May 10, 2022

PIB 22-50

Introducing PowerLine F 10 QS Laser Marker

Introduction

Coherent Munich introduces the PowerLine F 10 QS single laser marker and the PowerLine F 10 QS T Twin laser marker. Both laser markers use green fiber laser sources and provide an average laser power of up to 9 W and 2 × 9 W, respectively. The requirement to develop these products was primarily driven by the semiconductor industry as these laser markers have an excellent performance when marking thin semiconductor devices with minimal marking depth.

Key Advantages

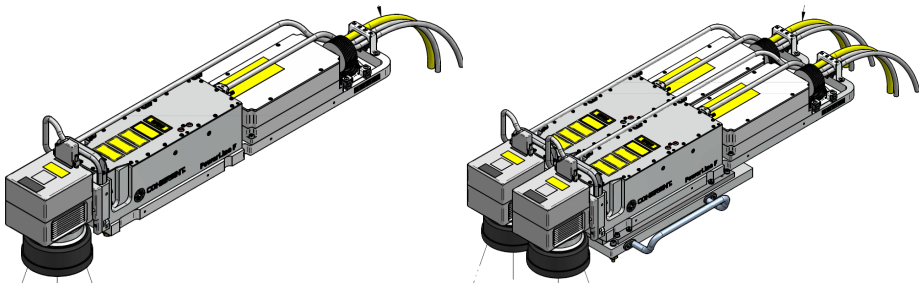
- Bursts of very short nanosecond laser pulses.
- Unique marking performance compared to standard DPSS ns lasers.

Key Message / Applications

Excellent solution for shallow marking of semiconductor devices and other applications requiring only a modification of the surface of a workpiece. Marking of some plastic materials (application test required) will benefit from the performance of green fiber lasers, too.

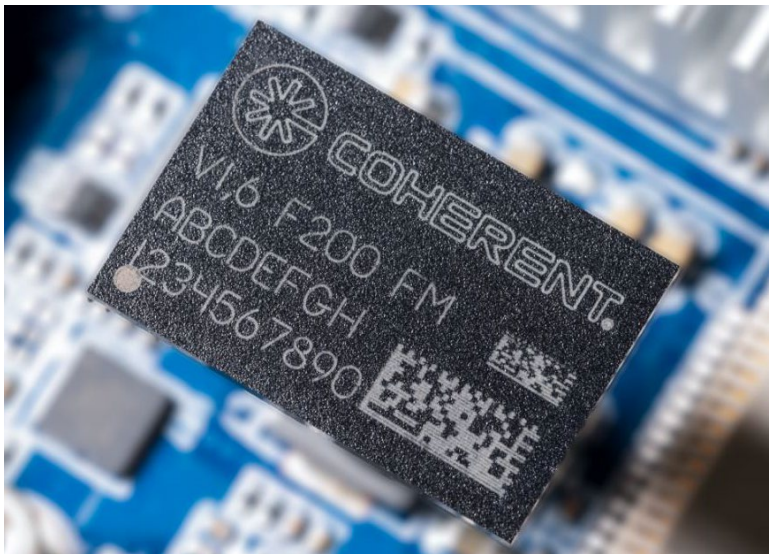
Positioning

An important differentiator to our end-pumped green DPSS laser markers from the PowerLine E series is the short pulse width of only 1.5 ns. Frequency range is adjustable between 10 and 250 kHz. With this frequency, the laser emits bursts, each consisting of three 1.5 ns pulses separated by a gap of 10 ns. These pulse characteristics provide a unique marking performance. We expect these new laser markers to be also successful outside the semiconductor industry, particularly for the marking of organic materials. Please note, that green fiber lasers are still comparably expensive and cannot be sold on price but must be sold on performance.



Specifications

The green fiber laser consists of two main components: The fiber laser itself is mounted inside the supply unit. The output head is mounted on the laser marker rail. The length of the fiber connection between laser and output head is 2.6 m. This length cannot be extended.
A beam expander is mounted inside the optics box which is located between output head and galvanometer scanner. A positioning laser is a standard feature of PowerLine F 10 QS laser markers and is integrated into the optics box, too. The Twin version has two variable beam expanders as a standard to allow adjusting marking performance for both laser heads.
The laser is air-cooled by a small fan unit located at the rear of the rail. The laser marker can reliably be operated within an ambient temperature range between +15°C and +30°C. Please note that the maximum allowed temperature is lower than with other laser markers because longevity and power stability suffer when temperatures are higher.



A field of application the PowerLine F 10 QS was successfully tested with is the marking of semiconductor ICs. Especially memory devices are sensitive to the marking step because only a thin mold compound cap protects the silicon die. It was demonstrated that it is easy to achieve high contrast marks with a marking depth of less than 10 microns where normal green nanosecond lasers produce marking depth of around 20 microns.

Pricing

PowerLine F 10 QS laser markers are configurable products. They can be configured using configurator model MOD00740 and MOD00754 (Twin). Our First Level Support Team will help you preparing quotes for these products. List prices of standard PowerLine F 10 QS and PowerLine F 10 QS T are:

1	**PowerLine F 10 QS** - Yb doped fiber laser - Wavelength: 532 nm - Average power: - (cw), 9 W, M2: 1.2 - Frequency: 10-250 kHz, bursts of 3 pulses, pulse width: 1.5 ns - Air cooling - Collimated laser beam - Laser diode positioning help (1.0 mW, 660 nm) - No internal power sensor - RCU (ITX) control system - VLM editor, RCU and laser console software, Windows 10 - Supply unit 3 RU x 19" x 537 mm (H x W x D) - PC (ITX motherboard with CPU) integrated into supply unit - Protection rating: Laser head and supply unit (IP20) / scanner head (IP54) - Length of feed line: 2.6 m - Dimensions according to technical drawing	**73,210 US$**
1	**Galvanometer Scanner SC10 for 532 nm**	
1	**f-Theta objective, 532 nm, f-170 mm**	
1	**Beam expander / 532 nm / Fixed Expansion Factor / 85 mm**	

1	**PowerLine F 10 QS T** - Twin laser marker with two Yb-doped fiber lasers - Wavelength: 532 nm - Average power: - (cw), 9 W, M2: 1.2 - Frequency: 10-250 kHz, bursts of 3 pulses, pulse width: 1.5 ns - Air cooling - Collimation optics - Variable beam expanders (1-3x) for individual adjustment of both fiber lasers - Laser diode positioning help (1.0 mW, 660 nm) - No internal power sensor - RCU (ITX) control system - VLM editor, RCU and laser console software, Windows 10 - Two supply units (master/slave) 4 RU x 19" x 537 mm (H x W x D) - PC (ITX motherboard with CPU) integrated into master supply unit - Protection rating: Laser head and supply unit (IP20) / scanner head (IP54) - Length of feed line: 2.6 m - Dimensions according to technical drawing	**136,949 US$**
2	**Galvanometer Scanner SC10 for 532 nm**	
2	**f-Theta objective, 532 nm, f-170 mm**	

Availability Timelines

The first PowerLine F 10 QS Laser Markers were already delivered to a semiconductor manufacturer. Their performance is robust. PowerLine F 10 QS are available with our standard lead times. Please check our lead time report.

Service Strategy & Pricing

Standard warranty period is 24+3 months and covers all components. The additional 3 months are granted as goodwill to allow integrators to integrate the laser marker and ship their system to their customer before warranty period starts. While we offer the A+ program, we do not offer P+ because the supplier of the green fiber laser source does not extend their warranty.

Product Info	Standard Warranty		Installation	
	Months	Hours	Installation included	Installation by customer
PowerLine F 10 QS	24 + 3	-	No	Possible
PowerLine F 10 QS T	24 + 3	-	No	Possible

Product Info	In warranty			Out of Warranty				
	Primary Strategy	Secondary Strategy	A+ available	Primary Strategy	Secondary Strategy	A+ available	Evaluation Cost	Remote Service?
PowerLine F 10 QS	FS	DR	Yes	FS	DR	Yes	TBD	Yes
PowerLine F 10 QS T	FS	DR	Yes	FS	DR	Yes	TBD	Yes

FS Field Service DR Depot Repair A+ Selected spares availability at GLS

Service

- A depot repair is normally not needed – Exchange procedure advanced replacement.
- The system is ready for remote control.
- The sub-system will be supported by the Coherent service worldwide.
- Yearly preventive maintenance by local service is recommended.
  Recommendation: One shift: once a year – two/three shift: two times a year

Part numbers of Service Packages:

Product	Service Module	P/N	Price
PowerLine F 10 QS	A+ Advanced Replacement *)	2267223	4,000 US$
	P+ Extended Warranty	n/a	-
PowerLine F 10 QS T	A+ Advanced Replacement *)	2257227	7,200 US$
	P+ Extended Warranty	n/a	-

*) Includes fiber laser sources, supply units and ITX PC-boards

Training

The Training Center in Gilching offers:

- VLM training (2 day)
- Application training and process assistance (charged per day, application engineer level)
- Service training for Coherent and Sales Channel Partner staff (2 days)

Standard trainings can be selected within the Quote Quickly configurator

Please contact training center for details of prices, course content and available schedules:
DEGCG-TBU Training TBUTraining.Munich@coherent.com

Set-Up	1 day	1336171	1,200 €	$1,500
Installation	excl. travelling costs, accommodation and expenses			
Training PL F Service	1 day	1391872	2,300 €	$2,700
Operator / Service / PM	excl. travelling costs, accommodation and expenses			
Training VLM	2 days	1391959	4,600 €	$5,400
	excl. travelling costs, accommodation and expenses			
Application Support	1 day	1404030	2,300 €	$2,700
	excl. travelling costs, accommodation and expenses			

For Agile users: The spare parts lists are available with documents:

D208993: PowerLine F 10 QS
D209008: PowerLine F 10 QS T
D209007: Supply units

Replacement Products

The PowerLine F 10 QS is not a replacement of another product. Please note, however, that the short pulses for some applications will make the PowerLine F 10 QS a possible replacement for the PowerLine Pico 10-532 that was discontinued a few years ago.

Competitive Landscape

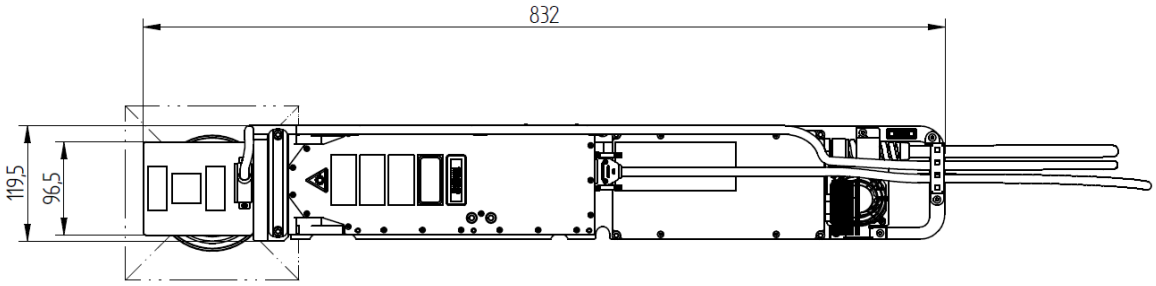
EO Technics, a supplier of semiconductor manufacturing equipment, offers marking systems with green fiber lasers. In other industries green fiber laser markers are not yet common.

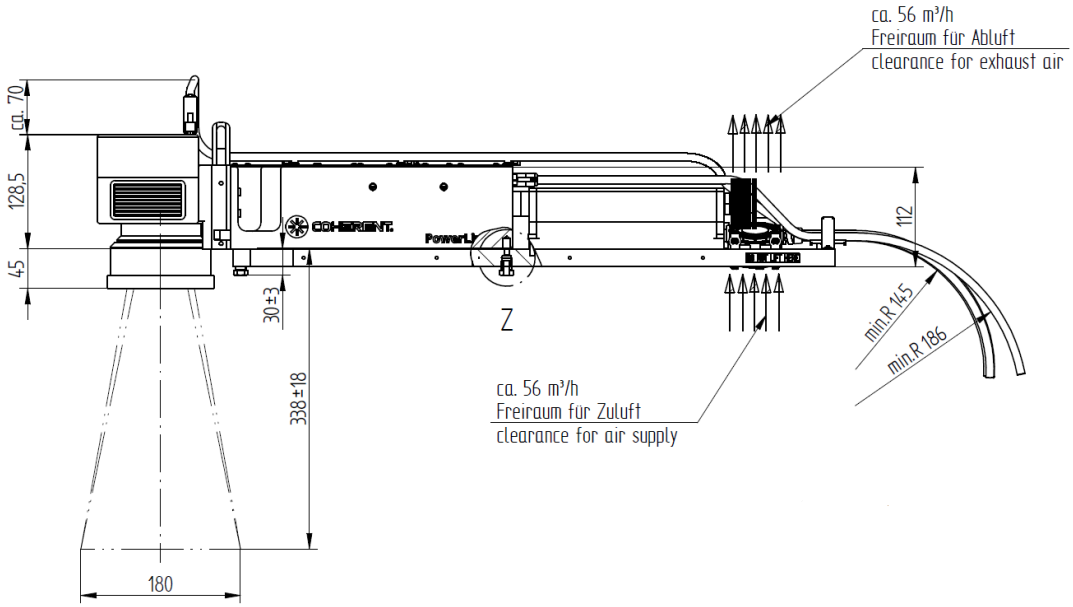
Related Documents

- PowerLine F 10 QS / PowerLine F 10 QS T Manuals (on PIC)
- Data sheet (on PIC)
- Customer-ready PowerPoint presentation (on PIC)
- Integration drawing (on PIC)
- PowerLine Order Form – Revision 2.5 (on PIC)
- Powerline Price Configurator – Revision 2.2 (on PIC)

