13.6 Test with primary and redundant GASU connected to FREE

Photocopy complete section four times and use it to verify continuity for Ref. Des. JL-180 through JL-187. This corresponds to GASU 4LB-A and B, or 4RB-A and B, or 4RA-A and B, and 4LA-A and B. One each primary and redundant connections are made, thus there are 4 copies of measurements.

<table>
<thead>
<tr>
<th>PARA</th>
<th>DESCRIPTION</th>
<th>PASSED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test without FREE connected</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Test with FREE connected, Voltage Tests</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test with FREE connected, Function Test Primary GASU Side</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Test with FREE connected, Function Test Primary GASU Side</td>
<td></td>
<td>Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Title:</th>
<th>LATD-0878</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operator:</td>
<td>J. Ludvik</td>
</tr>
<tr>
<td>Temperature:</td>
<td>25°C</td>
</tr>
</tbody>
</table>

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13.6.1 Connectors under test

Ref. Des. JL-180 through JL-187. This corresponds to GASU (4LB-A and B), or (4RB-A and B), or (4RA-A and B), and (4LA-A and B).

Enter Connector pair Ref Des here, primary and redundant:
13.6.3 Test without FREE Connection

This test can be skipped since it is not required.

Skipped [ ] Yes [ ] No:

Primary BOB with connection, redundant side BOB with open connections. Measure on FREE side connection of redundant side BOB.

13.6.2.1 Supply Voltage Test with FREE power off

<table>
<thead>
<tr>
<th>Measurement No.</th>
<th>Signal Pair</th>
<th>Pin 1</th>
<th>Expected Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ACD_NDD</td>
<td>JL-180 – 1</td>
<td>V &lt; 1 V</td>
</tr>
<tr>
<td>5</td>
<td>ACD_2BV</td>
<td>JL-180 – 5</td>
<td>V &lt; 0.5 V</td>
</tr>
</tbody>
</table>

Assuming load-current (from LED) is a few milli-amps, otherwise pin 5 is < 29 V and pin 1 < 3.9 V for no load.

13.6.2.2 Voltage Test with FREE power disabled

<table>
<thead>
<tr>
<th>SIGNAL NAME</th>
<th>PIN</th>
<th>EXPECTED VOLTAGE</th>
<th>PASS / FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>NVETO_0_P</td>
<td>71</td>
<td>V &lt; 1 V</td>
<td></td>
</tr>
<tr>
<td>NVETO_0_M</td>
<td>70</td>
<td>V &lt; 1 V</td>
<td></td>
</tr>
<tr>
<td>NVETO_1_P</td>
<td>69</td>
<td>V &lt; 1 V</td>
<td></td>
</tr>
<tr>
<td>NVETO_1_M</td>
<td>68</td>
<td>V &lt; 1 V</td>
<td></td>
</tr>
<tr>
<td>NVETO_2_P</td>
<td>67</td>
<td>V &lt; 1 V</td>
<td></td>
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<tr>
<td>NVETO_2_M</td>
<td>66</td>
<td>V &lt; 1 V</td>
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<td>NVETO_3_P</td>
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<td></td>
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<table>
<thead>
<tr>
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</thead>
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LAT-TD-03827 Page 75
<table>
<thead>
<tr>
<th>SIGNAL NAME</th>
<th>PIN</th>
<th>EXPECTED VOLTAGE</th>
<th>PASS / FAIL</th>
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<tbody>
<tr>
<td>NCEO_M</td>
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<tr>
<td>CLK_M</td>
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<td>NCMO_M</td>
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<td>V = 1V</td>
<td></td>
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<tr>
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<td></td>
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<tr>
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<tr>
<td>NDATA_M</td>
<td>72</td>
<td>0V &lt; V &lt; 3V</td>
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<tr>
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<td>23</td>
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</tr>
<tr>
<td>HV_MON_1_M</td>
<td>24</td>
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<tr>
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<td>25</td>
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<tr>
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<td>ACOG_VDD1</td>
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<td>ACOG_GND1</td>
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<td>ACOG_28V_0</td>
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<td></td>
</tr>
<tr>
<td>ACOG_28V_RTN_0</td>
<td>33</td>
<td>V &lt; 0.1V</td>
<td></td>
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<tr>
<td>ACOG_28V_1</td>
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<td></td>
</tr>
<tr>
<td>ACOG_28V_RTN_1</td>
<td>34</td>
<td>V &lt; 0.1V</td>
<td></td>
</tr>
</tbody>
</table>

