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BiGSKY INVESTMENTS®

Equity Research
Executive Summary

IPG Photonics		Ticker: IPGP
Price	(11/03/2017)	**$213.86**
Style		Mid Growth
Beta		1.69
Industry		Industrials
Sector		Electrical Components & Equipment

EPS & Revenue Forecasts

FY Ended Dec	2016A	2017E	2018E
Revenue ($M)	$ 1,006.2	$ 1,387.8	$ 1,465.0
EPS	4.85	7.05	7.20
P/E Ratio	44x	30.3x	29.6x

Key Statistics

52-wk. Price Range	$92.88 - $211.73
Average Daily Volume (3mo.)(K)	366.2
Market Value (Mil)	$11,511.13
Shares Outstanding (Mil)	54
Cash per share	$18.29
Total Debt/Capital	0.1%
Book Value per share	$35.97
Dividend & Yield	-

Valuation Summary

	Last	Industry	Sector
P/E Ratio	31.47	28.12	24.12
P/Book	5.84	3.64	2.79
P/Sales	8.67	5.2	24.82
ROA (TTM)	18.61	8.89	5.03
ROE (TTM)	21.36	13.46	11.94

Growth Summary — *Annualized*

	1-yr	3-yr	5-yr
Sales %	31.98	24.17	27.22
EBITDA	38.31	29.03	29.51
Net Income	41.79	28.18	31.01
EPS (Diluted)	40.21	26.47	28.39
Dividends	-	-	-

Company Description

IPG Photonics, is a vertically integrated designer and manufacturer focused on the production of high-performance fiber lasers, fiber amplifiers and diode lasers used for diverse applications, primarily in materials processing.

Summary

IPG Photonics is the industry leading provider of high-power fiber laser solutions. Fiber lasers enable faster processing speeds and superior productivity and flexibility at a lower cost. These fiber-based cutting systems are replacing non-laser technologies including machine presses for punching and stamping of metal that use inflexible dies for cutting and drilling that wear out and break over time.

IPG Photonics is experiencing rapid growth thanks to a secular migration to high-power products across their largest applications and geographies. IPG Photonics vertically-integrated business model allows them to rapidly scale production, reduce costs, and deliver innovation more competitively than the competition. IPGP is also experiencing rapid growth in their other product categories such as QCW Lasers, nanosecond pulsed fiber lasers, green pulsed lasers, ultrafast lasers, optical accessories and fully integrated systems to drive new applications for laser technology.

IPGPs mission statement is, "to drive adoption of our leading-edge technology through product improvements and cost reductions, making our fiber laser technology the tool of choice in mass production."

Bull Case

IPGP is the industry leading provider of high-powered fiber laser solutions.

Rapid growth and vertical integration means that IPGP is extremely well positioned to take advantage of a secular migration in materials processing towards the use of high-powered fiber laser technologies.

IPGP is a highly innovative company who will maintain competitive advantage over rivals.

Bear Case

Rapid appreciation of the companies share price has made IPGP stock overvalued.

There is risk in assuming that these high growth rates can continue.

Threat of competition may reduce market share and profit margins.

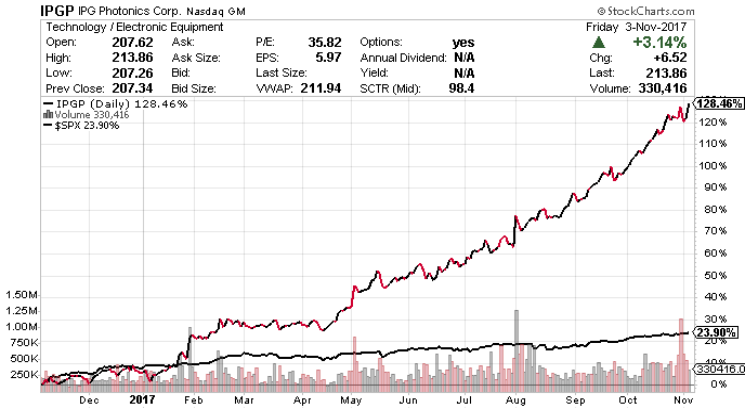
Recommendation — HOLD

IPG Photonics is benefiting from a sector-wide migration towards high-powered fiber laser technology. Management appears to be very competant and has positioned themself to take advantage of opportunities in their specific field. IPGP is experiencing rapid top and bottom-line growth in the majority of their operating segments.

Because of the rapid appreceation of the stock over the past year, I would not advise adding to our position until after a reasonable amount of time for the price to consolidate.

