Headquarter Address:
8F.No.33, Lane 155, Sec.3, Bei-Shen Rd.,
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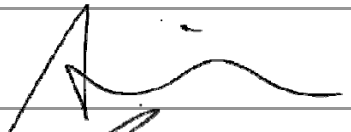
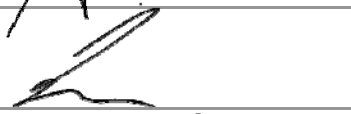
Product/Process Change Notification

PCN#	Effective Date	Issue Date
2010-11-01C-01	2011/5/1	2010/11/1
PCN Classification	**Product Category**	
Major	SOT-523	
Subject		
Copper Bonding Wire Implementation		
Affected Product(s)		
As attachment		
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

www.SeCosGmbH.com

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Affected Product

SCS221T	DTA114EE	2SA1774
MMBD4148T	DTA114TE	2SA1832
MMBD4448HT	DTA114YE	2SA2018F
MMBD4448HTA	DTA123JE	2SC4617
MMBD4448HTC	DTA123YE	2SC4618
MMBD4448HTS	DTA124EE	2SC4738
SCS222NT	DTA143EE	2SC5585
SCS222PT	DTA143TE	BC847T
BAS16T	DTA143XE	MMBT2222AT
BAV70T	DTA143ZE	MMBT2907FW
BAV99T	DTA144EE	MMBT3904FW
BAW56T	DTA144TE	MMBT3904T
BAS21T	DTC113ZE	MMBT3906FW
BAT54T	DTC114EE	MMBT3906T
BAT54AT	DTC114TE	MM5Z***T SERIES
BAT54CT	DTC114WE	
BAT54ST	DTC114YE	
SCS715T	DTC123JE	
BAS40T	DTC123YE	
BAS40-04T	DTC124EE	
BAS40-05T	DTC143EE	
BAS40-06T	DTC143TE	
BAS70T	DTC143XE	
BAS70-04T	DTC143ZE	
BAS70-05T	DTC144EE	
BAS70-06T	DTC144TE	

SeCoS Corporation

Reliability Testing Summary Report

Date: 2010/10/29 Document No.: SD10 -10- 11

Test Item	P/N	Test Condition	(LTPD)	Sample Numbers	Allow Fall Numbers	Fall Numbers	Result
HTRB High Temp Reverse Bias	MMBT3904FW	100 ± 5℃, 100%VR, T = 1000hrs		77	0	0	ACC
HTSL High Temperature Storage Life	MMBT3904FW	150℃, T = 1000 hrs		77	0	0	ACC
PCT Pressure Cooker Test	MMBT3904FW	121℃, 29.7PSIG, 168 hrs		77	0	0	ACC
TCT Temperature Cycle Test	MMBT3904FW	-55℃/30min, 150℃/30min, For 1000 Cycle		77	0	0	ACC
THT High Temperature High Humidity Test	MMBT3904FW	85 ± 2℃, RH=85±5%, 1000 hrs		77	0	0	ACC
H3TRB High Temper High Humidity Reverse Bies Test	MMBT3904FW	85 ± 2℃, RH=85±5%, 1000 hrs		77	0	0	ACC
Solderability	MMBT3904FW	245 ± 5℃, 5Sec the inspected area of each lead must have 95% solder coverage minimum		10	0	0	ACC

Judgment:

■ **qualified** □ **unqualified**

Testing Start Date: 2010.09.01 Testing End Date: 2010.10.29

Tester: Peter Yang Approval: Taylor Yang

SeCoS Corporation

Electrical Test Data

Report No : T101029-011
Part No : MMBT3904FW
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 40V, 100 < HFE < 300, VCE(sat) < 300mV
Test Condition: 25℃
Test Date: 2010.09.01 ~ 2010.09.01
Test Standard : Specifications
Operator: Peter Yang

Test Result: PASS

No	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)
1	54.72V	207.1	121.2mV
2	55.42V	202.3	130.7mV
3	54.09V	210.7	148.7mV
4	52.67V	213.1	109.5mV
5	53.19V	200.4	141.4mV
6	54.65V	204.8	118.8mV
7	53.12V	199.3	154.4mV
8	52.61V	201.5	147.0mV
9	53.65V	206.8	149.3mV
10	54.41V	206.2	121.2mV
11	53.46V	200.2	148.3mV
12	53.18V	204.7	118.2mV
13	54.71V	210.5	131.0mV
14	54.21V	211.0	140.6mV
15	52.80V	208.2	145.0mV
16	55.42V	200.2	115.7mV
17	54.14V	200.7	107.4mV
18	54.30V	208.7	133.9mV
19	54.33V	210.5	144.3mV
20	52.68V	200.0	128.6mV
21	54.15V	203.0	144.4mV
22	52.90V	208.5	108.2mV
23	54.88V	200.3	135.2mV
24	52.75V	198.4	127.0mV
25	55.21V	212.4	135.4mV
26	55.22V	208.5	127.9mV
27	53.47V	210.0	122.9mV
28	55.10V	198.0	154.4mV
29	53.71V	208.5	130.0mV
30	54.62V	204.9	141.0mV
31	54.67V	201.4	143.6mV

SeCoS Corporation

Electrical Test Data

Report No : T101029-011
Part No : MMBT3904FW
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 40V, 100 < HFE < 300, VCE(sat) < 300mV
Test Condition: 25℃
Test Date: 2010.09.01 ~ 2010.09.01
Test Standard : Specifications
Operator: Peter Yang

Test Result: PASS

No	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)
32	52.53V	200.7	142.0mV
33	53.33V	209.1	133.1mV
34	55.12V	201.3	145.3mV
35	53.81V	200.8	137.8mV
36	52.54V	212.8	122.8mV
37	52.96V	208.9	147.5mV
38	53.57V	200.6	107.6mV
39	55.00V	206.2	131.0mV
40	54.49V	198.3	156.7mV
41	53.74V	202.2	110.0mV
42	54.84V	199.4	150.9mV
43	52.72V	205.2	151.7mV
44	55.23V	205.3	113.5mV
45	54.82V	198.8	127.7mV
46	54.21V	212.7	132.3mV
47	54.37V	210.2	123.3mV
48	52.98V	197.7	118.1mV
49	53.29V	201.4	111.6mV
50	54.80V	211.2	116.6mV
51	55.33V	199.8	127.5mV
52	55.58V	201.7	118.9mV
53	53.12V	197.9	108.5mV
54	54.35V	201.8	122.4mV
55	53.94V	206.3	120.7mV
56	52.34V	199.0	143.0mV
57	54.64V	209.3	118.1mV
58	52.90V	198.9	119.1mV
59	54.54V	204.0	121.3mV
60	53.44V	209.8	120.4mV
61	54.57V	212.6	156.1mV
62	55.48V	199.0	132.1mV

