NO：

TO：

Halogen Free Part

SPECIFICATION FOR APPROVAL

DESCRIPTION：0.5mm M.2 H6.7 E-KEY;HF

CUSTOMER P/N：

LOTES P/N：APCI0154-P001A

CUSTOMER APPROVAL SIGN：

SEND BY	QA CONFIRM	R&D CONFIRM	PREPARE BY
		Frod	Jinjin Tu

Lotes SZ　　Lotes GZ，　　Lotes TW

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LOTES CO., LTD

INDEX

PRODUCT SPECIFICATION	REV	ECN No.
	1B	SN14***

DIMENSION

1.This specification covers M.2 connector.

2.The physical dimensions and the M.2 connector are shown in drawing.

MATERIAL AND FINISH

1.Housing: High temperature thermoplastic, Color: Black;

2. Contact: Copper Alloy, 50-120u" Nickel under plated, Au on contact area, Au on soldering area;

3. SMT TAB: S50C, 50-120u"Nickel under plated, plating Tin (Matte)80-180u" over all;

OPERATING PERFORMANCE

1.Operation Temperature: -55℃to 85℃

2.Voltage Rating: 30V

3.Current Rating: 0.5A

ELECTRICAL PERFORMANCE

Test item	Test condition	Requirements
Examination of product	· Visual inspection	· No physical damage
Low Level Contact Resistance	· EIA-364-23 · Mate connectors: apply a current of 10mA(Max) at open circuit voltage of 20mVvoltage(Max)	· Initial 55mΩ Max. · Final △ LLCR =20mΩ Max.
Insulation resistance	· Applying 500VDC for one minute between adjacent contacts of unmated connectors EIA-364-21	· 500MΩ Min.
Dielectric withstanding voltage	· Measured by applying 300V/AC for one minute between adjacent contacts of unmated connector assemblies. EIA-364-20	· No breakdown or flash · Current leakage: 0.5 mA
Temperature rise versus current	· The temperature rise above ambient shall not exceed 30℃.the ambient condition is still air at 25℃. EIA-364-70 Method 2	· No physical damage · △ T=30℃Max.

LOTES CO., LTD	**PRODUCT NAME:** M.2 CONNECTOR		
	DOCUMENT No: SP-APCI0018	**REV:** 1B	**PAGE:** 1 OF 5
	APPROVED BY: Barney	**CHECKED BY:** Vito	**WRITTEN BY:** TAN ZHI WU

MECHANICAL PERFORMANCE

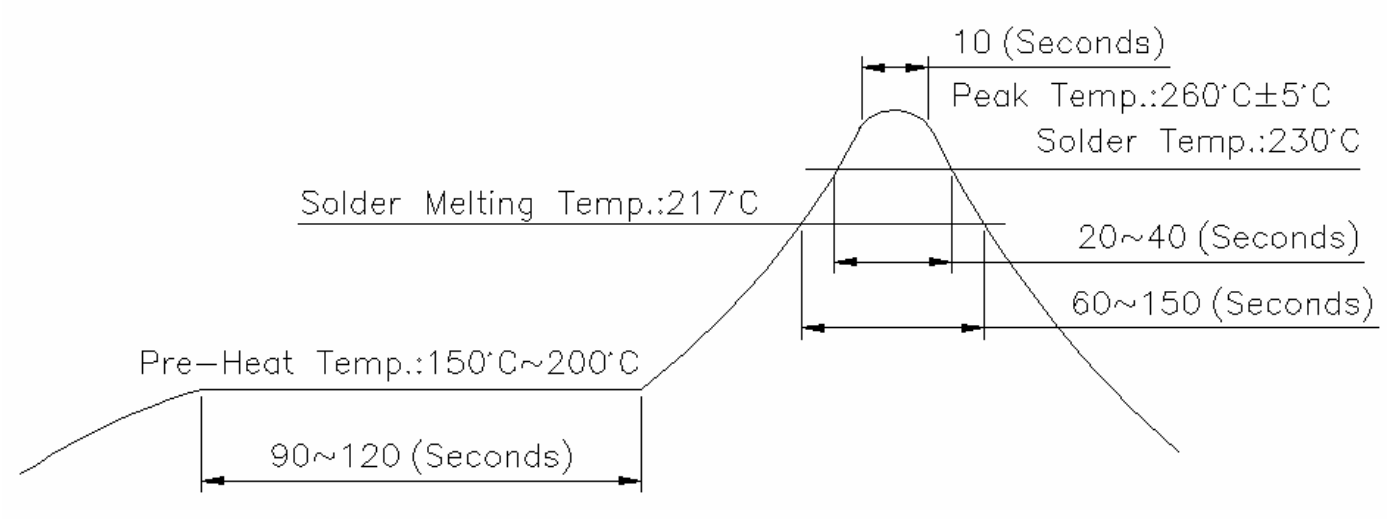
Test item	Test condition	Requirements
Vibration test	• EIA-364-28, test condition Ⅶ, test condition letter D(15 minutes in each of 3 mutually perpendicular directions . Both mating halves should be rigidly fixed so as not to contribute to the relative motion of one contact against another . The method of fixturing should be detailed in the test report)	• No electrical discontinuity greater than 1 microsecond. • △LLCR=20mΩ Max.(Final)
Mechanical shock	• 250 G (Ultra-book) and 285 G (Tablet) at 2m Sec half sine on all six axis	• No electrical discontinuity greater than 1 microsecond • △ LLCR=20mΩ Max.(Final) • No physical damage
Insertion/Removal Force	• Insertion Force-20 N (2.04 kgf) Max. Removal Force-Typical 20 N, 25 N (2.55 kgf) Max. EIA-364-13	• No evidence of physical damage
Durability (precondition)	• EIA-364-09 • Perform 5 unplug /plug cycles if the application requires up to 25 over the life of the connector , 20 cycles if the application requires 26-200;	• No evidence of physical damage
Durability	• Option1:Repeat insertion the Card to the connector and extraction Card from the connector for 25 cycles(Au:30u”Max). • Option2:Repeat insertion the Card to the connector and extraction Card from the connector for 60 cycles(Au:30u”Min). EIA-364-09	• △LLCR=20mΩ Max.(Final)
Reseating	• Manually unplug/plug the connector or socket perform 3 cycles	• No evidence of physical damage

ENVIRONMENTAL PERFORMANCE

Test item	Test condition	Requirements
Cyclic temperature &Humidity	・EIA-364-31 method III without conditioning, initial measurements, cold shock and vibration. (Except cycle the connector or socket between 25℃±3℃ at 80% ± 3% RH and 65℃±3℃ at 50% ± 3% RH . Ramp times should be 0.5 hour and dwell times should be 1.0 hour. Dwell times start when the temperature and humidity have stabilized within the specified levels. Perform 24 such cycles.) ・EIA-364-31	• Contact resistance: △LLCR=20mΩ Max. • Insulation resistance:500MΩ Min. • No physical damage.
Thermal shock	・EIA-364-32,method A,test condition I,test duration A-4 Cold extreme :-55℃+0/-5℃ Hot extreme :85℃+3/-0℃ each temperature dwell 2 hour, perform 10 cycles in mated condition.	• Contact resistance: △LLCR=20mΩ Max.(Final) • No physical damage.
Salt spray	・Subject the connector to 5% salt-solution concentration at 35℃ for 48 hours.	• Contact resistance: △LLCR=20mΩ Max .(Final) • No physical damage.
Temperature life	・Mate PCB module and subject to 105±2℃ for 120 hours EIA-364-17	• Contact resistance: △LLCR=20mΩ Max.(Final) • No physical damage.
Temperature life (preconditioning)	・Mate PCB module and subject to 105±2℃ for 72 hours EIA 364-17 method A, using table 9 for reference	• Contact resistance: △LLCR=20mΩ Max.(Final) • No physical damage.
Resistance to Reflow Soldering Heat	・Test connector on PCB ・Pre-Heat :100~150℃ ・Heat : 210℃ ・Heat Peak : 260+5℃/-0℃,10+/-1s	• No physical damage
Solder ability	・Solder Temperature :245±5℃ ・Solder time : 3±0.5s	• Wet solder coverage: 95% Min.
Rework temperature	・350°C,3-5seconds for “solder iron-Max.”, temperature of component by rework process.	• No Damage
Mixed flowing gas	・EIA-364-65, Environmental Class – IIA • For 7days, Connectors should be mated during this portion of the test. Total Mixed flowing gas exposure 168 hours , include unmated exposure 112 hours and mated exposure 56 hours.	• No discontinuations of microsecond or longer duration • Contact resistance: △LLCR=20mΩ Max. (Final)
Thermal disturbance	・Cycle the mated connector between 15℃±3℃ and 85℃±3℃, as measured on the part. Ramps should be a minimum of 2℃ per minute, and dwell times should insure that the contacts reach the temperature extremes(a minimum of 5 minutes). Humidity is not controlled. Perform 10 such cycles.	• No evidence of physical damage • Contact resistance: △LLCR=20mΩ Max. (Final)

LOTES RECOMMENDED LEAD FREE SMT TEMPERATURE PROFILE

Suggestion：In SMT process , the thickness of solder paste is 0.13mm minimum



PACKAGE

All parts shall be packaged and packed to protect against physical damage, corrosion and deterioration during shipment and storage.

Test conditions

The tests shall be carried out under the conditions as the referring.0

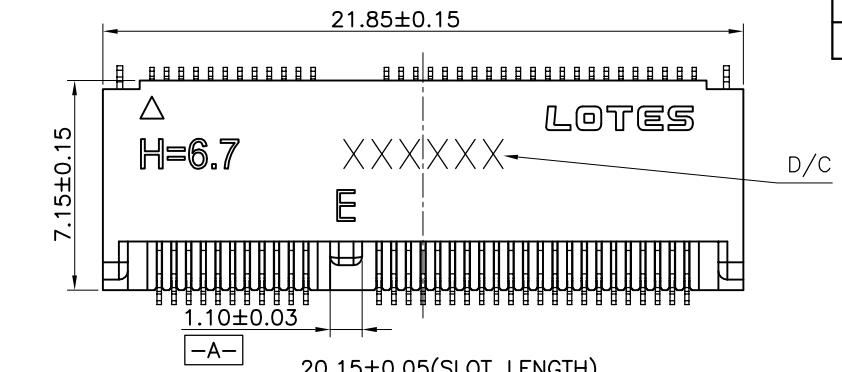
(1).Temperature:15~35℃.

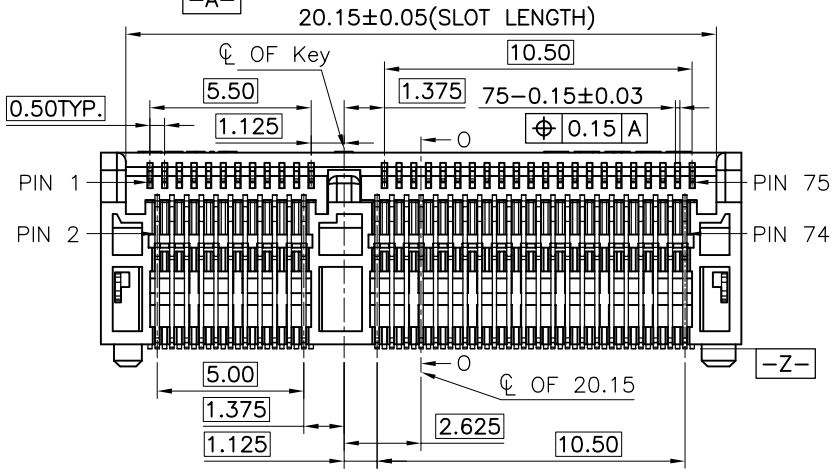
(2).Humidity: 45~75%

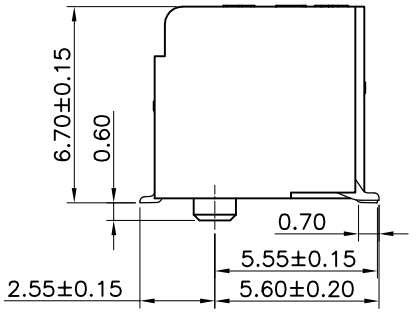
Test Sequence:

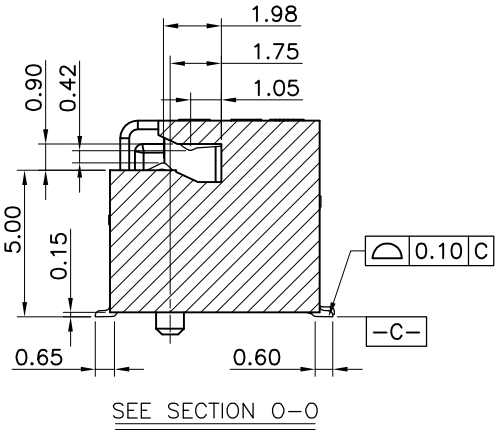
Test or Examination	Test Group					
	A	B	C	D	E	F
Examination of Product	1,8	1,10	1,10	1,10	1,4	1
Low Level Contact Resistance	2,5,7	2,5,7,9	2,5,7,9	2,6,9		
Dielectric Withstanding Voltage					2	
Insulation Resistance					3	
Temperature versus current						2
Vibration			6			
Mechanical shock			8			
Insertion/Removal Force				3,5,8		
Durability (precondition)	3	3	3			
Durability				4,7		
Thermal Shock		4				
Cyclic temperature(Humidity)		6				
Mixed flowing gas						
Reseating	6	8				
Thermal disturbance						
Temperature life	4					
Temperature life (Preconditioning)			4			
Specimen quantity (pcs)	5	5	5	5	5	5

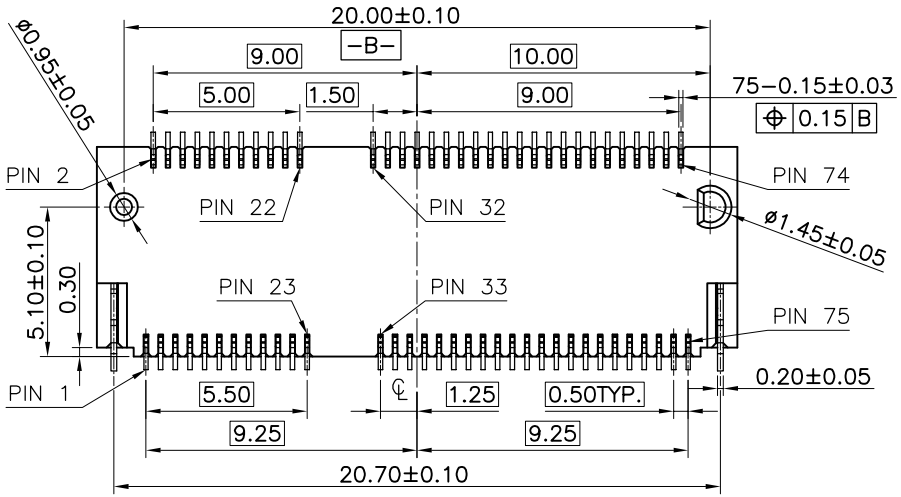
REV.	ECR/N NO./DESCRIPTION	DATE	DRAWN	CHECKED	APPROVE
1	SN15057	06/30'15	Lxh	Vito	Barney







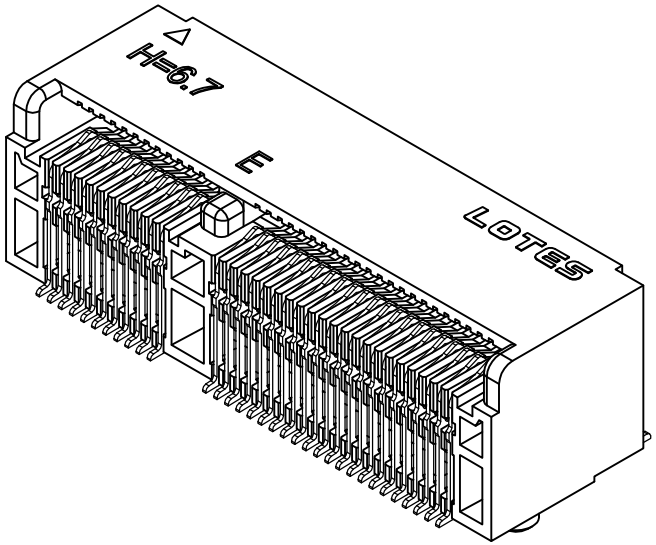




GENERAL TOLERANCES UNLESS SPECIFIED		PART NO. SEE TABLE	LOTES
.X ± 0.35	X.° ± 3°		
.XX ± 0.25	.X° ± 2°	APPROVED BY Barney	TITLE 0.5MM PITCH M.2 H6.7 (KEY E)
.XXX ± 0.15	.XX° ± 1°		
CUSTOMER DRAWING		CHECKED BY Vito	DWG NO. AP-APCI0154
SIZE A4	UNITS MM[INCH]	DRAWN BY Lxh	SHEET 1 / 5 · SCALE 4:1 · REV 1

TABLE:

NO.	PART NO.	DESCRIPTION	DURABILITY
1	APCI0154-P001A	GOLD G/F ON CONTACT AREA	25 CYCLES
		GOLD G/F ON SOLDER AREA	
2	APCI0154-P002A	GOLD 10u" ON CONTACT AREA	25 CYCLES
		GOLD G/F ON SOLDER AREA	
3	APCI0154-P003A	GOLD 15u" ON CONTACT AREA	25 CYCLES
		GOLD G/F ON SOLDER AREA	
4	APCI0154-P004A	GOLD 30u" ON CONTACT AREA	60 CYCLES
		GOLD G/F ON SOLDER AREA	



3D VIEW

Notes:

1. MATERIAL SPECIFICATION:
   1.1. HOUSING:LCP+40%GF,UL94V-0,COLOR:BLACK.
   1.2. CONTACT:COPPER ALLOY.
   1.3. PEG:STEEL.

