



**Test Report**

Number : TWNC00231577

Applicant 申請商: GlobalTop Technology Inc.  
宇誠科技股份有限公司  
No.16 Nan-ke 9<sup>th</sup> Rd.  
Science-based Ind.Park Tainan741  
Taiwan R.O.C.  
台南科學工業園區南科九路 16 號

Date : Nov 14, 2011

**Sample Description 樣品敘述:**

One (1) group of submitted samples said to be :  
以下測試樣品乃供應商所提供及確認:

Sample Description : GPS Module  
樣品名稱  
Style / Item No. : Gmm-u2p  
產品型號  
Date Sample Received : Nov 07, 2011  
收件日期  
Date Test Started : Nov 07, 2011  
開始測試日期

**Test Conducted 測試執行 :**

As requested by the applicant, for details please refer to attached pages.  
依申請商之要求 , 細節請參考附頁 .

Authorized By:  
On Behalf Of Intertek Testing Services  
Taiwan Limited



K. Y. Liang  
Director

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except in full, without the written  
approval of the laboratory.

## Test Conducted

## ( I ) Test Result Summary 測試結果 :

Test Item 測試項目	Result 結果 (ppm)	
	(1)	(2) (#2)
<b>Heavy Metal / 重金屬</b>		
Cadmium (Cd) content / 鎘含量	ND	ND
Lead (Pb) content / 鉛含量	ND	ND
Mercury (Hg) content / 汞含量	ND	ND
Chromium VI (Cr <sup>6+</sup> ) content / 六價鉻含量 (for non-metal material 非金屬材質)	--	ND
Chromium VI (Cr <sup>6+</sup> ) content / 六價鉻含量 (by spot test on metal 金屬材質之點測試)	Negative	--
Chromium VI (Cr <sup>6+</sup> ) content / 六價鉻含量 (by boiling water extraction on metal 金屬材質之沸水法) (mg/kg with 50cm <sup>2</sup> )	Negative (#1)	--

Remarks: ppm = parts per million based on weight of tested sample = mg/kg  
 備註 = 百萬分之一，依據測試樣品重量計算

ND = Not Detected = 未檢測出

< = Less Than = 小於

mg/kg with 50cm<sup>2</sup> = milligram per kilogram with 50 square centimeter  
 = 公斤分之毫克，依據樣品面積的50平方公分計算

Negative = A negative test result indicated positive observation was not found at the time of testing. When the spot test showed a negative result, the boiling water extraction procedure shall be used to verify the result.  
 此陰性結果顯示樣品在分析過程中無發現任何陽性現象的存在，此外，當點測試的結果為陰性時，樣品應執行沸水萃取的測試程序以確認分析結果。

#1 = Due to the insufficient sample area, reduced total sample surface of 10 cm<sup>2</sup> was used and the dilution factor was adjusted accordingly.

樣品面積不足，測試改取樣品總面積 10cm<sup>2</sup> 並進行適當調整。

#2 = Samples were ground and randomly selected for test  
 樣品經粉碎及隨機均勻取樣後進行測試。



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Test Conducted

( I ) Test Result Summary 測試結果 :

Test Item 測試項目	Result 結果 (ppm)	
	(1)	(2) (#2)
<b>Polybrominated Biphenyls (PBBs) / 多溴聯苯</b>		
Monobrominated Biphenyls (MonoBB) / 單溴聯苯	--	ND
Dibrominated Biphenyls (DiBB) / 二溴聯苯	--	ND
Tribrominated Biphenyls (TriBB) / 三溴聯苯	--	ND
Tetrabrominated Biphenyls (TetraBB) / 四溴聯苯	--	ND
Pentabrominated Biphenyls (PentaBB) / 五溴聯苯	--	ND
Hexabrominated Biphenyls (HexaBB) / 六溴聯苯	--	ND
Heptabrominated Biphenyls (HeptaBB) / 七溴聯苯	--	ND
Octabrominated Biphenyls (OctaBB) / 八溴聯苯	--	ND
Nonabrominated Biphenyls (NonaBB) / 九溴聯苯	--	ND
Decabrominated Biphenyl (DecaBB) / 十溴聯苯	--	ND
<b>Polybrominated Diphenyl Ethers (PBDEs) / 多溴聯苯醚</b>		
Monobrominated Diphenyl Ethers (MonoBDE) / 單溴聯苯醚	--	ND
Dibrominated Diphenyl Ethers (DiBDE) / 二溴聯苯醚	--	ND
Tribrominated Diphenyl Ethers (TriBDE) / 三溴聯苯醚	--	ND
Tetrabrominated Diphenyl Ethers (TetraBDE) / 四溴聯苯醚	--	ND
Pentabrominated Diphenyl Ethers (PentaBDE) / 五溴聯苯醚	--	ND
Hexabrominated Diphenyl Ethers (HexaBDE) / 六溴聯苯醚	--	ND
Heptabrominated Diphenyl Ethers (HeptaBDE) / 七溴聯苯醚	--	ND
Octabrominated Diphenyl Ethers (OctaBDE) / 八溴聯苯醚	--	ND
Nonabrominated Diphenyl Ethers (NonaBDE) / 九溴聯苯醚	--	ND
Decabrominated Diphenyl Ether (DecaBDE) / 十溴聯苯醚	--	ND