SeCoS Corporation

Electrical Test Data

Report No : T101029-011
Part No : MMBT3904FW
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 40V, 100 < HFE < 300, VCE(sat) < 300mV
Test Condition: 25℃
Test Date: 2010.09.01 ~ 2010.09.01
Test Standard : Specifications
Operator: Peter Yang

Test Result: PASS

No	$V_{(BR)CEO}$ (V)	h_{FE}	$V_{CE(sat)}$ (mV)
63	53.53V	198.7	108.1mV
64	53.45V	208.3	115.7mV
65	55.49V	209.3	116.6mV
66	55.43V	205.6	117.4mV
67	53.34V	210.8	153.5mV
68	52.40V	201.3	127.5mV
69	53.25V	203.6	135.6mV
70	53.82V	210.6	125.5mV
71	53.86V	199.5	150.6mV
72	54.21V	209.0	155.9mV
73	55.57V	202.6	137.0mV
74	52.64V	205.0	138.3mV
75	54.76V	211.4	142.2mV
76	54.10V	200.1	129.4mV
77	53.36V	209.4	119.9mV

Made By: Peter Yang

Approval: Taylor Yang

SeCoS Corporation

High Temperature Reverse Bias Test Data

Report No : T101029-011
Part No : MMBT3904FW
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 40V, 100 < HFE < 300, VCE(sat) < 300mV
Test Condition: 100 ± 5℃, 100%VR, T = 1000 hrs
Test Date: 2010.09.01 ~ 2010.10.13
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	52.98V	210.1	130.0mV	54.02V	209.1	109.6mV
2	54.44V	210.7	142.8mV	55.34V	212.6	126.2mV
3	55.67V	211.5	156.2mV	55.42V	208.1	119.7mV
4	52.52V	197.5	135.0mV	55.47V	199.1	154.8mV
5	54.72V	201.0	140.4mV	52.65V	213.0	137.8mV
6	54.64V	197.4	149.5mV	55.16V	198.5	147.3mV
7	54.86V	200.7	115.3mV	54.03V	203.0	108.5mV
8	54.40V	205.2	109.7mV	55.29V	198.7	139.5mV
9	52.58V	211.9	108.0mV	52.62V	200.4	109.4mV
10	53.64V	203.0	125.6mV	53.14V	213.1	119.1mV
11	53.14V	204.7	142.0mV	54.05V	213.1	145.6mV
12	53.03V	209.0	108.1mV	52.75V	201.9	144.9mV
13	55.03V	206.3	136.4mV	53.86V	201.1	122.0mV
14	54.23V	206.3	152.8mV	54.41V	207.0	134.4mV
15	53.41V	202.9	108.6mV	54.84V	205.0	150.2mV
16	53.30V	209.1	108.7mV	55.18V	211.9	148.9mV
17	53.54V	213.2	141.9mV	52.62V	211.5	110.9mV
18	52.89V	205.8	133.2mV	54.89V	203.6	122.7mV
19	52.78V	206.7	145.9mV	53.24V	210.5	148.6mV
20	52.88V	199.5	136.1mV	53.98V	198.2	143.5mV
21	53.45V	204.9	137.3mV	52.55V	200.4	146.3mV
22	55.68V	203.6	116.4mV	52.86V	208.7	123.8mV
23	55.22V	208.8	128.0mV	54.08V	198.2	126.3mV
24	52.31V	207.9	120.9mV	53.56V	208.2	146.5mV
25	53.04V	197.6	146.5mV	55.21V	202.8	113.5mV
26	55.39V	201.2	133.6mV	55.31V	209.1	130.7mV
27	54.00V	211.6	139.0mV	53.63V	212.0	149.5mV
28	53.51V	203.4	137.3mV	52.41V	201.1	113.8mV
29	53.44V	202.9	118.6mV	54.59V	208.5	135.8mV
30	52.30V	199.7	120.5mV	55.57V	204.1	120.3mV

SeCoS Corporation

High Temperature Reverse Bias Test Data

Report No : T101029-011
Part No : MMBT3904FW
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 40V, 100 < HFE < 300, VCE(sat) < 300mV
Test Condition: 100 ± 5℃, 100%VR, T = 1000 hrs
Test Date: 2010.09.01 ~ 2010.10.13
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	54.73V	202.6	118.7mV	54.05V	212.0	142.9mV
32	53.92V	205.3	141.3mV	54.62V	201.7	135.8mV
33	54.36V	204.9	148.5mV	55.16V	201.6	119.3mV
34	55.21V	208.8	136.2mV	52.32V	199.8	155.3mV
35	53.67V	204.7	126.3mV	53.21V	199.0	112.3mV
36	55.17V	207.7	114.9mV	55.59V	204.3	129.0mV
37	54.15V	199.7	118.7mV	54.18V	203.6	122.6mV
38	54.44V	200.7	138.7mV	52.51V	209.5	143.7mV
39	54.99V	205.1	126.3mV	54.92V	203.0	138.5mV
40	53.09V	213.1	135.5mV	53.33V	206.0	142.6mV
41	54.18V	207.5	108.2mV	53.74V	208.5	112.3mV
42	52.70V	208.9	118.6mV	54.99V	209.2	119.7mV
43	54.35V	200.4	146.8mV	53.84V	199.8	111.4mV
44	52.88V	199.0	138.5mV	53.73V	212.2	117.5mV
45	52.65V	201.6	136.0mV	55.42V	202.3	120.8mV
46	54.89V	198.4	151.0mV	52.50V	204.0	156.8mV
47	54.39V	207.5	127.9mV	54.55V	207.2	153.2mV
48	55.14V	211.2	136.6mV	54.58V	198.8	127.1mV
49	53.59V	197.5	156.8mV	52.79V	205.6	108.1mV
50	52.75V	201.1	123.7mV	55.24V	210.2	119.3mV
51	53.63V	205.1	113.7mV	53.24V	198.2	150.8mV
52	54.91V	207.2	136.8mV	52.56V	202.6	155.8mV
53	54.90V	207.9	154.3mV	54.78V	200.7	110.5mV
54	54.38V	199.6	155.1mV	53.82V	210.3	156.2mV
55	55.23V	198.0	107.9mV	53.59V	210.8	153.1mV
56	52.82V	205.2	148.5mV	52.31V	208.2	156.4mV
57	52.81V	203.0	111.3mV	54.65V	212.9	123.8mV
58	55.36V	208.2	152.1mV	55.35V	207.3	152.6mV
59	52.29V	211.1	147.2mV	54.72V	209.6	108.2mV
60	52.90V	202.8	148.3mV	52.75V	208.1	114.0mV

