

本產品需符合  RoHS  SONY00259  其它  
 ※禁止使用本公司所禁用之有毒物質

A0	NEW DWG	寧小兵	07/07/27
REV	ECN.NO:	BY	DATE

-TOLERANCES-  
 UNLESS OTHERWISE SPECIFIED  
 公差參考

X.X	±0.20	X.X°	±3°
X.XX	±0.10	X.XX°	±1°
X.XXX	±0.05	X.XXX°	±0.5°

**LITE** 利德五金塑膠(深圳)有限公司  
 LITE METAL & PLASTIC (SHEN ZHEN) CO.,LTD.



TITLE:  
 產品名稱: 小S天線

DWG NO:  
 產品編號: CAR-ATR-180-001

DATE	SCALE	UNIT	PAGE
2007.07.27	FREE	mm	1

APPD:  
 核准:  
 CHECK:  
 審核:  
 DRAW:  
 繪圖: 寧小兵

# TECHNICAL DATA

## Material/Finish:

	Material	Finish
Connector body	Brass	Over Ni
Center PIN	Brass	Gold Plated 2U ”
Insulator	PTFE	None
Plastic	PC+PBT (black)	None
Plastic	TPEE (black)	None

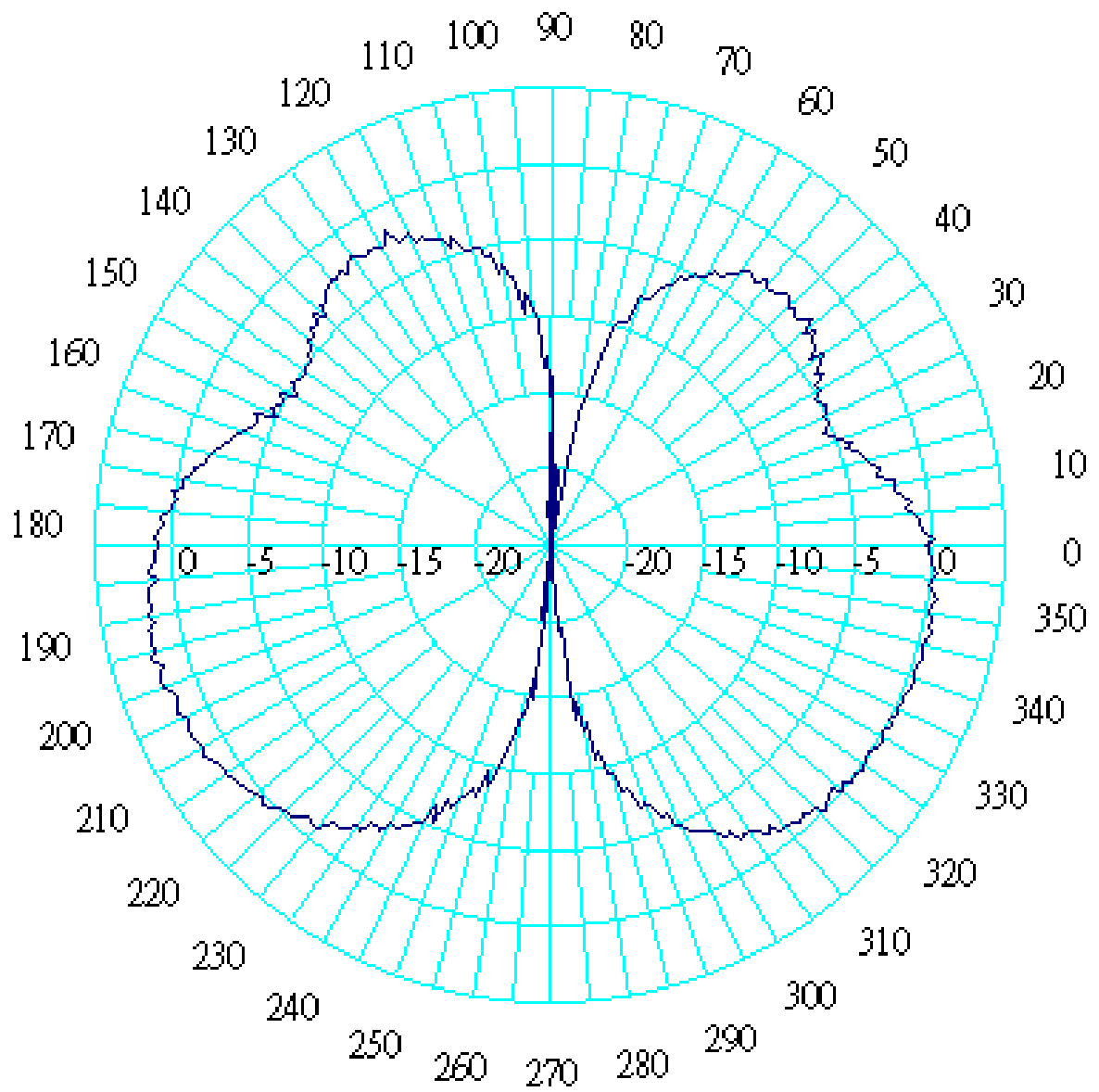
## Electrical:

Frequency Range	2.4-2.5GHz
Nominal Impedance	50
VSWR	2.0 MAX
Gain	2.0d Bi MIN
Radiation	Omni
Polarization	Vertical

