# WREB Functional Test Report

Board ID: 0x123b55b6
Board Type: b
Link Version: 020
Front-end FPGA Code Version: 0020
Test Performed: 2016-07-06 11:57:15

| Status | Test | Results |
|---|---|---|
| FAIL | Channel Comms | -3/33 channels missing. |
| PASS | ASPIC Comms | 1/1 ASPICS communicating. |
| FAIL | SCK Rails | LV Gain: 0.992940.  UV Gain: 0.852632.  43/50 values okay. |
| FAIL | RG Rails | LV Gain: 0.998743.  UV Gain: 0.872444.  44/50 values okay. |
| FAIL | Diverging SCK 0V | LV Gain: 0.725770.  UV Gain: 0.616037.  24/38 values okay. |
| FAIL | Diverging SCK 3V | LV Gain: 0.799504.  UV Gain: 0.703923.  16/38 values okay. |
| FAIL | Diverging SCK -3V | LV Gain: 0.366979.  UV Gain: 0.727448.  26/38 values okay. |
| PASS | Diverging RG 0V | LV Gain: 0.980889.  UV Gain: 0.951418.  35/38 values okay. |
| FAIL | Diverging RG 3V | LV Gain: 0.809605.  UV Gain: 0.951637.  16/38 values okay. |
| FAIL | Diverging RG -3V | LV Gain: 0.665621.  UV Gain: 0.827101.  27/38 values okay. |
| PASS | CCD Bias OG Voltage | Gain: 0.991664.  21/21 values okay. |
| PASS | CCD Bias OD Voltage | Gain: 0.993199.  15/16 values okay. |
| PASS | CCD Bias GR Voltage | Gain: 0.995837.  15/16 values okay. |
| PASS | CCD Bias RD Voltage | Gain: 0.996993.  15/16 values okay. |

Idle Current Test

| Channel | Voltage | Channel | Current |
|---|---|---|---|
| DigPS_V | 4.925 | DigPS_I | 643.5 |
| AnaPS_V | 6.975 | AnaPS_I | 284.25 |
| ODPS_V | 29.2003 | ODPS_I | 2.594 |
| ClkHPS_V | 9.0 | ClkHPS_I | 55.5 |
| DphiPS_V | 13.075 | DphiPS_I | 6.0 |
| HtrPS_V | 8.025 | HtrPS_I | 1.75 |

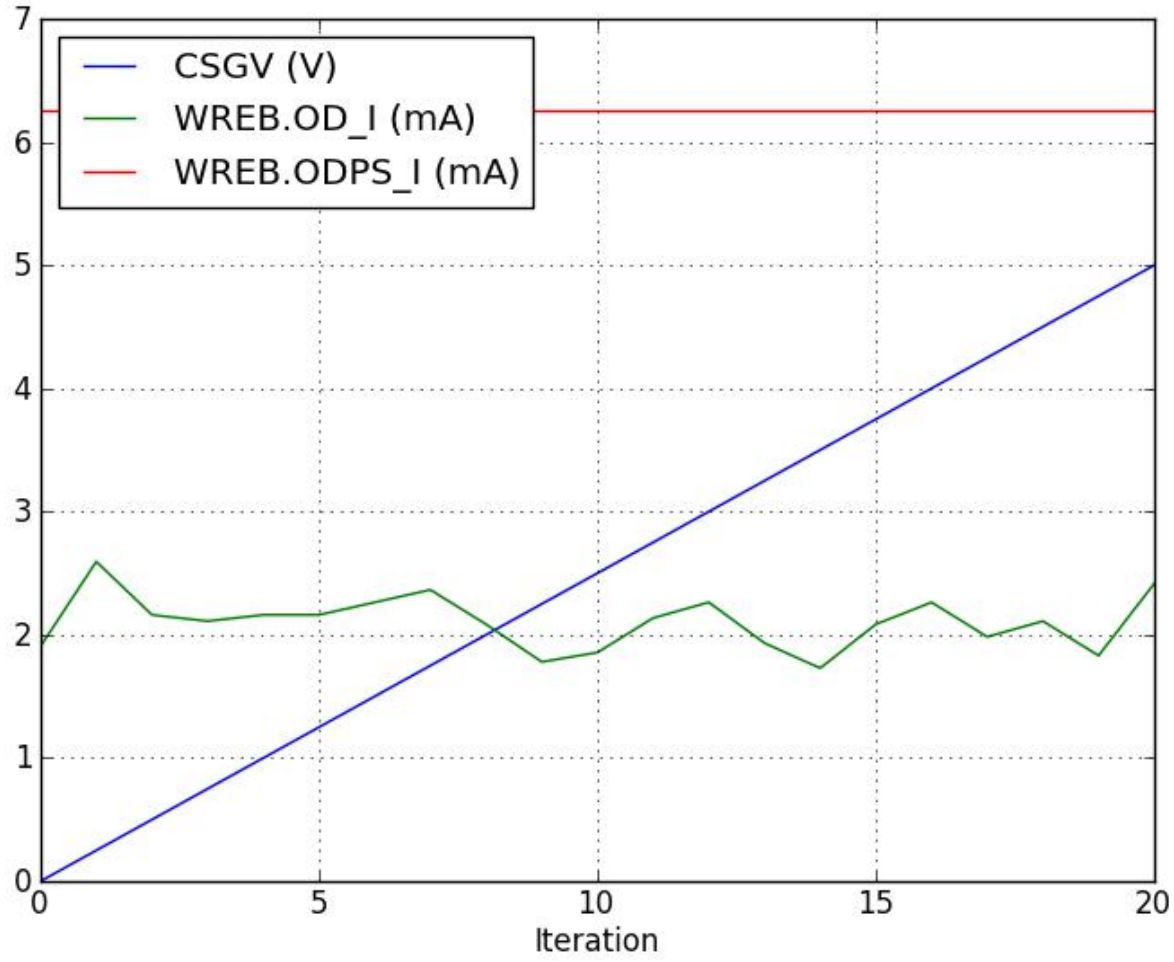
| Channel Communications Test | |
|---|---|
| Channel | Value |
| WREB.Temp1 | 38.5 |
| WREB.Temp2 | 40.4375 |
| WREB.Temp3 | 34.0 |
| WREB.Temp4 | 36.3125 |
| WREB.Temp5 | 37.75 |
| WREB.Temp6 | 35.375 |
| WREB.Atemp0U | -128.4935 |
| WREB.Atemp0L | -128.3096 |
| WREB.CCDtemp | 2857.1427 |
| WREB.RTDtemp | 2857.1427 |
| WREB.DigPS_V | 4.925 |
| WREB.DigPS_I | 643.25 |
| WREB.AnaPS_V | 6.975 |
| WREB.AnaPS_I | 284.25 |
| WREB.ODPS_V | 31.05 |
| WREB.ODPS_I | 6.25 |
| WREB.ClkHPS_V | 9.0 |
| WREB.ClkHPS_I | 33.5 |
| WREB.DphiPS_V | 13.075 |
| WREB.DphiPS_I | 6.0 |
| WREB.HtrPS_V | 8.025 |
| WREB.HtrPS_I | 1.75 |
| WREB.VREF25 | 2.4947 |
| WREB.OD_V | 26.0078 |
| WREB.OD_I | 2.3397 |
| WREB.OG_V | -2.4271 |
| WREB.RD_V | 11.5646 |
| WREB.GD_V | 25.8652 |
| WREB.CKP_V | 4.0652 |
| WREB.CKPSH_V | 4.0558 |
| WREB.CKS_V | 4.171 |
| WREB.SCKU_V | 4.1557 |
| WREB.SCKL_V | -4.0413 |
| WREB.RG_V | 8.0264 |
| WREB.RGU_V | 8.0025 |
| WREB.RGL_V | -1.9341 |

## Channel Communications Test

Test PASS. 1/1 ASPICS communicating.

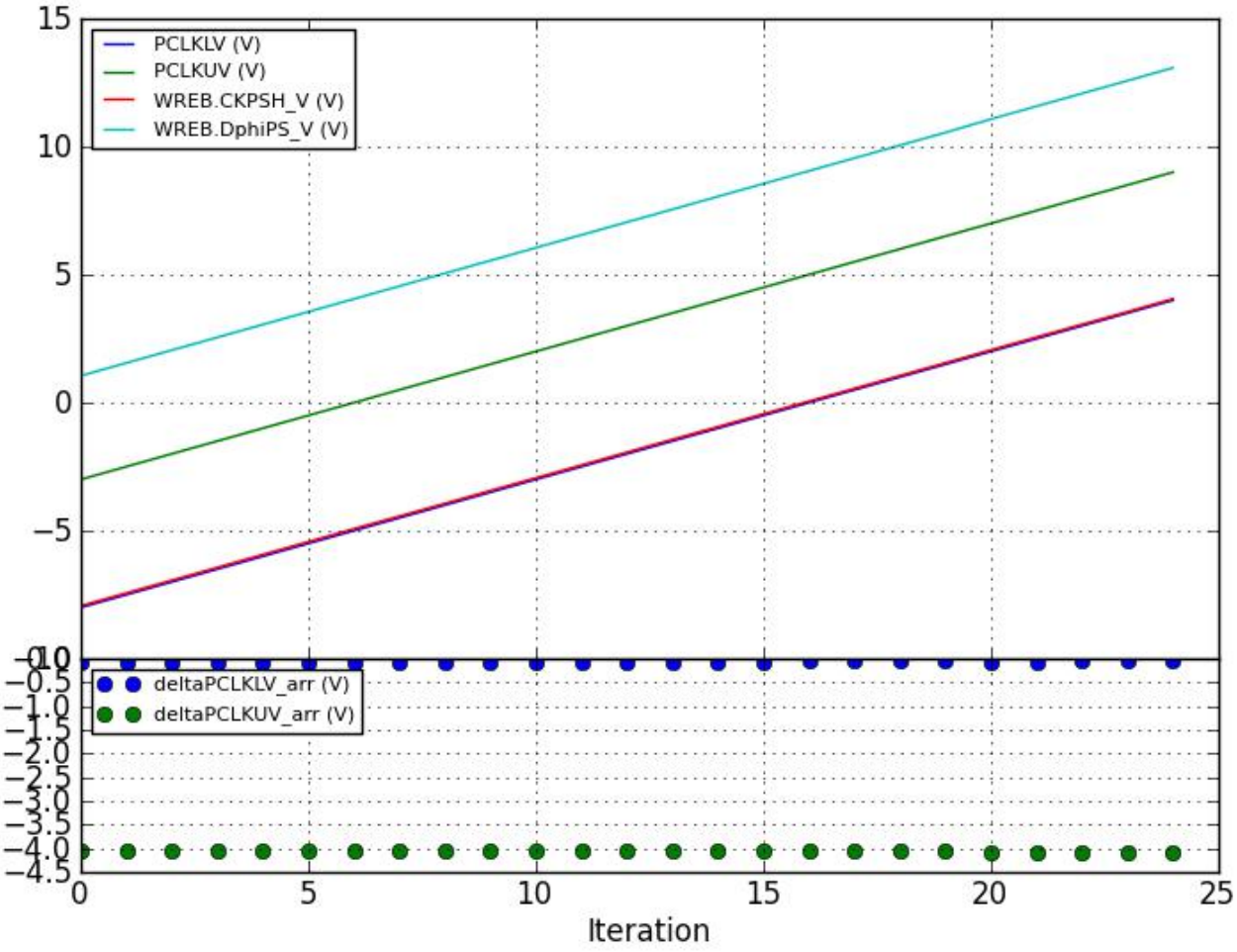
ccs-cr.checkAsics result: [0]

