Customer Process Change Notification Form PCN-2011-432

Part Information

Cirrus Logic Part # / Quantity

CS4272-CZZR CS8416-DZZR CS8427-CZZR CS4271-DZZR CS8406-CZZR
CS4272-DZZR CS8415A-CZZR CS8427-DZZR CS4360-KZZR CS8406-DZZR
CS8416-CZZR CS8415A-IZZR CS4271-CZZR CS4398-CZZR CS4360-DZZR

PCN Effective Date: 7/4/2011

Lot Effective Date: 7/4/2011

(Contact the sales representative for availability of samples if applicable)

Cirrus P/N Change: ○ Yes ◉ No

If yes, provide new part number:

Package Mark Change: ○ Yes ◉ No

If Yes, briefly explain:

[Any Fab, Assembly, or Design changes results in pack mark changes, please provide detail]

Reason for Change:

- ☐ Design/New Rev
- ☐ Fab Process
- ☐ Assembly Site
- ☐ Additional Assembly Source
- ☐ Fab Site
- ☐ Assembly Process
- ☑ Other (Specify)
- ☐ Additional Fab Source

Carrier Tape and Qty per Reel

Description of Change:

- ☐ Fix Errata
- ☐ Yield Enhancement
- ☐ Fix Known Bug
- ☐ Performance Improvement
- ☑ Other (specify)

28 TSSOP	ANST Current	ANST New
Vendor	Advantek	Kostat
Qty/Reel	2K	4K

Quality and Reliability Impact:

Qualification Data Required? ◉ Yes ○ No

Data Sheet Change Required? ○ **Yes** ◉ **No**

If Yes, briefly explain:

Software Change Required? ○ **Yes** ◉ **No**

If Yes, briefly explain:

Customer Acknowledgement and Agreement

Acknowledged and Agreed as of the Date written below:

Customer Company Name: _____

Customer Contact Name: _____

Title: _____

Signature: _____

Date:

○ Customer Agreed ○ Customer Reject ○ Not Applicable

Customer Comments:

CIRRUS LOGIC	Title: **CUSTOMER PROCESS CHANGE NOTIFICATION FORM**		
	Digitally Signed By: Cirrus Customer Quality Digitally signed by Cirrus Customer Quality DN: cn=Cirrus Customer Quality, c=US, ou=Cirrus - Austin Quality, email=customer_quality@cirrus.com Reason: All signatures on file Date: 2011.05.04 16:03:52 -05'00'	Doc No: 4-QUAL-00017	Rev: D

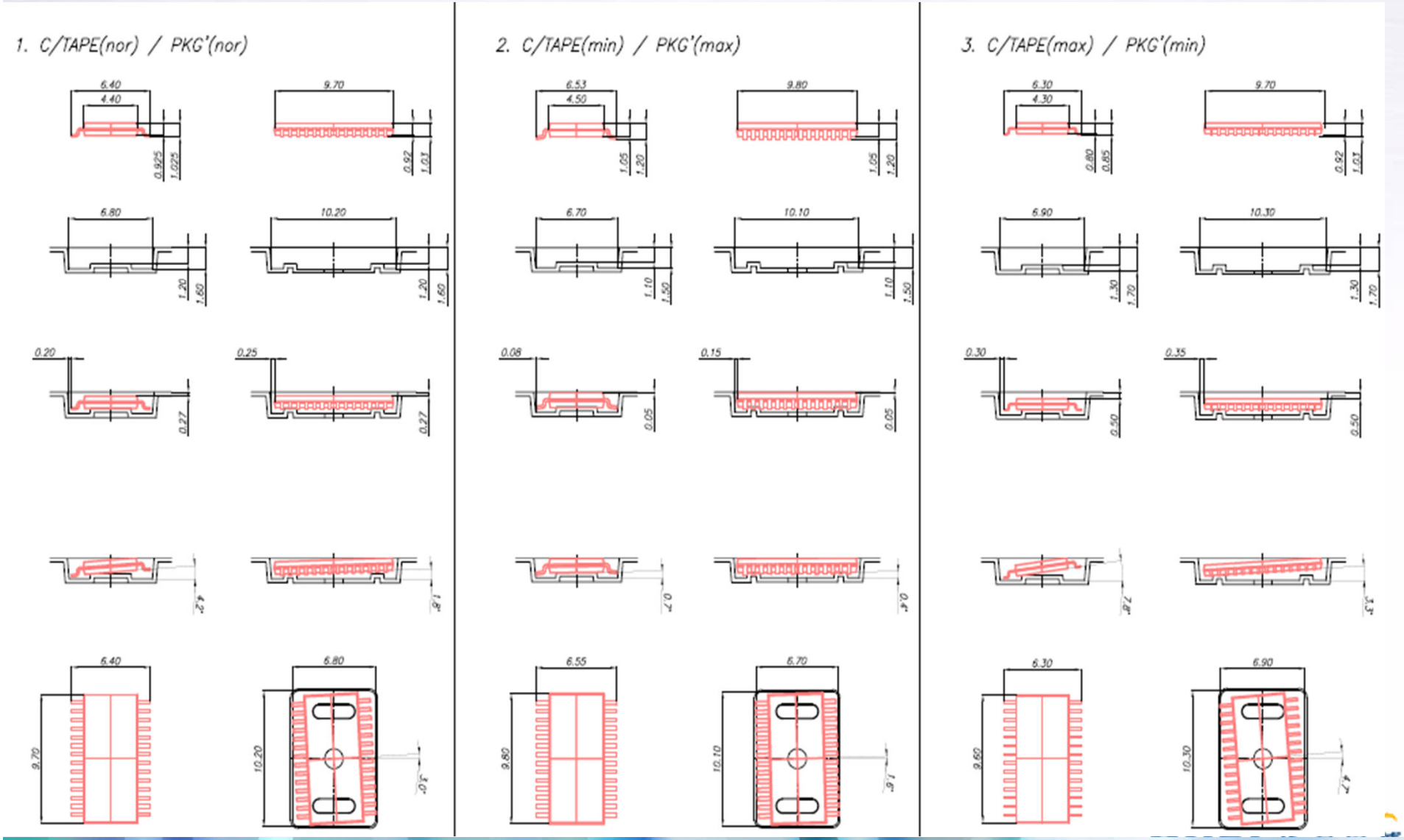
Qualification Plan

4.TSSOP 28

Process	Check item	Sample Size	SPEC
Appearance	Width(mm)	15.96	16.00±0.30
	A0（mm）	6.85	6.8±0.10
	B0（mm）	10.25	10.2±0.10
	K0（mm）	1.55	1.6±0.10
	Material	POLYSTYRENE	POLYSTYRENE
	Drawing	TSSOP 28LD(Kostat)	

Qualification Data (Reliability data if necessary)

Fit analysis report



Qualification Data (Reliability data if necessary)

Material drawing comparison

	Current	Propose
Ao	6.80±0.10	6.80±0.10
Bo	10.20±0.10	10.20±0.10
Ko	1.60±0.10	1.60±0.10
W	16.00±0.30	16.00±0.30
Po	4.00±0.10	4.00±0.10
P1	8.00±0.10	8.00±0.10
P2	2.00±0.10	2.00±0.10
E	1.75±0.10	1.75±0.10
F	7.50±0.10	7.50±0.10
Do	Φ1.5	Φ1.5
D1	Φ1.5	Φ1.5
T	0.3±0.05	0.3±0.05
Drawing	Old	new

Qualification Data (Reliability data if necessary)

QA Data

Vendor's OQA data:

KOSTAT

ANST'S IQA data:

ANST

Qualification Data (Reliability data if necessary)

Peel test report

4.1.Standard:

4.1.1 Split test: 20g-50g

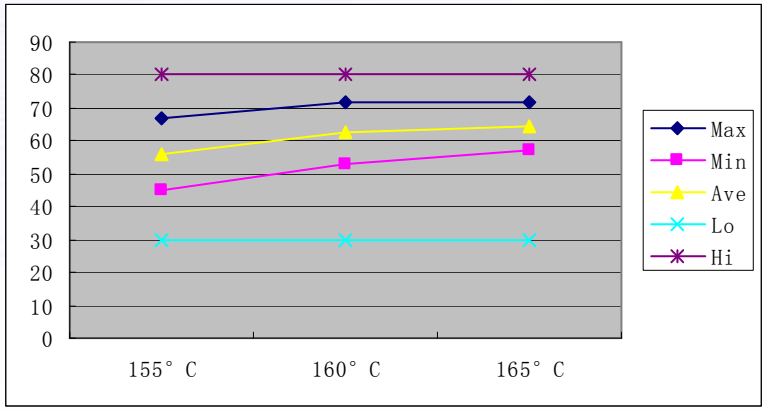
4.1.2 Full test: 30g-80g

4.2. Testing

Sealing time: 30MS

4.3.1 Peel test in different temperature.

Tem	Max	Min	Ave	Lo	Hi
155° C	67	45	56	30	80
160° C	72	53	62.5	30	80
165° C	72	57	64.5	30	80



Qualification Data (Reliability data if necessary)

Drop test

1.Specimen:

Package Code		Package Size	TSSOP/28LD
Lead Count	28 lead	Reel vendor	Advantek
Material Code	3202035181	Sample Size	4K/reel
Packing method	Follow Cirrus's packing method		

Qualification Data (Reliability data if necessary)

Drop test

2. Test Specification

Sequence	The Parts of the container for free fall drop	Trial
1	The basic corner	1
2	The shortest edge radiating from the container	1
3	The next longest edge radiating from the container	1
4	The longest edge radiating from the container	1
5~10	All six surfaces of the container	6
Total Trials		10
Free Fall Drop Height		1.0 meter

Summary: Zero defect found before and after drop test

Qualification Plan

Cover Tape

Check item		Proposed Cover tape (Denka)	Current Cover tape （Advantek）
Appearance	Length（m）	480	300
	Width（mm）	13.3±0.1	13.3±0.1
	Antistatic polyester film (inch)	0.0007874	0.0010
	Antistatic adhesive coating (inch)	0.00137795	0.00111
	Transparency	OK (Haze:50%)	OK (Haze. 51%)
	Color	Milky white	Natural, non-pigmented
	IQA Report	IOA report	N/A

Qualification Data (Reliability data if necessary)

