



# Nexperia Takes the **POLE POSITION** in Automotive Logic Applications

*An exclusive interview with Michael Lyons,  
Nexperia's Technical Marketing Manager for BL Logic.*

ON FEBRUARY 7, 2017 THE FORMER NXP STANDARD PRODUCT BUSINESS BECAME A NEW COMPANY WITH THE TRADENAME NEXPERIA. NEXPERIA IS AN INDUSTRY LEADING SUPPLIER OF DISCRETE, LOGIC AND POWERMOS SEMICONDUCTORS WITH ITS FOCUS ON THE AUTOMOTIVE, INDUSTRIAL, COMPUTING, CONSUMER AND WEARABLE APPLICATION MARKETS.

Logic allows different types of chips or circuits to work together by acting as an interface between them, and as such even though it has been around since the days when engineers used slide rules, it is still an essential part of embedded design. As a leading supplier of logic products to the automotive industry, Nexperia's logic products are employed in a wide variety of automotive applications including instrument clusters, body control modules and engine control units. The company offers a complete range of standard and Mini-Logic functions, including analog switches, buffers/inverters, bus switches, counters, decoders/de-multiplexers, multiplexers, flip-flops, gates, latches, level shifters, multivibrators, Schmitt-triggers, shift registers and transceivers. Along with this broad choice, Nexperia helps speed the design process with the versatility of its configurable logic and offers advanced logic solutions with low dynamic and static power consumption. And its industry-leading small packages, produced in-house, combine power and thermal efficiency with best-in-class quality levels.

Recently, we had a chance to talk with Nexperia's Michael Lyons about this new company with a long history, broad experience and a global customer base. Lyons himself has over 25 years of experience in new product development functions within the semiconductor industry, having held various marketing, business development and product engineering management positions.



*Michael Lyons*

**nexperia**

**Q** How has the launch of Nexperia gone so far? What has the response been from your automotive customers to the new company?

**A** The launch of Nexperia has gone well. The planning and long hours put in by the Management Team and all teams over the globe paid off. We did have start-up issues with a few interface systems at some customers, but the customer response has generally been very cooperative and positive.

**Q** The slogan of the new company seems to be “the company where efficiency wins”. Could you explain this a bit more?

**A** “Nexperia—the company where efficiency wins” captures how we strive to be efficient or improve efficiency in our way of working and our products. We deliver over 70 billion semiconductor products annually to thousands of customers, either directly and via our channel partners. As the efficiency semiconductor company, we offer power efficient devices in industry leading, small, space efficient packages.

**Q** Logic gates are the fundamental building blocks of any digital circuit. Your comprehensive range of logic gates allow for a variety of control logic solutions in automotive functions such as engine monitoring, navigation, interior lighting, battery monitoring, etc. Are there any interesting applications you’ve come across that you can tell us about?

**As the efficiency semiconductor company, we offer power efficient devices in industry leading, small, space efficient packages.**

**A** Continuing with the efficiency theme, we have seen a growing increase of voltage level translators within automotive applications. As the density of electronics increases within vehicles, the need to lower the power consumption of applications has increased. As power is directly proportional to voltage, moving to lower supply-voltage achieves the goal of power reduction. Reducing the supply from the 5 V to the 3.3 V supply node or the 3.3 V to 1.8 V supply node results in a 34% or 30% system level power reduction. In practice, not all elements of an application have lower voltage equivalents or there is a requirement to interface with legacy higher voltage systems. Low-power voltage level translators such as LVCnT, AVCnT and AXPnT enable system level power reduction while maintaining compatibility with existing higher voltage systems.

**Q** What about the trend to go from gold to copper interconnects? Will we see this in the automotive Q100 portfolio?

**A** Yes, we now have the reliability data required to allow us to introduce copper wire products into the automotive portfolio. Copper wire has been used in our non-automotive portfolio since 2012 with a failure rate < 7 PPB. This is better than our gold wire products and meets our safe launch criteria. We have issued process change notifications to begin the conversion of the automotive portfolio to copper wire.

**Q** Last year NXP introduced Industry’s smallest 8-pin GX logic package for mobile, portable and IoT applications. Will there be automotive applications as well?

