www.SeCosGmbH.com

Headquarter Address:
8F.No.33, Lane 155, Sec.3, Bei-Shen Rd.,
Shen Keng Dist, New Taipei City, Taiwan
TEL: +886-2-26620988
FAX: +886-2-26620488

Product/Process Change Notification

PCN#	Effective Date	Issue Date
2017-12-08C-02	2018/3/8	2017/12/8

PCN Classification	Product Category
Major	Transistor

Subject

Production process change from lead free to halogen free.

Affected Product(s)

SOT-223 Package of Transistor, Such as attachments.

Description of Change(s)

To meet EU environment requirement, we implement halogen free to our products.

Content of Change(s)

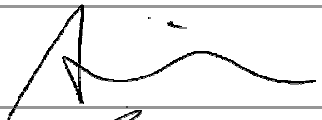
Adding “-C” to each part number.

Impact(s)

N/A

Attachment(s)

SGS report. Reliability report.

Approval		
Issue by	Alice Lai	e-mail: alice@secosgmbh.com
Development Engineer		Alice Lai
QA Manager		Peter Yang
General Manger		Mathew Liu

For more information, please contact us directly or visit our website http://www.secosgmbh.com

www.SeCosGmbH.com

Headquarter Address:
8F.No.33, Lane 155, Sec.3, Bei-Shen Rd.,
Shen Keng Dist, New Taipei City, Taiwan
TEL: +886-2-26620988
FAX: +886-2-26620488

Affected Product(s)

2SA94	PZT3904
BCP51	PZT3906
BCP55	PZT559
BCP56	PZT559A
BCP69	PZT5712
CZT31C	PZT649A
CZT5401	PZT882J
CZT5551	PZT9401A
PZT157	PZT9411A
PZT195A	PZTA06
PZT2222A	PZTA42
PZT2907A	PZTA44
PZT32C	PZTA56
PZT359	PZTA64

SeCoS Corporation

Reliability Testing Summary Report

Date: 2017/11/30 Document No.: SK17 -11- 103

Test Item	P/N	Test Condition	(LTPD)	Sample Numbers	Allow Fall Numbers	Fall Numbers	Result
HTRB High Temp Reverse Bias	PZT559A-C	150 ± 5℃, 80%VR, T = 1000hrs		77	0	0	ACC
HTSL High Temperature Storage Life	PZT559A-C	150℃, T = 1000 hrs		77	0	0	ACC
PCT Pressure Cooker Test	PZT559A-C	121℃, 29.7PSIG, 168 hrs		77	0	0	ACC
TCT Temperature Cycle Test	PZT559A-C	-55℃/30min, 150℃/30min, For 1000 Cycle		77	0	0	ACC
THT High Temperature High Humidity Test	PZT559A-C	85 ± 2℃, RH=85±5%, 1000 hrs		77	0	0	ACC
H3TRB High Temper High Humidity Reverse Bies Test	PZT559A-C	85 ± 2℃, RH=85±5%, 80%VR, 1000 hrs		77	0	0	ACC
Resistance to Solder Heat Test	PZT559A-C	270℃±5℃, 7Sec +2/-0Sec		10	0	0	ACC

Judgment:

■ **qualified** □ **unqualified**

Testing Start Date: 2017.10.05 Testing End Date: 2017.11.30

Tester: King Huang Approval: Peter Yang

SeCoS Corporation

Electrical Test Data

Report No : T171130-103
Part No : PZT559A-C
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -140V@IC=-10mA, IB=0 ； 100 < hFE < 300@VCE=-5V, IC=-1A
VCE(sat) < -360mV@IC=-3A, IB=-300mA
Test Condition: 25℃
Test Date: 2017.10.05
Test Standard : Specifications
Operator: Leo Hsia

Test Result: PASS

No	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)
1	-167.6V	194.9	-201.1mV
2	-162.4V	218.9	-202.5mV
3	-160.9V	197.9	-221.0mV
4	-171.3V	217.2	-201.4mV
5	-161.7V	202.0	-203.4mV
6	-167.0V	196.7	-201.3mV
7	-166.8V	196.2	-222.8mV
8	-168.6V	216.8	-211.1mV
9	-160.8V	216.2	-200.2mV
10	-169.0V	218.2	-204.5mV
11	-162.1V	201.0	-202.7mV
12	-164.2V	209.3	-207.2mV
13	-163.0V	202.8	-222.6mV
14	-167.7V	215.1	-220.5mV
15	-165.4V	217.4	-207.2mV
16	-164.6V	212.3	-221.1mV
17	-167.0V	215.3	-217.3mV
18	-163.8V	202.1	-219.7mV
19	-161.9V	217.3	-207.5mV
20	-164.0V	219.7	-225.0mV
21	-168.0V	213.4	-206.1mV
22	-161.0V	192.7	-213.7mV
23	-169.0V	204.3	-215.4mV
24	-167.7V	210.7	-207.7mV
25	-163.9V	209.3	-221.0mV
26	-162.6V	211.7	-212.0mV
27	-162.1V	202.9	-219.6mV
28	-164.3V	201.2	-200.2mV
29	-166.2V	220.4	-223.4mV
30	-166.2V	220.0	-200.0mV

SeCoS Corporation

Electrical Test Data

Report No : T171130-103
Part No : PZT559A-C
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -140V@IC=-10mA, IB=0 ； 100 < hFE < 300@VCE=-5V, IC=-1A
VCE(sat) < -360mV@IC=-3A, IB=-300mA
Test Condition: 25℃
Test Date: 2017.10.05
Test Standard : Specifications
Operator: Leo Hsia

Test Result: PASS

No	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)
31	-168.8V	208.9	-219.4mV
32	-165.5V	198.0	-223.5mV
33	-168.1V	211.9	-206.3mV
34	-166.4V	215.5	-218.1mV
35	-162.7V	218.2	-213.2mV
36	-167.9V	214.0	-210.2mV
37	-168.7V	205.9	-217.7mV
38	-162.1V	201.6	-220.9mV
39	-165.7V	220.7	-223.3mV
40	-164.8V	213.3	-215.0mV
41	-168.4V	193.0	-203.9mV
42	-160.5V	198.9	-218.8mV
43	-163.0V	220.3	-209.7mV
44	-167.6V	197.6	-215.7mV
45	-160.9V	204.4	-211.2mV
46	-161.8V	204.8	-222.9mV
47	-167.5V	205.2	-214.8mV
48	-163.9V	193.2	-210.7mV
49	-163.6V	199.4	-202.9mV
50	-169.9V	208.8	-217.5mV
51	-167.5V	215.5	-219.9mV
52	-169.8V	204.1	-209.5mV
53	-169.6V	216.7	-207.9mV
54	-168.4V	217.3	-214.8mV
55	-163.1V	197.3	-220.2mV
56	-161.5V	207.8	-220.1mV
57	-165.5V	199.1	-215.0mV
58	-160.2V	214.2	-219.4mV
59	-164.6V	201.5	-222.3mV
60	-169.8V	203.5	-210.5mV

SeCoS Corporation

Electrical Test Data

Report No : T171130-103
Part No : PZT559A-C
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -140V@IC=-10mA, IB=0 ； 100 < hFE < 300@VCE=-5V, IC=-1A
VCE(sat) < -360mV@IC=-3A, IB=-300mA
Test Condition: 25℃
Test Date: 2017.10.05
Test Standard : Specifications
Operator: Leo Hsia

Test Result: PASS

No	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)
61	-168.5V	216.6	-214.3mV
62	-168.3V	212.1	-208.1mV
63	-161.9V	215.9	-222.6mV
64	-160.6V	205.7	-220.6mV
65	-164.5V	193.6	-214.7mV
66	-170.4V	203.6	-218.1mV
67	-166.4V	201.5	-218.1mV
68	-160.4V	198.9	-202.9mV
69	-163.7V	198.5	-199.5mV
70	-164.5V	205.3	-206.6mV
71	-170.3V	200.3	-207.3mV
72	-170.4V	192.9	-209.3mV
73	-167.9V	220.6	-224.8mV
74	-163.9V	199.6	-217.9mV
75	-167.2V	194.5	-219.5mV
76	-169.7V	192.8	-217.8mV
77	-171.2V	216.1	-205.9mV

Made By: King Huang

Approval: Peter Yang

SeCoS Corporation

High Temperature Reverse Bias Test Data

Report No : T171130-103
Part No : PZT559A-C
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -140V@IC=-10mA, IB=0 ； 100 < hFE < 300@VCE=-5V, IC=-1A
VCE(sat) < -360mV@IC=-3A, IB=-300mA
Test Condition: 150 ± 5℃, 80%VR, T = 1000 hrs
Test Date: 2017.10.05 ~ 2017.11.17
Test Standard : JESD22 STANDARD Method-A108
Operator: Leo Hsia

Test Result: PASS

	Before			After		
No	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)
1	-168.5V	196.1	-215.8mV	-163.7V	196.2	-225.3mV
2	-167.3V	198.2	-207.1mV	-160.9V	200.8	-208.4mV
3	-163.3V	214.8	-203.9mV	-167.2V	195.8	-218.4mV
4	-165.2V	206.0	-214.7mV	-168.7V	219.2	-222.4mV
5	-165.5V	216.1	-211.4mV	-162.8V	212.7	-218.7mV
6	-170.3V	202.8	-219.6mV	-171.1V	214.1	-218.9mV
7	-171.0V	193.1	-224.0mV	-171.2V	208.2	-213.8mV
8	-166.7V	217.6	-202.0mV	-169.2V	211.5	-217.5mV
9	-169.8V	218.2	-201.6mV	-165.6V	203.8	-214.6mV
10	-162.6V	207.5	-210.3mV	-162.7V	213.8	-218.0mV
11	-168.8V	211.5	-224.2mV	-166.5V	205.7	-221.0mV
12	-164.6V	214.4	-225.5mV	-168.5V	201.3	-211.9mV
13	-169.1V	201.5	-205.5mV	-162.3V	207.4	-220.2mV
14	-170.5V	216.2	-209.9mV	-162.9V	214.2	-202.8mV
15	-166.8V	217.7	-223.6mV	-160.6V	202.5	-220.1mV
16	-170.5V	213.3	-221.3mV	-167.7V	199.3	-223.2mV
17	-163.9V	215.1	-203.4mV	-163.1V	201.9	-213.3mV
18	-167.8V	218.7	-214.8mV	-161.7V	193.3	-219.7mV
19	-162.4V	201.9	-222.4mV	-162.1V	220.9	-210.5mV
20	-165.0V	213.0	-202.1mV	-169.4V	194.1	-221.6mV
21	-160.7V	216.1	-220.4mV	-165.9V	200.5	-205.5mV
22	-167.2V	220.1	-225.0mV	-164.0V	198.8	-207.5mV
23	-166.7V	216.3	-211.7mV	-164.8V	217.0	-218.8mV
24	-165.4V	192.9	-200.9mV	-162.0V	216.3	-209.3mV
25	-164.5V	217.5	-200.0mV	-160.5V	200.5	-214.5mV
26	-161.8V	197.2	-223.3mV	-161.1V	205.6	-205.2mV
27	-164.1V	217.8	-224.1mV	-167.4V	219.4	-201.5mV
28	-161.2V	201.7	-215.0mV	-165.4V	193.8	-214.3mV
29	-168.1V	205.9	-216.6mV	-170.3V	194.9	-205.7mV

SeCoS Corporation

High Temperature Reverse Bias Test Data

Report No : T171130-103
Part No : PZT559A-C
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -140V@IC=-10mA, IB=0 ； 100 < hFE < 300@VCE=-5V, IC=-1A
VCE(sat) < -360mV@IC=-3A, IB=-300mA
Test Condition: 150 ± 5℃, 80%VR, T = 1000 hrs
Test Date: 2017.10.05 ~ 2017.11.17
Test Standard : JESD22 STANDARD Method-A108
Operator: Leo Hsia

Test Result: PASS

	Before			After		
No	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)
30	-166.5V	218.0	-207.0mV	-166.7V	221.0	-208.0mV
31	-168.6V	221.0	-223.2mV	-165.9V	212.3	-223.0mV
32	-167.6V	207.3	-223.8mV	-165.9V	192.8	-224.0mV
33	-165.0V	218.7	-199.8mV	-169.6V	200.7	-222.6mV
34	-165.4V	202.6	-218.7mV	-166.6V	207.6	-222.5mV
35	-160.5V	215.1	-207.5mV	-162.4V	199.9	-206.4mV
36	-168.8V	207.5	-200.3mV	-166.1V	208.4	-200.9mV
37	-164.1V	212.0	-202.4mV	-161.7V	214.9	-214.7mV
38	-169.5V	202.6	-220.0mV	-169.8V	210.5	-220.3mV
39	-161.5V	220.6	-200.8mV	-160.2V	200.2	-199.4mV
40	-168.6V	214.8	-225.3mV	-161.6V	220.9	-210.9mV
41	-163.8V	215.2	-214.0mV	-166.3V	213.8	-209.3mV
42	-167.0V	193.6	-204.2mV	-167.5V	204.7	-219.9mV
43	-170.7V	219.1	-212.1mV	-168.7V	212.5	-205.5mV
44	-161.2V	208.4	-220.4mV	-161.4V	216.3	-225.0mV
45	-163.5V	193.5	-222.6mV	-165.9V	203.1	-225.4mV
46	-167.2V	204.3	-201.5mV	-165.0V	201.4	-210.4mV
47	-162.3V	214.2	-215.4mV	-168.8V	211.5	-207.7mV
48	-170.2V	195.3	-216.0mV	-164.2V	206.5	-200.1mV
49	-163.4V	220.0	-203.9mV	-161.8V	217.8	-221.9mV
50	-168.2V	218.3	-220.7mV	-166.4V	215.7	-200.0mV
51	-163.8V	217.8	-225.2mV	-163.4V	219.9	-212.0mV
52	-160.9V	210.8	-225.0mV	-168.6V	198.2	-224.2mV
53	-166.0V	212.8	-199.6mV	-161.5V	201.7	-221.0mV
54	-169.5V	209.2	-222.3mV	-166.1V	210.1	-214.0mV
55	-161.1V	198.5	-209.4mV	-169.3V	214.4	-222.5mV
56	-160.4V	219.3	-206.2mV	-160.9V	214.0	-220.0mV
57	-161.2V	208.6	-210.5mV	-160.4V	205.7	-213.4mV
58	-167.8V	210.8	-205.0mV	-170.2V	210.1	-214.6mV