2. PLATING SPECIFICATION:
   2.1. CONTACT:50u" MIN. NICKEL UNDER PLATING OVER ALL. G/F PLATING ON SOLDER AREA. GOLD PLATING ON CONTACT AREA:SEE TABLE
   2.2. PEG:50u" MIN. NICKEL UNDER PLATING OVER ALL. 80u" MIN. MATTE TIN PLATING ON SOLDER AREA.

3. HF COMPLIANT, RoHS COMPLIANT.

4. DATE CODE: XX XX XX
   - DAY
   - WEEK
   - YEAR

5. MECHANICAL PERFORMANCE:
   5.1. DURABILITY: SEE TABLE

6. ELECTRICAL PERFORMANCE:
   6.1. CURRENT: 0.5A PER PIN.
   6.2. LLCR: INITIAL 55mΩ MAX.;FINAL △LLCR=20mΩ MAX.

7. IR REFLOW:
   THE TEMPERATURE SHALL BE 260±5°C MAINTAINING 10±1 SECONDS.

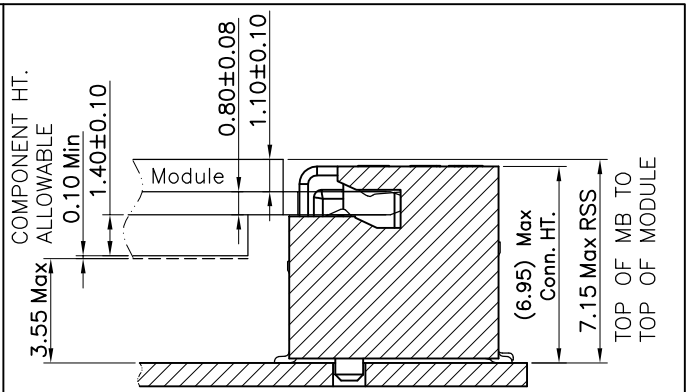
8. PRODUCT NUMBER NOTE:

A P C I X X X X – X X X X X

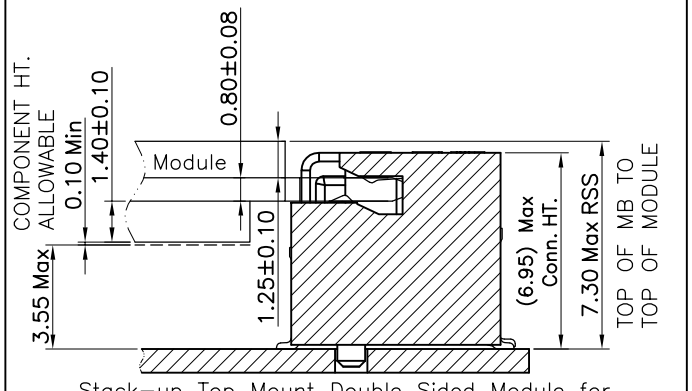
- A: FINISHED PRODUCT
- P C I: PRODUCT TYPE
- X X X X: TYPE SERIAL NUMBER
- X: P:HF COMPLIANT
- X X X: PRODUCT SERIAL NUMBER
- X: PACKING TYPE

GENERAL TOLERANCES UNLESS SPECIFIED .X± 0.35 X.°± 3° .XX± 0.25 .X°± 2° .XXX± 0.15 .XX°± 1°		PART NO. SEE TABLE	LOTES
		APPROVED BY Barney	TITLE 0.5MM PITCH M.2 H6.7 (KEY E)
CUSTOMER DRAWING		CHECKED BY Vito	DWG NO. AP-APCI0154
SIZE A4	UNITS MM[INCH]	DRAWN BY Lxh	SHEET 2 / 5 · SCALE 4:1 · REV 1

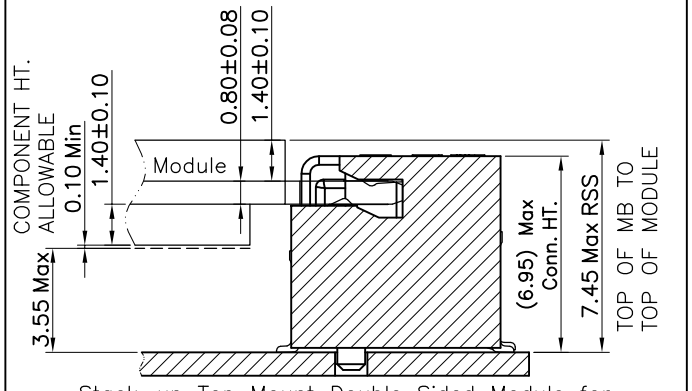
Assembly stack height schematic digram



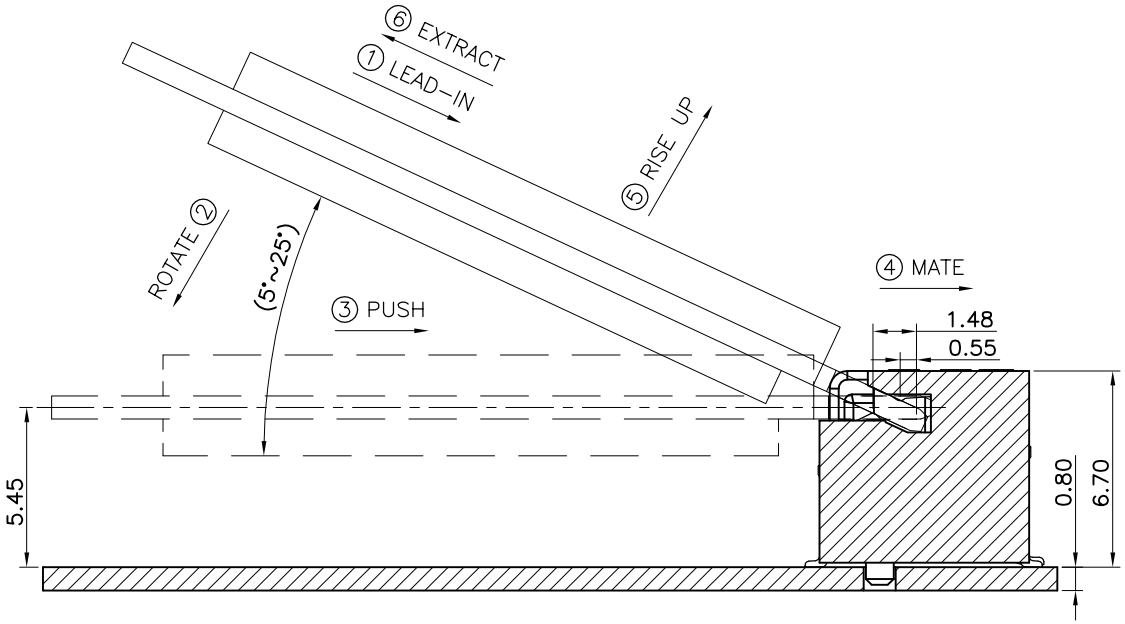
Stack-up Top Mount Double Sided Module for
1.20 max top-side component height



Stack-up Top Mount Double Sided Module for
1.35 max top-side component height



Stack-up Top Mount Double Sided Module for
1.50 max top-side component height



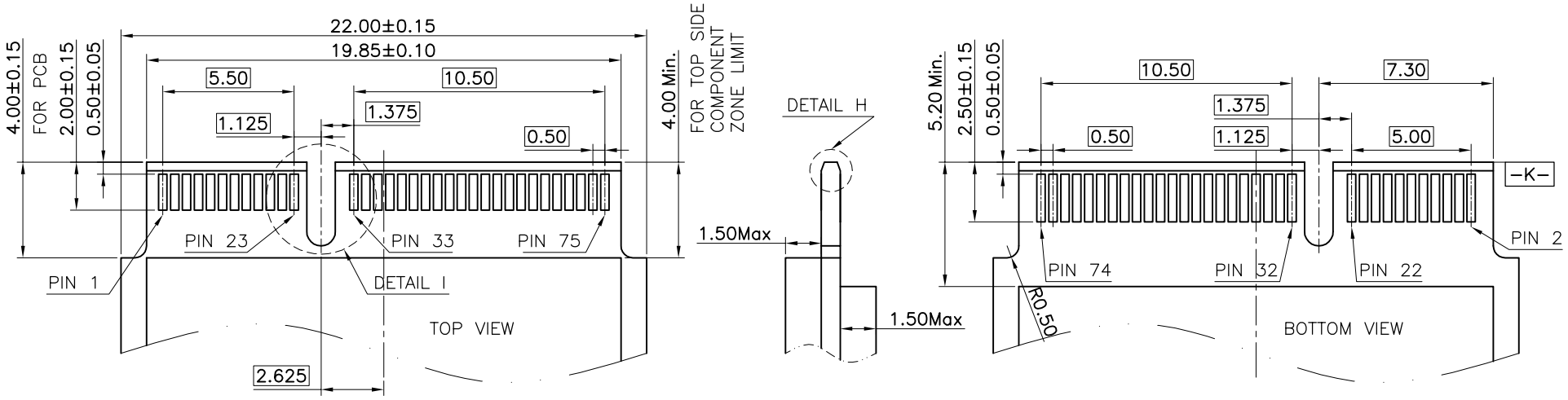
HOW TO MATE AND EXTRACT

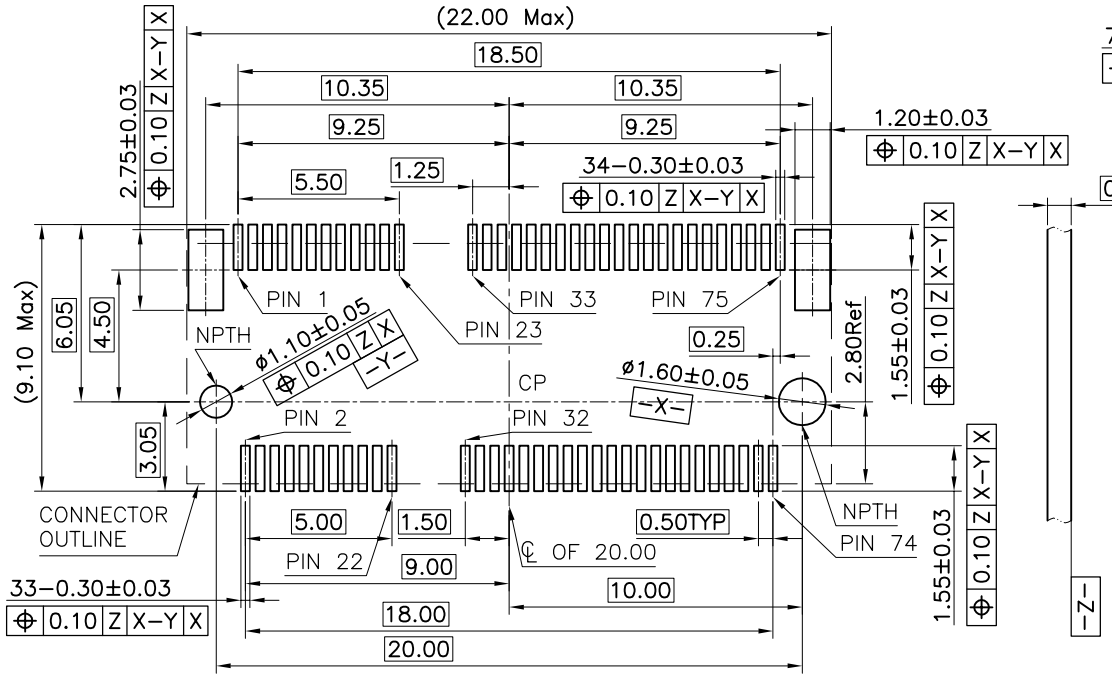
MATE: ① → ④

EXTRACT: ⑤ → ⑥

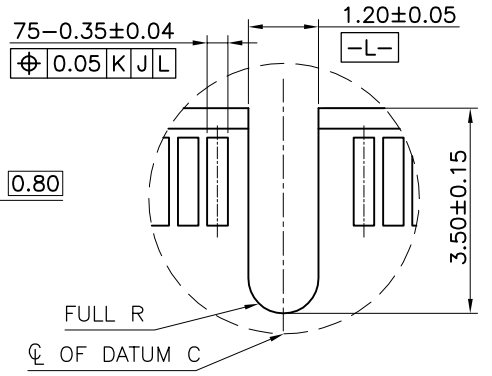
NOTE:Mating force will generate from step 3 to step 4.

GENERAL TOLERANCES UNLESS SPECIFIED		PART NO. SEE TABLE	LOTES
.X ± 0.35	X.°± 3°		
.XX ± 0.25	.X°± 2°	APPROVED BY Barney	TITLE 0.5MM PITCH M.2 H6.7 (KEY E)
.XXX ± 0.15	.XX°± 1°		
CUSTOMER DRAWING		CHECKED BY Vito	DWG NO. AP-APCI0154
SIZE	UNITS	DRAWN BY Lxh	SHEET 3 / 5 · SCALE 4:1 · REV 1
A4	MM[INCH]		