## CSGate Test

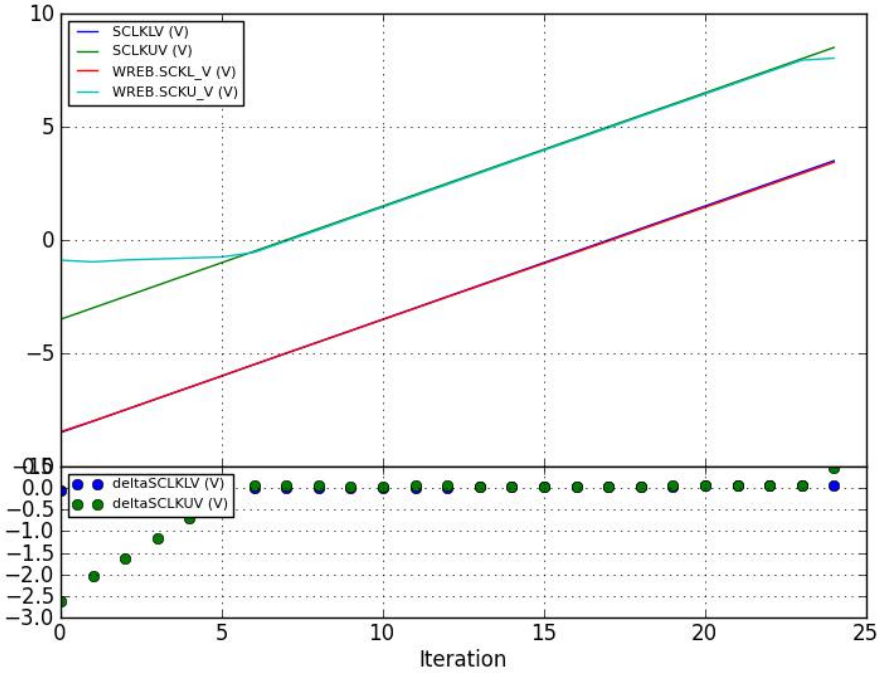



| CSGV (V) | WREB.OD_I (mA) | WREB.ODPS_I (mA) |
|---|---|---|
| 0 | 1.9073 | 6.25 |
| 0.25 | 2.594 | 6.25 |
| 0.5 | 2.1617 | 6.25 |
| 0.75 | 2.1108 | 6.25 |
| 1.0 | 2.1617 | 6.25 |
| 1.25 | 2.1617 | 6.25 |
| 1.5 | 2.2634 | 6.25 |
| 1.75 | 2.3651 | 6.25 |
| 2.0 | 2.0854 | 6.25 |
| 2.25 | 1.7802 | 6.25 |
| 2.5 | 1.8565 | 6.25 |
| 2.75 | 2.1362 | 6.25 |
| 3.0 | 2.2634 | 6.25 |
| 3.25 | 1.9328 | 6.25 |
| 3.5 | 1.7293 | 6.25 |
| 3.75 | 2.0854 | 6.25 |
| 4.0 | 2.2634 | 6.25 |
| 4.25 | 1.9836 | 6.25 |
| 4.5 | 2.1108 | 6.25 |
| 4.75 | 1.8311 | 6.25 |
| 5.0 | 2.416 | 6.25 |

## PCKRails Test



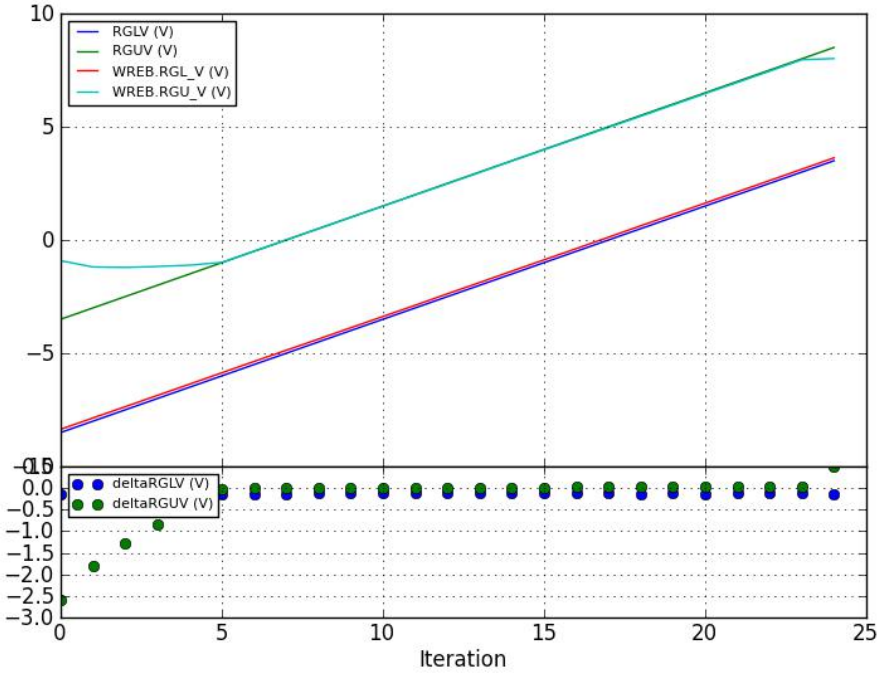
## SCK Rails Test




LV Gain: 0.992940.  UV Gain: 0.852632.  43/50 values okay.
Test FAILED.

| SCLKLV (V) | SCLKUV (V) | WREB.SCKL_V (V) | WREB.SCKU_V (V) | deltaSCLKLV (V) | deltaSCLKUV (V) |
|---|---|---|---|---|---|
| -8.5 | -3.5 | -8.4602 | -0.8911 | -0.0398 | -2.6089 |
| -8.0 | -3.0 | -7.9956 | -0.9666 | -0.0044 | -2.0334 |
| -7.5 | -2.5 | -7.4997 | -0.882 | -0.0003 | -1.618 |
| -7.0 | -2.0 | -7.0 | -0.8377 | -0.0 | -1.1623 |
| -6.5 | -1.5 | -6.5041 | -0.798 | 0.0041 | -0.702 |
| -6.0 | -1.0 | -6.0081 | -0.7477 | 0.0081 | -0.2523 |
| -5.5 | -0.5 | -5.497 | -0.5501 | -0.003 | 0.0501 |
| -5.0 | 0.0 | -4.998 | -0.0481 | -0.002 | 0.0481 |
| -4.5 | 0.5 | -4.5052 | 0.4478 | 0.0052 | 0.0522 |
| -4.0 | 1.0 | -4.0108 | 0.9552 | 0.0108 | 0.0448 |
| -3.5 | 1.5 | -3.5126 | 1.4526 | 0.0126 | 0.0474 |
| -3.0 | 2.0 | -3.0159 | 1.9508 | 0.0159 | 0.0492 |
| -2.5 | 2.5 | -2.5131 | 2.4506 | 0.0131 | 0.0494 |
| -2.0 | 3.0 | -2.021 | 2.9526 | 0.021 | 0.0474 |
| -1.5 | 3.5 | -1.5266 | 3.4576 | 0.0266 | 0.0424 |
| -1.0 | 4.0 | -1.0345 | 3.9604 | 0.0345 | 0.0396 |
| -0.5 | 4.5 | -0.5409 | 4.4525 | 0.0409 | 0.0475 |
| 0.0 | 5.0 | -0.0465 | 4.9522 | 0.0465 | 0.0478 |
| 0.5 | 5.5 | 0.4547 | 5.4565 | 0.0453 | 0.0435 |
| 1.0 | 6.0 | 0.9529 | 5.9517 | 0.0471 | 0.0483 |
| 1.5 | 6.5 | 1.4458 | 6.4461 | 0.0542 | 0.0539 |
| 2.0 | 7.0 | 1.9402 | 6.9458 | 0.0598 | 0.0542 |
| 2.5 | 7.5 | 2.4422 | 7.4432 | 0.0578 | 0.0568 |
| 3.0 | 8.0 | 2.9358 | 7.9384 | 0.0642 | 0.0616 |
| 3.5 | 8.5 | 3.4348 | 8.0269 | 0.0652 | 0.4731 |