SeCoS Corporation

High Temperature Reverse Bias Test Data

Report No : T171130-103
Part No : PZT559A-C
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -140V@IC=-10mA, IB=0 ； 100 < hFE < 300@VCE=-5V, IC=-1A
VCE(sat) < -360mV@IC=-3A, IB=-300mA
Test Condition: 150 ± 5℃, 80%VR, T = 1000 hrs
Test Date: 2017.10.05 ~ 2017.11.17
Test Standard : JESD22 STANDARD Method-A108
Operator: Leo Hsia

Test Result: PASS

	Before			After		
No	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)
59	-164.4V	212.4	-203.0mV	-160.8V	197.3	-210.5mV
60	-170.9V	207.6	-220.9mV	-163.4V	198.0	-209.8mV
61	-167.6V	200.4	-205.9mV	-162.4V	198.7	-225.4mV
62	-160.2V	216.9	-218.2mV	-160.6V	217.0	-222.0mV
63	-169.9V	214.6	-205.6mV	-163.0V	216.1	-219.0mV
64	-170.8V	203.4	-214.0mV	-162.3V	193.4	-208.1mV
65	-165.1V	197.3	-223.9mV	-170.0V	212.7	-217.3mV
66	-165.6V	193.1	-216.0mV	-161.5V	207.1	-219.8mV
67	-168.0V	193.0	-203.6mV	-170.4V	206.8	-220.2mV
68	-165.5V	203.2	-205.9mV	-164.1V	208.6	-199.5mV
69	-170.1V	216.3	-201.8mV	-160.6V	194.0	-219.2mV
70	-162.1V	208.3	-211.5mV	-166.2V	215.6	-202.9mV
71	-162.4V	194.0	-220.9mV	-170.4V	209.5	-211.5mV
72	-169.9V	202.8	-219.2mV	-168.8V	195.3	-222.6mV
73	-169.7V	207.9	-217.9mV	-169.1V	214.5	-206.4mV
74	-161.9V	192.7	-199.7mV	-165.2V	211.9	-206.0mV
75	-166.1V	212.1	-209.6mV	-169.6V	219.0	-203.0mV
76	-162.5V	209.0	-217.0mV	-161.3V	216.1	-214.5mV
77	-160.2V	207.3	-200.5mV	-170.4V	211.1	-220.7mV

Made By: King Huang

Approval: Peter Yang

SeCoS Corporation

High Temperature Storage Life Test Data

Report No : T171130-103
Part No : PZT559A-C
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -140V@IC=-10mA, IB=0 ； 100 < hFE < 300@VCE=-5V, IC=-1A
VCE(sat) < -360mV@IC=-3A, IB=-300mA
Test Condition: 150℃, 1000Hrs
Test Date: 2017.10.05 ~ 2017.11.17
Test Standard : JESD22 STANDARD Method-A103
Operator: Leo Hsia

Test Result: PASS

	Before			After		
No	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)
1	-165.6V	203.7	-215.5mV	-166.3V	211.6	-223.9mV
2	-162.1V	201.9	-210.3mV	-160.2V	199.5	-224.6mV
3	-170.0V	216.5	-205.0mV	-169.8V	205.4	-217.7mV
4	-168.0V	218.9	-211.6mV	-165.2V	196.7	-200.0mV
5	-161.2V	199.0	-207.2mV	-164.1V	195.5	-205.3mV
6	-160.2V	202.2	-221.7mV	-163.7V	200.0	-213.4mV
7	-170.7V	216.0	-220.6mV	-165.4V	193.2	-205.4mV
8	-163.4V	219.0	-204.6mV	-163.1V	210.1	-222.6mV
9	-167.5V	197.9	-220.1mV	-167.0V	217.8	-204.2mV
10	-167.8V	203.1	-216.9mV	-170.5V	199.1	-211.1mV
11	-161.5V	202.3	-211.2mV	-164.7V	220.7	-201.0mV
12	-162.4V	203.5	-212.1mV	-161.1V	196.1	-221.4mV
13	-165.0V	200.0	-223.7mV	-167.3V	216.2	-207.0mV
14	-165.1V	200.9	-205.8mV	-168.2V	218.8	-217.7mV
15	-165.5V	209.0	-215.4mV	-169.7V	207.6	-213.5mV
16	-164.4V	218.7	-200.4mV	-165.5V	207.2	-209.6mV
17	-169.2V	211.5	-217.9mV	-162.9V	195.8	-200.9mV
18	-164.6V	198.9	-202.5mV	-161.3V	200.7	-218.2mV
19	-161.0V	219.8	-214.5mV	-161.5V	211.5	-223.2mV
20	-162.3V	220.2	-221.1mV	-167.6V	193.4	-215.0mV
21	-164.5V	217.5	-200.0mV	-167.5V	195.5	-204.6mV
22	-170.7V	208.7	-215.7mV	-171.1V	204.1	-222.5mV
23	-168.3V	197.3	-201.2mV	-169.2V	209.8	-223.5mV
24	-164.7V	204.0	-220.1mV	-169.1V	192.7	-202.9mV
25	-162.0V	196.1	-217.1mV	-167.0V	208.6	-206.7mV
26	-162.9V	203.5	-214.5mV	-167.5V	211.6	-207.5mV
27	-167.1V	206.1	-219.0mV	-171.4V	201.0	-214.7mV
28	-171.1V	214.5	-215.8mV	-164.7V	220.9	-213.5mV
29	-162.4V	200.3	-201.2mV	-167.5V	192.6	-211.0mV

SeCoS Corporation

High Temperature Storage Life Test Data

Report No : T171130-103
Part No : PZT559A-C
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -140V@IC=-10mA, IB=0 ； 100 < hFE < 300@VCE=-5V, IC=-1A
VCE(sat) < -360mV@IC=-3A, IB=-300mA
Test Condition: 150℃, 1000Hrs
Test Date: 2017.10.05 ~ 2017.11.17
Test Standard : JESD22 STANDARD Method-A103
Operator: Leo Hsia

Test Result: PASS

	Before			After		
No	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)
30	-163.3V	196.7	-207.7mV	-161.5V	211.8	-214.5mV
31	-163.9V	204.4	-216.7mV	-160.2V	202.2	-212.2mV
32	-164.3V	192.9	-222.5mV	-166.2V	208.6	-204.3mV
33	-161.2V	218.9	-217.5mV	-170.1V	197.1	-204.0mV
34	-164.9V	196.4	-200.0mV	-168.8V	210.2	-203.4mV
35	-169.0V	205.2	-217.6mV	-162.7V	201.9	-224.4mV
36	-164.1V	210.4	-222.6mV	-161.2V	203.0	-203.3mV
37	-160.1V	197.0	-212.4mV	-170.5V	219.2	-206.1mV
38	-166.9V	211.1	-207.4mV	-168.5V	219.9	-208.0mV
39	-167.4V	207.8	-218.1mV	-167.5V	209.1	-217.9mV
40	-160.7V	211.2	-206.3mV	-161.5V	220.4	-218.1mV
41	-161.9V	213.5	-211.0mV	-164.6V	210.7	-200.6mV
42	-168.5V	206.0	-218.1mV	-161.6V	219.0	-202.4mV
43	-167.7V	196.5	-217.1mV	-168.7V	195.8	-199.7mV
44	-165.1V	197.9	-212.7mV	-168.4V	195.0	-211.0mV
45	-161.6V	208.1	-224.6mV	-165.1V	207.4	-217.8mV
46	-167.8V	200.0	-211.0mV	-160.7V	197.6	-223.0mV
47	-161.8V	199.8	-203.3mV	-169.8V	197.3	-207.8mV
48	-166.5V	216.2	-223.2mV	-164.5V	200.9	-218.0mV
49	-170.5V	194.2	-225.0mV	-165.3V	220.7	-203.9mV
50	-164.3V	212.8	-223.5mV	-164.5V	219.9	-216.0mV
51	-164.9V	210.8	-215.9mV	-162.3V	202.3	-222.4mV
52	-162.0V	194.7	-215.7mV	-165.1V	198.6	-222.4mV
53	-166.6V	213.8	-219.5mV	-167.6V	218.0	-222.9mV
54	-170.3V	206.0	-208.2mV	-170.6V	206.9	-202.8mV
55	-160.9V	220.4	-215.8mV	-162.8V	202.4	-217.9mV
56	-165.2V	195.3	-211.5mV	-168.9V	218.4	-224.5mV
57	-166.0V	193.0	-203.1mV	-168.6V	203.5	-200.7mV
58	-165.3V	216.0	-209.4mV	-166.9V	204.2	-221.3mV

SeCoS Corporation

High Temperature Storage Life Test Data

Report No : T171130-103
Part No : PZT559A-C
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -140V@IC=-10mA, IB=0 ； 100 < hFE < 300@VCE=-5V, IC=-1A
VCE(sat) < -360mV@IC=-3A, IB=-300mA
Test Condition: 150℃, 1000Hrs
Test Date: 2017.10.05 ~ 2017.11.17
Test Standard : JESD22 STANDARD Method-A103
Operator: Leo Hsia

Test Result: PASS

	Before			After		
No	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)
59	-167.7V	216.5	-214.4mV	-162.5V	216.0	-215.7mV
60	-167.0V	207.8	-202.9mV	-170.4V	197.2	-213.1mV
61	-161.1V	206.8	-223.9mV	-170.0V	201.2	-224.6mV
62	-166.7V	211.8	-224.7mV	-168.3V	219.4	-215.4mV
63	-162.7V	214.8	-223.1mV	-161.3V	197.8	-222.9mV
64	-170.5V	198.2	-216.8mV	-171.2V	210.4	-220.7mV
65	-161.7V	196.9	-202.8mV	-170.9V	198.5	-223.8mV
66	-165.2V	213.3	-209.4mV	-161.4V	208.3	-213.1mV
67	-170.1V	194.8	-211.8mV	-165.8V	212.8	-208.9mV
68	-170.1V	212.9	-213.1mV	-164.8V	201.6	-220.2mV
69	-171.2V	207.7	-202.8mV	-166.3V	220.5	-212.6mV
70	-170.4V	196.5	-204.5mV	-165.8V	220.1	-219.0mV
71	-170.2V	200.6	-223.9mV	-161.9V	195.1	-210.5mV
72	-166.3V	198.0	-213.5mV	-167.8V	197.7	-223.3mV
73	-167.3V	194.3	-213.7mV	-166.4V	210.3	-213.3mV
74	-168.1V	215.1	-223.7mV	-160.3V	216.2	-212.2mV
75	-162.0V	200.8	-207.9mV	-167.0V	196.9	-199.8mV
76	-165.4V	220.6	-215.4mV	-167.8V	210.9	-206.1mV
77	-164.2V	201.4	-217.6mV	-163.3V	197.2	-200.1mV

Made By: King Huang

Approval: Peter Yang

SeCoS Corporation

Pressure Cooker Test Data

Report No : T171130-103
Part No : PZT559A-C
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -140V@IC=-10mA, IB=0 ； 100 < hFE < 300@VCE=-5V, IC=-1A
VCE(sat) < -360mV@IC=-3A, IB=-300mA
Test Condition: 121℃, 100%RH, 29.7PSIG, 168Hrs
Test Date: 2017.10.05 ~ 2017.10.13
Test Standard : JESD22 STANDARD Method-A102
Operator: Leo Hsia

