Test Report issued under the responsibility of:

TEST REPORT
EN 62471
Photobiological safety of lamps and lamp systems

Report Reference No.....:	TZ2021110103-B01-P	
Tested by……..…..:	Heler Yang	signature: Heler Yang
Approved by……..……..…..:	Will Chen	signature: Will Chen
Date of issue……..…..:	2021-11-23	
Total number of pages.....:	22	

Testing Laboratory .....:	Guangdong Tianzheng Technology Co.,Ltd.
Address.....:	Room 103, No.39-2, Keji East Road, Torch Development Park, Zhongshan, Guangdong, China
Applicant's name.....:	Zhongshan Guangsheng Semiconductor Technology Co., Ltd.
Address.....:	Floor 2-3, Building 2, Qifang Industrial Park, Pinghe Road, Tongyi Industrial district, Guzhen Town, Zhongshan City, China
Test specification:	
Standard..... :	EN 62471: 2008
Test item description..... :	Mirror Aluminum COB Light Source
Trade Mark .....:	/
Manufacturer.....:	Zhongshan Guangsheng Semiconductor Technology Co., Ltd.
Address..... :	Floor 2-3, Building 2, Qifang Industrial Park, Pinghe Road, Tongyi Industrial district, Guzhen Town, Zhongshan City, China
Model/Type reference.....:	See page 2-8(Model list)
Date of receipt of test item.....:	2021-11-3
Date (s) of performance of tests .....:	From 2021-11-3 to 2021-11-10

EXAMINED SECTIONS

The test have been performed on a range of products see model list.

All models have the similar electrical and mechanical construction, except different wattage and appearance. Details see model list.

Due to above information, the following tests are performed:
All sections for GSCOBW60-2700W108-V23
No tests are performed for other models.

Model list

Model No.	Voltage(VDC)	Current(A)	Wattage(W)	CCT(K)
GSCOBW60-2700W108-V23	34-38V	2700mA	108W	6000K
GSCOBW50-2700W108-V23	34-38V	2700mA	108W	5000K
GSCOBW40-2700W108-V23	34-38V	2700mA	108W	4000K
GSCOBW35-2700W108-V23	34-38V	2700mA	108W	3500K
GSCOBW30-2700W108-V23	34-38V	2700mA	108W	3000K
GSCOBW27-2700W108-V23	34-38V	2700mA	108W	2700K
GSCOBW60-2700W108-G23	34-38V	2250mA	90W	6000K
GSCOBW50-2700W108-G23	34-38V	2250mA	90W	5000K
GSCOBW40-2700W108-G23	34-38V	2250mA	90W	4000K
GSCOBW35-2700W108-G23	34-38V	2250mA	90W	3500K
GSCOBW30-2700W108-G23	34-38V	2250mA	90W	3000K
GSCOBW27-2700W108-G23	34-38V	2250mA	90W	2700K
GSCOBW60-2250W90-V23	34-38V	2250mA	90W	6000K
GSCOBW50-2250W90-V23	34-38V	2250mA	90W	5000K
GSCOBW40-2250W90-V23	34-38V	2250mA	90W	4000K
GSCOBW35-2250W90-V23	34-38V	2250mA	90W	3500K
GSCOBW30-2250W90-V23	34-38V	2250mA	90W	3000K
GSCOBW27-2250W90-V23	34-38V	2250mA	90W	2700K
GSCOBW60-2250W90-G23	34-38V	2250mA	90W	6000K
GSCOBW50-2250W90-G23	34-38V	2250mA	90W	5000K
GSCOBW40-2250W90-G23	34-38V	2250mA	90W	4000K
GSCOBW35-2250W90-G23	34-38V	2250mA	90W	3500K
GSCOBW30-2250W90-G23	34-38V	2250mA	90W	3000K
GSCOBW27-2250W90-G23	34-38V	2250mA	90W	2700K
GSCOBW60-2100W84-V23	34-38V	2100mA	84W	6000K

GSCOBW50-2100W84-V23	34-38V	2100mA	84W	5000K
GSCOBW40-2100W84-V23	34-38V	2100mA	84W	4000K
GSCOBW35-2100W84-V23	34-38V	2100mA	84W	3500K
GSCOBW30-2100W84-V23	34-38V	2100mA	84W	3000K
GSCOBW27-2100W84-V23	34-38V	2100mA	84W	2700K
GSCOBW60-2100W84-G23	34-38V	2100mA	84W	6000K
GSCOBW50-2100W84-G23	34-38V	2100mA	84W	5000K
GSCOBW40-2100W84-G23	34-38V	2100mA	84W	4000K
GSCOBW35-2100W84-G23	34-38V	2100mA	84W	3500K
GSCOBW30-2100W84-G23	34-38V	2100mA	84W	3000K
GSCOBW27-2100W84-G23	34-38V	2100mA	84W	2700K
GSCOBW60-1950W78-V23	34-38V	1950mA	78W	6000K
GSCOBW50-1950W78-V23	34-38V	1950mA	78W	5000K
GSCOBW40-1950W78-V23	34-38V	1950mA	78W	4000K
GSCOBW35-1950W78-V23	34-38V	1950mA	78W	3500K
GSCOBW30-1950W78-V23	34-38V	1950mA	78W	3000K
GSCOBW27-1950W78-V23	34-38V	1950mA	78W	2700K
GSCOBW60-1950W78-G23	34-38V	1950mA	78W	6000K
GSCOBW50-1950W78-G23	34-38V	1950mA	78W	5000K
GSCOBW40-1950W78-G23	34-38V	1950mA	78W	4000K
GSCOBW35-1950W78-G23	34-38V	1950mA	78W	3500K
GSCOBW30-1950W78-G23	34-38V	1950mA	78W	3000K
GSCOBW27-1950W78-G23	34-38V	1950mA	78W	2700K
GSCOBW60-1800W72-V23	34-38V	1800mA	72W	6000K
GSCOBW50-1800W72-V23	34-38V	1800mA	72W	5000K
GSCOBW40-1800W72-V23	34-38V	1800mA	72W	4000K
GSCOBW35-1800W72-V23	34-38V	1800mA	72W	3500K
GSCOBW30-1800W72-V23	34-38V	1800mA	72W	3000K
GSCOBW27-1800W72-V23	34-38V	1800mA	72W	2700K
GSCOBW60-1800W72-G23	34-38V	1800mA	72W	6000K
GSCOBW50-1800W72-G23	34-38V	1800mA	72W	5000K
GSCOBW40-1800W72-G23	34-38V	1800mA	72W	4000K
GSCOBW35-1800W72-G23	34-38V	1800mA	72W	3500K
GSCOBW30-1800W72-G23	34-38V	1800mA	72W	3000K
GSCOBW27-1800W72-G23	34-38V	1800mA	72W	2700K
GSCOBW60-1650W66-V23	34-38V	1650mA	66W	6000K
GSCOBW50-1650W66-V23	34-38V	1650mA	66W	5000K
GSCOBW40-1650W66-V23	34-38V	1650mA	66W	4000K