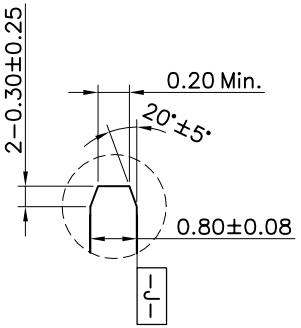




RECOMMENDED PCB LAYOUT(TOP VIEW)
DEFAULT TOLERANCE ±0.05MM

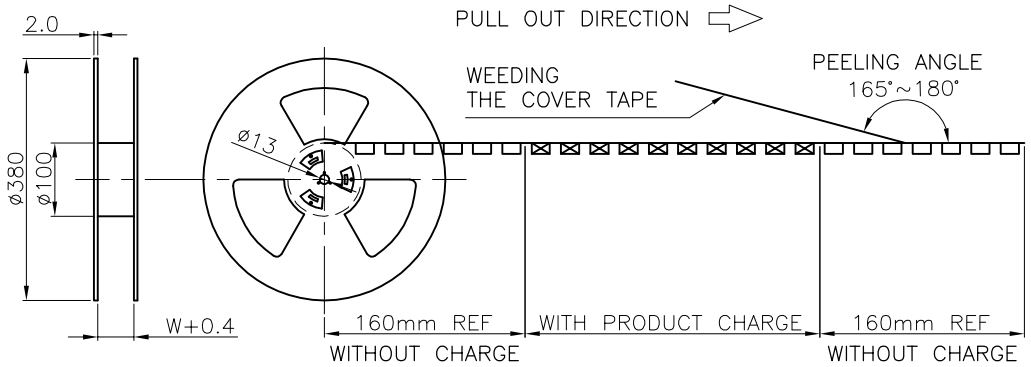


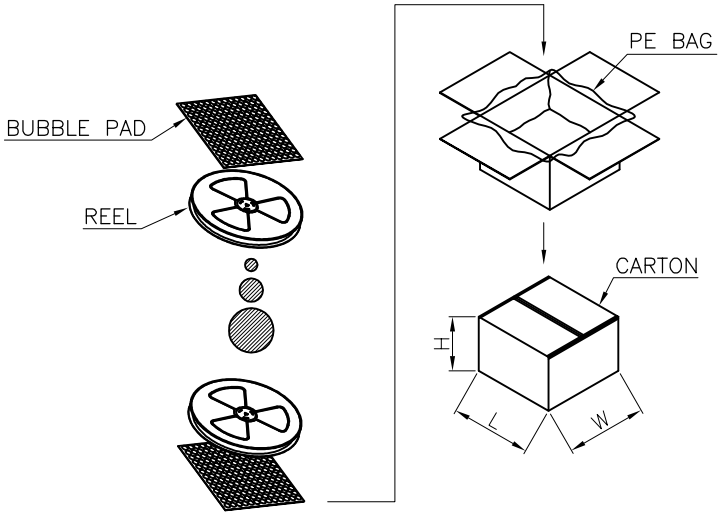
DETAIL I
SCALE 2:1

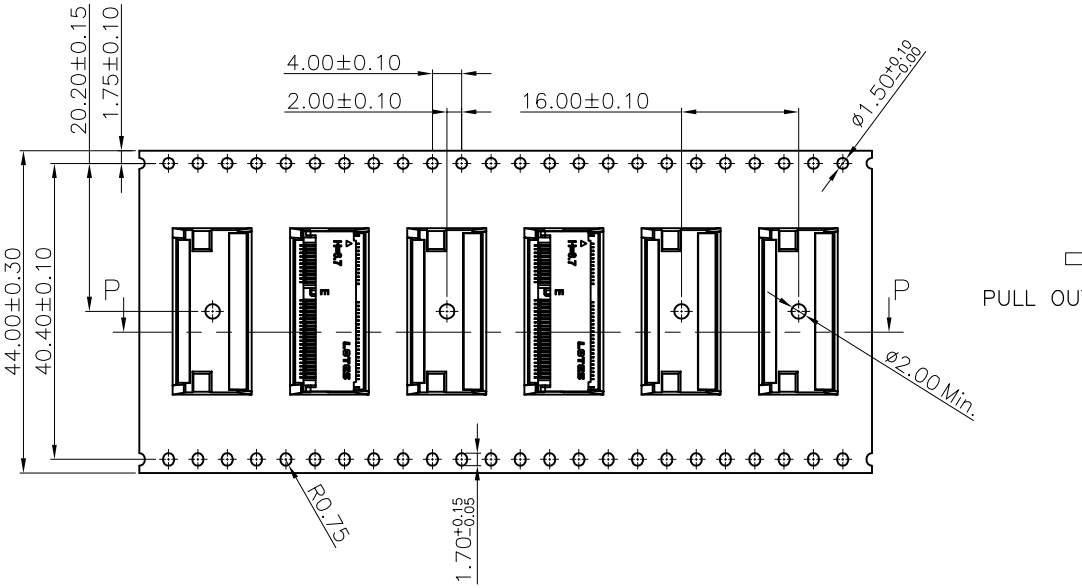


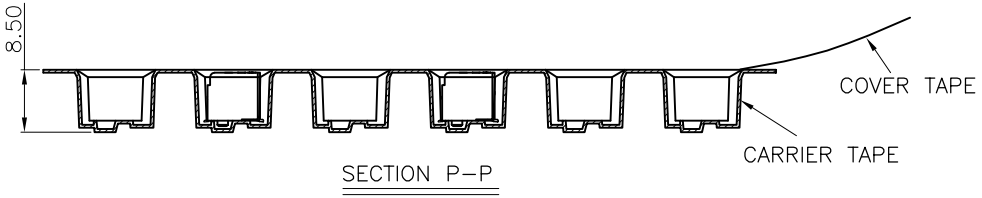
DETAIL H
SCALE 2:1

GENERAL TOLERANCES UNLESS SPECIFIED		PART NO. SEE TABLE	LOTES
.X ± 0.35	X.° ± 3°		
.XX ± 0.25	.X° ± 2°	APPROVED BY Barney	TITLE 0.5MM PITCH M.2 H6.7 (KEY E)
.XXX ± 0.15	.XX° ± 1°		
CUSTOMER DRAWING		CHECKED BY Vito	DWG NO. AP-APCI0154
SIZE	UNITS	DRAWN BY Lxh	SHEET 4 / 5 · SCALE 4:1 · REV 1
A4	MM[INCH]		









700	4200
PCS/REEL	PCS/CARTON

GENERAL TOLERANCES UNLESS SPECIFIED		PART NO. SEE TABLE	LOTES
.X ± 0.35	X.°± 3°		
.XX ± 0.25	.X°± 2°	APPROVED BY Barney	TITLE 0.5MM PITCH M.2 H6.7 (KEY E)
.XXX ± 0.15	.XX°± 1°		
CUSTOMER DRAWING		CHECKED BY Vito	DWG NO. AP-APCI0154
SIZE	UNITS	DRAWN BY Lxh	SHEET 5 / 5 · SCALE 1:1 · REV 1
A4	MM[INCH]		

PRODUCT RELIABILITY TEST REPORT

ReportNo:GL-SZ20141211-01

product:NGFF 6.7H E-Key CONNECTOR
Part NO:APCI0154-P00*A
Test Object:Product Reliability Test
Sample Quantity:35pcs
Test Environment:Temperature ： 22℃ , Humidity：50%RH
Date of Test:2014-12-15~2015-03-02

Prepared By:陈子正
Checked By:苏士坤
Approved By:周志奇

Test Result Summary:

Qualification Group	*Pass / Fail*	*Comments*
groupA	Qualified	
groupB	Qualified	
groupC	Qualified	
groupD	Qualified	
groupE	Qualified	
groupF	Qualified	
groupG	Qualified	

LOTES

PRODUCT RELIABILITY TEST REPORT

Report No. GL-SZ20141211-01 **GL-P-027-005**

1. Testing Sequence:

Test or Examination	Test Group					
	A	B	C	D	E	F
Examination of Product	1,8	1,10	1,10	1,10	1,4	1
Low Level Contact Resistance	2,5,7	2,5,7,9	2,5,7,9	2,6,9		
Dielectric Withstanding Voltage					2	
Insulation Resistance					3	
Temperature versus current						2
Vibration			6			
Mechanical shock			8			
Insertion/Removal Force				3,5,8		
Durability (precondition)	3	3	3			
Durability				4,7		
Thermal Shock		4				
Cyclic temperature(Humidity)		6				
Mixed flowing gas						
Reseating	6	8				
Thermal disturbance						
Temperature life	4					
Temperature life (Preconditioning)			4			
Specimen quantity (pcs)	5	5	5	5	5	5

LOTES

PRODUCT RELIABILITY TEST REPORT

Report No. GL-SZ20141211-01 **GL-P-027-005**

2. Test Item & Condition & Requirements ：

Test item		Test Condition	Requirements
1	Examination of product	Visual inspection	No physical damage
2	Low Level Contact Resistance	EIA-364-23 Mate connectors: apply a current of 10mA(Max) at open circuit voltage of 20mVvoltage(Max)	Initial 55mΩ Max. Final △ LLCR =20mΩ Max.
3	Dielectric withstanding voltage	Measured by applying 300V/AC for one minute between adjacent contacts of unmated connector assemblies. EIA-364-20	No breakdown or flash Current leakage: 0.5 mA
4	Insulation resistance	Applying 500VDC for one minute between adjacent contacts of unmated connectors EIA-364-21	500MΩ Min.
5	Temperature rise versus current	The temperature rise above ambient shall not exceed 30℃.the ambient condition is still air at 25 ℃. EIA-364-70 Method 2	No physical damage △ T=30℃Max.
6	Vibration test	EIA-364-28 test condition Ⅶ, test condition letter D(15 minutes in each of 3 mutually perpendicular directions . Both mating halves should be rigidly fixed so as not to contribute to the relative motion of one contact against another . The method of fixturing should be detailed in the test report)	No electrical discontinuity greater than 1 microsecond. △LLCR=20mΩ Max.(Final)
7	Mechanical shock	250 G (Ultra-book) and 285 G (Tablet) at 2m Sec half sine on all six axis	No electrical discontinuity greater than 1 microsecond △ LLCR=20mΩ Max.(Final) No physical damage
8	Insertion/Removal Force	Insertion Force-20 N (2.04 kgf) Max. Removal Force-Typical 20 N, 25 N (2.55 kgf) Max. EIA-364-13	No evidence of physical damage

LOTES

PRODUCT RELIABILITY TEST REPORT

Report No. GL-SZ20141211-01 **GL-P-027-005**

	Test item	Test Condition	Requirements
9	Durability (precondition)	EIA-364-09 Perform 5 unplug /plug cycles if the application requires up to 25 over the life of the connector , 20 cycles if the application requires 26-200;	No evidence of physical damage
10	Durability	Option1:Repeat insertion the Card to the connector and extraction Card from the connector for 25 cycles(Au:30u"Max). Option2:Repeat insertion the Card to the connector and extraction Card from the connector for 60 cycles(Au:30u"Min). EIA-364-09	△LLCR=20mΩ Max.(Final)
11	Thermal shock	EIA-364-32,method A,test condition I,test duration A-4 Cold extreme :-55℃+0/-5℃ Hot extreme :85℃+3/-0℃ each temperature dwell 2 hour, perform 10 cycles in mated condition.	Contact resistance: △LLCR=20mΩ Max.(Final) No physical damage.
12	Cyclic temperature &Humidity	EIA-364-31 method III without conditioning, initial measurements, cold shock and vibration. (Except cycle the connector or socket between 25℃±3℃ at 80% ± 3% RH and 65℃±3℃ at 50% ± 3% RH . Ramp times should be 0.5 hour and dwell times should be 1.0 hour. Dwell times start when the temperature and humidity have stabilized within the specified levels. Perform 24 such cycles.) EIA-364-31	Contact resistance: △LLCR=20mΩ Max. Insulation resistance:500 MΩ Min. No physical damage.
13	Mixed flowing gas	EIA-364-65, Environmental Class – IIA For 7days, Connectors should be mated during this portion of the test. Total Mixed flowing gas exposure 168 hours ,include unmated exposure 112 hours and mated exposure 56 hours.	No discontinuations of microsecond or longer duration Contact resistance: △LLCR=20mΩ Max. (Final)

LOTES

PRODUCT RELIABILITY TEST REPORT

Report No. GL-SZ20141211-01 **GL-P-027-005**

Test item		Test Condition	Requirements
14	Reseating	Manually unplug/plug the connector or socket perform 3 cycles	No evidence of physical damage
15	Thermal disturbance	Cycle the mated connector between 15℃±3℃ and 85℃±3℃, as measured on the part. Ramps should be a minimum of 2℃ per minute, and dwell times should insure that the contacts reach the temperature extremes(a minimum of 5 minutes). Humidity is not controlled. Perform 10 such cycles.	No evidence of physical damage Contact resistance: △LLCR=20mΩ Max. (Final)
16	Temperature life	Mate PCB module and subject to 105±2℃ for 120 hours EIA-364-17	Contact resistance: △LLCR=20mΩ Max.(Final) No physical damage.
17	Temperature life (preconditioning)	Mate PCB module and subject to 105±2℃ for 72 hours EIA 364-17 method A, using table 9 for reference	Contact resistance: △LLCR=20mΩ Max.(Final) No physical damage.

PRODUCT RELIABILITY TEST REPORT

Report No. GL-SZ20141211-01 **GL-P-027-005**

3. Testing Result:

Group A:

Examination step/ item		Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Unit	Pass/fail
1	Examination of products	Normal	Normal	Normal	Normal	Normal	/	Pass
2	LLCR	34.31	32.48	33.64	33.99	31.10	mΩ	Pass
3	Durability (precondition)	Normal	Normal	Normal	Normal	Normal	/	Pass
4	Temperature life	Normal	Normal	Normal	Normal	Normal	/	Pass
5	LLCR	30.50	30.13	30.55	29.67	29.23	mΩ	Pass
	△LLCR	6.95	4.04	7.74	8.15	5.43	mΩ	Pass
6	Reseating	Normal	Normal	Normal	Normal	Normal	/	Pass
7	LLCR	33.59	29.04	29.57	29.36	28.79	mΩ	Pass
	△LLCR	6.82	4.25	7.54	7.69	5.89	mΩ	Pass
8	Examination of products	Normal	Normal	Normal	Normal	Normal	/	Pass

Group B:

Examination step/ item		Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Unit	Pass/fail
1	Examination of products	Normal	Normal	Normal	Normal	Normal	/	Pass
2	LLCR	31.56	28.80	30.61	37.07	31.46	mΩ	Pass
3	Durability (precondition)	Normal	Normal	Normal	Normal	Normal	/	Pass
4	Thermal shock	Normal	Normal	Normal	Normal	Normal	/	Pass
5	LLCR	28.47	28.62	30.47	29.62	29.11	mΩ	Pass
	△LLCR	5.46	2.87	3.34	11.18	6.69	mΩ	Pass
6	Cyclic temperature (humidity)	Normal	Normal	Normal	Normal	Normal	/	Pass
7	LLCR	31.35	28.21	30.01	29.54	34.54	mΩ	Pass
	△LLCR	6.94	3.54	4.09	12.74	7.34	mΩ	Pass
8	Reseating	Normal	Normal	Normal	Normal	Normal	/	Pass
9	LLCR	29.51	30.08	29.94	29.41	29.99	mΩ	Pass
	△LLCR	5.52	5.10	4.53	7.82	5.25	mΩ	Pass
10	Examination of products	Normal	Normal	Normal	Normal	Normal	/	Pass

LOTES

PRODUCT RELIABILITY TEST REPORT

Report No. GL-SZ20141211-01 **GL-P-027-005**

Group C:

Examination step/ item		Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Unit	Pass/fail
1	Examination of products	Normal	Normal	Normal	Normal	Normal	/	Pass
2	LLCR	32.66	32.45	32.63	32.59	33.15	mΩ	Pass
3	Durability (precondition)	Normal	Normal	Normal	Normal	Normal	/	Pass
4	Temperature life(preconditioning)	Normal	Normal	Normal	Normal	Normal	/	Pass
5	LLCR	29.34	28.30	29.16	29.69	29.47	mΩ	Pass
	△LLCR	5.62	5.60	6.43	5.90	4.23	mΩ	Pass
6	Vibration	Normal	Normal	Normal	Normal	Normal	/	Pass
7	LLCR	30.35	30.56	31.98	30.55	31.05	mΩ	Pass
	△LLCR	5.61	5.13	5.77	4.91	3.05	mΩ	Pass
8	Mechanical shock	Normal	Normal	Normal	Normal	Normal	/	Pass
9	LLCR	30.04	30.95	31.07	32.10	32.09	mΩ	Pass
	△LLCR	5.24	5.17	5.52	4.45	2.05	mΩ	Pass
10	Examination of products	Normal	Normal	Normal	Normal	Normal	/	Pass

LOTES

PRODUCT RELIABILITY TEST REPORT

Report No. GL-SZ20141211-01 **GL-P-027-005**

Group D:

Examination step/ item		Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Unit	Pass/fail
1	Examination of products	Normal	Normal	Normal	Normal	Normal	/	Pass
2	LLCR	32.79	33.09	34.54	28.87	35.32	mΩ	Pass
3	Insertion Force	14.80	14.20	15.60	14.60	13.90	N	Pass
	Removal Force	9.40	9.00	10.30	9.40	8.70	N	Pass
4	Durability	Normal	Normal	Normal	Normal	Normal	/	Pass
5	Insertion Force	16.60	15.90	16.00	17.20	15.40	N	Pass
	Removal Force	11.50	11.40	10.90	12.30	10.20	N	Pass
6	LLCR	30.23	34.09	33.60	34.37	36.13	mΩ	Pass
	△LLCR	6.15	4.46	5.84	7.56	8.72	mΩ	Pass
7	Durability	Normal	Normal	Normal	Normal	Normal	/	Pass
8	Insertion Force	17.20	18.00	17.80	18.90	16.50	N	Pass
	Removal Force	13.10	14.70	13.70	14.40	13.80	N	Pass
9	LLCR	29.88	33.99	33.48	36.19	32.98	mΩ	Pass
	△LLCR	7.13	4.36	3.35	9.45	5.48	mΩ	Pass
10	Examination of products	Normal	Normal	Normal	Normal	Normal	/	Pass

Group E:

Examination step/ item		Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Unit	Pass/fail
1	Examination of products	Normal	Normal	Normal	Normal	Normal	/	Pass
2	Dielectric Withstanding Voltage	300	300	300	300	300	VAC	Pass
3	Insulation Resistance	＞500	＞500	＞500	＞500	＞500	MΩ	Pass
4	Examination of products	Normal	Normal	Normal	Normal	Normal	/	Pass

