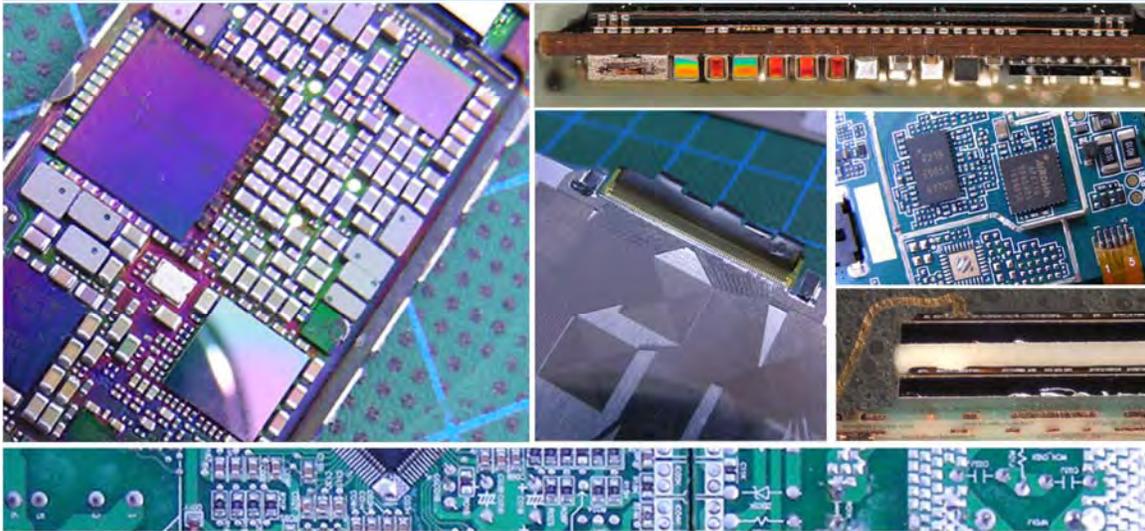


THE PRINTED CIRCUIT REPORT

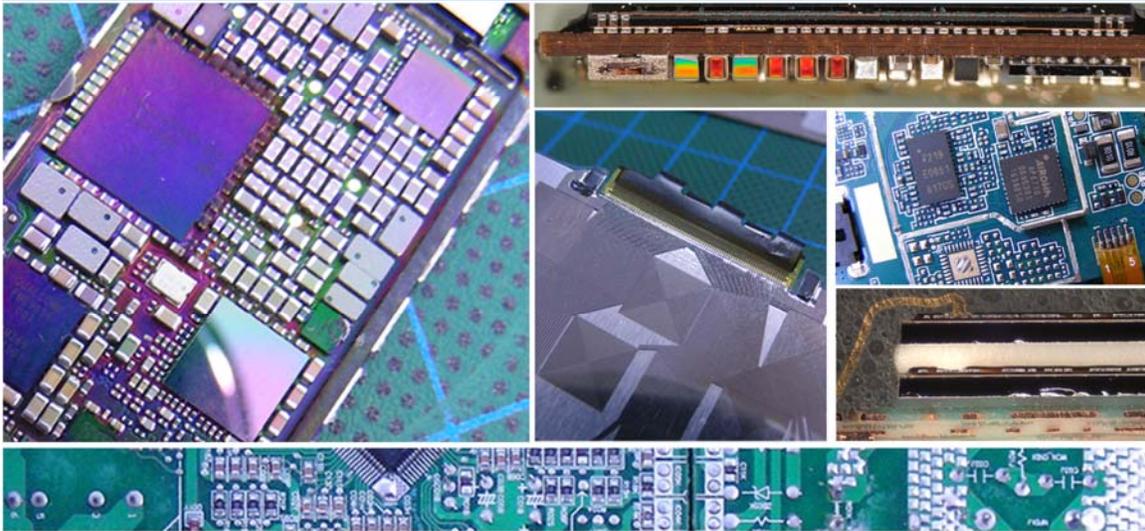
THIRD QUARTER • NOVEMBER 2020



- The forty leading PCB suppliers, which account for over one-half of industry sales, reported aggregate revenue increases of 1.5% in Q3 2020 over Q3 2019, and 5.5% YTD 2020 over 2019.
- In the midst of a pandemic, the PCB market has performed surprisingly well. Even though the market declined by 16% QoQ in Q1, it rebounded by 8% and 12% QoQ, respectively in Q2 and Q3. For the fourth quarter, Prismark expects 5% growth QoQ.
- Prismark has revised its forecast for the PCB market, and is now expecting a growth of 4.4% in 2020 over 2019. This growth is driven mostly by the package substrate segment (23.2% growth), but the HDI segment is also expected to grow well (6.3% growth).
- This report provides:
 - An update on the pandemic, recent medical developments and their impact on the global economy, electronics industry and PCB market.
 - Comprehensive data and analysis of the PCB market, showing Prismark's revised forecast for 2020, as well as our longer-term forecast for 2024 by PCB technology and region of production.
 - A detailed discussion of major developments in printed circuit boards due to the integration of sub-6GHz and mmWave 5G in smartphones. Furthermore, a review of the HDI market.

THE PRINTED CIRCUIT REPORT

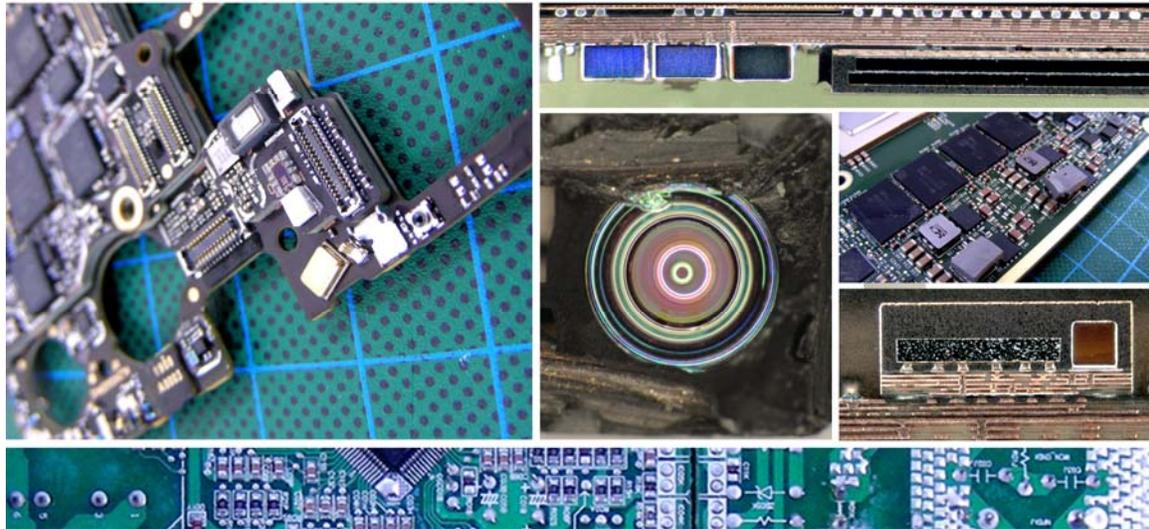
SECOND QUARTER • AUGUST 2020



- The forty leading PCB suppliers, which account for over one-half of industry sales, reported aggregate revenue increases of 11.5% in Q2 2020 over Q2 2019.
- The first half of 2020 has been surprisingly positive for the PCB market, for a number of reasons discussed in this report. Prismark expects the third quarter to decline YoY, and the fourth quarter to be flat YoY.
- Prismark has revised its forecast for the PCB market, and is now expecting a growth of 0.3% in 2020 over 2019. This growth is very lopsided, however, and driven almost exclusively by the strong demand for package substrates.
- This report provides:
 - An update on Prismark’s assessment of the coronavirus impact on the global electronics industry, including the PCB market.
 - Comprehensive data and analysis of the PCB market, showing Prismark’s revised forecast for 2020, as well as our longer-term forecast for 2024 by PCB technology and region of production.
 - A detailed discussion of major technology and market developments of flexible circuits, with a particular focus on rigid-flex circuits.

