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Product/Process Change Notification

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

PCN Classification	Product Category
Major	TO-92L

Subject

Copper Bonding Wire Implementation

Affected Product(s)

2SA1013. 2SA684. 2SB764L. 2SC1383L. 2SC1384L. KSA708. KSA928ATL. KTA1023. KTC1027. KTC3205

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)

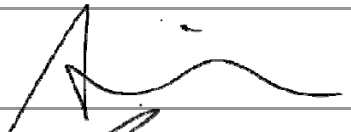
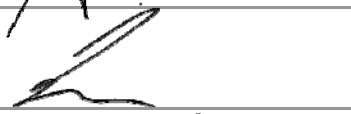
Changing bonding wire material from gold to copper

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- 12

Test Item	P/N	Test Condition	(LTPD)	Sample Numbers	Allow Fall Numbers	Fall Numbers	Result
HTRB High Temp Reverse Bias	2SC1384L	100 ± 5℃, 100%VR, T = 1000hrs		77	0	0	ACC
HTSL High Temperature Storage Life	2SC1384L	150℃, T = 1000 hrs		77	0	0	ACC
PCT Pressure Cooker Test	2SC1384L	121℃, 29.7PSIG, 168 hrs		77	0	0	ACC
TCT Temperature Cycle Test	2SC1384L	-55℃/30min, 150℃/30min, For 1000 Cycle		77	0	0	ACC
THT High Temperature High Humidity Test	2SC1384L	85 ± 2℃, RH=85±5%, 1000 hrs		77	0	0	ACC
H3TRB High Temper High Humidity Reverse Bies Test	2SC1384L	85 ± 2℃, RH=85±5%, 1000 hrs		77	0	0	ACC
Solder Resistance DITY	2SC1384L	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 : T100630-012
Part No : 2SC1384L
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 50V, 85 < HFE < 340, VCE(sat) < 400mV
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	67.76V	198.0	312.0mV
2	68.18V	194.0	308.7mV
3	67.79V	190.4	307.9mV
4	66.57V	191.7	310.0mV
5	66.33V	192.1	306.9mV
6	66.15V	188.4	312.1mV
7	65.83V	195.9	309.9mV
8	67.49V	197.7	308.2mV
9	66.54V	196.1	309.4mV
10	65.83V	200.0	312.0mV
11	67.18V	192.1	307.9mV
12	68.04V	193.4	310.3mV
13	67.13V	200.1	311.1mV
14	68.44V	197.0	308.3mV
15	66.93V	188.0	308.7mV
16	67.76V	186.5	313.1mV
17	68.28V	200.1	311.6mV
18	67.10V	197.8	313.3mV
19	66.93V	191.4	306.9mV
20	68.46V	199.8	311.8mV
21	65.59V	185.1	307.3mV
22	67.83V	183.1	307.7mV
23	67.72V	193.9	308.6mV
24	66.55V	190.7	308.2mV
25	67.24V	186.2	307.8mV
26	65.91V	189.1	307.2mV
27	66.35V	185.2	307.4mV
28	68.25V	188.3	309.8mV
29	66.20V	191.5	310.7mV
30	67.71V	193.2	307.5mV
31	65.48V	193.2	310.8mV

SeCoS Corporation

Electrical Test Data

Report No : T100630-012
Part No : 2SC1384L
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 50V, 85 < HFE < 340, VCE(sat) < 400mV
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	66.21V	189.5	311.2mV
33	67.90V	185.6	307.2mV
34	65.64V	185.3	309.3mV
35	67.46V	193.5	311.7mV
36	68.44V	186.8	307.9mV
37	65.68V	187.8	307.6mV
38	65.56V	191.9	308.0mV
39	66.99V	186.7	306.9mV
40	66.58V	183.8	310.7mV
41	66.41V	199.4	310.4mV
42	66.60V	187.9	310.8mV
43	66.33V	187.4	313.2mV
44	66.79V	185.4	309.2mV
45	65.37V	188.1	312.9mV
46	67.44V	196.8	307.4mV
47	67.28V	191.4	307.1mV
48	66.82V	182.4	307.3mV
49	67.22V	183.2	309.7mV
50	65.57V	184.9	309.3mV
51	65.43V	181.8	309.2mV
52	68.41V	199.5	309.9mV
53	66.97V	194.5	309.9mV
54	67.13V	184.4	312.3mV
55	67.66V	199.7	311.4mV
56	66.13V	194.9	308.2mV
57	67.29V	187.0	313.0mV
58	65.67V	182.4	308.4mV
59	65.72V	191.8	310.1mV
60	67.15V	197.3	309.0mV
61	67.63V	185.3	307.9mV
62	66.79V	186.9	309.8mV

SeCoS Corporation

Electrical Test Data

Report No : T100630-012
Part No : 2SC1384L
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 50V, 85 < HFE < 340, VCE(sat) < 400mV
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	66.28V	186.6	313.3mV
64	65.99V	197.8	312.6mV
65	65.87V	198.1	312.2mV
66	65.96V	198.8	312.6mV
67	66.52V	199.1	308.3mV
68	66.76V	185.2	312.0mV
69	68.39V	197.7	308.0mV
70	67.42V	190.5	312.8mV
71	67.60V	194.3	309.4mV
72	66.64V	190.1	310.3mV
73	65.87V	199.1	310.5mV
74	66.59V	193.4	311.5mV
75	66.09V	181.6	309.6mV
76	67.19V	181.8	309.9mV
77	67.49V	198.7	307.1mV

