www.SeCosGmbH.com

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 |
|---|---|---|
| 2014-01-01C-02 | 2014/1/1 | 2014/1/1 |

| PCN Classification | Product Category |
|---|---|
| Major | SMB Package |

**Subject**

Add lead frame vendor

**Affected Product(s)**

SMB Package

**Description of Change(s)**

In order to avoid shortage of material, and enhance the speed of delivery, thus, we add a new vendor.

**Content of Change(s)**

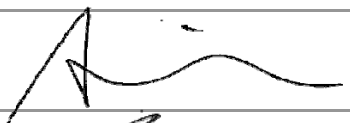
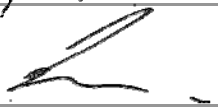
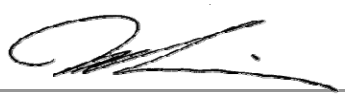
add a new lead frame vendor

**Impact(s)**

None

**Attachment(s)**

Reliability test report. SGS report.

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

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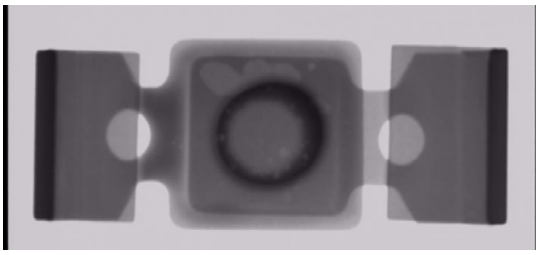
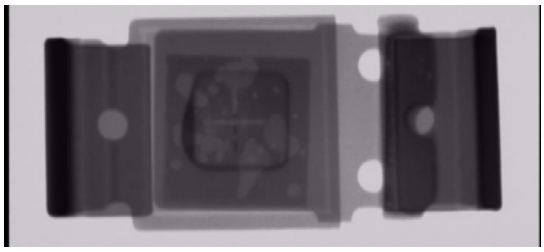
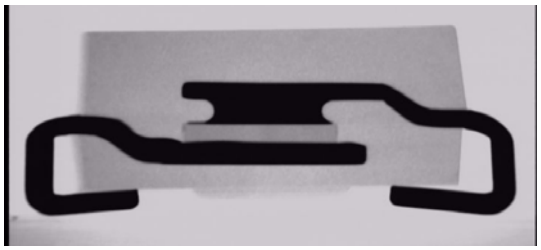
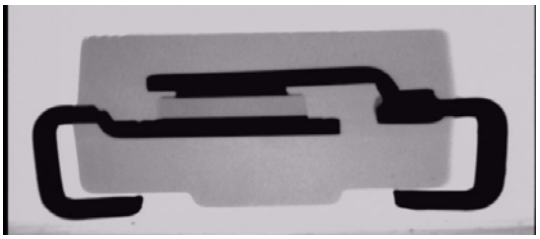
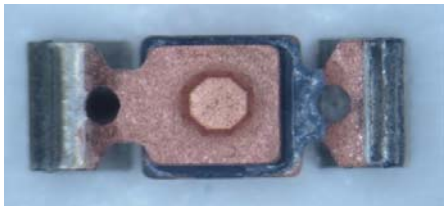
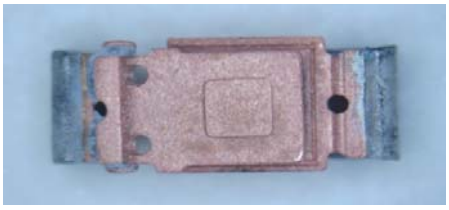
| Exterior comparison Chart | |
|---|---|
| SMB Package | |
| Original | News |
|  Top View |  Top View |
|  Lateral View |  Lateral View |
|  Top View |  Top View |
|  Lateral View |  Lateral View |

# SeCoS Corporation

## Reliability Testing Summary Report

Date: 2013/11/30 Document No.: SG13 -11- 14

| Test Item | P/N | Test Condition | (LTPD) | Sample Numbers | Allow Fall Numbers | Fall Numbers | Result |
|---|---|---|---|---|---|---|---|
| HTRB<br>High Temp<br>Reverse Bias | ES23B | 100 ± 5℃,<br>80%VR,<br>T = 1000hrs | | 77 | 0 | 0 | ACC |
| HTSL<br>High<br>Temperature<br>Storage Life | ES23B | 150℃,<br>T = 1000hrs | | 77 | 0 | 0 | ACC |
| PCT<br>Pressure Cooker<br>Test | ES23B | 121℃, 29.7PSIG,<br>RH = 100%,<br>T = 168 hrs | | 77 | 0 | 0 | ACC |
| TCT<br>Temperature<br>Cycle Test | ES23B | -55℃/30min,<br>150℃/30min,<br>For 1000 Cycle | | 77 | 0 | 0 | ACC |
| THT<br>High<br>Temperature<br>High Humidity<br>Test | ES23B | 85 ± 2℃,<br>RH = 85 ± 5%,<br>1000 hrs | | 77 | 0 | 0 | ACC |
| H3TRB<br>High Temper<br>High Humidity<br>Reverse Bies Test | ES23B | 85 ± 2℃,<br>RH = 85 ± 5%,<br>80%VR,<br>T = 1000 hrs | | 77 | 0 | 0 | ACC |
| Solderability | ES23B | 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: 2013.10.01 Testing End Date: 2013.11.30**

**Tester: Leo Hsia Approval: Peter Yang**

# SeCoS Corporation

## Electrical Test Data

Report No : T131130-014
Part No : ES23B
Test Equipment: JUNO Test System DTS-1000
Test Condition : VF<0.9V@IF=2A, IR<5uA@VR=200V
Test Condition: 25℃
Test Date: 2013.10.01 ~ 2013.10.01
Test Standard : Specifications
Operator: Leo Hsia

Test Result: PASS

| No | VF (mV) | IR (uA) |
|---|---|---|
| 1 | 870mV | 0.564uA |
| 2 | 879mV | 0.575uA |
| 3 | 886mV | 0.412uA |
| 4 | 872mV | 0.604uA |
| 5 | 865mV | 0.608uA |
| 6 | 858mV | 0.020uA |
| 7 | 874mV | 0.046uA |
| 8 | 882mV | 0.344uA |
| 9 | 859mV | 0.625uA |
| 10 | 870mV | 0.233uA |
| 11 | 884mV | 0.337uA |
| 12 | 859mV | 0.168uA |
| 13 | 877mV | 0.469uA |
| 14 | 866mV | 0.227uA |
| 15 | 868mV | 0.163uA |
| 16 | 859mV | 0.538uA |
| 17 | 875mV | 0.213uA |
| 18 | 872mV | 0.369uA |
| 19 | 870mV | 0.199uA |
| 20 | 875mV | 0.303uA |
| 21 | 867mV | 0.292uA |
| 22 | 878mV | 0.321uA |
| 23 | 881mV | 0.458uA |
| 24 | 873mV | 0.434uA |
| 25 | 871mV | 0.426uA |
| 26 | 878mV | 0.219uA |
| 27 | 878mV | 0.609uA |
| 28 | 879mV | 0.218uA |
| 29 | 864mV | 0.066uA |
| 30 | 876mV | 0.289uA |
| 31 | 889mV | 0.475uA |

# SeCoS Corporation

## Electrical Test Data

Report No : T131130-014
Part No : ES23B
Test Equipment: JUNO Test System DTS-1000
Test Condition : VF<0.9V@IF=2A, IR<5uA@VR=200V
Test Condition: 25℃
Test Date: 2013.10.01 ~ 2013.10.01
Test Standard : Specifications
Operator: Leo Hsia

Test Result: PASS

| No | VF (mV) | IR (uA) |
|---|---|---|
| 32 | 869mV | 0.170uA |
| 33 | 871mV | 0.470uA |
| 34 | 858mV | 0.376uA |
| 35 | 889mV | 0.590uA |
| 36 | 865mV | 0.435uA |
| 37 | 874mV | 0.407uA |
| 38 | 891mV | 0.545uA |
| 39 | 888mV | 0.046uA |
| 40 | 888mV | 0.012uA |
| 41 | 873mV | 0.152uA |
| 42 | 886mV | 0.395uA |
| 43 | 863mV | 0.049uA |
| 44 | 891mV | 0.092uA |
| 45 | 881mV | 0.301uA |
| 46 | 877mV | 0.179uA |
| 47 | 862mV | 0.181uA |
| 48 | 873mV | 0.425uA |
| 49 | 872mV | 0.295uA |
| 50 | 860mV | 0.379uA |
| 51 | 885mV | 0.366uA |
| 52 | 888mV | 0.351uA |
| 53 | 862mV | 0.519uA |
| 54 | 885mV | 0.060uA |
| 55 | 880mV | 0.354uA |
| 56 | 873mV | 0.340uA |
| 57 | 874mV | 0.199uA |
| 58 | 887mV | 0.439uA |
| 59 | 877mV | 0.202uA |
| 60 | 885mV | 0.440uA |
| 61 | 889mV | 0.558uA |
| 62 | 884mV | 0.186uA |

# SeCoS Corporation

## Electrical Test Data

Report No : T131130-014
Part No : ES23B
Test Equipment: JUNO Test System DTS-1000
Test Condition : VF<0.9V@IF=2A, IR<5uA@VR=200V
Test Condition: 25℃
Test Date: 2013.10.01 ~ 2013.10.01
Test Standard : Specifications
Operator: Leo Hsia

