

Intel® Whitebook LAPQC71A, LAPQC71B, LAPQC71C and LAPQC71D

Product Specification

Regulatory Model Name:

QC7

Version 1.07

June 2020

Revision History

Revision	Revision History	Date
1.0	First release	June 2019
1.01	Clarified battery life test environment	June 2019
1.02	Further clarified estimated battery life configuration and test. Clarified system measurement numbers	July 2019
1.03	Updated table 2 and figure 2	August 2019
1.04	Updated Feature Summary and included safety Warning section	September 2019
1.05	Updated New SKUs and Enhancement Features	March 2020
1.06	Updated BIOS Revision and Product Codes	June 2020
1.07	Updated BIOS Revision and Battery performance features	September 2020
·		

Disclaimer

This product specification applies to only the standard Intel® Whitebook LAPQC71A, Intel® Whitebook LAPQC71B, Intel® Whitebook LAPQC71D with BIOS identifier QCCFL357.86A.

INFORMATION IN THIS DOCUMENT IS PROVIDED IN CONNECTION WITH INTEL® PRODUCTS. NO LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OR OTHERWISE, TO ANY INTELLECTUAL PROPERTY RIGHTS IS GRANTED BY THIS DOCUMENT. EXCEPT AS PROVIDED IN INTEL'S TERMS AND CONDITIONS OF SALE FOR SUCH PRODUCTS, INTEL ASSUMES NO LIABILITY WHATSOEVER, AND INTEL DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY, RELATING TO SALE AND/OR USE OF INTEL PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT. UNLESS OTHERWISE AGREED IN WRITING BY INTEL, THE INTEL PRODUCTS ARE NOT DESIGNED NOR INTENDED FOR ANY APPLICATION IN WHICH THE FAILURE OF THE INTEL PRODUCT COULD CREATE A SITUATION WHERE PERSONAL INJURY OR DEATH MAY OCCUR.

LAPQC71B, LAPQC71C and LAPQC71D are evaluated as Information Technology Equipment (I.T.E.) for use in personal computers (PC) for installation in homes, offices, schools, computer rooms, and similar locations. The suitability of this product for other PC or embedded non-PC applications or other environments, such as medical, industrial, alarm systems, test equipment, etc. may not be supported without further evaluation by Intel.

Intel Corporation may have patents or pending patent applications, trademarks, copyrights, or other intellectual property rights that relate to the presented subject matter. The furnishing of documents and other materials and information does not provide any license, express or implied, by estoppel or otherwise, to any such patents, trademarks, copyrights, or other intellectual property rights.

Intel may make changes to specifications and product descriptions at any time, without notice.

Designers must not rely on the absence or characteristics of any features or instructions marked "reserved" or "undefined." Intel reserves these for future definition and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to them.

Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families: Go to:

Learn About Intel* Processor Numbers

Intel® Whitebooks may contain design defects or errors known as errata, which may cause the product to deviate from published specifications. Current characterized errata, if any, are available in this document.

Contact your local Intel sales office or your distributor to obtain the latest specifications before placing your product order.

Intel, the Intel logo and Intel Core 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 $\ensuremath{@}$ 2020 Intel Corporation. All rights reserved.

Intel® Whitebook LAPQC71A, Intel® Whitebook LAPQC71B Intel® Whitebook LAPQC71C and Intel® Whitebook LAPQC71D Identification Information

Intel® Whitebook LAPQC71A, Intel® Whitebook LAPQC71B, Intel® Whitebook LAPQC71C and Intel® Whitebook LAPQC71D Identification Information

SA Revision	Product Code	BIOS Revision	Note
			s
K54902-301	BQC71ABBU6000	QCCFL357.0064.2020.1226.1657	1,2
K63034-301	BQC71AUBU6000	QCCFL357.0064.2020.1226.1657	1,2
K54906-301	BQC71BBBU6000	QCCFL357.0064.2020.1226.1657	1,2
K63036-301	BQC71BUBU6000	QCCFL357.0064.2020.1226.1657	1,2
K91761-300	BQC71DBDU6000	QCCFL357.0114.2020.0401.1544	1,2
K91762-300	BQC71CBDU6000	QCCFL357.0114.2020.0401.1544	1,2
K91763-300	BQC71DBDB6000	QCCFL357.0114.2020.0401.1544	1,2
K91765-300	BQC71CBDB6000	QCCFL357.0114.2020.0401.1544	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™ i7-9750H	UO	SRF6U

Specification Changes or Clarifications

The table below indicates the Specification Changes or Specification Clarifications, if any, that apply to the Intel® Whitebook LAPQC71A, Intel® Whitebook LAPQC71B, Intel® Whitebook LAPQC71C and Intel® Whitebook LAPQC71D

Specification Changes or Clarifications

Date	Type of Change	Description of Changes or Clarifications	
8 Jul 2019	Spec	System height measurement changed to a front to back range	
17 Mar 2020	New SKU/Products	Added new product names and new SKUs	

Errata

Current characterized errata, if any, will be documented in a separate section of this Product Specification. See below for the latest documentation.