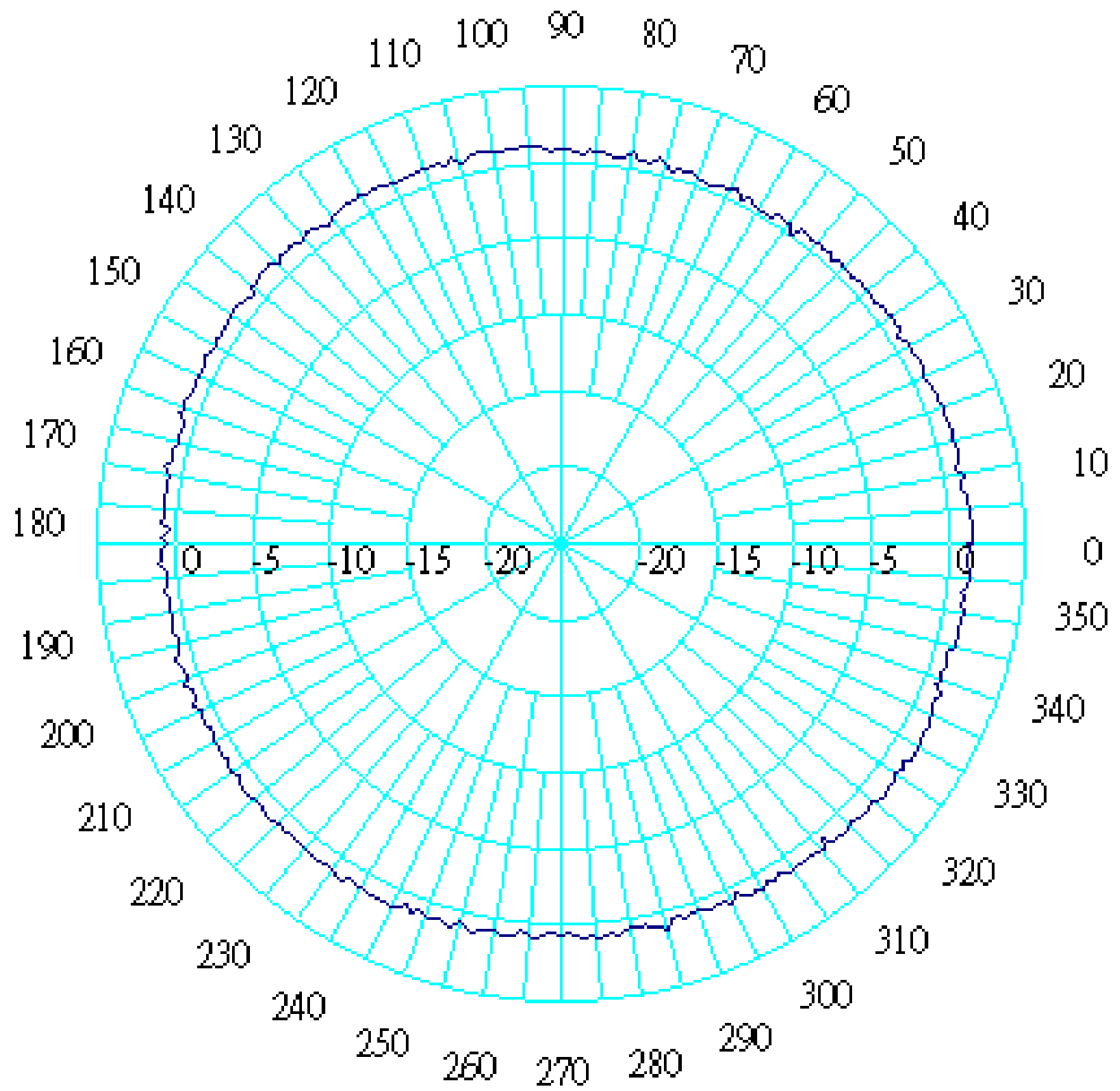
## Mechanical & Environmental

Durability	500 Cycles MIN
Temperature Range	-55 to +165
Relative Humidity	MIL-STD-202, method 106
Vibration	MIL-STD-202, method 213
Corrosion	MIL-STD-202, method 101