Although tempting and reasonale to take some profits, IPGPs growth trajectory is very promising and I believe that shares will continue to appreceate as high-power fiber laser technology continues to gain acceptance and replaces antiquated C02 laser and non-laser materials processing technologies.

One-Year Price Performance vs. S&P 500



IPG Photonics

IPG Photonics (IPGP) is an industrial manufacturing company engaged in the design and manufacture of high-performance fiber lasers and various other related product offerings. Russian physicist Valentin P. Gapontsev, Ph.D. founded IPG Photonics in 1991 with a small team of graduate students. Valentin's dream was to, "…see lasers—like computers—become a tool of choice in mass production, rather than being viewed as a last resort in many applications." Valentin desires to have "IPG Photonics to play a pivotal role in realizing this dream, and being sure to maintain our independence along the way."

In 2000 IPGP established their world headquarters in Oxford Massachusetts and invested in new high-capacity production facilities in the USA to manufacture their own diode pumps. Because of this vertical integration strategy, IPGP is extensively involved with their products through the entire manufacturing lifecycle from design to manufacture and delivery of the finished goods. IPGP leverages this comprehensive product knowledge as competitive advantage and continuously strives to update product offerings as well as streamline production and logistics.

Since 1992, IPGP has been involved with the creation of high powered fiber lasers. When it comes to materials processing, the higher the power, the better. High powered lasers provide clean, efficient cuts and minimize time. The power of IPGPS lasers has been on an exponential growth curve since their first was created in 1995. (See Figure 1) In their 2016 10K, IPGP states that they "Produce the highest-power solid-state lasers in the industry." With their ytterbium fiber lasers reaching power levels of up to 20,000 watts and single-mode, erbium and thulium fiber lasers with power levels of up to 500 watts. Their compact, durable design and integrated fiber optic beam delivery allows them to offer versatile laser energy sources and simple laser integration for complex production processes without compromising quality, speed or power.

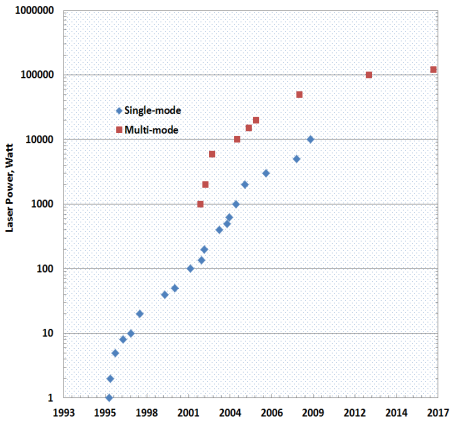


Figure 1

IPGP went public on the NASDAQ Global Select stock exchange December 12, 2006 with an offering of 9M shares, priced at $16.50, cumulating in a market capitalization of $148.5M.
As of November 3, 2017, IPGP had roughly 53.6M shares outstanding which were trading at a price of $213.86 per share. Today IPGP market capitalization amounts to $11.46B. This means that IPGP stock has appreciated 7,619.06% since their IPO. Annualized this figure amounts to 692.64% per year.

IPG Photonics principal product lines are used for a wide variety of applications in a multitude of markets. The table illustrated in Figure 2 lists the primary markets and applications for those product lines that generated the substantial majority of revenues in 2016.

Product Line	Principal Markets	Principal Applications
High-Power Ytterbium CW (1,000 — 100,000 Watts)	Automotive Heavy Industry General Manufacturing Natural Resources Aerospace	• Cutting • Welding • Annealing • Drilling • Cladding • Brazing • 3D Printing
Mid-Power Ytterbium CW (100 — 999 Watts)	General Manufacturing Consumer Medical Devices Printing Electronics	• Cutting • Welding • Scribing • Engraving • 3D printing
Pulsed Ytterbium (0.1 to 200 Watts)	General Manufacturing Semiconductor Medical Devices Consumer Electronics Panel Displays	• Marking • Engraving • Scribing • Drilling • Coating removal • Cutting
Pulsed and CW Green Lasers	Microprocessing and Semiconductor Solar General Manufacturing	• Annealing silicon wafers • Thin film ablation • Marking plastics
Quasi-CW Ytterbium (100 — 4500 Watts)	Medical Device Computer Components Fine-Processing	• Welding and micro-welding • Drilling • Cutting metals and crystals
Erbium Amplifiers	Broadband Access Cable TV DWDM Instrumentation Scientific Research	• Telephony • Video on demand • High-speed internet • Ultra-long-haul transmission • Beam combining
Transceivers	Telecommunications Cable TV Data Center Networking	• SONET/SDH optical transport • Ethernet switching • IP routing

Figure 2

IPGP's markets are competitive and characterized by rapidly changing technology and continuously evolving customer requirements. IPGP has identified the primary competitive factors in their markets as: product performance and reliability, quality and service support, price and value to the customer, ability to manufacture and deliver products on a timely basis, ability to achieve qualification for and integration into OEM systems, ability to meet customer specifications, and ability to respond quickly to market demand and technological developments.

In the materials processing market, the competition is fragmented and includes a large number of competitors. Figure 3 details the companies that IPG Photonics most closely competes with.

High- Power Co2, YAG, Disc Lasers	Low-Power Co2, Solid State Lasers	Direct Diode Lasers	Fiber Laser Makers
(COHR) Coherent, Inc	Coherent, Inc.	Laserline GmbH	Trumpf GmbH + Co. KG
TSE: 6954 Fanuc Corporation, Inc.	GSI Group Inc.	TeraDiode Inc.	Coherent, Inc
Trumpf GmbH + Co. KG			Hypertherm, Inc.
			Fanuc Corporation
			TSE: 5801 Furukawa Electric Co. Ltd.
			Keopsys SA
			TSE: 5711 Mitsubishi Cable Industries, Ltd.
			Raycus Fiber Laser Technologies Co. Ltd.
			Maxophotonics Co. Ltd.
			nLight Corporation
			(LITE) Lumentum Holdings Inc.

Figure 3 Identified Competitors

The majority of these competitors are privately held entities. Of those that are publically traded, I was able to obtain comparable metrics as shown in Figure 4.

NetAdvantage

Company	Company Name	Primary Industry	Mkt Cap	Shr Out	Price	Week High	Week Low	5 Year Beta	Annualized Div Per Shr	Div Yld	Volume	Tot Rev	Gross Profit	EBITDA	NI	Norm EPS	Tot Rev	TEV / EBITDA	Tot Rev, 1Y Gr %	Return on Capital %	ROE
6954	Fanuc Corporation	Industrial Machinery	45822.5	193.85	238.6	238.2	155.65	0.93	4.16	1.76%	0.69	5572.1	2409.9	1893	1361.3	40.51x	7.04x	19.6x	7.40%	11.1	11.6
IPGP	IPG Photonics Corporation	Electronic Manufacturing Services	11462.8	53.6	213.9	219.6	92.89	1.68	-	-	0.33	1327.96	743.65	585.24	369.79	36.29x	7.88x	17.88x	39.83%	18.47	21.36
COHR	Coherent, Inc.	Electronic Equipment and Instruments	6400.98	24.63	259.9	281	115	0.78	-	-	0.38	1481.47	668.95	403.41	164.16	33.99x	4.45x	16.33x	80.99%	15.23	17.18
5711	Mitsubishi Materials Corporation	Diversified Metals and Mining	5051.08	130.98	38.32	38.67	24.78	0.82	0.7	1.82%	0.32	11915.75	1816	1109.8	260.08	14.71x	0.85x	9.13x	(1.28)%	3.29	5.77
5801	Furukawa Electric Co., Ltd.	Electrical Components and Equipment	4453.45	70.47	53.11	63.26	25.98	1.15	0.53	0.83%	4.82	8021.77	1478.8	627.26	289.46	19.82x	0.84x	10.28x	6.99%	6.01	15.97
LITE	Lumentum Holdings Inc.	Communications Equipment	3676.6	62	59.3	68.63	34.15	0.92	-	-	2.83	986.7	310.5	110.3	-92	NM	3.6x	32.24x	4.03%	3.52	-14.28

Figure 4 Publically Traded Competitors Financial Comps

Several competitors and customers recently introduced fiber lasers or announced plans to produce fiber lasers that compete with IPG Photonics products. However, the company has confidence in their ability to compete favorably with other makers of fiber lasers on price and value to customer, reliability, service, and performance.

Technical analysis indicators for IPG Photonics (IPG) are very bullish.
IPGP has well outperformed the S&P 500 within a one-year timeframe, with shares appreciating 128.46% in twelve months' vs the S&P 500 at 23.90%.