SGS Report


Carrier tape SGS Report


Cover tape SGS Report

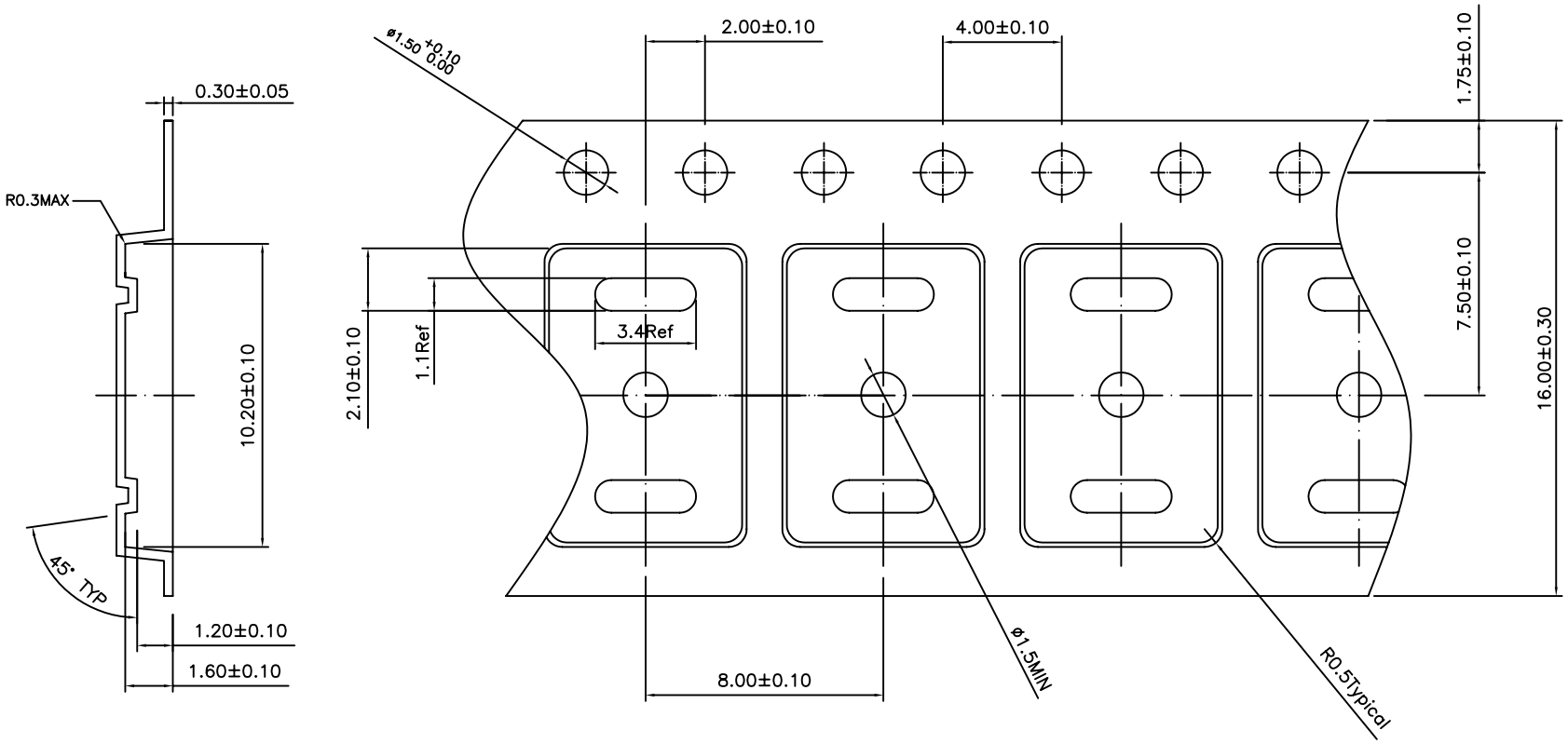

Carrier tape MSDS Report

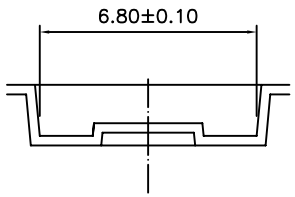

cover tape MSDS Report

Conclusion

Conclusion：

1. The new material pass the peel test .
2. The new material pass the IQA dimension test.
3. The new material pass the drop test.
4. The new vendor’s carrier tape and cover tape can meet the request.





NOTES:
1.10 sprocket hole pitch cumulative tolerance±0.2
2.Camber not to exceed imm in 250mm.
3.Material: Black conductive Polystyrene.
4.Ao and Bo measured on a plane 0.3mm above the bottom of the pocket.
5.Ko measured from a plane on the inside bottom of the pocket to the top suface of the carrier.
6.Pocket postion ralative to sprocket hole measured as true postion of pocket ,not pocket hole.
7.Pocket center and pocket hole center must be same postion.
8.Surface Resistance: 1.0E+05 TO 1.0E+11 OHMS/SQ

Anst 安 盛 科 技

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. TOLERANCES ARE:
DECIMALS ANGLES
X.X ±0.13 ±1°
X.X X ±0.10

TITLE
载带 16mm 6.8mm*10.2mm PS 410m(kostat)

DRAWING NO. | REV. AA

PROJECTION | SCALE | SIZE A4

Material Code. 3202035181

Reference Code.

SHEET 2 OF 2

DRAWING REVISION HISTORY

REV. NO.	REASON FOR REV.	DATE	Prepared
AA	New Release	2008/03/05	Majx

DRAFTED BY Majx		DATE
REVIEWED BY Zhoujh		DATE
APPROVED BY Lif		DATE
APPROVED BY		DATE
APPROVED BY Raymond		DATE
APPROVED BY		DATE

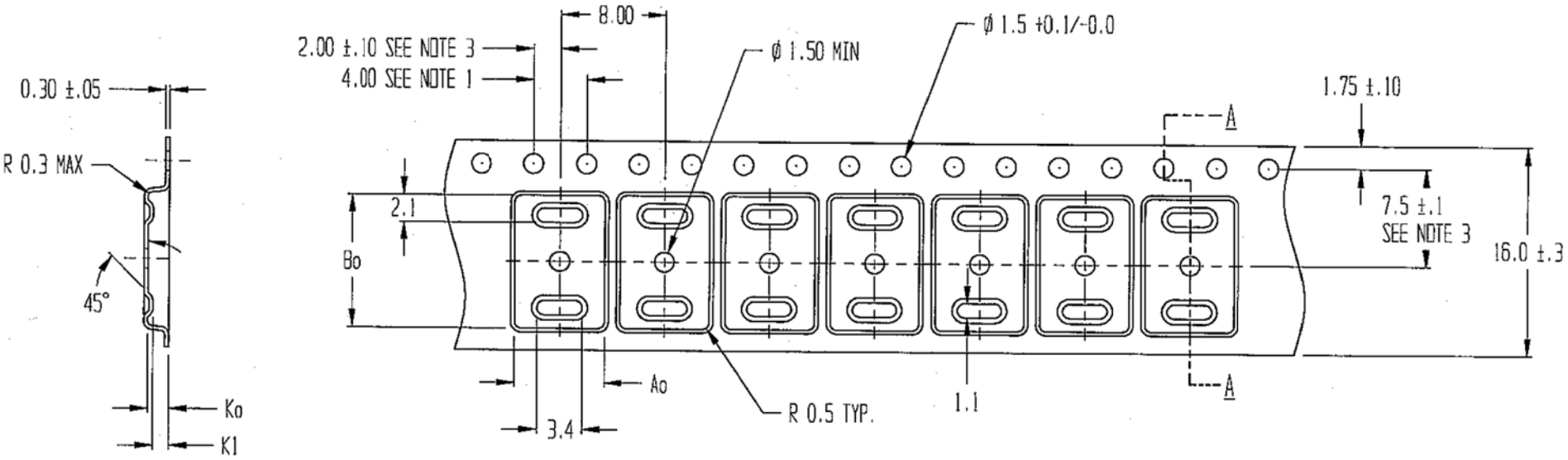
Anst 安 盛 科 技

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. TOLERANCES ARE:

TITLE: 载带 16mm 6.8mm*10.2mm 410m PS

DRAWING NO. S-TST-PED-OT-034 REV. AA

PROJECTION	SCALE	SIZE		
	2/1	A4	Material Code. 3202035180	SHEET 1 OF 2
			Reference Code. R021-0208A	



SECTION A - A

Ao = 6.80
Bo = 10.20
Ko = 1.60
K1 = 1.20

NOTES:

1. 10 SPROCKET HOLE PITCH CUMULATIVE TOLERANCE ±0.2
2. CAMBER IN COMPLIANCE WITH EIA 481
3. POCKET POSITION RELATIVE TO SPROCKET HOLE MEASURED AS TRUE POSITION OF POCKET, NOT POCKET HOLE

Anst 安盛科技

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. TOLERANCES ARE:

TITLE: 载带 16mm 6.8mm*10.2mm 410m PS

DRAWING NO.: S-TST-PED-OT-034

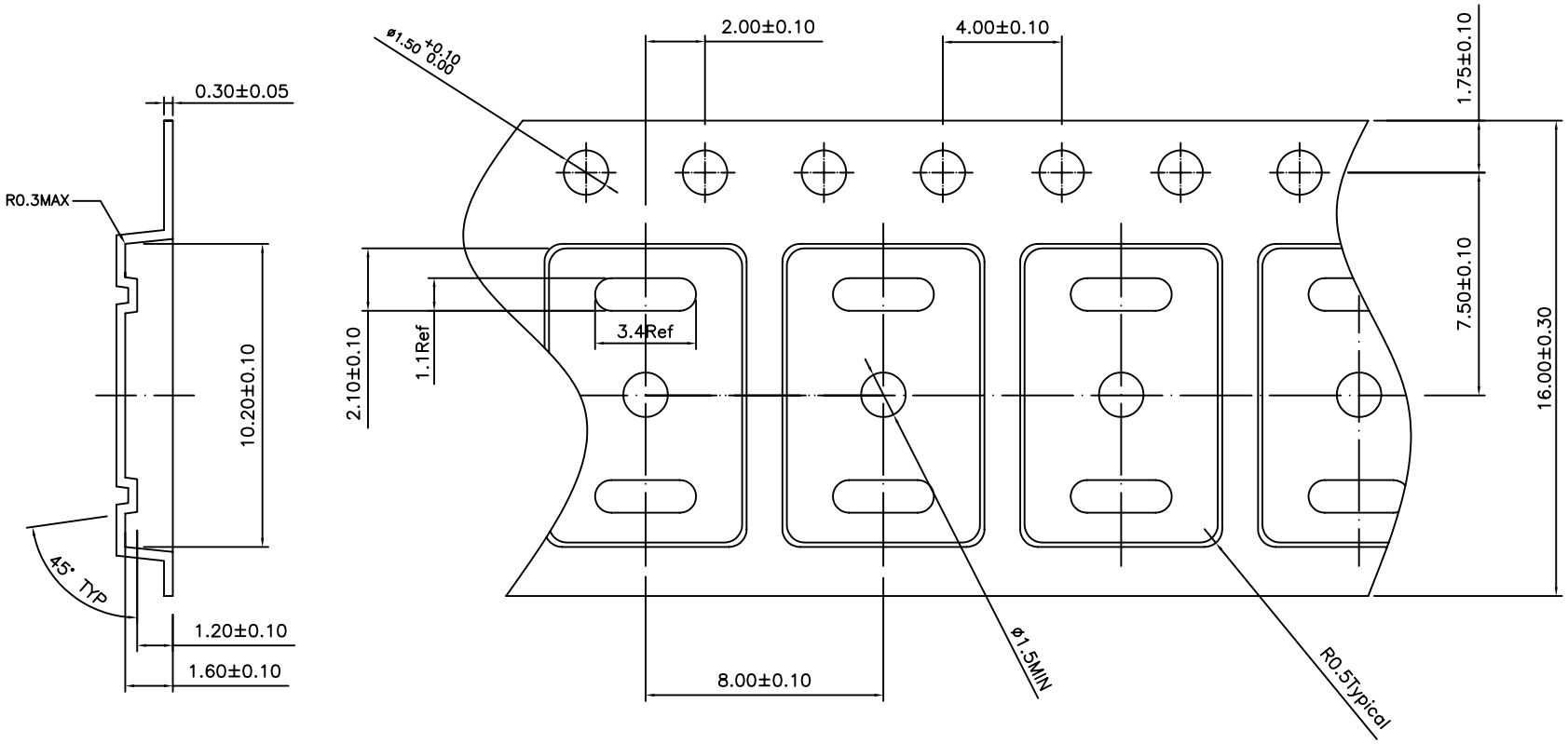
REV.: AA

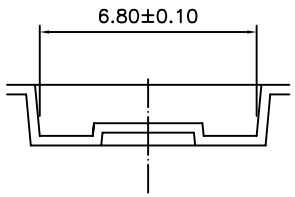
PROJECTION | SCALE | SIZE: A4

Material Code.: 3202035180

Reference Code.: R021-0208A

SHEET: 2 OF 2





NOTES:
1.10 sprocket hole pitch cumulative tolerance±0.2
2.Camber not to exceed imm in 250mm.
3.Material: Black conductive Polystyrene.
4.Ao and Bo measured on a plane 0.3mm above the bottom of the pocket.
5.Ko measured from a plane on the inside bottom of the pocket to the top suface of the carrier.
6.Pocket postion ralative to sprocket hole measured as true postion of pocket ,not pocket hole.
7.Pocket center and pocket hole center must be same postion.
8.Surface Resistance: 1.0E+05 TO 1.0E+11 OHMS/SQ

Anst 安 盛 科 技

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS. TOLERANCES ARE:
DECIMALS ANGLES
X.X ±0.13 ±1°
X.X X ±0.10

TITLE
载带 16mm 6.8mm*10.2mm PS 410m(kostat)

DRAWING NO. | REV. AA

PROJECTION | SCALE | SIZE A4

Material Code. 3202035181

Reference Code.

SHEET 2 OF 2

CARRIER TAPE OUTGOING INSPECTION REPORT

PART NO. :	TSSOP28LD	CUSTOMER :	Comiracle
CUSTOMER PART NO. :	N/A	REVISION NO. :	#00
DRAWING CODE NO. :	KS-1608-155	DATE INSP. :	2011.02.16
MATERIAL :	POLYSTYRENE	QTY.INSP.:	11 PIECES
INVOICE :	N/A	TOTAL QUANTITY :	1 ROLL
P.O NO :	N/A	LOT NO. :	N/A

IQA 003 ACC

1. DIMENSIONAL MEASUREMENT :

ITEM	DIMENSION	LSL	USL	1	2	3	4	5	6	7	8	9	10	11	MEAN	STDEV	C_{PK}	P/F
AO	POCKET LENGTH IN AO DIRECTION	6.70	6.90	6.799	6.759	6.770	6.764	6.763	6.763	6.756	6.756	6.769	6.770	6.759	6.766	0.012	1.805	PAS
BO	POCKET LENGTH IN BO DIRECTION	10.10	10.30	10.152	10.158	10.170	10.177	10.173	10.192	10.163	10.160	10.161	10.185	10.178	10.170	0.012	1.880	PAS
E	CENTER OF SPROCKET HOLE TO TAPE EDGE	1.65	1.85	1.724	1.732	1.725	1.711	1.722	1.714	1.722	1.717	1.721	1.708	1.714	1.719	0.007	3.299	PAS
PO	CENTER TO CENTER OF SPROCKET HOLES	3.90	4.10	3.954	4.009	3.993	3.999	3.997	4.001	3.997	3.998	3.990	4.003	4.007	3.995	0.015	2.142	PAS
KO	POCKET DEPTH	1.50	1.70	1.591	1.595	1.592	1.609	1.609	1.595	1.596	1.604	1.596	1.594	1.591	1.597	0.007	4.842	PAS
F	CENTER OF CAVITY HOLES TO (SIDEWAYS)	7.40	7.60	7.480	7.467	7.491	7.467	7.465	7.471	7.477	7.451	7.485	7.463	7.466	7.471	0.011	2.112	PAS
D0	SPROCKET HOLE	1.50	1.60	1.566	1.582	1.575	1.563	1.568	1.569	1.561	1.577	1.569	1.578	1.564	1.570	0.007	1.433	PAS
D1	CENTER HOLES	MIN1.5		1.663	1.662	1.651	1.664	1.661	1.671	1.652	1.642	1.663	1.656	1.655	1.658	0.008	1.744	PAS
P2	CENTER OF CAVITY HOLES TO (LENGHWISE)	1.90	2.10	1.984	1.997	2.000	1.983	2.006	1.993	1.992	1.980	1.993	1.991	2.000	1.993	0.008	3.917	PAS
	CENTER OF ROUND SPROCKET HOLES																	
P1	CENTER TO CENTER OF CAVITY HOLES	7.90	8.10	7.989	7.976	7.992	8.005	7.958	8.008	7.978	7.954	8.014	7.998	7.963	7.985	0.021	1.372	PAS
T	TAPE THICKNESS (IS APPLICABLE AS	0.25	0.35	0.313	0.308	0.314	0.290	0.282	0.284	0.285	0.286	0.302	0.293	0.283	0.295	0.012	1.195	PAS
	MEASURED AT THE EDGE OF TAPE)																	
W	TAPE WIDTH	15.70	16.30	15.967	15.966	15.958	15.965	15.976	15.951	15.944	15.924	15.914	15.952	15.934	15.950	0.019	4.299	PAS
10XPO	10 SPROCKET PITCH CUMULATIVE VALUE	39.80	40.20	40.027	39.977	39.984	40.027	40.020	40.023	39.981	40.000	40.019	40.017	39.993	40.006	0.020	3.309	PAS

2.0 VISUAL :

DEVECTS	DEFECTS	RESULTS
POCKET DEFECTS	0	ACCEPT
CONTAMINATION	0	ACCEPT
SCRATCH	0	ACCEPT
PIMPLE	< 4/M	ACCEPT
BURRS	0	ACCEPT
OTHERS	0	ACCEPT

3.0 SURFACE RESISTIVITY : 1.0E+05 TO 1.0E+11 OHMS/SQ

4.0 CAMBER : <1MM/100MM,NON-CUNULATIVE OVER 250MM

DIMENSIONAL MEASUREMENT :	1	2	3	4	5	P/F
	0.3	0.5	0.45	0.4	0.45	PASS

5.0 FINAL RESULTS: A/R ACCEPT

NOTE :

1.0 ALL DIMENSIONS ARE PER EIA-481 AND ARE DISPLAYED IN MILLIMETERS.

2.0 T DIMENSION IS MEASURED BY DIGITAL CALIPER, KO IS MEASURED BY DIGITAL HEIGHT GAUGE, OTHERS ARE MEASURED BY PROFILE PROJECTOR

INSPECTED BY : LFYANG DATE : 2011.02.16 APPROVED BY : K.S CHOI DATE : 2011.02.16

Anst 安盛科技

POSITROL LOG

Production Line: ALL	Process: IQA	Document No.: S-TCM-IQA-PL-01	Revision: AF
Title: 载带 Incoming Inspection Report		Frequency: 1X/Shipment	Revise Date:10.11.29

Receive Date	2011. 3. 7	Supplier Name	浙江	Eng'r Approval
Inspection Date	2011. 3. 8	IQA No.	CT-DK-11-03-005-A	
Material Code	3202035181	Material Type	载带16mm b.8*10.2	

1.Verification ☑ Accept ☐ Reject

Packing Condition	☑ OK ☐ NG	Quantity	1 ROLL
Lot No.	CT20110216094		

2. C of C ☑ Accept ☐ Reject

Material Type	T540P28LD	Material Code	N/A	Q'ty	1 ROLL
Drawing No./Rev.	N/A	Mfg. Date	N/A	Expired Date	N/A
Lot No.	N/A	Dimension Test Result	☑ OK ☐ NG ☐ NA		
Visual Inspection Result	☑ OK ☐ NG	Function Test Result	☐ OK ☐ NG ☑ NA		

3. Label ☑ Accept ☐ Reject

Material Type	T540P28LD	Mfg. Date	N/A	Q'ty	☑ OK ☐ NG
Material Code	N/A	Expired Date	N/A	Lot No.	☑ OK ☐ NG
Supplier Name	☑ OK ☐ NG				