SeCoS Corporation

High Temperature Reverse Bias Test Data

Report No : T101029-011
Part No : MMBT3904FW
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 40V, 100 < HFE < 300, VCE(sat) < 300mV
Test Condition: 100 ± 5℃, 100%VR, T = 1000 hrs
Test Date: 2010.09.01 ~ 2010.10.13
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	52.52V	205.0	152.9mV	54.72V	201.9	122.2mV
62	54.69V	203.8	114.5mV	55.10V	205.5	130.8mV
63	53.02V	208.8	138.3mV	52.71V	212.3	145.0mV
64	54.38V	207.2	150.1mV	54.30V	209.0	140.9mV
65	53.35V	211.6	126.8mV	52.67V	203.7	148.9mV
66	54.29V	201.0	131.7mV	53.77V	200.9	113.4mV
67	53.12V	211.4	156.3mV	55.50V	213.3	151.4mV
68	54.48V	213.1	135.7mV	55.11V	211.5	126.0mV
69	52.77V	201.0	108.8mV	54.82V	200.9	151.3mV
70	52.73V	209.6	155.5mV	54.53V	203.0	141.9mV
71	52.31V	210.3	129.1mV	54.29V	198.3	142.4mV
72	54.82V	197.4	131.3mV	54.74V	199.5	127.8mV
73	52.37V	211.5	132.0mV	54.58V	203.9	127.3mV
74	54.91V	203.2	133.7mV	54.51V	211.1	136.0mV
75	53.70V	211.5	114.3mV	52.76V	205.8	133.3mV
76	52.81V	198.9	151.7mV	54.70V	205.0	155.4mV
77	54.69V	198.4	151.0mV	53.81V	208.1	123.9mV

Made By: Peter Yang

Approval: Taylor Yang

SeCoS Corporation

High Temperature Storage Life Test Data

Report No : T101029-011
Part No : MMBT3904FW
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 40V, 100 < HFE < 300, VCE(sat) < 300mV
Test Condition: 150℃, 1000Hrs
Test Date: 2010.09.01 ~ 2010.10.13
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	54.72V	200.8	152.4mV	53.62V	212.2	119.3mV
2	53.24V	203.7	130.2mV	53.11V	209.9	123.3mV
3	53.55V	199.2	108.0mV	53.14V	211.1	133.0mV
4	53.21V	210.8	108.4mV	55.30V	199.9	114.2mV
5	54.91V	201.1	122.2mV	53.98V	198.6	126.0mV
6	54.23V	205.0	134.9mV	53.92V	209.4	120.9mV
7	54.54V	211.7	121.5mV	55.01V	210.9	132.9mV
8	54.50V	206.0	141.7mV	52.32V	207.7	146.7mV
9	55.66V	201.6	156.0mV	54.44V	212.5	120.3mV
10	53.39V	207.4	144.8mV	52.54V	205.7	113.9mV
11	52.71V	204.4	140.8mV	55.01V	212.0	129.8mV
12	55.55V	204.3	108.1mV	54.27V	204.0	146.9mV
13	52.48V	207.7	134.9mV	55.59V	213.0	109.4mV
14	55.07V	202.5	120.7mV	55.42V	197.5	149.6mV
15	55.45V	204.8	129.9mV	54.09V	208.1	116.0mV
16	53.81V	209.6	136.5mV	53.93V	201.9	109.4mV
17	52.53V	210.3	125.0mV	54.70V	203.8	140.1mV
18	53.90V	199.6	116.2mV	53.99V	210.0	111.6mV
19	54.40V	209.2	124.8mV	54.16V	204.3	122.5mV
20	54.64V	206.5	113.9mV	52.51V	197.7	113.0mV
21	55.35V	201.9	114.7mV	54.51V	202.2	132.7mV
22	52.41V	199.6	148.6mV	54.13V	206.2	110.7mV
23	55.10V	202.4	135.4mV	55.52V	205.0	143.5mV
24	52.46V	200.1	141.3mV	53.64V	197.9	107.4mV
25	53.57V	212.5	145.2mV	55.01V	202.8	113.4mV
26	54.42V	210.5	125.4mV	54.63V	198.1	129.6mV
27	54.79V	200.4	117.5mV	55.60V	211.3	153.0mV
28	55.24V	200.3	144.6mV	54.11V	201.1	149.0mV
29	54.76V	201.9	123.2mV	53.93V	203.7	134.4mV
30	53.56V	197.6	130.9mV	53.86V	197.7	127.1mV

SeCoS Corporation

High Temperature Storage Life Test Data

Report No : T101029-011
Part No : MMBT3904FW
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 40V, 100 < HFE < 300, VCE(sat) < 300mV
Test Condition: 150℃, 1000Hrs
Test Date: 2010.09.01 ~ 2010.10.13
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	54.61V	199.8	145.8mV	52.83V	201.2	146.0mV
32	55.04V	201.2	125.9mV	54.32V	209.1	155.6mV
33	55.08V	208.7	144.9mV	52.64V	198.6	121.4mV
34	54.17V	207.8	132.8mV	52.55V	203.3	155.5mV
35	54.54V	202.9	142.9mV	53.47V	200.0	119.8mV
36	54.91V	205.7	107.8mV	52.92V	209.4	154.2mV
37	53.73V	211.4	126.8mV	53.38V	206.6	153.4mV
38	52.80V	199.0	131.5mV	53.61V	211.9	122.4mV
39	52.89V	205.6	135.0mV	53.88V	207.2	112.8mV
40	52.77V	205.0	154.8mV	52.35V	200.9	112.1mV
41	55.55V	203.7	148.1mV	53.90V	210.2	153.9mV
42	54.85V	209.1	118.3mV	54.07V	207.3	118.3mV
43	55.33V	209.0	131.6mV	55.27V	205.6	125.2mV
44	52.57V	209.0	156.5mV	53.12V	202.3	149.4mV
45	54.63V	203.8	117.7mV	54.49V	212.0	138.7mV
46	53.20V	205.1	125.9mV	52.30V	212.7	118.1mV
47	54.58V	206.6	124.0mV	53.98V	198.6	126.8mV
48	54.30V	210.1	112.4mV	54.47V	204.8	119.0mV
49	52.44V	205.9	133.6mV	53.32V	213.1	149.7mV
50	54.63V	197.8	155.5mV	52.54V	207.0	132.1mV
51	53.77V	210.9	117.1mV	53.00V	197.4	132.6mV
52	52.77V	211.3	154.1mV	52.31V	205.1	155.2mV
53	55.09V	197.4	154.7mV	53.99V	200.7	124.3mV
54	53.11V	198.9	126.0mV	53.85V	203.6	150.7mV
55	52.86V	204.6	150.9mV	53.80V	213.3	117.6mV
56	52.89V	202.7	150.4mV	53.66V	200.8	155.8mV
57	52.47V	204.2	136.9mV	55.12V	212.3	135.8mV
58	54.68V	204.0	123.9mV	53.28V	199.3	142.0mV
59	54.32V	203.6	132.7mV	52.61V	206.0	125.0mV
60	54.43V	201.4	116.7mV	52.45V	205.8	125.0mV