GSCOBW35-1650W66-V23	34-38V	1650mA	66W	3500K
GSCOBW30-1650W66-V23	34-38V	1650mA	66W	3000K
GSCOBW27-1650W66-V23	34-38V	1650mA	66W	2700K
GSCOBW60-1650W66-G23	34-38V	1650mA	66W	6000K
GSCOBW50-1650W66-G23	34-38V	1650mA	66W	5000K
GSCOBW40-1650W66-G23	34-38V	1650mA	66W	4000K
GSCOBW35-1650W66-G23	34-38V	1650mA	66W	3500K
GSCOBW30-1650W66-G23	34-38V	1650mA	66W	3000K
GSCOBW27-1650W66-G23	34-38V	1650mA	66W	2700K
GSCOBW60-1500W60-V23	34-38V	1500mA	60W	6000K
GSCOBW50-1500W60-V23	34-38V	1500mA	60W	5000K
GSCOBW40-1500W60-V23	34-38V	1500mA	60W	4000K
GSCOBW35-1500W60-V23	34-38V	1500mA	60W	3500K
GSCOBW30-1500W60-V23	34-38V	1500mA	60W	3000K
GSCOBW27-1500W60-V23	34-38V	1500mA	60W	2700K
GSCOBW60-1500W60-V23	34-38V	1500mA	60W	6000K
GSCOBW50-1500W60-G23	34-38V	1500mA	60W	5000K
GSCOBW40-1500W60-G23	34-38V	1500mA	60W	4000K
GSCOBW35-1500W60-G23	34-38V	1500mA	60W	3500K
GSCOBW30-1500W60-G23	34-38V	1500mA	60W	3000K
GSCOBW27-1500W60-G23	34-38V	1500mA	60W	2700K
GSCOBW60-1350W54-V23	34-38V	1350mA	54W	6000K
GSCOBW50-1350W54-V23	34-38V	1350mA	54W	5000K
GSCOBW40-1350W54-V23	34-38V	1350mA	54W	4000K
GSCOBW35-1350W54-V23	34-38V	1350mA	54W	3500K
GSCOBW30-1350W54-V23	34-38V	1350mA	54W	3000K
GSCOBW27-1350W54-V23	34-38V	1350mA	54W	2700K
GSCOBW60-1350W54-G23	34-38V	1350mA	54W	6000K
GSCOBW50-1350W54-G23	34-38V	1350mA	54W	5000K
GSCOBW40-1350W54-G23	34-38V	1350mA	54W	4000K
GSCOBW35-1350W54-G23	34-38V	1350mA	54W	3500K
GSCOBW30-1350W54-G23	34-38V	1350mA	54W	3000K
GSCOBW27-1350W54-G23	34-38V	1350mA	54W	2700K
GSCOBW60-1200W48-V23	34-38V	1200mA	48W	6000K
GSCOBW50-1200W48-V23	34-38V	1200mA	48W	5000K
GSCOBW40-1200W48-V23	34-38V	1200mA	48W	4000K
GSCOBW35-1200W48-V23	34-38V	1200mA	48W	3500K
GSCOBW30-1200W48-V23	34-38V	1200mA	48W	3000K

GSCOBW27-1200W48-V23	34-38V	1200mA	48W	2700K
GSCOBW60-1200W48-G23	34-38V	1200mA	48W	6000K
GSCOBW50-1200W48-G23	34-38V	1200mA	48W	5000K
GSCOBW40-1200W48-G23	34-38V	1200mA	48W	4000K
GSCOBW35-1200W48-G23	34-38V	1200mA	48W	3500K
GSCOBW30-1200W48-G23	34-38V	1200mA	48W	3000K
GSCOBW27-1200W48-G23	34-38V	1200mA	48W	2700K
GSCOBW60-1050W42-V23	34-38V	1050mA	42W	6000K
GSCOBW50-1050W42-V23	34-38V	1050mA	42W	5000K
GSCOBW40-1050W42-V23	34-38V	1050mA	42W	4000K
GSCOBW35-1050W42-V23	34-38V	1050mA	42W	3500K
GSCOBW30-1050W42-V23	34-38V	1050mA	42W	3000K
GSCOBW27-1050W42-V23	34-38V	1050mA	42W	2700K
GSCOBW60-1050W42-G23	34-38V	1050mA	42W	6000K
GSCOBW50-1050W42-G23	34-38V	1050mA	42W	5000K
GSCOBW40-1050W42-G23	34-38V	1050mA	42W	4000K
GSCOBW35-1050W42-G23	34-38V	1050mA	42W	3500K
GSCOBW30-1050W42-G23	34-38V	1050mA	42W	3000K
GSCOBW27-1050W42-G23	34-38V	1050mA	42W	2700K
GSCOBW60-1500W60-V17	34-38V	1500mA	60W	6000K
GSCOBW50-1500W60-V17	34-38V	1500mA	60W	5000K
GSCOBW40-1500W60-V17	34-38V	1500mA	60W	4000K
GSCOBW35-1500W60-V17	34-38V	1500mA	60W	3500K
GSCOBW30-1500W60-V17	34-38V	1500mA	60W	3000K
GSCOBW27-1500W60-V17	34-38V	1500mA	60W	2700K
GSCOBW60-1500W60-G17	34-38V	1500mA	60W	6000K
GSCOBW50-1500W60-G17	34-38V	1500mA	60W	5000K
GSCOBW40-1500W60-G17	34-38V	1500mA	60W	4000K
GSCOBW35-1500W60-G17	34-38V	1500mA	60W	3500K
GSCOBW30-1500W60-G17	34-38V	1500mA	60W	3000K
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GSCOBW30-1350W54-V17	34-38V	1350mA	54W	3000K
GSCOBW27-1350W54-V17	34-38V	1350mA	54W	2700K
GSCOBW60-1350W54-G17	34-38V	1350mA	54W	6000K