Test Result: PASS

| No | VF (mV) | IR (uA) |
|---|---|---|
| 63 | 869mV | 0.081uA |
| 64 | 873mV | 0.553uA |
| 65 | 882mV | 0.508uA |
| 66 | 881mV | 0.105uA |
| 67 | 862mV | 0.064uA |
| 68 | 868mV | 0.143uA |
| 69 | 882mV | 0.027uA |
| 70 | 872mV | 0.573uA |
| 71 | 873mV | 0.633uA |
| 72 | 868mV | 0.188uA |
| 73 | 867mV | 0.525uA |
| 74 | 882mV | 0.367uA |
| 75 | 870mV | 0.324uA |
| 76 | 868mV | 0.213uA |
| 77 | 865mV | 0.159uA |

Made By: Leo Hsia  Approval: Peter Yang

# SeCoS Corporation

## High Temperature Reverse Bias Test Data

Report No : T131130-014
Part No : ES23B
Test Equipment: JUNO Test System DTS-1000
Test Condition : VF<0.9V@IF=2A, IR<5uA@VR=200V
Test Condition: 100 ± 5℃, 80%VR, T = 1000 hrs
Test Date: 2013.10.02 ~ 2013.11.13
Test Standard : JESD22 STANDER Method-A108
Operator: Leo Hsia

Test Result: PASS

| | Before | | After | |
|---|---|---|---|---|
| No | VF (mV) | IR (uA) | VF (mV) | IR (uA) |
| 1 | 859mV | 0.129uA | 873mV | 0.127uA |
| 2 | 869mV | 0.006uA | 874mV | 0.628uA |
| 3 | 885mV | 0.060uA | 868mV | 0.531uA |
| 4 | 890mV | 0.173uA | 866mV | 0.297uA |
| 5 | 858mV | 0.278uA | 867mV | 0.359uA |
| 6 | 884mV | 0.162uA | 875mV | 0.253uA |
| 7 | 885mV | 0.104uA | 864mV | 0.233uA |
| 8 | 879mV | 0.544uA | 871mV | 0.477uA |
| 9 | 859mV | 0.210uA | 859mV | 0.458uA |
| 10 | 869mV | 0.543uA | 865mV | 0.511uA |
| 11 | 888mV | 0.592uA | 875mV | 0.290uA |
| 12 | 889mV | 0.168uA | 872mV | 0.609uA |
| 13 | 885mV | 0.024uA | 868mV | 0.248uA |
| 14 | 875mV | 0.074uA | 889mV | 0.097uA |
| 15 | 885mV | 0.605uA | 876mV | 0.334uA |
| 16 | 859mV | 0.239uA | 872mV | 0.258uA |
| 17 | 879mV | 0.093uA | 870mV | 0.463uA |
| 18 | 874mV | 0.522uA | 882mV | 0.480uA |
| 19 | 878mV | 0.162uA | 861mV | 0.183uA |
| 20 | 876mV | 0.531uA | 873mV | 0.236uA |
| 21 | 883mV | 0.175uA | 873mV | 0.470uA |
| 22 | 876mV | 0.202uA | 870mV | 0.585uA |
| 23 | 870mV | 0.108uA | 877mV | 0.521uA |
| 24 | 888mV | 0.501uA | 870mV | 0.245uA |
| 25 | 878mV | 0.071uA | 876mV | 0.508uA |
| 26 | 874mV | 0.317uA | 862mV | 0.349uA |
| 27 | 871mV | 0.497uA | 884mV | 0.200uA |
| 28 | 861mV | 0.619uA | 868mV | 0.371uA |
| 29 | 884mV | 0.043uA | 884mV | 0.221uA |
| 30 | 886mV | 0.089uA | 864mV | 0.443uA |

# SeCoS Corporation

## High Temperature Reverse Bias Test Data

Report No : T131130-014
Part No : ES23B
Test Equipment: JUNO Test System DTS-1000
Test Condition : VF<0.9V@IF=2A, IR<5uA@VR=200V
Test Condition: 100 ± 5℃, 80%VR, T = 1000 hrs
Test Date: 2013.10.02 ~ 2013.11.13
Test Standard : JESD22 STANDER Method-A108
Operator: Leo Hsia

Test Result: PASS

| | Before | | After | |
|---|---|---|---|---|
| No | VF (mV) | IR (uA) | VF (mV) | IR (uA) |
| 31 | 869mV | 0.402uA | 866mV | 0.236uA |
| 32 | 885mV | 0.474uA | 866mV | 0.193uA |
| 33 | 876mV | 0.642uA | 865mV | 0.464uA |
| 34 | 877mV | 0.280uA | 863mV | 0.360uA |
| 35 | 872mV | 0.511uA | 860mV | 0.111uA |
| 36 | 874mV | 0.242uA | 858mV | 0.024uA |
| 37 | 871mV | 0.244uA | 890mV | 0.190uA |
| 38 | 866mV | 0.038uA | 859mV | 0.106uA |
| 39 | 879mV | 0.313uA | 878mV | 0.272uA |
| 40 | 862mV | 0.300uA | 890mV | 0.106uA |
| 41 | 872mV | 0.232uA | 879mV | 0.440uA |
| 42 | 880mV | 0.298uA | 881mV | 0.112uA |
| 43 | 889mV | 0.215uA | 859mV | 0.334uA |
| 44 | 864mV | 0.185uA | 884mV | 0.267uA |
| 45 | 881mV | 0.060uA | 872mV | 0.622uA |
| 46 | 887mV | 0.534uA | 868mV | 0.589uA |
| 47 | 858mV | 0.343uA | 858mV | 0.427uA |
| 48 | 861mV | 0.355uA | 885mV | 0.510uA |
| 49 | 879mV | 0.026uA | 868mV | 0.325uA |
| 50 | 884mV | 0.491uA | 883mV | 0.334uA |
| 51 | 888mV | 0.558uA | 880mV | 0.617uA |
| 52 | 866mV | 0.608uA | 888mV | 0.173uA |
| 53 | 866mV | 0.278uA | 877mV | 0.443uA |
| 54 | 888mV | 0.072uA | 862mV | 0.385uA |
| 55 | 879mV | 0.550uA | 886mV | 0.333uA |
| 56 | 891mV | 0.632uA | 864mV | 0.097uA |
| 57 | 874mV | 0.131uA | 880mV | 0.338uA |
| 58 | 863mV | 0.056uA | 877mV | 0.494uA |
| 59 | 887mV | 0.530uA | 859mV | 0.559uA |
| 60 | 874mV | 0.237uA | 887mV | 0.087uA |

# SeCoS Corporation

## High Temperature Reverse Bias Test Data

Report No : T131130-014
Part No : ES23B
Test Equipment: JUNO Test System DTS-1000
Test Condition : VF<0.9V@IF=2A, IR<5uA@VR=200V
Test Condition: 100 ± 5℃, 80%VR, T = 1000 hrs
Test Date: 2013.10.02 ~ 2013.11.13
Test Standard : JESD22 STANDER Method-A108
Operator: Leo Hsia

Test Result: PASS

| | Before | | After | |
|---|---|---|---|---|
| No | VF (mV) | IR (uA) | VF (mV) | IR (uA) |
| 61 | 864mV | 0.446uA | 870mV | 0.296uA |
| 62 | 870mV | 0.287uA | 872mV | 0.255uA |
| 63 | 860mV | 0.506uA | 885mV | 0.065uA |
| 64 | 886mV | 0.623uA | 882mV | 0.513uA |
| 65 | 864mV | 0.455uA | 865mV | 0.600uA |
| 66 | 875mV | 0.212uA | 860mV | 0.604uA |
| 67 | 881mV | 0.280uA | 870mV | 0.143uA |
| 68 | 888mV | 0.177uA | 868mV | 0.325uA |
| 69 | 885mV | 0.423uA | 864mV | 0.362uA |
| 70 | 873mV | 0.420uA | 869mV | 0.268uA |
| 71 | 870mV | 0.599uA | 880mV | 0.020uA |
| 72 | 889mV | 0.210uA | 867mV | 0.640uA |
| 73 | 875mV | 0.465uA | 884mV | 0.617uA |
| 74 | 862mV | 0.632uA | 870mV | 0.514uA |
| 75 | 884mV | 0.312uA | 860mV | 0.419uA |
| 76 | 879mV | 0.562uA | 877mV | 0.089uA |
| 77 | 882mV | 0.339uA | 876mV | 0.287uA |

Made By: Leo Hsia

Approval: Peter Yang

# SeCoS Corporation

## High Temperature Storage Life Test Data

Report No : T131130-014
Part No : ES23B
Test Equipment: JUNO Test System DTS-1000
Test Condition : VF<0.9V@IF=2A, IR<5uA@VR=200V
Test Condition: 150℃, 1000Hrs
Test Date: 2013.10.09 ~ 2013.11.20
Test Standard : JESD22 STANDER Method-A103
Operator: Leo Hsia

