

## Frequently Asked Questions about the Logiccircuit Safe IP™ Catalog

### What is the Safe IP™ catalog?

The Safe IP catalog is a portfolio of commercial off the shelf (COTS) intellectual property (IP) that has been developed to be compliant to DO-254 DAL A. This IP comes with a Certification Data Package (CDP), which includes the IP itself<sup>1</sup> in encrypted form, and provides evidence of compliance, along with artifacts and information that is necessary to support reuse of the IP-level compliance to support chip-level compliance. Each IP in the catalog has been sponsored by a customer for use on a program that has undergone or is currently undergoing certification.

### Can your IP be used in other Safety Critical domains?

Yes, medical, automotive, nuclear and other domains may be able to use the Logiccircuit DO-254 DAL A Safe IP library in their programs subject to their own industry compliance guidance. In the medical domain, we have done an analysis of IEC 62304 (which can apply to FPGA firmware) and apart from different document naming conventions, the process itself maps very nicely to DO-254. The new ISO 26262 standard in the automotive domain also acknowledges DO-254 for electronics. The automotive standard is a derivative of the Industrial functional safety standard IEC 61508. A new standard in the nuclear naval domain maps very closely to the objectives and activities of DO-254. Each of the domains, and others with safety (and possibly security) concerns can potentially use the compliance effort already employed in our IP catalog.

### Is your IP compliance process accepted by the FAA and EASA?

Our IP compliance process, which we call a re-engineering for compliance process, has been accepted for use in both FAA and EASA programs. This approach supports the position presented in the new [CAST 33](#) paper on COTS IP. We follow a process that upgrades a design baseline (i.e., the initial commercial IP) for DAL A compliance. Our approach is a combination of developing the IP to DO-254 compliance and reverse engineering the IP to be compliant, which are the acceptable methods presented in this position paper. While our processes support the recommendations of this paper, DO-254 compliance occurs at the FPGA level. So the entire process of the IP acceptance also includes the incorporation of the IP into the FPGA. See "[What do I as an IP user need to do to show compliance at the FPGA level?](#)" below for more information on this aspect.

### Where can I learn more about your IP compliance process?

We have a whitepaper that covers our process generally that is available by request on our [Resources](#) page. We also have a very detailed whitepaper that describes our process and how it supports CAST 33. You can request it from [info@logiccircuit.com](mailto:info@logiccircuit.com). We are also happy to set up a discussion with your team.

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<sup>1</sup> Note that several of the IP in the catalog require a purchase of the commercial version as a pre-requisite to acquiring the DO-254 compliant version offered by Logiccircuit.

### What do I, as an IP user, need to do to show compliance at the FPGA level?

Logiccircuit provides a “Credit Sought” table with each IP. This table identifies all DO-254 objectives and data and provides information on which have been fully, partially, or not met in the compliance process for that IP. For each objective not fully met, the table provides guidance as to what the IP User needs to do to achieve compliance at the chip level for the IP function.

### Do you provide the IP source?

No. In order to protect the interests of our commercial IP partners, we do not provide the source but rather an encrypted version. The encrypted version can be used in simulation, synthesis, place and route, and so on. There is no need for the IP User to acquire the source code. All the DO-254 compliant tasks associated with the source have been done by Logiccircuit and we provide the documentation and artifacts that demonstrate this in the CDP that comes with the IP.

### What data is provided to demonstrate compliance?

Each IP comes with a Certification Data Package, or CDP. This CDP includes all the documents and artifacts needed to demonstrate that a DO-254 DAL A compliance process has been performed on the IP. The IP User will need to reference various documents from the CDP at their FPGA level of compliance.

### How is Verification Done?

The verification process and effort is split between Logiccircuit and the IP purchaser (user). Logiccircuit performs white-box testing of the IP including requirements-based testing of the IP requirements along with elemental analysis. The IP user also performs black-box testing of the IP in its FPGA usage context. More detail is provided in the whitepaper “The Verification Process for Compliant COTS IP” available here: <http://logiccircuit.com/resources/>

### What are your Business Models?

Logiccircuit offers two sorts of licenses: Sponsor/Perpetual and Standard.

Each IP in the Safe IP catalog is requested first by a customer. This customer is the “Sponsor.” The Sponsor pays for a “Sponsor License.” This Sponsor License gives them perpetual site usage (unlimited projects/instantiations, no royalties or per unit costs) and bug fixes (for the purchased version) along with one year of support for the specific IP being sponsored. The Sponsor License price is a fraction of the actual cost for Logiccircuit to develop the compliant IP. Future sales to other customers help recover the remaining engineering costs. Once an IP has been sponsored, it becomes part of the IP catalog where it can be sold to other customers.