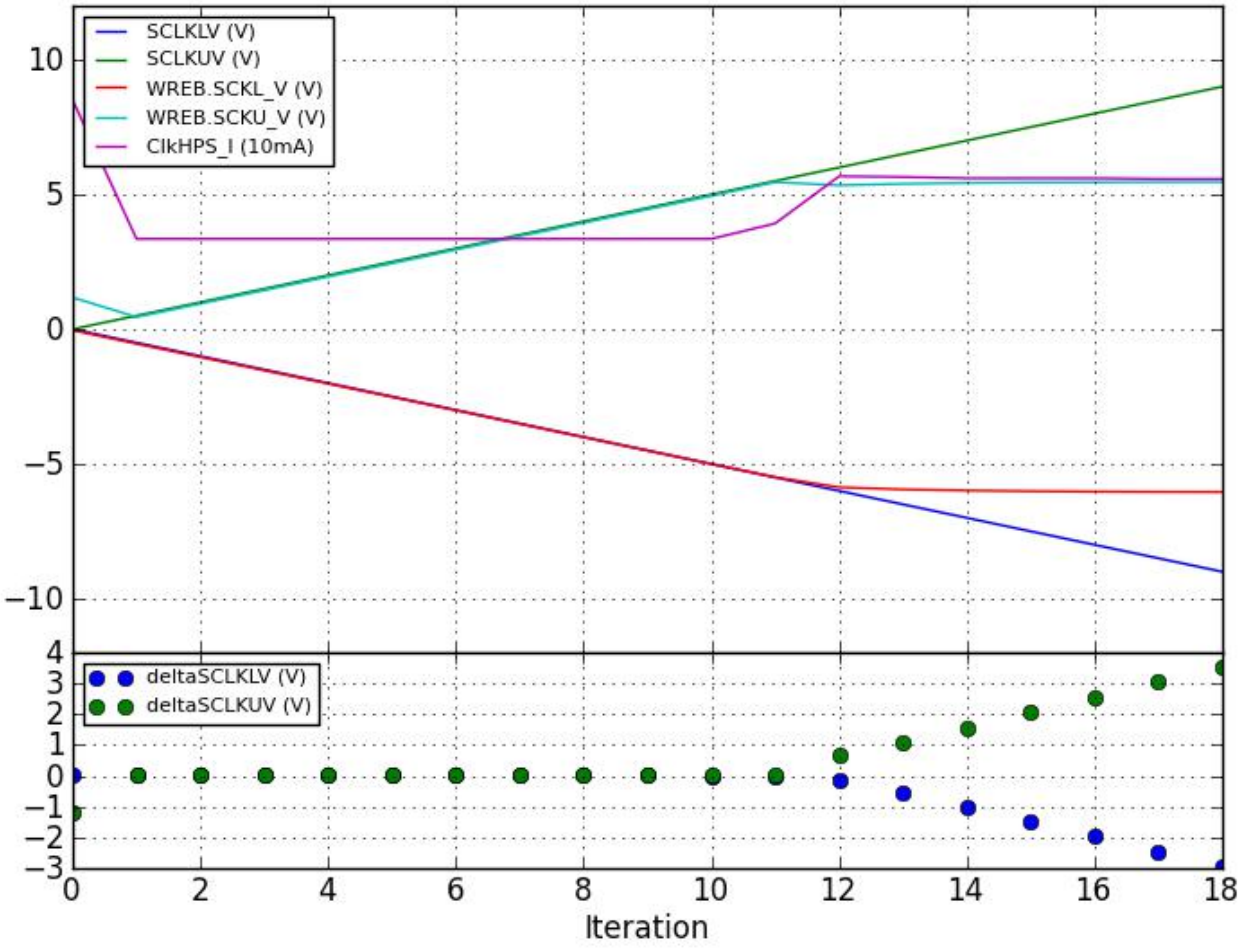
## RG Rails Test




LV Gain: 0.998743. UV Gain: 0.872444. 44/50 values okay.
Test FAILED.

| RGLV (V) | RGUV (V) | WREB.RGL_V (V) | WREB.RGU_V (V) | deltaRGLV (V) | deltaRGUV (V) |
|---|---|---|---|---|---|
| -8.5 | -3.5 | -8.358 | -0.9125 | -0.142 | -2.5875 |
| -8.0 | -3.0 | -7.8583 | -1.1909 | -0.1417 | -1.8091 |
| -7.5 | -2.5 | -7.3631 | -1.21 | -0.1369 | -1.29 |
| -7.0 | -2.0 | -6.8634 | -1.1681 | -0.1366 | -0.8319 |
| -6.5 | -1.5 | -6.3652 | -1.1124 | -0.1348 | -0.3876 |
| -6.0 | -1.0 | -5.8647 | -0.9895 | -0.1353 | -0.0105 |
| -5.5 | -0.5 | -5.3635 | -0.4936 | -0.1365 | -0.0064 |
| -5.0 | 0.0 | -4.8676 | 0.0023 | -0.1324 | -0.0023 |
| -4.5 | 0.5 | -4.3747 | 0.5051 | -0.1253 | -0.0051 |
| -4.0 | 1.0 | -3.8757 | 1.0025 | -0.1243 | -0.0025 |
| -3.5 | 1.5 | -3.3775 | 1.4946 | -0.1225 | 0.0054 |
| -3.0 | 2.0 | -2.8824 | 1.9897 | -0.1176 | 0.0103 |
| -2.5 | 2.5 | -2.3758 | 2.4834 | -0.1242 | 0.0166 |
| -2.0 | 3.0 | -1.8784 | 2.9831 | -0.1216 | 0.0169 |
| -1.5 | 3.5 | -1.3763 | 3.4859 | -0.1237 | 0.0141 |
| -1.0 | 4.0 | -0.8774 | 3.9825 | -0.1226 | 0.0175 |
| -0.5 | 4.5 | -0.3784 | 4.4746 | -0.1216 | 0.0254 |
| 0.0 | 5.0 | 0.1228 | 4.969 | -0.1228 | 0.031 |
| 0.5 | 5.5 | 0.6271 | 5.4634 | -0.1271 | 0.0366 |
| 1.0 | 6.0 | 1.1261 | 5.9624 | -0.1261 | 0.0376 |
| 1.5 | 6.5 | 1.6281 | 6.4621 | -0.1281 | 0.0379 |
| 2.0 | 7.0 | 2.1233 | 6.955 | -0.1233 | 0.045 |
| 2.5 | 7.5 | 2.6253 | 7.4532 | -0.1253 | 0.0468 |
| 3.0 | 8.0 | 3.125 | 7.959 | -0.125 | 0.041 |
| 3.5 | 8.5 | 3.6285 | 8.0101 | -0.1285 | 0.4899 |

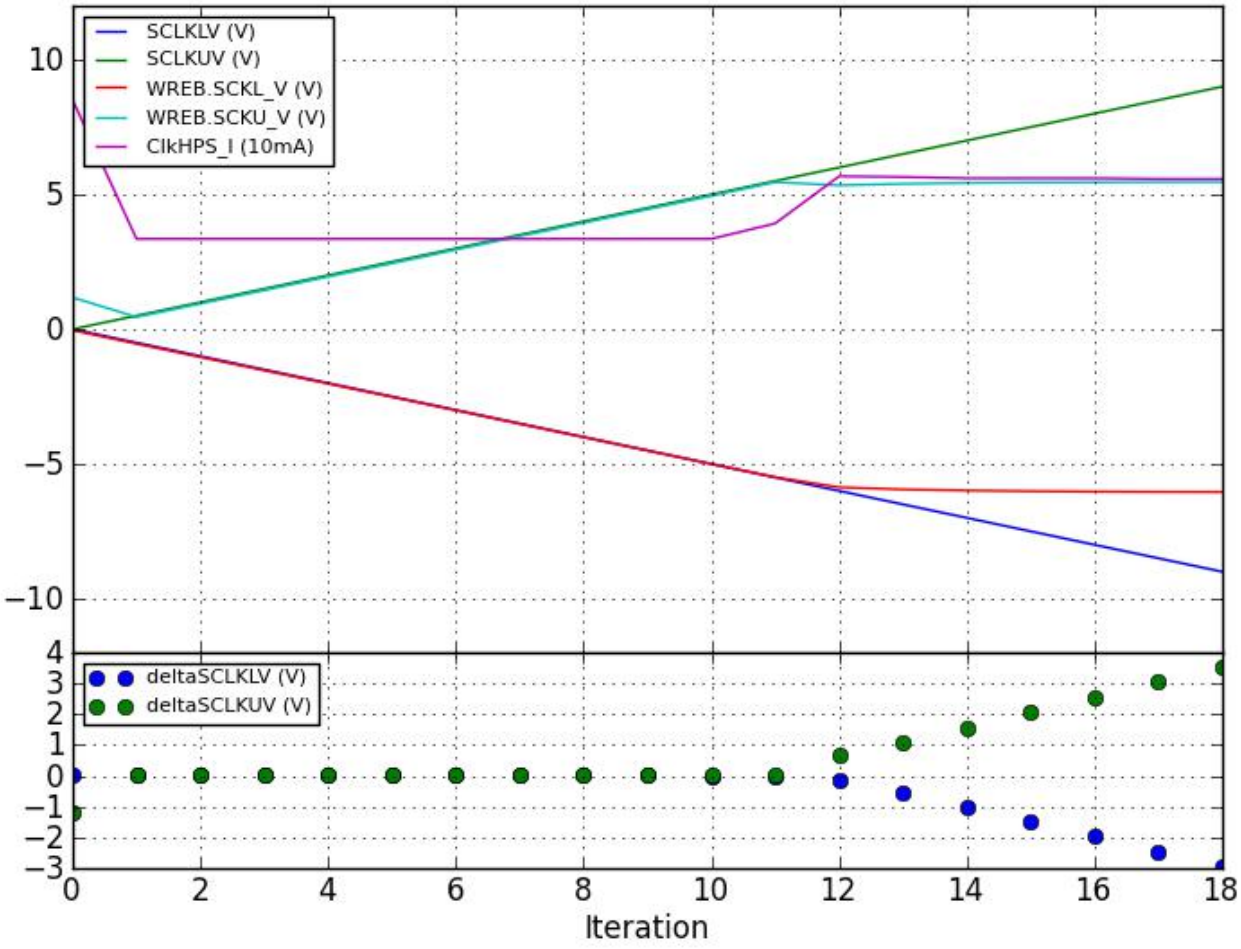
## Diverging SCKRails Test 0V




LV Gain: 0.725770. UV Gain: 0.616037. 24/38 values okay.
Test FAILED.

| SCLKLV (V) | SCLKUV (V) | WREB.SCKL_V (V) | WREB.SCKU_V (V) | ClkHPS_I (10mA) | deltaSCLKLV (V) | deltaSCLKUV (V) |
|---|---|---|---|---|---|---|
| 0.0 | 0.0 | -0.042 | 1.1749 | 8.5 | 0.042 | -1.1749 |
| -0.5 | 0.5 | -0.5409 | 0.4501 | 3.35 | 0.0409 | 0.0499 |
| -1.0 | 1.0 | -1.0361 | 0.9491 | 3.35 | 0.0361 | 0.0509 |
| -1.5 | 1.5 | -1.5289 | 1.445 | 3.35 | 0.0289 | 0.055 |
| -2.0 | 2.0 | -2.0218 | 1.9485 | 3.35 | 0.0218 | 0.0515 |
| -2.5 | 2.5 | -2.5154 | 2.4437 | 3.35 | 0.0154 | 0.0563 |
| -3.0 | 3.0 | -3.0098 | 2.9503 | 3.35 | 0.0098 | 0.0497 |
| -3.5 | 3.5 | -3.511 | 3.4492 | 3.35 | 0.011 | 0.0508 |
| -4.0 | 4.0 | -4.01 | 3.9467 | 3.35 | 0.01 | 0.0533 |
| -4.5 | 4.5 | -4.5052 | 4.4479 | 3.35 | 0.0052 | 0.0521 |
| -5.0 | 5.0 | -5.0018 | 4.95 | 3.35 | 0.0018 | 0.05 |
| -5.5 | 5.5 | -5.4924 | 5.455 | 3.925 | -0.0076 | 0.045 |
| -6.0 | 6.0 | -5.867 | 5.3391 | 5.675 | -0.133 | 0.6609 |
| -6.5 | 6.5 | -5.9448 | 5.394 | 5.65 | -0.5552 | 1.106 |
| -7.0 | 7.0 | -5.986 | 5.4268 | 5.6 | -1.014 | 1.5732 |
| -7.5 | 7.5 | -6.0112 | 5.4428 | 5.6 | -1.4888 | 2.0572 |
| -8.0 | 8.0 | -6.0272 | 5.4527 | 5.6 | -1.9728 | 2.5473 |
| -8.5 | 8.5 | -6.0364 | 5.4604 | 5.575 | -2.4636 | 3.0396 |
| -9.0 | 9.0 | -6.0402 | 5.4642 | 5.575 | -2.9598 | 3.5358 |

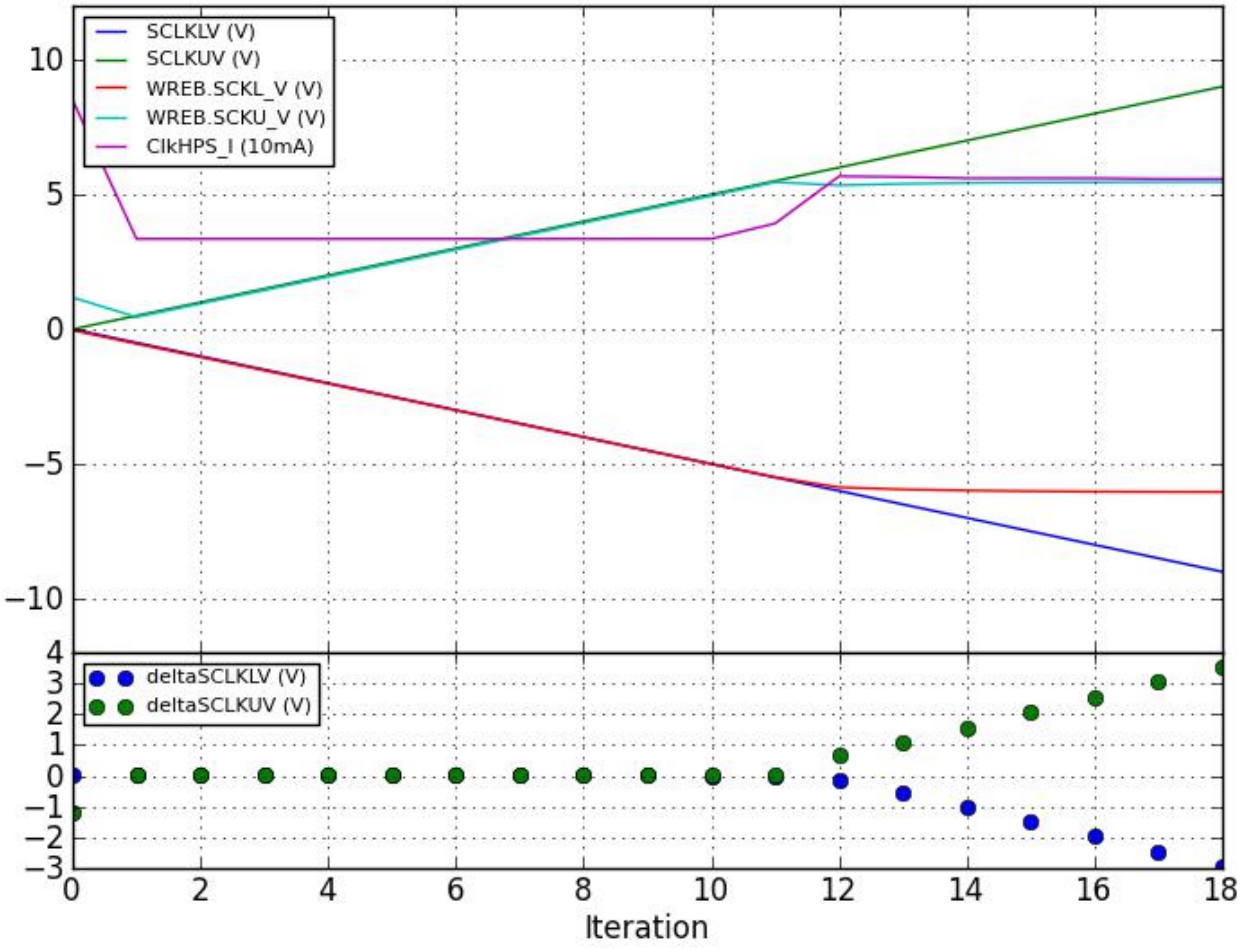
## Diverging SCKRails Test 0V




LV Gain: 0.799504. UV Gain: 0.703923. 16/38 values okay.
Test FAILED.

| SCLKLV (V) | SCLKUV (V) | WREB.SCKL_V (V) | WREB.SCKU_V (V) | ClkHPS_I (10mA) | deltaSCLKLV (V) | deltaSCLKUV (V) |
|---|---|---|---|---|---|---|
| 3.0 | 3.0 | -0.8873 | 1.1391 | 9.1 | 3.8873 | 1.8609 |
| 2.5 | 3.5 | 0.6813 | 0.6821 | 8.95 | 1.8187 | 2.8179 |
| 2.0 | 4.0 | 1.0025 | 0.9857 | 8.675 | 0.9975 | 3.0143 |
| 1.5 | 4.5 | 1.4458 | 1.445 | 3.325 | 0.0542 | 3.055 |
| 1.0 | 5.0 | 0.9521 | 1.9485 | 3.35 | 0.0479 | 3.0515 |
| 0.5 | 5.5 | 0.4601 | 2.4445 | 3.35 | 0.0399 | 3.0555 |
| 0.0 | 6.0 | -0.0359 | 2.951 | 3.35 | 0.0359 | 3.049 |
| -0.5 | 6.5 | -0.5371 | 3.4492 | 3.35 | 0.0371 | 3.0508 |
| -1.0 | 7.0 | -1.0345 | 3.9467 | 3.35 | 0.0345 | 3.0533 |
| -1.5 | 7.5 | -1.5327 | 4.4472 | 3.35 | 0.0327 | 3.0528 |
| -2.0 | 8.0 | -2.0279 | 4.9492 | 3.35 | 0.0279 | 3.0508 |
| -2.5 | 8.5 | -2.52 | 5.455 | 3.35 | 0.02 | 3.045 |
| -3.0 | 9.0 | -3.019 | 5.9578 | 3.35 | 0.019 | 3.0422 |
| -3.5 | 9.5 | -3.5294 | 6.4507 | 3.35 | 0.0294 | 3.0493 |
| -4.0 | 10.0 | -4.0245 | 6.9099 | 4.1 | 0.0245 | 3.0901 |
| -4.5 | 10.5 | -4.5204 | 6.5277 | 4.475 | 0.0204 | 3.9723 |
| -5.0 | 11.0 | -5.0194 | 6.1401 | 4.85 | 0.0194 | 4.8599 |
| -5.5 | 11.5 | -5.5153 | 5.7587 | 5.225 | 0.0153 | 5.7413 |
| -6.0 | 12.0 | -5.9525 | 5.4237 | 5.6 | -0.0475 | 6.5763 |

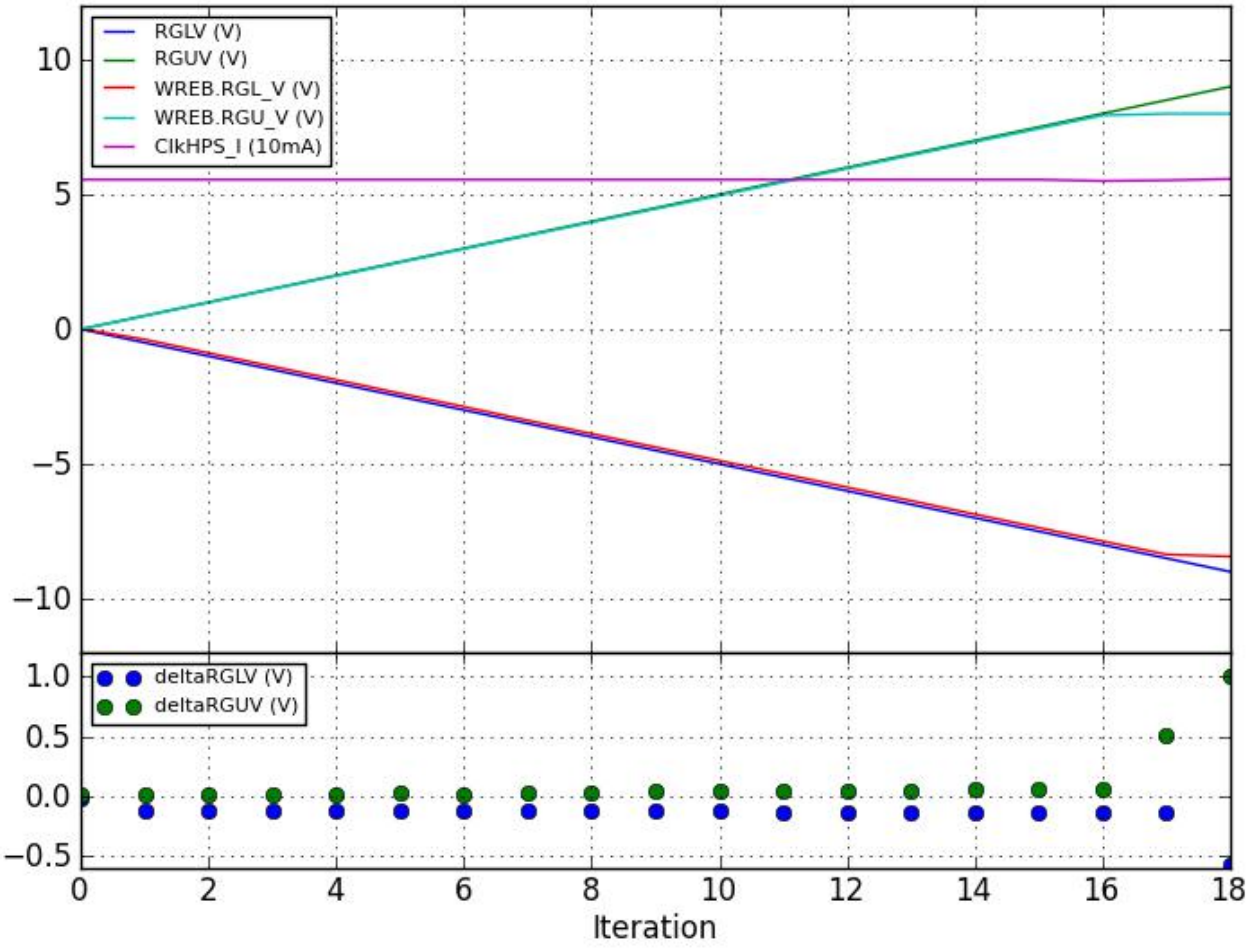
## Diverging SCKRails Test 0V




LV Gain: 0.366979. UV Gain: 0.727448. 26/38 values okay.
Test FAILED.

| SCLKLV (V) | SCLKUV (V) | WREB.SCKL_V (V) | WREB.SCKU_V (V) | ClkHPS_I (10mA) | deltaSCLKLV (V) | deltaSCLKUV (V) |
|---|---|---|---|---|---|---|
| -3.0 | -3.0 | -3.0312 | 1.0094 | 7.3 | 0.0312 | -4.0094 |
| -3.5 | -2.5 | -3.5324 | -0.1755 | 6.925 | 0.0324 | -2.3245 |
| -4.0 | -2.0 | -4.0268 | -0.5241 | 6.5 | 0.0268 | -1.4759 |
| -4.5 | -1.5 | -4.5204 | -0.6714 | 6.075 | 0.0204 | -0.8286 |
| -5.0 | -1.0 | -5.0133 | -0.7591 | 5.65 | 0.0133 | -0.2409 |
| -5.5 | -0.5 | -5.5061 | -0.5486 | 3.35 | 0.0061 | 0.0486 |
| -6.0 | 0.0 | -5.9982 | -0.042 | 3.35 | -0.0018 | 0.042 |
| -6.5 | 0.5 | -6.5018 | 0.4555 | 3.35 | 0.0018 | 0.0445 |
| -7.0 | 1.0 | -6.9984 | 0.9544 | 3.35 | -0.0016 | 0.0456 |
| -7.5 | 1.5 | -7.4944 | 1.4549 | 3.35 | -0.0056 | 0.0451 |
| -8.0 | 2.0 | -7.991 | 1.9569 | 3.35 | -0.009 | 0.0431 |
| -8.5 | 2.5 | -8.3488 | 2.4605 | 3.425 | -0.1512 | 0.0395 |
| -9.0 | 3.0 | -7.9239 | 2.964 | 3.775 | -1.0761 | 0.036 |
| -9.5 | 3.5 | -7.5157 | 3.4576 | 4.125 | -1.9843 | 0.0424 |
| -10.0 | 4.0 | -7.1136 | 3.9558 | 4.5 | -2.8864 | 0.0442 |
| -10.5 | 4.5 | -6.7146 | 4.4594 | 4.85 | -3.7854 | 0.0406 |
| -11.0 | 5.0 | -6.3248 | 4.9545 | 5.2 | -4.6752 | 0.0455 |
| -11.5 | 5.5 | -5.9776 | 5.41 | 5.6 | -5.5224 | 0.09 |
| -12.0 | 6.0 | -6.0059 | 5.4398 | 5.6 | -5.9941 | 0.5602 |

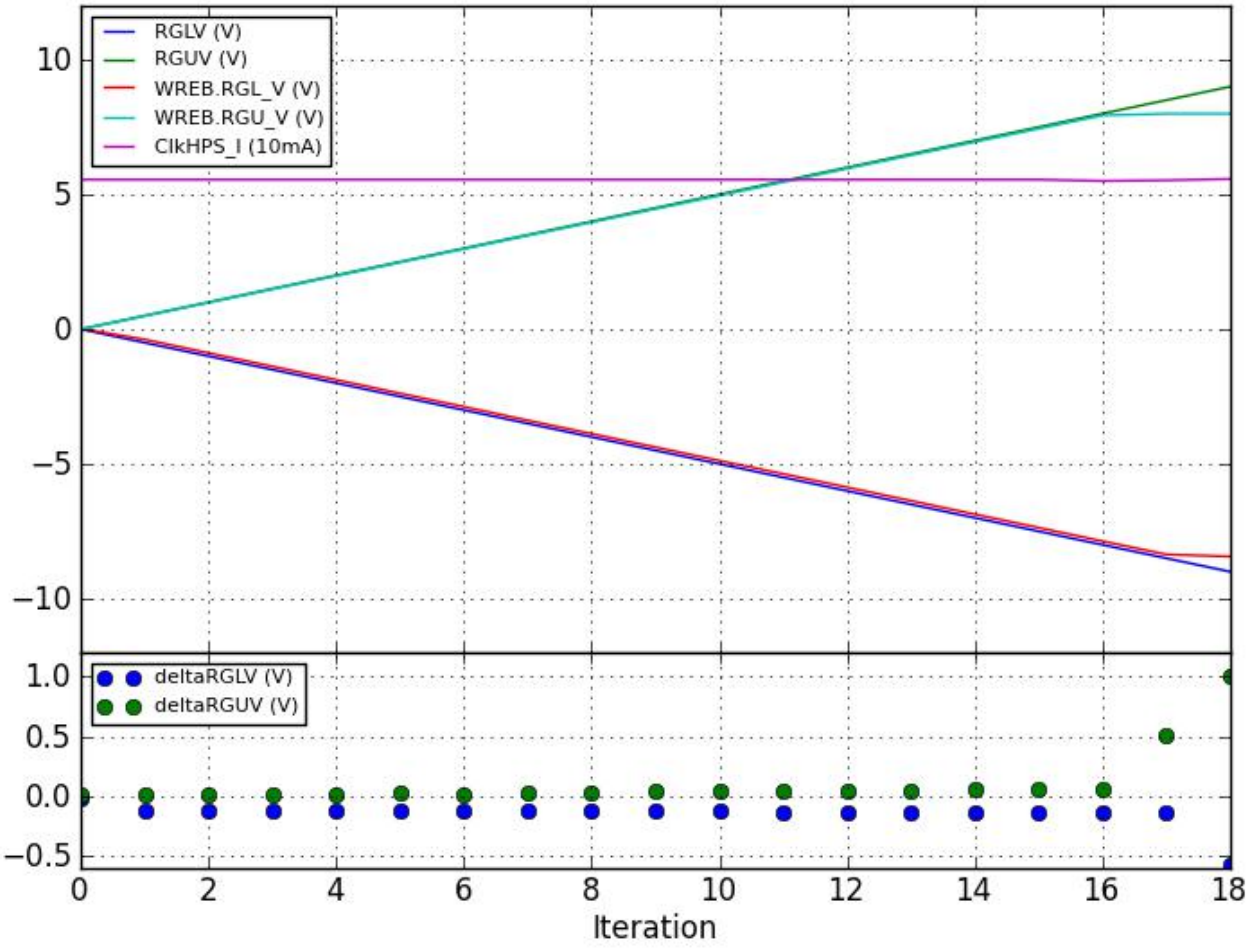
## Diverging RGRails Test 0V




LV Gain: 0.980889. UV Gain: 0.951418. 35/38 values okay.
Test PASSED.

| RGLV (V) | RGUV (V) | WREB.RGL_V (V) | WREB.RGU_V (V) | ClkHPS_I (10mA) | deltaRGLV (V) | deltaRGUV (V) |
|---|---|---|---|---|---|---|
| 0.0 | 0.0 | 0.0214 | -0.0114 | 5.55 | -0.0214 | 0.0114 |
| -0.5 | 0.5 | -0.3799 | 0.4898 | 5.55 | -0.1201 | 0.0102 |
| -1.0 | 1.0 | -0.8827 | 0.985 | 5.55 | -0.1173 | 0.015 |
| -1.5 | 1.5 | -1.3817 | 1.4832 | 5.55 | -0.1183 | 0.0168 |
| -2.0 | 2.0 | -1.8784 | 1.9775 | 5.55 | -0.1216 | 0.0225 |
| -2.5 | 2.5 | -2.3827 | 2.4773 | 5.55 | -0.1173 | 0.0227 |
| -3.0 | 3.0 | -2.8786 | 2.9778 | 5.55 | -0.1214 | 0.0222 |
| -3.5 | 3.5 | -3.3852 | 3.4744 | 5.55 | -0.1148 | 0.0256 |
| -4.0 | 4.0 | -3.8818 | 3.9665 | 5.55 | -0.1182 | 0.0335 |
| -4.5 | 4.5 | -4.3793 | 4.4624 | 5.55 | -0.1207 | 0.0376 |
| -5.0 | 5.0 | -4.8767 | 4.9561 | 5.55 | -0.1233 | 0.0439 |
| -5.5 | 5.5 | -5.3696 | 5.4543 | 5.55 | -0.1304 | 0.0457 |
| -6.0 | 6.0 | -5.867 | 5.9586 | 5.55 | -0.133 | 0.0414 |
| -6.5 | 6.5 | -6.3667 | 6.4545 | 5.55 | -0.1333 | 0.0455 |
| -7.0 | 7.0 | -6.8687 | 6.9473 | 5.55 | -0.1313 | 0.0527 |
| -7.5 | 7.5 | -7.3669 | 7.4409 | 5.55 | -0.1331 | 0.0591 |
| -8.0 | 8.0 | -7.8659 | 7.9338 | 5.5 | -0.1341 | 0.0662 |
| -8.5 | 8.5 | -8.3618 | 7.9964 | 5.525 | -0.1382 | 0.5036 |
| -9.0 | 9.0 | -8.4328 | 7.9956 | 5.575 | -0.5672 | 1.0044 |

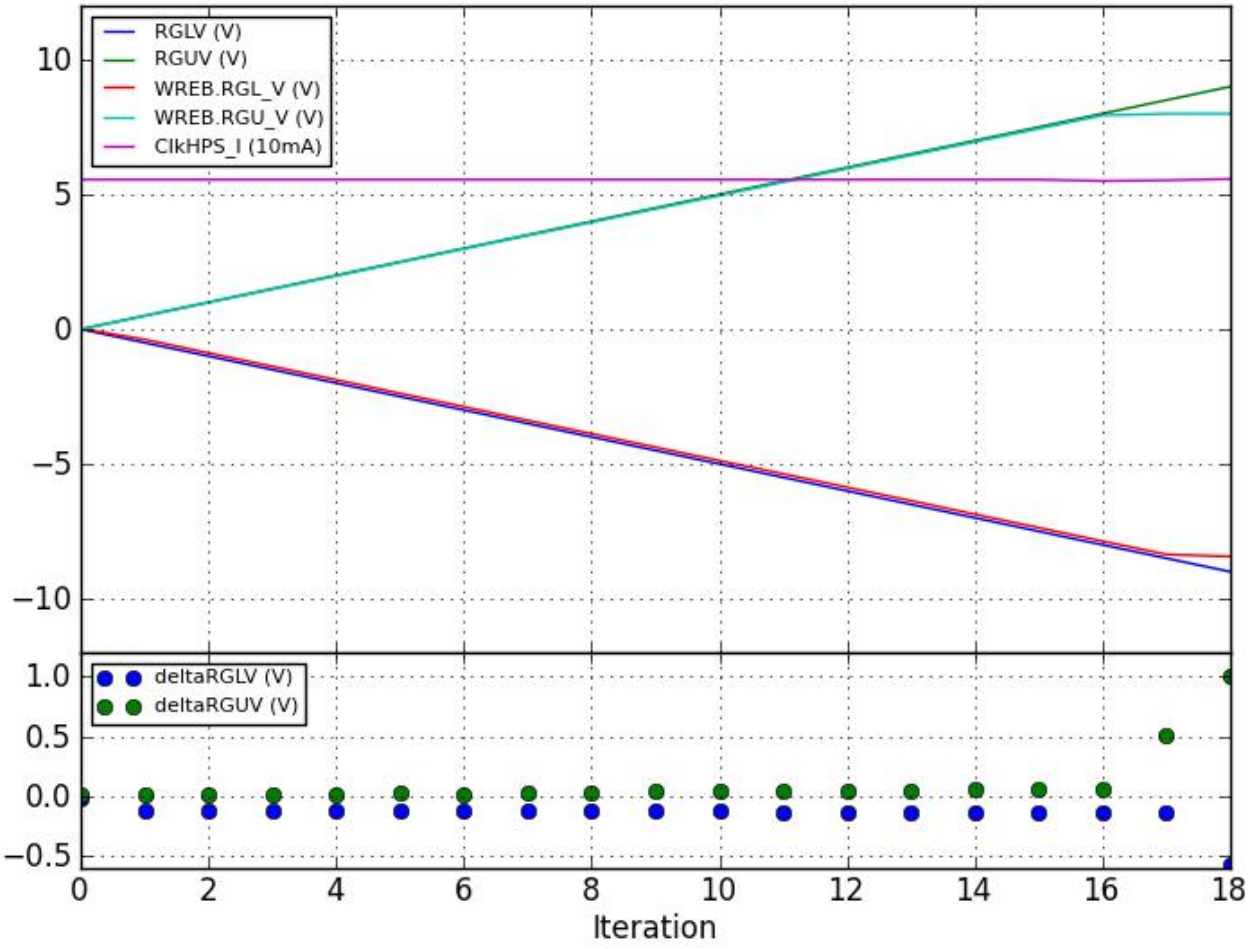
## Diverging RGRails Test 0V




LV Gain: 0.809605. UV Gain: 0.951637. 16/38 values okay.
Test FAILED.

| RGLV (V) | RGUV (V) | WREB.RGL_V (V) | WREB.RGU_V (V) | ClkHPS_I (10mA) | deltaRGLV (V) | deltaRGUV (V) |
|---|---|---|---|---|---|---|
| 3.0 | 3.0 | -0.0656 | -0.0122 | 5.55 | 3.0656 | 3.0122 |
| 2.5 | 3.5 | 0.5104 | 0.4883 | 5.55 | 1.9896 | 3.0117 |
| 2.0 | 4.0 | 1.001 | 0.985 | 5.55 | 0.999 | 3.015 |
| 1.5 | 4.5 | 1.4915 | 1.4839 | 5.525 | 0.0085 | 3.0161 |
| 1.0 | 5.0 | 1.1009 | 1.9783 | 5.55 | -0.1009 | 3.0217 |
| 0.5 | 5.5 | 0.5981 | 2.4765 | 5.55 | -0.0981 | 3.0235 |
| 0.0 | 6.0 | 0.1015 | 2.9785 | 5.55 | -0.1015 | 3.0215 |
| -0.5 | 6.5 | -0.4051 | 3.4744 | 5.55 | -0.0949 | 3.0256 |
| -1.0 | 7.0 | -0.9003 | 3.9673 | 5.55 | -0.0997 | 3.0327 |
| -1.5 | 7.5 | -1.3969 | 4.4632 | 5.55 | -0.1031 | 3.0368 |
| -2.0 | 8.0 | -1.8951 | 4.9568 | 5.55 | -0.1049 | 3.0432 |
| -2.5 | 8.5 | -2.388 | 5.455 | 5.55 | -0.112 | 3.045 |
| -3.0 | 9.0 | -2.8854 | 5.9563 | 5.55 | -0.1146 | 3.0437 |
| -3.5 | 9.5 | -3.3859 | 6.4545 | 5.55 | -0.1141 | 3.0455 |
| -4.0 | 10.0 | -3.8864 | 6.9481 | 5.55 | -0.1136 | 3.0519 |
| -4.5 | 10.5 | -4.3877 | 7.4402 | 5.55 | -0.1123 | 3.0598 |
| -5.0 | 11.0 | -4.8866 | 7.9346 | 5.5 | -0.1134 | 3.0654 |
| -5.5 | 11.5 | -5.3802 | 7.9994 | 5.575 | -0.1198 | 3.5006 |
| -6.0 | 12.0 | -5.88 | 7.9987 | 5.575 | -0.12 | 4.0013 |

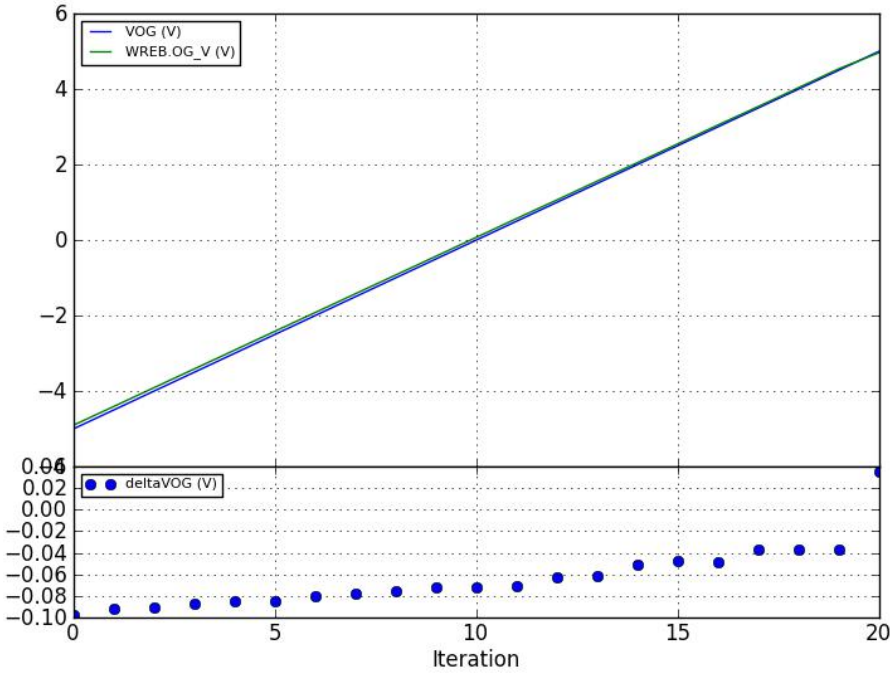
## Diverging RGRails Test 0V




LV Gain: 0.665621. UV Gain: 0.827101. 27/38 values okay.
Test FAILED.