GSCOBW50-1350W54-G17	34-38V	1350mA	54W	5000K
GSCOBW40-1350W54-G17	34-38V	1350mA	54W	4000K
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GSCOBW30-1350W54-G17	34-38V	1350mA	54W	3000K
GSCOBW27-1350W54-G17	34-38V	1350mA	54W	2700K
GSCOBW60-1200W48-V17	34-38V	1200mA	48W	6000K
GSCOBW50-1200W48-V17	34-38V	1200mA	48W	5000K
GSCOBW40-1200W48-V17	34-38V	1200mA	48W	4000K
GSCOBW35-1200W48-V17	34-38V	1200mA	48W	3500K
GSCOBW30-1200W48-V17	34-38V	1200mA	48W	3000K
GSCOBW27-1200W48-V17	34-38V	1200mA	48W	2700K
GSCOBW60-1200W48-G17	34-38V	1200mA	48W	6000K
GSCOBW50-1200W48-G17	34-38V	1200mA	48W	5000K
GSCOBW40-1200W48-G17	34-38V	1200mA	48W	4000K
GSCOBW35-1200W48-G17	34-38V	1200mA	48W	3500K
GSCOBW30-1200W48-G17	34-38V	1200mA	48W	3000K
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GSCOBW60-1050W42-V17	34-38V	1050mA	42W	6000K
GSCOBW50-1050W42-V17	34-38V	1050mA	42W	5000K
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GSCOBW35-1050W42-V17	34-38V	1050mA	42W	3500K
GSCOBW30-1050W42-V17	34-38V	1050mA	42W	3000K
GSCOBW27-1050W42-V17	34-38V	1050mA	42W	2700K
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GSCOBW50-1050W42-G17	34-38V	1050mA	42W	5000K
GSCOBW40-1050W42-G17	34-38V	1050mA	42W	4000K
GSCOBW35-1050W42-G17	34-38V	1050mA	42W	3500K
GSCOBW30-1050W42-G17	34-38V	1050mA	42W	3000K
GSCOBW27-1050W42-G17	34-38V	1050mA	42W	2700K
GSCOBW60-900W36-V17	34-38V	900mA	36W	6000K
GSCOBW50-900W36-V17	34-38V	900mA	36W	5000K
GSCOBW40-900W36-V17	34-38V	900mA	36W	4000K
GSCOBW35-900W36-V17	34-38V	900mA	36W	3500K
GSCOBW30-900W36-V17	34-38V	900mA	36W	3000K
GSCOBW27-900W36-V17	34-38V	900mA	36W	2700K
GSCOBW60-900W36-G17	34-38V	900mA	36W	6000K
GSCOBW50-900W36-G17	34-38V	900mA	36W	5000K
GSCOBW40-900W36-G17	34-38V	900mA	36W	4000K

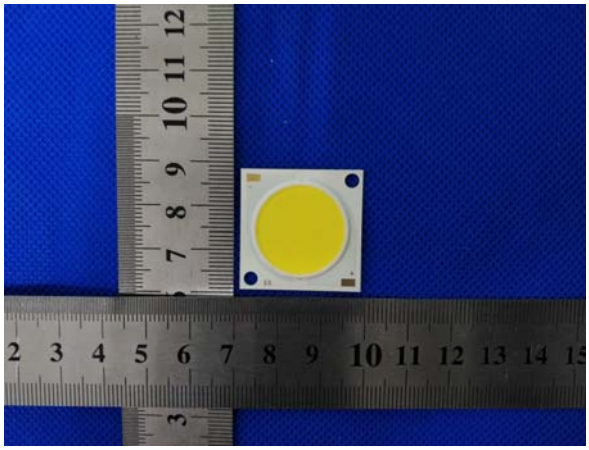
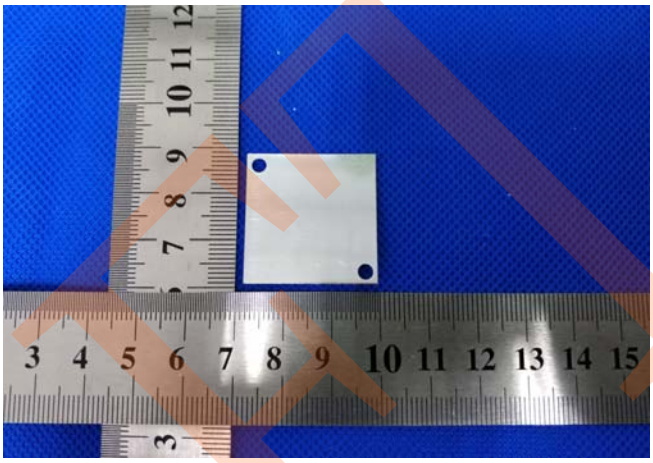
GSCOBW35-900W36-G17	34-38V	900mA	36W	3500K
GSCOBW30-900W36-G17	34-38V	900mA	36W	3000K
GSCOBW27-900W36-G17	34-38V	900mA	36W	2700K
GSCOBW60-750W30-V17	34-38V	750mA	30W	6000K
GSCOBW50-750W30-V17	34-38V	750mA	30W	5000K
GSCOBW40-750W30-V17	34-38V	750mA	30W	4000K
GSCOBW35-750W30-V17	34-38V	750mA	30W	3500K
GSCOBW30-750W30-V17	34-38V	750mA	30W	3000K
GSCOBW27-750W30-V17	34-38V	750mA	30W	2700K
GSCOBW60-750W30-G17	34-38V	750mA	30W	6000K
GSCOBW50-750W30-G17	34-38V	750mA	30W	5000K
GSCOBW40-750W30-G17	34-38V	750mA	30W	4000K
GSCOBW35-750W30-G17	34-38V	750mA	30W	3500K
GSCOBW30-750W30-G17	34-38V	750mA	30W	3000K
GSCOBW27-750W30-G17	34-38V	750mA	30W	2700K
GSCOBW60-600W24-V17	34-38V	600mA	24W	6000K
GSCOBW50-600W24-V17	34-38V	600mA	24W	5000K
GSCOBW40-600W24-V17	34-38V	600mA	24W	4000K
GSCOBW35-600W24-V17	34-38V	600mA	24W	3500K
GSCOBW30-600W24-V17	34-38V	600mA	24W	3000K
GSCOBW27-600W24-V17	34-38V	600mA	24W	2700K
GSCOBW60-600W24-G17	34-38V	600mA	24W	6000K
GSCOBW50-600W24-G17	34-38V	600mA	24W	5000K
GSCOBW40-600W24-G17	34-38V	600mA	24W	4000K
GSCOBW35-600W24-G17	34-38V	600mA	24W	3500K
GSCOBW30-600W24-G17	34-38V	600mA	24W	3000K
GSCOBW27-600W24-G17	34-38V	600mA	24W	2700K
GSCOBW60-450W18-V17	34-38V	450mA	18W	6000K
GSCOBW50-450W18-V17	34-38V	450mA	18W	5000K
GSCOBW40-450W18-V17	34-38V	450mA	18W	4000K
GSCOBW35-450W18-V17	34-38V	450mA	18W	3500K
GSCOBW30-450W18-V17	34-38V	450mA	18W	3000K
GSCOBW27-450W18-V17	34-38V	450mA	18W	2700K
GSCOBW60-450W18-G17	34-38V	450mA	18W	6000K
GSCOBW50-450W18-G17	34-38V	450mA	18W	5000K
GSCOBW40-450W18-G17	34-38V	450mA	18W	4000K
GSCOBW35-450W18-G17	34-38V	450mA	18W	3500K
GSCOBW30-450W18-G17	34-38V	450mA	18W	3000K