Made By: Peter Yang

Approval: Taylor Yang

SeCoS Corporation

High Temperature Reverse Bias Test Data

Report No : T100630-012
Part No : 2SC1384L
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 50V, 85 < HFE < 340, VCE(sat) < 400mV
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	66.57V	199.8	309.6mV	67.89V	196.9	312.7mV
2	66.23V	190.6	307.7mV	68.39V	185.1	313.3mV
3	67.24V	186.6	310.1mV	66.66V	183.2	307.1mV
4	66.29V	186.3	311.2mV	66.39V	198.5	308.1mV
5	66.29V	193.9	308.8mV	67.03V	189.5	311.8mV
6	67.53V	191.4	306.9mV	67.54V	190.7	310.9mV
7	66.40V	193.9	310.0mV	65.76V	187.5	308.1mV
8	66.13V	184.7	312.7mV	68.41V	186.7	310.4mV
9	66.85V	191.7	308.6mV	67.51V	181.3	311.8mV
10	67.73V	193.7	310.8mV	67.55V	184.0	312.5mV
11	68.45V	193.5	306.8mV	66.76V	184.8	306.9mV
12	68.48V	196.3	307.0mV	68.15V	190.7	308.8mV
13	67.40V	195.5	311.6mV	65.66V	188.5	310.9mV
14	67.64V	188.2	313.0mV	66.24V	199.4	312.6mV
15	66.02V	197.9	312.7mV	67.06V	193.6	310.6mV
16	68.24V	194.5	307.7mV	66.21V	190.4	309.0mV
17	68.06V	200.2	308.1mV	66.25V	196.0	309.3mV
18	68.39V	197.9	312.2mV	65.73V	182.0	311.6mV
19	67.37V	190.9	308.5mV	68.49V	197.1	308.4mV
20	68.20V	191.9	308.9mV	67.98V	193.1	307.4mV
21	66.67V	188.8	312.0mV	65.56V	192.7	309.4mV
22	67.38V	188.0	307.3mV	65.31V	183.5	310.4mV
23	65.83V	188.7	307.1mV	66.00V	187.5	311.6mV
24	65.33V	181.9	308.7mV	65.32V	189.1	308.0mV
25	65.37V	200.0	310.9mV	67.38V	181.6	312.9mV
26	65.89V	199.6	309.3mV	66.23V	187.6	306.8mV
27	66.39V	182.2	309.1mV	66.91V	197.4	310.4mV
28	67.81V	183.3	312.3mV	66.82V	189.0	309.0mV
29	65.38V	184.0	311.3mV	68.43V	193.0	312.0mV
30	65.97V	194.8	311.6mV	66.13V	183.3	310.7mV

SeCoS Corporation

High Temperature Reverse Bias Test Data

Report No : T100630-012
Part No : 2SC1384L
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 50V, 85 < HFE < 340, VCE(sat) < 400mV
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	66.85V	193.6	308.0mV	66.21V	183.0	309.7mV
32	65.97V	198.2	311.6mV	65.62V	194.9	311.9mV
33	66.77V	182.7	312.1mV	66.87V	186.5	308.3mV
34	68.10V	189.3	310.3mV	67.58V	193.2	312.9mV
35	65.64V	185.4	312.6mV	65.70V	192.6	311.9mV
36	66.06V	190.3	306.9mV	65.75V	190.0	312.0mV
37	68.11V	195.4	310.6mV	67.16V	191.2	311.9mV
38	66.98V	187.2	312.9mV	65.50V	187.2	312.6mV
39	67.25V	199.8	312.9mV	65.75V	198.4	308.6mV
40	66.38V	189.2	312.9mV	68.49V	188.4	312.3mV
41	67.40V	182.8	307.3mV	65.32V	186.2	312.5mV
42	65.68V	196.4	307.1mV	66.06V	183.8	313.3mV
43	67.33V	185.8	310.0mV	66.80V	188.2	308.2mV
44	65.74V	184.1	308.8mV	66.78V	199.8	309.5mV
45	65.45V	191.3	312.7mV	65.69V	183.9	309.4mV
46	67.09V	199.3	309.7mV	67.23V	187.9	308.4mV
47	66.08V	192.5	310.6mV	65.37V	196.3	309.7mV
48	68.46V	181.8	309.5mV	65.99V	183.4	310.0mV
49	67.87V	199.0	310.3mV	67.61V	198.4	309.3mV
50	65.38V	182.0	307.6mV	66.20V	184.2	312.8mV
51	67.97V	193.7	308.5mV	67.94V	184.9	310.8mV
52	68.38V	187.3	307.1mV	66.29V	195.8	308.8mV
53	66.33V	194.1	311.4mV	68.00V	195.1	307.4mV
54	67.70V	197.4	310.8mV	67.03V	193.1	310.5mV
55	68.49V	191.2	310.0mV	66.97V	187.6	312.8mV
56	67.02V	191.1	313.0mV	67.48V	189.3	313.0mV
57	65.68V	181.9	309.9mV	67.86V	189.2	306.9mV
58	66.22V	197.2	309.4mV	67.40V	194.7	312.0mV
59	66.72V	183.9	310.8mV	66.04V	190.2	308.7mV
60	66.93V	196.1	313.2mV	65.42V	189.5	307.9mV

SeCoS Corporation

High Temperature Reverse Bias Test Data

Report No : T100630-012
Part No : 2SC1384L
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 50V, 85 < HFE < 340, VCE(sat) < 400mV
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	66.29V	193.0	311.0mV	67.65V	181.9	309.7mV
62	67.46V	198.5	310.2mV	68.34V	183.2	310.7mV
63	65.62V	198.7	312.0mV	66.20V	192.7	312.9mV
64	67.96V	182.1	312.4mV	66.11V	182.5	309.9mV
65	68.26V	182.7	311.5mV	67.90V	190.9	310.8mV
66	65.40V	189.2	311.6mV	67.52V	183.4	311.0mV
67	67.30V	199.7	313.2mV	67.87V	182.0	312.7mV
68	67.97V	195.6	312.2mV	67.87V	188.3	311.3mV
69	68.02V	187.9	310.1mV	67.60V	186.9	313.0mV
70	68.00V	190.2	311.6mV	67.88V	183.9	306.9mV
71	67.32V	181.8	308.1mV	65.57V	188.3	308.8mV
72	68.46V	188.3	307.5mV	66.28V	191.5	307.5mV
73	68.03V	193.1	309.8mV	67.41V	191.7	310.7mV
74	67.64V	198.2	311.4mV	66.33V	195.0	308.5mV
75	65.85V	196.8	309.3mV	68.39V	190.5	309.6mV
76	66.33V	192.8	308.0mV	67.02V	190.9	307.0mV
77	65.79V	192.0	311.9mV	67.81V	197.6	309.0mV

Made By: Peter Yang

Approval: Taylor Yang

SeCoS Corporation

High Temperature Storage Life Test Data

Report No : T100630-012
Part No : 2SC1384L
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 50V, 85 < HFE < 340, VCE(sat) < 400mV
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	66.67V	199.5	312.0mV	66.76V	181.9	309.6mV
2	65.77V	181.4	310.9mV	66.95V	182.5	312.7mV
3	66.27V	191.3	310.1mV	66.41V	181.5	310.4mV
4	66.86V	193.6	311.2mV	67.43V	185.2	308.6mV
5	66.49V	190.6	311.1mV	66.49V	181.9	311.2mV
6	65.50V	199.3	312.3mV	67.94V	181.8	308.7mV
7	68.18V	189.6	309.6mV	66.07V	182.9	313.1mV
8	65.67V	194.7	307.4mV	66.92V	186.1	312.1mV
9	65.79V	199.7	308.2mV	65.86V	184.0	311.5mV
10	65.49V	182.9	312.8mV	68.31V	199.5	312.0mV
11	66.68V	186.4	309.7mV	66.82V	184.3	309.7mV
12	68.37V	187.3	309.9mV	66.17V	189.6	312.0mV
13	68.38V	188.9	312.1mV	67.46V	194.0	310.0mV
14	66.58V	200.0	308.8mV	67.34V	194.2	308.4mV
15	66.18V	184.2	312.7mV	65.44V	186.7	311.5mV
16	65.38V	191.1	310.8mV	66.18V	186.5	312.7mV
17	68.01V	190.9	308.0mV	66.01V	190.8	310.8mV
18	65.84V	186.8	310.5mV	67.20V	184.6	310.3mV
19	68.02V	193.1	307.5mV	65.82V	195.0	311.9mV
20	67.98V	194.2	309.5mV	66.13V	195.3	310.3mV
21	65.45V	191.0	308.4mV	66.03V	197.6	312.4mV
22	67.93V	181.6	312.9mV	67.67V	195.4	307.3mV
23	68.15V	197.7	309.9mV	67.22V	187.6	310.3mV
24	67.42V	198.5	307.6mV	65.48V	195.5	311.4mV
25	66.66V	186.8	312.1mV	68.43V	193.3	311.5mV
26	67.10V	183.6	309.0mV	67.72V	190.8	307.7mV
27	68.36V	188.5	311.4mV	67.37V	188.2	311.1mV
28	68.34V	182.1	308.5mV	67.29V	194.4	309.7mV
29	68.20V	184.4	307.8mV	65.67V	188.8	312.4mV
30	67.49V	184.9	311.5mV	65.64V	187.3	309.2mV

SeCoS Corporation

High Temperature Storage Life Test Data

Report No : T100630-012
Part No : 2SC1384L
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 50V, 85 < HFE < 340, VCE(sat) < 400mV
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	65.69V	185.7	309.7mV	65.84V	188.0	307.5mV
32	66.89V	184.8	310.6mV	65.66V	185.5	308.1mV
33	67.12V	193.2	308.9mV	68.47V	190.4	312.1mV
34	68.12V	188.4	306.9mV	67.83V	183.8	307.7mV
35	67.63V	196.3	310.2mV	67.37V	196.0	309.8mV
36	68.01V	199.7	310.6mV	65.93V	185.6	307.6mV
37	66.32V	191.4	312.0mV	68.30V	194.2	310.2mV
38	67.00V	187.9	312.5mV	67.07V	196.9	312.5mV
39	65.39V	190.5	307.0mV	67.39V	190.9	313.3mV
40	67.57V	199.1	312.4mV	65.65V	200.0	312.6mV
41	68.06V	183.2	310.1mV	65.54V	197.2	311.5mV
42	65.57V	197.7	309.8mV	67.69V	198.4	312.3mV
43	65.41V	181.7	312.7mV	68.41V	195.6	310.9mV
44	66.38V	185.4	308.8mV	67.06V	183.2	312.0mV
45	66.52V	195.3	307.2mV	67.83V	183.8	309.0mV
46	67.81V	191.5	310.3mV	67.46V	192.8	309.5mV
47	66.01V	199.7	310.4mV	67.83V	187.4	313.1mV
48	65.86V	200.0	313.0mV	67.19V	199.3	311.3mV
49	65.33V	181.7	310.7mV	66.68V	190.4	308.9mV
50	66.51V	193.0	310.7mV	67.53V	189.3	308.0mV
51	66.59V	191.0	309.4mV	67.52V	188.2	311.5mV
52	66.97V	194.8	310.9mV	67.66V	196.5	313.4mV
53	68.47V	184.3	309.9mV	67.45V	184.7	308.7mV
54	65.48V	192.9	311.2mV	65.92V	186.9	310.0mV
55	67.72V	192.9	308.5mV	66.68V	194.3	312.6mV
56	65.42V	190.0	310.9mV	67.51V	184.7	312.0mV
57	67.38V	196.1	312.2mV	68.13V	181.4	310.3mV
58	65.87V	182.0	313.1mV	67.51V	197.5	307.1mV
59	66.08V	192.3	313.3mV	66.97V	196.8	312.2mV
60	68.33V	195.4	312.6mV	66.81V	196.8	310.4mV

