

Report Number	TRN-15550
Customer	LED Evolution
Contact	Robin Day
Product Type	Street Light
Test Purpose	UMS Energy Performance Test
Sales Order Ref	Q-LUX15-20173
Works Order Number	WO-6181
Test Item Reference	TI-10394
LAB Test Method Reference	TES-20012
Test Standards	LM-79-08 and Elexon UMS Charge Code process V4.0
Lab Location Reference	Performance
Tested By	Huw Rees
Date of Test	21/09/2015
Analysed by	Steve Hunt
Number of products tested	5

Address: LUX-TSI Ltd.,
Pencoed Technology Park,
Pencoed, Bridgend,
CF35 5AQ, UK
Telephone: +44 (0) 1656 864618
Authorised by: Gareth Jones
Email: gjones@lux-tsi.com
Signed:




Roadway Single - 80W - 80% - LED
Evolution

Date: 28/09/2015

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Nomenclature

Lamp Orientation described below relates to the position in which a lamp is designed to operate for maximum performance and safety, these include:

- BD - Base Down (bulb is vertically positioned with the metal base at the bottom, glass up)
 - BU - Base Up (bulb is vertically positioned with the metal base at the top, glass hanging down)
 - HBD - Horizontal $+15^\circ$ to Base Down
 - H45 - Horizontal to -45° only
 - VBV - Vertical Base Up $\pm 15^\circ$
 - VBD - Vertical Base Down $\pm 15^\circ$
 - HBU - Base Up $\pm 90^\circ$ (bulb can be operated in a base up or horizontal position)
 - HOR - Horizontal Burn (bulb is positioned with the metal base parallel to the ground)
 - H75 - Horizontal $\pm 75^\circ$ (bulb should not be operated within 15° of vertical)
 - U - Universal Burn (burn can be operated in any position)
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Test Equipment and Description

Yokogawa WT210 Power Analyser. Kikusui PCR2000M Stable AC Power Supply with PC control and data recording



The products under test are connected to the UMS Test system which has full data control and recording using Labview software. This allows full integration of the test equipment used - Kikusui AC Stable Power Supply, Yokogawa Power Analyser, Pico Temperature Logger and a LUX-TSI distribution control panel

Product Name	Roadway Single - 80W - 80% - LED Evolution
Part/Serial Number	See (Identifier) below
Type of Product	Street Light
Manufacturer	LED Evolution
Date of Manufacturer	2015
Base Type	N/A
Driver Type	Mains
Driver Model	LUMOTECH L05175
Light Engine Model	E304660
Operating Orientation	Base Up
Test Orientation	Base Up
Ambient Temperature	26.7°C
Humidity	<65% RH
Thermal Management	Passive
Dimmable	Yes
Product Summary	The product is of a street lantern design with a Metal enclosure. The driver is situated within the enclosure and the Light engine fitted on underside of the product

Dimension	Sample	Luminous Opening
Diameter/Width	200 mm	150 mm
Length	710 mm	230 mm
Height/Depth	95 mm	10 mm