GSCOBW27-450W18-G17	34-38V	450mA	18W	2700K
GSCOBW60-300W12-V17	34-38V	300mA	12W	6000K
GSCOBW50-300W12-V17	34-38V	300mA	12W	5000K
GSCOBW40-300W12-V17	34-38V	300mA	12W	4000K
GSCOBW35-300W12-V17	34-38V	300mA	12W	3500K
GSCOBW30-300W12-V17	34-38V	300mA	12W	3000K
GSCOBW27-300W12-V17	34-38V	300mA	12W	2700K
GSCOBW60-300W12-V17	34-38V	300mA	12W	6000K
GSCOBW50-300W12-V17	34-38V	300mA	12W	5000K
GSCOBW40-300W12-V17	34-38V	300mA	12W	4000K
GSCOBW35-300W12-V17	34-38V	300mA	12W	3500K
GSCOBW30-300W12-V17	34-38V	300mA	12W	3000K
GSCOBW27-300W12-V17	34-38V	300mA	12W	2700K
GSCOBW60-600W24-V11	34-38V	600mA	24W	6000K
GSCOBW50-600W24-V11	34-38V	600mA	24W	5000K
GSCOBW40-600W24-V11	34-38V	600mA	24W	4000K
GSCOBW35-600W24-V11	34-38V	600mA	24W	3500K
GSCOBW30-600W24-V11	34-38V	600mA	24W	3000K
GSCOBW27-600W24-V11	34-38V	600mA	24W	2700K
GSCOBW60-600W24-G11	34-38V	600mA	24W	6000K
GSCOBW50-600W24-G11	34-38V	600mA	24W	5000K
GSCOBW40-600W24-G11	34-38V	600mA	24W	4000K
GSCOBW35-600W24-G11	34-38V	600mA	24W	3500K
GSCOBW30-600W24-G11	34-38V	600mA	24W	3000K
GSCOBW27-600W24-G11	34-38V	600mA	24W	2700K
GSCOBW60-450W18-V11	34-38V	450mA	18W	6000K
GSCOBW50-450W18-V11	34-38V	450mA	18W	5000K
GSCOBW40-450W18-V11	34-38V	450mA	18W	4000K
GSCOBW35-450W18-V11	34-38V	450mA	18W	3500K
GSCOBW30-450W18-V11	34-38V	450mA	18W	3000K
GSCOBW27-450W18-V11	34-38V	450mA	18W	2700K
GSCOBW60-450W18-G11	34-38V	450mA	18W	6000K
GSCOBW50-450W18-G11	34-38V	450mA	18W	5000K
GSCOBW40-450W18-G11	34-38V	450mA	18W	4000K
GSCOBW35-450W18-G11	34-38V	450mA	18W	3500K
GSCOBW30-450W18-G11	34-38V	450mA	18W	3000K
GSCOBW27-450W18-G11	34-38V	450mA	18W	2700K
GSCOBW60-300W12-V11	34-38V	300mA	12W	6000K

GSCOBW50-300W12-V11	34-38V	300mA	12W	5000K
GSCOBW40-300W12-V11	34-38V	300mA	12W	4000K
GSCOBW35-300W12-V11	34-38V	300mA	12W	3500K
GSCOBW30-300W12-V11	34-38V	300mA	12W	3000K
GSCOBW27-300W12-V11	34-38V	300mA	12W	2700K
GSCOBW60-300W12-G11	34-38V	300mA	12W	6000K
GSCOBW50-300W12-G11	34-38V	300mA	12W	5000K
GSCOBW40-300W12-G11	34-38V	300mA	12W	4000K
GSCOBW35-300W12-G11	34-38V	300mA	12W	3500K
GSCOBW30-300W12-G11	34-38V	300mA	12W	3000K
GSCOBW27-300W12-G11	34-38V	300mA	12W	2700K
GSCOBW60-150W6-V11	34-38V	150mA	6W	6000K
GSCOBW50-150W6-V11	34-38V	150mA	6W	5000K
GSCOBW40-150W6-V11	34-38V	150mA	6W	4000K
GSCOBW35-150W6-V11	34-38V	150mA	6W	3500K
GSCOBW30-150W6-V11	34-38V	150mA	6W	3000K
GSCOBW27-150W6-V11	34-38V	150mA	6W	2700K
GSCOBW60-150W6-G11	34-38V	150mA	6W	6000K
GSCOBW50-150W6-G11	34-38V	150mA	6W	5000K
GSCOBW40-150W6-G11	34-38V	150mA	6W	4000K
GSCOBW35-150W6-G11	34-38V	150mA	6W	3500K
GSCOBW30-150W6-G11	34-38V	150mA	6W	3000K
GSCOBW27-150W6-G11	34-38V	150mA	6W	2700K
GSCOBW60-300W12-V08	34-38V	300mA	12W	6000K
GSCOBW50-300W12-V08	34-38V	300mA	12W	5000K
GSCOBW40-300W12-V08	34-38V	300mA	12W	4000K
GSCOBW35-300W12-V08	34-38V	300mA	12W	3500K
GSCOBW30-300W12-V08	34-38V	300mA	12W	3000K
GSCOBW27-300W12-V08	34-38V	300mA	12W	2700K
GSCOBW60-300W12-G08	34-38V	300mA	12W	6000K
GSCOBW50-300W12-G08	34-38V	300mA	12W	5000K
GSCOBW40-300W12-G08	34-38V	300mA	12W	4000K
GSCOBW35-300W12-G08	34-38V	300mA	12W	3500K
GSCOBW30-300W12-G08	34-38V	300mA	12W	3000K
GSCOBW27-300W12-G08	34-38V	300mA	12W	2700K
GSCOBW60-150W6-V08	34-38V	150mA	6W	6000K
GSCOBW50-150W6-V08	34-38V	150mA	6W	5000K
GSCOBW40-150W6-V08	34-38V	150mA	6W	4000K

GSCOBW35-150W6-V08	34-38V	150mA	6W	3500K
GSCOBW30-150W6-V08	34-38V	150mA	6W	3000K
GSCOBW27-150W6-V08	34-38V	150mA	6W	2700K
GSCOBW60-150W6-G08	34-38V	150mA	6W	6000K
GSCOBW50-150W6-G08	34-38V	150mA	6W	5000K
GSCOBW40-150W6-G08	34-38V	150mA	6W	4000K
GSCOBW35-150W6-G08	34-38V	150mA	6W	3500K
GSCOBW30-150W6-G08	34-38V	150mA	6W	3000K
GSCOBW27-150W6-G08	34-38V	150mA	6W	2700K

PICTURE OF THE SAMPLE TESTED:

Model GSCOBW60-2700W108-V23	
	

DESCRIPTION	
Type of appliance:	Mirror Aluminum COB Light Source
Type / model:	See model list
Tested lamp:	☒ continuous wave lamps ☐ pulsed lamps
Tested lamp system:	NA
Lamp classification group:	☐ exempt ☒ risk 1 ☐ risk 2 ☐ risk 3
Lamp Cap:	N/A
Bulb:	LED
Rated of the lamp:	-
Furthermore marking on the lamp:	-
Information for safety use:	-

Possible test case verdicts:	
- Test object does meet the requirement	P (Pass)
- Test case does not apply to the test object	NA (Not applicable)
- Test object does not meet the requirement	F (Fail)
- Test object does not demand	ND (Not demanded)
General remarks:	
"(See remark #)" refers to a remark appended to the report. Throughout this report a point is used as the decimal separator.	

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Section	Requirement Test	Result – Value – Remark	Verdict
4	**EXPOSURE LIMITS**		P
4.1	General		P
	The exposure limits in this standard is not less than 0,01 ms and not more than any 8-hour period and should be used as guides in the control of exposure		P
	Detailed spectral data of a light source are generally required only if the luminance of the source exceeds 10^4 cd·m^{-2}	see clause 4.3	P
4.3	Hazard exposure limits		P
4.3.1	Actinic UV hazard exposure limit for the skin and eye		P
	The exposure limit for effective radiant exposure is 30 J·m^{-2} within any 8-hour period		P
	To protect against injury of the eye or skin from ultraviolet radiation exposure produced by a broadband source, the effective integrated spectral irradiance , E_S, of the light source shall not exceed the levels defined by:		P
	$E_s \cdot t = \sum_{200}^{400} \sum_{t} E_\lambda(\lambda,t) \cdot S_{UV}(\lambda) \cdot \Delta t \cdot \Delta\lambda \le 30$ J·m^{-2}		P
	The permissible time for exposure to ultraviolet radiation incident upon the unprotected eye or skin shall be computed by:		P
	$t_{max} = \frac{30}{E_s}$ s		P
4.3.2	Near-UV hazard exposure limit for eye		P
	For the spectral region 315 nm to 400 nm (UV-A) the total radiant exposure to the eye shall not exceed 10000 J·m^{-2} for exposure times less than 1000 s. For exposure times greater than 1000 s (approximately 16 minutes) the UV-A irradiance for the unprotected eye, E_{UVA}, shall not exceed 10 W·m^{-2}.		P
	The permissible time for exposure to ultraviolet radiation incident upon the unprotected eye for time less than 1000 s, shall be computed by:		P
	$t_{max} \le \frac{10000}{E_{UVA}}$ s		P
4.3.3	Retinal blue light hazard exposure limit		P
	To protect against retinal photochemical injury from chronic blue-light exposure, the integrated spectral radiance of the light source weighted against the blue-light hazard function, B(λ), i.e., the blue-light weighted radiance , L_B, shall not exceed the levels defined by:		P

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	$L_B \cdot t = \sum_{300}^{700} \sum_{t} L_\lambda(\lambda,t) \cdot B(\lambda) \cdot \Delta t \cdot \Delta\lambda \le 10^6$ J·m^{-2}·sr^{-1}	for t ≤ 10^4 s $t_{max} = \frac{10^6}{L_B}$	P
	$L_B = \sum_{300}^{700} L_\lambda \cdot B(\lambda) \cdot \Delta\lambda \le 100$ W·m^{-2}·sr^{-1}	for t > 10^4 s	P
4.3.4	Retinal blue light hazard exposure limit - small source		NA
	Thus the spectral irradiance at the eye E_λ, weighted against the blue-light hazard function B(λ) shall not exceed the levels defined by:	see table 4.2	NA
	$E_B \cdot t = \sum_{300}^{700} \sum_{t} E_\lambda(\lambda,t) \cdot B(\lambda) \cdot \Delta t \cdot \Delta\lambda \le 100$ J·m^{-2}	for t ≤ 100 s	NA
	$E_B = \sum_{300}^{700} E_\lambda \cdot B(\lambda) \cdot \Delta\lambda \le 1$	for t > 100 s	NA
4.3.5	Retinal thermal hazard exposure limit		P
	To protect against retinal thermal injury, the integrated spectral radiance of the light source, L_λ, weighted by the burn hazard weighting function R(λ) (from Figure 4.2), i.e., the burn hazard weighted radiance, shall not exceed the levels defined by:		P
	$L_R = \sum_{380}^{1400} L_\lambda \cdot R(\lambda) \cdot \Delta\lambda \le \frac{50000}{\alpha \cdot t^{0,25}}$ W·m^{-2}·sr^{-1}	(10 µs ≤ t ≤ 10 s)	P
4.3.6	Retinal thermal hazard exposure limit – weak visual stimulus		NA
	For an infrared heat lamp or any near-infrared source where a weak visual stimulus is inadequate to activate the aversion response, the near infrared (780 nm to 1400 nm) radiance, L_{IR}, as viewed by the eye for exposure times greater than 10 s shall be limited to:		NA
	$L_{IR} = \sum_{780}^{1400} L_\lambda \cdot R(\lambda) \cdot \Delta\lambda \le \frac{6000}{\alpha}$ W·m^{-2}·sr^{-1}	t > 10 s	NA
4.3.7	Infrared radiation hazard exposure limits for the eye		P
	The avoid thermal injury of the cornea and possible delayed effects upon the lens of the eye (cataractogenesis), ocular exposure to infrared radiation, E_{IR}, over the wavelength range 780 nm to 3000 nm, for times less than 1000 s, shall not exceed:		P
	$E_{IR} = \sum_{780}^{3000} E_\lambda \cdot \Delta\lambda \le 18000 \cdot t^{-0,75}$ W·m^{-2}	t ≤ 1000 s	P
	For times greater than 1000 s the limit becomes:		P
	$E_{IR} = \sum_{780}^{3000} E_\lambda \cdot \Delta\lambda \le 100$ W·m^{-2}	t > 1000 s	P

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Section	Requirement Test	Result – Value – Remark	Verdict
4.3.8	Thermal hazard exposure limit for the skin		P
	Visible and infrared radiant exposure (380 nm to 3000 nm) of the skin shall be limited to:		P
	$E_H \cdot t = \sum_{380}^{3000} \sum_{t} E_\lambda(\lambda,t) \cdot \Delta t \cdot \Delta\lambda \le 20000 \cdot t^{0,25}$ J·m^{-2}		P
5	**MEASUREMENT OF LAMPS AND LAMP SYSTEMS**		P
5.1	Measurement conditions		P
	Measurement conditions shall be reported as part of the evaluation against the exposure limits and the assignment of risk classification.		P
5.1.1	Lamp ageing (seasoning)		NA
	Seasoning of lamps shall be done as stated in the appropriate IEC lamp standard.		NA
5.1.2	Test environment		P
	For specific test conditions, see the appropriate IEC lamp standard or in absence of such standards, the appropriate national standards or manufacturer's recommendations.		P
5.1.3	Extraneous radiation		P
	Careful checks should be made to ensure that extraneous sources of radiation and reflections do not add significantly to the measurement results.		P
5.1.4	Lamp operation		NA
	Operation of the test lamp shall be provided in accordance with:		NA
	– the appropriate IEC lamp standard, or		NA
	– the manufacturer' s recommendation		NA
5.1.5	Lamp system operation		P
	The power source for operation of the test lamp shall be provided in accordance with:		P
	– the appropriate IEC standard, or		NA
	– the manufacturer' s recommendation		P
5.2	Measurement procedure		P
5.2.1	Irradiance measurements		P
	Minimum aperture diameter 7mm.		P
	Maximum aperture diameter 50 mm.		P
	The measurement shall be made in that position of the beam giving the maximum reading.		P