SeCoS Corporation

High Temperature Storage Life Test Data

Report No : T100630-012
Part No : 2SC1384L
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 50V, 85 < HFE < 340, VCE(sat) < 400mV
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	68.21V	198.9	312.8mV	65.31V	196.3	313.3mV
62	66.67V	182.3	308.1mV	66.54V	199.4	310.2mV
63	66.63V	182.7	307.9mV	66.14V	190.1	309.0mV
64	65.54V	187.7	306.8mV	67.68V	196.5	307.4mV
65	66.85V	199.2	310.7mV	68.34V	184.7	306.8mV
66	67.89V	185.0	311.6mV	68.25V	188.9	312.3mV
67	66.67V	187.9	310.5mV	65.44V	187.2	311.6mV
68	65.52V	193.8	311.7mV	67.31V	182.2	306.9mV
69	66.61V	181.9	312.5mV	65.60V	199.7	311.7mV
70	67.37V	198.0	308.5mV	66.00V	195.2	307.6mV
71	68.15V	195.6	307.5mV	66.05V	185.5	308.9mV
72	67.91V	189.0	309.6mV	66.86V	189.8	307.1mV
73	68.29V	188.7	309.8mV	67.74V	195.3	308.8mV
74	68.01V	192.6	311.4mV	66.44V	195.2	313.2mV
75	65.70V	191.3	310.8mV	67.14V	181.7	307.3mV
76	67.20V	189.3	310.4mV	68.01V	198.8	309.2mV
77	67.65V	188.3	313.3mV	66.45V	182.1	308.3mV

Made By: Peter Yang

Approval: Taylor Yang

SeCoS Corporation

Pressure Cooker Test Data

Report No : T100630-012
Part No : 2SC1384L
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 50V, 85 < HFE < 340, VCE(sat) < 400mV
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	66.64V	198.1	312.5mV	67.58V	182.2	310.6mV
2	65.49V	186.2	310.6mV	66.51V	197.6	310.2mV
3	66.74V	194.8	312.8mV	66.99V	183.1	312.1mV
4	67.48V	199.6	307.7mV	65.49V	182.5	306.9mV
5	66.67V	185.4	306.8mV	65.71V	190.6	307.2mV
6	67.61V	191.3	313.0mV	67.86V	192.0	310.5mV
7	67.09V	188.8	311.2mV	65.98V	184.3	309.4mV
8	65.94V	192.1	311.9mV	66.21V	185.7	309.7mV
9	67.19V	193.4	311.0mV	67.83V	194.6	309.1mV
10	65.43V	192.2	308.0mV	67.55V	189.7	308.2mV
11	67.52V	190.2	310.3mV	66.68V	181.8	313.3mV
12	67.07V	182.3	309.7mV	65.59V	186.9	309.0mV
13	66.60V	185.5	309.7mV	67.77V	197.3	308.8mV
14	66.74V	196.0	312.6mV	65.45V	197.2	308.9mV
15	65.52V	191.8	307.1mV	66.51V	188.1	309.8mV
16	66.67V	183.9	310.1mV	65.70V	192.4	310.9mV
17	65.48V	199.9	308.6mV	67.45V	184.3	313.2mV
18	68.24V	196.1	308.0mV	65.41V	194.6	312.3mV
19	65.91V	194.6	313.3mV	65.79V	191.6	310.4mV
20	67.92V	193.4	308.9mV	67.60V	198.5	311.9mV
21	66.50V	187.0	311.5mV	65.80V	185.8	309.0mV
22	68.49V	198.7	311.2mV	66.39V	186.0	312.5mV
23	68.05V	187.8	312.1mV	65.81V	195.2	310.3mV
24	68.46V	189.2	312.4mV	66.98V	196.2	306.8mV
25	66.39V	191.5	307.4mV	68.46V	190.1	313.2mV
26	67.23V	191.1	312.9mV	66.36V	183.5	308.0mV
27	67.46V	190.8	310.7mV	67.29V	192.0	311.6mV
28	67.38V	190.1	307.0mV	68.00V	196.8	310.0mV
29	67.72V	195.0	310.1mV	66.35V	196.2	313.4mV
30	66.29V	182.9	312.2mV	67.91V	191.5	310.9mV

SeCoS Corporation

Pressure Cooker Test Data

Report No : T100630-012
Part No : 2SC1384L
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 50V, 85 < HFE < 340, VCE(sat) < 400mV
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	66.46V	194.1	310.6mV	67.42V	190.3	307.2mV
32	66.71V	199.5	307.3mV	65.43V	182.0	312.4mV
33	66.41V	188.2	308.5mV	66.40V	196.4	311.0mV
34	65.85V	184.8	310.6mV	65.66V	196.5	313.0mV
35	65.71V	191.9	313.0mV	65.95V	197.1	312.4mV
36	66.52V	194.4	312.9mV	67.63V	198.6	310.8mV
37	66.89V	194.6	310.6mV	68.35V	187.2	313.1mV
38	68.33V	184.2	307.5mV	66.85V	195.8	307.7mV
39	67.77V	187.1	308.3mV	67.52V	194.3	311.6mV
40	67.90V	198.0	310.6mV	67.93V	186.7	310.0mV
41	65.94V	198.1	308.6mV	66.18V	190.6	308.5mV
42	66.47V	183.1	309.4mV	65.82V	196.6	312.2mV
43	66.67V	192.5	311.5mV	66.02V	187.6	308.3mV
44	66.24V	196.2	312.0mV	65.97V	190.7	308.6mV
45	67.45V	183.6	313.3mV	66.72V	187.6	307.2mV
46	67.92V	191.3	307.9mV	65.77V	192.2	311.3mV
47	66.68V	187.9	311.5mV	68.25V	188.7	309.7mV
48	65.66V	193.3	309.1mV	67.05V	199.3	309.2mV
49	67.14V	195.8	312.7mV	67.15V	190.3	308.1mV
50	67.79V	182.2	311.0mV	68.01V	195.3	310.6mV
51	67.30V	197.5	307.6mV	65.36V	189.6	310.3mV
52	66.16V	198.9	307.0mV	66.87V	182.8	308.4mV
53	67.60V	196.2	312.5mV	67.50V	184.1	312.6mV
54	66.23V	184.4	309.7mV	66.40V	186.7	307.0mV
55	67.91V	196.4	308.3mV	67.74V	197.9	308.7mV
56	67.51V	188.1	312.9mV	66.27V	187.6	309.1mV
57	66.14V	188.5	311.6mV	65.50V	188.3	307.7mV
58	65.48V	187.6	310.7mV	66.14V	190.5	311.1mV
59	68.15V	192.9	313.3mV	67.31V	199.6	309.7mV
60	67.64V	182.9	311.5mV	67.33V	190.8	309.5mV

