

Prüfbericht-Nr.: <i>Test Report No.:</i>	CN21KLGR 001	Auftrags-Nr.: <i>Order No.:</i>	168306493	Seite 1 von 21 <i>Page 1 of 21</i>
Kunden-Referenz-Nr.: <i>Client Reference No.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2021-01-26	
Auftraggeber: <i>Client:</i>	Shenzhen AtomStack Technologies Co., Ltd. AB301, New Chabridge Industrial Park, No.3, Baolong 6th Rd., Longgang Dist, Shenzhen, 518116 Guangdong, P.R. China			
Prüfgegenstand: <i>Test item:</i>	Laser Module			
Bezeichnung / Typ-Nr.: <i>Identification / Type No.:</i>	L10, L20, L30, L40, L50, M30, M40			
Auftrags-Inhalt: <i>Order content:</i>	TÜV Rheinland test report only			
Prüfgrundlage: <i>Test specification:</i>	IEC 60825-1:2014 (Third Edition)			
Wareneingangsdatum: <i>Date of receipt:</i>	2021-01-26	 (see photo documentation for details)		
Prüfmuster-Nr.: <i>Test sample No.:</i>	A002986105-001, A002986105-002, A002990348-001, A002999980-001 to A002999980-005			
Prüfzeitraum: <i>Testing period:</i>	2021-01-26			
Ort der Prüfung: <i>Place of testing:</i>	See page 4			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von: <i>tested by:</i>	Jammy Zhang	genehmigt von: <i>authorized by:</i>	Jet Luo	
Datum: <i>Date:</i>	2021-03-02	Ausstellungsdatum: <i>Issue date:</i>	2021-03-02	
Stellung / Position:	Projekthandler/Project handler	Stellung / Position:	Sachverständige(r)/Expert	
Sonstiges / Other: See page 2				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>		Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>		
* Legende: 1 = sehr gut 2 = gut 3 = befriedigend 4 = ausreichend 5 = mangelhaft P(ass) = entspricht o.g. Prüfgrundlage(n) F(all) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet Legend: 1 = very good 2 = good 3 = satisfactory 4 = sufficient 5 = poor P(ass) = passed a.m. test specification(s) F(all) = failed a.m. test specification(s) N/A = not applicable N/T = not tested				
<p>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.</p> <p><i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i></p>				

v05

Prüfbericht-Nr.: <i>Test Report No.:</i>	CN21KLGR 001	Auftrags-Nr.: <i>Order No.:</i>	168306493	Seite 2 von 21 <i>Page 2 of 21</i>
--	--------------	---	-----------	---------------------------------------

Sonstiges / Other:

This report contains 21 pages including this cover page, 3 pages of national differences (attachment 1), 17 pages of photo documentation (attachment 2).

TEST REPORT
IEC 60825-1
Safety of laser products -
Part 1: Equipment classification and requirements

Report Number : See cover page

Date of issue..... : See cover page

Total number of pages : See cover page

Name of Testing Laboratory preparing the Report..... : See cover page

Applicant's name : See cover page

Address..... : See cover page

Test specification:

Standard..... : See cover page

Test procedure : Type test report

Non-standard test method : N/A

Test Report Form No. : IEC60825_1F

Test Report Form(s) Originator : OVE

Master TRF..... : Dated 2019-10-14

Copyright © 2019 IEC System of Conformity Assessment Schemes for Electrotechnical Equipment and Components (IECEE System). All rights reserved.

This publication may be reproduced in whole or in part for non-commercial purposes as long as the IECEE is acknowledged as copyright owner and source of the material. IECEE takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer:

The test results presented in this report relate only to the object tested.

This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Test item description	Laser Module	
Trade Mark	ATOMSTACK, NASUM, ATOMBLEND, DERSECO	
Original Product/Equipment Manufacturer	Same as applicant	
Branding Manufacturer(s)	--	
Model/Type reference	L10, L20, L30, L40, L50, M30, M40	
Ratings	12Vdc, 3A; built-in equipment, Class 4 laser product.	
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
<input checked="" type="checkbox"/>	Testing Laboratory:	TÜV Rheinland (Shenzhen) Co., Ltd.
	Testing location/ address	1601 R&D Room, 1602-1604, 17-18F, Building 7 Site C, Vanke Cloud City Phase I, XingKe First Street, Xili Street, Xili Community, Nanshan District, Shenzhen 518052, China
	Tested by (name, function, signature)	See cover page
	Approved by (name, function, signature) ...:	See cover page
<input type="checkbox"/>	Testing procedure: CTF Stage 1:	
	Testing location/ address	
	Tested by (name, function, signature)	
	Approved by (name, function, signature) ...:	
<input type="checkbox"/>	Testing procedure: CTF Stage 2:	
	Testing location/ address	
	Tested by (name + signature)	
	Witnessed by (name, function, signature) . :	
	Approved by (name, function, signature) ...:	
<input type="checkbox"/>	Testing procedure: CTF Stage 3:	
<input type="checkbox"/>	Testing procedure: CTF Stage 4:	
	Testing location/ address	
	Tested by (name, function, signature)	
	Witnessed by (name, function, signature) . :	
	Approved by (name, function, signature) ...:	
	Supervised by (name, function, signature) :	

<p>Summary of testing:</p> <p>The equipment was tested to compliance with IEC 60825-1:2014 / EN 60825-1:2014 and it was classified as Class 4 Laser Product.</p> <p>Note:</p> <p>The equipment is a built-in equipment, adequate laser safeguard shall be provided in end product.</p>	
<p>Tests performed (name of test and test clause):</p> <p>5.4 Measurement geometry.</p> <p>Note: if no other specified, all test were performed on model M30 to represents all models.</p> <p>As per client request, model L10 is classified as Class 4 laser product even its maximum output laser power is 400mW.</p>	<p>Testing location:</p> <p>See cover page</p>
<p>Summary of compliance with National Differences:</p> <p>List of countries addressed</p> <p>CA</p> <p>Explanation of used codes: CA=Canada</p> <p>For national differences, see attachment 1 for details.</p> <p><input checked="" type="checkbox"/> The product fulfils the requirements of <u>EN 60825-1: 2014.</u></p>	
<p>Statement concerning the uncertainty of the measurement systems used for the tests</p> <p><input type="checkbox"/> Internal procedure used for type testing through which traceability of the measuring uncertainty has been established:</p> <p>Procedure number, issue date and title:</p> <p>Calculations leading to the reported values are on file with the NCB and testing laboratory that conducted the testing.</p> <p><input checked="" type="checkbox"/> Statement not required by the standard used for type testing</p> <p>When determining for test conclusion, measurement uncertainty of tests has been considered.</p> <p>The determination of the test conclusion is based on IEC Guide 115 in consideration of measurement uncertainty.</p>	

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

ATOMSTACK

Product Name: Laser Module Model No.: L10
 Focus mode: Fixed-focus
 Max Input of Laser Module: 12V 3A

Wavelength: 405±5nm
 Pulse Working: Duration=1ms Frequency=1KHz
 Maximum Laser Power: 400mW
 Compiles with IEC 60825-1:2014

www.atomstack3d.com **MADE IN CHINA**
 Manufactured by: Shenzhen AtomStack Technologies Co., Ltd.
 AB301, New Chabridge Industrial Park, No.3, Baolong 6th Rd., Longgang Dist., Shenzhen 518116, China
 0086-755-89667680
 E-mail address: support@atomstack3d.com

CE FC RoHS 

	DANGER LASER 4		
AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION			

ATOMSTACK

Product Name: Laser Module Model No.: L20
 Focus mode: Fixed-focus
 Max Input of Laser Module: 12V 3A

Wavelength: 455±5nm
 Pulse Working: Duration=1ms Frequency=1KHz
 Maximum Laser Power: 5W
 Compiles with IEC 60825-1:2014

www.atomstack3d.com **MADE IN CHINA**
 Manufactured by: Shenzhen AtomStack Technologies Co., Ltd.
 AB301, New Chabridge Industrial Park, No.3, Baolong 6th Rd., Longgang Dist., Shenzhen 518116, China
 0086-755-89667680
 E-mail address: support@atomstack3d.com

CE FC RoHS 

	DANGER LASER 4		
AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION			

ATOMSTACK

Product Name: Laser Module Model No.: L30
 Focus mode: Fixed-focus
 Max Input of Laser Module: 12V 3A

Wavelength: 455±5nm
 Pulse Working: Duration=1ms Frequency=1KHz
 Maximum Laser Power: 5W
 Compiles with IEC 60825-1:2014

www.atomstack3d.com **MADE IN CHINA**
 Manufactured by: Shenzhen AtomStack Technologies Co., Ltd.
 AB301, New Chabridge Industrial Park, No.3, Baolong 6th Rd., Longgang Dist., Shenzhen 518116, China
 0086-755-89667680
 E-mail address: support@atomstack3d.com

CE FC RoHS 

	DANGER LASER 4		
AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION			

ATOMSTACK

Product Name: Laser Module Model No.: L40
 Focus mode: Fixed-focus
 Max Input of Laser Module: 12V 3A

Wavelength: 455±5nm
 Pulse Working: Duration=1ms Frequency=1KHz
 Maximum Laser Power: 5W
 Compiles with IEC 60825-1:2014

www.atomstack3d.com **MADE IN CHINA**
 Manufactured by: Shenzhen AtomStack Technologies Co., Ltd.
 AB301, New Chabridge Industrial Park, No.3, Baolong 6th Rd., Longgang Dist., Shenzhen 518116, China
 0086-755-89667680
 E-mail address: support@atomstack3d.com



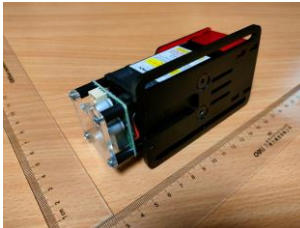
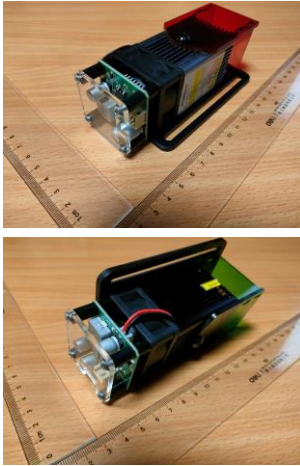


CE FC RoHS 

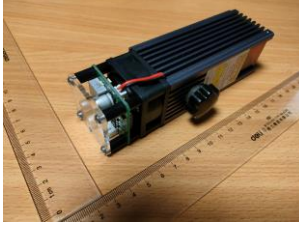
	DANGER LASER 4		
AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION			

