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# Test Report

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Report No.: AGC03507190404SS01

**PRODUCT DESIGNATION** : Laser pen  
**BRAND NAME** : N/A  
**MODEL NAME** : M08097, M08193  
**CLIENT** : MID OCEAN BRANDS B.V  
**DATE OF ISSUE** : Apr. 16, 2019  
**STANDARD(S)** : EN 60825-1:2014  
**REPORT VERSION** : V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd.



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<b>TEST REPORT</b> <b>EN 60825-1</b> <b>Safety of laser products –</b> <b>Part 1: Equipment classification and requirements</b>	
Report reference No .....	AGC03507190404SS01
Tested by (+ signature) .....	Winston Wang 
Review by (+ signature) .....	Byron Wang 
Approved by (+ signature) .....	Matte He (Authorized Officer) 
Date of issue .....	Apr. 16, 2019
Contents .....	Total 13 pages
<b>Testing laboratory</b>	
Name .....	Attestation of Global Compliance (Shenzhen) Co., Ltd.
Address .....	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao 'an District, Shenzhen, Guangdong, China
Testing location .....	Same as above
<b>Applicant</b>	
Name .....	MID OCEAN BRANDS B.V
Address .....	7/F, Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong.
<b>Manufacturer</b>	
Name .....	MID OCEAN BRANDS B.V
Address .....	7/F, Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong.
<b>Test specification</b>	
Standard .....	EN 60825-1:2014
Test procedure .....	type test
Procedure deviation .....	N/A
Non-standard test method .....	N/A
<b>Test Report Form/blank test report</b>	
Test Report Form No. ....	AGC60825-1A3
TTRF originator .....	AGC
Master TTRF .....	Dated 2017-01

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<b>Test item</b>				
Product designation .....: Laser pen				
Brand name .....: N/A				
Model Name.....: MO8097, MO8193				
Rating(s) .....: 4.5V (Installed 3 X1.5V LR41 batteries)				
Protection Class of equipment .....: Class 2				
<b>Test case verdicts</b>				
Test case does not apply to the test object.: N(/A)				
Test item does meet the requirement .....: P(ass)				
Test item does not meet the requirement ....: F(ail)				
<b>Testing</b>				
Date of receipt of test item .....: Apr. 08, 2019				
Date(s) of performance of test .....: Apr. 15, 2019				
<b>Attachments</b>				
Attachment A .....: Photos of product				
<b>General remarks</b>				
This report shall not be reproduced except in full without the written approval of the testing laboratory.				
The test results presented in this report relate only to the item tested.				
Clause numbers between brackets refer to clauses in IEC 60825-1 (EN 60825-1).				
"(see remark #)" refers to a remark appended to the report.				
"(see Annex #)" refers to an annex appended to the report.				
Throughout this report a comma is used as the decimal separator.				
Report Revise Record				
Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Apr. 16, 2019	Valid	Initial release
<b>Summary of testing</b>				
The test part of product was classified as Class 2 product.				
<b>Copy of marking plate:</b>				
				

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EN 60825-1			
Clause	Requirement – Test	Result	Verdict
<b>4</b>	<b>CLASSIFICATION PRINCIPLES</b>		
4.3	Classification rules		---
4.3 a	Radiation of a single wavelength		P
4.3 b	Radiation of multiple wavelengths		N
	1) Laser product emits at two or more wavelengths shown as additive in Table 1		N
	2) Laser product emits at two or more wavelengths not shown as additive in Table 1		N
4.3 c	Radiation from extended sources (see 5.4.3)		N
4.3 d	Non-uniform, non-circular or multiple apparent source		N
4.3 e	Time bases		---
	1) 0,25 s		N
	2) 100 s		P
	3) 30000 s		N
4.3 f	Repetitively pulsed or modulated lasers		N
	1) Any single pulse		N
	2) Average power for pulse trains		N
	3) Pulse duration $t \leq T_i$ .....: Number of pulses N and $C_5$ .....:		N
	3) Pulse duration $t > T_i$ .....: Number of pulses N and $C_5$ .....:		N
4.4	Laser products designed to function as conventional lamps.		N
	$\alpha$ measured at 200 mm distance from closest point of human access ( $\alpha > 5$ mrad).		N
	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

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EN 60825-1			
Clause	Requirement – Test	Result	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

