

3D Attachments for the BOOST-LDC3114EVM



ABSTRACT

This document serves to accompany the design files for the BOOST-LDC3114EVM 3D printed attachments. These design files are provided as examples and may be used in a 3D printer to generate demonstration on the button and proximity functionalities of the LDC3114.

Design files for the attachments in this guide can be downloaded [here](#).

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1 Introduction

The 3D printed attachments for the [BOOST-LDC3114EVM](#) have two functions, a button and a proximity slider. The button attachment is a small flat surface that clips onto the EVM and can be used to showcase the button functionality or the raw data mode. The proximity attachment has two parts, the slider and the housing. The housing clips into the EVM the same way the button attachment does and allows the slider to move up and down. The proximity slider is designed to use with the raw data mode of the LDC3114. In order for these to work, they both need a metal target attached to the 3D printed structure.

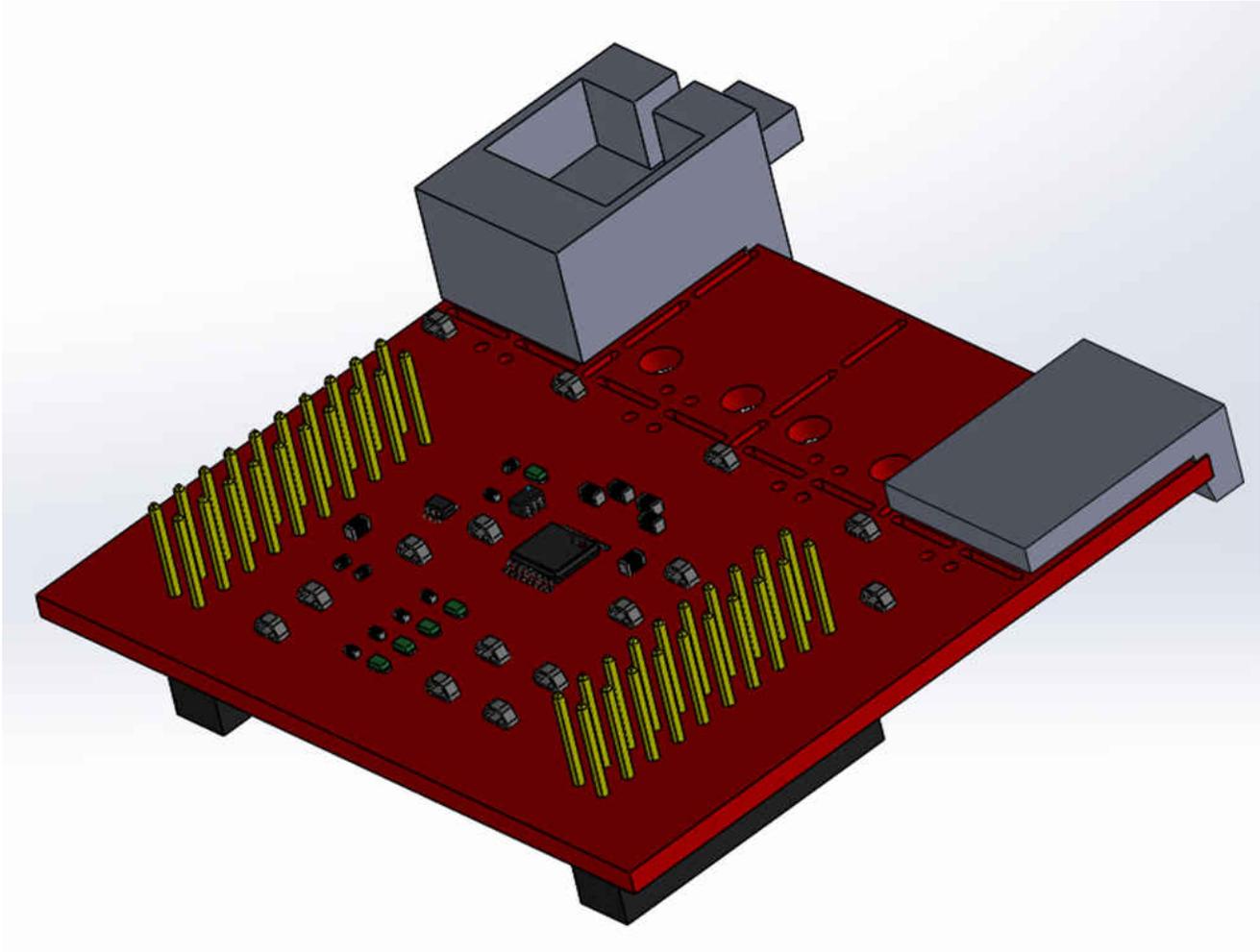


Figure 1-1. BOOST-LDC3114EVM Attachments

2 Button Attachment

The button attachment module is a simple platform that clips into the BOOST-LDC3114EVM coils. It is a 3D printed plastic part that uses copper tape to provide a target for the LDC3114. The copper tape is placed on the coil side of the plastic so that as force is applied to the flat surface, the copper bends slightly towards the coil.