Test Result: PASS

| | Before | | After | |
|---|---|---|---|---|
| No | VF (mV) | IR (uA) | VF (mV) | IR (uA) |
| 1 | 872mV | 0.570uA | 886mV | 0.313uA |
| 2 | 879mV | 0.556uA | 876mV | 0.601uA |
| 3 | 871mV | 0.328uA | 875mV | 0.598uA |
| 4 | 868mV | 0.447uA | 885mV | 0.584uA |
| 5 | 865mV | 0.118uA | 874mV | 0.556uA |
| 6 | 886mV | 0.519uA | 877mV | 0.058uA |
| 7 | 860mV | 0.063uA | 880mV | 0.239uA |
| 8 | 874mV | 0.270uA | 872mV | 0.566uA |
| 9 | 863mV | 0.533uA | 890mV | 0.348uA |
| 10 | 868mV | 0.397uA | 874mV | 0.128uA |
| 11 | 865mV | 0.581uA | 873mV | 0.348uA |
| 12 | 863mV | 0.402uA | 868mV | 0.340uA |
| 13 | 891mV | 0.300uA | 889mV | 0.140uA |
| 14 | 879mV | 0.098uA | 858mV | 0.463uA |
| 15 | 888mV | 0.021uA | 859mV | 0.356uA |
| 16 | 859mV | 0.473uA | 875mV | 0.320uA |
| 17 | 881mV | 0.052uA | 874mV | 0.399uA |
| 18 | 874mV | 0.365uA | 884mV | 0.189uA |
| 19 | 864mV | 0.179uA | 870mV | 0.283uA |
| 20 | 882mV | 0.548uA | 887mV | 0.617uA |
| 21 | 866mV | 0.257uA | 861mV | 0.114uA |
| 22 | 890mV | 0.579uA | 886mV | 0.138uA |
| 23 | 886mV | 0.316uA | 880mV | 0.462uA |
| 24 | 880mV | 0.223uA | 861mV | 0.008uA |
| 25 | 867mV | 0.600uA | 868mV | 0.641uA |
| 26 | 868mV | 0.361uA | 866mV | 0.213uA |
| 27 | 885mV | 0.291uA | 878mV | 0.418uA |
| 28 | 879mV | 0.531uA | 866mV | 0.459uA |
| 29 | 891mV | 0.045uA | 879mV | 0.028uA |
| 30 | 878mV | 0.539uA | 884mV | 0.447uA |

# SeCoS Corporation

## High Temperature Storage Life Test Data

Report No : T131130-014
Part No : ES23B
Test Equipment: JUNO Test System DTS-1000
Test Condition : VF<0.9V@IF=2A, IR<5uA@VR=200V
Test Condition: 150℃, 1000Hrs
Test Date: 2013.10.09 ~ 2013.11.20
Test Standard : JESD22 STANDER Method-A103
Operator: Leo Hsia

Test Result: PASS

| | Before | | After | |
|---|---|---|---|---|
| No | VF (mV) | IR (uA) | VF (mV) | IR (uA) |
| 31 | 860mV | 0.141uA | 873mV | 0.592uA |
| 32 | 887mV | 0.149uA | 877mV | 0.096uA |
| 33 | 877mV | 0.603uA | 884mV | 0.349uA |
| 34 | 880mV | 0.524uA | 880mV | 0.319uA |
| 35 | 871mV | 0.467uA | 860mV | 0.375uA |
| 36 | 891mV | 0.575uA | 876mV | 0.044uA |
| 37 | 886mV | 0.277uA | 878mV | 0.261uA |
| 38 | 873mV | 0.409uA | 868mV | 0.587uA |
| 39 | 882mV | 0.523uA | 888mV | 0.033uA |
| 40 | 875mV | 0.220uA | 885mV | 0.605uA |
| 41 | 874mV | 0.540uA | 865mV | 0.035uA |
| 42 | 872mV | 0.347uA | 880mV | 0.515uA |
| 43 | 875mV | 0.635uA | 891mV | 0.213uA |
| 44 | 886mV | 0.419uA | 879mV | 0.128uA |
| 45 | 874mV | 0.318uA | 883mV | 0.267uA |
| 46 | 867mV | 0.319uA | 870mV | 0.548uA |
| 47 | 862mV | 0.228uA | 860mV | 0.629uA |
| 48 | 875mV | 0.117uA | 886mV | 0.215uA |
| 49 | 867mV | 0.471uA | 876mV | 0.592uA |
| 50 | 861mV | 0.368uA | 886mV | 0.106uA |
| 51 | 858mV | 0.296uA | 876mV | 0.287uA |
| 52 | 887mV | 0.082uA | 879mV | 0.447uA |
| 53 | 867mV | 0.087uA | 869mV | 0.605uA |
| 54 | 869mV | 0.588uA | 869mV | 0.630uA |
| 55 | 881mV | 0.084uA | 882mV | 0.425uA |
| 56 | 873mV | 0.370uA | 887mV | 0.007uA |
| 57 | 865mV | 0.612uA | 861mV | 0.536uA |
| 58 | 883mV | 0.032uA | 869mV | 0.624uA |
| 59 | 863mV | 0.156uA | 872mV | 0.241uA |
| 60 | 881mV | 0.126uA | 872mV | 0.052uA |

# SeCoS Corporation

## High Temperature Storage Life Test Data

Report No : T131130-014
Part No : ES23B
Test Equipment: JUNO Test System DTS-1000
Test Condition : VF<0.9V@IF=2A, IR<5uA@VR=200V
Test Condition: 150℃, 1000Hrs
Test Date: 2013.10.09 ~ 2013.11.20
Test Standard : JESD22 STANDER Method-A103
Operator: Leo Hsia

Test Result: PASS

| | Before | | After | |
|---|---|---|---|---|
| No | VF (mV) | IR (uA) | VF (mV) | IR (uA) |
| 61 | 864mV | 0.321uA | 882mV | 0.640uA |
| 62 | 869mV | 0.540uA | 881mV | 0.612uA |
| 63 | 874mV | 0.183uA | 878mV | 0.023uA |
| 64 | 883mV | 0.340uA | 884mV | 0.533uA |
| 65 | 889mV | 0.535uA | 866mV | 0.371uA |
| 66 | 876mV | 0.583uA | 872mV | 0.500uA |
| 67 | 873mV | 0.105uA | 861mV | 0.458uA |
| 68 | 858mV | 0.586uA | 890mV | 0.637uA |
| 69 | 879mV | 0.505uA | 879mV | 0.284uA |
| 70 | 862mV | 0.217uA | 860mV | 0.030uA |
| 71 | 889mV | 0.561uA | 886mV | 0.545uA |
| 72 | 888mV | 0.108uA | 882mV | 0.545uA |
| 73 | 866mV | 0.422uA | 865mV | 0.223uA |
| 74 | 890mV | 0.248uA | 879mV | 0.106uA |
| 75 | 872mV | 0.504uA | 881mV | 0.037uA |
| 76 | 889mV | 0.216uA | 874mV | 0.292uA |
| 77 | 881mV | 0.264uA | 887mV | 0.388uA |

Made By: Leo Hsia

Approval: Peter Yang

# SeCoS Corporation

## Pressure Cooker Test Data

Report No : T131130-014
Part No : ES23B
Test Equipment: JUNO Test System DTS-1000
Test Condition : VF<0.9V@IF=2A, IR<5uA@VR=200V
Test Condition: 121℃, 100%RH, 29.7PSIG, 168Hrs
Test Date: 2013.10.21 ~ 2013.10.29
Test Standard : JESD22 STANDER Method-A102
Operator: Leo Hsia

Test Result: PASS

| | Before | | After | |
|---|---|---|---|---|
| No | VF (mV) | IR (uA) | VF (mV) | IR (uA) |
| 1 | 872mV | 0.413uA | 869mV | 0.024uA |
| 2 | 860mV | 0.096uA | 862mV | 0.399uA |
| 3 | 873mV | 0.303uA | 871mV | 0.392uA |
| 4 | 865mV | 0.513uA | 869mV | 0.009uA |
| 5 | 861mV | 0.592uA | 879mV | 0.324uA |
| 6 | 862mV | 0.335uA | 863mV | 0.333uA |
| 7 | 871mV | 0.637uA | 885mV | 0.543uA |
| 8 | 859mV | 0.060uA | 880mV | 0.400uA |
| 9 | 887mV | 0.511uA | 882mV | 0.377uA |
| 10 | 873mV | 0.534uA | 874mV | 0.078uA |
| 11 | 882mV | 0.007uA | 861mV | 0.474uA |
| 12 | 866mV | 0.348uA | 891mV | 0.094uA |
| 13 | 881mV | 0.305uA | 860mV | 0.232uA |
| 14 | 859mV | 0.396uA | 860mV | 0.421uA |
| 15 | 876mV | 0.297uA | 873mV | 0.055uA |
| 16 | 890mV | 0.564uA | 858mV | 0.155uA |
| 17 | 882mV | 0.156uA | 883mV | 0.224uA |
| 18 | 883mV | 0.486uA | 859mV | 0.463uA |
| 19 | 882mV | 0.010uA | 862mV | 0.638uA |
| 20 | 865mV | 0.470uA | 879mV | 0.580uA |
| 21 | 887mV | 0.356uA | 874mV | 0.086uA |
| 22 | 889mV | 0.218uA | 888mV | 0.035uA |
| 23 | 882mV | 0.289uA | 869mV | 0.142uA |
| 24 | 877mV | 0.322uA | 866mV | 0.320uA |
| 25 | 859mV | 0.182uA | 877mV | 0.530uA |
| 26 | 858mV | 0.489uA | 874mV | 0.361uA |
| 27 | 871mV | 0.063uA | 861mV | 0.037uA |
| 28 | 890mV | 0.174uA | 885mV | 0.371uA |
| 29 | 887mV | 0.398uA | 882mV | 0.628uA |
| 30 | 872mV | 0.136uA | 862mV | 0.018uA |

