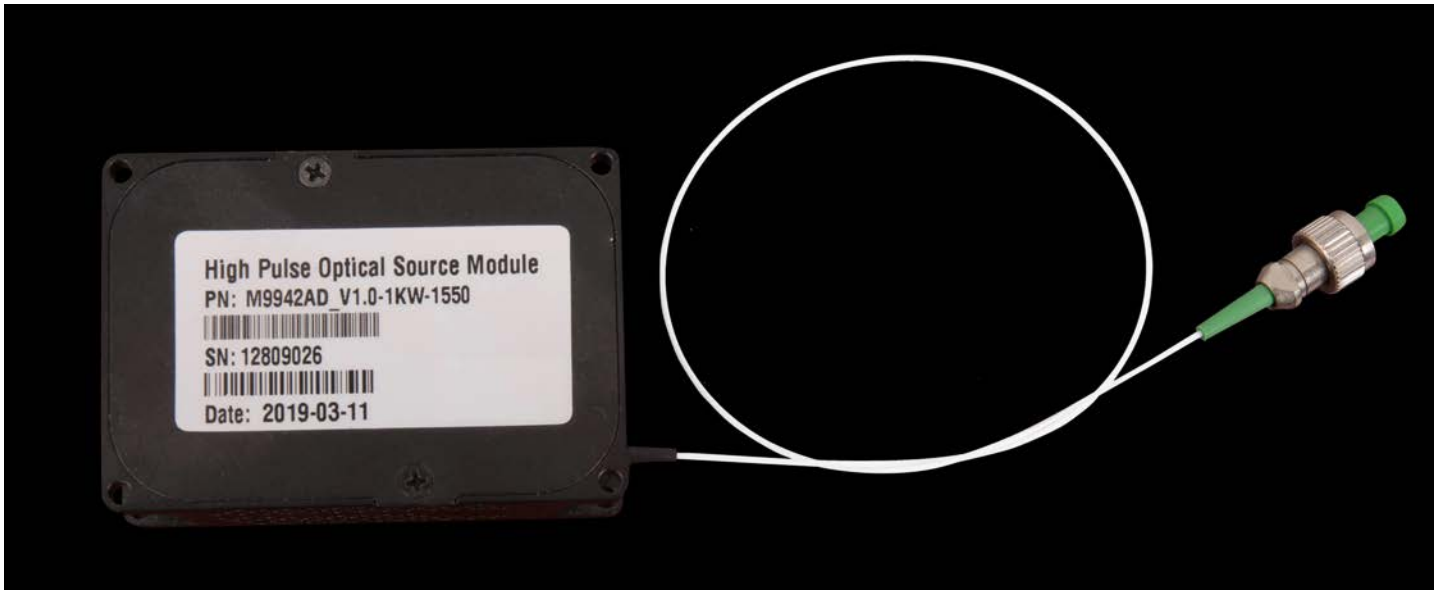
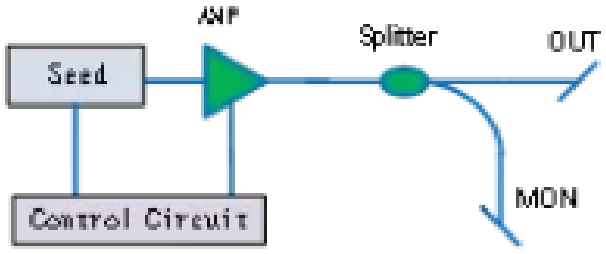
Pulsed LiDAR Optical Laser Source



Product Introduction

Pulsed LiDAR Optical Laser Source product are 1550nm eye safety pulsed LiDAR source. The configuration uses MOPA design, it can achieve high peak power, ns level pulse width and high repetition rate. The module uses compact package with smart size, wide operating temperature range and low power consumption. It is the ideal source for LiDAR, mapping, and range-detecting.