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13.6.2.3 Stray Voltage Test with FREE power enabled

Nominal V, ACD_V_adjust= 0V

<table>
<thead>
<tr>
<th>Measurement No.</th>
<th>Signal Pair</th>
<th>Pin 1</th>
<th>Expected Voltage</th>
<th>Verified</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ACD_3IDD</td>
<td>JL-180-1</td>
<td>3.2V &lt; V &lt; 3.6V</td>
<td>✔️</td>
</tr>
<tr>
<td>5</td>
<td>ACD_28V</td>
<td>JL-180-5</td>
<td>25V &lt; V &lt; 28V</td>
<td>✔️</td>
</tr>
</tbody>
</table>

13.6.2.4 Voltage Test with FREE power enabled

<table>
<thead>
<tr>
<th>SIGNAL_NAME</th>
<th>PIN</th>
<th>EXPECTED_VOLTAGE</th>
<th>PASS / FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>NVETO_0_P</td>
<td>71</td>
<td>3V &lt; V &lt; 3.5V</td>
<td>✔️</td>
</tr>
<tr>
<td>NVETO_0_M</td>
<td>70</td>
<td>0V &lt; V &lt; 1V</td>
<td>✔️</td>
</tr>
<tr>
<td>NVETO_1_P</td>
<td>69</td>
<td>3V &lt; V &lt; 3.5V</td>
<td>✔️</td>
</tr>
<tr>
<td>NVETO_1_M</td>
<td>68</td>
<td>0V &lt; V &lt; 1V</td>
<td>✔️</td>
</tr>
<tr>
<td>NVETO_2_P</td>
<td>67</td>
<td>3V &lt; V &lt; 3.5V</td>
<td>✔️</td>
</tr>
<tr>
<td>NVETO_2_M</td>
<td>66</td>
<td>0V &lt; V &lt; 1V</td>
<td>✔️</td>
</tr>
<tr>
<td>NVETO_3_P</td>
<td>65</td>
<td>3V &lt; V &lt; 3.5V</td>
<td>✔️</td>
</tr>
<tr>
<td>NVETO_3_M</td>
<td>64</td>
<td>0V &lt; V &lt; 1V</td>
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<td>63</td>
<td>3V &lt; V &lt; 3.5V</td>
<td>✔️</td>
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<tr>
<td>NVETO_4_M</td>
<td>62</td>
<td>0V &lt; V &lt; 1V</td>
<td>✔️</td>
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<tr>
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<td>61</td>
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<td>0V &lt; V &lt; 1V</td>
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<tr>
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</tr>
<tr>
<td>NVETO_7_P</td>
<td>57</td>
<td>3V &lt; V &lt; 3.5V</td>
<td>✔️</td>
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<td>NVETO_7_M</td>
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<tr>
<td>NVETO_8_P</td>
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</table>

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<table>
<thead>
<tr>
<th>SIGNAL_NAME</th>
<th>PIN</th>
<th>EXPECTED VOLTAGE</th>
<th>PASS / FAIL</th>
</tr>
</thead>
<tbody>
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<td>NVETO_8M</td>
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<tr>
<td>NVETO_9_P</td>
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<td>NVETO_9_M</td>
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<td>NVETO_11_P</td>
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<tr>
<td>TEMP_MON_M</td>
<td>26</td>
<td>1V &lt; V &lt; 2V</td>
<td>✓</td>
</tr>
</tbody>
</table>

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13.6.3 Test with FREE connected, Voltage Tests

13.6.3.1 Stay Voltage Test at the AEM Interface with FREE power disabled

1) Turn off 28-V power
2) With the shorting plugs inserted in the break out boxes, turn on 28V bench supply to primary GASU.
3) Boot VME-SBC
4) Boot successful: Yes/No
5) Start LATTE (see I&T LATTE instructions)
6) Make sure FREE power-on register is turned-off.

