LCTECH

NVLAP LAB CODE 500080-0

IESNA SUSTAINING MEMBER

Ref. No.: LCCP15100129
Version: 1.0
Date of Issue: Nov. 6, 2015
Total pages: 12

Test report of

IES LM-79-08

Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Rendered to:
LIGHT EFFICIENT DESIGN,DIV OF TADD LLC
188 S.Northwest Highway Cary, IL 60013.

For products:
LED Lamp

Models No.:
LED-8045M50,LED-8045M50C

Test Date:	Oct. 30, 2015 to Nov. 4, 2015
Test Lab.:	LCTECH (Zhongshan) Testing Service Co.,Ltd 2/F.,Technology and Enterprise Development Center, Guangyuan Road, Xiaolan, Zhongshan, Guangdong, China
Test Note:	*Model LED-8045M50 and LED-8045M50C are the same except for model number.*

Complied by:		**Reviewed by:**	
Thomas Liu	Thomas Liu	**Richard Li**	
Project Engineer		**Technical Manager**	
Nov. 6, 2015		**Nov. 6, 2015**	

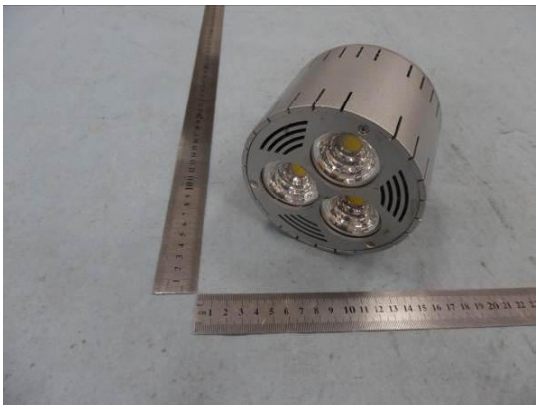
Table of Contents

1. General

1.1 Product Information

Brand Name	Light Efficient Design
Trade Mark	-
Luminaire Type	LED Lamps
Model Number	LED-8045M50,LED-8045M50C
Rated Inputs	120-277VAC 50-60Hz
Rated Power	50 W
Rated Light output	4500 lm
Declared CCT	5000 K
Power Supply	Integral LED driver
LED Package, Array or Module	Not provided
Receipt Samples	1 unit
Date of Receipt Samples	Oct. 29, 2015

Photo



Picture 1

Picture 2

1.2 Standards or methods

The following standards are partly or totally used or referenced for test:

No.	Name
ANSI/NEMA/ ANSLG C78.377-2011	Specifications for the Chromaticity of Solid State Lighting Products
ANSI C82.77-2002	Harmonic Emission Limits—Related Power Quality Requirements for Lighting Equipment
CIE Pub. No. 13.3-1995	Method of Measuring and Specifying Color Rendering of Light Sources
CIE Pub. No. 15:2004	Colorimetry
IES LM-79-08	Electrical and Photometric Measurements of Solid-State Lighting Products

1.3 Equipment list

Instrument	ID	Model name	Cal. date	Next cal. Date
AC Power supply	LC-I-923	CHP-500	2015-02-05	2016-02-04
AC Power supply	LC-I-987	APW-110N	2015-02-05	2016-02-04
Power analyzer	LC-I-928	WT210	2015-02-09	2016-02-08
Power analyzer	LC-I-954	WT210	2015-03-04	2016-03-03
Multimeter	LC-I-972	Fluke 17B	2015-08-17	2016-08-16
Photometric colorimetric electric system (2 meter sphere)	LC-I-900	SPR3000	Before use	Before use
Standard lamp	LC-I-917	24V100W	2015-10-09	2016-10-08
Luminous Flux Standard Lamp	LC-I-946	110V/200W	2015-10-09	2016-10-08
Goniophotometer(with mirror)	LC-I-902	GMS2000	2012-05-10	2016-05-09
Wireless temperature transmitter	LC-I-978	DWRF-B	2015-02-11	2016-02-10
Wireless temperature transmitter	LC-I-979	DWRF-B	2015-02-11	2016-02-10

2. Test conducted and method

2.1 Ambient Condition

The ambient temperature in which measurements are being taken was maintained at 25 °C ± 1°C; the air flow around the sample(s) being tested did not affect the performance.