System Function Diagram



Features

➢ 1550nm Eye safety
➢ High beam quality M2<1.2
➢ Low power consumption
➢ Temperature control system
➢ High stability and reliability

Application

◊ ADAS
◊ Mapping
◊ Rang-detecting
◊ 3D scanning
◊ Fiber sensor

Environmental Requirements

Parameter	Min.	Max.	Unit
Operating Temperature*	-40	105	℃
Storage Temperature	-40	125	℃
Humidity	5	95	%

*case temperature

Mechanics and Electrics

Parameter	Min.	Typ.	Max.	Unit
Size	L×W×H≤80*50*20mm3			mm
Power Consumption(1)	-----	12	14	W
Supply Voltage	9	12	13	V
Electrical Strength	-----	500	-----	V
Trigger		External		NA
Connector		TBD		

(1)The power consumption depends on the actual output power and environment temperature.

Optical Parameters

Specification	Unit	Min.	Typ.	Max.	Notes
Wavelength Center	nm	1540	1550	1565	
Wavelength Drift	nm/℃		0.1		For working temperature -40~105℃
Line width@3dB	nm			0.2	
Pulse Width (FWHM)	ns	2	4	5	fixed 4ns
Pulse Width Accuracy	ns	-10%		10%	in full temperature range
Repetition Rate	MHz	0.2	0.5	2	Adjustable
Average Power (Main output)	W	0.95	1	1.05	@500 kHz, 4ns, 25℃
Average Power at 105C	W	0.5			@500kHz, 4ns, 100% DAC setting
ASE	%			5	@500W peak power
OSNR	dB	30		-	
Peak Power	W	500	700		
Polarization			Random		
Reference output	%	0.08	0.1	0.12	0.1% Tap is preferred, TBD
Output Fiber Type			SMF-28ultra		
Fiber Length, Main Output	M		1		With 900um jacket
Fiber Length, Reference	M		1		With 900um jacket
Fiber connector Type			FC/APC		
Optical Isolation	dB	40	50		
E-O delay	ms			1.5	Between pump enable and optical output
E-O Jitter	Ps			100	

Connector Type

Item	Specification	Notes
Connector	7 Pin Connector	-

PIN Definitions

PIN	DESCRIPTION	NOTES
1	VCC	+12V
2	GND	
3	GND	
4	Tx	3.3V-TTL,Pull up with 4.75K resistor
5	Rx	3.3V-TTL,Pull up with 4.75K resistor
6	EN	3.3V-TTL,Pull up with 4.75K resistor
7	NC	

Alarm Threshold and Hysteresis Default Values

All alarm threshold and hysteresis values are programmable. Their default values are listed in the following table.

Alarm	Threshold		Hysteresis	
	Range	Default	Range	Default
Module temperature too low	-	-40℃		2℃
Module temperature toohigh	-	105℃		2℃
Pump Bias EOL alarm (percentage of EOL value of pump bias)		100%*Imax		2%

Command Summary

This section describes the serial communication commands, which provide high level interface to access module information or set module parameters via RS232. Commands are sent in the ASCII form, which can be accessed through a standard RS232 monitor/terminal.

Command	Description	Type	
		Read	Write
VER	Get version information	x	
ECHO	Set command line echo	x	x
BAUD	Set baud rate	x	x
BOOT	Reboot firmware		x
MODE	Get/Set control mode.	X	x
MT	Get module case temperature	x	
PUMP	Get /Set pump status	x	x
PUMP ISP	Get/Set multi-mode pump current	x	x
ALRM	Get/Set alarm setpoints	x	x
AST	Get activated alarms	x	
RECV FW	Download protocol		x
TRIFREQ	Set internal trigger frequency	x	x
POUT	Get output power	x	
TRIMODE	Get/Set trigger mode	x	x
PULSEWID	Get/Set optical pulsewidth	x	x

Command Syntax

Command	Description	Example
VER	Get version information. This read-only command results in the iqw34 responding with several lines of version and configuration information: Configuration: Firmware version: Hardware version: Part Number: Serial Number: Firmware Date:	>VER Configuration: B&A Pulsed Fiber Laser Firmware version: V1.0.1017 Hardware version: V1.01.01 Part Number: xxxxxxxxxxx Serial Number: xxx

