Intel® NUC M15 Laptop Kit Powered by Intel® EVO™

LAPBC510
LAPBC710

Product Specification

Version 1.3

Regulatory Model Name: BC57

April 2022

Intel® LAPBC510 and LAPBC710 may contain design defects or errors known as errata that may cause the product to deviate from published specifications. Current characterized errata, if any, are documented in this Product Specification.

Revision History

Revision	Revision History	Date
1.0	First Release	December 2020
1.1	Title/Product Name Change	January 2021
1.2	Updated figure 2 to reflect new Windows 11 key icon and updated operating system installed to Microsoft* Windows 11 Home Plus.	February 2022
1.3	Specification change of battery capacity ± percentage	April 2022

Disclaimer

This product specification applies to only the standard Intel® NUC M15 Laptop Kit LAPBC510 and Intel® NUC M15 Laptop Kit LAPBC710 with a BIOS identifier that starts with BCTGL357.

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Intel® NUC M15 Laptop Kit LAPBC510/LAPBC710 Identification Information

LAPBC510/LAPBC710 Identification Information

Original SA Revision	Product Code	Original BIOS Revision	Notes
M28199-502	BBC510EAUXBC6	BCTGL357.0048.2020.1118.2111	1,2
M28198-502	BBC510BCBXBC2	BCTGL357.0048.2020.1118.2111	1,2
M26923-502	BBC710BCUXBC1	BCTGL357.0048.2020.1118.2111	1,2
M26927-502	BBC710ECUXBC1	BCTGL357.0048.2020.1118.2111	1,2

Notes:

1. The SA number is found on the back cover.
2. The processors used on this SA revision may consist of the following components:

Device	Stepping	Spec Code
Intel® Core™ i5-1135G7	B1	SRK04
Intel® Core™ i7-1165G7	B1	SRK01

Specification Changes or Clarifications

The table below indicates the Specification Changes or Specification Clarifications, if any, that apply to LAPBC510 and LAPBC710.

Specification Changes or Clarifications

Date	Type of Change	Description of Changes or Clarifications
April 2022	Specification	Change battery capacity percentage to ±10% of 4830mAh

Errata

Current characterized errata, if any, will be documented in a separate section of this Product Specification.

Preface

This Product Specification specifies the layout, components, connectors, power and environmental features for the Intel® NUC M15 Laptop Kit LAPBC510/LAPBC710.

NOTE

In this document, the use of "Intel® NUC M15 Laptop Kit LAPBC510/LAPBC710 will refer to the LAPBC510 and LAPBC710 versions of the Intel® NUC M15 Laptop Kit.

Intended Audience

This document is intended to provide technical information about LAPBC510 and LAPBC710 and its components to the vendors, system integrators, and other engineers and technicians who need this level of information. It is specifically *not* intended for general audiences.

What This Document Contains

Chapter	Description
1	A description of the LAPBC510 and LAPBC710 features
2	A technical description of the LAPBC510 and LAPBC710

Typographical Conventions

This section contains information about the conventions used in this specification. Not all of these symbols and abbreviations appear in all specifications of this type.

Notes, Cautions, and Warnings

NOTE

Notes call attention to important information.

CAUTION

Cautions are included to help you avoid damaging hardware or losing data.

Other Common Notation

#	Used after a signal name to identify an active-low signal (such as USBP0#)
GB	Gigabyte (1,073,741,824 bytes)
GB/s	Gigabytes per second
Gb/s	Gigabits per second
KB	Kilobyte (1024 bytes)
Kb	Kilobit (1024 bits)
kb/s	1000 bits per second
MB	Megabyte (1,048,576 bytes)
MB/s	Megabytes per second
Mb	Megabit (1,048,576 bits)
Mb/s	Megabits per second
TDP	Thermal Design Power
Xxh	An address or data value ending with a lowercase h indicates a hexadecimal value.
x.x V	Volts. Voltages are DC unless otherwise specified.
*	This symbol is used to indicate third-party brands and names that are the property of their respective owners.

