

Advanced Micro Devices (AMD)

\$52.39 (As of 04/30/20)

Price Target (6-12 Months): **\$54.00**

Long Term: 6-12 Months

Zacks Recommendation:

Neutral

(Since: 05/07/19)

Prior Recommendation: Underperform

Short Term: 1-3 Months

Zacks Rank: (1-5)

3-Hold

Zacks Style Scores:

VGM: C

Value: F

Growth: A

Momentum: C

Summary

AMD's first-quarter results benefited from robust adoption of Ryzen, Radeon and latest second-gen EPYC server processors. Further, accelerated adoption of AMD's products in the data center industry remains a key catalyst. Moreover, the growing clout of GPUs on account of increasing adoption of AI techniques and ML tools in industries like cloud gaming and supercomputing domain, holds promise. Notably, shares of the company have outperformed the industry in the past year. However, sluggishness in China on account of coronavirus crisis-induced lockdowns, weighed on PC-related sales in first-quarter 2020. Moreover, AMD provided cautious revenue guidance for the second quarter, which is a concern. Further, increasing expenses on product development amid stiff competition from NVIDIA and Intel are likely to weigh on profitability.

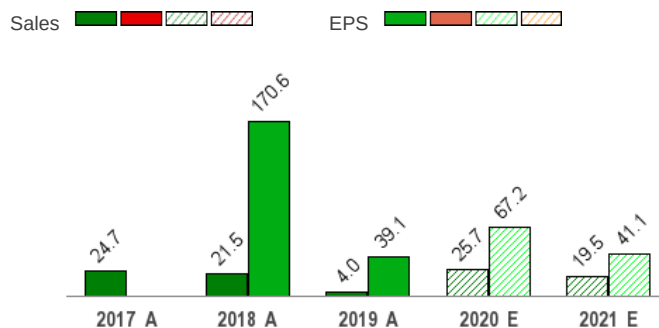
Price, Consensus & Surprise



Data Overview

52 Week High-Low	\$59.27 - \$26.03
20 Day Average Volume (sh)	77,189,808
Market Cap	\$61.4 B
YTD Price Change	14.2%
Beta	2.18
Dividend / Div Yld	\$0.00 / 0.0%
Industry	Electronics - Semiconductors
Zacks Industry Rank	Top 15% (38 out of 253)

Sales and EPS Growth Rates (Y/Y %)



Last EPS Surprise	0.0%
Last Sales Surprise	0.4%
EPS F1 Est- 4 week change	-1.2%
Expected Report Date	08/04/2020
Earnings ESP	-12.4%

Sales Estimates (millions of \$)

	Q1	Q2	Q3	Q4	Annual*
2021	2,185 E	2,362 E	2,677 E	2,776 E	10,115 E
2020	1,786 A	1,853 E	2,297 E	2,445 E	8,461 E
2019	1,272 A	1,531 A	1,801 A	2,127 A	6,731 A

EPS Estimates

	Q1	Q2	Q3	Q4	Annual*
2021	\$0.29 E	\$0.33 E	\$0.43 E	\$0.47 E	\$1.51 E
2020	\$0.18 A	\$0.18 E	\$0.31 E	\$0.37 E	\$1.07 E
2019	\$0.06 A	\$0.08 A	\$0.18 A	\$0.32 A	\$0.64 A

*Quarterly figures may not add up to annual.

P/E TTM	68.9
P/E F1	49.0
PEG F1	1.6
P/S TTM	8.5

The data in the charts and tables, including the Zacks Consensus EPS and Sales estimates, is as of 04/30/2020. The reports text is as of 05/01/2020.

Overview

Advanced Micro Devices has strengthened its position in the semiconductor market on the back of its evolution as an enterprise-focus company from a pure-bred consumer-PC chip provider.

AMD has emerged as a strong challenger to NVIDIA's dominance in the graphic processing unit or GPU market based on its Radeon technology.