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Section	Requirement Test	Result – Value – Remark	Verdict
	The measurement instrument is adequate calibrated.		P
5.2.2	Radiance measurements		P
5.2.2.1	Standard method		P
	The measurements made with an optical system.		P
	The instrument shall be calibrated to read in absolute radiant power per unit receiving area and per unit solid angle to acceptance averaged over the field of view of the instrument.		P
5.2.2.2	Alternative method		NA
	Alternatively to an imaging radiance set-up, an irradiance measurement set-up with a circular field stop placed at the source can be used to perform radiance measurements.		NA
5.2.3	Measurement of source size		P
	The determination of α, the angle subtended by a source, requires the determination of the 50% emission points of the source.		P
5.2.4	Pulse width measurement for pulsed sources		NA
	The determination of Δt, the nominal pulse duration of a source, requires the determination of the time during which the emission is > 50% of its peak value.		NA
5.3	Analysis methods		P
5.3.1	Weighting curve interpolations		P
	To standardize interpolated values, use linear interpolation on the log of given values to obtain intermediate points at the wavelength intervals desired.	See table 4.1	P
5.3.2	Calculations		P
	The calculation of source hazard values shall be performed by weighting the spectral scan by the appropriate function and calculating the total weighted energy.		P
5.3.3	Measurement uncertainty		P
	The quality of all measurement results must be quantified by an analysis of the uncertainty.	see Annex C in the norm	P

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Section	Requirement Test	Result – Value – Remark	Verdict
6	**LAMP CLASSIFICATION**		P
	For the purposes of this standard it was decided that the values shall be reported as follows:	see table 6.1	P
	– for lamps intended for general lighting service, the hazard values shall be reported as either irradiance or radiance values at a distance which produces an illuminance of 500 lux, but not at a distance less than 200 mm	3.07904m	P
	– for all other light sources, including pulsed lamp sources, the hazard values shall be reported at a distance of 200 mm		NA
6.1	Continuous wave lamps		P
6.1.1	Except Group		NA
	In the except group are lamps, which does not pose any photobiological hazard. The requirement is met by any lamp that does not pose:		NA
	– an actinic ultraviolet hazard (E_S) within 8-hours exposure (30000 s), nor		NA
	– a near-UV hazard (E_{UVA}) within 1000 s, (about 16 min), nor		NA
	– a retinal blue-light hazard (L_B) within 10000 s (about 2,8 h), nor		NA
	– a retinal thermal hazard (L_R) within 10 s, nor		NA
	– an infrared radiation hazard for the eye (E_{IR}) within 1000 s		NA
6.1.2	Risk Group 1 (Low-Risk)		P
	In this group are lamps, which exceeds the limits for the except group but that does not pose:		P
	– an actinic ultraviolet hazard (E_S) within 10000 s, nor		P
	– a near ultraviolet hazard (E_{UVA}) within 300 s, nor		P
	– a retinal blue-light hazard (L_B) within 100 s, nor		P
	– a retinal thermal hazard (L_R) within 10 s, nor		P
	– an infrared radiation hazard for the eye (E_{IR}) within 100 s		P
	Lamps that emit infrared radiation without a strong visual stimulus and do not pose a near-infrared retinal hazard (L_{IR}), within 100 s are in Risk Group 1.		P
6.1.3	Risk Group 2 (Moderate-Risk)		NA
	This requirement is met by any lamp that exceeds the limits for Risk Group 1, but that does not pose:		NA

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	– an actinic ultraviolet hazard (E_S) within 1000 s exposure, nor		NA
	– a near ultraviolet hazard (E_{UVA}) within 100 s, nor		NA
	– a retinal blue-light hazard (L_B) within 0,25 s (aversion response), nor		NA
	– a retinal thermal hazard (L_R) within 0,25 s (aversion response), nor		NA
	– an infrared radiation hazard for the eye (E_{IR}) within 10 s		NA
	Lamps that emit infrared radiation without a strong visual stimulus and do not pose a near-infrared retinal hazard (L_{IR}), within 10 s are in Risk Group 2.		NA
6.1.4	Risk Group 3 (High-Risk)		NA
	Lamps which exceed the limits for Risk Group 2 are in Group 3.		NA
6.2	Pulsed lamps		NA
	Pulse lamp criteria shall apply to a single pulse and to any group of pulses within 0,25 s.		NA
	A pulsed lamp shall be evaluated at the highest nominal energy loading as specified by the manufacturer.		NA
	The risk group determination of the lamp being tested shall be made as follows:		NA
	– a lamp that exceeds the exposure limit shall be classified as belonging to Risk Group 3 (High-Risk)		NA
	– for single pulsed lamps, a lamp whose weighted radiant exposure or weighted radiance does is below the EL shall be classified as belonging to the Exempt Group		NA
	– for repetitively pulsed lamps, a lamp whose weighted radiant exposure or weighted radiance dose is below the EL, shall be evaluated using the continuous wave risk criteria discussed in clause 6.1, using time averaged values of the pulsed emission		NA

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Table 4.1	Spectral weighting function for assessing ultraviolet hazards for skin and eye	P

Wavelength[1] λ, nm	**UV hazard function SUV(λ)**	**Wavelength λ, nm**	**UV hazard function SUV(λ)**
200	0.030	313*	0.006
205	0.051	315	0.003
210	0.075	316	0.0024
215	0.095	317	0.0020
220	0.120	318	0.0016
225	0.150	319	0.0012
230	0.190	320	0.0010
235	0.240	322	0.00067
240	0.300	323	0.00054
245	0.360	325	0.00050
250	0.430	328	0.00044
254*	0.500	330	0.00041
255	0.520	333*	0.00037
260	0.650	335	0.00034
265	0.810	340	0.00028
270	1.000	345	0.00024
275	0.960	350	0.00020
280*	0.880	355	0.00016
285	0.770	360	0.00013
290	0.640	365*	0.00011
295	0.540	370	0.000093
297*	0.460	375	0.000077
300	0.300	380	0.000064
303*	0.120	385	0.000053
305	0.060	390	0.000044
308	0.026	395	0.000036
310	0.015	400	0.000030

[1] Wavelengths chosen are representative: other values should be obtained by logarithmic interpolation at intermediate wavelengths.

* Emission lines of a mercury discharge spectrum.

