

 BKtel	Technical Requirement Specification Fiber Laser Module CPFL-300am-FCAPC-FCAPC	Id.- No.: 420301 Rev.: 1.1 Date: 2021-04-27
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Compact Pulsed Fiber Laser Module

**1 W average power,
1550nm Wavelength stabilized
3ns, 100kHz-1MHz, With monitor port
For Autonomous Drive**

1 Document History

Edition	Date	Changes
1.0	2020-04-23	Creation
1.1	2020-04-23	Isolator added

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2 Product Specification

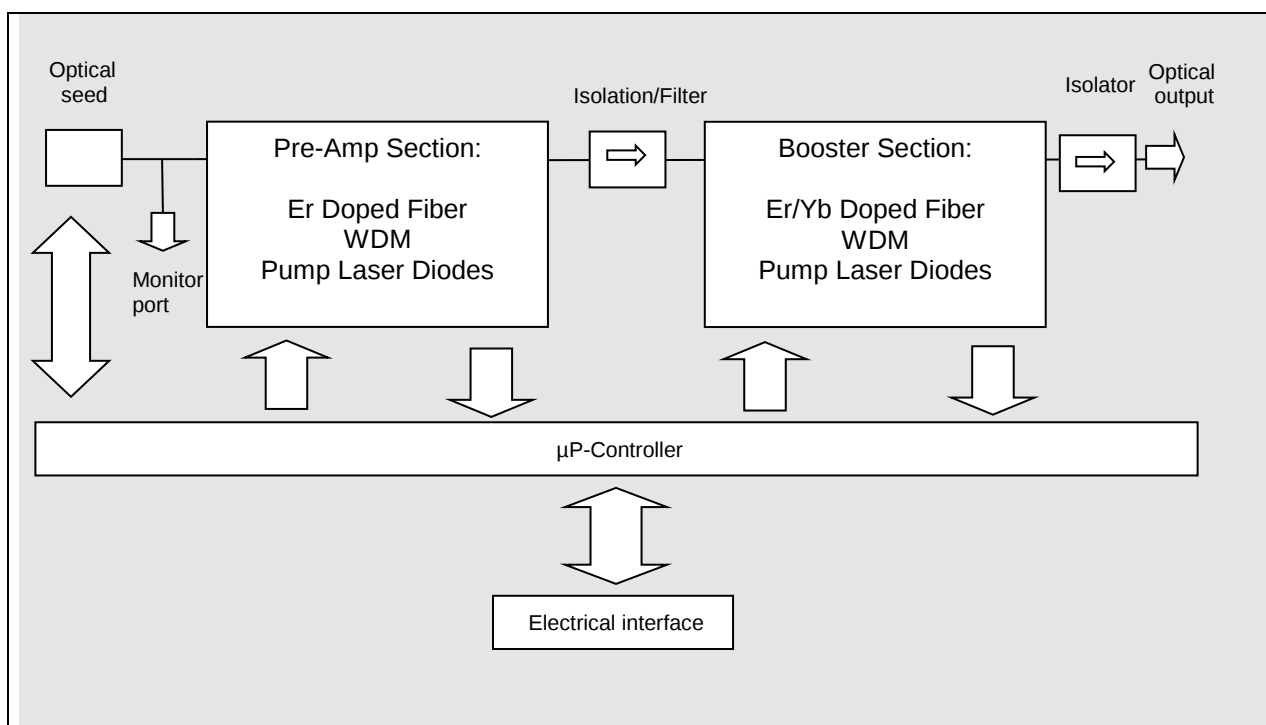
2.1 Overview

The CPFL-Module is a pigtailed, stand alone optical pulsed fiber laser module for integration into custom housings.