Launch of 7 nanometer (nm)-based AMD Radeon RX 5700-series gaming graphics card family featuring RDNA architecture, high-speed GDDR6 (Graphics Double Data Rate type 6) memory and support for the PCIe 4.0 interface, has helped the company increase presence among gamers.

Moreover, AMD's Radeon Pro graphics cards and Radeon VR Creator cards support game developers, and virtual reality (VR) and augmented reality (AR) technologies, respectively.

Further, AMD Radeon Instinct family of GPU products are gaining traction in data center applications, including deep learning training and traditional high-performance computing (HPC) workloads.

Additionally, AMD EPYC 7001 Series of high-performance processors is helping AMD gain share in the server market. Further, AMD EPYC Embedded 3000 Series of processors addresses new markets including, networking, storage and edge computing devices.

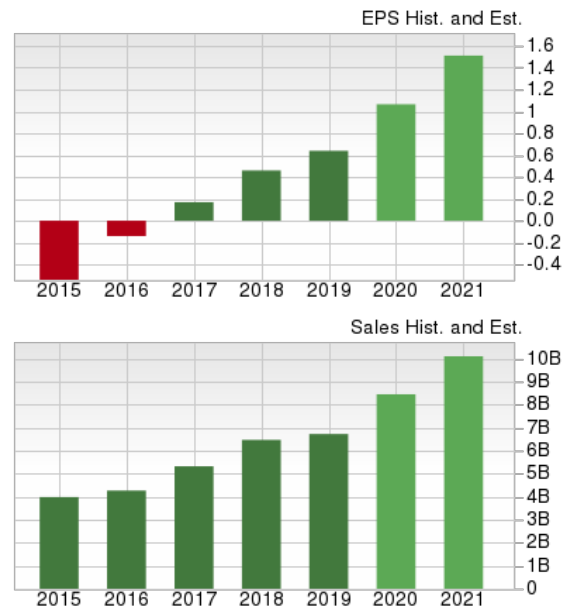
In consumer-PC market, AMD has become a key challenger to Intel courtesy AMD Ryzen desktop processor family. The company's desktop-based processor offerings include Ryzen and high-end Ryzen Threadripper processors, among others. AMD Athlon and AMD PRO series of processors cater to commercial and consumer desktop PC market.

AMD's processors are primarily powered by the company's proprietary "Zen" CPU and "Vega" GPU architectures.

Santa Clara, CA-based, AMD generated revenues of \$6.731 billion in 2019. The company reports operations under two segments — Computing and Graphics, and Enterprise, Embedded and Semi-Custom.

Computing and Graphics segment includes desktop and notebook processors and chipsets, discrete GPUs and professional graphics. This segment generated revenues of \$4.709 billion in 2019.

Enterprise, Embedded and Semi-Custom segment includes server and embedded processors, dense servers, semi-custom SoC products, engineering services and royalties. This segment generated \$2.02 billion in 2019.



Reasons To Buy:

- ▲ In order to diversify its business beyond the slowing, transitioning PC market, AMD started its semi-custom chip business in 2012 and has been performing very well till date. The semi-custom chip business combines both intellectual property (IP) from AMD's engineers as well as IP from customers to help design the chips for their own needs. Both Microsoft and Sony's game consoles use an accelerated processing unit (APU) chip that combines AMD's microprocessor and graphics technologies on the same piece of silicon. AMD plans to expand its semi-custom business into other high-growth markets such as the semi-custom ultra-low power client, embedded, dense server and professional graphics markets, where it can offer differentiated products that use its APU and graphics IP. The company's release of Vega-based GPUs and increasing demand for its Polaris products in both gaming and blockchain industries are key catalysts. AMD recently introduced promising features for gamers in computing, PC gaming and visualization technologies based on its new Radeon RX 5700 graphics card and third generation AMD Ryzen desktop processor. In CES 2020, AMD launched the much-awaited, next-generation, 7-nanometer (nm) Radeon Vega GPU, AMD Radeon VII. The card has been designed to deliver more than 29% of computing performance, offering extreme gaming details with 2X superior brightness and color volume. The number of Ryzen notebook models set to be launched in 2020 is 50% higher than the ones launched in 2019. These systems are mostly from the likes of Acer, Asus, Dell, HP, Lenovo and other OEMs and are expected to be launched in 2020. AMD also expanded Ryzen embedded family of processors by launching the new AMD Ryzen Embedded R1000 SoC.
- ▲ Despite its late entry, AMD has attained the position of a major player in the microprocessor and graphics processing markets. The company started small, targeting the low-end segment and gradually built a position for itself. AMD has had a very rough time because of the strength and market position of its two primary competitors Intel and NVIDIA. While Intel remains supreme in the microprocessor segment and has also notably strengthened its graphics capabilities, NVIDIA remains very strong in the graphics market. AMD combined its own engineering talent with that of ATI to develop capabilities in both these areas. Considering the might of its competitors, AMD has done well to hold its own in the face of significant changes in the markets it serves. Moreover, increasing demand for cryptocurrency mining has been a key catalyst for AMD's GPU sales in recent times.
- ▲ Given the persistent weakness in the core PC business, AMD like Intel, has started investing in its embedded business. Strength in this segment should continue in the future too as the company scores more wins. Given continued product enhancements and design wins at strategic players in key verticals such as digital signage and medical equipment, we expect the momentum to continue through 2020. The company is currently targeting the communications, industrial, and gaming segments of the market and there appear to be suitable design wins to generate substantial revenue growth over the next few years. These new SoCs are expected to deliver a noteworthy performance per watt improvement compared with its previous generation and offer industry-leading graphics capabilities for embedded designs. AMD expects the total addressable market for its high-performance embedded SOC and processors to be \$9 billion and therefore the company is trying to increase its share in this market by delivering competitive products.
- ▲ AMD entered into a definitive agreement to form a joint venture with Tianjin Haiguang Advanced Technology Investment Co., Ltd. (THATIC) in Apr 2016. This agreement is part of the company's efforts to gain share in China, which is the fastest growing regional data center server market. AMD licensed certain of its intellectual property (IP) to the THATIC JV for a total of approximately \$293 million in license fees payable over several years contingent upon achievement of certain milestones. The company also expects to receive a royalty based on the sales of the THATIC JV's products to be developed on the basis of its IPs. In 2016, AMD recognized \$88 million licensing gain associated with the THATIC JV. The trade deal with China is expected to benefit AMD in this regard.
- ▲ Management execution has been good amid testing times in the wake of the coronavirus pandemic. The solid net-cash balance of \$902 million as of Mar 28, 2020, provides the flexibility required to pursue strategic acquisitions and invest in other growth initiatives.

AMD is well-poised to benefit from strong demand for its x86-based microprocessors, semi-custom chips, and embedded processors, and GPUs driven by increasing adoption of AI and ML techniques.

Reasons To Sell:

- ▼ In the traditional computing market, which still generates a chunk of its revenues, AMD is up against Intel's strong market position. With Intel systems so well entrenched, there is an obvious preference for system integrators to choose Intel processors over AMD. So far, Intel processors have also afforded superior functionality, enabling it to exercise pricing power. In the past, AMD was forced to resort to penetration pricing, which severely impacted its profitability. Now that it is getting into the higher-range segment, it is facing very stiff competition from Intel. Moreover, AMD faces significant competition from NVIDIA in GPU market. AMD has had relatively greater success in the mobile segment and its current product lineup indicates that this focus will continue. However, competition in the mobile segment is likely to accelerate, with more ARM-based devices coming on the market. Moreover, Microsoft's surface devices and Google chromebooks tend to cannibalize on notebooks, which primarily run on Intel chips. This adds to the pressure on AMD. While Intel has been relatively less successful in the mobile segment, the company's initiative to build new products, enter into strategic alliances and offer subsidies could in combination drive notable share gains.
- ▼ AMD faces significant customer concentration from Sony and Microsoft. Consequently, loss of any one of these customers is anticipated to massively hurt the top line. Notably, Sony accounted for more than 10% of the company's total revenues in 2019. Also, AMD derives a significant proportion of its revenues from outside the United States (74% in 2019), subjecting the company to exchange rate volatility.
- ▼ Declining trend in PC shipments negatively impacted business prospects of AMD, which continues to depend substantially on PC sales. Per Gartner's preliminary data, PC shipments in first-quarter 2020 declined 12.3% year over year to 51.6 million units. Going by the IDC report, shipments were down 9.8% on a year-over-year basis and totaled 53.2 million in the period under review. The company anticipates decline in the PC total addressable market (TAM) in the second half of 2020 as weakness in economy is likely to offset the spike in coronavirus-led demand, which remains a major concern. In fact, sluggishness in China on account of coronavirus crisis-induced lockdowns, weighed on PC-related sales in first-quarter 2020.
- ▼ Moreover, the company is trading at premium in terms of Price/Book (P/B). AMD currently has a trailing 12-month P/B ratio of 21.7. This level compares unfavorably with what the industry witnessed in the last year. Consequently, the valuation looks slightly stretched from P/B perspective.

Intensifying competition in the traditional PC market and GPU segment, customer concentration and leveraged balance sheet remain headwinds.

Last Earnings Report

AMD Q1 Earnings Match Estimates, Revenues Up Y/Y

Advanced Micro Devices reported first-quarter 2020 non-GAAP earnings of 18 cents per share, which matched the Zacks Consensus Estimate. Notably, the bottom line improved 200% year over year but declined 43.8% sequentially.

Revenues of \$1.79 billion surpassed the Zacks Consensus Estimate by 0.4% and surged 40% year over year. However, the top line declined 16% sequentially.

Strength in Computing and Graphics, and Enterprise segment drove year-over-year improvement.

Segmental Details

Computing and Graphics segment (80.4% of total revenues) revenues of \$1.44 billion, improved 73% year over year. This can be attributed to robust adoption of Ryzen and Radeon processors. The figure declined 13% sequentially thanks to sluggish graphics processor sales.

In desktop vertical, seasonal uptick in demand for second and third generation Ryzen processors across retailers and e-tailers drove segment results. However, sluggishness in China, owing to coronavirus crisis-induced lockdowns, weighed on PC-related sales.

Client processor average selling price (ASP) improved year over year on higher Ryzen processor sales. Client processor ASP declined sequentially on account of higher notebook sales.

In mobile domain, unit shipments grew double-digit on a year-over-year basis. Revenues from Notebook processors benefited from continued demand for previous generation products and increasing traction of Ryzen 4000 mobile processors.

Management also remains optimistic regarding growing clout of Ryzen 4000 mobile processors families across leading OEMs. Markedly, Ryzen 4000 mobile processors powered laptops from HP, Dell, Lenovo and other major OEMs, slated for release in 2020, are expected to help AMD in expanding presence in the commercial market. ASUS and Acer have already launched notebooks based on the AMD Ryzen 4000 Series mobile processors.

The latest AMD Ryzen PRO 4000 Series mobile processors are witnessing traction across leading commercial OEMs. Lenovo is set to leverage the processors in its ThinkPad T series, X series and L series of business notebooks, while HP has rolled out new "enterprise-ready" ProBooks.

In graphics domain, higher sales of Radeon RX 5000 series GPUs based on RDNA architecture drove double-digit growth in unit shipments and revenues on a year-over-year basis. However, GPU ASP declined on a year-over-year basis and sequentially due to product mix.

Management notes that the company is on track to launch next-generation gaming GPUs, enhanced with a 50% increase in performance per watt over the existing products, later in 2020.

Moreover, desktop channel sales increase was driven by robust utilization of Radeon RX 500 series GPUs and new processors based on 7 nanometer (nm) RDNA architecture.

Management noted that Data Center GPU business is making progress. The company inked new deal wins in cloud, game streaming and VDI verticals in the reported quarter.

Enterprise, Embedded and Semi-Custom segment (19.4% of total revenues) revenues of \$348 million were down 21% year over year and 25% sequentially.

The decline can primarily be attributed to lower semi-custom product revenues, partially offset by higher EPYC server processor sales.

In server domain, unit shipments improved by double-digit growth on a sequential basis and more than tripled on a year-over-year basis. Strength in AMD's latest EPYC processors are enabling the company to win new deals from major enterprise, cloud, and HPC companies.

In cloud vertical, AMD's second gen EPYC processors witnessed traction across IBM, Google Cloud Platform and Microsoft Azure. Moreover, major cloud players utilized server processors to meet accelerated demand for collaboration services induced by coronavirus-led work-from-home wave and increased use of online schooling solutions.

In enterprise domain, AMD rolled out new high-performance processors to support complex applications, advanced modeling, database and hyper-converged workloads.

Considering HPC vertical, Lawrence Livermore National Laboratories intends to use AMD's second Gen EPYC processors and Radeon Instinct GPUs to power El Capitan supercomputer.

Management is optimistic on increasing utilization of AMD CPUs and GPUs across supercomputing systems.

Operating Details

Non-GAAP gross margin expanded 500 basis points (bps) on a year-over-year basis to 46%, driven by strong adoption of EPYC and Ryzen processors.

Quarter Ending 03/2020

Report Date	Apr 28, 2020
Sales Surprise	0.39%
EPS Surprise	0.00%
Quarterly EPS	0.18
Annual EPS (TTM)	0.76

Non-GAAP operating expenses on a non-GAAP basis increased 7.2% year over year to \$584 million, due to higher investments in Research & development (R&D) and go-to-market initiatives.

R&D expenses rose 18.5% year over year to \$442 million. Marketing, general and administrative expenses climbed 17.1% year over year to \$199 million.

Adjusted EBITDA soared 133.8% year over year to \$304 million on earnings growth.

Non-GAAP operating income came in at \$236 million, up 181% year over year. Rising revenue base, and higher contribution from EPYC and Ryzen processors sales drove year-over-year improvement.

Segment wise, Computing and Graphics operating income was \$262 million, compared with \$16 million reported in the year-ago quarter courtesy of higher revenues. Enterprise, Embedded and Semi-Custom loss was \$26 million against an operating income of \$68 million in the year-ago quarter.

Balance Sheet & Cash Flow

As of Mar 28, 2020, AMD had cash and cash equivalents (including marketable securities) of \$1.39 billion compared with \$1.50 billion as of Dec 28, 2019.

As of Mar 28, 2020, total debt (long-term plus short-term) was \$488 million, up from \$486 million as of Dec 28, 2019.

Operating cash outflow was reported at \$65 million, against \$442 million generated in the previous quarter.

Free cash outflow was \$120 million against free cash flow of \$400 million in the prior quarter.

Guidance

AMD expects second-quarter 2020 revenues to be roughly \$1.85 billion (+/- \$100 million), indicating year-over-year and quarter-over-quarter growth of 21% and 4%, respectively.

For second-quarter 2020, AMD expects robust sales from Ryzen and EPYC processor to drive year-over-year revenues. Further, sequential increase in revenues is anticipated on account of growth in EPYC processor and semi-custom sales.

Semi-custom revenues are projected to gain from production increase to support the launch of the latest Xbox Series X and PlayStation 5 gaming consoles scheduled for holiday season of 2020.

Non-GAAP gross margin is anticipated to be 44%.

For 2020, AMD projects revenues to grow 25% (+/-5%) over 2019 amid weak demand environment induced by the coronavirus crisis. Non-GAAP gross margin is anticipated to be 45%.

Recent News

On Apr 30, 2020, AMD announced a multi-year partnership with Oxide Games to co-develop advanced graphics technologies for cloud gaming.

