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Product/Process Change Notification

PCN#	Effective Date	Issue Date
2010-07-01C-02	2011/1/1	2010/7/1

PCN Classification	Product Category
Major	TO-92MOD

Subject
Copper Bonding Wire Implementation

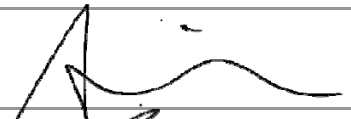
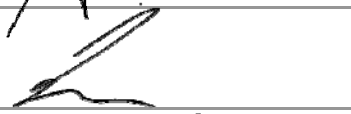
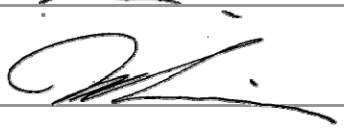
Affected Product(s)
2SA1020. 2SA965TM. 2SB647A. 2SC2235TM. 2SC2655.2SD667A

Description of Change(s)
Copper wire has lower electrical resisting conductivity, and able to achieve lower Vce(set) with slight improvement in thermal performance, it's mechanical properties (vs gold wire)will help to reduce the wire defects (eg. sagging/ broken wire).

Content of Change(s)
Changing bonding wire material from gold to copper

Impact(s)
N/A

Attachment(s)
Reliability Teat 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

SeCoS Corporation

Reliability Testing Summary Report

Date: 2010/06/30 Document No.: SD10 -06- 13

Test Item	P/N	Test Condition	(LTPD)	Sample Numbers	Allow Fall Numbers	Fall Numbers	Result
HTRB High Temp Reverse Bias	2SA1020	100 ± 5℃, 100%VR, T = 1000hrs		77	0	0	ACC
HTSL High Temperature Storage Life	2SA1020	150℃, T = 1000 hrs		77	0	0	ACC
PCT Pressure Cooker Test	2SA1020	121℃, 29.7PSIG, 168 hrs		77	0	0	ACC
TCT Temperature Cycle Test	2SA1020	-55℃/30min, 150℃/30min, For 1000 Cycle		77	0	0	ACC
THT High Temperature High Humidity Test	2SA1020	85 ± 2℃, RH=85±5%, 1000 hrs		77	0	0	ACC
H3TRB High Temper High Humidity Reverse Bies Test	2SA1020	85 ± 2℃, RH=85±5%, 1000 hrs		77	0	0	ACC
Solder Resistance DITY	2SA1020	270±5℃, 7Sec ＋2/－0 Sec		10	0	0	ACC

Judgment:

■ **qualified** □ **unqualified**

Testing Start Date: 2010.05.03 **Testing End Date:** 2010.06.30

Tester: Peter Yang **Approval:** Taylor Yang

SeCoS Corporation

Electrical Test Data

Report No : T100630-013
Part No : 2SA1020
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -50V, 85 < HFE < 340, VCE(sat) < -500mV
Test Condition: 25℃
Test Date: 2010.05.03 ~ 2010.05.03
Test Standard : Specifications
Operator: Peter Yang

Test Result: PASS

No	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)
1	-62.41V	168.2	-211.2mV
2	-60.53V	161.9	-217.9mV
3	-65.54V	167.9	-213.3mV
4	-66.23V	154.2	-193.1mV
5	-58.20V	158.5	-205.9mV
6	-63.21V	155.2	-208.1mV
7	-66.26V	155.6	-198.2mV
8	-60.09V	156.7	-196.3mV
9	-59.90V	162.1	-218.9mV
10	-59.60V	153.9	-207.9mV
11	-69.79V	162.1	-216.5mV
12	-66.11V	171.1	-191.1mV
13	-64.70V	172.9	-221.2mV
14	-69.05V	172.0	-203.3mV
15	-64.18V	159.3	-190.9mV
16	-69.02V	160.7	-219.4mV
17	-60.59V	163.5	-221.3mV
18	-64.53V	155.6	-217.8mV
19	-65.52V	157.5	-199.3mV
20	-58.20V	153.8	-204.9mV
21	-69.67V	165.3	-206.8mV
22	-65.03V	156.3	-220.8mV
23	-58.95V	160.1	-197.3mV
24	-62.49V	157.4	-190.1mV
25	-61.23V	157.5	-220.1mV
26	-66.31V	168.7	-196.9mV
27	-60.10V	162.6	-218.0mV
28	-58.33V	172.8	-208.5mV
29	-58.18V	160.4	-203.1mV
30	-58.87V	162.6	-210.7mV
31	-57.72V	167.9	-214.0mV

SeCoS Corporation

Electrical Test Data

Report No : T100630-013
Part No : 2SA1020
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -50V, 85 < HFE < 340, VCE(sat) < -500mV
Test Condition: 25℃
Test Date: 2010.05.03 ~ 2010.05.03
Test Standard : Specifications
Operator: Peter Yang

Test Result: PASS

No	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)
32	-57.56V	171.7	-208.0mV
33	-63.58V	158.6	-219.2mV
34	-67.69V	158.3	-216.0mV
35	-65.56V	171.3	-213.4mV
36	-67.88V	156.2	-194.9mV
37	-58.66V	163.9	-216.7mV
38	-58.89V	156.7	-203.5mV
39	-66.05V	165.8	-196.7mV
40	-58.66V	170.3	-192.4mV
41	-70.32V	159.1	-193.9mV
42	-66.64V	154.4	-211.0mV
43	-61.39V	159.7	-216.5mV
44	-66.30V	164.0	-221.5mV
45	-59.12V	163.9	-204.0mV
46	-66.94V	171.3	-210.2mV
47	-67.28V	161.4	-193.8mV
48	-68.01V	163.1	-213.3mV
49	-66.97V	171.8	-204.3mV
50	-67.92V	166.4	-217.9mV
51	-62.87V	158.6	-207.3mV
52	-62.11V	169.2	-192.8mV
53	-58.81V	161.4	-203.8mV
54	-68.32V	168.3	-194.2mV
55	-58.64V	157.4	-203.6mV
56	-63.45V	172.6	-211.2mV
57	-67.93V	168.7	-201.8mV
58	-68.53V	160.9	-194.5mV
59	-63.82V	154.2	-201.2mV
60	-66.40V	170.4	-190.7mV
61	-68.95V	165.1	-209.5mV
62	-63.35V	172.2	-220.2mV

SeCoS Corporation

Electrical Test Data

Report No : T100630-013
Part No : 2SA1020
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -50V, 85 < HFE < 340, VCE(sat) < -500mV
Test Condition: 25℃
Test Date: 2010.05.03 ~ 2010.05.03
Test Standard : Specifications
Operator: Peter Yang

Test Result: PASS

No	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)
63	-59.70V	160.5	-211.5mV
64	-66.31V	161.7	-198.9mV
65	-67.71V	168.5	-212.1mV
66	-70.18V	165.2	-214.9mV
67	-68.85V	156.1	-214.2mV
68	-64.16V	164.4	-199.8mV
69	-63.07V	167.3	-217.4mV
70	-57.71V	157.6	-209.0mV
71	-62.09V	153.7	-220.6mV
72	-69.48V	160.8	-195.8mV
73	-57.72V	167.2	-219.2mV
74	-64.72V	159.7	-193.4mV
75	-62.04V	160.1	-207.9mV
76	-59.57V	156.7	-203.9mV
77	-65.00V	160.0	-192.4mV

Made By: Peter Yang

Approval: Taylor Yang

SeCoS Corporation

High Temperature Reverse Bias Test Data

Report No : T100630-013
Part No : 2SA1020
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -50V, 85 < HFE < 340, VCE(sat) < -500mV
Test Condition: 100 ± 5℃, 100%VR, T = 1000 hrs
Test Date: 2010.05.03 ~ 2010.06.15
Test Standard : JESD22 STANDARD Method-A108
Operator: Peter Yang

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	-65.29V	153.9	-217.7mV	-62.29V	171.7	-213.3mV
2	-60.91V	165.9	-215.1mV	-63.64V	159.6	-203.8mV
3	-60.24V	162.8	-192.4mV	-62.90V	166.0	-215.7mV
4	-57.36V	158.7	-207.1mV	-61.40V	169.3	-194.4mV
5	-62.96V	168.9	-217.6mV	-59.06V	163.1	-220.2mV
6	-59.70V	160.3	-200.9mV	-58.61V	158.0	-192.1mV
7	-69.16V	165.5	-192.3mV	-61.05V	156.9	-191.1mV
8	-60.96V	172.3	-195.9mV	-58.46V	155.1	-218.4mV
9	-64.52V	165.7	-203.9mV	-61.09V	156.8	-194.0mV
10	-59.99V	154.9	-213.7mV	-62.95V	158.0	-210.4mV
11	-65.06V	169.6	-203.0mV	-69.95V	170.2	-209.8mV
12	-66.10V	164.9	-206.3mV	-66.41V	166.9	-216.4mV
13	-68.73V	154.6	-198.8mV	-63.21V	159.1	-191.6mV
14	-68.78V	156.6	-208.6mV	-59.48V	158.3	-205.6mV
15	-69.22V	159.1	-199.9mV	-70.27V	158.4	-220.2mV
16	-62.67V	153.9	-198.4mV	-57.61V	156.5	-213.7mV
17	-66.96V	165.3	-216.6mV	-67.14V	163.4	-207.5mV
18	-67.51V	160.8	-215.2mV	-59.29V	165.3	-198.9mV
19	-59.85V	161.2	-206.5mV	-63.07V	165.5	-191.1mV
20	-60.38V	171.7	-198.1mV	-62.36V	167.8	-196.3mV
21	-63.54V	164.5	-201.6mV	-61.29V	169.4	-197.8mV
22	-63.23V	162.5	-195.4mV	-68.42V	165.8	-191.0mV
23	-59.24V	159.8	-204.7mV	-58.73V	155.5	-202.9mV
24	-62.63V	165.4	-211.2mV	-66.34V	156.2	-210.6mV
25	-60.72V	169.9	-197.9mV	-60.38V	173.0	-203.9mV
26	-66.18V	158.4	-209.3mV	-69.45V	165.9	-194.0mV
27	-68.21V	162.9	-218.4mV	-58.56V	155.4	-208.8mV
28	-69.69V	169.0	-193.9mV	-60.01V	169.7	-199.7mV
29	-64.02V	162.6	-195.4mV	-65.81V	154.5	-215.1mV
30	-68.91V	154.7	-200.4mV	-59.80V	156.6	-194.5mV

SeCoS Corporation

High Temperature Reverse Bias Test Data

Report No : T100630-013
Part No : 2SA1020
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -50V, 85 < HFE < 340, VCE(sat) < -500mV
Test Condition: 100 ± 5℃, 100%VR, T = 1000 hrs
Test Date: 2010.05.03 ~ 2010.06.15
Test Standard : JESD22 STANDARD Method-A108
Operator: Peter Yang

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)
31	-67.12V	162.4	-207.8mV	-58.10V	171.3	-192.4mV
32	-61.85V	170.2	-210.0mV	-63.88V	160.3	-211.8mV
33	-58.47V	155.7	-213.7mV	-68.31V	158.7	-198.3mV
34	-66.38V	169.3	-197.4mV	-57.44V	170.3	-214.6mV
35	-57.46V	163.9	-205.8mV	-65.82V	164.6	-210.9mV
36	-59.13V	169.4	-211.1mV	-70.02V	162.4	-202.7mV
37	-65.36V	168.0	-208.6mV	-61.55V	172.7	-196.7mV
38	-60.07V	168.8	-213.5mV	-68.83V	156.1	-220.9mV
39	-62.76V	172.5	-193.7mV	-65.25V	171.4	-199.1mV
40	-67.73V	155.7	-197.3mV	-66.29V	171.8	-219.9mV
41	-60.01V	167.3	-221.4mV	-68.59V	163.3	-194.3mV
42	-65.68V	163.3	-215.6mV	-62.49V	161.9	-202.8mV
43	-57.85V	162.6	-209.6mV	-61.05V	161.1	-207.5mV
44	-69.86V	172.4	-213.0mV	-66.46V	168.9	-211.2mV
45	-67.70V	158.3	-214.2mV	-61.18V	156.7	-212.7mV
46	-62.29V	165.2	-200.2mV	-58.85V	169.3	-192.0mV
47	-62.42V	172.6	-194.8mV	-69.50V	169.9	-220.4mV
48	-61.73V	159.6	-221.2mV	-58.25V	164.7	-202.1mV
49	-67.36V	172.0	-204.9mV	-61.78V	163.1	-196.5mV
50	-60.92V	161.8	-214.8mV	-69.19V	164.0	-205.1mV
51	-62.10V	161.0	-199.1mV	-64.33V	155.3	-191.9mV
52	-69.64V	156.0	-205.6mV	-67.62V	165.5	-199.0mV
53	-58.30V	169.8	-205.1mV	-59.12V	162.2	-211.5mV
54	-70.20V	154.3	-192.8mV	-66.56V	172.9	-220.7mV
55	-65.38V	169.9	-190.4mV	-62.33V	161.8	-209.0mV
56	-63.56V	163.8	-206.2mV	-68.11V	158.7	-214.7mV
57	-65.77V	170.1	-202.0mV	-58.82V	164.3	-208.2mV
58	-57.88V	170.6	-219.5mV	-64.44V	159.1	-198.1mV
59	-58.38V	163.5	-219.3mV	-62.92V	163.4	-209.5mV
60	-61.87V	170.2	-219.7mV	-59.76V	161.1	-197.5mV

SeCoS Corporation

High Temperature Reverse Bias Test Data

Report No : T100630-013
Part No : 2SA1020
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -50V, 85 < HFE < 340, VCE(sat) < -500mV
Test Condition: 100 ± 5℃, 100%VR, T = 1000 hrs
Test Date: 2010.05.03 ~ 2010.06.15
Test Standard : JESD22 STANDARD Method-A108
Operator: Peter Yang