<p style="text-align: center;">ATOMSTACK</p> <p>Product Name: Laser Module Model No.: L50 Focus mode: Fixed-focus Max Input of Laser Module: 12V 3A</p> <div style="border: 1px solid black; background-color: yellow; padding: 5px;"> <p>Wavelength: 455±5nm Pulse Working: Duration=1ms Frequency=1KHz Maximum Laser Power: 9W Compiles with IEC 60825-1:2014</p> </div> <p>www.atomstack3d.com MADE IN CHINA Manufactured by: Shenzhen AtomStack Technologies Co., Ltd. AB301, New Chabridge Industrial Park, No.3, Baolong 6th Rd., Longgang Dist., Shenzhen 518116, China 0086-755-89667680 E-mail address: support@atomstack3d.com</p> <p style="text-align: center;">CE FC RoHS </p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION</p> </div>	<p style="text-align: center;">ATOMSTACK</p> <p>Product Name: Laser Module Model No.: M30 Focus mode: Fixed-focus Max Input of Laser Module: 12V 3A</p> <div style="border: 1px solid black; background-color: yellow; padding: 5px;"> <p>Wavelength: 455±5nm Pulse Working: Duration=1ms Frequency=1KHz Maximum Laser Power: 5W Compiles with IEC 60825-1:2014</p> </div> <p>www.atomstack3d.com MADE IN CHINA Manufactured by: Shenzhen AtomStack Technologies Co., Ltd. AB301, New Chabridge Industrial Park, No.3, Baolong 6th Rd., Longgang Dist., Shenzhen 518116, China 0086-755-89667680 E-mail address: support@atomstack3d.com</p> <p style="text-align: center;">CE FC RoHS </p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION</p> </div>
<p style="text-align: center;">ATOMSTACK</p> <p>Product Name: Laser Module Model No.: M40 Focus mode : Fixed-focus Max Input of Laser Module : 12V 3A</p> <div style="border: 1px solid black; background-color: yellow; padding: 5px;"> <p>Wavelength: 455±5nm Pulse Working : Duration=1ms Frequency=1KHz Maximum Laser Power: 5W Compiles with IEC 60825-1:2014</p> </div> <p>www.atomstack3d.com MADE IN CHINA Manufactured by: Shenzhen AtomStack Technologies Co., Ltd. AB301, New Chabridge Industrial Park, No.3, Baolong 6th Rd., Longgang Dist., Shenzhen 518116, China 0086-755-89667680 E-mail address: support@atomstack3d.com</p> <p style="text-align: center;">CE FC RoHS </p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION</p> </div>	<div style="border: 2px solid black; background-color: yellow; padding: 10px; width: 150px; margin: 0 auto;"> </div>

Note: since similar rating label used, only above models with trademark ATOMSTACK listed to represents all similar ones.

Test item particulars			
Classification of installation and use: Class III			
Supply Connection: Supplied by AC/DC adapter			
.....:			
Possible test case verdicts:			
- test case does not apply to the test object.....: N/A			
- test object does meet the requirement.....: P (Pass)			
- test object does not meet the requirement.....: F (Fail)			
Testing:			
Date of receipt of test item: See cover page			
Date (s) of performance of tests: See cover page			
.....			
General remarks:			
"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report.			
Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.			
Manufacturer's Declaration per sub-clause 4.2.5 of IEC 60950-1:			
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable	
When differences exist; they shall be identified in the General product information section.			
Name and address of factory (ies): Shenzhen AtomStack Technologies Co., Ltd. AB301, New Chabridge Industrial Park, No.3,Baolong 6th Rd., Longgang Dist, Shenzhen, 518116 Guangdong, P.R. China			
General product information:			
The device are built-in laser module, it can used for carving and slicing, also emitted either continuous wavelength laser or pulse wavelength laser during normal use.			
The equipment contains a 455nm wavelength laser diode, it is a Class 4 laser product, adequate laser safeguard shall be provided in end product according to the user manual.			
All models are identical except for plastic cover around the laser aperture, laser output power and external shape, see table below for details.			
Model	Plastic cover around the laser aperture	Laser output power	External shape

L10	Orange	400mW	
L20	Red	5W	
L30	Red	5W	
L40	Red	5W	
L50	None	9W	
M30	Brown	5W	

M40	Red	5W	
<p>Note: Model L40 has two different color pastic cover, one is red, another one is green.</p>			

IEC 60825-1			
Clause	Requirement + Test	Result - Remark	Verdict
4	CLASSIFICATION PRINCIPLES		
4.3	Classification rules		---
4.3 a	Radiation of a single wavelength		P
4.3 b	Radiation of multiple wavelengths		N/A
	1) Laser product emits at two or more wavelengths shown as additive in Table 1		N/A
	2) Laser product emits at two or more wavelengths not shown as additive in Table 1		N/A
4.3 c	Radiation from extended sources (see 5.4.3)		N/A
4.3 d	Non-uniform, non-circular or multiple apparent source		N/A
4.3 e	Time bases		---
	1) 0,25 s		N/A
	2) 100 s		P
	3) 30000 s		N/A
4.3 f	Repetitively pulsed or modulated lasers	Continuous radiation considered only since the product is a Class 4 laser product.	N/A
	1) Any single pulse		N/A
	2) Average power for pulse trains		N/A
	3) Pulse duration $t \leq T_i$: Number of pulses N and C_5 :		N/A
	3) Pulse duration $t > T_i$: Number of pulses N and C_5 :		N/A
4.4	Laser products designed to function as conventional lamps.	Not such laser products.	N/A
	α measured at 200 mm distance from closest point of human access ($\alpha > 5$ mrad).		N/A
	Un-weighted radiance L measured at 200 mm distance (comparison with $L_T = 1 \text{ MWm}^{-2}\text{sr}^{-1}/\alpha$) under reasonably foreseeable single fault conditions.		N/A

IEC 60825-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Evaluation of emission according to IEC 62471 series (optional): Standard applied (IEC 62471 series).....: Risk Group.....: Labelling.....: Classification of product based on accessible laser radiation (if no laser radiation accessible: Class 1).		N/A
5	DETERMINATION OF THE ACCESSIBLE EMISSION LEVEL and PRODUCT CLASSIFICATION		
5.1	Tests	Details see appended table.	---
	Compliance under reasonably foreseeable single fault conditions.	The product is classified as Class 4 laser product, then there is no necessary to consider the foreseeable single fault conditions.	N/A
5.3	Determination of the class of the laser product ... : For Class 1C: vertical safety standard applied with requirements for Class 1C.	Not applicable.	---
5.4	Measurement geometry		---
5.4.1	General		---
5.4.2	Default (simplified) evaluation	Default method is applied	P
	Conditions applied	100mm	P
	Aperture diameter	7mm	P
	Reference point :.....	Laser aperture.	P
	Measurement distance	See details in measurement section.	P
	(for each condition)		
5.4.3	Evaluation condition for extended sources		N/A
	Conditions applied		N/A
	Most restrictive position		N/A
	(distance from reference point)		
	Angular subtense of the apparent source α and C_6 : (for each condition)		N/A
5.4.3 a	Aperture diameters (for each condition).		N/A
5.4.3 b	Angle of acceptance (for each condition).....		N/A

IEC 60825-1			
Clause	Requirement + Test	Result - Remark	Verdict

Measured accessible laser radiation and comparison with AEL:
Normal condition:

Wavelength: 455nm, 100mm distance position.

- Aperture size: 7mm;
- Measured power: 5.62W;

Foreseeable single fault condition: N/A

Conclusion:

The measured accessible laser radiation from 100mm distance of the accessible place is exceeding AEL of Class 3B, therefore the product is classified as Class 4 laser product.

Note: AEL of Class 3B=500mW

IEC 60825-1			
Clause	Requirement + Test	Result - Remark	Verdict
6	ENGINEERING SPECIFICATIONS		N/A
6.2	Protective housing		---
6.2.1	General		---
	Protective housing prevents access to energy levels in excess of the AEL for Class 1.	Built-in equipment, shall be evaluated in end product.	N/A
	Protective housing prevents access to energy levels equivalent to Class 4 and withstands exposures under reasonably foreseeable single fault conditions.	Built-in equipment, shall be evaluated in end product.	N/A
	Maintenance of Class 1, 1C, 1M, 2, 2M, or 3R (access to emissions of Class 3B or 4 is prevented).		N/A
	Maintenance of Class 3B product (access to emission of Class 4 is prevented).		N/A
6.2.2	Service	Built-in equipment, shall be evaluated in end product.	N/A
6.2.3	Removable laser system (laser system complies with requirements of Clauses 6 and 7).	Built-in equipment, shall be evaluated in end product.	N/A
6.3	Access panels and safety interlocks		---
6.3.1	Panel is intended to be removed during operation (or maintenance) and would give access to higher energy levels (see Table 13).	Built-in equipment, shall be evaluated in end product.	N/A
	Accessible emission (after removal of the panel) corresponds to product Class (designated by "X" in Table 13)	Built-in equipment, shall be evaluated in end product.	N/A
	Emission through the opening if interlocked panel of Class 1, 1C, 1M, 2, or 2M is removed (Emission < AEL of Class 1M or 2M).		N/A
	Emission through the opening if interlocked panel of Class 3R, 3B, or 4 is removed (Emission < AEL of Class 3R).	Built-in equipment, shall be evaluated in end product.	N/A
	Requirements regarding reasonably foreseeable single fault condition.	Built-in equipment, shall be evaluated in end product.	N/A
6.3.2	Override mechanism	No such devices provided.	N/A
	Behaviour of override in operation when the panel is replaced.		N/A
	Visible or audible warning for override mode.		N/A
6.4	Remote interlock connector	Built-in equipment, shall be evaluated in end product.	N/A
6.5	Manual reset	Built-in equipment, shall be evaluated in end product.	N/A

IEC 60825-1			
Clause	Requirement + Test	Result - Remark	Verdict
6.6	Key control	Built-in equipment, shall be evaluated in end product.	N/A
6.7	Laser radiation emission warning		---
6.7.1	Laser product is a 3R ($\lambda < 400$ nm; $\lambda > 700$ nm), 1C, 3B or 4 laser systems.	Built-in equipment, shall be evaluated in end product.	N/A
6.7.2	Audible or visible warning.	Built-in equipment, shall be evaluated in end product.	N/A
	Warning is failsafe or redundant.		N/A
	Viewing of the visible warning does not require exposure to emissions > AEL for Class 1M and 2M.		N/A
6.7.3	Operational control and laser aperture are provided with a warning device when they are separated more than 2 m from warning device.	Built-in equipment, shall be evaluated in end product.	N/A
6.7.4	Visible indication of output aperture if laser emission may be distributed through more than one output.	Built-in equipment, shall be evaluated in end product.	N/A
6.7.5	Switch for handheld Class 3R device must be depressed for emission (in lieu of emission indicator).		N/A
6.8	Beam stop or attenuator	Built-in equipment, shall be evaluated in end product.	N/A
6.9	Controls	Built-in equipment, shall be evaluated in end product.	N/A
6.10	Viewing optics		N/A
	a) Human access to laser radiation in excess of Class 1M prevented when the shutter is opened or attenuation varied.		N/A
	b) Opening of the shutter or variation of the attenuation prevented when exposure to laser radiation in excess of Class 1M is possible.		N/A
6.11	Scanning safeguard	No scanning safeguard.	N/A
6.12	Safeguard for Class 1C products		N/A
	a) Human access to laser radiation in excess of AEL for Class 1 measured under Condition 3 is prevented.		N/A
	b) Human access to laser radiation in excess of AEL for Class 3B measured through 3,5 mm aperture at 5 mm distance from applicator is prevented.		N/A
6.13	Walk-in access		N/A
	a) Means provided so that any person inside the housing can prevent activation of Class 3B or 4 laser hazards.		N/A