Test Item	Identifier
10394A	1
10394B	2
10394C	3
10394D	4
10394E	5

Test Conditions

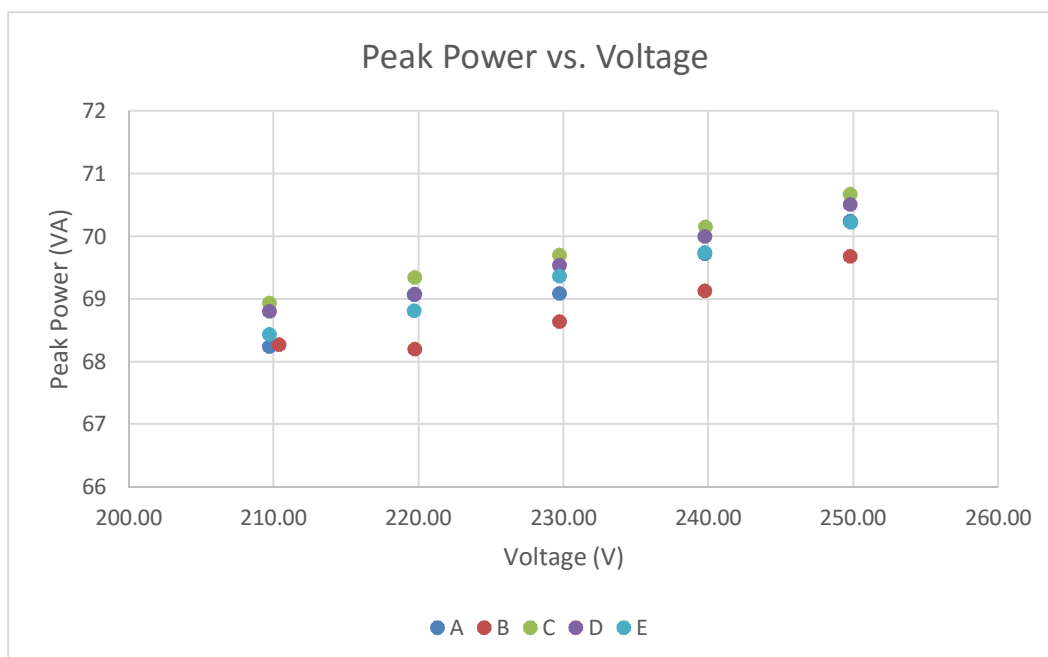
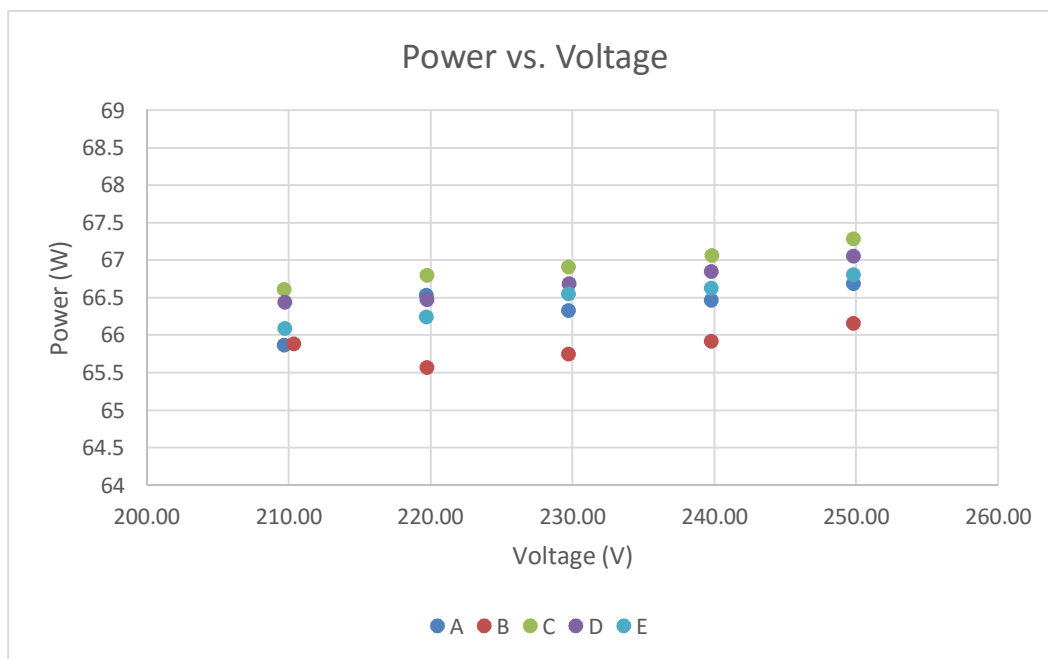
	Before Test	After Test
AC Supply Voltage (V)	249.9V	249.83V
AC Supply Frequency (Hz)	50Hz	50Hz
Voltage RMS Summation of the Harmonic Components (THC)	0.08%	0.1%