4. Inspection items ☑ Accept ☐ Reject

S/N	Item	Sample Size: (Ac=0,Re=1)	Defect Q'ty	Defect Mode	Result
1	外观	1	0	N/A	☑ OK ☐ NG
2	尺寸	1	0	N/A	☑ OK ☐ NG
3	表面电阻率	1	0	N/A	☑ OK ☐ NG
4					☐ OK ☐ NG
5					☐ OK ☐ NG
6					☐ OK ☐ NG

5. XRF Test ☑ Accept ☐ Reject ☐ NA

S/N	Element元素	Curve曲线	Upper Limit上限规格 (ppm)	Content 含量(ppm)	Result结果
1	Hg 汞	☑ PE ☐ SOLDER	ND	ND	☑ OK ☐ NG
2	Br 溴	PE	1000	ND	☑ OK ☐ NG ☐ NA
3	Cd 镉	☑ PE ☐ SOLDER	5	ND	☑ OK ☐ NG
4	Pb 铅	☑ PE ☐ SOLDER	100	ND	☑ OK ☐ NG
5	Cr 铬	☑ workCurveCr ☐ SOLDER	100	ND	☑ OK ☐ NG
6	Cr+Cd+Pb+Hg	NA	100	ND	☑ OK ☐ NG ☐ NA

6. Final Result

Final Result	☑ Accept ☐ Reject	Stamp	

Remark:

Anst 安碩科技

POSITROL LOG

Production Line: ALL	Process: IQA	Document No.: S-TCM-IQA-PL-06	Revision: AD
Title: Test Item Data		Frequency: 1X/Shipment	Revision Date: 10.11.29

Test Data

Inspector: Zhang GY

Test Item	Spec. (mm)	Data					Result
		S1	S2	S3	S4	S5	
A0	6.8±0.10	6.85					OK
B0	10.2±0.10	10.25					OK
K0	1.6±0.10	1.55					OK
T	0.3±0.05	0.27					OK
表面电阻	$10^5<R<10^{12}$ ohms/sq.	10^8					OK

POSITROL LOG

Production Line: ALL	Process: IQA	Document No.: S-TCM-IQA-PL-01	Revision: AE
Title: 盖带 Incoming Inspection Report		Frequency: 1X/Shipment	Revise Date: 08.10.30

Receive Date	2010.3.11	Supplier Name	志硕	Eng'r Approval
Inspection Date	2010.3.14	IQA No.	CO-XX-10-04-038-01	
Material Code	N/A	Material Type	盖带13.3mm 480m	☑ Accept ☐ Reject

1.Verification

Packing Condition	☑ OK ☐ NG	Quantity	1
Lot No.	/		☑ Accept ☐ Reject

2. C of C

Material Type	13.3MM 480M	Material Code	N/A	Q'ty	1
Drawing No./Rev.	N/A	Mfg. Date	N/A	Expired Date	N/A
Lot No.	N/A	Dimension Test Result	☑ OK ☐ NG ☐ NA		
Visual Inspection Result	☑ OK ☐ NG	Function Test Result	☐ OK ☐ NG ☑ NA		

N/A ☐ Accept ☐ Reject

3. Label

Material Type		Mfg. Date		Q'ty	☐ OK ☐ NG
Material Code		Expired Date		Lot No.	☐ OK ☐ NG
Supplier Name	☐ OK ☐ NG				

☑ Accept ☐ Reject

4. Inspection items

S/N	Item	Sample Size: (Ac=0,Re=1)	Defect Q'ty	Defect Mode	Result
1	外观	1	0	N/A	☑ OK ☐ NG
2	表面电阻	1	0	N/A	☑ OK ☐ NG
3					☐ OK ☐ NG
4					☐ OK ☐ NG
5					☐ OK ☐ NG
6					☐ OK ☐ NG

☑ Accept ☐ Reject ☐ NA

5. XRF Test

S/N	Element元素	Curve曲线	Upper Limit上限规格 (ppm)	Content 含量(ppm)	Result结果
1	Hg 汞	☑ PE ☐ SOLDER	ND	ND	☑ OK ☐ NG
2	Br 溴	PE	1000	ND	☑ OK ☐ NG ☐ NA
3	Cd 镉	☑ PE ☐ SOLDER	5	ND	☑ OK ☐ NG
4	Pb 铅	☑ PE ☐ SOLDER	100	30.4	☑ OK ☐ NG
5	Cr 铬	☑ workCurveCr ☐ SOLDER	100	ND	☑ OK ☐ NG
6	Cr+Cd+Pb+Hg	NA	100	30.4	☑ OK ☐ NG ☐ NA

6. Final Result

Final Result	☑ Accept ☐ Reject	**Stamp**	

Remark:

nst 安盛科技

POSITROL LOG

oduction Line: ALL	Process: IQA	Document No.: S-TCM-IQA-PL-06	Revision: AC
Title: Test Item Data		Frequency: 1X/Shipment	Revision Date: 08.10.30

Test Data

Inspector: zhuhw

Test Item	Spec.	Data					Result
		S1	S2	S3	S4	S5	
表面电阻	10^5<R<10^{12}(ohms/sq)	10^8	—	—	—	—	ok

DENKI KAGAKU KOGYO KABUSHIKI KAISHA

NIHONBSHI MITSUI TOWER,1-1,NIHONBASHI-MUROMACHI 2-CHOME,CHUO-KU,TOKYO,JAPAN

The following sample(s) was/were submitted and identified on behalf of the clients as : COVER TAPE

SGS Job No. :	SP10-017729 - SH
Model No. :	ALS-PRA
Date of Sample Received :	26 May 2010
Testing Period :	26 May 2010 - 31 May 2010
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 samples, the results comply with the RoHS Directive 2002/95/EC and its subsequent amendments.

Signed for and on behalf of
SGS-CSTC Ltd.

Fan Jingjie, JJ
Approved Signatory

Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
1	SHA10-071366.002	Transparent plastic tape

Remarks :

(1) 1 mg/kg = 1 ppm = 0.0001%

(2) MDL = Method Detection Limit

(3) ND = Not Detected (< MDL)

(4) "-" = Not Regulated

RoHS Directive 2002/95/EC

Test Method : With reference to IEC 62321:2008

(1) Determination of Cadmium by ICP-OES.
(2) Determination of Lead by ICP-OES.
(3) Determination of Mercury by ICP-OES.
(4) Determination of Hexavalent Chromium by Colorimetric Method using UV-Vis.
(5) Determination of PBBs / PBDEs content by GC-MS.

Test Item(s)	Limit	Unit	MDL	*002*
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1,000	mg/kg	2	ND
Mercury (Hg)	1,000	mg/kg	2	ND
Hexavalent Chromium (CrVI)	1,000	mg/kg	2	ND
Sum of PBBs	1,000	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
Sum of PBDEs	1,000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND

Test Item(s)	Limit	Unit	MDL	*002*
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

Notes :

(1) The maximum permissible limit is quoted from the document 2005/618/EC amending RoHS directive 2002/95/EC

Halogen

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

Test Item(s)	Unit	MDL	*002*
Fluorine (F)	mg/kg	50	ND
Chlorine (Cl)	mg/kg	50	ND
Bromine (Br)	mg/kg	50	ND
Iodine (I)	mg/kg	50	ND

Polychlorinated Naphthalenes (PCNs)

Test Method : With reference to US EPA 8081B: 2007, analysis was performed by GC-MS

Test Item(s)	Unit	MDL	*002*
2-Chlorinated Naphthalene	mg/kg	5	ND
1,4-Dichlorinated Naphthalene	mg/kg	5	ND
1,5-Dichlorinated Naphthalene	mg/kg	5	ND
1,2-Dichlorinated Naphthalene	mg/kg	5	ND
1,8-Dichlorinated Naphthalene	mg/kg	5	ND
1,2,3-Trichlorinated Naphthalene	mg/kg	5	ND
1,2,3,4-Tetrachlorinated Naphthalene	mg/kg	5	ND
1,2,3,4,6-Pentachlorinated Naphthalene	mg/kg	5	ND
Octa-chlorinaed Naphthalene	mg/kg	5	ND

Short Chained Chlorinated Paraffin (SCCP)

Test Method : With reference to US EPA 3550C: 2007, analysis was performed by GC-ECD.

Test Item(s)	Unit	MDL	*002*
Short Chained Chlorinated Paraffin (SCCP)	mg/kg	30	ND

Notes :

(1) Short Chain Chlorinated Paraffin Reference Information: Entry 42 of Regulation (EC) No 552/2009 amending Annex XVII of REACH Regulation (EC) No 1907/2006 (previously restricted under Directive 2002/45/EC):
Shall not be placed on the market, or used as substances, or as constituents of other substances or in mixtures in concentrations greater than 1% by weight, where the substance or mixture is intended for:
- metalworking
- fat liquoring of leather
Please refer to Regulation (EC) No 552/2009 to get more detail information

Polychlorinated Terphenyls (PCTs)

Test Method : With reference to US EPA 8082A: 2007, analysis was performed by GC-MS

Test Item(s)	Unit	MDL	*002*
Aroclor 5432	mg/kg	5	ND
Aroclor 5442	mg/kg	5	ND

Notes :

(1) PCTs Reference Information: Entry 1 of Regulation (EC) No 552/2009 amending Annex XVII of REACH Regulation (EC) No 1907/2006 (previously restricted under Directive 89/677/EC)
Shall not be placed on the market, or used:
- as substances,
- In mixtures, including waste oils, or in equipment, in concentrations greater than 50 mg/kg (0,005 % by weight).
Please refer to Regulation (EC) No 552/2009 to get more detail information

PFOS (Perfluorooctane Sulfonates) and PFOA (Perfluorooctanoic Acid)

Test Method : With reference to US EPA 3550C: 2007, analysis was performed by HPLC-MS.

Test Item(s)	Unit	MDL	002
Perfluorooctane Sulfonates (PFOS) and related Acid,Metal Salt and Amide	mg/kg	10	ND
Perfluorooctyl Acid (PFOA)	mg/kg	10	ND

Notes :

(1) PFOS Reference Information: Entry 53 of Regulation (EC) No 552/2009 amending Annex XVII of REACH Regulation (EC) No 1907/2006 (previously restricted under Directive 2006/122/EC)

(i) May not be placed on the market or used as a substance or constituent of preparations in a concentration equal to or higher than 0.005 % by mass.