SeCoS Corporation

High Temperature Storage Life Test Data

Report No : T101029-011
Part No : MMBT3904FW
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 40V, 100 < HFE < 300, VCE(sat) < 300mV
Test Condition: 150℃, 1000Hrs
Test Date: 2010.09.01 ~ 2010.10.13
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	52.87V	210.7	153.9mV	55.30V	209.2	145.9mV
62	53.64V	201.4	126.5mV	55.38V	210.1	152.5mV
63	52.61V	205.1	111.3mV	54.82V	207.7	120.2mV
64	52.55V	209.9	119.7mV	53.39V	202.2	146.0mV
65	53.47V	209.4	144.3mV	53.64V	198.8	152.2mV
66	52.51V	200.2	148.8mV	54.55V	210.3	107.4mV
67	53.31V	211.9	149.1mV	54.94V	206.6	117.9mV
68	54.65V	205.9	134.3mV	54.70V	207.7	152.5mV
69	54.02V	200.7	141.1mV	54.48V	200.6	111.8mV
70	53.27V	208.5	129.4mV	54.71V	205.5	120.9mV
71	53.98V	199.5	156.9mV	55.46V	202.6	110.3mV
72	54.63V	202.8	137.3mV	54.10V	209.2	121.0mV
73	53.90V	200.8	110.0mV	54.60V	202.2	135.3mV
74	54.76V	210.1	131.8mV	55.53V	209.7	131.4mV
75	54.64V	199.0	156.4mV	53.13V	209.6	150.7mV
76	52.54V	206.0	150.2mV	52.31V	200.3	149.3mV
77	52.53V	197.9	150.2mV	54.78V	202.9	152.9mV

Made By: Peter Yang

Approval: Taylor Yang

SeCoS Corporation

Pressure Cooker Test Data

Report No : T101029-011
Part No : MMBT3904FW
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 40V, 100 < HFE < 300, VCE(sat) < 300mV
Test Condition: 121℃, 100%RH, 29.7PSIG, 168Hrs
Test Date: 2010.09.02 ~ 2010.09.10
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	52.92V	203.7	125.0mV	54.13V	209.7	155.1mV
2	55.02V	211.0	156.1mV	54.31V	205.7	114.8mV
3	55.11V	213.0	139.0mV	52.63V	202.7	136.4mV
4	55.34V	205.0	145.1mV	53.57V	204.1	127.5mV
5	54.03V	205.0	123.9mV	55.41V	199.7	149.2mV
6	55.49V	200.0	142.5mV	55.67V	202.2	111.8mV
7	52.47V	199.0	125.5mV	55.19V	209.2	142.4mV
8	52.89V	210.9	120.6mV	53.19V	202.9	135.3mV
9	53.38V	206.9	118.2mV	53.04V	211.6	124.5mV
10	54.45V	211.0	134.8mV	54.93V	199.4	139.0mV
11	53.93V	200.8	155.5mV	53.96V	210.3	152.5mV
12	54.85V	208.7	145.6mV	52.82V	203.1	111.3mV
13	53.08V	206.4	147.3mV	54.48V	207.1	120.6mV
14	52.80V	197.9	126.3mV	53.46V	203.3	145.7mV
15	52.94V	206.4	124.1mV	52.84V	202.2	117.2mV
16	52.55V	199.0	131.4mV	52.56V	206.5	133.2mV
17	53.46V	212.2	137.2mV	54.76V	203.5	113.9mV
18	53.96V	208.8	126.8mV	54.47V	207.9	116.9mV
19	53.70V	203.8	155.6mV	53.45V	198.7	112.0mV
20	55.57V	204.9	123.1mV	53.10V	209.6	114.4mV
21	52.92V	204.7	156.8mV	54.57V	212.6	147.7mV
22	54.30V	208.0	139.3mV	54.53V	207.5	133.8mV
23	54.38V	198.0	138.6mV	53.76V	208.2	118.6mV
24	54.62V	202.1	113.0mV	53.20V	205.9	141.6mV
25	55.51V	206.4	130.5mV	52.79V	207.5	128.0mV
26	53.38V	206.4	123.0mV	53.73V	197.8	151.6mV
27	53.36V	209.5	107.4mV	53.11V	197.6	143.2mV
28	54.51V	209.6	130.4mV	53.66V	198.9	123.0mV
29	52.33V	205.5	124.4mV	53.94V	204.5	148.1mV
30	53.48V	208.2	117.1mV	55.27V	212.7	148.6mV

