



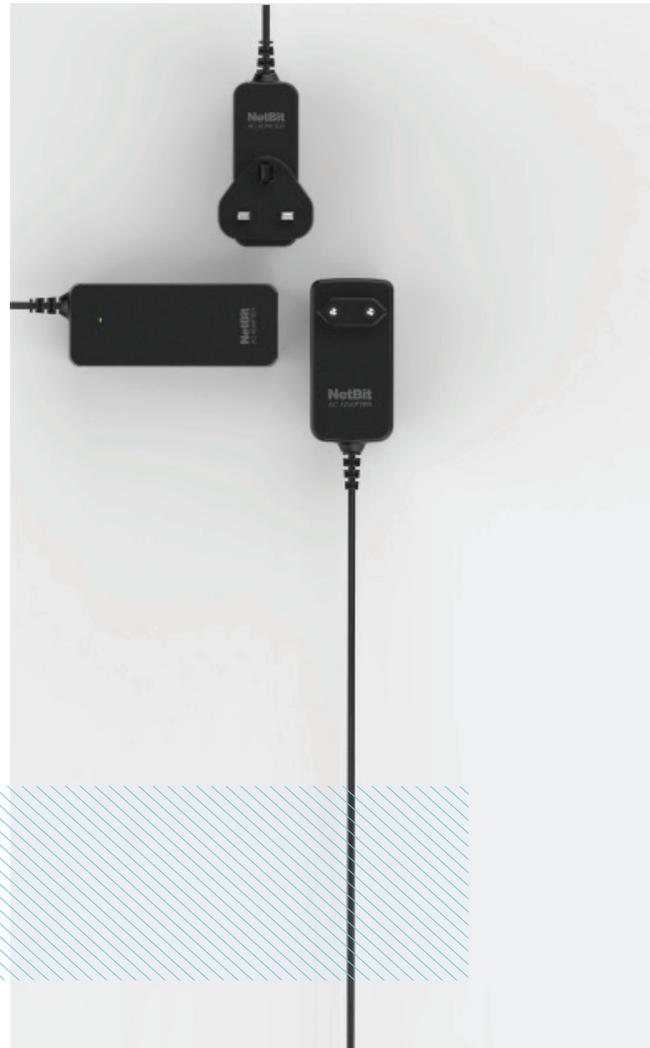
DESKTOP VS. WALL MOUNT?

Highlighting the main differences between Desktop and Wallmount PSUs and examining the benefits and disadvantages of both

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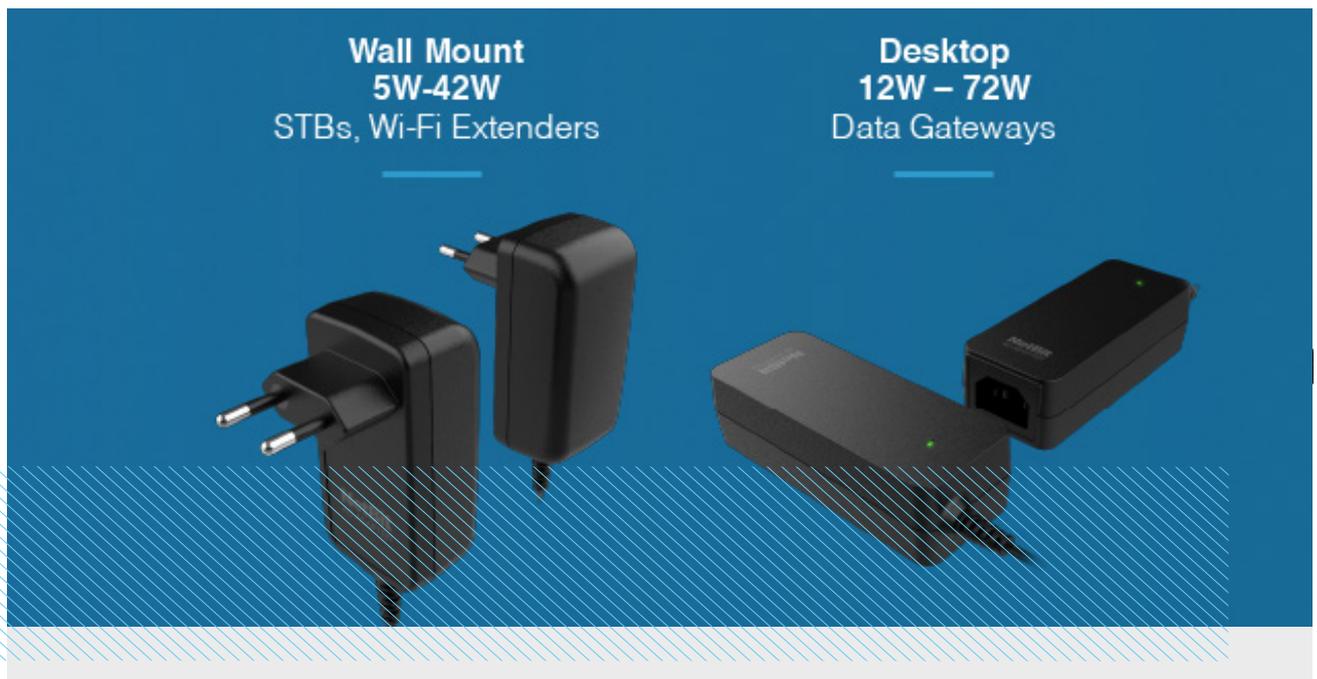


