Taiwan

TEST REPORT
IEC/EN 62471-5
Photobiological safety of lamps and lamp systems-
Part 5: Image projectors

Report Reference No. .....:	611061822601
Date of issue .....:	2018-10-05
Total number of pages .....:	9
Testing Laboratory .....:	TÜV SÜD Asia Ltd. Taiwan Branch
Address .....:	7F., No. 37, Sec. 2, Zhongyang S., Rd., Beitou District, Taipei City, 11270, Taiwan
Applicant's name .....:	Ultimems, Inc.
Address .....:	11F., No.213, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan (R.O.C.)
Test specification:	
Standard .....:	IEC 62471-5 (First Edition)
	EN 62471-5
Test procedure .....:	**IEC 62471-5**
Non-standard test method……..:	N/A
Test Report Form No. .....:	IEC62471_5A
TRF Originator .....:	UL (US), modified by **TÜV SÜD** to IEC TRF
Master TRF .....:	2015-11

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.

Test item description .....:	Laser Scanning Projection Module
Trade Mark .....:	**ANYBEAM**
Manufacturer .....:	Ultimems, Inc.
Model/Type reference .....:	HD301
Ratings .....:	4.75 – 5.25 Vdc, Max. 3.5 W

Tested by……..:	
(+signature)	_____ Dony Wang
Approved by……..:	
(+signature)	_____ Jack Tsai

Summary of testing:	
Tests performed (name of test and test clause): All tests were performed according to IEC/EN 62471-5 The test sample was configured for continuous emission and powered by 5.25 Vdc The accessible emission shall be determined at a distance of 1,0 m from the closest point of human access toward the light source along the axis of the light beam	**Testing location:** TÜV SÜD Asia Ltd. Taiwan Branch
Summary of compliance with National Differences: N/A	
Copy of marking plate: 	

Test item particulars	:	Laser Scanning Projection Module
Supply Connection	:	Class I / Class II / **Class III**
Intended Application	:	☒ Data projector ☐ Home-use projector
		☐ Cinema-use projector ☐ Other [ ]
Equipment Mobility	:	☐ Hand-held ☐ Transportable ☒ Movable
		☐ Stationary ☐ Other [ ]
Emission Condition	:	☒ Continuous Wave (CW) Emission
		☐ Pulse Emission
Lamp Type	:	☐ LED ☐ Tungsten-halogen
		☐ Discharge or arc-lamp
		☒ Laser generated
Projector Risk Group (RG)	:	☒ RG0 projector ☐ RG1 projector
		☐ RG2 projector ☐ RG3 projector

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 : 2018-09-18

Date (s) of performance of tests : 2018-09-21

General remarks:

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 testing laboratory.
"(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 comma (point) is used as the decimal separator.
List of test equipment must be kept on file and available for review.

General product information:

The equipment is a Laser Scanning Projection Module as information technology equipment.

The product was complied with the requirements of Exempt Group product according to IEC/EN 62471-5

IEC/EN 62471-5			
Clause	Requirement + Test	Result – Remark	Verdict

4	**GENERAL**		P
4.4	Assessment criteria – assigned risk group of projector	Laser Scanning Projection Module: Exempt Group	P

5	**RISK GROUP DETERMINATION**		P
5.1	Test conditions		P
	- climatic conditions		P
	- vibration and shock		N/A
	Evaluation with product adjusted to maximum emissions and light source operated at maximum optical power output.		P
	Evaluation under reasonably foreseeable single fault	The light emission level does not exceed the RG0 under fault condition, because the laser bank is shutdown or damage	P
5.2	Measurement conditions for image projector		P
5.2.1	Measurement throw ratio ..... :	See the spec.	P
5.2.2	Measurement distance (1 m from the closest point of human access) ..... :	Test distance: 1 m	P
5.3	The position and size of apparent source, the calculation of angular subtense	See appended table 3	P
	Angular subtense of apparent source..... :	See appended table 3	—
5.4	Measurement of irradiance – specified apertures		P
	Angle of acceptance..... :	11 mrad.	—
	Aperture stop diameter..... :	50 mm	—
5.5	Measurement of radiance		P
	Field of view for CW emission (Table 1)..... :	IEC/EN 62471-5_Table 1	P
	Field of view for pulsed emission (Table 2) ..... :		N/A
5.6	Accessible emission limits	Exempt Group	P
5.6.1	For CW emission	See appended table 3	P
5.6.2	For pulsed emission	Not applicable	N/A
5.6.2.1	Emission considered pulsed due to peak radiated power over 1.5 times average radiated power.	The peak radiated power is less than 1.5 times the average radiated power (Peak radiated power: 0.023 W, Average radiated power: 0.016 W)	N/A
5.6.2.2	For UV, UVA, photochemical retinal limits and IR cornea limit	See appended table 3	N/A

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5.6.2.3	For retinal thermal limit		N/A
	a) Averaged radiance		N/A
	(a-1) Regular pulse pattern		N/A
	(a-2) Irregular pulse pattern		N/A
	b) Peak radiance		N/A
	Number of pulses N and factor C_5 (Table 6) ..... :		N/A
5.6.3	Spectral weighting functions	IEC 62471-5_Table 8	N/A
5.7	Applying information from the lamp manufacturers	See the product spec	P
5.7.1	General		P
5.7.2	Limits provided in irradiance/radiant exposure	See IEC 62471	P
5.7.3	Limits provided in radiance or radiance dose	See IEC 62471	P