IEC 60825-1			
Clause	Requirement + Test	Result - Remark	Verdict
	b) A warning device provides adequate warning of emission to any person within the housing.		N/A
	c) Where "walk-in" access during operation is intended or reasonably foreseeable, emission of laser radiation that is equivalent to Class 3B or 4 while someone is present inside the enclosure of Class 1, Class 2 or Class 3R product is prevented by engineering means.		N/A
6.14	Environmental conditions		---
	- climatic conditions	The climatic conditions are considered for laser safety evaluation and there is no influence to the laser safety result.	N/A
	- vibration and shock		N/A
6.15	Protection against other hazards		---
6.15.1	Non-optical hazards (product safety standard)	Not evaluated in this report	N/A
	- electrical hazards;		N/A
	- excessive temperature;		N/A
	- spread of fire from the equipment;		N/A
	- sound and ultrasonics;		N/A
	- harmful substances;		N/A
	- explosion;		N/A
6.15.2	Collateral radiation	No collateral radiation.	N/A
6.16	Power limiting circuit	No power limiting circuit.	N/A

7	LABELLING		
7.1	General		---
	Labels durable, permanently affixed		P
	Labels clearly visible	See copying of marking.	P
	Reading of labels is possible without exposure to laser radiation in excess of AEL for Class 1.		P
	Colour combination	See copying of marking.	P
	Labelling impractical due to the size or design of the product.		N/A
	Warning label – Hazard symbol (Figure 3)	See copying of marking.	P
7.2 - 7.7	Text on explanatory label or pictogram (laser class, warning text)	See copying of marking.	P

IEC 60825-1			
Clause	Requirement + Test	Result - Remark	Verdict
7.8	Aperture label	See copying of marking.	P
7.9	Radiation output and standards information		---
	Max output of laser radiation	See copying of marking.	P
	Pulse duration	See copying of marking.	P
	Emitted wavelength(s)	See copying of marking.	P
	Name and publication date of the standard	See copying of marking.	P
7.10	Labels for access panels		---
7.10.1 a) – f)	Labels for panels - warning wording used	Built-in equipment, shall be evaluated in end product.	N/A
7.10.2	Labels for safety interlocked panels - Warning wording used	Built-in equipment, shall be evaluated in end product.	N/A
7.11	Warning for invisible laser radiation		N/A
7.12	Warning for visible laser radiation	Built-in equipment, shall be evaluated in end product.	N/A
7.13	Warning for potential hazard to the skin or anterior parts of the eye - warning wording used	Built-in equipment, shall be evaluated in end product.	N/A

8	OTHER INFORMATIONAL REQUIREMENTS		
8.1	Information for the user		---
	a) adequate instructions for assembly, maintenance and safe use and description of the classification limitations, if appropriate.	Adequate laser safety related informaiton and instructions are provided in product manual.	P
	b) additional warning for Class 1M and 2M		N/A
	c) laser beam parameters for radiation above the AEL of Class 1		---
	• Wavelength	455±5nm	P
	• Beam divergence		N/A
	• Pulse pattern	Pulse duration=1ms, frequency=1KHz	P
	• Maximum power or energy output	Adequate laser safety related informaiton and instructions are provided in product manual.	P
	d) safety instruction for embedded laser products and other incorporated laser products.		P

IEC 60825-1			
Clause	Requirement + Test	Result - Remark	Verdict
	e) MPE and NOHD for Class 3B and 4 laser products; For collimated beam Class 1M and 2M lasers the extended NOHD (ENOHD).	Built-in equipment, shall be evaluated in end product.	N/A
	f) information for the selection of eye protection.		P
	g) reproduction of all required labels and warnings.		P
	h) location of laser apertures		P
	i) list of controls, adjustments of procedures for operation and maintenance - and warning statement.		P
	j) information (compatibility requirements) about laser energy source if not incorporated.		N/A
	k) additional warning for Class 1, 1M, 2, 2M, and 3R regarding skin or corneal burns.	Class 4 laser	N/A
	l) Information for Class 1C products (e.g. warning that repeated application may pose a risk).		N/A
8.2	Purchasing and service information	Provided in the laser generator manual	P
	a) safety classification of each laser product stated in all descriptive material (e.g. brochures).	Provided in the laser generator manual	P
	b) adequate instructions for servicing available: <ul style="list-style-type: none"> • warnings and precautions regarding exposure of laser emission above Class 1 • maintenance schedule • list of controls and procedures that could increase accessible emissions • description of displaceable parts • protective procedures for service personnel • reproduction of labels and hazard warnings 	Provided in the laser generator manual	P

9 ADDITIONAL REQUIREMENTS FOR SPECIFIC LASER PRODUCTS			
9.1	Applicable other parts of the standard series IEC 60825		---
	IEC 60825-2 (Safety of optical communication systems)		N/A
	IEC 60825-4 (Laser guards)		N/A
	IEC 60825-12 (Safety of free space optical communication systems used for transmission of information)		N/A

IEC 60825-1			
Clause	Requirement + Test	Result - Remark	Verdict
9.2	Medical laser products: Class 3B and Class 4 medical laser products comply with IEC 60601-2-22		N/A
9.3	Laser processing machines: Comply with IEC/ISO 11553 series.		N/A
9.4	Electric toys: Comply with IEC 62115		N/A
9.5	Consumer electronic products: Comply with IEC 60950 (IT-equipment) or IEC 60065 (AV equipment)		N/A

TABLE: Critical components information					--
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾
Laser diode	NICHIA CORPORATION	NUBM0E	Input: DC33V, Power: 41W, wavelength: 450-460nm, Class 4	IEC 60825-1:2014 EN 60825-1:2014	Tested within appliance
Supplementary information:					

Table 1: List of test equipment used

Equipment No.	Measurement / testing	Model	Range used	Calibration due date
G1816955	Wavelength	BRC111A (mfr.: BWTEK)	200-1100nm	2022.03.12
1.473	Laser power meter	Ophir / NOVA II& L40(250)A-BB-50	0-30W	2021.11.08

-- End of Report --

IEC60825_1E ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT IEC 60825-1, Ed. 3 (2014) CANADIAN NATIONAL DIFFERENCES Safety of laser products – Part 1: Equipment classification and requirements			
Differences according to		National standard CAN/CSA-E60825-1:15	
Attachment Form No.		CA_ND_IEC60825_1F	
Attachment Originator		CSA Group	
Master Attachment		Date 2019-03-08	
Copyright © 2019 IEC System for Conformity Testing and Certification of Electrical Equipment (IECEE), Geneva, Switzerland. All rights reserved.			

	National Differences		—
	Canadian deviations: Replace all references to “IEC 60825-1” with: “CAN/CSA E60825-1”	Replaced	P
1	Scope and object In the eighth paragraph, replace “IEC 62115” with: “CSA C22.2 No. 149” Add the following paragraph at the end of the clause: This Standard covers the above-noted products that are intended to be installed or used in accordance with CSA C22.1, Canadian Electrical Code, Part I.		P
2	Normative references Where reference is made to CSA Group publications, such reference shall be considered to refer to the latest edition and all amendments published to that edition. This Standard refers to the following publications, and the years shown indicate the latest editions available at the time of printing:	Considered	P
	CSA Group C22.1-15 Canadian Electrical Code, Part I CAN/CSA-C22.2 No. 0-10 (R2015) General requirements — Canadian Electrical Code, Part II C22.2 No. 0.8-12 Safety functions incorporating electronic technology C22.2 No. 149-72 (R2013) Electrically operated toys C22.2 No. 173-M1983 (R2014) Transformers for toy and hobby use		—
	The following National Standards of Canada, published by CSA Group, are adoptions of IEC Standards. The requirements of these CSA Group Standards shall take precedence over the International Standards on which they are based; any reference within CAN/CSA-E60825-1 to the International Standards shall be replaced by a reference to the equivalent Canadian Standard. Any reference to International Standards that are adopted as National Standards of Canada		N/A

IEC60825_1E ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	subsequent to the publication of CAN/CSA-E60825-1 shall be replaced by the relevant National Standard of Canada.		
	<p>CAN/CSA-C22.2 No. 60065:03 (R2013) Audio, video and similar electronic apparatus — Safety requirements</p> <p>CAN/CSA-C22.2 No. 60079-0:11 Explosive atmospheres — Part 0: Equipment — General requirements</p> <p>CAN/CSA-C22.2 No. 60601-2 series of Standards Medical electrical equipment — Part 2: Particular requirements</p> <p>CAN/CSA-C22.2 No. 60601-2-22:08 (R2014) Medical electrical equipment — Part 2-22: Particular requirements for basic safety and essential performance of surgical, cosmetic, therapeutic and diagnostic laser equipment</p> <p>CAN/CSA-C22.2 No. 60950-1:07 (R2012) Information technology equipment — Safety — Part 1: General requirements</p> <p>CAN/CSA-C22.2 No. 61010-1:12 Safety requirements for electrical equipment for measurement, control, and laboratory use — Part 1: General requirements</p> <p>CAN/CSA-C22.2 No. 62368-1:14 Audio/video, information and communication technology equipment — Part 1: Safety requirements</p> <p>CAN/CSA-C22.2 No. 62471:12 Photobiological safety of lamps and lamp systems</p> <p>CAN/CSA-E60335-2 series of Standards Safety of Household and Similar Electrical Appliances — Part 2</p>		—
4.1A	<p>General requirements</p> <p>Products covered by the scope of this Standard are also subject to the requirements of CAN/CSA-C22.2 No. 0.</p>		P
5.1	<p>Tests</p> <p>In the second and third paragraphs, replace “IEC 61508” with: “CSA C22.2 No. 0.8”</p>	Replaced	P
5.3	<p>Determination of the class of the laser product</p> <p>In the second paragraph of Item b), replace the last sentence with the following: The laser product can be assigned to Class 1C only if it also complies with a set of safety requirements for Class 1C laser products that can be found in an applicable Canadian CSA C22.2 vertical Standard.</p>		N/A
6.3.1	<p>In the fourth paragraph, replace “IEC product safety standard” with: “Canadian product safety standard”</p>	Replaced	P
6.12	<p>Safeguard for Class 1C products</p> <p>In the second paragraph, replace “IEC 61508” with: “CSA C22.2 No. 0.8”</p>	Class 4 laser	N/A
7.1	<p>General</p> <p>Add the following paragraph: In Canada, all warning and caution texts shall be</p>	Should be evaluated in end product.	N/A