2.2 Functional Description

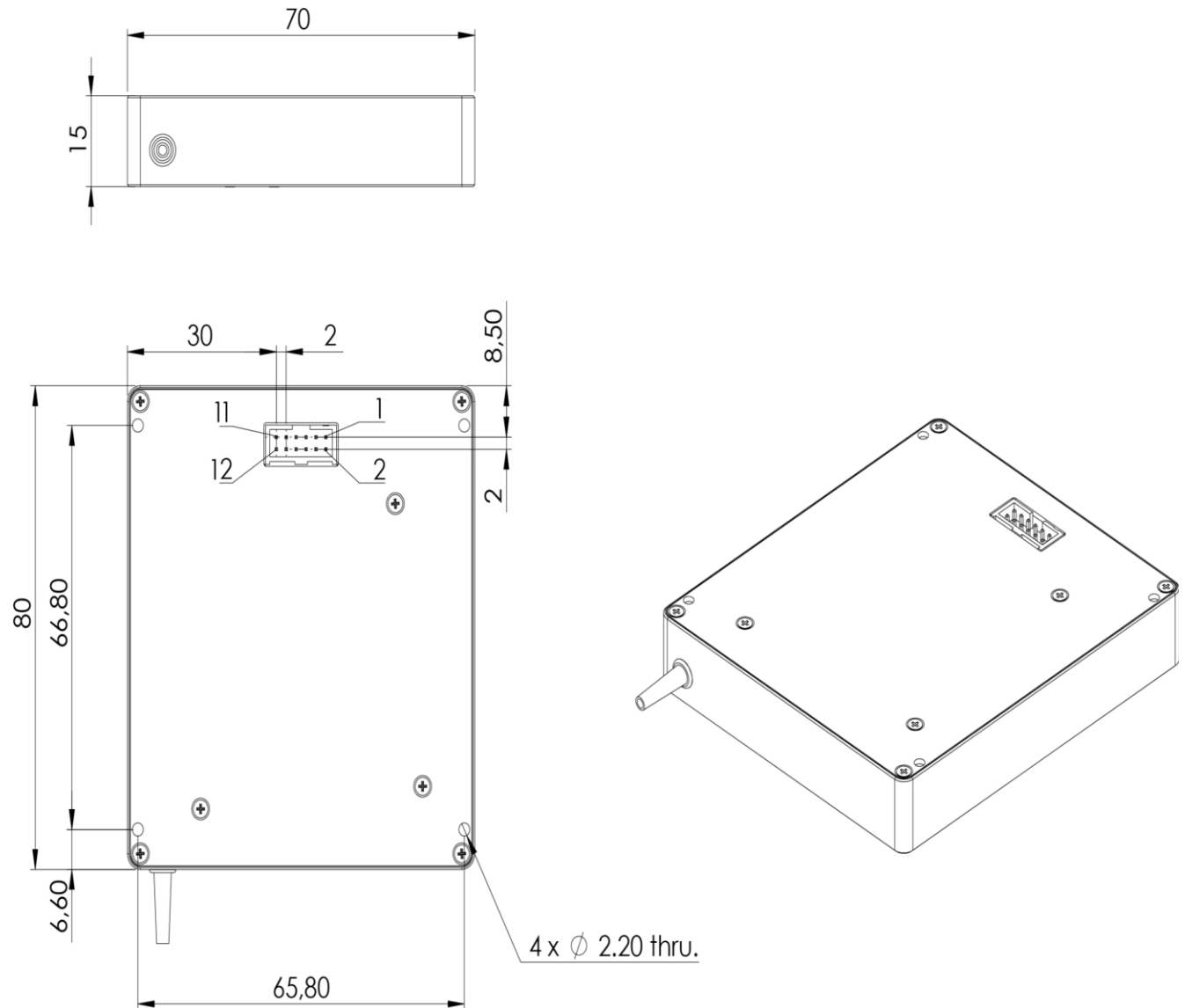
The fiber laser module comprises of laser diodes, optical isolators, WDMs and taps, erbium doped fiber and the micro-processor based controller for stand alone operation. Communication is provided by a serial RS-232 link in the electrical interface.

