



工業技術研究院

Industrial Technology
Research Institute

檢 測 服 務 報 告

MEASUREMENT SERVICE REPORT

工業技術研究院
Industrial Technology Research Institute

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報告使用說明

Directions & Reminders

1. 本案係依約定之委託服務項目、內容及執行方法對委託人送檢樣品進行檢測。

This Measurement Service is conducted on the Sample(s) provided by the CLIENT according to the terms and conditions mutually agreed by both parties.

2. 本案報告僅供委託人內部參考使用，未經本院同意，委託人不得任意摘錄或複製使用，亦不得以之作為任何證明、法庭證據、廣告或商品行銷之用。

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3. 除特別聲明外，報告內之數值係於本院實驗室環境下執行檢測所得之結果。

Unless otherwise specified herein, the data and information contained in this Report are obtained under the environmental condition in ITRI lab.

4. 本報告無論正副本均應加蓋本院報告專用章及經實驗室主管審核確認，始生效力。

This Report, including its original and copy, shall be invalid unless affixed with ITRI authorized chops and reviewed and approved by the chief of the ITRI lab.



Test Report

Date Issued : 2022-03-24

Report No. : 11107C01090-1-2-02

Version : A

Service Item : Special yellow light LED tube

Client

Company Name : Benson Energy Saving Technology CO.,LTD

Address : 18F.,NO.689-96, Xiaodong Rd., Yongkand Dist., Tainan
City 710, Taiwan (R.O.C)

Result of Service Item, performed by ITRI Laboratory, is specified on the next/ following page(s).

This report, including a signature page and content, is a total of 11 pages. The validity of this report no longer exists if signature page and content are separated.



Jeng-Yow Lin

Executive Director
Center for Measurement Standards

Shih-Chin Kao

Approved Signatory



Commission Information:

Sample name : Special yellow light LED tube

Manufacturer : BEST

Model no. / Serial no. : SW-T84F-CRL-AL / 111010900101

Date of request : 2022.03.16

Laboratory Information:

Testing Laboratory: Optical and Electrical Testing Laboratory, CMS, ITRI

Address of Lab.: 3F, Bldg. 7, No.321, Sec. 2, KuangFu Rd., Hsinchu, 30011,

Taiwan, R.O.C.