Remarks: ppm = parts per million based on weight of tested sample = mg/kg  
 備註 = 百萬分之一，依據測試樣品重量計算  
 ND = Not Detected = 未檢測出  
 #2 = Samples were ground and randomly selected for test  
 樣品經粉碎及隨機均勻取樣後進行測試。

Tested Components 測試元件

- (1) Silvery Metal
- (2) PCBA

Responsibility Of Chemist 分析人員 : Irene Chiou / Kevin Liu / Cathy Chen

Date Sample Received 樣品收件日期 : Nov 07, 2011

Test Period 樣品測試期間 : Nov 07, 2011 To Nov 11, 2011

## Test Conducted

## (II) RoHS Requirement 限值:

Restricted Substances 限用物質	Limits 限值
Cadmium (Cd) content / 鎘含量	0.01% (100ppm)
Lead (Pb) content / 鉛含量	0.1% (1000ppm)
Mercury (Hg) content / 汞含量	0.1% (1000ppm)
Chromium VI (Cr <sup>6+</sup> ) content / 六價鉻含量	0.1% (1000ppm)
Polybrominated Biphenyls (PBBs) / 多溴聯苯	0.1% (1000ppm)
Polybrominated Diphenyl Ehters (PBDEs) / 多溴聯苯醚	0.1% (1000ppm)

The above limits were quoted from 2002/95/EC and amendment 2005/618/EC for homogeneous material.

本限值是依據歐盟指令 2002/95/EC 與其更新指令 2005/618/EC 針對均質材質所訂定。

## (III) Test Method 測試方法:

Test Item 測試項目	Test Method 測試方法	Reporting Limit 報告極限
Cadmium (Cd) content 鎘含量	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES. 參考IEC 62321, 2008年第一版第8/9/10章, 以微波消化法測試樣品直到樣品完全溶解並用感應耦合電漿原子放射光譜儀分析。	2 ppm
Lead (Pb) content 鉛含量	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES. 參考IEC 62321, 2008年第一版第8/9/10章, 以微波消化法測試樣品直到樣品完全溶解並用感應耦合電漿原子放射光譜儀分析。	2 ppm
Mercury (Hg) content 汞含量	With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES. 參考IEC 62321, 2008年第一版第7章, 以微波消化法測試樣品直到樣品完全溶解並用感應耦合電漿原子放射光譜儀分析。	2 ppm

## Test Conducted

## (III) Test Method 測試方法:

<u>Test Item</u> 測試項目	<u>Test Method</u> 測試方法	<u>Reporting Limit</u> 報告極限
Chromium VI (Cr <sup>6+</sup> ) content (for non-metal material) 六價鉻含量 (非金屬材質)	With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-Vis spectrophotometer. 參考IEC 62321, 2008年第一版附錄C, 以鹼液消化並用紫外光-可見光分光光度計分析。	1 ppm
Chromium VI (Cr <sup>6+</sup> ) content (by spot test on metal) 六價鉻含量 (金屬材質之點測試)	With reference to IEC 62321 edition 1.0:2008 in annex B, by spot test. 參考IEC 62321, 2008年第一版附錄B, 以點測試法分析。	Negative (< 1 mg/kg)
Chromium VI (Cr <sup>6+</sup> ) content (by boiling water extraction on metal) 六價鉻含量 (金屬材質之沸水法) (mg/kg with 50cm <sup>2</sup> )	With reference to IEC 62321 edition 1.0:2008 in annex B, by boiling water extraction and determined by UV-Vis spectrophotometer. 參考IEC 62321, 2008年第一版附錄B, 以沸水萃取並用紫外光-可見光分光光度計分析。	0.02 mg/kg with 50cm <sup>2</sup>
Polybrominated Biphenyls (PBBs) 多溴聯苯	With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary 參考IEC 62321, 2008年第一版附錄A, 以溶劑萃取並用氣相層析質譜儀分析, 必要時會以高效能液相層析-二極體陣列偵檢器進行確認。	5 ppm
Polybrominated Diphenyl Ethers (PBDEs) 多溴聯苯醚	With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary 參考IEC 62321, 2008年第一版附錄A, 以溶劑萃取並用氣相層析質譜儀分析, 必要時會以高效能液相層析-二極體陣列偵檢器進行確認。	5 ppm

