

# IOTG Apollo Lake Platform - Juniper Hill Customer Reference Board (CRB)

Quick Start Guide

---

July 2016

**Intel Confidential**



## Legal Disclaimer

---

You may not use or facilitate the use of this document in connection with any infringement or other legal analysis concerning Intel products described herein. You agree to grant Intel a non-exclusive, royalty-free license to any patent claim thereafter drafted which includes subject matter disclosed herein.

No license (express or implied, by estoppel or otherwise) to any intellectual property rights is granted by this document.

All information provided here is subject to change without notice. Contact your Intel representative to obtain the latest Intel product specifications and roadmaps.

The products described may contain design defects or errors known as errata which may cause the product to deviate from published specifications. Current characterized errata are available on request.

Copies of documents which have an order number and are referenced in this document may be obtained by calling 1-800-548-4725 or by visiting: <http://www.intel.com/design/literature.htm>

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Learn more at <http://www.intel.com/> or from the OEM or retailer.

No computer system can be absolutely secure.

Intel and the Intel logo are trademarks of Intel Corporation in the U.S. and/or other countries.

\*Other names and brands may be claimed as the property of others.

Copyright © 2016, Intel Corporation. All rights reserved.



## Contents

<b>1.0 Introduction.....</b>	<b>5</b>
1.1 Terminology .....	5
1.2 Reference Documents.....	6
1.3 CRB and Boot Kit Package List.....	6
<b>2.0 Quick Start.....</b>	<b>11</b>
2.1 Boot Ingredients .....	11
2.2 Powering Up the CRB.....	11
2.3 Powering Down the CRB.....	13

## Figures

Figure 1.	CRB Block Diagram .....	8
Figure 2.	CRB Top Layer View .....	9
Figure 3	CRB Bottom Layer View.....	10
Figure 4.	Critical Power-On Components.....	12

## Tables

Table 1.	Terminology .....	5
Table 2.	CRB, Boot Kit: Package List.....	7



## Revision History

---

Date	Revision	Description
July 2016	1.5	Added HDMI cable in the boot kit list. Added note to mention use the supplied HDMI cable.
March 2016	1.0	Initial release

§§



## 1.0 Introduction

This quick start guide provides the getting started procedures for the Juniper Hill Customer Reference Board (CRB). Intel recommends that you have both the schematic and CRB present as you proceed through this document. Refer to [section 1.2](#) for schematic downloading.

**Note:** In this document, the term CRB is synonymous with Apollo Lake (APL) Juniper Hill CRB.

**Note:** This document is only relevant to the Apollo Lake Juniper Hill CRB. The references in this document correlate to the reference designators and board properties of the Apollo Lake Juniper Hill CRB.

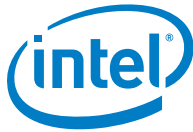
**Note:** All diagrams displayed in this document are for illustration purposes only. The board you received may look different from the one shown in this document.

### 1.1 Terminology

The acronyms and terms used in this document are listed in Table 1.

Table 1. Terminology

Term/Acronym	Definition
AIC	Add In Card
APL	Apollo Lake
CMOS	Complementary Metal-Oxide Semiconductor (transistor type)
CRB	Customer Reference Board
DP	Display Port*
HDMI	High-Definition Multi-Media Interface
IOTG	Internet of Things Group
LPE	Low Power Engine
RTC	Real Time Clock
SATA	Serial ATA
SATA HDD	SATA Hard Disk Drive
SSD	Solid State Drive



Term/Acronym	Definition
SoC	System on a Chip
UART	Universal Asynchronous Receiver Transmitter
USB	Universal Serial Bus

## 1.2 Reference Documents

Document	Number
<i>IOTG Apollo Lake Platform Juniper Hill CRB (DDR3L ECC) - Board File</i>	562547
<i>IOTG Apollo Lake Platform Juniper Hill CRB (DDR3L ECC) - Schematics</i>	562548

For issue reporting, please go to <http://goto/CRMprod>

## 1.3 CRB and Boot Kit Package List

The Board and Boot Kit Package contains the following:

- Juniper Hill CRB
- Boot Kits



Table 2 provides details on the contents of the package list.

**Table 2. CRB, Boot Kit: Package List**

BIL	Intel PN/Model #	Description	Qty.	Photo
1	H72225-2xx	Juniper Hill CRB	1	
2	H97855-001/ KVR16LSE11/4	4G DDR3L ECC SODIMM	1	
3	FSP084-DIBAN2 WS-001+002	Power Adapter + power cord	1	
4	G51041-001/ 4808K-ND	Board Standoff	4	
5	726260-001/ 4C25PPMZB	Board Standoff screws	4	
6	GL39-00121A	HDMI cable	1	

Figure 1 shows the CRB Block Diagram.

