The Bishop Report
Performance and Forecast of the World Connector Industry

Issue No. 367 | 2nd Quarter 2023 | May 2023

April Orders Down -11.8%
Sales Down -1.6%

Regional Performance:
World sales declined -0.5% YTD in April but Europe achieved growth of +6.2%.

Worldwide, orders were down -15.7% YTD. Japan had the worst performance at -22.3%.

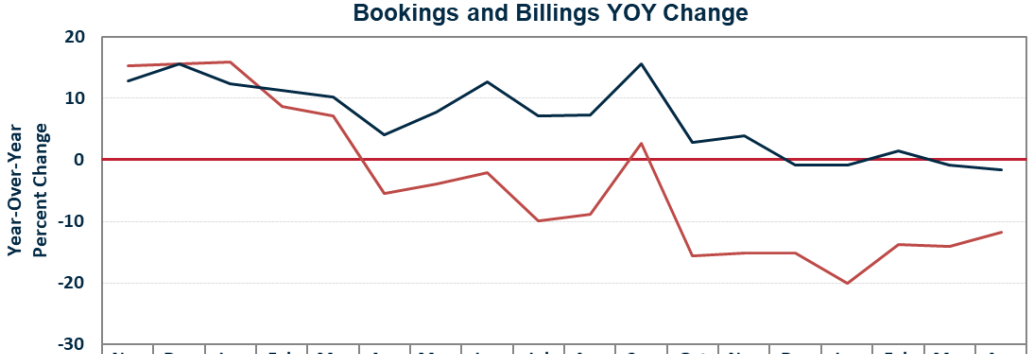
2023 Outlook:
Using a five-year historical analysis of sales, the historical average would put sales at $87,797 million, up +2.0% in 2023.

Industry Backlog:
April's backlog was $22,170 million (13.7 weeks).

2022 Currency Impact:
The industry declined -0.5% YTD in April in USD and -0.2% in local currencies.

April bookings were down -11.8%, the seventh consecutive month of double-digit declines. Billings were down -1.6%. The backlog in April decreased to $22,170 million or 13.7 weeks.

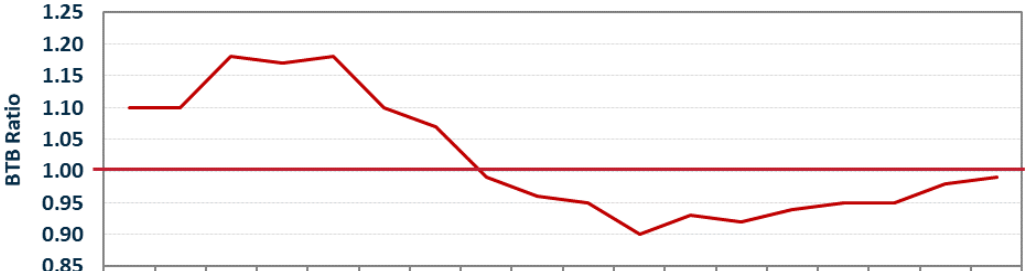
Bookings and Billings YOY Change



	Nov 21	Dec 21	Jan 22	Feb 22	Mar 22	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Sep 22	Oct 22	Nov 22	Dec 22	Jan 23	Feb 23	Mar 23	Apr 23
Bookings	15.3	15.5	15.9	8.7	7.1	-5.5	-3.9	-2.1	-9.9	-8.8	2.6	-15.6	-15.2	-15.1	-20.1	-13.8	-14.0	-11.8
Billings	12.8	15.5	12.4	11.2	10.2	4.1	7.7	12.7	7.1	7.3	15.5	2.8	3.9	-0.9	-0.8	1.40	-0.9	-1.6

The book-to-bill ratio in April was 0.99 and YTD was 0.97.

Connector Industry Book-to-Bill

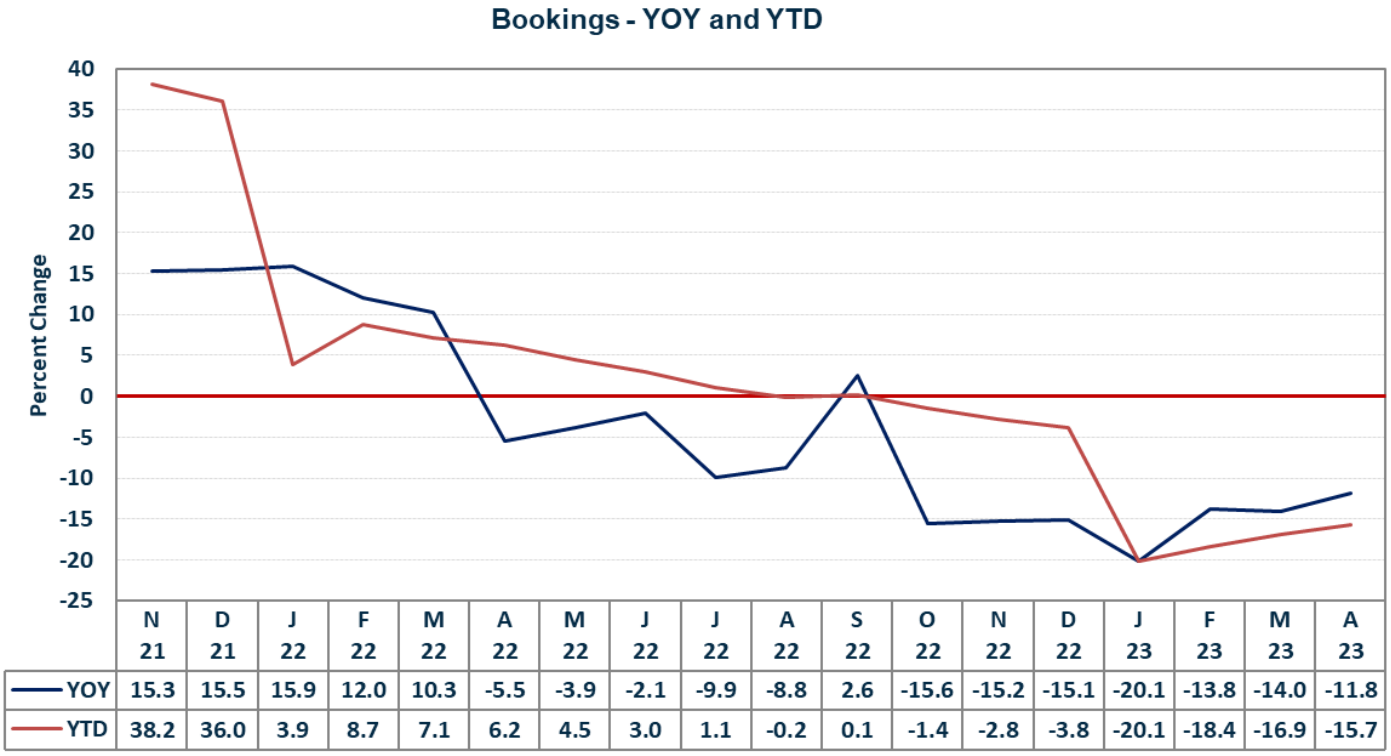


	Nov 21	Dec 21	Jan 22	Feb 22	Mar 22	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Sep 22	Oct 22	Nov 22	Dec 22	Jan 23	Feb 23	Mar 23	Apr 23
BtB	1.10	1.10	1.18	1.17	1.18	1.10	1.07	0.99	0.96	0.95	0.90	0.93	0.92	0.94	0.95	0.95	0.98	0.99

Booking Highlights and Conclusions

Sequential, Year-Over-Year, and Year-To-Date Bookings Percentage Change – 2021/2022/2023

	Sequential			Year-Over-Year			Year-To-Date		
Month	2021	2022	2023	2021	2022	2023	2021	2022	2023
Jan	2.3%	2.6%	-3.2%	24.7%	15.9%	-20.1%	24.7%	15.9%	-20.1%
Feb	17.7%	10.4%	14.4%	38.9%	8.7%	-13.8%	32.0%	12.0%	-18.4%
Mar	-3.5%	-5.3%	-1.8%	34.5%	7.1%	-14.0%	32.8%	10.3%	-16.9%
Apr	3.2%	-8.5%	-6.1%	81.9%	-5.5%	-11.8%	42.9%	6.2%	-15.7%
May	5.1%	7.0%		86.4%	-3.9%		50.5%	4.5%	
Jun	-8.3%	-6.7%		59.7%	-2.1%		51.9%	3.0%	
Jul	-1.9%	-9.6%		36.4%	-9.9%		49.6%	1.1%	
Aug	6.6%	8.0%		32.5%	-8.8%		47.1%	-0.2%	
Sep	-11.9%	-1.0%		19.1%	2.6%		43.7%	0.1%	
Oct	6.8%	-12.1%		22.1%	-15.6%		41.2%	-1.4%	
Nov	9.3%	9.8%		15.3%	-15.2%		38.2%	-2.8%	
Dec	-7.0%	-6.8%		15.5%	-15.1%		36.0%	-3.8%	



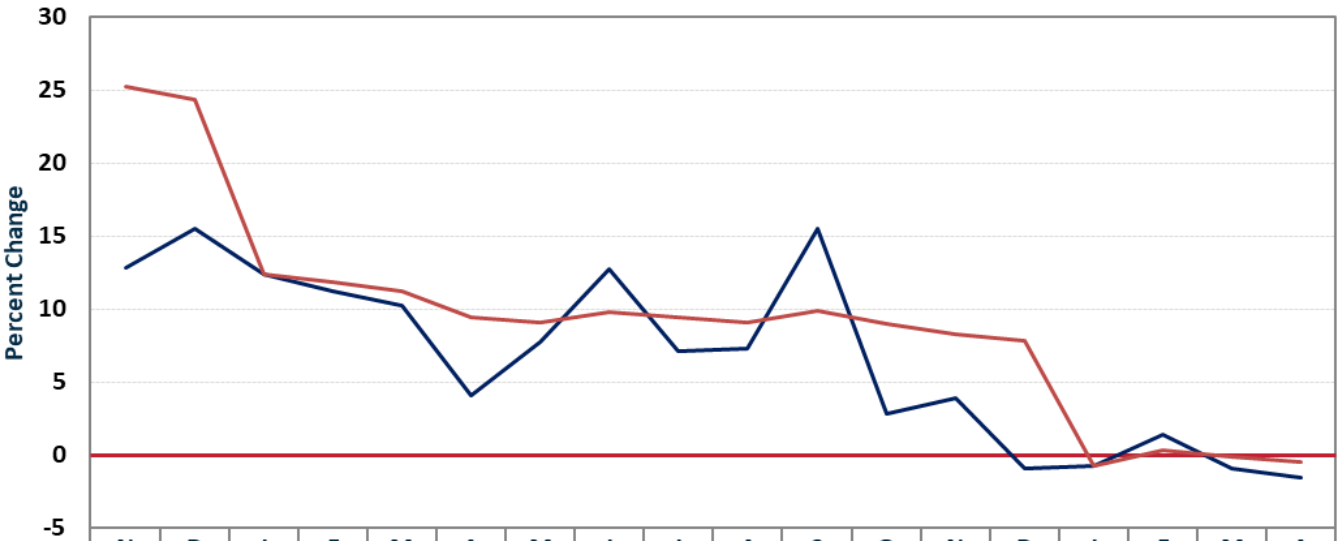
- April bookings decreased -11.8% YOY and -15.7% YTD. Orders have decreased YOY in double digits for the last seven months.
- Orders decreased -6.1% sequentially.
- The book-to-bill ratio for April was 0.99 and YTD was 0.97.