Preface

This Product Specification specifies the layout, components, connectors, power and environmental features for the Intel® Whitebook LAPQC71A, Intel® Whitebook LAPQC71B, Intel® Whitebook LAPQC71C and Intel® Whitebook LAPQC71D.



NOTE

In this document, the use of "Intel® Whitebook LAPQC71A, Intel® Whitebook LAPQC71B, Intel® Whitebook LAPQC71C and Intel® Whitebook LAPQC71D will refer to the LAPQC71A, LAPQC71B, LAPQC71C and LAPQC71D versions of the Intel® Whitebook.

Intended Audience

This document is intended to provide technical information about LAPQC71A, LAPQC71B, LAPQC71C and LAPQC71D 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 LAPQC71A, LAPQC71B, LAPQC71C and LAPQC71D features
2	A technical description of the LAPQC71A, LAPQC71B, LAPQC71C and LAPQC71D

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
КВ	Kilobyte (1024 bytes)
Kb	Kilobit (1024 bits)
kb/s	1000 bits per second
МВ	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

Re	evision History	ii
	Disclaimer	
	Errata	
Ρı	reface	V
•	Intended Audience	
	What This Document Contains	
	Typographical Conventions	
C	ontents	
1		
•	1.1 Overview	
	1.2 Version Summary	
	1.3 Feature Summary	
_	•	
2	Technical Reference	
	2.1 Block Diagram	
	2.2 Exterior Features	
	2.3 Back Cover Removal	
	2.4 Memory	
	2.5 Storage	
	2.5.1 AHCI Mode	
	2.5.2 Intel® Rapid Storage Technology / SATA RAID	
	2.7 Environmental	
_		
3	Characterized Errata	23
Fi	igures	
Fig	gure 1. Block Diagram	13
Fig	gure 2. Top-Open Features	14
Fi	gure 3. Front Features	15
•	gure 4. Bottom Features	
	gure 5. Back Features	
•	gure 6. Left Features	
•	gure 7. Right Features	
	gure 8. Back Cover Removal	
_	gure 9. Location of the SO-DIMM Connectors	
•	gure 10. Location of the M.2 Connectors	
118	gure 11. Location of the BIOS Security Switch	20

Tables

Table 1.	Version Summary	9
	LAPQC71A and LAPQC71B Feature Summary	
Table 3.	LAPQC71C and LAPQC71D Feature Summary	.11
Table 4	Top-Open Features	.14
Table 5	Front Features	.15
Table 6	Bottom Features	.15
Table 7	Back Features	.16
Table 8	Left Features	.16
Table 9	Right Features	.16
Table 1	O. Supported DDR4/-RS Non-ECC SO-DIMM Module Configurations	.18
Table 1	1. BIOS Security Switch Settings	.21
Table 1	2. Environmental Specifications	.22

1 Product Description

1.1 Overview

The Intel® Whitebook LAPQC71A, Intel® Whitebook LAPQC71B, Intel® Whitebook LAPQC71C and Intel® Whitebook LAPQC71D are premium, metal, thin and light performance laptops.

1.2 Version Summary

There are four different versions of LAPQC71A, four different versions of LAPQC71B, two different versions of LAPQC71C and two different versions of LAPQC71D available 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	GPU	Color
BQC71ABBU6000	Intel® Core™ i7-9750H	GeForce* 1660 Ti	Black
BQC71AUBU6000	Intel® Core™ i7-9750H	GeForce 1660 Ti	Gunmetal
BQC71BBBU6000	Intel® Core™ i7-9750H	GeForce RTX 2070	Black
BQC71BUBU6000	Intel® Core™ i7-9750H	GeForce RTX 2070	Gunmetal
BQC71DBDU6000	Intel® Core™ i7-9750H	GeForce RTX RTX 2070 Super Max Q	Black
BQC71CBDU6000	Intel® Core™ i7-9750H	GeForce RTX RTX 2060	Black
BQC71DBDB6000	Intel® Core™ i7-9750H	GeForce RTX RTX 2070 Super Max Q	Black
BQC71CBDB6000	Intel® Core™ i7-9750H	GeForce RTX RTX 2060	Black