# E-Plane Field Pattern



# H-Plain Field Pattern



CH2 S22

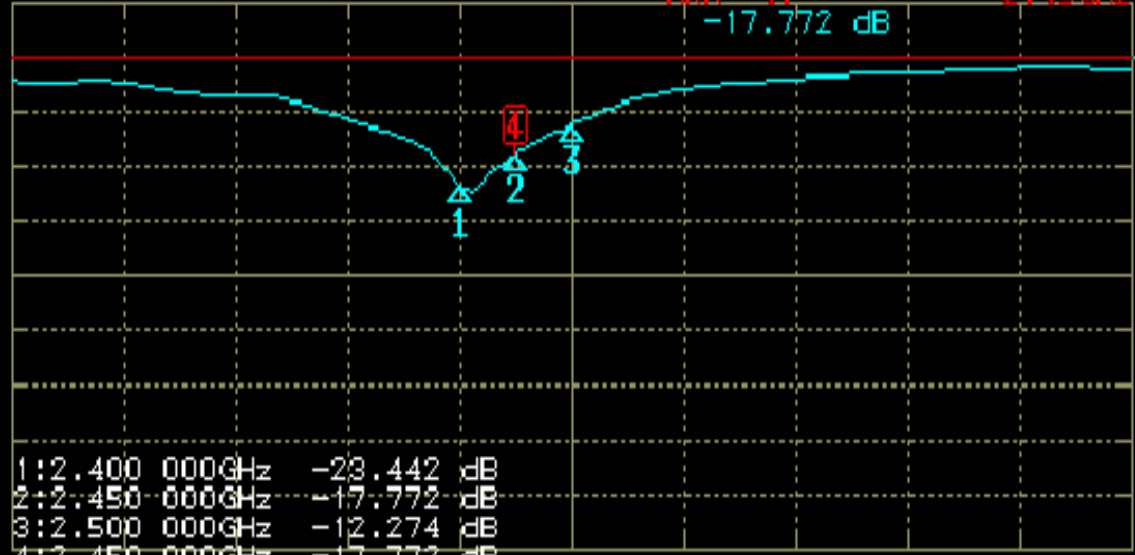
LOG MAG

REF 0.000 dB 10.000 dB/

MKR 4: 2.45GHz

-17.772 dB

Cor



RECALL REG\_10

RECALL POWER OFF

LOAD FILE

More 2/4

CENTER 2.5GHz

[ 8.00 dBm ]

SPAN 1GHz

CH2 S22

SWR

REF

1.000

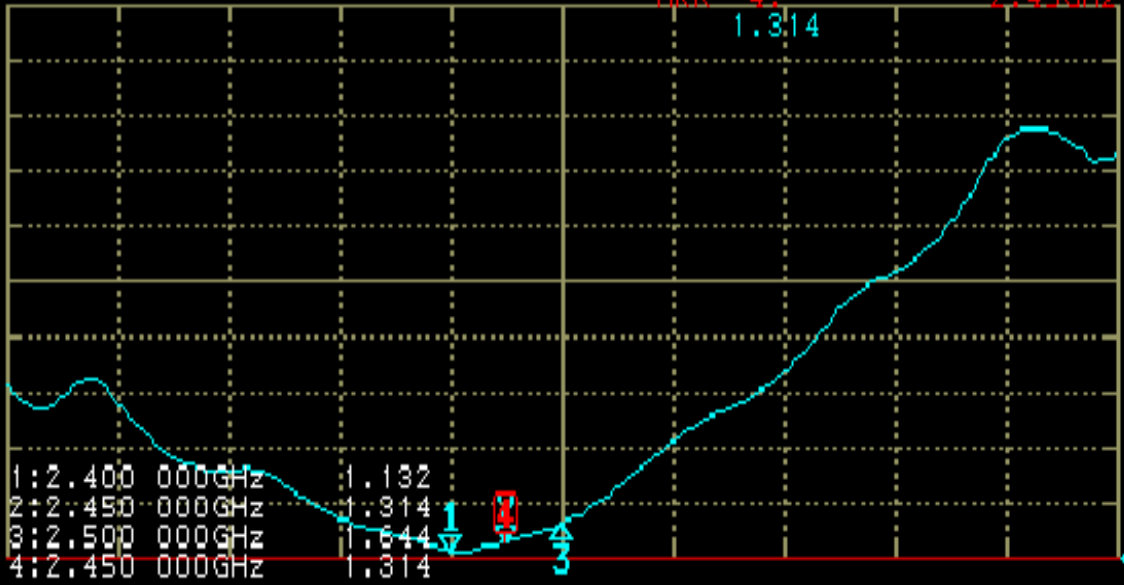
1.000 /

MKR 4:

2.45GHz

1.314

Cor



LOG MAG & PHASE

LOG MAG & DELAY

LIN MAG & PHASE

More 2/2

CENTER 2.5GHz

[ 8.00 dBm ]

SPAN 1GHz

CH2 S22

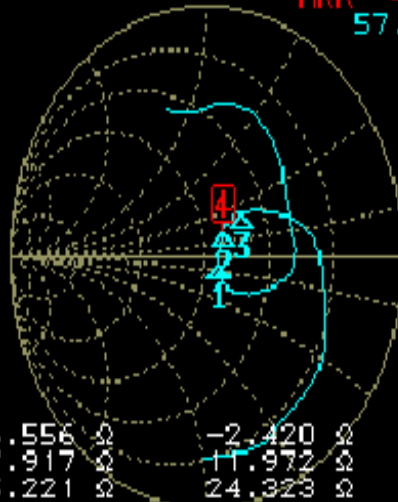
SMITH(G+jB)

FS 1.000

MKR 4:  
57.917  $\Omega$

2.45GHz  
11.972  $\Omega$

Cor



1:2.400 000GHz	56.556 $\Omega$	-2.420 $\Omega$	27.398pF
2:2.450 000GHz	57.917 $\Omega$	11.972 $\Omega$	777.725pH
3:2.500 000GHz	65.221 $\Omega$	24.323 $\Omega$	1.548nH
4:2.450 000GHz	57.917 $\Omega$	11.972 $\Omega$	777.725pH

CENTER 2.5GHz

[ 8.00 dBm ]

SPAN 1GHz

SMITH (G+jB) 5

POLAR 6

LIN MAG 7

More 1/2 8

Certificate of Analysis for LG

Product Information

Material: TPEE

Grade: BT-1055D

TYPICAL PROPERTICS	VALUE	UNIT	TEST METUOD
Tensile Strength	13	Mpa	D638
Elongation	635	%	D638
Flexural Strength	6	Mpa	D638
Flexural Modulus	195	Mpa	D790
IZOD Impact Strength 1/8	--	J/u	D256
Hardness	55	Shore	D2240
Mold Shrinkage	1.2	%	D955
Heat Deflection Temp(1.82)	80	℃	D648
Density	1.19	g/cm <sup>3</sup>	D792
Flammability Rating	HB	mm	UL94



