A glowing blue microchip is centered on a circuit board. The chip has a grid of small squares on its surface and is surrounded by intricate circuitry. The entire scene is bathed in a blue light, giving it a futuristic and technological appearance.

TPC Semiconductor Market Survey

January, 2019

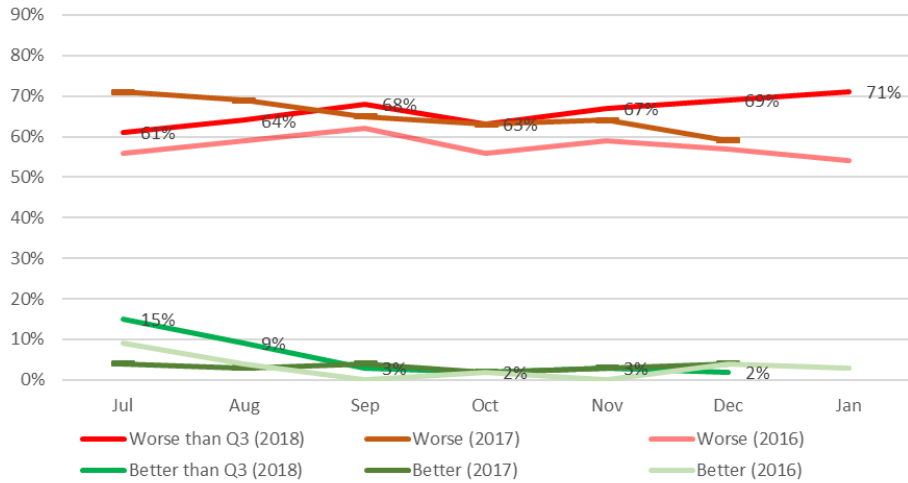
TPC January 2019 Survey Summary

Survey Date: January 11-14 Respondents: ~10,600 Location: Worldwide (~73% Asia) Who: Active Electronics Industry Professionals

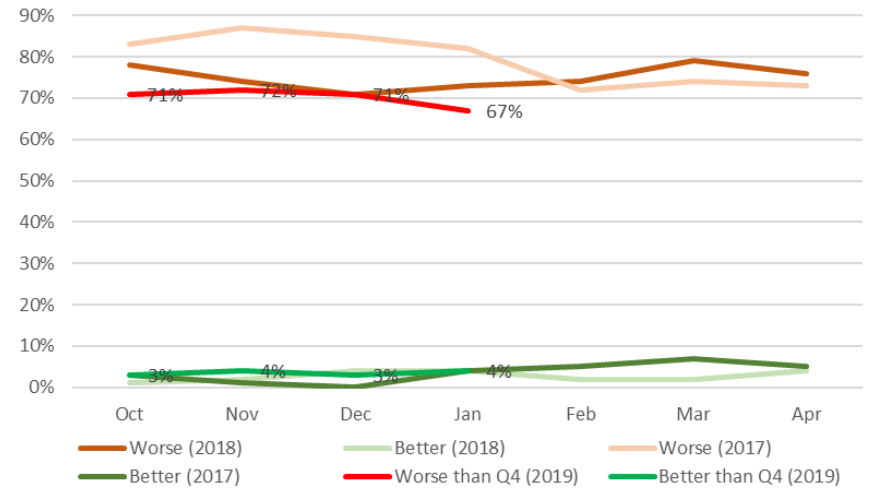
- Our January 2018 Semi industry survey of over 20k electronic industry professionals continued to show some weakening across a few metrics for Semiconductor and Passive component demand exiting Q4 and into Q1. We believe we are in a period of significantly weaker demand that will likely last into C2Q. We believe this is being driven by the impact from tariffs and the supply chain having too much inventory.
- The q/q demand growth for C4Q18 ticked lower vs. last month's survey; while C1Q19 demand outlook did improve modestly albeit still weak.
 - For C4Q, 71% saw Q4 demand to be weaker than Q3 (vs. 69% previously); while only 2% saw better growth.
 - For C1Q, 67% expect weaker q/q growth vs. 71% previously. Only 4% expect better q/q growth.
 - The majority see C1Q as sub seasonal vs. previous year's outlook.
 - Our initial outlook for C2Q demand looks seasonally weaker than the previous few years.
- C4Q18's booking expectations improved slightly with 65% expecting bookings to decrease q/q vs. 67% in last month's survey; however, only 7% expect improved bookings for C4Q. Most also expect C1Q19's booking to remain the same as C4Q's at 63%.
- Inventories appear to be moderating somewhat, with 43% saying C4Q18 inventories increased while only 8% see inventories decreasing – both slight improvements since last month. 35% expect them to continue to worsen in C1Q19 while only 14% expect them to improve. This is also a slight improvement from last month's survey
- Slide 9, which shows a more granular view of inventory by key components, shows inventory and availability continuing to improve all products. Of particular note is DRAM which ticked above the nominal line for the first time in 9 months.
- One negative indicator that continues to stand out is cancellation expectations which continue to ratchet up with 42% seeing an increase in cancellations over the last 30 days (vs. 39% last month). This represents a 2-year high.
- The Auto and Industrial verticals continue to weaken while Comm continues to improve.

