PHOTOBIOLOGICAL SAFETY EVALUATION OF LED PRODUCTS

Prepared for

Lazer Security

The signer of this document certifies on behalf of Nichia Corporation that, to the best of Nichia Corporation's knowledge the product below was tested and evaluated by Nichia Corporation in compliance with IEC 62471(2006) assigned to the risk group specified as follows:

CLASSIFICATION

Part Description: WARM WHITE LED

Part Number: NSBLL110-V1

Risk Group: Exempt Group (for general lighting service (GLS) lamps)

Risk Group 1 (for all other light sources)

[I_F = 600 mA DC, Absolute Maximum Ratings]

DETAILS OF EVALUATION

Characteristics:

Apparent source size	Luminous Flux [I_F = 320 mA DC]
8.43 mm	1150 lm (Rank J1150)

Evaluation Results:

Hazard Name	Symbol	Measurement Value*1	Emission Limits			Units	Risk Group
			Exempt	Low-Risk	Mod-Risk		
Actinic UV	E_S	*2	10^{-3}	3×10^{-3}	3×10^{-2}	W/m^2	Exempt Group*3
Near UV	E_{UVA}	*2	10	33	10^2	W/m^2	Exempt Group*3
Retinal blue-light	L_B	5.39×10^{1} *4 5.57×10^{3} *5	10^2	10^4	4×10^6	W/m^2/sr	Exempt Group*4 Risk Group 1*5
Retinal blue-light, small source	E_B	4.24×10^{-1} *4 5.29×10^{-1} *5	1	1	4×10^2	W/m^2	Exempt Group*4 Exempt Group*5
Retinal thermal	L_R	6.29×10^{4} *4 8.22×10^{4} *5	3.8×10^{6} *4 6.6×10^{5} *5	3.8×10^{6} *4 6.6×10^{5} *5	9.6×10^{6} *4 1.7×10^{6} *5	W/m^2/sr	Exempt Group*4 Exempt Group*5
Retinal thermal, weak visual stimulus	L_{IR}	*2	5.5×10^{5} *4 1.4×10^{5} *5	5.5×10^{5} *4 1.4×10^{5} *5	5.5×10^{5} *4 1.4×10^{5} *5	W/m^2/sr	Exempt Group*3
IR radiation, eye	E_{IR}	*2	10^2	5.7×10^2	3.2×10^3	W/m^2	Exempt Group*3

*1 This column provides only the measurement value of applicable risk group.
*2 This measurement was not conducted because radiation in the applied wavelength range does not exist.
*3 This risk group was classified as the exempt group because radiation in the applied wavelength range does not exist.
*4 Measurement conditions for GLS lamps: [Measuring distance: 1135 mm, Aperture: 7 mm, Angular subtense: 7.43 mrad, Ambient: 25°C, 40%RH]
*5 Measurement conditions for all other light sources: [Measuring distance: 200 mm, Aperture: 7 mm, Angular subtense: 42.16 mrad, Ambient: 25°C, 40%RH]

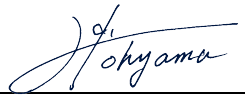
NOTES

In accordance with the classification for lamps intended for general lighting service (GLS), the product was classified as Exempt Group. The measurement value for each hazard was below the emission limit for Exempt Group.

In accordance with the classification for all other light sources, the product was classified as Risk Group 1 (Low Risk). The retinal blue-light hazard value exceeded the emission limit for Exempt Group.

This report shows the LED evaluation results. When using a LED as a component of equipment, please evaluate the equipment that incorporates the LED.

Issue Date: March 28, 2013

Signature: 

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