Contents

Figures

Tables

1 Product Description

1.1 Overview

The Intel® NUC M15 Laptop Kit LAPBC510 and Intel® NUC M15 Laptop Kit LAPBC710 are premium anodized aluminum, thin and light laptops powered by Intel® EVO™.

1.2 Version Summary

There are two different versions of LAPBC510 and two different versions of LAPBC710 documented in this product specification which are summarized in Table 1. Unless otherwise noted in this document, not all features are available on all versions.

Table 1. Version Summary

Version	CPU	Memory	Storage	Display	Color
BBC510EAUXBC6	Intel® Core™ i5-1135G7	16GB	512GB	FHD, non-touch	Shadow Gray
BBC510BCBXBC2	Intel® Core™ i5-1135G7	16GB	512GB	FHD, touch	Midnight Black
BBC710BCUXBC1	Intel® Core™ i7-1165G7	16GB	512GB	FHD, touch	Midnight Black
BBC710ECUXBC1	Intel® Core™ i7-1165G7	16GB	512GB	FHD, touch	Shadow Gray

NOTE

The above listed versions incorporate different keyboard languages, keyboard layouts and AC power cords. See Section 2.3 and Section 2.7 respectively for more information.

To find information about...	Visit this World Wide Web site:
Available configurations	http://ark.intel.com
Intel Processors	http://www.intel.com/processors
Intel Graphics	http://www.intel.com/graphics
Intel HD Audio	http://www.intel.com/content/www/us/en/products/docs/chipsets/high-definition-audio.html
Intel Wireless	http://www.intel.com/wireless
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1.3 Feature Summary

Table 2 summarizes the major features of the LAPBC510 and LAPBC710 powered by Intel® EVO.