Growth & Seasonality Outlook

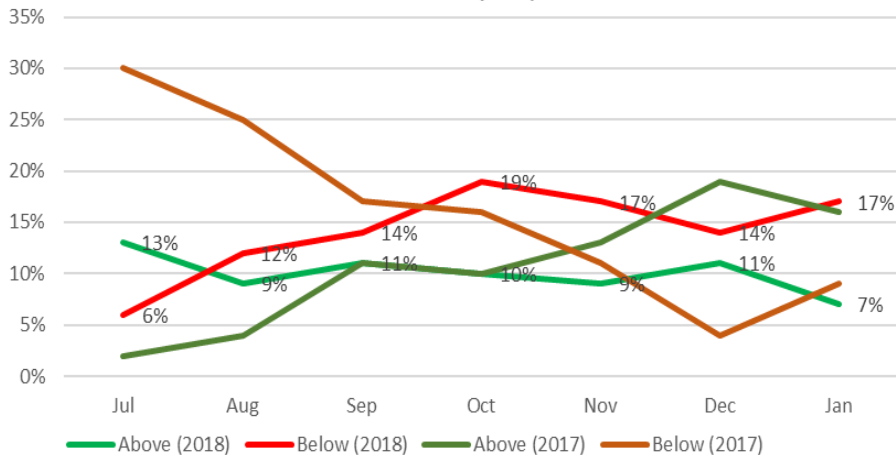
4Q Growth Expectations



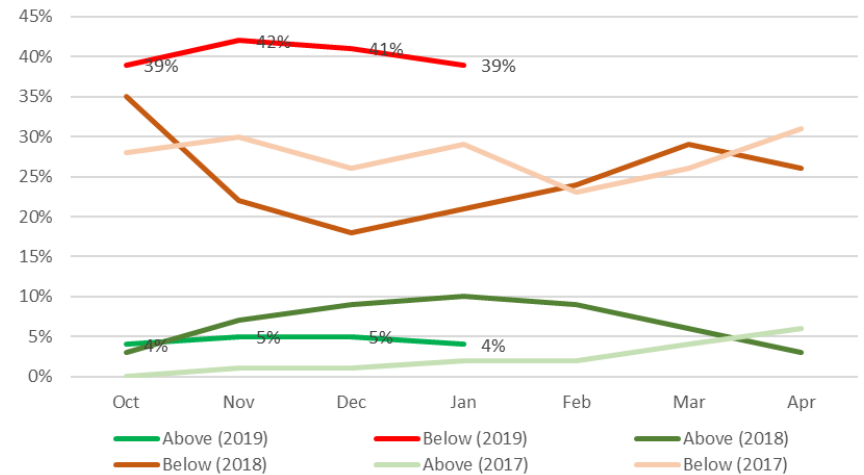
1Q Growth Expectations



4Q18 Seasonality Expectations

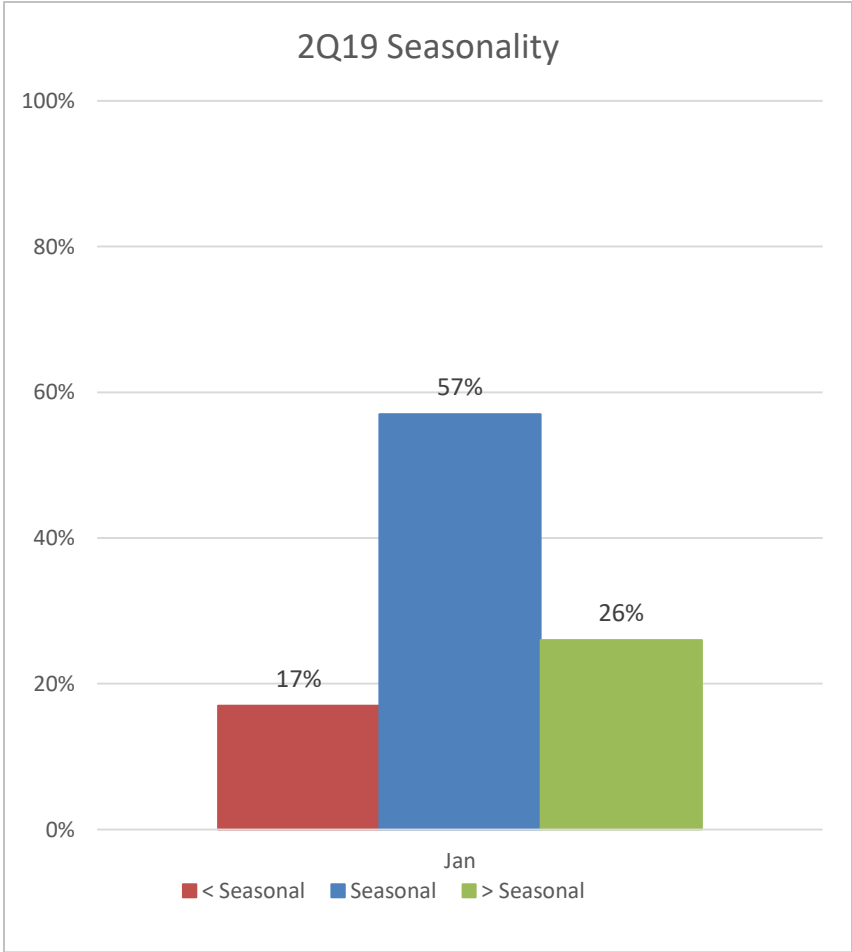
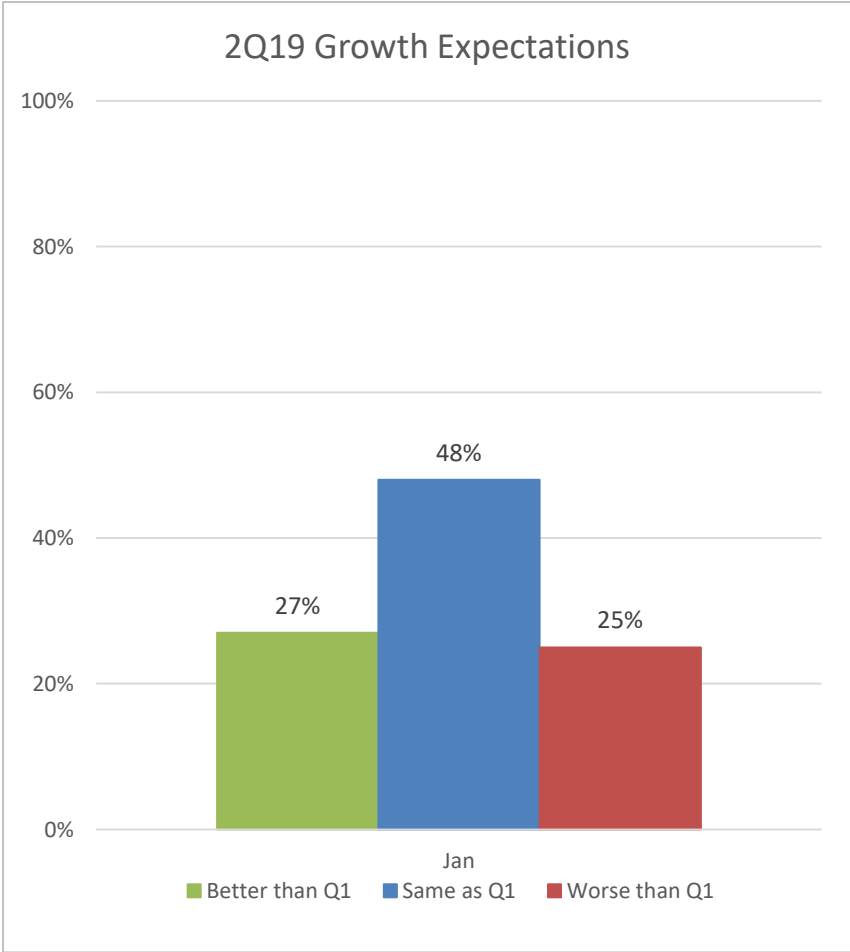