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8) Run AEM test scripts

8A) Pass/Fail

13.6.3.2 Supply Voltage Level Test with FREE power disabled

(nominal VDD-ACD)

<table>
<thead>
<tr>
<th>Measurement No.</th>
<th>Signal Pair</th>
<th>Pin 1</th>
<th>Expected Voltage</th>
<th>Verified</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ACD_VDD</td>
<td>JL-180 - 1</td>
<td>V &lt; 1 V</td>
<td>✓</td>
</tr>
<tr>
<td>5</td>
<td>ACD_28V</td>
<td>JL-180 - 5</td>
<td>V &lt; 0.1 V</td>
<td>✓</td>
</tr>
</tbody>
</table>

13.6.3.3 Bench Supply Current Level Test with FREE power enabled

<table>
<thead>
<tr>
<th>Measurement No.</th>
<th>Signal</th>
<th>Expected Current</th>
<th>Verified</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>28V bench supply</td>
<td>330 mA &lt; I &lt; 380mA</td>
<td>✓</td>
</tr>
</tbody>
</table>

13.6.3.4 Supply Voltage Level Test with FREE power enabled

(nominal VDD-ACD)

<table>
<thead>
<tr>
<th>Measurement No.</th>
<th>Signal Pair</th>
<th>Pin 1</th>
<th>Expected Voltage</th>
<th>Verified</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ACD_VDD</td>
<td>JL-180 - 1</td>
<td>3.5 V &lt; V &lt; 3.7 V</td>
<td>✓</td>
</tr>
<tr>
<td>5</td>
<td>ACD_28V</td>
<td>JL-180 - 5</td>
<td>27 V &lt; V &lt; 28 V</td>
<td>✓</td>
</tr>
</tbody>
</table>
13.6.3.5 Voltage Test at redundant connection with primary FREE power enabled