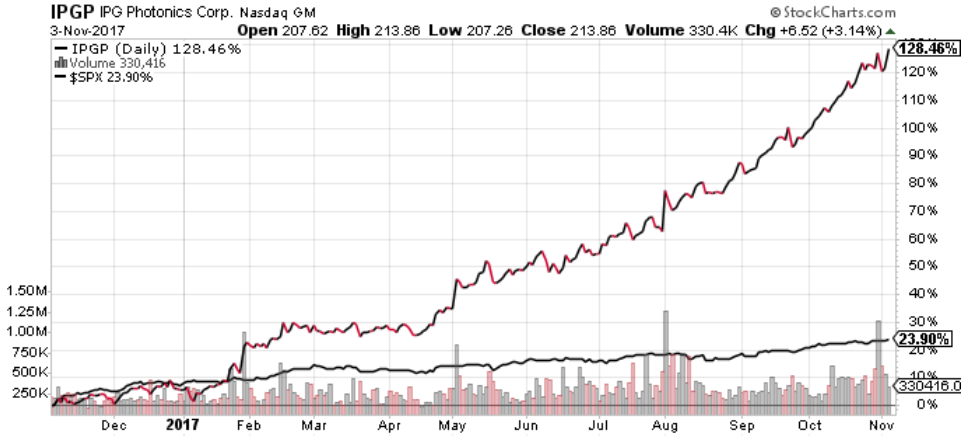


Figure 5 *IPGP 12 Month Performance vs. S&P 500*

Figure 6 *IPGP Monthly Candlestick Chart*

The monthly chart shows a long, pronounced uptrend dating back to before 2010. After consolidating for roughly six years between 2011 and 2016, IPGP broke the resistance to the upside more than doubling in 2017.

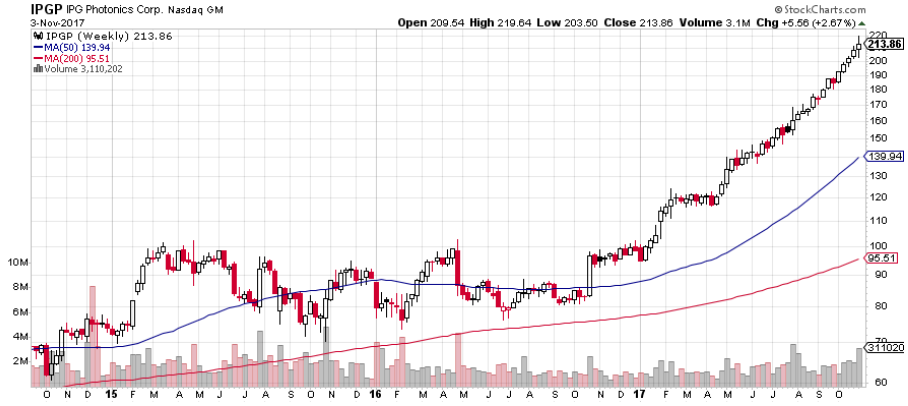


Figure 7 *IPGP Weekly with 50 & 200DMA*

The weekly chart shows the run that IPGP went on after consolidating around and breaking the 50 daily moving average resistance in October 2016. IPG is above all major moving averages.

Bear Case:

I will introduce one more technical analysis tool to best illustrate the bear case. Figure 8 illustrates a traditional point and figure chart. Point and figure charts have an advantage over comparable bar charts because these charts ignore time and derive their shape strictly using price movements.
The most recent point and figure chart pattern identified on October 24, 2017 is, 'long tail up.' Looking at the chart, one can clearly see how far up IPGP stock is extended from a strong base. This could suggest that IPGP stock has traveled, 'too far, too fast,' and is due for a pullback.
Bears would scoff at IPGP's rapid growth and claim that the growth rate they have experienced to date is unsustainable and the company is currently overvalued.

Figure 8 *P&F Chart*

Bull Case:

Bulls will argue that IPGP is well-positioned to capitalize on a secular migration in materials processing towards the use of high-powered fiber laser technologies. Taking a vertical-integration approach to manufacturing reduced costs and allow IPGP to quickly pivot in implementing new technologies. IPGP is likely to maintain and build-upon their differentiator position as the industry leading provider of high-powered fiber laser solutions. IPGP is continues to find new used for their proprietary technology and is expanding into many categories besides materials processing which are also experiencing rapid growth.

Recommendation

After conducting this analysis, it is my recommendation to HOLD shares in IPG Photonics.
The company is experiencing phenomenal growth in a unique industry that is disrupting antiquated methods of materials processing. IPGP's financials are solid. Although the current valuation with a Price/Earnings ratio of roughly 44x is high, if IPGP continues this rapid growth, the valuation is justified. I do not recommend adding to our position at this time because IPGP shares have experienced such rapid price appreciation over a twelve-month timespan (128.46%). It is probable that shares may need some time to consolidate and base-out before moving higher.
IPG Photonics is growing at such a phenomenal rate, is well positioned in their industry, and has delivered sizable returns for shareholders.

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