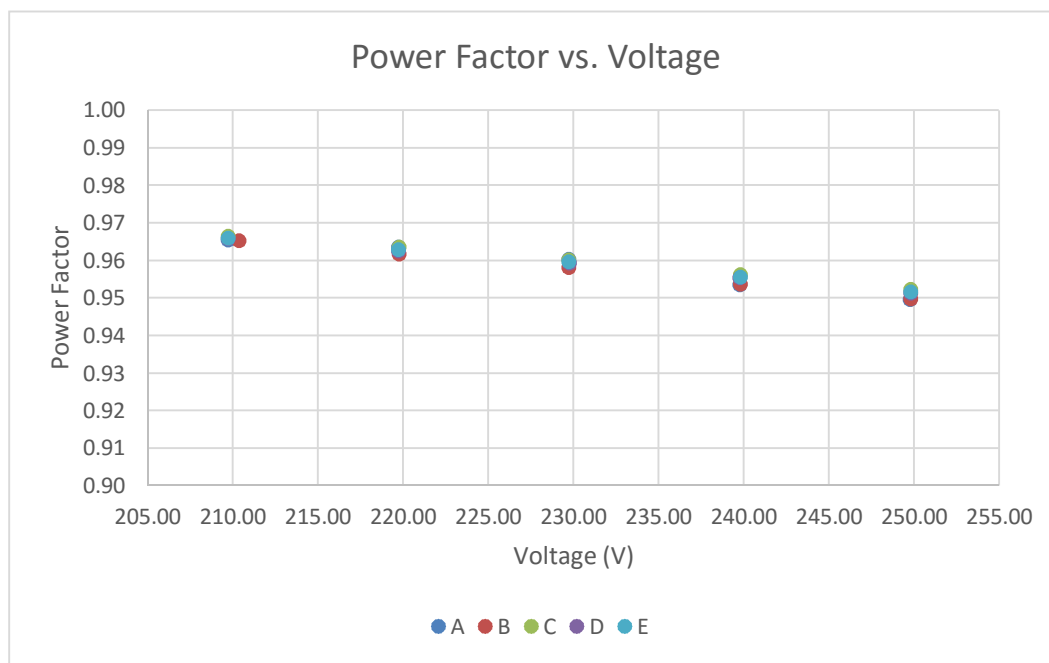
The test items were stabilised according to the electrical power stability of LM79-08. Stabilization is achieved when the difference in electrical power measurement is less than 0.5%. Each test item was stabilised at 250V.

Measurements were made with an ambient temperature of 25°C +/- 2°C. Measurements were taken only after sufficient time for thermal stabilisation has been allowed.

Test Results Summary

These are the summary graphs of the test results for all products tested. The raw results are on page 6 of this test report.





Power factors measured have a Leading phase angle and therefore the driver has capacitive properties.

Measurement Uncertainty

Parameter	Uncertainty
Voltage (300 V, 50/60 Hz)	$\pm 0.061 V_{rms}$
Current (200 mA, 50/60Hz)	$\pm 0.07 mA_{rms}$
Current (0.5 A, 50/60Hz)	$\pm 0.16 mA_{rms}$
Current (5 A, 50/60Hz)	$\pm 0.0016 A_{rms}$
Power (300 V, 200 mA, 50/60 Hz)	$\pm 0.032 W_{rms}$
Power (300 V, 0.5 A, 50/60 Hz)	$\pm 0.09 W_{rms}$
Power (300 V, 5 A, 50/60 Hz)	$\pm 0.0009 kW_{rms}$
Frequency (50/60 Hz)	$\pm 0.001 Hz$
Power Factor	$\pm 0.0006 PF$

Measurements of power of 0.50W or greater are made with an uncertainty of less than or equal to 2% at the 95% confidence level. Measurements of power less than 0.50W are made with an uncertainty of less than or equal to 0.01W at the 95% confidence level.