SeCoS Corporation

Pressure Cooker Test Data

Report No : T101029-011
Part No : MMBT3904FW
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 40V, 100 < HFE < 300, VCE(sat) < 300mV
Test Condition: 121℃, 100%RH, 29.7PSIG, 168Hrs
Test Date: 2010.09.02 ~ 2010.09.10
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	52.70V	208.8	143.4mV	52.38V	207.6	122.9mV
32	55.40V	209.1	156.9mV	52.44V	200.2	112.9mV
33	55.09V	208.4	132.3mV	53.58V	212.9	136.0mV
34	55.63V	200.4	129.4mV	53.21V	199.2	154.4mV
35	54.10V	197.6	137.7mV	53.66V	206.1	134.8mV
36	55.34V	208.1	146.5mV	54.22V	201.5	152.1mV
37	55.67V	213.1	140.6mV	53.58V	197.4	120.2mV
38	53.91V	211.6	126.0mV	52.82V	206.2	149.3mV
39	54.52V	201.4	146.0mV	53.80V	201.7	125.6mV
40	53.97V	201.1	115.4mV	54.31V	206.4	121.3mV
41	52.77V	199.6	136.5mV	54.58V	209.9	138.6mV
42	55.05V	212.3	149.7mV	52.33V	198.4	124.7mV
43	52.90V	202.9	130.5mV	52.35V	197.4	148.1mV
44	54.61V	210.1	140.8mV	54.28V	200.2	107.9mV
45	55.63V	208.4	136.0mV	55.31V	200.2	150.5mV
46	55.12V	198.0	147.0mV	52.67V	199.6	126.5mV
47	54.55V	205.9	151.0mV	52.34V	208.6	147.9mV
48	52.72V	209.1	123.3mV	52.96V	198.3	156.5mV
49	55.61V	209.0	110.2mV	52.74V	205.2	109.9mV
50	52.82V	209.4	154.6mV	54.05V	209.2	146.3mV
51	54.14V	200.9	143.7mV	54.18V	211.7	133.5mV
52	53.41V	203.9	149.9mV	54.57V	205.6	113.4mV
53	52.70V	210.5	136.7mV	52.75V	204.5	155.7mV
54	54.29V	209.7	116.2mV	54.57V	205.1	134.5mV
55	52.29V	204.4	115.4mV	53.76V	205.9	113.2mV
56	54.77V	199.8	144.3mV	52.91V	209.4	147.1mV
57	54.19V	205.1	141.6mV	52.78V	213.1	121.4mV
58	52.80V	211.4	137.9mV	53.30V	207.8	115.6mV
59	54.17V	207.4	110.2mV	52.42V	203.2	153.5mV
60	52.62V	200.9	146.1mV	52.87V	204.3	134.6mV

SeCoS Corporation

Pressure Cooker Test Data

Report No : T101029-011
Part No : MMBT3904FW
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 40V, 100 < HFE < 300, VCE(sat) < 300mV
Test Condition: 121℃, 100%RH, 29.7PSIG, 168Hrs
Test Date: 2010.09.02 ~ 2010.09.10
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	54.37V	213.1	137.2mV	53.36V	207.7	144.3mV
62	54.44V	198.0	142.5mV	55.40V	201.0	145.5mV
63	53.12V	209.6	122.9mV	52.75V	203.8	118.3mV
64	53.83V	211.1	113.0mV	53.92V	213.0	118.0mV
65	53.06V	203.0	121.5mV	53.92V	211.2	119.6mV
66	55.54V	203.4	117.3mV	54.05V	209.5	110.4mV
67	55.50V	198.7	155.6mV	55.14V	204.8	128.5mV
68	53.24V	210.6	120.7mV	52.41V	200.0	134.2mV
69	53.14V	207.0	120.7mV	54.46V	206.7	110.2mV
70	54.65V	210.8	124.5mV	54.98V	212.3	126.1mV
71	55.57V	198.8	141.6mV	52.50V	203.7	157.0mV
72	55.00V	208.5	156.2mV	54.98V	199.1	120.0mV
73	54.15V	199.9	131.1mV	54.41V	211.1	148.8mV
74	53.87V	206.3	155.1mV	55.22V	209.6	135.7mV
75	54.01V	199.2	142.4mV	55.57V	208.9	146.2mV
76	55.07V	203.9	128.9mV	53.70V	210.9	145.8mV
77	55.10V	201.8	115.6mV	53.08V	209.5	146.4mV

Made By: Peter Yang

Approval: Taylor Yang

SeCoS Corporation

Temperature Cycle Test Data

Report No : T101029-011
Part No : MMBT3904FW
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 40V, 100 < HFE < 300, VCE(sat) < 300mV
Test Condition: -55℃/30min, 150℃/30min, for1000 Cycle
Test Date: 2010.09.02 ~ 2010.10.25
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	53.04V	201.0	148.4mV	55.48V	198.1	121.7mV
2	52.62V	202.0	112.8mV	52.41V	205.4	132.2mV
3	52.82V	200.7	125.4mV	53.16V	200.9	145.7mV
4	52.79V	207.6	111.0mV	53.02V	213.2	121.5mV
5	54.14V	198.3	157.2mV	52.31V	199.5	143.1mV
6	53.51V	202.4	112.2mV	55.18V	213.2	143.2mV
7	55.40V	197.4	119.2mV	53.24V	199.8	122.4mV
8	54.57V	210.5	133.5mV	53.83V	204.5	134.1mV
9	53.89V	205.9	111.9mV	54.11V	206.0	111.9mV
10	55.55V	210.9	144.4mV	53.89V	197.3	131.9mV
11	54.18V	210.8	156.0mV	55.56V	197.6	157.1mV
12	54.70V	204.6	124.3mV	55.56V	211.4	150.5mV
13	53.35V	206.2	155.0mV	55.27V	210.6	144.8mV
14	55.28V	201.2	149.0mV	54.04V	207.4	128.7mV
15	55.16V	210.4	119.1mV	55.00V	202.2	108.4mV
16	54.18V	205.0	156.3mV	55.41V	203.8	140.7mV
17	55.65V	211.2	111.2mV	53.79V	208.1	124.3mV
18	53.06V	205.3	140.9mV	54.97V	199.2	124.0mV
19	54.82V	198.2	113.7mV	54.60V	201.7	156.4mV
20	53.57V	198.6	134.4mV	55.13V	208.6	131.1mV
21	54.22V	197.7	124.0mV	53.95V	199.8	122.5mV
22	54.91V	203.7	123.2mV	54.14V	212.8	112.9mV
23	54.18V	207.6	113.3mV	55.06V	205.1	107.7mV
24	52.95V	210.2	127.7mV	54.09V	201.7	137.6mV
25	54.31V	198.8	151.3mV	53.60V	206.0	129.7mV
26	53.15V	207.0	117.6mV	55.64V	205.3	145.8mV
27	53.60V	212.6	149.1mV	53.29V	210.4	149.3mV
28	53.12V	209.1	114.9mV	53.56V	203.9	135.3mV
29	55.07V	209.6	124.5mV	52.39V	210.5	115.5mV
30	53.63V	203.5	130.5mV	54.63V	205.6	120.3mV