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

 Intel Technologies
 http://www.intel.com/technology

1.3 Feature Summary

Table 2 summarizes the major features of the LAPQC71A and LAPQC71B

Table 2. LAPQC71A and LAPQC71B Feature Summary

Feature	LAPQC71A	LAPQC71B
Color	Black or Gunmetal	Black or Gunmetal
Materials	Magnesium Alloy	Magnesium Alloy
Processor	Intel® Core™ i7-9750H	Intel® Core™ i7-9750H
Chipset	Intel® HM370	Intel® HM370
Memory	2 DDR4 SO-DIMM Slots , 2666Mhz	2 DDR4 SO-DIMM Slots, 2666Mhz
Graphics	Nvidia* GeForce* GTX 1660 Ti	Nvidia GeForce RTX 2070 Max-Q
VRAM	6GB GDDR6	8GB GDDR6
Storage	1 M.2 22x80 PCIe x4 NVMe	1 M.2 22x80 PCle x4 NVMe
	1 M.2 22x80 PCle x4 NVMe or SATA SSD	1 M.2 22x80 PCle x4 NVMe or SATA SSD
	Support for Intel® Optane™ Technology	Support for Intel® Optane™ Technology
Card Reader	SDXC v3.01 2-in-1 SD/SDHC/SDXC	SDXC v3.01 2-in-1 SD/SDHC/SDXC
Display Panel	Narrow Bezel IPS 15.6" FHD, 16:9 ratio, 144Hz,	Narrow Bezel IPS 15.6" FHD, 16:9 ratio, 144Hz,
	LED backlight, Response Time=5ms nominal	LED backlight, Response Time=5ms nominal
Display	1 Full Size HDMI Output	1 Full Size HDMI Output
Outputs	1 DisplayPort via USB Type C	1 DisplayPort via USB Type C
Audio	Realtek* ALC269M with Intel® HD Audio	Realtek ALC269M with Intel® HD Audio
	1 3.5mm Audio Out Jack	1 3.5mm Audio Out Jack
	1 3.5mm Microphone In Jack	1 3.5mm Microphone In Jack
Speakers	2 Built In, 2W each	2 Built In, 2W each
Microphones	2 Digital Microphones	2 Digital Microphones
Keyboard	Silent Mechanical with RGB backlight,	Silent Mechanical with RGB backlight
	2.0mm travel	2.0mm travel
Pointing	Glass Click Pad with Microsoft Precision	Glass Click Pad with Microsoft Precision
Device	Touchpad Driver Support	Touchpad Driver Support
	Enable/Disable option with LED indicator	Enable/Disable option with LED indicator
Camera	HD IR with Windows Hello Support	HD IR with Windows Hello Support
Wired LAN	Gigabit Ethernet (RJ-45)	Gigabit Ethernet (RJ-45)
Wireless LAN	Intel® WiFi 6 AX 200, Bluetooth* 5.0	Intel® WiFi 6 AX 200, Bluetooth 5.0
Power Supply	19.5V, 230W 100/240V AC 50/60Hz 1 Power Input Jack	19.5V, 230W 100/240V AC 50/60Hz 1 Power Input Jack
Patton/	94Whr (8200mAh) with Fast Charge Support	94Whr (8200mAh) with Fast Charge Support
Battery		
Power LED	Power On: White, Power Off: Off Suspend: Blinking White	Power On: White, Power Off: Off Suspend: Blinking White
Charging and	Charging (Power On): Blinking White	Charging (Power On): Blinking White
Battery LED	Charging (Power Off): Blinking White	Charging (Power Off): Blinking White
battery LLD	Battery Low (<6%): Amber	Battery Low (<6%): Amber
	Charging Finish (w/AC): White, w/o AC: Off	Charging Finish (w/AC): White, w/o AC: Off
Mode LED	Battery Saver: Both LEDs Off	Battery Saver: Both LEDs Off
000 222	Balanced: Left LED on	Balanced: Left LED on
	Performance: Both LEDs On	Performance: Both LEDs On
Front Light Bar	RGB	RGB
USB	2 USB 3.1 (Gen 1) Type A	2 USB 3.1 (Gen 1) Type A
	1 USB 3.1 (Gen 2) Type A	1 USB 3.1 (Gen 2) Type A
	1 Type C Thunderbolt™ 3	1 Type C Thunderbolt™ 3
Size	356.4mm x 233.6mm x 20.5mm (front) to	356.4mm x 233.6mm x 20.5mm (front) to
	21.4mm (back)	21.4mm (back)
Weight	1.85kg +/-5%	1.85kg +/-5%
Measured	Idle: 16.3dBA	Idle: 16.3dBA
Acoustics ¹	Battery Saver Mode: 34.7dBA	Battery Saver Mode: 34.7dBA
	Balanced Mode: 39.3dBA	Balanced Mode: 39.3dBA
	Performance Mode: 51.5dBA	Performance Mode: 51.5dBA