Table 2. LAPBC510 and LAPBC710 Feature Summary

Feature	LAPBC510	LAPBC710
Color	Midnight Black or Shadow Gray	Midnight Black or Shadow Gray
Materials	Anodized Aluminum	Anodized Aluminum
Processor	Intel® Core™ i5-1135G7	Intel® Core™ i7-1165G7
Memory	16GB LPDDR4x 4266Mhz	16GB LPDDR4x 4266MHz
Graphics	Integrated Intel® Iris® Xᵉ Graphics	Integrated Intel® Iris® Xᵉ Graphics
Storage	1 M.2 22x80 PCIe x4 Gen4 NVMe with 512GB SSD installed	1 M.2 22x80 PCIe x4 Gen4 NVMe with 512GB SSD installed
Display Panel	Narrow Bezel IPS 15.6" 1920x1080, 60Hz,16:9 ratio, 100% sRGB[1], LED backlight, touch and non-touch screen options (see Table 1)	Narrow Bezel IPS 15.6" 1920x1080, 60Hz, 16:9 ratio, 100% sRGB[1], LED backlight, touch screen
Display Outputs	1 Full Size HDMI 2.0b Output 2 DisplayPort 1.4a via USB Type C	1 Full Size HDMI 2.0b Output 2 DisplayPort 1.4a via USB Type C
Audio	Realtek* ALC711 with Intel® HD Audio Intel® Smart Sound Technology 1 3.5mm Headset Audio Jack	Realtek* ALC711 with Intel® HD Audio Intel® Smart Sound Technology 1 3.5mm Headset Audio Jack
Speakers	2 Built In, 2W each	2 Built In, 2W each
Microphones	4 Digital Microphones	4 Digital Microphones
Keyboard	Silent Membrane with backlight, 1.2mm travel	Silent Membrane with backlight,1.2mm travel
Pointing Device	Glass Touch/Click Pad with Microsoft Precision Touchpad Driver Support Enable/Disable option with LED indicator	Glass Touch/Click Pad with Microsoft Precision Touchpad Driver Support Enable/Disable option with LED indicator
Camera	HD IR with Windows Hello Support	HD IR with Windows Hello Support
Network	Intel® Wi-Fi 6 AX201, Bluetooth* 5.1	Intel® Wi-Fi 6 AX201, Bluetooth 5.1
Power Supply	USB-C PD 20V, 65W 100/240V AC 50/60Hz	USB-C PD 20V, 65W 100/240V AC 50/60Hz
Battery	73.41Whr (4830mAh) ±10% with Fast Charge Support	73.41Whr (4830mAh) ±10% with Fast Charge Support
Power, Charging and Battery LED	Power On: White, Power Off: Off Charging (Power On): Breathing White Charging (Power Off): Breathing White Battery Low (<20%): Amber Charging Finish (w/AC): White, w/o AC: Off	Power On: White, Power Off: Off Charging (Power On): Breathing White Charging (Power Off): Breathing White Battery Low (<20%): Amber Charging Finish (w/AC): White, w/o AC: Off
Front Light Bar	RGB	RGB
USB	2 USB 3.2 (Gen 2) x1 Type A 2 Type C Thunderbolt™ 4 (USB 4/DP 1.4a)	2 USB 3.2 (Gen 2) x1 Type A 2 Type C Thunderbolt™ 4 (USB 4/DP 1.4a)
Size	355mmx230mmx15mm	355mmx230mmx15mm
Weight	1.65kg ±0.05kg	1.65kg ±0.05kg
Security	1 Kensington* NanoSaver Lock	1 Kensington* NanoSaver Lock
Advanced Technologies Supported	Intel® Speed Shift Technology Intel® Turbo Boost Technology 2.0 Intel® Hyper-Threading Technology Intel® Dynamic Tuning Technology Intel® Virtualization Technology (VT-x) Intel® Virtualization Technology for Directed I/O (VT-d) Intel® Deep Learning Boost (Intel® DL Boost) Intel® 64 Architecture Intel® SSE4.1, Intel® SSE4.2, Intel® AVX2, Intel® AVX-512 Thermal Monitoring Technologies	Intel® Speed Shift Technology Intel® Turbo Boost Technology 2.0 Intel® Hyper-Threading Technology Intel® Dynamic Tuning Technology Intel® Virtualization Technology (VT-x) Intel® Virtualization Technology for Directed I/O (VT-d) Intel® Deep Learning Boost (Intel® DL Boost) Intel® 64 Architecture Intel® SSE4.1, Intel® SSE4.2, Intel® AVX2, Intel® AVX-512 Thermal Monitoring Technologies
Security and Reliability	Intel® AES New Instructions Intel® Boot Guard	Intel® AES New Instructions Intel® Boot Guard

Feature	LAPBC510	LAPBC710
	Intel® OS Guard Intel® Software Guard Extensions (Intel® SGX) Intel® Platform Trust Technology (Intel® PTT) Mode -based Execute Control (MBE)	Intel® OS Guard Intel® Software Guard Extensions (Intel® SGX) Intel® Platform Trust Technology (Intel® PTT) Mode -based Execute Control (MBE)
OS Features	NUC Software Studio, NUC Audio Studio, Windows Hello Support, Voice Assistant Support for Alexa and Cortana. Support for Modern Standby	NUC Software Studio, NUC Audio Studio, Windows Hello Support, Voice Assistant Support for Alexa and Cortana. Support for Modern Standby
Operating System Installed	Microsoft* Windows 11 Home Plus 64-bit	Microsoft* Windows 11 Home Plus 64-bit

1 - For color gamut, 100% sRGB is per the specification, 95% sRGB is guaranteed.

2 Technical Reference

2.1 Block Diagrams

Figure 1 is a block diagram of the major functional areas of LAPBC510 and LAPBC710. Note that some versions may have a non-touch display.