Tel : + 886-3-5732071

Fax : +886-3-5732048

Lab. Approved Signatory

Shih-Chin Kao

Testing Lab. Head

Wei-Yun Liang



Test Results and Descriptions

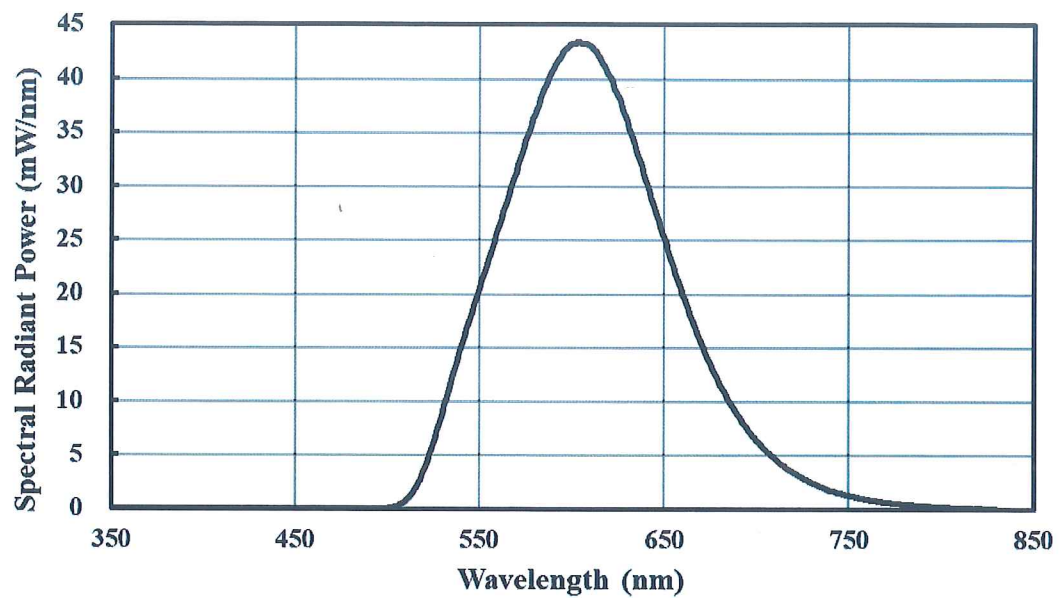
I. Test Results

1. Table of test results

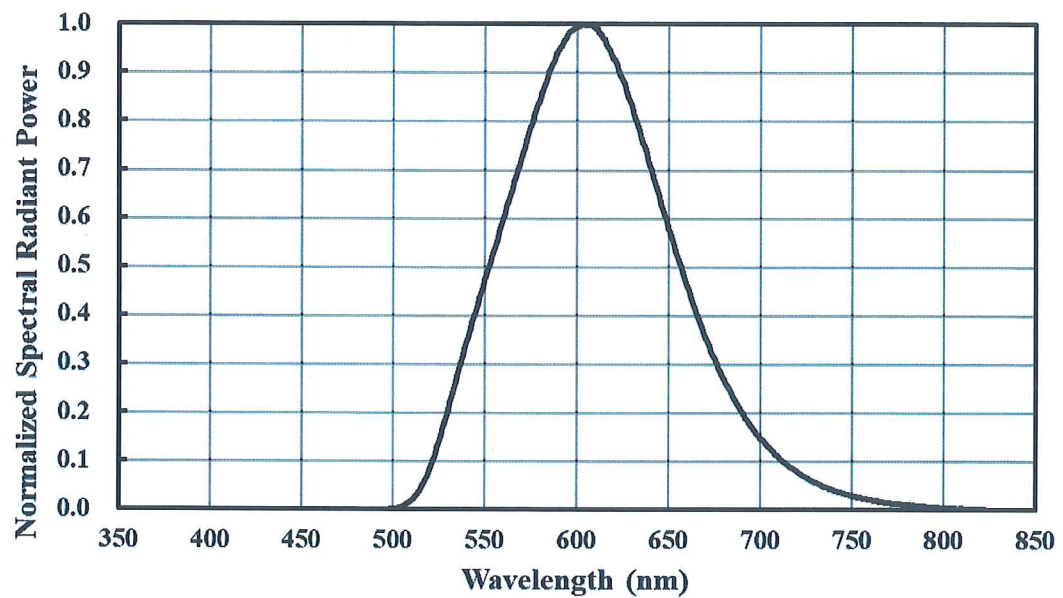
No.	Item	Data
1	Input Voltage (V)	220
2	Frequency (Hz)	50
3	Input Current (mA)	91.0
4	Input Power (W)	18.6
5	Power Factor (PF)	0.927
6	Total Luminous Flux (lm)	1692.6
7	Luminous Efficacy (lm/W)	91.1
8	Chromaticity Ordinate, x	0.5483
9	Chromaticity Ordinate, y	0.4487
10	Correlated color Temperature (K)	2063
11	Light Output Power (W)	4.81
12	Color Rendering Index (CRI, R_a)	52.6
	Color Rendering Index (CRI, R_9)	-55.5

Note : The range of Light Output Power is (350 ~ 830) nm.

2. Spectral Radiant Power Distribution



3. Normalized Spectral Radiant Power Distribution





3. Data of Spectral Radiant Power

λ (nm)	mW/nm	λ (nm)	mW/nm	λ (nm)	mW/nm	λ (nm)	mW/nm
350	0.00	381	0.00	412	0.00	443	0.00
351	0.00	382	0.00	413	0.00	444	0.00
352	0.00	383	0.00	414	0.00	445	0.00
353	0.00	384	0.00	415	0.00	446	0.00
354	0.00	385	0.00	416	0.00	447	0.00
355	0.00	386	0.00	417	0.00	448	0.00
356	0.00	387	0.00	418	0.00	449	0.00
357	0.00	388	0.00	419	0.00	450	0.00
358	0.00	389	0.00	420	0.00	451	0.00
359	0.00	390	0.00	421	0.00	452	0.00
360	0.00	391	0.00	422	0.00	453	0.00
361	0.00	392	0.00	423	0.00	454	0.00
362	0.00	393	0.00	424	0.00	455	0.00
363	0.00	394	0.00	425	0.00	456	0.00
364	0.00	395	0.00	426	0.00	457	0.00
365	0.00	396	0.00	427	0.00	458	0.00
366	0.00	397	0.00	428	0.00	459	0.00
367	0.00	398	0.00	429	0.00	460	0.00
368	0.00	399	0.00	430	0.00	461	0.00
369	0.00	400	0.00	431	0.00	462	0.00
370	0.00	401	0.00	432	0.00	463	0.00
371	0.00	402	0.00	433	0.00	464	0.00
372	0.00	403	0.00	434	0.00	465	0.00
373	0.00	404	0.00	435	0.00	466	0.00
374	0.00	405	0.00	436	0.00	467	0.00
375	0.00	406	0.00	437	0.00	468	0.00
376	0.00	407	0.00	438	0.00	469	0.00
377	0.00	408	0.00	439	0.00	470	0.00
378	0.00	409	0.00	440	0.00	471	0.00
379	0.00	410	0.00	441	0.00	472	0.00
380	0.00	411	0.00	442	0.00	473	0.00