Feature	LAPQC71A	LAPQC71B
Battery Life	Idle: ~12 hours, 5 minutes	Idle: ~12 hours
Estimates ²	Battery Saver Mode: ~10.75 hours	Battery Saver Mode: ~10 hours
	Balanced Mode: ~10.5 hours	Balanced Mode: ~10 hours
	Performance Mode: ~10 hours	Performance Mode: ~9.75 hours
Security	1 Kensington* Lock	1 Kensington Lock
Advanced	Intel® Speed Shift Technology	Intel® Speed Shift Technology
Technologies	Intel® Turbo Boost Technology	Intel® Turbo Boost Technology
Supported	Intel® Virtualization Technology (VT-x)	Intel® Virtualization Technology (VT-x)
	Intel® 64	Intel® 64
	Enhanced Intel® SpeedStep® Technology	Enhanced Intel® SpeedStep® Technology
	Intel® Flex Memory Access	Intel® Flex Memory Access Intel® Thermal
	Intel® Hyper-Threading Technology	Intel® Hyper-Threading Technology
	Intel® Virtualization Technology for Directed I/O	Intel® virtualization Technology for Directed I/O
	(VT-d)	(VT-d)
	Intel(VT-x with Extended Page Tables (EPT)	Intel(VT-x with Extended Page Tables (EPT)
	Intel® Identity Protection Technology	Intel® Identity Protection Technology
Security and	Intel® AES New Instructions	Intel® AES New Instructions
Reliability	Intel® OS Guard	Intel® OS Guard
	Intel® Memory Protection Extensions (Intel® MPX)	Intel® Memory Protection Extensions (Intel®
	Secure Key	MPX)
	Execute Disable Bit	Secure Key
	Intel® Software Guard Extensions (Intel® SGX)	Execute Disable Bit
	Intel® Platform Trust Technology (Intel® PTT)	Intel® Software Guard Extensions (Intel® SGX)
		Intel® Platform Trust Technology (Intel® PTT)
Operating	Control Center Utility, Windows Hello Support,	Control Center Utility, Windows Hello Support,
System	Voice Assistant Support for Alexa and Cortana	Voice Assistant Support for Alexa and Cortana
Features		

Table 2 summarizes the major features of the LAPQC71C and LAPQC71D $\,$

Table 3. LAPQC71C and LAPQC71D Feature Summary

Feature	LAPQC71C	LAPQC71D
Color	Black or Gunmetal	Black or Gunmetal
Materials	Magnesium Alloy	Magnesium Alloy
Processor	Intel® Core™ i7-9750H	Intel® Core™ i7-9750H
Chipset	Intel® HM370	Intel® HM370
Memory	2 DDR4 SO-DIMM Slots , 2666Mhz	2 DDR4 SO-DIMM Slots, 2666Mhz
Graphics	Nvidia* GeForce* RTX 2060	Nvidia GeForce RTX 2070SQ
VRAM	6GB GDDR6	8GB GDDR6
Storage	1 M.2 22x80 PCle x4 NVMe	1 M.2 22x80 PCle x4 NVMe
	1 M.2 22x80 PCle x4 NVMe or SATA SSD	1 M.2 22x80 PCle x4 NVMe or SATA SSD
	Support for Intel® Optane™ Technology	Support for Intel® Optane™ Technology
Card Reader	SDXC v3.01 2-in-1 SD/SDHC/SDXC	SDXC v3.01 2-in-1 SD/SDHC/SDXC
Display Panel	Narrow Bezel IPS 15.6" FHD, 16:9 ratio, 144Hz,	Narrow Bezel IPS 15.6" FHD, 16:9 ratio, 144Hz,
	LED backlight, Response Time=5ms nominal	LED backlight, Response Time=5ms nominal
Display	1 Full Size HDMI Output	1 Full Size HDMI Output
Outputs	1 DisplayPort via USB Type C	1 DisplayPort via USB Type C
Audio	Realtek* ALC269M with Intel® HD Audio	Realtek ALC269M with Intel® HD Audio
	1 3.5mm Audio Out Jack	1 3.5mm Audio Out Jack
	1 3.5mm Microphone In Jack	1 3.5mm Microphone In Jack
Speakers	2 Built In, 2W each	2 Built In, 2W each
Microphones	2 Digital Microphones	2 Digital Microphones
Keyboard	Silent Mechanical with RGB backlight,	Silent Mechanical with RGB backlight
	2.0mm travel	2.0mm travel
Pointing	Glass Click Pad with Microsoft Precision	Glass Click Pad with Microsoft Precision
Device	Touchpad Driver Support	Touchpad Driver Support
	Enable/Disable option with LED indicator	Enable/Disable option with LED indicator