SeCoS Corporation

Temperature Cycle Test Data

Report No : T101029-011
Part No : MMBT3904FW
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 40V, 100 < HFE < 300, VCE(sat) < 300mV
Test Condition: -55℃/30min, 150℃/30min, for1000 Cycle
Test Date: 2010.09.02 ~ 2010.10.25
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	54.04V	213.3	122.8mV	53.67V	200.9	125.4mV
32	55.62V	200.4	108.9mV	54.42V	213.1	151.8mV
33	53.21V	204.0	126.6mV	52.51V	202.1	134.6mV
34	53.14V	197.2	134.3mV	54.85V	200.8	120.7mV
35	54.41V	202.8	131.7mV	54.57V	199.5	116.1mV
36	52.68V	201.4	150.7mV	54.60V	201.3	138.1mV
37	54.84V	201.2	157.1mV	52.34V	209.7	146.0mV
38	52.52V	213.0	121.8mV	55.66V	202.0	108.5mV
39	52.94V	212.2	136.6mV	53.06V	197.3	149.3mV
40	54.92V	204.1	146.7mV	54.78V	211.7	153.1mV
41	53.34V	211.2	149.1mV	55.30V	212.9	149.6mV
42	55.55V	200.4	129.2mV	54.88V	205.4	138.3mV
43	52.88V	207.8	138.7mV	53.47V	208.0	118.6mV
44	54.19V	207.2	121.1mV	55.57V	207.7	129.9mV
45	54.10V	209.8	130.3mV	53.68V	207.7	145.5mV
46	55.43V	201.5	136.6mV	54.16V	202.5	142.4mV
47	52.51V	206.1	112.1mV	53.70V	205.6	124.0mV
48	53.79V	200.9	154.7mV	54.46V	211.6	121.7mV
49	54.03V	205.1	135.3mV	52.79V	206.1	126.1mV
50	54.55V	211.5	149.5mV	53.99V	211.9	151.6mV
51	52.37V	197.6	119.7mV	54.64V	198.0	144.3mV
52	52.68V	208.9	139.6mV	54.21V	205.5	136.8mV
53	55.18V	213.0	111.5mV	52.69V	203.2	112.6mV
54	53.78V	199.2	138.9mV	54.84V	206.2	136.3mV
55	55.59V	200.3	135.7mV	53.75V	212.9	148.0mV
56	55.38V	199.3	117.6mV	54.99V	204.5	107.4mV
57	54.17V	209.8	130.0mV	55.00V	208.9	145.7mV
58	53.82V	197.2	138.1mV	54.46V	201.0	156.9mV
59	54.63V	210.7	114.7mV	53.13V	202.6	142.1mV
60	52.53V	203.5	152.0mV	54.35V	201.5	120.5mV

SeCoS Corporation

Temperature Cycle Test Data

Report No : T101029-011
Part No : MMBT3904FW
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 40V, 100 < HFE < 300, VCE(sat) < 300mV
Test Condition: -55℃/30min, 150℃/30min, for1000 Cycle
Test Date: 2010.09.02 ~ 2010.10.25
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	53.43V	203.3	150.3mV	55.36V	207.3	127.6mV
62	53.19V	203.8	126.9mV	55.61V	213.1	138.3mV
63	53.84V	203.3	124.6mV	52.83V	212.3	149.9mV
64	52.97V	198.8	156.5mV	54.97V	204.1	147.8mV
65	55.27V	202.7	113.8mV	52.67V	197.3	147.8mV
66	52.67V	210.9	149.1mV	55.55V	208.2	148.4mV
67	53.89V	202.4	156.3mV	53.34V	199.1	118.5mV
68	55.51V	204.1	123.7mV	54.07V	197.8	132.8mV
69	53.68V	197.3	127.4mV	55.44V	200.9	149.5mV
70	53.88V	200.8	130.6mV	54.94V	200.8	148.7mV
71	55.18V	202.8	111.0mV	52.48V	210.4	107.4mV
72	52.54V	206.2	119.0mV	52.49V	204.2	152.8mV
73	52.50V	210.6	139.5mV	54.22V	202.0	154.0mV
74	55.01V	210.1	123.6mV	53.31V	203.5	112.9mV
75	54.10V	201.3	108.6mV	53.12V	209.9	121.4mV
76	54.56V	200.5	138.0mV	53.59V	198.8	154.4mV
77	53.34V	206.2	149.0mV	53.86V	212.9	123.8mV

Made By: Peter Yang

Approval: Taylor Yang

SeCoS Corporation

High Temperature High Humidity Test Data

Report No : T101029-011
Part No : MMBT3904FW
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 40V, 100 < HFE < 300, VCE(sat) < 300mV
Test Condition: 85±2℃, 85±5%RH, 1000Hrs
Test Date: 2010.09.13 ~ 2010.10.26
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	53.31V	202.0	156.2mV	53.43V	210.0	118.3mV
2	54.09V	206.2	109.1mV	52.62V	211.8	126.3mV
3	53.80V	212.1	125.3mV	54.52V	213.0	132.7mV
4	55.65V	207.9	153.4mV	53.28V	202.9	150.6mV
5	54.56V	210.6	149.8mV	53.48V	210.7	128.9mV
6	52.46V	201.0	144.5mV	54.02V	201.5	142.3mV
7	55.21V	203.1	135.9mV	53.48V	198.6	125.3mV
8	53.06V	201.5	142.9mV	52.99V	201.0	111.9mV
9	52.76V	201.9	120.3mV	54.00V	206.4	131.4mV
10	53.49V	200.3	109.9mV	53.91V	206.2	134.6mV
11	54.29V	203.5	143.0mV	55.18V	198.6	131.9mV
12	54.14V	203.7	147.4mV	54.87V	204.8	111.1mV
13	53.94V	200.3	117.0mV	53.33V	209.0	139.3mV
14	53.82V	210.5	153.3mV	53.47V	198.2	149.7mV
15	53.58V	211.3	156.6mV	53.40V	207.9	109.7mV
16	53.75V	198.8	112.9mV	55.39V	209.4	141.7mV
17	52.59V	206.5	125.8mV	52.55V	208.2	136.4mV
18	53.42V	200.1	129.2mV	53.92V	206.7	137.7mV
19	53.49V	202.4	142.0mV	52.51V	212.0	137.8mV
20	54.63V	213.2	122.2mV	53.03V	209.1	119.8mV
21	54.18V	203.9	108.3mV	55.58V	207.0	133.9mV
22	55.07V	201.0	142.0mV	54.48V	213.2	157.0mV
23	55.30V	197.2	136.1mV	53.33V	198.6	142.5mV
24	54.95V	202.3	141.6mV	55.39V	199.9	109.2mV
25	53.17V	205.1	118.1mV	53.77V	211.5	150.6mV
26	55.13V	201.1	156.5mV	53.04V	197.5	117.2mV
27	52.87V	210.3	127.1mV	52.43V	198.9	121.7mV
28	54.71V	212.8	114.4mV	53.58V	203.9	120.3mV
29	53.59V	206.5	120.7mV	52.47V	199.4	112.8mV
30	55.52V	199.4	133.3mV	54.48V	212.4	113.2mV