λ (nm)	mW/nm	λ (nm)	mW/nm	λ (nm)	mW/nm	λ (nm)	mW/nm
474	0.00	505	0.26	536	12.59	567	29.74
475	0.00	506	0.33	537	13.21	568	30.37
476	0.00	507	0.42	538	13.79	569	30.95
477	0.00	508	0.52	539	14.38	570	31.36
478	0.00	509	0.64	540	14.98	571	32.01
479	0.00	510	0.78	541	15.53	572	32.49
480	0.00	511	0.94	542	16.12	573	33.06
481	0.00	512	1.13	543	16.70	574	33.65
482	0.00	513	1.33	544	17.16	575	34.27
483	0.00	514	1.57	545	17.77	576	34.64
484	0.00	515	1.83	546	18.28	577	35.15
485	0.00	516	2.12	547	18.89	578	35.74
486	0.00	517	2.43	548	19.37	579	36.30
487	0.00	518	2.77	549	19.93	580	36.61
488	0.00	519	3.16	550	20.52	581	37.19
489	0.00	520	3.59	551	20.98	582	37.60
490	0.00	521	4.00	552	21.59	583	38.12
491	0.00	522	4.48	553	22.08	584	38.69
492	0.00	523	4.96	554	22.61	585	39.12
493	0.00	524	5.48	555	23.11	586	39.47
494	0.00	525	6.03	556	23.64	587	39.84
495	0.01	526	6.56	557	24.22	588	40.28
496	0.01	527	7.14	558	24.80	589	40.74
497	0.02	528	7.74	559	25.37	590	40.99
498	0.03	529	8.31	560	25.93	591	41.30
499	0.04	530	8.91	561	26.50	592	41.60
500	0.06	531	9.54	562	27.04	593	41.89
501	0.09	532	10.09	563	27.58	594	42.09
502	0.12	533	10.76	564	28.09	595	42.48
503	0.16	534	11.40	565	28.65	596	42.61
504	0.20	535	11.96	566	29.25	597	42.83



λ (nm)	mW/nm	λ (nm)	mW/nm	λ (nm)	mW/nm	λ (nm)	mW/nm
598	42.92	629	36.51	660	19.96	691	8.47
599	43.12	630	36.01	661	19.59	692	8.21
600	43.22	631	35.46	662	19.04	693	7.95
601	43.20	632	34.93	663	18.55	694	7.69
602	43.27	633	34.44	664	18.03	695	7.44
603	43.39	634	33.88	665	17.64	696	7.28
604	43.39	635	33.36	666	17.21	697	7.04
605	43.25	636	32.76	667	16.71	698	6.78
606	43.23	637	32.44	668	16.28	699	6.62
607	43.28	638	31.80	669	15.91	700	6.40
608	43.24	639	31.22	670	15.45	701	6.24
609	43.14	640	30.66	671	15.06	702	6.06
610	43.01	641	30.15	672	14.64	703	5.81
611	42.95	642	29.58	673	14.17	704	5.68
612	42.64	643	29.04	674	13.79	705	5.49
613	42.56	644	28.50	675	13.48	706	5.31
614	42.11	645	27.91	676	13.09	707	5.17
615	42.05	646	27.28	677	12.70	708	4.97
616	41.61	647	26.81	678	12.42	709	4.88
617	41.28	648	26.28	679	11.98	710	4.70
618	40.97	649	25.72	680	11.66	711	4.54
619	40.68	650	25.15	681	11.34	712	4.39
620	40.28	651	24.77	682	11.07	713	4.25
621	40.13	652	24.09	683	10.77	714	4.14
622	39.60	653	23.48	684	10.46	715	4.02
623	39.09	654	22.93	685	10.11	716	3.85
624	38.76	655	22.54	686	9.82	717	3.73
625	38.36	656	22.00	687	9.53	718	3.63
626	38.04	657	21.51	688	9.37	719	3.53
627	37.56	658	21.03	689	9.01	720	3.42
628	36.90	659	20.51	690	8.73	721	3.29