Test Result: PASS

	Before			After		
No	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)
1	-170.4V	209.7	-224.2mV	-165.3V	205.9	-201.2mV
2	-167.5V	198.8	-200.9mV	-160.3V	211.8	-224.4mV
3	-162.0V	219.3	-225.5mV	-163.1V	212.1	-208.9mV
4	-165.5V	208.6	-218.7mV	-160.2V	192.7	-225.1mV
5	-171.0V	206.3	-207.3mV	-163.6V	211.5	-202.7mV
6	-168.6V	202.0	-202.5mV	-170.0V	203.4	-211.8mV
7	-163.5V	215.8	-224.5mV	-168.8V	206.9	-208.9mV
8	-160.8V	192.9	-213.1mV	-162.9V	201.6	-218.3mV
9	-170.3V	215.0	-204.1mV	-161.4V	214.6	-209.8mV
10	-168.4V	198.3	-209.3mV	-162.8V	197.9	-215.9mV
11	-161.0V	218.6	-216.5mV	-163.9V	209.3	-213.1mV
12	-162.5V	210.7	-221.3mV	-169.3V	206.3	-211.6mV
13	-168.6V	209.6	-223.9mV	-160.7V	197.3	-209.3mV
14	-170.2V	198.7	-205.2mV	-160.6V	202.6	-220.5mV
15	-165.7V	201.8	-224.2mV	-167.3V	205.0	-208.8mV
16	-171.1V	205.3	-218.7mV	-171.1V	207.1	-217.8mV
17	-169.7V	214.8	-205.6mV	-167.1V	201.4	-208.0mV
18	-170.8V	207.6	-200.6mV	-165.5V	200.1	-210.5mV
19	-170.3V	193.3	-212.3mV	-169.1V	204.8	-218.4mV
20	-163.3V	200.3	-206.0mV	-162.7V	212.1	-200.7mV
21	-166.3V	215.3	-220.3mV	-163.5V	217.5	-211.3mV
22	-164.4V	218.1	-224.7mV	-163.7V	198.8	-201.9mV
23	-165.0V	198.7	-222.4mV	-162.0V	203.7	-221.9mV
24	-163.2V	217.2	-205.6mV	-162.4V	214.3	-205.8mV
25	-163.5V	193.3	-211.3mV	-165.3V	206.0	-213.2mV
26	-166.2V	204.3	-207.4mV	-162.3V	194.0	-206.8mV
27	-166.1V	220.8	-221.0mV	-165.9V	215.1	-223.0mV
28	-171.2V	214.5	-209.9mV	-167.2V	198.7	-216.5mV
29	-167.1V	194.0	-225.1mV	-162.0V	206.4	-223.4mV

SeCoS Corporation

Pressure Cooker Test Data

Report No : T171130-103
Part No : PZT559A-C
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -140V@IC=-10mA, IB=0 ； 100 < hFE < 300@VCE=-5V, IC=-1A
VCE(sat) < -360mV@IC=-3A, IB=-300mA
Test Condition: 121℃, 100%RH, 29.7PSIG, 168Hrs
Test Date: 2017.10.05 ~ 2017.10.13
Test Standard : JESD22 STANDARD Method-A102
Operator: Leo Hsia

Test Result: PASS

	Before			After		
No	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)
30	-161.2V	193.3	-200.9mV	-160.5V	220.1	-212.4mV
31	-164.1V	208.3	-221.6mV	-168.2V	208.1	-219.8mV
32	-162.0V	201.9	-219.2mV	-162.1V	196.0	-206.7mV
33	-162.6V	220.6	-212.6mV	-171.1V	196.0	-222.0mV
34	-167.8V	214.0	-208.9mV	-170.6V	217.2	-213.1mV
35	-170.3V	196.8	-219.3mV	-161.9V	201.2	-218.3mV
36	-162.9V	212.9	-212.8mV	-163.9V	199.4	-205.1mV
37	-169.6V	193.0	-203.2mV	-165.1V	216.0	-216.4mV
38	-162.7V	199.7	-223.5mV	-165.3V	202.4	-209.7mV
39	-171.1V	202.9	-216.4mV	-160.7V	214.3	-200.3mV
40	-169.3V	217.4	-224.7mV	-163.5V	203.6	-214.2mV
41	-164.6V	199.9	-205.7mV	-166.4V	207.2	-203.2mV
42	-170.3V	196.8	-217.8mV	-168.9V	193.2	-220.4mV
43	-164.9V	218.8	-217.5mV	-165.2V	214.1	-211.2mV
44	-165.9V	201.9	-216.5mV	-161.5V	195.7	-222.2mV
45	-163.1V	199.4	-223.0mV	-161.9V	204.4	-211.5mV
46	-163.6V	203.8	-207.5mV	-165.8V	198.4	-203.6mV
47	-170.6V	192.5	-220.5mV	-162.8V	204.2	-223.0mV
48	-164.0V	214.3	-209.2mV	-170.8V	211.1	-218.0mV
49	-160.8V	208.5	-205.4mV	-167.3V	193.5	-204.6mV
50	-171.1V	208.6	-222.6mV	-162.0V	207.0	-223.4mV
51	-160.2V	196.6	-214.3mV	-166.1V	208.8	-214.4mV
52	-162.3V	214.2	-204.1mV	-163.5V	217.0	-208.2mV
53	-169.9V	213.7	-211.3mV	-160.8V	198.7	-218.8mV
54	-161.0V	220.1	-211.0mV	-165.9V	216.0	-202.7mV
55	-168.7V	204.3	-213.8mV	-164.1V	210.5	-222.1mV
56	-169.7V	211.9	-199.7mV	-169.1V	214.6	-223.0mV
57	-169.7V	212.9	-218.3mV	-161.5V	194.3	-222.3mV
58	-160.9V	216.4	-204.1mV	-169.8V	214.7	-220.7mV

SeCoS Corporation

Pressure Cooker Test Data

Report No : T171130-103
Part No : PZT559A-C
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -140V@IC=-10mA, IB=0 ； 100 < hFE < 300@VCE=-5V, IC=-1A
VCE(sat) < -360mV@IC=-3A, IB=-300mA
Test Condition: 121℃, 100%RH, 29.7PSIG, 168Hrs
Test Date: 2017.10.05 ~ 2017.10.13
Test Standard : JESD22 STANDARD Method-A102
Operator: Leo Hsia

Test Result: PASS

	Before			After		
No	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)
59	-171.1V	212.0	-215.6mV	-167.8V	209.3	-205.9mV
60	-169.1V	197.6	-221.4mV	-166.9V	218.9	-211.3mV
61	-169.6V	213.9	-225.1mV	-169.1V	198.1	-206.0mV
62	-162.2V	207.9	-202.9mV	-166.6V	211.3	-214.6mV
63	-166.7V	193.3	-219.1mV	-171.0V	197.2	-210.6mV
64	-163.3V	211.6	-224.1mV	-164.7V	202.6	-217.5mV
65	-171.2V	210.1	-223.0mV	-167.5V	194.8	-211.5mV
66	-164.7V	220.5	-200.5mV	-170.9V	200.0	-211.3mV
67	-168.5V	197.3	-223.0mV	-160.4V	201.5	-199.5mV
68	-163.4V	208.0	-199.9mV	-165.1V	202.7	-219.6mV
69	-163.0V	220.4	-212.6mV	-168.1V	213.2	-218.3mV
70	-161.1V	216.8	-218.7mV	-160.9V	211.2	-212.1mV
71	-164.6V	206.3	-200.0mV	-168.0V	206.9	-209.0mV
72	-166.5V	193.2	-217.0mV	-166.1V	196.4	-204.5mV
73	-167.8V	193.5	-202.4mV	-169.3V	220.7	-211.2mV
74	-164.7V	205.3	-206.0mV	-161.7V	217.9	-224.5mV
75	-167.0V	211.5	-212.7mV	-168.6V	212.5	-208.7mV
76	-168.8V	204.3	-216.5mV	-161.3V	203.2	-217.9mV
77	-161.3V	198.4	-206.2mV	-166.0V	193.8	-202.2mV

Made By: King Huang

Approval: Peter Yang

SeCoS Corporation

Temperature Cycle Test Data

Report No : T171130-103
Part No : PZT559A-C
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -140V@IC=-10mA, IB=0 ； 100 < hFE < 300@VCE=-5V, IC=-1A
VCE(sat) < -360mV@IC=-3A, IB=-300mA
Test Condition: -55℃/30min, 150℃/30min, for1000 Cycle
Test Date: 2017.10.06 ~ 2017.11.28
Test Standard : JESD22 STANDARD Method-A104
Operator: Leo Hsia

Test Result: PASS

	Before			After		
No	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)
1	-163.6V	216.2	-203.4mV	-162.6V	209.5	-210.4mV
2	-168.7V	213.7	-225.2mV	-162.9V	204.1	-210.3mV
3	-166.9V	219.6	-221.6mV	-165.8V	201.1	-215.9mV
4	-160.8V	219.2	-206.4mV	-166.2V	219.1	-219.8mV
5	-171.3V	205.4	-208.6mV	-161.8V	195.5	-224.6mV
6	-169.6V	205.7	-207.2mV	-170.2V	217.2	-219.2mV
7	-166.0V	200.9	-207.5mV	-171.3V	210.4	-201.5mV
8	-161.4V	210.0	-209.4mV	-167.4V	203.1	-208.1mV
9	-170.6V	195.0	-210.7mV	-169.5V	216.1	-216.9mV
10	-167.4V	213.0	-200.2mV	-170.1V	193.1	-205.8mV
11	-167.0V	213.4	-219.6mV	-166.5V	202.4	-201.7mV
12	-169.5V	200.1	-200.1mV	-171.3V	220.9	-209.7mV
13	-160.5V	207.8	-225.3mV	-164.4V	204.8	-206.0mV
14	-167.8V	209.9	-222.6mV	-165.6V	210.1	-205.5mV
15	-164.3V	199.6	-204.9mV	-168.0V	202.5	-200.5mV
16	-162.3V	213.3	-214.9mV	-164.1V	199.1	-219.0mV
17	-165.2V	213.6	-209.6mV	-162.5V	196.0	-224.7mV
18	-162.9V	207.5	-215.4mV	-166.1V	196.3	-223.5mV
19	-164.5V	217.4	-221.6mV	-160.2V	217.8	-200.0mV
20	-168.9V	213.0	-214.8mV	-170.9V	209.9	-205.9mV
21	-171.2V	203.4	-219.5mV	-170.0V	221.1	-223.2mV
22	-161.4V	209.9	-201.5mV	-170.2V	198.6	-220.2mV
23	-160.6V	214.7	-225.3mV	-162.1V	205.7	-222.4mV
24	-161.7V	210.7	-212.5mV	-169.9V	201.4	-203.9mV
25	-160.5V	206.6	-217.3mV	-169.5V	210.6	-221.2mV
26	-169.7V	205.0	-214.1mV	-163.3V	204.6	-203.1mV
27	-165.5V	200.0	-223.6mV	-169.0V	219.1	-225.0mV
28	-164.3V	219.6	-222.1mV	-170.5V	203.2	-205.2mV
29	-166.4V	213.0	-208.0mV	-160.9V	196.3	-211.9mV

SeCoS Corporation

Temperature Cycle Test Data

Report No : T171130-103
Part No : PZT559A-C
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -140V@IC=-10mA, IB=0 ； 100 < hFE < 300@VCE=-5V, IC=-1A
VCE(sat) < -360mV@IC=-3A, IB=-300mA
Test Condition: -55℃/30min, 150℃/30min, for1000 Cycle
Test Date: 2017.10.06 ~ 2017.11.28
Test Standard : JESD22 STANDARD Method-A104
Operator: Leo Hsia

Test Result: PASS

	Before			After		
No	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)
30	-168.6V	206.2	-206.6mV	-161.8V	218.3	-215.1mV
31	-164.7V	196.8	-200.1mV	-160.9V	217.7	-221.5mV
32	-161.1V	203.3	-209.6mV	-170.8V	217.5	-202.8mV
33	-167.0V	212.3	-206.4mV	-165.4V	201.3	-222.9mV
34	-165.9V	216.2	-208.5mV	-163.0V	197.1	-209.7mV
35	-162.0V	205.6	-207.1mV	-167.3V	216.1	-212.0mV
36	-170.8V	209.4	-214.4mV	-167.7V	217.5	-208.4mV
37	-167.4V	192.8	-216.4mV	-161.6V	196.3	-222.7mV
38	-168.9V	200.0	-201.3mV	-163.1V	208.1	-217.8mV
39	-169.0V	217.1	-212.3mV	-167.2V	204.4	-214.7mV
40	-171.3V	197.3	-214.8mV	-163.2V	212.0	-221.6mV
41	-160.8V	209.4	-207.3mV	-167.7V	200.2	-215.1mV
42	-165.3V	195.6	-219.2mV	-166.4V	196.2	-200.0mV
43	-171.3V	212.4	-218.0mV	-167.5V	203.2	-225.5mV
44	-168.8V	217.0	-206.9mV	-166.3V	210.3	-200.2mV
45	-165.6V	204.2	-219.7mV	-164.1V	220.9	-199.5mV
46	-161.6V	206.4	-207.5mV	-167.1V	220.0	-209.8mV
47	-163.2V	219.0	-209.3mV	-166.7V	209.6	-213.1mV
48	-168.1V	208.1	-200.7mV	-168.6V	206.7	-218.6mV
49	-162.4V	208.1	-202.5mV	-170.1V	199.4	-222.3mV
50	-168.7V	197.8	-209.2mV	-171.0V	196.0	-213.4mV
51	-169.0V	199.7	-211.1mV	-166.6V	193.0	-208.6mV
52	-162.0V	198.9	-206.3mV	-165.0V	219.9	-218.6mV
53	-169.3V	194.6	-225.4mV	-169.3V	215.0	-199.5mV
54	-168.4V	211.2	-214.9mV	-170.3V	204.9	-216.8mV
55	-162.7V	217.4	-208.4mV	-165.2V	198.2	-209.4mV
56	-170.9V	219.7	-216.6mV	-160.4V	193.4	-218.0mV
57	-169.5V	194.2	-217.3mV	-167.8V	219.5	-206.5mV
58	-168.9V	205.6	-216.9mV	-166.9V	204.3	-219.4mV

SeCoS Corporation

Temperature Cycle Test Data

Report No : T171130-103
Part No : PZT559A-C
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -140V@IC=-10mA, IB=0 ； 100 < hFE < 300@VCE=-5V, IC=-1A
VCE(sat) < -360mV@IC=-3A, IB=-300mA
Test Condition: -55℃/30min, 150℃/30min, for1000 Cycle
Test Date: 2017.10.06 ~ 2017.11.28
Test Standard : JESD22 STANDARD Method-A104
Operator: Leo Hsia

Test Result: PASS

	Before			After		
No	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)
59	-168.8V	220.0	-213.0mV	-165.6V	199.5	-211.3mV
60	-160.1V	217.6	-218.2mV	-167.9V	194.0	-206.0mV
61	-164.5V	217.4	-225.2mV	-164.6V	216.6	-207.0mV
62	-162.9V	206.8	-225.4mV	-160.6V	216.9	-214.7mV
63	-160.4V	193.8	-209.6mV	-169.9V	208.6	-224.5mV
64	-161.7V	217.0	-222.5mV	-161.1V	193.5	-210.9mV
65	-170.6V	211.8	-201.1mV	-170.7V	202.2	-220.7mV
66	-168.1V	193.5	-212.9mV	-169.5V	194.0	-207.3mV
67	-169.0V	192.9	-223.1mV	-166.7V	201.3	-204.4mV
68	-167.1V	218.4	-219.7mV	-166.4V	204.4	-201.3mV
69	-163.4V	205.2	-214.5mV	-168.7V	200.7	-205.8mV
70	-165.5V	196.6	-214.4mV	-165.6V	196.5	-219.9mV
71	-167.8V	216.1	-201.0mV	-162.7V	214.4	-203.1mV
72	-166.1V	217.8	-202.5mV	-164.8V	214.0	-212.3mV
73	-160.7V	203.8	-217.4mV	-163.5V	193.8	-200.8mV
74	-165.9V	213.8	-211.0mV	-164.4V	216.8	-220.6mV
75	-170.2V	213.6	-200.7mV	-165.8V	202.1	-212.5mV
76	-163.1V	207.6	-199.4mV	-169.5V	202.2	-212.9mV
77	-171.3V	206.3	-219.6mV	-170.3V	210.1	-217.2mV

Made By: King Huang

Approval: Peter Yang

SeCoS Corporation

High Temperature High Humidity Test Data

Report No : T171130-103
Part No : PZT559A-C
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -140V@IC=-10mA, IB=0 ； 100 < hFE < 300@VCE=-5V, IC=-1A
VCE(sat) < -360mV@IC=-3A, IB=-300mA
Test Condition: 85±2℃, 85±5%RH, 1000Hrs
Test Date: 2017.10.16 ~ 2017.11.28
Test Standard : JESD22 STANDARD Method-A101
Operator: Leo Hsia

Test Result: PASS

	Before			After		
No	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)
1	-168.2V	210.1	-208.8mV	-165.7V	205.8	-210.1mV
2	-163.7V	212.4	-218.6mV	-168.6V	205.4	-200.1mV
3	-160.3V	214.9	-201.9mV	-163.7V	200.2	-206.6mV
4	-163.7V	201.3	-218.7mV	-161.9V	193.9	-220.3mV
5	-169.7V	204.3	-211.1mV	-164.3V	220.1	-201.3mV
6	-169.5V	202.9	-199.5mV	-167.6V	210.2	-219.4mV
7	-171.2V	208.5	-202.3mV	-168.8V	202.5	-214.2mV
8	-170.3V	199.4	-220.3mV	-170.1V	210.5	-202.7mV
9	-162.9V	198.5	-221.3mV	-160.5V	212.8	-201.5mV
10	-167.5V	218.6	-213.0mV	-161.0V	192.7	-211.9mV
11	-160.6V	216.0	-207.1mV	-164.2V	211.5	-214.0mV
12	-166.5V	203.6	-213.6mV	-168.6V	194.4	-212.1mV
13	-160.5V	199.1	-203.7mV	-161.9V	207.8	-225.4mV
14	-162.2V	196.9	-217.1mV	-166.4V	205.8	-213.8mV
15	-160.2V	199.6	-213.4mV	-164.3V	203.1	-201.1mV
16	-166.6V	192.7	-203.5mV	-167.7V	215.9	-215.0mV
17	-171.2V	214.5	-210.1mV	-162.8V	194.5	-223.7mV
18	-165.2V	202.3	-222.8mV	-164.0V	204.7	-225.2mV
19	-165.6V	194.9	-211.6mV	-161.9V	194.4	-210.7mV
20	-165.7V	194.9	-202.0mV	-167.8V	194.8	-217.4mV
21	-171.4V	211.6	-221.3mV	-160.8V	213.6	-225.2mV
22	-162.1V	201.2	-219.8mV	-170.4V	198.5	-202.6mV
23	-162.3V	214.7	-211.3mV	-168.8V	208.7	-209.1mV
24	-164.9V	215.4	-223.9mV	-166.0V	218.0	-217.5mV
25	-161.1V	195.0	-222.1mV	-163.9V	193.4	-209.3mV
26	-163.4V	200.7	-224.2mV	-164.8V	199.5	-220.9mV
27	-168.6V	206.8	-210.9mV	-171.2V	204.0	-218.6mV
28	-167.9V	211.4	-221.6mV	-160.1V	207.4	-200.5mV
29	-170.9V	212.1	-222.5mV	-165.0V	199.4	-218.7mV

SeCoS Corporation

High Temperature High Humidity Test Data

Report No : T171130-103
Part No : PZT559A-C
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -140V@IC=-10mA, IB=0 ； 100 < hFE < 300@VCE=-5V, IC=-1A
VCE(sat) < -360mV@IC=-3A, IB=-300mA
Test Condition: 85±2℃, 85±5%RH, 1000Hrs
Test Date: 2017.10.16 ~ 2017.11.28
Test Standard : JESD22 STANDARD Method-A101
Operator: Leo Hsia

Test Result: PASS

	Before			After		
No	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)
30	-170.4V	216.8	-200.1mV	-162.6V	213.6	-205.3mV
31	-169.1V	198.2	-208.6mV	-166.6V	198.3	-224.9mV
32	-167.8V	195.1	-214.4mV	-166.9V	206.9	-224.7mV
33	-164.6V	207.1	-223.4mV	-168.4V	220.4	-225.1mV
34	-166.5V	202.3	-205.3mV	-163.3V	218.1	-202.4mV
35	-165.7V	201.5	-216.7mV	-163.6V	200.4	-224.1mV
36	-165.1V	213.5	-216.5mV	-167.5V	201.1	-221.7mV
37	-171.2V	220.9	-205.3mV	-167.2V	213.7	-211.9mV
38	-163.7V	196.1	-206.8mV	-164.3V	210.8	-201.1mV
39	-168.7V	196.0	-204.3mV	-168.6V	205.7	-209.0mV
40	-161.2V	212.4	-222.7mV	-166.5V	195.1	-224.4mV
41	-160.8V	216.2	-223.7mV	-166.9V	208.2	-219.4mV
42	-169.8V	205.1	-209.4mV	-166.2V	217.0	-207.0mV
43	-165.3V	219.4	-224.4mV	-168.3V	213.5	-216.2mV
44	-167.5V	220.1	-203.9mV	-164.6V	206.8	-219.7mV
45	-161.0V	206.6	-223.4mV	-161.3V	199.2	-220.1mV
46	-169.9V	215.9	-216.1mV	-170.5V	207.4	-218.3mV
47	-167.2V	196.3	-207.6mV	-164.1V	197.3	-206.3mV
48	-161.8V	210.9	-225.0mV	-163.0V	197.8	-217.5mV
49	-170.3V	206.8	-204.0mV	-170.6V	204.3	-205.9mV
50	-166.6V	202.9	-205.7mV	-169.0V	196.2	-208.7mV
51	-162.9V	194.1	-217.2mV	-166.0V	196.9	-206.5mV
52	-166.8V	202.5	-223.7mV	-162.9V	208.6	-200.2mV
53	-169.4V	193.5	-221.3mV	-162.9V	217.1	-209.7mV
54	-171.3V	192.8	-212.4mV	-166.7V	198.0	-216.9mV
55	-165.9V	197.2	-202.5mV	-167.8V	197.6	-200.8mV
56	-168.8V	211.1	-200.8mV	-171.2V	218.4	-224.9mV
57	-161.8V	194.9	-215.2mV	-166.7V	218.3	-213.5mV
58	-164.0V	197.7	-219.8mV	-171.1V	218.1	-201.5mV

SeCoS Corporation

High Temperature High Humidity Test Data

Report No : T171130-103
Part No : PZT559A-C
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -140V@IC=-10mA, IB=0 ； 100 < hFE < 300@VCE=-5V, IC=-1A
VCE(sat) < -360mV@IC=-3A, IB=-300mA
Test Condition: 85±2℃, 85±5%RH, 1000Hrs
Test Date: 2017.10.16 ~ 2017.11.28
Test Standard : JESD22 STANDARD Method-A101
Operator: Leo Hsia

Test Result: PASS

	Before			After		
No	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)
59	-166.1V	200.3	-202.9mV	-168.1V	205.3	-207.8mV
60	-167.5V	206.6	-204.9mV	-167.1V	202.2	-210.9mV
61	-166.4V	193.7	-206.9mV	-169.7V	214.6	-203.0mV
62	-167.4V	212.8	-213.0mV	-171.0V	192.5	-207.0mV
63	-164.8V	214.9	-221.9mV	-164.5V	217.5	-202.0mV
64	-165.1V	202.1	-218.3mV	-169.4V	205.0	-208.3mV
65	-167.7V	213.6	-216.2mV	-165.7V	203.5	-221.6mV
66	-169.6V	204.8	-216.0mV	-164.5V	205.7	-206.2mV
67	-160.8V	216.2	-223.1mV	-169.4V	208.4	-219.1mV
68	-164.9V	198.3	-208.2mV	-171.3V	207.7	-210.9mV
69	-164.8V	198.7	-224.3mV	-165.7V	216.6	-215.5mV
70	-167.3V	193.9	-221.7mV	-160.2V	217.6	-210.9mV
71	-162.9V	213.6	-224.8mV	-165.7V	200.1	-213.2mV
72	-162.2V	218.1	-210.8mV	-163.5V	212.5	-211.8mV
73	-162.1V	199.2	-216.6mV	-160.6V	210.4	-216.2mV
74	-170.7V	208.5	-208.2mV	-167.6V	213.2	-220.4mV
75	-166.7V	203.5	-215.6mV	-160.2V	201.4	-221.1mV
76	-170.1V	219.4	-203.5mV	-171.3V	205.0	-222.3mV
77	-160.5V	203.2	-212.0mV	-161.0V	201.4	-225.0mV

Made By: King Huang

Approval: Peter Yang

SeCoS Corporation

High Temper High Humidity Reverse Bies Test Data

Report No : T171130-103
Part No : PZT559A-C
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -140V@IC=-10mA, IB=0 ； 100 < hFE < 300@VCE=-5V, IC=-1A
VCE(sat) < -360mV@IC=-3A, IB=-300mA
Test Condition: 85±2℃, 85±5%RH, 80%VR, 1000Hrs
Test Date: 2017.10.16 ~ 2017.11.28
Test Standard : JESD22 STANDARD Method-A101
Operator: Leo Hsia

Test Result: PASS

	Before			After		
No	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)
1	-163.7V	210.7	-212.7mV	-170.0V	196.7	-222.4mV
2	-166.1V	209.0	-204.3mV	-167.3V	200.1	-216.8mV
3	-170.8V	205.6	-202.8mV	-168.3V	192.7	-217.6mV
4	-163.1V	208.3	-210.4mV	-169.5V	212.3	-212.4mV
5	-164.8V	193.4	-201.7mV	-163.7V	220.4	-222.4mV
6	-160.6V	219.9	-200.1mV	-161.7V	210.6	-214.4mV
7	-162.3V	195.0	-215.3mV	-166.7V	218.1	-208.2mV
8	-161.9V	203.7	-216.0mV	-164.5V	206.8	-211.9mV
9	-165.0V	204.4	-208.7mV	-161.4V	215.3	-219.8mV
10	-170.4V	204.0	-200.7mV	-170.0V	193.9	-213.1mV
11	-160.4V	212.7	-216.4mV	-160.6V	200.4	-218.1mV
12	-170.3V	203.1	-215.9mV	-165.7V	206.8	-220.1mV
13	-169.1V	193.4	-203.4mV	-161.4V	210.5	-216.4mV
14	-168.3V	205.1	-209.7mV	-161.7V	220.8	-220.2mV
15	-163.0V	212.7	-223.8mV	-170.1V	204.8	-220.8mV
16	-168.1V	209.4	-223.5mV	-165.2V	207.2	-208.2mV
17	-161.7V	214.0	-203.3mV	-162.5V	200.8	-218.7mV
18	-167.4V	202.3	-202.9mV	-166.4V	198.9	-223.8mV
19	-161.2V	202.3	-209.6mV	-161.7V	218.0	-221.9mV
20	-168.9V	209.7	-222.6mV	-164.3V	194.7	-211.0mV
21	-170.4V	199.8	-218.7mV	-166.0V	209.1	-217.0mV
22	-164.8V	213.0	-205.1mV	-160.2V	204.8	-210.5mV
23	-171.3V	216.9	-204.4mV	-166.2V	192.7	-215.7mV
24	-168.0V	213.3	-215.8mV	-170.8V	193.3	-201.6mV
25	-167.6V	218.3	-222.2mV	-169.2V	199.0	-207.1mV
26	-168.5V	207.1	-207.3mV	-165.9V	210.8	-218.7mV
27	-169.6V	195.6	-203.3mV	-162.2V	208.7	-219.9mV
28	-169.6V	213.7	-203.2mV	-170.1V	211.3	-220.0mV
29	-167.5V	202.1	-220.3mV	-160.4V	198.2	-216.0mV