*[Signature]*  
 Qiangyu Engineering  
 Plastics Co., Ltd





Test Report No. F6906-01/LF-CTSGP00-05581

Date: March 17, 2007

Page 1 of 3

To: LG CHEM, LTD.  
LG twin tower, 23  
Yoido-dong  
Youngdongpo-gu  
SEOUL 150-721  
Korea

The following merchandise was submitted and identified by the client as

Commodity : KEYPLEX BT-10550  
SGS File No. : GA08-05581  
Received Date : March 10, 2007  
Test Performing Date : March 13, 2007  
Test Performed : SGS Testing Korea tested the sample(s) selected by applicant with following results  
Test Results : For further details, please refer to following page(s)

SGS Testing Korea Co. Ltd.

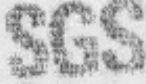
Brendan Lee  
Mona Jeong  
Jully Oh  
Jerry Jung  
/Testing Person

Jeff Jang / Technical Mgr

Jason Han / Lab Director



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Test Report No. F690501/LF-CTSGP06-05581

Date: March 17, 2007

Page 2 of 3

Sample No. : GP06-05581.001  
Sample Description : KEYFLEX BT-10550  
Distributor No. : N/A

**Heavy Metals**

Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	EN 1122(2001), US EPA 6010B(1996)	0.5	N.D.
Lead (Pb)	mg/kg	US EPA 3050B(1996), US EPA 6010B(1996)	5	N.D.
Mercury (Hg)	mg/kg	US EPA 3062(1996), US EPA 6010B(1996)	2	N.D.
Hexavalent Chromium (Cr VI)	mg/kg	US EPA 5090A(1996), US EPA 7190A(1992)	1	N.D.

**Halogenated Biphenyls**

Test Items	Unit	Test Method	MDL	Results
Monobromobiphenyl	mg/kg	US EPA 3540C, GCMS	5	N.D.
Diobromobiphenyl	mg/kg	US EPA 3540C, GCMS	5	N.D.
Triobromobiphenyl	mg/kg	US EPA 3540C, GCMS	5	N.D.
Tetraobromobiphenyl	mg/kg	US EPA 3540C, GCMS	5	N.D.
Pentabromobiphenyl	mg/kg	US EPA 3540C, GCMS	5	N.D.
Hexabromobiphenyl	mg/kg	US EPA 3540C, GCMS	5	N.D.
Pentabromobiphenyl	mg/kg	US EPA 3540C, GCMS	5	N.D.
Octabromobiphenyl	mg/kg	US EPA 3540C, GCMS	5	N.D.
Nonabromobiphenyl	mg/kg	US EPA 3540C, GCMS	5	N.D.
Decabromobiphenyl	mg/kg	US EPA 3540C, GCMS	5	N.D.
Monobromodiphenyl ether	mg/kg	US EPA 3540C, GCMS	5	N.D.
Diobromodiphenyl ether	mg/kg	US EPA 3540C, GCMS	5	N.D.
Triobromodiphenyl ether	mg/kg	US EPA 3540C, GCMS	5	N.D.
Tetraobromodiphenyl ether	mg/kg	US EPA 3540C, GCMS	5	N.D.
Hexabromodiphenyl ether	mg/kg	US EPA 3540C, GCMS	5	N.D.
Pentabromodiphenyl ether	mg/kg	US EPA 3540C, GCMS	5	N.D.
Octabromodiphenyl ether	mg/kg	US EPA 3540C, GCMS	5	N.D.
Nonabromodiphenyl ether	mg/kg	US EPA 3540C, GCMS	5	N.D.
Decabromodiphenyl ether	mg/kg	US EPA 3540C, GCMS	5	N.D.

- NOTE: (1) N.D. = Not detected (<MDL)  
 (2) ppm = mg/kg  
 (3) MDL = Method Detection Limit  
 (4) - = No regulation  
 (5) \* = Qualitative analysis (No Unit)  
 (6) Negative = Undetectable / Positive = Detectable



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SGS

Test Report No. F690501/LF-CTSGP05-05581

Date: March 17, 2007

Page 3 of 3

Picture of Sample as Received:



\*\*\* End \*\*\*

- NOTE: (1) N.D. = Not detected (<MDL)  
(2) ppm = mg/kg  
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(5) \*\* = Qualitative analysis (No Unit)  
(6) Negative = Undetectable / Positive = Detectable

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# 聚甲醛 (POM) 性能

## 综合性能

密度: 1.43  
结晶度: 75%—85%  
机械强度 : 较高  
成型加工温度范围: 约10℃  
熔点: 175℃

## 机械性能

伸强度: 70MPa  
拉伸弹性模数: 2.9GPa  
伸长率: 15%  
压缩强度: 127MPa  
挠曲强度: 98MPa  
冲击强度: 108KJ/m<sup>2</sup>

## 热性能

比密: 704cm<sup>2</sup>/kg  
吸水率(24h): 0.25%  
成型收缩率: 2.0%—2.5%  
马丁耐热性: 60℃—64℃  
连续耐热性: 85℃