# SeCoS Corporation

## Pressure Cooker Test Data

Report No : T131130-014
Part No : ES23B
Test Equipment: JUNO Test System DTS-1000
Test Condition : VF<0.9V@IF=2A, IR<5uA@VR=200V
Test Condition: 121℃, 100%RH, 29.7PSIG, 168Hrs
Test Date: 2013.10.21 ~ 2013.10.29
Test Standard : JESD22 STANDER Method-A102
Operator: Leo Hsia

Test Result: PASS

| | Before | | After | |
|---|---|---|---|---|
| No | VF (mV) | IR (uA) | VF (mV) | IR (uA) |
| 31 | 870mV | 0.039uA | 860mV | 0.359uA |
| 32 | 874mV | 0.247uA | 876mV | 0.034uA |
| 33 | 870mV | 0.024uA | 861mV | 0.460uA |
| 34 | 874mV | 0.259uA | 867mV | 0.169uA |
| 35 | 883mV | 0.012uA | 881mV | 0.194uA |
| 36 | 875mV | 0.606uA | 872mV | 0.300uA |
| 37 | 880mV | 0.528uA | 888mV | 0.551uA |
| 38 | 863mV | 0.290uA | 866mV | 0.110uA |
| 39 | 871mV | 0.015uA | 863mV | 0.119uA |
| 40 | 864mV | 0.485uA | 878mV | 0.498uA |
| 41 | 880mV | 0.063uA | 882mV | 0.585uA |
| 42 | 882mV | 0.372uA | 869mV | 0.313uA |
| 43 | 883mV | 0.443uA | 871mV | 0.576uA |
| 44 | 882mV | 0.027uA | 879mV | 0.471uA |
| 45 | 883mV | 0.367uA | 863mV | 0.323uA |
| 46 | 875mV | 0.398uA | 865mV | 0.104uA |
| 47 | 891mV | 0.396uA | 873mV | 0.618uA |
| 48 | 883mV | 0.051uA | 870mV | 0.610uA |
| 49 | 862mV | 0.039uA | 885mV | 0.428uA |
| 50 | 889mV | 0.512uA | 869mV | 0.473uA |
| 51 | 887mV | 0.517uA | 887mV | 0.462uA |
| 52 | 883mV | 0.054uA | 889mV | 0.604uA |
| 53 | 879mV | 0.385uA | 859mV | 0.632uA |
| 54 | 868mV | 0.574uA | 865mV | 0.556uA |
| 55 | 865mV | 0.176uA | 871mV | 0.568uA |
| 56 | 874mV | 0.270uA | 886mV | 0.376uA |
| 57 | 865mV | 0.020uA | 875mV | 0.097uA |
| 58 | 883mV | 0.393uA | 872mV | 0.585uA |
| 59 | 874mV | 0.384uA | 880mV | 0.558uA |
| 60 | 877mV | 0.511uA | 874mV | 0.241uA |

# SeCoS Corporation

## Pressure Cooker Test Data

Report No : T131130-014
Part No : ES23B
Test Equipment: JUNO Test System DTS-1000
Test Condition : VF<0.9V@IF=2A, IR<5uA@VR=200V
Test Condition: 121℃, 100%RH, 29.7PSIG, 168Hrs
Test Date: 2013.10.21 ~ 2013.10.29
Test Standard : JESD22 STANDER Method-A102
Operator: Leo Hsia

Test Result: PASS

| | Before | | After | |
|---|---|---|---|---|
| No | VF (mV) | IR (uA) | VF (mV) | IR (uA) |
| 61 | 884mV | 0.431uA | 878mV | 0.080uA |
| 62 | 868mV | 0.640uA | 878mV | 0.466uA |
| 63 | 875mV | 0.331uA | 878mV | 0.200uA |
| 64 | 873mV | 0.397uA | 862mV | 0.375uA |
| 65 | 876mV | 0.301uA | 890mV | 0.569uA |
| 66 | 869mV | 0.455uA | 879mV | 0.355uA |
| 67 | 867mV | 0.636uA | 874mV | 0.216uA |
| 68 | 863mV | 0.557uA | 862mV | 0.268uA |
| 69 | 878mV | 0.431uA | 884mV | 0.630uA |
| 70 | 875mV | 0.577uA | 867mV | 0.115uA |
| 71 | 877mV | 0.573uA | 862mV | 0.124uA |
| 72 | 865mV | 0.619uA | 863mV | 0.619uA |
| 73 | 871mV | 0.213uA | 868mV | 0.643uA |
| 74 | 863mV | 0.068uA | 874mV | 0.347uA |
| 75 | 876mV | 0.262uA | 865mV | 0.059uA |
| 76 | 877mV | 0.464uA | 887mV | 0.604uA |
| 77 | 880mV | 0.163uA | 866mV | 0.593uA |

Made By: Leo Hsia

Approval: Peter Yang

# SeCoS Corporation

## Temperature Cycle Test Data

Report No : T131130-014
Part No : ES23B
Test Equipment: JUNO Test System DTS-1000
Test Condition : VF<0.9V@IF=2A, IR<5uA@VR=200V
Test Condition: -55℃/30min, 150℃/30min, for1000 Cycle
Test Date: 2013.10.02 ~ 2013.11.23
Test Standard : JESD22 STANDER Method-A104
Operator: Leo Hsia

Test Result: PASS

| | Before | | After | |
|---|---|---|---|---|
| No | VF (mV) | IR (uA) | VF (mV) | IR (uA) |
| 1 | 863mV | 0.469uA | 881mV | 0.600uA |
| 2 | 864mV | 0.030uA | 864mV | 0.608uA |
| 3 | 858mV | 0.123uA | 880mV | 0.017uA |
| 4 | 861mV | 0.634uA | 868mV | 0.130uA |
| 5 | 859mV | 0.529uA | 876mV | 0.474uA |
| 6 | 882mV | 0.116uA | 887mV | 0.511uA |
| 7 | 864mV | 0.450uA | 871mV | 0.188uA |
| 8 | 882mV | 0.114uA | 869mV | 0.450uA |
| 9 | 873mV | 0.009uA | 891mV | 0.603uA |
| 10 | 884mV | 0.443uA | 885mV | 0.064uA |
| 11 | 889mV | 0.166uA | 882mV | 0.460uA |
| 12 | 858mV | 0.178uA | 883mV | 0.203uA |
| 13 | 888mV | 0.237uA | 872mV | 0.372uA |
| 14 | 874mV | 0.615uA | 862mV | 0.259uA |
| 15 | 868mV | 0.351uA | 866mV | 0.328uA |
| 16 | 872mV | 0.160uA | 864mV | 0.468uA |
| 17 | 874mV | 0.052uA | 881mV | 0.433uA |
| 18 | 872mV | 0.625uA | 886mV | 0.117uA |
| 19 | 866mV | 0.151uA | 884mV | 0.398uA |
| 20 | 876mV | 0.612uA | 862mV | 0.312uA |
| 21 | 889mV | 0.248uA | 877mV | 0.287uA |
| 22 | 872mV | 0.421uA | 888mV | 0.245uA |
| 23 | 884mV | 0.419uA | 863mV | 0.455uA |
| 24 | 874mV | 0.455uA | 881mV | 0.307uA |
| 25 | 876mV | 0.598uA | 888mV | 0.306uA |
| 26 | 870mV | 0.041uA | 887mV | 0.023uA |
| 27 | 875mV | 0.539uA | 885mV | 0.607uA |
| 28 | 860mV | 0.046uA | 887mV | 0.517uA |
| 29 | 889mV | 0.093uA | 882mV | 0.623uA |
| 30 | 859mV | 0.162uA | 867mV | 0.480uA |

# SeCoS Corporation

## Temperature Cycle Test Data

Report No : T131130-014
Part No : ES23B
Test Equipment: JUNO Test System DTS-1000
Test Condition : VF<0.9V@IF=2A, IR<5uA@VR=200V
Test Condition: -55℃/30min, 150℃/30min, for1000 Cycle
Test Date: 2013.10.02 ~ 2013.11.23
Test Standard : JESD22 STANDER Method-A104
Operator: Leo Hsia

Test Result: PASS

| | Before | | After | |
|---|---|---|---|---|
| No | VF (mV) | IR (uA) | VF (mV) | IR (uA) |
| 31 | 872mV | 0.023uA | 883mV | 0.032uA |
| 32 | 861mV | 0.633uA | 867mV | 0.597uA |
| 33 | 864mV | 0.384uA | 883mV | 0.153uA |
| 34 | 884mV | 0.541uA | 867mV | 0.047uA |
| 35 | 889mV | 0.135uA | 874mV | 0.461uA |
| 36 | 875mV | 0.440uA | 865mV | 0.173uA |
| 37 | 859mV | 0.367uA | 870mV | 0.539uA |
| 38 | 863mV | 0.072uA | 883mV | 0.515uA |
| 39 | 879mV | 0.566uA | 878mV | 0.442uA |
| 40 | 858mV | 0.412uA | 881mV | 0.358uA |
| 41 | 872mV | 0.353uA | 863mV | 0.572uA |
| 42 | 874mV | 0.258uA | 864mV | 0.579uA |
| 43 | 872mV | 0.451uA | 867mV | 0.023uA |
| 44 | 864mV | 0.578uA | 869mV | 0.243uA |
| 45 | 886mV | 0.508uA | 862mV | 0.397uA |
| 46 | 874mV | 0.273uA | 866mV | 0.177uA |
| 47 | 872mV | 0.121uA | 868mV | 0.230uA |
| 48 | 884mV | 0.138uA | 882mV | 0.024uA |
| 49 | 884mV | 0.334uA | 887mV | 0.442uA |
| 50 | 891mV | 0.038uA | 866mV | 0.622uA |
| 51 | 868mV | 0.114uA | 866mV | 0.153uA |
| 52 | 862mV | 0.259uA | 875mV | 0.091uA |
| 53 | 881mV | 0.135uA | 864mV | 0.344uA |
| 54 | 882mV | 0.130uA | 875mV | 0.379uA |
| 55 | 864mV | 0.031uA | 862mV | 0.140uA |
| 56 | 862mV | 0.118uA | 875mV | 0.482uA |
| 57 | 873mV | 0.251uA | 888mV | 0.310uA |
| 58 | 890mV | 0.113uA | 867mV | 0.489uA |
| 59 | 872mV | 0.424uA | 870mV | 0.093uA |
| 60 | 865mV | 0.499uA | 886mV | 0.062uA |