SeCoS Corporation

High Temperature High Humidity Test Data

Report No : T101029-011
Part No : MMBT3904FW
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 40V, 100 < HFE < 300, VCE(sat) < 300mV
Test Condition: 85±2℃, 85±5%RH, 1000Hrs
Test Date: 2010.09.13 ~ 2010.10.26
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	52.52V	199.7	126.7mV	55.54V	209.3	112.7mV
32	54.43V	203.1	132.6mV	53.34V	197.2	133.9mV
33	53.23V	197.9	123.1mV	54.95V	199.4	112.1mV
34	55.48V	203.4	116.1mV	54.72V	201.5	107.5mV
35	52.91V	204.4	120.5mV	53.19V	203.8	128.3mV
36	54.56V	207.6	112.0mV	52.31V	199.6	135.4mV
37	53.89V	203.1	129.7mV	53.99V	197.7	143.1mV
38	53.09V	212.8	145.3mV	55.29V	198.0	144.1mV
39	52.91V	198.4	134.1mV	52.69V	201.3	149.1mV
40	52.57V	201.4	118.1mV	55.48V	213.1	118.5mV
41	52.75V	211.8	123.4mV	54.78V	200.9	114.7mV
42	53.09V	204.7	112.8mV	54.49V	210.9	149.9mV
43	55.36V	209.7	120.8mV	52.33V	198.6	142.8mV
44	52.59V	201.7	109.1mV	54.66V	199.9	126.2mV
45	55.12V	202.0	118.7mV	52.45V	197.6	111.2mV
46	53.92V	204.4	134.0mV	52.65V	205.9	111.8mV
47	55.38V	213.1	115.9mV	52.47V	209.6	118.7mV
48	55.32V	213.3	140.7mV	55.35V	201.8	145.8mV
49	53.60V	210.0	124.8mV	55.63V	200.2	132.2mV
50	53.61V	198.4	152.4mV	55.03V	199.7	148.0mV
51	53.15V	201.1	151.8mV	54.79V	209.7	124.5mV
52	53.43V	209.2	148.2mV	54.41V	203.2	134.2mV
53	55.12V	207.1	121.3mV	54.13V	206.6	156.0mV
54	52.91V	203.2	122.9mV	52.94V	206.7	155.4mV
55	53.98V	206.6	151.5mV	55.06V	209.6	117.0mV
56	54.83V	205.9	131.8mV	54.48V	212.9	152.4mV
57	53.77V	202.0	155.0mV	53.52V	205.1	144.1mV
58	55.09V	198.9	151.5mV	54.39V	204.7	117.2mV
59	53.88V	210.2	108.1mV	54.03V	213.2	154.4mV
60	54.14V	203.7	111.0mV	53.88V	210.3	126.2mV

SeCoS Corporation

High Temperature High Humidity Test Data

Report No : T101029-011
Part No : MMBT3904FW
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 40V, 100 < HFE < 300, VCE(sat) < 300mV
Test Condition: 85±2℃, 85±5%RH, 1000Hrs
Test Date: 2010.09.13 ~ 2010.10.26
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	52.49V	208.6	115.5mV	53.62V	198.4	154.3mV
62	53.87V	197.4	144.1mV	55.61V	197.4	140.0mV
63	55.50V	203.3	133.2mV	53.23V	210.7	155.8mV
64	52.28V	204.2	109.6mV	55.33V	208.9	152.6mV
65	55.55V	206.4	135.6mV	54.48V	200.5	122.0mV
66	53.52V	211.8	141.5mV	53.40V	209.3	154.5mV
67	53.39V	205.6	145.2mV	54.48V	208.7	140.2mV
68	54.38V	210.0	118.7mV	55.65V	202.1	117.3mV
69	55.48V	212.5	132.0mV	54.14V	208.4	156.8mV
70	53.75V	201.2	140.8mV	55.21V	207.4	130.5mV
71	54.31V	204.8	108.7mV	52.92V	202.1	140.3mV
72	55.40V	203.2	156.2mV	55.10V	205.4	138.2mV
73	54.74V	212.9	129.0mV	55.41V	209.4	109.3mV
74	52.71V	206.2	109.7mV	53.53V	212.4	149.5mV
75	54.67V	198.8	141.2mV	53.79V	213.1	134.8mV
76	54.98V	207.6	155.5mV	53.80V	202.6	124.1mV
77	55.45V	206.8	136.8mV	54.92V	211.6	114.9mV

Made By: Peter Yang

Approval: Taylor Yang

SeCoS Corporation

High Temper High Humidity Reverse Bies Test Data

Report No : T101029-011
Part No : MMBT3904FW
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 40V, 100 < HFE < 300, VCE(sat) < 300mV
Test Condition: 85±2℃, 85±5%RH, 1000Hrs
Test Date: 2010.09.13 ~ 2010.10.26
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	54.48V	208.4	121.9mV	54.37V	208.6	109.2mV
2	52.91V	208.7	121.7mV	52.48V	200.4	150.4mV
3	53.99V	207.4	114.4mV	53.90V	210.8	132.4mV
4	52.57V	205.4	132.3mV	54.62V	197.9	108.3mV
5	53.50V	212.3	112.8mV	54.07V	210.0	156.9mV
6	52.79V	204.5	114.7mV	53.93V	198.3	149.7mV
7	54.82V	210.3	112.9mV	54.63V	197.5	144.8mV
8	55.10V	210.3	144.8mV	53.18V	211.6	128.6mV
9	55.21V	211.2	141.9mV	54.41V	207.3	131.2mV
10	54.21V	201.4	129.8mV	55.03V	200.3	116.7mV
11	54.38V	203.8	141.2mV	52.57V	209.8	127.0mV
12	54.61V	201.6	141.9mV	53.07V	199.1	138.0mV
13	53.15V	203.4	156.6mV	55.21V	207.1	124.5mV
14	54.29V	205.6	112.7mV	53.44V	212.2	151.9mV
15	55.31V	209.0	155.3mV	52.43V	209.5	126.9mV
16	54.31V	206.7	143.1mV	54.33V	199.6	141.4mV
17	55.36V	201.4	119.6mV	53.78V	205.6	123.7mV
18	55.46V	211.3	149.2mV	54.33V	197.4	133.9mV
19	53.43V	203.2	137.8mV	52.59V	208.0	138.4mV
20	53.61V	201.0	141.5mV	52.70V	203.1	148.1mV
21	55.49V	202.2	148.7mV	52.48V	197.9	120.8mV
22	54.02V	213.2	139.2mV	54.21V	211.7	136.0mV
23	55.53V	205.0	141.7mV	55.12V	198.9	128.3mV
24	52.76V	201.7	143.3mV	53.34V	206.5	149.0mV
25	55.18V	212.8	139.8mV	53.52V	197.9	109.9mV
26	55.16V	203.1	137.0mV	55.56V	203.9	119.7mV
27	53.79V	212.2	114.4mV	52.91V	209.8	155.4mV
28	53.64V	202.0	109.3mV	53.22V	199.2	144.8mV
29	54.43V	200.9	126.1mV	53.34V	202.2	156.0mV
30	54.82V	200.3	132.9mV	55.25V	201.6	126.6mV