SeCoS Corporation

High Temper High Humidity Reverse Bies Test Data

Report No : T171130-103
Part No : PZT559A-C
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -140V@IC=-10mA, IB=0 ； 100 < hFE < 300@VCE=-5V, IC=-1A
VCE(sat) < -360mV@IC=-3A, IB=-300mA
Test Condition: 85±2℃, 85±5%RH, 80%VR, 1000Hrs
Test Date: 2017.10.16 ~ 2017.11.28
Test Standard : JESD22 STANDARD Method-A101
Operator: Leo Hsia

Test Result: PASS

	Before			After		
No	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)
30	-168.2V	195.7	-220.9mV	-166.3V	193.7	-215.6mV
31	-161.5V	200.7	-214.6mV	-166.6V	219.1	-202.7mV
32	-168.3V	204.1	-220.1mV	-165.7V	206.6	-219.5mV
33	-171.1V	211.2	-208.6mV	-162.8V	211.2	-207.3mV
34	-169.4V	195.0	-221.5mV	-164.9V	214.2	-210.4mV
35	-164.5V	218.5	-212.2mV	-162.5V	194.7	-205.9mV
36	-166.7V	218.3	-216.7mV	-163.4V	200.3	-213.1mV
37	-169.3V	217.6	-217.5mV	-166.5V	214.2	-214.8mV
38	-168.0V	198.6	-203.3mV	-169.5V	213.4	-200.9mV
39	-165.9V	213.4	-201.8mV	-163.7V	198.0	-211.0mV
40	-167.4V	207.4	-210.7mV	-170.7V	210.0	-221.9mV
41	-161.9V	212.8	-223.5mV	-168.8V	213.4	-203.3mV
42	-169.2V	206.6	-220.5mV	-165.5V	199.9	-223.0mV
43	-171.4V	220.8	-199.6mV	-161.2V	198.8	-202.0mV
44	-163.0V	199.1	-200.6mV	-162.8V	213.8	-204.3mV
45	-169.5V	209.9	-212.7mV	-170.7V	215.9	-209.6mV
46	-170.1V	201.4	-225.5mV	-170.8V	199.6	-212.1mV
47	-170.2V	220.5	-209.1mV	-162.0V	216.5	-209.0mV
48	-160.9V	210.6	-212.3mV	-168.9V	205.6	-205.8mV
49	-168.6V	199.5	-206.4mV	-160.6V	197.6	-219.8mV
50	-164.7V	206.7	-203.3mV	-161.6V	220.4	-222.7mV
51	-170.9V	193.4	-213.0mV	-168.4V	204.8	-209.1mV
52	-161.6V	220.1	-207.9mV	-167.5V	199.6	-215.2mV
53	-169.9V	200.6	-217.4mV	-164.2V	204.9	-203.9mV
54	-170.8V	202.9	-201.1mV	-166.5V	201.1	-221.0mV
55	-164.7V	193.2	-209.9mV	-168.9V	207.8	-204.7mV
56	-160.1V	206.6	-219.6mV	-166.0V	214.1	-216.7mV
57	-162.5V	214.7	-223.2mV	-168.0V	198.1	-201.1mV
58	-167.5V	200.6	-213.0mV	-169.7V	213.2	-214.0mV

SeCoS Corporation

High Temper High Humidity Reverse Bies Test Data

Report No : T171130-103
Part No : PZT559A-C
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -140V@IC=-10mA, IB=0 ； 100 < hFE < 300@VCE=-5V, IC=-1A
VCE(sat) < -360mV@IC=-3A, IB=-300mA
Test Condition: 85±2℃, 85±5%RH, 80%VR, 1000Hrs
Test Date: 2017.10.16 ~ 2017.11.28
Test Standard : JESD22 STANDARD Method-A101
Operator: Leo Hsia

Test Result: PASS

	Before			After		
No	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)
59	-161.1V	213.2	-199.5mV	-164.5V	199.4	-224.2mV
60	-164.5V	210.0	-203.5mV	-163.6V	212.7	-204.5mV
61	-163.5V	194.9	-220.1mV	-167.6V	193.4	-215.5mV
62	-167.7V	215.9	-209.2mV	-164.4V	193.0	-220.4mV
63	-161.9V	201.0	-214.2mV	-171.3V	199.6	-206.8mV
64	-161.8V	211.8	-207.6mV	-161.4V	203.1	-204.0mV
65	-166.2V	206.0	-212.3mV	-166.2V	197.1	-223.4mV
66	-167.6V	192.7	-201.7mV	-163.6V	195.0	-222.5mV
67	-161.0V	205.6	-211.3mV	-166.4V	197.8	-202.3mV
68	-161.4V	211.9	-224.1mV	-167.0V	220.4	-203.6mV
69	-171.3V	195.1	-201.2mV	-161.6V	197.8	-205.3mV
70	-161.6V	209.9	-219.0mV	-164.9V	194.7	-223.3mV
71	-161.3V	195.6	-216.0mV	-167.9V	206.9	-208.2mV
72	-168.4V	205.8	-205.1mV	-162.1V	207.9	-201.8mV
73	-166.0V	205.6	-209.7mV	-163.3V	217.4	-202.6mV
74	-163.8V	193.8	-210.4mV	-170.8V	202.5	-207.4mV
75	-166.7V	206.9	-200.4mV	-161.1V	216.9	-225.0mV
76	-167.8V	212.0	-216.6mV	-160.3V	206.0	-203.6mV
77	-170.4V	202.3	-208.1mV	-170.2V	197.0	-218.3mV

Made By: King Huang

Approval: Peter Yang

SeCoS Corporation

Resistance to Solder Heat Test Data

Report No : T171130-103
Part No : PZT559A-C
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -140V@IC=-10mA, IB=0 ； 100 < hFE < 300@VCE=-5V, IC=-1A
VCE(sat) < -360mV@IC=-3A, IB=-300mA
Test Condition: 270℃ ± 5℃, 7Sec + 2Sec/-0Sec
Test Date: 2017.11.29
Test Standard : JESD22 STANDARD Method-B106
Operator: Leo Hsia

Test Result: PASS

	Before			After		
No	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)
1	-169.3V	202.7	-222.2mV	-161.2V	203.3	-200.1mV
2	-168.5V	195.8	-203.2mV	-162.2V	199.7	-199.7mV
3	-167.0V	197.0	-211.2mV	-166.2V	199.4	-209.9mV
4	-163.3V	205.6	-205.0mV	-163.9V	207.8	-200.2mV
5	-171.0V	209.9	-216.1mV	-169.4V	216.8	-212.7mV
6	-167.7V	197.0	-203.4mV	-170.3V	193.5	-204.8mV
7	-165.2V	209.4	-214.8mV	-160.7V	199.9	-221.8mV
8	-165.4V	195.4	-209.6mV	-171.1V	206.3	-206.3mV
9	-166.3V	195.2	-213.5mV	-168.7V	211.4	-203.0mV
10	-162.3V	206.4	-223.9mV	-160.2V	211.8	-219.7mV

Made By: King Huang

Approval: Peter Yang

化學實驗室-高雄 Chemical Laboratory - Kao., SGS Taiwan Ltd.

試驗報告

號碼(No.) : KA/2017/61160 日期(Date) : 2017/06/15

Test Report

義典科技股份有限公司
E'DALE TECHNOLOGY CO., LTD.
72242 台南市佳里區六安里六安130號/江蘇省無錫市錫山區東港鎮錫港東路35號
NO. 130, LIOUAN, LIOUAN LI, JIALI DIST., TAINAN CITY, TAIWAN
NO. 35, XIGANG EAST ROAD, DONGGANG TOWN, XISHAN DIST., WUXI CITY, JIANG SU, CHINA

以下測試樣品係由申請廠商所提供及確認 (The following sample(s) was/were submitted and identified by/on behalf of the applicant as)：

樣品名稱(Sample Description)	:	EPOXY MOLDING COMPOUND
樣品型號(Style/Item No.)	:	ELER-8-SERIES
收件日期(Sample Receiving Date)	:	2017/06/13
測試期間(Testing Period)	:	2017/06/13 TO 2017/06/15
送樣廠商(Sample Submitted By)	:	義典科技股份有限公司 (E'DALE TECHNOLOGY CO., LTD.)

==========

測試需求(Test Requested) :

(1) 依據客户指定，參考RoHS2011/65/EU Annex II及其修訂指令(EU) 2015/863測試鎘、鉛、汞、六價鉻、多溴聯苯、多溴聯苯醚, DBP, BBP, DEHP, DIBP. (As specified by client, with reference to RoHS 2011/65/EU Annex II and amending Directive (EU) 2015/863 to determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP contents in the submitted sample.)

(2) 其他測試項目請見下一頁 . (Please refer to next pages for the other item(s).)

測試結果(Test Results) : 請見下一頁 (Please refer to next pages).

結　論(Conclusion) :

(1) 根據客户所提供的樣品，其鎘、鉛、汞、六價鉻、多溴聯苯、多溴聯苯醚, DBP, BBP, DEHP, DIBP的測試結果符合RoHS指令暨(EU) 2015/863之限值要求. (Based on the performed tests on submitted samples, the test results of Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP comply with the limits as set by RoHS and amending Directive (EU) 2015/863.)

報告簽署人/Ray Chang, Ph.D./Manager -Tech
Signed for and on behalf of
SGS Taiwan Limited

試驗報告

Test Report

義典科技股份有限公司
E'DALE TECHNOLOGY CO., LTD.
72242 台南市佳里區六安里六安130號/江蘇省無錫市錫山區東港鎮錫港東路35號
NO. 130, LIOUAN, LIOUAN LI, JIALI DIST., TAINAN CITY, TAIWAN
NO. 35, XIGANG EAST ROAD, DONGGANG TOWN, XISHAN DIST., WUXI CITY, JIANG SU, CHINA

測試結果(Test Results)

測試部位(PART NAME)No.1 : 黑色 EPOXY MOLDING COMPOUND
(BLACK EPOXY MOLDING COMPOUND)

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測極限值 (MDL)	結果 (Result) No.1	限值 (Limit)
鎘 / Cadmium (Cd)	mg/kg	參考IEC 62321-5:2013方法, 以感應耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321-5:2013 and performed by ICP-AES.	2	n.d.	100
鉛 / Lead (Pb)	mg/kg	參考IEC 62321-5:2013方法, 以感應耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321-5:2013 and performed by ICP-AES.	2	n.d.	1000
汞 / Mercury (Hg)	mg/kg	參考IEC 62321-4:2013方法, 以感應耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321-4:2013 and performed by ICP-AES.	2	n.d.	1000
六價鉻 / Hexavalent Chromium Cr(VI)	mg/kg	參考IEC 62321-7-2:2017，以UV-VIS檢測. / With reference to IEC 62321-7-2:2017 and performed by UV-VIS.	8	n.d.	1000

試驗報告

Test Report

義典科技股份有限公司
E'DALE TECHNOLOGY CO., LTD.
72242 台南市佳里區六安里六安130號/江蘇省無錫市錫山區東港鎮錫港東路35號
NO. 130, LIOUAN, LIOUAN LI, JIALI DIST., TAINAN CITY, TAIWAN
NO. 35, XIGANG EAST ROAD, DONGGANG TOWN, XISHAN DIST., WUXI CITY, JIANG SU, CHINA

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測極限值 (MDL)	結果 (Result) No.1	限值 (Limit)
多溴聯苯總和 / Sum of PBBs	mg/kg	參考IEC 62321-6: 2015方法, 以氣相層析/質譜儀檢測. / With reference to IEC 62321-6: 2015 and performed by GC/MS.	-	n.d.	1000
一溴聯苯 / Monobromobiphenyl	mg/kg		5	n.d.	-
二溴聯苯 / Dibromobiphenyl	mg/kg		5	n.d.	-
三溴聯苯 / Tribromobiphenyl	mg/kg		5	n.d.	-
四溴聯苯 / Tetrabromobiphenyl	mg/kg		5	n.d.	-
五溴聯苯 / Pentabromobiphenyl	mg/kg		5	n.d.	-
六溴聯苯 / Hexabromobiphenyl	mg/kg		5	n.d.	-
七溴聯苯 / Heptabromobiphenyl	mg/kg		5	n.d.	-
八溴聯苯 / Octabromobiphenyl	mg/kg		5	n.d.	-
九溴聯苯 / Nonabromobiphenyl	mg/kg		5	n.d.	-
十溴聯苯 / Decabromobiphenyl	mg/kg		5	n.d.	-
多溴聯苯醚總和 / Sum of PBDEs	mg/kg	參考IEC 62321-6: 2015方法, 以氣相層析/質譜儀檢測. / With reference to IEC 62321-6: 2015 and performed by GC/MS.	-	n.d.	1000
一溴聯苯醚 / Monobromodiphenyl ether	mg/kg		5	n.d.	-
二溴聯苯醚 / Dibromodiphenyl ether	mg/kg		5	n.d.	-
三溴聯苯醚 / Tribromodiphenyl ether	mg/kg		5	n.d.	-
四溴聯苯醚 / Tetrabromodiphenyl ether	mg/kg		5	n.d.	-
五溴聯苯醚 / Pentabromodiphenyl ether	mg/kg		5	n.d.	-
六溴聯苯醚 / Hexabromodiphenyl ether	mg/kg		5	n.d.	-
七溴聯苯醚 / Heptabromodiphenyl ether	mg/kg		5	n.d.	-
八溴聯苯醚 / Octabromodiphenyl ether	mg/kg		5	n.d.	-
九溴聯苯醚 / Nonabromodiphenyl ether	mg/kg		5	n.d.	-
十溴聯苯醚 / Decabromodiphenyl ether	mg/kg		5	n.d.	-