Feature	LAPQC71C	LAPQC71D	
Camera	HD IR with Windows Hello Support	HD IR with Windows Hello Support	
Wired LAN	Gigabit Ethernet (RJ-45)	Gigabit Ethernet (RJ-45)	
Wireless LAN	Intel® WiFi 6 AX 200, Bluetooth* 5.0	Intel® WiFi 6 AX 200, Bluetooth 5.0	
Power Supply	19.5V, 230W 100/240V AC 50/60Hz	19.5V, 230W 100/240V AC 50/60Hz	
	1 Power Input Jack	1 Power Input Jack	
Battery	94Whr (8200mAh) with Fast Charge Support	94Whr (8200mAh) with Fast Charge Support	
Power LED	Power On: White, Power Off: Off	Power On: White, Power Off: Off	
	Suspend: Blinking White	Suspend: Blinking White	
Charging and	Charging (Power On): Blinking White	Charging (Power On): Blinking White	
Battery LED	Charging (Power Off): Blinking White	Charging (Power Off): Blinking White	
	Battery Low (<6%): Amber	Battery Low (<6%): Amber	
	Charging Finish (w/AC): White, w/o AC: Off	Charging Finish (w/AC): White, w/o AC: Off	
Mode LED	Battery Saver: Both LEDs Off	Battery Saver: Both LEDs Off	
	Balanced: Left LED on	Balanced: Left LED on	
	Performance: Both LEDs On	Performance: Both LEDs On	
Front Light Bar	RGB	RGB	
USB	2 USB 3.1 (Gen 1) Type A	2 USB 3.1 (Gen 1) Type A	
	1 USB 3.1 (Gen 2) Type A	1 USB 3.1 (Gen 2) Type A	
	1 Type C Thunderbolt™ 3	1 Type C Thunderbolt™ 3	
Size	356.4mm x 233.6mm x 20.5mm (front) to	356.4mm x 233.6mm x 20.5mm (front) to	
	21.4mm (back)	21.4mm (back)	
Weight	1.85kg +/-5%	1.85kg +/-5%	
Measured	Idle: 16.3dBA	Idle: 16.3dBA	
Acoustics ¹	Battery Saver Mode: 34.7dBA	Battery Saver Mode: 34.7dBA	
	Balanced Mode: 39.3dBA	Balanced Mode: 39.3dBA	
	Performance Mode: 51.5dBA	Performance Mode: 51.5dBA	

^{1 –} Acoustic performance will vary based on system placement, room size and background noise. Acoustic testing for the different operating modes was conducted using a simulated full workload.

^{2 –} Battery life will vary based on system configuration and actual system usage. Battery life testing for the different operating modes was conducted by playing a locally stored H.264 1080p video, volume at 67% and backlight at 40%. Wireless was enabled, but not connected to a network. LAPQC71A configured with 8GB memory/256GB storage, LAPQC71B configured with 8GB memory/512GB storage, LAPQC71D configured with 8GB memory/512GB storage.

2 Technical Reference

2.1 Block Diagram

Figure 1 is a block diagram of the major functional areas of LAPQC71A, LAPQC71B, LAPQC71C and LAPQC71D.