IEC60825_1E ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	listed in English and French.		
9.4	Electric toys Replace "IEC 62115" with: "CSA C22.2 No. 149 or CSA C22.2 No. 173"		N/A
9.5	Consumer electronic products Add the following at the end of the clause: or to CAN/CSA-C22.2 No. 62368-1.		N/A
C.2.6	Class 3R Replace the note with the following: NOTE Compared to ocular MPE values as well as AEL values for Class 1, 1M, 2, 2M and 3R specified in the second edition of IEC 60825-1, the respective values in the third edition of IEC 60825-1 were decreased for some single-pulsed point sources, but increased for most repetitively pulsed sources, and also increased for most pulsed extended sources; reduction factors (safety margins) in these values were changed correspondingly. Consequently, some pulsed products that were classified as Class 3R under IEC Edition 2 are Class 2 under IEC Edition 3, and some pulsed products that were classified as Class 3B under IEC Edition 2 are Class 3R under IEC Edition 3. For the latter, there is less practical experience available regarding the risk for injury as it exists for CW sources with collimated beams with powers up to 5 mW being used for many years as alignment lasers.	Class 4 laser	N/A
C.2.9	Note on nomenclature Replace the last sentence of the second paragraph with the following: The "B" for Class 3B has historical origins, as in a previous version of this Standard (CAN/CSA-E60825-1:03), a Class 3A existed, which had a similar meaning to what is now Class 1M and Class 2M.	Class 4 laser	N/A

----- END REPORT -----

Product: Laser Module

Type Designation: M30, M40, L10, L20, L30, L40, L50



Figure 1. Overall view of all models M30, M40, L10, L20, L30, L40 with red plastic cover, L40 with green plastic cover, L50