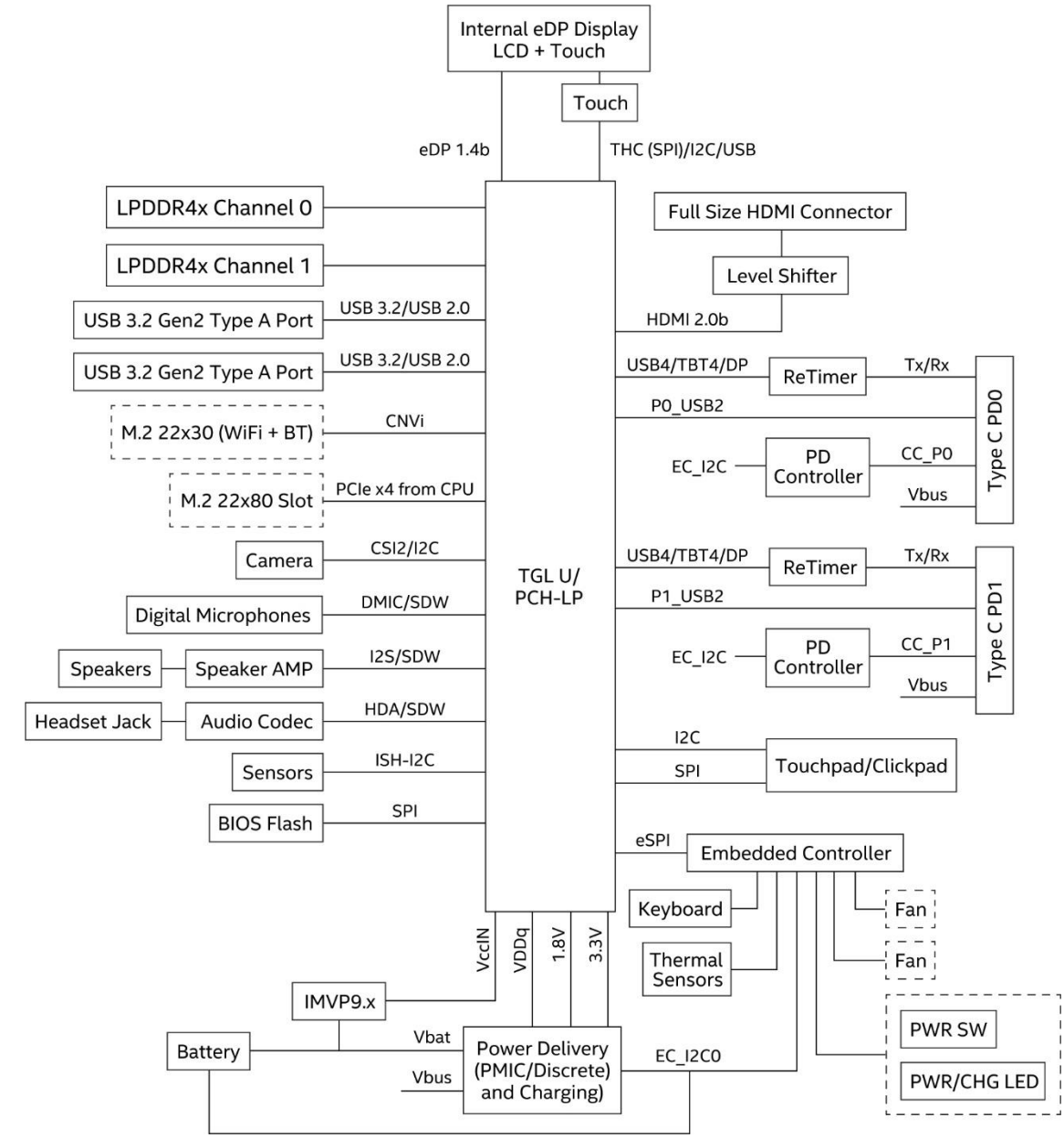

Figure 1. LAPBC510/LAPBC710 Block Diagram

2.2 Exterior Features

The following figures show the exterior features for all versions of the laptop.

