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**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-8055E27, LED-8055E27C, LED-8055M27, LED-8055M27C

**Test Date:** Oct. 15, 2015 to Oct. 16, 2015

**Test Lab.:** LCTECH (Zhongshan) Testing Service Co., Ltd

2/F., Technology and Enterprise Development Center, Guangyuan Road, Xiaolan,  
Zhongshan, Guangdong, China

**Test Note:** *LED-8055E27, LED-8055E27C, LED-8055M27, LED-8055M27C are all the same except for model number and lamp base. This report is based on report LCGP15100124, they are all the same except for model number. Model LED-8055E27 is selected as the representative test sample.*

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**Mar. 9, 2016**

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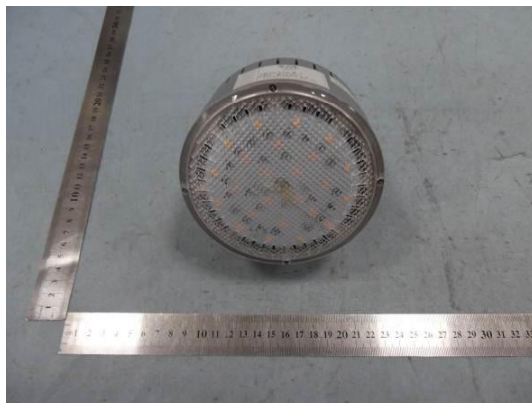


# 1. General

## 1.1 Product Information

Brand Name	Light Efficient Design
Trade Mark	-
Luminaire Type	LED Lamps
Model Number	LED-8055E27,LED-8055E27C,LED-8055M27,LED-8055M27C
Rated Inputs	120-277VAC 50-60Hz
Rated Power	30 W
Rated Light output	2800 lm
Declared CCT	2700 K
Power Supply	Integral LED driver
LED Package, Array or Module	Not provided
Receipt Samples	1 unit
Date of Receipt Samples	Oct. 13, 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  $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ ; 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  $\pm 0.2$  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	277.00V~60Hz	277.08V~60Hz
Input Current(A)	0.121	0.122
Total Power(W)	30.24	30.40
Power Factor	0.900	0.900
I-THD	13.35%	-

#### 3.2 Photometric data

Criteria Item	Result(Sphere)	Result(Goniophotometer)
Total Lumens(lm)	2537.20	2550.22
Luminaire Efficacy(Lm/W)	83.90	83.89
Correlated Color Temperature (CCT)(K)	2783	-
Color Rendering Index (CRI)	82.2	-
R9	9	-
Chromaticity Coordinate (x,y)	x = 0.4513 y = 0.4055	-
Chromaticity Coordinate (u,v)	u = 0.2593 v = 0.3494	-
Chromaticity Coordinate (u',v')	u' = 0.2593 v' = 0.5241	-
Duv	-0.00115	-
Beam Angle	-	C90 plan: 113.23°
Filed Angle	-	C90 plan: 166.4°

#### 3.3 Color Rendering Details

R1	R2	R3	R4	R5	R6	R7	R8
80	91	96	80	81	89	82	58
R9	R10	R11	R12	R13	R14	R15	-
9	80	78	75	83	99	74	-

Note: N.A.

