**Document No. : 18-045087-01-b-1**

**Title : EV-LTZ1000-REFZ Customer Evaluation Board Test Procedure**

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| REVISION HISTORY | | | | |
| **Revision** | **ECR #** | **Description of Change** | **Date** | **Author** |
| A |  | Initial Release | August 22, 2017 | Estibaliz Sanz |
| B |  | Heater control loop test included | September 2017 | Estibaliz Sanz |

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| **Required Approvers** | |
| **Approver Roles** | **Approver Names** |
| Apps Engineer | Estibaliz Sanz |
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## Equipment List

* Computer or laptop
* Mini-USB to USB Cable
* SDP Evaluation Board (SDP-B Required)
* EVAL-AD5791SDZ Evaluation board
* EV-LTZ1000-REFZ Reference Board
* +15V , -15V, +5V DC Power supply
* Digital Multimeter

## SDP Setup

1. Download SDP EEPROM Programmer and install.  
   <ftp://ftp.analog.com/pub/PSA_Support/SDP/Release/SDPEEPROMProgrammer.zip>
2. Connect the EV-LTZ1000-REFZ Reference Board (J1, J4, J9) to the EVAL-AD5791SDZ Evaluation board (J1, J4, J9), and connect the SDP-B Evaluation Board (CON A) to the EVAL-AD5791SDZ Evaluation board (J14) as shown in Figure 1.
3. Connect mini USB cable to SDP-B Evaluation Board (J1) and to USB port on the test PC.

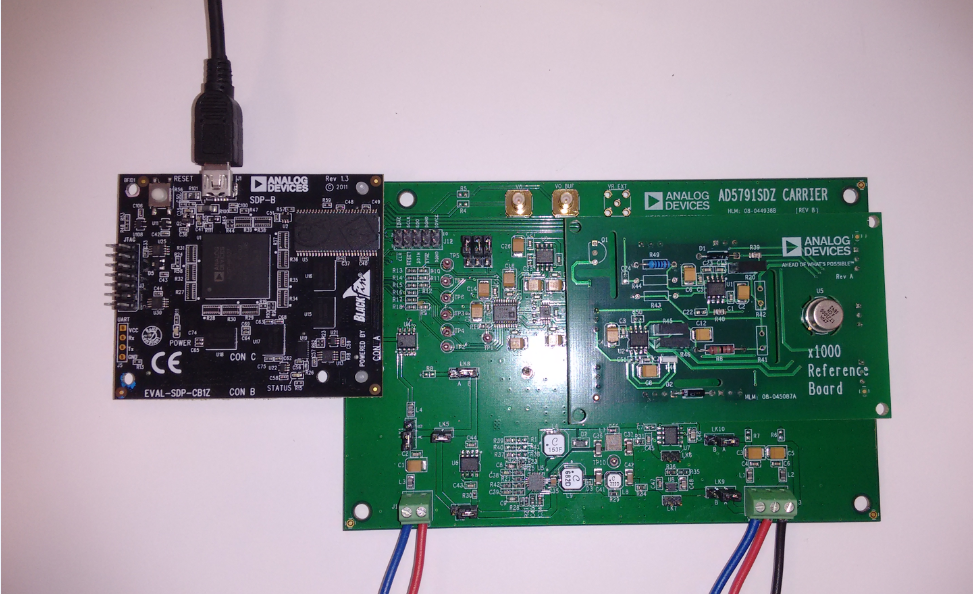


Figure : EV-LTZ1000-REFZ Hardware Setup

## Program EEPROM ID

1. Run SDP EEPROM PROGRAMMER
2. Program as seen below in Figure 2.
   1. Connector = Connector A
   2. Load Existing
   3. EEPROM Address = 0x51
   4. Browse: Select file provided “AD5791\_EEPROM.dat”
   5. Click on the “Write File to EEPROM” button.