Billing Highlights and Conclusions

Sequential, Year-Over-Year, and Year-To-Date Billings Percentage Change – 2021/2022/2023

	Sequential			Year-Over-Year			Year-To-Date		
Month	2021	2022	2023	2021	2022	2023	2021	2022	2023
Jan	-1.6%	-4.3%	-4.4%	19.0%	12.4%	-0.8%	19.0%	12.4%	-0.8%
Feb	12.6%	11.4%	13.9%	26.7%	11.2%	1.4%	22.9%	11.8%	0.3%
Mar	-1.1%	-2.0%	-4.4%	25.5%	10.2%	-0.9%	23.8%	11.2%	-0.1%
Apr	-1.2%	-6.6%	-7.3%	49.5%	4.1%	-1.6%	29.4%	9.4%	-0.5%
May	7.0%	10.7%		47.1%	7.7%		32.8%	9.1%	
Jun	-3.8%	0.7%		33.5%	12.7%		33.0%	9.8%	
Jul	-2.0%	-7.1%		20.6%	7.1%		31.0%	9.4%	
Aug	8.7%	8.9%		21.5%	7.3%		29.7%	9.1%	
Sep	-2.3%	5.1%		19.4%	15.5%		28.2%	9.9%	
Oct	-3.4%	-14.0%		15.3%	2.8%		26.8%	9.1%	
Nov	9.4%	10.6%		12.8%	3.9%		25.2%	8.6%	
Dec	-5.6%	-10.0%		15.5%	-0.9%		24.3%	7.8%	

Billings - YOY and YTD



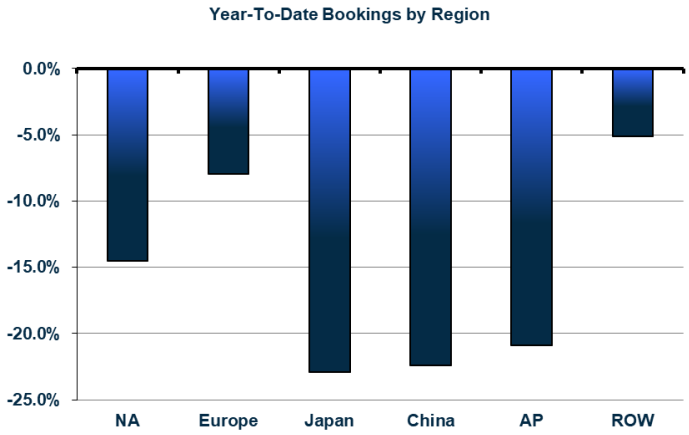
	N 21	D 21	J 22	F 22	M 22	A 22	M 22	J 22	J 22	A 22	S 22	O 22	N 22	D 22	J 23	F 23	M 23	A 23
YOY	12.8	15.5	12.4	11.2	10.2	4.1	7.7	12.7	7.1	7.3	15.5	2.8	3.9	-0.9	-0.8	1.40	-0.9	-1.6
YTD	25.2	24.3	12.4	11.8	11.2	9.4	9.1	9.8	9.4	9.1	9.9	9.0	8.3	7.8	-0.8	0.3	-0.1	-0.5

- April billings decreased -1.6% YOY and -0.5% YTD.
- Sequentially, billings decreased -7.3% in April.

Regional Performance: BOOKINGS

April 2023 Bookings

Region	Sequential	YOY	YTD
NA	-5.7%	-15.7%	-14.5%
Europe	-5.7%	2.5%	-7.9%
Japan	-8.4%	-22.3%	-22.9%
China	-8.0%	-17.0%	-22.4%
AP	-3.0%	-17.9%	-20.9%
ROW	-5.6%	-8.5%	-5.1%
Total	-6.1%	-11.8%	-15.7%



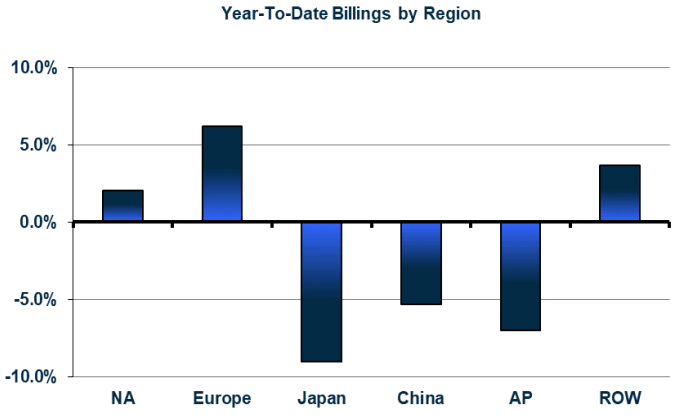
- April bookings decreased -11.8% YOY.
- YOY orders declined in all regions except Europe.
- Japan's YOY bookings decreased the most at -22.3%.
- All regions have negative sequential and YTD results.
- The book-to-bill ratio was 0.99, the 11th consecutive month below 1.00.

Note, orders have declined in 12 of the past 13 months, strongly suggesting that we are moving toward a recession in the industry.

Regional Performance: BILLINGS

April 2023 Billings

Region	Sequential	YOY	YTD
NA	-6.9%	-2.7%	2.1%
Europe	-5.2%	7.2%	6.2%
Japan	-2.5%	-8.4%	-9.0%
China	-11.4%	-2.4%	-5.3%
AP	-7.4%	-12.5%	-7.0%
ROW	-5.3%	-2.3%	3.7%
Total	-7.3%	-1.6%	-0.5%



- April connector sales decreased -1.6% YOY.
- All regions contracted sequentially.
- All regions contracted YOY except Europe.
- YTD, North America, Europe, and ROW remain positive.
- Industry growth is down -0.5% year-to-date in US dollars and up -0.2% in local currencies (see page 17).

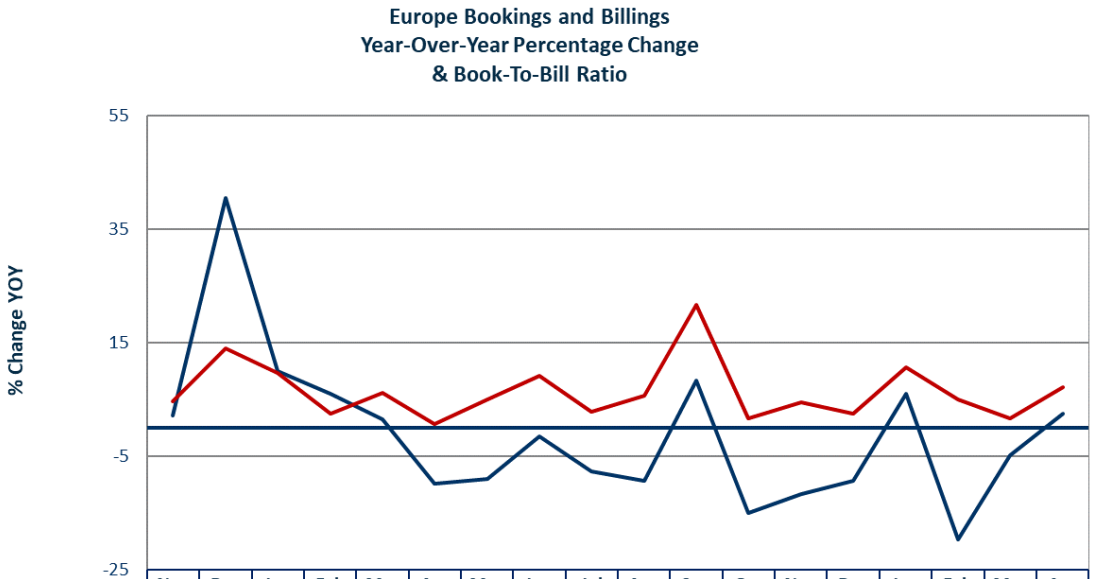
North America: The following chart displays the year-over-year percentage change in bookings and billings for the last 18 months. The monthly book-to-bill (BTB) ratio is also displayed.

	Nov 21	Dec 21	Jan 22	Feb 22	Mar 22	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Sep 22	Oct 22	Nov 22	Dec 22	Jan 23	Feb 23	Mar 23	Apr 23
Bookings	24.2	36.2	29.1	13.3	15.8	3.5	13.0	4.0	-6.7	-5.0	4.6	-11.8	10.1	-2.2	-7.6	0.7	-15.9	-15.7
Billings	18.7	23.7	17.6	22.2	18.6	14.8	20.8	18.6	15.9	13.8	21.6	9.4	11.1	4.2	8.0	2.0	1.5	-2.7
Billing SEQ	7.8	-1.9	-6.9	19.1	-4.6	-7.2	14.5	-6.6	-3.9	12.7	1.2	-13.9	9.4	-8.0	-3.6	12.4	-5.1	-6.9
BTB	1.11	1.07	1.25	1.10	1.16	1.11	1.06	1.04	0.94	0.95	0.87	0.94	0.91	1.00	0.96	0.98	0.95	0.96

North America Performance

- Sales contracted -2.7% and orders contracted -15.7% YOY in April. North American billings were down sequentially -6.9%. The book-to-bill was 0.96.
- US inflation slowed to 4.9% in April, the lowest since April 2021, breaking a string of 22 months at or above 5%. Core inflation decreased to 5.5%.
- Industrial production increased slightly to 0.2% YOY in April.
- Manufacturing PMI decreased to 48.5 in April after only one month of factory growth out of the last seven.
- US unemployment was down slightly to 3.4% in April.
- Retail sales were up 1.6% YOY in April.
- Housing starts were up an unexpected 2.2% sequentially in April.
- US automotive sales in April increased 7.7% YOY according to MarkLines.
- Consumer confidence decreased to 57.7 in May from 63.5 in April.
- The trade deficit decreased to $64.2 billion in March, the lowest in four months.
- The debt ceiling showdown is looming in Congress. The failure to act soon could results in a significant drop in the financial markets and wreak havoc on an already fragile economy.

Europe: The following chart displays the year-over-year percentage change in bookings and billings for the last 18 months. The monthly book-to-bill ratio is also displayed.