<table>
<thead>
<tr>
<th>SIGNAL NAME</th>
<th>PIN</th>
<th>EXPECTED VOLTAGE</th>
<th>PASS / FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>NVETO_6.P</td>
<td>71</td>
<td>1.1V &lt; V &lt; 1.5V</td>
<td>✔</td>
</tr>
<tr>
<td>NVETO_6.M</td>
<td>70</td>
<td>0.8V &lt; V &lt; 1.3V</td>
<td>✔</td>
</tr>
<tr>
<td>NVETO_1.P</td>
<td>69</td>
<td>1.1V &lt; V &lt; 1.5V</td>
<td>✔</td>
</tr>
<tr>
<td>NVETO_1.M</td>
<td>68</td>
<td>0.8V &lt; V &lt; 1.3V</td>
<td>✔</td>
</tr>
<tr>
<td>NVETO_2.P</td>
<td>67</td>
<td>1.1V &lt; V &lt; 1.5V</td>
<td>✔</td>
</tr>
<tr>
<td>NVETO_2.M</td>
<td>66</td>
<td>0.8V &lt; V &lt; 1.3V</td>
<td>✔</td>
</tr>
<tr>
<td>NVETO_3.P</td>
<td>65</td>
<td>1.1V &lt; V &lt; 1.5V</td>
<td>✔</td>
</tr>
<tr>
<td>NVETO_3.M</td>
<td>64</td>
<td>0.8V &lt; V &lt; 1.3V</td>
<td>✔</td>
</tr>
<tr>
<td>NVETO_4.P</td>
<td>63</td>
<td>1.1V &lt; V &lt; 1.5V</td>
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</tr>
<tr>
<td>NVETO_4.M</td>
<td>62</td>
<td>0.8V &lt; V &lt; 1.3V</td>
<td>✔</td>
</tr>
<tr>
<td>NVETO_5.P</td>
<td>61</td>
<td>1.1V &lt; V &lt; 1.5V</td>
<td>✔</td>
</tr>
<tr>
<td>NVETO_5.M</td>
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<td>0.8V &lt; V &lt; 1.3V</td>
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</tr>
<tr>
<td>NVETO_6.P</td>
<td>59</td>
<td>1.1V &lt; V &lt; 1.5V</td>
<td>✔</td>
</tr>
<tr>
<td>NVETO_6.M</td>
<td>58</td>
<td>0.8V &lt; V &lt; 1.3V</td>
<td>✔</td>
</tr>
<tr>
<td>NVETO_7.P</td>
<td>57</td>
<td>1.1V &lt; V &lt; 1.5V</td>
<td>✔</td>
</tr>
<tr>
<td>NVETO_7.M</td>
<td>56</td>
<td>0.8V &lt; V &lt; 1.3V</td>
<td>✔</td>
</tr>
<tr>
<td>NVETO_8.P</td>
<td>55</td>
<td>1.1V &lt; V &lt; 1.5V</td>
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<tr>
<td>NVETO_8.M</td>
<td>54</td>
<td>0.8V &lt; V &lt; 1.3V</td>
<td>✔</td>
</tr>
<tr>
<td>NVETO_9.P</td>
<td>53</td>
<td>1.1V &lt; V &lt; 1.5V</td>
<td>✔</td>
</tr>
<tr>
<td>NVETO_9.M</td>
<td>52</td>
<td>0.8V &lt; V &lt; 1.3V</td>
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<tr>
<td>NVETO_10.P</td>
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<td>1.1V &lt; V &lt; 1.5V</td>
<td>✔</td>
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<tr>
<td>NVETO_10.M</td>
<td>50</td>
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<td>✔</td>
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<tr>
<td>NVETO_11.P</td>
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</tr>
<tr>
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<td>48</td>
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<tr>
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<tr>
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<td>46</td>
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<tr>
<td>NVETO_13.P</td>
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<td>NVETO_13.M</td>
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<tr>
<td>NVETO_14.P</td>
<td>43</td>
<td>1.1V &lt; V &lt; 1.5V</td>
<td>✔</td>
</tr>
<tr>
<td>NVETO_14.M</td>
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<td>0.8V &lt; V &lt; 1.3V</td>
<td>✔</td>
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<tr>
<td>NVETO_15.P</td>
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<td>✔</td>
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<tr>
<td>NVETO_15.M</td>
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<td>0.8V &lt; V &lt; 1.3V</td>
<td>✔</td>
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<tr>
<td>NVETO_16.P</td>
<td>39</td>
<td>1.1V &lt; V &lt; 1.5V</td>
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<tr>
<td>NVETO_16.M</td>
<td>38</td>
<td>0.8V &lt; V &lt; 1.3V</td>
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<tr>
<td>NVETO_17.P</td>
<td>37</td>
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<td>✔</td>
</tr>
<tr>
<td>NVETO_17.M</td>
<td>36</td>
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</tr>
<tr>
<td>NCHO_P</td>
<td>21</td>
<td>1.0V &lt; V &lt; 1.5V</td>
<td>✔</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>SIGNAL NAME</th>
<th>PIN</th>
<th>EXPECTED VOLTAGE</th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCNQ_M</td>
<td>22</td>
<td>0.6V &lt; V &lt; 1.3V</td>
<td>✔</td>
</tr>
<tr>
<td>CLK_P</td>
<td>79</td>
<td>0.8V &lt; V &lt; 1.3V</td>
<td>✔</td>
</tr>
<tr>
<td>CLK_M</td>
<td>78</td>
<td>0.8V &lt; V &lt; 1.3V</td>
<td>✔</td>
</tr>
<tr>
<td>NCMD_P</td>
<td>77</td>
<td>0.8V &lt; V &lt; 1.3V</td>
<td>✔</td>
</tr>
<tr>
<td>NCMD_M</td>
<td>76</td>
<td>0.8V &lt; V &lt; 1.3V</td>
<td>✔</td>
</tr>
<tr>
<td>NRESET_P</td>
<td>75</td>
<td>1.5V &lt; V &lt; 1.8V</td>
<td>✔</td>
</tr>
<tr>
<td>NRESET_M</td>
<td>74</td>
<td>0.6V &lt; V &lt; 1.3V</td>
<td>✔</td>
</tr>
<tr>
<td>NDATA_P</td>
<td>73</td>
<td>1.2V &lt; V &lt; 1.6V</td>
<td>✔</td>
</tr>
<tr>
<td>NDATA_M</td>
<td>72</td>
<td>0.8V &lt; V &lt; 1.3V</td>
<td>✔</td>
</tr>
<tr>
<td>HV_MON_1_P</td>
<td>23</td>
<td>1.2V &lt; V &lt; 1.6V</td>
<td>✔</td>
</tr>
<tr>
<td>HV_MON_1_M</td>
<td>24</td>
<td>1.2V &lt; V &lt; 1.6V</td>
<td>✔</td>
</tr>
<tr>
<td>TEMP_MON_P</td>
<td>25</td>
<td>0V &lt; V &lt; 1V</td>
<td>✔</td>
</tr>
<tr>
<td>TEMP_MON_M</td>
<td>26</td>
<td>0V &lt; V &lt; 1V</td>
<td>✔</td>
</tr>
<tr>
<td>HV_MON_2_P</td>
<td>27</td>
<td>1.2V &lt; V &lt; 1.6V</td>
<td>✔</td>
</tr>
<tr>
<td>HV_MON_2_M</td>
<td>28</td>
<td>1.2V &lt; V &lt; 1.6V</td>
<td>✔</td>
</tr>
<tr>
<td>ACD_VDD0</td>
<td>1</td>
<td>3.2V &lt; V &lt; 3.6V</td>
<td>✔</td>
</tr>
<tr>
<td>ACD_GND0</td>
<td>30</td>
<td>V &lt; 0.1V</td>
<td>✔</td>
</tr>
<tr>
<td>ACD_VDD1</td>
<td>3</td>
<td>3.2V &lt; V &lt; 3.6V</td>
<td>✔</td>
</tr>
<tr>
<td>ACD_GND1</td>
<td>31</td>
<td>V &lt; 0.1V</td>
<td>✔</td>
</tr>
<tr>
<td>ACD_VDD2</td>
<td>4</td>
<td>3.2V &lt; V &lt; 3.6V</td>
<td>✔</td>
</tr>
<tr>
<td>ACD_GND2</td>
<td>32</td>
<td>V &lt; 0.1V</td>
<td>✔</td>
</tr>
<tr>
<td>ACD_BV0</td>
<td>5</td>
<td>25V &lt; V &lt; 27V</td>
<td>✔</td>
</tr>
<tr>
<td>ACD_BV_RTN_0</td>
<td>23</td>
<td>V &lt; 0.1V</td>
<td>✔</td>
</tr>
<tr>
<td>ACD_BV_1</td>
<td>7</td>
<td>25V &lt; V &lt; 27V</td>
<td>✔</td>
</tr>
<tr>
<td>ACD_BV_RTN_1</td>
<td>34</td>
<td>V &lt; 0.1V</td>
<td>✔</td>
</tr>
</tbody>
</table>

13.6.4 Test with FREE connected: FREE Function Test GASU primary side

13.6.4.1 Nominal ACD-3.3V, System clock at 20 MHz

13.6.4.1.1 Write/Read FREE registers

Script: Pass/Fail:

13.6.4.1.2 Event Data

Script: Pass/Fail:

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13.6.4.1.3 Trigger

Script: Pass/Fail:

13.6.5 Test with FREE connected: FREE Function Test GASU redundant side

1) Turn off 28-V power
2) With the shorting plugs inserted in the break out boxes, turn on 28V bench supply to redundant GASU.
3) Boot VME-BSC
4) Boot successful: Yes/No
5) Start LATTE (see LATTE instructions)
6) Make sure FREE power-on register is turned off.
7)  

<table>
<thead>
<tr>
<th>Measurement No.</th>
<th>Signal</th>
<th>Expected Current</th>
<th>Verified</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>28V bench supply</td>
<td>250 mA &lt; I &lt; 350 mA</td>
<td>✔</td>
</tr>
</tbody>
</table>

8) Run AEM test scripts

Pass/Fail

13.6.5.1 Supply Voltage Level Test with FREE power disabled

(nominal VDD-ACD)

<table>
<thead>
<tr>
<th>Measurement No.</th>
<th>Signal Pair</th>
<th>Pin 1</th>
<th>Expected Voltage</th>
<th>Verified</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ACD_VDD</td>
<td>IL-180 - 1</td>
<td>V &lt; 1V</td>
<td>✔</td>
</tr>
<tr>
<td>5</td>
<td>ACD_28V</td>
<td>IL-180 - 5</td>
<td>V &lt; 0.5V</td>
<td>✔</td>
</tr>
</tbody>
</table>

13.6.5.2 Bench Supply Current Level Test with FREE power enabled

Enable FREE Power

---

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13.6.5.3 Nominal ACD-3.3V, System clock at 20 MHz

13.6.5.3.1 Write/Read FREE registers

Scripts Pass/Fail:

13.6.5.3.2 Event Data

Scripts Pass/Fail:

13.6.5.3.3 Trigger

Scripts Pass/Fail: