

FT CUSTOM DESIGN

By Ben Savage | [Ben's Blog](#) | March 31, 2021

Force Technologies offers a wide range of solutions when supporting obsolete semiconductors for our customer base. One of these is a comprehensive re-creation or custom design which guarantees a form fit and function replacement.

Our redesign process starts by quoting an NRE figure and Unit cost along with a Lead time and any potential hurdles to be overcome on the design. The project starts with 33% upfront NRE payment and a further 33% when we fabricate the first wafer prototypes. Packaged samples are then provided and if the design requires further modification, we continue to provide samples with no additional cost until our customer signs off that the design is acceptable. At this point the final 33% of the NRE is paid and we move to full production where unit costs are applicable.

Some of the benefits of a custom redesign include:

- Guaranteed Form Fit and Function drop-in replacement, we work with you to ensure the design works in your application.
- Enhancements to the product can be made if required
- Guaranteed indefinite support for 20-30 years or more.
- Modern assembly techniques and all the benefits that come with it.

The main drawbacks of such an approach are the relatively long lead times. It takes traditionally around 6-12 Months to provide first prototypes for approval which makes it unviable for customers requiring an immediate solution. The NRE payments whilst split can also make it unattractive for customers who do not have the upfront project funding for such a solution.

For those wondering how our FFF redesigns work we image the original part, convert that into a GDS database, and then extract a transistor level schematic. This transistor level schematic is converted into a gate level Verilog netlist, which is then simulated, verified, and eventually turned into an ASIC. Consideration also needs to be given to any existing patents or trademarked technology which are addressed before any work begins.

If you would like any further information regarding our custom design services please contact Info@forcetechnologies.co.uk

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BEN SAVAGE / ABOUT AUTHOR

By Ben Savage | [Ben's Blog](#) | February 28, 2021

In this blog i would like to discuss one of our service offerings which is the upscreening of semiconductor devices.

For those of you unfamiliar with upscreening it is in short the act of functionally verifying a device functions to a higher specification level than originally outlined by the OEM. This is made possible via multiple factors including the fact that OEMs often use the same die and packages across Commercial, Industrial and Military temperature ranges and produce far more Commercial/Industrial units as the market demand is far higher.

As the more specialist grade semiconductors come to their end of life or become obsolete the lower graded products are often still commercially available for reasons mentioned above. Upscreening these Commercial or Industrial parts to elevated temperature ranges or environmental specification offers a viable, cost effective and sustainable solution (depending on base material availability).

Common scenarios in which up-screening may be warranted include:

- An obsolete device is required to repair or continue a legacy application however is no longer available and upscreening becomes a viable solution as the lower grade base material is available.
- A customer is looking to use a COTS (Commercially Off-The-Shelf) item however needs assurance of enhanced performance and/or environmental tolerance.
- The customer wishes to weed out marginal product via burn-in to help ensure long term application reliability.
- A design issue is present that requires a product to be characterised to specific set of values prior to use.

Force hold a large library of test programs built up over the past 25 years that give us excellent test coverage over a wide range of semiconductor devices. In the event we have not tested the device in question before we can design and create the software/hardware required to offer a comprehensive functional upscreen. All donor parts are subject to the rigorous Force Technologies Goods Inward Inspection Process an AS6081A/C inspection/test or are procured from franchised distribution.



BEN SAVAGE / ABOUT AUTHOR

By Ben Savage | [Ben's Blog](#) | January 28, 2021

Today I would like to dive deeper on one of the lesser discussed areas of IC obsolescence support, which is ensuring directly equivalent packages are available for our customers' demands. Often ensuring the replacement package meets both the environmental concerns and drops exactly into the target system can be harder than ensuring the device itself is functionally equivalent.

Over the years force has utilised a number of cost effective approaches that allows us to offer comprehensive and practical solutions to our customers obsolescence package requirements.

Understandably the best approach when ignoring the financial implications is to make direct investments in packages as they are made obsolete, especially those with anticipated or known market demand. Force currently holds a large array of CERDIP, Cerquad, CQFP and many more packages including the often extremely hard to source windowed CERDIP packages for our UVEPROM range of products, that we have been supporting for the last 20-30 years.

In situations where we do not hold stock of the required package force can offer cost effective direct soft or hard tooling for ceramic packages in low or high volumes. Over the years Force has built good relationships with major package manufacturers that ensure our retooled replacements are identical in reliability and quality to those sourced originally by the OEM. Once re-tooled the package is available for long term sustainable support safeguarding against EOL/Obsolescence concerns.

Whilst the majority of our solutions are to aid the Aerospace and Defence markets and predominately built in high reliability ceramic packages. Force also support the Commercial and Industrial sectors. Offering cost effective replacements to plastic packages can be extremely challenging. Plastic tooling costs when factoring the three main tools to create them which are the book mold (package form), the de-junk tool (excess plastic removal), and a shear and form tool (lead trim/form) are extremely expensive and can cost upwards of \$50,000-\$100,000 per tool.

A way around such expensive tooling is to use a FR4 laminate as a substrate and create a drop in footprint replacement to the original package. Once the die has been wire bonded and tested the assembly can then be encapsulated using dam & fill glob top technologies. The resultant solution can have a number of finishes and encapsulations to maintain product integrity and security for even the harshest of commercial/Industrial requirements and an example of this can be seen in the image below. You can read more about our Chip and Wire solutions [here](#).

As always if you have any specific part issue or would like more information our Technical staff are always available at sales@forcetechnologies.co.uk and I hope everyone is staying safe and well

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