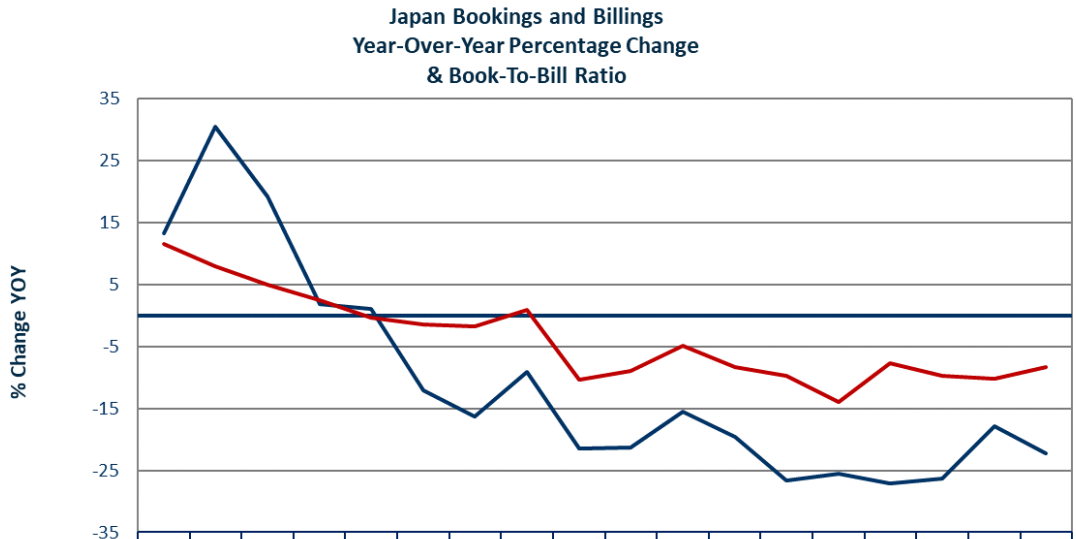


	Nov 21	Dec 21	Jan 22	Feb 22	Mar 22	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Sep 22	Oct 22	Nov 22	Dec 22	Jan 23	Feb 23	Mar 23	Apr 23
Bookings	2.1	40.4	9.9	6.0	1.5	-9.8	-9.0	-1.5	-7.7	-9.3	8.3	-15.0	-11.7	-9.4	6.0	-19.6	-4.8	2.5
Billings	4.6	13.9	9.6	2.4	6.2	0.6	5.0	9.1	2.8	5.6	21.7	1.6	4.5	2.4	10.7	5.0	1.7	7.2
Billing SEQ	12.5	-9.0	-2.3	21.7	-4.5	-13.1	15.9	-2.9	-11.3	11.9	13.1	-22.8	16.0	-10.9	5.6	14.5	-8.0	-5.2
BTB	1.06	1.13	1.18	1.27	1.14	1.10	1.06	1.02	1.02	0.96	0.87	0.97	0.97	1.00	0.99	0.96	1.06	1.05

Europe Performance

- YOY billings were up +7.2% and orders were up +2.5%. The book-to-bill ratio was 1.05. Sequentially, sales were down -5.2%.
- Euro Area industrial production decreased -1.4% YOY in March.
- The manufacturing PMI declined to 44.6 in May and represented the 11th consecutive month of declining factory activity.
- Retail sales decreased 3.8% YOY in March, the sixth straight month of declining sales.
- The inflation rate increased to 7.0% in April from 6.9% in March. Core inflation, which excludes energy and food, eased slightly to 5.6% in April.
- New car registrations grew 17.2% in April. Shortages of semiconductors is becoming less of an issue. Car sales have now increased for the last nine months.
- The unemployment rate decreased slightly to 6.5% in March.
- Consumer confidence was up slightly to -17.4 in May, the highest rating since February 2022.

Japan: The following chart displays the year-over-year percentage change in bookings and billings for the last 18 months. The monthly book-to-bill ratio is also displayed.

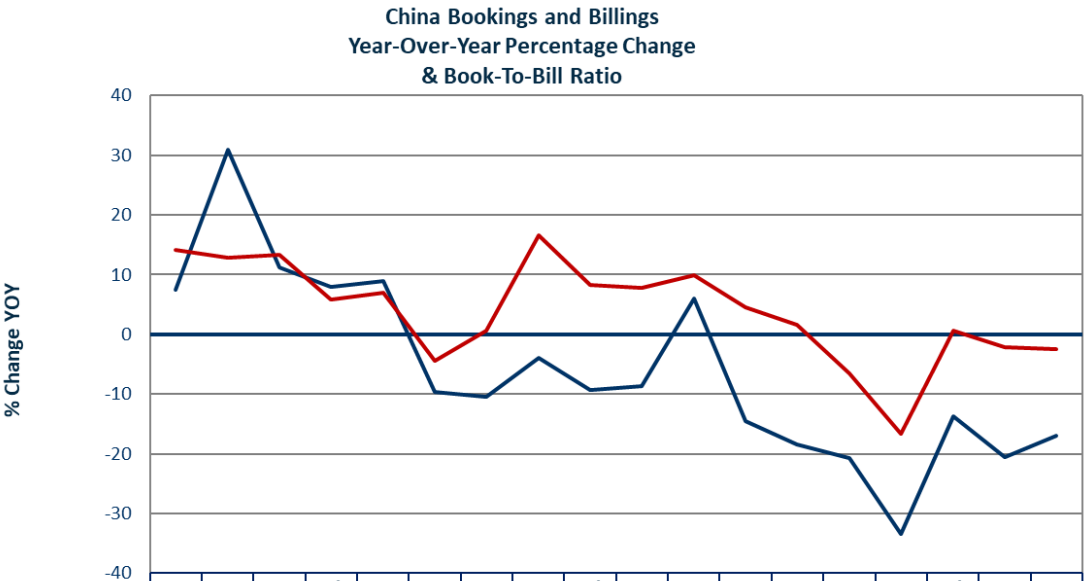


	Nov 21	Dec 21	Jan 22	Feb 22	Mar 22	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Sep 22	Oct 22	Nov 22	Dec 22	Jan 23	Feb 23	Mar 23	Apr 23
Bookings	13.3	30.5	19.2	1.8	1.0	-12.1	-16.3	-9.1	-21.5	-21.3	-15.5	-19.6	-26.6	-25.5	-27.1	-26.4	-17.8	-22.3
Billings	11.6	8.0	4.9	2.4	-0.3	-1.4	-1.8	0.9	-10.3	-8.9	-4.9	-8.3	-9.7	-13.9	-7.7	-9.7	-10.2	-8.4
Billing SEQ	9.7	-4.5	-11.1	15.1	-5.0	-5.0	-0.2	4.9	-9.7	7.0	0.9	-7.2	8.1	-8.9	-4.7	12.6	-5.5	-2.5
BTB	1.13	1.14	1.17	1.12	1.38	1.09	1.05	0.99	1.02	0.95	0.96	1.01	0.94	0.99	0.92	0.94	0.99	0.93

Japan Performance

- Bookings were down -22.3% in April. Sales declined -8.4% YOY, and sequentially were down -2.5%. Japan's book-to-bill ratio was 0.93.
- 1Q23 GDP was up 1.3% YOY and up 0.4% sequentially.
- The inflation rate in April increased to 3.5%.
- Japan's currency devalued 5.6% against the US dollar in April YTD (far below the rates in 2022).
- The industrial production rate decreased 0.7% YOY in March. This is five consecutive months of decline.
- March retail sales grew 7.2% YOY.
- Exports were down 6.1% sequentially and up 2.6% YOY in April.
- The May manufacturing PMI was 50.8, breaking six consecutive months of factory contraction.
- Housing starts were down 3.2% YOY in March.
- Consumer confidence was 35.4 in April, the highest reading since August 2022.

China: The following chart displays the year-over-year percentage change in bookings and billings for the last 18 months. The monthly book-to-bill ratio is also displayed.

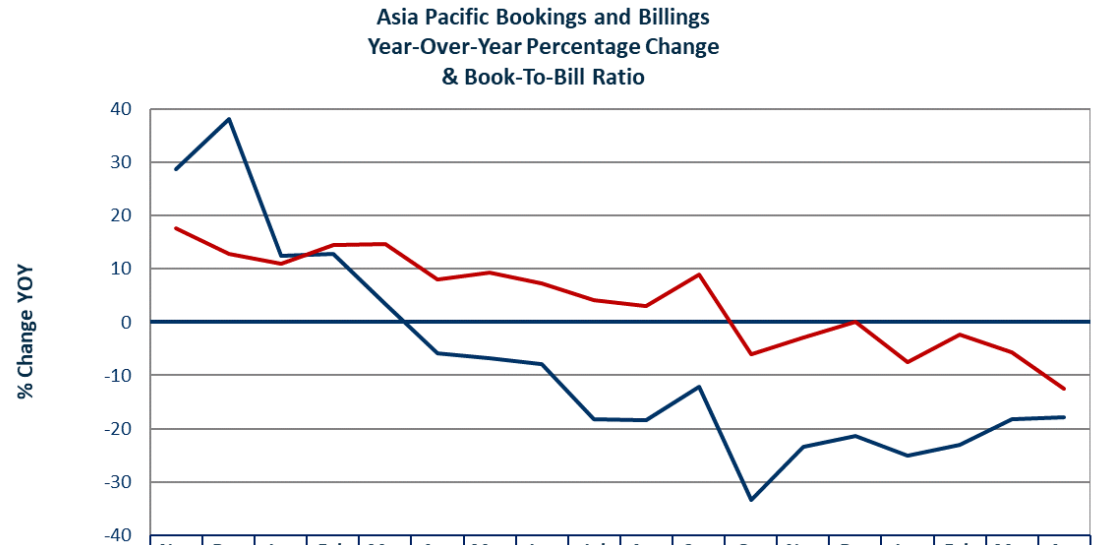


	Nov 21	Dec 21	Jan 22	Feb 22	Mar 22	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Sep 22	Oct 22	Nov 22	Dec 22	Jan 23	Feb 23	Mar 23	Apr 23
Bookings	7.5	30.9	11.2	7.9	9.0	-9.7	-10.4	-4.0	-9.4	-8.7	6.0	-14.6	-18.4	-20.7	-33.5	-13.7	-20.5	-17.0
Billings	14.1	12.8	13.4	5.8	7.0	-4.4	0.6	16.5	8.3	7.8	9.9	4.5	1.6	-6.5	-16.7	0.6	-2.2	-2.4
Billing SEQ	11.1	-5.2	-2.7	-3.9	3.2	-15.4	10.3	12.5	-6.6	5.2	2.9	-7.2	8.1	-12.7	-13.4	16.1	0.1	-11.4
BTB	1.00	1.03	1.12	1.14	1.22	1.12	1.07	0.94	0.94	1.00	0.97	0.90	0.87	0.88	0.89	0.93	0.92	0.96

China Performance

- China's sales decreased -2.4% YOY and orders decreased -17.0% YOY. The BTB was 0.96. Sequentially, sales decreased -11.4% in April.
- Industrial production grew 3.9% YOY in March.
- China's manufacturing PMI unexpectedly fell to 49.5 in April signaling a contraction of factory activity.
- Retail sales rose 18.4% YOY in April, the strongest pace since March 2021.
- Exports from China decreased 6.7% sequentially but increased 8.5% YOY.
- China's total vehicle sales increased 82.7% YOY in April and were up 9.7% sequentially.
- The inflation rate decreased to 0.1% in April. Core inflation was at 0.7%.
- The unemployment rate dropped to 5.2% in April.