A Standard License, which is half the price of a Sponsor License, is a timed (one year) site license (unlimited projects/instantiations, no royalties or per unit costs) and comes with one year of support for the specific IP being requested. This support helps the purchaser both integrate the IP itself into the design as well as reuse the DO-254 compliance work already done on the IP as part of device level compliance effort. If the design development process goes beyond one year, annual support will need to be purchased to enable ongoing design work (i.e., use of the IP in the Xilinx design environment and ability to generate a bitstream).

Customers on support will also receive new versions of the IP (which include new features, not just bug fixes). Annual support is 25% of the Standard License price. Annual support is included for the first year with either license model.

Customers who want Perpetual access can purchase under the Sponsor license model. This provides perpetual access to the specific version of IP, and includes one year of support. If additional support is needed/wanted it can be purchased.

### How Much Does it Cost?

This depends on the complexity of the IP. Please contact [info@logiccircuit.com](mailto:info@logiccircuit.com) with your specific request and we'll be happy to provide a quote.

### Can multiple users use the same IP at the same time?

IP can be used in multiple projects simultaneously. However only one user at a time can be using the IP in the Xilinx back-end (i.e., synthesis, P&R, etc.) toolset. If multiple users want to use the same IP in this way at the same time, the second user will have to wait for a license to be freed. Multiple subscription seats can be purchased if needed.

### What if we have multiple sites who want to use the IP?

Typically each site purchases their own licenses. However, if a company wants to purchase for multiple sites, we can offer a discounted, corporate level contract.

### How is the IP licensed?

We offer both server-based or node-locked licensing via FlexLM.

### What is included in your support?

Logiccircuit support includes 10 hours (annually) of email/phone assistance regarding both the use and integration of the IP itself along with using the compliance data provided in the CDP for the chip level DO-254 compliance.

### What if I don't need DAL A compliance?

All Logiccircuit IP is re-engineered for DAL A compliance. This IP can be used in programs with any DAL level. We do not offer packages with lower DALs. The compliance work is done to DAL A and cannot be un-done.

### Can I evaluate your IP?

Yes, we can provide 30 day evaluation codes of any available IP if a project team is willing to sign a NDA and is seriously considering a purchase.

### How does an IP get on your roadmap?

The roadmap IP are all either being sponsored or are in final sponsor discussions.

### How do I request an IP to get it on your roadmap?

We get new IP requests all the time. That is how we build our roadmap. If you need an IP not currently in our catalog or on our roadmap, contact us to discuss the situation. Most likely you would become the Sponsor for this new IP and would purchase under the Sponsor license model. Once a purchase order is issued to Sponsor an IP, Logiccircuit begins working on it.

### What about Custom IP?

If a client has their own internal IP that they'd like re-engineered for DO-254 compliance for their own use, Logiccircuit is happy to assist. We do this all the time as part of our services business.

### What is your association with Xilinx?

We are the exclusive Xilinx Alliance Partner to support DO-254 use of IP in Xilinx FPGAs. Xilinx also recommends Logiccircuit to their customers who may need assistance with general DO-254 and DO-178C compliance.

### What is your association with Patmos Engineering Services?

Tammy Reeve, President of [Patmos Engineering Services](#), is the FAA consultant DER we work with on our IP compliance processes. Tammy was instrumental in helping us establish a process for both compliance and reuse that has been accepted by certification authorities. Tammy also performs SOI-1 to 4 audits on all of our IP so our customers and certification authorities can be assured we followed all appropriate compliance requirements. When we do service work, we use whatever DER or auditor that the customer employs (oftentimes, this is Patmos).

### What is your association with Great River Technology?

We provide DO-254 compliant versions of the [Great River Technology](#) (GRT) ARINC 818 core. Customers interested in this IP must first discuss their needs and purchase the core through GRT. Then they can discuss their compliance needs with Logiccircuit.<sup>2</sup>

### What is your association with Zipcores?

[Zipcores](#) is one of our commercial IP partners. Zipcores customers can request compliant versions of Zipcores IP through Logiccircuit. Logiccircuit includes some Zipcore IP in the Safe IP catalog, but the commercial versions must first be purchased from Zipcores prior to unlocking the DO-254 version in the Safe IP catalog.

### What if I have additional questions?

Contact us at [info@logiccircuit.com](mailto:info@logiccircuit.com).

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<sup>2</sup> ARINC 818 is a special case requiring some customized services work to ensure full compliance of the customer's specific configuration.