## 电性能

介电系数(60Hz, 10Hz) 3.7  
介电损耗(60Hz, 10Hz) 0.004  
电阻率: 6X10<sup>10</sup>Ωcm

POM-1



测试报告

编号: GZ0701146228/CHEM

日期: 2007年1月12日 页码 1 of 4

鑫达塑胶原料(东莞)有限公司  
东莞市樟木头塑胶市场

本报告是基于所提供的名称“POM”的样品所做的测试

客户参考信息:型号:MG0-44

SGS参考编号: SZ10085011  
收板日期: 2007年1月6日  
测试日期: 2007年1月6日至2007年1月12日

测试要求: (1) 委托测试样品中的铅, 镉, 汞和六价铬含量。  
(2) 委托测试样品中的多溴联苯, 多溴联苯醚的含量。

测试方法: (1) 铅含量-参照 EPA 3050B: 1996 & 其它酸消解。  
镉含量-参照 BS EN1122: 2001 方法 B & 其它酸消解。  
汞含量-参照 EPA 3052: 1996 & EPA 7473: 1998 & 其它酸消解。  
六价铬含量-参照 EPA 3060A: 1996 & EPA 7196A: 1992。  
分析仪器为火焰原子吸收光谱仪(AAS) & 电感耦合等离子体发射光谱仪(ICP-AES) & 测汞仪 & 紫外分光光度计(UV-VIS)。  
(2) 参照 EPA 3540C & EPA 3550C。分析仪器为 GC-MS。

测试结果: 请参见下一页  
结论: 根据要求进行测试: 报告中显示的测试结果未超过 2002/95/EC (RoHS) 的补充文件 2005/618/EC 规定的限值。

Signed for and on behalf of  
SGS-CSTC LTD.

Wang Honglei, Leo  
Sr. Engineer

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SGS-CSTC Standards Technical Services Co., Ltd.  
Guangzhou Branch Technical Laboratory

19th Floor, Road, SOFITECH Park, Guangzhou Economic & Technology Development District, Guangzhou, China 510663  
中国·广州·经济技术开发区科学城科城路198号 邮编: 510663  
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## 测试报告

编号: GZ0701146228/CHEM

日期: 2007年1月12日 页码 2 of 4

测试结果:

(1)

项目	单位	MDL	塑胶粒	限值
铅含量 (Pb)	毫克/千克	2	6	< 1000 毫克/千克
镉含量 (Cd)	毫克/千克	2	N.D.	< 100 毫克/千克
汞含量 (Hg)	毫克/千克	2	N.D.	< 1000 毫克/千克
六价铬含量 [Cr(VI)]	毫克/千克	2	N.D.	< 1000 毫克/千克

说明: - N.D. = 未检出 (< MDL)

- MDL = 方法检测限

- 毫克/千克 = ppm

(2)

项目	单位	MDL	塑胶粒	限值
阻燃剂				
多溴联苯 (PBBs)				< 1000 毫克/千克
单溴联苯	毫克/千克	5	N.D.	
二溴联苯	毫克/千克	5	N.D.	
三溴联苯	毫克/千克	5	N.D.	
四溴联苯	毫克/千克	5	N.D.	
五溴联苯	毫克/千克	5	N.D.	
六溴联苯	毫克/千克	5	N.D.	
七溴联苯	毫克/千克	5	N.D.	
八溴联苯	毫克/千克	5	N.D.	
九溴联苯	毫克/千克	5	N.D.	
十溴联苯	毫克/千克	5	N.D.	
多溴联苯醚 (PBDEs) (单溴联苯醚—九溴联苯醚)				< 1000 毫克/千克
单溴联苯醚	毫克/千克	5	N.D.	
二溴联苯醚	毫克/千克	5	N.D.	
三溴联苯醚	毫克/千克	5	N.D.	
四溴联苯醚	毫克/千克	5	N.D.	
五溴联苯醚	毫克/千克	5	N.D.	
六溴联苯醚	毫克/千克	5	N.D.	
七溴联苯醚	毫克/千克	5	N.D.	
八溴联苯醚	毫克/千克	5	N.D.	
九溴联苯醚	毫克/千克	5	27	
十溴联苯醚 <sup>a</sup>	毫克/千克	5	22	

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✉ [sgs.china@sgs.com](mailto:sgs.china@sgs.com)

测试报告

编号: GZ0701146228/CHEM

日期: 2007年1月12日 页码 3 of 4

- 说明:
- N.D. = 未检出 (< MDL)
  - MDL = 方法检测限
  - 毫克/千克 = ppm
  - 2002/95/EC 的补充文件 2005/717/EC 豁免了十溴联苯醚的使用限制。

备注: 根据客户申请, SGS 出具了此中文报告; 英文版本可根据客户要求提供。 (The Chinese test report is issued according to the applicant's request. The English version is available from SGS if further needed).

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测试报告

编号: GZ0701146228/CHEM

日期: 2007年1月12日 页码 3 of 4

- 说明:
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Member of the SGS Group (SGS SA)



## PC/PBT性能指标

测试项目 Test Properties	测试方法 Test method (ASTM)	单位 Unit	PC/PBT
密度 Density	D792	g/cm <sup>3</sup>	1.55
熔体流动指数 Melt Flow Index	D1238	g/10min	
硬度 Rockwell Hardness	D785	R-Scale	120
伸张强度 Tensile Strength	D638	MPa	100
伸张率 Tensile Elongation	D638	%	4
弯曲强度 Flexural Strength	D790	MPa	150
弯曲模数 Flexural Module	D790	MPa	3000
悬臂梁冲击强度 Izod Impact Strength 23°C	D256	kg. cm/cm	14.0
模收缩率 Mould Shrinkage	D955	%	0.2-0.6
热变形温度 HDT (18.6kg/cm <sup>2</sup> )	D648	°C	180
玻纤含量 Glass Fiber content	灼烧法	%	30.0
吸水率 Water Absorption	D-570	% 23°C, 24hr	0.1
燃烧性 Flammability	UL-94	class	V-0
特性 Speciality	环保阻燃增强级 Glassfibre reinforced		