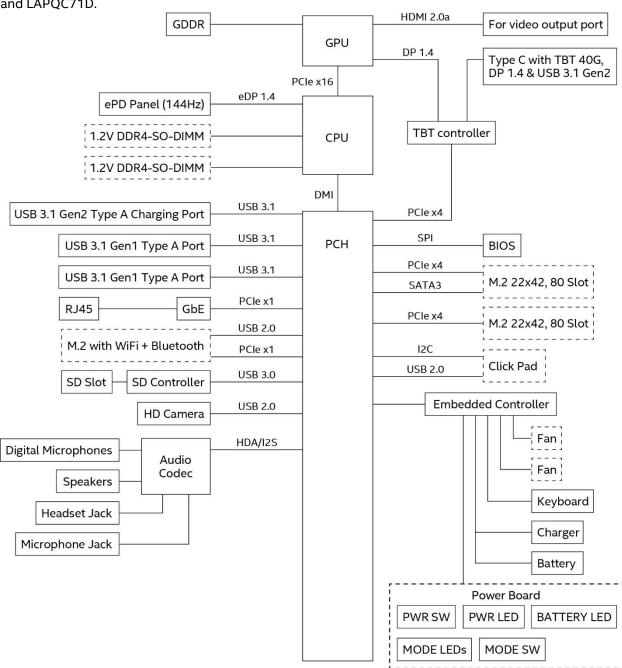


Figure 1. Block Diagram

2.2 Exterior Features

The following figures show the exterior features of the laptop

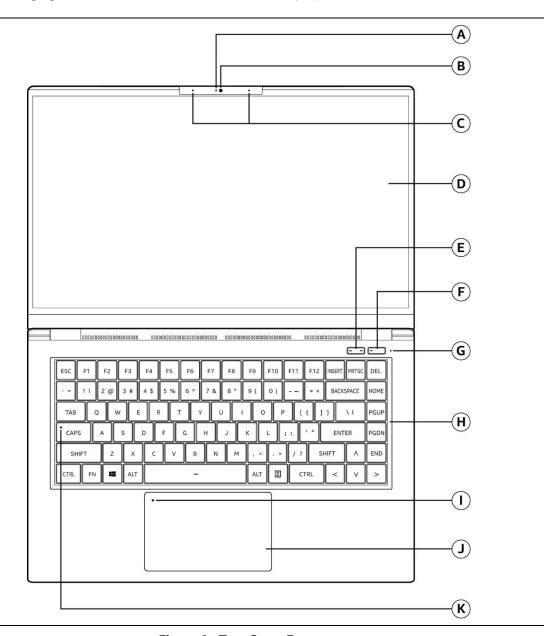


Figure 2. Top-Open Features

Table 4. Top-Open Features

Feature	Description	Feature	Description	Feature	Description
Α	Camera Status LED	F	Power Button with LED	K	Caps Lock Status LED
В	Camera	G	Battery Status LED		
С	Digital Microphones	Н	Mechanical RGB Keyboard		
D	LCD Screen	1	Touchpad Switch/LED		
E	Mode Button with LEDs	J	Touchpad/Clickpad		

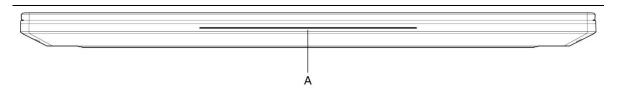


Figure 3. Front Features

Table 5. Front Features

Letter	Feature
Α	RGB Light Bar

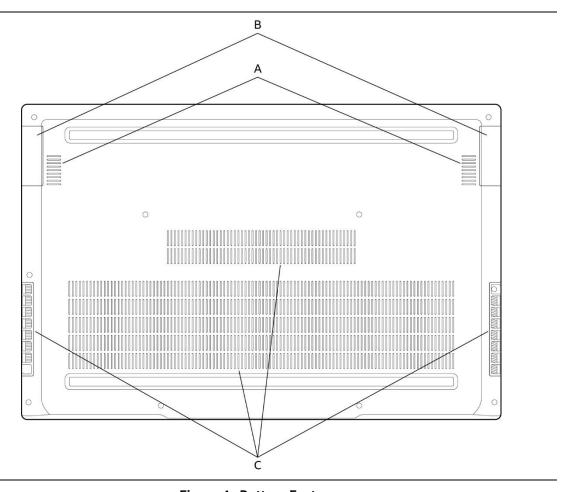


Figure 4. Bottom Features

Table 6. Bottom Features

Feature	Description
Α	Speakers
В	Antennas
С	Air Vents

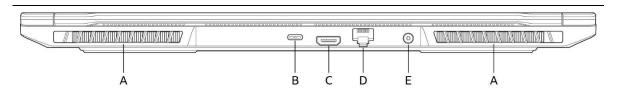


Figure 5. Back Features

Table 7. Back Features

Feature	Description
Α	Air Vents
В	Thunderbolt 3 Port (USB Type C with support for DisplayPort*)
С	HDMI Port
D	RJ-45 Network Jack
E	Power Connector

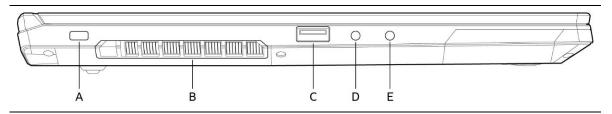


Figure 6. Left Features

Table 8. Left Features

Feature	Description
Α	Kensington Security Lock
В	Air Vents
С	USB 3.1 (Gen 2) Type A (support for charging)
D	3.5mm Microphone Jack
E	3.5mm Headphone Jack

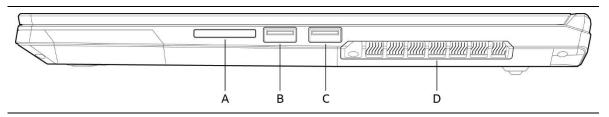


Figure 7. Right Features

Table 9. Right Features

Feature	Description		
Α	SD Card Slot (SD/SDHC/SDXC)		
В	USB 3.1 (Gen 1) Type A		
С	USB 3.1 (Gen 1) Type A		
D	Air Vents		

2.3 **Back Cover Removal**

The back cover of the laptop will need to be removed in order to access the SO-DIMM connectors, the M.2 connectors and the BIOS Security Jumper. See Figure 8 on how to remove the back cover.