Figure 1. CRB Block Diagram

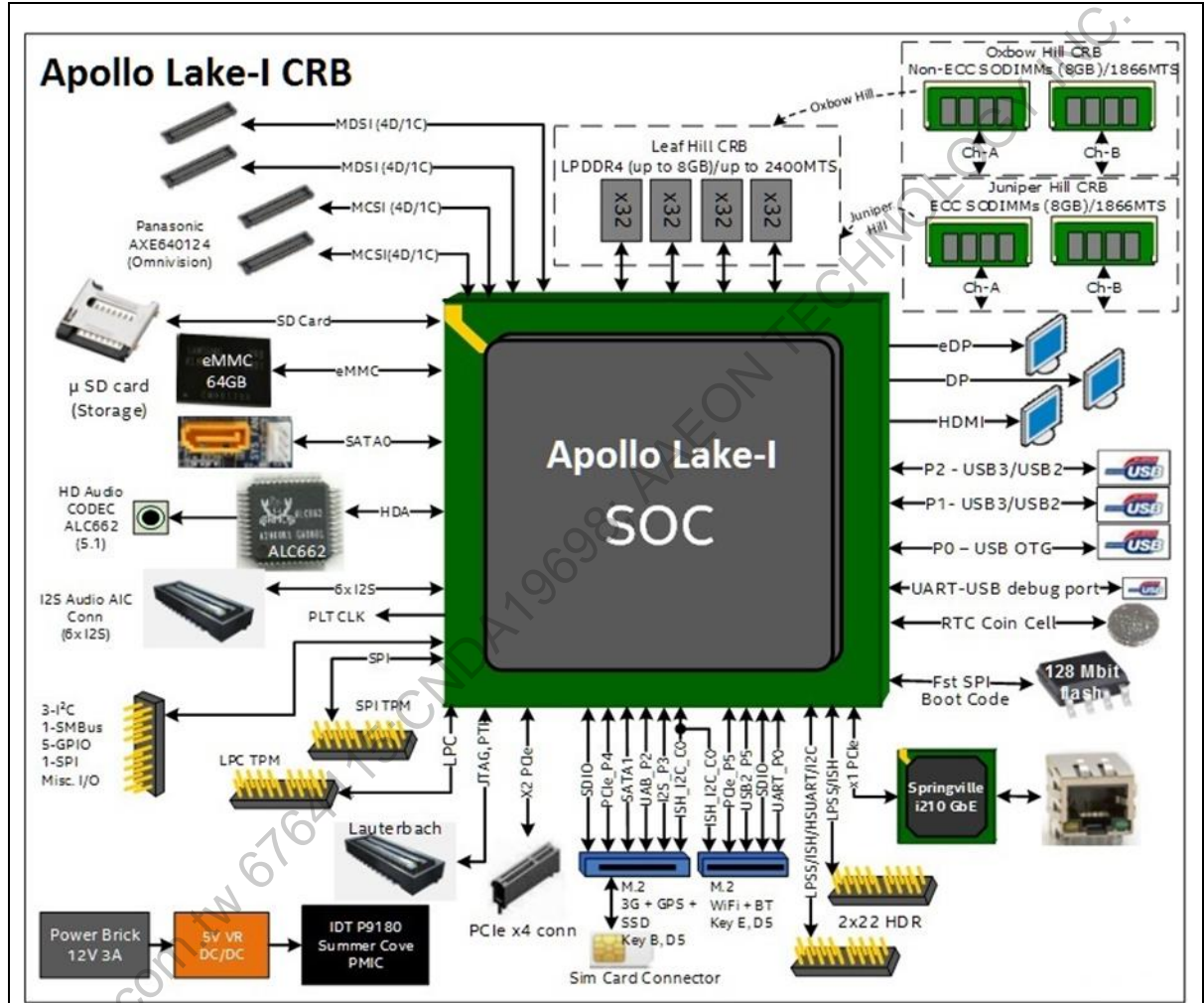




Figure 2 shows the CRB top layer view without the heat sink.