1Q19 Seasonality Expectations



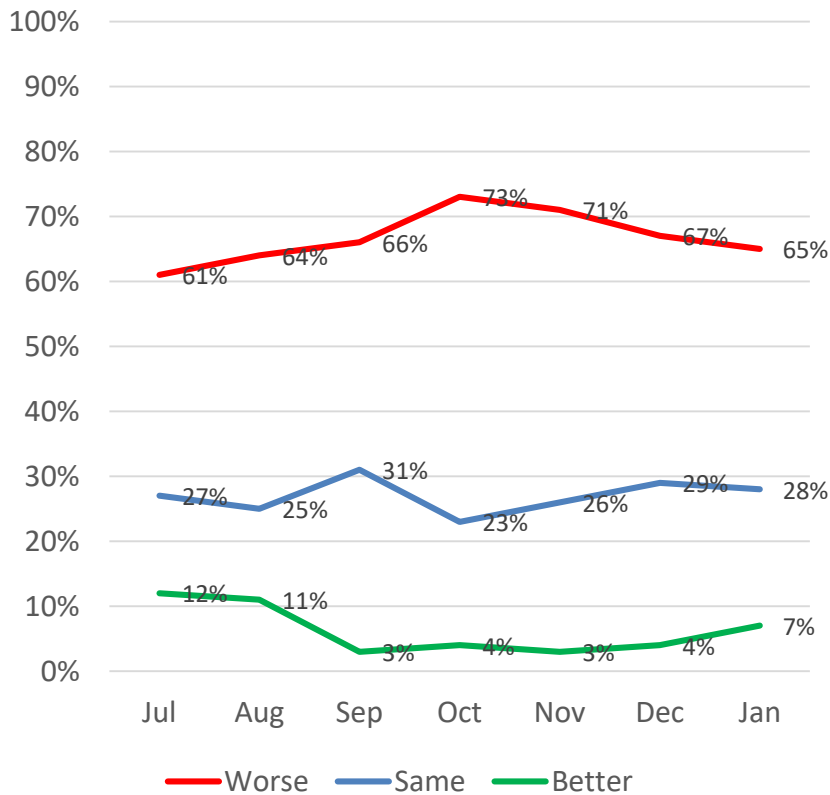
Growth & Seasonality Outlook

(both outlooks are weaker than previous 3 years)