## Test Report

Report No.: SZR0704211189102

Date: Apr. 26, 2007

Page 1 of 5

Client : SAN YU PLASTICS CO., LTD

Address : BUILDING B2 EAST JIAN FU INDUSTRIAL PARK DA YANG DEVELOPMENT  
AREA FUYONG TOWN, SHENZHEN CITY

Report on the submitted sample said to be:

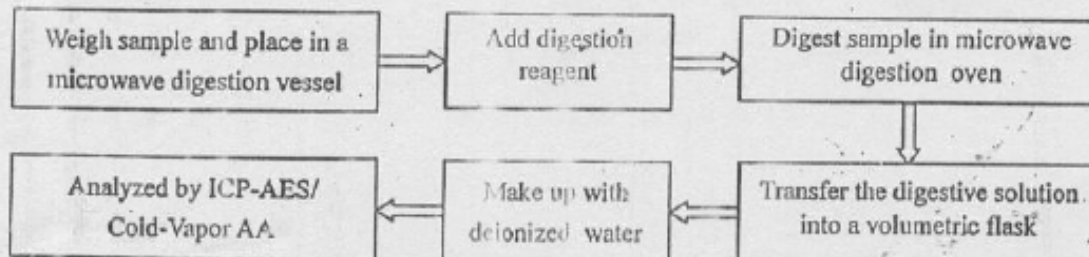
Sample Name : PC/PBT  
 Tested Component Description : White plastic grains  
 Sample Received Date : Apr. 21, 2007  
 Completed Date : Apr. 26, 2007  
 Test Requested : As specified by client, to determine the Lead, Mercury, Cadmium, Hexavalent Chromium, PBBs & PBDEs contents in the submitted sample.

### Test Method:

Tested Items	Pretreatment Method	Measured Equipment	Report Limit
Lead (Pb)	Refer to US EPA 3052:1996	ICP-AES	2 ppm
Mercury (Hg)	Refer to US EPA 3052:1996	Cold-Vapor AA	2 ppm
Cadmium (Cd)	Refer to EN 1122:2001 method B	ICP-AES	2 ppm
Hexavalent Chromium (Cr <sup>6+</sup> )	Refer to US EPA 3060A:1996	UV-Vis	0.05 ppm
Polybrominated Biphenyls (PBBs)	Refer to US EPA 3540 C:1996	GC-MSD	5 ppm
Polybrominated Diphenyl Ethers (PBDEs)	Refer to US EPA 3540 C:1996	GC-MSD	5 ppm