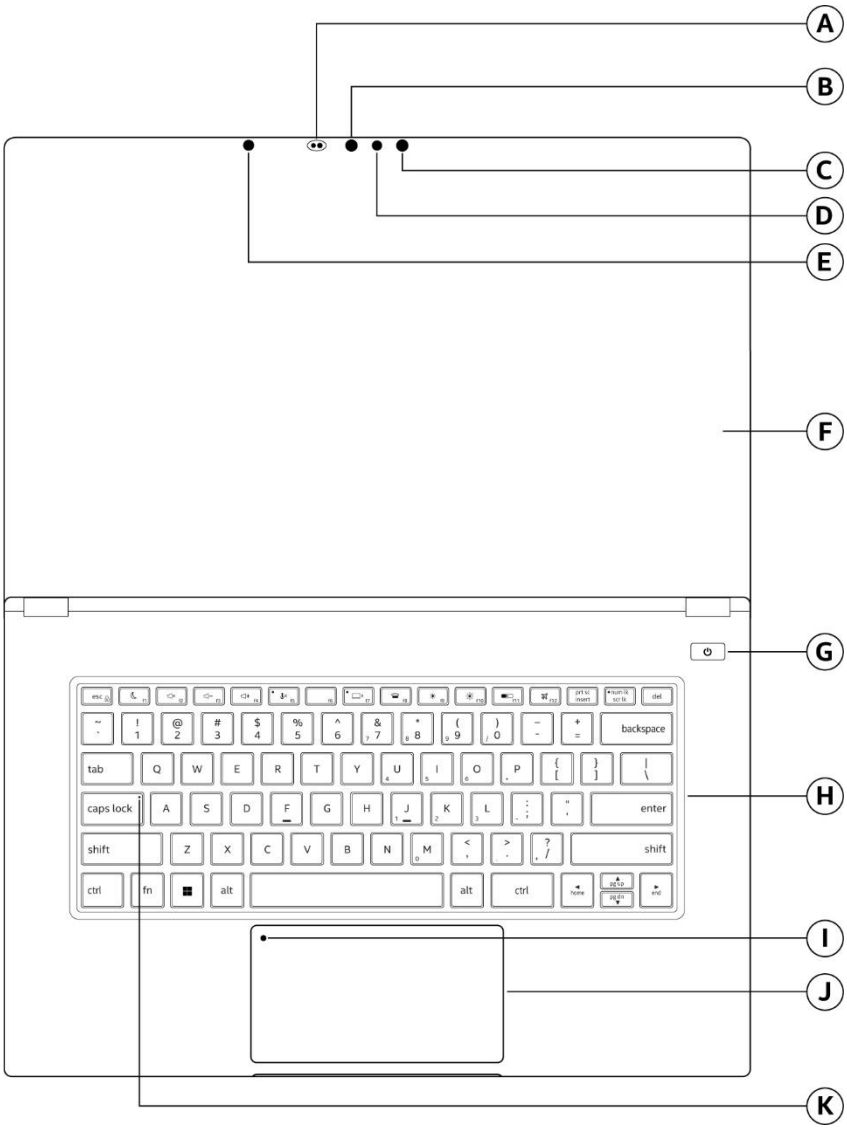

Figure 2. Top-Open Features

Table 3. Top-Open Features

Feature	Description	Feature	Description	Feature	Description
A	Time of Flight Sensor	E	Ambient Light Sensor	I	Touchpad Enable/disable Switch/LED
B	Infrared LED	F	Display	J	Touchpad/Clickpad
C	Infrared LED	G	Power Button[1]	K	Caps Lock Status LED
D	Camera	H	Keyboard[2]		

1. The power button incorporates a power and battery status LED.
2. United States ANSI keyboard shown. Other keyboard layouts and languages are available. See section 2.3.