<b>5</b>	<b>DETERMINATION OF THE ACCESSIBLE EMISSION LEVEL and PRODUCT CLASSIFICATION</b>		
5.1	Tests		---
	Compliance under reasonably foreseeable single fault conditions.		P
5.3	Determination of the class of the laser product ..... For Class 1C: vertical safety standard applied with requirements for Class 1C.		---
5.4	Measurement geometry		---
5.4.1	General		---
5.4.2	Default (simplified) evaluation		P
	Conditions applied .....	3	P
	Aperture diameter .....	7mm	P
	Reference point : .....	Beam waist	P
	Measurement distance .....	100mm	P
	(for each condition)		
5.4.3	Evaluation condition for extended sources		N
	Conditions applied .....		N
	Most restrictive position .....		N
	(distance from reference point)		
	Angular subtense of the apparent source $\alpha$ and $C_6$ : (for each condition)		N
5.4.3 a	Aperture diameters (for each condition).....:		N
5.4.3 b	Angle of acceptance (for each condition).....:		N
<b>6</b>	<b>ENGINEERING SPECIFICATIONS</b>		
6.2	Protective housing		---
6.2.1	General		---

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EN 60825-1			
Clause	Requirement – Test	Result	Verdict
	Protective housing prevents access to energy levels in excess of the AEL for Class 1.		N
	Protective housing prevents access to energy levels equivalent to Class 4 and withstands exposures under reasonably foreseeable single fault conditions.		N
	Maintenance of Class 1, 1C, 1M, 2, 2M, or 3R (access to emissions of Class 3B or 4 is prevented).		P
	Maintenance of Class 3B product (access to emission of Class 4 is prevented).		N
6.2.2	Service		N
6.2.3	Removable laser system (laser system complies with requirements of Clauses 6 and 7).		N
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).		N
	Accessible emission (after removal of the panel) corresponds to product Class (designated by "X" in Table 13)		N
	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
	Emission through the opening if interlocked panel of Class 3R, 3B, or 4 is removed (Emission < AEL of Class 3R).		N
	Requirements regarding reasonably foreseeable single fault condition.		N
6.3.2	Override mechanism		N
	Behaviour of override in operation when the panel is replaced.		N
	Visible or audible warning for override mode.		N
6.4	Remote interlock connector		N
6.5	Manual reset		N
6.6	Key control		N
6.7	Laser radiation emission warning		---
6.7.1	Laser product is a 3R ( $\lambda < 400 \text{ nm}$ ; $\lambda > 700 \text{ nm}$ ), 1C, 3B or 4 laser systems.		N
6.7.2	Audible or visible warning.		N
	Warning is failsafe or redundant.		N

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Clause	Requirement – Test	Result	Verdict
	Viewing of the visible warning does not require exposure to emissions > AEL for Class 1M and 2M.....		N
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.		N
6.7.4	Visible indication of output aperture if laser emission may be distributed through more than one output.		N
6.7.5	Switch for handheld Class 3R device must be depressed for emission (in lieu of emission indicator).		N
6.8	Beam stop or attenuator		N
6.9	Controls		N
6.10	Viewing optics		N
	a) Human access to laser radiation in excess of Class 1M prevented when the shutter is opened or attenuation varied.		N
	b) Opening of the shutter or variation of the attenuation prevented when exposure to laser radiation in excess of Class 1M is possible.		N
6.11	Scanning safeguard		N
6.12	Safeguard for Class 1C products		N
	a) Human access to laser radiation in excess of AEL for Class 1 measured under Condition 3 is prevented.		N
	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
6.13	Walk-in access		N
	a) Means provided so that any person inside the housing can prevent activation of Class 3B or 4 laser hazards.		N
	b) A warning device provides adequate warning of emission to any person within the housing.		N
	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
6.14	Environmental conditions		---
	- climatic conditions		P
	- vibration and shock		P
6.15	Protection against other hazards		---
6.15.1	Non-optical hazards (product safety standard)		N

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Clause	Requirement – Test	Result	Verdict
	- electrical hazards;		N
	- excessive temperature;		N
	- spread of fire from the equipment;		N
	- sound and ultrasonics;		N
	- harmful substances;		N
	- explosion;		N
6.15.2	Collateral radiation		N
6.16	Power limiting circuit		P