On Apr 29, 2020, AMD announced that its second-generation AMD EPYC processors have been adopted by Oracle Cloud to enhance computing performance of its Oracle Cloud Infrastructure Compute E3 platform.

On Apr 14, 2020, AMD introduced three new second generation EPYC Processors — AMD EPYC 7F32, EPYC 7F52 and EPYC 7F72. These 7F72 series of processors feature enhanced performance capabilities that are designed to handle enterprise workloads like database, commercial, hyperconverged infrastructure workloads and high-performance computing (HPC).

On Apr 1, 2020, AMD announced that its second-generation AMD EPYC processors have been adopted by IBM Cloud to enhance computing performance of its latest bare metal servers.

On Mar 25, 2020, AMD announced that its second generation EPYC processors and Radeon Instinct MI25 GPUs have been selected by Microsoft's Azure division to power its NVv4 virtual machines (VMs).

On Mar 6, 2020, AMD announced that it is maintaining outlook despite lingering coronavirus woes. AMD anticipates the impact of COVID1-19 outbreak to be "modest" in first-quarter 2020, with revenues possibly coming near the lower end of its guidance of \$1.8 billion (+/- \$50 million).

On Feb 18, 2020, AMD declared that its 2nd Gen AMD EPYC processors utilized by Google Cloud have accelerated the beta availability of N2D virtual machines (VMs) on Google Compute Engine.

On Feb 10, 2020, AMD announced the AMD Radeon Pro W5500 workstation graphics card for design and engineering professionals. It also announced the AMD Radeon Pro W5500M GPU to power next-generation, professional mobile workstations.

On Feb 4, 2020, AMD announced a multi-year partnership with Mercedes-AMG Petronas Formula One Team. The team will make use of AMD commercial solutions like AMD EPYC server processors and AMD Ryzen PRO laptop processors to optimize their workstreams.

Valuation

Advanced Micro Devices shares are up 14.2% in the year-to-date period and 85.2% over the trailing 12-month period. Stocks in the Zacks sub-industry and the Zacks Computer & Technology sector are down 5.7% and 1.7% in the year-to-date period, respectively. Over the past year, the Zacks sub-industry and the sector are up 12.7% and 8.7%, respectively.

The S&P 500 index is down 8.3% in the year-to-date period and up 2.5% in the past year.

The stock is currently trading at 6.72X forward 12-month sales, which compares to 6.41X for the Zacks sub-industry, 3.52X for the Zacks sector and 3.3X for the S&P 500 index.

Over the past five years, the stock has traded as high as 8.13X and as low as 0.31X, with a 5-year median of 2.19X. Our Neutral recommendation indicates that the stock will perform in line with the market. Our \$54 price target reflects 6.93X forward 12-month sales.

The table below shows summary valuation data for AMD

Valuation Multiples - AMD					
		Stock	Sub-Industry	Sector	S&P 500
P/S F12M	Current	6.72	6.41	3.52	3.3
	5-Year High	8.13	6.73	3.59	3.44
	5-Year Low	0.31	4.85	2.32	2.54
	5-Year Median	2.19	5.87	3.1	3.01
EV/Sales TTM	Current	8.34	6.08	3.92	2.92
	5-Year High	9.59	6.9	4.44	3.45
	5-Year Low	0.53	2.69	2.58	2.16
	5-Year Median	2.53	5.35	3.57	2.82

As of 04/30/2020

Industry Analysis Zacks Industry Rank: Top 15% (38 out of 253)



Top Peers

Company (Ticker)	Rec	Rank
QUALCOMM Incorporated (QCOM)	Outperform	3
Applied Materials, Inc. (AMAT)	Neutral	3
Broadcom Inc. (AVGO)	Neutral	3
Intel Corporation (INTC)	Neutral	3
Microchip Technology Incorporated (MCHP)	Neutral	4
Marvell Technology Group Ltd. (MRVL)	Neutral	3
Maxim Integrated Products, Inc. (MXIM)	Neutral	3
NVIDIA Corporation (NVDA)	Neutral	2