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)
61	-60.85V	160.1	-212.0mV	-66.91V	170.7	-215.9mV
62	-65.97V	161.2	-190.4mV	-62.44V	157.7	-193.2mV
63	-61.75V	170.6	-213.9mV	-66.19V	168.5	-207.9mV
64	-67.12V	169.0	-194.9mV	-64.00V	159.6	-216.2mV
65	-63.06V	169.6	-218.6mV	-63.40V	157.6	-203.2mV
66	-64.11V	158.7	-193.1mV	-69.34V	169.7	-204.2mV
67	-62.93V	165.3	-201.3mV	-64.44V	161.8	-193.7mV
68	-69.36V	154.1	-221.1mV	-58.94V	172.9	-199.8mV
69	-65.29V	163.0	-213.8mV	-67.29V	163.5	-209.3mV
70	-58.24V	159.5	-217.4mV	-61.27V	160.6	-214.3mV
71	-60.85V	157.8	-208.3mV	-67.57V	166.0	-195.6mV
72	-59.90V	163.5	-204.4mV	-61.80V	169.4	-201.5mV
73	-70.31V	160.7	-222.1mV	-61.20V	165.4	-195.9mV
74	-68.42V	154.9	-220.3mV	-67.33V	165.0	-201.7mV
75	-69.58V	163.0	-206.2mV	-65.06V	171.3	-202.7mV
76	-68.87V	161.9	-214.7mV	-67.36V	172.4	-195.4mV
77	-69.45V	158.7	-219.9mV	-61.00V	159.6	-208.2mV

Made By: Peter Yang

Approval: Taylor Yang

SeCoS Corporation

High Temperature Storage Life Test Data

Report No : T100630-013
Part No : 2SA1020
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -50V, 85 < HFE < 340, VCE(sat) < -500mV
Test Condition: 150℃, 1000Hrs
Test Date: 2010.05.03 ~ 2010.06.15
Test Standard : JESD22 STANDARD Method-A103
Operator: Peter Yang

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	-64.65V	165.3	-201.2mV	-63.85V	158.6	-197.4mV
2	-70.28V	168.5	-201.1mV	-65.01V	157.4	-207.7mV
3	-66.48V	172.9	-221.5mV	-60.20V	162.4	-218.6mV
4	-66.06V	163.6	-193.5mV	-70.07V	162.8	-199.9mV
5	-58.03V	157.3	-213.4mV	-64.21V	169.6	-198.8mV
6	-60.78V	156.9	-194.5mV	-67.86V	172.5	-207.7mV
7	-65.07V	162.5	-207.7mV	-68.16V	158.0	-207.8mV
8	-66.33V	168.8	-190.6mV	-62.94V	153.9	-201.7mV
9	-58.51V	170.9	-202.4mV	-58.53V	163.5	-200.7mV
10	-59.87V	158.2	-197.4mV	-70.09V	168.7	-205.8mV
11	-65.81V	160.7	-198.7mV	-66.65V	166.9	-219.4mV
12	-57.98V	170.4	-192.6mV	-61.25V	170.9	-197.0mV
13	-64.15V	160.8	-192.1mV	-65.82V	167.1	-198.1mV
14	-60.67V	163.7	-201.5mV	-66.44V	171.0	-209.2mV
15	-61.43V	165.7	-216.5mV	-65.53V	162.8	-218.7mV
16	-59.95V	168.8	-215.5mV	-68.01V	164.4	-218.4mV
17	-58.04V	154.7	-212.8mV	-60.26V	165.3	-189.8mV
18	-63.13V	162.8	-218.2mV	-59.36V	158.9	-199.4mV
19	-62.84V	172.2	-212.8mV	-65.02V	164.6	-190.3mV
20	-67.38V	166.5	-198.4mV	-61.13V	166.7	-202.4mV
21	-60.77V	155.0	-194.5mV	-57.84V	161.7	-203.4mV
22	-62.71V	171.6	-218.9mV	-68.42V	162.1	-212.8mV
23	-57.76V	161.1	-206.8mV	-63.79V	155.8	-220.4mV
24	-69.82V	154.7	-194.8mV	-61.49V	166.2	-193.8mV
25	-69.11V	159.3	-209.1mV	-60.78V	169.7	-218.5mV
26	-60.75V	158.7	-213.9mV	-66.12V	162.1	-220.7mV
27	-66.18V	159.6	-201.1mV	-64.54V	153.8	-201.2mV
28	-68.21V	167.7	-189.9mV	-63.76V	165.4	-219.5mV
29	-63.35V	157.5	-206.9mV	-67.81V	168.8	-202.4mV
30	-58.74V	168.5	-221.1mV	-70.02V	171.1	-204.3mV

SeCoS Corporation

High Temperature Storage Life Test Data

Report No : T100630-013
Part No : 2SA1020
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -50V, 85 < HFE < 340, VCE(sat) < -500mV
Test Condition: 150℃, 1000Hrs
Test Date: 2010.05.03 ~ 2010.06.15
Test Standard : JESD22 STANDARD Method-A103
Operator: Peter Yang

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)
31	-64.00V	172.7	-220.9mV	-61.90V	170.3	-213.5mV
32	-62.46V	159.6	-201.5mV	-58.70V	161.0	-207.5mV
33	-61.89V	166.3	-212.7mV	-58.39V	161.5	-206.7mV
34	-67.74V	169.9	-205.9mV	-60.77V	161.2	-221.3mV
35	-58.80V	162.3	-194.1mV	-61.94V	172.3	-201.6mV
36	-67.87V	157.2	-200.8mV	-66.07V	170.1	-207.4mV
37	-61.01V	164.3	-202.7mV	-60.16V	153.6	-210.4mV
38	-69.38V	171.6	-219.3mV	-59.84V	168.3	-195.1mV
39	-67.21V	162.3	-219.3mV	-68.72V	155.8	-221.3mV
40	-64.38V	168.1	-202.9mV	-67.09V	155.0	-215.9mV
41	-63.10V	170.5	-198.0mV	-66.68V	156.9	-192.4mV
42	-67.92V	168.3	-197.3mV	-61.92V	161.0	-213.8mV
43	-60.94V	160.2	-207.6mV	-61.35V	154.6	-211.1mV
44	-68.17V	157.2	-207.7mV	-67.33V	166.7	-210.9mV
45	-62.22V	169.9	-204.3mV	-69.56V	169.3	-192.9mV
46	-67.74V	171.4	-196.6mV	-65.33V	165.8	-194.7mV
47	-62.57V	154.4	-210.8mV	-59.33V	163.9	-202.6mV
48	-58.72V	169.3	-202.8mV	-68.10V	169.9	-198.8mV
49	-58.81V	166.4	-199.4mV	-69.56V	166.9	-220.5mV
50	-64.41V	165.6	-219.4mV	-60.82V	166.7	-218.2mV
51	-65.45V	164.0	-217.8mV	-68.05V	169.4	-210.3mV
52	-63.36V	170.8	-191.3mV	-59.62V	157.1	-211.2mV
53	-61.03V	162.7	-192.7mV	-68.60V	172.5	-213.3mV
54	-62.06V	170.7	-209.7mV	-70.01V	162.8	-210.9mV
55	-60.24V	168.9	-218.5mV	-66.95V	169.7	-200.3mV
56	-68.58V	155.4	-218.4mV	-68.68V	170.8	-190.1mV
57	-68.11V	159.3	-220.7mV	-61.63V	154.4	-211.8mV
58	-66.00V	154.9	-216.4mV	-70.28V	160.7	-216.4mV
59	-59.55V	169.2	-206.4mV	-68.00V	167.5	-209.2mV
60	-62.26V	169.5	-204.1mV	-64.76V	172.3	-213.7mV