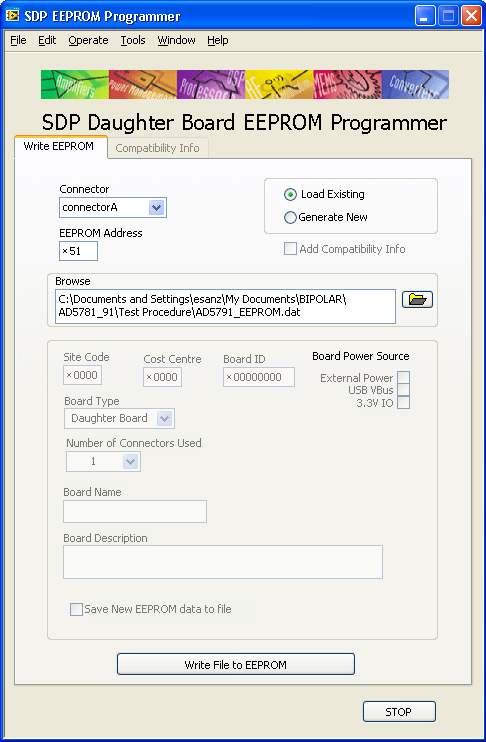


Figure : EVAL-AD5791SDZ EEPROM Programmer Setup

## EV-LTZ1000-REFZ Test Hardware Setup and Test

1. Set the link options on the EVAL-AD5791SDZ evaluation board for the required operating setup before using the board as in Table 1.

|  |  |
| --- | --- |
| **Link Number** | **Default Configuration** |
| LK1 | A |
| LK2 | Inserted |
| LK3 | Removed |
| LK4 | Removed |
| LK5 | Removed |
| LK6 | Removed |
| LK7 | Removed |
| LK8 | B |
| LK9 | B |
| LK10 | B |
| LK11 | Removed |

Table : Link Option Setup

1. Connect +3.3V and GND to connector J11 as shown in Figure 1.
2. Connect +15V, -15V and GND to connector J13 as shown in Figure 1.
3. Let the heater stabilize for a couple of minutes. The LTZ1000 (U5) should feel hot as it is temperature stabilized.
4. Measure the voltages at the following test points and make sure they are as below.
   1. LK2 = +3.27V
   2. LK8 = +3.18V
   3. LK9 = -14V
   4. LK10 = +13.85V
   5. J4 = ±10V ±0.2V

If this is not correct, check all link connections with Table 1 and confirm Single and Dual supply connections are connected properly.

1. Measure the voltages at the transistor to make sure that the heater control loop is working.
   1. Collector of Q1 = ~13.8V
   2. Base-Emitter voltage VBE ~= 0.72V if the heater control loop is working correctly
   3. Base = 9.39v
   4. Emitter = 8.68v
2. Measure the voltage across the heater resistor.
   1. Measure voltage between Q1 Emitter and D2 Anode. This should be between 6V to 9V, typically around 7.8V

**If the above heater check fails, power cycle the board and repeat. If this fails again the board is faulty. The part may still have a correct voltage output even if the heater doesn’t work, this is still a bad board.**

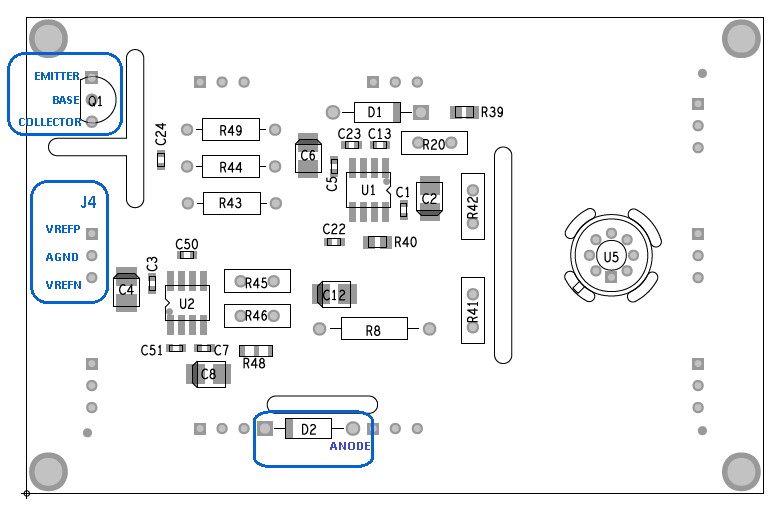


Figure : EVAL-LTZ1000-REFZ Test Points Description

## EV-LTZ1000-REFZ Test Software Setup and Test

1. Install the test software from CD available for the EVAL-AD5791SDZ Evaluation Kit. Run the “setup.exe” file.
2. RESET the SDP-B board using the RESET button on this board.
3. Launch software from Start – Programs – Analog Devices – AD5791.
4. Click Program Voltage Tab, see Figure 5.
5. Type +5V into Program Voltage input and hit enter on keyboard.
6. Measure +5V on digital multimeter at VO SMB connector.