Group F:

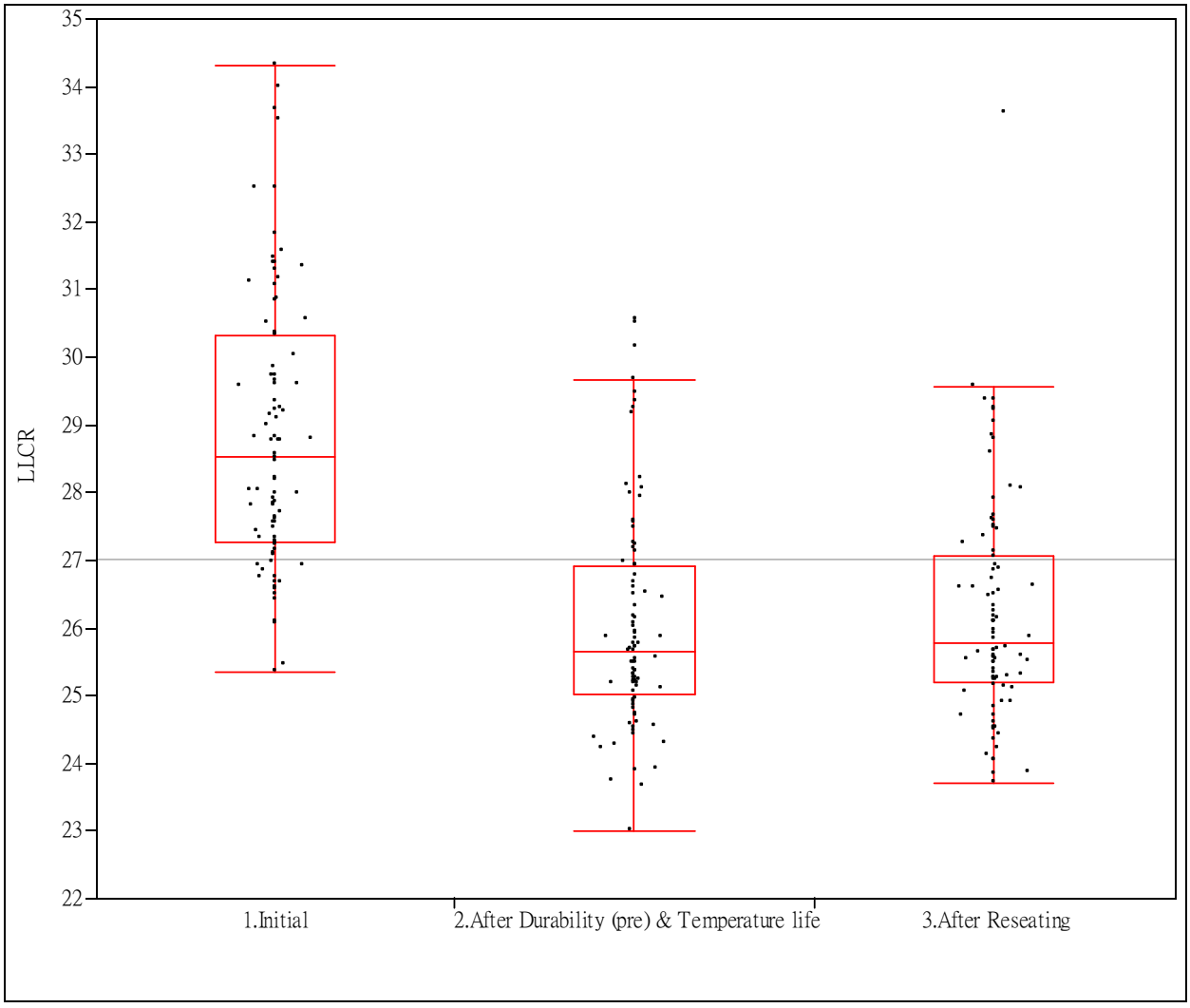
Examination step/ item		Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Unit	Pass/fail
1	Examination of products	Normal	Normal	Normal	Normal	Normal	/	Pass
2	Temperature versus current	4.51	5.34	3.98	4.25	4.32	℃	Pass

PRODUCT RELIABILITY TEST REPORT

Report No. GL-SZ20141211-01 **GL-P-027-005**

4. The LLCR as follow: (Unit: mΩ)

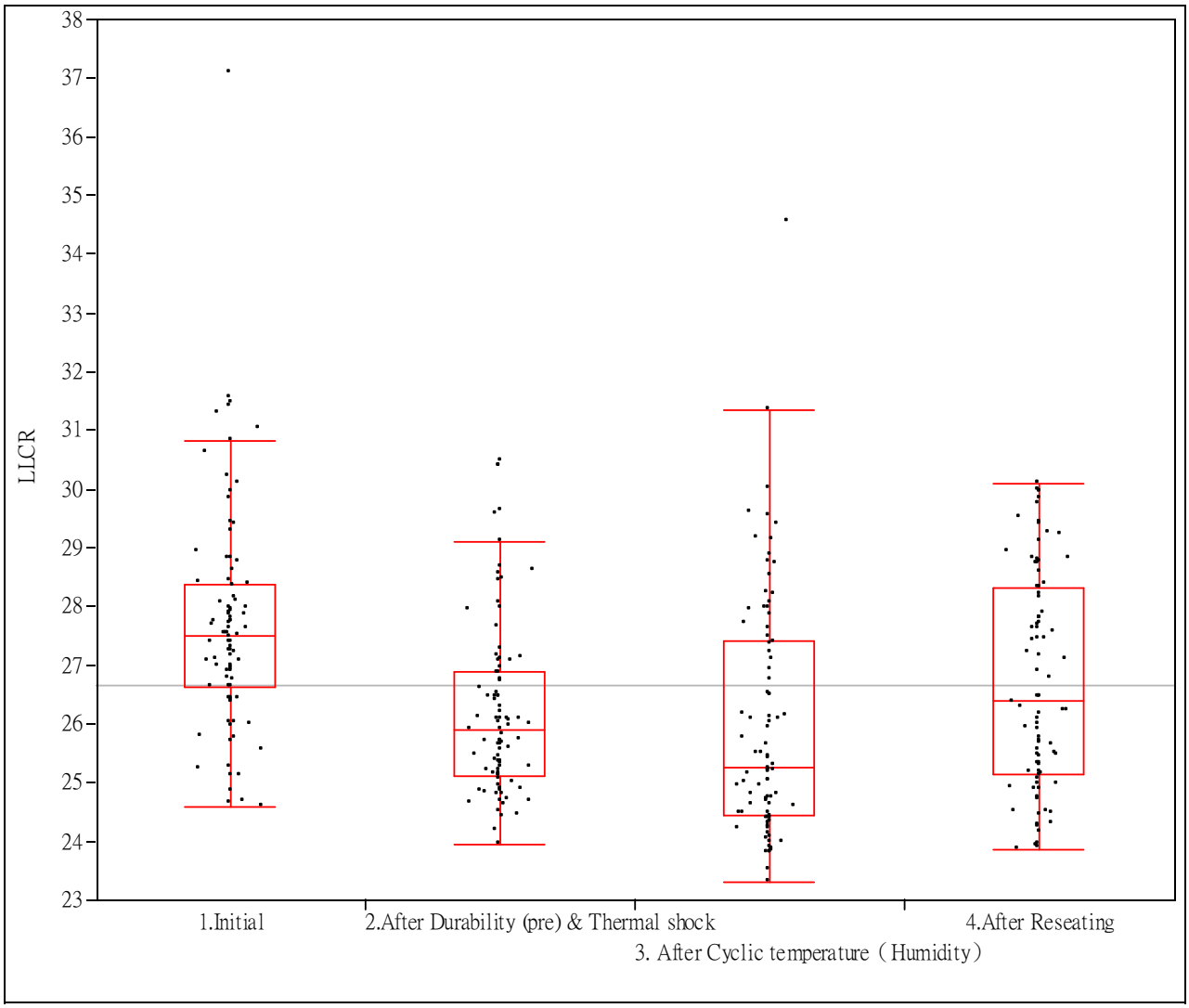
Group A:



PRODUCT RELIABILITY TEST REPORT

Report No. GL-SZ20141211-01 **GL-P-027-005**

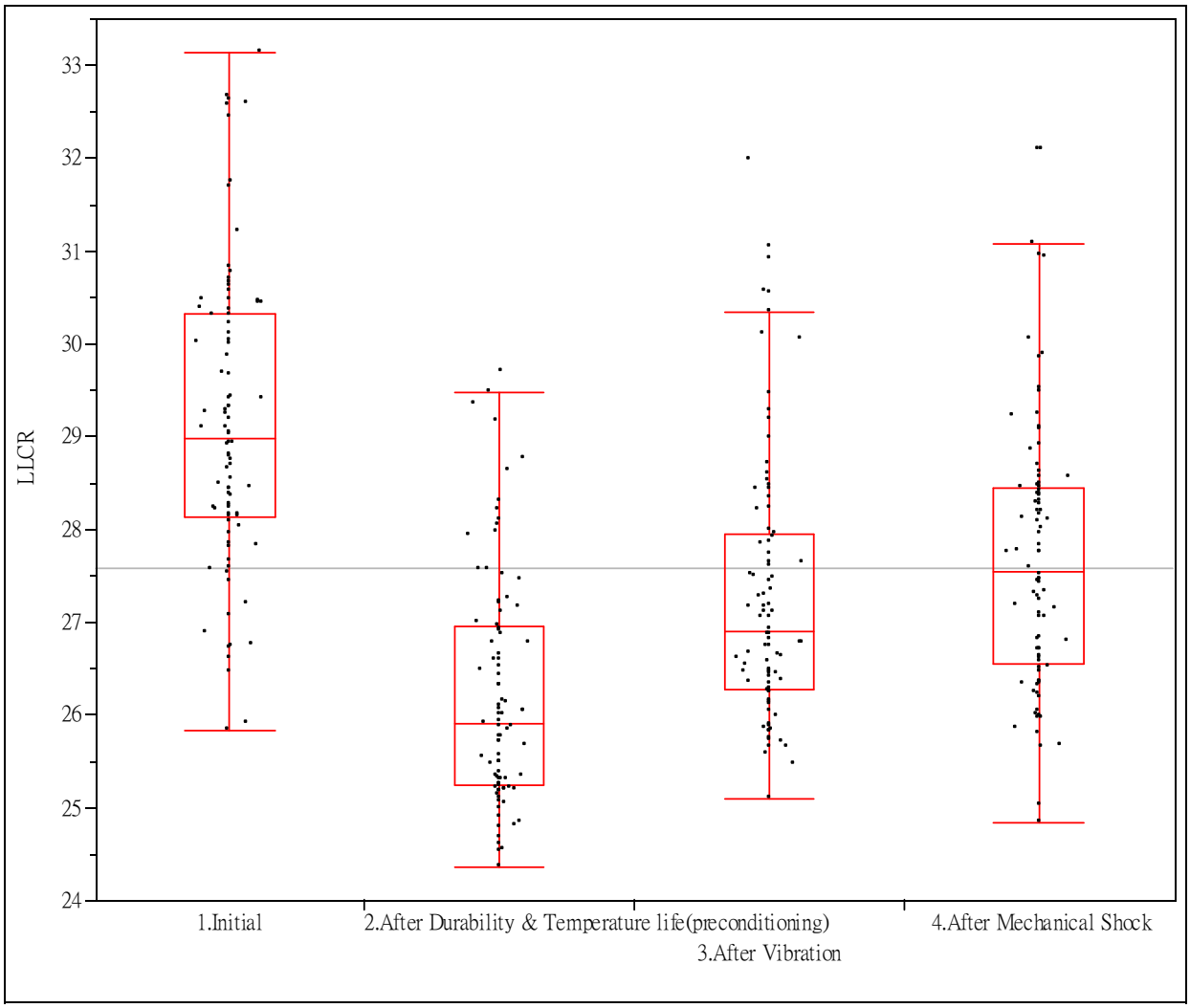
Group B:



PRODUCT RELIABILITY TEST REPORT

Report No. GL-SZ20141211-01 **GL-P-027-005**

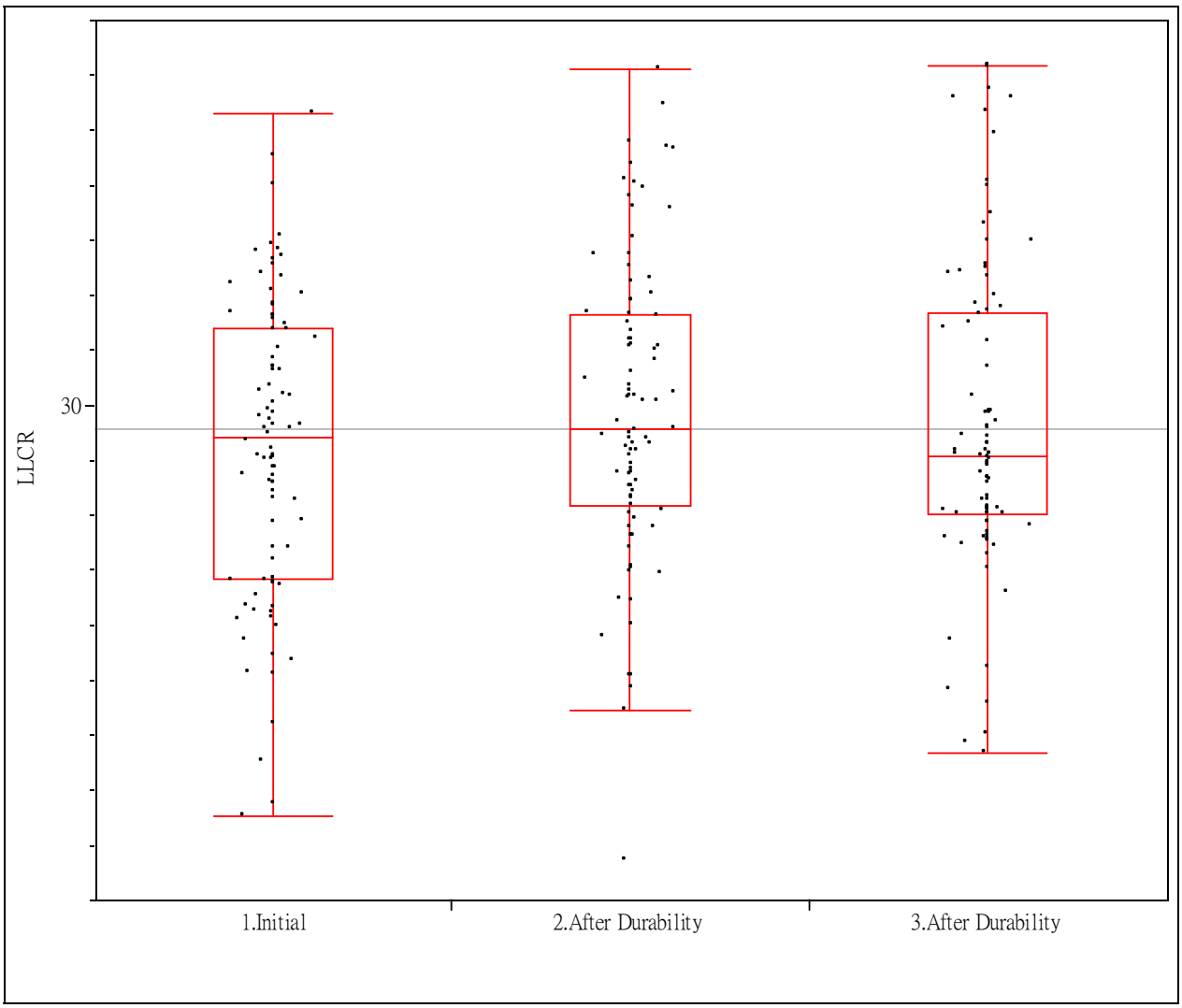
Group C:



PRODUCT RELIABILITY TEST REPORT

Report No. GL-SZ20141211-01 **GL-P-027-005**

Group D:



5. The LLCR data as follow：(Unit: mΩ)

Sumitomo Chemical Co.,Ltd.
IT-Related Chemicals Research Laboratory

Properties of Sumikasuper LCP SV6808THF

		ASTM	Unit	SV6808THF
Specific gravity		D792		1.72
Mold shrinkage rate	MD	Sumitomo chemical method	%	0.22
	TD		%	0.91
Tensile		Strength	D638	100MPa
		Elongation		4.30%
Flexural	Strength	D790	MPa	127
	Modulus		GPa	9.3
Izod impact strength	D256	J/m		590
TDUL 1.82MPa		D648	Degree C	270

1. The tool of 64mmX64mmX3mmt was used.
2. The highest temperature at which the test piece does not deform after immersing in a solder bath for 60 seconds.