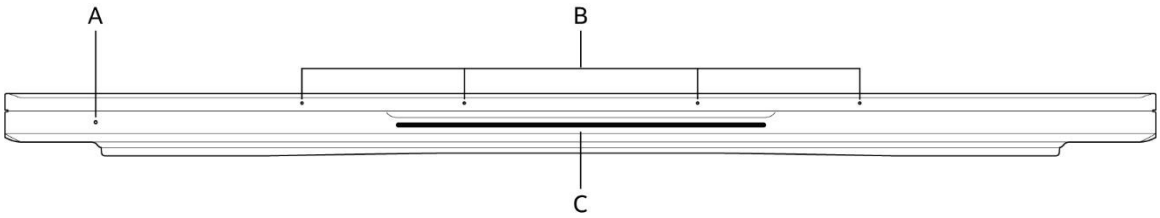

Figure 3. Front Features

Table 4. Front Features

Feature	Description	Feature	Description
A	Power/Battery Status LED[1]	C	RGB Light Bar
B	Digital Microphones		

Table 5. Power/Charging/Battery Status Indicator States

Laptop Power Status	Powered On	Modern Standby	Hibernate	Powered Off
AC and Charging	White Breathing			
AC NOT Charging	White Solid	Off		
Battery	White Solid	Off		
Battery Low	Amber	Amber	Off	

1. The power/charging/battery status indicator will only be active when the lid is closed.

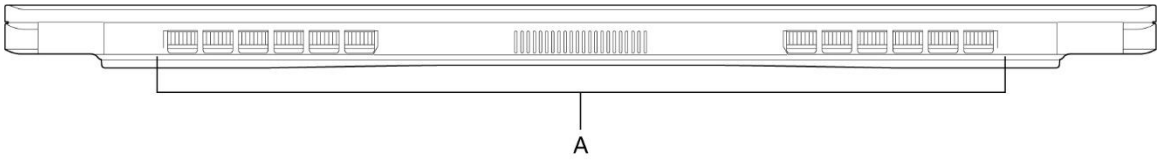

Figure 4. Back Features

Table 6. Back Features

Feature	Description
A	Air Vents

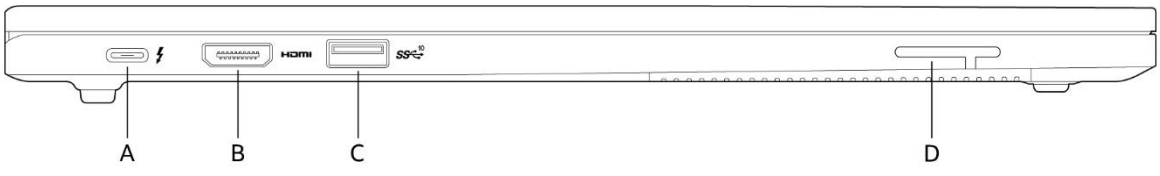

Figure 5. Left Features

Table 7. Left Features

Feature	Description	Feature	Description
A	Thunderbolt™ 4 Port/Power Connector	C	USB 3.2 (Gen 2) Type A Port
B	HDMI 2.0b Port	D	Wireless Antenna

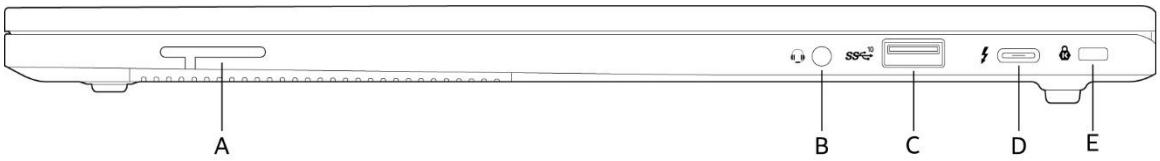

Figure 6. Right Features

Table 8. Right Features

Feature	Description	Feature	Description
A	Wireless Antenna	D	Thunderbolt™ 4 Port/ Power Connector
B	Headset Jack	E	Kensington NanoSaver Lock
C	USB 3.2 (Gen 2) Type A		