Asia Pacific: The following chart displays the year-over-year percentage change in bookings and billings for the last 18 months. The monthly book-to-bill ratio is also displayed.

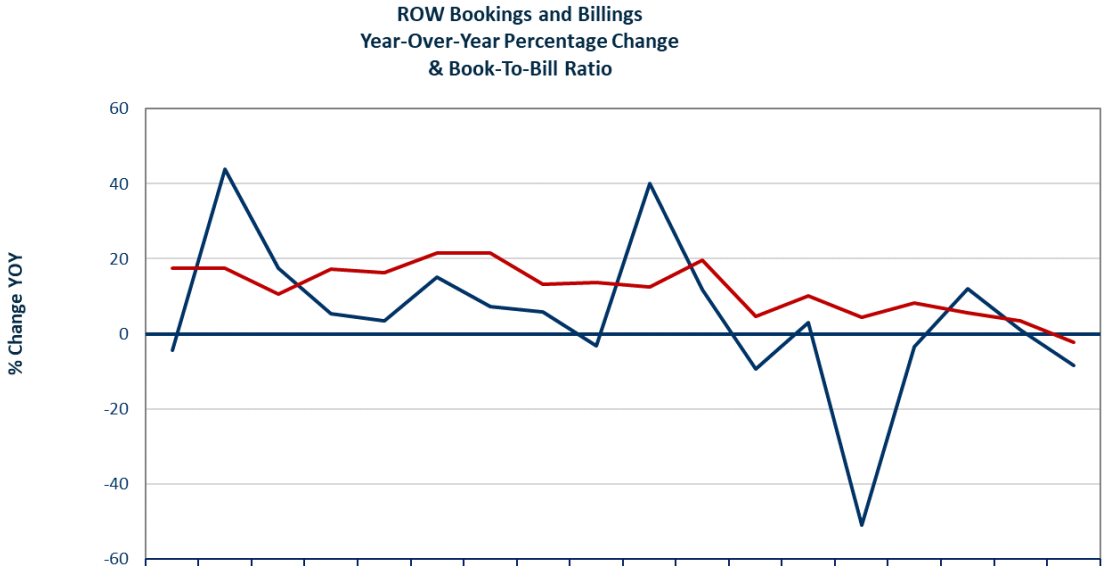


	Nov 21	Dec 21	Jan 22	Feb 22	Mar 22	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Sep 22	Oct 22	Nov 22	Dec 22	Jan 23	Feb 23	Mar 23	Apr 23
Bookings	28.7	38.1	12.4	12.9	3.4	-5.9	-6.7	-7.9	-18.2	-18.4	-12.1	-33.4	-23.5	-21.3	-25.1	-23.1	-18.2	-17.9
Billings	17.6	12.9	11.0	14.5	14.7	8.1	9.4	7.3	4.1	3.0	9.0	-6.0	-2.9	0.0	-7.5	-2.3	-5.7	-12.5
Billing SEQ	4.4	-7.1	-2.2	5.2	0.9	-5.0	7.3	-2.9	-5.7	3.3	10.8	-11.2	9.9	-6.0	-9.9	11.3	-2.9	-7.4
BTB	1.50	1.04	1.16	1.15	1.21	1.07	1.06	0.94	0.86	0.96	0.84	0.89	0.97	0.82	0.93	0.92	0.96	1.01

Asia Pacific Performance

- Orders were down -17.9% in April and sales were down -12.5% YOY. The book-to-bill ratio was 1.01. Sequentially, sales decreased -7.4%.
- India's industrial production grew 1.1% YOY in March. Exports decreased 12.7% YOY in April to $34.7 billion. Electrical and electronic equipment only represents 4.8% of total exports. The manufacturing PMI increased to 57.2 in April. There have been 22 straight months of factory expansion. Inflation in April decreased to 4.7%.
- South Korea's 1Q23 GDP grew 0.8% YOY and 0.3% sequentially. Industrial production fell 7.6% YOY in March for the sixth straight month of declines. Exports decreased 14.2% YOY in April after a 13.6% drop in the prior month. Electrical and electronic equipment comprise 31% of their exports. The manufacturing PMI was 48.1 in April for the 10th consecutive month of contracting factory activity. Inflation decreased to 3.7% in March.

Rest of World: The following chart displays the year-over-year percentage change in bookings and billings for the last 18 months. The monthly book-to-bill ratio is also displayed.



	Nov 21	Dec 21	Jan 22	Feb 22	Mar 22	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Sep 22	Oct 22	Nov 22	Dec 22	Jan 23	Feb 23	Mar 23	Apr 23
Bookings	-4.3	44.0	17.6	5.3	3.5	15.2	7.2	5.9	-3.1	40.1	11.8	-9.3	3.0	-50.9	-3.5	12.1	1.1	-8.5
Billings	17.6	17.6	10.7	17.2	16.2	21.5	21.6	13.3	13.7	12.4	19.7	4.7	10.2	4.4	8.3	5.6	3.5	-2.3
Billing SEQ	1.9	-7.1	-5.8	18.5	-3.3	-5.3	13.1	-8.2	-2.2	9.6	2.0	-11.5	7.3	-12.0	-3.1	15.9	-5.2	-5.3
BTB	0.85	1.89	1.16	1.20	1.07	1.11	1.06	1.02	1.10	0.92	0.86	0.90	0.97	0.89	1.04	1.04	1.04	1.04

Rest of World Performance

- Orders decreased -8.5% and sales decreased -2.3% YOY in April. Sequentially, sales in the region decreased -5.3%. The book-to-bill ratio was 1.04.
- Brazil's industrial production grew 0.9% YOY in March. The inflation rate decreased to 4.18% in April. The manufacturing PMI dropped to 44.3 in April, the sixth consecutive month of factory contraction. The unemployment rate rose to 8.8% in March. Exports fell 0.3% YOY in April to $27.4 billion. Retail sales grew 3.2% YOY in March.
- Russia’s economic data is still questionable but here are a few data points. The GDP for 1Q23 is reported at a contraction of 1.9% YOY. Their industrial production grew slightly in March to 1.2%. This is first growth in one year. YOY, retail sales have declined monthly for the last year.

Regional Summary At-A-Glance

The following table shows a snapshot of the performance of each region. The table displays the latest metric available, and the trend of the metric compared to prior months/quarters.

	North America	Europe	Japan	China	Asia Pacific	ROW
GDP Growth YOY	1.6% Slowing	1.3% Slowing	1.3%, Flat	4.5% Slowing	NA	NA
Industrial Production Growth	0.2% Down	-1.4% Down	-0.6% Down	5.6% Up	NA	NA
Manufacturing PMI*	48.5 Down	44.6 Down	50.8 Up	49.5 Down	NA	NA
Inflation Rate	4.9% Slowing	7.0% Slowing	3.5% Increasing	0.1% Slowing	NA	NA
Unemployment Rate	3.4% Steady	6.5% Steady	2.8% Increasing	5.2% Down	NA	NA
Retail Sale Growth YOY	1.6% Down	-3.8% Down	7.2% Steady	18.4% Up	NA	NA
YTD Connector Sales Performance	2.1% Down	6.2% Flat	-9.0% Down	-5.3% Down	-7.0% Down	3.7% Down
YTD Connector Orders Performance	-14.5% Down	-7.9% Down	-22.9% Down	-22.4% Down	-20.9% Down	-5.1% Down

* Purchasing Manager Index, Below 50 is contracting factory activity.

Industry Backlog Is 13.7 Weeks

The industry has been shipping $1,615 million average per week since January. The April ending balance is $22,170 million which equates to 13.7 weeks.

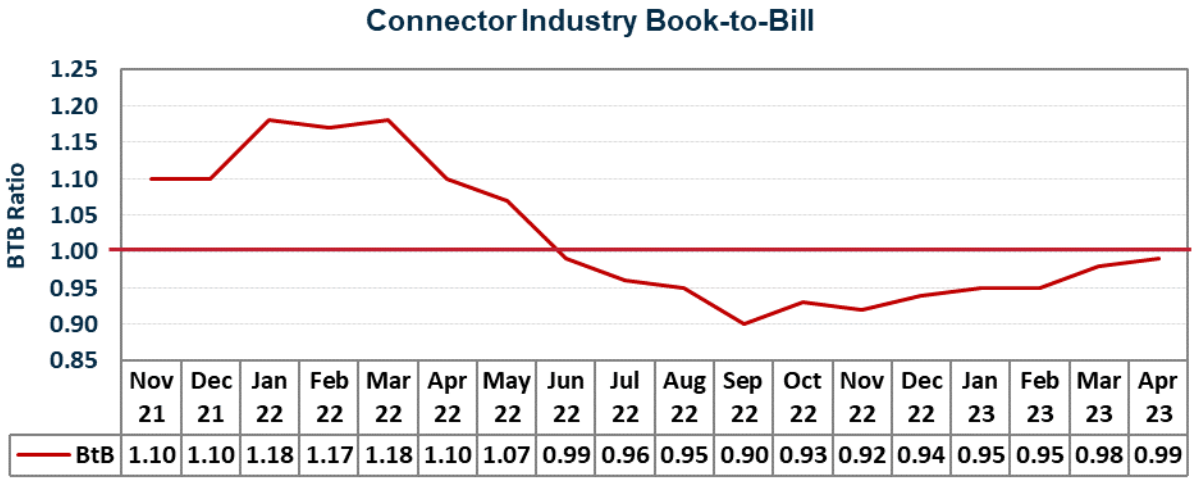
The following table compares 2022 industry backlog to the current backlog.

Industry Backlog

	2022	YTD Apr 2023
BtB Ratio	1.01	0.97
Beginning Backlog	$21,499	$22,983
Bookings	$85,575	$26,642
Billings	$84,091	$27,455
Ending Backlog	$22,983	$22,170
Backlog in Weeks	14.2	13.7

$ Millions

The industry has reported 11 consecutive months of a below 1.00 book-to-bill ratios. This is shown in the following graph. April's BTB ratio is 0.99 to 1.00.