* The above physical properties data are just for reference, and are not intended for any warranty or guaranty on the materials stated in this brochure.

- End of document -

Component - Plastics **E249884**

SUMITOMO CHEMICAL CO LTD

ELECTRONIC MATERIALS DIV, TOKYO SUMITOMO TWIN BLDG, 27-1 SHINKAWA 2-CHOME, CHUO-KU TOKYO 104-8260 JP

SV6808THF(r5)

Liquid Crystal Polymer (LCP), "SUMIKASUPER", furnished as pellets

Color	Min Thk (mm)	Flame Class	HWI	HAI	RTI Elec	RTI Imp	RTI Str
NC, BK	0.3	V-0	-	-	130	130	130
	3.0	V-0	-	-	130	130	130

Comparative Tracking Index (CTI): -
Inclined Plane Tracking (IPT): -
Dielectric Strength (kV/mm): -
Volume Resistivity (10^X ohm-cm) : -
High-Voltage Arc Tracking Rate (HVTR): -
High Volt, Low Current Arc Resis (D495): -
Dimensional Stability (%): -

(r5) - Virgin and regrind material up to 70% by weight have the same V-0 flammability characteristics. No other properties have been evaluated for 25% - 70% regrind.

ANSI/UL 94 small-scale test data does not pertain to building materials, furnishings and related contents. ANSI/UL 94 small-scale test data is intended solely for determining the flammability of plastic materials used in the components and parts of end-product devices and appliances, where the acceptability of the combination is determined by UL.

Report Date: 2012-12-26
Last Revised: 2012-12-27

IEC and ISO Test Methods

Test Name	Test Method	Units	Thickness Tested (mm)	Value
Flammability	IEC 60695-11-10	Class (color)	0.3	V-0 (NC, BK)
			3.0	V-0 (NC, BK)
Glow-Wire Flammability (GWFI)	IEC 60695-2-12	C	-	-
Glow-Wire Ignition (GWIT)	IEC 60695-2-13	C	-	-
IEC Comparative Tracking Index	IEC 60112	Volts (Max)	-	-
IEC Ball Pressure	IEC 60695-10-2	C	-	-
ISO Heat Deflection (1.80 MPa)	ISO 75-2	C	-	-
ISO Tensile Strength	ISO 527-2	MPa	-	-
ISO Flexural Strength	ISO 178	MPa	-	-
ISO Tensile Impact	ISO 8256	kJ/m^2	-	-
ISO Izod Impact	ISO 180	kJ/m^2	-	-
ISO Charpy Impact	ISO 179-2	kJ/m^2	-	-

SHANGHAI YIKANG CHEMICALS&INDUSTRIES CO.,LTD

RM2501-2502 ZHONGYINHUILONG BUILDING,#8 SUZHOU AVENUE WEST,SSZHOU INDUSTRIAL PARK.215021 CHINA

The following sample(s) was/were submitted and identified on behalf of the clients as : Sumitomo LCP SV6808THF BK

SGS Job No. :	SP17-018118 - SH
Model No. :	LCP
Material No. :	SV6808THF BK
Date of Sample Received :	01 Jun 2017
Testing Period :	01 Jun 2017 - 03 Jun 2017
Test Requested :	Selected test(s) as requested by client.
Test Method :	Please refer to next page(s).
Test Results :	Please refer to next page(s).
Conclusion :	Based on the performed tests on submitted sample(s), the results of Cadmium, Lead, Mercury, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs) and Phthalates such as Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP) comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

Signed for and on behalf of
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

Marry Ma
Approved Signatory

3rd Building,No.889 Yishan Road Xuhui District,Shanghai China 200233 t E&E (86-21) 61402553 f E&E (86-21)64953679 www.sgsgroup.com.cn
中国·上海·徐汇区宜山路889号3号楼 邮编: 200233 t HL (86-21) 61402594 f HL (86-21)61156899 e sgs.china@sgs.com

Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	SHA17-112561.001	Black solid pellet

Remarks :

(1) 1 mg/kg = 0.0001%

(2) MDL = Method Detection Limit

(3) ND = Not Detected (< MDL)

(4) "-" = Not Regulated

RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU

Test Method : (1) With reference to IEC 62321-5:2013, determination of Cadmium by ICP-OES.
(2) With reference to IEC 62321-5:2013, determination of Lead by ICP-OES.
(3) With reference to IEC 62321-4:2013, determination of Mercury by ICP-OES.
(4) With reference to IEC 62321-7-2:2017, determination of Hexavalent Chromium by Colorimetric Method using UV-Vis and/or with reference to IEC 62321-5:2013, determination of Chromium by ICP-OES.
(5) With reference to IEC 62321-6:2015, determination of PBBs and PBDEs by GC-MS.
(6) With reference to IEC 62321-8:2017, determination of phthalates by GC-MS.

Test Item(s)	Limit	Unit	MDL	*001*
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1000	mg/kg	2	ND
Mercury (Hg)	1000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))	1000	mg/kg	8	ND
Sum of PBBs	1000	mg/kg	-	ND
Monobromobiphenyl	-	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	-	mg/kg	5	ND
Tetrabromobiphenyl	-	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl	-	mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl	-	mg/kg	5	ND

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. Testing Center-Chemical Laboratory
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Test Item(s)	Limit	Unit	MDL	*001*
Sum of PBDEs	1000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND
Dibromodiphenyl ether	-	mg/kg	5	ND
Tribromodiphenyl ether	-	mg/kg	5	ND
Tetrabromodiphenyl ether	-	mg/kg	5	ND
Pentabromodiphenyl ether	-	mg/kg	5	ND
Hexabromodiphenyl ether	-	mg/kg	5	ND
Heptabromodiphenyl ether	-	mg/kg	5	ND
Octabromodiphenyl ether	-	mg/kg	5	ND
Nonabromodiphenyl ether	-	mg/kg	5	ND
Decabromodiphenyl ether	-	mg/kg	5	ND
Di-butyl Phthalate (DBP)	1000	mg/kg	50	ND
Benzyl Butyl Phthalate (BBP)	1000	mg/kg	50	ND
Di-2-Ethyl Hexyl Phthalate (DEHP)	1000	mg/kg	50	ND
Diisobutyl Phthalates (DIBP)	1000	mg/kg	50	ND

Notes :

(1) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.
IEC 62321 series is equivalent to EN 62321 series
http://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101::::FSP_ORG_ID,FSP_LANG_ID:1258637,25

(2) The result of Hexavalent Chromium (Cr(VI)) is deemed to be "ND" since the result of total chromium content is "ND", so testing of Hexavalent Chromium (Cr(VI)) is not required.

(3) If the Chromium (Cr) content is greater than the MDL of Hexavalent Chromium (Cr(VI)), confirmation test of Hexavalent Chromium (Cr(VI)) is required.

(4) On 4 June 2015, Commission Directive (EU) 2015/863 was published in the Official Journal of the European Union (OJEU) to include the phthalates BBP, DBP, DEHP and DIBP into ANNEX II of the Rohs Recast Directive. The new law restricts each phthalate to no more than 0.1% in each homogeneous material of an electrical product.

(5) The restriction of DEHP, BBP, DBP and DIBP shall apply to medical devices, including in vitro medical devices, and monitoring and control instruments, including industrial monitoring and control instruments, from 22 July 2021.

(6) The restriction of DEHP, BBP, DBP and DIBP shall not apply to cables or spare parts for the repair, the reuse, the updating of functionalities or upgrading of capacity of EEE placed on the market before 22 July 2019, and of medical devices, including in vitro medical devices, and monitoring and control instruments, including industrial monitoring and control instruments, placed on the market before 22 July 2021.

(7) The restriction of DEHP, BBP and DBP shall not apply to toys which are already subject to the restriction of DEHP, BBP and DBP through entry 51 of Annex XVII to Regulation (EC) No 1907/2006.

Halogen

Test Method : With reference to EN 14582: 2007, analysis was performed by Ion Chromatograph (IC).

Test Item(s)	Unit	MDL	*001*
Fluorine (F)	mg/kg	50	307
Chlorine (Cl)	mg/kg	50	ND
Bromine (Br)	mg/kg	50	ND
Iodine (I)	mg/kg	50	ND

Remark:
The test results are taken from report SHAEC1711256101.

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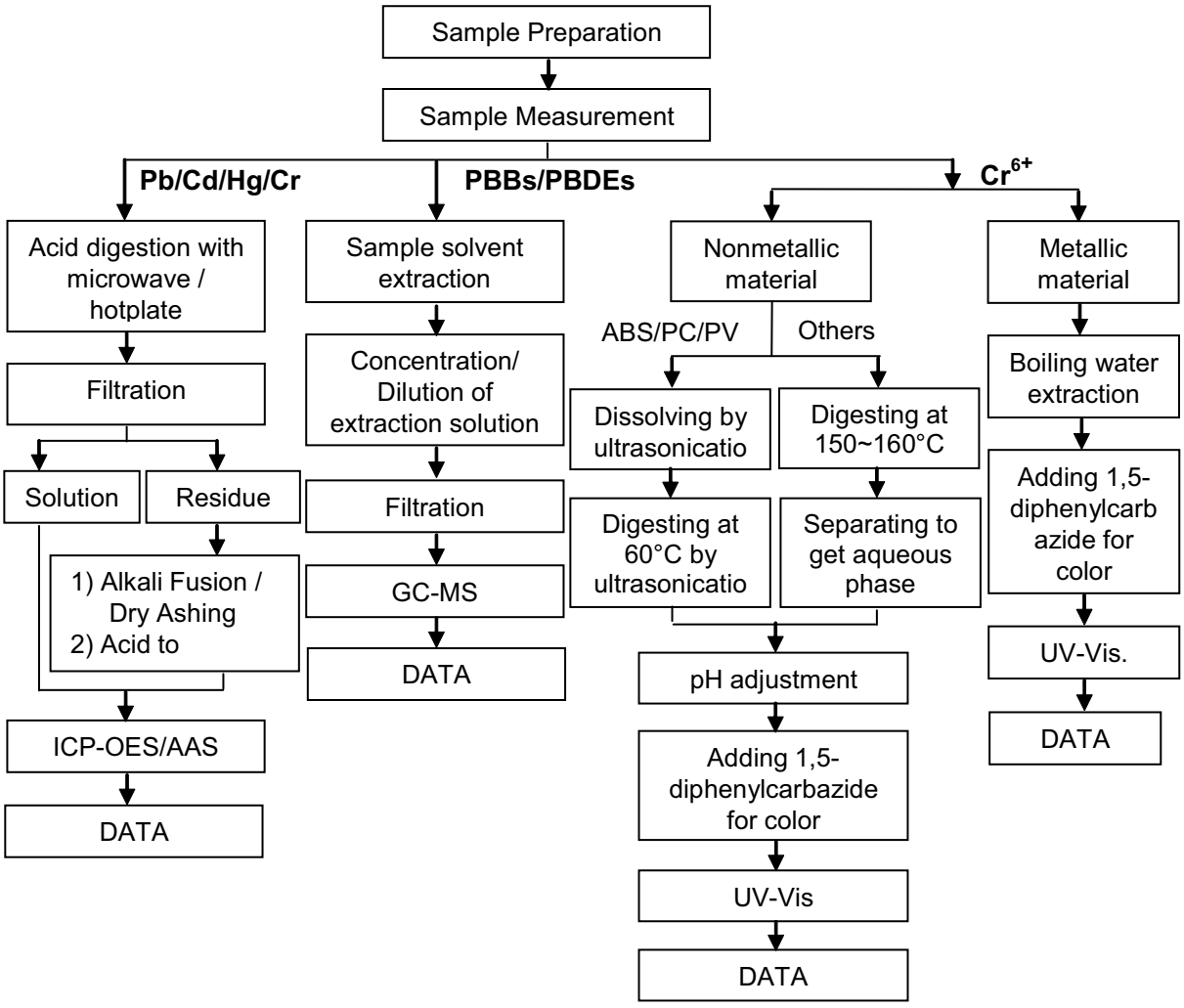
ATTACHMENTS

RoHS Testing Flow Chart

1) Name of the person who made testing: Meria Jin/Gary Xu/Sean Li/Sielina Song
2) Name of the person in charge of testing: Jan Shi/Jessy Huang/Luna Xu/Shara Wang
3) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr^{6+} and PBBs/PBDEs test method excluded)



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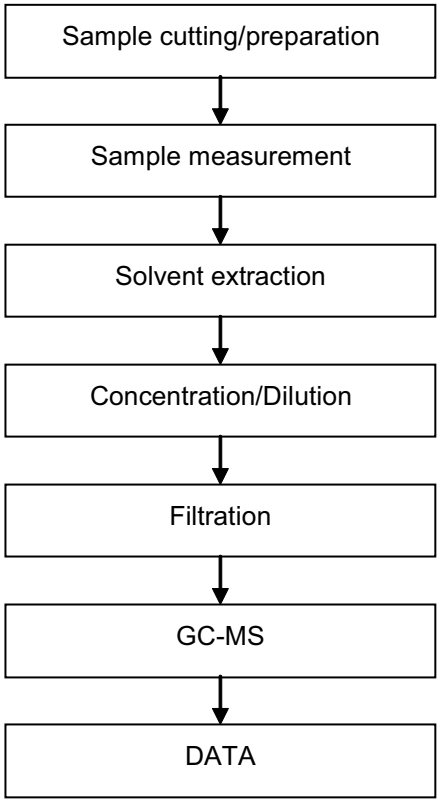
ATTACHMENTS

Phthalates Testing Flow Chart

1) Name of the person who made testing: Sherlock Gao
2) Name of the person in charge of testing: Jessy Huang



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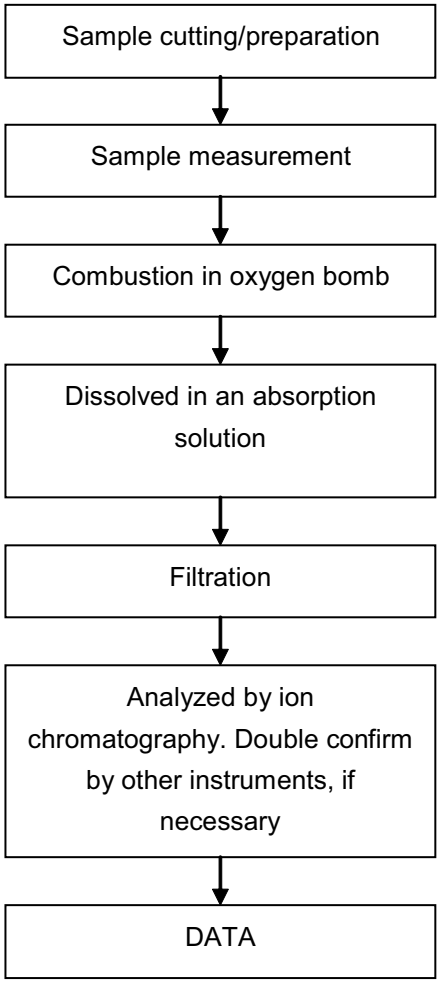
ATTACHMENTS

Halogen Testing (oxygen bomb) Flow Chart

1) Name of the person who made testing: Kevin Xu
2) Name of the person in charge of testing: Sisily Yin



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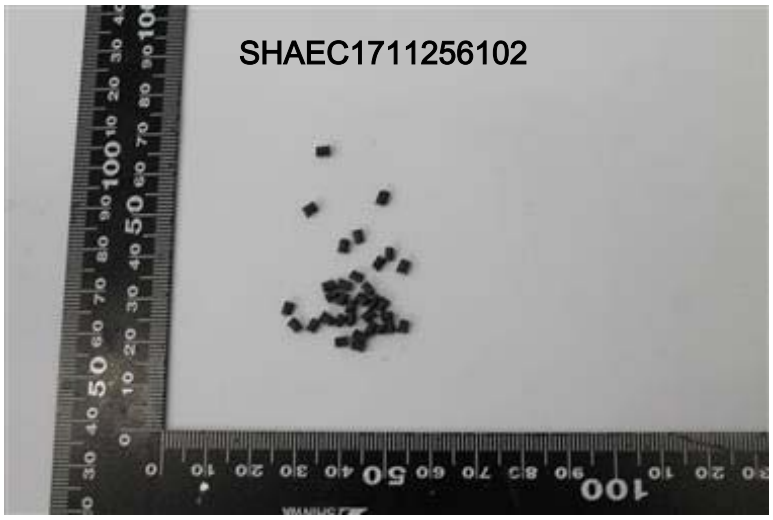
Sample photo:



SHA17-112561.001

SGS authenticate the photo on original report only

*** End of Report ***

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INSPECTION CERTIFICATE according to EN10204 3.1

Our Reference:	**Certificate No:**	**Date:**
Shipping Zutphen	13 05453	19-09-2013

Customer:
AURUBIS AHE MATERIAL D.C.
(Shanghai) Co.Ltd.Section A
1th Fl. No.211 Fute Road
Waigaoqiao Free Trade Zone
200131 SHANGHAI China.