2.2.1 Fiber Laser Module





2.2.2 Mechanical Dimension



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2.3 Technical Specifications

2.3.1 Optical Specifications

Optical Performance						
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Operating Wavelength	WB	25°C	1547	1550	1553	nm
Wavelength vs Temperature				10		pm/°C
Wavelength Excursion	WE	Over all operating temperature range			0.3	nm
Polarazation	PL		Random			
Pulse Width(FWHM)	PW		2.5	3	3.5	ns
Repetition frequency	RF		100		1000	kHz
Pulse energy	PE	@100kHz		10		uJ
		@500kHz		2		uJ
		@1000kHz		1		uJ
Average Output Power	P-ave	Including ASE		1000		mW
Peak Power	P-peak	@100kHz		-	3.2	kW
Output power stability	P-stab	RMS 1 hour @ RT	-	-	4	%
Output power tunability	P-tun		10		100	%
Output isolation	ISO		30			dB
Pulse Delay	PD			118	150	ns
Pulse delay Jitter	J			0.04		ns
Power within Bandwidth			90			%
Optical Monitor	MON	Average power		-38		dBm

Pluse delay: Delay between electronical (pulse trigger) to optical leading edge medians

Pulse delay jitter: Deviation delay between electronical (pulse trigger) to optical leading edge medians

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2.3.2 Optical Fiber Ports

Fiber Pigtails						
Single mode 9/125/250 with 900um easy strip buffer or equivalent (same for monitor pigtail fiber)						
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Length	Lf	-	45	50	55	cm
Bending radius	R	-	30	-	-	mm
Beam quality	M ²			1.1	1.2	M ²

Connectors Output	Connector Monitor
FC/ACP (Red)	FC/APC (White)

2.3.3 Electrical Specifications

Electrical Conditions						
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Power supply voltage	U _{op}		10	12.0	14	V
Power consumption	P _{op}	all conditions	-	16	20	W
Digital Signal Level	-	LVTTL	0	-	3.3	V
Trigger Signal Level	-	LVTTL	0	-	3.3	V

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2.3.4 Electrical Pinning Description

The electrical connector is SAMTEC ZLTMM-106-65-F-D-328

Pin	Meaning	Remark
1	+12.0 VDC	
2	+12.0 VDC	
3	GND	
4	GND	
5	RS232 Input (LVTTL)	default 9600 Baud
6	RS232 Output (LVTTL)	default 9600 Baud
7	Module Enable Input	active low (Enabled in CC mode)
8	Pump Modulation	Pull-down resistor, LVTTL, active high, (Enabled in CC mode)
9	LVDS-	100 Ohm termination resistor
10	LVDS+	100 Ohm termination resistor
11	Laser Status	active high(Unit is ON), LVTTL output
12	Alarm	active high, LVTTL output

2.3.5 Environmental Specification

Module Environmental Conditions						
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Storage temperature range	T _{storage}	see note 1	-40	-	85	°C
Case operating temperature range	T _{op}	-	-30	-	65	°C
Humidity	-	non-condensing	-	-	80	%
Heat Disipaching		Surface conductive via bottom side				

2.3.6 Product Safety and RoHS Conformity

The module complies with the European low voltage directive 2006/95/EC as elaborated by standard EN 60950-1.

The module complies with the directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)

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3 RS232 Serial Interface Specification

3.1 Overview

The CPFL modules are controlled by serial RS232 interface using TTL logic Terminal emulator programs should be used to communicate with the module (e.g. Microsoft Hyper terminal). The CPFL modules use the following terminal interface parameters:

Terminal Parameter	Setting	Unit
Baud rate	9600	Baud
Data bits	8	Bits
Parity	None	
Stop bits	1	Bit
Flow control	None	

The command list is described in detail in a separate document:

4 Applicable Documents

4.1 Proof of Delivery Quality

An individual test report is delivered for each module with detailed measurements including:

- Module serial number

- 1) Pump current parameter VS Average Power
- 2) Trigger (external) to pulse (optical out) delay and jitter @500kHz
- 3) Peak power @ 3nsec pulse duration, 500kHz pulse repetition freq.

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4.2 Equipment Labeling

4.2.1 Sticker Front Side

- Color: White
- Printed or fixed on center of top plate

4.2.2 Laser class indication

- The module is labelled as laser class 4 product

4.3 Equipment Packaging

Each device will be supplied in single packaging. The packaging is safe against transport damages and protects particularly the pigtails and the connectors. On the packaging a label with the indication of BKtel type is to be applied on the front face.