**Figure 2. CRB Top Layer View**

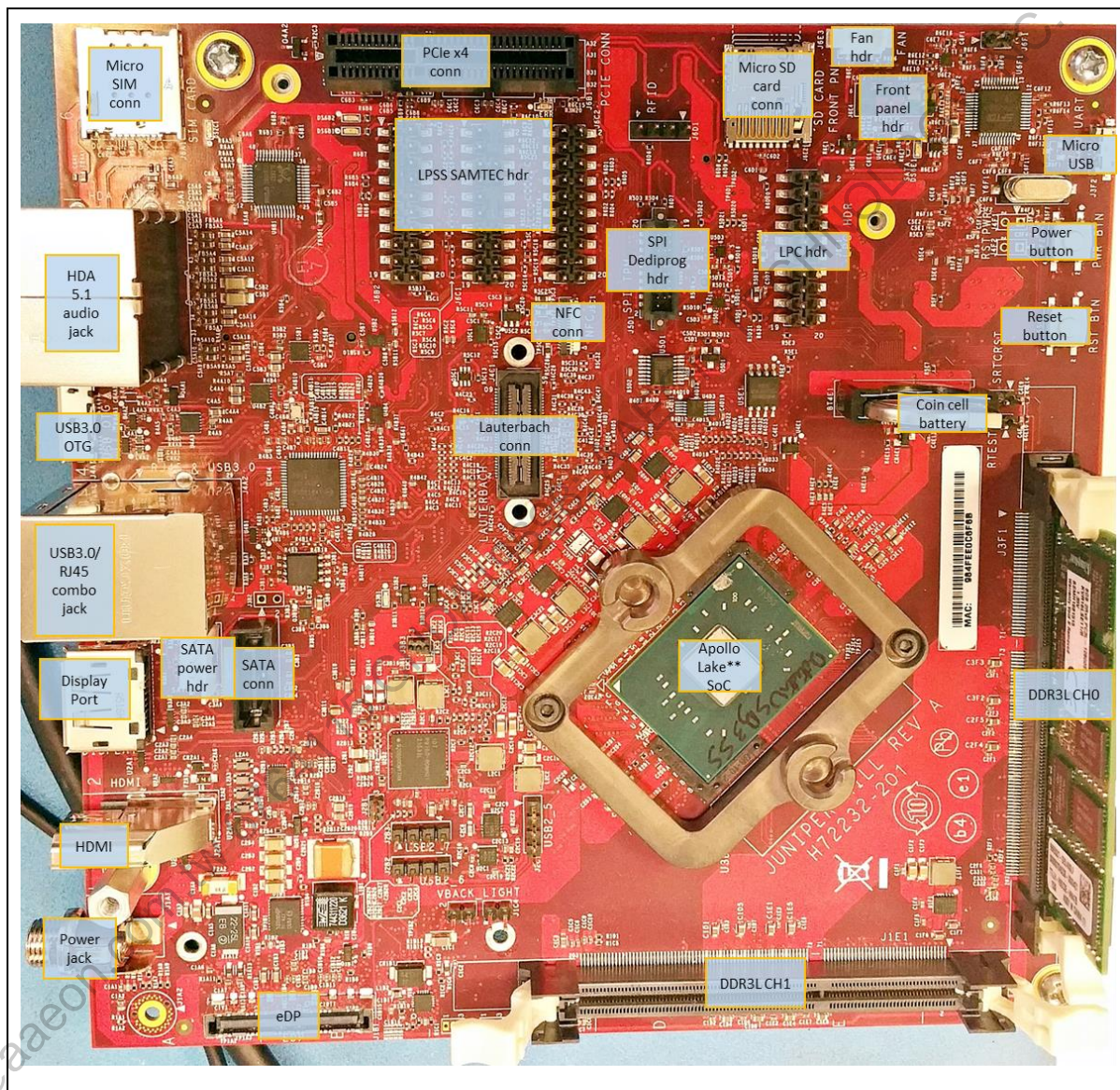
