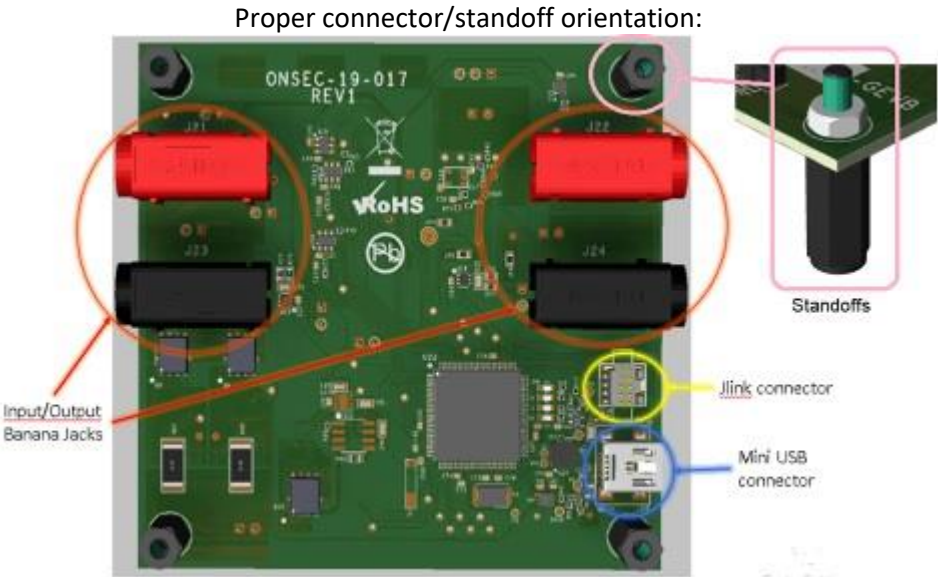
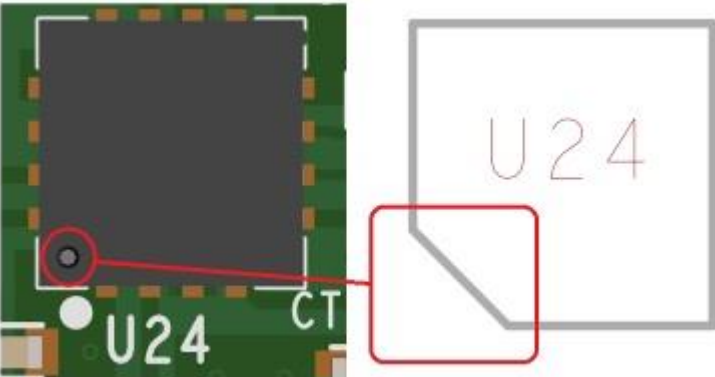
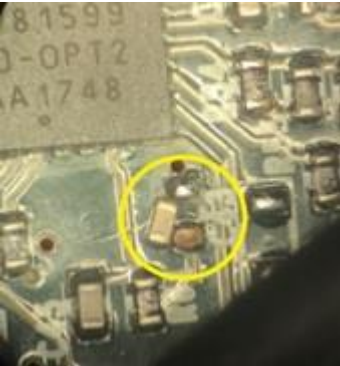
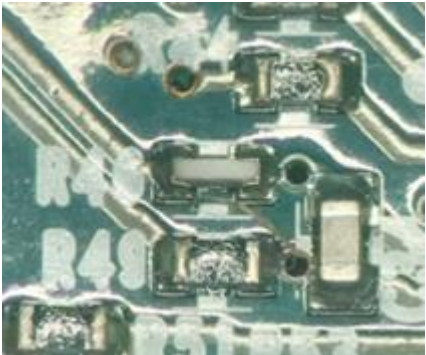

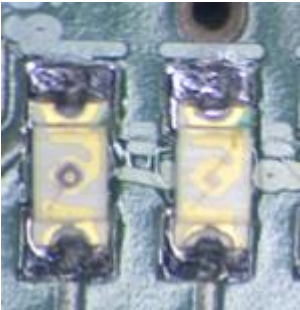



Visual Inspection

Please perform a brief visual inspection of every PCB to ensure adequate PCB fabrication and assembly quality. The tests are generic and intended to catch “big-ticket” manufacturing errors that could indicate electrical performance issues and the existence of obscure issues. Return to the manufacturer if any of these issues are present:

Test	Instructions		Pass Condition
All Board Tests	Tests must be done for every board.		
Component Orientation	<div>1) Ensure proper orientation of all major connectors/mechanical components:<div>a) Mini USB receptacle</div><div>b) Input/output banana jacks</div><div>c) JLink debug connector</div><div>d) Standoffs</div></div> <div>2) Check orientation of polarized component against the assembly layer according to the “Layout” gerber document in Strata’s Platform Content tab. DO NOT use silkscreen as a reference for polarity.<div>a) ICs: U2/U11</div><div>b) Caps: C29/C30</div><div>c) Diodes: D1/D6/D7</div></div>	<div>Proper connector/standoff orientation:</div>  <div>Example of correct IC orientation:</div> 	<div><input type="checkbox"/> All components installed with proper orientation</div>
Component Solder Attach/ Seating	<div>1) Check for noticeable errors in component installation:<div>a) Tombstoned/misaligned components</div><div>b) Ripped pads</div><div>c) Cold solder joints</div></div>	<div>Example of improper component placement/seating:</div>  <div>Example of resistor rotated on its side:</div> 	<div><input type="checkbox"/> No obvious solder attachment and seating issues for any components</div>

		<div>Example of ripped pads:</div>  <div>Example of questionably cold/hand-soldered joints:</div> 	
Silkscreen Quality	<div>1) Check for major silkscreen errors. At a minimum, ensure the following are legible:<div><div>a) OPN marking</div><div>b) ON logo</div><div>c) Strata logo</div></div></div> <div>2) Ensure no silk on pads</div>	<div>Example of poor silkscreen quality:</div> 	<div><input type="checkbox"/> No major silkscreen errors</div>

Electrical Tests

The following are electrical tests to ensure basic hardware functionality and do not require opening the Strata application. The following lab equipment is required to perform the tests:


1.) Multimeter

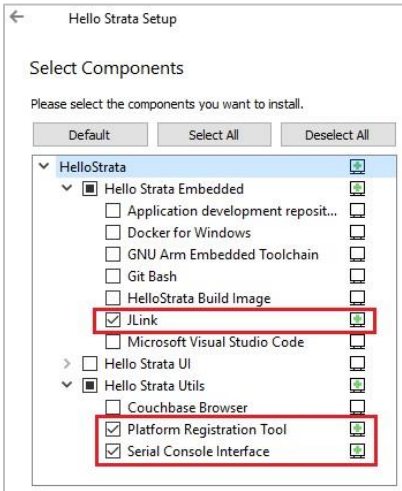
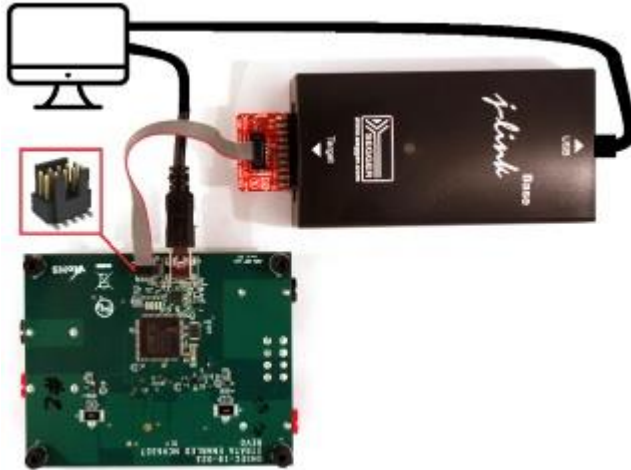

Test	Instructions	Pass Condition
All Board Tests	Tests must be done for every board.	
Power Rail Shorts	<div>1) With a multimeter, check for greater than <resistance> from the following main power rails to ground:<div><div>a) VIN</div><div>b) VINR</div><div>c) 3V3</div><div>d) 5V_REG</div><div>e) 5V_USB</div><div>f) VOUTR</div><div>g) VCC</div><div>h) PVCC</div><div>i) BST</div><div>j) VSW</div></div></div> <div>2) Check no shorts between the following rails:<div><div>a) VINR <-> VOUTR</div><div>b) 3V3 <-> VCC</div><div>c) 5V_USB <-> 5V_REG</div></div></div>	<div><input type="checkbox"/> No undesired shorts to ground or other rails for all main power rails</div>