Description:	BRSTRP 305 X 0.15 MM	**Order No:**	378759 / 1
Order No/Ref:	PO000366B	**Alloy - Temper:**	1065 - 95
Mark:		**Norm Specification:**	
Part No:		**Our part no:**	768719
		Net weight:	911 kg

CHEMICAL COMPOSITION

	Coil	Cu min/max	Zn min/max
Specified values:		64,5 / 66,5	33,5 / 35,5
Actual values:	**214524**	65,7 / 66,0	Remainder

DIMENSIONAL REQUIREMENTS

	Coil	Thickness min/max mm	x	s	n	Width min/max mm
Specified values:		0,143 / 0,157				304,85 / 305,15
Actual values:	**214524**	0,147 / 0,154	0,149	0,0013	794	304,98 / 304,98

MECHANICAL PROPERTIES

	Coil	Hardness (Vickers) min/max	Tensile strength N/mm2 min/max
Specified values:		180 / 210	565 / 635
Actual values:	**214524**	194 / 195	635 / 635

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AURUBIS NETHERLANDS B.V.
Oostzeestraat 1, P.O. Box 2, 7200 AA Zutphen, The Netherlands
Tel. +31 575 594 594, Fax +31 575 512 171
K.v.K. Apeldoorn 52930610, VAT NL850670676B01

Test Report

Report No. ECL01J012504001

Applicant AURUBIS METAL PRODUCTS (SHANGHAI) CO.,LTD
Address PART A,1F,NO.211,FUTE RD(N),WAIGAOQIAO FREE TRADE ZONE,SHANGHAI,200131

The following sample(s) and sample information was/were submitted and identified by/on the behalf of the client

Sample Name	Brass Strip
Part No.	SM1065
Color	Yellow
Material	Brass
Supplier	Aurubis Netherlands BV
Buyer	LOTES Suzhou CO.,LTD
Sample Received Date	Mar. 9, 2017
Testing Period	Mar. 9, 2017 to Mar. 13, 2017

Test Requested As specified by client, to test Lead (Pb), Cadmium (Cd), Mercury (Hg), Hexavalent Chromium(Cr(VI)), Polybrominated Biphenyls(PBBs) , Polybrominated Diphenyl Ethers(PBDEs) in the submitted sample(s).

Test Method Please refer to the following page(s).

Test Result(s) Please refer to the following page(s).

****

Conclusion

Tested Sample	According to directive	Result
Submitted Sample	2011/65/EU	Pass

****

Pass means that the results shown on the report comply with the limits set by RoHS Directive 2011/65/EU.

Tested by

Approved by Su Hongwei

Su Hongwei
Senior Laboratory Manager

Reviewed by Taoying

Date Mar. 13, 2017

No. T172793908

Test Report

Test Method

Test Item(s)	Test Method	Measured Equipment(s)
Lead (Pb)	IEC 62321-5:2013 Ed.1.0	ICP-OES
Cadmium (Cd)	IEC 62321-5:2013 Ed.1.0	ICP-OES
Mercury (Hg)	IEC 62321-4:2013 Ed.1.0	ICP-OES
Hexavalent Chromium(Cr(VI))	IEC 62321-7-1:2015	UV-Vis
Polybrominated Biphenyls(PBBs)	IEC 62321-6:2015	GC-MS
Polybrominated Diphenyl Ethers(PBDEs)	IEC 62321-6:2015	GC-MS

Test Result(s)

Tested Item(s)	**Result**	**MDL**	**Limit of Directive 2011/65/EU**
Lead (Pb)	19 mg/kg	2 mg/kg	1000 mg/kg
Cadmium (Cd)	N.D.	2 mg/kg	100 mg/kg
Mercury (Hg)	N.D.	2 mg/kg	1000 mg/kg
Hexavalent Chromium(Cr(VI))	N.D. ▼	0.10 μg/cm²(LOQ)	1000 mg/kg

Tested Item(s)	**Result**	**MDL**	**Limit of Directive 2011/65/EU**
Polybrominated Biphenyls(PBBs)			
Monobromobiphenyl	N.D.	5 mg/kg	1000 mg/kg
Dibromobiphenyl	N.D.	5 mg/kg	
Tribromobiphenyl	N.D.	5 mg/kg	
Tetrabromobiphenyl	N.D.	5 mg/kg	
Pentabromobiphenyl	N.D.	5 mg/kg	
Hexabromobiphenyl	N.D.	5 mg/kg	
Heptabromobiphenyl	N.D.	5 mg/kg	
Octabromobiphenyl	N.D.	5 mg/kg	
Nonabromobiphenyl	N.D.	5 mg/kg	
Decabromobiphenyl	N.D.	5 mg/kg	

Test Report

Tested Item(s)	Result	MDL	Limit of Directive 2011/65/EU
Polybrominated Diphenyl Ethers(PBDEs)			
Monobromodiphenyl ether	N.D.	5 mg/kg	1000 mg/kg
Dibromodiphenyl ether	N.D.	5 mg/kg	
Tribromodiphenyl ether	N.D.	5 mg/kg	
Tetrabromodiphenyl ether	N.D.	5 mg/kg	
Pentabromodiphenyl ether	N.D.	5 mg/kg	
Hexabromodiphenyl ether	N.D.	5 mg/kg	
Heptabromodiphenyl ether	N.D.	5 mg/kg	
Octabromodiphenyl ether	N.D.	5 mg/kg	
Nonabromodiphenyl ether	N.D.	5 mg/kg	
Decabromodiphenyl ether	N.D.	5 mg/kg	

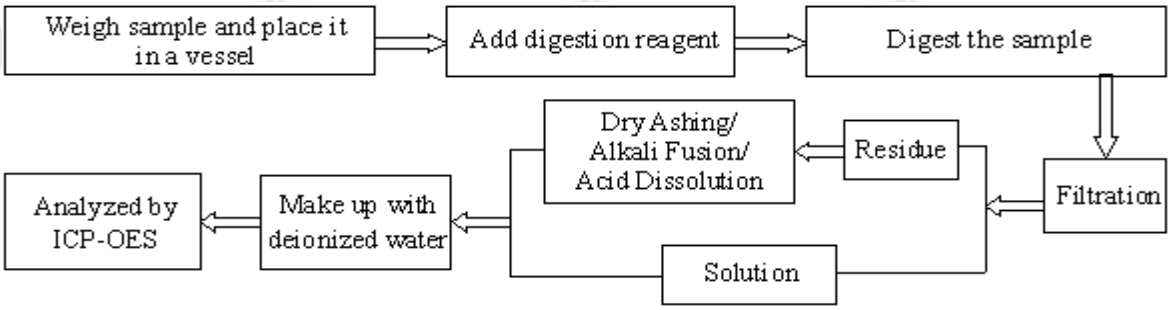
Tested Sample/Part Description Golden metal

Remark: **The sample(s) had been dissolved totally tested for Lead, Cadmium, Mercury.**
-MDL = Method Detection Limit
-N.D. = Not Detected (<MDL or LOQ)
-mg/kg = ppm = parts per million
-LOQ = Limit of Quantification, The LOQ of Hexavalent chromium is 0.10 μg/cm²
-▼The sample is negative for Cr(VI) − The Cr(VI) concentration is below 0.10 μg/cm².
The coating is considered a non-Cr(VI) based coating.

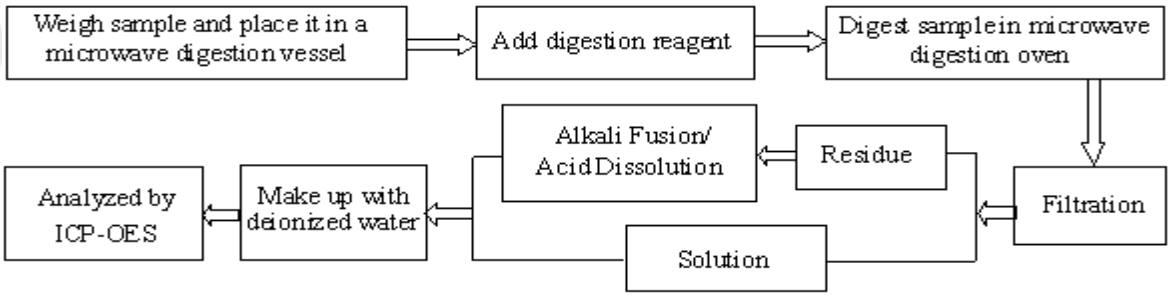
Test Report

Test Process

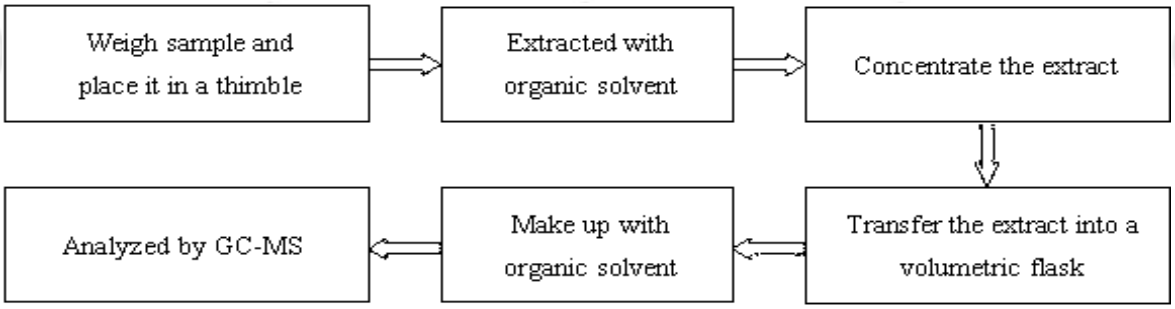
1. Lead (Pb), Cadmium (Cd)



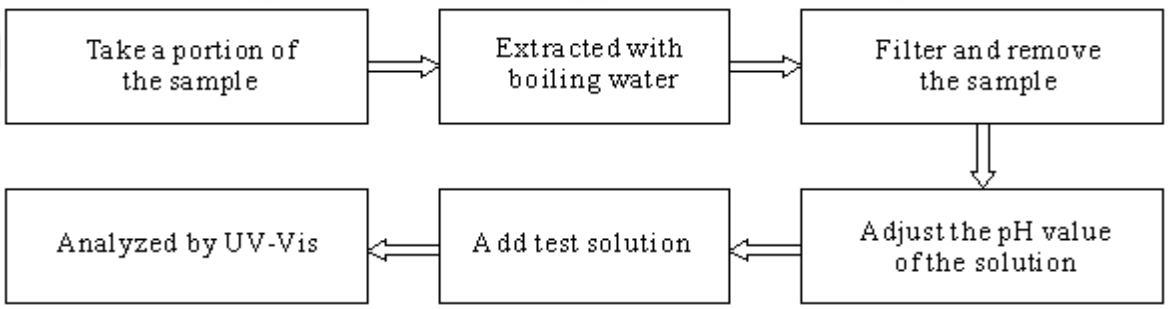
2. Mercury (Hg)



3. Polybrominated Biphenyls(PBBs) , Polybrominated Diphenyl Ethers(PBDEs)

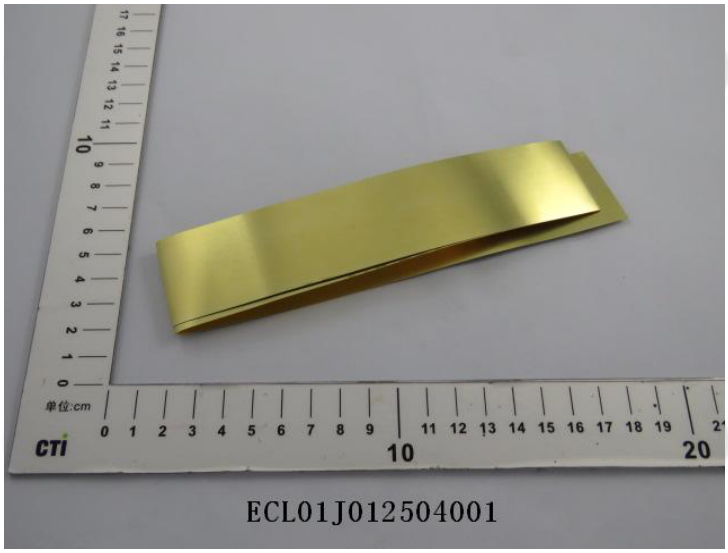


4. Hexavalent Chromium(Cr(VI))



Test Report

Photo(s) of the sample(s)



*** End of report ***

材 質 證 明 書

昆山瑞华达精密电子材料有限公司

Kunshan Ruihuada Precision Electronic Material Co., Ltd.

MATERIAL CERTIFICATE

昆山市张浦镇振新西路 300 号

TEL：0512-57299581 FAX：0512-36603722

製造編號	得意	生產編號 Customer No	20110830001	開立日期 Issue Date	2011-8-30	證明書編號 Certificate No	20110830001
鋼種名稱	S50C	訂單編號 Order No		依據規範 By Standard	JIS		

專案 Item	鋼卷編號 Coil No	厚度（MM） Thickness	寬度（MM） Width	長度（MM） Length	數量 Quantity	重量 （KG） Weight	成品表面加工 Surface Finish
1		0.2	13	COIL	1C	样品	
2				COIL			
3				COIL			
4				COIL			
5				COIL			

規格 Spec	化學（Chemical Analysis Wtx%）									規格 Spec / 試片編號 Specimen	硬度 Hardness	降伏強度 (N/mm²) Yieldstress	引張強度 (N/mm²) Tensile Stress	伸長率（%） Elongation	彎曲試驗 BendTest
Spec	C	Si	Mn	P	S	Ni	Cr	Mo	N						
專案 Item	0.47 0.53	0.15 0.35	0.60 0.90	0.030 max.	0.035 max.						HV	min	min	min	min
1	0.48	0.25	0.74	0.022	0.003					20110830001	155	375	630	14	OK
2															
3															
4															
5															

以上所列出的典型資料，僅供參考，並不代表技術資料的最大或最小值，也不用於最終設計。任一具體材料的資料可能與此表中所列出的資料有所不同。

Data shown are typical,For reference only,and should not be construed as maximum or minimum values for specification or for final .Data on any particular piece of material may vary from those shown heren.

如有異常，請於三天內回復。

Only discrepancy pls contact us within3day`s.

技術部經理

Mamger Technology Department

KUNSHAN RUIHUADA PRECISION ELECTRONIC MATERIAL CO.,LTD

NO.889, WEST ZHENXIN ROAD, ZHANGPU TOWN, KUNSHAN CITY

The following sample(s) was/were submitted and identified on behalf of the clients as : Carbon Steel S50C

SGS Job No. :	SP17-023598 - SH
Model No. :	S50C
Date of Sample Received :	03 Jul 2017
Testing Period :	03 Jul 2017 - 05 Jul 2017
Test Requested :	Selected test(s) as requested by client.
Test Method :	Please refer to next page(s).
Test Results :	Please refer to next page(s).
Conclusion :	Based on the performed tests on submitted sample(s), the results of Lead, Mercury, Cadmium, Hexavalent chromium comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

Signed for and on behalf of
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

Marry Ma
Approved Signatory

3rd Building,No.889 Yishan Road Xuhui District,Shanghai China 200233 t E&E (86-21) 61402553 f E&E (86-21)64953679 www.sgsgroup.com.cn
中国·上海·徐汇区宜山路889号3号楼 邮编: 200233 t HL (86-21) 61402594 f HL (86-21)61156899 e sgs.china@sgs.com

Test Results :

Test Part Description :

[redacted]	[redacted]	[redacted]
SN1	SHA17-141149.003	Silvery metal plate

Remarks :

(1) 1 mg/kg = 0.0001%

(2) MDL = Method Detection Limit

(3) ND = Not Detected (< MDL)

(4) "-" = Not Regulated

[redacted]

Test Method : (1) With reference to IEC 62321-5:2013, determination of Cadmium by ICP-OES.
(2) With reference to IEC 62321-5:2013, determination of Lead by AAS.
(3) With reference to IEC 62321-4:2013, determination of Mercury by ICP-OES.
(4)With reference to IEC 62321-7-1:2015 , determination of Hexavalent Chromium by Colorimetric Method using UV-Vis.