2.2 Power Supply Characteristics

The AC power supply had a sinusoidal voltage wave shape at the prescribed frequency (60 Hz) such that the RMS summation of the harmonic components does not exceed 3 percent of the fundamental during operation of the test item.

The voltage of AC power supply (RMS voltage) applied to the device under test was regulated to within±0.2 percent under load.

2.3 Seasoning and Stabilization

No seasoning was performed in accordance with IESNA LM-79-08. And before the measurement, the sample was stabilized until the light output and power variations were less than 0.5% in 30 minutes intervals (3 readings, 15 minutes apart).

2.4 Electrical Instrumentation

The calibration uncertainties of the instruments for AC voltage and current were less than 0.2 percent, and the calibration uncertainty of the AC power meter was less than 0.5 percent(95 % confidence interval, k=2).

2.5 Color Measurement Method

Spectral radiant flux was measured by a sphere (2 meter)-spectroradiometer system, and the color characteristics (Color rendering index, correlated color temperature, chromaticity coordinate) were calculated from these by software automatically.

2.6 Total Luminous Flux Measurement Method

Total luminous flux was measured by sphere-spectroradiometer system and type C goniophotometer system.

Light intensity distribution was measured by a type C goniophotometer (with mirror) which can keep the sample in burn position when the tests conduct, and the total luminous flux was calculated from the intensity data by software automatically.

Spectral radiant flux was measured by a sphere (2 meter)-spectroradiometer system, and the total luminous flux was calculated from these by software automatically.

2.7 Luminous Intensity Distribution Measurement Method

Luminous intensity distribution was measured by a mirror-type goniophotometer (Type C) which can keep the sample in burn position when the tests conduct, and the kinds of graph were generated by software automatically.

2.8 Spatial Non-uniformity of Chromaticity

The customer did not require this measurement.

3. Test Result Summary

3.1 Electrical data

Criteria Item	Result(Sphere)	Result(Goniophotometer)
Input Voltage & Frequency	276.90V~60Hz	277.00V~60Hz
Input Current(A)	0.201	0.203
Total Power(W)	52.69	53.01
Power Factor	0.949	0.945
I-THD	10.44%	-

3.2 Photometric data

Criteria Item	Result(Sphere)	Result(Goniophotometer)
Total Lumens(lm)	4684.60	4683.71
Luminaire Efficacy(Lm/W)	88.89	88.36
Correlated Color Temperature (CCT)(K)	5132	-
Color Rendering Index (CRI)	83.9	-
R9	20	-
Chromaticity Coordinate (x,y)	x = 0.3416 y = 0.3505	-
Chromaticity Coordinate (u,v)	u = 0.2095 v = 0.3224	-
Chromaticity Coordinate (u',v')	u' = 0.2095 v' = 0.4836	-
Duv	0.000856	-
Beam Angle	-	C15 plan: 57.63°
Filed Angle	-	C0 plan: 95.6°

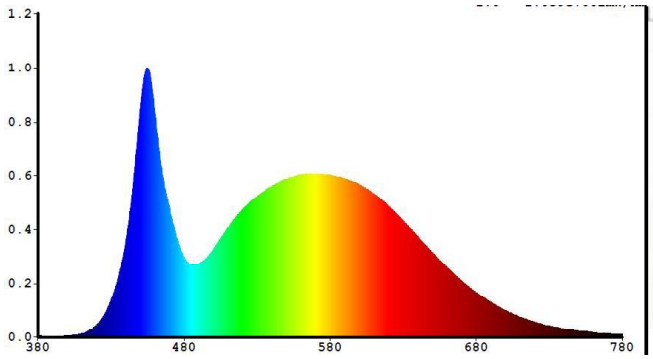
3.3 Color Rendering Details

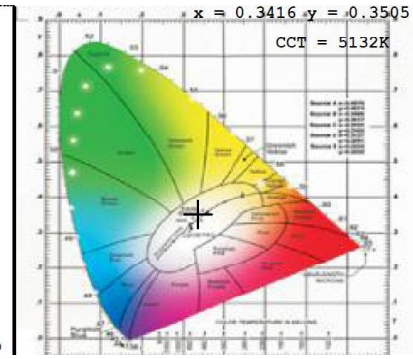
R1	R2	R3	R4	R5	R6	R7	R8
83	90	92	82	82	84	88	71
R9	R10	R11	R12	R13	R14	R15	-
20	73	79	60	85	96	80	-

Note: N.A.

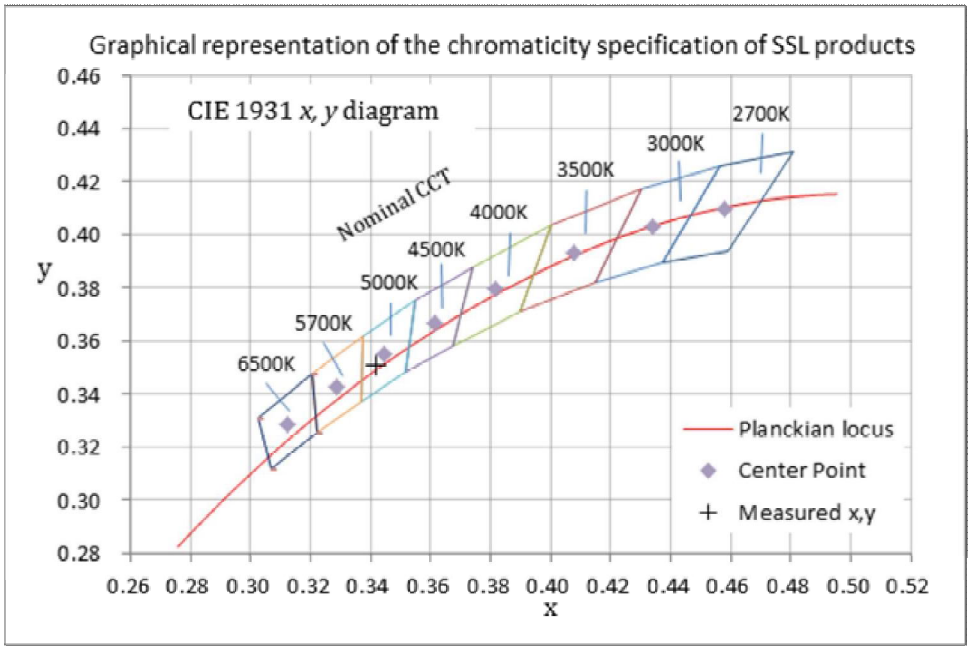
4. Test Data

4.1 Spectral Distribution





4.2 ANSI Chromaticity Quadrangles Diagram



4.3 Goniometry Test Data

CIE Type	Direct	Basic Luminous Shape	Circular w/Sides
Spacing Criteria (0-180)	0.82	Luminous Length	0.09 m(Diameter)
Spacing Criteria (90-270)	0.82	Luminous Width	0.09 m(Diameter)
Spacing Criteria (Diagonal)	0.92	Luminous Height	0 m
Test Distance	30.04 m		

4.4 Zonal Lumen Summary

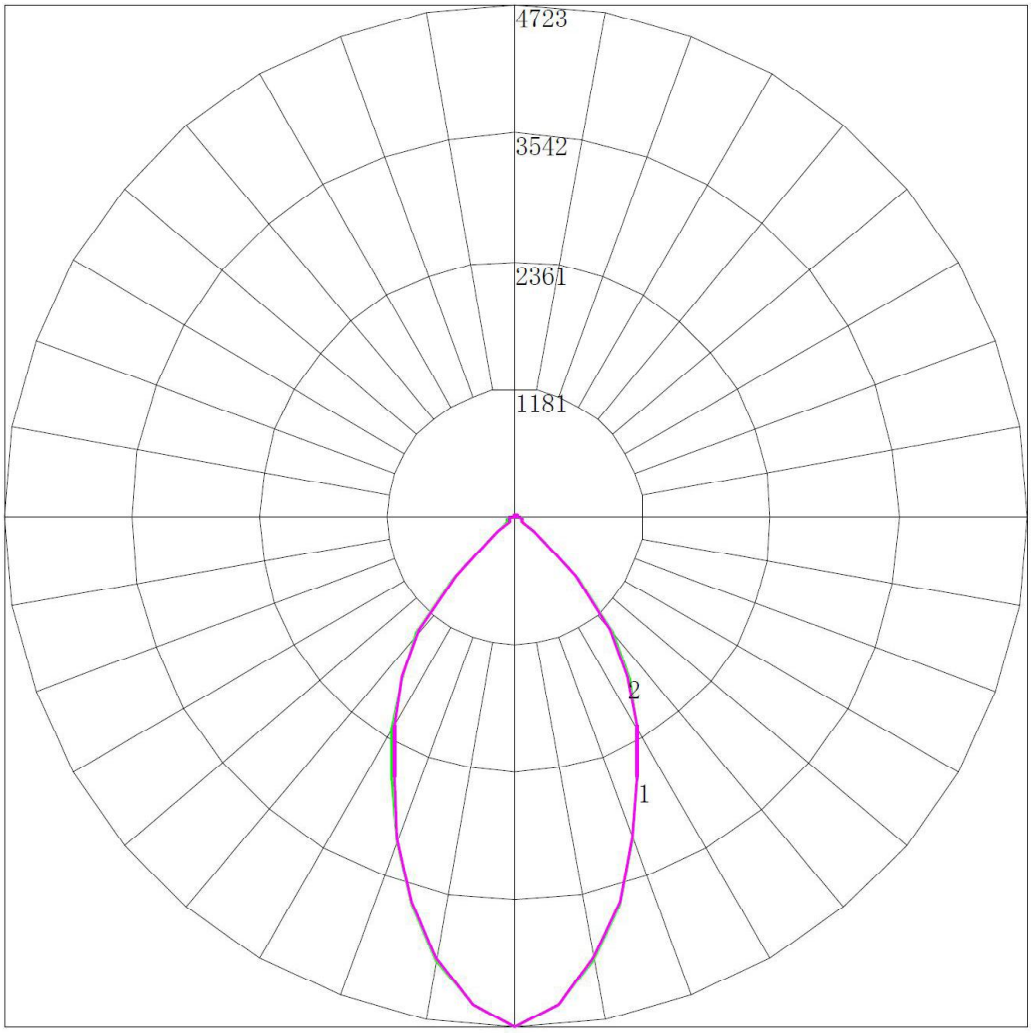
Zone	Lumens	%Lamp	%Fixt
0-20	1460.15	31.20	31.20
0-30	2702.2	57.70	57.70
0-40	3841.29	82.00	82.00
0-60	4565.68	97.50	97.50
0-80	4660.46	99.50	99.50
0-90	4670.43	99.70	99.70
10-90	4248.07	90.70	90.70
20-40	2381.14	50.80	50.80
20-50	2998.21	64.00	64.00
40-70	784.51	16.70	16.70
60-80	94.78	2.00	2.00
70-80	34.66	0.70	0.70
80-90	9.97	0.20	0.20
90-110	0.24	0.00	0.00
90-120	0.25	0.00	0.00
90-130	0.75	0.00	0.00
90-150	3.65	0.10	0.10
90-180	13.27	0.30	0.30
110-180	13.04	0.30	0.30
0-180	4683.71	100.00	100.00

Total Luminaire Efficiency = 100.00%

ZONAL LUMEN SUMMARY

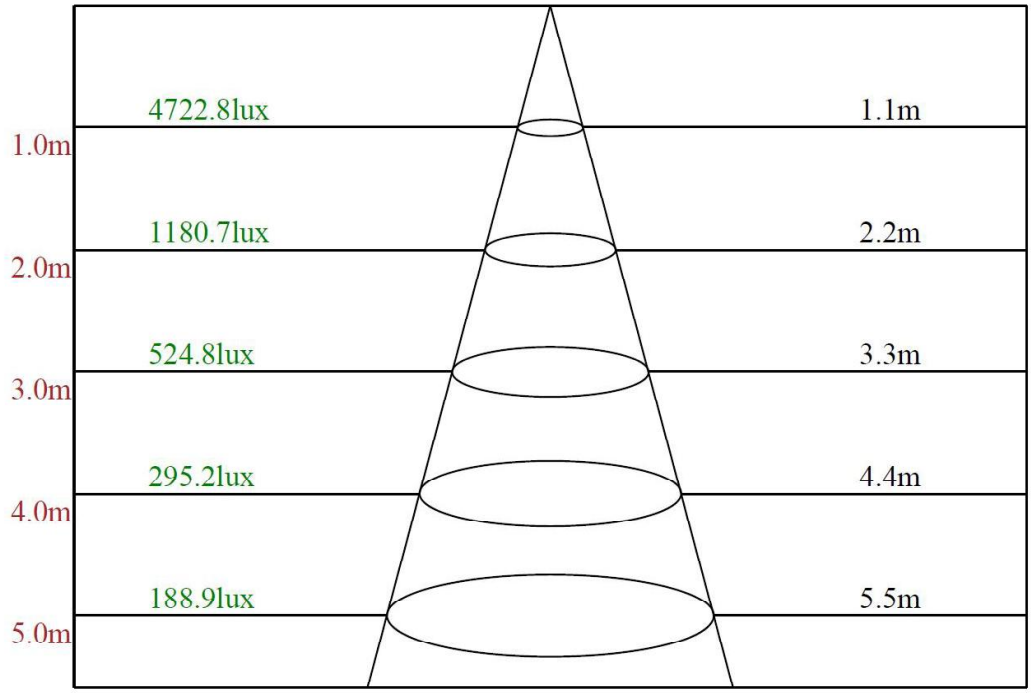
Zone	Lumens
0-10	422.37
10-20	1037.79
20-30	1242.05
30-40	1139.09
40-50	617.07
50-60	107.32
60-70	60.12
70-80	34.66
80-90	9.97
90-100	0.24
100-110	0.00
110-120	0.01
120-130	0.50
130-140	0.89
140-150	2.01
150-160	3.59
160-170	4.27
170-180	1.76