Full Test Results

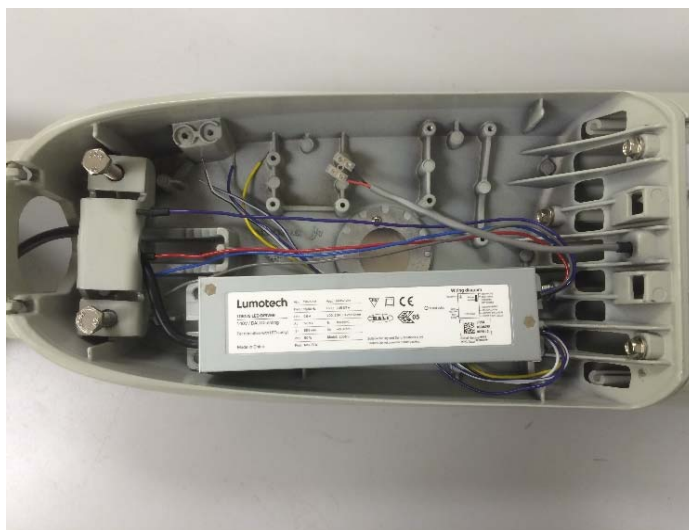
Test Item	Voltage (V)	Current (mA)	Electrical Power (W)	Ambient Temp (°C)	Peak Power (VA)	Power Factor	Leading / Lagging
A	249.81	281.17	66.69	26.75	70.24	0.950	Leading
B	249.83	278.89	66.16	26.72	69.68	0.950	Leading
C	249.82	282.88	67.29	26.58	70.67	0.952	Leading
D	249.82	282.23	67.06	26.69	70.51	0.951	Leading
E	249.84	281.05	66.81	26.76	70.22	0.951	Leading
A	239.79	290.75	66.47	26.76	69.72	0.953	Lagging
B	239.81	288.26	65.92	27.04	69.13	0.954	Leading
C	239.84	292.49	67.07	26.96	70.15	0.956	Leading
D	239.79	291.89	66.85	26.79	69.99	0.955	Leading
E	239.81	290.82	66.63	26.91	69.74	0.955	Leading
A	229.76	300.07	66.33	26.91	69.08	0.960	Lagging
B	229.76	298.71	65.75	27.22	68.63	0.958	Leading
C	229.76	303.30	66.91	27.21	69.70	0.960	Leading
D	229.77	302.60	66.69	27.18	69.53	0.959	Leading
E	229.76	301.90	66.55	27.37	69.36	0.960	Leading
A	219.74	314.29	66.53	27.32	69.06	0.963	Lagging
B	219.77	310.30	65.57	27.32	68.19	0.962	Leading
C	219.77	315.50	66.80	27.21	69.34	0.963	Leading
D	219.76	314.30	66.48	27.47	69.07	0.962	Leading
E	219.75	313.10	66.25	27.44	68.81	0.963	Leading
A	209.73	325.37	65.87	27.33	68.24	0.965	Lagging
B	210.39	324.50	65.89	27.55	68.27	0.965	Leading
C	209.73	328.70	66.61	27.52	68.93	0.966	Leading
D	209.75	328.00	66.44	27.61	68.80	0.966	Leading
E	209.74	326.30	66.09	27.40	68.43	0.966	Leading

Test Item Photographs

TI-10394

Images of Product(s) under test includes (where possible) labelling, Driver and Light engine details



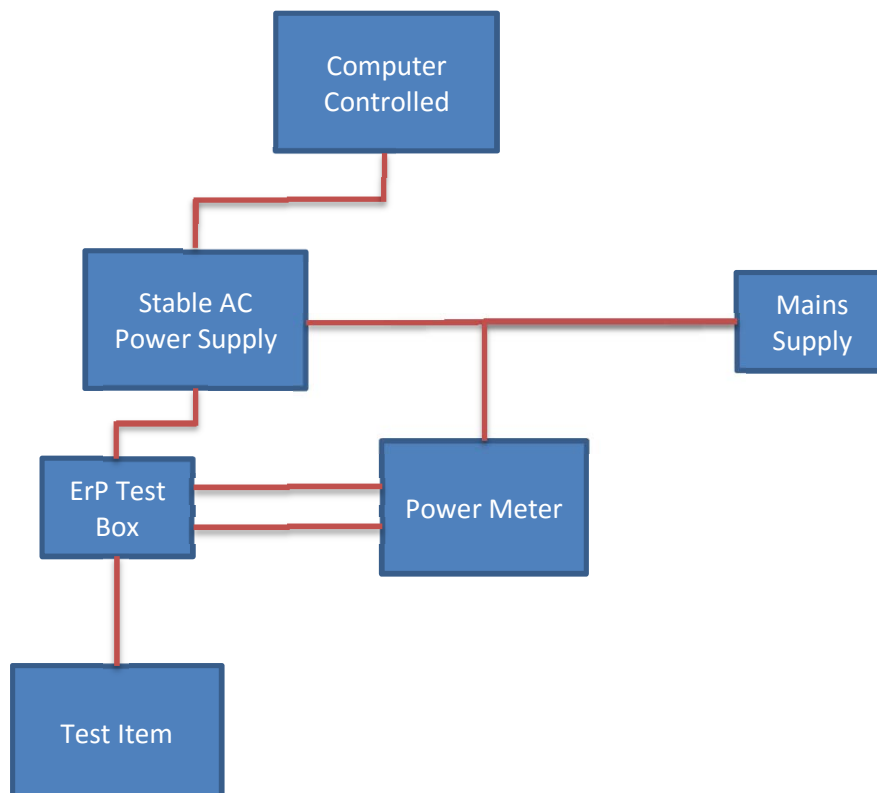


Driver in Situ



Light Engine

Appendix 1: Test item set-up



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