Integration Drawing

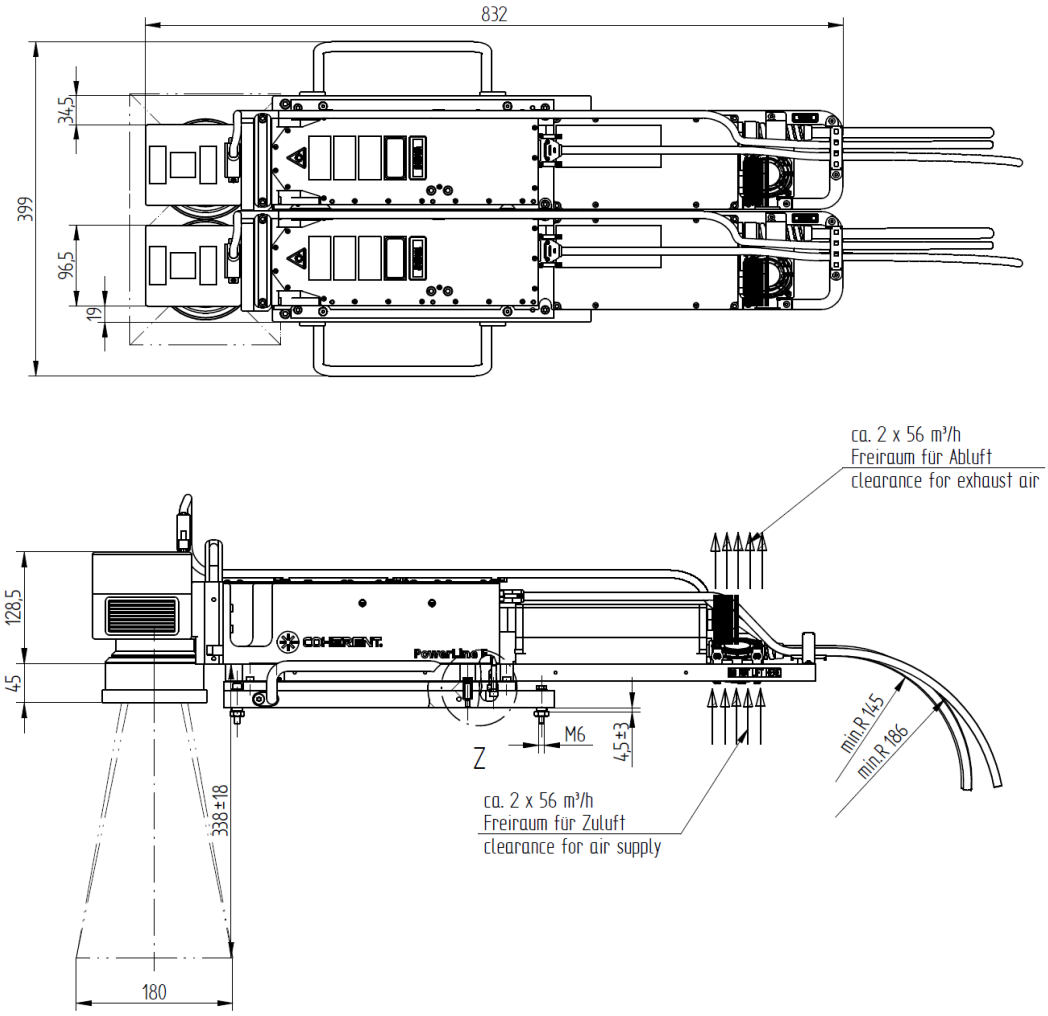
PowerLine F 10 QS





Integration Drawing

PowerLine F 10 QS T



Marketing Activities

The data sheet for this laser marker is online on the PowerLine product page:
https://www.coherent.com/machines-systems/laser-marking-engraving/powerline-series
You can find the PowerLine F 10 QS in the general marking presentation on the PIC.
A blog post and social media post will follow in summer.

For more information about this PIB, please contact:

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