THE PRINTED CIRCUIT REPORT

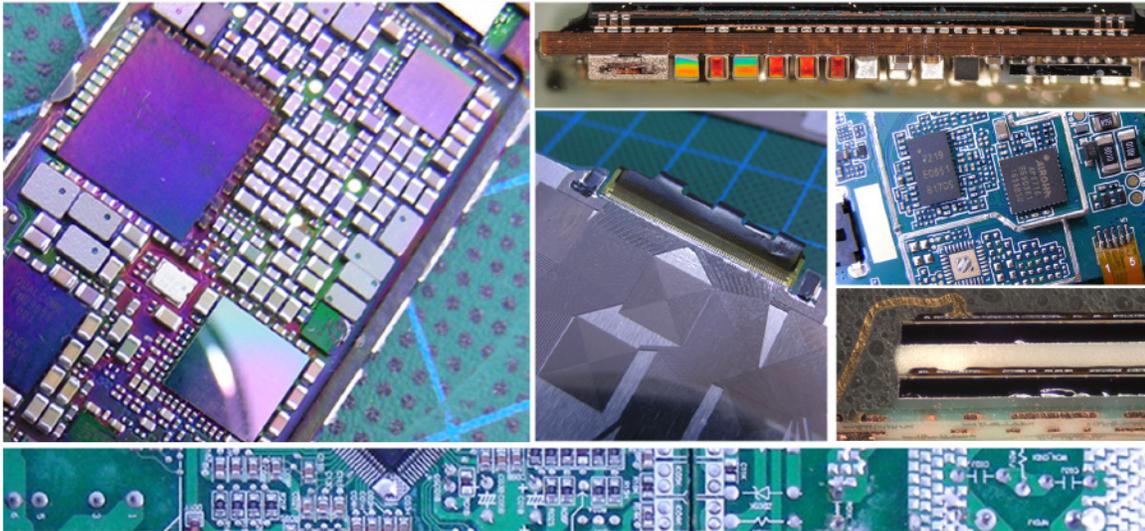
FIRST QUARTER • MAY 2020



- The forty leading PCB suppliers, which account for over one-half of industry sales, reported aggregate revenue increases of 6.9% in Q1 2020 over Q1 2019.
- Prismark estimates that the entire PCB market grew by 2.3% in terms of value in Q1 2020 over Q1 2019. This was a surprisingly positive outcome, as Prismark had expected the market to decline due to the coronavirus outbreak.
- In reality, the Q1 2020 PCB market was generally weak, but was bolstered by a few strong growth areas, primarily benefiting the package substrate business.
- Currently available data points suggest that positive momentum continued into Q2, but 2H remains highly uncertain. Prismark fears that 2H will experience a significant YoY decline. Altogether, Prismark's forecast of a 4.9% decline of the PCB market in 2020 has not been changed.
- This report provides:
 - An update on Prismark's assessment of the coronavirus impact on the global electronics industry, including the PCB market.
 - Comprehensive data on the PCB market for 2019, our forecast for 2020, as well as our longer-term forecast for 2024 by PCB technology and region of production.
 - A detailed discussion of the high-speed PCB market, which has seen significant market and technology shifts in the past few years. Trends are also explored on the systems, PCB, and laminate level.

THE PRINTED CIRCUIT REPORT

FOURTH QUARTER • FEBRUARY 2020



- The fifty leading PCB suppliers, which account for over one-half of industry sales, reported aggregate revenue increases of 0.4% in 2019 over 2018. The entire PCB market declined by 1.7% in value for 2019 over 2018.
- The PCB market declined in all regions except for China. Even there, PCB value growth was subdued at just 0.7% in value for 2019 over 2018.
- All PCB categories except for package substrates (+7.7%) declined. The decline was particularly strong for commodity paper (-9.2%) and composite (-7.9%), but most multilayer PCB products also performed poorly.
- Huawei was the main growth driver for PCB demand in 2019, and that company's PCB supply chains have benefited handsomely.
- The impact of the Coronavirus epidemic on PCB demand is still difficult to assess. Based on our current assumptions, Prismark forecasts the PCB market to grow by 2.0% in 2020, down from our previous expectations of 3.3% growth.



*CONSULTANTS TO THE ELECTRONICS INDUSTRY
BUSINESS OPPORTUNITY FROM TECHNOLOGY AND
MARKET CHANGES*

PRISMARK PARTNERS LLC

This material is © Prismark Partners LLC

130 Main Street, Cold Spring Harbor, NY 11724 USA • Telephone: 631-367-9187 • Fax: 631-367-9223 • e-mail: partners@prismark.com

Prismark Asia, 8F., No. 96, Guangfu N. Road, Taipei 105, TAIWAN • Telephone: 886-2-25779697 • Fax: 886-2-25701230

Visit our website at **www.prismark.com**