Industry Comparison Industry: Electronics - Semiconductors				Industry Peers		
	AMD	X Industry	S&P 500	INTC	MRVL	NVDA
Zacks Recommendation (Long Term)	Neutral	-	-	Neutral	Neutral	Neutral
Zacks Rank (Short Term)	3	-	-	3	3	2
VGM Score	C	-	-	A	F	C
Market Cap	61.36 B	634.78 M	20.61 B	253.96 B	17.93 B	179.79 B
# of Analysts	11	3	14	14	12	11
Dividend Yield	0.00%	0.00%	2.11%	2.20%	0.90%	0.22%
Value Score	F	-	-	B	D	D
Cash/Price	0.02	0.24	0.06	0.05	0.04	0.06
EV/EBITDA	80.03	5.44	11.87	7.63	12.73	50.38
PEG Ratio	1.52	2.02	2.47	1.66	1.67	2.61
Price/Book (P/B)	20.64	2.08	2.67	3.32	2.07	14.67
Price/Cash Flow (P/CF)	68.88	11.85	10.66	7.89	22.46	55.64
P/E (F1)	46.56	19.57	19.01	12.45	31.40	39.56
Price/Sales (P/S)	8.47	2.64	2.10	3.35	6.64	16.47
Earnings Yield	2.04%	2.33%	5.05%	8.04%	3.18%	2.53%
Debt/Equity	0.17	0.11	0.72	0.33	0.17	0.21
Cash Flow (\$/share)	0.76	0.57	7.01	7.60	1.19	5.25
Growth Score	A	-	-	A	F	A
Hist. EPS Growth (3-5 yrs)	NA%	2.66%	10.88%	21.32%	8.01%	43.93%
Proj. EPS Growth (F1/F0)	66.48%	5.67%	-7.32%	-1.07%	29.04%	27.60%
Curr. Cash Flow Growth	44.79%	-2.08%	5.92%	6.53%	-24.70%	-20.70%
Hist. Cash Flow Growth (3-5 yrs)	27.24%	10.45%	8.55%	9.99%	6.05%	28.68%
Current Ratio	1.95	3.30	1.23	1.40	2.16	7.67
Debt/Capital	14.67%	11.85%	43.84%	24.62%	14.22%	17.30%
Net Margin	6.72%	0.98%	11.08%	30.02%	58.70%	25.60%
Return on Equity	30.54%	4.03%	16.44%	31.72%	2.74%	26.08%
Sales/Assets	1.33	0.69	0.54	0.57	0.26	0.71
Proj. Sales Growth (F1/F0)	25.38%	1.86%	-1.42%	2.62%	9.58%	19.77%
Momentum Score	C	-	-	C	C	F
Daily Price Chg	-2.37%	-2.37%	-2.39%	-2.95%	-3.64%	-2.07%
1 Week Price Chg	-0.74%	0.00%	-1.74%	-1.82%	4.53%	-0.93%
4 Week Price Chg	17.76%	20.39%	17.07%	10.36%	18.06%	14.41%
12 Week Price Chg	6.22%	-13.64%	-18.53%	-10.60%	3.84%	14.96%
52 Week Price Chg	85.19%	0.16%	-9.82%	18.66%	8.22%	59.55%
20 Day Average Volume	77,189,808	264,340	2,641,413	28,015,196	8,575,716	12,434,947
(F1) EPS Est 1 week change	-1.22%	0.00%	0.00%	-0.38%	-2.17%	-1.05%
(F1) EPS Est 4 week change	-1.22%	0.00%	-6.62%	-0.30%	-4.46%	-1.16%
(F1) EPS Est 12 week change	-5.50%	-11.42%	-13.28%	-3.37%	-11.94%	3.24%
(Q1) EPS Est Mthly Chg	-12.25%	0.00%	-11.97%	-11.04%	-2.13%	-0.71%

Zacks Stock Rating System

We offer two rating systems that take into account investors' holding horizons: Zacks Rank and Zacks Recommendation. Each provides valuable insights into the future profitability of the stock and can be used separately or in combination with each other depending on your investment style.