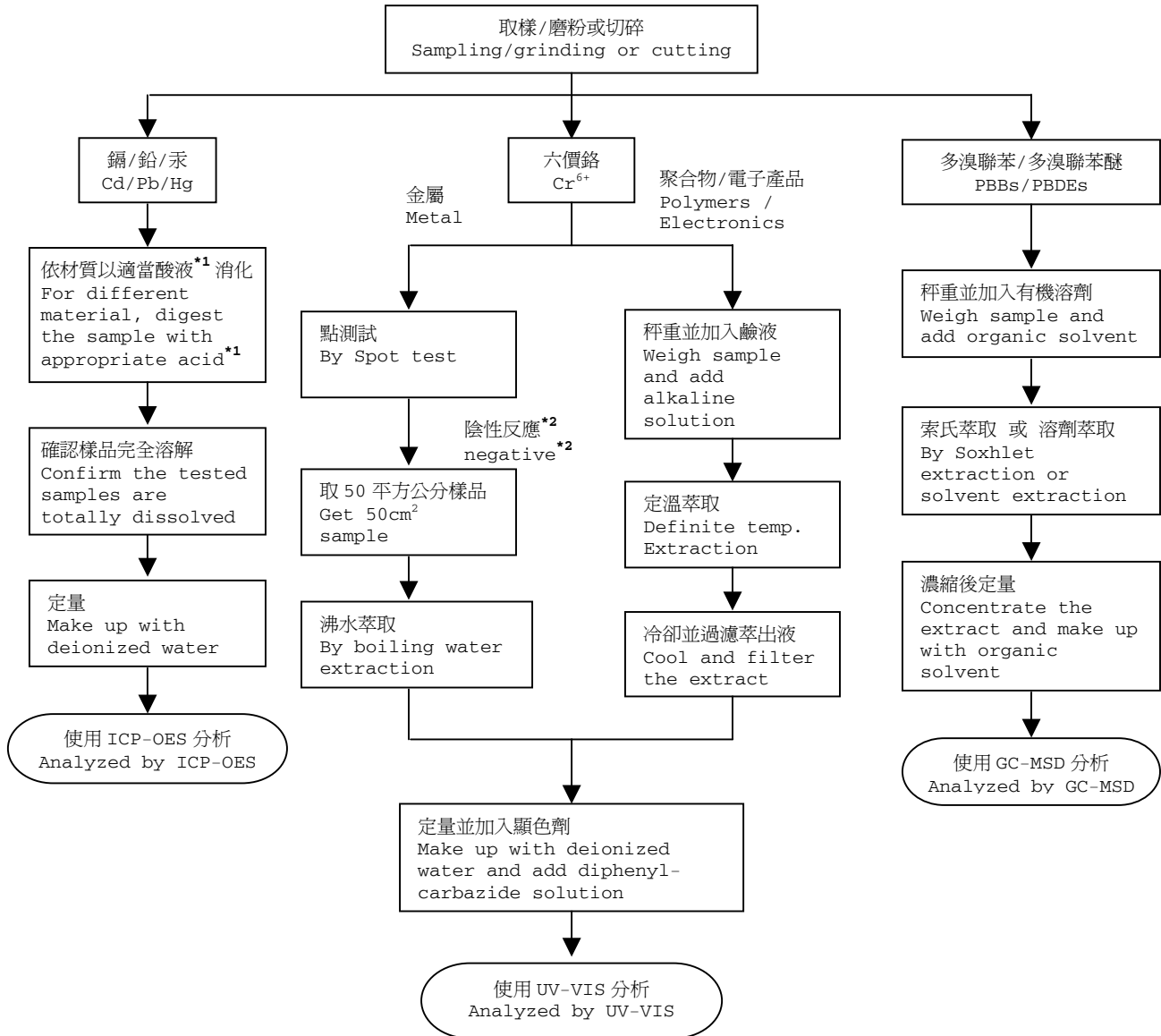
Remark: Reporting Limit = Quantitation limit of analyte in sample  
備註 報告極限 = 測試樣品之定量偵測極限

Test Conducted

(IV) Measurement Flowchart 測試流程圖:

Test For Cd/Pb/Hg/Chromium (VI)/PBBs/PBDEs Contents RoHS六項測試流程圖

Reference Standard 參考方法: IEC 62321 edition 1.0:2008



Remarks 備註:

\*1: List Of Appropriate Acid 各材質添加酸液如下表:

Material 樣品材質	Acid Added For Digestion 添加酸液種類
Polymers / 聚合物	HNO <sub>3</sub> , HCl, HF, H <sub>2</sub> O <sub>2</sub> , H <sub>3</sub> BO <sub>3</sub> 硝酸、鹽酸、氫氟酸、雙氧水、硼酸
Metals / 金屬	HNO <sub>3</sub> , HCl, HF 硝酸、鹽酸、氫氟酸
Electronics / 電子產品	HNO <sub>3</sub> , HCl, H <sub>2</sub> O <sub>2</sub> , HBF <sub>4</sub> 硝酸、鹽酸、雙氧水、氟硼酸

\*2: If the result of spot test is positive, Chromium VI would be determined as detected.  
若點測試的結果為陽性反應，則直接判定為測試樣品含有六價鉻。

End of Report

Test Conducted

Photo