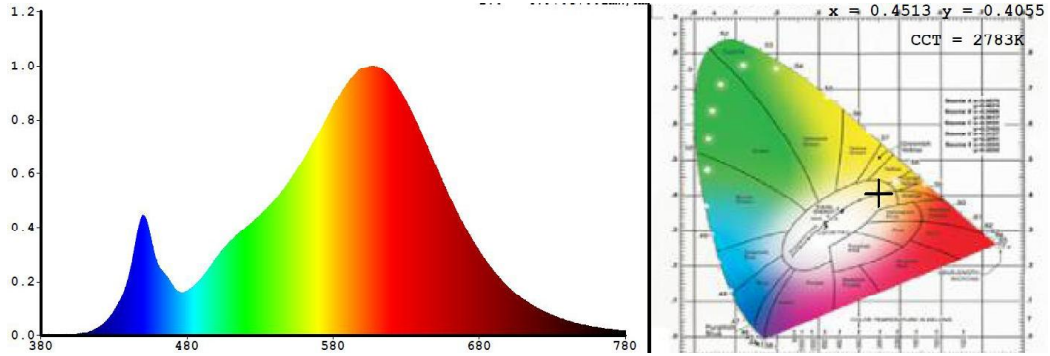


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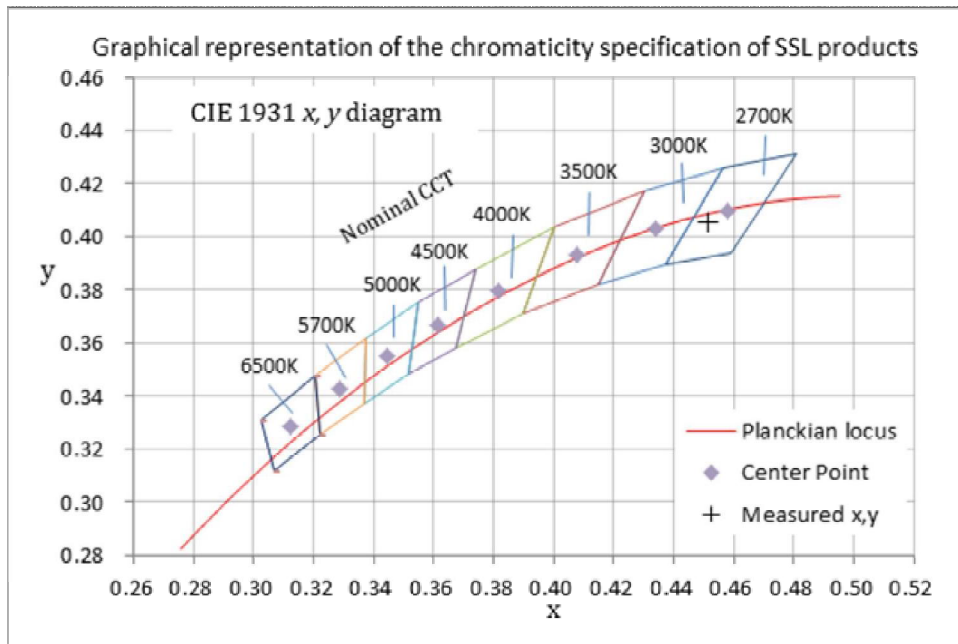


### 4. Test Data

#### 4.1 Spectral Distribution



#### 4.2 ANSI Chromaticity Quadrangles Diagram





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**4.3 Goniometry Test Data**

CIE Type	Direct	Basic Luminous Shape	Circular w/Sides
Spacing Criteria (0-180)	1.30	Luminous Length	0.12(Diameter)
Spacing Criteria (90-270)	1.32	Luminous Width	0.12(Diameter)
Spacing Criteria (Diagonal)	1.42	Luminous Height	0.01m
Test Distance	30.04 m		

**4.4 Zonal Lumen Summary**

Zone	Lumens	%Lamp	%Fixt
0-20	300.36	11.80	11.80
0-30	644.21	25.30	25.30
0-40	1062.35	41.70	41.70
0-60	1898.62	74.40	74.40
0-80	2398.47	94.00	94.00
0-90	2476.16	97.10	97.10
10-90	2399.15	94.10	94.10
20-40	761.99	29.90	29.90
20-50	1199.48	47.00	47.00
40-70	1145.79	44.90	44.90
60-80	499.85	19.60	19.60
70-80	190.33	7.50	7.50
80-90	77.69	3.00	3.00
90-110	41.79	1.60	1.60
90-120	51.92	2.00	2.00
90-130	59.23	2.30	2.30
90-150	69.35	2.70	2.70
90-180	74.05	2.90	2.90
110-180	32.27	1.30	1.30
0-180	2550.22	100.00	100.00

Total Luminaire Efficiency = 100.00%

**ZONAL LUMEN SUMMARY**

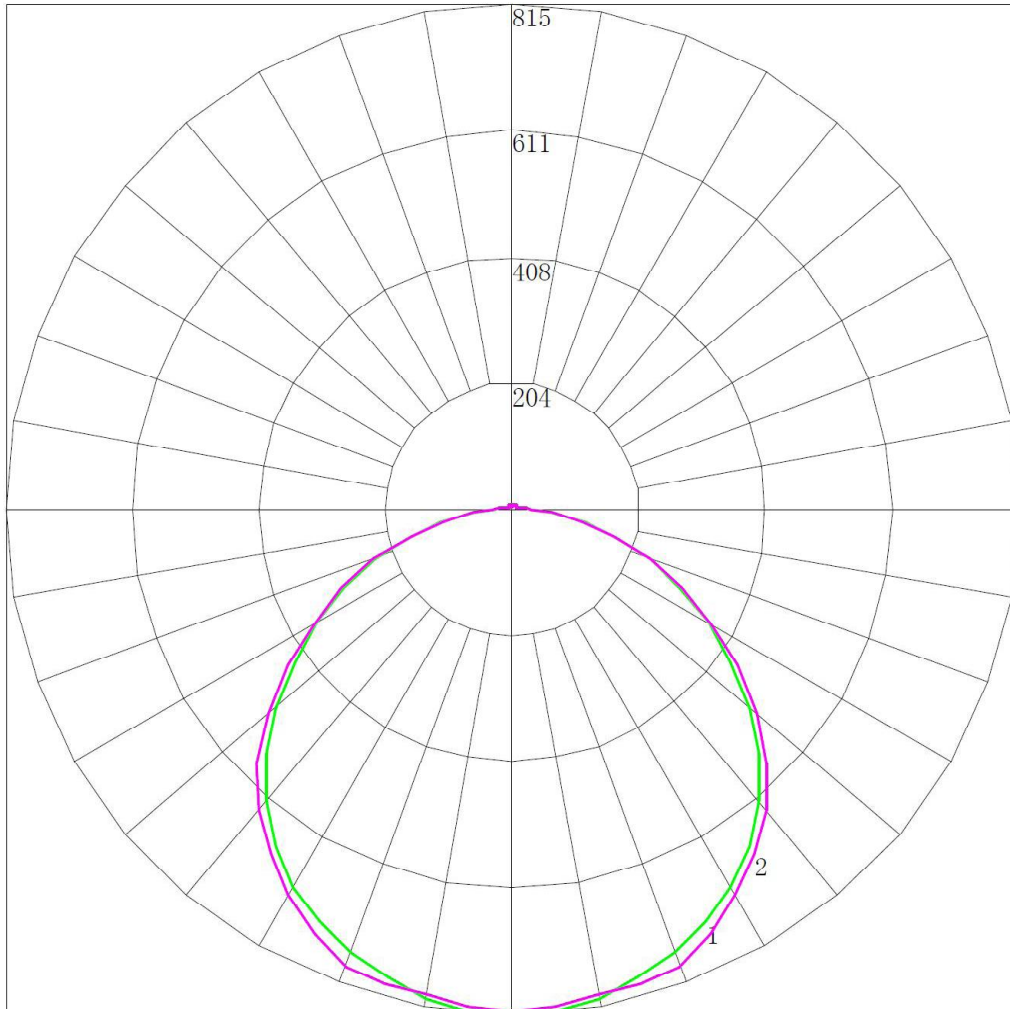
Zone	Lumens
0-10	77.02
10-20	223.34
20-30	343.85
30-40	418.14
40-50	437.48
50-60	398.79
60-70	309.51
70-80	190.33
80-90	77.69
90-100	26.66
100-110	15.12
110-120	10.14
120-130	7.31
130-140	5.87
140-150	4.26
150-160	2.68
160-170	1.56
170-180	0.46