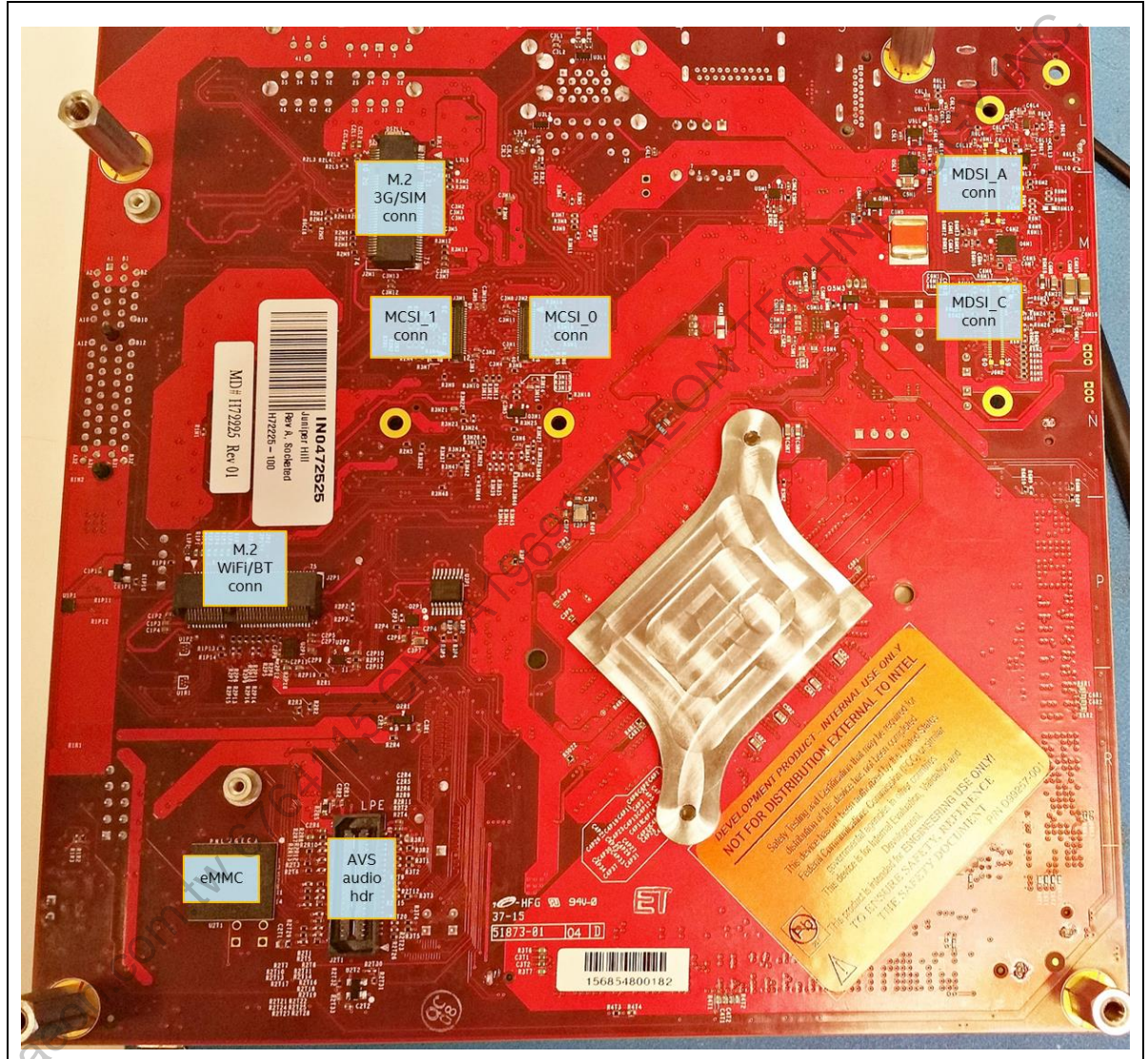
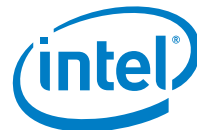