Test Item(s)	Limit	Unit	MDL	*003*
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1000	mg/kg	2	ND
Mercury (Hg)	1000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))▾	-	µg/cm²	0.10	ND

Notes :

(1) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.
IEC 62321 series is equivalent to EN 62321 series
http://www.cenelec.eu/dyn/www/f?p=104:30:17422328703511101::::FSP_ORG_ID,FSP_LANG_ID:1258637,25

(2) ▾= a. The sample is positive for CrVI if the CrVI concentration is greater than 0.13 µg/cm². The sample coating is considered to contain CrVI
b. The sample is negative for CrVI if CrVI is ND (concentration less than 0.10 µg/cm²). The coating is considered a non-CrVI based coating
c. The result between 0.10 µg/cm² and 0.13 µg/cm² is considered to be inconclusive - unavoidable coating variations may influence the determination

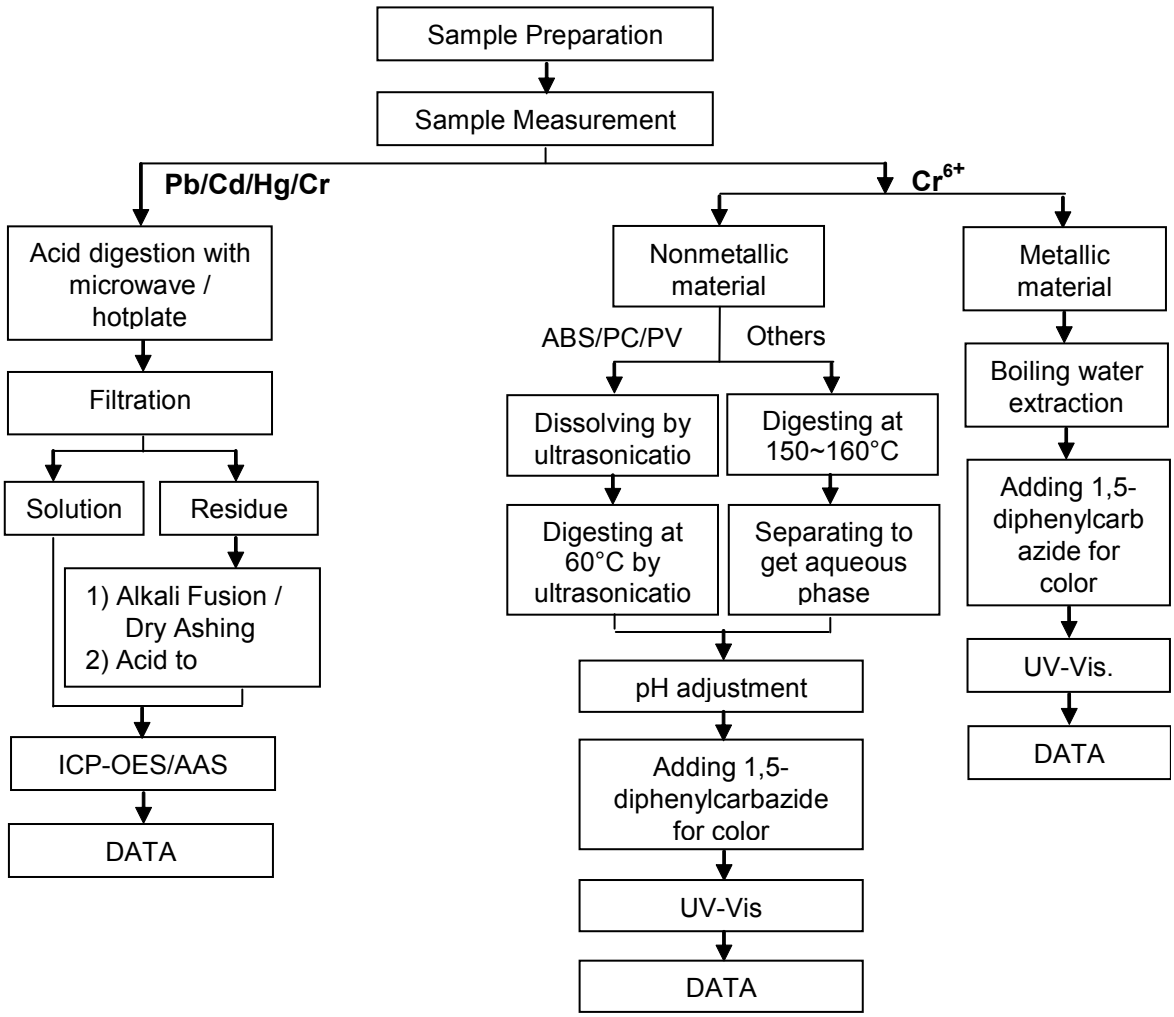
Information on storage conditions and production date of the tested sample is unavailable and thus Cr(VI) results represent status of the sample at the time of testing.

3rd Building,No.889 Yishan Road Xuhui District,Shanghai China 200233 t E&E (86-21) 61402553 f E&E (86-21)64953679 www.sgsgroup.com.cn
中国·上海·徐汇区宜山路889号3号楼 邮编: 200233 t HL (86-21) 61402594 f HL (86-21)61156899 e sgs.china@sgs.com

ATTACHMENTS

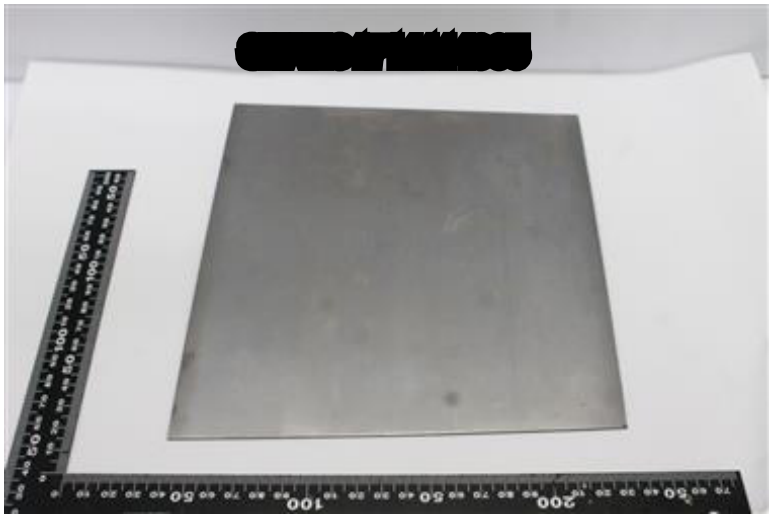
Pb/Cd/Hg/Cr^{6+} Testing Flow Chart

1) Name of the person who made testing: Meria Jin/Gary Xu/Sean Li/Sielina Song
2) Name of the person in charge of testing: Jan Shi/Jessy Huang/Luna Xu/Shara Wang
3) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr^{6+} test method excluded)



3/F,Building,No.889 Yishan Road Xuhui District,Shanghai China 200233 t E&E (86-21) 61402553 f E&E (86-21)64953679 www.sgsgroup.com.cn
中国·上海·徐汇区宜山路889号3号楼 邮编: 200233 t HL (86-21) 61402594 f HL (86-21)61156899 e sgs.china@sgs.com

Sample photo:



SHA17-141149.003

SGS authenticate the photo on original report only

*** End of Report ***

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. Testing Center-Chemical Laboratory
3/F Building,No.889 Yishan Road Xuhui District,Shanghai China 200233 t E&E (86-21) 61402553 f E&E (86-21)64953679 www.sgsgroup.com.cn
中国·上海·徐汇区宜山路889号3号楼 邮编: 200233 t HL (86-21) 61402594 f HL (86-21)61156899 e sgs.china@sgs.com

检测报告
Test Report

报告编号 ECL01I062655002E
Report No. ECL01I062655002E

申请单位 得意精密電子(蘇州)有限公司
Applicant LOTES(SUZHOU) CO.,LTD

地 址 江蘇省蘇州市相城經濟開發區漕湖大道26號
Address NO.26 CAOHU ROAD XIANGCHENG ECONOMIC DEVELOPMENT ZONE,SUZHOU CHINA

以下测试之样品及样品信息由申请者提供并确认
The following sample(s) and sample information was/were submitted and identified by/on the behalf of the client

样品名称 Sample Name	鍍Ni Au
材料名称 Material	C1065
样品接收日期 Sample Received Date	2016.10.24 Oct. 24, 2016
样品检测日期 Testing Period	2016.10.24-2016.10.27 Oct. 24, 2016 to Oct. 27, 2016
检测要求 Test Requested	根据客户要求，对所提交样品中的铅(Pb)，镉(Cd)，汞(Hg)，六价铬(Cr(VI))，全氟辛烷磺酸盐(PFOS)进行测试。 As specified by client, to test Lead (Pb), Cadmium (Cd), Mercury (Hg), Hexavalent Chromium(Cr(VI)), Perfluorooctane Sulfonates(PFOS) in the submitted sample(s).
检测依据/检测结果 Test Method/Test Result(s)	请参见下页。 Please refer to the following page(s).

主 检 Tested by 陈娟娟
审 核 Reviewed by 陶英
批 准 Approved by
日 期 Date 2016.10.27

基红伟
实验室高级经理 Senior Laboratory Manager

No. R264041685

上海华测品标检测技术有限公司
Centre Testing International Pinbiao(Shanghai) Co., Ltd.
上海市浦东新区新金桥路1996号
No.1996,Xinjinqiao Road, Pudong New District,Shanghai,China

检测报告
Test Report

检测依据 Test Method

测试项目 Test Item(s)	测试方法 Test Method	测试仪器 Measured Equipment(s)
铅(Pb) Lead (Pb)	参考IEC 62321-5:2013 Ed.1.0 Refer to IEC 62321-5:2013 Ed.1.0	ICP-OES
镉(Cd) Cadmium (Cd)	参考IEC 62321-5:2013 Ed.1.0 Refer to IEC 62321-5:2013 Ed.1.0	ICP-OES
汞(Hg) Mercury (Hg)	参考IEC 62321-4:2013 Ed.1.0 Refer to IEC 62321-4:2013 Ed.1.0	ICP-OES
六价铬(Cr(VI)) Hexavalent Chromium(Cr(VI))	IEC 62321-7-1:2015	UV-Vis
全氟辛烷磺酸盐(PFOS) Perfluorooctane Sulfonates(PFOS)	参考US EPA 3550C:2007 & US EPA 8321B:2007 Refer to US EPA 3550C:2007 & US EPA 8321B:2007	LC-MS-MS

检测结果 Test Result(s)

测试项目 Test Item(s)	结果 Result	方法检出限 MDL
铅(Pb) Lead (Pb)	60 mg/kg	2 mg/kg
镉(Cd) Cadmium (Cd)	N.D.	2 mg/kg
汞(Hg) Mercury (Hg)	N.D.	2 mg/kg
六价铬(Cr(VI)) Hexavalent Chromium(Cr(VI))	N.D. ▼	0.10 μg/cm2(LOQ)

测试项目 Test Item(s)	结果 Result	方法检出限 MDL
全氟辛烷磺酸盐(PFOS) Perfluorooctane Sulfonates(PFOS)	N.D.	0.5 μg/m²

检测报告
Test Report

测试样品/部位描述 银色镀层
Tested Sample/Part Description Silvery plating

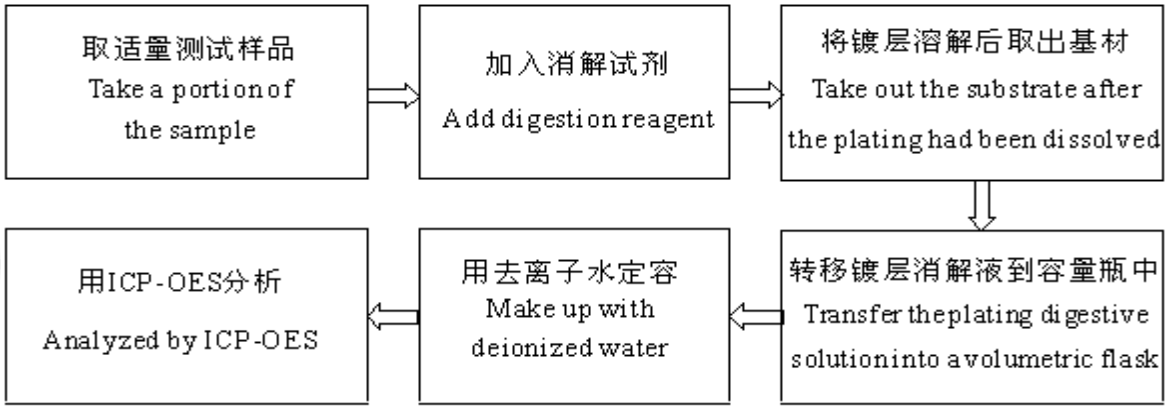
备注: **对于检测铅，镉，汞之样品已完全溶解。**
-N.D. = 未检出（小于方法检出限或定量限）
-mg/kg = ppm = 百万分之一
-LOQ = 定量限，六价铬的定量限为0.10 μg/cm2
-▼六价铬浓度小于0.10 μg/cm2，样品未检出六价铬。

Remark: **The sample(s) had been dissolved totally tested for Lead, Cadmium, Mercury.**
-MDL = Method Detection Limit
-N.D. = Not Detected (<MDL or LOQ)
-mg/kg = ppm = parts per million
-LOQ = Limit of Quantification, The LOQ of Hexavalent chromium is 0.10 μg/cm2
-▼The sample is negative for Cr(VI) − The Cr(VI) concentration is below 0.10 μg/cm2. The coating is considered a non-Cr(VI) based coating.