SeCoS Corporation

High Temper High Humidity Reverse Bies Test Data

Report No : T101029-011
Part No : MMBT3904FW
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 40V, 100 < HFE < 300, VCE(sat) < 300mV
Test Condition: 85±2℃, 85±5%RH, 1000Hrs
Test Date: 2010.09.13 ~ 2010.10.26
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	53.73V	211.2	139.1mV	55.26V	207.2	125.4mV
32	54.37V	211.8	113.0mV	53.91V	209.7	108.8mV
33	53.46V	212.9	120.5mV	52.38V	200.2	113.2mV
34	53.02V	201.5	146.7mV	54.47V	209.9	134.8mV
35	52.82V	197.5	153.0mV	53.57V	213.2	142.3mV
36	54.96V	212.6	112.9mV	53.10V	203.7	125.2mV
37	53.74V	201.9	147.6mV	54.63V	205.0	132.2mV
38	55.04V	205.4	118.9mV	53.04V	212.9	108.8mV
39	53.43V	211.7	125.0mV	54.43V	212.1	145.1mV
40	54.13V	201.4	140.0mV	52.90V	208.2	109.0mV
41	53.92V	213.3	137.2mV	54.00V	205.3	112.6mV
42	52.58V	197.9	156.9mV	54.53V	211.9	140.4mV
43	55.47V	203.0	153.3mV	53.83V	198.9	138.2mV
44	53.54V	201.3	125.2mV	53.47V	209.5	154.2mV
45	55.17V	203.1	134.9mV	54.42V	201.5	135.4mV
46	53.21V	213.0	140.6mV	52.96V	205.1	144.4mV
47	54.26V	209.5	146.1mV	54.58V	199.0	154.6mV
48	53.38V	202.0	153.4mV	54.40V	212.0	126.4mV
49	52.28V	199.4	109.6mV	55.64V	199.0	120.5mV
50	54.27V	199.5	131.6mV	55.61V	211.8	152.3mV
51	53.65V	202.6	139.4mV	52.55V	198.2	115.6mV
52	52.40V	211.4	111.8mV	55.39V	198.8	116.1mV
53	53.29V	206.2	125.5mV	54.87V	210.8	112.6mV
54	52.30V	208.9	146.2mV	55.02V	206.6	143.7mV
55	53.65V	202.0	124.7mV	54.23V	201.0	109.9mV
56	53.76V	207.8	155.6mV	53.66V	206.1	137.7mV
57	53.44V	209.5	153.1mV	54.08V	209.6	154.0mV
58	53.26V	198.9	111.6mV	54.34V	201.2	149.4mV
59	54.32V	203.2	120.0mV	53.43V	213.2	136.2mV
60	52.78V	198.9	133.0mV	54.80V	212.4	119.1mV

SeCoS Corporation

High Temper High Humidity Reverse Bies Test Data

Report No : T101029-011
Part No : MMBT3904FW
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 40V, 100 < HFE < 300, VCE(sat) < 300mV
Test Condition: 85±2℃, 85±5%RH, 1000Hrs
Test Date: 2010.09.13 ~ 2010.10.26
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	54.38V	202.3	116.5mV	54.12V	199.7	137.6mV
62	54.53V	203.5	156.2mV	53.72V	199.0	129.6mV
63	53.15V	212.1	145.2mV	52.91V	202.1	112.4mV
64	54.41V	205.0	153.1mV	53.38V	199.2	134.7mV
65	52.82V	199.4	140.9mV	52.31V	199.3	148.6mV
66	54.90V	212.3	156.7mV	54.68V	204.9	145.5mV
67	53.13V	197.3	127.4mV	55.54V	204.3	133.5mV
68	55.52V	201.9	115.8mV	53.89V	209.2	109.3mV
69	54.27V	211.4	126.3mV	54.05V	210.5	107.6mV
70	54.27V	212.9	145.7mV	54.11V	198.7	155.3mV
71	55.03V	203.1	133.6mV	53.28V	208.0	155.5mV
72	53.31V	207.1	111.5mV	54.51V	205.2	156.9mV
73	55.30V	204.8	119.5mV	55.51V	205.0	110.4mV
74	54.83V	208.9	152.7mV	52.46V	209.7	135.7mV
75	52.42V	203.7	107.5mV	52.71V	208.3	143.9mV
76	53.75V	206.8	138.9mV	55.45V	209.8	142.7mV
77	52.74V	205.0	116.0mV	52.74V	203.3	150.2mV

Made By: Peter Yang

Approval: Taylor Yang

SeCoS Corporation

Solderability Test Data

Report No : T101029-011
Part No : MMBT3904FW
Test Equipment: JUNO Test System DTS-1000
Test Condition : V(BR)CEO > 40V, 100 < HFE < 300, VCE(sat) < 300mV
Test Condition: 245℃ ± 5℃, 5Sec
Test Date: 2010.10.28 ~ 2010.10.28
Test Standard : JESD22 STANDER Method-B102
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	53.92V	210.3	112.1mV	55.29V	212.0	153.6mV
2	52.52V	209.0	115.4mV	54.02V	206.7	134.0mV
3	54.17V	213.1	112.4mV	54.50V	211.0	124.9mV
4	55.07V	208.7	125.2mV	54.10V	205.9	152.2mV
5	53.42V	208.3	114.3mV	53.74V	210.5	143.2mV
6	55.16V	208.7	114.8mV	54.60V	197.5	115.8mV
7	52.86V	209.6	134.6mV	53.29V	208.7	152.0mV
8	54.20V	200.7	143.6mV	53.16V	206.1	140.2mV
9	52.46V	203.8	114.1mV	52.49V	198.3	142.5mV
10	53.99V	197.3	151.2mV	52.39V	209.4	124.8mV

Made By: Peter Yang

Approval: Taylor Yang