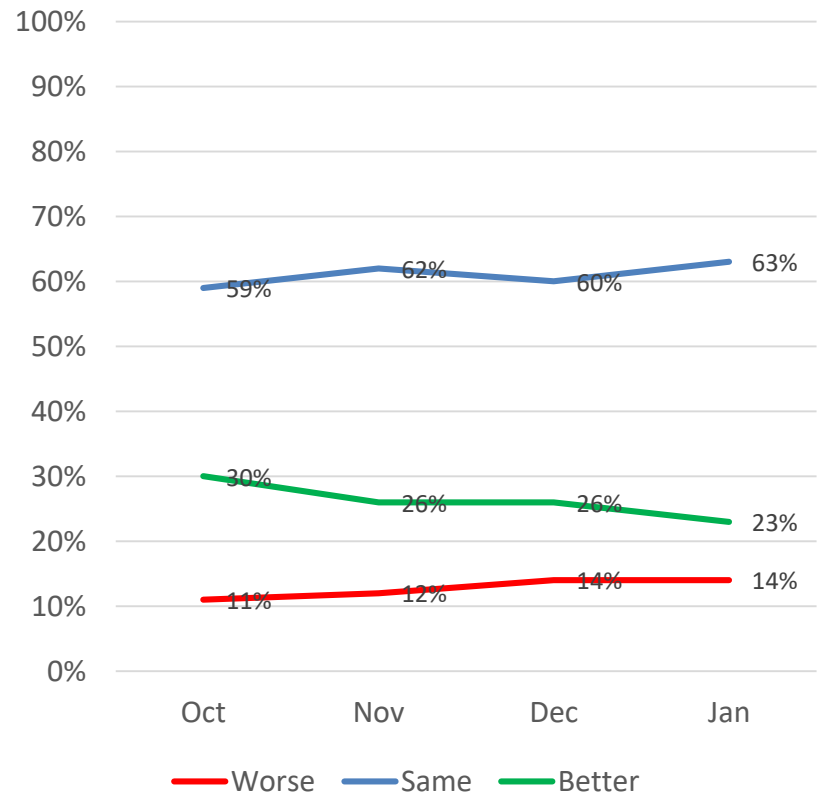


Q/Q Bookings Growth

C4Q18 Bookings vs. C3Q18

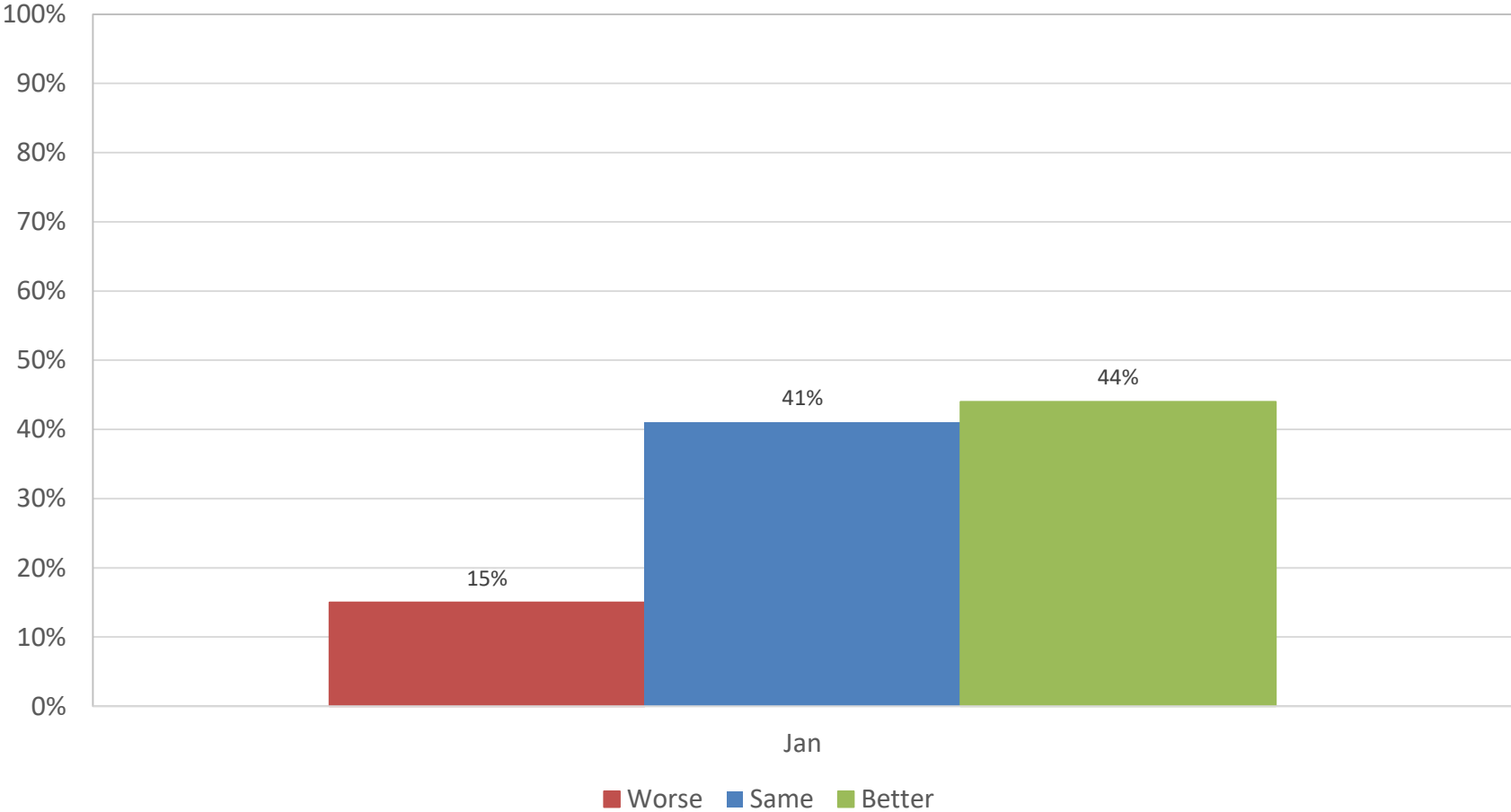


C1Q19 Bookings vs. C4Q18

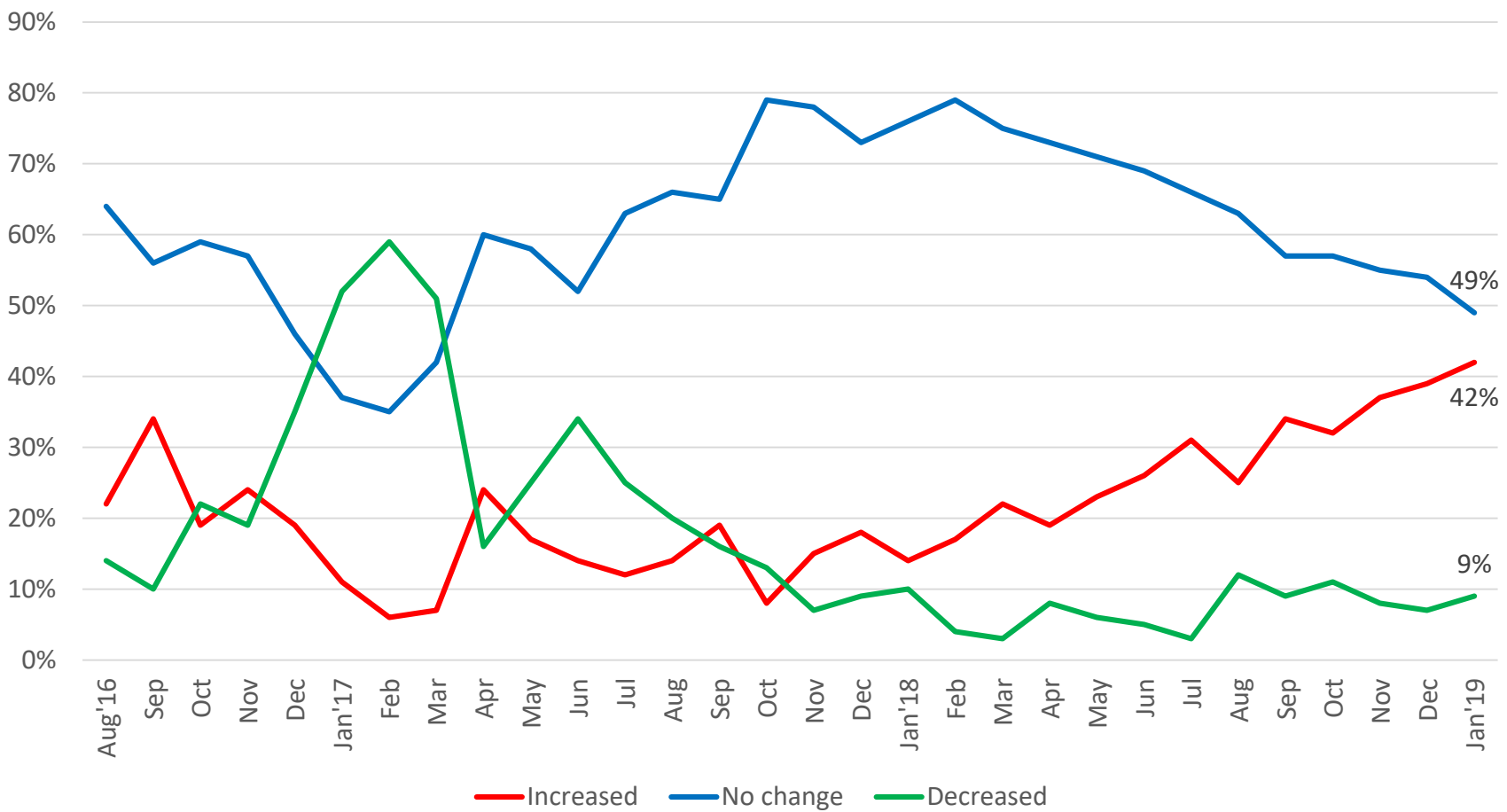


Q/Q Bookings Growth

C2Q19 Bookings vs. C1Q19

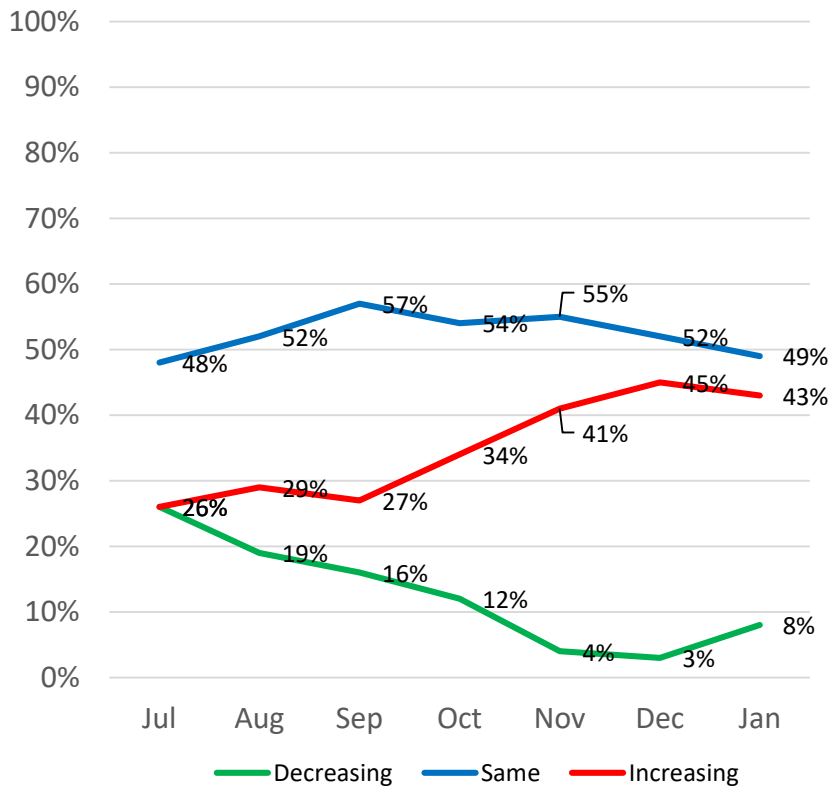


Backlog Order Cancellations vs. 30 Days Ago

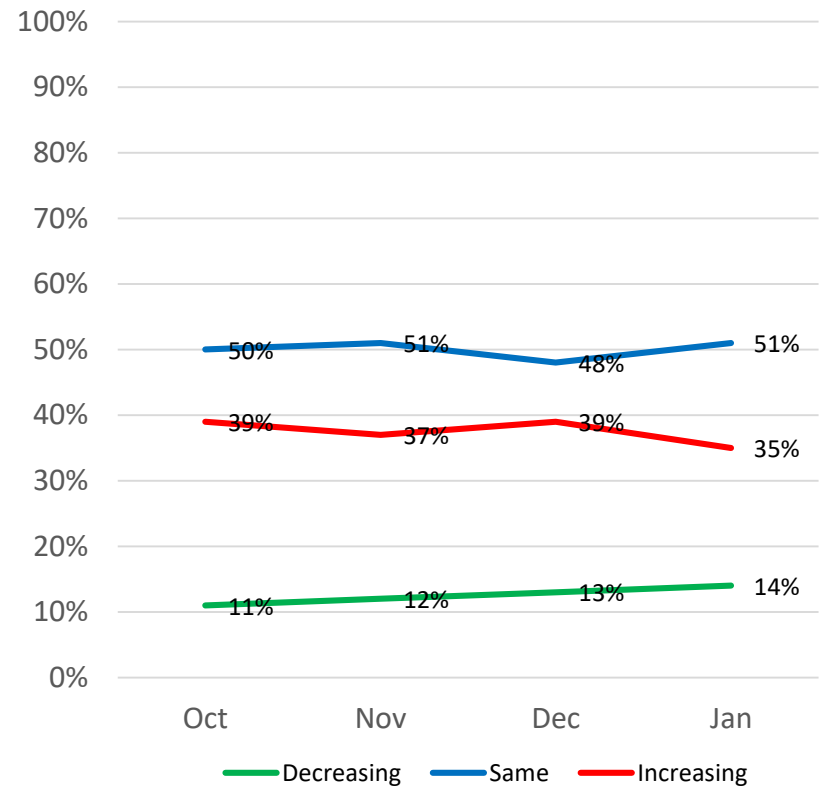


Q/Q Inventory Growth

