



# Green Computing with Single Board Computer Technology

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**Abstract** -Green computing is big thing according to present status of earth. The research paper is targeted to make a computing less harmful to nature. In this Research paper we evaluate SBC latte panda in terms of green computing, after then we compare it with normal desktop computer to get our result of this research.

**Keywords** –Green Computing, Single board computer, Energy efficient computer, Portable computer, Eco friendly computer, Everyday computing.

## I. INTRODUCTION

Computers are logically the most powerful machine on earth. Computers are used in every field according to the needs of the field. In present, it's become a basic need of every educated human being. It let humans shape their imaginations, it's a good thing but the people do not know how much capabilities their machines does have. And somehow this is letting the people to wasting the good machine and energy in such unneeded way. A powerful computer leaves off a good amount of carbon footprint. So this research is dedicated to motivating the green computing concept and make computers eco-friendly, portable, budget-friendly & energy efficient.

SBC (single board computers) are a kind of computer which can make this green computing concept success in many scales. In this paper, we discuss many terms and needs of green computing and evaluate it all according to basic uses of a computer. We will also do a comparison between different kinds of computers to evaluate the exact difference between them. Single Board computer is a computer in a single board. Now there is a difference between traditional computers and single board computers. People must be familiar that full-fledged computers (like PCs and Mac) have a motherboard. We find motherboard in all processor of various companies and other circuitry associated with that. You will also find slots for other peripherals like RAM, ROM,

Hard Disk, LAN Card, CPU Fan, Heat Sink, LCD monitor, etc. To make the PC fully functional we need all peripheral devices to be connected with motherboard.

**II. METHODOLOGY** - Single board PCs comprise of everything on a single board itself on the board, we have a processor and all other essential peripherals and hardware also. We have installed RAM, ROM, streak stockpiling, AV ports, Ethernet port, and so forth. This implies one board is adequate to go about as an undeniable PC, even they can boot into a working framework (OS) like Linux, Android, and so on and work like some other PC. Being lightweight and particular, they have discovered gigantic application in cell phones, tablets and other customer items.

Nowadays' semiconductor producers are building ever effective processors, which are no not as much as monsters, because of Moore's Law. These processors, based upon an exceptional engineering like ARM, Intel x86 or other custom models, give walloping exhibitions like 1.2 GHz clock recurrence, and so forth. At the point when consolidated with 1GB DDR3 RAM, 2GB Flash stockpiling, HDMI/AV port, USB ports, LAN ports, and so forth on a similar board, it turns into a single board PC. Essentially control it up, interface with a show gadget and it's good to go to go. Your PC has effectively booted into an OS like Linux, Android, and so forth. These single board PCs are not as capable as the present day PCs, portable PCs or Mac, and subsequently don't scatter much warmth. Notwithstanding that, the processors are planned so as to create less warmth and devour less power. That is the reason you can run your cell phone the whole day without charging the battery or chilling it off.

Now we pick a single port computer to match our keywords, we took our practical on a single Board Computer called latte panda board (figure 1).

The configuration of this Single board computer is given in figure 2. Latte Panda is a single board PC composed particularly for all things Windows 10. The board is little, however capable, and works simply like an ordinary Windows 10 desktop, but since of its size, you can attachment and-play anywhere.

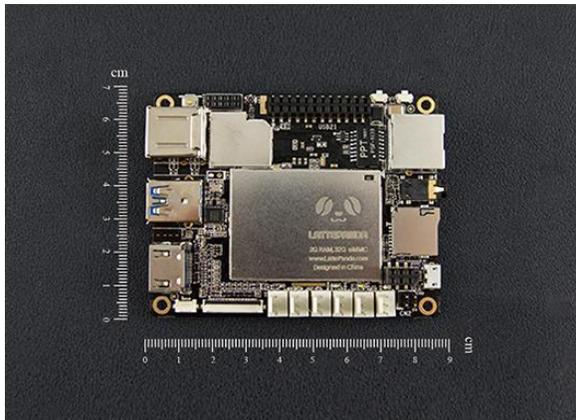


Fig. 1: Latte Panda simple and configuration Board

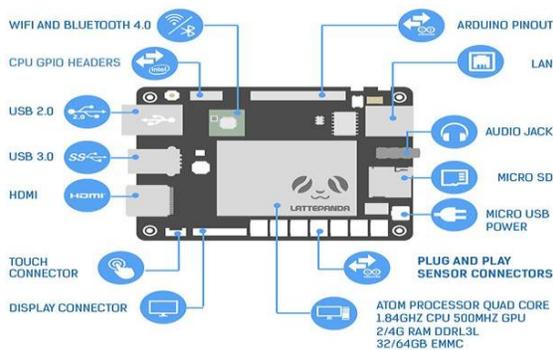


Fig. 2. Latte Panda is a single board PC

#### A. Specifications of Latte Panda

- Processor- Intel Cherry Trail Z8300 Quad Core 1.8GHz
- Operating System - Pre installed full edition of Windows 10
- RAM - 2GB DDR3L
- Storage Capability-32GB
- GPU- Intel HD Graphics, 12 EUs @200-500 MHZ, single ,channel memory
- Built-in Arduino Co-Processor - ATmega32u4
- Video output - HDMI and MIPI-DSI