試驗報告

Test Report

義典科技股份有限公司
E'DALE TECHNOLOGY CO., LTD.
72242 台南市佳里區六安里六安130號/江蘇省無錫市錫山區東港鎮錫港東路35號
NO. 130, LIOUAN, LIOUAN LI, JIALI DIST., TAINAN CITY, TAIWAN
NO. 35, XIGANG EAST ROAD, DONGGANG TOWN, XISHAN DIST., WUXI CITY, JIANG SU, CHINA

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測極限值 (MDL)	結果 (Result) No.1	限值 (Limit)
鄰苯二甲酸二異丁酯 / DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5)	mg/kg	參考IEC 62321-8:2017, 以氣相層析儀/質譜儀檢測. / With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	1000
鄰苯二甲酸丁苯甲酯 / BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)	mg/kg		50	n.d.	1000
鄰苯二甲酸二丁酯 / DBP (Dibutyl phthalate) (CAS No.: 84-74-2)	mg/kg		50	n.d.	1000
鄰苯二甲酸二 (2-乙基己基)酯 / DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	mg/kg		50	n.d.	1000
鄰苯二甲酸二異癸酯 / DIDP (Di-isodecyl phthalate) (CAS No.: 26761-40-0, 68515-49-1)	mg/kg		50	n.d.	-
鄰苯二甲酸二異壬酯 / DINP (Di-isononyl phthalate) (CAS No.: 28553-12-0, 68515-48-0)	mg/kg		50	n.d.	-
鄰苯二甲酸二正辛酯 / DNOP (Di-n-octyl phthalate) (CAS No.: 117-84-0)	mg/kg		50	n.d.	-
鄰苯二甲酸二(2-甲氧基乙基)酯 / DMEP (Bis (2-methoxyethyl) phthalate) (CAS No.: 117-82-8)	mg/kg		50	n.d.	-
鄰苯二甲酸二正戊酯/ DNPP(Di-n-pentyl phthalate) (CAS No.: 131-18-0)	mg/kg		50	n.d.	-
鄰苯二甲酸二己酯 / DNHP (Di-n-hexyl phthalate) (CAS No.: 84-75-3)	mg/kg		50	n.d.	-

試驗報告

Test Report

義典科技股份有限公司
E'DALE TECHNOLOGY CO., LTD.
72242 台南市佳里區六安里六安130號/江蘇省無錫市錫山區東港鎮錫港東路35號
NO. 130, LIOUAN, LIOUAN LI, JIALI DIST., TAINAN CITY, TAIWAN
NO. 35, XIGANG EAST ROAD, DONGGANG TOWN, XISHAN DIST., WUXI CITY, JIANG SU, CHINA

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測極限值 (MDL)	結果 (Result) No.1	限值 (Limit)
銻 / Antimony (Sb)	mg/kg	參考US EPA 3052方法，用感應藕合電漿原子發射光譜儀檢測銻含量. / With reference to US EPA Method 3052 for Antimony Content. Analysis was performed by ICP-AES.	2	n.d.	-
鈹 / Beryllium (Be)	mg/kg	參考US EPA 3052方法，用感應藕合電漿原子發射光譜儀檢測鈹含量. / With reference to US EPA Method 3052 for Beryllium Content. Analysis was performed by ICP-AES.	2	n.d.	-
砷 / Arsenic (As)	mg/kg	參考US EPA 3052方法，用感應藕合電漿原子發射光譜儀檢測砷含量. / With reference to US EPA Method 3052 for Arsenic Content. Analysis was performed by ICP-AES.	2	n.d.	-
磷 / Phosphorus (P)	mg/kg	參考US EPA 3052方法，用感應藕合電漿原子發射光譜儀檢測磷含量. / With reference to US EPA Method 3052 for Phosphorus Content. Analysis was performed by ICP-AES.	10	115	-
六溴環十二烷及所有主要被辨別出的異構物 / Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α-HBCDD, β- HBCDD, γ- HBCDD) (CAS No.: 25637-99-4 and 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8))	mg/kg	參考IEC 62321: 2008方法，以氣相層析/質譜儀檢測. / With reference to IEC 62321: 2008 method. Analysis was performed by GC/MS.	5	n.d.	-
四溴雙酚-A / Tetrabromobisphenol A (TBBP-A) (CAS No.: 79-94-7)	mg/kg	參考RSTS-E&E-121方法，以液相層析/質譜儀分析. / With reference to RSTS-E&E-121. Analysis was performed by LC/MS.	10	n.d.	-

試驗報告

Test Report

義典科技股份有限公司
E'DALE TECHNOLOGY CO., LTD.
72242 台南市佳里區六安里六安130號/江蘇省無錫市錫山區東港鎮錫港東路35號
NO. 130, LIOUAN, LIOUAN LI, JIALI DIST., TAINAN CITY, TAIWAN
NO. 35, XIGANG EAST ROAD, DONGGANG TOWN, XISHAN DIST., WUXI CITY, JIANG SU, CHINA

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測極限值 (MDL)	結果 (Result) No.1	限值 (Limit)
紅磷 / Red phosphorus	**	本測試以熱裂解-氣相層析/質譜儀分析. / Analysis was performed by Pyrolyzer-GC/MS.	-	Negative	-
聚氯乙烯 / PVC	**	以紅外光譜分析及焰色法檢測. / Analysis was performed by FTIR and FLAME Test.	-	Negative	-
全氟辛酸(銨) / PFOA (CAS No.: 335-67-1)	mg/kg	參考US EPA 3550C: 2007方法, 以液相層析/質譜儀檢測. / With reference to US EPA 3550C: 2007. Analysis was performed by LC/MS.	10	n.d.	-
全氟辛烷磺酸 / Perfluorooctane sulfonates (PFOS)	mg/kg	參考US EPA 3550C: 2007方法, 以液相層析/質譜儀檢測. / With reference to US EPA 3550C: 2007. Analysis was performed by LC/MS.	10	n.d.	-
鹵素 / Halogen					
鹵素 (氟) / Halogen-Fluorine (F) (CAS No.: 014762-94-8)	mg/kg	參考BS EN 14582:2016，以離子層析儀分析. / With reference to BS EN 14582:2016. Analysis was performed by IC.	50	n.d.	-
鹵素 (氯) / Halogen-Chlorine (Cl) (CAS No.: 022537-15-1)	mg/kg		50	104	-
鹵素 (溴) / Halogen-Bromine (Br) (CAS No.: 010097-32-2)	mg/kg		50	n.d.	-
鹵素 (碘) / Halogen-Iodine (I) (CAS No.: 014362-44-8)	mg/kg		50	n.d.	-

試驗報告

Test Report

義典科技股份有限公司
E'DALE TECHNOLOGY CO., LTD.
72242 台南市佳里區六安里六安130號/江蘇省無錫市錫山區東港鎮錫港東路35號
NO. 130, LIOUAN, LIOUAN LI, JIALI DIST., TAINAN CITY, TAIWAN
NO. 35, XIGANG EAST ROAD, DONGGANG TOWN, XISHAN DIST., WUXI CITY, JIANG SU, CHINA

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測極限值 (MDL)	結果 (Result) No.1	限值 (Limit)
多環芳香烴 / Polynuclear Aromatic Hydrocarbons (PAHs)					
苊 / Acenaphthene (CAS No.: 83-32-9)	mg/kg	參考AfPS GS 2014:01 PAK方法，以氣相層析/質譜儀檢測. / With reference to AfPS GS 2014:01 PAK method. Analysis was performed by GC/MS.	0.2	n.d.	-
苊烯 / Acenaphthylene (CAS No.: 208-96-8)	mg/kg		0.2	n.d.	-
蒽 / Anthracene (CAS No.: 120-12-7)	mg/kg		0.2	n.d.	-
苯駢蒽 / Benzo[a]anthracene (CAS No.: 56-55-3)	mg/kg		0.2	n.d.	-
苯駢(a)芘 / Benzo[a]pyrene (CAS No.: 50-32-8)	mg/kg		0.2	n.d.	-
苯(b)苯駢芴 / Benzo[b]fluoranthene (CAS No.: 205-99-2)	mg/kg		0.2	n.d.	-
苯駢苝 / Benzo[g,h,i]perylene (CAS No.: 191-24-2)	mg/kg		0.2	n.d.	-
苯(k)苯駢芴 / Benzo[k]fluoranthene (CAS No.: 207-08-9)	mg/kg		0.2	n.d.	-
Chrysene (CAS No.: 218-01-9)	mg/kg		0.2	n.d.	-
二苯駢蒽 / Dibenzo[a,h]anthracene (CAS No.: 53-70-3)	mg/kg		0.2	n.d.	-
苯駢芴 / Fluoranthene (CAS No.: 206-44-0)	mg/kg		0.2	n.d.	-
芴 / Fluorene (CAS No.: 86-73-7)	mg/kg		0.2	n.d.	-
茚酮芘 / Indeno[1,2,3-c,d] pyrene (CAS No.: 193-39-5)	mg/kg		0.2	n.d.	-
萘 / Naphthalene (CAS No.: 91-20-3)	mg/kg		0.2	n.d.	-
菲 / Phenanthrene (CAS No.: 85-01-8)	mg/kg		0.2	n.d.	-
芘 / Pyrene (CAS No.: 129-00-0)	mg/kg		0.2	n.d.	-
苯(j)苯駢芴 / Benzo[j]fluoranthene (CAS No.: 205-82-3)	mg/kg		0.2	n.d.	-
苯駢(e)芘 / Benzo[e]pyrene (CAS No.: 192-97-2)	mg/kg		0.2	n.d.	-
多環芳香烴18項總和 / Sum of 18 PAHs	mg/kg		-	n.d.	-

試驗報告

Test Report

義典科技股份有限公司
E'DALE TECHNOLOGY CO., LTD.
72242 台南市佳里區六安里六安130號/江蘇省無錫市錫山區東港鎮錫港東路35號
NO. 130, LIOUAN, LIOUAN LI, JIALI DIST., TAINAN CITY, TAIWAN
NO. 35, XIGANG EAST ROAD, DONGGANG TOWN, XISHAN DIST., WUXI CITY, JIANG SU, CHINA

備註(Note)：

1. mg/kg = ppm；0.1wt% = 1000ppm
2. n.d. = Not Detected (未檢出)
3. MDL = Method Detection Limit (方法偵測極限值)
4. "-" = Not Regulated (無規格值)
5. **= Qualitative analysis (No Unit) 定性分析(無單位)
6. Negative = Undetectable 陰性(未偵測到); Positive = Detectable 陽性(已偵測到)
7. 聚氯乙烯測試由SGS其他實驗室執行 (The PVC test was subcontracted to other SGS Laboratory.)
8. 紅磷定性分析測試由SGS其他實驗室執行
   (The Red Phosphorus test was subcontracted to other SGS Laboratory.)

PFOS參考資訊(Reference Information) : 持久性有機污染物 POPs - (EU) 757/2010

PFOS濃度在物質或製備中不得超過0.001%(10ppm)，在半成品、成品或零部件中不得超過0.1%(1000ppm)，在紡織品或塗層材料中不得超過1μg/m^2。(Outlawing PFOS as substances or preparations in concentrations above 0.001% (10ppm), in semi-finished products or articles or parts at a level above 0.1%(1000ppm), in textiles or other coated materials above 1μg/m^2.)

全氟辛烷磺酸指全氟辛烷磺酸和它的衍生物包括全氟辛烷磺酸, 全氟辛基磺醯胺, N-甲基全氟辛烷磺酰胺, N-乙基全氟辛烷磺酰胺, N-甲基全氟辛基磺酰基氨基乙醇, N-乙基全氟辛基磺酰基氨基乙醇。(PFOS refer to Perfluorooctanesulfonic acid and its derivatives including Perfluorooctanesulfonic acid, Perfluoroctane sulfonamide, N-Methylperfluoroctane sulfonamide, N-Ethylperfluoroctane sulfonamide, N-Methylperfluoroctane sulfonamidoethanol and N-Ethylperfluoroctane sulfonamidoethanol.)

試驗報告

Test Report

義典科技股份有限公司
E'DALE TECHNOLOGY CO., LTD.
72242 台南市佳里區六安里六安130號/江蘇省無錫市錫山區東港鎮錫港東路35號
NO. 130, LIOUAN, LIOUAN LI, JIALI DIST., TAINAN CITY, TAIWAN
NO. 35, XIGANG EAST ROAD, DONGGANG TOWN, XISHAN DIST., WUXI CITY, JIANG SU, CHINA

德國產品安全委員會(AfPS) GS PAHs 要求 /
AfPS (German commission for Product Safety): GS PAHs requirements

項目 (Parameter)	第1類 (Category 1)	第2類 (Category 2)		第3類 (Category 3)	
	意圖放入嘴內的材料或玩具會與皮膚有所接觸(超過30秒). (Material indented to be put in the mouth or toys with intended skin contact (longer than 30 s).)	不屬於第1類的材料並可預見與皮膚接觸逾30秒(長期或經常與皮膚接觸). (Materials not falling under category 1 with foreseeable contact to skin for longer than 30 seconds (long-term skin or frequent contact).)		可預見與皮膚接觸短於30秒(短期與皮膚接觸), 以及不屬於第1類或第2類的材料. (Materials not falling under category 1 or 2 with foreseeable contact to skin for less than 30 seconds (short-term skin contact).)	
		列於2009/48/EC之玩具 (Toy under 2009/48/EC)	列於德國產品安全法之其他產品 (Other products under ProdSG)	列於2009/48/EC之玩具 (Toy under 2009/48/EC)	列於德國產品安全法之其他產品 (Other products under ProdSG)
Naphthalene	< 1	< 2		< 10	
Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene	< 1 Sum	< 5 Sum	< 10 Sum	< 20 Sum	< 50 Sum
Benzo[a]anthracene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Chrysene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo[b]fluoranthene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo[j]fluoranthene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo[k]fluoranthene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo[a]pyrene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo[e]pyrene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Indeno[1,2,3-c,d] pyrene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Dibenzo[a,h]anthracene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo[g,h,i]perylene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
18項PAH總濃度 (Sum of 18 PAH)	< 1	< 5	< 10	< 20	< 50

試驗報告

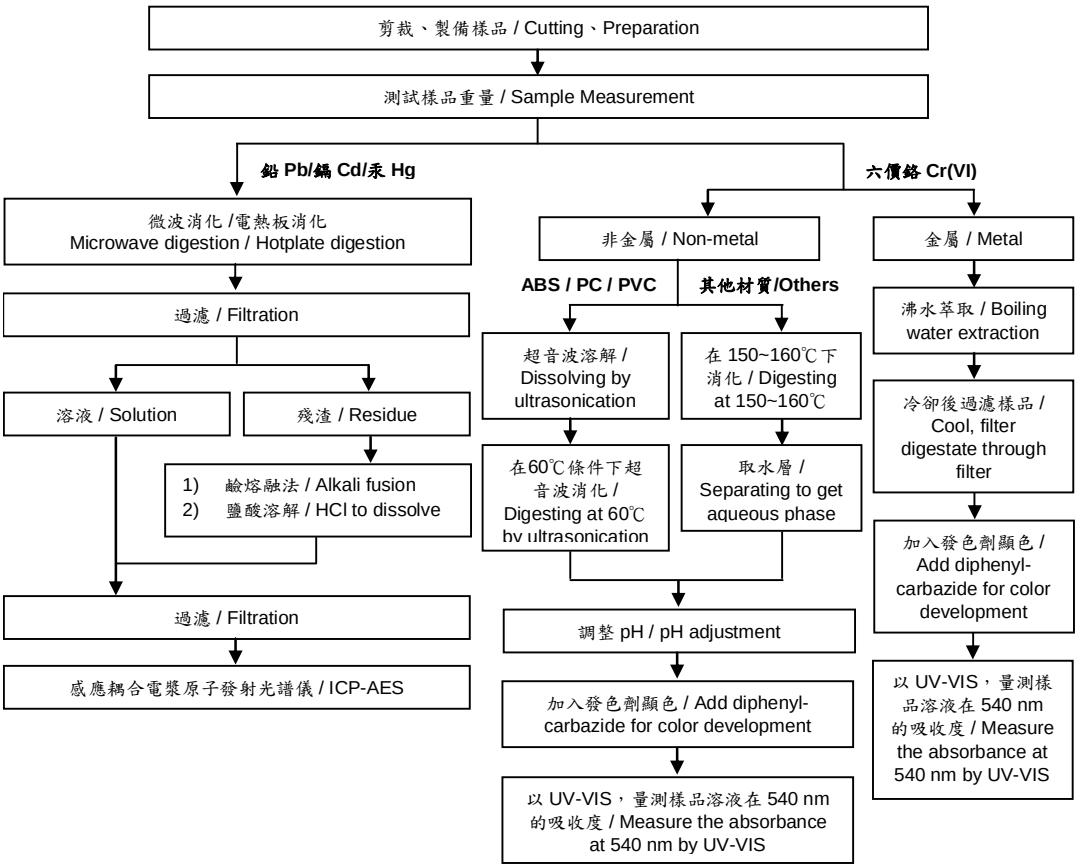
Test Report

義典科技股份有限公司
E'DALE TECHNOLOGY CO., LTD.
72242 台南市佳里區六安里六安130號/江蘇省無錫市錫山區東港鎮錫港東路35號
NO. 130, LIOUAN, LIOUAN LI, JIALI DIST., TAINAN CITY, TAIWAN
NO. 35, XIGANG EAST ROAD, DONGGANG TOWN, XISHAN DIST., WUXI CITY, JIANG SU, CHINA

重金屬流程圖 / Analytical flow chart of Heavy Metal

根據以下的流程圖之條件，樣品已完全溶解。（六價鉻測試方法除外）
These samples were dissolved totally by pre-conditioning method according to below flow chart.（Cr^{6+} test method excluded）

- 測試人員：劉俊宏/ Technician : Jony Liu
- 測試負責人：張伯睿/ Supervisor: Ray Chang



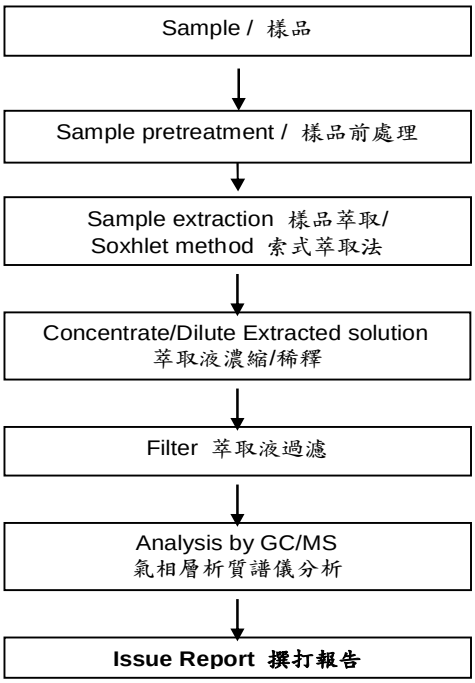
試驗報告

Test Report

義典科技股份有限公司
E'DALE TECHNOLOGY CO., LTD.
72242 台南市佳里區六安里六安130號/江蘇省無錫市錫山區東港鎮錫港東路35號
NO. 130, LIOUAN, LIOUAN LI, JIALI DIST., TAINAN CITY, TAIWAN
NO. 35, XIGANG EAST ROAD, DONGGANG TOWN, XISHAN DIST., WUXI CITY, JIANG SU, CHINA

多溴聯苯/多溴聯苯醚 分析流程圖 / PBB/PBDE analytical FLOW CHART

1)測試人員：陳威錚 / Name of the person who made measurement: Dorothy Chen
2)測試負責人：張伯睿 / Name of the person in charge of measurement: Ray Chang



試驗報告

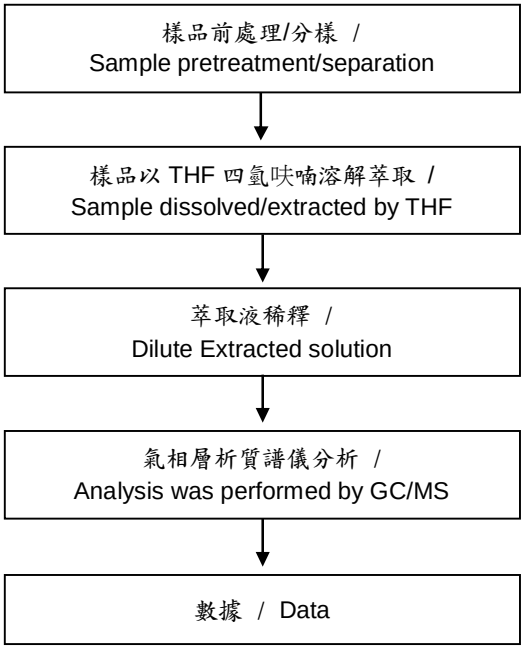
Test Report

義典科技股份有限公司
E'DALE TECHNOLOGY CO., LTD.
72242 台南市佳里區六安里六安130號/江蘇省無錫市錫山區東港鎮錫港東路35號
NO. 130, LIOUAN, LIOUAN LI, JIALI DIST., TAINAN CITY, TAIWAN
NO. 35, XIGANG EAST ROAD, DONGGANG TOWN, XISHAN DIST., WUXI CITY, JIANG SU, CHINA

可塑劑分析流程圖 / Analytical flow chart of phthalate content

- 測試人員：陳威錚 / Name of the person who made measurement: Dorothy Chen
- 測試負責人：張伯睿 / Name of the person in charge of measurement: Ray Chang

【測試方法/Test method: IEC 62321-8】



試驗報告

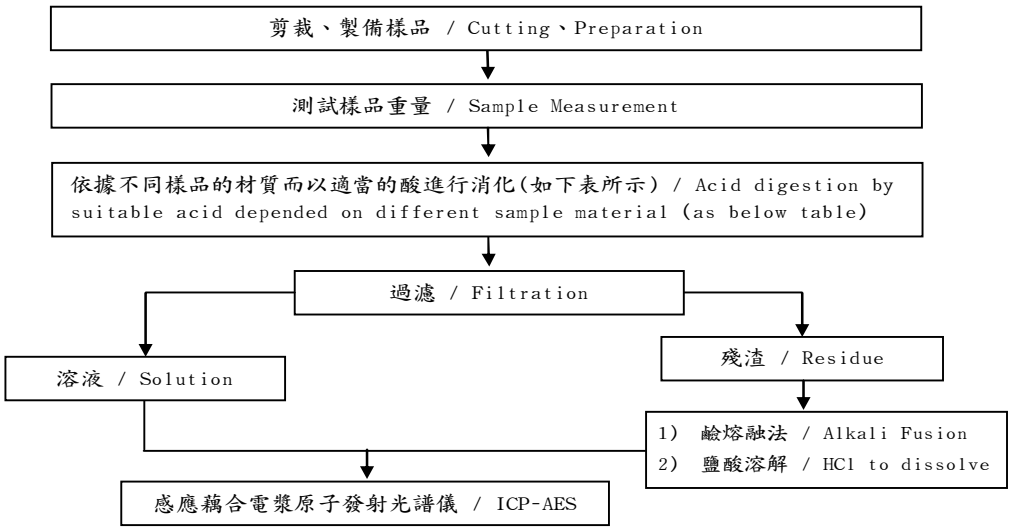
Test Report

義典科技股份有限公司
E'DALE TECHNOLOGY CO., LTD.
72242 台南市佳里區六安里六安130號/江蘇省無錫市錫山區東港鎮錫港東路35號
NO. 130, LIOUAN, LIOUAN LI, JIALI DIST., TAINAN CITY, TAIWAN
NO. 35, XIGANG EAST ROAD, DONGGANG TOWN, XISHAN DIST., WUXI CITY, JIANG SU, CHINA

1) 根據以下的流程圖之條件，樣品已完全溶解。 / These samples were dissolved totally by pre-conditioning method according to below flow chart.
2) 測試人員：劉俊宏 / Name of the person who made measurement: Jony Liu
3) 測試負責人：張伯睿 / Name of the person in charge of measurement: Ray Chang

元素以 ICP-AES 分析的消化流程圖

(Flow Chart of digestion for the elements analysis performed by ICP-AES)



鋼,銅,鋁,焊錫 / Steel, copper, aluminum, solder	王水,硝酸,鹽酸,氫氟酸,雙氧水 / Aqua regia, HNO_3, HCl, HF, H_2O_2
玻璃 / Glass	硝酸,氫氟酸 / HNO_3/HF
金,鉑,鈀,陶瓷 / Gold, platinum, palladium, ceramic	王水 / Aqua regia
銀 / Silver	硝酸 / HNO_3
塑膠 / Plastic	硫酸,雙氧水,硝酸,鹽酸 / H_2SO_4, H_2O_2, HNO_3, HCl
其他 / Others	加入任何酸至完全溶解 / Any acid to total digestion

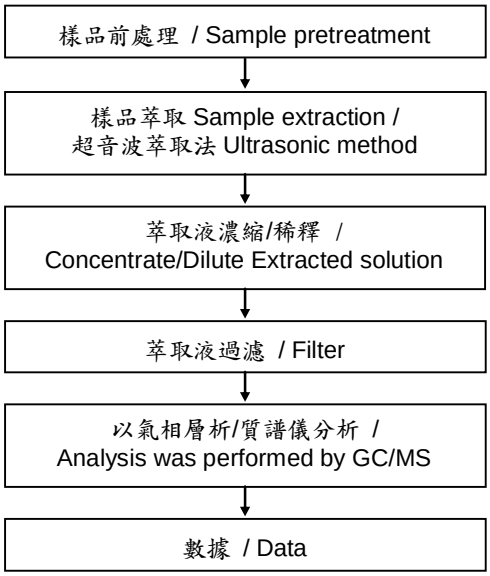
試驗報告

Test Report

義典科技股份有限公司
E'DALE TECHNOLOGY CO., LTD.
72242 台南市佳里區六安里六安130號/江蘇省無錫市錫山區東港鎮錫港東路35號
NO. 130, LIOUAN, LIOUAN LI, JIALI DIST., TAINAN CITY, TAIWAN
NO. 35, XIGANG EAST ROAD, DONGGANG TOWN, XISHAN DIST., WUXI CITY, JIANG SU, CHINA

六溴環十二烷分析流程圖 / HBCDD analytical flow chart

1) 測試人員：陳威錚/ Name of the person who made measurement: Dorothy Chen
2) 測試負責人：張伯睿/ Name of the person in charge of measurement: Ray Chang



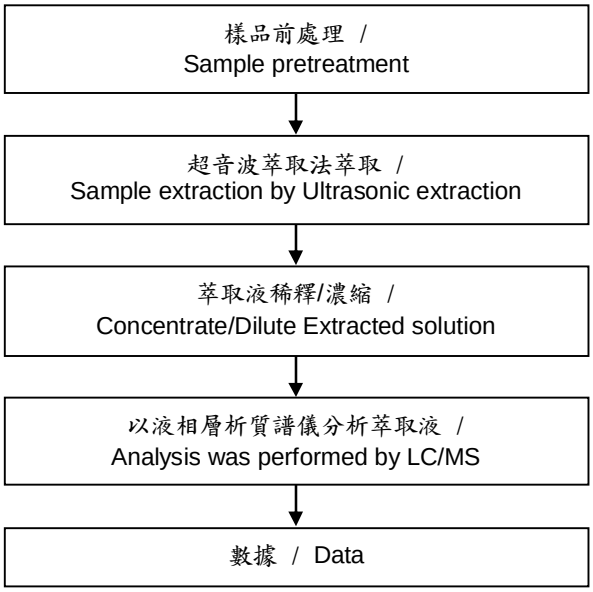
試驗報告

Test Report

義典科技股份有限公司
E'DALE TECHNOLOGY CO., LTD.
72242 台南市佳里區六安里六安130號/江蘇省無錫市錫山區東港鎮錫港東路35號
NO. 130, LIOUAN, LIOUAN LI, JIALI DIST., TAINAN CITY, TAIWAN
NO. 35, XIGANG EAST ROAD, DONGGANG TOWN, XISHAN DIST., WUXI CITY, JIANG SU, CHINA

四溴雙酚-A分析流程圖 / TBBP-A analytical flow chart

- 測試人員：黃璟瓔/ Name of the person who made measurement: Ginny Huang
- 測試負責人：張伯睿/ Name of the person in charge of measurement: Ray Chang



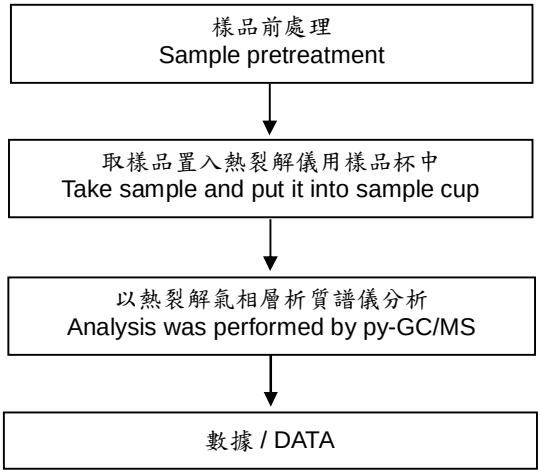
試驗報告

Test Report

義典科技股份有限公司
E'DALE TECHNOLOGY CO., LTD.
72242 台南市佳里區六安里六安130號/江蘇省無錫市錫山區東港鎮錫港東路35號
NO. 130, LIOUAN, LIOUAN LI, JIALI DIST., TAINAN CITY, TAIWAN
NO. 35, XIGANG EAST ROAD, DONGGANG TOWN, XISHAN DIST., WUXI CITY, JIANG SU, CHINA

紅磷分析流程 / Analytical flow chart of Red phosphorus

- 測試人員：林建宇 / Name of the person who made measurement: Roy Lin
- 測試負責人：張啟興 / Name of the person in charge of measurement: Troy Chang



試驗報告

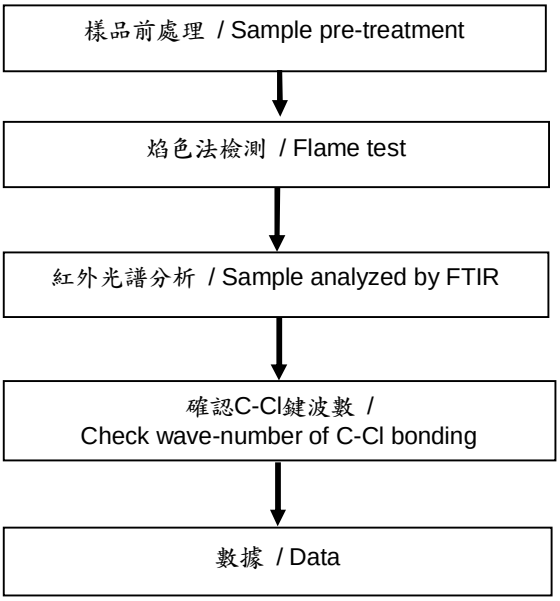
Test Report

義典科技股份有限公司
E'DALE TECHNOLOGY CO., LTD.
72242 台南市佳里區六安里六安130號/江蘇省無錫市錫山區東港鎮錫港東路35號
NO. 130, LIOUAN, LIOUAN LI, JIALI DIST., TAINAN CITY, TAIWAN
NO. 35, XIGANG EAST ROAD, DONGGANG TOWN, XISHAN DIST., WUXI CITY, JIANG SU, CHINA

聚氯乙烯物質判定分析流程圖 /

Analysis flow chart for determination of PVC in material

1)測試人員：戴秀純 / Name of the person who made measurement: Hannah Tai
2)測試負責人：林立翔 / Name of the person in charge of measurement: Roger Lin



試驗報告

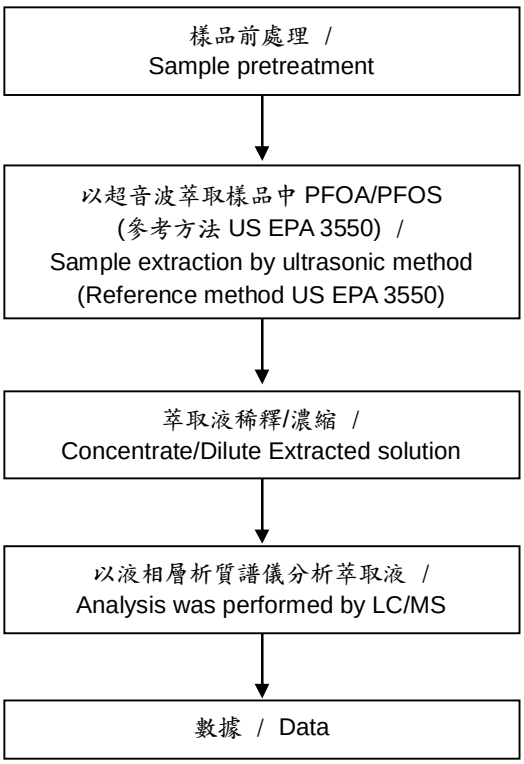
Test Report

義典科技股份有限公司
E'DALE TECHNOLOGY CO., LTD.
72242 台南市佳里區六安里六安130號/江蘇省無錫市錫山區東港鎮錫港東路35號
NO. 130, LIOUAN, LIOUAN LI, JIALI DIST., TAINAN CITY, TAIWAN
NO. 35, XIGANG EAST ROAD, DONGGANG TOWN, XISHAN DIST., WUXI CITY, JIANG SU, CHINA

全氟辛酸(鹽)/ 全氟辛烷磺酸分析流程圖 /
Analytical flow chart of PFOA/PFOS content

1)測試人員：黃璟瓔 / Name of the person who made measurement: Ginny Huang

2)測試負責人：張伯睿 / Name of the person in charge of measurement: Ray Chang



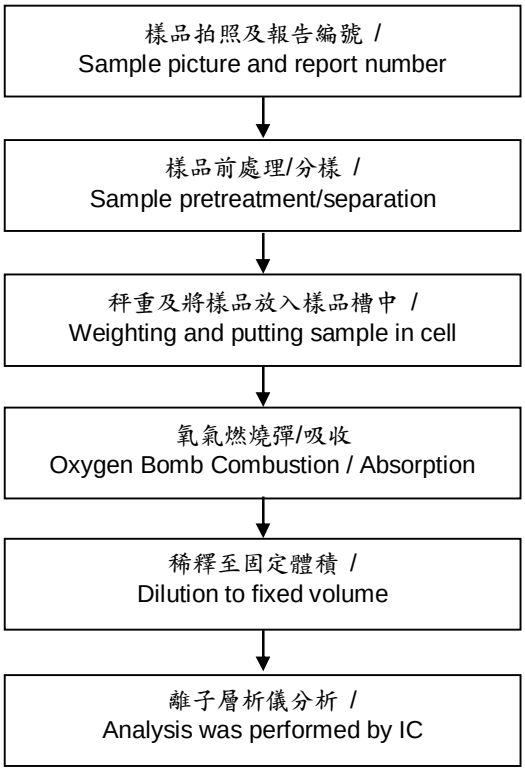
試驗報告

Test Report

義典科技股份有限公司
E'DALE TECHNOLOGY CO., LTD.
72242 台南市佳里區六安里六安130號/江蘇省無錫市錫山區東港鎮錫港東路35號
NO. 130, LIOUAN, LIOUAN LI, JIALI DIST., TAINAN CITY, TAIWAN
NO. 35, XIGANG EAST ROAD, DONGGANG TOWN, XISHAN DIST., WUXI CITY, JIANG SU, CHINA

鹵素分析流程圖 / Analytical flow chart of halogen content

1) 測試人員：洪秀眞/ Name of the person who made measurement: Jean Hung
2) 測試負責人：張伯睿/ Name of the person in charge of measurement: Ray Chang



試驗報告

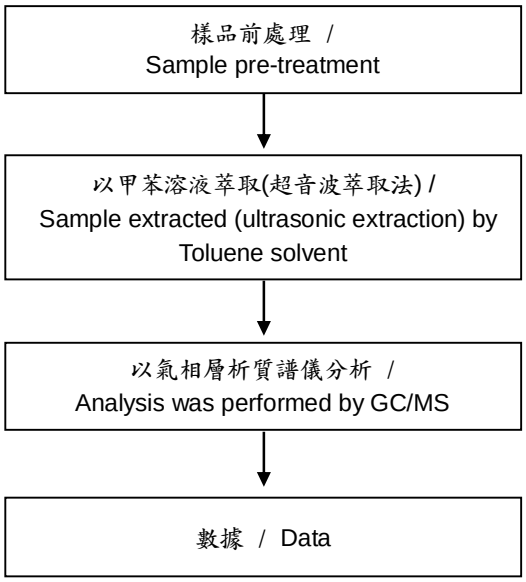
Test Report

義典科技股份有限公司
E'DALE TECHNOLOGY CO., LTD.
72242 台南市佳里區六安里六安130號/江蘇省無錫市錫山區東港鎮錫港東路35號
NO. 130, LIOUAN, LIOUAN LI, JIALI DIST., TAINAN CITY, TAIWAN
NO. 35, XIGANG EAST ROAD, DONGGANG TOWN, XISHAN DIST., WUXI CITY, JIANG SU, CHINA

多苯環芳香族化合物分析流程圖 /
PAHs (Poly Aromatic Hydrocarbons) analytical flow chart

1)測試人員：陳威錚 / Name of the person who made measurement: Dorothy Chen

2)測試負責人：張伯睿 / Name of the person in charge of measurement: Ray Chang



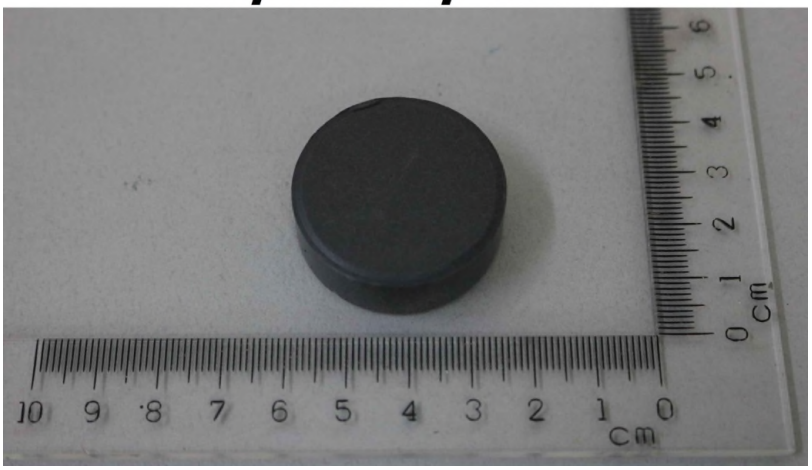
試驗報告

Test Report

義典科技股份有限公司
E'DALE TECHNOLOGY CO., LTD.
72242 台南市佳里區六安里六安130號/江蘇省無錫市錫山區東港鎮錫港東路35號
NO. 130, LIOUAN, LIOUAN LI, JIALI DIST., TAINAN CITY, TAIWAN
NO. 35, XIGANG EAST ROAD, DONGGANG TOWN, XISHAN DIST., WUXI CITY, JIANG SU, CHINA

*** 照片中如有箭頭標示，則表示爲實際檢測之樣品/部位. ***
(The tested sample / part is marked by an arrow if it's shown on the photo.)

KA/2017/61160



** 報告結尾 (End of Report) **