C4Q18 Inventories vs. C3Q18

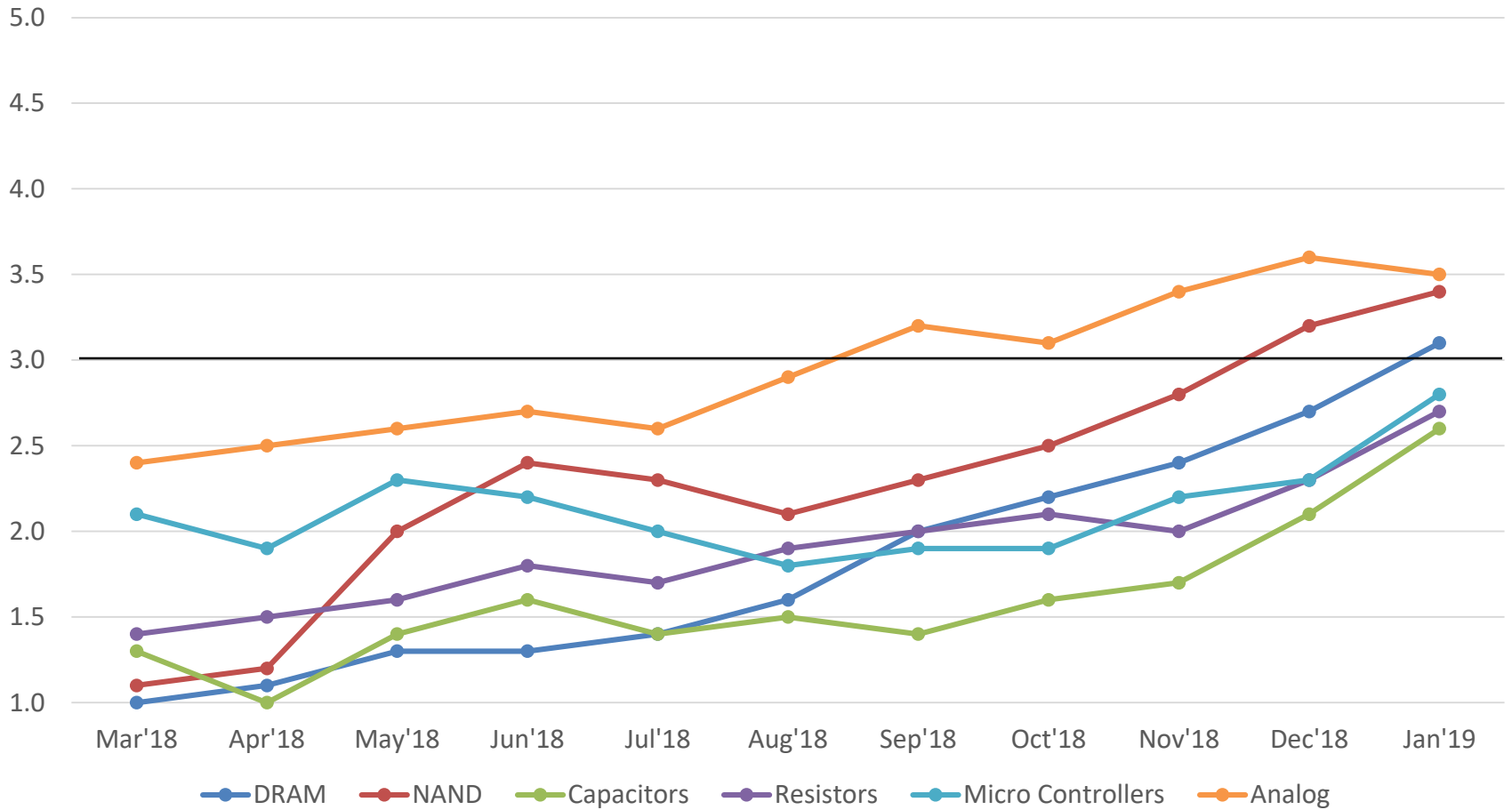


C1Q19 Inventories vs. C4Q18



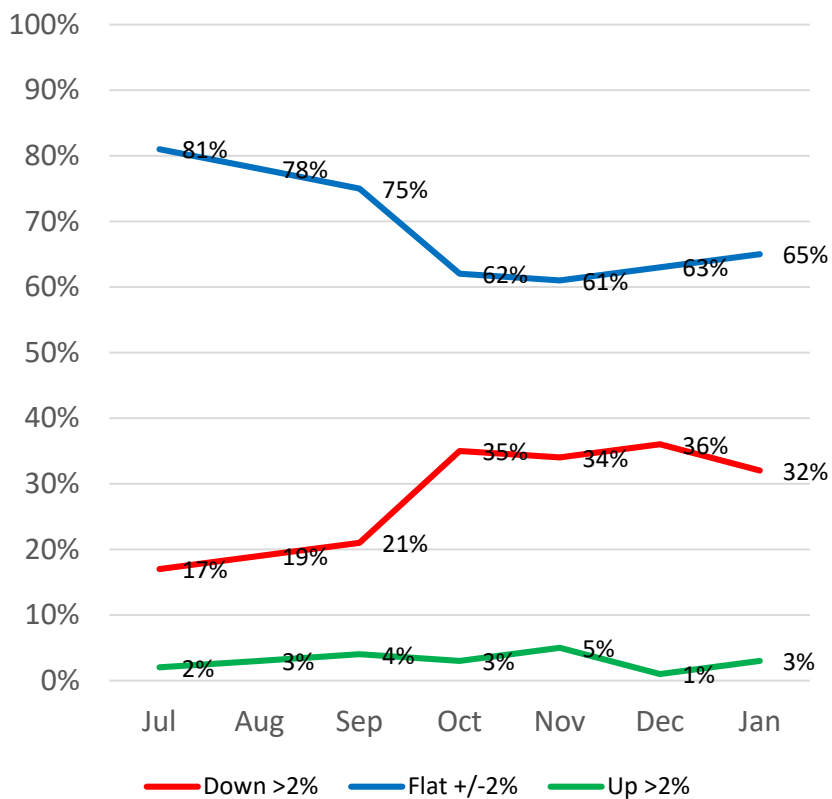
Inventory Status

(Using a scale of 1 to 5; with 1 being