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Table 4.2	Spectral weighting functions for assessing retinal hazards from broadband optical sources	P

Wavelength nm	**Blue-light hazard function B (λ)**	**Burn hazard function R (λ)**
300	0.01	
305	0.01	
310	0.01	
315	0.01	
320	0.01	
325	0.01	
330	0.01	
335	0.01	
340	0.01	
345	0.01	
350	0.01	
355	0.01	
360	0.01	
365	0.01	
370	0.01	
375	0.01	
380	0.01	0.1
385	0.013	0.13
390	0.025	0.25
395	0.05	0.5
400	0.10	1.0
405	0.20	2.0
410	0.40	4.0
415	0.80	8.0
420	0.90	9.0
425	0.95	9.5
430	0.98	9.8
435	1.00	10.0
440	1.00	10.0
445	0.97	9.7
450	0.94	9.4
455	0.90	9.0
460	0.80	8.0
465	0.70	7.0
470	0.62	6.2
475	0.55	5.5
480	0.45	4.5
485	0.40	4.0
490	0.22	2.2
495	0.16	1.6
500-600	$10^{[(450-\lambda)/50]}$	1.0
600-700	0.001	1.0
700-1050		$10^{[(700-\lambda)/500]}$
1050-1150		0.2
1150-1200		$0.2 \cdot 10^{0.02(1150-\lambda)}$
1200-1400		0.02

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Table 5.4	Summary of the ELs for the surface of the skin or cornea (irradiance based values)				P
Hazard Name	**Relevant equation**	**Wavelength range nm**	**Exposure duration sec**	**Limiting aperture rad (deg)**	**EL in terms of constant irradiance $W \cdot m^{-2}$**
Actinic UV skin & eye	$E_S = \Sigma E_\lambda \cdot S(\lambda) \cdot \Delta\lambda$	200 – 400	< 30000	1.4 (80)	30/t
Eye UV-A	$E_{UVA} = \Sigma E_\lambda \cdot \Delta\lambda$	315 – 400	≤1000 >1000	1.4 (80)	10000/t 10
Blue-light small source	$E_B = \Sigma E_\lambda \cdot B(\lambda) \cdot \Delta\lambda$	300 – 700	≤100 >100	< 0.011	100/t 1.0
Eye IR	$E_{IR} = \Sigma E_\lambda \cdot \Delta\lambda$	780 –3000	≤1000 >1000	1.4 (80)	$18000/t^{0.75}$ 100
Skin thermal	$E_H = \Sigma E_\lambda \cdot \Delta\lambda$	380 – 3000	< 10	2π sr	$20000/t^{0.75}$

Table 5.5	Summary of the ELs for the retina (radiance based values)				P
Hazard Name	**Relevant equation**	**Wavelength range nm**	**Exposure duration sec**	**Field of view radians**	**EL in terms of constant radiance $W \cdot m^{-2} \cdot sr^{-1}$)**
Blue light	$L_B = \Sigma L_\lambda \cdot B(\lambda) \cdot \Delta\lambda$	300 – 700	0.25 – 10 10-100 100-10000 ≥ 10000	$0.011 \cdot \sqrt{(t/10)}$ 0.011 $0.0011 \cdot \sqrt{t}$ 0.1	$10^6/t$ $10^6/t$ $10^6/t$ 100
Retinal thermal	$L_R = \Sigma L_\lambda \cdot R(\lambda) \cdot \Delta\lambda$	380 – 1400	< 0.25 0.25 – 10	0.0017 $0.011 \cdot \sqrt{(t/10)}$	$50000/(\alpha \cdot t^{0.25})$ $50000/(\alpha \cdot t^{0.25})$
Retinal thermal (weak visual stimulus)	$L_{IR} = \Sigma L_\lambda \cdot R(\lambda) \cdot \Delta\lambda$	780 – 1400	> 10	0.011	$6000/\alpha$

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Section	Requirement Test	Result – Value – Remark	Verdict

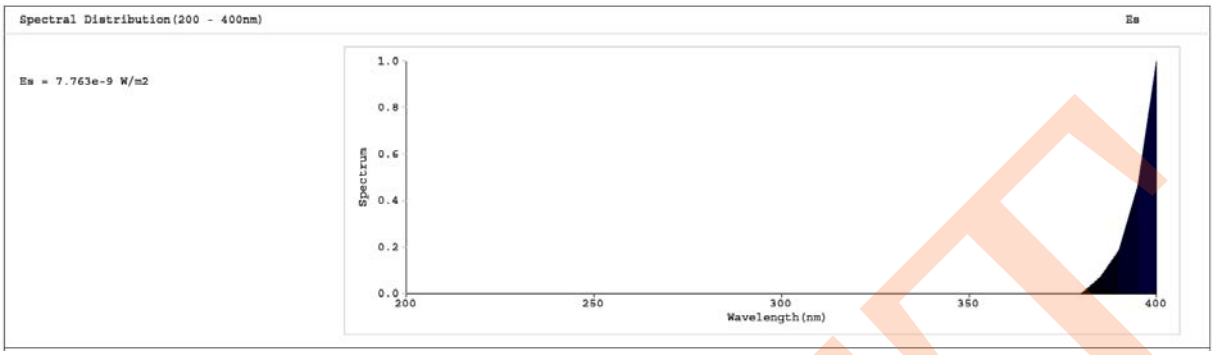
Table 6.1 Emission limits for risk groups of continuous wave lamps. For GSCOBW60-2700W108-V23) — P

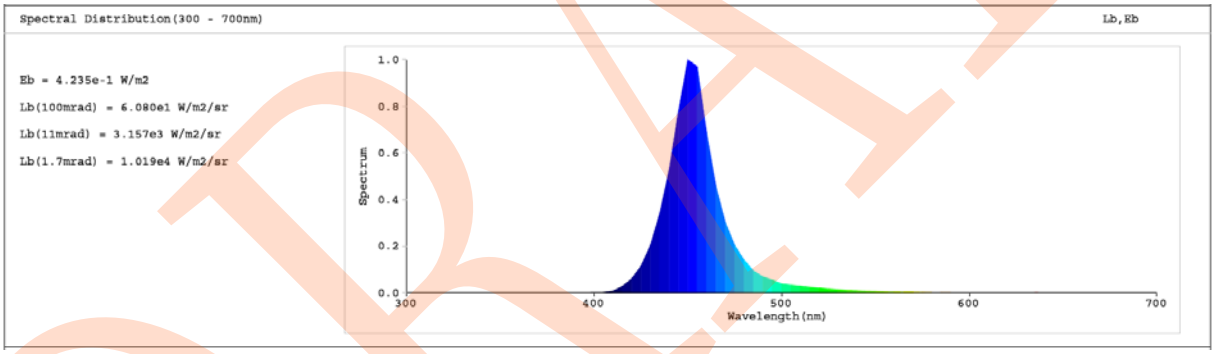
Risk	Action spectrum	Symbol	Units	Emission Measurement					
				Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	$S_{UV}(\lambda)$	E_s	$W \cdot m^{-2}$	1.000e-3	7.763e-9	3.000e-3	7.76e-9	3.000e-2	7.76e-9
Near UV		E_{UVA}	$W \cdot m^{-2}$	3.300e-1	2.234e-4	3.300e1	2.234e-4	1.000e2	2.234e-4
Blue light	B(λ)	L_B	$W \cdot m^{-2} \cdot sr^{-1}$	1.000e2	6.080e1	1.000e4	3.157e3	4.000e6	1.019e4
Blue light, small source*	B(λ)	E_B	$W \cdot m^{-2}$	1.000e-2	4.235e-1	1.000e0	4.235e-1	4.000e2	4.235e-1
Retinal thermal	R(λ)	L_R	$W \cdot m^{-2} \cdot sr^{-1}$	4.828e6	3.850e4 (α = 5.8 mrad)	4.828e6	3.850e4	1.224e7	1.242e5
Retinal thermal, weak visual stimulus**	R(λ)	L_{IR}	$W \cdot m^{-2} \cdot sr^{-1}$	-	2.867e0	-	2.867e0	-	2.867e0
IR radiation, eye		E_{IR}	$W \cdot m^{-2}$	1.000e2	8.662e-4	5.700e2	8.662e-4	3.200e3	8.662e-4