7	LABELLING		
7.1	General		---
	Labels durable, permanently affixed	See whole product	P
	Labels clearly visible		P
	Reading of labels is possible without exposure to laser radiation in excess of AEL for Class 1.		N
	Colour combination		P
	Labelling impractical due to the size or design of the product.		P
	Warning label – Hazard symbol (Figure 3)		P
7.2 - 7.7	Text on explanatory label or pictogram (laser class, warning text)		P
7.8	Aperture label		P
7.9	Radiation output and standards information		---
	Max output of laser radiation .....		N
	Pulse duration .....		N
	Emitted wavelength(s) .....		N
	Name and publication date of the standard .....		N
7.10	Labels for access panels		---
7.10.1 a) – f)	Labels for panels - warning wording used .....		N
7.10.2	Labels for safety interlocked panels - Warning wording used .....		N
7.11	Warning for invisible laser radiation .....		P
7.12	Warning for visible laser radiation .....		N

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Clause	Requirement – Test	Result	Verdict
7.13	Warning for potential hazard to the skin or anterior parts of the eye - warning wording used .....		N

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.		P
	b) additional warning for Class 1M and 2M		N
	c) laser beam parameters for radiation above the AEL of Class 1	Class 2 laser product	---
	• Wavelength .....	650nm	---
	• Beam divergence .....	<1.5mrad	---
	• Pulse pattern ..... (pulse duration, repetition rate, ...)		---
	• Maximum power or energy output .....	1000μW	---
	d) safety instruction for embedded laser products and other incorporated laser products.		P
	e) MPE and NOHD for Class 3B and 4 laser products; For collimated beam Class 1M and 2M lasers the extended NOHD (ENOHD).		N
	f) information for the selection of eye protection.		N
	g) reproduction of all required labels and warnings.		N
	h) location of laser apertures		N
	i) list of controls, adjustments of procedures for operation and maintenance - and warning statement.		N
	j) information (compatibility requirements) about laser energy source if not incorporated.		N
	k) additional warning for Class 1, 1M, 2, 2M, and 3R regarding skin or corneal burns.		N
	l) Information for Class 1C products (e.g. warning that repeated application may pose a risk).		N
8.2	Purchasing and service information		N
	a) safety classification of each laser product stated in all descriptive material (e.g. brochures).		N

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Clause	Requirement – Test	Result	Verdict
	b) adequate instructions for servicing available: <ul style="list-style-type: none"> <li>warnings and precautions regarding exposure of laser emission above Class 1</li> <li>maintenance schedule</li> <li>list of controls and procedures that could increase accessible emissions</li> <li>description of displaceable parts</li> <li>protective procedures for service personnel</li> <li>reproduction of labels and hazard warnings</li> </ul>		N

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
	IEC 60825-4 (Laser guards)		N
	IEC 60825-12 (Safety of free space optical communication systems used for transmission of information)		N
9.2	Medical laser products: Class 3B and Class 4 medical laser products comply with IEC 60601-2-22		N
9.3	Laser processing machines: Comply with IEC/ISO 11553 series.		N
9.4	Electric toys: Comply with IEC 62115		N
9.5	Consumer electronic products: Comply with IEC 60950 (IT-equipment) or IEC 60065 (AV equipment)		N

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## EN 60825-1

Clause	Requirement – Test	Result	Verdict
Measured accessible laser radiation and comparison with AEL:			
<b>1. Measuring condition</b>			
- The radiant power is measured under normal condition.			
- Measurement condition 3 is measured.			
<b>2. Measured Results</b>			
The LED changed frequently, The max. power is recorded.			
Ambient temperature:	24°C		P
Ambient radiation:	58.7nW compensated with “zero” function of power meter		—
Measurement	Input current	Measured radiant power	Limited(AEL)
Normal condition(red)	--	417.25μW	1000μW
<b>Fault condition :</b>			
--	--	--	--
<b>3. Classification</b>			
The test part of product is classified as Class 2.			