The book-to-bill ratio has been below 1.00 for 11 consecutive months beginning in June 2022. However, you will note in the following table, the backlog has remained in the $21 to $22 million level since November 2022. Perhaps the backlog has reached, or is approaching a bottom.

Ending Backlog Since May 2022

Month	Ending Backlog	BTB Ratio
May	$26,373	1.07
June	$26,302	0.99
July	$26,036	0.96
August	$25,673	0.95
September	$24,846	0.90
October	$24,396	0.93
November	$21,828	0.92
December	$22,983	0.94
January	$22,725	0.95
February	$21,422	0.95
March	$22,233	0.98
April	$22,170	0.99

$ Millions

Industry Orders – April 2023

Sales are down a modest -0.5% through April, but orders are down a whopping -15.7% YTD. In fact, orders have declined in 12 of the past 13 months with the past seven consecutive months down double digits.

Double Digit Order Declines

	% Decline
October 22	-15.6%
November 22	-15.2%
December 22	-15.1%
January 23	-20.1%
February 23	-13.8%
March 23	-14.0%
April 23	-11.8%

The slowdown in order demand is a function of a slowing global economy caused by high inflation, rising interest rates and overall economic uncertainty.

2023 Outlook

We analyzed industry sales over the past five years (2018-2022) to determine how year-to-date April sales related to full year sales. We found that January through April sales averaged 32% of full year sales. The lowest sales average was 27.8% and the highest was 34.9%

The following table presents a high, average, and low range of sales outcomes for 2023 based on April year-to-date and the five-year averages.

2023 Forecast Range

	Five Year Historical Range		
	High	**Average**	**Low**
Apr YTD Hist Sales %	27.8%	32.0%	34.9%
Apr Actual Sales	$27,455	$27,455	$27,455
Full Year Forecast	$98,759	$85,797	$78,668
2022 Actual Sales	$84,091	$84,091	$84,091
% Increase/Decrease	**17.4%**	**2.0%**	**-6.4%**

$ Millions

Using this analysis (performance of the past five years) the industry could report a sales gain of +17.4%. This seems unrealistic considering current economic trends and the weak new orders inflow.

We believe a single digit gain (+2.0%) or a modest single digit decline (-6.4%) is more likely. In fact, our forecast is for +1.9% sales growth in 2023.

2022 and 2023F Sales

	2022 Results	2023 Forecast	Change
North America	$18,889	$19,256	1.9%
Europe	$17,328	$17,502	1.0%
Japan	$5,173	$5,106	-1.3%
China	$26,494	$27,166	2.5%
Asia Pacific	$12,195	$12,567	3.1%
ROW	$4,012	$4,103	2.3%
Total	**$84,091**	**$85,700**	**1.9%**

$ Million, Bishop ©2023

It would not be a surprise if the industry experienced a modest decline in 2023 sales.

Currency Flucuation Changes Performance from -0.5% in USD to -0.2% in Local Currencies

The dollar has been strengthening against the euro, the yen, and the yuan. The following table measures the impact for April 2022 versus April 2023 and shows results for these three currencies.

Local Currency to One USD
April 2022 versus April 2023

Currency	2022	2023	% Change
Euro	0.9462	0.9139	-3.4%
Yuan	6.6962	6.9470	3.7%
Yen	128.8633	136.0368	5.6%

Europe, China, and Japan account for approximately 60% of world connector sales. Currency fluctuation against the US dollar can have a significant impact on our reporting of sales performance in US dollars.

The following table shows April YTD sales performance by region in US dollars and local currencies.

Industry Sales Performance
YTD April 2023
USD-vs-Local Currencies

Region	U.S.$	Local Currency
North America	2.1%	2.1%
Europe	6.2%	2.6%
Japan	-9.0%	-3.9%
China	-5.3%	-1.8%
Asia Pacific	-7.0%	-7.0%
ROW	3.7%	3.7%
World	**-0.5%**	**-0.2%**

Connector sales are 0.3 percentage points higher when stated in local currencies rather than in US dollars, putting industry performance at -0.2% contraction in April (versus -0.5% in US dollars). This is the result of a weaker US dollar, on average, compared to the three primary currencies.

Significant News

Smartphone Market Woes Continue With 14.6% Drop in First Quarter

Worldwide smartphone shipments declined 14.6% year over year to 268.6 million units in the first quarter of 2023 (1Q23), according to preliminary data from IDC. This marks the seventh consecutive quarter of decline as the market continues to struggle with lukewarm demand, inflation, and macro uncertainties. While the decline is more than the 12.7% IDC previously forecasted, the results aren't surprising. Inventory has remained elevated across regions; however, it is in significantly better shape compared to six months ago thanks to reduced shipments and heavy promotional activities.

Almost all the regions suffered double digit decline in 1Q23. China witnessed close to 12% drop, which was slightly more than expected despite the recent reopening of the market. Consumers are prioritizing travel and entertainment over smartphone purchases and uncertainty still lingers, which is dampening consumer sentiment. Developed markets like the USA and Western Europe fared better than others with declines of 11.5% and 9.4% respectively. Emerging markets like APeJC, CEE and MEA saw larger 17- 20% declines. Samsung's profit plunged 95% to its lowest level since 2009 as chip demand slumps. South Korean electronics giant Samsung's operating profit plunged in the first quarter as prices for its memory chips continued to fall and demand remained weak.

Traditionally, Samsung's biggest profit driver is its semiconductor division which consists of sales of memory chips that go into everything from personal computers to smartphones to servers in data centers.

During the pandemic, smartphone and PC makers stockpiled chips as demand for consumer devices increased, but they are now grappling with excess inventories as consumers cut back on purchases of these goods due to rising inflation. This has led to a fall in prices for the memory chips that Samsung sells.

The South Korean giant said this month it would be making a "meaningful" cut in memory chip production, following the lead of smaller rivals such as SK Hynix and Micron.

Samsung did, however, forecast a recovery in the second half of the year.

China's Smartphone Market Fell 11.8% in 1Q23 Despite the Lifting of the Zero-COVID Policy

According to the IDC, 65.4 million smartphones shipped in China in 1Q23, down 11.8% year-on-year (YoY). The market continued its double-digit decline since the first quarter of 2022, even though the zero-COVID policy ended in December. Gloomy consumer confidence continued to constrain the demand for smartphones, while wealthier consumers shifted their spending to areas like leisure and services. On the supply side, more RAM and storage are lengthening replacement cycles.

North American EMS Industry Down 3.1 Percent in March

IPC announced March 2023 findings from its North American Electronics Manufacturing Services (EMS). The book-to-bill ratio stands at 1.28. Total North American EMS shipments in March 2023 were down 3.1 percent compared to the same month last year. Compared to the preceding month, March shipments increased 6.2 percent. EMS bookings in March decreased 7.1 percent year-over-year and increased 9.9 percent from the previous month.

North American PCB Industry Sales Up 11.6 Percent in March

IPC announced the March 2023 findings from its North American Printed Circuit Board (PCB) Statistical Program. The book-to-bill ratio stands at 0.91. Total North American PCB shipments in March 2023 were up 11.6 percent compared to the same month last year. Compared to the preceding month, March shipments were up 30.1 percent. PCB bookings in March were down 10.5 percent compared to the same month last year. March bookings were up 2.3 percent compared to the preceding month.

Chip Sales Set to Drop 11.2 Percent This Year: US

Global semiconductor sales are forecast to decrease 11.2 percent this year from a year earlier due to weak market demand for electronic goods and higher chip inventories, according to US research firm Gartner Inc. Total sales are estimated at US$532.2 billion this year, down from US$599.6 billion last year, when sales grew marginally by 0.2 percent from 2021, Gartner said.

“As economic headwinds persist, weak end-market electronics demand is spreading from consumers to businesses, creating an uncertain investment environment. In addition, an oversupply of chips, which is elevating inventories and reducing chip prices, is accelerating the decline of the semiconductor market this year,” Gartner practice vice president Richard Gordon wrote in a statement.

U.S. Manufacturing Marks 6-Month Contraction

U.S. factory activity contracted for the sixth straight month in April as demand remains soft and end-customer inventories continue to build. The Institute for Supply Management’s PMI improved slightly in April – by 0.8 percent – to 47.1. Any number below 50 indicates contraction.

After an extended period of shortages and disruption, the supply chain is poised for growth to resume, according to Tim Fiore, chair of the ISM’s manufacturing survey panel. Lead times for critical purchases are declining, Fiore said, and supplier deliveries are improving.

However, new order rates remain sluggish as panelists remain concerned about when manufacturing growth will resume. New orders for April remained in contraction territory at 45.7 percent, up 1.4 percent from the prior month.

Price instability remains and future demand is uncertain as companies continue to work down overdue deliveries and backlogs. Seventy-three percent of manufacturing gross domestic product (GDP) is contracting, up from 70 percent in March, according to the ISM.

Raw material prices in April increased by 4 percent to 53.2 – the highest level since July 2022. Customer inventories entered the “too high” territory in April – up 2.4 percent to 51.3 — a negative for future production.

Additionally, excess inventory usually sells at a discount. Component prices have spiked since the beginning of the semiconductor shortage in 2020.

Other data from April:
The backlog of orders index registered 43.1 percent; 0.8 percent lower than the March reading of 43.9 percent. Supplier deliveries stood at 44.6 percent; 0.2 percent lower than 44.8 percent in March. This is the index’s lowest reading since March 2009 (43.2 percent). The new export orders index, at 49.8 percent, is 2.2 percent higher than March’s level of 47.6 percent. The imports index remained in contraction territory, though just barely, at 49.9 percent; that’s 2 percent above the March level of 47.9 percent.

Apple Reports Better-Than-Expected Quarter Driven by iPhone Sales

Apple reported second-fiscal quarter earnings on Thursday that beat Wall Street's soft expectations, driven by stronger-than-anticipated iPhones sales. Apple CEO Tim Cook told CNBC that the quarter was "better than we expected." However, Apple's overall sales fell for the second quarter in a row. The tech giant's shares rose nearly 2% in extended trading, and continued climbing when Apple gave forecast data points about the current quarter.

Here's how the company did versus Wall Street expectations per Refinitiv consensus expectations:
EPS: $1.52 per share vs. $1.43 expected
Revenue: $94.84 billion vs. $92.96 billion expected
Gross margin: 44.3% vs. 44.1% expected
Apple reported $24.16 billion in net income during the quarter compared to $25.01 billion in the year-earlier period. Total revenue was off 3% from $97.28 billion in the prior quarter.

Here's how Apple's individual product lines did versus StreetAccount consensus expectations:
iPhone revenue: $51.33 billion vs. $48.84 billion expected
Mac revenue: $7.17 billion vs. $7.80 billion expected
iPad revenue: $6.67 billion vs. $6.69 billion expected
Other Products revenue: $8.76 billion vs. $8.43 billion expected
Services revenue: $20.91 billion vs. $20.97 billion expected

Apple finance chief Luca Maestri said the company expects overall revenue in the current quarter to decline about 3%.