extremely low inventory, 3 being the right amount, and 5 being extremely high inventory; how do you view inventory levels for the following products?)

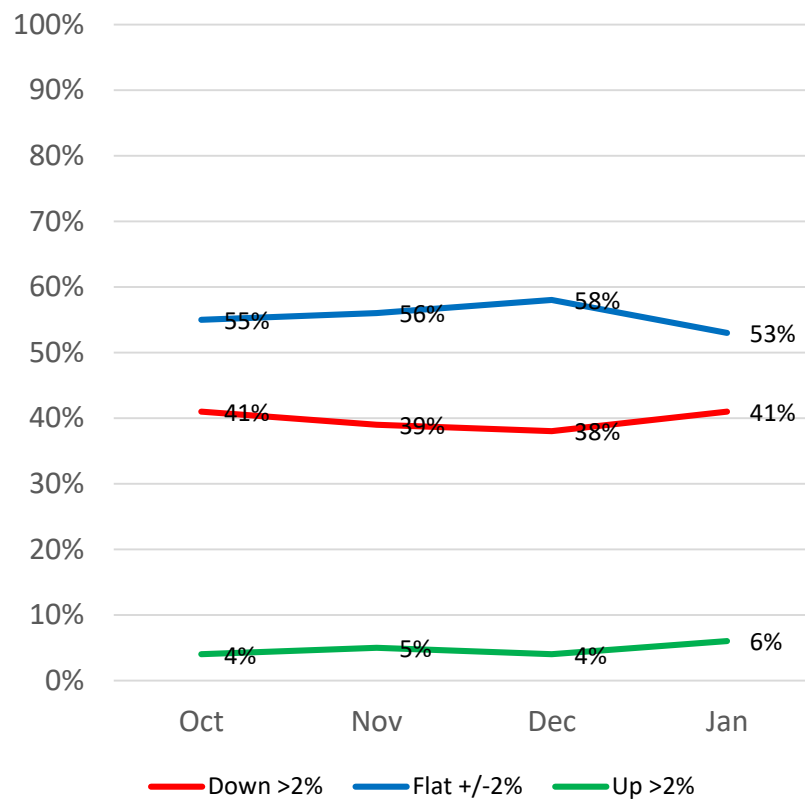


Q/Q Pricing Trends

C4Q18 Pricing vs. C3Q18



C1Q19 Pricing vs. C4Q18



Vertical Outlook

The outlook for Industrial continues to be strong and Consumer is starting to show improvement due to seasonal trends

