

Macao Funding Scheme for Key R&D Projects 2020

Application Guideline for Projects of Chip Design

I. Background

The integrated circuit industry is the core of the information technology industry, and is a strategic, fundamental and pilot industry that supports economic and social development and safeguards national security. The Chinese government attaches great importance to the development of the integrated circuit industry. Since 2014, it has launched a series of policies, including the "Outline of the Program for National Integrated Circuit Industry Development" and "Made in China 2025" , to promote the development of the integrated circuit industry. In the "13th Five-Year National Plan for the Development of Strategic Emerging Industries", the key area to be strengthened in the integrated circuit industry is the design of key chips.

In the new era of national development, involving itself into the overall national development is a major opportunity for Macao to achieve moderate economic diversification and sustainable development, and it is also the fundamental way to solve the problem of space limitations and to explore new directions for development. The Macao SAR government also proposed in its "Policy Address for the fiscal year 2020" to "explore and develop high-tech industries to support the country's high-quality development." The integrated circuit industry is a key development

area of the Guangdong-Hong Kong-Macao Greater Bay Area International Innovation and Technology Hub, and is a highly capital-intensive and technology-intensive industry with relatively less demand for natural resources. In 2010, the Ministry of Science and Technology approved the establishment of the State Key Laboratory of Analog and Mixed Signal VLSI (AMSV) in Macao. With the continuous support and the R&D funding from the Chinese governments and Macao SAR government, the design and development of electronic chips have already reached the world top level.

In order to give full play to the leading role of Macao-based National Key Laboratories in Macao's scientific and technological innovation, and to further explore and develop high-tech industries and enhance R&D capabilities and industrialization levels, Macao's Science and Technology Development Fund researched and proposed this key R&D plan by seeking opinions from Macao scientific researchers in the related fields and help from mainland China experts. It will cooperate with China as needed systematically and following steps, and will give full play to the strengths of Macao. FDCT hopes that technological innovation can promote the moderate economic diversification in Macao, boost the development of chip design industry, and help with the construction of Guangdong-Hong Kong-Macao Greater Bay Area International Innovation and Technology Hub, and make Macao more involved into the overall national development.

II. Overall Objective

Macao should take advantage of its research and development advantages in the field of chip design, combine the construction of the Guangdong-Hong Kong-Macao Greater Bay Area International Innovation and Technology Hub with the focus of regional cooperative development, and develop high-speed and high-precision ADC chips based on the characteristics of the chip design industry and on the application requirements for product added value extensions to achieve application verification and support industrialized application.

III. Research Fields

This guide focuses on the research of chip design, and will be implemented for 3 years.

It is aimed at carrying out key technological researches focused on high-speed and high-precision ADC chips, including low-jitter and high-precision clock circuits, broadband sample-and-hold circuits and low-noise and low-power circuits; at developing technologies integrated with new infrastructure-related industrial applications such as 5G communications, artificial intelligence silicon-based optoelectronics, the Internet of Things, and smart sensing and achieving application verification; It is also aimed at developing high-speed ADC samples with an accuracy of 12Bit or above, a sampling frequency of 2GHz or above, and a power consumption of less than 30mW, and at issuing application verification certificate(s) for at least one Chinese company in the Global 500 Largest Companies.

IV. Application Requirements

The applying unit should organize the application in the form of projects with subjects listed, which should be in accordance with the research contents directed by the guideline. Each project should be applied as a whole and in principle, should satisfy all assessment indicators. Unless otherwise specified, each project should have no more than 3 topics. The lead unit must be from Macao. Cooperation with non-Macao enterprises or units that have experience in cooperation with the applicant unit is encouraged with no more than 6 cooperation units per project. The project leader and the subject leaders must be eligible to work full-time in Macao.

Match funding provided by enterprises is preferred.

The maximum application amount for each project is MOP \$20 million.

V. Experts involved in Drawing up the Guideline

Chen Dapeng	Research Fellow and Deputy Director of the Institute of Microelectronics of the Chinese Academy of Sciences
Hu Weiwu	Research Fellow and Chief Engineer of the Institute of Computing Technology of the Chinese Academy of Sciences
Wang Xiang	Professor and Director of Beihang University
Wu Nanjian	Professor of the Institute of Semiconductors of the Chinese Academy of Sciences
Zhao Yuanfu	Research Fellow and Director of Beijing Microelectronics Technology Institute