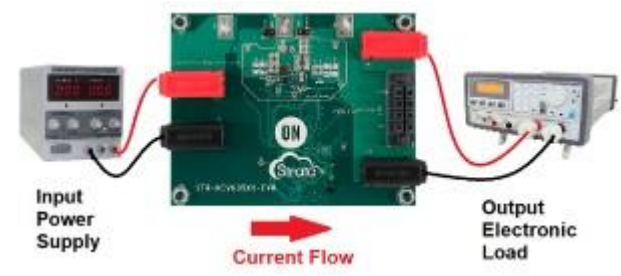
Pullups/Pulldowns	<div>1) Confirm ~10k to ground for the following signals:<div>a) ENb) SYNC_ENc) CSS_SEL</div></div> <div>2) Confirm approx. 10k to 3V3 for the following signals:<div>a) PGb) OS/ALERT#c) VCC_SELd) SYNC_SELe) CM_SEL</div></div> <div>3) Confirm ~5k to 3V3 for the following signals:<div>a) SDA/SCL</div></div> <div>4) Confirm ~5k to 5V_REG for the following signals:<div>a) SDA_5V/SCL_5V</div></div>	<div><input type="checkbox"/> Signals have appropriate pullup/pulldown resistances with no undesired shorts to ground or a power rail</div>
USB 5V/MCU 3V3	<div>1) Plug in the mini USB connector to to board.</div> <div>2) With a multimeter, probe the following voltages:<div>a) 5V_USBb) 3V3</div></div>	<div><input type="checkbox"/> 5V_USB voltage reads from 4.5V-5.25V</div> <div><input type="checkbox"/> 3V3 rail voltage reads 3.3V ± 5%</div>

Strata Functionality

The following tests are used to verify basic Strata connectivity and proper functionality of the UI/firmware for receiving telemetry and controlling the platform. Some tests only need to be completed once, while others must be completed for every board.

Test	Instructions		Pass Condition
One Time Tests	These tests only need to be done one time per OPN.		
Strata Version Confirmation	<div>1) Ensure Strata version is appropriate for validation.</div> <div>2) Open Strata and login. Create a login if you don't already have one.</div> <div>3) Click the profile letter (first letter of the first name used for login registration step), in the top right corner of the screen, then select "About".</div> <div>4) Check the Strata version in the dialog box that comes up.<div>a) If version is out of date, install the newest Strata release.</div><div>b) If the newest official release version is not new enough, contact SEC for a Beta release.</div></div>		<div><input type="checkbox"/> Strata Developer Studio version <x.x.x> or later is installed</div>
Strata Platform Selector	<div>1) On "Platform Selection" tab find the STR OPN in this list. There are <x> possible OPNs that are listed below:<div>a) STR-FAN65004B-GEVBb) STR-FAN65004C-GEVBc) STR-FAN65005A-GEVBd) STR-FAN65008B-GEVB</div></div> <div>2) Select "Browse Documentation"</div>		<div><input type="checkbox"/> Ensure all <x> OPNs are in the "Platform Selection" list</div> <div><input type="checkbox"/> At least one document is shown on "Platform Content" tab under "Platform Documents" and optionally documents displayed on "Part Datasheets" and "Downloads"</div>

Setup	<div>1) Install “Hello Strata Utils” using the newest Hello Strata installer here a) \\usbserv1\deployment\hello_strata 2) ONLY REQUIRED TO INSTALL THE FOLLOWING!! See picture to right. a) JLink b) Platform Registration Tool c) Serial Console Interface</div>	<div></div>	<div><input type="checkbox"/> One-time installation completed</div>
All Board Tests	Tests below this line must be done on every board.		
Platform Registration Tool	<div>1) Ensure “Setup” section was completed. Those instructions only need to be repeated if the “Hello Strata Utils” are not installed. 2) Connect the EVB as shown in the picture to the right 3) Open the “Platform Registration Tool” application a) Per OPN, download the .bin file from Strata’s “Platform Documents” > “Downloads” section b) Browse to the downloaded .bin file in the “Firmware data file” browse “Select” dialog 4) Click “Begin” 5) Ensure programming was successful a) Repeat steps 1) through 5) for the remaining boards before continuing to next step. Note: simply unplug JLink and platform and plug into another and the flash will start automatically.</div>	<div></div>	<div><input type="checkbox"/> TBD</div>
Serial Console Interface	<div>1) TBD, contact Portland SEC for flashing instructions. Commands below are for internal reference. 2) Open the “Serial Console Interface” application and execute the following commands per OPN. Ensure commands are entered exactly as written below!: a) STR-FAN65004B-GEVB: i) {"cmd":"set_platform_id","payload":{"platform_id": "043683ef-537b-49e6-a090-30e314a73265","class_id": "043683ef-537b-49e6-a090-30e314a73265","board_count":< board_number>}} b) STR-FAN65004C-GEVB: i) {"cmd":"set_platform_id","payload":{"platform_id": "101d15b0-3aa9-40b5-a1ae-b0e0b87f4f5b","class_id": "101d15b0-3aa9-40b5-a1ae-b0e0b87f4f5b","board_count": < board_number>}} c) STR-FAN65005A-GEVB: i) {"cmd":"set_platform_id","payload":{"platform_id": "f81d23a7-3c93-40c6-ac5f-e836e936728b","class_id": "f81d23a7-3c93-40c6-ac5f-e836e936728b","board_count": < board_number>}} d) STR-FAN65008B-GEVB: i) {"cmd":"set_platform_id","payload":{"platform_id": "a3359627-3938-4a84-9a9c-fb57ff22deed","class_id": "a3359627-3938-4a84-9a9c-fb57ff22deed","board_count": < board_number>}} e) Here <board number> refers to the number of the board that was manufactured, e.g. if 40 boards were made, <board number> would be a number between 1 and 40. Each board should have a different number. Example command when validating board 3 out of 40 for OPN STR-FAN65004A-GEVB would be: i) {"cmd":"set_platform_id","payload":{"platform_id": "043683ef-537b-49e6-a090-30e314a73265","class_id": "043683ef-537b-49e6-a090-30e314a73265","board_count":3}} 3) Repeat step 2) for the remaining boards before continuing to next step.</div>	<div><input type="checkbox"/> Command status is “OK” </div>	