BRIEF

This white paper will highlight the main differences between Desktop and Wall mount PSUs and examine the benefits and disadvantages of both formats.

ECONOMICS

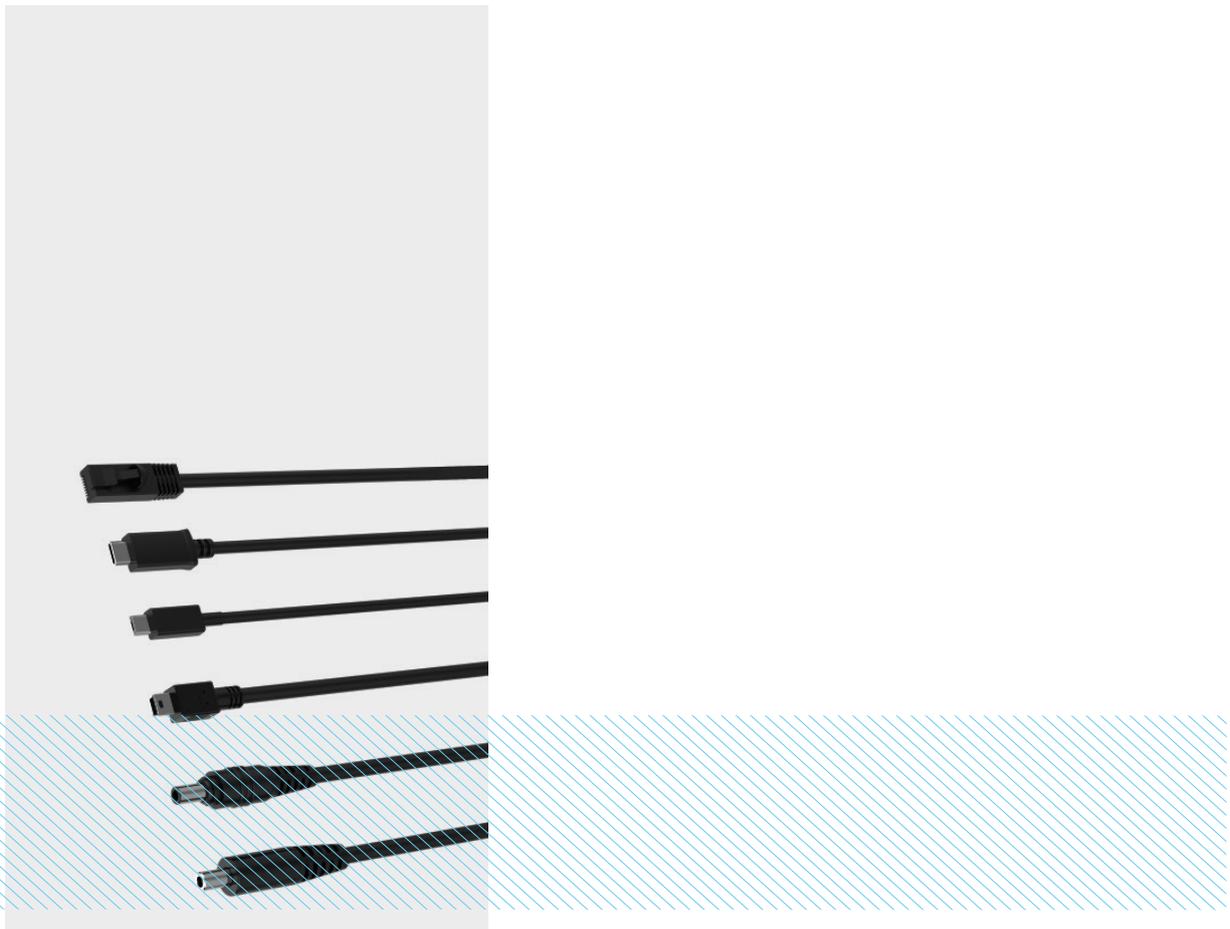
From an economic standpoint, one clear benefit of a wall mount power supply over a desktop is the fact that it removes the need for an AC cable. Eliminating the cable results in cost savings of around 50c per unit. Very often, for reasons explored below, desktop PSUs are specified with universal AC input range which also increases cost typically by 15c to 30c per unit depending on the power level. Most commonly, their wall-mount counterparts are generally single range. Size reduction provides additional supply chain/logistics benefits by allowing a higher volume of products per shipping container.