SeCoS Corporation

Pressure Cooker Test Data

Report No : T100630-012
Part No : 2SC1384L
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 50V, 85 < HFE < 340, VCE(sat) < 400mV
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	67.70V	197.9	309.0mV	65.55V	192.1	313.0mV
62	66.81V	183.3	307.6mV	66.08V	183.0	311.7mV
63	66.29V	197.6	310.4mV	67.89V	200.3	312.3mV
64	68.33V	197.9	310.3mV	67.91V	196.6	310.2mV
65	66.58V	193.7	310.4mV	65.66V	185.6	311.3mV
66	67.23V	199.0	312.6mV	67.32V	193.0	309.8mV
67	66.15V	186.3	308.1mV	68.49V	187.7	310.1mV
68	67.06V	197.6	310.2mV	66.17V	188.5	311.2mV
69	67.69V	198.4	313.2mV	67.08V	182.9	313.0mV
70	67.98V	193.7	312.9mV	68.24V	194.5	310.7mV
71	68.31V	193.4	307.8mV	67.79V	188.6	313.3mV
72	65.75V	189.6	311.3mV	65.97V	188.3	308.6mV
73	65.33V	199.2	312.9mV	66.97V	186.9	311.6mV
74	67.66V	189.8	311.8mV	66.14V	188.8	312.5mV
75	67.44V	195.1	311.4mV	67.32V	188.6	311.5mV
76	66.44V	191.8	307.1mV	67.47V	191.9	312.0mV
77	65.44V	194.5	308.9mV	65.81V	198.1	311.3mV

Made By: Peter Yang

Approval: Taylor Yang

SeCoS Corporation

Temperature Cycle Test Data

Report No : T100630-012
Part No : 2SC1384L
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 50V, 85 < HFE < 340, VCE(sat) < 400mV
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	66.26V	192.9	311.5mV	65.98V	191.3	308.5mV
2	67.67V	191.4	308.1mV	67.26V	184.9	307.9mV
3	66.59V	188.4	309.5mV	66.08V	193.6	308.1mV
4	68.14V	190.1	311.7mV	67.08V	185.7	310.8mV
5	66.19V	199.1	307.2mV	68.43V	190.2	312.3mV
6	66.15V	200.3	309.1mV	66.31V	198.7	308.3mV
7	66.69V	192.0	311.3mV	66.54V	185.8	307.4mV
8	67.25V	191.9	309.9mV	66.44V	197.7	308.9mV
9	66.83V	186.5	308.0mV	67.30V	185.9	311.7mV
10	67.56V	185.7	306.8mV	66.18V	199.2	308.3mV
11	66.07V	198.4	309.5mV	66.53V	182.0	312.4mV
12	66.99V	184.6	311.8mV	66.75V	182.3	312.6mV
13	66.88V	191.6	312.4mV	66.03V	196.9	308.1mV
14	65.52V	184.6	311.5mV	66.78V	194.6	313.4mV
15	65.76V	197.0	309.1mV	67.83V	198.7	313.1mV
16	66.52V	197.0	311.7mV	65.31V	195.0	310.1mV
17	68.16V	187.8	308.0mV	67.75V	198.5	310.4mV
18	68.08V	198.6	312.6mV	66.50V	188.5	311.3mV
19	68.33V	181.7	312.5mV	67.59V	181.7	310.9mV
20	67.85V	184.5	308.9mV	67.65V	193.0	308.4mV
21	65.72V	197.7	309.9mV	66.70V	182.7	308.1mV
22	68.15V	181.7	312.0mV	66.74V	186.1	307.3mV
23	68.43V	195.0	307.6mV	67.06V	196.7	310.6mV
24	66.66V	191.4	313.2mV	66.70V	194.4	311.9mV
25	65.31V	197.9	310.1mV	65.76V	195.1	309.2mV
26	66.35V	182.8	312.0mV	66.91V	197.9	312.4mV
27	67.26V	193.2	311.4mV	67.24V	194.9	309.4mV
28	66.48V	186.4	311.0mV	65.84V	194.8	308.3mV
29	67.58V	199.7	313.1mV	67.50V	194.3	313.2mV
30	67.75V	195.7	306.9mV	66.85V	187.6	312.7mV