| RGLV (V) | RGUV (V) | WREB.RGL_V (V) | WREB.RGU_V (V) | ClkHPS_I (10mA) | deltaRGLV (V) | deltaRGUV (V) |
|---|---|---|---|---|---|---|
| -3.0 | -3.0 | -2.8641 | -0.5386 | 5.55 | -0.1359 | -2.4614 |
| -3.5 | -2.5 | -3.3684 | -0.7332 | 5.55 | -0.1316 | -1.7668 |
| -4.0 | -2.0 | -3.8704 | -0.8446 | 5.55 | -0.1296 | -1.1554 |
| -4.5 | -1.5 | -4.3701 | -0.9277 | 5.55 | -0.1299 | -0.5723 |
| -5.0 | -1.0 | -4.8683 | -0.9872 | 5.525 | -0.1317 | -0.0128 |
| -5.5 | -0.5 | -5.3711 | -0.4974 | 5.55 | -0.1289 | -0.0026 |
| -6.0 | 0.0 | -5.8678 | 0.0061 | 5.55 | -0.1322 | -0.0061 |
| -6.5 | 0.5 | -6.3751 | 0.5043 | 5.55 | -0.1249 | -0.0043 |
| -7.0 | 1.0 | -6.8703 | 0.9949 | 5.55 | -0.1297 | 0.0051 |
| -7.5 | 1.5 | -7.3677 | 1.49 | 5.55 | -0.1323 | 0.01 |
| -8.0 | 2.0 | -7.8659 | 1.9844 | 5.55 | -0.1341 | 0.0156 |
| -8.5 | 2.5 | -8.3572 | 2.4818 | 5.5 | -0.1428 | 0.0182 |
| -9.0 | 3.0 | -8.4335 | 2.9869 | 5.55 | -0.5665 | 0.0131 |
| -9.5 | 3.5 | -8.4335 | 3.4813 | 5.55 | -1.0665 | 0.0187 |
| -10.0 | 4.0 | -8.4335 | 3.9757 | 5.55 | -1.5665 | 0.0243 |
| -10.5 | 4.5 | -8.4335 | 4.4678 | 5.55 | -2.0665 | 0.0322 |
| -11.0 | 5.0 | -8.4335 | 4.9629 | 5.55 | -2.5665 | 0.0371 |
| -11.5 | 5.5 | -8.4335 | 5.4634 | 5.55 | -3.0665 | 0.0366 |
| -12.0 | 6.0 | -8.4335 | 5.9624 | 5.55 | -3.5665 | 0.0376 |

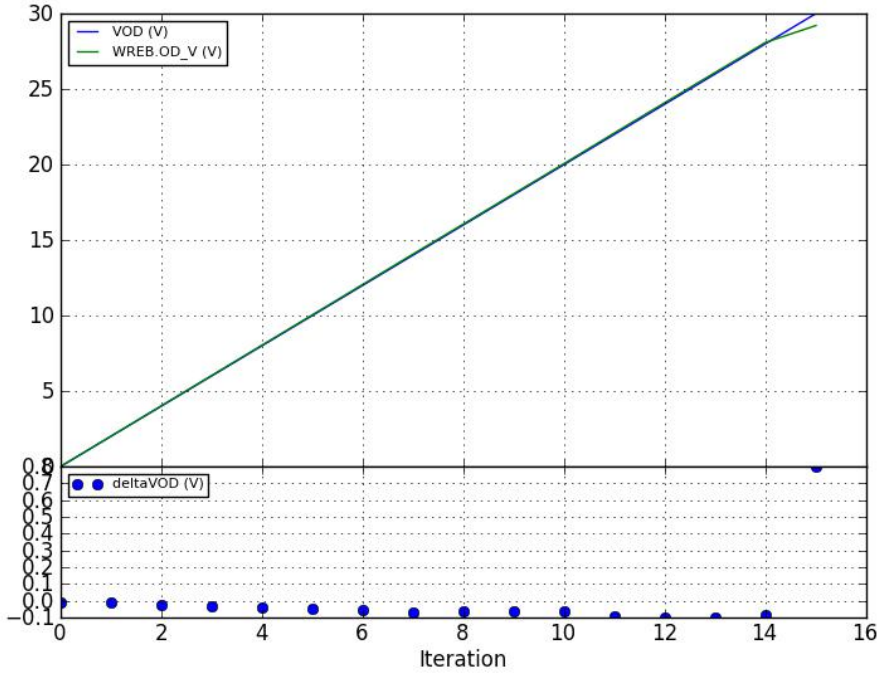
## OG Bias Test




Gain: 0.991664.  21/21 values okay.
Test PASSED.

| VOG (V) | WREB.OG_V (V) | deltaVOG (V) |
|---|---|---|
| -5.0 | -4.9028 | -0.0972 |
| -4.5 | -4.4077 | -0.0923 |
| -4.0 | -3.9091 | -0.0909 |
| -3.5 | -3.4123 | -0.0877 |
| -3.0 | -2.9155 | -0.0845 |
| -2.5 | -2.4153 | -0.0847 |
| -2.0 | -1.9202 | -0.0798 |
| -1.5 | -1.4217 | -0.0783 |
| -1.0 | -0.9248 | -0.0752 |
| -0.5 | -0.428 | -0.072 |
| 0.0 | 0.0722 | -0.0722 |
| 0.5 | 0.5707 | -0.0707 |
| 1.0 | 1.0625 | -0.0625 |
| 1.5 | 1.561 | -0.061 |
| 2.0 | 2.0511 | -0.0511 |
| 2.5 | 2.5479 | -0.0479 |
| 3.0 | 3.0481 | -0.0481 |
| 3.5 | 3.5365 | -0.0365 |
| 4.0 | 4.0367 | -0.0367 |
| 4.5 | 4.5369 | -0.0369 |
| 5.0 | 4.9649 | 0.0351 |

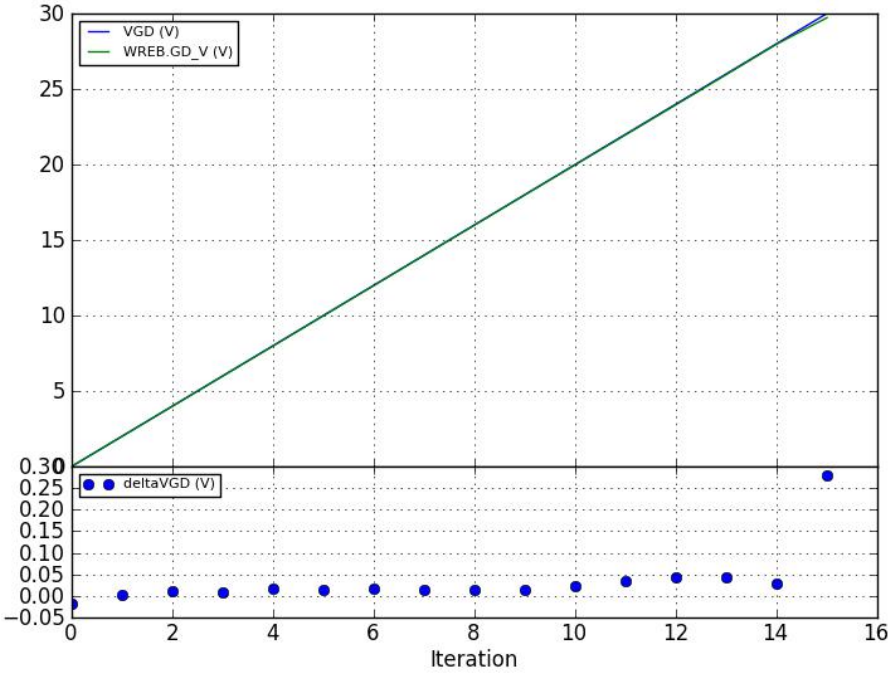
## OD Bias Test




Gain: 0.993199.  15/16 values okay.
Test PASSED.

| VOD (V) | WREB.OD_V (V) | deltaVOD (V) |
|---|---|---|
| 0 | 0.0117 | -0.0117 |
| 2 | 2.0108 | -0.0108 |
| 4 | 4.025 | -0.025 |
| 6 | 6.0307 | -0.0307 |
| 8 | 8.0382 | -0.0382 |
| 10 | 10.0439 | -0.0439 |
| 12 | 12.0564 | -0.0564 |
| 14 | 14.0706 | -0.0706 |
| 16 | 16.0596 | -0.0596 |
| 18 | 18.0637 | -0.0637 |
| 20 | 20.0644 | -0.0644 |
| 22 | 22.092 | -0.092 |
| 24 | 24.0994 | -0.0994 |
| 26 | 26.0968 | -0.0968 |
| 28 | 28.0858 | -0.0858 |
| 30 | 29.2036 | 0.7964 |