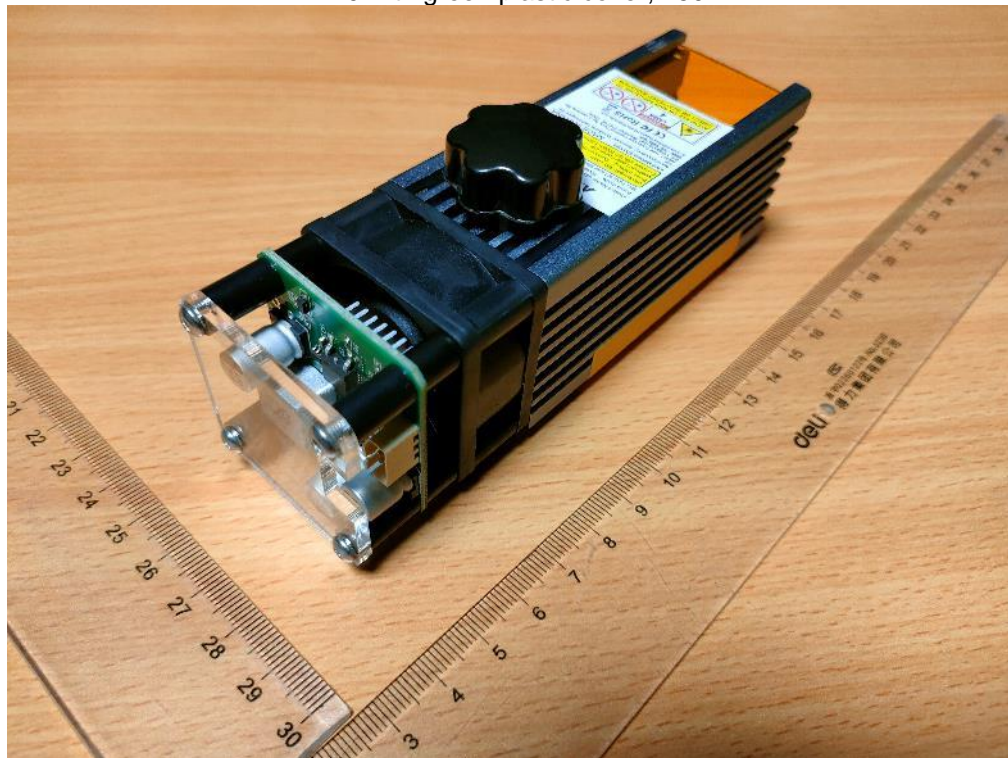


Figure 2. Overall view of model M30

ATTACHMENT 2 Photo Documentation

Product: Laser Module

Type Designation: M30, M40, L10, L20, L30, L40, L50

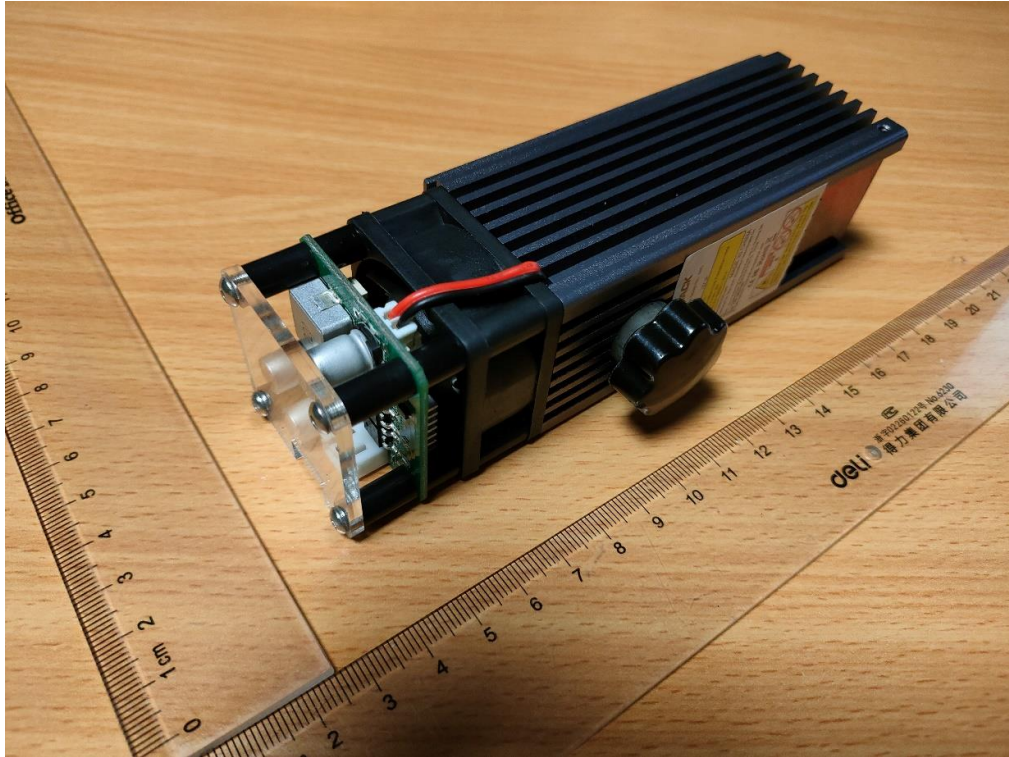


Figure 3. Overall view of model M40



Figure 4. Overall view of model L10

Product: Laser Module

Type Designation: M30, M40, L10, L20, L30, L40, L50

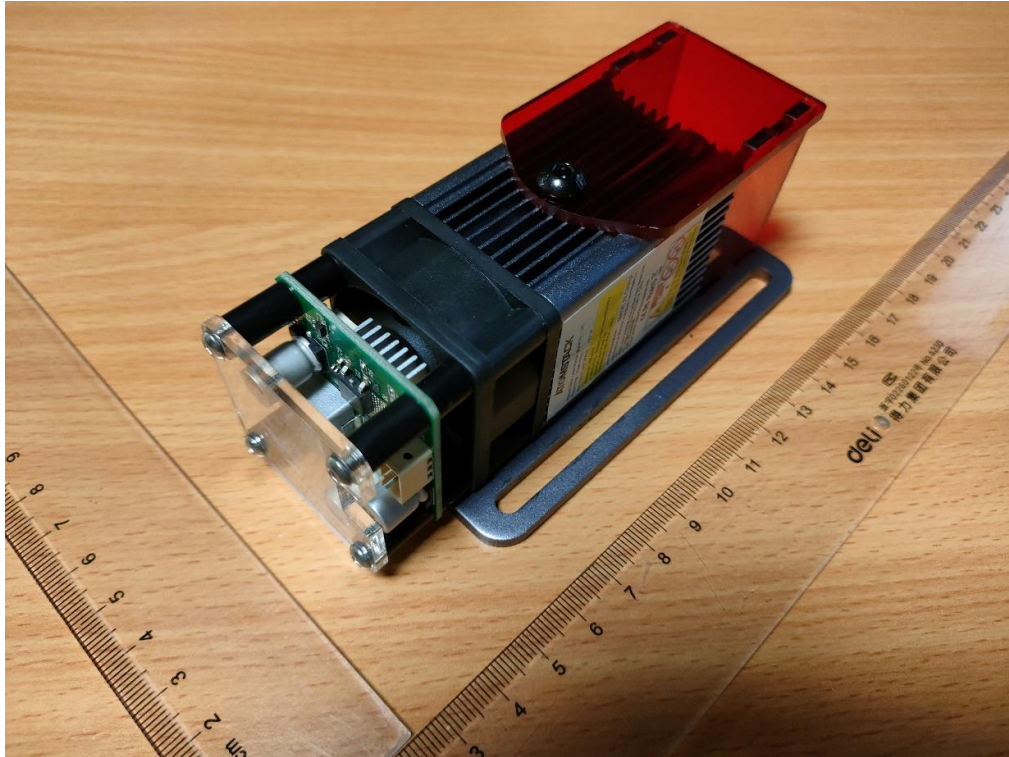


Figure 5. Overall view of model L20

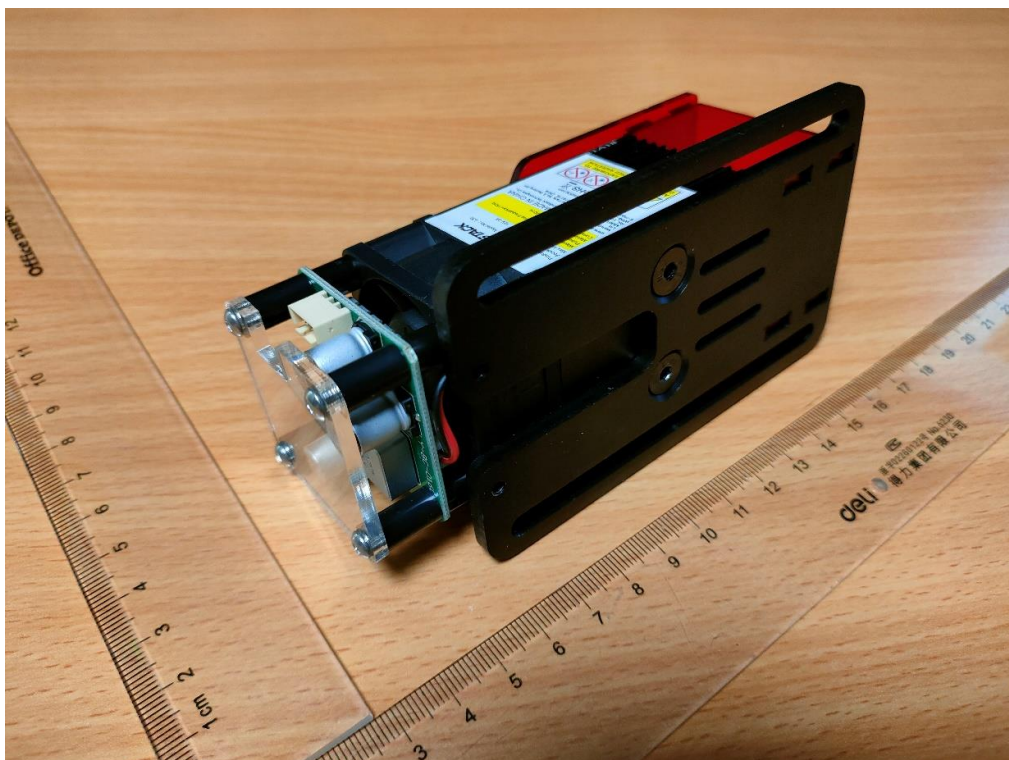


Figure 6. Overall view of model L30

ATTACHMENT 2 Photo Documentation

Product: Laser Module

Type Designation: M30, M40, L10, L20, L30, L40, L50

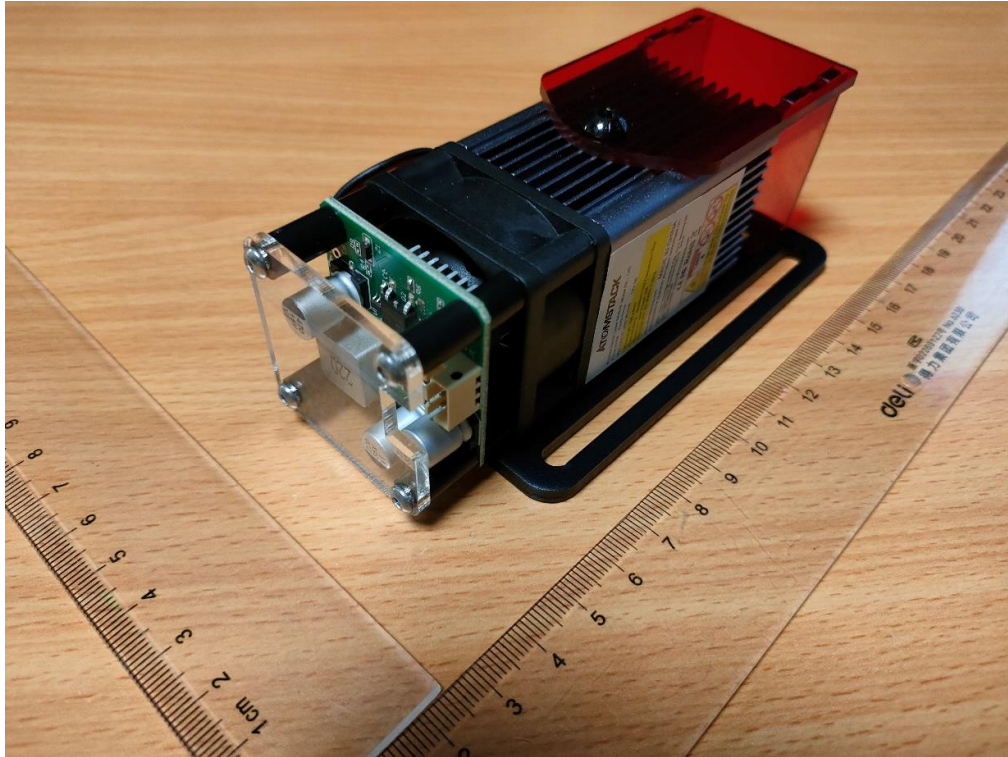


Figure 7. Overall view of model L40 with red plastic cover

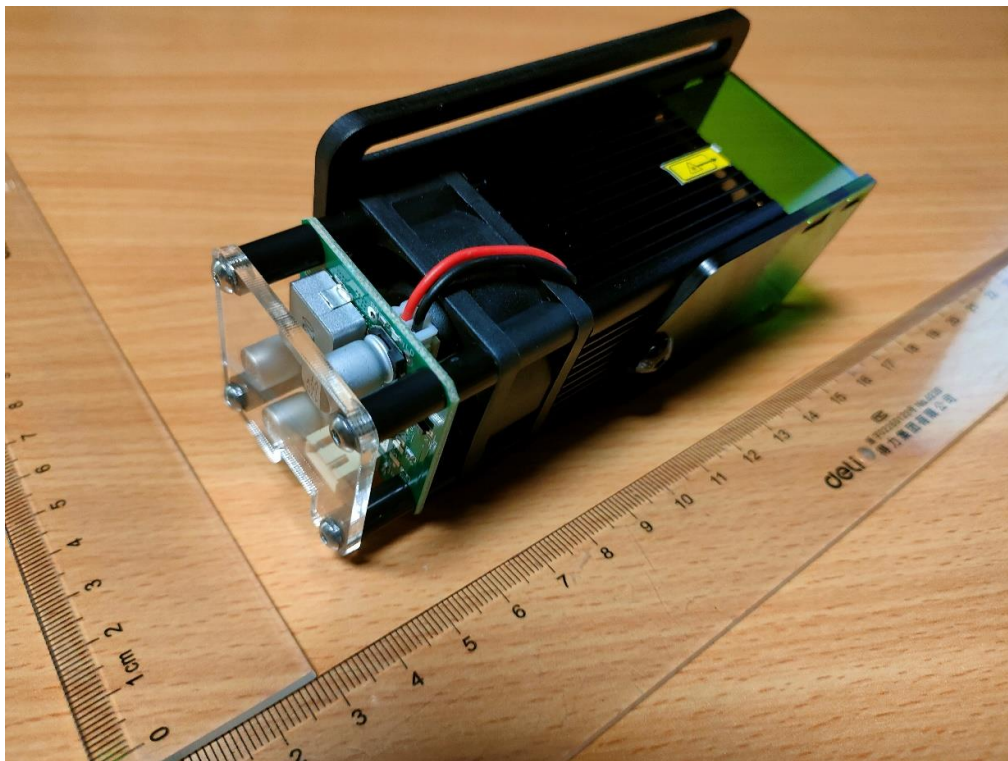


Figure 8. Overall view of model L40 with green plastic cover

ATTACHMENT 2 Photo Documentation

Product: Laser Module