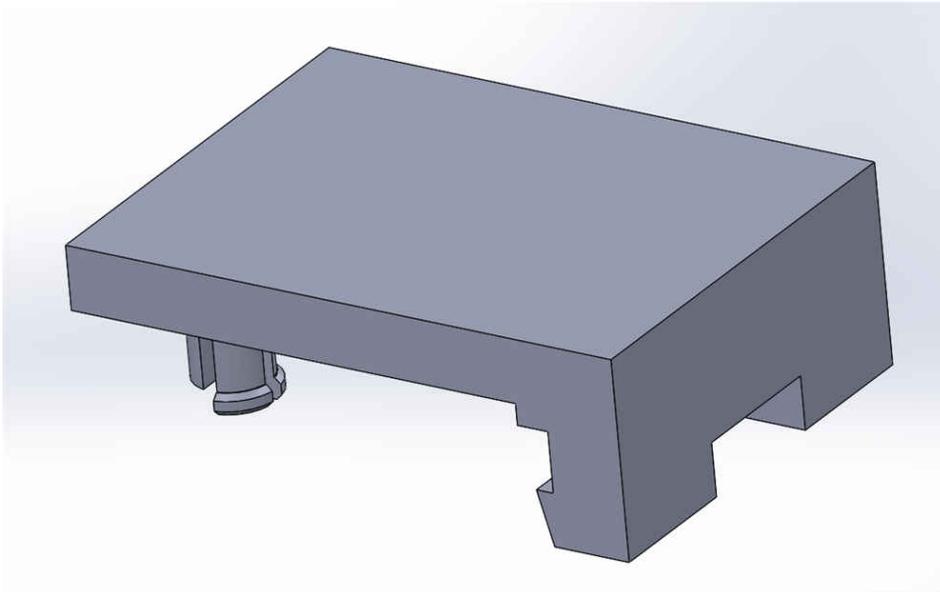


Figure 2-1. LDC3114EVM Button Attachment

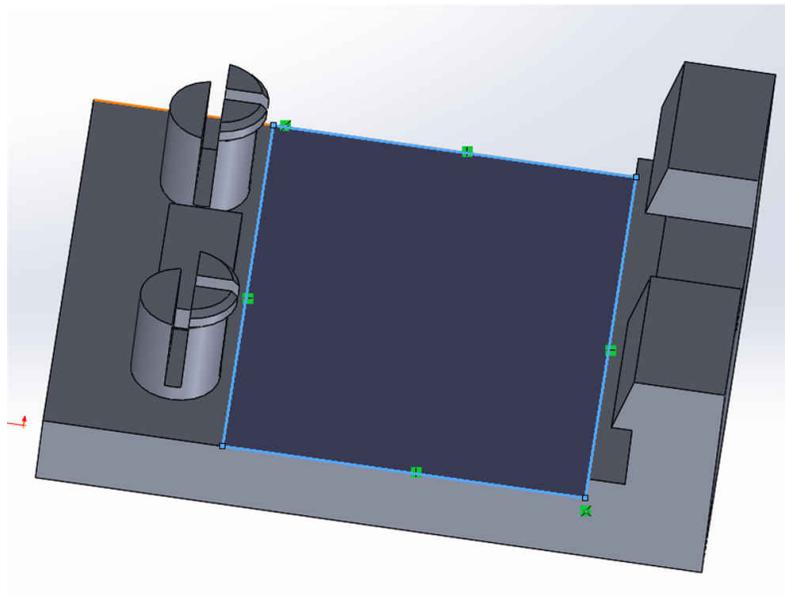


Figure 2-2. Button Attachment Metal Placement

This is a simple example of how a button application can work with the LDC3114. Pressing on the flat surface causes the copper tape to deflect towards the sensor. The impact of this can be seen by monitoring the data with the LDC3114EVM GUI or watching the LEDs on the EVM to see the digital button output. In the data graph, the button data fluctuates at the start of the press. Cases like this can happen when pressing the button, so it is important to consider adjusting the hysteresis settings in the device's button algorithm. More information about the button algorithm settings can be found in the [internal algorithm functionality app note](#). Using hysteresis, this example of a button press shows a clear digital output correlating to the button data.

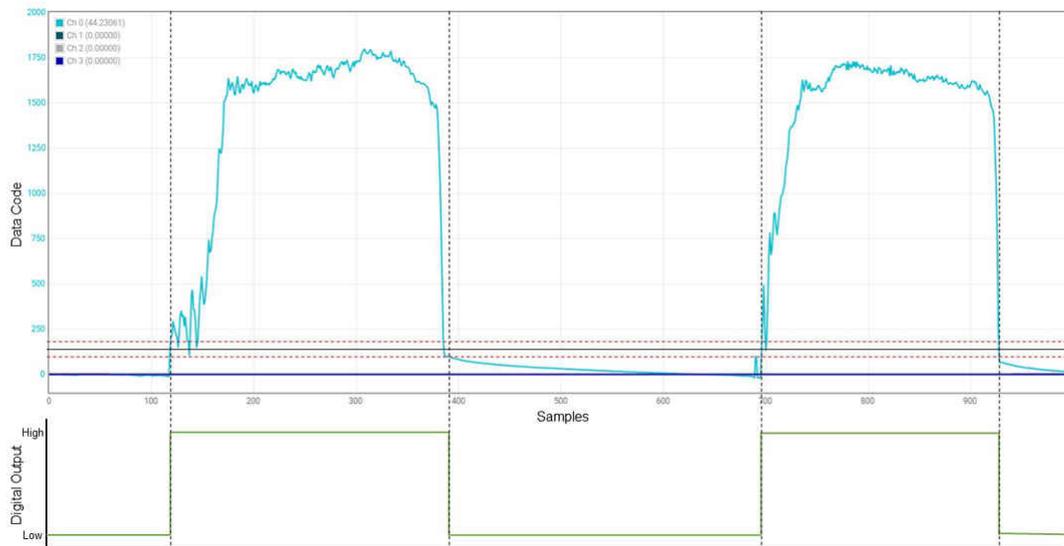


Figure 2-3. Button Attachment Data

3 Proximity Attachment

The proximity attachment has two different parts to it that combine to create a slider. This slider uses friction to stay in place and is a simple tool to showcase how the device performs in a proximity sensing application. Similar to the button attachment, the sliding portion has copper tape placed on it so the attachment can provide a metal target for the coil to sense. The side with the copper tape should be facing towards the sensor coil when the slider is inserted in the housing.

