


<p>TEST REPORT IES LM-79-08</p> <p>TÜV SÜD Test Report for Beyond LED Technology</p>	
Report reference No.	: 68.184.22.0286.01
Date of issue	: 2022-05-01
Project handler	: Sky Feng
Testing laboratory	: TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Client	: Beyond LED Technology
Standard.....	: This TÜV SÜD test program is based on the following requirements: IES LM-79-08
TRF originated by.	: TÜV SÜD Product Service GmbH, Mr. Kenneth Lau
Copyright blank test report	: This test report is based on the content of the standard (see above). The test report considered selected clauses of the a.m. standard(s) and experience gained with product testing. It was prepared by TÜV SÜD Product Service GmbH. TUV SUD Group takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.
Test procedure	: <input type="checkbox"/> TÜV Mark <input checked="" type="checkbox"/> without certification
Non-standard test method	: N/A
National deviations.....	: N/A
Number of pages (Report)	: 22
Number of pages (Attachments)	: 1
Compiled by : Sky Feng (+ signature)	Approved by.....: Jake Xu (+ signature)



Test sample.....	LED Wall Pack		
Type of test object	Outdoor Full-Cutoff Wall-Mounted Area Luminaires		
Trade mark	 zopoise		
Model and/or type reference.....	ZPS-MB422-100W.V1-T1-E9-P3 ("P" can be Blank or P3. Blank means without photocontrol switch; P3 means with photocontrol switch.)		
Rating(s)	120-277VAC; 50/60Hz; 100W		
Manufacturer	Same as applicant		
Sub-contractors/ tests (clause).....	N/A		
Name	N/A		
Order description	<input checked="" type="checkbox"/>	Complete test according to TRF	
	<input type="checkbox"/>	Partial test according to manufacturer's specifications	
	<input type="checkbox"/>	Preliminary test	
	<input type="checkbox"/>	Spot check	
	<input type="checkbox"/>	Other:	
Date of order	2022-04-20		
Date of receipt of test item.....	2022-04-20		
Date(s) of performance of test.....	2022-04-20 to 2022-05-01		
Test item particulars (declared):			
Lamp type :	<input type="checkbox"/> Bare lamp <input type="checkbox"/> Covered lamp, no reflector <input type="checkbox"/> Lamp with reflector <input checked="" type="checkbox"/> other: LED Wall Pack		
Lamp cap installed:	--		
Rated Voltage:	120-277VAC; 50/60Hz		
Rated Power:	100W		
Rated Power Factor:	> 0.9		
Rated Luminous Flux:	--		
Rated CCT:	3000K, 4000K, 5000K		
Rated CRI:	> 70		
Attachments:			
1. Test Equipment List			

General remarks:

"(See remark #)" refers to a remark appended to the report.
 "(See appended table)" refers to a table appended to the report.
 Throughout this report a point is used as the decimal separator.
 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 testing laboratory.
 Measurement uncertainty budgets have been determined for applicable test methods and are available upon request.

Measurement Uncertainty Budget (k=2)

Voltage	$U_{rel}=0.29\%, K=2$
Current	$U_{rel}=0.36\%, K=2$
Power	$U_{rel}=0.69\%, K=2$
Total Luminous Flux by integrated sphere	$U_{rel}=4.2\%, K=2$
Total Luminous Flux by goniophotometer	$U_{rel}=2.2\%, K=2$

Product information:

The product is White-Tunable product. The adjustable CCT is 3000K, 4000K and 5000K.
 Unless otherwise specified, 1pc **ZPS-MB422-100W.V1-T1-E9-P3** with all CCT were chosen to perform all tests.

TUV SUD Cert & Testing (China) Co., Ltd. Shenzhen Branch is an accredited Test Laboratory (NVLAP Lab Code: 500067-0) to IESNA LM-79-08 by NVLAP (National Voluntary Laboratory Accreditation Program).



The report must not be used by the client to claim product certification, approval or endorsement by NVLAP, NIST or any agency of the federal government.

Summary of testing:

Model:	ZPS-MB422-100W.V1-T1-E9-P3		
CCT	3000K	4000K	5000K
Luminous Efficacy (Lumens/Watt)	108.2	128.0	113.7
Luminous Flux (Lumens)	10892	12052	11558
Input Voltage (Volt)	120	120	120
Input Power (Watts)	100.70	94.11	101.64
Power Factor	0.9931	0.9922	0.9932
A-THD	9.31%	9.23%	9.25%
CCT (K)	2992	3740	4802
SDCM (ANSI C78.377-2017)	<7	<7	<7
CRI	70.0	71.8	70.4
R9	-42	-35	-39
Rf	73	74	72
Rg	94	94	94
Rcs, h1	-17%	-17%	-18%
BUG Ratings	B3-U0-G3	B3-U0-G3	B3-U0-G3
Zonal flux (0-90°)	100%	100%	100%
Zonal flux (80-90°)	0.9%	0.9%	0.8%
Stabilisation Time (Light Power) (mins)	90	90	90

Model	CCT	Test Voltage(V)	Test Current(A)	Power(W)	PF	A-THD
ZPS-MB422-100W.V1-T1-E9-P3	3000K	277	0.3827	100.6	0.9480	9.50%
	4000K	277	0.3625	93.84	0.9364	9.48%
	5000K	277	0.3830	100.4	0.9470	9.62%

LED specification:

Model	Manufactory	Vf (V)	If (mA)	Viewing angle (°)	CCT (K)	Ra
01. JT.12L3030M7 0N22	SHENZHEN JUFEI OPTOELECTRONICS CO., LTD	3.0-3.4	300	120	3000K 4000K 5000K	>70

Picture of the product



1. Overview



2. Overview

Copy of marking plate: --
Characteristic data --
Purpose of the product LED Wall Pack for general lighting purpose.
Possible test case verdicts: - test case does not apply to the test object:: N/A - test object does meet the requirement.....: P(ass) - test object does not meet the requirement:: F(ail) Possible suffixes to the verdicts: - suffix for detailed information for the client.....:- C(comment) - suffix for important information for factory inspection...: - M(manufacturing)

IES LM-79-08			
Clause	Requirement – Test	Measuring result – Remark	Verdict
1.0	Introduction		--
2.0	Ambient Conditions		P
2.1	General		P
2.2	Air Temperature		P
2.3	Thermal Condition for Mounting SSL Products		P
2.4	Air Movement		P
3.0	Power Supply Characteristics		P
3.1	Wave shape of AC power supply		P
3.2	Voltage regulation		P
4.0	Seasoning of SSL Product	No seasoning of SSL product	N/A
5.0	Stabilization of SSL Product		P
	SSL product has sufficiently stabilized before measurement		P
6.0	Operation Orientation		P
	SSL product shall be stabilized and measured in intended operating orientation	As normal working	P
7.0	Electrical Settings		P
	SSL product shall be operated at rated voltage		P
	SSL product with dimming capability are tested at maximum input power condition		N/A
	SSL product with different modes are measured in all relevant modes		N/A
8.0	Electrical Instrumentations		P
8.1	Circuits		P
8.2	Uncertainties		P
9.0	Test methods for Luminous Flux measurement		P
9.1	Integrating sphere with a spectroradiometer (Sphere-spectroradiometer system)		P
9.2	Integrating sphere with a photometer head (Sphere-photometer system)		N/A
9.3	Goniophotometer		P
10.0	Luminous Intensity Distribution		P
	Reporting acc, to IEC LM-63		P
11.0	Luminous Efficacy		P
	Calculation	See table 1	P
12.0	Test Methods for Colour Characteristics of SSL Products		P
	Measurements	See table 1	P
13.0	Uncertainty statement		N/A
14.0	Test report		--

Table 1	Test data		
Model:	ZPS-MB422-100W.V1-T1-E9-P3 (CCT 3000K)		
Rated Voltage (V):	120-277VAC	Rated Power (W):	100
Rated luminous flux (lm):	--	Ambient temperature 25 ±1 (°C):	25.1
Test item	Measured Value		
	Integrating Sphere		Goniophotometer
Key Photometric Results			
Luminous Efficacy (Lumens/Watt)	--		108.2
Total Luminous Flux (Lumens)	--		10892
Correlated Color Temperature (CCT: K)	2992		--
Color Rendering Index (CRI)	70.0		--
Chromaticity (Chroma x / Chroma y)	0.4402 / 0.4098		--
Chromaticity (Chroma u / Chroma v)	0.2502 / 0.3494		--
Chromaticity (Chroma u' / Chroma v')	0.2502 / 0.5241		--
Duv Value	0.0018		--
Colour Angular Uniformity (Max,du'v')	--		--
Stabilization Time (Light and Power)	90		90
Total Run Time – (Minutes)	100		100
Zonal flux (0-90°)	--		100%
Zonal flux (80-90°)	--		0.9%
Spacing Criteria (C/γ)	--		C:22.5° / γ:1.0°
Electrical Input Results			
Input Power (Watts)	--		100.70
Input Voltage (Volts AC)	--		120
Input Current (Amps)	--		0.8481
Input Frequency (Hertz)	--		60
Power Factor	--		0.9931
A-THD (Current – Total Harmonic Distortion)	--		9.31%
Additional Information			
Ambient Temperature (°C):	25.1		25.1
ISTMT (In-Situ Temperature Measurement) (°C):	--		
Photometric measurement condition	--		--
Supplementary Information:			
<ul style="list-style-type: none"> - Absorbion Correction used: Yes - Stabilization was considered reached by: the variation (maximum-minimum) of at least 3 readings of the light output and electrical power over a period of 30 minutes is less than 0.5%. 			

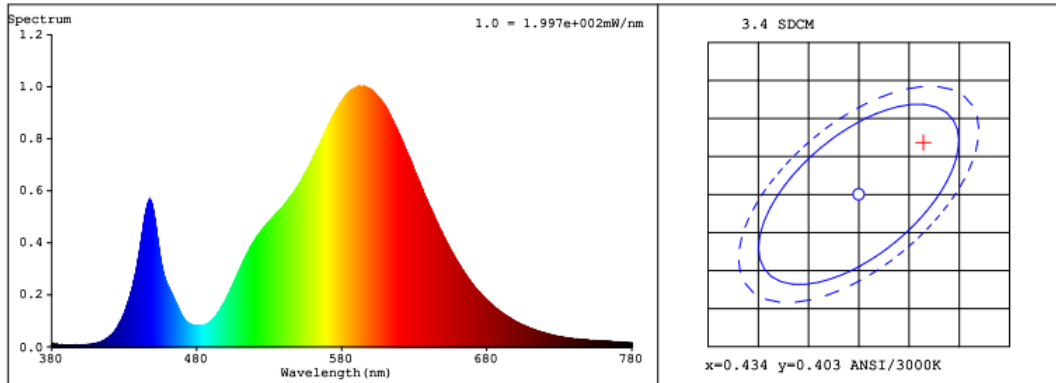
Table 2	Test data		
Model:	ZPS-MB422-100W.V1-T1-E9-P3 (CCT 4000K)		
Rated Voltage (V):	120-277VAC	Rated Power (W):	100
Rated luminous flux (lm):	--	Ambient temperature 25 ±1 (°C):	25.1
Test item	Measured Value		
	Integrating Sphere		Goniophotometer
Key Photometric Results			
Luminous Efficacy (Lumens/Watt)	--		128.0
Total Luminous Flux (Lumens)	--		12052
Correlated Color Temperature (CCT: K)	3740		--
Color Rendering Index (CRI)	71.8		--
Chromaticity (Chroma x / Chroma y)	0.3940 / 0.3883		--
Chromaticity (Chroma u / Chroma v)	0.2294 / 0.3390		--
Chromaticity (Chroma u' / Chroma v')	0.2294 / 0.5086		--
Duv Value	0.0015		--
Colour Angular Uniformity (Max,du'v')	--		--
Stabilization Time (Light and Power)	90		90
Total Run Time – (Minutes)	100		100
Zonal flux (0-90°)	--		100%
Zonal flux (80-90°)	--		0.9%
Spacing Criteria (C/γ)	--		C:22.5° / γ:1.0°
Electrical Input Results			
Input Power (Watts)	--		94.11
Input Voltage (Volts AC)	--		120
Input Current (Amps)	--		0.7936
Input Frequency (Hertz)	--		60
Power Factor	--		0.9922
A-THD (Current – Total Harmonic Distortion)	--		9.23%
Additional Information			
Ambient Temperature (°C):	25.1		25.1
ISTMT (In-Situ Temperature Measurement) (°C):	--		
Photometric measurement condition	--		--
Supplementary Information:			
<ul style="list-style-type: none"> - Absorbion Correction used: Yes - Stabilization was considered reached by: the variation (maximum-minimum) of at least 3 readings of the light output and electrical power over a period of 30 minutes is less than 0.5%. 			

Table 3		Test data	
Model:	ZPS-MB422-100W.V1-T1-E9-P3 (CCT 5000K)		
Rated Voltage (V):	120-277VAC	Rated Power (W):	100
Rated luminous flux (lm):	--	Ambient temperature 25 ±1 (°C):	25.1
Test item	Measured Value		
	Integrating Sphere		Goniophotometer
Key Photometric Results			
Luminous Efficacy (Lumens/Watt)	--	113.7	
Total Luminous Flux (Lumens)	--	11558	
Correlated Color Temperature (CCT: K)	4802	--	
Color Rendering Index (CRI)	70.4	--	
Chromaticity (Chroma x / Chroma y)	0.3522 / 0.3665	--	
Chromaticity (Chroma u / Chroma v)	0.2104 / 0.3285	--	
Chromaticity (Chroma u' / Chroma v')	0.2104 / 0.4928	--	
Duv Value	0.0045	--	
Colour Angular Uniformity (Max,du'v')	--	--	
Stabilization Time (Light and Power)	90	90	
Total Run Time – (Minutes)	100	100	
Zonal flux (0-90°)	--	100%	
Zonal flux (80-90°)	--	0.8%	
Spacing Criteria (C/γ)	--	C:22.5° / γ:1.0°	
Electrical Input Results			
Input Power (Watts)	--	101.64	
Input Voltage (Volts AC)	--	120	
Input Current (Amps)	--	0.8564	
Input Frequency (Hertz)	--	60	
Power Factor	--	0.9932	
A-THD (Current – Total Harmonic Distortion)	--	9.25%	
Additional Information			
Ambient Temperature (°C):	25.1	25.1	
ISTMT (In-Situ Temperature Measurement) (°C):	--		
Photometric measurement condition	--	--	
Supplementary Information:			
<ul style="list-style-type: none"> - Absorbion Correction used: Yes - Stabilization was considered reached by: the variation (maximum-minimum) of at least 3 readings of the light output and electrical power over a period of 30 minutes is less than 0.5%. 			

Table 4	Spectral Flux Graph
Model:	ZPS-MB422-100W.V1-T1-E9-P3 (CCT 3000K)

The following graph shows the spectral response curve of the radiant flux for the sample:

Spectrum



Colorimetric Parameters

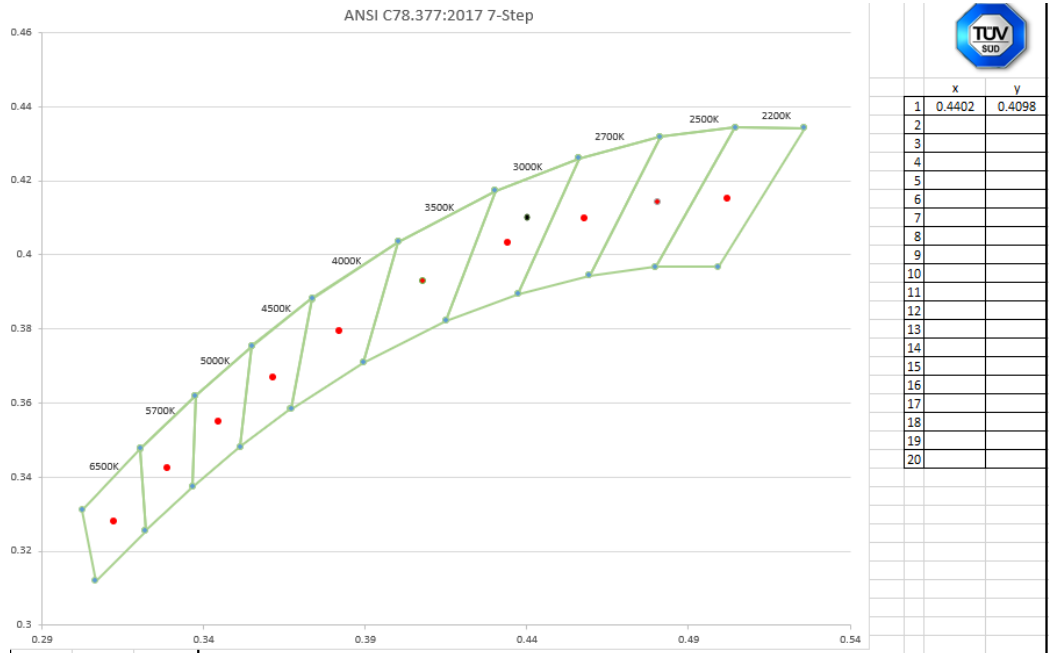
Chromaticity Coordinate: $x = 0.4402$ $y = 0.4098$ / $u' = 0.2502$ $v' = 0.5241$ ($duv=1.82e-03$)
 CCT= 2992K Prcp WL: Ld=582.2nm Purity=55.2%
 Peak WL: Lp=592nm FWHM: =110.1nm Ratio:R=20.9% G=77.6% B=1.5%

Render Index: Ra = 70.0

R1 =66 R2 =80 R3 =93 R4 =66 R5 =65 R6 =72 R7 =77
 R8 =40 R9 =0 R10=55 R11=61 R12=45 R13=68 R14=96 R15=57
 LEVEL:OUT WHITE:ANSI_3000K

Spectral response of the Radiant Flux

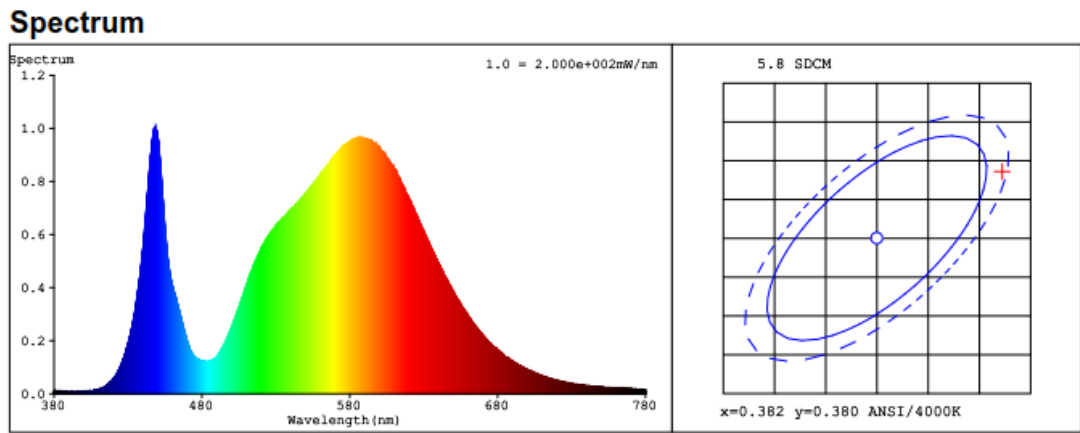
(380nm to 780nm – calibrated range of the Spectroradiometer)



7-step quadrangle

Table 5	Spectral Flux Graph
Model:	ZPS-MB422-100W.V1-T1-E9-P3 (CCT 4000K)

The following graph shows the spectral response curve of the radiant flux for the sample:



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.3940$ $y = 0.3883$ / $u' = 0.2294$ $v' = 0.5086$ ($duv=1.59e-03$)
 CCT= 3740K Prcp WL: Ld=579.3nm Purity=34.8%
 Peak WL: Lp=449nm FWHM: =17.9nm Ratio:R=17.6% G=80.2% B=2.2%

Render Index: Ra = 71.8

R1 =68 R2 =79 R3 =88 R4 =70 R5 =68 R6 =71 R7 =80
 R8 =49 R9 =0 R10=51 R11=66 R12=43 R13=70 R14=93 R15=61

LEVEL:OUT WHITE:ANSI_4000K

Spectral response of the Radiant Flux
 (380nm to 780nm – calibrated range of the Spectroradiometer)

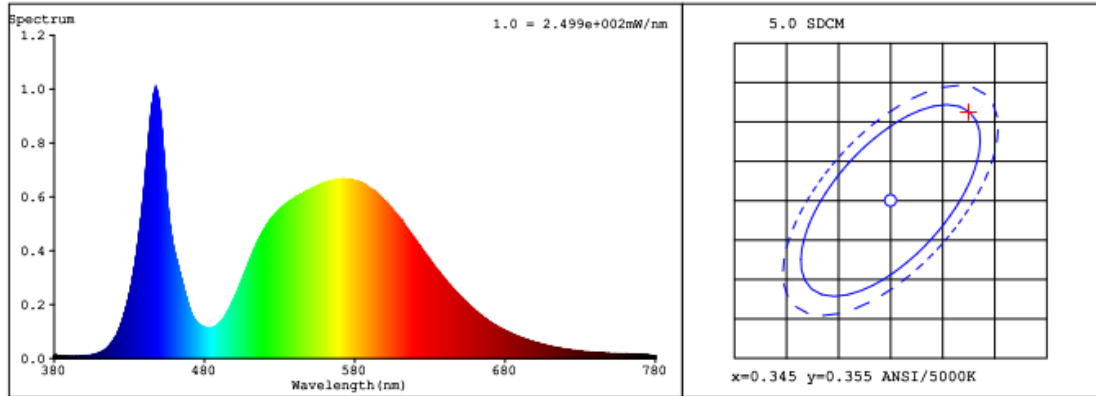


7-step quadrangle

Table 6	Spectral Flux Graph
Model:	ZPS-MB422-100W.V1-T1-E9-P3 (CCT 5000K)

The following graph shows the spectral response curve of the radiant flux for the sample:

Spectrum



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.3522$ $y = 0.3665$ / $u' = 0.2104$ $v' = 0.4928$ ($duv=4.59e-03$)

CCT= 4802K Prcp WL: Ld=571.4nm Purity=15.7%

Peak WL: Lp=448nm FWHM: =19.5nm Ratio:R=14.2% G=82.9% B=2.8%

Render Index: Ra = 70.4

R1 =67 R2 =76 R3 =82 R4 =70 R5 =67 R6 =66 R7 =81

R8 =53 R9 =0 R10=42 R11=66 R12=38 R13=68 R14=90 R15=60

LEVEL:OUT WHITE:ANSI_5000K

Spectral response of the Radiant Flux
(380nm to 780nm – calibrated range of the Spectroradiometer)



7-step quadrangle

Table 7	ANSI/IES TM-30-18 Full Report
Model:	ZPS-MB422-100W.V1-T1-E9-P3 (CCT 3000K)

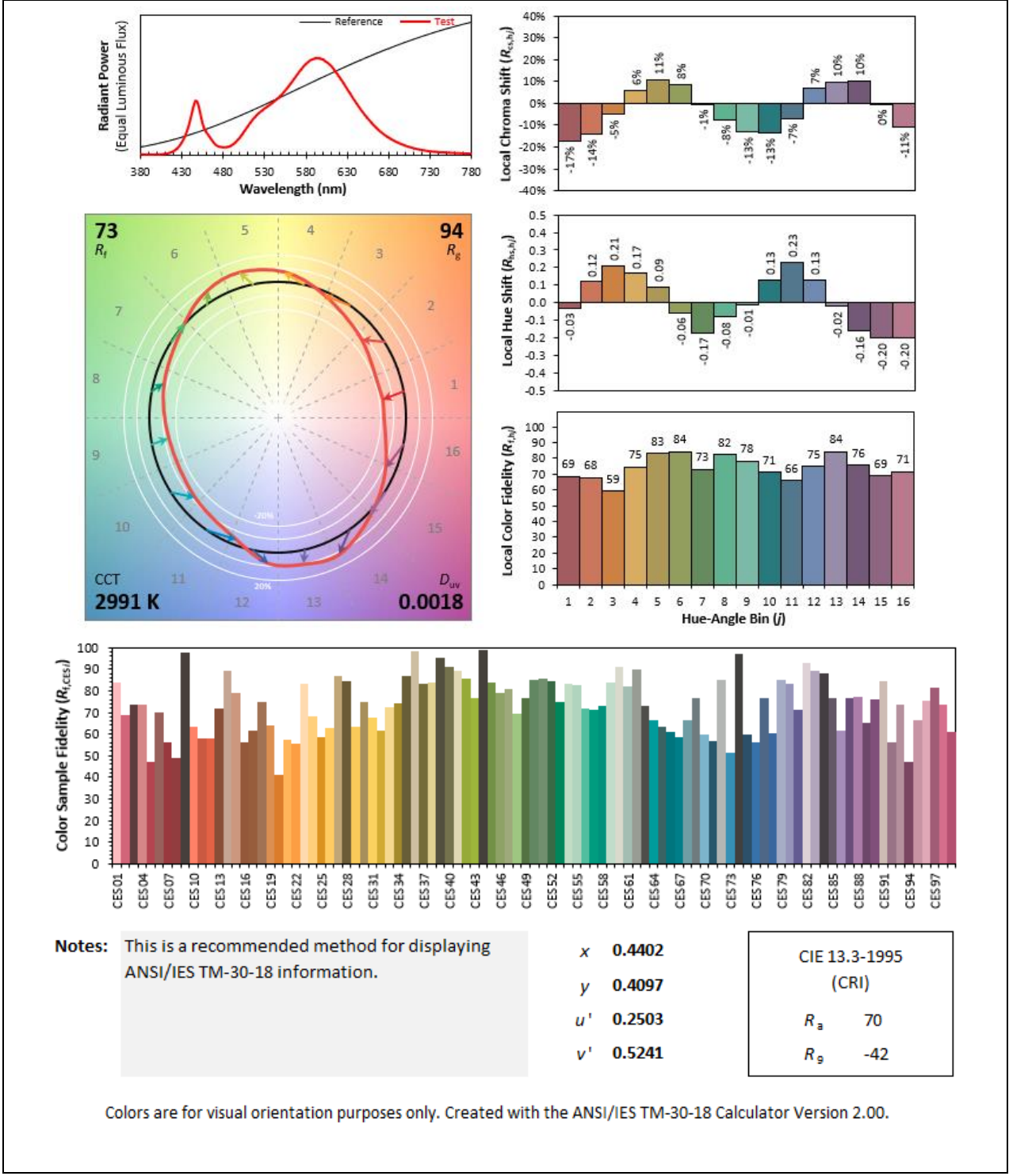


Table 8	ANSI/IES TM-30-18 Full Report
Model:	ZPS-MB422-100W.V1-T1-E9-P3 (CCT 4000K)

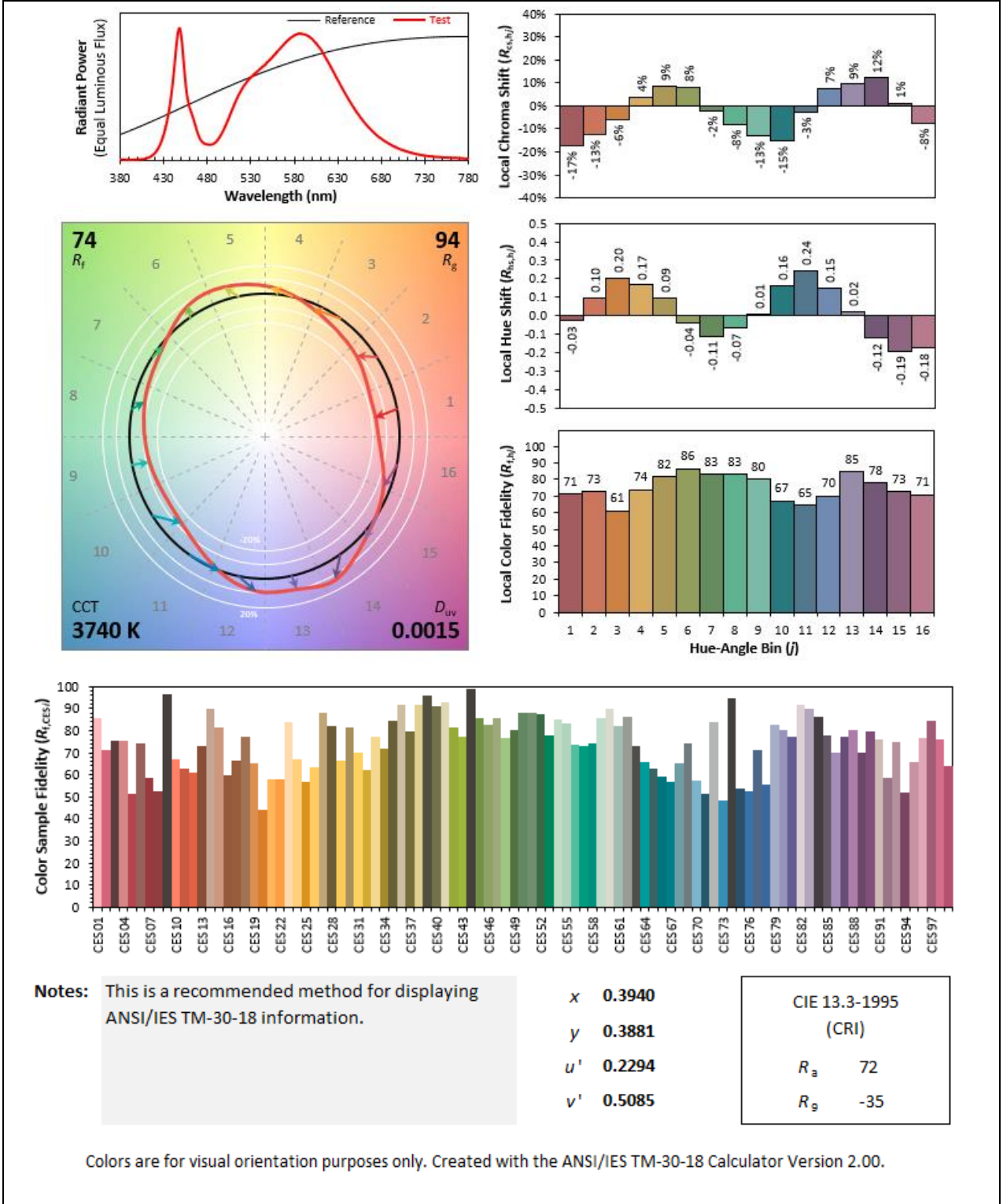


Table 9	ANSI/IES TM-30-18 Full Report
Model:	ZPS-MB422-100W.V1-T1-E9-P3 (CCT 5000K)

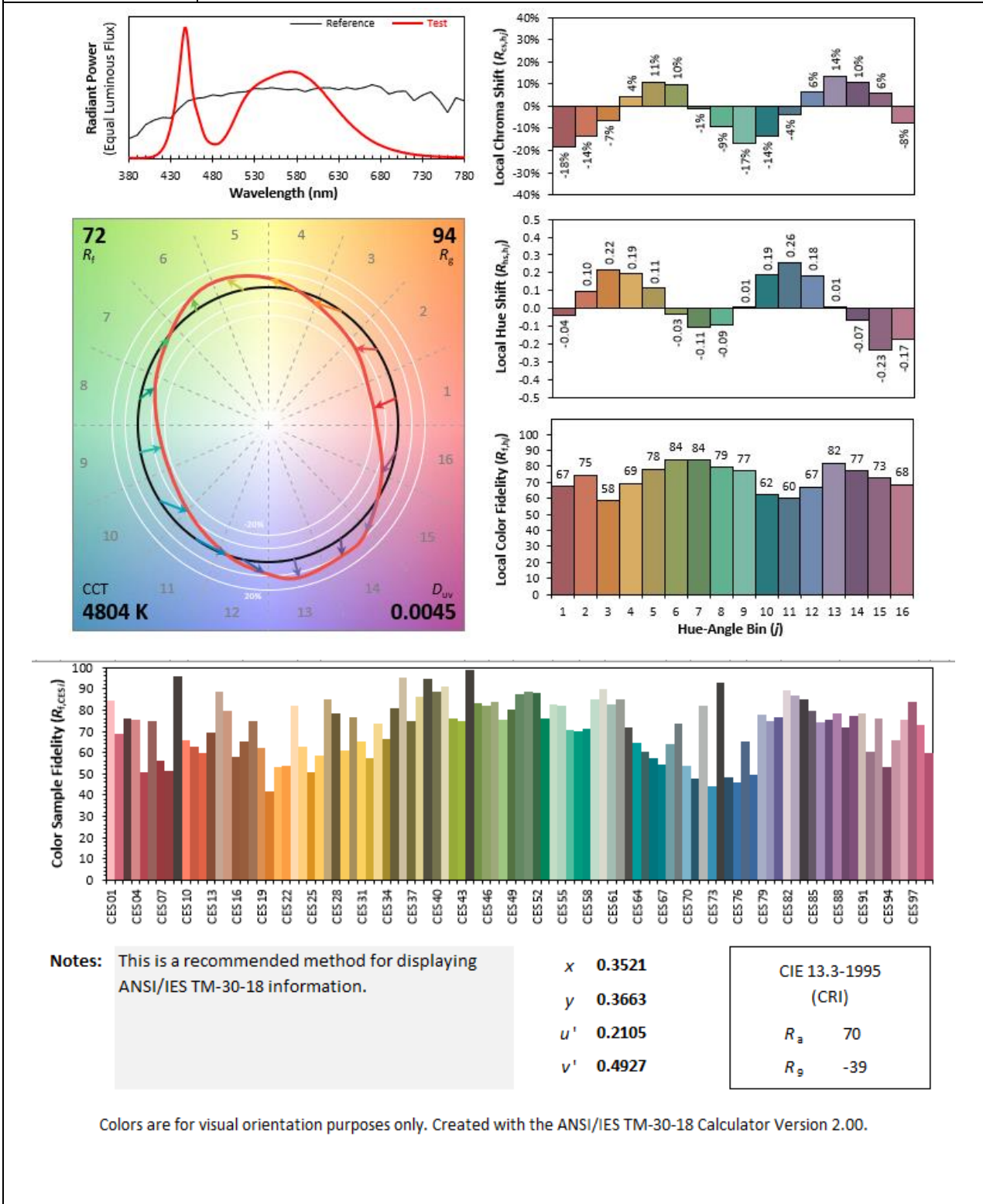
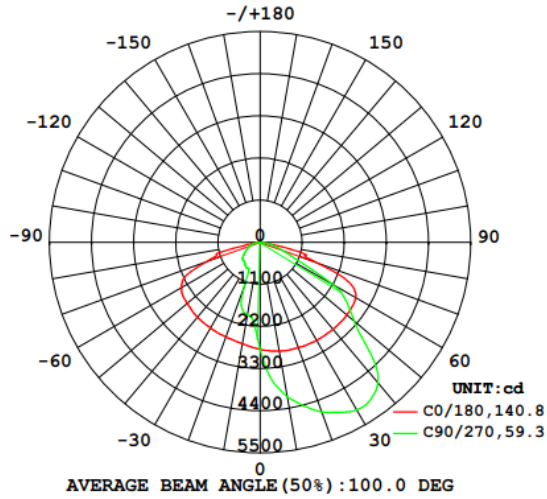


Table 10	Luminous Intensity distribution diagram
Model:	ZPS-MB422-100W.V1-T1-E9-P3 (CCT 3000K)

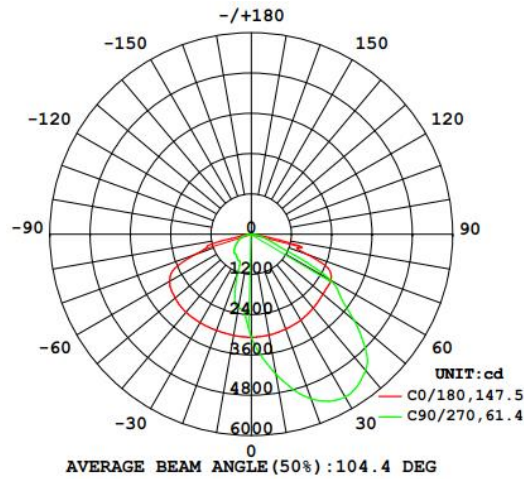
Luminous Intensity distribution diagram (Unit: cd)



γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	ηlum,lamp
10	2886	3842	4092	3823	2692	1965	1923	1991	0- 10	272.0	272.0	2.5,2.5
20	2929	4354	4715	4446	2634	1808	1186	1863	10- 20	845.7	1118	10.3,10.3
30	2955	4658	5052	5027	2591	872.6	753.6	1195	20- 30	1359	2477	22.7,22.7
40	2962	4749	4785	5268	2552	788.1	658.6	757.4	30- 40	1834	4311	39.6,39.6
50	2957	4261	3213	4974	2488	673.0	591.0	703.4	40- 50	2104	6414	58.9,58.9
60	2885	2896	2160	3555	2375	495.1	427.3	553.7	50- 60	2040	8454	77.6,77.6
70	1628	1848	632.3	3029	1505	318.8	287.0	383.6	60- 70	1622	10076	92.5,92.5
80	222.4	224.5	154.6	222.1	250.0	117.6	102.5	192.9	70- 80	722.7	10799	99.1,99.1
90	0	0	0	0	0	0	0	0	80- 90	92.59	10892	100,100
100	0	0	0	0	0	0	0	0	90-100	0	10892	100,100
110	0	0	0	0	0	0	0	0	100-110	0	10892	100,100
120	0	0	0	0	0	0	0	0	110-120	0	10892	100,100
130	0	0	0	0	0	0	0	0	120-130	0	10892	100,100
140	0	0	0	0	0	0	0	0	130-140	0	10892	100,100
150	0	0	0	0	0	0	0	0	140-150	0	10892	100,100
160	0	0	0	0	0	0	0	0	150-160	0	10892	100,100
170	0	0	0	0	0	0	0	0	160-170	0	10892	100,100
180	0	0	0	0	0	0	0	0	170-180	0	10892	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

Table 11	Luminous Intensity distribution diagram
Model:	ZPS-MB422-100W.V1-T1-E9-P3 (CCT 4000K)

Luminous Intensity distribution diagram (Unit: cd)

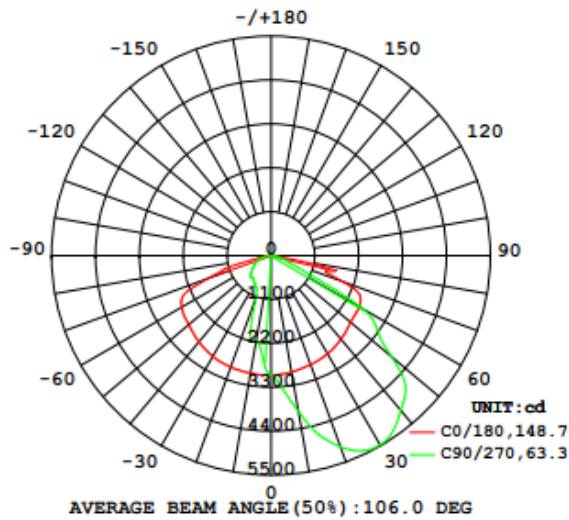


γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum, lamp
10	3053	3871	4231	3899	3061	2267	2220	2265	0- 10	291.5	291.5	2.42, 2.42
20	3007	4598	5214	4736	3050	1946	1144	1967	10- 20	903.7	1195	9.92, 9.92
30	2957	5110	5592	5485	3046	1045	843.7	1081	20- 30	1470	2665	22.1, 22.1
40	2873	5295	5295	5778	3036	882.7	762.5	852.8	30- 40	1988	4653	38.6, 38.6
50	2786	5080	4012	5591	2962	765.6	654.7	754.6	40- 50	2322	6975	57.9, 57.9
60	2737	3774	2703	4347	2813	579.4	486.1	607.1	50- 60	2289	9264	76.9, 76.9
70	1788	3009	602.5	3280	1805	358.7	322.1	434.2	60- 70	1841	11106	92.1, 92.1
80	254.1	254.6	132.3	255.2	309.0	135.7	115.0	213.0	70- 80	837.4	11943	99.1, 99.1
90	0	0	0	0	0	0	0	0	80- 90	108.8	12052	100, 100
100	0	0	0	0	0	0	0	0	90-100	0	12052	100, 100
110	0	0	0	0	0	0	0	0	100-110	0	12052	100, 100
120	0	0	0	0	0	0	0	0	110-120	0	12052	100, 100
130	0	0	0	0	0	0	0	0	120-130	0	12052	100, 100
140	0	0	0	0	0	0	0	0	130-140	0	12052	100, 100
150	0	0	0	0	0	0	0	0	140-150	0	12052	100, 100
160	0	0	0	0	0	0	0	0	150-160	0	12052	100, 100
170	0	0	0	0	0	0	0	0	160-170	0	12052	100, 100
180	0	0	0	0	0	0	0	0	170-180	0	12052	100, 100
DEG	LUMINOUS INTENSITY:cd								UNIT:lm			

Table 12	Luminous Intensity distribution diagram
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Model:	ZPS-MB422-100W.V1-T1-E9-P3 (CCT 5000K)
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Luminous Intensity distribution diagram (Unit: cd)



γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	Φ lum, lamp
10	2960	3588	3965	3551	2992	2283	2208	2295	0- 10	283.2	283.2	2.45, 2.45
20	2903	4458	5098	4460	2972	1979	1107	2063	10- 20	875.5	1159	10, 10
30	2840	4994	5476	5214	2918	1019	824.1	1119	20- 30	1424	2583	22.3, 22.3
40	2731	5228	5062	5666	2820	834.4	729.1	824.3	30- 40	1909	4491	38.9, 38.9
50	2607	4952	3949	5623	2694	721.4	655.3	719.7	40- 50	2230	6721	58.2, 58.2
60	2559	3588	2658	4554	2584	561.5	491.8	593.2	50- 60	2211	8932	77.3, 77.3
70	1910	3170	454.8	3708	1706	351.8	339.6	440.1	60- 70	1766	10698	92.6, 92.6
80	580.1	200.8	79.65	208.1	218.7	128.3	121.7	214.0	70- 80	765.8	11464	99.2, 99.2
90	0	0	0	0	0	0	0	0	80- 90	93.73	11558	100, 100
100	0	0	0	0	0	0	0	0	90-100	0	11558	100, 100
110	0	0	0	0	0	0	0	0	100-110	0	11558	100, 100
120	0	0	0	0	0	0	0	0	110-120	0	11558	100, 100
130	0	0	0	0	0	0	0	0	120-130	0	11558	100, 100
140	0	0	0	0	0	0	0	0	130-140	0	11558	100, 100
150	0	0	0	0	0	0	0	0	140-150	0	11558	100, 100
160	0	0	0	0	0	0	0	0	150-160	0	11558	100, 100
170	0	0	0	0	0	0	0	0	160-170	0	11558	100, 100
180	0	0	0	0	0	0	0	0	170-180	0	11558	100, 100
DEG	LUMINOUS INTENSITY: cd									UNIT: lm		

Table 13	BUG		
Model:	ZPS-MB422-100W.V1-T1-E9-P3 (CCT 3000K)		
IES "BUG" RATING (BACK LIGHT, UPLIGHT, GLARE) PER IES TM-15-11			
IESNA Luminaire Flux Distribution Table:			
Zone	Lumens	Luminaire %	
FL - Front-Low(0-30)	1406.4	12.9	
FM - Front-Medium(30-60)	3308.4	30.4	
FH - Front-High(60-80)	1228.7	11.3	
FVH - Front-Very High(80-90)	54.034	0.5	
Total Forward Light	5997.5	55.1	
BL - Back-Low(0-30)	1070.1	9.8	
BM - Back-Medium(30-60)	2669.1	24.5	
BH - Back-High(60-80)	1116.3	10.2	
BVH - Back-Very High(80-90)	38.553	0.4	
Total Back Light	4894.2	44.9	
UL - Uplight-Low(90-100)	0	0.0	
UH - Uplight-High(100-180)	0	0.0	
Total Up Light	0	0.0	
BUG(Back,Up,Glare) Rating	B3-U0-G3		
Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	4894.2	0	4894.2
Street Side	5997.5	0	5997.5

Table 14	BUG		
Model:	ZPS-MB422-100W.V1-T1-E9-P3 (CCT 4000K)		
IES "BUG" RATING (BACK LIGHT, UPLIGHT, GLARE) PER IES TM-15-11			
IESNA Luminaire Flux Distribution Table:			
Zone	Lumens	Luminaire %	
FL - Front-Low (0-30)	1492.5	12.4	
FM - Front-Medium (30-60)	3592.1	29.8	
FH - Front-High (60-80)	1419	11.8	
FVH - Front-Very High (80-90)	66.48	0.6	
Total Forward Light	6570	54.5	
BL - Back-Low (0-30)	1172.9	9.7	
BM - Back-Medium (30-60)	3006.9	24.9	
BH - Back-High (60-80)	1259.8	10.5	
BVH - Back-Very High (80-90)	42.326	0.4	
Total Back Light	5481.9	45.5	
UL - Uplight-Low (90-100)	0	0.0	
UH - Uplight-High (100-180)	0	0.0	
Total Up Light	0	0.0	
BUG (Back, Up, Glare) Rating	B3-U0-G3		
Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	5481.9	0	5481.9
Street Side	6570	0	6570

Table 15	BUG
Model:	ZPS-MB422-100W.V1-T1-E9-P3 (CCT 5000K)

**IES "BUG" RATING (BACK LIGHT, UPLIGHT, GLARE)
PER IES TM-15-11**

IESNA Luminaire Flux Distribution Table:

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	1457.8	12.6
FM - Front-Medium(30-60)	3494	30.2
FH - Front-High(60-80)	1362.2	11.8
FVH - Front-Very High(80-90)	63.373	0.5
Total Forward Light	6377.4	55.2

BL - Back-Low(0-30)	1125	9.7
BM - Back-Medium(30-60)	2855.3	24.7
BH - Back-High(60-80)	1169.8	10.1
BVH - Back-Very High(80-90)	30.352	0.3
Total Back Light	5180.4	44.8

UL - Uplight-Low(90-100)	0	0.0
UH - Uplight-High(100-180)	0	0.0
Total Up Light	0	0.0

BUG(Back,Up,Glare) Rating	B3-U0-G3
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Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	5180.4	0	5180.4
Street Side	6377.4	0	6377.4

Attachment 1: Equipment List

Equipment	ID No.	Model	Brand/Manufacturer	Calibration due date
Digital Power Meter	13217	WT210	YOKOGAWA	2022-08-21
Anemometer	15798	Testo417	Testo	2022-10-20
Temperature and Humidity meter	13397	SK-L200TH	SATO	2022-08-12
Goniophotometer system	13345	GO-R5000-SML	Everfine	2023-03-23
Integrating sphere test system	13342	CSLMS-7621	Labsphere	2022-10-17

END OF TEST REPORT