



Home \ News \ **Substrate-like PCB – The highlight in the future PCB industry**

Substrate-like PCB – The highlight in the future PCB industry

February 1, 2023

Apple Promoted the Development of Substrate-Like PCB

Smartphones have evolved from 4G LTE to 5G, and the complexity of Massive MIMO antenna configurations has made RF front-ends take up more space in 5G smartphones. In addition, the amount of data processed by the 5G system will grow

We value your privacy

We use cookies to enhance your browsing experience, serve personalised ads or content, and analyse our traffic. By clicking "Accept All", you consent to our use of cookies.

[Customise](#)

[Reject All](#)

[Accept All](#)

In 2017, Apple requested a new circuit board, called **Substrate-like PCB (SLP PCB)**, for iPhone 8/X. By introducing Substrate-like PCB, Apple reduced 30% the volume of the mainboard while all of the chips remained. Substrate-like PCB requires a more sophisticated process, which has resulted in a modified semi-additive process (mSAP) came up by PCB manufacturers. And then, Substrate-like PCB technology got introduced into the new version Samsung smartphones in the same year, which was aimed to bestow additional flexibility to their products.

 Substrate-like PCB for iPhone X

iPhone X Mainboard

By designated by the world's two largest smartphone manufacturers at the same time, Substrate-like PCB began to draw more and more attention. It is expected, Substrate-like PCBs are going to be imported into more Android smartphones in 5G era, along with the smartphones are smaller and smaller.

 Development of Smartphone

Development of Smartphone (From AT&S)

So, what is Substrate-like PCB?

Substrate-like PCB (SLP PCB) is the next generation of high-density PCB which requires trace/spacing equal to or less than 30/30 μm (now 40/40 μm is the limit for HDI), for further reducing the device size, leaving more space for other components.

This kind of PCB is called substrate-like PCB because it is very closer to the IC carrier board (an advanced "circuit board" carrying a chip, with circuitry inside for connecting die and the motherboard, the regular trace/spacing is required about 15/15 μm) for semiconductor packaging, but it has not yet reached the specifications of the IC carrier board, and it is still equipped with various active and passive components, so SLP board still belongs to the category of PCB.

We value your privacy

We use cookies to enhance your browsing experience, serve personalised ads or content, and analyse our traffic. By clicking "Accept All", you consent to our use of cookies.

1. Extremely thin trace/spacing and fine pitch BGA require higher advanced technology than HDI.

A few years ago, 0.6 mm-0.8 mm pitch was applied in handheld devices at the time. This generation of smartphones equips 0.4 mm pitch technology extensively due to the number of component I/Os and product miniaturization. Currently, this trend is moving towards 0.3 mm, which requires trace/spacing of 30/30µm. The current HDI does not meet the requirements, a higher process class PCB is required.

2. Substrate-like PCB is more in line with the [SIP packaging] requirements.

SIP is a system-level packaging technology, combining multiple electronic components with different features in a single packaging system to implement certain functions. If conventional IC substrate is 1 substrate to 1 chip, SIP technology is 1 substrate to more chips. In recent years, SIP has become a new technology trend in the electronics industry. Apple has used a large number of SIP packages in their products. For the SIP, since the density of the internal traces of the system-level package is very high, the ordinary PCB board is difficult to carry, while Substrate-like PCB is the suitable choice.

Substrate-like PCB's market is growing rapidly

In addition to Apple and Samsung, Huawei also adopted SLP PCB in its new smartphone P30 in 2019. More and more other digital manufacturers hope to join in this market.

According to Yole's statistics, in 2018, the global SLP market is 987 million US dollars. In 2018, the proportion of SLP technology used in global mobile phone shipments is only about 7%, and the corresponding output value is about 12%. Yole estimates that the proportion of shipments using SLP technology handsets will increase to 16% by 2024, corresponding to an output value of approximately 27%.

We value your privacy

We use cookies to enhance your browsing experience, serve personalised ads or content, and analyse our traffic. By clicking "Accept All", you consent to our use of cookies.

In terms of production technology, SLP technology is currently dominated by Taiwan, South Korea, and Japan, such as Zhen Ding Technology (ZDT) and Meiko Electronics, while Chinese mainland PCB manufacturers aren't been left behind, many of which have invested a large number of high-end HDI/SLP PCB lines in the Pearl River Delta, Jiangxi, and Hebei in recent years, meanwhile, most industry analysts are also optimistic about the transfer of Substrate-like PCB technology to the mainland.

There are reasons to believe that Chinese PCB manufacturers would dominate the SLP market within the next decade.

Tags: PCB MANUFACTURING TECHNOLOGIES

Leave a Reply

Your email address will not be published. Required fields are marked *

Name *

Email *

Website

Comment *

We value your privacy

We use cookies to enhance your browsing experience, serve personalised ads or content, and analyse our traffic. By clicking "Accept All", you consent to our use of cookies.