The highlight of Apple's report was iPhone sales, which grew from the year-ago quarter even as the broader smartphone industry contracted nearly 15% during the same time, according to an IDC estimate.

iPhone revenue increased 2% during the quarter that ended April 1, suggesting that parts shortages and supply chain issues that had hampered the product for the last few years — including an iPhone factory shutdown late last year — had finally abated.

India Smartphone Market Declined by 16% YoY in 1Q23

According to IDC, 31 million smartphones were shipped in India in 1Q23 (Jan-Mar), a decline of 16% YoY (year-over-year), and the lowest first-quarter shipments in four years. Consumer demand remained sluggish amid uncertain macroeconomic conditions and inventory levels were elevated because of high stocking in 2H22. The ASP (average selling price) reached an all-time high of US$265 and the share of higher-priced smartphones (US$600+) increased to 11% compared to 4% a year ago. 5G smartphone share increased to 45%, up from 31% in 1Q22, led by Samsung which accounted for more than a quarter of the 5G smartphone shipments. Shipments to online channels dropped significantly, as offline channels were backed by new model launches and attractive channel promotions in 1Q23. Samsung climbed to the top slot after more than five years, supported by the launch of affordable 5G smartphones and the Galaxy S23 series, followed by vivo which continued to build on its omnichannel portfolio and OPPO (including OnePlus), while Xiaomi slipped to fourth slot in 1Q23. India's smartphone market is expected to see flat growth in 2023.

Tablet Shipments Returns to Pre-Pandemic Levels

Worldwide tablet shipments posted a decline of 19.1% year over year in the first quarter of 2023 (1Q23), totaling 30.7 million units, according to preliminary data from IDC. The low shipment volume is now comparable to pre-pandemic levels. Shipment volume in 1Q23 was comparable to the 30.1 million units shipped in 1Q19 and 31.6 million in 1Q18. Sell-in shipment in the first half of 2023 is expected to be low, with

vendors focusing on clearing out their inventory before the launch of newer models. Chromebook shipments also continued to contract in 1Q23 with shipments totaling 3.8 million units for a year-over-year decline of 31% year over year. However, the quarterly decline was much less as Chromebook shipments picked up slightly by the end of the quarter with some vendors pulling-in orders due to an expected increase in the Chrome OS licensing cost in the second half of 2023.

All top tablet vendors posted a decline in the quarter. The decline came from a very healthy base compared to the past years. As employees return to the office around the world and as consumers continue to be cautious of their expenditure, the market continues to witness weakening demand. However, with signs of global economic recovery, including easing inflation, the second half of 2023 may witness some improvements in the shipments. In Q1 2023, Apple, followed by Samsung led the market once again, both the vendors making up nearly 58% of the tablet market even with the changing landscape post-pandemic. Huawei moved up in rank and secured the third position this quarter as they continue to create a competitive portfolio of large screen tablets. The two new models - MatePad SE 10.4” and MatePad 11” tablets were well received in PRC. However, the new launches still couldn’t offset the decline due to the prevailing macro-economic factors and their shipments declined by 9.7% year over year. In the fourth position was Lenovo, who also continued to have contracted volume due to weaking demand. Amazon rounded up at the fifth position, with a huge drop of 62% year over year. Amazon’s shipments in 2023Q1 have been the lowest since the pandemic and this decline can be attributed to seasonality, piled up inventory and low demand.

Global Notebook Shipments to Resume Sequential Growth in 2Q23

Global notebook shipments (not including detachable models) performed better than originally expected, shrinking only 9.5% sequentially and less than 35% on year in the first quarter of 2023, and the volumes will grow back 9% sequentially in the second quarter, according to DIGITIMES Research's latest numbers from the report covering the notebook industry. The performance in the first quarter was driven by brand vendors' keen inventory digestion and component procurement deceleration, strong demand from the gaming sector, and a wave of robust short-term orders in March. With their inventory digestion reaching an end in the early second quarter, brands' new notebooks to begin volume shipment, and a recovery in the education sector's demand, Taiwan's shipments are expected to resume sequential growth in the second quarter with on-year decline shrinking to only slightly less than 15%.

All the top 6 notebook brands except Hewlett-Packard (HP) enjoyed a sequential shipment increase in the second quarter. HP had a high comparison base in the first quarter because of robust short-term orders in March. The US-based brand's orders for enterprise models are expected to decelerate, but its overall shipments will still stay flat from a quarter ago, figures from the report show. Lenovo, ranked second, is expected to continue to be impacted by a high channel inventory in the second quarter. With its key markets, Europe, and China, showing no major demand improvement, Lenovo's sequential shipment growth in the quarter will be lower than its competitors. Dell, in third place, after suffering from sequential declines for three quarters straight, will see its shipments rise 10% sequentially in the second quarter with the strategy to focus on new enterprise procurement orders. Number-4 Apple saw a major shipment decline in the first quarter because of weak demand and the fact that the US-based brand will soon release its new 15-inch entry-level MacBook Air. With the new notebook, Apple's shipments are expected to rise in the second quarter. Asustek Computer, in fifth place, will focus on selling its gaming notebooks in the second quarter, while Acer, coming in sixth, will push for Chromebook procurement orders. Both brands are eyeing to achieve a 20% sequential shipment increase. Taiwan ODMs' second-quarter shipments will also enjoy a recovery in the second quarter with Quanta seeing the highest pick-up in shipment share thanks to orders for Apple's new MacBook Air.

India Wearable Market Ships 25.1mn Units in 1Q23, Growing by 80.9% YoY

According to IDC, 25.1 million wearable units were shipped in India in 1Q23, registering a strong 80.9% YoY (year-over-year) growth but remained flat QoQ (quarter-over-quarter) following a strong 4Q22. Share of the smartwatches grew to 41.4% from 26.8% a year ago. The earwear category also witnessed a strong 48.5% YoY growth. Improved supplies, leaner inventory, multiple new launches, and faster portfolio refresh are the key reasons for this healthy growth. Additionally, a long tail of several India based small players (collectively holding > 15% share), is further intensifying the competition, and lowering the overall ASPs to US$22.7 (vs US$29.5 a year ago) in 1Q23. The dominance of online channel remains with a share of 73.9% in the overall wearable market.

Samsung Retains Number 1 Position in Global TV Market

Samsung Electronics Co. has held on to its position as the world's top TV manufacturer in the first quarter of 2023, securing a 32.1% share of the market in terms of value, according to global market research firm Omdia's data.

Samsung's continued dominance is attributed to premium and ultra-large models like Neo QLED, OLED and Lifestyle TVs. Specifically, it captured nearly half of the 80 inches or larger ultra-large TV segment.

The data also revealed Samsung's strong foothold in the rapidly growing ultra-large TV market of 75 inches or more, with a value-based market share of 38.8%. In the premium TV market, Samsung's market shares were impressive in North America and Europe, with 52.6% and 60.7% respectively. Meanwhile, in the ultra-large category of 80 inches or more, the company retained its leadership with a 43.9% share, boosted by new 98-inch offerings.

For premium TVs priced above $2,500, Samsung increased its market share by about 10 percentage points year-on-year to 59.1% in terms of value.

The global QLED TV market experienced robust growth, with sales increasing by 13% year-over-year to 3.73 million units, accounting for 8.0% of the total TV market. Samsung took the lion's share of this segment, selling 2.15 million QLED units, representing 57.5% of the total QLED market. Since its debut in 2017, Samsung's QLED TV sales have reached a total of approximately 38 million units as of the first quarter of 2023.

In contrast, the overall global TV market contracted in Q1 2023, largely due to an economic slowdown and seasonal downturn. Market value shrank by 12.5% to $22.49 billion, while volume dipped 5.2% to 46.52 million units.

Global Server Shipments to Rebound Slightly in 2Q23 After a Double-digit Decline in 1Q23

Global server shipments performed weaker than DIGITIMES Research had anticipated originally, slipping almost 14% sequentially to fall below four million units. Having a lower comparison base in the same quarter a year ago and the fact that brand vendors are expected to begin volume shipments of servers with new CPU platforms, overall server shipments are expected to witness a low single-digit sequential growth in the second quarter of 2023, according to DIGITIMES Research's latest server report figures.

With mature markets continuing to be haunted by high interest rates and inflation, their impacts on consumers' and enterprises' spending have widened, affecting US-based cloud services providers' (CSPs) plans on establishing new datacenters and undermining brand vendors' server orders from enterprises.

Large public cloud services providers including Meta and Amazon were pessimistic about their cloud service business in the upcoming quarter and had significantly reduced their order pull-ins in the first quarter of 2023, resulting in a more than 8% sequential decline in US-based datacenter operators' overall shipments.

Meanwhile, enterprises in mature markets also largely cut their on-premise server deployments, leading to a double-digit downfall in the shipments by server brands Dell and HP Enterprise (HPE). With the US government's export controls on high-end ICs plus China's stagnant digital economy development, China-based datacenter operators' shipments also exhibited a sequential decline in the first quarter of 2023.

Looking into the second-quarter 2023, global server shipments are expected to show a moderate rebound of nearly 4%. US-based datacenter operators' shipments will pale in comparison to the overall market performance as Meta continues to reduce its shipments. Microsoft and Google may place extra orders for AI servers to keep up with the rising popularity of ChatGPT but their shares among global server shipments will still be limited.

Server brands are expected to fare better in the second quarter of 2023, to show a mid-to-high single-digit sequential growth as they step up shipments of servers with next-generation CPU platforms. China-based datacenter operators will also deliver a single-digit sequential growth due to a low comparison base in the first quarter of 2023.

Hon Hai revenue increases 7.23%

Hon Hai Precision Industry Co said its revenue last month grew 7.23 percent from March, boosted by contributions from its smartphone and computer products. Revenue last month expanded to NT$429.22 billion (US$14.01 billion) from NT$400.29 billion in March, the company said in a statement. However, revenue was down 11.77 percent from NT$486.46 billion in April last year, as demand weakened across the board, it said.

In the first fourth months of this year, revenue fell 0.14 percent year-on-year to NT$1.891 trillion from NT$1.894 trillion in the same period last year.

Hon Hai attributed the revenue decline to a period of product transition and an unusually strong pull-in in the first half of last year, when a year-long components shortage began to ease. Hon Hai posted double-digit percentage revenue growth from smart consumer electronic products, primarily smartphones, thanks to customers' pull-in, it said. Computing products were another growth driver, gaining significant momentum from March, the company said. Revenue from cloud and networking products held steady last month, while components and other products lost steam and registered lower revenues amid weakness in its non-core businesses, Hon Hai said.