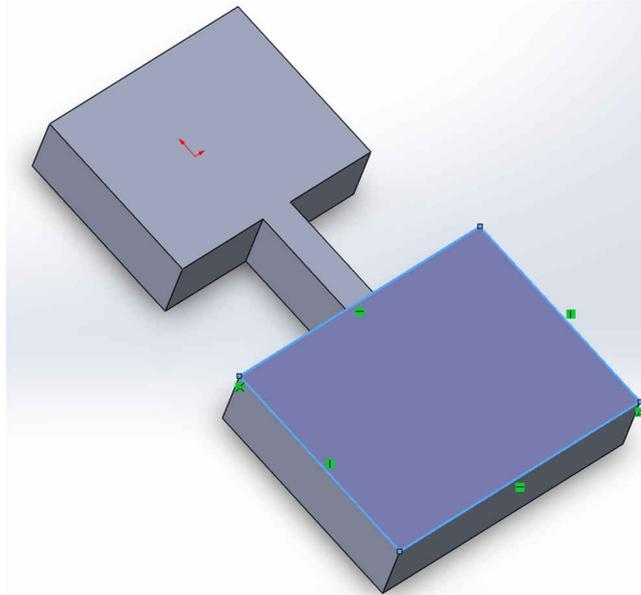


Figure 3-1. Proximity Attachment Slider with Metal Placement

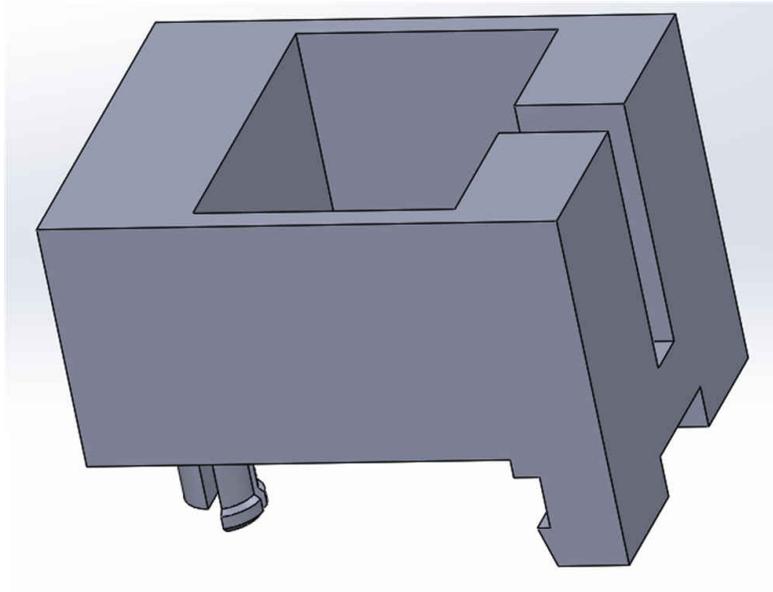


Figure 3-2. Proximity Attachment Housing

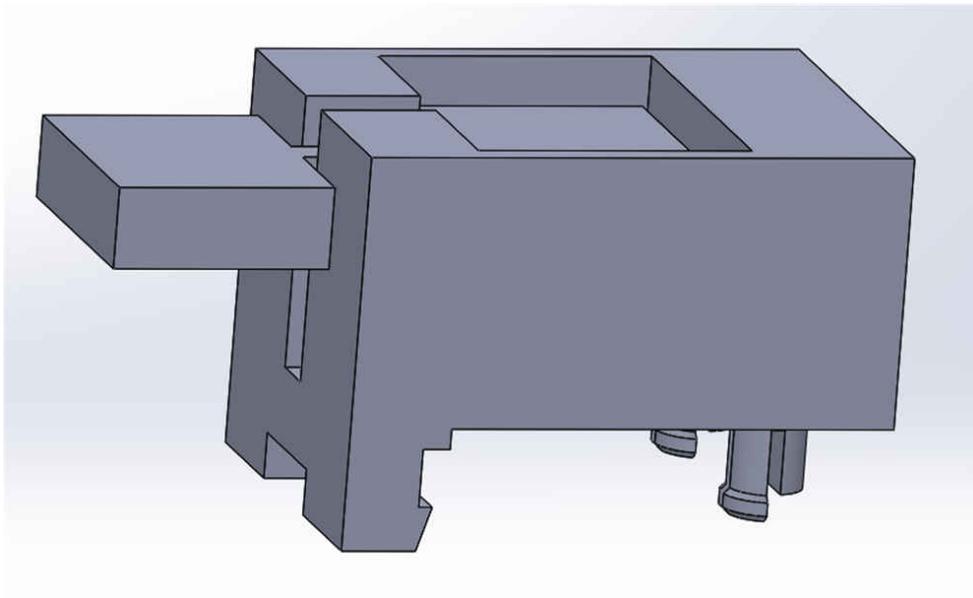


Figure 3-3. Proximity Attachment

Similar to the button attachment, the data from the LDC3114 can be viewed through the EVM GUI. In this case, however, the device is put into raw data mode since this is a proximity application. The slider has about 7 mm of motion range from the top of the housing to the lower limit. This full range can cause a large shift in the raw data output as seen in the data graph. This graph shows the data change as the slider starts at the top of the housing, moves to the lowest position, pauses for a small amount of time, and then is returned to the top position.

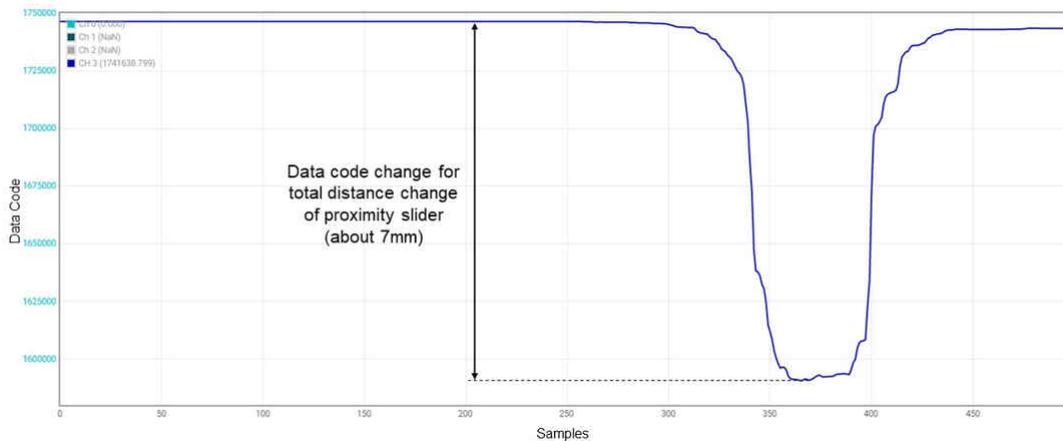


Figure 3-4. Proximity Attachment Data

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