(ii) May not be placed on the market in semi-finished products or articles, or parts thereof, if the concentration of PFOS is equal to or higher than 0.1 % by mass calculated with reference to the mass of structurally or microstructurally distinct parts that contain PFOS or, for textiles or other coated materials, if the amount of PFOS is equal to or higher than 1μg /m² of the coated material.

Please refer to Regulation (EC) No 552/2009 to get more detail information

Polychlorinated Biphenyls (PCBs)

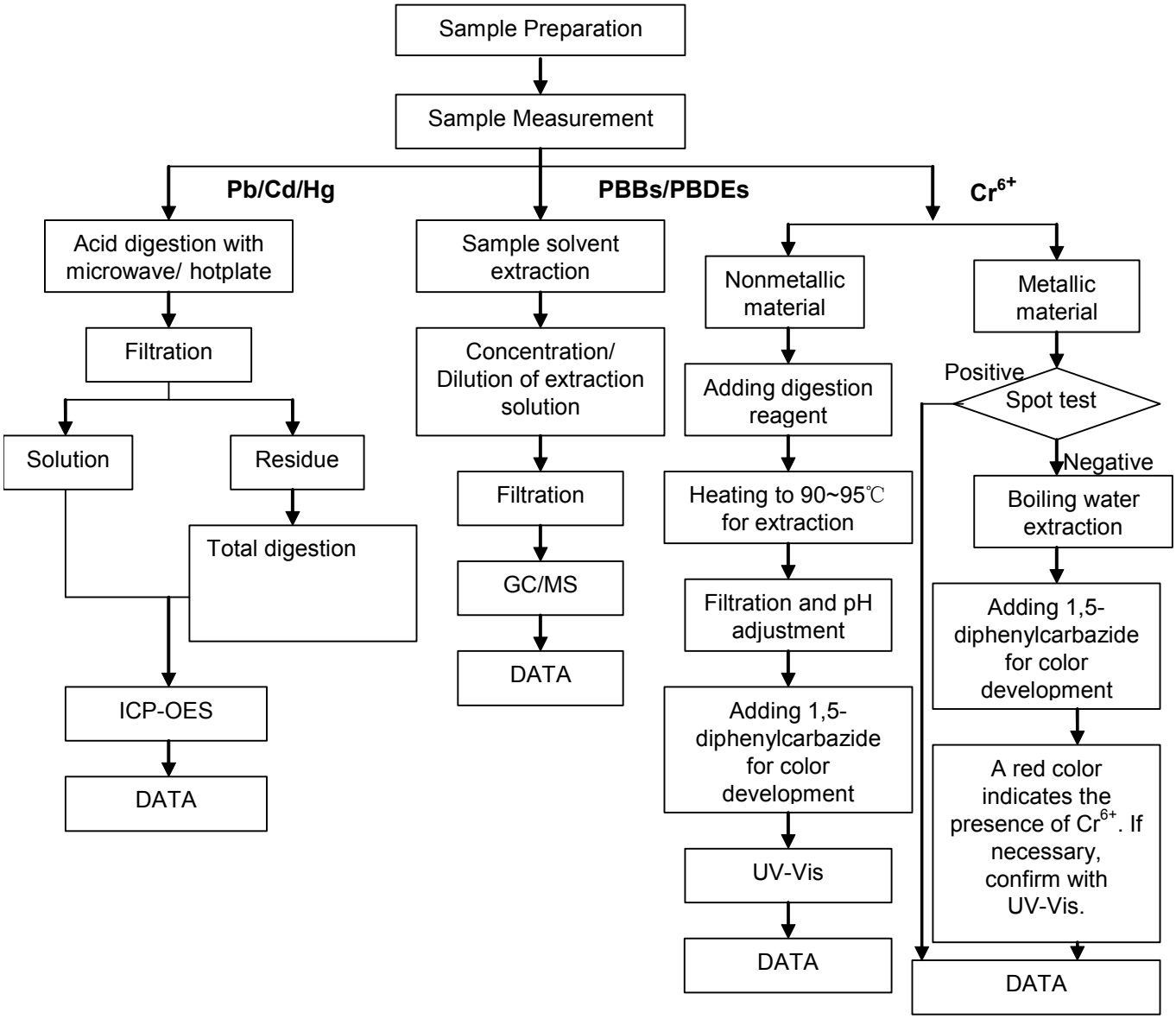
Test Method : With reference to US EPA 8082A: 2007, analysis was performed by GC-MS

Test Item(s)	CAS_NO	Unit	MDL	002
2.4.4'-Trichlorobiphenyl (PCB 28)	7012-37-5	mg/kg	0.5	ND
2.2'.5.5'-Tetrachloro-biphenyl (PCB 52)	35693-99-3	mg/kg	0.5	ND
2.2'.4.5.5'-Pentachloro-biphenyl (PCB 101)	37680-73-2	mg/kg	0.5	ND
2.3'.4.4'.5-Pentachlorobiphenyl (PCB 118)	31508-00-6	mg/kg	0.5	ND
2.2'3.4.4'.5'-Hexachloro-biphenyl (PCB 138)	35065-28-2	mg/kg	0.5	ND
2.2'.4.4'.5.5'-Hexachloro-biphenyl (PCB 153)	35065-27-1	mg/kg	0.5	ND
2.2'.3.4.4'.5.5'-Heptachlorobiphenyl (PCB 180)	35065-29-3	mg/kg	0.5	ND

ATTACHMENTS

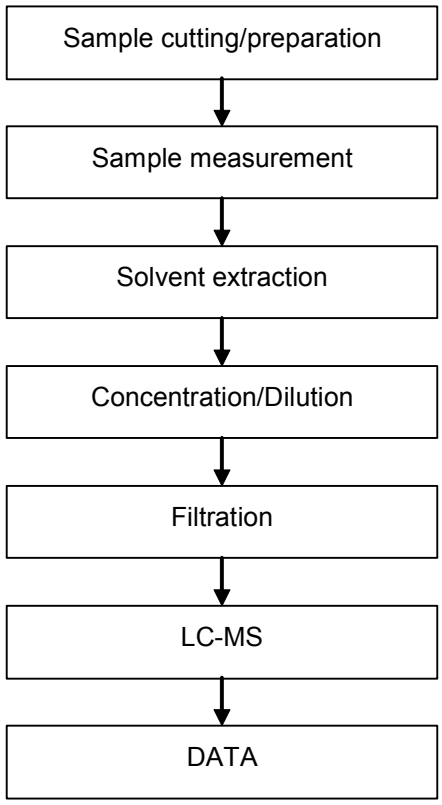
RoHS Testing Flow Chart

1) Name of the person who made testing: Allen Xiao/ Spring Zuo / Frank Fang /Elim Lin
2) Name of the person in charge of testing: Jeff Zhang/George Xu/Tracy Yue
3) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr^{6+} and PBBs/PBDEs test method excluded)



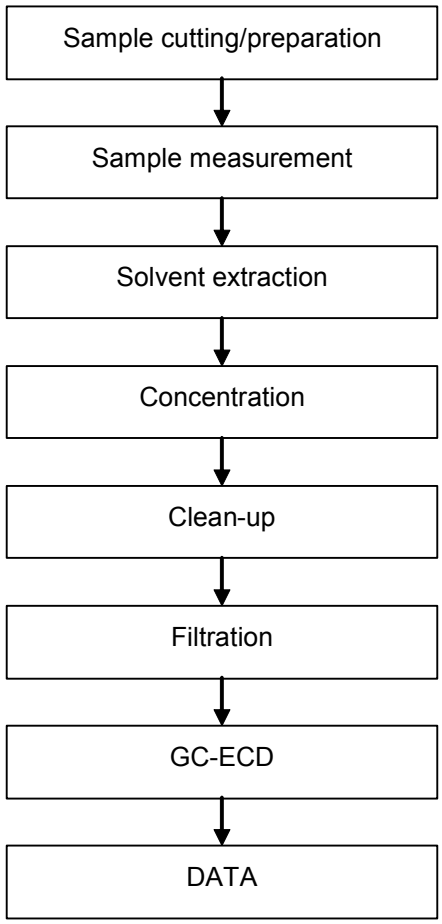
PFOS/PFOA Testing Flow Chart

1) Name of the person who made testing: Judy Li
2) Name of the person in charge of testing: Nancy Du



SCCP Testing Flow Chart

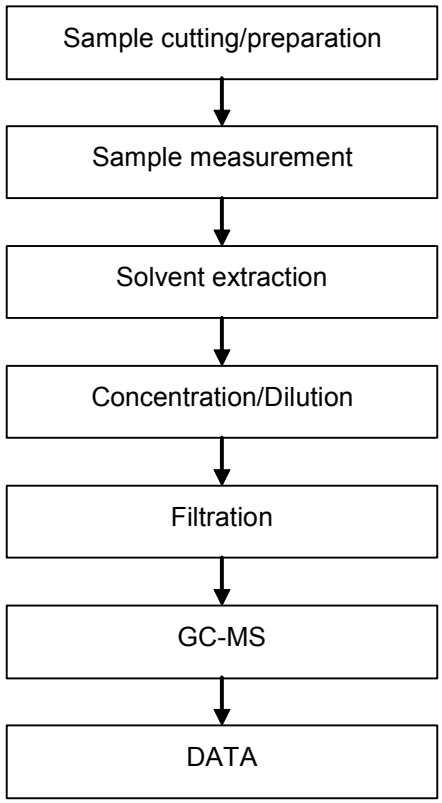
1) Name of the person who made testing: Bill Zhong
2) Name of the person in charge of testing: Susan Liu



SGS-CSTC Standards Technical Services Co., Ltd. Shanghai Branch · Chemical Laboratory
3rd Building,No.889,Yishan Road,Shanghai,China 200233 tE&E:(86-21) 61402553 fE&E:(86-21) 64953679 www.cn.sgs.com
中国 ·上海 · 宜山路889号3号楼 邮编: 200233 HL:(86-21) 61402594 HL:(86-21) 54500353 e sgs.china@sgs.com

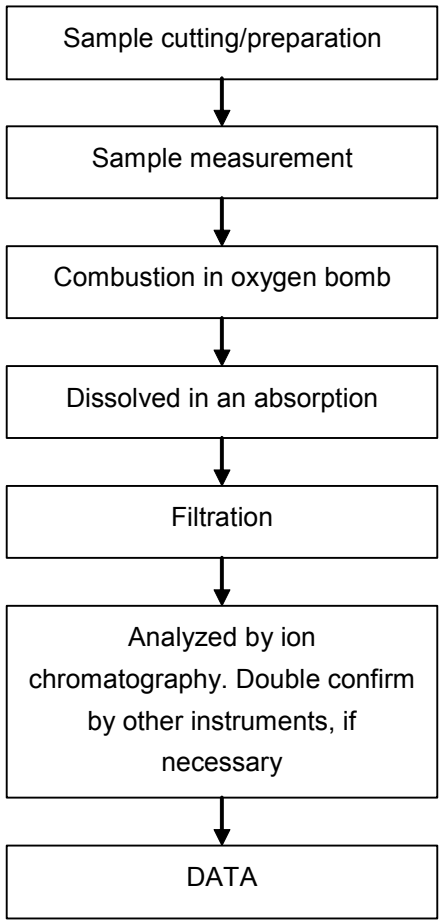
PCB/ PCT/ PCN Testing Flow Chart

1) Name of the person who made testing: Bill Zhong
2) Name of the person in charge of testing: Susan Liu



Halogen Testing Flow Chart

1) Name of the person who made testing: Daisy Gong
2) Name of the person in charge of testing: Alex Jiang



SGS-CSTC Standards Technical Services Co., Ltd. Shanghai Branch
3rd Building,No.889,Yishan Road,Shanghai,China 200233 tE&E:(86-21) 61402553 fE&E:(86-21) 64953679 www.cn.sgs.com
中国·上海·宜山路889号3号楼 邮编: 200233 HL:(86-21) 61402594 HL:(86-21) 54500353 e sgs.china@sgs.com

Sample photo:

SHA10-071366.002

SGS authenticate the photo on original report only

*** End of Report ***

SGS-CSTC Standards Technical Services Co., Ltd.
Shanghai Branch · Testing Service Chemical Laboratory
3rd Building,No.889,Yishan Road,Shanghai,China 200233 tE&E:(86-21) 61402553 fE&E:(86-21) 64953679 www.cn.sgs.com
中国 ·上海 · 宜山路889号3号楼 邮编: 200233 HL:(86-21) 61402594 HL:(86-21) 54500353 e sgs.china@sgs.com

DENKI KAGAKU KOGYO KABUSHIKI KAISHA

NIHONBSHI MITSUI TOWER,1-1,NIHONBASHI-MUROMACHI 2-CHOME,CHUO-KU,TOKYO,JAPAN

The following sample(s) was/were submitted and identified on behalf of the clients as : COVER TAPE

SGS Job No. :	SP10-017729 - SH
Model No. :	ALS-PRA
Date of Sample Received :	26 May 2010
Testing Period :	26 May 2010 - 31 May 2010
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 samples, the results comply with the RoHS Directive 2002/95/EC and its subsequent amendments.

Signed for and on behalf of
SGS-CSTC Ltd.

Fan Jingjie, JJ
Approved Signatory

Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
1	SHA10-071366.002	Transparent plastic tape

Remarks :

(1) 1 mg/kg = 1 ppm = 0.0001%

(2) MDL = Method Detection Limit

(3) ND = Not Detected (< MDL)

(4) "-" = Not Regulated

RoHS Directive 2002/95/EC

Test Method : With reference to IEC 62321:2008

(1) Determination of Cadmium by ICP-OES.
(2) Determination of Lead by ICP-OES.
(3) Determination of Mercury by ICP-OES.
(4) Determination of Hexavalent Chromium by Colorimetric Method using UV-Vis.
(5) Determination of PBBs / PBDEs content by GC-MS.

Test Item(s)	Limit	Unit	MDL	*002*
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1,000	mg/kg	2	ND
Mercury (Hg)	1,000	mg/kg	2	ND
Hexavalent Chromium (CrVI)	1,000	mg/kg	2	ND
Sum of PBBs	1,000	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
Sum of PBDEs	1,000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND

Test Item(s)	Limit	Unit	MDL	*002*
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

Notes :

(1) The maximum permissible limit is quoted from the document 2005/618/EC amending RoHS directive 2002/95/EC

Halogen

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

Test Item(s)	Unit	MDL	*002*
Fluorine (F)	mg/kg	50	ND
Chlorine (Cl)	mg/kg	50	ND
Bromine (Br)	mg/kg	50	ND
Iodine (I)	mg/kg	50	ND

Polychlorinated Naphthalenes (PCNs)

Test Method : With reference to US EPA 8081B: 2007, analysis was performed by GC-MS

Test Item(s)	Unit	MDL	*002*
2-Chlorinated Naphthalene	mg/kg	5	ND
1,4-Dichlorinated Naphthalene	mg/kg	5	ND
1,5-Dichlorinated Naphthalene	mg/kg	5	ND
1,2-Dichlorinated Naphthalene	mg/kg	5	ND
1,8-Dichlorinated Naphthalene	mg/kg	5	ND
1,2,3-Trichlorinated Naphthalene	mg/kg	5	ND
1,2,3,4-Tetrachlorinated Naphthalene	mg/kg	5	ND
1,2,3,4,6-Pentachlorinated Naphthalene	mg/kg	5	ND
Octa-chlorinaed Naphthalene	mg/kg	5	ND

Short Chained Chlorinated Paraffin (SCCP)

Test Method : With reference to US EPA 3550C: 2007, analysis was performed by GC-ECD.

Test Item(s)	Unit	MDL	*002*
Short Chained Chlorinated Paraffin (SCCP)	mg/kg	30	ND

Notes :

(1) Short Chain Chlorinated Paraffin Reference Information: Entry 42 of Regulation (EC) No 552/2009 amending Annex XVII of REACH Regulation (EC) No 1907/2006 (previously restricted under Directive 2002/45/EC):
Shall not be placed on the market, or used as substances, or as constituents of other substances or in mixtures in concentrations greater than 1% by weight, where the substance or mixture is intended for:
- metalworking
- fat liquoring of leather
Please refer to Regulation (EC) No 552/2009 to get more detail information

Polychlorinated Terphenyls (PCTs)

Test Method : With reference to US EPA 8082A: 2007, analysis was performed by GC-MS

Test Item(s)	Unit	MDL	*002*
Aroclor 5432	mg/kg	5	ND
Aroclor 5442	mg/kg	5	ND

Notes :

(1) PCTs Reference Information: Entry 1 of Regulation (EC) No 552/2009 amending Annex XVII of REACH Regulation (EC) No 1907/2006 (previously restricted under Directive 89/677/EC)
Shall not be placed on the market, or used:
- as substances,
- In mixtures, including waste oils, or in equipment, in concentrations greater than 50 mg/kg (0,005 % by weight).
Please refer to Regulation (EC) No 552/2009 to get more detail information

PFOS (Perfluorooctane Sulfonates) and PFOA (Perfluorooctanoic Acid)

Test Method : With reference to US EPA 3550C: 2007, analysis was performed by HPLC-MS.

Test Item(s)	Unit	MDL	002
Perfluorooctane Sulfonates (PFOS) and related Acid,Metal Salt and Amide	mg/kg	10	ND
Perfluorooctyl Acid (PFOA)	mg/kg	10	ND

Notes :

(1) PFOS Reference Information: Entry 53 of Regulation (EC) No 552/2009 amending Annex XVII of REACH Regulation (EC) No 1907/2006 (previously restricted under Directive 2006/122/EC)

(i) May not be placed on the market or used as a substance or constituent of preparations in a concentration equal to or higher than 0.005 % by mass.

(ii) May not be placed on the market in semi-finished products or articles, or parts thereof, if the concentration of PFOS is equal to or higher than 0.1 % by mass calculated with reference to the mass of structurally or microstructurally distinct parts that contain PFOS or, for textiles or other coated materials, if the amount of PFOS is equal to or higher than 1μg /m² of the coated material.

Please refer to Regulation (EC) No 552/2009 to get more detail information

Polychlorinated Biphenyls (PCBs)

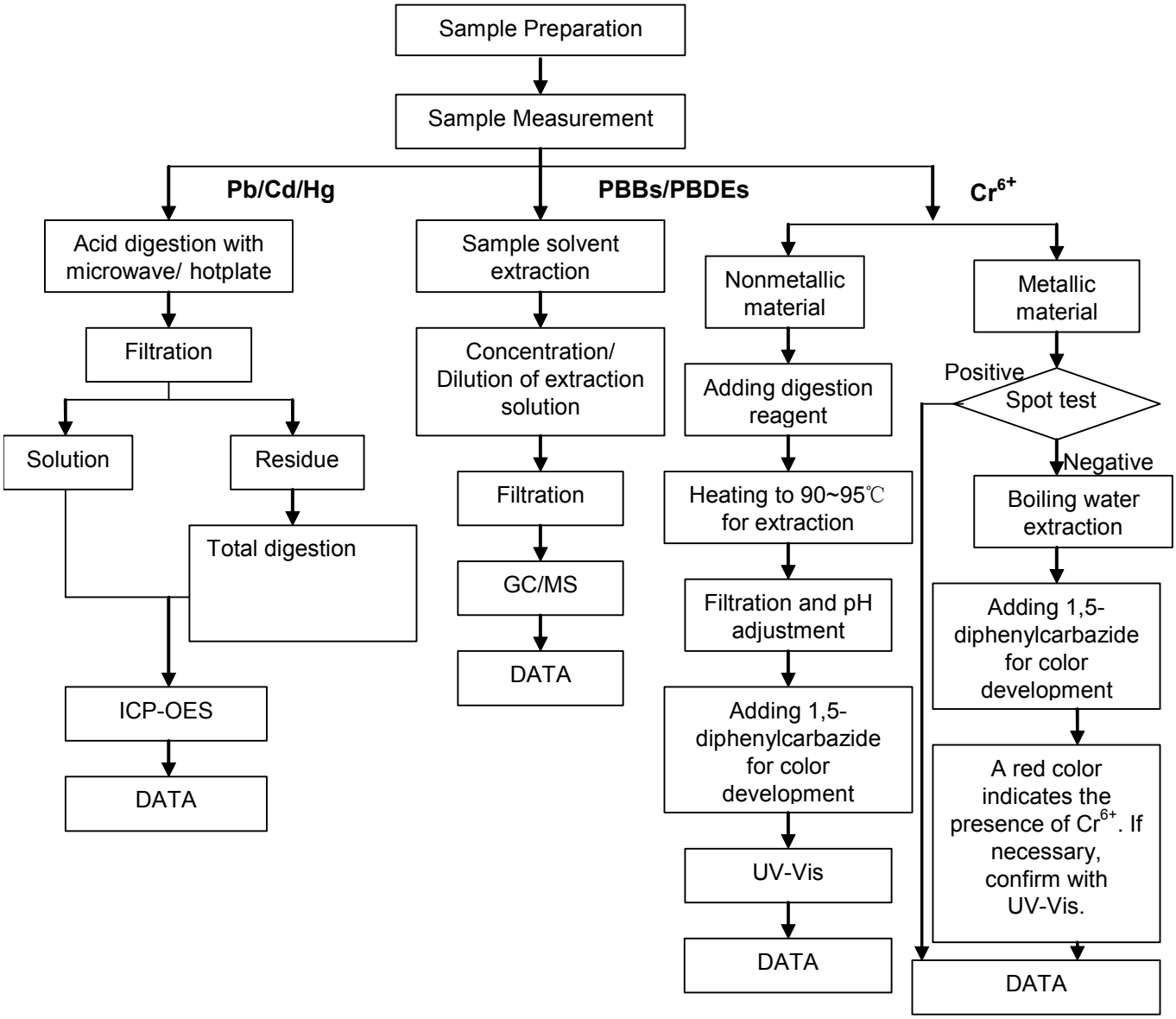
Test Method : With reference to US EPA 8082A: 2007, analysis was performed by GC-MS

Test Item(s)	CAS_NO	Unit	MDL	002
2.4.4'-Trichlorobiphenyl (PCB 28)	7012-37-5	mg/kg	0.5	ND
2.2'.5.5'-Tetrachloro-biphenyl (PCB 52)	35693-99-3	mg/kg	0.5	ND
2.2'.4.5.5'-Pentachloro-biphenyl (PCB 101)	37680-73-2	mg/kg	0.5	ND
2.3'.4.4'.5-Pentachlorobiphenyl (PCB 118)	31508-00-6	mg/kg	0.5	ND
2.2'3.4.4'.5'-Hexachloro-biphenyl (PCB 138)	35065-28-2	mg/kg	0.5	ND
2.2'.4.4'.5.5'-Hexachloro-biphenyl (PCB 153)	35065-27-1	mg/kg	0.5	ND
2.2'.3.4.4'.5.5'-Heptachlorobiphenyl (PCB 180)	35065-29-3	mg/kg	0.5	ND

ATTACHMENTS

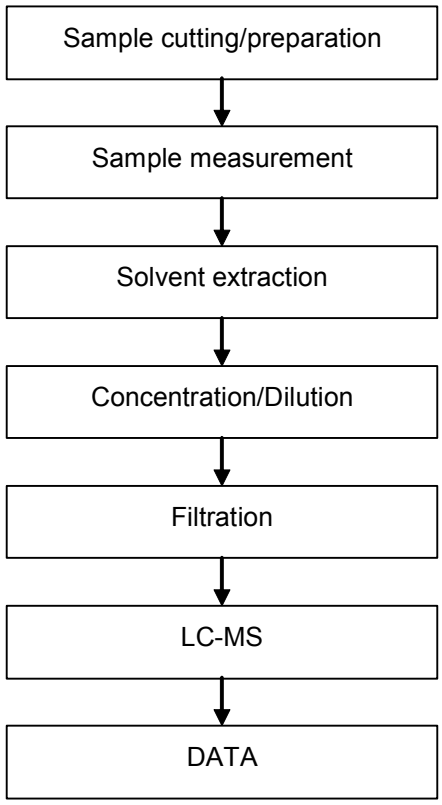
RoHS Testing Flow Chart

1) Name of the person who made testing: Allen Xiao/ Spring Zuo / Frank Fang /Elim Lin
2) Name of the person in charge of testing: Jeff Zhang/George Xu/Tracy Yue
3) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr^{6+} and PBBs/PBDEs test method excluded)



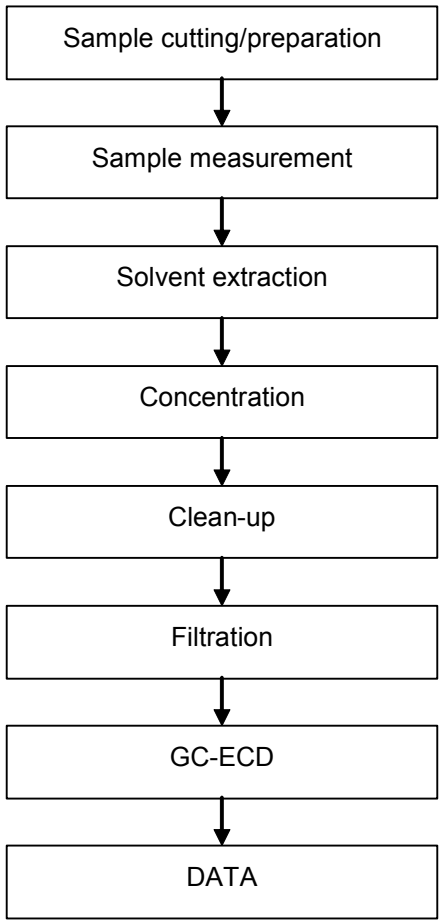
PFOS/PFOA Testing Flow Chart

1) Name of the person who made testing: Judy Li
2) Name of the person in charge of testing: Nancy Du



SCCP Testing Flow Chart

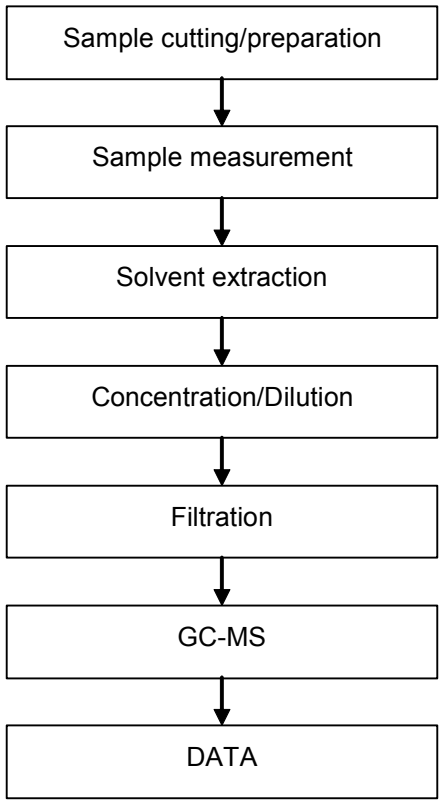
1) Name of the person who made testing: Bill Zhong
2) Name of the person in charge of testing: Susan Liu



SGS-CSTC Standards Technical Services Co., Ltd. Shanghai Branch · Chemical Laboratory
3rd Building,No.889,Yishan Road,Shanghai,China 200233 tE&E:(86-21) 61402553 fE&E:(86-21) 64953679 www.cn.sgs.com
中国 ·上海 · 宜山路889号3号楼 邮编: 200233 HL:(86-21) 61402594 HL:(86-21) 54500353 e sgs.china@sgs.com

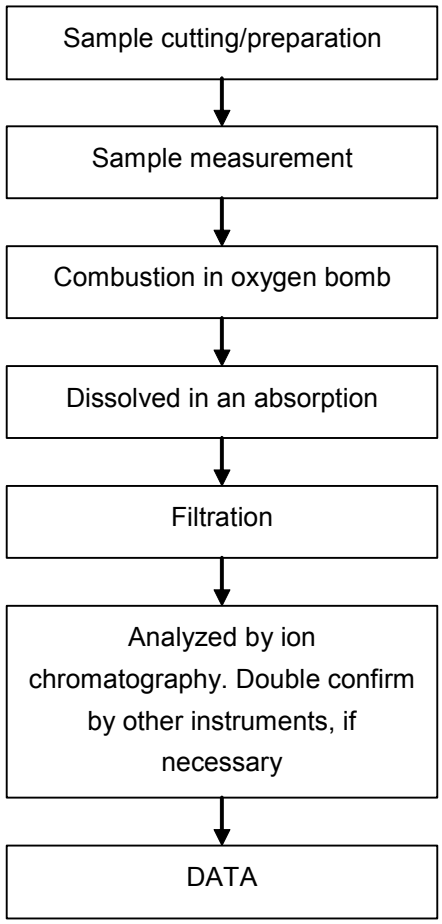
PCB/ PCT/ PCN Testing Flow Chart

1) Name of the person who made testing: Bill Zhong
2) Name of the person in charge of testing: Susan Liu



Halogen Testing Flow Chart

1) Name of the person who made testing: Daisy Gong
2) Name of the person in charge of testing: Alex Jiang



SGS-CSTC Standards Technical Services Co., Ltd. Shanghai Branch
3rd Building,No.889,Yishan Road,Shanghai,China 200233 tE&E:(86-21) 61402553 fE&E:(86-21) 64953679 www.cn.sgs.com
中国·上海·宜山路889号3号楼 邮编: 200233 HL:(86-21) 61402594 HL:(86-21) 54500353 e sgs.china@sgs.com

Sample photo:

SHA10-071366.002

SGS authenticate the photo on original report only

*** End of Report ***

SGS-CSTC Standards Technical Services Co., Ltd.
Shanghai Branch · Testing Service Chemical Laboratory
3rd Building,No.889,Yishan Road,Shanghai,China 200233 tE&E:(86-21) 61402553 fE&E:(86-21) 64953679 www.cn.sgs.com
中国 ·上海 · 宜山路889号3号楼 邮编: 200233 HL:(86-21) 61402594 HL:(86-21) 54500353 e sgs.china@sgs.com

KOSTAT ESD & EMI SHIELDING

Kostat, Inc. 358-15, Gogange-Dong, Ojung-gu, Buchun-City Kyoung Ki-Do, Korea Tel: 82-32-671-8100 Fax: 82-32-671-0259	**M S D S** [Material Safety Data Sheet]	Issue Date	2010.03.03
	Carrier tapes	Revision date	2010.05.03
	KKB	Valid date	2012.05.03
		Page	1/4

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	Carrier tapes
Ext. Appearance	Thermoforming Poly Styrene sheet
Purpose/Use	May be use to produce molding or extruded particles or as a compound of other industrial products
Manufacture	Kostat, Inc., 49, Wonsan-Ri, Hasung-Myun, Gimpo-City, Kyoung Ki-Do, Korea
Contact	(Tel) 82-31-988-2350 (Fax) 82-31-988-2354

2. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Common Name	CAS No.	Content (%)
High Impact Polystyrene	HIPS	9003-53-6	60~65
Styrene Butadiene Copolymer	SBS	9003-55-8	10~15
Carbon Black	Carbon Black	1333-86-4	20~25
Anti Oxidant	A/O	6683-19-8	0.5~1.0

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEWS

Sheets have slight or no odor.