Type Designation: M30, M40, L10, L20, L30, L40, L50



Figure 9. Overall view of model L50

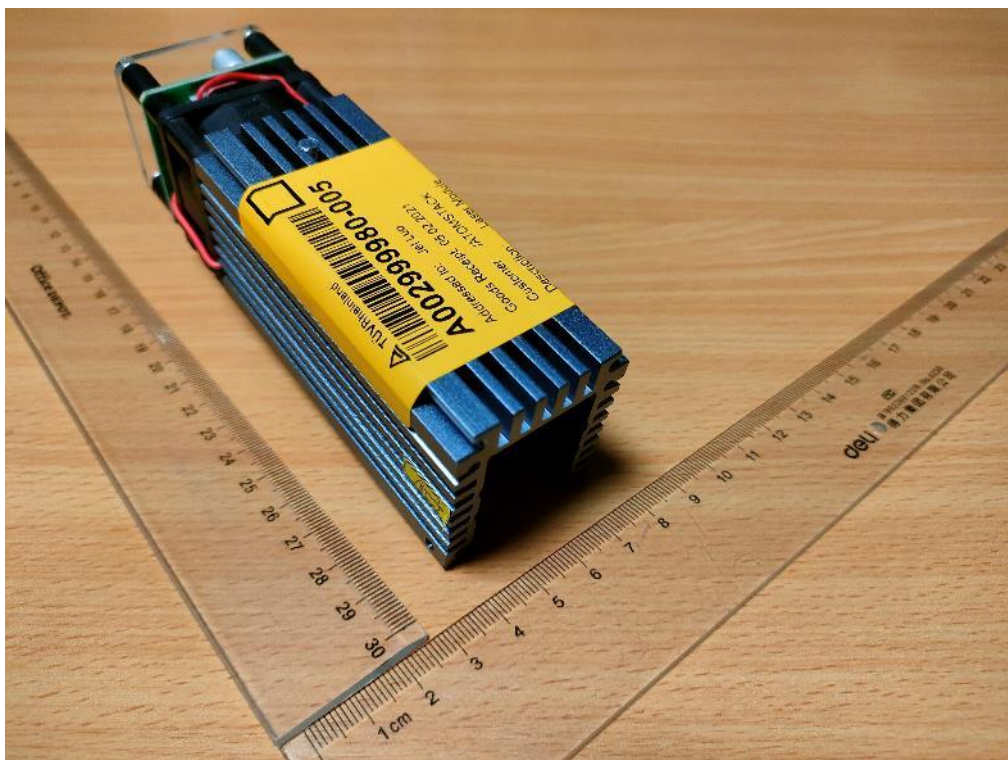


Figure 10. Overall view of model M30

ATTACHMENT 2 Photo Documentation

Product: Laser Module

Type Designation: M30, M40, L10, L20, L30, L40, L50

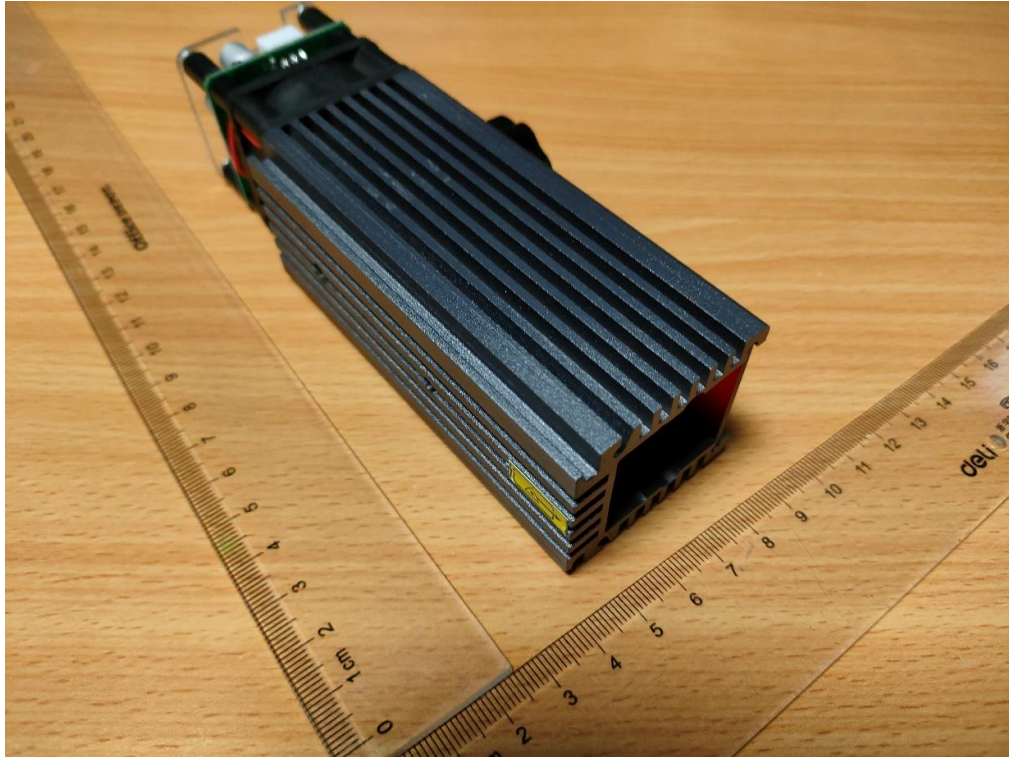


Figure 11. Overall view of model M40



Figure 12. Overall view of model L10

Product: Laser Module

Type Designation: M30, M40, L10, L20, L30, L40, L50

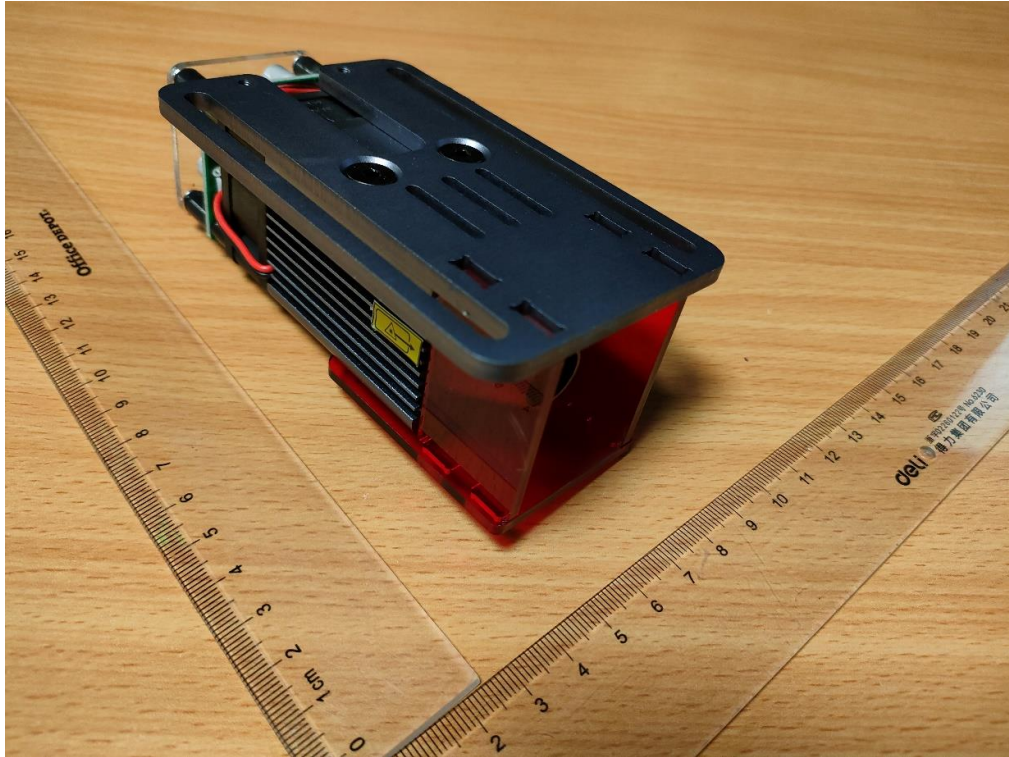


Figure 13. Overall view of model L20

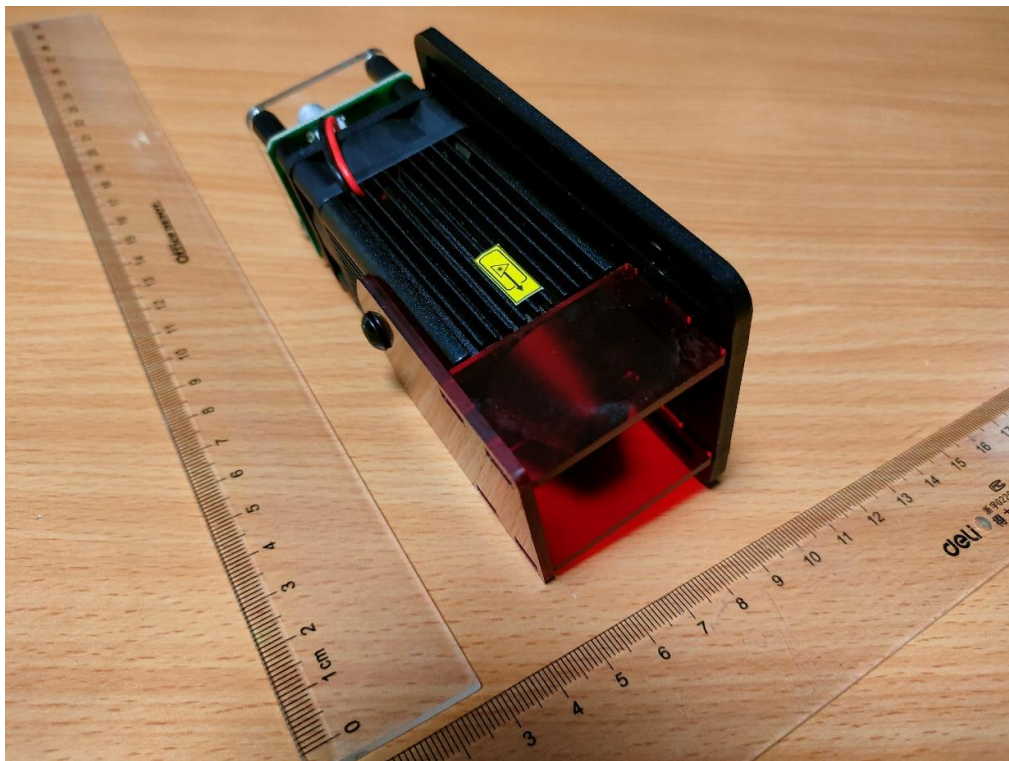


Figure 14. Overall view of model L30

ATTACHMENT 2 Photo Documentation

Product: Laser Module

Type Designation: M30, M40, L10, L20, L30, L40, L50

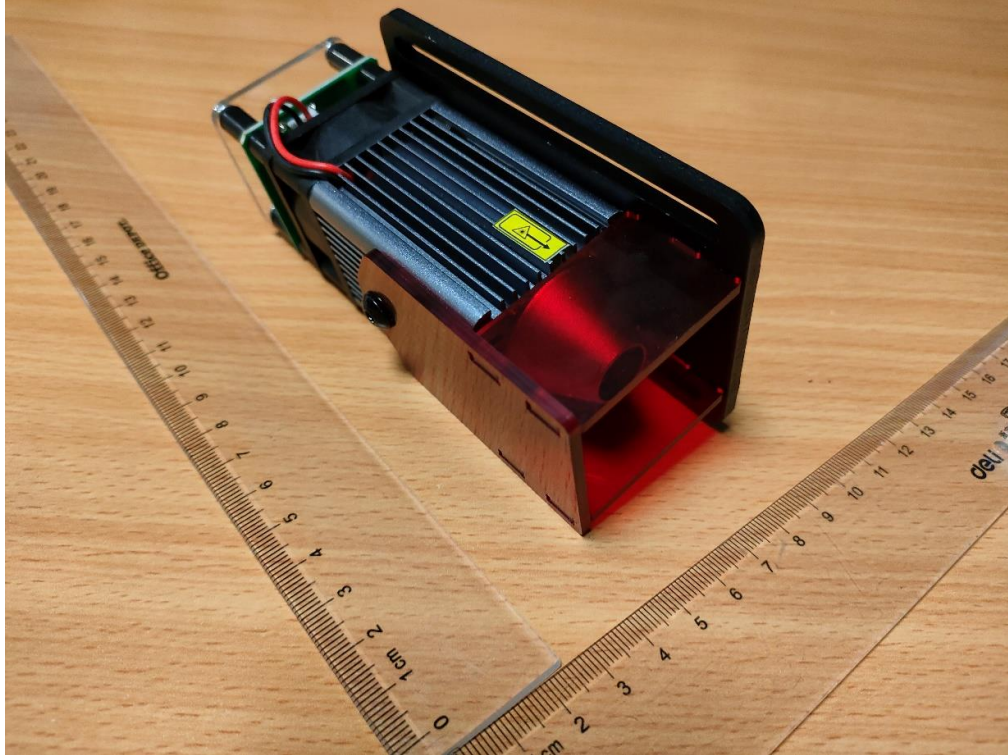


Figure 15. Overall view of model L40 with red plastic cover

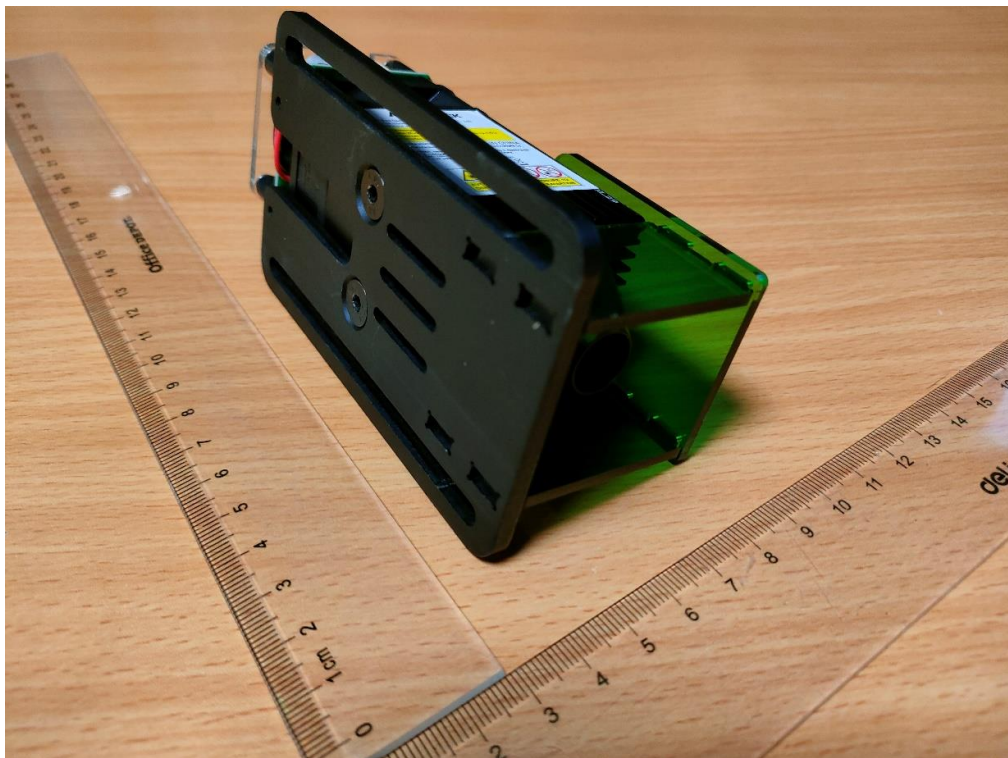


Figure 16. Overall view of model L40 with green plastic cover