SeCoS Corporation

Temperature Cycle Test Data

Report No : T100630-012
Part No : 2SC1384L
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 50V, 85 < HFE < 340, VCE(sat) < 400mV
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	65.72V	186.6	308.7mV	68.05V	193.8	307.7mV
32	67.43V	191.2	308.7mV	66.21V	195.0	307.4mV
33	67.28V	191.4	309.6mV	66.40V	196.6	307.3mV
34	66.45V	181.5	310.0mV	66.83V	196.3	312.2mV
35	65.59V	184.5	311.4mV	68.26V	198.5	311.6mV
36	65.64V	191.0	312.4mV	66.26V	195.3	309.8mV
37	65.38V	184.5	310.8mV	66.68V	189.6	309.7mV
38	66.93V	198.7	307.4mV	67.50V	194.3	311.0mV
39	67.93V	197.0	307.1mV	67.31V	181.7	311.7mV
40	66.43V	190.3	313.3mV	66.37V	199.5	308.0mV
41	67.29V	192.2	311.0mV	66.09V	182.3	308.8mV
42	66.56V	192.5	309.5mV	65.65V	187.8	312.1mV
43	66.50V	184.9	309.0mV	65.80V	199.9	306.9mV
44	67.85V	191.2	311.3mV	67.34V	198.4	308.8mV
45	68.26V	194.9	313.3mV	66.42V	197.6	309.4mV
46	66.00V	182.6	307.1mV	65.97V	197.1	307.2mV
47	66.17V	187.2	311.0mV	66.22V	193.8	308.4mV
48	67.36V	188.4	310.9mV	65.38V	187.7	311.5mV
49	67.87V	196.7	310.1mV	65.49V	183.7	313.2mV
50	65.45V	184.1	308.9mV	68.09V	183.1	311.3mV
51	67.83V	196.9	307.8mV	66.80V	190.0	311.1mV
52	67.95V	188.8	311.1mV	66.89V	199.0	311.8mV
53	66.01V	197.1	309.0mV	67.22V	195.4	309.0mV
54	67.86V	193.1	310.4mV	66.02V	185.0	312.2mV
55	68.32V	199.3	307.8mV	67.61V	185.4	307.8mV
56	67.66V	188.4	307.9mV	66.53V	196.2	312.5mV
57	66.14V	186.1	310.2mV	66.19V	186.1	312.6mV
58	66.12V	185.3	309.9mV	67.55V	194.1	308.0mV
59	66.83V	199.8	310.6mV	68.47V	194.5	308.2mV
60	65.69V	187.2	308.2mV	67.09V	185.7	310.2mV

SeCoS Corporation

Temperature Cycle Test Data

Report No : T100630-012
Part No : 2SC1384L
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 50V, 85 < HFE < 340, VCE(sat) < 400mV
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	67.84V	182.0	311.4mV	67.95V	190.3	310.5mV
62	67.19V	193.0	310.6mV	68.07V	196.5	312.2mV
63	67.83V	192.6	308.2mV	66.22V	185.1	309.8mV
64	65.53V	190.6	313.3mV	67.66V	182.2	312.8mV
65	68.15V	194.2	310.4mV	66.53V	193.0	312.4mV
66	68.42V	193.5	307.4mV	66.97V	182.9	308.3mV
67	67.59V	191.9	311.6mV	67.08V	185.9	312.5mV
68	66.70V	195.7	311.9mV	66.84V	198.7	306.9mV
69	65.60V	186.1	312.3mV	65.89V	187.7	309.0mV
70	67.12V	189.5	309.7mV	67.88V	194.9	312.2mV
71	66.96V	190.0	308.2mV	67.03V	197.8	311.9mV
72	67.37V	183.2	310.3mV	65.49V	190.1	311.4mV
73	65.82V	182.9	308.5mV	67.56V	198.2	310.9mV
74	68.22V	198.3	309.2mV	68.38V	197.9	308.8mV
75	66.43V	189.9	307.2mV	66.65V	192.2	308.5mV
76	65.46V	184.2	310.8mV	67.96V	183.3	310.4mV
77	68.46V	197.0	307.5mV	66.03V	194.4	312.1mV

Made By: Peter Yang

Approval: Taylor Yang

SeCoS Corporation

High Temperature High Humidity Test Data

Report No : T100630-012
Part No : 2SC1384L
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 50V, 85 < HFE < 340, VCE(sat) < 400mV
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	67.90V	192.8	312.8mV	65.87V	195.9	311.3mV
2	66.49V	198.5	309.4mV	67.82V	189.4	307.2mV
3	67.62V	182.4	311.2mV	66.59V	196.3	312.5mV
4	67.27V	196.7	308.6mV	68.10V	191.2	312.4mV
5	67.40V	185.9	310.8mV	66.76V	181.7	309.3mV
6	66.05V	197.5	311.3mV	66.50V	184.1	312.3mV
7	65.36V	184.8	309.3mV	66.16V	182.9	313.2mV
8	67.78V	195.6	312.2mV	66.07V	200.1	307.6mV
9	66.45V	182.0	310.1mV	65.68V	189.3	307.5mV
10	66.76V	192.9	310.8mV	66.67V	196.7	312.6mV
11	66.46V	197.5	310.8mV	66.52V	188.0	309.4mV
12	67.29V	187.1	313.1mV	66.69V	196.7	308.0mV
13	65.94V	181.7	312.1mV	66.88V	182.6	310.6mV
14	66.26V	181.7	307.4mV	66.03V	187.3	312.2mV
15	66.38V	191.5	308.9mV	66.48V	189.2	310.6mV
16	67.04V	185.0	310.6mV	66.31V	192.4	309.1mV
17	68.42V	193.7	312.3mV	67.92V	188.9	309.7mV
18	66.47V	193.3	312.5mV	65.31V	193.4	307.1mV
19	66.94V	193.5	309.1mV	67.97V	183.5	310.2mV
20	66.90V	193.7	310.1mV	66.20V	200.1	311.0mV
21	67.14V	187.3	307.3mV	66.58V	181.5	307.8mV
22	66.25V	196.4	309.0mV	67.45V	195.8	313.3mV
23	65.53V	183.4	309.5mV	68.21V	190.2	311.6mV
24	67.86V	190.9	309.1mV	65.35V	186.4	307.8mV
25	67.16V	183.0	309.6mV	66.57V	184.0	309.9mV
26	66.06V	188.9	309.8mV	65.73V	188.2	311.9mV
27	66.60V	187.3	313.4mV	68.14V	197.8	309.8mV
28	65.53V	200.2	309.9mV	67.39V	194.7	308.4mV
29	65.63V	199.0	307.3mV	66.61V	196.4	309.1mV
30	66.75V	187.1	307.3mV	66.69V	195.4	307.3mV