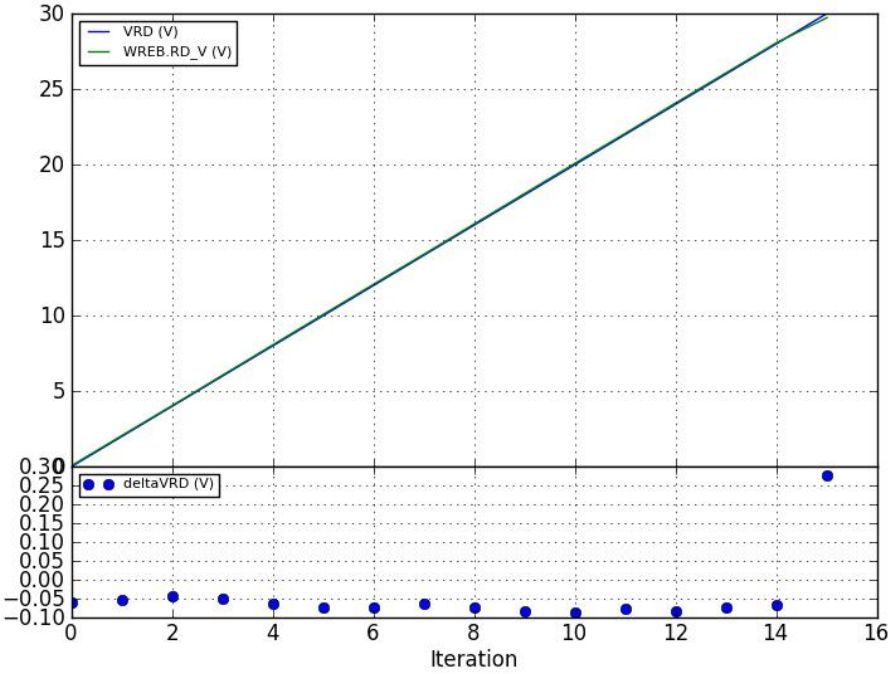
## GD Bias Test




Gain: 0.995837.  15/16 values okay.
Test PASSED.

| VGD (V) | WREB.GD_V (V) | deltaVGD (V) |
|---|---|---|
| 0 | 0.0185 | -0.0185 |
| 2 | 1.9974 | 0.0026 |
| 4 | 3.9897 | 0.0103 |
| 6 | 5.9904 | 0.0096 |
| 8 | 7.9828 | 0.0172 |
| 10 | 9.9852 | 0.0148 |
| 12 | 11.9843 | 0.0157 |
| 14 | 13.985 | 0.015 |
| 16 | 15.9857 | 0.0143 |
| 18 | 17.9865 | 0.0135 |
| 20 | 19.9771 | 0.0229 |
| 22 | 21.9644 | 0.0356 |
| 24 | 23.9568 | 0.0432 |
| 26 | 25.9558 | 0.0442 |
| 28 | 27.97 | 0.03 |
| 30 | 29.7206 | 0.2794 |

## RD Bias Test

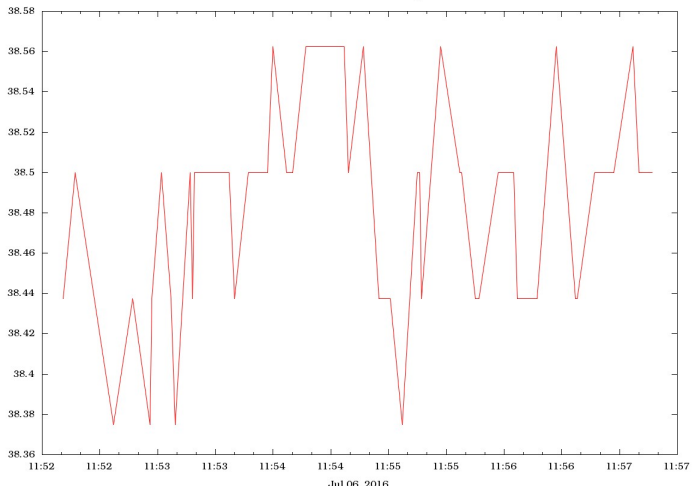



Gain: 0.996993.  15/16 values okay.
Test PASSED.

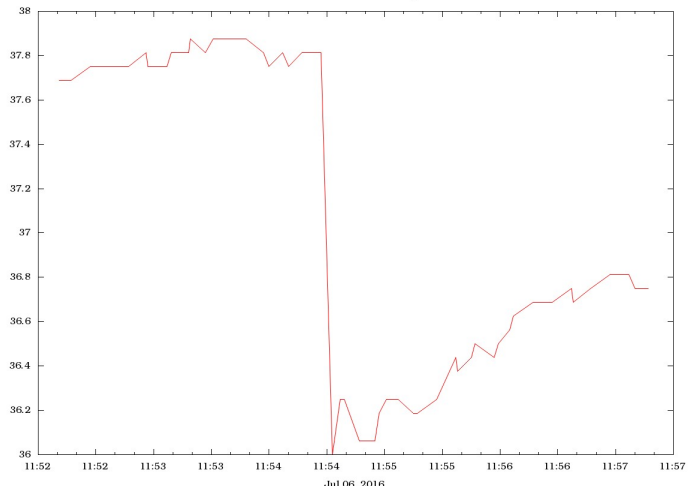
| VRD (V) | WREB.RD_V (V) | deltaVRD (V) |
|---|---|---|
| 0 | 0.0587 | -0.0587 |
| 2 | 2.0544 | -0.0544 |
| 4 | 4.0434 | -0.0434 |
| 6 | 6.0509 | -0.0509 |
| 8 | 8.0634 | -0.0634 |
| 10 | 10.0742 | -0.0742 |
| 12 | 12.0749 | -0.0749 |
| 14 | 14.0639 | -0.0639 |
| 16 | 16.073 | -0.073 |
| 18 | 18.0838 | -0.0838 |
| 20 | 20.0862 | -0.0862 |
| 22 | 22.0752 | -0.0752 |
| 24 | 24.0826 | -0.0826 |
| 26 | 26.075 | -0.075 |
| 28 | 28.0656 | -0.0656 |
| 30 | 29.7223 | 0.2777 |

## Board temperature test

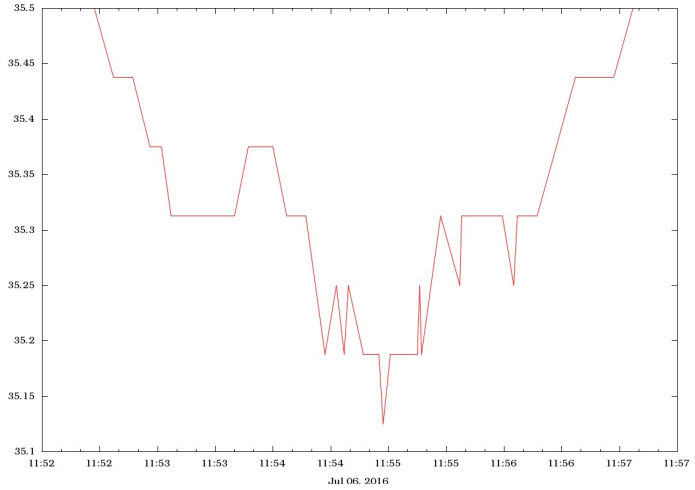
ccs-cr: WREB.Temp1



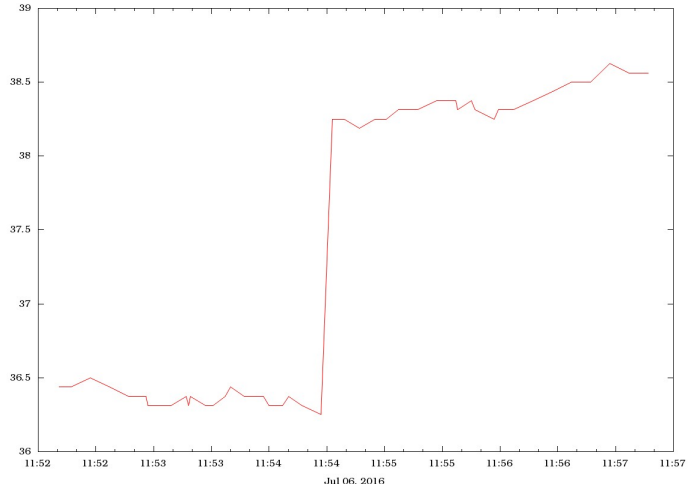

ccs-cr: WREB.Temp5



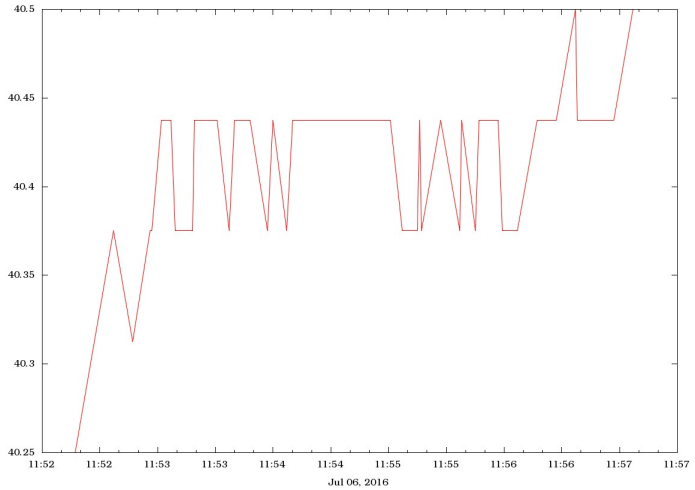

ccs-cr: WREB.Temp6



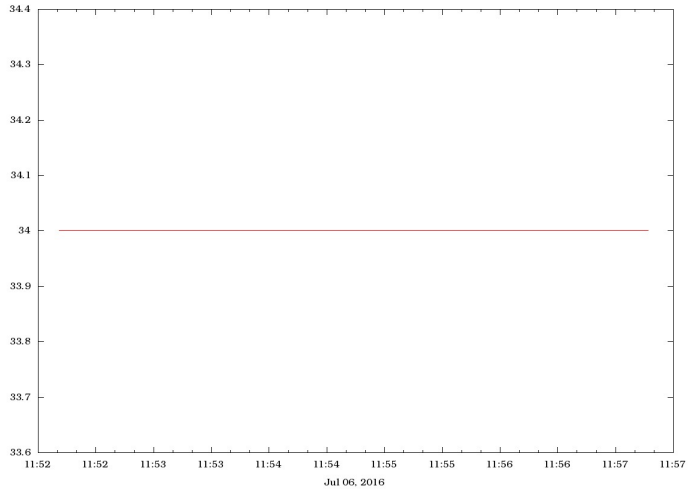

ccs-cr: WREB.Temp4




ccs-cr: WREB.Temp2




ccs-cr: WREB.Temp3



# WREB Test: 2016-07-06 11:57

## CCD temperature test