4.5 Polar Curves



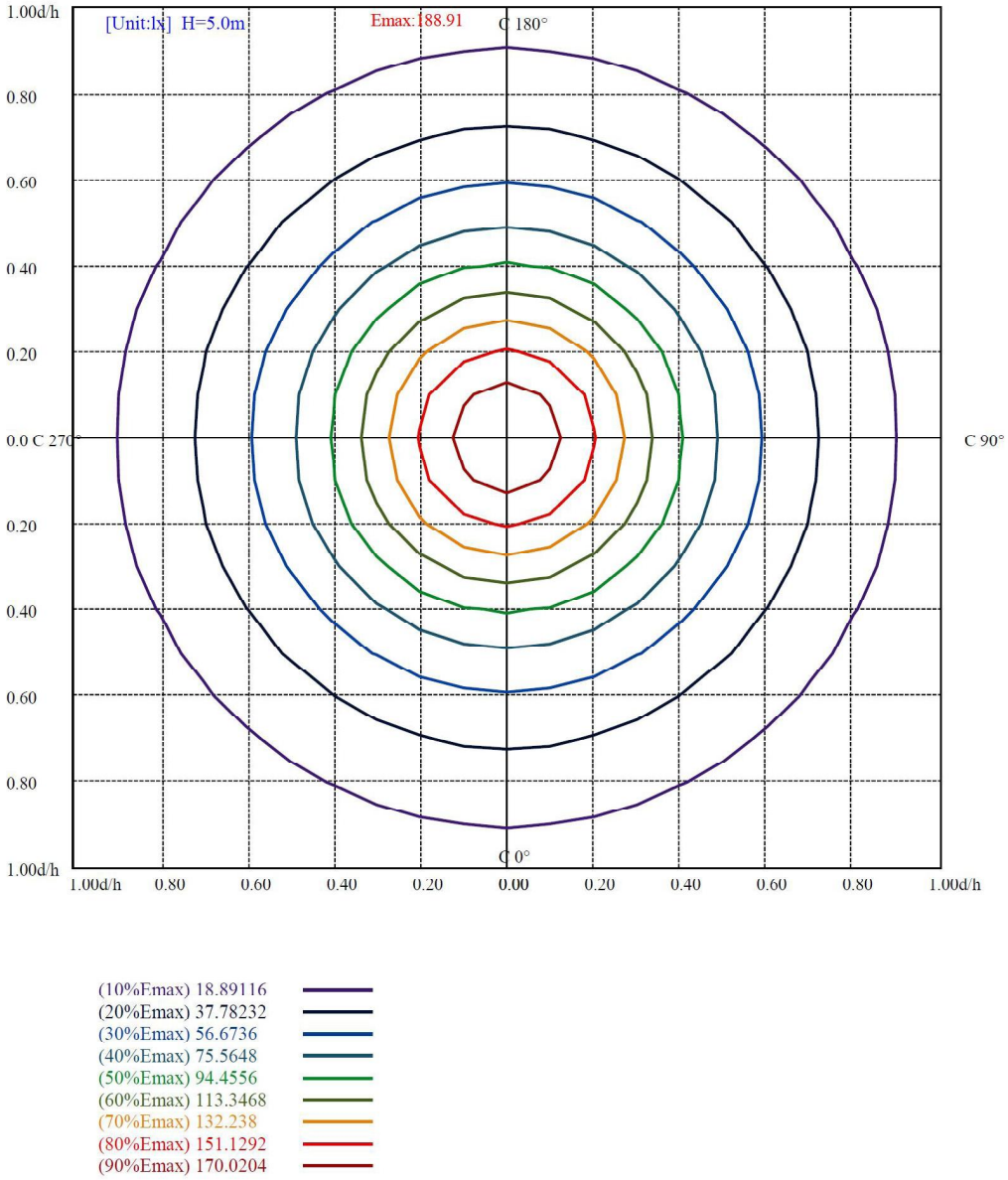
Maximum Candela = 4722.793 Located At Horizontal Angle = 0, Vertical Angle = 0
1 - Vertical Plane Through Horizontal Angles (0 - 180)
2 - Vertical Plane Through Horizontal Angles (90 - 270)