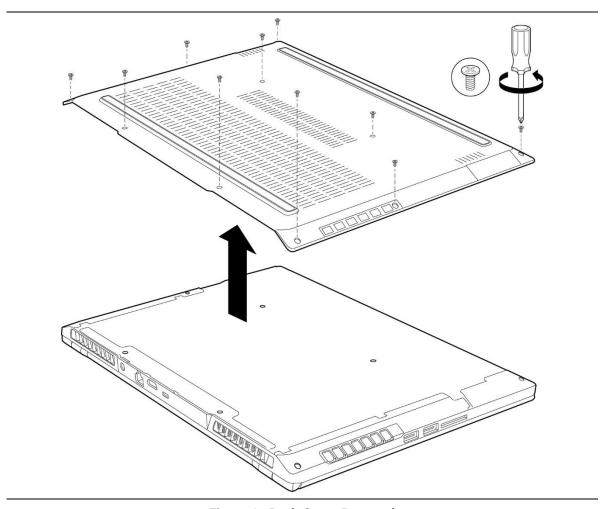


Figure 8. Back Cover Removal



A CAUTION

Do not remove or replace the back cover with the power on. Always turn off the power and unplug the power cord from the system before removing or replacing the back cover. Otherwise, the system could be damaged.

2.4 **Memory**

Two 260-pin SO-DIMM sockets support the following memory features:

- 1.2V DDR4 SDRAM SO-DIMMs with gold plated contacts
- Two independent memory channels with interleaved mode support
- Unbuffered, single-sided or double-sided SO-DIMMs
- 64 GB maximum total system memory
- Non-ECC SO-DIMMs
- Serial Presence Detect
- DDR4 2666 MHz SDRAM SO-DIMMs



NOTE

To be fully compliant with all applicable DDR SDRAM memory specifications, the LAPQC71 should be populated with SO-DIMMs that support the Serial Presence Detect (SPD) data structure. This allows the BIOS to read the SPD data and program the chipset to accurately configure memory settings for optimum performance.

Table 10 lists the supported SO-DIMM configurations.

Table 10. Supported DDR4/-RS Non-ECC SO-DIMM Module Configurations

Raw Card Version	DIMM Capacity	DRAM Device Technology	DRAM Organization	# of DRAM Devices	# of Ranks	# of Row/Col Address Bits	# of Banks Inside DRAM	Page Size
A	4GB	4Gb	512M x 8	8	1	15/10	16	8K
Α	8GB	8Gb	1024M x 8	8	1	16/10	16	8K
В	8GB	4Gb	512M x 8	16	2	15/10	16	8K
В	16GB	8Gb	1024M x 8	16	2	16/10	16	8K
С	2GB	4Gb	256M x 16	4	1	15/10	8	8K
С	4GB	8Gb	512M x 16	4	1	16/10	8	8K
E	8GB	4Gb	512M x 8	16	2	15/10	16	8K
E	16GB	8Gb	1024M x 8	16	2	16/10	16	8K
E	32GB	8Gb	2048M x 8	16	2	16/10	16	8K



/!\ CAUTION

Do not add or remove memory with the power on. Always turn off the power and unplug the power cord from the system before adding or removing memory. Otherwise, the system could be damaged.

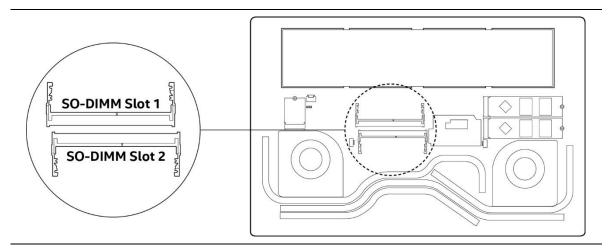


Figure 9. Location of the SO-DIMM Connectors

2.5 Storage

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

- SATA 6.0 Gb/s ports are reserved for the M.2 storage modules supporting M.2 2280 (key type M) modules (Only supported on M.2 slot 1)
- Gen 3 PCIe X4 AHCI, NVMe ports are reserved for the M.2 storage modules supporting M.2 2280 (key type M) modules (supported on both M.2 slots)

2.5.1 AHCI Mode

LAPQC71 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; however, it is always good practice to update the AHCI drivers to the latest available by Intel.

2.5.2 Intel® Rapid Storage Technology / SATA RAID

LAPQC71 supports Intel® Rapid Storage Technology, providing both AHCI and integrated RAID functionality. The RAID capability provides high-performance RAID 0 and 1 functionality on all PCIe NVMe M.2 drives. Other RAID features include hot spare support and SMART alerting. Software components include an Option ROM for pre-boot configuration and boot functionality, a Microsoft Windows compatible driver, and a user interface for configuration and management of the RAID capability.



