

Questions raised by BEIS Parliamentary Committee on the current state of the UK semiconductor industry

1. What is the current and future anticipated demand for common products built with semiconductor materials (e.g. computer chips) both in the UK and globally?

Our world is becoming ever more connected and digitised by the day. From personal computers, through smartphones, to smart home appliances, almost everything we interact with on a daily basis contains some type of electronic semiconductor-based technology. The so-called “Internet-of-Things” (IoT) revolution is rapidly growing and some estimates say that the world will have over 70b IoT devices. Being a highly-developed and digitised economy, the UK will form a significant part of that demand despite its relatively small population.

2. What is the UK’s semiconductor supply chain and is this secure? If not, how can this be improved? What specific strengths does the UK have to contribute to regional or global semiconductor supply chains? How competitive is the UK within the global context of the semiconductor industry?

The UK has a strong network of semiconductor developers that operate on all the stages of the supply chain from design to packaging and testing. However, for many common components, much of the UK’s supply chain relies on components purchased from elsewhere, especially from vendors in East Asia in order to reduce costs. The UK has some incredible IP especially in the design of innovative semiconductor-based solutions. For example, it is home to ARM, a leader in the design of semiconductor products for a large portion of the global semiconductor industry. The UK also has leading testing facilities such as the Compound Semiconductor Applications Catapult. On the more research side, the UK is home to some of the world’s most innovative research groups looking into novel semiconductors applications and capabilities. As such, the UK is quite competitive globally. However, there are many gaps in the supply chain especially on the higher TRL side of R&D and the scaling of production. This forces SMEs to go to foreign-based subcontractors to increase their TRL, engendering additional costs and admin complexities associated with applicable import fees and tariffs. This has been a recurring issue that we have personally faced in our business and which can cause delays and additional unexpected costs.

3. Are there opportunities for strengthening different parts of the current UK semiconductor industry? What are the potential weaknesses and strengths of the UK semiconductor industry to meet future requirements of electronic device manufacturing?

There are multiple opportunities for strengthening the UK’s semiconductor industry, including, but not limited to, investing in expanding the capabilities of enabling infrastructure (e.g. foundries), encouraging partnerships with other developed semiconductor ecosystems to allow for knowledge and resource exchange, and pushing for supply chain security assurance when it comes to critical applications. The main strength that the UK semiconductor industry has is its capability for innovation and its main weakness is the capacity for production and its reliance on international production capabilities.

4. In which industries does the UK not have an end-to-end semiconductor supply chain? Are there any opportunities for these supply chain gaps to be filled within the UK?

One of the industries in which the UK’s supply chain has not kept up with global development is in integrated photonics. The UK has excellent research capabilities in this sector, however when it comes to taking products to commercialisation, the infrastructure isn’t available. Many companies resort to outsourcing the fabrication, packaging and testing

of photonics outside of the UK, usually to EU member states. Again, after the UK's exit from the EU common market, this can lead to additional costs associated with import fees, as well as additional logistical complexity. There are currently many initiatives, such as the Qupid consortium, to fill this gap within the UK and develop an end-to-end supply chain that can help take some of the innovative photonic technologies invented in the UK and develop them into products using local resources and capabilities.

5. How can the Government strengthen semiconductor research and innovation? Are there any current areas of weakness in the present Government strategy to semiconductor innovation? Is there effective communication between the various stakeholders within the UK's semiconductor ecosystem?

The UK has some of the best research institutes in the world working on the cutting edge of semiconductor technologies. However, taking this research and increasing its market readiness is a multi-step process that goes through an iterative design-testing-fabrication workflow. To allow this happen, a network of research, prototyping and scaling fabrication foundries and packaging providers needs to be available to support the progress of the development process.

6. Does the UK have the required skills, talent and diversity to be able to boost its current semiconductor industry and to respond to future disruption?

The UK labour market has some of the most skilled and experienced researchers, engineers, designers and salespeople in the world. However, this pool has unfortunately gotten smaller over the past few years due to the impact of the UK's exit from the EU's common labour market. One of the consequences of this is that SMEs working on disruptive technologies and looking to hire niche expertise have had to apply for the ability to sponsor work visas to be able to hire the necessary talent, whereas they would previously find the talent they needed within the pool of people who already had right to work in the UK. This adds additional costs and administrative overhead to what was already a difficult and time-consuming process. To adapt to the new realities of the labour market, the visa process should be more streamlined and made more accessible to SMEs. We have also experienced some delays due to delay in getting our sponsorship license.

7. What are the potential national security concerns or vulnerabilities in our semiconductor industry? How should the UK collaborate with the United States and European Union? What are the ramifications on other industries and the wider economy within the UK?

As more and more of the UK's infrastructure becomes digitised, the threat of cyberattacks and the magnitude of their potential impact increases. As such, having a secure trusted supply chain becomes more important. Both the UK and the EU have started initiatives to combat these threats, e.g. the European Chips Act. The UK must ensure that it takes an active role in these initiatives to leverage some of the already developed infrastructure that its security partners have.

8. Is the Government currently providing the clarity and direction required to enable growth and security in the semiconductor industry? Are the right governmental organisations involved with ensuring effective development of our current semiconductor industry to thrive in the future?

In response to the potential threats as well as the potential national security interests that innovative semiconductor technologies present, the UK has taken many proactive steps, including for example the National Security and Investment act. However, many of these steps have had the unintended consequences of raising concerns with foreign investors and partners who wish to work with British firms. This is because many of the initiatives are still

Written submission from Quantum Dice Ltd (SEM0073)

relatively vague in their scope and consequences. Successful hardware development requires the ability to put in place long-term plans both for R&D and commercialisation. Subsequently, it thrives more in environments that have regulatory stability and transparency. New sudden changes whose consequences are unclear can put future deals and commercial progress in jeopardy. Many of the right government organisations are actively involved with the development of the UK's semiconductor industry, however the initiatives would benefit from more engagement with companies, especially SMEs, to ensure that the steps that are taken are complimentary to the currently existing ecosystem and drive it forwards.