Can burn in a fire creating dense toxic smoke. Molten plastic can cause severe thermal burns.

Fumes produced during melt processing may cause eye, skin and respiratory tract irritation.

POTENTIAL HEALTH EFFECTS

Eye	Product may cause irritation or injury due to mechanical action.
Skin	Pellets not likely to cause skin irritation.
Ingestion	Not acutely toxic.

CHRONIC/CARCINOGENICITY

NTP: Not Tested OSHA: Not Regulated IARC: Not Listed

4. FIRST AID MEASURES

Eye	Remove contact lenses at once, immediately. Flush eyes well with copious quantities of water or normal saline for at least 15-20 minutes. If irritation persists, seek medical attention.
Skin	Seek medical attention if rash or burn occurs.
Inhalation	Not likely to be inhaled due to physical form.
Ingestion	Not probable. If a large amount is swallowed, seek medical attention.

MELT PROCESSING

For molten plastic skin contact, cool rapidly flush water and immediately seek medical attention. For skin contact with fume commiserate, immediately each thoroughly with soap and water. If irritation develops seek medical attention.

5. FIRE FIGHTING MEASURES

Approved pressure demand breathing apparatus and protective clothing should be used for all fires.

Water spray is the preferred extinguishing medium.

This product will melt but will not be carried on the surface for water.

EXTINGUISHING MEDIA

Water spray and foam, water is the best extinguishing medium.

HAZARDOUS COMBUSTION PRODUCTS

Hazardous combustion products may include intense heat, dense black smoke, carbon monoxide, carbon dioxide, oxides of phosphorus, hydrogen xyanide, hydrocarbon fragments, hydrogen fluoride, carbonyl fluoride and fluorocarbon fragments.

6. ACCIDENTAL RELEASE MEASURES

Sweep or gather up material and place in container for disposal or recovery.[see section 13]

7. HANDING AND STORAGE

Handing	Follow recommendations on label in processing guide. Prevent contact with skin and eyes. Use good industrial hygiene practices. Provide adequate ventilation.
Storage	Store in a dry place away from moisture, excessive heat and sources of ignition.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

A continuous supply of fresh air to the workplace together with removal of processing fumes through exhaust systems is recommended. Processing fume condensate may be a fire hazard and toxic remove periodically from exhaust hoods, ducts work and other surfaces using appropriate.

PERSONAL PROTECTION

Eye/Face Protection	Wear safety glasses or goggles to product against dust particles.
Skin Protection	Wear chemical resistant gloves and protective clothing.
Respiratory Protection	Use NIOSH approved respirator as needed to mitigate exposure.
Engineering Controls	Work in well ventilated areas. Do not breathe dust.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Form	Solid
Color and Appearance	Plastic pellet with slight odor
Boiling Point	Not Applicable
Specific Gravity (WATER=1)	1.15 ~ 1.20
Water Solubility	Insoluble
PH	Not Applicable
Oder threshold	Not established

10. STABILITY AND REACTIVITY

Stability	Stable
Incompatibility	Strong oxidizing agents, strong acids, strong bases
Hazardous decomposition Products	Not decomposition expected under normal storage conditions.

Do not exceed melt temperature recommendations in product literature.

11. TOXICOLOGICAL INFORMATION

Not available

12. ECOLOGICAL INFORMATION

Not expected to present any significant ecological problems.

13. DISPOSAL CONSIDERATIONS

Waste Disposal	Recycling is encouraged. Landfill or incinerate in accordance with federal, state and local requirements. Collected processing fume condensates and incinerator ash should be tested to determine waste classification.

14. TRANSPORT INFORMATION

This product is not regulated as a hazardous material for transport

Sea	Free for any transport
Air	Free for any transport

15. REGULATORY INFORMATION

Listed below are chemical substances subject to supplier notification requirements.

U.S. Regulations

TSCA Inventory	This product complies with the chemical substance inventory requirements of the US EPA TSCA
CERCLA SECTION 103	Not Listed
SARA SECTION 313	Not Listed
STATE REGULATIONS	Not Listed
EUROPEAN REGULATIONS	Not Assigned

16. OTHER INFORMATION

The information submitted in this MSDS is based on our current knowledge and experience.

Because it is not possible to anticipate all conditions of use additional safety precautions may be required, we make no warranty.

ABBREVIATIONS:

ACGIH	American Conference of Governmental industrial Hygienist
DOT	Department of transportation
EC	European Communities
EPA	Environmental Protection Agency
IARC	International Agency for Research on Cancer.
NOISH	National Institute for Occupational Safety and Health
NTP	National Toxicology Program
OSHA	Occupational Safety and Health Administration
RTECS	Registry of Toxic Effects of Chemical Substances
CAS#	Chemical Abstracts Service Number
RCRA	Resource Conservation and Recovery Act

DENKA THERMOFILM ALS
Modified date:May.31.2007

MATERIAL SAFETY DATA SHEET

MANUFACTURER INFORMATION

MANUFACTURER	: Denki Kagaku Kogyo Kabushiki Kaisya
SECTION IN CHARGE	: Electronic Packaging Materials Department Electronic Materials Business Division
ADDRESS	: Nihonbashi Mitsui Tower,1-1,Nihonbashi-Muromachi 2-chome,Chuo-ku, Tokyo 103-8338,JAPAN
EMERGENCY PHONE No.	: 81-3-5290-5383 (voice) 81-3-5290-5306 (fax)

PRODUCT NAME : Denka thermofilm ALS-PRA

COMPOSITION / INFORMATION ON INGREDIENTS

DISTINCTION OF SINGLE PRODUCT OR MIXTURE

: mixture (layered)

INGREDIENT
: Polyethyleneterephthalate resin
: Polyolefinic resin
: Polyolefinic resin

HAZARDS IDENTIFICATION

Emergency overview

Odorless translucent film. Can burn in a fire.

POTENTIAL HEALTH EFFECTS AND FIRST AID MEASURES

EYE	: In usual handling, this does not go into an eye. When entering, it may damage an eyeball. Wash an eye with pure water and go to doctor.
SKIN	: There is usually no skin obstacle by contact. If abnormalities occur, flush the skin with pure water and go to doctor. Cutting of the skin may be carried out when the skin is strongly rubbed with the edge of a film.
INHALATION	: Gas may have occurred by high temperature during heat sealing. When inhaling this gas severely, move to the place of fresh air and gargle simultaneously. When coughing and breath difficulty will occur, go to doctor.

INGESTION : Ingestion does not happen in usual handling. If little, it does not need special action. If abundant, makes vomit.

FIRE FIGHTING MEASURES

Sever the source of combustion like a general fire, and extinguish the fire using a lot of water and a fire-extinguisher.

In case of fire, black smoke and carbon monoxide, etc. may occur by heat decomposition and imperfect combustion of polymer ingredient. Use suitable protection implement for avoiding risks of inhaling those and barring a field of view for injury on fire-extinguishing activity.

ACCIDENTAL RELEASE MEASURES

Sweep or vacuum material and place in a disposal container.

HANDLING AND STORAGE

HANDLING : Although there is no fear such as ignition, combustion, and explosion in normal temperature, it can burn at high temperature.
Since this material is a roll-like film with heavy weight, take caution in fall up to a leg etc.
Cutting of the skin may be carried out when the skin is strongly rubbed with the edge of a film.

STORAGE : Storage in room at normal temperature and avoid to expose by rain, wind, and direct sunshine.

EXPOSURE CONTROLS / PERSONAL PROTECTION

MANAGEMENT CONCENTRATION
: Not applicable

PERMISSION CONCENTRATION
: Not defined

MEASURE AGAINST EQUIPMENT
: Not necessary

PROTECTION : Not necessary at usual handling

PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE : Translucent plastic film

SPECIFIC GRAVITY : 1.05～1.07

MELTING POINT : Since this material is a mixture, it does not exist clearly.

SOLUBILITY IN WATER : Not applicable

STABILITY AND REACTIVITY

FLUSH POINT : No data available

IGNITING POINT : There are not natural ignition nature and ignition nature by the reactivity with water.

INFLAMMABILITY : Yes

OXIDIZING : No

SELF-REACTIVITY : No

VOLATILITY : No

DUST EXPLOSION : Not applicable

STABILITY AND REACTIVITY

: Stable and deficient in reactivity

TOXICOLOGICAL INFORMATION

Although there is no knowledge now, the following view is appropriate.

STIMULUS NATURE : Physical stimulus

ACUTE TOXICITY : Inactive physiologically and there is no special acute action to a human body.

ECOLOGICAL INFORMATION

Decomposition nature, accumulation nature, and fish

TOXICITY : Not applicable

OTHERS : Since a film is considered to be stable that it is hard to decompose, it must not be abandoned anywhere to prevent that a sea living thing and birds take in.

DISPOSAL CONSIDERATION

WASTE MANAGEMENT INFORMATION (DISPOSAL)

: Any disposal practice must be in compliance with local, state, and federal laws and regulations (contact local or state enviromenmental agency for specific rules).

TRANSPORT INFORMATION

Ensure shipping and load to prevent collapse and damage.

REGULATORY INFORMATION

OSHA HAZARD COMMUNICATION RULES

: This product contains no substances under this rules.