Zacks Recommendation

The Zacks Recommendation aims to predict performance over the next 6 to 12 months. The foundation for the quantitatively determined Zacks Recommendation is trends in the company's estimate revisions and earnings outlook. The Zacks Recommendation is broken down into 3 Levels; Outperform, Neutral and Underperform. Unlike many Wall Street firms, we have an excellent balance between the number of Outperform and Neutral recommendations. Our team of 70 analysts are fully versed in the benefits of earnings estimate revisions and how that is harnessed through the Zacks quantitative rating system. But we have given our analysts the ability to override the Zacks Recommendation for the 1200 stocks that they follow. The reason for the analyst over-rides is that there are often factors such as valuation, industry conditions and management effectiveness that a trained investment professional can spot better than a quantitative model.

Zacks Rank

The Zacks Rank is our short-term rating system that is most effective over the one- to three-month holding horizon. The underlying driver for the quantitatively-determined Zacks Rank is the same as the Zacks Recommendation, and reflects trends in earnings estimate revisions.

Zacks Style Scores

The Zacks Style Score is as a complementary indicator to the Zacks rating system, giving investors a way to focus on the highest rated stocks that best fit their own stock picking preferences.

Academic research has proven that stocks with the best Value, Growth and Momentum characteristics outperform the market. The Zacks Style Scores rate stocks on each of these individual styles and assigns a rating of A, B, C, D and F. We also produce the VGM Score (V for Value, G for Growth and M for Momentum), which combines the weighted average of the individual Style Scores into one score. This is perfectly suited for those who want their stocks to have the best scores across the board.

Value Score	F
Growth Score	A
Momentum Score	C
VGM Score	C

As an investor, you want to buy stocks with the highest probability of success. That means buying stocks with a Zacks Recommendation of Outperform, which also has a Style Score of an A or a B.

Disclosures

This report contains independent commentary to be used for informational purposes only. The analysts contributing to this report do not hold any shares of this stock. The analysts contributing to this report do not serve on the board of the company that issued this stock. The EPS and revenue forecasts are the Zacks Consensus estimates, unless indicated otherwise on the reports first page. Additionally, the analysts contributing to this report certify that the views expressed herein accurately reflect the analysts personal views as to the subject securities and issuers. ZIR certifies that no part of the analysts compensation was, is, or will be, directly or indirectly, related to the specific recommendation or views expressed by the analyst in the report.

Additional information on the securities mentioned in this report is available upon request. This report is based on data obtained from sources we believe to be reliable, but is not guaranteed as to accuracy and does not purport to be complete. Any opinions expressed herein are subject to change.

ZIR is not an investment advisor and the report should not be construed as advice designed to meet the particular investment needs of any investor. Prior to making any investment decision, you are advised to consult with your broker, investment advisor, or other appropriate tax or financial professional to determine the suitability of any investment. This report and others like it are published regularly and not in response to episodic market activity or events affecting the securities industry.

This report is not to be construed as an offer or the solicitation of an offer to buy or sell the securities herein mentioned. ZIR or its officers, employees or customers may have a position long or short in the securities mentioned and buy or sell the securities from time to time. ZIR is not a broker-dealer. ZIR may enter into arms-length agreements with broker-dealers to provide this research to their clients. Zacks and its staff are not involved in investment banking activities for the stock issuer covered in this report.

ZIR uses the following rating system for the securities it covers. **Outperform-** ZIR expects that the subject company will outperform the broader U.S. equities markets over the next six to twelve months. **Neutral-** ZIR expects that the company will perform in line with the broader U.S. equities markets over the next six to twelve months. **Underperform-** ZIR expects the company will underperform the broader U.S. equities markets over the next six to twelve months.

No part of this report can be reprinted, republished or transmitted electronically without the prior written authorization of ZIR.