SeCoS Corporation

High Temperature Storage Life Test Data

Report No : T100630-013
Part No : 2SA1020
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -50V, 85 < HFE < 340, VCE(sat) < -500mV
Test Condition: 150℃, 1000Hrs
Test Date: 2010.05.03 ~ 2010.06.15
Test Standard : JESD22 STANDARD Method-A103
Operator: Peter Yang

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)
61	-59.35V	161.6	-216.4mV	-61.77V	154.6	-219.2mV
62	-59.55V	169.7	-198.3mV	-64.05V	154.1	-207.5mV
63	-62.71V	160.4	-205.2mV	-66.96V	156.9	-217.9mV
64	-65.96V	161.9	-191.1mV	-63.29V	158.8	-205.2mV
65	-64.08V	171.1	-200.7mV	-60.70V	172.4	-196.5mV
66	-69.09V	167.0	-213.3mV	-57.42V	168.2	-199.3mV
67	-64.47V	164.2	-215.9mV	-58.49V	161.3	-214.4mV
68	-69.50V	170.2	-208.9mV	-57.57V	170.7	-218.5mV
69	-60.39V	161.1	-208.5mV	-59.74V	163.9	-196.5mV
70	-58.97V	155.9	-214.3mV	-69.31V	158.3	-195.6mV
71	-58.00V	155.8	-196.4mV	-67.77V	159.5	-200.3mV
72	-69.84V	171.5	-211.9mV	-70.17V	162.8	-202.6mV
73	-66.36V	172.9	-205.1mV	-63.87V	164.4	-218.8mV
74	-58.42V	161.7	-198.8mV	-67.71V	159.0	-208.3mV
75	-59.74V	169.3	-209.3mV	-65.30V	160.5	-219.3mV
76	-63.09V	160.0	-207.7mV	-63.05V	157.6	-209.1mV
77	-69.87V	167.0	-197.6mV	-70.37V	171.1	-193.8mV

Made By: Peter Yang

Approval: Taylor Yang

SeCoS Corporation

Pressure Cooker Test Data

Report No : T100630-013
Part No : 2SA1020
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -50V, 85 < HFE < 340, VCE(sat) < -500mV
Test Condition: 121℃, 100%RH, 29.7PSIG, 168Hrs
Test Date: 2010.05.03 ~ 2010.05.11
Test Standard : JESD22 STANDARD Method-A102
Operator: Peter Yang

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	-68.02V	157.8	-218.0mV	-68.76V	162.5	-216.0mV
2	-65.22V	169.3	-208.8mV	-60.84V	162.0	-198.8mV
3	-65.33V	162.7	-222.1mV	-62.86V	153.6	-199.5mV
4	-63.94V	167.3	-200.3mV	-61.60V	155.7	-193.9mV
5	-70.21V	167.6	-220.0mV	-58.99V	168.5	-207.8mV
6	-68.44V	159.7	-210.5mV	-62.20V	154.8	-205.8mV
7	-62.07V	154.5	-191.1mV	-58.59V	171.0	-190.1mV
8	-60.34V	170.7	-213.7mV	-69.70V	153.9	-202.1mV
9	-65.18V	170.4	-192.4mV	-58.36V	167.0	-218.3mV
10	-63.89V	161.7	-203.3mV	-64.69V	154.4	-213.1mV
11	-59.35V	154.8	-200.0mV	-66.52V	172.2	-205.3mV
12	-68.82V	156.2	-204.6mV	-59.92V	160.7	-207.2mV
13	-60.82V	163.6	-201.1mV	-65.96V	163.0	-211.6mV
14	-67.21V	172.3	-200.6mV	-60.86V	160.5	-205.0mV
15	-68.37V	164.8	-192.1mV	-64.22V	156.2	-196.7mV
16	-64.66V	162.0	-206.1mV	-61.97V	164.1	-195.7mV
17	-66.47V	160.8	-194.6mV	-68.75V	168.3	-219.9mV
18	-66.48V	170.7	-219.4mV	-57.85V	163.2	-208.2mV
19	-65.83V	173.1	-203.7mV	-58.80V	165.4	-221.2mV
20	-66.82V	169.5	-198.5mV	-70.20V	166.4	-191.0mV
21	-62.91V	167.1	-203.1mV	-60.26V	164.5	-219.2mV
22	-63.69V	172.3	-198.3mV	-57.78V	166.7	-205.8mV
23	-63.93V	159.5	-220.4mV	-69.82V	161.7	-209.1mV
24	-60.90V	170.1	-199.8mV	-63.14V	160.7	-208.5mV
25	-64.89V	159.5	-197.5mV	-69.19V	158.0	-198.1mV
26	-67.68V	155.7	-213.5mV	-58.69V	166.2	-189.8mV
27	-61.50V	166.6	-198.7mV	-60.58V	166.5	-210.2mV
28	-59.31V	166.8	-199.3mV	-58.94V	154.5	-221.0mV
29	-64.80V	172.3	-201.2mV	-63.28V	156.8	-208.9mV
30	-66.76V	160.5	-195.4mV	-66.48V	161.8	-200.6mV

SeCoS Corporation

Pressure Cooker Test Data

Report No : T100630-013
Part No : 2SA1020
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -50V, 85 < HFE < 340, VCE(sat) < -500mV
Test Condition: 121℃, 100%RH, 29.7PSIG, 168Hrs
Test Date: 2010.05.03 ~ 2010.05.11
Test Standard : JESD22 STANDARD Method-A102
Operator: Peter Yang

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)
31	-62.31V	164.8	-205.2mV	-57.41V	154.1	-193.4mV
32	-61.59V	161.7	-199.8mV	-58.56V	156.9	-206.9mV
33	-65.98V	155.7	-199.1mV	-57.38V	169.8	-197.4mV
34	-61.02V	155.0	-200.9mV	-60.82V	166.1	-190.4mV
35	-64.21V	166.7	-210.1mV	-68.71V	166.4	-191.9mV
36	-66.43V	167.0	-205.1mV	-66.32V	155.0	-201.2mV
37	-66.86V	162.2	-206.6mV	-66.65V	155.3	-191.5mV
38	-60.23V	155.5	-208.7mV	-57.68V	161.4	-202.5mV
39	-66.11V	170.6	-210.3mV	-57.43V	154.5	-196.3mV
40	-64.98V	172.9	-214.4mV	-65.69V	165.4	-192.5mV
41	-66.15V	173.0	-218.8mV	-63.98V	157.3	-199.9mV
42	-65.26V	165.7	-198.2mV	-67.38V	160.1	-221.0mV
43	-65.73V	159.9	-213.7mV	-69.36V	153.6	-207.9mV
44	-66.00V	172.3	-202.2mV	-64.10V	172.7	-218.2mV
45	-65.81V	153.7	-196.8mV	-65.05V	157.3	-216.1mV
46	-59.60V	164.3	-197.8mV	-60.32V	167.2	-196.1mV
47	-68.58V	164.2	-219.6mV	-65.23V	170.2	-193.6mV
48	-65.78V	155.6	-198.5mV	-68.21V	169.3	-203.1mV
49	-58.21V	157.8	-194.4mV	-60.95V	156.3	-207.4mV
50	-70.50V	154.4	-189.6mV	-64.06V	156.0	-218.3mV
51	-60.16V	173.0	-193.7mV	-59.80V	164.0	-201.5mV
52	-61.88V	170.9	-214.7mV	-61.40V	167.9	-193.8mV
53	-65.82V	171.4	-216.5mV	-60.51V	172.7	-203.5mV
54	-58.52V	163.3	-209.1mV	-65.37V	164.9	-191.1mV
55	-68.24V	170.4	-196.8mV	-66.00V	168.6	-194.0mV
56	-63.83V	172.9	-190.0mV	-62.06V	170.5	-193.5mV
57	-67.72V	164.1	-206.8mV	-57.95V	154.9	-206.3mV
58	-62.89V	172.3	-210.7mV	-68.98V	156.5	-208.2mV
59	-63.37V	153.6	-212.7mV	-67.12V	159.7	-209.3mV
60	-66.68V	161.4	-198.6mV	-66.52V	169.5	-193.3mV