SeCoS Corporation

High Temperature High Humidity Test Data

Report No : T100630-012
Part No : 2SC1384L
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 50V, 85 < HFE < 340, VCE(sat) < 400mV
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	65.62V	187.9	310.4mV	67.86V	185.2	311.3mV
32	65.31V	196.4	308.2mV	68.04V	198.0	308.6mV
33	65.61V	186.1	307.2mV	67.63V	183.1	310.0mV
34	68.26V	191.1	310.5mV	68.20V	186.2	307.3mV
35	67.98V	183.1	311.3mV	65.69V	194.4	307.6mV
36	68.42V	190.5	307.7mV	67.71V	185.8	313.1mV
37	68.12V	189.8	310.7mV	67.64V	194.0	310.5mV
38	68.47V	189.9	311.3mV	66.34V	184.7	307.0mV
39	65.44V	187.5	312.8mV	67.55V	194.2	309.7mV
40	67.21V	196.7	310.6mV	66.91V	192.7	308.5mV
41	66.11V	189.4	308.9mV	66.48V	195.2	311.0mV
42	66.61V	195.4	309.1mV	67.89V	196.1	312.3mV
43	66.61V	186.4	306.9mV	68.31V	200.1	312.2mV
44	65.71V	192.4	308.0mV	67.93V	190.8	307.2mV
45	68.37V	198.4	307.7mV	66.30V	186.7	312.7mV
46	65.87V	188.3	307.3mV	66.74V	193.0	307.5mV
47	67.40V	189.5	309.4mV	65.79V	186.9	312.9mV
48	67.90V	191.2	311.7mV	66.86V	194.1	311.6mV
49	65.87V	191.7	309.6mV	68.31V	190.7	312.5mV
50	65.65V	198.8	309.1mV	67.54V	196.1	309.0mV
51	65.60V	185.7	311.6mV	65.51V	195.2	310.9mV
52	67.11V	193.0	307.5mV	65.64V	181.3	308.0mV
53	67.64V	200.0	311.9mV	66.91V	188.8	310.8mV
54	68.48V	189.2	312.7mV	67.11V	195.0	307.4mV
55	65.84V	194.1	312.0mV	66.81V	189.5	309.6mV
56	66.50V	183.6	308.7mV	67.67V	194.2	312.1mV
57	67.43V	194.1	310.0mV	65.83V	191.2	311.6mV
58	67.82V	185.3	312.6mV	65.97V	188.5	308.6mV
59	66.04V	197.4	312.1mV	65.54V	196.3	308.9mV
60	67.95V	196.4	311.4mV	66.33V	192.2	310.0mV

SeCoS Corporation

High Temperature High Humidity Test Data

Report No : T100630-012
Part No : 2SC1384L
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 50V, 85 < HFE < 340, VCE(sat) < 400mV
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	65.88V	186.1	312.5mV	68.24V	186.9	308.7mV
62	67.85V	190.4	306.8mV	67.90V	190.1	311.9mV
63	65.69V	187.6	309.5mV	68.02V	193.9	307.2mV
64	67.61V	186.4	309.5mV	66.56V	184.1	307.5mV
65	65.34V	199.5	308.8mV	67.59V	194.2	312.3mV
66	66.18V	197.9	311.9mV	68.22V	191.7	312.6mV
67	65.44V	193.3	308.4mV	68.26V	190.5	312.1mV
68	65.67V	192.7	311.2mV	66.20V	188.6	308.2mV
69	67.21V	189.2	313.0mV	68.48V	197.3	313.3mV
70	66.46V	182.5	307.1mV	66.95V	182.6	311.3mV
71	66.91V	191.6	307.2mV	65.49V	183.9	310.9mV
72	66.26V	190.1	308.7mV	65.32V	191.5	308.4mV
73	68.07V	196.4	309.4mV	65.40V	187.3	311.2mV
74	66.00V	189.5	308.0mV	66.60V	182.0	310.9mV
75	66.20V	195.1	308.4mV	67.51V	188.7	312.4mV
76	66.51V	188.4	312.7mV	65.54V	191.6	309.2mV
77	65.82V	193.4	311.9mV	66.58V	188.5	311.4mV

Made By: Peter Yang

Approval: Taylor Yang

SeCoS Corporation

High Temper High Humidity Reverse Bies Test Data

Report No : T100630-012
Part No : 2SC1384L
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 50V, 85 < HFE < 340, VCE(sat) < 400mV
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	67.76V	189.6	311.7mV	66.52V	189.8	311.2mV
2	65.86V	195.6	308.5mV	67.65V	188.5	311.9mV
3	67.62V	184.5	311.3mV	66.18V	197.6	307.8mV
4	68.42V	187.8	310.3mV	68.45V	194.0	307.7mV
5	65.60V	188.8	307.6mV	67.28V	197.6	312.6mV
6	66.84V	189.6	308.1mV	68.35V	200.0	307.0mV
7	65.55V	190.8	313.3mV	66.71V	192.4	307.1mV
8	68.28V	187.4	310.9mV	68.22V	195.1	309.4mV
9	66.01V	181.9	309.0mV	66.09V	195.1	310.3mV
10	66.04V	189.8	309.5mV	66.28V	197.3	313.3mV
11	65.50V	198.4	313.0mV	67.75V	196.6	308.4mV
12	67.94V	197.8	307.9mV	68.06V	182.3	311.0mV
13	65.97V	194.4	306.8mV	68.22V	192.5	310.2mV
14	68.03V	193.6	310.3mV	66.77V	197.9	310.3mV
15	68.30V	190.6	311.4mV	65.94V	190.0	310.2mV
16	66.75V	185.0	312.2mV	68.27V	193.7	313.1mV
17	66.67V	191.1	307.8mV	66.84V	191.7	310.8mV
18	66.06V	185.1	310.6mV	67.77V	193.5	311.8mV
19	65.41V	181.3	312.5mV	67.19V	189.6	309.1mV
20	65.43V	198.1	312.3mV	67.88V	183.1	309.9mV
21	67.58V	194.1	307.8mV	66.61V	195.7	310.8mV
22	67.79V	189.9	307.8mV	67.76V	190.9	313.0mV
23	66.30V	184.5	307.1mV	66.93V	183.8	312.2mV
24	67.36V	189.5	309.2mV	66.94V	198.6	306.8mV
25	67.75V	195.4	308.2mV	66.48V	195.0	308.1mV
26	66.04V	194.2	310.0mV	68.15V	183.4	309.4mV
27	68.09V	191.5	307.3mV	67.36V	193.2	312.1mV
28	68.46V	191.6	312.8mV	67.80V	194.3	312.1mV
29	67.80V	192.3	309.9mV	65.38V	186.0	310.1mV
30	65.86V	196.4	307.8mV	66.04V	189.4	309.6mV