NOTE

In order to use supported RAID features, you must first enable RAID in the BIOS.

A CAUTION

Do not add or remove storage with the power on. Always turn off the power and unplug the power cord from the system before adding or removing storage. Otherwise, the system could be damaged.

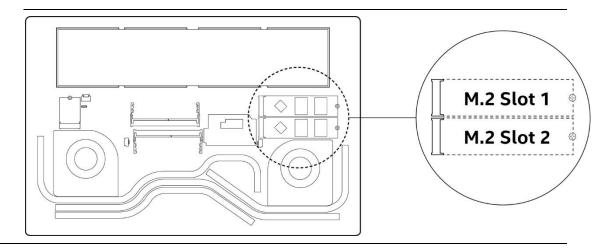


Figure 10. Location of the M.2 Connectors

2.6 **BIOS Security Jumper**



A CAUTION

Do not change the jumper with the power on. Always turn off the power and unplug the power cord from the system before changing a jumper setting. Otherwise, the system could be damaged. Figure 11 shows the location of the BIOS Security Jumper. The 3-position jumper determines the BIOS Security program's mode.

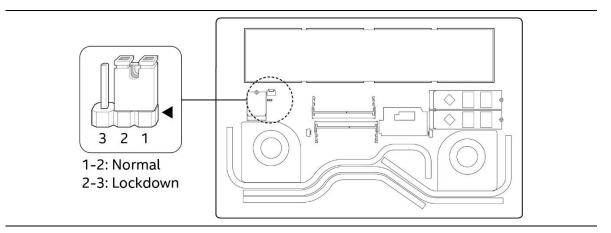


Figure 11. Location of the BIOS Security Switch

Table 11 describes the jumper settings for the three modes: normal, lockdown, and configuration.

Table 11. BIOS Security Switch Settings

Function/Mode	Switch Setting	Configuration
Normal	1-2	The BIOS uses current configuration information and passwords for booting.
Lockdown	2-3	The BIOS uses current configuration information and passwords for booting, except:
		All POST Hotkeys are suppressed (prompts are not displayed and keys are not accepted. For example, F2 for Setup, F10 for the Boot Menu).
		BIOS updates are not available except for automatic Recovery due to flash corruption.
Configuration	None	BIOS Recovery Update process if \EFI\INTEL\QCCFL357.CAP file is found. Recovery Update can be cancelled by pressing the Esc key.
		If the Recovery Update was cancelled or \EFI\INTEL\QCCFL357.CAP file was not found, a Config Menu will be displayed. The Config Menu consists of the following options:
		[1] Suppress this menu until the BIOS Security Jumper is replaced.
		[2] Clear BIOS User and Supervisor Passwords.
		[3] Clear Trusted Platform Module Warning: Data encrypted with the TPM will no longer be accessible if the TPM is cleared
		[F2] BIOS Setup
		[F4] BIOS Recovery

2.7 Environmental

Table 12 lists the environmental specifications for the LAPQC71A, LAPQC71B, LAPQC71C and LAPQC71D.

Table 12. Environmental Specifications

Parameter	Specification						
Temperature							
Non-Operating	-40 °C to +60 °C						
Operating	0 °C to +30 °C						
Shock							
Unpackaged	50 g trapezoidal waveform						
	Velocity change of 170 inche	es/s²					
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 20 Hz: 0.01 g² Hz sloping up to 0.02 g² Hz						
	20 Hz to 500 Hz: 0.02 g ² Hz (flat)						
Packaged	5 Hz to 40 Hz: 0.015 g² Hz (flat)						
	40 Hz to 500 Hz: 0.015 g ² H	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.

Warning! 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 60950).

3 Characterized Errata

NO.	Plans	Errata	
1	Plan Fix	BIOS v0128 or older causes LAPQC71x battery to overheat and swell	

4 Errata

1. The battery

PROBLEM: LAPQC71x original 10-hour battery was design to pull higher output voltage leading to battery swelling at 45C temperature and charging voltage above 4.15V. The fix required reduction in voltage output which subsequently shortened battery life as well as reduced battery capacity depending on the age of the battery and usage.

IMPLICATION: Not updating to BIOS 00138 or later, could cause the battery in the Intel® NUC 9 Extreme Laptop Kits to swell and read incorrect battery usage status.

Solution: LAPQC71x users must update their systems to a BIOS version v0138. or later as well as run the battery manufacturing date tool to reset battery actual age accurately. Customers must reset New Batteries manufacturing date to get accurate capacity and battery life readings.

STATUS: This erratum may be fixed in a future LAPQC71x BIOS releases.