Figure 3 shows the CRB Bottom Layer View.

**Figure 3 CRB Bottom Layer View**





## 2.0 Quick Start

---

This chapter provides the Quick Start steps.

### 2.1 Boot Ingredients

The Boot Ingredients are as follows:

- DDR3L ECC SODIMM (Part of Boot kit).
- Power adaptor (AC Brick, Part of Boot kit).
- Keyboard, Mouse (USB based, not supplied by Intel).
- SATA Hard drive (not supplied by Intel), cable (not supplied by Intel).
- BIOS image (pre-programmed on the SPI NOR chip).
- Dediprog\* SF600 with adapter to flash images (not supplied by Intel).
- External display (i.e. HDMI/DP/eDP, not supplied by Intel), HDMI cable (part of the boot kit).

### 2.2 Powering Up the CRB

To power up the CRB:

1. Plug in DDR3L ECC SODIMM (supplied by the boot kit) into CH0 SODIMM connector (J3F1).
2. Connect Dediprog\* SF600 to J5D1 header for SPINOR programming.
3. Connect to DP or HDMI or eDP panel for output display. HDMI (J2A1) enabled on DDI0, DP (J2A2) enabled on DDI1. eDP (J1B1) enabled on eDP lanes.

**Note:** Connect external graphic option to PCIe x4 connector (J6B1) in case external graphic is desired.

**Note:** Use the HDMI cable supplied by Intel in case HDMI display is being used.

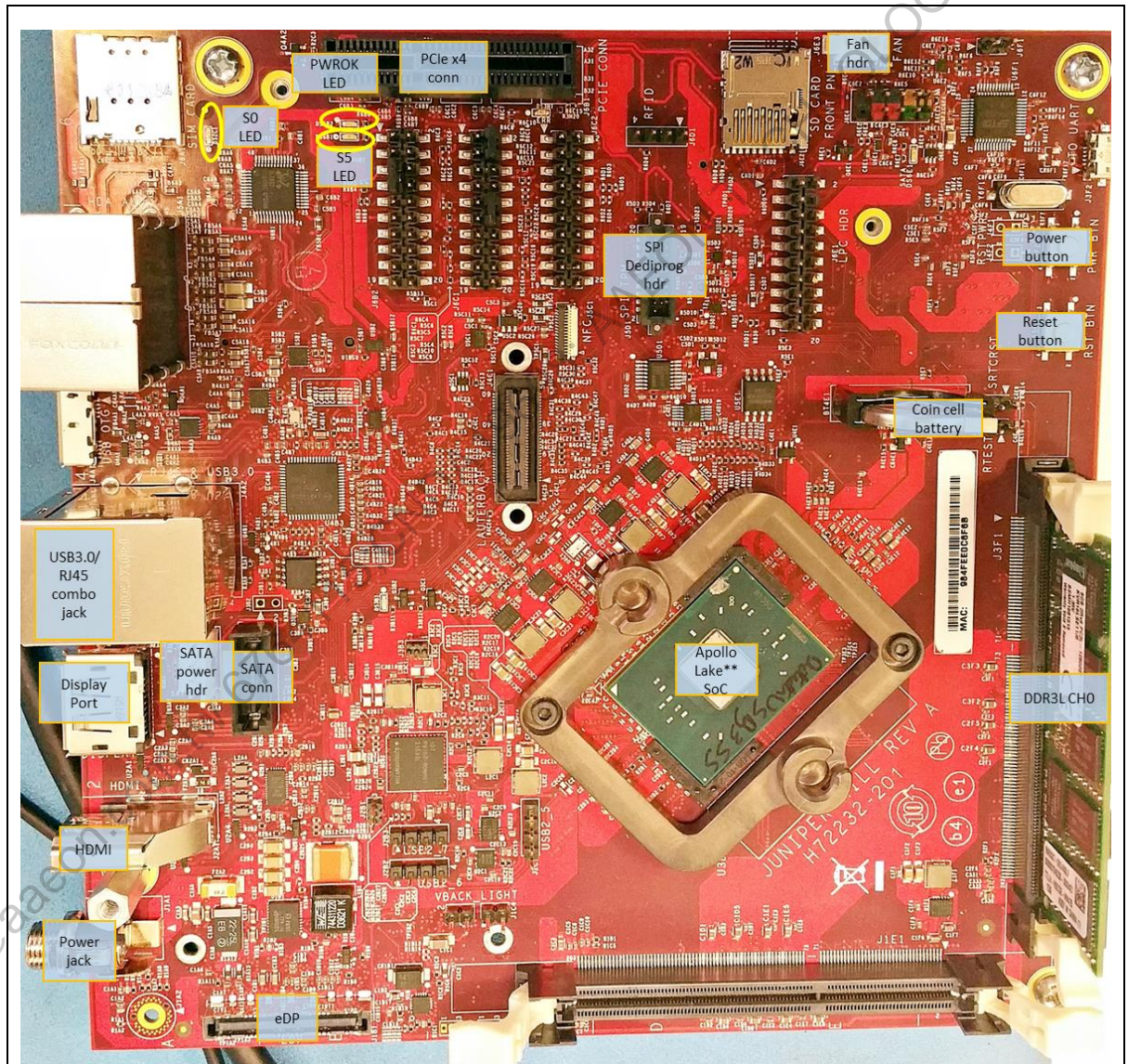
4. Connect SATA HDD with OS installed to SATA connector J3B1 and SATA power connector J3A1 through the SATA cable.
5. Connect USB mouse/keyboard to J4A2.
6. Connect power adaptor (AC brick) to power jack J1A1.
7. Press the power button at S5F2.
8. Observe S0 status LED (DS2C1), S5 status LED (DS6B1), and PWROK LED (DS6B2). These LEDs should light up in green.
9. As the system boots, press **F2** to enter the BIOS setup screen.



10. Check the time, date, and configuration settings. The default settings should be sufficient for most users. Exit the BIOS setup.
11. The system boots up and is ready for use.

Figure 4 shows the critical power-on components.

**Figure 4. Critical Power-On Components**





## 2.3 Powering Down the CRB

1. Shut down the OS.
2. Turn off and remove the AC brick power adaptor.

**Note:** Intel does not recommend powering down the board by simply shutting off power at the AC brick power adaptor, unplugging the power adapter from the CRB's power jack, or through holding down the power button.

§§