SeCoS Corporation

High Temper High Humidity Reverse Bies Test Data

Report No : T100630-012
Part No : 2SC1384L
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 50V, 85 < HFE < 340, VCE(sat) < 400mV
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	65.53V	196.7	312.6mV	67.32V	194.3	309.5mV
32	67.75V	192.7	310.6mV	65.58V	197.0	309.6mV
33	66.49V	189.1	307.0mV	66.51V	190.8	307.8mV
34	65.51V	195.4	312.8mV	65.52V	188.8	307.2mV
35	66.88V	194.0	309.1mV	67.51V	184.7	311.5mV
36	66.55V	183.1	312.3mV	65.65V	183.9	307.1mV
37	66.53V	198.5	308.7mV	66.12V	189.7	308.0mV
38	66.97V	190.2	310.4mV	68.48V	200.3	308.5mV
39	66.06V	193.3	310.0mV	66.80V	182.5	313.3mV
40	67.00V	186.2	308.6mV	65.47V	182.1	307.5mV
41	66.89V	198.4	307.1mV	66.90V	196.6	312.6mV
42	67.64V	192.8	311.2mV	66.91V	191.1	309.8mV
43	67.67V	194.0	306.8mV	66.45V	189.0	311.5mV
44	68.33V	186.9	312.4mV	65.65V	191.2	313.4mV
45	66.76V	188.1	310.1mV	67.87V	193.1	309.4mV
46	67.03V	193.8	307.1mV	67.12V	183.2	312.1mV
47	66.03V	200.2	310.2mV	66.21V	181.4	308.4mV
48	65.51V	196.6	313.4mV	66.68V	181.4	309.5mV
49	66.90V	189.8	311.5mV	66.90V	197.0	307.7mV
50	66.57V	198.0	312.6mV	66.73V	187.6	312.6mV
51	66.03V	193.0	309.3mV	68.43V	198.4	308.3mV
52	68.13V	189.4	309.5mV	67.80V	191.3	312.2mV
53	67.74V	194.3	312.1mV	67.08V	187.5	307.5mV
54	67.29V	190.6	308.9mV	67.29V	188.7	306.9mV
55	68.14V	194.2	308.7mV	66.08V	194.4	312.2mV
56	67.95V	197.6	312.8mV	68.15V	191.8	307.4mV
57	65.72V	196.9	311.4mV	65.40V	197.8	309.7mV
58	66.62V	188.4	312.3mV	67.52V	194.2	310.8mV
59	66.00V	182.5	310.1mV	65.99V	194.3	313.2mV
60	66.45V	189.4	313.2mV	65.64V	199.4	307.2mV

SeCoS Corporation

High Temper High Humidity Reverse Bies Test Data

Report No : T100630-012
Part No : 2SC1384L
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 50V, 85 < HFE < 340, VCE(sat) < 400mV
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	65.88V	184.1	307.8mV	67.47V	193.7	310.4mV
62	65.93V	193.4	310.9mV	68.38V	188.0	310.0mV
63	68.44V	196.6	312.7mV	67.54V	183.7	309.9mV
64	66.77V	196.4	310.3mV	65.43V	186.3	308.6mV
65	65.65V	184.2	312.6mV	66.22V	186.7	311.4mV
66	67.79V	187.2	309.6mV	66.39V	192.3	306.9mV
67	66.71V	197.7	307.2mV	66.28V	187.7	306.8mV
68	68.13V	200.1	311.6mV	68.22V	199.2	307.8mV
69	66.57V	198.6	310.1mV	66.77V	182.1	312.1mV
70	66.48V	197.6	309.0mV	65.31V	194.1	310.4mV
71	67.71V	194.1	307.6mV	66.74V	183.4	310.8mV
72	67.65V	198.2	307.7mV	68.01V	190.6	307.7mV
73	67.55V	190.9	310.0mV	65.60V	199.9	310.9mV
74	68.36V	182.6	310.4mV	67.06V	194.0	310.9mV
75	66.60V	199.6	309.7mV	66.99V	193.3	309.7mV
76	66.74V	186.4	311.2mV	67.81V	181.9	311.2mV
77	65.37V	195.9	312.1mV	68.25V	198.9	310.4mV

Made By: Peter Yang

Approval: Taylor Yang

SeCoS Corporation

Solderability Test Data

Report No : T100630-012
Part No : 2SC1384L
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 50V, 85 < HFE < 340, VCE(sat) < 400mV
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	68.38V	189.0	308.5mV	66.42V	190.0	310.8mV
2	67.59V	192.1	308.1mV	67.55V	191.4	307.0mV
3	67.62V	186.0	307.5mV	67.86V	181.4	307.3mV
4	66.21V	196.5	311.4mV	65.74V	186.4	311.5mV
5	65.94V	185.1	308.2mV	67.87V	192.6	306.9mV
6	66.23V	183.5	310.9mV	67.58V	199.2	312.7mV
7	67.11V	196.1	311.4mV	67.38V	197.0	308.5mV
8	67.63V	187.6	308.1mV	66.70V	194.3	307.4mV
9	66.39V	191.9	311.2mV	67.26V	181.4	312.9mV
10	67.72V	197.5	311.5mV	66.56V	200.3	307.5mV

Made By: Peter Yang

Approval: Taylor Yang