	Manufacturing Date: Manufacturer: … More info can be shown per customer request.	Firmware Date:2021-07-14 09:45:08 Manufacturing Date:2021-07-14 Manufacturer: B&A Technology Co., Ltd. >
BAUD x BAUD	BAUD x: Set baud rate to x bits-per-second to one the values: 9600, 19200, 38400, 57600,115200. BAUD: Get current setting	>BAUD BAUD:115200 >BAUD115200 OK >
BOOT	Reboot the firmware. It is equivalent to resetting the module by asserting the CPU Reset input . (show start up messages)	>BOOT OK > System startup success >
MODE xy MODE x MODE	MODE x y: Set the control mode of the amplifier to x with set pointy Control modes are: ● P: Output power control mode: y is the output power set point in mW. When y is not supplied, this command displays the last APC mode setpoint. ● M: Manual pump control: y is not supplied. In this mode, each pump is driven at a fixed current specified by the PUMP ISP command (ACC). ● D: Disable mode: y is not supplied. All pumps are shutoff. MODE: Get the current system mode and setpoint.	>MODE MODE: P600mW >MODE P MODE:P 600mW >MODE D OK >MODE MODE:D >MODE M OK >MODE MODE: M 4500 mA >
MT	Get module case temperature in degrees C.	>MT MT: 45.60C >
PUMP	Get the pump parameter as below: ● ILD: Laser diode current in mA ● EOL: Laser diode end-of-life current in mA ● ISP: Pump current set point in mA	>PUMP PUMP ILD:4500 mA PUMPEOL: 10000mA PUMP ISP: 4500 mA >
PUMP ISP x	Set pump to x milliamps.	>PUMP ISP 5000 OK >PUMP PUMP ILD: 5000 mA PUMPEOL: 10000mA PUMP ISP: 5000 mA >
ALRM xy ALRM x	Get information about alarms. ALRM xy:	>ALRM ALRM ILD STA: OFF

ALRM y ALRM	x: Alarm name y: Alarm parameters Valid alarm names (x values)are: ● ILD: Pump over current alarm ● MTH: High module (case) temperature alarm ● MTL: Low module (case) temperature alarm Valid alarm parameters (y values)are: ● STA: Current status ● THR: Threshold ● HYS: Hysteresis (relative to threshold) ALRM x: Get all of the above parameters ALRMy: Get parameter y for all alarms. ALRM: Get all parameters for all alarms	ALRM ILD THR: 95.00 % ALRM ILD HYS: 2.00 % ALRM MTH STA: OFF ALRM MTH THR: 105.00 C ALRM MTH HYS: 1.00 C ALRM MTL STA: OFF ALRM MTL THR: - 40.00 C ALRM MTL HYS: 1.00 C >ALRM STA ALRM ILD STA: OFF ALRM MTH STA: OFF ALRM MTL STA: OFF >ALRM MTH ALRM MTH STA: OFF ALRM MTH THR: 105.00 C ALRM MTH HYS: 1.00 C >
ALRM x THRy ALRM x HYSy	Set threshold or hysteresis level for the specified alarm. X: Alarm name y: Threshold or hysteres is value.	>ALRM MTH HYS 1.00 OK >
AST	Lists all active (on)alarms. Alarms are not cleared until the alarming condition is cleared. If no alarms are on, the response is “OK”.	>AST AST: MTL >AST AST:OK
RECVFW	Downloads FW using the 1K XMODEM file transfer protocol. (1K XMODEM file transfer)	>RECV FW >CCCCCCC
TRIFREQx	Set internal trigger frequency in KHz X:set point in 200~2000kHz Set /Read in trimode2 Read only in trimode0	>TRIFREQ500 OK >TRIFREQ TRIGGER FREQUENCY: 500 KHZ >
TRIMODEx	Get or Set trigger mode 0:External trigger mode	>TRIMODE TRIMODE: 0 >TRIMODE 0 OK >

PULSEWIDx	Get or Set optical pulse width X: set point in 2~5ns	>PULSEWID PULSEWID: 4NS >PULSEWID 2 OK >

Default Setting

Commands /Settings	Default Values	Note
ECHO	OFF	-
BAUD	115200	-
MODE	D	-
TRIMODE	0	External Trigger Mode

Mechanical Drawing

Size: 80×50×20mm³