- Onboard touch panel overlay connector

- Supports 100Mbps Ethernet
- One USB 3.0 port and two USB 2.0 ports
- Wi-Fi and Bluetooth 4.0
- GPIO:
- 6 GPIOs from Cherry Trail processor
- 20 GPIOs from Arduino Leonardo
- 6 plug and play Gravity sensor connectors

Power- 5v/2A

Dimension of Board - 88 \* 70 mm/3.46 \* 2.76 inches

Packing size - 110 \* 94\*30 mm/4.33 \* 3.70 \* 1.18 inches

N.N. - 55g

GW - 100g

Envision is it conceivable to utilize Windows 10 on a Single Board Computer (SBC) ideal out of the case. That is latte Panda. A Shanghai-based startup those Makers at Latte were baffled at the absence of devices those are accessible to producers searching for making Windows-based activities. That is paying little mind to what you are speculation has some pertinence. As Windows is the most well-known buyer OS on the planet. That has a gigantic bolster group and an unlimited list. Accordingly, the group made a palm-sized latte Panda. That is quad-center having Intel Cherry Trail 1.8GHz full Windows 10 PC. The latte Panda is absolutely about availability.

The 1.8GHz quad-center PC includes up to 4GB of RAM and 64GB of locally available glimmer stockpiling. Every PC highlights Bluetooth 4.0, locally available Wi-Fi, HDMI ports, USB3.0 interfaces all the standard suspects with this. The practical utilization of latte Panda has been shown by the Latte group in various tasks including a machine learning shading acknowledgment design, a DIY shrewd auto hookup, 3D printing ventures, ongoing 3D demonstrating for automatons and Microsoft Kinect ventures that is an ideal opportunity to tidy that off. Wi-Fi and Bluetooth 4.0 is implicit. It makes it appear like a decent purchase for the measure of the likelihood appeared in their presentation video.

We installed latest Windows 10 Operating system on it and play the machine for hours. The performance of the latte panda board is impressive. It does capable to do all the normal task people perform in everyday computing. It also performed well with professional software's like Visual studio, Mat lab, php, Microsoft office and it is also capable to run some of games like Crysis, half-life 2. This result proves that it can be a replace idea for home and school lab pcs.

**B. Discussion** – its all clear with evaluation of Latte panda now we compare a normal desktop computer mother board (specification of mother board Figure 1.3) with and we find the result really impressive. The Sbc Latte panda is stands better in all green computer. Its size is less than normal desktop mother board, produces less Carbone foot print, less electricity consumption, less in weight.

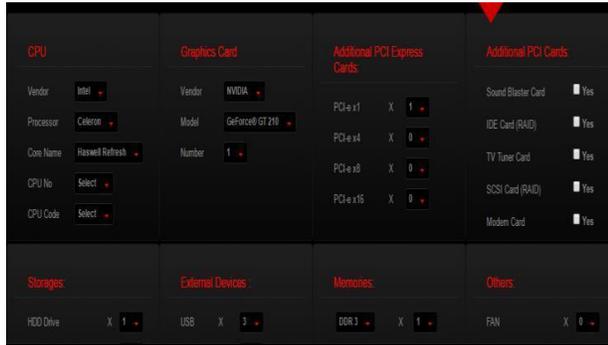


Fig..3: Desktop Configuration

In case of price Latte panda is cheaper than normal desktop computers. The reason behind is that in desktop systems we have to buy and assemble all other things except the mother board, like RAM, Microprocessor, Video cards etc. In Figure 4 Comparison is displayed -

Name of Device	Dimension	Weight	Elctriciti Consumption in kWh	Carbon Footprint
MST Intel H81 LGA 1150 DDR3 USB 3.1 Micro ATX Motherboard (H81M-E34)	9.3 x 8.1 x 2.2 inches	772 g	0.087kwh(87 Watts)	(BTU) 296.9
Latte panda	3.46x2.76 x1.5 inches	100 g	0.01 kWh (10Watts)	(BTU) 34.12

Fig. 4: Table of comparison

**III. CONCLUSION** – The result of comparison and evaluation clears that SBC latte panda is take best place in every term of green Computer. Result of research is founded positive. The sbc can take place of normal home n lab desk computers due to its properties.

- Advantages-

It is lesser in size.

It produces less carbon foot print.

It Consume less electricity.

Its portable.

It Supports green computing concept.

- Disadvantages –

Its weaker in some terms then desktop computer. It's not that traditional as desktop .

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