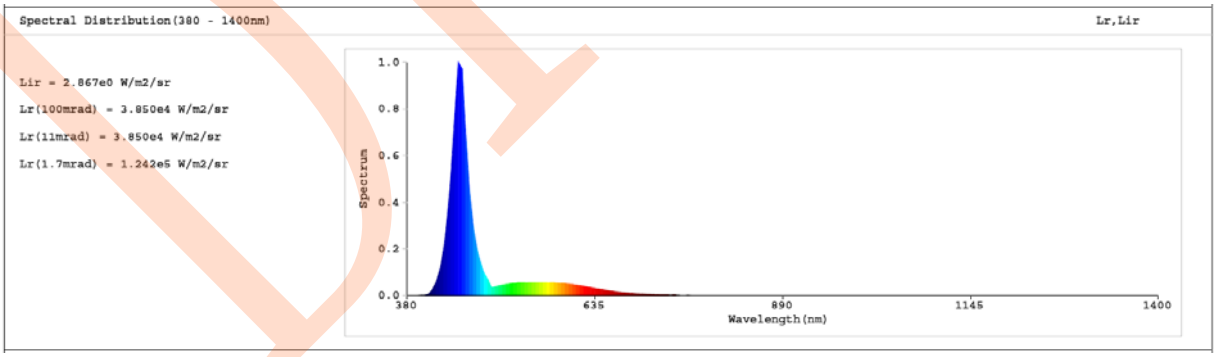
* Small source defined as one with α < 0.011 radian. Averaging field of view at 10000 s is 0.1 radian.
** Involves evaluation of non-GLS source

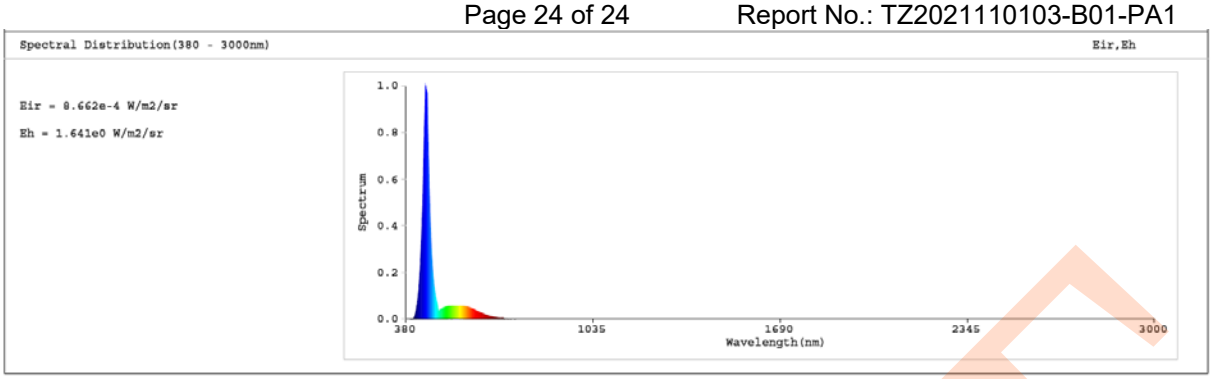
NOTE The action functions: see Table 4.1 and Table 4.2
The applicable aperture diameters: see 4.2.1
The limitations for the angular subtenses: see 4.2.2
The related measurement condition 5.2.3 and the range of acceptance angles: see Table 5.5.

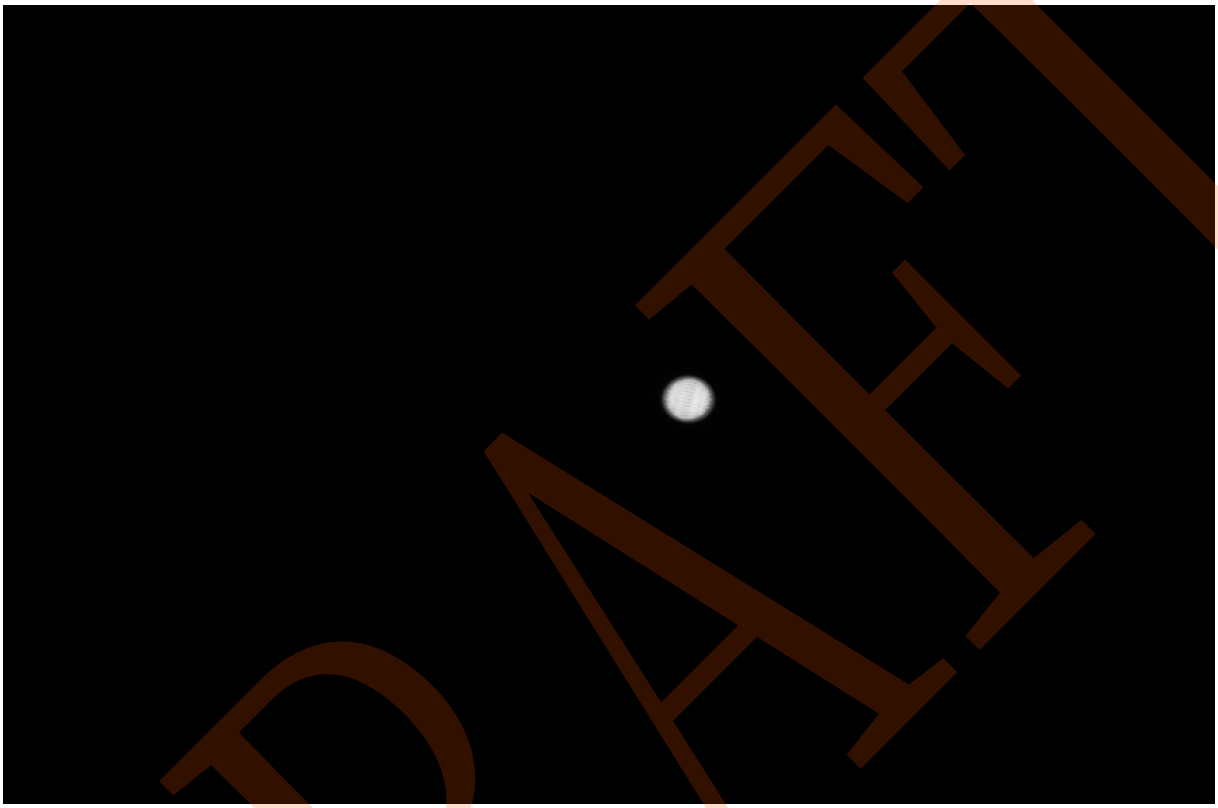
Annex 1 – Test result in graphical presentation –GSCOBW60-2700W108-V23)











**********END OF THE REPORT**********