Strata Detection	<ol style="list-style-type: none"> 1) Unplug mini USB cable from previous steps (see picture to right for reference to which USB cable). 2) Open Strata and Login, you should see Platform Selection list 3) Plug in board to computer using mini USB cable 		<input type="checkbox"/> Strata detects board and user interface is automatically shown on “Platform Controls” tab <input type="checkbox"/> Board Temperature gauge should read room temperature, approximately 21-26°C.
Input Voltage	<ol style="list-style-type: none"> 1) Using lab power supply and banana plugs provide evaluation board with 48V DC with at least 10A current limit (see image to right for polarity). Do not hot plug the power cables. Apply power from the input power supply after the cables have been inserted properly. 2) Connect electronic load. 		<input type="checkbox"/> “Input Voltage” box should read 48V within 5%.
Enable	<ol style="list-style-type: none"> 1) Toggle the “Enable (EN)” switch to the “On” position. Read the Output voltage. 		<input type="checkbox"/> The “Output Voltage” reading matches the “Select Output Voltage” slider within 5%.
OCP Threshold	<ol style="list-style-type: none"> 1) Turn on the load at 0A. 2) Increase the load until the FAN6500xx turns off (PGOOD turns red, voltage goes to 0V). Note the load at which the regulator turns off. 3) Toggle the “Enable (EN)” switch to “Off”. Increase the “OCP Threshold” slider by 2A. Toggle the “Enable (EN)” switch to “On”. 4) Repeat step 2. 		<input type="checkbox"/> The load at which the regulator turns off is 2A higher, within 20%.
Current Sense	<ol style="list-style-type: none"> 1) Toggle the “Enable (EN)” switch to “Off”. 2) Change load to 1A. 3) Toggle the “Enable (EN)” switch to “On”. 4) Enable load. 		<input type="checkbox"/> The “Input Current” and “Output Current” boxes match the input supply current and load current, respectively.
Operating Mode	<ol style="list-style-type: none"> 1) Toggle the “Enable (EN)” switch to “Off”. 2) Change load to 0.2A. 3) Change “Select Output Voltage” slider to 20V. 4) Set “Operating Mode” dropdown to “DCM”. 5) Toggle the “Enable (EN)” switch to “On”. Note the efficiency in the “Efficiency” gauge. 6) Repeat steps 1-5, except change the “Operating Mode” dropdown to “FCCM”. 		<input type="checkbox"/> The efficiency while in “FCCM” is noticeably lower than in “DCM” (~10%).
Switching Frequency	<ol style="list-style-type: none"> 1) Toggle the “Enable (EN)” switch to “Off”. 2) Change load to 1A. 3) Change “Select Output Voltage” slider to 20V. Change “OCP Threshold” slider to its maximum value. 4) Set “Switch Frequency” slider to “200 kHz”. 5) Toggle the “Enable (EN)” switch to “On”. Wait 10 seconds, and then note the temperature in the “Board Temperature” gauge. 6) Repeat steps 1-5, except change the “Switch Frequency” slider to “1000 kHz”. Waiting is not required in step 5 if new temperature is >5 degrees above previous temperature. 		<input type="checkbox"/> The temperature while at 1000 Khz is >5 degrees higher than at 200 kHz.