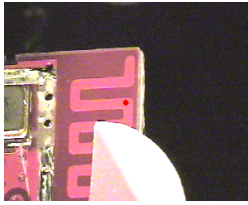
| Point Analysis | No. | Figure | Material | X-ray Screening | | |
|-----------------------------------------------------------------------------------|-----|-------------------------------------------------------------------------------------|--------------------|-----------------|-------|--------------------------|
| | | | Type | Element | Data | Note |
|  | 1 |  | Composite Material | Pb | n.d. | Refer to No.1 in Table 3 |
| | | | | Cd | n.d. | |
| | | | | Hg | n.d. | |
| | | | | Cr | n.d. | |
| | | | | Br | 17100 | |

Table 3 The confirming test results for point analysis on PCBA (Unit: mg/kg)

| Type of Components | Description | | Figure | MDL Category | Substance | UV | ICP-AES | GC-MS | Note |
|---------------------------------------------------------------------------------------------|-------------|---------|-----------------------------------------------------------------------------------|--------------------|-----------|---------|----------|----------|------|
| | | | | | | Cr (VI) | Pb/Cd/Hg | PBB/PBDE | |
| No.1.1  | 1 | RAW PCB |  | Composite Material | Pb | | --- | | |
| | | | | | Cd | | --- | | |
| | | | | | Hg | | --- | | |
| | | | | | Cr | | | | |
| | | | | | Br | --- | | | |
| | | | | | Cr(VI) | | | | |
| | | | | | PBB | | n.d. | | |
| | | | | | PBDE | | n.d. | | |



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Table 4 The test results of Phthalates (Unit: mg/kg)

| Test Item (s): | Method | MDL | Result |
|---------------------------------------------------------|------------------------------------------------------------------------|-----|--------|
| | | | 1.1 |
| BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7) | With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS. | 50 | n.d. |
| DBP (Dibutyl phthalate) (CAS No.: 84-74-2) | | 50 | n.d. |
| DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7) | | 50 | n.d. |
| DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5) | | 50 | n.d. |



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| Test Item | MDL (mg/kg) | | | XRF screening threshold | Test method |
|-----------------------------|---------------------|----------|--------------------|-------------------------|----------------------------------------|
| | Category Element | Polymers | Composite Material | | |
| XRF (X-ray fluorescence) | Pb | 50 | 100 | 100 | With reference to IEC 62321-3-1 (2013) |
| | Cd | 50 | 50 | 50 | |
| | Hg | 50 | 100 | 100 | |
| | Cr | 50 | 100 | 100 | |
| | Br | 50 | 100 | n.a. | |

| Test Item (s) | Test method | MDL | Unit |
|---------------|------------------------------------------------------------------------------------------------|-----|--------------------|
| Cr(VI) | With reference to IEC 62321-7-2 (2017) and performed by UV-VIS. (For Polymers and Electronics) | 8 | mg/kg |
| | With reference to IEC 62321-7-1 (2015) and performed by UV-VIS. (For Coatings on Metals) (#2) | 0.1 | µg/cm ² |
| Pb/Cd | With reference to IEC 62321-5 (2013) and performed by ICP-AES. | 2 | mg/kg |
| Hg | With reference to IEC 62321-4 (2013) and performed by ICP-AES. | 2 | mg/kg |

| Test Item (s) | Unit | Method | MDL (mg/kg) | |
|--------------------------|-------|--------------------------------------------------------------|-------------|--|
| PBBs | | | | |
| Monobromobiphenyl | mg/kg | With reference to IEC 62321-6 (2015) and performed by GC/MS. | 5 | |
| Dibromobiphenyl | mg/kg | | 5 | |
| Tribromobiphenyl | mg/kg | | 5 | |
| Tetrabromobiphenyl | mg/kg | | 5 | |
| Pentabromobiphenyl | mg/kg | | 5 | |
| Hexabromobiphenyl | mg/kg | | 5 | |
| Heptabromobiphenyl | mg/kg | | 5 | |
| Octabromobiphenyl | mg/kg | | 5 | |
| Nonabromobiphenyl | mg/kg | | 5 | |
| Decabromobiphenyl | mg/kg | | 5 | |
| PBDEs | | | | |
| Monobromodiphenyl ether | mg/kg | | 5 | |
| Dibromodiphenyl ether | mg/kg | | 5 | |
| Tribromodiphenyl ether | mg/kg | | 5 | |
| Tetrabromodiphenyl ether | mg/kg | 5 | | |
| Pentabromodiphenyl ether | mg/kg | 5 | | |
| Hexabromodiphenyl ether | mg/kg | 5 | | |
| Heptabromodiphenyl ether | mg/kg | 5 | | |
| Octabromodiphenyl ether | mg/kg | 5 | | |
| Nonabromodiphenyl ether | mg/kg | 5 | | |
| Decabromodiphenyl ether | mg/kg | 5 | | |

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1. mg/kg = ppm
2. MDL = Method detection limit
3. n.d. = not detected or lower than MDL
4. "---" = not conducted
5. n.a. = not applicable
6. " - " = Not Regulated
7. The XRF result of Br for metal sample is conducted from semi-quantitative method of polymer. If the Br result is shown as n.d., the reading will be less than 100ppm.
8. (#2):
 - 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 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 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.

9. Magnetic samples can not be located on test position and there are breakdown risks on XRF equipment. Therefore, this kind of sample will be conducted chemical test directly.
10. If the test result by EDXRF analysis is greater than XRF screening threshold, the test sample should be further conducted by chemical test.

| Mark | Description of Mark |
|------|----------------------------------------------------------------------------------------|
| *1 | The sample weight is not enough to conduct chemical tests. |
| *2 | The item is exempted from EU RoHS directive. |
| --*2 | The item might be exempted from EU RoHS directive. |
| *3 | The result was retested after regetting the same sample from client. |
| *4 | The sample is provided separately from the client. |
| *5 | Adopting modified IEC 62321-7-1(2015), due to the test area less than 25 cm^2 |
| *6 | The test item was tested by dry base. |
| *7 | This sample follows requirement of client to conduct directly chemical tests. |