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Attachment A

Photos of product

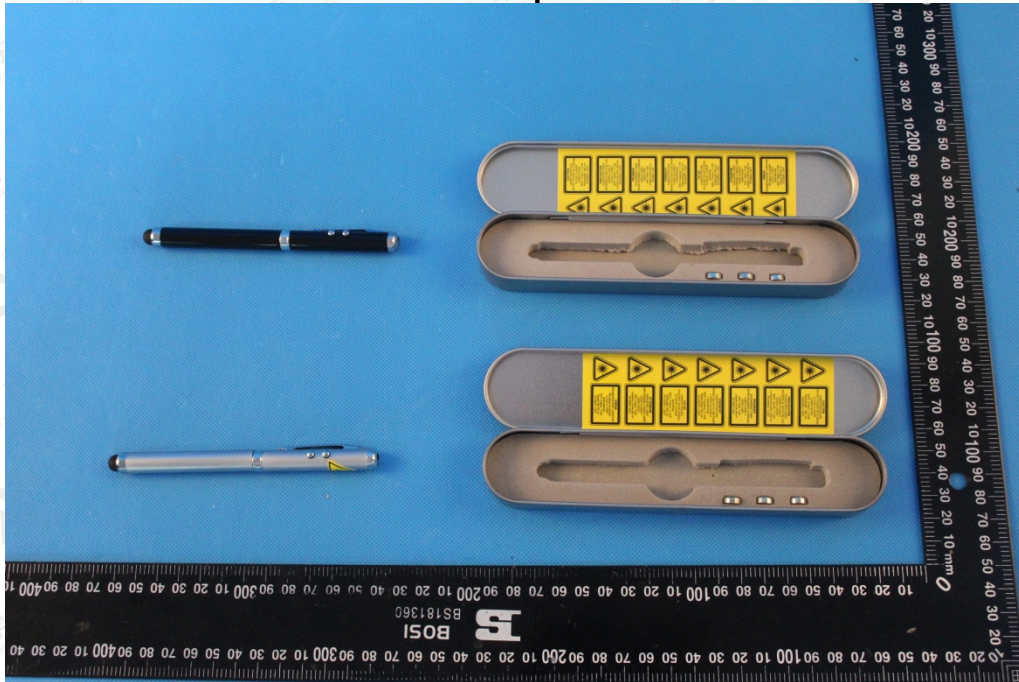


Fig.1. - overview



Fig.2. -overview

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Fig.3. --overview

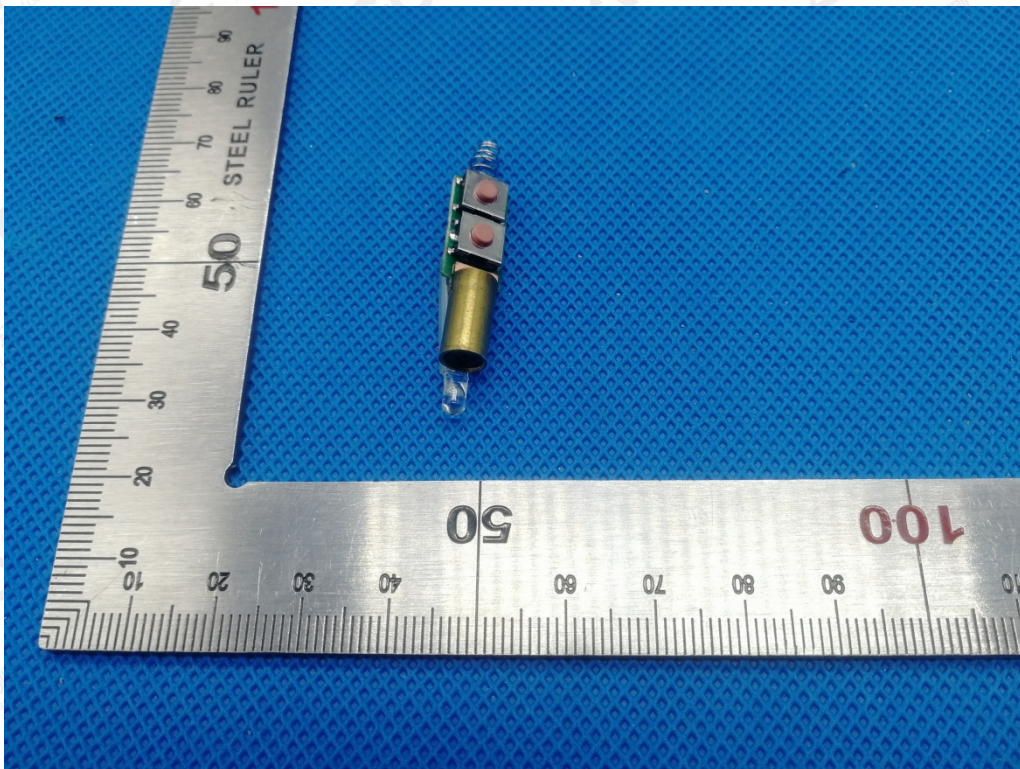


Fig.4. --partview

---End of Report---

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