At first sight, we would think that the power management segment is well established, with a $19B market in 2018, a well-known technology and confirmed players. However, if we have an in-depth look at its current status, we see that many things are about to change, and we have seen two main areas of evolution: societal impacts and strategic decision making.

To talk about societal impacts, what would be better than taking China as an example? The country has been experiencing an environmental conscience change for some time now. The decrease in CO₂ emissions and in power consumption has become a major focus for the government, leading to big subventions for energy savings. Moreover, the country is also focused on increasing share of home-made (China-made) products. Power management has become such an important piece of the puzzle leading to decreased power consumption that it is expected an increased number of Chinese companies will be implementing their own PMICs (Power Management Integrated Circuit). It is already the case at a foundry level, where many Chinese fabs re-use their 8-inch equipment (before used for CMOS processes) for BCD (Bipolar-CMOS-DMOS) processes.

As regards strategic decisions, we refer to major company actions to further push their market share and revenue. For instance, the ownership of the technology by a major end-user is key for high performing products at an affordable cost. This is the case of the recent licensing of Dialog Semiconductor products to Apple. In fact, Apple decided to stop subcontracting Dialog for their PMICs and to invest about $600M to license the PMIC technology from Dialog and to take the knowledge of the technology design with them. This allows Apple to no longer be a fabless for their power management products. We note that in the past, Apple did the same for other products that they use for their phones, tablets and laptops, so little by little the company is taking ownership and controlling their full supply chain. Who will be next?

In this report you will find more about other strategic decisions, mergers and acquisitions that have been done in the last few years.

Many applications are pushing power management products

The power management market is expected to grow to $21.3B by 2024, with a CAGR 2018-2024 of 1.9%. This is due to the fact that every electronic component needs to be controlled and powered, irrespective of the required voltage level or the final application.
that more and more sensors and cameras will be introduced into the car in the coming years with the increase of autonomy, the number of power management products will likewise increase. Similarly with car electrification, which will require increased power management due to the inverter content as well as for the battery system. In the industrial segment, increased efficiency and lower power consumption is required, which is driving new regulations for motor drives and expansion of green energies, resulting in a 4.6% CAGR to reach $4B by 2024.

With regard to power management growth, IoT expansion must also be taken into account as specific PMICs will be included in the different emitter products, as well as it will also impact the data centres (to be able to cope with the high amounts of information in the cloud). These will influence, for example, the medical market, which will increase power management content due to medical wearables and connected healthcare, both being used as preventive systems.

In this report, Yole Développement focuses on six main applications for power management: mobile & consumer, automotive & transportation, telecom & infrastructure, medical, industrial and computing; including general market trends for each of them.

![2018 - 2024 power management market evolution - Split by application](image)

STANDARD OR SPECIFIC PMIC: 300MM VS TECHNOLOGY DESIGN

The power management products are differentiated by standard PMIC components (Vreg, Vsw, etc.) and specific PMICs (including various functionalities in a single IC). The first market is highly competitive with a high focus on cost, whereas the second has a high focus on performance and energy savings.

In the same scope of strategic decisions that we discussed earlier, in order to increase margin and benefits without acquiring a company, the shift to 300mm is another obvious choice for any big manufacturer that can afford it. This is the case for Texas Instruments or Infineon a few years ago with the shift to 300mm for BCD technologies, (Infineon building a new 300mm fab in Villach, Austria), as well as other actors, such as STMicroelectronics (currently also building new 300mm fab), or ON Semiconductor’s deal with Global Foundries’ 300mm fab. Foundries are also using 300mm for PMICs, as is the case for TSMC, Towerjazz and UMC, who last year acquired Fuji’s 300mm. All these huge investments are not only focused on PMICs but on the full power product package. In this way, the “big fishes” will become even larger while small players will have to take other actions to retain a share of the market.

In the case of the special PMICs, the key is on the product design. We can think of a battery management IC, where the device has to
efficiently monitor and control the cells of a battery. In this case, the highest performance and the lowest losses are required, and the market will be ruled by the player with the best technology. Let us take the example of Linear Technology: the company had in-depth knowledge in mixed signals, and Analog Devices (which had a good ranking in standard PMICs) took advantage of the acquisition to enlarge its portfolio of offerings in specific PMICs. Another example is on big OEMs (such as Apple) which are changing their business model, being their own PMIC suppliers and positioning themselves as one of the larger worldwide PMIC manufacturer. More key deals have been made in recent years and we expect they are not over…

In this report, a global view of the landscape and the supply chain, including mergers and acquisitions, can be found.

**REPORT OBJECTIVES**

- Provide a general power management overview by application: automotive & transportation, mobile & consumer, medical, industrial, computing and telecom & infrastructure
- Understand the market dynamics for power management IC applications
- Provide a breakdown of the market by type of component, including switching regulators, LDOs, battery management ICs, multi-channel power management ICs, and other power ASICs
- Provide an overall view of the competitive landscape of the power management IC market
- Furnish the key power management players’ dynamics and market shares
- Present the latest M&A activity for power management players
- Provide an understanding of the main technological challenges for power management products

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