09290-003

Figure : EVAL-AD5791SDZ EVB Main Window

09290-004

Figure : EVAL-AD5791SDZ EVB Program Voltage Tab Window

1. After the board is tested, exit the program.

## EV-LTZ1000-REFZ Test Hardware Setup, Test Software Setup and Test

1. Set the link options on the EVAL-AD5791SDZ evaluation board for the required operating setup before using the board as in Table 1.

|  |  |
| --- | --- |
| **Link Number** | **Default Configuration** |
| LK1 | A |
| LK2 | Removed |
| LK3 | Removed |
| LK4 | Removed |
| LK5 | Inserted |
| LK6 | Removed |
| LK7 | Removed |
| LK8 | B |
| LK9 | A |
| LK10 | A |
| LK11 | Removed |

Table : Link Option Setup

1. Connect +3.3V and GND to connector J11 as shown in Figure 1.
2. Connect +15V, -15V and GND to connector J13 as shown in Figure 1.
3. Let the heater stabilize for a couple of minutes. The LTZ1000 (U5) should feel hot as it is temperature stabilized.
4. Measure the voltages at the following test points and make sure they are as below.
   1. LK2 = +3.31V
   2. LK8 = +3.31V
   3. LK9 = -15V
   4. LK10 = +15V
   5. J4 = ±10V ±0.2V

If this is not correct, check all link connections with Table 1 and confirm Single and Dual supply connections are connected properly.

1. Measure the voltages at the transistor to make sure that the heater control loop is working.
   1. Collector of Q1 = VDD on J13
   2. Base-Emitter voltage VBE ~= 0.72V if the heater control loop is working correctly
   3. Base = 9.39v
   4. Emitter = 8.68v
2. Measure the voltage across the heater resistor.
   1. Measure voltage between Q1 Emitter and D2 Anode. This should be between 6V to 9V, typically around 7.8V

**If the above heater check fails, power cycle the board and repeat. If this fails again the board is faulty. The part may still have a correct voltage output even if the heater doesn’t work, this is still a bad board.**

1. Launch software from Start – Programs – Analog Devices – AD5791.
2. Click Program Voltage Tab, see Figure 5.
3. Type +5V into Program Voltage input and hit enter on keyboard.
4. Measure +5V on digital multimeter at VO SMB connector.
5. After the board is tested, exit the program.

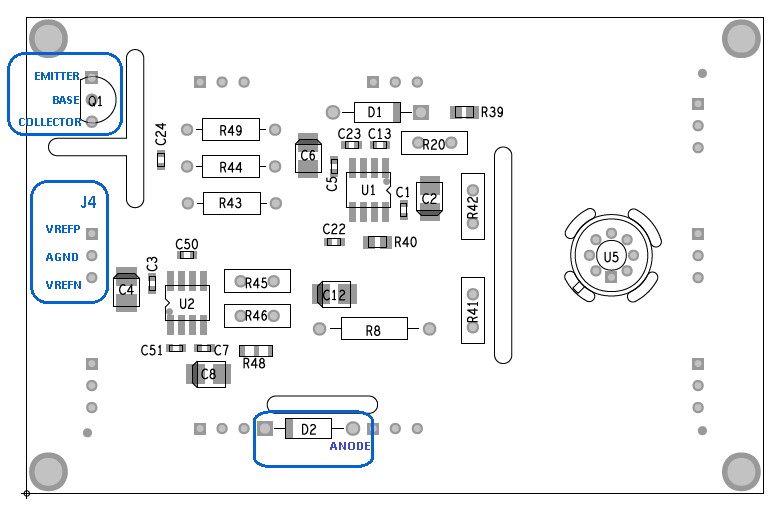


Figure : EVAL-LTZ1000-REFZ Test Points Description