China's Imports Shrink, Exports Slow

China's imports contracted sharply last month, while exports rose at a slower pace, reinforcing signs of feeble domestic demand despite the lifting of COVID-19 curbs and heaping pressure on an economy already struggling in the face of cooling global growth. China's economy grew faster than expected in the first quarter of this year thanks to robust services consumption, but factory output has lagged, and the latest trade numbers point to a long road to regaining pre-COVID-19 momentum.

Inbound shipments to the world's second-largest economy fell 7.9 percent year-on-year, extending the 1.4 percent decline seen a month earlier, while exports grew 8.5 percent, easing from the 14.8 percent surge in March, customs data showed yesterday. The downturn in imports suggests that the global economy is unlikely to be able to count much on China's domestic engine of growth, and as the nation re-exports some of its imports, it also reinforces the extent of weakness in some of its major trading partner economies. Analysts

say the sharp global monetary policy tightening campaign of the past 12 to 18 months and recent Western banking stress remain concerns for the revival prospects of China and the world.

Shipment growth to ASEAN, China's largest export partner, slowed to 4.5 percent last month from 35.4 percent in March. Other data showed that South Korean exports to China, a leading indicator of China's

imports, were down 26.5 percent last month, continuing 10 consecutive months of decline. China's coal imports fell last month from a 15-month high the prior month, while imports of copper — a proxy for global growth — and natural gas were also down in the same period.

China Bars US Chips Made by Micron

China delivered the latest salvo in an escalating semiconductor war with the US, announcing that Micron Technology Inc products have failed to pass a cybersecurity review in the country.

Operators of key infrastructure in China should not buy the company's goods, the Cyberspace Administration of China (CAC) said in a statement on Sunday, adding that it found "relatively serious" cybersecurity risks in Micron products sold in China.

The components caused "significant security risks to our critical information infrastructure supply chain," which would affect national security, it said.

The results come more than a month after China announced an investigation on imports from the US' largest memory chip maker.

The tech sector has become a key battlefield over national security between the two largest economies, with Washington having blacklisted Chinese tech firms, cut off the flow of sophisticated processors and banned its citizens from providing help to the Chinese chip industry.

Beijing's conclusion had "no basis in fact," and Washington would continue to limit industry disruptions with its allies, the US Department of Commerce said in a statement.

"No one should understand this decision by CAC as anything but retaliation for the US's export controls on semiconductors," said Holden Triplett, founder of Trenchcoat Advisors and a former FBI counterintelligence official in Beijing.

"No foreign business operating in China should be deceived by this subterfuge. These are political actions pure and simple, and any business could be the next one to be made an example of," Triplett said.

The move brings fresh uncertainty to other US chipmakers that sell to China, the world's biggest market for semiconductors. Companies such as Qualcomm Inc, Broadcom Inc and Intel Corp deliver billions of chips to the country, which use the components in electronic products shipped all over the world.

The agency said that while the country welcomes products and services provided by companies of all countries as long as they comply with its laws and regulations, the investigation into Micron products is a "necessary measure" to safeguard national security.

It did not give details on what the security risks were or identify which Micron products have been barred. Micron, which had previously said it stood by the security of its products and commitments to customers, said in a statement on Sunday that it is evaluating the conclusion of the review.

The company is assessing its next steps, it said, adding that it looks forward “to continuing to engage in discussions with Chinese authorities.”

The agency’s move would likely have little effect on Micron, as the ban applies to “critical information infrastructure (CII),” Jefferies Group LLC analysts, including Edison Lee said in a research report, referring to operations such as data centers and cloud computing services with security risks.

Most of Micron’s memory chips sold in China are used in consumer electronics, such as smartphones and notebook computers, they said.

Elon Musk and Texas Gov. Greg Abbott Break Ground on Tesla Lithium Refinery

Tesla CEO Elon Musk joined Texas Governor Greg Abbott to break ground at the site of the electric vehicle maker’s new lithium refinery in Corpus Christi on Monday.

Tesla plans to invest $375 million to build the facility on the Gulf coast that will help it secure a domestic supply of lithium hydroxide, a key ingredient used to make batteries for its electric vehicles, and its home- and utility-scale batteries. Musk said that Tesla is aiming to produce enough battery-grade lithium at the refinery to manufacture one million vehicles per year, and to produce more lithium than the rest of North America’s refining capacity combined there.

Mining company Albemarle announced plans to invest $1.3 billion in a new lithium processing facility in South Carolina in March.

According to filings with the Texas Comptroller’s office, Tesla specifically plans to construct a “battery-grade lithium hydroxide refining facility,” and other “facilities to support other types of battery materials processing, refining and manufacturing and ancillary manufacturing operations in support of Tesla’s sustainable product line.”

The company promised in its filings that “the process Tesla will use is innovative and designed to consume less hazardous reagents and create usable byproducts compared to the conventional process.”
Musk claimed, “There’s no toxic emissions or anything -- you could live right in the middle of the refinery and not suffer any ill effects.”

Factory Closures, Layoffs Happening in China Electronics Industry

Many small- and medium-size businesses involved in the local supply chain for electronics parts and other devices have seen factory closures and layoffs in southern and eastern China, according to industry sources. Due to a poor outlook on China's consumer electronics market, numerous small and medium-size businesses in southern China that are part of the local supply chain for electronics accessories, parts, and other products have relocated or closed. The factories that remain open have also implemented layoffs, wage reductions, and unpaid leave to respond to dwindling orders, the sources indicated.

Despite the progressive relaxation of COVID lockdowns and restrictions in China, the country's southern area, where manufacturing is the mainstay, faces a dire economic situation, the sources said. China's domestic demand is cautious, and market competition is severe, with raw material prices rising. More electronics manufacturing companies in Southern China will close, according to the sources.

The industry supply chain in Shenzhen, for example, is mostly involved in the fields of electronics and toys. The global economic downturn and diminishing market demand have had an immediate impact on local factory operations in Shenzhen, the sources noted.

A wave of industry closures has accelerated in southern China since 2022, with large electronics factories that have been in operation for more than 30 years declaring their closure one after the other, the sources said. Several factories in Shenzhen were closed during the city's lockdown. There were production issues, orders were received, and delivery could not be fulfilled, resulting in the inability to begin work.

While the epidemic has subsided, consumption has yet to recover. Even though the present surviving factories have avoided bankruptcy, orders in the electronics supply chain remain disappointing. To save costs, factory hiring is still strictly regulated, resulting in an oversupply of labor in both southern and eastern China, the sources indicated.

The layoff phenomenon may persist in part because most businesses are pursuing industrial transformation, upgrading technology and equipment, and eventually replacing labor with artificial intelligence (AI) and automation equipment, according to the sources.

Furthermore, rising geopolitical tensions push businesses to diversify their manufacturing bases. The strategy for using China as a manufacturing base has evolved, affecting the electronics industries of southern and eastern China, the sources said.

Almost Half of all Refurbished Smartphones Sold Last Year Were Apple iPhones

Although Samsung recently moved ahead of Apple when it comes to global smartphone shipments, one area where Cupertino dominates is the refurbished phones market. About half of the refurbed handsets sold globally last year were iPhones, marking a 16% year-on-year increase.

According to Counterpoint Research's data, the global economic crisis saw demand for cheaper, refurbished smartphones grow 5% last year, with India (+19%) and Latin America (+18%) leading the way. While refurbed phone sales increased in 2022, shipments of new devices fell -11.3%.

The global figure for refurb sales would have been even higher were it not for the -17% decline in sales in China due to increasing Covid-19 cases and the country's extreme Covid-Zero policies that impacted businesses and demand. Samsung might have edged past Apple when it comes to global smartphone shipments, but iPhones were dominant in the refurbished market last year. Their global volumes increased 16% YoY, taking Apple's market share to 49%. Samsung, meanwhile, saw its share decrease from 28% to 26%. As such, there was a slight shift of Android consumers to iOS in 2022, a trend Counterpoint believes will continue. The increased demand for refurbished iPhones is affecting sales of new handsets and Apple's service revenue in many markets. But the popularity of refurbed iPhones means people are buying them even in places where new variants are hard to find.

The Most Popular Search Engine in the World is About to Look Different

Google is moving forward with plans to bring AI chat features to its core search engine as it works to keep pace with a wave of new artificial intelligence tools that could threaten the company’s dominance online for the first time in decades. The company said it is introducing the next evolution of Google Search, which will use an AI-powered chatbot to answer questions “you never thought Search could answer” and to help get users the information they want quicker than ever.

With the update, the look and feel of Google Search results will be noticeably different. When users type a query into the main search bar, they will automatically see a pop-up with an AI-generated response in addition to displaying traditional results.

Users can now sign up for a waitlist for the new Google Search, which will first launch in the United States, via the Google app or Chrome's desktop browser. A limited number of users will have access to it in the coming weeks, according to the company.

Why India is Proving More Attractive for Foreign Manufacturer

The Economist Intelligence Unit reported earlier this month that India was one of the most improved countries in its quarterly forecast of the best business environments in the next five years. In the EIU's Business Environment Ranking (BER) published on April 13, the South Asian nation climbed six notches on a global basis and from 14th to 10th among 17 economies in Asia.

As evidence of this improvement, Bloomberg in March this year reported that Apple contractor, Taiwan's Foxconn is looking to bolster manufacturing in India. The iPhone maker is planning to invest USD 700 million to build a factory near Bengaluru, which could significantly expand the production of Apple's smartphones in India. It further claimed that Indian officials say Apple wants to shift 25 per cent of its manufacturing there amid concerns about China.

Currently, India accounts for about 5-7 per cent of the total manufacturing output of Apple's components.

The planned manufacturing facility on a 300-acre site near the IT hub city of Bengaluru will manufacture iPhone components and may also assemble the devices. It will likely employ around 100,000 workers, making it about a third the size of the world's largest iPhone factory in the Chinese city of Zhengzhou.

According to the Bloomberg report, the new factory near Bengaluru could "boost the country's share of iPhone assembly to 10-15 per cent from a sub-5 per cent currently."

Forbes said JP Morgan projected last year that Apple will move 5 per cent of global iPhone 14 manufacturing to India by the end of 2022 and that number will rise to 25 per cent of all iPhone manufacturing by 2025.

Foxconn had earlier this year announced plans to build a major electronics manufacturing facility in the state of Telangana that would also create 100,000 jobs, but it is unclear if that plant will make Apple products. Up to this point, Foxconn, which is the world's largest iPhone manufacturer has most of its plants in mainland China.

The shift to India is a result of global geopolitical trends in particular the tension between Beijing and Washington. In addition, due to both the COVID-19 pandemic and the Russia-Ukraine war, global manufacturers have been re-evaluating their manufacturing supply chains and outsourcing options. Some are considering strategies for "reshoring sourcing" and "localization of manufacturing".