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4.5 Polar Curves

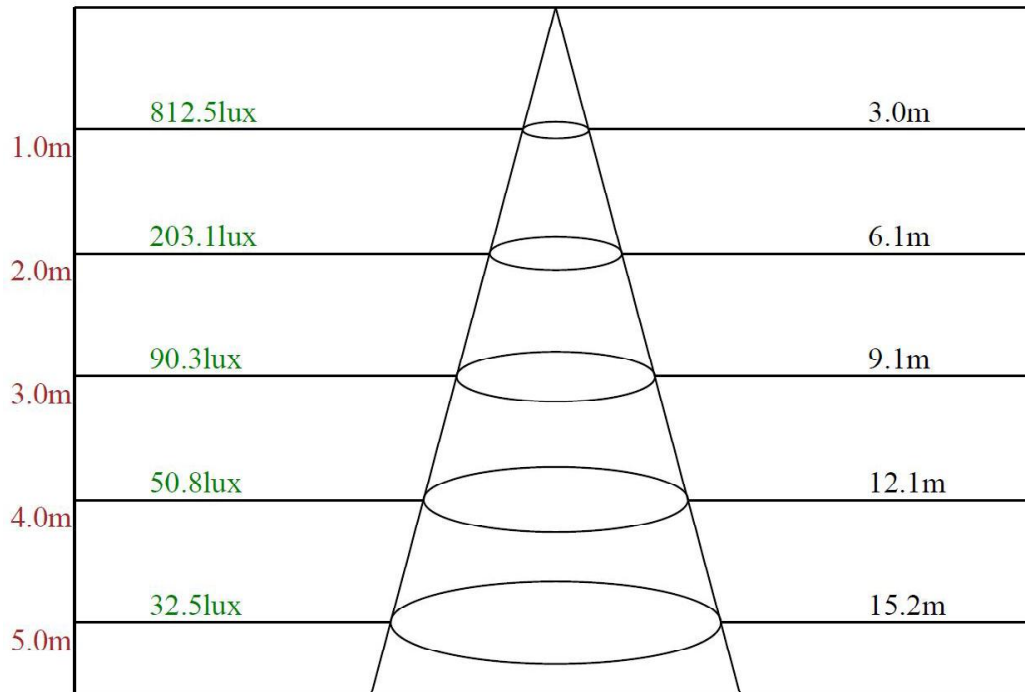


Maximum Candela = 815.092 Located At Horizontal Angle = 0, Vertical Angle = 5  
# 1 - Vertical Plane Through Horizontal Angles (0 - 180)  
# 2 - Vertical Plane Through Horizontal Angles (90 - 270)



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4.6 Lux Distance curve



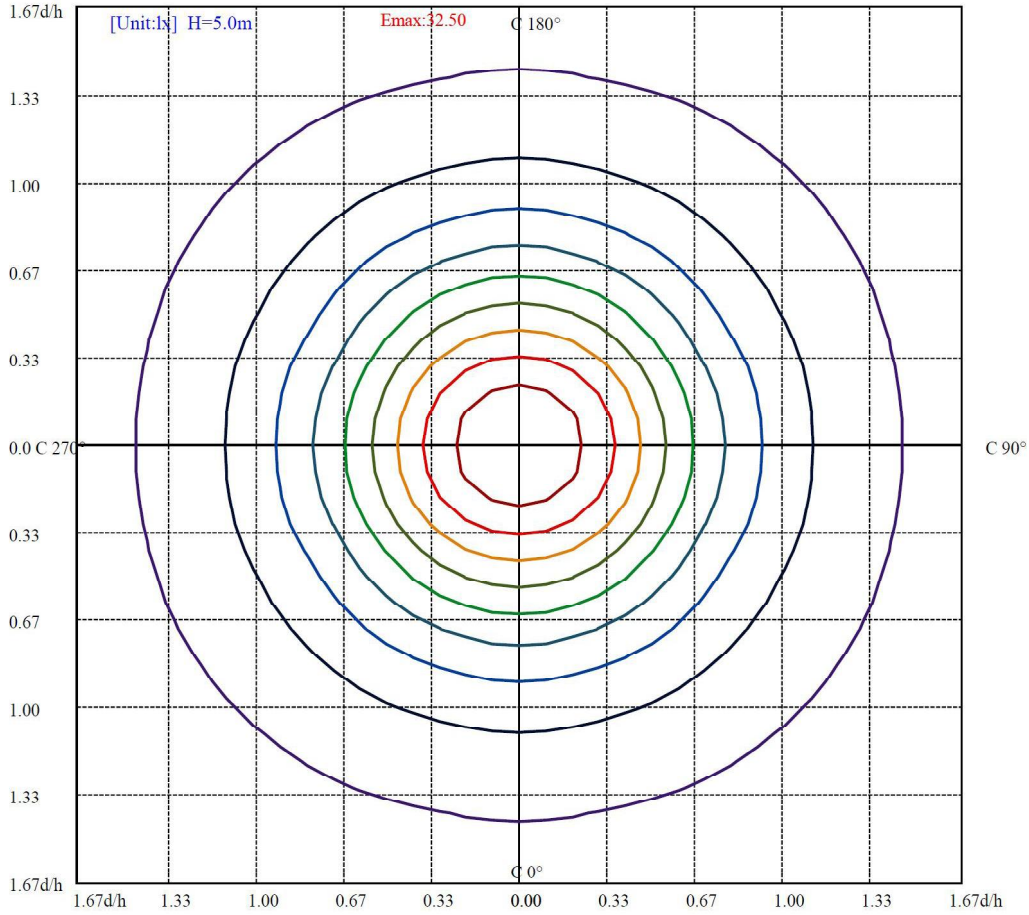
Beam angle of C90plane113.23



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4.7 ISO illuminance diagram



(10%Emax) 3.25006	—
(20%Emax) 6.50012	—
(30%Emax) 9.75016	—
(40%Emax) 13.00024	—
(50%Emax) 16.25028	—
(60%Emax) 19.50036	—
(70%Emax) 22.7504	—
(80%Emax) 26.00048	—
(90%Emax) 29.25052	—

4.8 Candela Tabulation

	<u>0</u>	<u>15</u>	<u>30</u>	<u>45</u>	<u>60</u>	<u>75</u>	<u>90</u>
<b>0</b>	812.515	812.515	812.515	812.515	812.515	812.515	812.515
<b>5</b>	815.092	813.240	811.950	810.125	807.401	805.462	807.466
<b>10</b>	802.387	801.705	803.113	802.412	800.733	797.396	796.827
<b>15</b>	782.764	781.978	787.000	791.158	795.800	798.658	794.573
<b>20</b>	762.326	762.294	764.649	771.064	783.635	787.776	787.045
<b>25</b>	737.142	737.104	738.364	745.242	753.876	756.842	757.563
<b>30</b>	704.044	705.184	708.641	710.150	710.804	716.556	719.290
<b>35</b>	663.577	662.317	668.292	666.534	663.767	679.176	680.522
<b>40</b>	616.643	609.692	618.950	619.174	613.193	633.595	636.885
<b>45</b>	561.978	553.007	564.799	569.784	566.359	578.822	580.986
<b>50</b>	498.225	492.556	509.650	516.741	518.128	514.001	513.096
<b>55</b>	429.046	427.884	450.451	458.556	460.684	447.535	440.248
<b>60</b>	362.444	362.292	383.477	394.733	391.142	378.049	369.473
<b>65</b>	298.555	300.126	315.398	327.776	321.690	309.464	302.845
<b>70</b>	235.525	238.271	247.478	257.006	252.824	242.254	236.758
<b>75</b>	168.788	173.570	179.558	186.891	183.350	173.715	168.147
<b>80</b>	117.876	116.435	120.631	131.097	123.788	113.490	114.502
<b>85</b>	61.086	64.290	65.774	69.010	67.604	63.019	63.698
<b>90</b>	30.339	32.958	35.486	35.926	36.337	33.729	31.150
<b>95</b>	21.025	22.797	23.982	23.567	23.631	22.936	21.864
<b>100</b>	16.413	17.584	17.743	17.275	17.616	17.011	17.626
<b>105</b>	12.977	14.198	14.149	13.622	14.125	14.082	14.651
<b>110</b>	11.032	11.940	11.799	11.614	11.872	11.649	12.081
<b>115</b>	9.721	9.887	10.239	10.464	10.227	9.914	9.963
<b>120</b>	8.772	8.872	9.199	9.246	9.033	8.246	8.385
<b>125</b>	7.596	7.901	8.318	8.367	8.042	7.525	7.438
<b>130</b>	7.234	7.472	8.092	8.277	7.997	7.570	7.438
<b>135</b>	7.054	7.201	7.685	7.961	7.817	7.661	7.483
<b>140</b>	6.827	7.020	7.346	7.645	7.479	7.300	7.213
<b>145</b>	6.601	6.569	6.849	6.969	6.893	6.759	6.672
<b>150</b>	6.240	6.050	6.238	6.270	6.218	6.061	6.086
<b>155</b>	5.607	5.598	5.718	5.751	5.699	5.678	5.635
<b>160</b>	5.471	5.508	5.606	5.616	5.587	5.610	5.590
<b>165</b>	5.245	5.508	5.311	5.413	5.677	5.678	5.770
<b>170</b>	5.381	5.260	5.266	5.322	5.339	5.430	5.635
<b>175</b>	4.612	4.650	4.701	4.668	4.686	4.822	4.914
<b>180</b>	3.848	3.848	3.848	3.848	3.848	3.848	3.848

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