### Test Process :

#### 1. Test for Pb/Hg Contents.



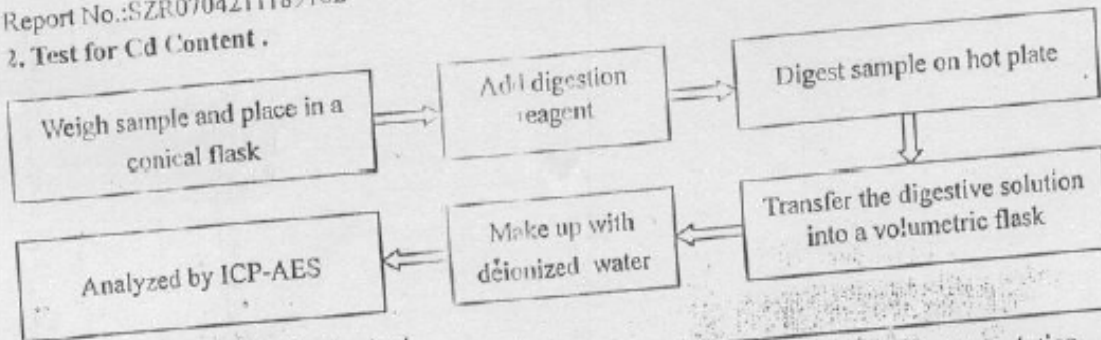
## Test Report

Date : Apr. 26, 2007

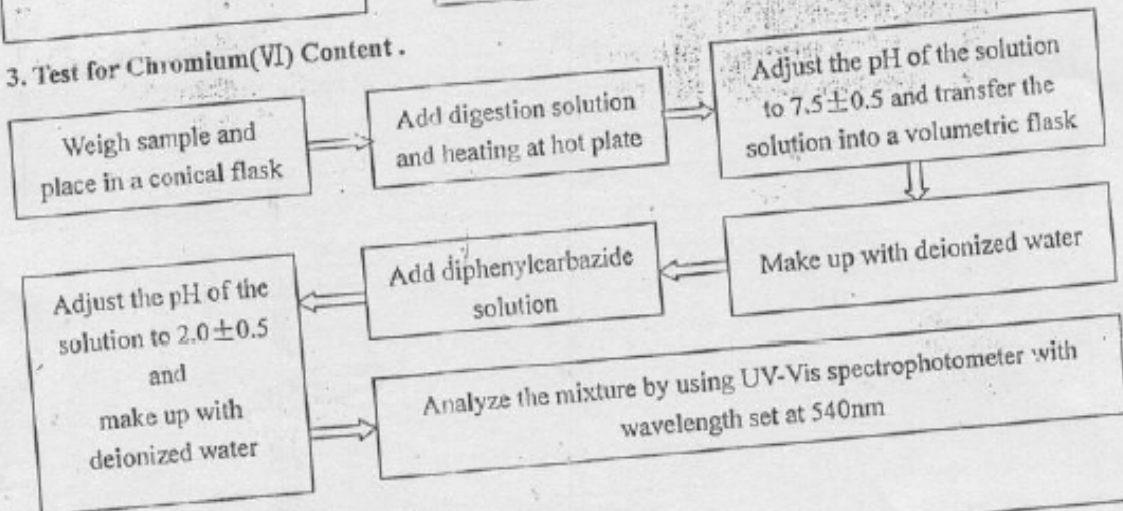
Page 2 of 5

Report No.: SZR0704211189102

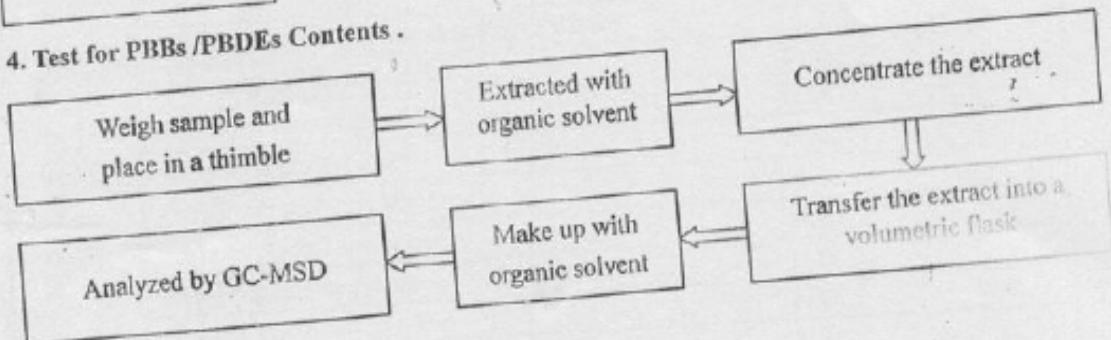
### 2. Test for Cd Content .



### 3. Test for Chromium(VI) Content .



### 4. Test for PBBs /PBDEs Contents .



## Test Report

Report No.:SZR0704211189102  
 Test Results:

Date :Apr. 26, 2007

Page 3 of 5

Tested Items	Contents
Lead (Pb)	N.D.
Mercury (Hg)	N.D.
Cadmium (Cd)	N.D.
Hexavalent Chromium (Cr <sup>6+</sup> )	N.D.

Tested Items	Contents
<b>Polybrominated Biphenyls(PBBs)</b>	
Monobromobiphenyl	N.D.
Dibromobiphenyl	N.D.
Tribromobiphenyl	N.D.
Tetrabromobiphenyl	N.D.
Pentabromobiphenyl	N.D.
Hexabromobiphenyl	N.D.
Heptabromobiphenyl	N.D.
Octabromobiphenyl	N.D.
Nonabromobiphenyl	N.D.
Decabromobiphenyl	N.D.
<b>Polybrominated Diphenyl Ethers(PBDEs)</b>	
Monobromodiphenyl ether	N.D.
Dibromodiphenyl ether	N.D.
Tribromodiphenyl ether	N.D.
Tetrabromodiphenyl ether	N.D.
Pentabromodiphenyl ether	N.D.
Hexabromodiphenyl ether	N.D.
Heptabromodiphenyl ether	N.D.
Octabromodiphenyl ether	N.D.
Nonabromodiphenyl ether	N.D.
Decabromodiphenyl ether	N.D.

Note : -N.D. = Not Detected (<report limit).

\*\*\* End of report \*\*\*





## Test Report

Report No.: SZR0704211189102

Date: Apr. 26, 2007

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Written by Tina

Inspected by Danny

Tested by Sunny

Approved by Jacky Chan

Lee

Position Manager

Ng

Date Apr. 26, 2007

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CTI Physical & Chemical Lab.



# CTI



Centre Testing International

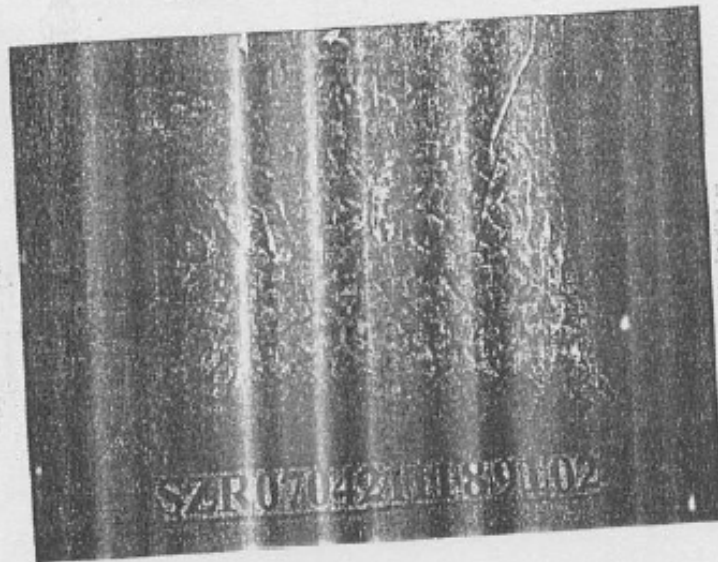
## Test Report

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Date: Apr. 26, 2007

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Photo of the sample



Building C, Hongwei Industrial zone, Baoan 70 district, Shenzhen, China  
Tel: 86-755-33868799 Fax: 86-755-33868999-9  
E-mail: info@cti-cert.com http://www.cti-cert.com

No. 0058164



Test Report

No.: GZ07050670f6/CHEM

Date: MAY 18, 2007

Page 1 of 3

SHENZHEN HAI-RX INDUSTRIAL CO., LTD  
14/F., 3 INDUSTRIAL ZONE OF XITIAN OF GUANGMING TOWN, BAOAN ZONE OF SHENZHEN

The following sample(s) was/were submitted and identified on behalf of the applicant as BRASS C3604.

