LM-79-08 Test Report

For

ELEC-TECH INTERNATIONAL CO LTD

No.1 Jinfeng Road, Tangjiawan Town, Xiangzhou District, Zhuhai City, Guangdong Province, P.R. China 519085

LED Ceiling Luminaire

Model name(s):
546203XX

Representative (Tested) Model:
54620311

Model Difference: XX=11-30 intends CCT is 3000K.

Prepare By:

Engineer: Leo Liu
Date: 2017-07-17

Review By:

Technical Lead: Vincent Yuan
Date: 2017-07-23

Note: This report does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Product Information:

Client Name:	ELEC-TECH INTERNATIONAL CO LTD
Brand Name:	Hampton Bay
Model Number:	546203XX(XX=11-30)
Product type:	LED Ceiling Luminaire
Rating Input:	AC120V, 60Hz, 28W
Declared CCT:	3000K
Declared Light output:	1600lm
LED Manufacturer:	Samsung
LED Model:	SPMWHX1229A
LED Quantity:	60 pcs
Forward current of LED Chip:	100mA
Date of Receipt Samples:	2017-06-18
Quantity of Receipt Samples:	3
Sample Number:	170618009-S1

Laboratory Information:

Test Laboratory:	Dongguan New Testing Centre Co., Ltd
Laboratory Address:	3F, No. 1 the 1st North Industry Road, Songshan Lake Science & Technology Park, Dongguan, Guangdong, China
Laboratory Contact Name:	Neil Zhong
Laboratory Contact E-mail:	Neil_ntc@163.com

Report Information

Issued Date of Test Report:	2017-07-23
Revised Date of Test Report:	N/A
Test Report No.:	NTCR17060048
Remark (*If applicable*)	N/A

Test Specifications:	
Date of Test	2017-06-25
Test item	1. Total Luminous Flux 2. Luminous Distribution Intensity 3. Luminous Efficacy 4. Correlated Color Temperature 5. Color Rendering Index 6. Chromaticity Coordinate
Reference Standard	IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products CIE 13.3-1995 Method of Measuring and Specifying Color Rendering Properties of Light Sources CIE 15-2004 Technical Report Colorimetry

Test Methods

1. Photometric and Electrical measurements – Light Distribution Method:

Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at 25° C ± 1° C, measured at a point not more than 1 m from the sample and at the same height as the sample. The sample was operated at 120 Volts AC, 60Hz. It was stabilized before measurement was made. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1° vertical intervals and 22.5° Vertical intervals.

2. Photometric and Electrical Measurements – Integrating Sphere Method:

Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25º C ± 1º C. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. The sample was operated at 120 Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at least 5 nm intervals over the range of 380 to 780 nm.

Integrating Sphere Test Results

Test Condition:

Test Ambient	Test Humidity	Orientation	Stabilization Time	Test Time
25.0	51	Face Down	90	25

Electrical Data:

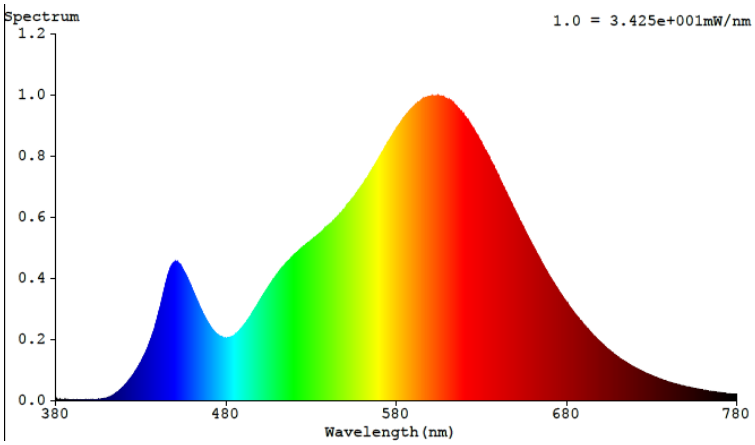
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.0	60	0.2197	24.80	0.9408

Color Data:

Parameter	Result
CCT (K)	3041
Color Rendering Index (CRI)	83.1
R9	11
Chromaticity, x	0.4344
Chromaticity, y	0.4038
Chromaticity u′	0.2491
Chromaticity v′	0.5209
Duv	0.000229

Special Color Rendering			
R1	81	R9	11
R2	91	R10	78
R3	97	R11	80
R4	81	R12	73
R5	82	R13	83
R6	88	R14	99
R7	84	R15	74
R8	61	-	-

Spectrum Diagram:



Goniophotometer Test Results:

Test Condition:

Test Ambient	Test Humidity	Orientation	Stabilization Time	Test Time
24.6	45	Face Down	90	25

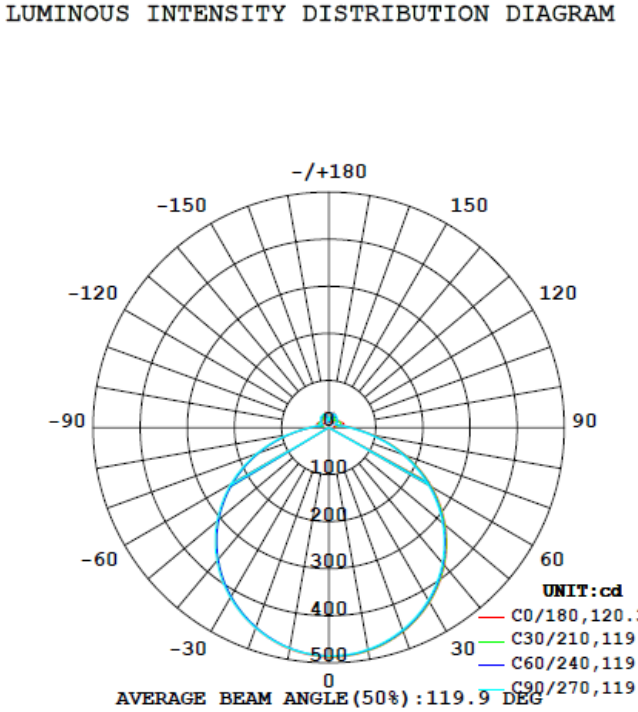
Electrical Data:

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.0	60	0.2220	24.75	0.9291

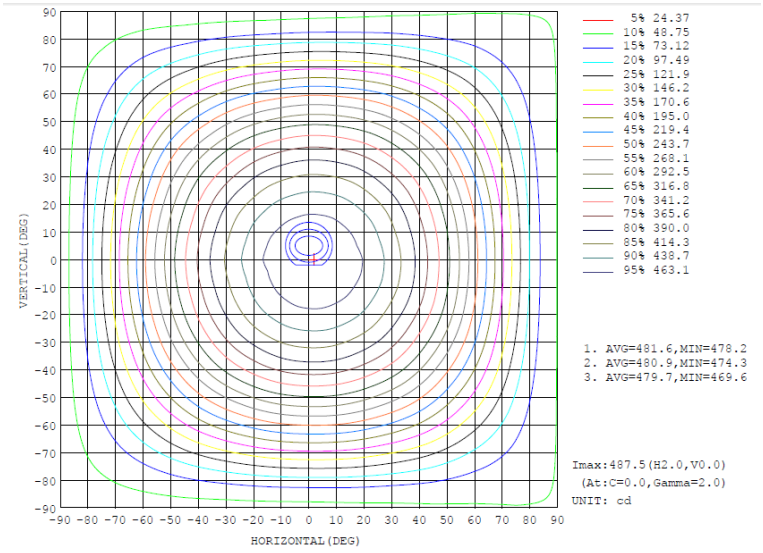
Goniophotometer Data:

Parameter	Result
Total Luminous (lm)	1700.5
Total Luminous per foot (lm/ft)	N/A
Luminous Efficacy (lm/w)	68.69
Zonal Lumens Distribution (0-90°)	91.2%
Beam Angle (°)	119.9
Center Beam Candle Power (cd)	487

Luminous Intensity Distribution Diagram:



Isocandela Diagram:



Zonal Flux Diagram:

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum,lamp
10	481.8	480.4	478.2	475.9	477.7	475.4	476.3	477.4	0- 10	45.94	45.94	2.7,2.7
20	461.5	460.4	457.2	453.5	453.4	450.7	453.2	456.5	10- 20	132.2	178.2	10.5,10.5
30	428.4	426.9	422.6	418.0	416.9	413.2	417.6	422.9	20- 30	202.7	380.9	22.4,22.4
40	382.0	380.1	374.9	370.2	368.2	363.8	369.5	376.4	30- 40	249.2	630.1	37.1,37.1
50	322.8	320.5	314.9	310.4	307.7	303.2	309.7	317.7	40- 50	265.7	895.8	52.7,52.7
60	252.5	250.1	244.2	240.5	237.5	233.1	240.1	248.4	50- 60	249.6	1145	67.4,67.4
70	174.0	171.6	166.5	163.1	160.2	156.8	163.1	171.3	60- 70	202.7	1348	79.3,79.3
80	96.46	94.80	90.74	88.32	85.75	83.59	88.29	94.40	70- 80	134.2	1482	87.2,87.2
90	48.05	46.00	42.28	40.71	38.82	37.44	40.85	46.27	80- 90	68.22	1551	91.2,91.2
100	11.06	24.12	24.15	21.18	13.77	19.03	21.48	23.63	90-100	33.50	1584	93.2,93.2
110	30.84	17.80	20.94	15.49	25.72	15.38	20.51	18.48	100-110	22.28	1606	94.5,94.5
120	27.07	23.46	16.81	21.31	23.45	21.30	16.60	24.26	110-120	20.25	1627	95.7,95.7
130	21.23	24.64	22.90	23.17	19.89	22.16	22.85	25.06	120-130	19.08	1646	96.8,96.8
140	21.00	24.39	27.82	23.13	21.35	21.99	27.41	24.62	130-140	17.50	1663	97.8,97.8
150	24.36	28.00	30.30	28.20	23.31	27.12	29.78	27.00	140-150	15.13	1678	98.7,98.7
160	33.55	26.25	32.19	28.32	23.87	26.62	30.85	26.71	150-160	12.84	1691	99.4,99.4
170	24.42	14.98	26.98	27.36	30.92	26.47	28.00	16.11	160-170	7.513	1699	99.9,99.9
180	22.72	20.10	16.69	16.76	22.77	20.08	16.70	16.76	170-180	1.854	1701	100,100
DEG	LUMINOUS INTENSITY:cd Less than 35% Percent = 15.9 %									UNIT:lm		

Luminous Distribution Intensity Data:

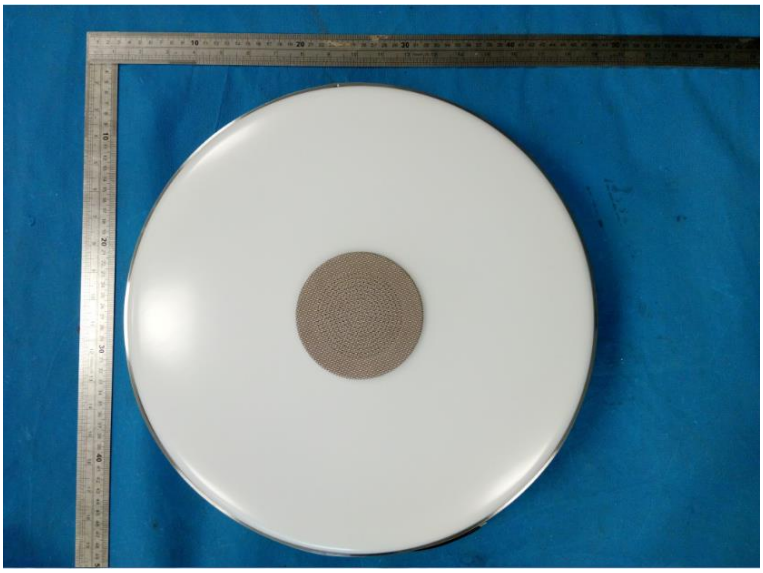
Table--1 UNIT: cd

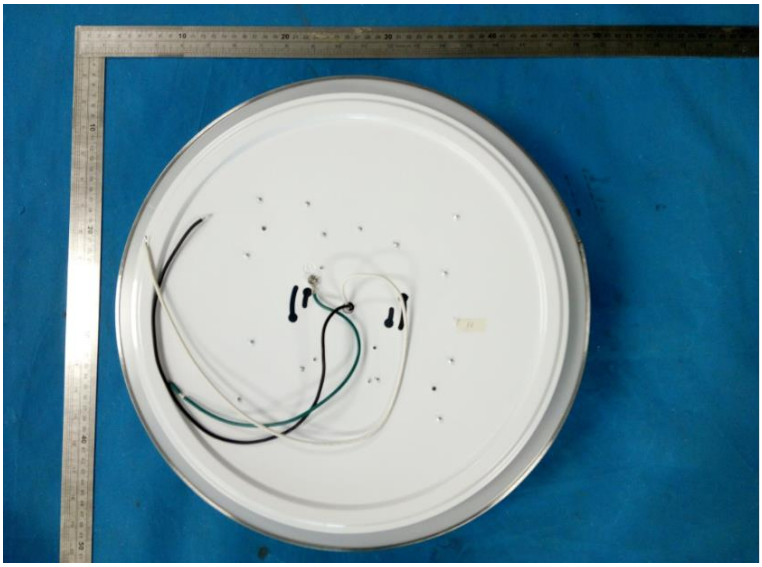
γ \ C (DEG) (DEG)	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270
0	487	486	486	486	485	485	485	485	484	484	484	484	487	486	486	486	485	485	485
5	486	486	485	485	484	484	483	483	482	482	481	481	484	483	483	482	482	482	482
10	482	481	481	480	480	479	478	478	477	476	475	474	478	476	476	475	476	476	476
15	473	473	472	472	471	471	469	469	467	466	465	464	467	466	466	465	465	465	466
20	462	462	460	460	459	458	457	456	455	453	452	451	453	451	451	451	451	452	453
25	447	447	446	445	444	443	442	441	439	437	435	434	437	434	434	434	435	435	437
30	428	429	427	427	425	424	423	422	420	418	416	415	417	414	414	413	414	415	418
35	407	407	405	405	403	402	400	399	397	396	393	392	394	391	391	390	391	392	395
40	382	383	380	380	378	377	375	374	372	370	368	366	368	365	365	364	365	366	370
45	354	355	352	352	349	348	346	345	343	342	339	338	339	336	336	335	336	338	341
50	323	324	321	321	318	317	315	314	312	310	308	306	308	304	305	303	305	306	310
55	289	290	287	287	284	283	281	280	278	276	274	273	274	270	271	269	271	272	276
60	252	254	250	250	247	247	244	244	241	240	238	237	238	234	235	233	235	236	240
65	214	215	212	211	209	207	206	205	203	202	200	198	199	196	196	196	197	199	202
70	174	175	172	172	169	168	166	166	164	163	161	159	160	157	158	157	159	160	163
75	134	135	132	132	130	129	127	127	125	124	122	121	122	119	120	119	121	122	125
80	96.5	97.3	94.3	94.8	92.9	92.0	90.7	90.1	89.1	88.3	86.6	85.4	85.7	83.2	84.2	83.6	84.9	86.0	88.3
85	66.1	66.7	64.9	64.6	62.7	62.1	60.7	60.4	59.2	59.0	57.5	56.8	56.7	54.7	55.6	54.9	56.1	56.7	58.8
90	48.1	48.1	46.6	46.0	44.3	43.4	42.3	41.8	41.0	40.7	39.7	39.0	38.8	37.6	37.7	37.4	38.3	39.1	40.9
95	30.9	30.8	32.1	35.5	35.1	34.4	33.6	33.1	31.6	29.7	26.9	26.2	25.8	24.9	25.2	27.1	29.1	30.5	32.1
100	11.1	14.8	16.4	24.1	23.4	24.3	24.1	23.4	23.2	21.2	16.3	9.10	13.8	8.46	11.9	19.0	20.7	20.6	21.5
105	33.3	27.7	24.6	18.6	20.0	20.9	20.6	20.8	18.8	16.6	20.7	23.1	27.0	22.3	20.5	15.6	17.0	19.7	20.1
110	30.8	25.9	27.5	17.8	18.1	20.2	20.9	19.6	15.9	15.5	24.0	21.9	25.7	21.2	23.2	15.4	16.2	18.1	20.5
115	28.8	24.3	26.8	20.8	15.8	16.7	18.2	15.3	14.6	18.8	23.7	20.9	24.5	20.3	22.5	18.5	14.6	13.2	15.1
120	27.1	23.0	25.4	23.5	19.5	17.4	16.8	16.7	18.4	21.3	22.6	20.0	23.5	19.7	22.0	21.3	17.9	16.3	16.6
125	22.7	20.7	24.6	24.1	22.5	20.6	20.3	20.4	21.4	22.6	22.3	17.3	18.8	17.3	21.9	21.6	21.0	19.6	20.0
130	21.2	20.0	21.4	24.6	24.3	23.5	22.9	23.3	23.3	23.2	19.6	17.8	19.9	19.5	19.4	22.2	22.1	22.2	22.8
135	21.7	18.5	22.1	25.4	25.3	25.2	24.9	24.8	24.6	23.3	21.2	16.9	20.8	17.5	20.6	22.8	23.4	23.7	24.6
140	21.0	18.6	21.1	24.4	26.8	27.9	27.8	27.4	26.4	23.1	21.1	17.8	21.4	17.9	20.6	22.0	25.4	26.2	27.4
145	14.0	15.7	21.3	26.7	26.5	29.3	29.7	29.1	27.0	26.3	20.6	20.1	20.9	20.8	21.8	25.2	26.2	28.0	29.2
150	24.4	21.7	25.2	28.0	28.8	30.4	30.3	30.0	29.9	28.2	22.3	20.5	23.3	20.6	23.4	27.1	27.9	29.1	29.8
155	30.2	24.0	25.0	27.8	31.7	29.4	30.1	31.5	31.5	29.0	25.5	22.2	27.2	22.1	25.6	28.9	29.2	30.6	29.7
160	33.6	27.5	26.9	26.2	24.4	23.9	32.2	33.0	31.8	28.3	28.8	24.0	23.9	25.4	27.9	26.6	30.7	31.9	30.9
165	28.5	25.2	22.9	23.2	23.3	19.9	29.8	29.8	30.2	30.0	27.4	25.9	29.0	24.7	26.9	29.8	30.1	29.6	28.9
170	24.4	23.0	18.2	15.0	13.3	23.0	27.0	27.0	27.4	27.4	25.6	27.2	30.9	27.7	26.5	26.5	26.0	27.8	28.0
175	17.5	16.9	15.5	13.0	14.5	16.1	18.0	20.4	19.7	18.7	19.3	19.3	21.7	18.0	18.8	18.2	19.3	19.5	18.4
180	22.7	23.0	19.9	20.1	19.8	18.3	16.7	17.5	17.1	16.8	18.2	22.6	22.8	23.0	20.0	20.1	19.8	18.3	16.7

Table--2 UNIT: cd

γ \ C (DEG) (DEG)	285	300	315	330	345
0	485	484	484	484	484
5	482	483	482	483	483
10	477	477	477	478	478
15	467	468	469	470	470
20	454	456	456	458	458
25	438	440	441	443	443
30	419	422	423	425	425
35	397	400	401	404	404
40	371	375	376	379	379
45	343	347	349	351	352
50	312	316	318	321	321
55	278	282	284	287	288
60	242	247	248	252	252
65	205	209	211	213	214
70	166	169	171	174	174
75	127	130	132	134	134
80	90.4	93.3	94.4	96.9	96.7
85	60.4	63.1	64.5	66.5	66.4
90	42.5	44.7	46.3	47.8	48.1
95	33.5	34.6	33.2	31.3	31.0
100	22.3	24.0	23.6	15.4	22.3
105	21.1	20.1	19.1	25.4	27.7
110	19.3	17.5	18.5	28.3	25.8
115	14.2	16.4	22.0	27.1	24.3
120	17.6	20.1	24.3	25.9	23.0
125	21.1	23.4	24.6	25.0	20.1
130	23.6	23.1	25.1	21.5	20.3
135	25.1	23.6	25.4	22.3	18.5
140	27.8	25.4	24.6	21.4	18.3
145	29.1	25.0	26.1	21.6	14.6
150	30.2	29.3	27.0	25.5	23.0
155	29.7	30.4	29.5	25.8	26.7
160	24.0	25.3	26.7	29.6	27.7
165	19.4	21.1	24.4	23.9	25.6
170	22.0	13.9	16.1	18.4	22.4
175	17.1	15.5	13.5	15.2	16.3
180	17.5	17.2	16.8	18.2	22.6

Photo of Sample:





Equipment List:

Equipment ID	Equipment Name	Last Cal.	Due Cal.
NTC-F01-001	Goniophotometer System	2016-12-03	2017-12-02
NTC-F01-006	2.0 meter Integrating Sphere	2016-12-03	2017-12-02
NTC-F01-013	Standard Lamp	2016-12-27	2017-12-26
NTC-F01-031	Digital Power Meter	2016-12-05	2017-12-04
NTC-F01-019	Temperature & Humidity Meter	2016-11-28	2017-11-27

*******END OF DATASHEET*******