INTERNATIONALISATION

Operators and CPE equipment manufacturers who plan to deploy a product across multiple countries have three basic choices to consider:

1. Utilise country specific versions of a wall-mount power supply which are aligned with the voltage range and AC socket style of the deployment location.
2. Utilise a wall-mount power supply with interchangeable AC plug inserts, due to the mechanism which enables the interchange this approach is more expensive than a dedicated country specific power supply but still cheaper than supplying a desktop model.
3. Adopt a single desktop power supply with Universal voltage range and then change only the AC cord. Whilst there can be some supply chain efficiencies associated with this approach, the unit cost will always be greater than with the wall-mount alternative.



AESTHETICS AND MODERNISATION

PSUs are continually being modernised. As technology advances, the need for power supplies to become more compact increases. Ensuring that PSUs fit in with these aesthetical advancements of the industry is critical. Wall-mount supplies have the advantage that they already offer a more compact solution to their desktop counterparts which can also enable smaller packaging, thus providing more logistical benefits, including a higher volume of products for a given container size.

Consumer expectations for miniaturisation are driving smaller and smaller CPE form factors and as the aesthetic is becoming more important power supplies are also expected to shrink in size. Improvements in power conversion components driven partially by energy efficiency legislation enable more efficient and compact designs than were previously achievable. NetBit is now regularly supporting 42W applications with wall-mount products and the power limit is trending higher with products which can support up to 55W currently in development.

In parallel with miniaturisation there has been an increase in the use of in-house design teams for Industrial Design (ID) & User Experience (UX). This has been driven by a desire to improve the aesthetics of the gateway/set top box and ensure that the power supply mirrors that design. In practice, this means that operator specific colour, texture, shape and branding may need to be adopted and in this regard, both wall-mount and desktop power supplies can be customised to match the application requirements with little to choose between the two options.

THERMAL CONSIDERATIONS

The amount of power which can be packaged in a given case size is dominated by the dissipated power which is in turn a function of the power-throughput and conversion efficiency in conjunction with the surface area and case material of the power supply.

Some operators and several CPE manufacturers place limits on the maximum temperature rise of the case which are much stricter than the limits allowed by the safety agencies. In addition to limits on the case temperature, there is a strong correlation between the temperature-rise and the lifetime, derating of the product.

In summary when reviewing the ability to package a given level of power into a small size for a specific application the following factors need to be considered:

1. Desired power throughput, ideally split between the continuous and transient (on demand) components.
2. Power conversion efficiency. Particularly the focus should be on the amount of power dissipated within the power supply itself and not the DC cable which factors into DoE, COC energy efficiency limits but has little influence on the thermal performance of the power supply. As time goes on better and better power conversion components, controllers and topologies are enabling efficiency improvements which in turn permit smaller package sizes.
3. Applicable limits on case temperature rise – dictated by either safety agency or operator/CPE manufacturer
4. Component derating limits.
5. Lifetime, dominated by E-cap life requirement.



Generally speaking, all of the above rules can be considered apply to both desktop and wall-mount supplies. These factors provide a practical limit on how small a power can be for a given application.

The specified test conditions, in particular continuous versus transient load power, minimum AC input voltage, maximum operating temperature will also play a significant role in determining the achievable power density.

Given the number of considerations listed above together with the associated inter-dependencies it is highly recommended to consult with specialists such as NetBit when considering achievable case size for a non-standard application.



CONCLUSION

developed a new 42W PSU platform which can be supplied in either desktop or wall mount case design, thus giving customers more choice for higher power applications up to 42W.

Overall, it is clear to state that both types of PSU offer varying benefits and disadvantages. Weighing up all the pros and cons, it is important for you to consider which option best caters to your needs and seek expert advice and making a final decision.