# SeCoS Corporation

## Temperature Cycle Test Data

Report No : T131130-014
Part No : ES23B
Test Equipment: JUNO Test System DTS-1000
Test Condition : VF<0.9V@IF=2A, IR<5uA@VR=200V
Test Condition: -55℃/30min, 150℃/30min, for1000 Cycle
Test Date: 2013.10.02 ~ 2013.11.23
Test Standard : JESD22 STANDER Method-A104
Operator: Leo Hsia

Test Result: PASS

| | Before | | After | |
|---|---|---|---|---|
| No | VF (mV) | IR (uA) | VF (mV) | IR (uA) |
| 61 | 869mV | 0.464uA | 889mV | 0.416uA |
| 62 | 890mV | 0.285uA | 888mV | 0.195uA |
| 63 | 866mV | 0.242uA | 870mV | 0.030uA |
| 64 | 876mV | 0.220uA | 871mV | 0.046uA |
| 65 | 873mV | 0.224uA | 859mV | 0.174uA |
| 66 | 864mV | 0.133uA | 890mV | 0.100uA |
| 67 | 865mV | 0.265uA | 878mV | 0.527uA |
| 68 | 876mV | 0.566uA | 888mV | 0.440uA |
| 69 | 865mV | 0.025uA | 864mV | 0.244uA |
| 70 | 866mV | 0.115uA | 860mV | 0.622uA |
| 71 | 890mV | 0.638uA | 863mV | 0.066uA |
| 72 | 882mV | 0.491uA | 890mV | 0.342uA |
| 73 | 876mV | 0.322uA | 873mV | 0.315uA |
| 74 | 864mV | 0.387uA | 889mV | 0.537uA |
| 75 | 880mV | 0.317uA | 864mV | 0.626uA |
| 76 | 884mV | 0.026uA | 866mV | 0.082uA |
| 77 | 864mV | 0.205uA | 885mV | 0.418uA |

Made By: Leo Hsia

Approval: Peter Yang

# SeCoS Corporation

## High Temperature High Humidity Test Data

Report No : T131130-014
Part No : ES23B
Test Equipment: JUNO Test System DTS-1000
Test Condition : VF<0.9V@IF=2A, IR<5uA@VR=200V
Test Condition: 85±2℃, 85±5%RH, 1000Hrs
Test Date: 2013.10.17 ~ 2013.11.29
Test Standard : JESD22 STANDER Method-A101
Operator: Leo Hsia

Test Result: PASS

| | Before | | After | |
|---|---|---|---|---|
| No | VF (mV) | IR (uA) | VF (mV) | IR (uA) |
| 1 | 866mV | 0.195uA | 882mV | 0.273uA |
| 2 | 884mV | 0.425uA | 875mV | 0.369uA |
| 3 | 879mV | 0.302uA | 863mV | 0.075uA |
| 4 | 880mV | 0.180uA | 859mV | 0.311uA |
| 5 | 863mV | 0.359uA | 863mV | 0.261uA |
| 6 | 891mV | 0.606uA | 883mV | 0.024uA |
| 7 | 878mV | 0.108uA | 879mV | 0.116uA |
| 8 | 879mV | 0.105uA | 859mV | 0.284uA |
| 9 | 887mV | 0.464uA | 877mV | 0.070uA |
| 10 | 877mV | 0.075uA | 877mV | 0.625uA |
| 11 | 867mV | 0.486uA | 876mV | 0.605uA |
| 12 | 862mV | 0.241uA | 887mV | 0.546uA |
| 13 | 858mV | 0.268uA | 870mV | 0.104uA |
| 14 | 870mV | 0.376uA | 864mV | 0.006uA |
| 15 | 865mV | 0.270uA | 863mV | 0.209uA |
| 16 | 874mV | 0.064uA | 860mV | 0.445uA |
| 17 | 886mV | 0.192uA | 875mV | 0.010uA |
| 18 | 859mV | 0.625uA | 860mV | 0.643uA |
| 19 | 888mV | 0.580uA | 890mV | 0.281uA |
| 20 | 875mV | 0.292uA | 887mV | 0.601uA |
| 21 | 888mV | 0.440uA | 882mV | 0.345uA |
| 22 | 862mV | 0.587uA | 865mV | 0.345uA |
| 23 | 871mV | 0.398uA | 878mV | 0.245uA |
| 24 | 883mV | 0.406uA | 870mV | 0.522uA |
| 25 | 862mV | 0.120uA | 891mV | 0.103uA |
| 26 | 868mV | 0.629uA | 882mV | 0.249uA |
| 27 | 862mV | 0.041uA | 887mV | 0.529uA |
| 28 | 860mV | 0.539uA | 886mV | 0.566uA |
| 29 | 878mV | 0.317uA | 878mV | 0.206uA |
| 30 | 869mV | 0.519uA | 887mV | 0.356uA |

# SeCoS Corporation

## High Temperature High Humidity Test Data

Report No : T131130-014
Part No : ES23B
Test Equipment: JUNO Test System DTS-1000
Test Condition : VF<0.9V@IF=2A, IR<5uA@VR=200V
Test Condition: 85±2℃, 85±5%RH, 1000Hrs
Test Date: 2013.10.17 ~ 2013.11.29
Test Standard : JESD22 STANDER Method-A101
Operator: Leo Hsia

Test Result: PASS

| | Before | | After | |
|---|---|---|---|---|
| No | VF (mV) | IR (uA) | VF (mV) | IR (uA) |
| 31 | 884mV | 0.468uA | 874mV | 0.497uA |
| 32 | 882mV | 0.446uA | 880mV | 0.235uA |
| 33 | 871mV | 0.385uA | 876mV | 0.418uA |
| 34 | 883mV | 0.392uA | 876mV | 0.234uA |
| 35 | 891mV | 0.274uA | 869mV | 0.189uA |
| 36 | 870mV | 0.080uA | 860mV | 0.276uA |
| 37 | 869mV | 0.101uA | 858mV | 0.110uA |
| 38 | 891mV | 0.388uA | 885mV | 0.105uA |
| 39 | 873mV | 0.133uA | 859mV | 0.203uA |
| 40 | 880mV | 0.068uA | 860mV | 0.290uA |
| 41 | 871mV | 0.475uA | 884mV | 0.238uA |
| 42 | 862mV | 0.548uA | 859mV | 0.604uA |
| 43 | 879mV | 0.237uA | 887mV | 0.465uA |
| 44 | 861mV | 0.302uA | 859mV | 0.140uA |
| 45 | 866mV | 0.301uA | 863mV | 0.105uA |
| 46 | 865mV | 0.181uA | 859mV | 0.577uA |
| 47 | 881mV | 0.254uA | 871mV | 0.351uA |
| 48 | 863mV | 0.066uA | 862mV | 0.179uA |
| 49 | 888mV | 0.530uA | 880mV | 0.526uA |
| 50 | 861mV | 0.250uA | 881mV | 0.480uA |
| 51 | 861mV | 0.610uA | 864mV | 0.246uA |
| 52 | 882mV | 0.023uA | 868mV | 0.365uA |
| 53 | 879mV | 0.141uA | 876mV | 0.329uA |
| 54 | 870mV | 0.591uA | 869mV | 0.086uA |
| 55 | 890mV | 0.060uA | 887mV | 0.364uA |
| 56 | 880mV | 0.443uA | 874mV | 0.210uA |
| 57 | 889mV | 0.480uA | 887mV | 0.286uA |
| 58 | 872mV | 0.520uA | 865mV | 0.529uA |
| 59 | 868mV | 0.085uA | 873mV | 0.547uA |
| 60 | 883mV | 0.041uA | 865mV | 0.024uA |

# SeCoS Corporation

## High Temperature High Humidity Test Data

Report No : T131130-014
Part No : ES23B
Test Equipment: JUNO Test System DTS-1000
Test Condition : VF<0.9V@IF=2A, IR<5uA@VR=200V
Test Condition: 85±2℃, 85±5%RH, 1000Hrs
Test Date: 2013.10.17 ~ 2013.11.29
Test Standard : JESD22 STANDER Method-A101
Operator: Leo Hsia

