Intel BX80684I79700K

Intel Core i7-9700K Desktop Processor Instruction Manual

Model: BX80684I79700K

1. INTRODUCTION

The Intel Core i7-9700K is a 9th Generation desktop processor designed for high-performance computing. Featuring 8 cores and a base clock speed of 3.60 GHz, with Intel Turbo Boost Technology 2.0 enabling speeds up to 4.90 GHz, this unlocked processor is suitable for demanding applications, gaming, and content creation. It includes Intel UHD Graphics 630 and supports Intel Optane Memory. Please note that a thermal solution is not included with this processor and must be purchased separately.

Image 1.1: Packaging for the Intel Core i7-9700K Desktop Processor.

2. SETUP AND INSTALLATION

2.1. Compatibility Requirements

- **Motherboard:** Compatible only with motherboards based on Intel 300 Series Chipsets, featuring an LGA1151 socket. Ensure your motherboard BIOS is updated to support 9th Generation Intel Core processors.
- **Cooling Solution:** A thermal solution (CPU cooler) is **NOT** included in the box. A high-performance CPU cooler is required for proper operation, especially when utilizing the processor's unlocked potential for overclocking.
- **Memory:** Supports DDR4 2666 MHz memory. Maximum capacity of 64 GB in a dual-channel architecture.

2.2. Physical Installation

Before beginning installation, ensure your system is powered off and unplugged. Refer to your motherboard's manual for specific instructions on CPU installation. Handle the processor by its edges to avoid touching the gold contacts or the integrated heat spreader (IHS).

1. Open the CPU socket retention lever on your motherboard.
2. Carefully align the processor with the socket, ensuring the gold triangle on the CPU matches the triangle on the socket.
3. Gently place the processor into the socket without forcing it.
4. Close the socket retention lever to secure the processor.
5. Apply a thin, even layer of thermal paste to the center of the processor's IHS.
6. Install your chosen CPU cooler according to its manufacturer's instructions.

Image 2.1: Top view of the Intel Core i7-9700K processor, showing the integrated heat spreader.

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Video 2.1: An official Intel video showcasing the Intel Core i7-9700K processor in its retail box. This video provides a visual overview of the product packaging.

3. OPERATING THE PROCESSOR

3.1. Key Features and Performance

The Intel Core i7-9700K processor is built for robust performance across various tasks. Its 8 cores provide strong multi-threaded capabilities, while Intel Turbo Boost Technology 2.0 dynamically increases clock speed up to 4.9 GHz when needed, optimizing performance for both single and multi-threaded applications.

- **8 Cores / 8 Threads:** Delivers efficient processing for multitasking and demanding workloads.
- **Up to 4.90 GHz Processor Frequency:** Achieved through Intel Turbo Boost Technology 2.0 for enhanced speed.
- **12 MB Intel Smart Cache:** Provides quick access to frequently used data.
- **95W TDP:** Indicates the thermal design power, requiring adequate cooling.

Image 3.1: Visual representation of the Intel Core i7-9700K's core specifications including core count, frequency, cache, and TDP.

3.2. Advanced Technologies

- **Unlocked & Overclockable:** The 'K' designation signifies an unlocked multiplier, allowing advanced users to manually adjust clock speeds for further performance gains.
- **Intel Turbo Boost Max Technology 3.0:** Identifies the fastest cores on the processor and directs critical workloads to them, providing increased performance on lightly threaded applications.
- **Intel Optane Memory Support:** Enhances system responsiveness by accelerating traditional hard drives.

- **Intel UHD Graphics 630:** Integrated graphics solution capable of handling everyday visual tasks and light gaming without a dedicated graphics card.
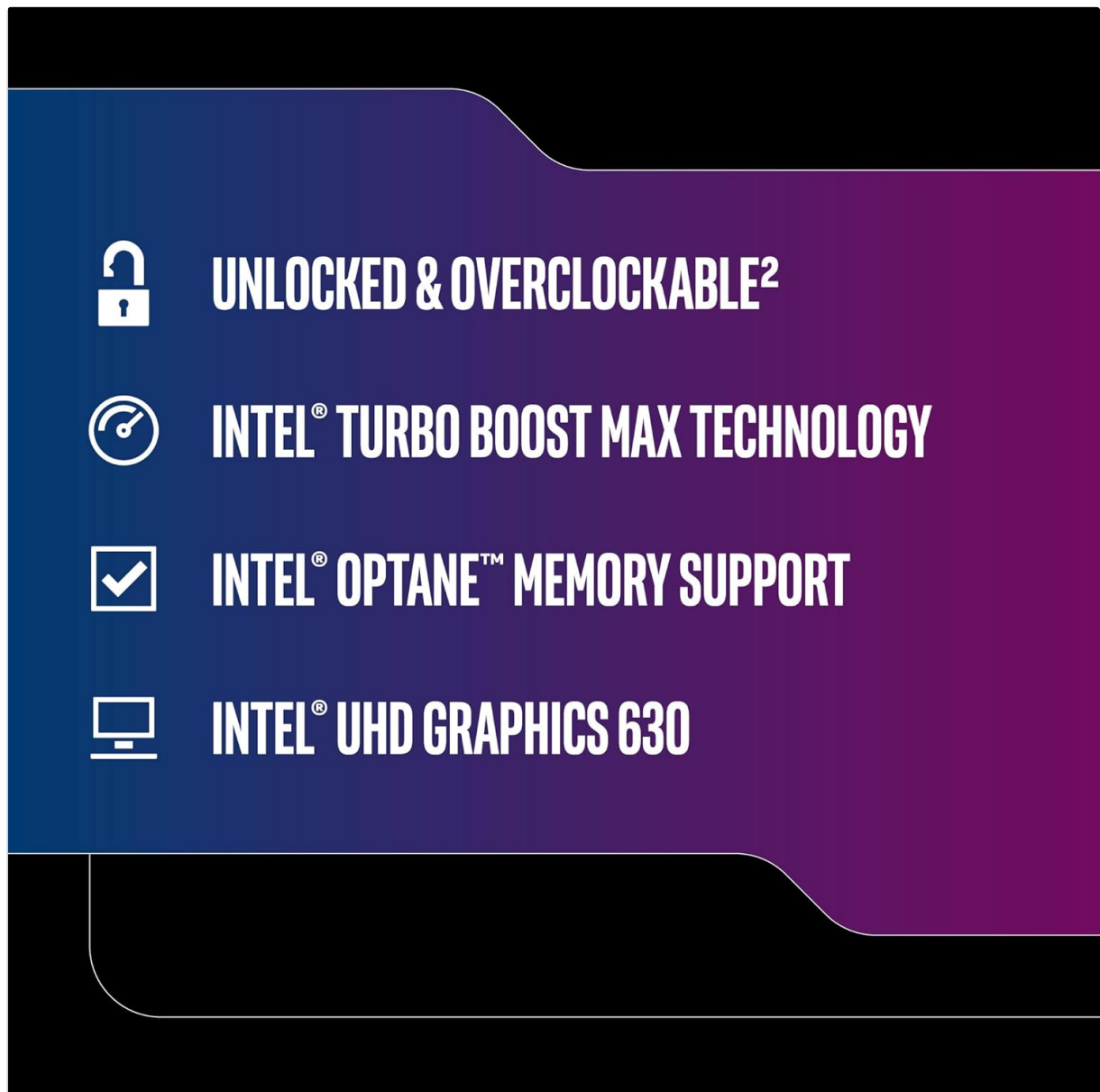

Image 3.2: Overview of advanced features such as unlocked status, Turbo Boost Max Technology, Optane Memory support, and integrated graphics.
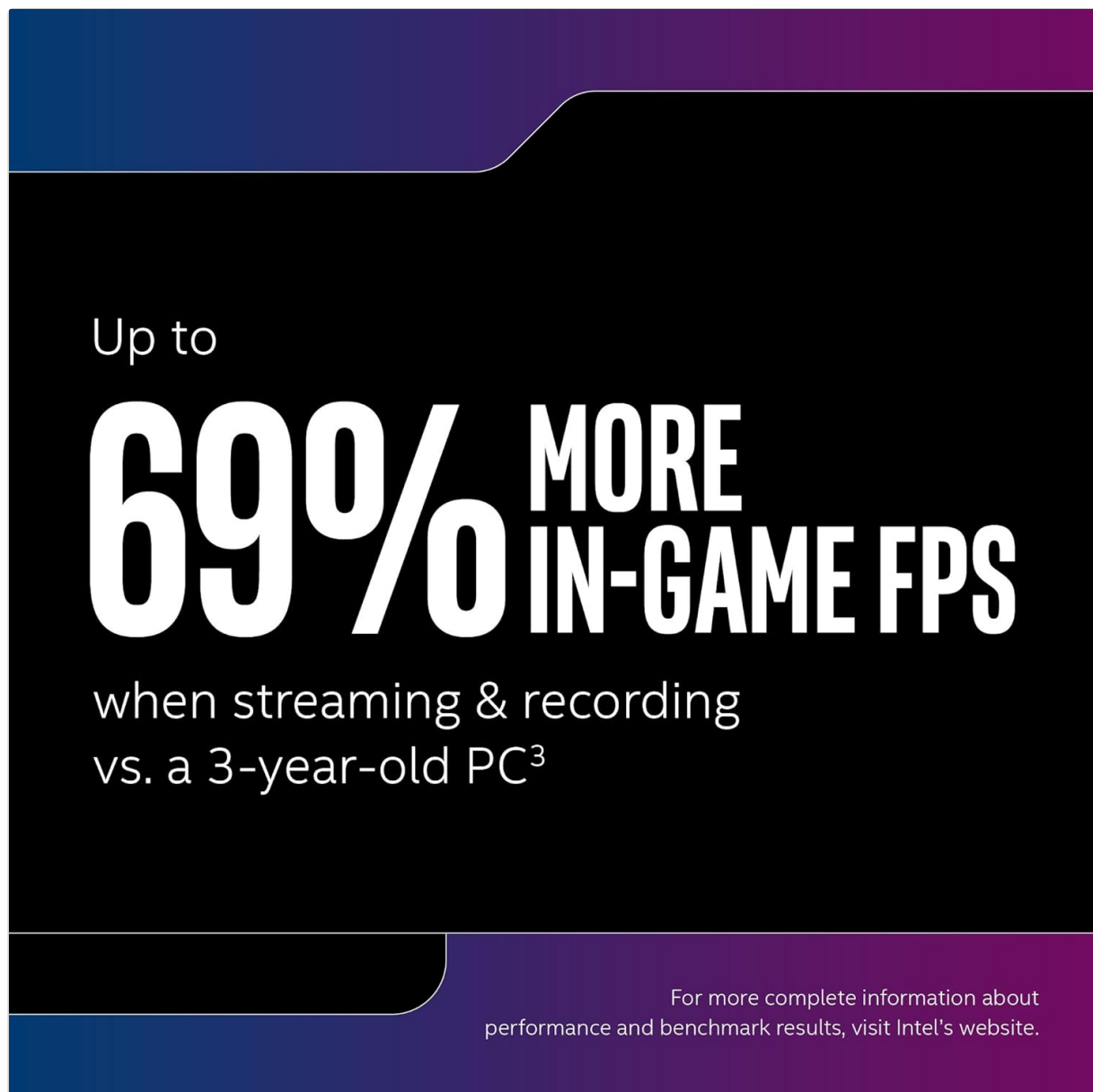
Image 3.3: Illustrates the potential for increased in-game frame rates when using the Intel Core i7-9700K processor, particularly when streaming and recording.

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Video 3.1: An official Intel video highlighting the performance capabilities of 9th Generation Intel Core i5, i7, and i9 processors, demonstrating their suitability for gaming and demanding tasks.

4. MAINTENANCE

Proper maintenance ensures the longevity and optimal performance of your processor. The primary concern for CPU maintenance is effective cooling.

- **Cooling System:** Regularly inspect your CPU cooler (fan, heatsink, or liquid cooling system) for dust accumulation. Clean dust from heatsink fins and fan blades using compressed air.
- **Thermal Paste:** Over time, thermal paste can dry out and become less effective. If you notice increased CPU temperatures, consider reapplying fresh thermal paste. This typically involves removing the cooler, cleaning off old paste, and applying new paste.
- **Airflow:** Ensure your PC case has adequate airflow. Keep intake and exhaust vents clear of obstructions and regularly clean case fans.

5. TROUBLESHOOTING

If you encounter issues with your Intel Core i7-9700K processor, consider the following troubleshooting steps:

- **System Not Booting/No Display:**

  - Verify the CPU is correctly seated in the motherboard socket.
  - Check all power connections to the motherboard and CPU.
  - Ensure RAM modules are properly installed.
  - Confirm your motherboard BIOS is updated to support 9th Gen processors.

- **Overheating Issues:**

  - Check if the CPU cooler is properly installed and making good contact with the CPU's IHS.
  - Ensure thermal paste has been applied correctly.
  - Verify CPU cooler fans are spinning and not obstructed.
  - Clean any dust from the heatsink and case fans.

- **System Instability/Crashes:**

  - If overclocked, revert to default settings to check for stability.
  - Ensure your power supply unit (PSU) provides sufficient wattage for all components.
  - Run memory diagnostic tools to check for RAM issues.

For more detailed troubleshooting, consult your motherboard's manual or Intel's official support resources.

6. SPECIFICATIONS

Feature	Specification
Processor Model	Intel Core i7-9700K
Cores / Threads	8 Cores / 8 Threads
Base Clock Speed	3.60 GHz
Max Turbo Frequency	4.90 GHz
Cache	12 MB Intel Smart Cache
TDP	95W
Socket Type	LGA1151
Compatible Chipsets	Intel 300 Series
Integrated Graphics	Intel UHD Graphics 630
Memory Support	DDR4 2666 MHz, Dual Channel, Max 64 GB
Intel Optane Memory Support	Yes
Unlocked	Yes

Feature	Specification
Item Model Number	BX80684I79700K
Product Dimensions	4.57 x 3.98 x 2.76 inches
Item Weight	1.59 ounces

7. WARRANTY AND SUPPORT

Intel provides a limited warranty for its processors. Performance and product warranties may vary depending on system configuration and may not apply if the processor is operated beyond its published specifications (e.g., extreme overclocking). For specific warranty details and support, please visit the official Intel support website or contact your retailer.

For comprehensive information about performance and benchmark results, and to learn more about Intel technologies, visit www.intel.com/benchmarks and support.intel.com.

Related Documents - BX80684I79700K

Intel Core i7-4790K Processor User Manual and Technical Specifications
Comprehensive user manual and technical specifications for the Intel Core i7-4790K desktop processor, codenamed Haswell. Includes product overview, installation guide, overclocking guidelines, and troubleshooting tips for PC enthusiasts and builders.

Intel Desktop Processor Warranty FAQ: Eligibility, Exchange, and Troubleshooting
Comprehensive FAQ guide on Intel desktop processor warranties. Covers eligibility for boxed vs. OEM processors, warranty exchange procedures, troubleshooting steps, and identification of engineering samples. Get answers to common warranty questions for Intel CPUs.

Intel® Core™ i7 Processor Family LGA2011-3 Socket Thermal Mechanical Specification and Design Guide
This technical specification and design guide from Intel details the thermal and mechanical requirements for the Intel® Core™ i7 Processor Family utilizing the LGA2011-3 Socket. It covers socket attributes, Independent Loading Mechanism (ILM), thermal profiles, heatsink design, and reliability standards for system designers.

6th Generation Intel® Processor Families for S-Platforms Datasheet

Detailed technical datasheet for Intel® Core™, Pentium®, and Celeron® 6th Generation processors designed for Desktop S-Platforms. Covers specifications, interfaces, technologies, power management, and thermal management.

Intel DX58SO2/DX58OG Desktop Board Performance Tuning Guide

A comprehensive guide from Intel detailing how to optimize the performance of Intel Desktop Boards DX58SO2 and DX58OG. It covers tuning using BIOS settings and the Intel Extreme Tuning Utility, focusing on processor, memory, and QPI configurations, along with recovery methods for unstable systems.

Intel Product Change Notification 853587-00: Boxed Processor Updates

Notification regarding updates to Intel Boxed Processor manuals, Single Point of Contact (SPoC) details, and China RoHS compliance tables, affecting various Intel Core and Xeon processors.