**A** The 8-pin GX package is fully AEC-Q100 qualified and we will be able to release it into our automotive range of products once we have met the safe launch criterion required by our zero-defect automotive strategy. A move to smaller packages is expected in automotive applications as electronic content increases in vehicles. The preference for optical inspection of solder joints on all but ball grid array packages may limit the use of the land grid array GX8 to only space critical applications in automotive.

**Q** How have design engineers used Dual PCB Configurable Logic to improve the way they implement control logic solutions into their designs?

**A** We see several innovative designs taking advantage of the non-traditional functions permitted by PCB configurable gates. With traditional functions a design engineer would require two devices to create a 2-input NAND gate with 1-input inverted. If there was a requirement to interface to slowly transitioning signals a Schmitt-trigger device may also be required. With integrated Schmitt-trigger inputs and non-traditional functions the configurable gates allow space and power savings by replacing up to three discrete logic devices.

**Q** DQFN represents the industry’s smallest logic packages for standard logic gates. These leadless packages provide space savings up to 76% over traditional leaded TSSOP packages. Talk about the future of DQFN in the automotive space.

**A** The use of our automotive DQFN packages allows our customers to reduce the footprint of their solutions while maintaining the ability to automatically optically inspect the quality of solder joints. We continue to see a migration within automotive applications away from the larger SO packages towards TSSOP and now the DQFN packages.

**Q** What’s going on with the advanced extremely low voltage and power (AXP) logic family?

**A** We continue to see the growth of AUP in low power applications, primarily due to compatibility with legacy 3.3 V applications. AXP is replacing AUP in applications that require higher speed but do not need 3.3 V compatibility. As a family of the future, AXP is set to grow in sub 3.3 V supply node applications. It has lower power, higher output drive and is faster than AUP at the 1.2, 1.5, 1.8 and 2.5 V supply nodes. AXP is the only logic family fully specified at 0.8 V. The introduction of the AXP translators (AXPnT) has facilitated the reduction of the system voltage to the range 0.7 to 2.75 V, while ensuring outputs can be used with legacy interfaces at 1.65 to 5.5 V.

**As a family of the future, AXP is set to grow in sub 3.3 V supply node applications.**



🎯 Finally, talk about your plans for product design support for your customers.

📌 Nexperia will use its depth of engineering expertise to assist customers in finding robust, lasting solutions. Within the sales and marketing community, our product application engineers help with the design-in of existing products and the definition of future solutions. They have access to and the support of a team of application marketing managers who in turn have direct contact to the engineering community within the business groups. Regular internal training ensures that the technical competence of the team is not only maintained at a very high standard, but continually improves. As the efficiency company our goal is to ensure we equip our team with the tools and information they need to provide quality customer support quickly.

For more information about Nexperia go to <http://www.nexperia.com>.

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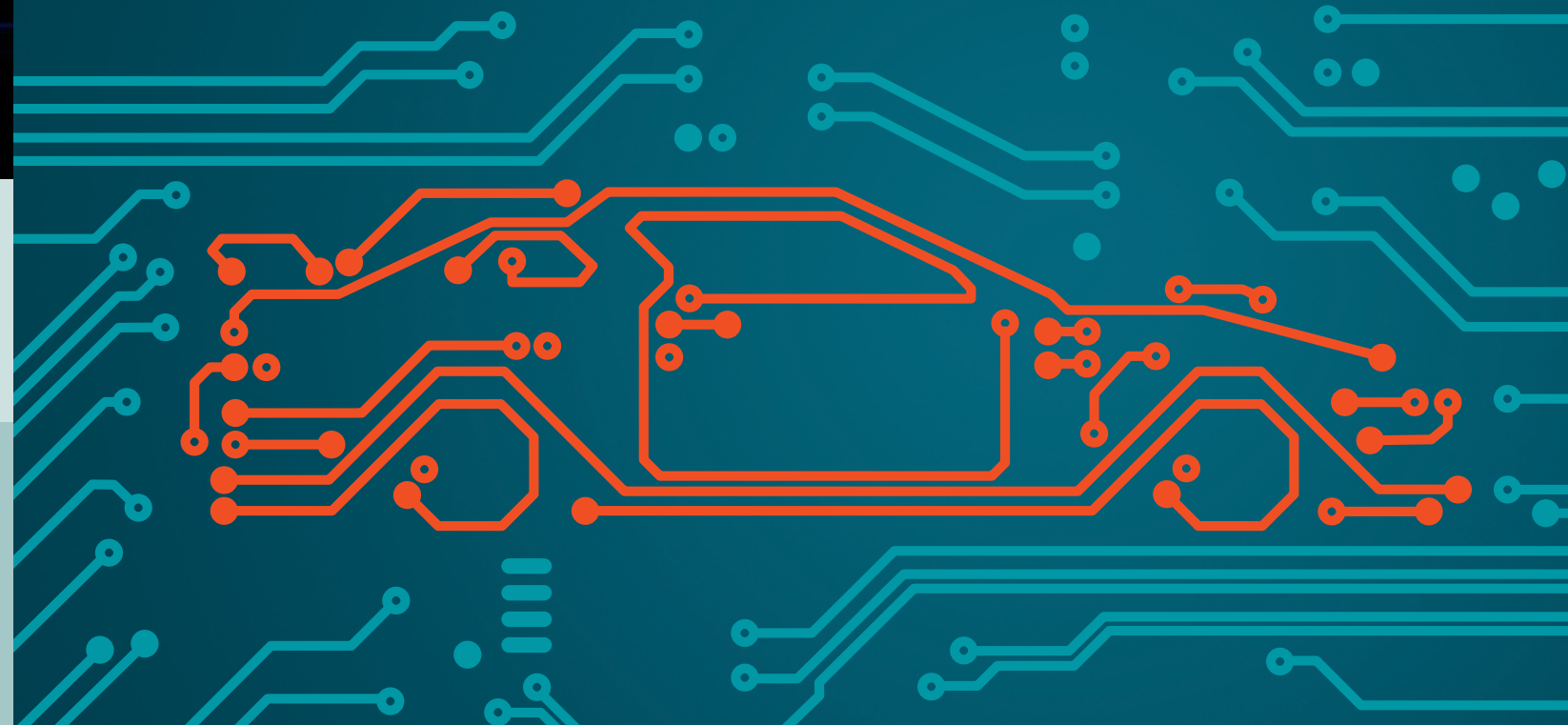


Nexperia continually invests in new process and package technologies, as well as new packaging facilities, and is focused on increasing performance, lowering power consumption, and reducing size. The company has the largest portfolio of dedicated Q100 devices. As an example, consider its 74LVC08A-Q100 providing four 2-input AND gates. Inputs can be driven from either 3.3 V or 5 V devices allowing use of these devices as translators in mixed 3.3 V and 5 V applications. Features include:

- » Automotive product qualification in accordance with AEC-Q100 (Grade 1)
- » Specified from -40 °C to +85 °C and from -40 °C to +125 °C
- » 5 V tolerant inputs for interfacing with 5 V logic
- » Wide supply voltage range from 1.2 V to 3.6 V
- » CMOS low power consumption
- » Direct interface with TTL levels
- » Complies with JEDEC standard:
  - » JESD8-7A (1.65 V to 1.95 V)
  - » JESD8-5A (2.3 V to 2.7 V)
  - » JESD8-C/JESD36 (2.7 V to 3.6 V)
- » ESD protection:
  - » MIL-STD-883, method 3015 exceeds 2000 V
  - » HBM JESD22-A114F exceeds 2000 V
  - » MM JESD22-A115-A exceeds 200 V (C = 200 pF, R = 0 Ω)
- » Multiple package options



# Smart & efficient Logic for automotive applications



Nexperia brings over 50 years of proven quality, commitment, and efficiency to automotive Logic applications. Our product portfolio meets and even exceeds the AEC-Q100 standard. Nexperia -Q100 Logic is guaranteed for automotive applications by meeting OEM zero defect requirements, supporting higher visibility and traceability in automotive production.

With over 1,000 automotive certified -Q100 types, Nexperia delivers the largest product portfolio in the industry. We offer a wide range of functional categories (gates, switches, shift registers, etc.), traditional HC(T), AHC(T), full feature LVC, AUP logic families, and PnT translating gates, in either Standard Logic (> 10 pin) or Mini Logic (≤ 10 pin) types.

With globally located sales and support teams, you're assured of priority technical support, priority design-in assistance, PPAP Q100 qualification data, and fast turn-around on support issues.

To learn more, please visit [www.nexperia.com/logic](http://www.nexperia.com/logic)

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