
5 Things You Didn't Know about a Custom ASICs

Edel Griffith, Strategic Marketing Manager, Industrial ASIC BU

Custom ASICs have been around for many years and custom silicon is the ideal for many device maker and original equipment manufacturers (OEM). Beyond having a highly optimized, efficient system designed exactly to your application requirement, what other advantages do custom ASICs offer?

1. Your know-how is protected.

Counterfeiting is big business and the integrated component market is not exempt. It is in fact a lucrative market which costs semiconductor manufacturers a lot of money every year. One estimate from the Semiconductor Industry Association puts this number at upwards of \$7.5 billion for U.S. semiconductor companies alone. Outside of the financial losses incurred, there is also a concern regarding your intellectual property being exposed. You spent years developing IP to gain a leadership position in your market, and now that IP can potentially be copied and sold, resulting in damage to your market position and ultimately costing you a lot of money. With a custom chip however, you can embed your IP in silicon and secure it. Having your know-how integrated into silicon means that it's virtually impossible to duplicate, thereby securing your IP and helping you maintain your leadership in the market.

2. Your system can achieve superior performance

When developing a system using commercial off-the-shelf components, it is often necessary to select components that are of higher specification than what you require, purely to achieve the performance you need for your system. With a custom ASIC, the performance you require is the performance you get. With integration, you can offset a lot of the issues associated with wiring and PCB layout, for example, reducing your system noise and making your product less power hungry. Custom ASICs means no more over-specifying and no unnecessary functionality. With custom ASICs your system can attain the superior performance with no overheads.

3. You can create a truly differentiated product

When building your system using commercial off-the-shelf components, you have access to the same components as everyone else, making it more difficult to differentiate your product from your competitor's solution. With a custom chip, you specify what you want from the product, and your ASIC partner develops the chip. The final chip will differentiate you from your peers by offering not only superior performance but also due to savings in cost/area enable you to leverage many more advantages into your end product than would be possible with commercial components.

4. You can significantly reduce BOM cost

The bill of materials is the complete list of all the items required to build a product and can range from a small number of components up to thousands. The BOM is comprised of lists from multiple suppliers, all with different rules regarding ordering, lead time and quantities. One component may be in plentiful supply whereas another might be on restricted ordering due to shortage of supply. One may have small quantity orders whereas others may have minimum order quantities. All of these details must be managed on a continuous basis so that an OEM does not have too much stock in inventory but has enough to meet demand and ensure no lines go down. With a custom ASIC you can integrated onto a single chip a lot of the component functionality from your printed circuit board. This has the advantage of reducing the number of components on your BOM from hundreds or

thousands down to a single custom IC. The end results are simpler supply management and reduced knock-on costs associated with procuring multiple components versus a single component.

5. You can rest easy knowing you have secure, reliable supply (no EOL issues)

Product discontinuance is something with which OEMs must regularly contend. Bill of material listings are getting bigger and bigger. With the semiconductor industry having shipped over 1 trillion units in 2018, there is an increasing likelihood that BOM management can become unsustainable. Some OEMs are trying to circumvent this by trying to reduce their exposure to suppliers, consolidating the number of suppliers and the number of components that they buy from them. However, this strategy can also leave a company more exposed if an important single-source component goes. When products are made end of life (EOL), companies must source replacements with potentially long lead times, and then may have excess stock as they buy for the future. Worst case, they may have to re-design the board to accommodate the replacement option if it is not pin-for-pin or performance equivalent. All these problems can be solved through the use of a custom ASICs, where you set the performance specification and you own the design. You can rest easy knowing you won't have any future issues with obsolescence, and knowing you have a design partner always on-hand to help should you need them.