ATTACHMENT 2 Photo Documentation

Product: Laser Module

Type Designation: M30, M40, L10, L20, L30, L40, L50

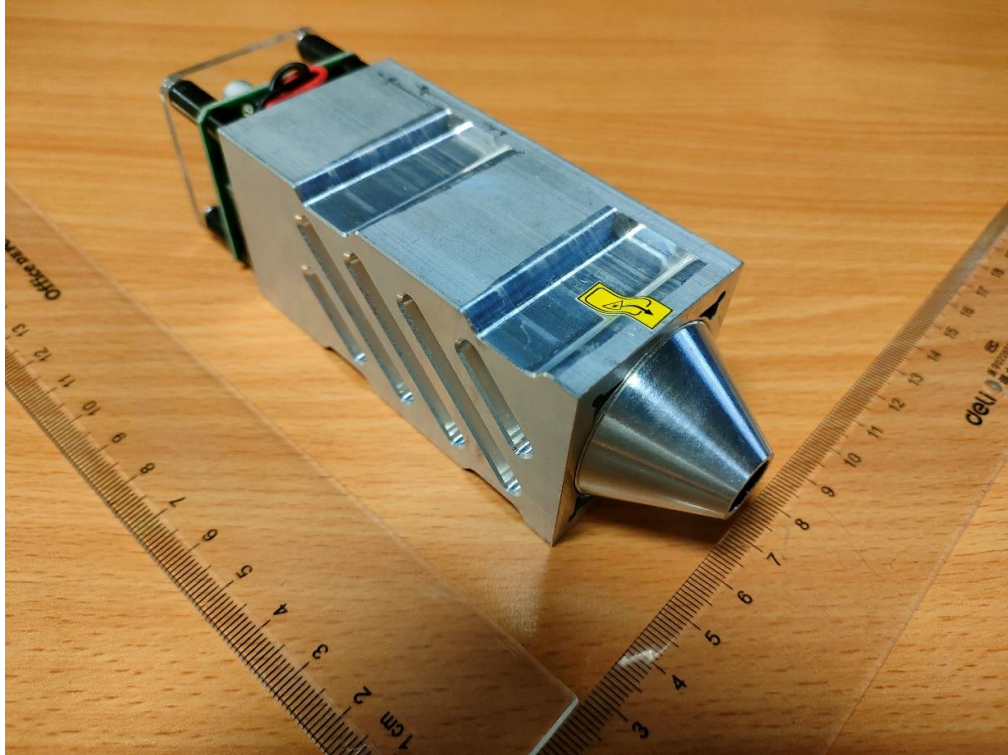


Figure 17. Overall view of model L50



Figure 18. Label of model M30

Product: Laser Module

Type Designation: M30, M40, L10, L20, L30, L40, L50



Figure 19. Label of model M40



Figure 20. Label of model L10

ATTACHMENT 2 Photo Documentation

Product: Laser Module

Type Designation: M30, M40, L10, L20, L30, L40, L50



Figure 21. Label of model L20



Figure 22. Label of model L30

Product: Laser Module

Type Designation: M30, M40, L10, L20, L30, L40, L50

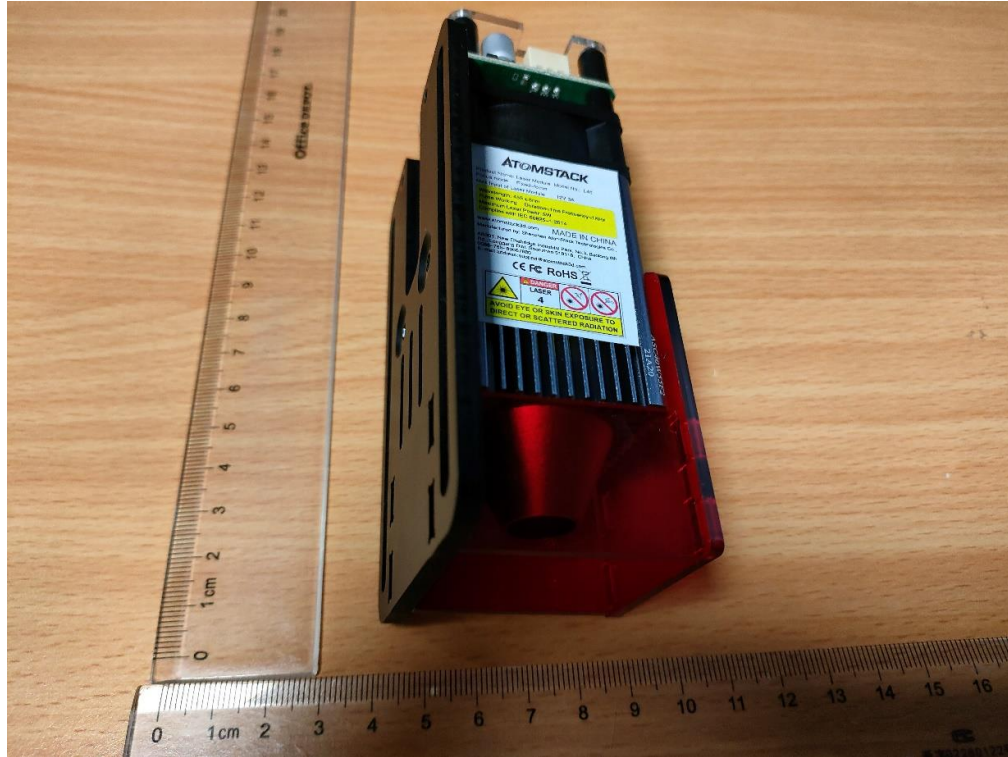


Figure 23. Label of model L40 with red plastic cover



Figure 24. Label of model L40 with green plastic cover

Product: Laser Module

Type Designation: M30, M40, L10, L20, L30, L40, L50



Figure 25. Label of model L50

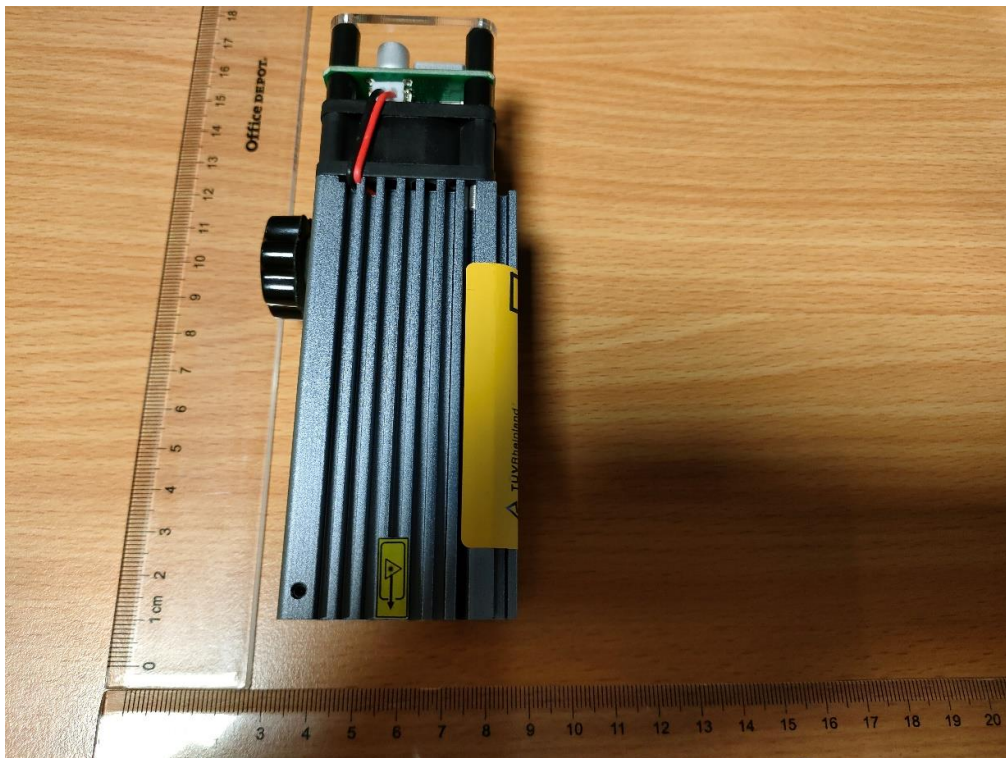


Figure 26. Laser aperture of model M30

Product: Laser Module

Type Designation: M30, M40, L10, L20, L30, L40, L50



Figure 27. Laser aperture of model M40

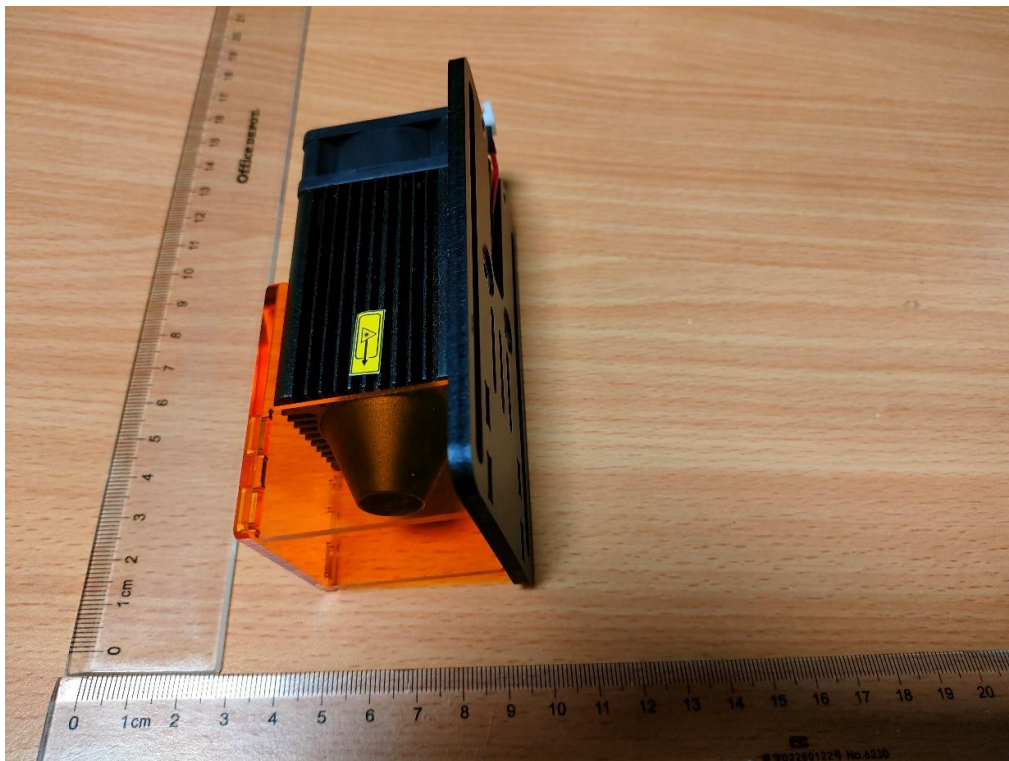


Figure 28. Laser aperture of model L10

ATTACHMENT 2 Photo Documentation

Product: Laser Module

Type Designation: M30, M40, L10, L20, L30, L40, L50

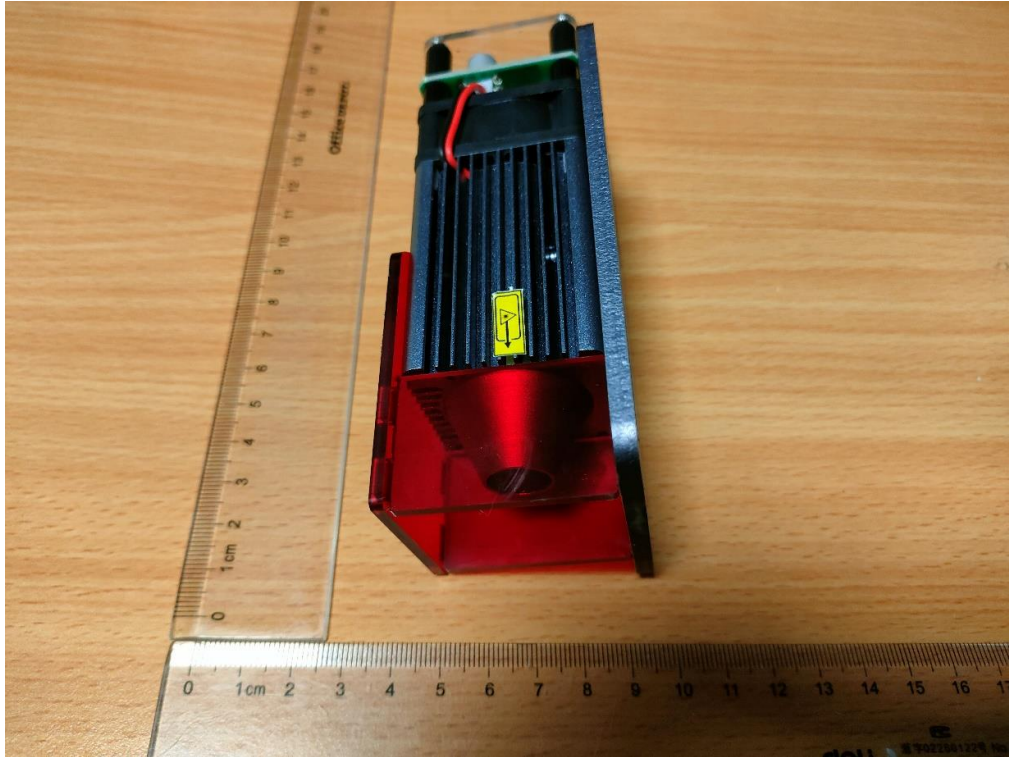


Figure 29. Laser aperture of model L20

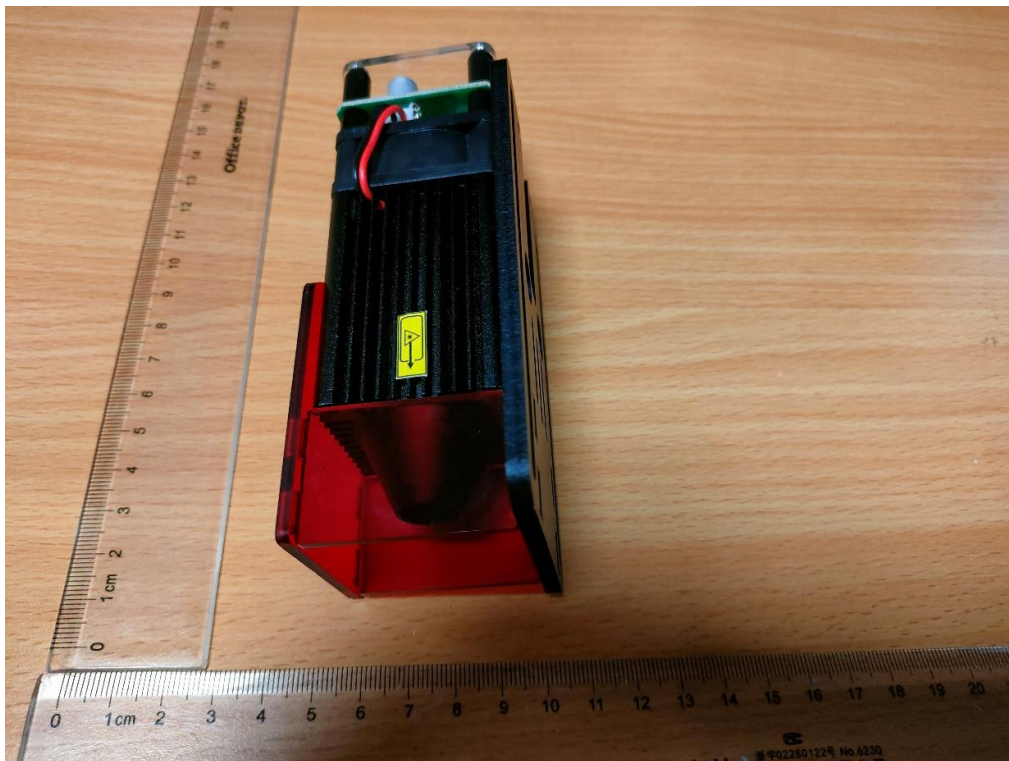


Figure 30. Laser aperture of model L30

Product: Laser Module

Type Designation: M30, M40, L10, L20, L30, L40, L50

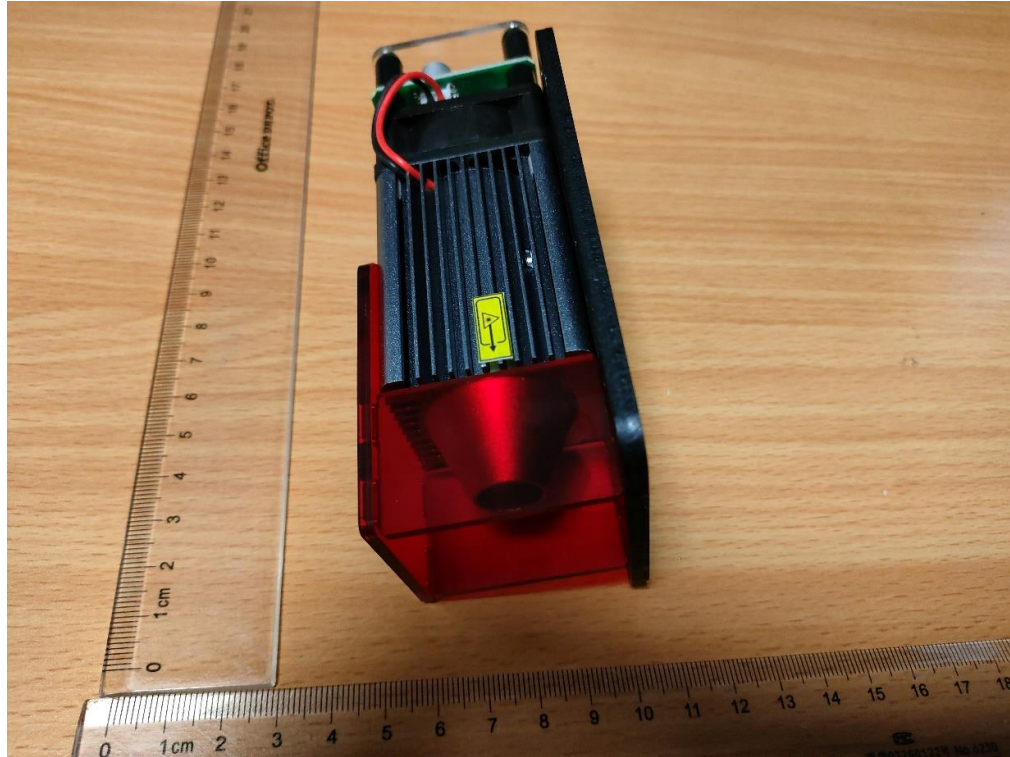


Figure 31. Laser aperture of model L40 with red plastic cover



Figure 32. Laser aperture of model L40 with green plastic cover

Product: Laser Module

Type Designation: M30, M40, L10, L20, L30, L40, L50

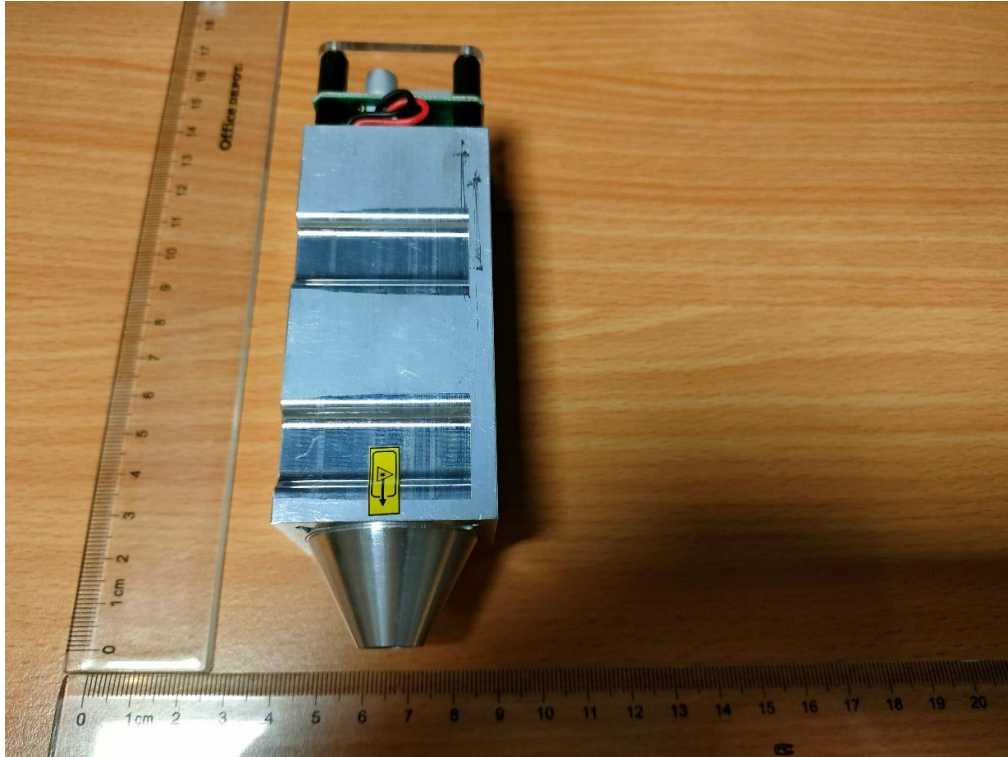


Figure 33. Laser aperture of model L50