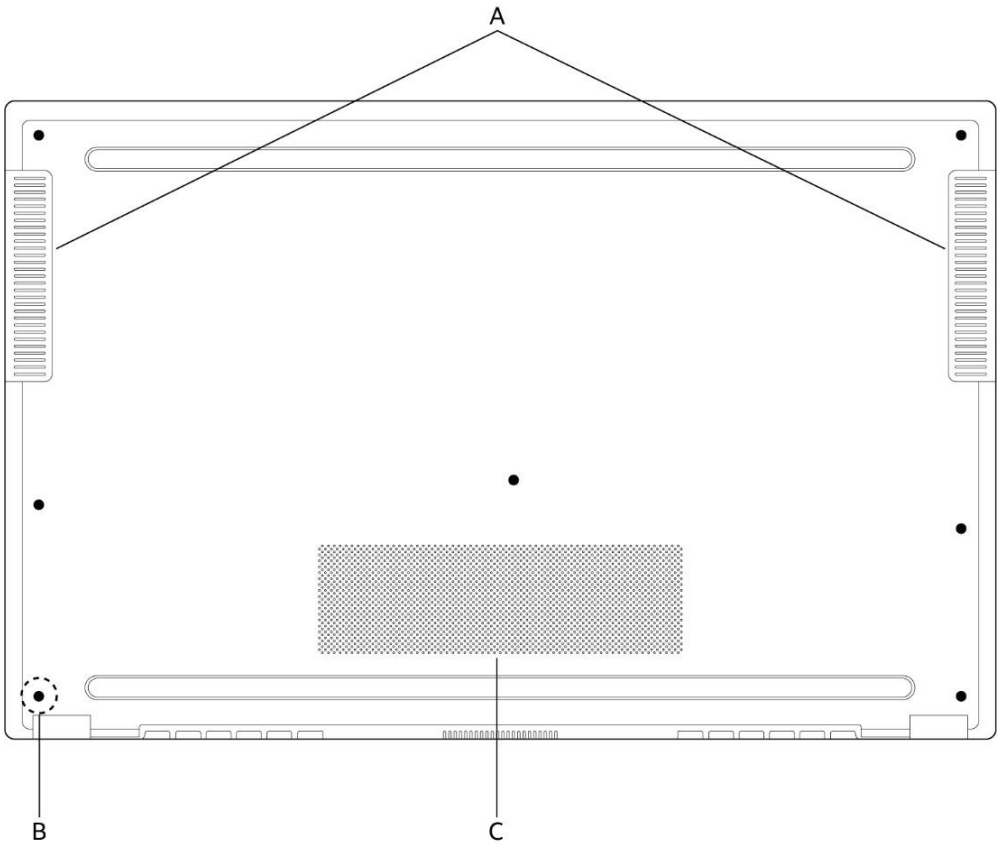

Figure 7. Bottom Features

Table 9. Bottom Features

Feature	Description
A	Speakers
B	Back Cover Screws
C	Air Vents

2.3 Keyboard

The following keyboard layouts and languages are available on these versions of LAPBC510 and LAPBC710.