4.6 Lux Distance curve



Beam angle of C15plane57.63

4.7 ISO illuminance diagram



4.8 Candela Tabulation

	0	15	30	45	60	75	90
0	4722.793	4722.793	4722.793	4722.793	4722.793	4722.793	4722.793
5	4534.063	4527.768	4538.705	4538.138	4532.129	4534.796	4526.386
10	4180.080	4173.102	4182.331	4186.223	4185.897	4181.541	4159.636
15	3721.797	3711.204	3723.743	3715.787	3725.315	3725.210	3694.009
20	3180.888	3190.323	3188.054	3192.538	3196.093	3190.549	3176.695
25	2686.936	2683.415	2687.983	2692.759	2700.942	2696.299	2660.729
30	2260.259	2249.465	2247.003	2252.584	2260.894	2257.368	2246.338
35	1843.064	1837.365	1836.710	1827.980	1828.794	1835.895	1818.015
40	1408.711	1393.975	1388.983	1385.328	1385.334	1382.647	1372.612
45	820.845	806.185	797.135	795.484	797.545	804.006	791.926
50	231.625	225.408	261.273	259.342	257.354	253.294	217.982
55	82.175	81.289	82.778	83.522	80.682	79.972	77.754
60	75.402	73.634	75.110	76.299	73.221	72.508	72.361
65	61.405	60.126	60.899	61.400	59.440	58.734	57.979
70	50.569	48.866	48.947	49.437	47.907	46.980	48.091
75	33.863	33.102	32.931	32.957	32.317	31.626	31.461
80	18.512	18.465	18.268	17.832	17.180	16.948	15.731
85	9.933	9.909	9.698	9.029	8.590	8.132	8.090
90	0.903	0.898	0.899	0.902	1.135	0.911	0.000
95	0.000	0.000	0.000	0.000	0.000	0.000	0.000
100	0.000	0.000	0.000	0.000	0.000	0.000	0.000
105	0.000	0.000	0.000	0.000	0.000	0.000	0.000
110	0.000	0.000	0.000	0.000	0.000	0.000	0.000
115	0.000	0.000	0.000	0.000	0.000	0.000	0.000
120	0.000	0.000	0.000	0.000	0.000	0.228	0.000
125	0.903	0.675	0.676	0.903	0.452	0.452	0.899
130	0.903	0.901	1.129	0.903	0.679	0.904	0.449
135	0.903	0.901	1.129	1.129	0.904	1.128	0.899
140	1.806	1.802	1.805	1.806	1.808	1.583	1.348
145	3.161	3.153	3.158	3.160	3.164	3.163	3.146
150	4.967	4.954	4.962	4.966	4.972	4.970	4.944
155	7.676	7.432	7.444	7.449	7.457	7.453	7.641
160	11.739	11.710	11.729	11.738	11.979	11.519	11.686
165	15.803	15.764	16.014	15.801	15.820	15.813	15.731
170	17.609	17.790	17.819	18.059	18.080	18.072	17.978
175	18.512	18.466	18.723	18.736	18.757	18.748	18.877
180	19.204	19.204	19.204	19.204	19.204	19.204	19.204

****End of test report****