SeCoS Corporation

Pressure Cooker Test Data

Report No : T100630-013
Part No : 2SA1020
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -50V, 85 < HFE < 340, VCE(sat) < -500mV
Test Condition: 121℃, 100%RH, 29.7PSIG, 168Hrs
Test Date: 2010.05.03 ~ 2010.05.11
Test Standard : JESD22 STANDARD Method-A102
Operator: Peter Yang

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)
61	-57.85V	158.1	-216.0mV	-70.10V	163.4	-202.8mV
62	-59.68V	172.8	-210.1mV	-69.50V	160.1	-202.9mV
63	-65.62V	157.0	-215.1mV	-66.30V	172.1	-210.7mV
64	-60.04V	168.9	-209.2mV	-63.70V	168.7	-196.8mV
65	-60.18V	166.1	-207.2mV	-64.98V	163.2	-191.2mV
66	-70.40V	171.1	-221.2mV	-70.12V	157.7	-214.3mV
67	-70.30V	169.9	-193.1mV	-61.22V	162.7	-199.6mV
68	-66.83V	160.0	-211.3mV	-65.89V	156.0	-197.2mV
69	-63.23V	164.1	-203.4mV	-66.11V	172.3	-215.8mV
70	-58.18V	156.3	-219.5mV	-64.82V	168.8	-200.5mV
71	-60.49V	154.4	-220.0mV	-64.59V	161.1	-206.3mV
72	-61.16V	153.8	-198.9mV	-68.80V	172.3	-215.1mV
73	-57.60V	161.8	-221.4mV	-57.36V	155.8	-205.5mV
74	-57.98V	159.4	-213.9mV	-65.68V	169.6	-197.0mV
75	-70.46V	171.3	-211.1mV	-63.52V	158.5	-216.8mV
76	-57.74V	165.5	-197.4mV	-68.21V	153.6	-208.9mV
77	-65.62V	171.9	-195.3mV	-57.64V	169.8	-207.2mV

Made By: Peter Yang

Approval: Taylor Yang

SeCoS Corporation

Temperature Cycle Test Data

Report No : T100630-013
Part No : 2SA1020
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -50V, 85 < HFE < 340, VCE(sat) < -500mV
Test Condition: -55℃/30min, 150℃/30min, for1000 Cycle
Test Date: 2010.05.03 ~ 2010.06.25
Test Standard : JESD22 STANDARD Method-A104
Operator: Peter Yang

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	-64.79V	156.0	-195.4mV	-61.20V	162.7	-213.9mV
2	-67.24V	173.0	-213.0mV	-67.34V	158.3	-218.6mV
3	-59.12V	158.7	-221.9mV	-62.94V	157.4	-209.0mV
4	-70.40V	160.9	-207.6mV	-67.85V	172.9	-220.7mV
5	-63.81V	158.5	-193.8mV	-64.92V	172.9	-190.0mV
6	-69.07V	157.6	-195.5mV	-69.40V	171.7	-214.7mV
7	-63.24V	165.7	-218.7mV	-60.44V	158.8	-206.0mV
8	-60.27V	172.2	-189.9mV	-70.08V	164.1	-208.3mV
9	-64.07V	172.6	-204.2mV	-59.83V	154.4	-200.6mV
10	-62.13V	169.7	-206.4mV	-59.82V	163.4	-200.7mV
11	-67.14V	171.7	-216.5mV	-57.46V	163.2	-192.7mV
12	-68.34V	158.5	-214.0mV	-63.23V	162.1	-205.4mV
13	-58.86V	170.4	-191.7mV	-61.73V	167.2	-215.3mV
14	-58.12V	160.8	-209.1mV	-61.27V	156.5	-193.9mV
15	-67.31V	170.0	-208.2mV	-59.38V	169.4	-213.6mV
16	-58.23V	158.9	-203.3mV	-57.53V	155.8	-211.4mV
17	-66.84V	168.4	-194.2mV	-68.80V	164.4	-191.5mV
18	-66.21V	165.2	-191.8mV	-68.25V	168.7	-211.7mV
19	-60.57V	170.6	-209.4mV	-60.12V	153.9	-201.5mV
20	-61.22V	172.3	-207.2mV	-66.57V	156.1	-219.3mV
21	-63.83V	167.6	-203.6mV	-66.24V	162.4	-202.3mV
22	-64.88V	159.6	-207.9mV	-58.16V	165.6	-221.8mV
23	-63.90V	162.6	-211.7mV	-64.85V	162.6	-202.7mV
24	-66.34V	162.2	-205.4mV	-66.43V	158.7	-217.4mV
25	-65.84V	170.8	-209.9mV	-61.30V	159.3	-196.5mV
26	-69.68V	166.9	-192.5mV	-61.02V	158.3	-217.0mV
27	-68.62V	165.9	-193.7mV	-64.81V	171.6	-200.0mV
28	-62.29V	166.9	-191.5mV	-65.44V	170.3	-207.5mV
29	-68.66V	169.2	-212.6mV	-57.73V	161.8	-206.2mV
30	-68.60V	155.6	-208.0mV	-69.20V	158.9	-201.3mV

SeCoS Corporation

Temperature Cycle Test Data

Report No : T100630-013
Part No : 2SA1020
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -50V, 85 < HFE < 340, VCE(sat) < -500mV
Test Condition: -55℃/30min, 150℃/30min, for1000 Cycle
Test Date: 2010.05.03 ~ 2010.06.25
Test Standard : JESD22 STANDARD Method-A104
Operator: Peter Yang

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)
31	-60.78V	165.4	-219.0mV	-58.61V	172.2	-209.1mV
32	-57.54V	155.2	-220.0mV	-64.07V	155.7	-214.7mV
33	-70.06V	171.7	-201.5mV	-64.80V	160.9	-216.0mV
34	-62.99V	166.9	-207.4mV	-65.86V	161.5	-216.9mV
35	-68.30V	160.2	-206.1mV	-58.45V	159.0	-205.0mV
36	-59.31V	171.7	-200.4mV	-69.98V	165.8	-206.4mV
37	-60.37V	161.4	-203.3mV	-67.08V	164.5	-205.2mV
38	-62.44V	162.0	-220.2mV	-68.79V	154.0	-219.0mV
39	-60.35V	154.8	-219.7mV	-58.54V	169.0	-200.5mV
40	-66.05V	156.6	-209.0mV	-69.77V	159.0	-204.5mV
41	-61.74V	158.9	-211.2mV	-61.12V	172.7	-206.1mV
42	-66.65V	159.0	-193.9mV	-57.39V	160.2	-190.4mV
43	-58.37V	163.4	-213.0mV	-70.40V	159.5	-198.0mV
44	-68.45V	164.2	-198.5mV	-68.84V	156.3	-216.2mV
45	-60.63V	155.3	-208.8mV	-58.45V	165.8	-212.8mV
46	-67.37V	154.5	-213.3mV	-63.15V	155.8	-213.3mV
47	-67.33V	153.9	-222.0mV	-59.56V	166.4	-220.9mV
48	-63.79V	155.3	-193.2mV	-61.86V	172.9	-206.3mV
49	-58.47V	154.8	-206.6mV	-70.35V	169.7	-217.3mV
50	-57.80V	156.6	-195.3mV	-68.94V	158.0	-220.7mV
51	-67.73V	157.9	-210.1mV	-68.75V	170.2	-202.8mV
52	-62.09V	155.6	-220.1mV	-68.61V	153.8	-205.3mV
53	-59.21V	164.1	-203.9mV	-62.81V	161.9	-206.5mV
54	-59.30V	171.6	-194.0mV	-68.15V	163.6	-218.4mV
55	-67.07V	156.2	-203.0mV	-58.71V	156.2	-205.7mV
56	-58.39V	171.5	-216.1mV	-63.84V	158.2	-202.9mV
57	-61.58V	170.4	-189.9mV	-65.57V	172.8	-198.4mV
58	-59.87V	164.1	-193.9mV	-59.35V	155.3	-210.3mV
59	-64.98V	164.1	-198.5mV	-69.27V	153.6	-200.7mV
60	-59.83V	169.5	-195.5mV	-58.63V	167.1	-208.7mV

SeCoS Corporation

Temperature Cycle Test Data

Report No : T100630-013
Part No : 2SA1020
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -50V, 85 < HFE < 340, VCE(sat) < -500mV
Test Condition: -55℃/30min, 150℃/30min, for1000 Cycle
Test Date: 2010.05.03 ~ 2010.06.25
Test Standard : JESD22 STANDARD Method-A104
Operator: Peter Yang

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)
61	-64.08V	171.5	-198.1mV	-57.66V	161.7	-209.7mV
62	-58.47V	168.2	-196.7mV	-61.34V	157.4	-214.0mV
63	-66.52V	155.1	-197.9mV	-58.64V	160.7	-215.1mV
64	-59.50V	162.4	-207.5mV	-67.25V	166.5	-202.4mV
65	-60.34V	161.3	-197.9mV	-68.93V	167.9	-200.5mV
66	-63.70V	160.9	-203.5mV	-66.87V	170.6	-199.3mV
67	-63.60V	169.0	-193.1mV	-59.91V	169.6	-198.3mV
68	-61.85V	166.6	-203.1mV	-62.39V	157.6	-194.1mV
69	-61.51V	154.2	-196.8mV	-68.88V	155.4	-211.8mV
70	-57.42V	157.5	-203.6mV	-59.42V	166.5	-208.5mV
71	-60.77V	170.7	-211.3mV	-59.22V	157.8	-205.9mV
72	-68.80V	158.2	-220.6mV	-61.68V	164.1	-204.4mV
73	-63.34V	158.9	-197.9mV	-70.21V	157.7	-206.9mV
74	-63.19V	155.6	-193.1mV	-61.38V	159.3	-202.9mV
75	-65.72V	168.4	-215.1mV	-67.62V	163.0	-195.2mV
76	-59.43V	155.5	-201.8mV	-60.92V	159.1	-212.4mV
77	-59.58V	159.3	-201.5mV	-58.99V	159.4	-189.6mV

Made By: Peter Yang

Approval: Taylor Yang

SeCoS Corporation

High Temperature High Humidity Test Data

Report No : T100630-013
Part No : 2SA1020
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -50V, 85 < HFE < 340, VCE(sat) < -500mV
Test Condition: 85±2℃, 85±5%RH, 1000Hrs
Test Date: 2010.05.17 ~ 2010.06.29
Test Standard : JESD22 STANDARD Method-A101
Operator: Peter Yang

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	-58.75V	168.5	-213.8mV	-60.32V	166.8	-205.2mV
2	-61.09V	156.2	-211.9mV	-65.80V	155.4	-208.3mV
3	-69.39V	154.8	-202.8mV	-68.37V	162.2	-221.6mV
4	-62.81V	167.3	-213.2mV	-60.16V	155.0	-195.5mV
5	-59.57V	166.9	-190.7mV	-65.56V	165.7	-193.7mV
6	-64.93V	158.6	-213.9mV	-61.67V	170.8	-201.6mV
7	-64.71V	166.0	-220.8mV	-65.30V	157.2	-195.9mV
8	-69.45V	161.9	-192.2mV	-59.78V	171.1	-192.5mV
9	-63.65V	156.4	-216.5mV	-63.55V	156.7	-203.8mV
10	-65.53V	168.4	-220.4mV	-63.52V	168.1	-194.0mV
11	-69.50V	156.6	-218.5mV	-58.47V	158.1	-197.1mV
12	-68.60V	168.1	-218.2mV	-68.94V	168.9	-209.2mV
13	-60.38V	171.1	-216.4mV	-67.27V	154.4	-211.6mV
14	-67.12V	155.8	-216.8mV	-63.12V	158.8	-190.1mV
15	-62.86V	168.9	-191.9mV	-69.41V	163.9	-202.3mV
16	-59.77V	165.1	-202.2mV	-64.51V	161.5	-191.7mV
17	-57.67V	156.2	-215.9mV	-66.45V	172.5	-193.4mV
18	-58.64V	162.8	-220.7mV	-61.12V	157.9	-197.1mV
19	-60.04V	169.0	-202.6mV	-64.51V	165.8	-197.0mV
20	-66.11V	161.6	-210.8mV	-70.03V	167.9	-192.0mV
21	-67.99V	171.6	-202.2mV	-58.64V	169.1	-197.3mV
22	-62.01V	153.9	-195.9mV	-60.26V	170.8	-191.6mV
23	-64.56V	160.8	-217.4mV	-69.20V	168.1	-197.8mV
24	-68.49V	166.3	-217.0mV	-66.69V	162.2	-193.6mV
25	-61.90V	169.5	-212.4mV	-61.97V	156.8	-193.8mV
26	-58.99V	164.3	-208.3mV	-64.90V	157.0	-208.9mV
27	-59.45V	171.2	-194.1mV	-64.01V	164.4	-191.9mV
28	-65.40V	157.1	-192.1mV	-65.01V	160.6	-190.6mV
29	-69.14V	158.5	-203.8mV	-62.32V	170.5	-204.1mV
30	-58.11V	160.2	-217.4mV	-70.50V	154.1	-195.5mV

SeCoS Corporation

High Temperature High Humidity Test Data

Report No : T100630-013
Part No : 2SA1020
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -50V, 85 < HFE < 340, VCE(sat) < -500mV
Test Condition: 85±2℃, 85±5%RH, 1000Hrs
Test Date: 2010.05.17 ~ 2010.06.29
Test Standard : JESD22 STANDARD Method-A101
Operator: Peter Yang

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)
31	-61.08V	164.5	-216.8mV	-67.31V	154.8	-218.8mV
32	-60.54V	172.2	-194.9mV	-59.11V	172.1	-197.5mV
33	-58.74V	163.3	-202.5mV	-70.06V	159.6	-216.0mV
34	-57.86V	162.4	-210.3mV	-63.91V	169.2	-212.1mV
35	-57.83V	165.3	-194.3mV	-63.35V	160.9	-192.7mV
36	-63.34V	154.2	-194.7mV	-65.95V	156.5	-218.0mV
37	-68.11V	155.3	-202.1mV	-58.24V	161.9	-196.1mV
38	-59.08V	171.9	-215.7mV	-61.60V	163.9	-219.0mV
39	-63.08V	168.7	-193.5mV	-58.30V	160.8	-216.1mV
40	-62.24V	155.8	-215.7mV	-59.49V	162.3	-221.3mV
41	-69.11V	155.8	-195.5mV	-66.21V	171.3	-211.7mV
42	-65.57V	162.6	-196.4mV	-59.83V	155.8	-207.5mV
43	-60.74V	156.9	-210.3mV	-61.56V	166.9	-218.7mV
44	-58.47V	154.0	-214.3mV	-68.44V	168.7	-209.4mV
45	-67.43V	156.6	-214.6mV	-61.93V	169.7	-190.2mV
46	-67.90V	163.2	-199.7mV	-62.38V	171.6	-217.0mV
47	-67.30V	159.4	-211.3mV	-63.91V	171.0	-197.5mV
48	-58.89V	159.4	-194.4mV	-70.21V	164.3	-201.9mV
49	-64.41V	164.7	-216.2mV	-64.43V	160.0	-192.5mV
50	-57.53V	155.8	-221.4mV	-59.65V	171.9	-210.5mV
51	-67.33V	165.3	-205.9mV	-67.13V	159.4	-192.3mV
52	-61.56V	171.7	-194.7mV	-68.90V	162.9	-211.8mV
53	-57.97V	159.0	-215.2mV	-68.77V	171.9	-211.9mV
54	-62.34V	161.2	-221.4mV	-60.80V	162.4	-196.6mV
55	-57.36V	154.8	-221.3mV	-64.63V	162.7	-210.0mV
56	-66.15V	154.9	-196.8mV	-64.31V	157.7	-210.0mV
57	-64.05V	155.3	-202.4mV	-67.82V	155.7	-200.8mV
58	-67.28V	158.7	-201.0mV	-70.06V	171.1	-215.8mV
59	-66.25V	155.5	-221.0mV	-62.66V	154.9	-209.5mV
60	-59.41V	168.7	-216.8mV	-67.02V	158.9	-218.6mV

SeCoS Corporation

High Temperature High Humidity Test Data

Report No : T100630-013
Part No : 2SA1020
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -50V, 85 < HFE < 340, VCE(sat) < -500mV
Test Condition: 85±2℃, 85±5%RH, 1000Hrs
Test Date: 2010.05.17 ~ 2010.06.29
Test Standard : JESD22 STANDARD Method-A101
Operator: Peter Yang

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)
61	-62.51V	168.8	-220.7mV	-66.26V	154.7	-197.5mV
62	-65.15V	173.0	-193.1mV	-61.03V	172.6	-190.9mV
63	-66.34V	168.4	-196.3mV	-70.47V	170.5	-200.0mV
64	-61.59V	167.9	-199.7mV	-69.67V	157.4	-206.2mV
65	-63.93V	154.5	-219.2mV	-62.73V	158.6	-217.7mV
66	-65.40V	166.7	-203.3mV	-59.27V	164.3	-205.2mV
67	-62.67V	162.0	-190.1mV	-68.26V	168.5	-204.5mV
68	-61.40V	169.3	-209.6mV	-66.48V	154.7	-202.2mV
69	-70.42V	166.9	-201.0mV	-62.24V	165.9	-200.6mV
70	-60.00V	161.5	-193.5mV	-58.13V	161.0	-200.6mV
71	-58.29V	157.1	-202.4mV	-61.20V	169.0	-213.0mV
72	-65.40V	165.3	-191.2mV	-61.72V	168.5	-220.9mV
73	-69.52V	163.0	-219.3mV	-62.46V	156.2	-201.9mV
74	-62.64V	170.4	-215.3mV	-59.95V	165.4	-201.1mV
75	-59.56V	160.7	-217.2mV	-64.87V	159.2	-215.7mV
76	-64.23V	165.8	-219.5mV	-68.72V	169.9	-199.2mV
77	-64.10V	171.7	-193.5mV	-65.73V	171.3	-203.4mV

Made By: Peter Yang

Approval: Taylor Yang

SeCoS Corporation

High Temper High Humidity Reverse Bies Test Data

Report No : T100630-013
Part No : 2SA1020
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -50V, 85 < HFE < 340, VCE(sat) < -500mV
Test Condition: 85±2℃, 85±5%RH, 1000Hrs
Test Date: 2010.05.17 ~ 2010.06.29
Test Standard : JESD22 STANDARD Method-A101
Operator: Peter Yang

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	-59.55V	171.1	-205.7mV	-58.89V	161.4	-206.6mV
2	-60.21V	160.8	-220.4mV	-58.42V	154.6	-202.6mV
3	-67.39V	158.5	-221.3mV	-64.57V	165.9	-196.1mV
4	-68.06V	156.2	-218.6mV	-62.35V	168.8	-217.5mV
5	-61.03V	165.4	-194.2mV	-67.01V	161.8	-219.8mV
6	-68.09V	158.8	-204.5mV	-57.82V	157.6	-219.1mV
7	-67.64V	159.2	-210.1mV	-60.17V	166.2	-193.9mV
8	-57.78V	168.7	-213.3mV	-67.74V	159.4	-216.2mV
9	-60.03V	165.1	-218.7mV	-61.46V	166.3	-215.9mV
10	-64.45V	153.8	-212.6mV	-58.49V	168.0	-206.9mV
11	-57.38V	160.4	-213.3mV	-60.19V	160.9	-219.7mV
12	-66.91V	168.3	-220.0mV	-66.02V	160.9	-220.7mV
13	-57.65V	172.6	-194.5mV	-68.74V	166.0	-214.1mV
14	-61.63V	159.8	-216.1mV	-65.30V	159.6	-203.1mV
15	-61.38V	162.1	-210.3mV	-70.01V	167.8	-210.2mV
16	-65.92V	165.6	-207.1mV	-63.45V	153.9	-217.5mV
17	-62.32V	153.9	-192.9mV	-58.00V	166.8	-204.0mV
18	-63.98V	153.7	-190.7mV	-64.00V	166.0	-215.6mV
19	-57.89V	158.4	-205.0mV	-70.11V	156.0	-213.9mV
20	-63.83V	169.4	-222.1mV	-59.88V	168.3	-196.9mV
21	-65.55V	167.4	-208.9mV	-61.73V	163.9	-219.4mV
22	-63.94V	163.7	-195.0mV	-62.54V	154.0	-194.1mV
23	-58.29V	155.3	-221.8mV	-58.68V	171.1	-215.2mV
24	-70.37V	153.7	-218.5mV	-68.74V	162.9	-216.7mV
25	-64.82V	166.4	-194.5mV	-62.32V	156.8	-197.2mV
26	-58.18V	160.8	-206.1mV	-57.58V	154.2	-214.9mV
27	-67.90V	169.5	-205.3mV	-66.98V	169.7	-206.1mV
28	-57.40V	158.7	-203.0mV	-64.84V	163.6	-194.0mV
29	-62.86V	159.0	-216.9mV	-67.59V	164.7	-211.3mV
30	-58.24V	171.6	-220.2mV	-58.38V	157.9	-200.5mV

SeCoS Corporation

High Temper High Humidity Reverse Bies Test Data

Report No : T100630-013
Part No : 2SA1020
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -50V, 85 < HFE < 340, VCE(sat) < -500mV
Test Condition: 85±2℃, 85±5%RH, 1000Hrs
Test Date: 2010.05.17 ~ 2010.06.29
Test Standard : JESD22 STANDARD Method-A101
Operator: Peter Yang

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)
31	-66.11V	173.0	-198.1mV	-63.75V	166.8	-200.6mV
32	-66.52V	155.0	-220.0mV	-58.83V	161.1	-221.8mV
33	-58.93V	161.1	-207.2mV	-62.77V	168.2	-203.8mV
34	-66.17V	167.2	-216.3mV	-61.21V	162.1	-206.9mV
35	-60.32V	168.8	-203.7mV	-61.76V	169.3	-198.8mV
36	-60.07V	157.8	-216.8mV	-69.74V	162.6	-194.2mV
37	-64.81V	155.0	-213.2mV	-65.49V	168.3	-216.5mV
38	-59.54V	170.9	-194.2mV	-68.27V	171.1	-205.3mV
39	-63.85V	158.5	-220.4mV	-62.33V	158.1	-204.1mV
40	-69.50V	168.1	-209.7mV	-66.86V	170.2	-207.5mV
41	-69.45V	172.6	-206.8mV	-62.62V	157.8	-213.0mV
42	-65.26V	164.9	-221.1mV	-62.50V	158.7	-200.3mV
43	-61.17V	159.8	-196.1mV	-68.44V	168.8	-202.7mV
44	-61.06V	170.0	-198.0mV	-65.30V	168.6	-205.5mV
45	-68.61V	153.8	-202.7mV	-62.32V	168.8	-220.8mV
46	-58.27V	162.7	-210.2mV	-61.14V	163.0	-203.0mV
47	-63.62V	165.2	-203.4mV	-60.03V	164.8	-193.4mV
48	-61.00V	159.8	-190.6mV	-64.20V	167.9	-194.7mV
49	-65.22V	164.3	-214.8mV	-65.22V	162.6	-220.7mV
50	-65.62V	153.7	-203.0mV	-60.37V	153.5	-210.8mV
51	-65.60V	165.1	-197.3mV	-61.38V	155.7	-209.6mV
52	-66.02V	171.6	-217.4mV	-65.87V	158.3	-209.5mV
53	-69.80V	163.7	-195.1mV	-65.29V	161.8	-209.0mV
54	-58.92V	163.6	-212.2mV	-58.69V	164.9	-191.8mV
55	-70.46V	153.8	-214.7mV	-62.28V	172.8	-215.4mV
56	-69.36V	161.2	-208.6mV	-67.91V	169.1	-196.2mV
57	-68.78V	155.8	-221.9mV	-58.08V	168.8	-190.2mV
58	-64.48V	159.9	-220.1mV	-69.18V	168.0	-196.6mV
59	-62.83V	169.4	-198.7mV	-62.29V	162.5	-218.8mV
60	-58.86V	170.6	-191.4mV	-68.09V	154.6	-200.1mV

SeCoS Corporation

High Temper High Humidity Reverse Bies Test Data

Report No : T100630-013
Part No : 2SA1020
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -50V, 85 < HFE < 340, VCE(sat) < -500mV
Test Condition: 85±2℃, 85±5%RH, 1000Hrs
Test Date: 2010.05.17 ~ 2010.06.29
Test Standard : JESD22 STANDARD Method-A101
Operator: Peter Yang

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)
61	-66.30V	171.2	-189.8mV	-64.92V	156.7	-205.9mV
62	-64.17V	165.8	-194.5mV	-61.97V	160.4	-193.9mV
63	-69.88V	161.8	-212.9mV	-67.32V	161.2	-192.8mV
64	-69.97V	160.6	-194.1mV	-60.35V	170.7	-206.4mV
65	-58.39V	168.6	-195.5mV	-60.44V	163.0	-195.7mV
66	-62.49V	159.2	-211.2mV	-64.63V	164.0	-196.6mV
67	-59.53V	153.7	-194.3mV	-58.14V	157.9	-221.6mV
68	-63.71V	156.1	-201.9mV	-66.37V	172.9	-213.8mV
69	-66.38V	170.1	-202.7mV	-69.69V	171.8	-190.6mV
70	-62.53V	171.1	-203.1mV	-67.53V	172.6	-215.9mV
71	-61.37V	164.2	-194.1mV	-68.54V	154.0	-190.4mV
72	-66.39V	161.0	-205.6mV	-65.67V	158.0	-212.7mV
73	-69.83V	172.2	-200.6mV	-57.61V	161.9	-202.7mV
74	-60.48V	154.5	-192.3mV	-66.54V	170.6	-192.7mV
75	-57.47V	171.6	-197.4mV	-62.54V	159.6	-197.7mV
76	-65.67V	167.1	-206.2mV	-58.88V	168.2	-194.9mV
77	-64.22V	167.9	-200.9mV	-70.15V	164.8	-216.8mV

Made By: Peter Yang

Approval: Taylor Yang

SeCoS Corporation

Solderability Test Data

Report No : T100630-013
Part No : 2SA1020
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > -50V, 85 < HFE < 340, VCE(sat) < -500mV
Test Condition: 270℃ ± 5℃, 7 Sec ± 2Sec
Test Date: 2010.06.30 ~ 2010.06.30
Test Standard : JESD22 STANDER Method-A106
Operator: Peter Yang

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	-63.88V	154.3	-205.6mV	-65.13V	169.1	-218.8mV
2	-70.12V	168.1	-204.1mV	-58.82V	156.3	-209.8mV
3	-60.97V	172.4	-215.6mV	-68.25V	167.0	-200.6mV
4	-61.58V	158.4	-214.2mV	-61.64V	163.9	-201.0mV
5	-69.31V	166.4	-198.2mV	-67.43V	167.7	-210.4mV
6	-65.97V	172.9	-193.9mV	-61.73V	155.3	-208.6mV
7	-61.84V	166.6	-203.7mV	-58.68V	158.2	-201.6mV
8	-63.99V	168.8	-216.8mV	-68.97V	159.0	-208.4mV
9	-62.10V	171.7	-219.5mV	-60.44V	168.7	-211.2mV
10	-70.41V	168.0	-194.8mV	-59.46V	164.5	-194.2mV

Made By: Peter Yang

Approval: Taylor Yang