Table 10. Keyboard Layout and Languages

Product Code	Layout	Language
BBC510EAUXBC6	ANSI	US English
BBC510BCBXBC2	ISO	Blank
BBC710BCUXBC1	ANSI	US English
BBC710ECUXBC1	ANSI	US English

2.4 External Graphics

Maximum Supported Resolutions

- HDMI 2.0b – 3840x2160 48-60 Hz 24 bpp (RGB/YUV444) or 3840x2160 48-60 Hz 12 bpp (YUV420)
- DisplayPort* 1.4a via Thunderbolt™ 4 Port - 4096x2304 60 Hz 36 bpp or 5120 x3200 60 Hz 24 bpp

2.5 Memory

Memory is soldered down with support for the following memory features:

- Dual Channel LPDDR4x 4266Mhz
- 16GB of total memory

2.6 Storage

The following storage interface options are supported via one M.2 2280 (key type M) connector:

- Gen 4 PCIe x4 AHCI, NVMe port is reserved for the M.2 storage module supporting M.2 2280 (key type M) module. M.2 SATA SSD modules are not supported.
- A pre-installed Samsung* PM9A1 512GB NVMe PCIe x4 Gen 4 SSD.

2.6.1 AHCI Mode

LAPBC510 and LAPBC710 supports AHCI storage mode.

NOTE

In order to use AHCI mode, AHCI must be enabled in the BIOS. Microsoft Windows* 10 includes the necessary AHCI drivers without the need to install separate AHCI drivers during the operating system installation process.*

2.7 Power Adapter

All versions of the laptop ship with a 20V, 65W 100/240V AC 50/60Hz power adapter with a USB Type C DC connector. The following AC power cords are available on these versions of LAPBC510 and LAPBC710.

Product Code	AC Power Cord
BBC510EAUXBC6	China Type I
BBC510BCBXBC2	European Type F
BBC710BCUXBC1	US Type B
BBC710ECUXBC1	US Type B

2.8 Thunderbolt™ 4

Thunderbolt™ 4 is supported with up to 40 Gbps of data throughput, 5K (60Hz) monitor output, USB 4 connection, charging output capabilities up to 5V at 3A or 9V at 2A and a 20V at 5A maximum input via the USB Type C connectors.

2.9 Environmental

Table 11 lists the environmental specifications for the LAPBC510 and LAPBC710.

Table 11. Environmental Specifications

Parameter	Specification		
Temperature			
Non-Operating	-20 °C to +60 °C		
Operating	0 °C to +35 °C		
Shock			
Unpackaged	120 g half sinusoid waveform		
	3ms, 18 times (3 times/axis)		
Packaged	Half sine 2 millisecond		
	Product Weight (pounds)	Free Fall (inches)	Velocity Change (inches/s²)
	<20	36	167
	21-40	30	152
	41-80	24	136
	81-100	18	118
Vibration			
Unpackaged	5 Hz to 200 Hz: 2.62Grms, -6dB / octave from 200Hz to 500Hz		
	30 minutes per each axis (X, Y, Z)		
Packaged	5 Hz to 40 Hz: 0.015 g^2 Hz (flat)		
	40 Hz to 500 Hz: 0.015 g^2 Hz sloping down to 0.00015 g^2 Hz		

Note: Before attempting to operate this product, the overall temperature of the product must be above the minimum operating temperature specified. It is recommended that the product temperature be at least room temperature before attempting to power on the product. The operating and non-operating environment must avoid condensing humidity.

CAUTION

To reduce the possibility of heat -related injuries or of overheating the computer, do not place the computer directly on your lap or obstruct the computer air vents. Use the computer only on a hard, flat surface. Do not allow another hard surface, such as an adjoining optional printer, or a soft surface, such as pillows or rugs or clothing, to block airflow. Also, do not allow the AC adapter to come into contact with the skin or a soft surface, such as pillows or rugs or clothing, during operation. The computer and the AC adapter comply with the user -accessible surface temperature limits defined by the International Standard for Safety of Information Technology Equipment (IEC 62368-1).

3 Characterized Errata

This section of the document communicates product Errata for the Intel® NUC M15 Laptop Kits.

Errata are design defects or deviations from current published specifications for a given product. Published errata may or may not be corrected. Hardware and software designed to be used with any given processor stepping must assume that all errata documented for that process stepping are present on all devices.

There are no characterized errata currently.