Many companies have become wary of supply-chain overreliance on China, the world's factory and are implementing or considering "China plus one" strategies aimed at building production across multiple markets. Apple's reported plan to expand its manufacturing in India is to offset its **reliance** on Chinese factories. Foxconn's reported investments in India are likely an effort to align with Apple's goals. Apple's operations in China were also disrupted by Beijing's harsh anti-Covid lockdowns last year including one which triggered protests at Foxconn's Zhengzhou factory known as "iPhone City," where Apple manufactures nearly all its iPhone 14 Pro and Pro Plus models. This disruption caused Apple to fall short of its production target for the iPhone 14 in 2022 by nearly 6 million units. Apple is by no means the only large global manufacturer betting on India. In March, Korean electronics giant Samsung announced that it will invest in setting up smart manufacturing capabilities at its mobile phone plant in Noida to make production more competitive. Samsung, which started a manufacturing R-D center in India in 1996, has now close to 70,000 employees in the country.

Samsung estimates that India will have one billion smartphone users by 2026 and its population of 600 million in the age group of 18-35 years makes it the largest population of Millennials and GenZs in the world.

U.S. Crawls Toward Rebuilding Frail PCB Industry

On March 24, U.S. President Joe Biden and Canadian Prime Minister Justin Trudeau announced that both nations would contribute funds to support the North American manufacture of critical technologies that include semiconductors. The agreement earmarked $52 million for PCB production.

On March 27, Biden issued a determination that action to expand domestic production of PCBs under the Defense Production Act (DPA) is necessary to avert a shortfall of critical technology that would severely impair national security.

The U.S. portion of global PCB production has plunged to 4% today from 30% about 25 years ago, according to data provided by PCBAA. During the same period, China's share has soared to 54% from 8%. The global PCB market, worth $78 billion in 2021, is forecast to nearly double to $128 billion by 2030, according to Precedence Research.

Now, most of the boards that connect chips and other parts in electronic systems—ranging from data centers to drones—are made in China, the main strategic adversary of the U.S. For longer than six years, China and the U.S. have been engaged in an intensifying cold war to achieve dominance in technology.

Vulnerabilities go Beyond PCB Gap

The effort to fill the PCB gap underscores a range of vulnerabilities in the U.S. electronics supply chain running from chips to semiconductor packaging and on down to the board level.

To revive the U.S. PCB industry, domestic manufacturers must count on more than defense sales; they will need to gain a larger share of the high-end commercial business for boards used in computing, communications, and medical systems. That's where another legislative proposal—the Supporting American Printed Circuit Boards Act of 2022, a.k.a. HR 7677—could help.

The U.S. government efforts last month create "more awareness and support for things like HR 7677," Pillai said. "HR 7677 could result in two to three cutting-edge [PCB] fabs being built in the U.S."

The proposed act—which was introduced on May 6, 2022, in a previous session of Congress but didn't receive a vote—would provide $3 billion in funding to expand production. Building an advanced PCB fab is a two-year process that costs as much as $400 million. By contrast, a state-of-the-art chip fab costs as much as $20 billion to build.

Though the bill was not enacted, its provisions could become law by being included in another bill.

World Circular Connector Market 2023

Bishop & Associates has just released a new, extensive 229-page, seven-chapter research report providing an in-depth analysis of the MIL-spec/COTS equivalent and commercial/industrial circular connector markets. This new report furnishes detailed statistics worldwide and by region, broken down by circular connector types for the years 2021, 2022, 2023F and 2028F. In addition, to specific circular connector series, products are recapped as MIL-Spec/COTS equivalents and commercial/industrial types**.** An expanded quantitative review of cable assemblies using circular connectors is included along with reviews of many key manufacturers that produce the circular connectors discussed.

Total World Circular Connector Sales by Region
Mil-Spec & COTS Equivalent
2021-2022

	North America			Europe		
MIL-Spec Circular Connectors	**2021**	**2022**	**% Chg.**	**2021**	**2022**	**% Chg.**
Standard Circular Connectors (MIL & COTS)						
MIL-DTL-5015 A/B, E/F/R (MS is Inactive for New Design)						
CA/CT-, F-80, 97-, etc.	$XX.X	$XX.X	Y.Y%	$XX.X	$XX.X	Y.Y%
MIL-DTL-5015-340X (Front Release) & -350X (Rear Release)	$XX.X	$XX.X	Y.Y%	$XX.X	$XX.X	Y.Y%
MIL-DTL-83723 Series III (Crimp, Rear Release)						
EN2997/BACC, SBAC ESC10 & ESC11, GE M50TF3564	$XX.X	$XX.X	Y.Y%	$XX.X	$XX.X	Y.Y%
Standard Reverse Bayonet VG 95234 Types						
CA-B, CB, GCA/B	$XX.X	$XX.X	Y.Y%	$XX.X	$XX.X	Y.Y%
Others	$XX.X	$XX.X	Y.Y%	$XX.X	$XX.X	Y.Y%
Total Standard Circular	**$XXX.X**	**$XXX.X**	**Y.Y%**	**$XXX.X**	**$XXX.X**	**Y.Y%**
Miniature Circular Connectors (MIL & COTS)						
MIL-DTL-26482 Series I Solder, PT, SE, KPT	$XX.X	$XX.X	Y.Y%	$XX.X	$XX.X	Y.Y%
MIL-DTL-26482 Series I Crimp	$XX.X	$XX.X	Y.Y%	$XX.X	$XX.X	Y.Y%
MIL-DTL-26482 Series II & M83723 Series I	$XX.X	$XX.X	Y.Y%	$XX.X	$XX.X	Y.Y%
MIL-DTL-83723 Series III	$XX.X	$XX.X	Y.Y%	$XX.X	$XX.X	Y.Y%
MIL-DTL-26500, BACC45-BACC63BV/BP/BN or CC/CP, C48	$XX.X	$XX.X	Y.Y%	$XX.X	$XX.X	Y.Y%
Other Types: MIL-C-81582 (SAE-AS81582), MIL-DTL-83538, MIL-C-81703 (SAE-AS81703), etc.	$XX.X	$XX.X	Y.Y%	$XX.X	$XX.X	Y.Y%
Total Miniature Circular	**$XXX.X**	**$XXX.X**	**Y.Y%**	**$XXX.X**	**$XXX.X**	**Y.Y%**
Subminiature Circular Connectors (MIL & COTS)						
Mil-DTL-38999 Series I	$XX.X	$XX.X	Y.Y%	$XX.X	$XX.X	Y.Y%
Mil-DTL-38999 Series II, Incl. Composites	$XX.X	$XX.X	Y.Y%	$XX.X	$XX.X	Y.Y%
Mil-DTL-38999 Series III, incl. NATO Types & Composites: BACC63CT/CU or BACC63DB/DC, EN3645, CECC	$XX.X	$XX.X	Y.Y%	$XX.X	$XX.X	Y.Y%
Mil-DTL-38999 Series IV	$XX.X	$XX.X	Y.Y%	$XX.X	$XX.X	Y.Y%
Others: Mil-C-27599, Push-Pull, MIL-DTL-81511 SS as SAE-AS81511, 348	$XX.X	$XX.X	Y.Y%	$XX.X	$XX.X	Y.Y%
Total Subminiature Circular	**$XXX.X**	**$XXX.X**	**Y.Y%**	**$XXX.X**	**$XXX.X**	**Y.Y%**

$ Millions

Connectors are an essential part of electrical and electronic connections. In an increasingly electronic and digital world, connectors are key to creating products for networking and connectivity. They are used in all areas of electrical engineering and electronics. Depending on the application and transmission required, connectors are designed to satisfy the intended purpose in the best way possible, which is why there are so many variations, types, and sizes.

This report focuses on circular connectors, which range in size from nano and micro-miniature to huge, heavy-duty models. New product highlights include the recently issued MIL-DTL-32689 (micro DTL-38999 types), M5 for SPE, Multi-Port circulars with RF and FO, heavy duty vehicle connectors, hybrid and power M Series, hermaphroditic audio types, mini-sensor connectors, sealed and unsealed plastic circulars, push-pull and breakaway, and others, plus updates on both MIL and commercial versions of popular MIL-DTL-38999, MIL-DTL-5015, etc. Applicable US standards (MIL-Spec, EIA, SAE, etc.) plus selected international specifications (EU, Russian, Chinese, etc.) are listed.

Total World Circular Connector Sales by Region
Commercial and Industrial
2023F and 2028F with 5-Year CAGR

Commercial / Industrial Circular Connectors	2023F	2028F	5-Yr CAGR
DIN 41524, DIN 43563 Types (non-RF) Connectors			
Standard Circular	$XX.X	$XX.X	Y.Y%
Mini DIN Circular (Keyboard type, etc.)	$XX.X	$XX.X	Y.Y%
Subtotal DIN Connectors	**$XX.X**	**$XX.X**	**Y.Y%**
Audio/Microphone/Speaker Connectors			
Microphone (QG, XLR type)	$XX.X	$XX.X	Y.Y%
Large Types: MASScon, K/LK, SYNTAX SSX	$XX.X	$XX.X	Y.Y%
Speaker and Other Audio-type Connectors	$XX.X	$XX.X	Y.Y%
Subtotal Audio/Microphone Type Connectors	**$XX.X**	**$XX.X**	**Y.Y%**
Miscellaneous Circular			
Industrial Types: VEAM, HUBBELL, Eaton AMC, Amphenol DM, Socapex, ABB/Russellstoll , IEC 60309 connectors (IP69K), etc.	$XX.X	$XX.X	Y.Y%
Plastic Shell: ISO 15170, CPC types, HR30, etc.	$XX.X	$XX.X	Y.Y%
Soft Shell Types: Sure Seal, 164, Molded Remke, etc.	$XX.X	$XX.X	Y.Y%
Metal Shell: Amphenol 67, WPI 165, Japanese JIS C 5432, etc.	$XX.X	$XX.X	Y.Y%
Subtotal Misc. Circular	**$XX.X**	**$XX.X**	**Y.Y%**
Push Pull (Lemo, ODU, Fischer, YC8, types)			
Metal & Plastic Shell, Push Pull	$XX.X	$XX.X	Y.Y%
Subtotal Push Pull Connectors	**$XX.X**	**$XX.X**	**Y.Y%**

$ Millions

This report is intended for use by those interested in forecasting circular connectors by product and industry trends or benchmarking comparative sales by product type or overall and regional markets, while providing an understanding of various circular connectors including new types, industry standards, and primary suppliers. While an in-depth technical presentation is not intended (books are written just on the materials involved), basic technology and comparative specifications are included. Forecasts reference industry specifications and generic series terminology.

The following table of contents shows the detail provided in this new report.

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What's New ?

Bishop & Associates has recently completed several new research reports about the worldwide connector industry. A table of contents for each report can be found at **https://store.bishopinc.com**.

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