λ (nm)	mW/nm	λ (nm)	mW/nm	λ (nm)	mW/nm	λ (nm)	mW/nm
722	3.21	753	1.15	784	0.40	815	0.09
723	3.07	754	1.08	785	0.38	816	0.08
724	3.01	755	1.09	786	0.35	817	0.09
725	2.93	756	1.03	787	0.34	818	0.05
726	2.80	757	1.01	788	0.32	819	0.09
727	2.71	758	0.97	789	0.34	820	0.06
728	2.62	759	0.93	790	0.31	821	0.08
729	2.54	760	0.90	791	0.28	822	0.09
730	2.44	761	0.88	792	0.27	823	0.04
731	2.38	762	0.84	793	0.25	824	0.02
732	2.33	763	0.81	794	0.27	825	0.00
733	2.22	764	0.78	795	0.24	826	0.00
734	2.16	765	0.76	796	0.23	827	0.00
735	2.06	766	0.76	797	0.22	828	0.00
736	2.04	767	0.72	798	0.21	829	0.00
737	1.96	768	0.68	799	0.21	830	0.00
738	1.89	769	0.65	800	0.20		
739	1.83	770	0.64	801	0.17		
740	1.73	771	0.61	802	0.17		
741	1.71	772	0.58	803	0.18		
742	1.67	773	0.57	804	0.18		
743	1.57	774	0.55	805	0.16		
744	1.53	775	0.54	806	0.15		
745	1.51	776	0.53	807	0.14		
746	1.46	777	0.51	808	0.12		
747	1.41	778	0.47	809	0.13		
748	1.35	779	0.45	810	0.15		
749	1.31	780	0.44	811	0.11		
750	1.28	781	0.41	812	0.10		
751	1.21	782	0.42	813	0.11		
752	1.20	783	0.37	814	0.10		



II. Descriptions

1. Date and Location of Test

The test was performed at 3F, Bldg. 7, No.321, Sec. 2, Guangfu Rd., Hsinchu City on Mar. 23, 2022.

2. Test Methods

The tests are carried according to "LM 79:2019" , "CIE 15:2018" and "CIE 13.3:1995" , sphere diameter is 2 m, 4π geometry.

Operating position of DUT is base down.

The ageing time specified by the customer is 30 mins.

3. Test Equipment List

Equipment	Serial No.	Traceability Unit	Report No.	Calibration Date	Due Date
DC power Source	US11C3169J	CMS (TAF 0016)	11107C00349-2 -1-03 A 版	2022/01/24	2023/01/23
Temp./ Hum. Recorder	E00561	PTI (TAF 1805)	20A027045	2020/07/28	2022/07/27
Power Meter	C041076	CMS (TAF 0016)	11107C01025-5 -1-03 Rev. A	2022/03/16	2023/03/15
Standard lamp	6333	NML (N0688)	O210303A	2021/09/10	2022/09/09



4. Environmental Conditions

The tests were performed under the following environmental conditions.

Ambient temperature : $(25 \pm 1) ^\circ\text{C}$

Relative humidity : $(20 \sim 65) \%$

5. Execution Units

No.	Test Items	Execution Unit
1	Input Voltage (V)	Optical and Electrical Testing Laboratory, Center for Measurement Standards, Industrial Technology Research Institute
2	Frequency (Hz)	
3	Input Current (mA)	
4	Input Power (W)	
5	Power Factor (PF)	
6	Total Luminous Flux (lm)	
7	Luminous Efficacy (lm/W)	
8	Chromaticity Ordinate, x	
9	Chromaticity Ordinate, y	
10	Correlated color Temperature (K)	
11	Light Output Power (W)	
12	Color Rendering Index (CRI, R_a)	

III. References

1. ANSI/IES LM-79, "Optical and Electrical Measurements of Solid-State Lighting Products", 2019.
2. CIE Publication No. 15, "Colorimetry", 2018.
3. CIE Publication No. 13.3, "Method of measuring and specifying colour rendering properties of light sources", 1995.

IV. Appendix

1.1. Photo of device under test