Test Result: PASS

| | Before | | After | |
|---|---|---|---|---|
| No | VF (mV) | IR (uA) | VF (mV) | IR (uA) |
| 61 | 862mV | 0.045uA | 890mV | 0.016uA |
| 62 | 891mV | 0.537uA | 885mV | 0.310uA |
| 63 | 877mV | 0.430uA | 883mV | 0.032uA |
| 64 | 882mV | 0.280uA | 865mV | 0.427uA |
| 65 | 863mV | 0.117uA | 863mV | 0.016uA |
| 66 | 888mV | 0.159uA | 884mV | 0.551uA |
| 67 | 885mV | 0.535uA | 880mV | 0.135uA |
| 68 | 885mV | 0.519uA | 866mV | 0.053uA |
| 69 | 879mV | 0.160uA | 871mV | 0.138uA |
| 70 | 881mV | 0.069uA | 876mV | 0.356uA |
| 71 | 884mV | 0.479uA | 860mV | 0.011uA |
| 72 | 880mV | 0.191uA | 873mV | 0.481uA |
| 73 | 876mV | 0.471uA | 878mV | 0.336uA |
| 74 | 875mV | 0.564uA | 863mV | 0.187uA |
| 75 | 878mV | 0.458uA | 882mV | 0.217uA |
| 76 | 890mV | 0.013uA | 869mV | 0.027uA |
| 77 | 885mV | 0.277uA | 868mV | 0.426uA |

Made By: Leo Hsia

Approval: Peter Yang

# SeCoS Corporation

## High Temperature High Hum Reverse Bias Test Data

Report No : T131130-014
Part No : ES23B
Test Equipment: JUNO Test System DTS-1000
Test Condition : VF<0.9V@IF=2A, IR<5uA@VR=200V
Test Condition: 85±2℃, 85±5%RH, 80%VR, 1000Hrs
Test Date: 2013.10.02 ~ 2013.11.13
Test Standard : JESD22 STANDER Method-A101
Operator: Leo Hsia

Test Result: PASS

| | Before | | After | |
|---|---|---|---|---|
| No | VF (mV) | IR (uA) | VF (mV) | IR (uA) |
| 1 | 864mV | 0.509uA | 872mV | 0.258uA |
| 2 | 865mV | 0.419uA | 869mV | 0.023uA |
| 3 | 871mV | 0.134uA | 868mV | 0.295uA |
| 4 | 883mV | 0.154uA | 867mV | 0.152uA |
| 5 | 874mV | 0.527uA | 875mV | 0.131uA |
| 6 | 887mV | 0.026uA | 885mV | 0.215uA |
| 7 | 890mV | 0.561uA | 877mV | 0.240uA |
| 8 | 881mV | 0.516uA | 876mV | 0.107uA |
| 9 | 883mV | 0.229uA | 866mV | 0.540uA |
| 10 | 885mV | 0.425uA | 860mV | 0.050uA |
| 11 | 878mV | 0.354uA | 860mV | 0.218uA |
| 12 | 885mV | 0.506uA | 887mV | 0.455uA |
| 13 | 863mV | 0.469uA | 863mV | 0.198uA |
| 14 | 860mV | 0.167uA | 882mV | 0.297uA |
| 15 | 877mV | 0.350uA | 860mV | 0.437uA |
| 16 | 860mV | 0.059uA | 881mV | 0.595uA |
| 17 | 866mV | 0.514uA | 888mV | 0.438uA |
| 18 | 869mV | 0.620uA | 890mV | 0.256uA |
| 19 | 875mV | 0.643uA | 861mV | 0.011uA |
| 20 | 888mV | 0.544uA | 884mV | 0.430uA |
| 21 | 884mV | 0.301uA | 883mV | 0.212uA |
| 22 | 868mV | 0.150uA | 858mV | 0.029uA |
| 23 | 887mV | 0.610uA | 885mV | 0.375uA |
| 24 | 889mV | 0.077uA | 888mV | 0.595uA |
| 25 | 879mV | 0.039uA | 871mV | 0.157uA |
| 26 | 886mV | 0.602uA | 860mV | 0.239uA |
| 27 | 883mV | 0.015uA | 867mV | 0.379uA |
| 28 | 890mV | 0.271uA | 862mV | 0.144uA |
| 29 | 860mV | 0.221uA | 882mV | 0.476uA |
| 30 | 875mV | 0.629uA | 875mV | 0.025uA |

# SeCoS Corporation

## High Temperature High Hum Reverse Bias Test Data

Report No : T131130-014
Part No : ES23B
Test Equipment: JUNO Test System DTS-1000
Test Condition : VF<0.9V@IF=2A, IR<5uA@VR=200V
Test Condition: 85±2℃, 85±5%RH, 80%VR, 1000Hrs
Test Date: 2013.10.02 ~ 2013.11.13
Test Standard : JESD22 STANDER Method-A101
Operator: Leo Hsia

Test Result: PASS

| | Before | | After | |
|---|---|---|---|---|
| No | VF (mV) | IR (uA) | VF (mV) | IR (uA) |
| 31 | 875mV | 0.270uA | 858mV | 0.613uA |
| 32 | 891mV | 0.301uA | 884mV | 0.377uA |
| 33 | 887mV | 0.366uA | 860mV | 0.315uA |
| 34 | 875mV | 0.372uA | 890mV | 0.521uA |
| 35 | 881mV | 0.527uA | 862mV | 0.113uA |
| 36 | 889mV | 0.285uA | 876mV | 0.518uA |
| 37 | 867mV | 0.412uA | 866mV | 0.320uA |
| 38 | 873mV | 0.038uA | 860mV | 0.334uA |
| 39 | 888mV | 0.254uA | 869mV | 0.462uA |
| 40 | 880mV | 0.131uA | 862mV | 0.178uA |
| 41 | 885mV | 0.254uA | 890mV | 0.638uA |
| 42 | 879mV | 0.551uA | 874mV | 0.070uA |
| 43 | 889mV | 0.508uA | 869mV | 0.581uA |
| 44 | 873mV | 0.213uA | 861mV | 0.083uA |
| 45 | 890mV | 0.111uA | 875mV | 0.142uA |
| 46 | 872mV | 0.542uA | 870mV | 0.561uA |
| 47 | 891mV | 0.116uA | 871mV | 0.064uA |
| 48 | 887mV | 0.258uA | 876mV | 0.452uA |
| 49 | 890mV | 0.026uA | 875mV | 0.138uA |
| 50 | 868mV | 0.467uA | 877mV | 0.583uA |
| 51 | 868mV | 0.614uA | 888mV | 0.305uA |
| 52 | 872mV | 0.353uA | 862mV | 0.297uA |
| 53 | 872mV | 0.186uA | 882mV | 0.507uA |
| 54 | 864mV | 0.088uA | 877mV | 0.221uA |
| 55 | 872mV | 0.062uA | 858mV | 0.543uA |
| 56 | 879mV | 0.530uA | 890mV | 0.130uA |
| 57 | 889mV | 0.441uA | 871mV | 0.283uA |
| 58 | 886mV | 0.465uA | 863mV | 0.426uA |
| 59 | 880mV | 0.576uA | 867mV | 0.580uA |
| 60 | 871mV | 0.103uA | 879mV | 0.616uA |

# SeCoS Corporation

## High Temperature High Hum Reverse Bias Test Data

Report No : T131130-014
Part No : ES23B
Test Equipment: JUNO Test System DTS-1000
Test Condition : VF<0.9V@IF=2A, IR<5uA@VR=200V
Test Condition: 85±2℃, 85±5%RH, 80%VR, 1000Hrs
Test Date: 2013.10.02 ~ 2013.11.13
Test Standard : JESD22 STANDER Method-A101
Operator: Leo Hsia

Test Result: PASS

| | Before | | After | |
|---|---|---|---|---|
| No | VF (mV) | IR (uA) | VF (mV) | IR (uA) |
| 61 | 865mV | 0.240uA | 878mV | 0.359uA |
| 62 | 871mV | 0.398uA | 863mV | 0.182uA |
| 63 | 886mV | 0.253uA | 875mV | 0.432uA |
| 64 | 884mV | 0.617uA | 880mV | 0.279uA |
| 65 | 858mV | 0.318uA | 872mV | 0.265uA |
| 66 | 881mV | 0.140uA | 860mV | 0.519uA |
| 67 | 880mV | 0.093uA | 860mV | 0.099uA |
| 68 | 865mV | 0.289uA | 869mV | 0.159uA |
| 69 | 879mV | 0.536uA | 879mV | 0.269uA |
| 70 | 866mV | 0.296uA | 871mV | 0.442uA |
| 71 | 863mV | 0.058uA | 871mV | 0.606uA |
| 72 | 885mV | 0.381uA | 874mV | 0.458uA |
| 73 | 880mV | 0.097uA | 878mV | 0.094uA |
| 74 | 875mV | 0.137uA | 861mV | 0.634uA |
| 75 | 884mV | 0.347uA | 866mV | 0.364uA |
| 76 | 885mV | 0.188uA | 863mV | 0.050uA |
| 77 | 887mV | 0.036uA | 871mV | 0.511uA |

Made By: Leo Hsia

Approval: Peter Yang

# SeCoS Corporation

## Solderability Test Data

Report No : T131130-014
Part No : ES23B
Test Equipment: JUNO Test System DTS-1000
Test Condition : VF<0.9V@IF=2A, IR<5uA@VR=200V
Test Condition: 245℃ ± 5℃, 5Sec
Test Date: 2013.11.30 ~ 2013.11.30
Test Standard : JESD22 STANDER Method-B102
Operator: Leo Hsia

Test Result: PASS

| | Before | | After | |
|---|---|---|---|---|
| No | VF (mV) | IR (uA) | VF (mV) | IR (uA) |
| 1 | 865mV | 0.385uA | 862mV | 0.484uA |
| 2 | 869mV | 0.181uA | 865mV | 0.379uA |
| 3 | 862mV | 0.130uA | 890mV | 0.490uA |
| 4 | 861mV | 0.335uA | 875mV | 0.311uA |
| 5 | 889mV | 0.186uA | 875mV | 0.037uA |
| 6 | 890mV | 0.478uA | 877mV | 0.074uA |
| 7 | 860mV | 0.178uA | 865mV | 0.121uA |
| 8 | 870mV | 0.418uA | 885mV | 0.088uA |
| 9 | 881mV | 0.372uA | 875mV | 0.575uA |
| 10 | 883mV | 0.147uA | 865mV | 0.295uA |

Made By: Leo Hsia

Approval: Peter Yang

# Test Report

No. : CE/2013/A0292 Date : 2013/10/09 Page : 1 of 11

EXCEL CELL ELECTRONIC CO., LTD.
NO. 23, 20 ROAD., TAICHUNG INDUSTRIAL PARK, TAICHUNG, TAIWAN 40850

**The following sample(s) was/were submitted and identified by/on behalf of the applicant as :**

| | | |
|---|---|---|
| Sample Submitted By | : | EXCEL CELL ELECTRONIC CO., LTD. |
| Sample Description | : | C19210 COPPER |
| Sample Receiving Date | : | 2013/10/02 |
| Testing Period | : | 2013/10/02 TO 2013/10/09 |

==========

**Test Result(s)** : Please refer to next page(s).

Troy Chang / Manager-Tech
Signed for and on behalf of
SGS TAIWAN LTD.
Chemical Laboratory – Taipei

EXCEL CELL ELECTRONIC CO., LTD.
NO. 23, 20 ROAD., TAICHUNG INDUSTRIAL PARK, TAICHUNG, TAIWAN 40850

**Test Result(s)**

PART NAME No.1 : COPPER COLORED METAL

| Test Item(s) | Unit | Method | MDL | Result |
|---|---|---|---|---|
| | | | | No.1 |
| Cadmium (Cd) | mg/kg | With reference to IEC 62321-5: 2013 and performed by ICP-AES. | 2 | n.d. |
| Lead (Pb) | mg/kg | With reference to IEC 62321-5: 2013 and performed by ICP-AES. | 2 | n.d. |
| Mercury (Hg) | mg/kg | With reference to IEC 62321-4: 2013 and performed by ICP-AES. | 2 | n.d. |
| Hexavalent Chromium Cr(VI) | ** | With reference to IEC 62321: 2008 and performed by Boiling water extraction Method.# | # | Negative |
| Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α-HBCDD, β- HBCDD, γ- HBCDD) (CAS No.: 25637-99-4 and 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8)) | mg/kg | With reference to IEC 62321: 2008 method. Analysis was performed by GC/MS. | 5 | n.d. |
| BBP (Benzyl butyl phthalate) (CAS No.: 85-68-7) | % | With reference to EN 14372. Analysis was performed by GC/MS. | 0.003 | n.d. |
| DBP (Dibutyl phthalate) (CAS No.: 84-74-2) | % | With reference to EN 14372. Analysis was performed by GC/MS. | 0.003 | n.d. |
| DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7) | % | With reference to EN 14372. Analysis was performed by GC/MS. | 0.003 | n.d. |
| DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5) | % | With reference to EN 14372. Analysis was performed by GC/MS. | 0.003 | n.d. |
| Perfluorooctane sulfonates (PFOS-Acid, Metal Salt, Amide) | mg/kg | With reference to US EPA 3550C: 2007. Analysis was performed by LC/MS. | 10 | n.d. |
| PFOA (CAS No.: 335-67-1) | mg/kg | With reference to US EPA 3550C: 2007. Analysis was performed by LC/MS. | 10 | n.d. |

EXCEL CELL ELECTRONIC CO., LTD.
NO. 23, 20 ROAD., TAICHUNG INDUSTRIAL PARK, TAICHUNG, TAIWAN 40850

| Test Item(s) | Unit | Method | MDL | Result |
|---|---|---|---|---|
| | | | | No.1 |
| **Sum of PBBs** | mg/kg | With reference to IEC 62321: 2008 and performed by GC/MS. | - | n.d. |
| Monobromobiphenyl | | | 5 | n.d. |
| Dibromobiphenyl | | | 5 | n.d. |
| Tribromobiphenyl | | | 5 | n.d. |
| Tetrabromobiphenyl | | | 5 | n.d. |
| Pentabromobiphenyl | | | 5 | n.d. |
| Hexabromobiphenyl | | | 5 | n.d. |
| Heptabromobiphenyl | | | 5 | n.d. |
| Octabromobiphenyl | | | 5 | n.d. |
| Nonabromobiphenyl | | | 5 | n.d. |
| Decabromobiphenyl | | | 5 | n.d. |
| **Sum of PBDEs** | | | - | n.d. |
| Monobromodiphenyl ether | | | 5 | n.d. |
| Dibromodiphenyl ether | | | 5 | n.d. |
| Tribromodiphenyl ether | | | 5 | n.d. |
| Tetrabromodiphenyl ether | | | 5 | n.d. |
| Pentabromodiphenyl ether | | | 5 | n.d. |
| Hexabromodiphenyl ether | | | 5 | n.d. |
| Heptabromodiphenyl ether | | | 5 | n.d. |
| Octabromodiphenyl ether | | | 5 | n.d. |
| Nonabromodiphenyl ether | | | 5 | n.d. |
| Decabromodiphenyl ether | | | 5 | n.d. |
| **Halogen** | | | | |
| Halogen-Fluorine (F) (CAS No.: 14762-94-8) | mg/kg | With reference to BS EN 14582:2007. Analysis was performed by IC. | 50 | n.d. |
| Halogen-Chlorine (Cl) (CAS No.: 22537-15-1) | | | 50 | n.d. |
| Halogen-Bromine (Br) (CAS No.: 10097-32-2) | | | 50 | n.d. |
| Halogen-Iodine (I) (CAS No.: 14362-44-8) | | | 50 | n.d. |

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**Note：**

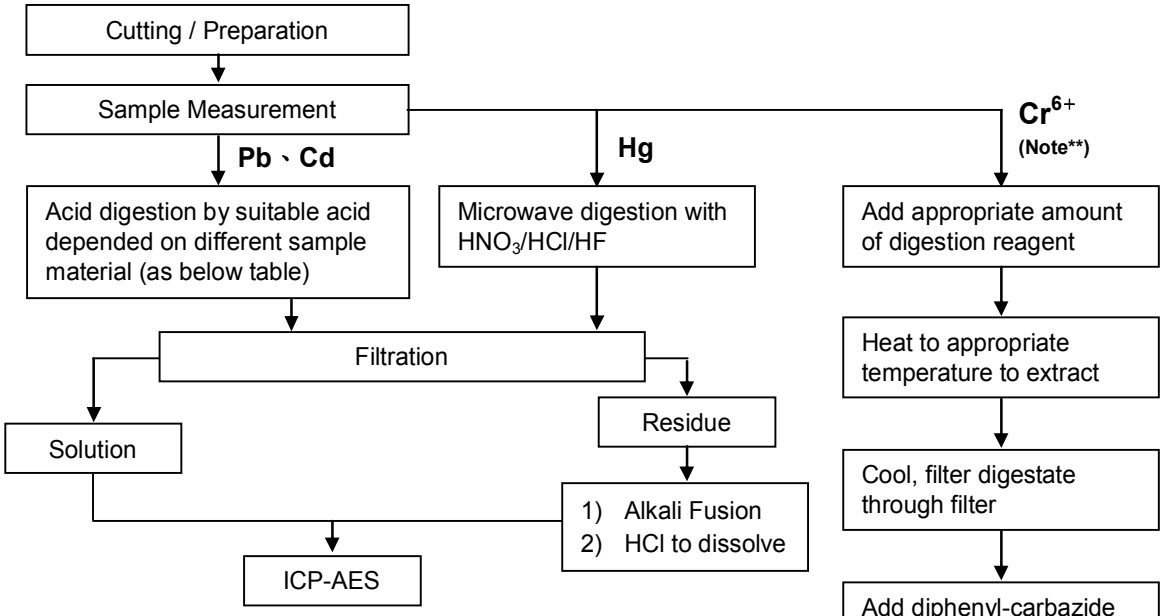
1. mg/kg = ppm；0.1wt% = 1000ppm
2. n.d. = Not Detected
3. MDL = Method Detection Limit
4. " - " = Not Regulated
5. ** = Qualitative analysis (No Unit)
6. # = a. Positive means the presence of CrVI on the tested areas
   b. Negative means the absence of CrVI on the tested areas
   The detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm² tested areas.

**PFOS Reference Information : POPs - (EU) 757/2010**

Outlawing PFOS as substances or preparations in concentrations above 0.001% (10ppm), in semi-finished products or articles or parts at a level above 0.1%(1000ppm), in textiles or other coated materials above 1μg/m².

EXCEL CELL ELECTRONIC CO., LTD.
NO. 23, 20 ROAD., TAICHUNG INDUSTRIAL PARK, TAICHUNG, TAIWAN 40850

1) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr$^{6+}$ test method excluded)
2) Name of the person who made measurement: Climbgreat Yang
3) Name of the person in charge of measurement: Troy Chang




| Sample Material | Digestion Acid |
|---|---|
| Steel, copper, aluminum, solder | Aqua regia, $HNO_3$, HCl, HF, $H_2O_2$ |
| Glass | $HNO_3$/HF |
| Gold, platinum, palladium, ceramic | Aqua regia |
| Silver | $HNO_3$ |
| Plastic | $H_2SO_4$, $H_2O_2$, $HNO_3$, HCl |
| Others | Added appropriate reagent to total digestion |

**Note** :** (1) For non-metallic material, add alkaline digestion reagent and heat to 90~95 ℃.
(2) For metallic material, add pure water and heat to boiling .

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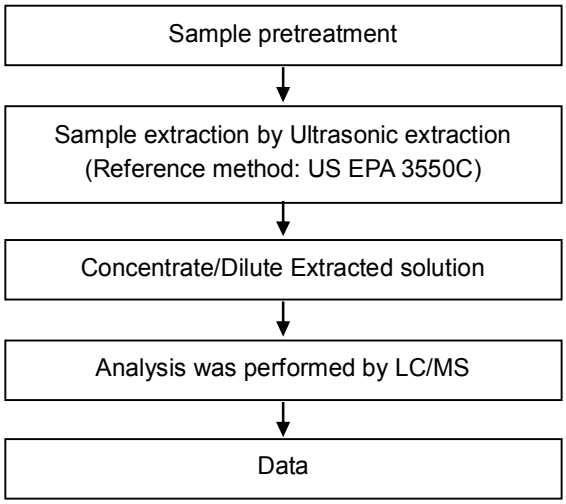
**PFOA/PFOS analytical flow chart of Ultrasonic extraction (LC/MS) procedure**

- Name of the person who made measurement: Roman Wong
- Name of the person in charge of measurement: Troy Chang



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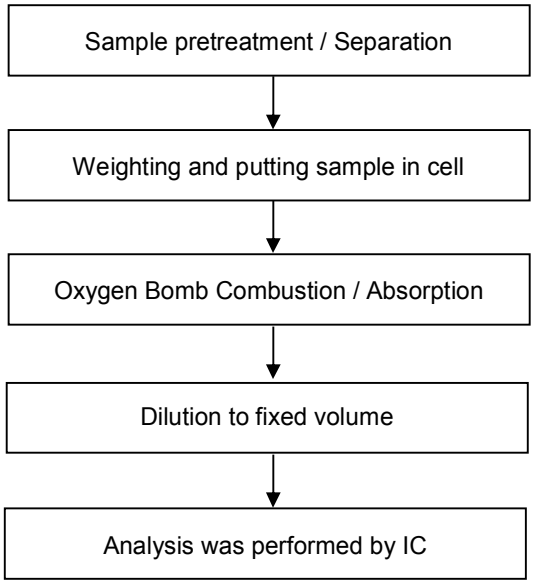
**Analytical flow chart of halogen content**

- Name of the person who made measurement: Rita Chen
- Name of the person in charge of measurement: Troy Chang



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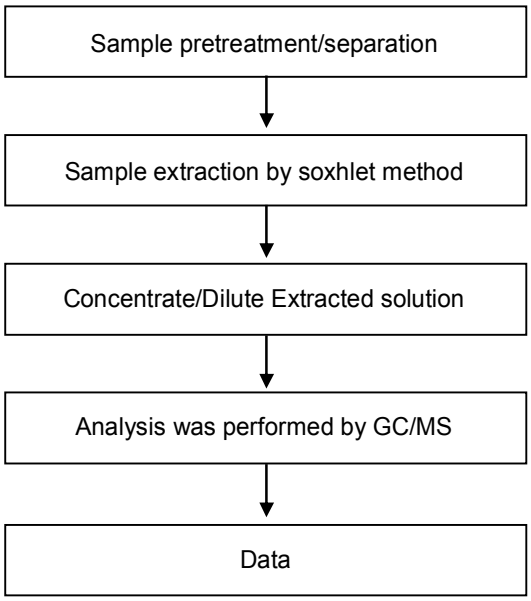
**Analytical flow chart of phthalate content**

- Name of the person who made measurement: Roman Wong
- Name of the person in charge of measurement: Troy Chang



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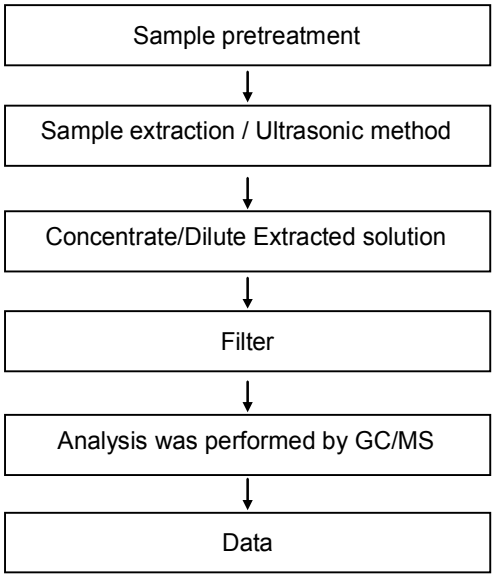
**HBCDD analytical flow chart**

- Name of the person who made measurement: Roman Wong
- Name of the person in charge of measurement: Troy Chang



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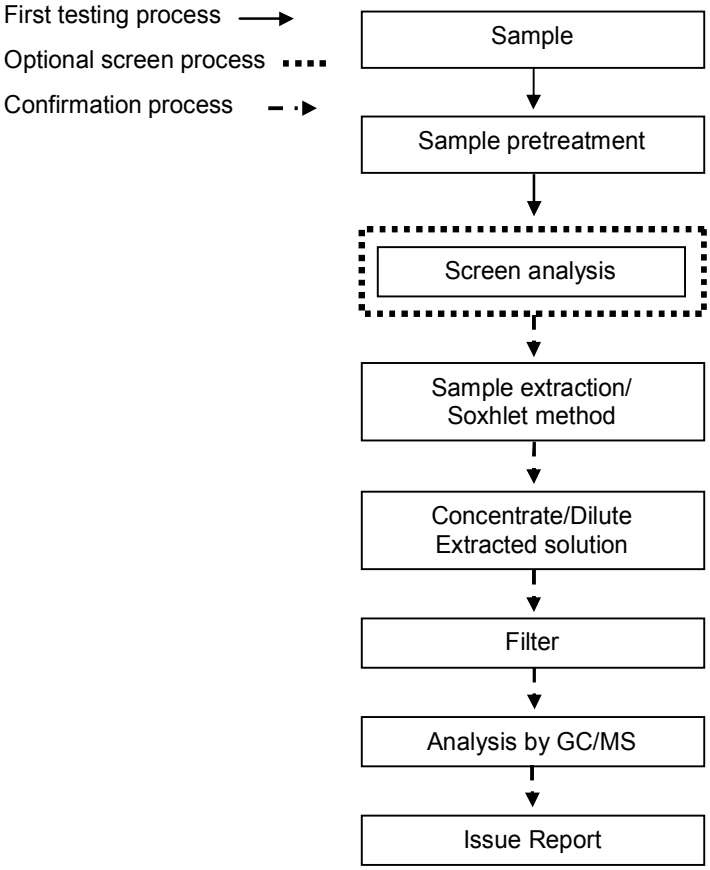
**PBB/PBDE analytical FLOW CHART**

- Name of the person who made measurement: Roman Wong
- Name of the person in charge of measurement: Troy Chang



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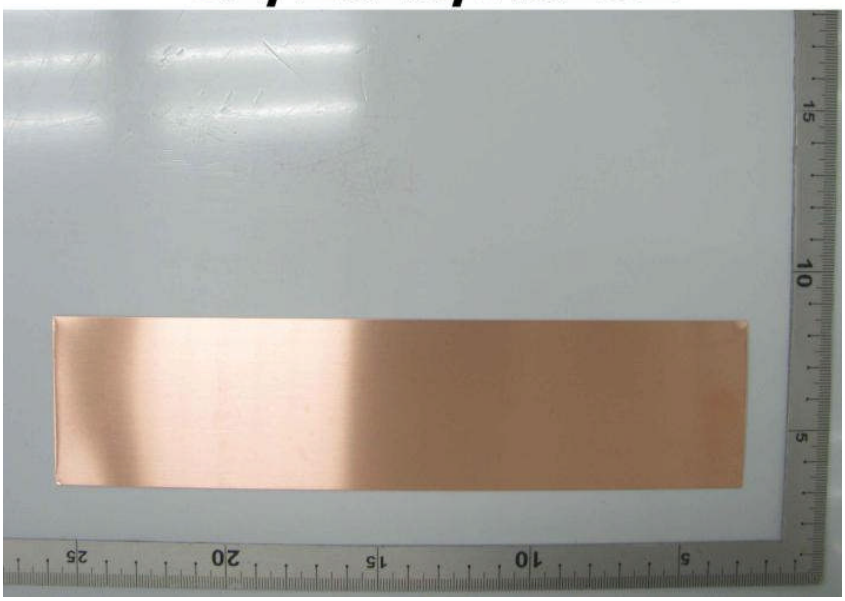
*** The tested sample / part is marked by an arrow if it's shown on the photo. ***

**CE/2013/A0292**



** End of Report **