SGS Ref No. : SZ10365032  
Sample Receiving Date : MAY 14, 2007  
Testing Period : MAY 14, 2007 TO MAY 18, 2007

Test Requested : In accordance with the RoHS Directive 2002/95/EC, and its amendment directives.

Test Method : With reference to IEC 62321 Ed.1 111/54/CDV  
Procedures for the Determination of Levels of Regulated Substances in Electrotechnical Products  
(1) Determination of Cadmium by ICP.  
(2) Determination of Lead by ICP.  
(3) Determination of Mercury by ICP.  
(4) Determination of Hexavalent Chromium by Colorimetric Method.

Test Results : Please refer to next page.

Conclusion : Based on the performed tests on submitted sample(s), the results comply with the RoHS Directive 2002/95/EC and its subsequent amendments.

Signed for and on behalf of  
SGS-CSTC Ltd.

Huang Fang, Sunny  
Sr. Engineer

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GZCM 1319084

Test results by chemical method (Unit: mg/kg)

Test Item(s):	Method (refer to)	No.1	MDL	RoHS Limit
Cadmium(Cd)	(1)	41	2	100
Lead (Pb)	(2)	28154 <sup>III</sup>	2	1000
Mercury (Hg)	(3)	N.D.	2	1000
Hexavalent Chromium (CrVI) by Spot test	(4)	Negative	See Note 4	#

**Test Part Description:**

No.1 Brassy metal

Note : 1. mg/kg = ppm

2. N.D. = Not Detected (< MDL)

3. MDL = Method Detection Limit

4. **Spot-test:**

Negative = Absence of CrVI coating, Positive = Presence of CrVI coating;

(The tested sample should be further verified by boiling-water-extraction method if the spot test result cannot be confirmed.)

**Boiling-water-extraction:**

Negative = Absence of CrVI coating

Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm<sup>2</sup> sample surface area.

5. # = Positive indicates the presence of CrVI on the tested areas and result be regarded as conflict with RoHS requirement.

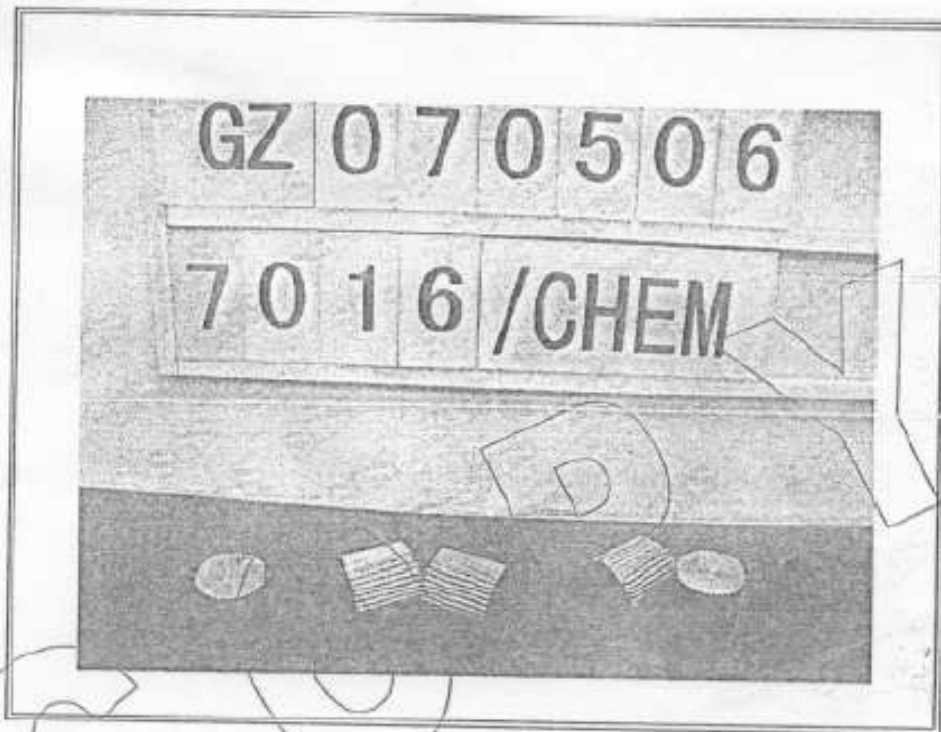
Negative indicates the absence of CrVI on the tested areas and result be regarded as no conflict with RoHS requirement.

Remark[1]: According to the specification from client, the sample is copper alloy, while Lead as an alloying element in copper alloy containing up to 4% Lead by weight is exempted by RoHS regulatory (Directive 2002/95/EC of the European Parliament and of the council of 27 January 2003).

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Sample photo :



SGS authenticate the photo on original report only

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