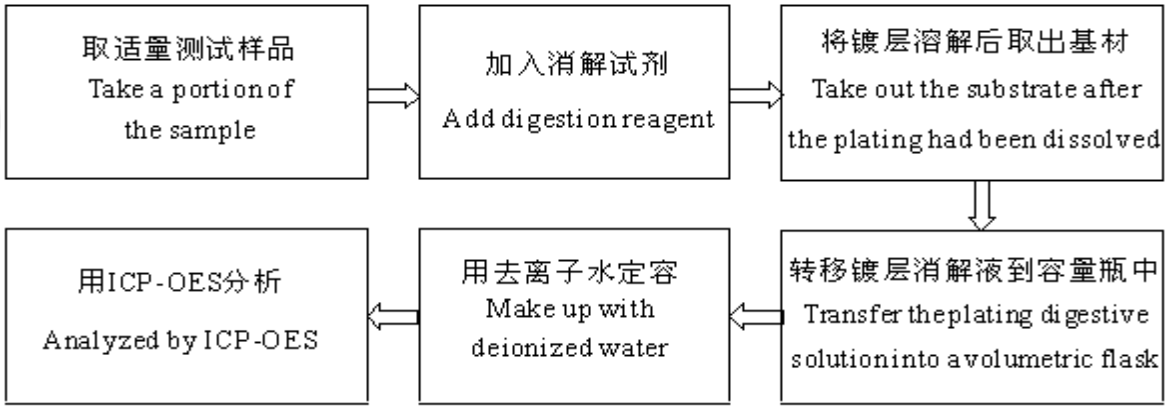
检测报告
Test Report

检测流程 Test Process

1. 铅(Pb)，镉(Cd)
Lead (Pb), Cadmium (Cd)

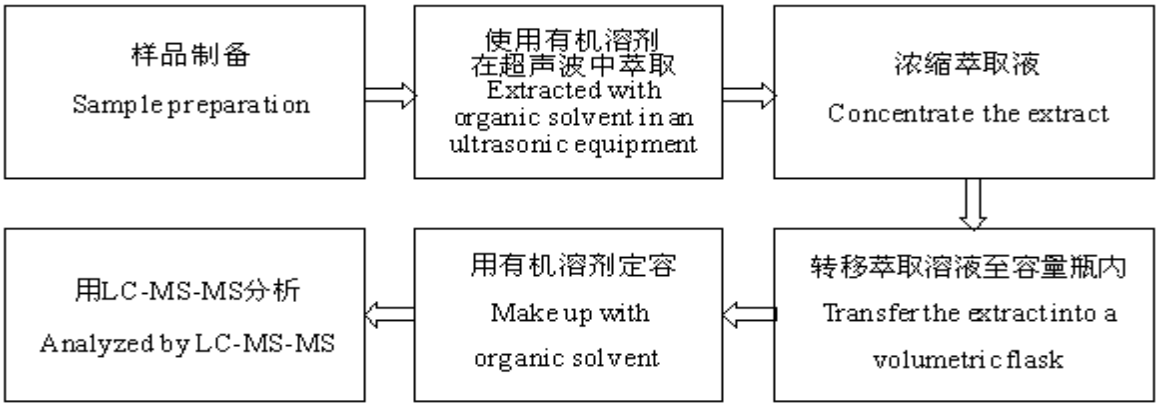


2. 汞(Hg)
Mercury (Hg)

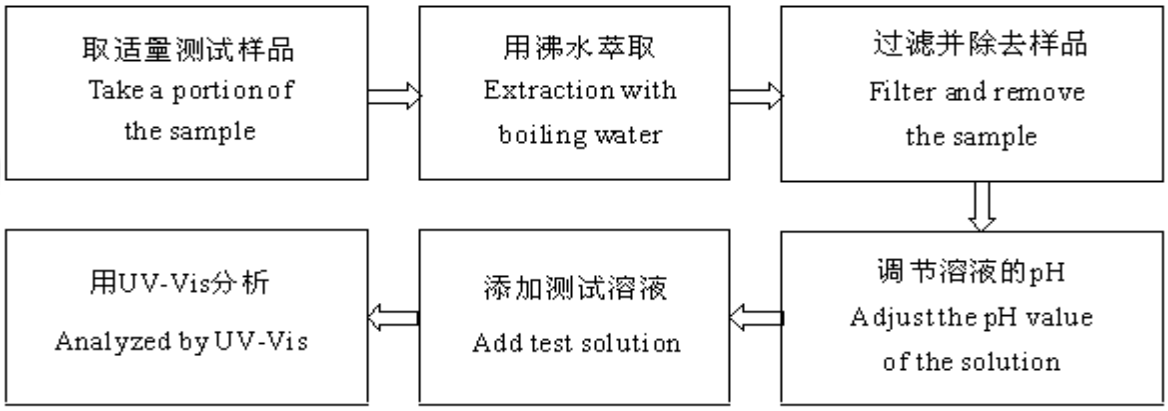


检测报告
Test Report

3. 全氟辛烷磺酸盐(PFOS)
Perfluorooctane Sulfonates(PFOS)

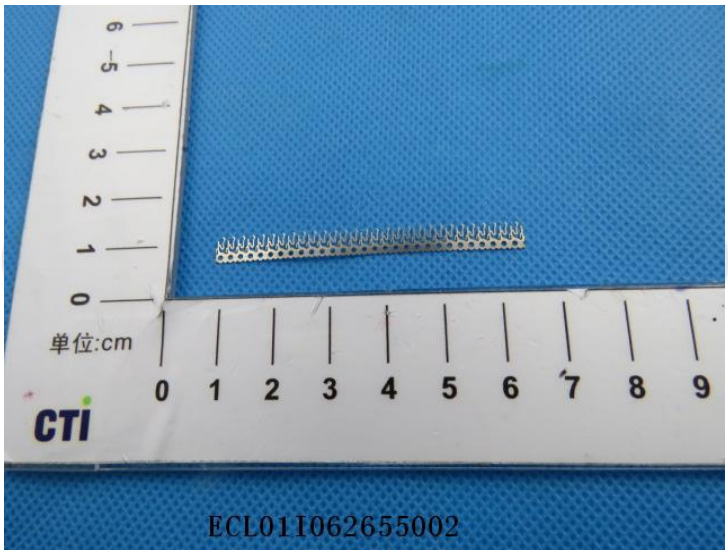


4. 六价铬(Cr(VI))
Hexavalent Chromium(Cr(VI))



检测报告
Test Report

样品图片
Photo(s) of the sample(s)



报告结束
*** End of report ***

检测报告
Test Report

报告编号 ECL01I062655001E
Report No. ECL01I062655001E

申请单位 得意精密電子(蘇州)有限公司
Applicant LOTES(SUZHOU) CO.,LTD

地 址 江蘇省蘇州市相城經濟開發區漕湖大道26號
Address NO.26 CAOHU ROAD XIANGCHENG ECONOMIC DEVELOPMENT ZONE,SUZHOU CHINA

以下测试之样品及样品信息由申请者提供并确认
The following sample(s) and sample information was/were submitted and identified by/on the behalf of the client

样品名称 Sample Name	鍍層Ni Sn
材料名称 Material	S50C
样品接收日期 Sample Received Date	2016.10.24 Oct. 24, 2016
样品检测日期 Testing Period	2016.10.24-2016.10.27 Oct. 24, 2016 to Oct. 27, 2016
检测要求 Test Requested	根据客户要求，对所提交样品中的铅(Pb)，镉(Cd)，汞(Hg)，六价铬(Cr(VI))，全氟辛烷磺酸盐(PFOS)进行测试。 As specified by client, to test Lead (Pb), Cadmium (Cd), Mercury (Hg), Hexavalent Chromium(Cr(VI)), Perfluorooctane Sulfonates(PFOS) in the submitted sample(s).
检测依据/检测结果 Test Method/Test Result(s)	请参见下页。 Please refer to the following page(s).

主 检 Tested by: 陈娟娟
审 核 Reviewed by: 陶英
批 准 Approved by: 苏红伟
日 期 Date: 2016.10.27

实验室高级经理 Senior Laboratory Manager

No. R264041685

上海华测品标检测技术有限公司
Centre Testing International Pinbiao(Shanghai) Co., Ltd.

上海市浦东新区新金桥路1996号
No.1996,Xinjinqiao Road, Pudong New District,Shanghai,China

检测报告
Test Report

检测依据 Test Method

测试项目 Test Item(s)	测试方法 Test Method	测试仪器 Measured Equipment(s)
铅(Pb) Lead (Pb)	参考IEC 62321-5:2013 Ed.1.0 Refer to IEC 62321-5:2013 Ed.1.0	ICP-OES
镉(Cd) Cadmium (Cd)	参考IEC 62321-5:2013 Ed.1.0 Refer to IEC 62321-5:2013 Ed.1.0	ICP-OES
汞(Hg) Mercury (Hg)	参考IEC 62321-4:2013 Ed.1.0 Refer to IEC 62321-4:2013 Ed.1.0	ICP-OES
六价铬(Cr(VI)) Hexavalent Chromium(Cr(VI))	IEC 62321-7-1:2015	UV-Vis
全氟辛烷磺酸盐(PFOS) Perfluorooctane Sulfonates(PFOS)	参考US EPA 3550C:2007 & US EPA 8321B:2007 Refer to US EPA 3550C:2007 & US EPA 8321B:2007	LC-MS-MS

检测结果 Test Result(s)

测试项目 Test Item(s)	结果 Result	方法检出限 MDL
铅(Pb) Lead (Pb)	36 mg/kg	2 mg/kg
镉(Cd) Cadmium (Cd)	N.D.	2 mg/kg
汞(Hg) Mercury (Hg)	N.D.	2 mg/kg
六价铬(Cr(VI)) Hexavalent Chromium(Cr(VI))	N.D. ▼	0.10 μg/cm2(LOQ)

测试项目 Test Item(s)	结果 Result	方法检出限 MDL
全氟辛烷磺酸盐(PFOS) Perfluorooctane Sulfonates(PFOS)	N.D.	0.5 μg/m²

检测报告
Test Report

测试样品/部位描述 银白色镀层
Tested Sample/Part Description Silver-white plating

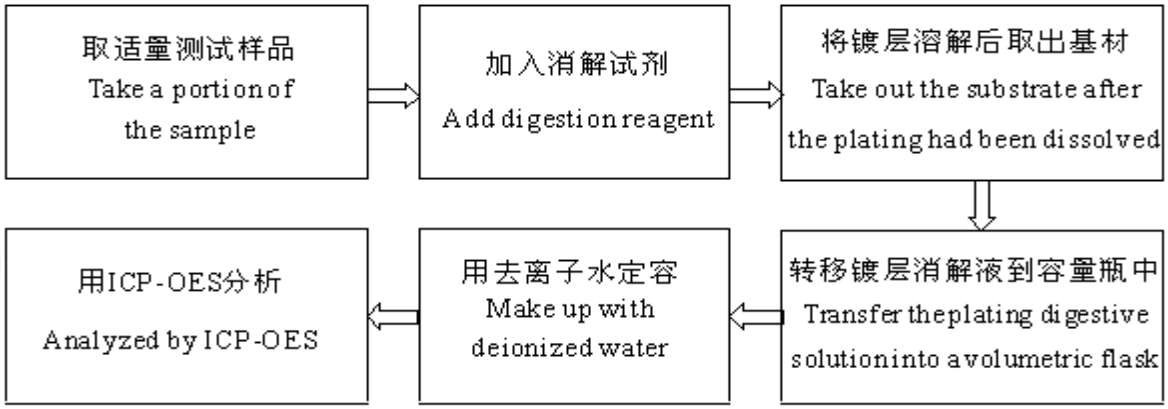
备注: **对于检测铅，镉，汞之样品已完全溶解。**
-N.D. = 未检出（小于方法检出限或定量限）
-mg/kg = ppm = 百万分之一
-LOQ = 定量限，六价铬的定量限为0.10 μg/cm2
-▼六价铬浓度小于0.10 μg/cm2，样品未检出六价铬。

Remark: **The sample(s) had been dissolved totally tested for Lead, Cadmium, Mercury.**
-MDL = Method Detection Limit
-N.D. = Not Detected (<MDL or LOQ)
-mg/kg = ppm = parts per million
-LOQ = Limit of Quantification, The LOQ of Hexavalent chromium is 0.10 μg/cm2
-▼The sample is negative for Cr(VI) − The Cr(VI) concentration is below 0.10 μg/cm2. The coating is considered a non-Cr(VI) based coating.

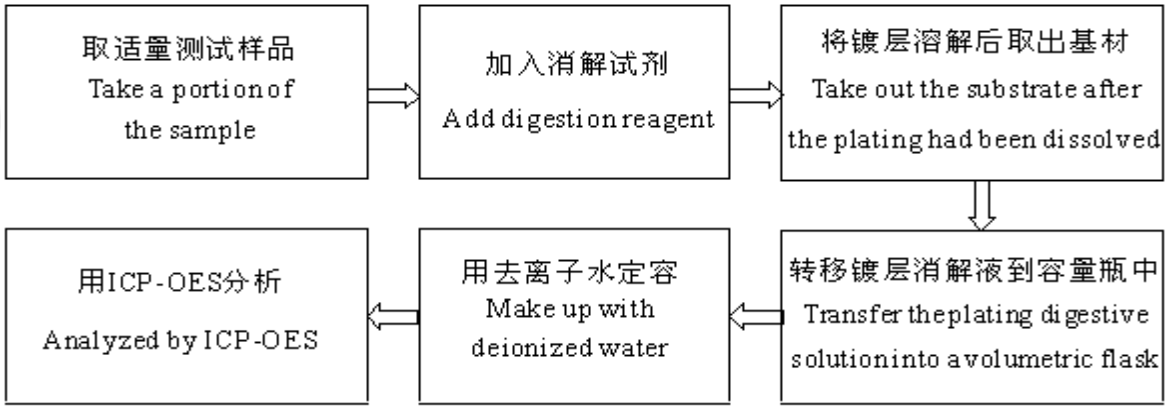
检测报告
Test Report

检测流程 Test Process

1. 铅(Pb)，镉(Cd)
Lead (Pb), Cadmium (Cd)



2. 汞(Hg)
Mercury (Hg)



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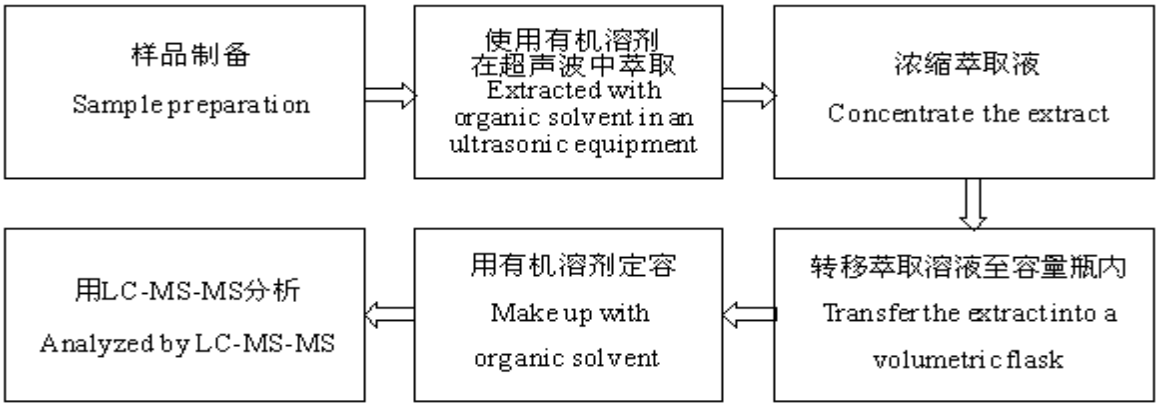
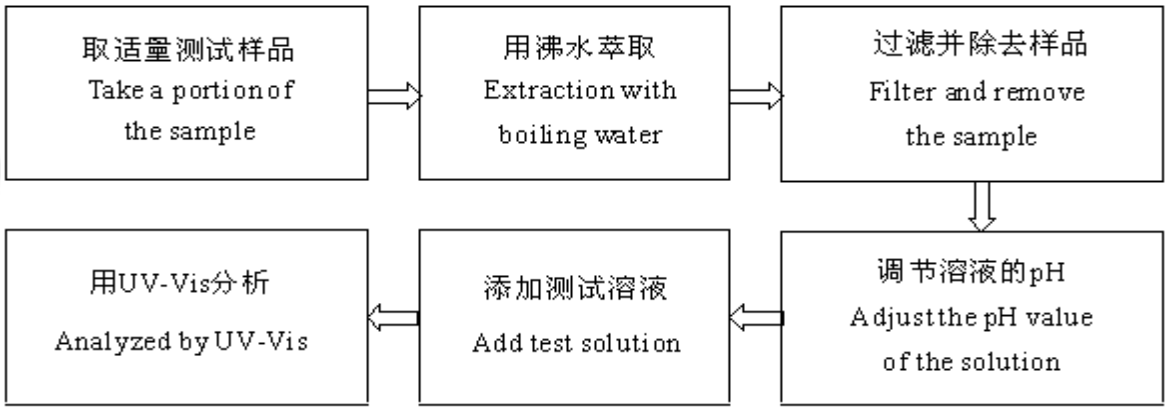
3. 全氟辛烷磺酸盐(PFOS)
Perfluorooctane Sulfonates(PFOS)



4. 六价铬(Cr(VI))
Hexavalent Chromium(Cr(VI))



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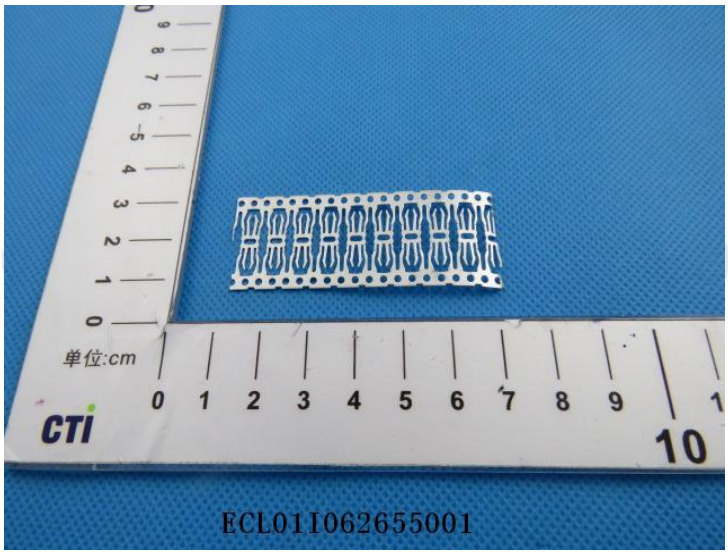
样品图片
Photo(s) of the sample(s)



报告结束
*** End of report ***