6	**MANUFACTURER'S REQUIREMENTS**		P
6.1	General	Exempt Group	P
6.2	Determination of HD (hazard distance)		N/A
6.3	Safety feature "soft start"		N/A
6.4	Optional safety features		N/A
6.4.1	Projection of warning message		N/A
6.4.2	Power reduction by sensor system		N/A
6.5	Labelling on products		N/A
6.5.1	General		N/A
	Labels durable, permanently affixed, legible, and clearly visible		N/A
	Labels positioned so that they can be read without exposure to radiation in excess of applicable AEL		N/A
	Label and symbol size adapted to product size		N/A
	Colour combination of text, borders and background		N/A
	Labels required by IEC 60825-1 for laser illuminated projectors		P
6.5.2	RG0 projector	RG0 projector	P
6.5.3	RG1 projector		N/A
	RG1 label (Figure 5) ..... :		N/A
6.5.4	RG2 projector		N/A
	RG2 label (Figure 6) ..... :		N/A
	RG2 caution symbol (Figure 7) ..... :		N/A
	RG2 caution pictogram (Figure 8) ..... :		N/A

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6.5.5	RG3 projector		N/A
	RG3 label (Figure 9) ..... :		N/A
	Optical radiation warning symbol (Figure 10) ..... :		N/A
	Not for household use symbol (Figure 11) ..... :		N/A
6.6	User information		P
6.6.1	General	Exempt Group	P
6.6.2	Assessment of user accessible area		N/A
6.6.3	User information (user manual)	RG0 projector	N/A
6.6.3.1	General		N/A
	Reproduction of all required labels		N/A
6.6.3.2	RG0 projector	RG0 projector	P
6.6.3.3	RG1 projector – wording used ..... :		N/A
6.6.3.4	RG2 projector – wording used ..... :		N/A
6.6.3.5	RG3 projector – wording used ..... :		N/A
	Hazard distance..... :		N/A
6.6.4	User information for maintenance		N/A
6.7	Labelling and user information for image projectors where the risk group will be changed by inter-changeable lens		N/A
6.7.1	General		N/A
6.7.2	Labelling on the projector		N/A
	Wording provided for projectors becoming RG3 when an interchangeable lens with higher throw ratio is used ..... :		—
6.7.3	Mark on the interchangeable lens		N/A
6.7.4	The user information in the user manual of the pro-jector		N/A
	Explanation of the change of hazard magnitude by installing interchangeable lenses		N/A
	List of model numbers of interchangeable lenses		N/A
	Hazard distance at the maximum TR of each lenses		N/A

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6.7.5	The user information in the user manual of the interchangeable lens		N/A
	Explanation of the change of hazard by installing the lens		N/A
	Throw ratio range of the lens		N/A
	List of model numbers of projectors with which the lens may be used		N/A
	Hazard distance according to the highest TR		N/A
7	**INFORMATION FOR SERVICE**		P
	Adequate instructions for service personnel		P

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Table 3	AEL (accessible emission limits) for risk groups of lamps and lamp systems emitting CW optical radiation								P
Hazard	**Wave-length range, nm**	**Symbol for emis-sion level[1]**	**Emission Measurement**						**Units**	**Assigned Risk Group**
			Exempt Group (RG0)		**Risk Group 1 (RG1)**		**Risk Group 2 (RG2)**			
			Limit	**Result**	**Limit**	**Result**	**Limit**	**Result**		
UV[2]	200 to 400	E_S	0,001	1.9×10^{-5}	0,003	-	0,03	-	$W \cdot m^{-2}$	RG0
UV-A[2]	315 to 400	E_{UVA}	10	1.4×10^{-5}	33	-	100	-	$W \cdot m^{-2}$	RG0
Blue-light	300 to 700	L_B	100	5.7×10^{1}	10 000	-	4 000 000	-	$W \cdot m^{-2} \cdot sr^{-1}$	RG0
Blue-light small source	300 to 700	E_B	1,0	-	1,0	-	400	-	$W \cdot m^{-2}$	-
Retinal thermal	380 to 1400	L_R	28 000/α	3.1×10^{4}	28 000/α	-	28 000/α	-	$W \cdot m^{-2} \cdot sr^{-1}$	RG0
IR anterior eye[2]	780 to 3000	E_{IR}	100	6.5×10^{-4}	570	-	3200	-	$W \cdot m^{-2}$	RG0

Supplementary information:

1 Symbols for emission levels (Es, E_{UVA}, L_B, E_B, L_R, E_{IR}) and each formula are defined in IEC 62471. Some formulae of above emission levels are defined by using weighting functions B(λ) and R(λ) (see Table 8).

2 For an image projector that is to be assigned to RG3, the AE for UV, UVA and IR shall not exceed the AEL for RG2.

Angular Subtense of Apparent Source α: 0.011 rad.

The product does not use any UV source

PHOTO: