

Report Number	TRN-15131
Customer	ASD Lighting plc
Contact	Paul Gledhill
Product Type	Street Light
Test Purpose	UMS Energy Performance Test
Sales Order Ref	Q-LUX2014-2520
Works Order Number	WO-5475
Test Item Reference	TI-4540
LAB Test Method Reference	TES-2012
Test Standards	LM-79-08 and UMS charge code process v4.0
Lab Location Reference	UMS
Tested by	Steve Hunt
Date of Test	26/06/2015
Analysed by	Steve Hunt
Number of products tested	5

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Signed:




28 LED - 500mA - 100% Output

Date: 26/06/2015

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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

VBU - 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)

Test Conditions

Measurements were made with an ambient temperature of $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$. Measurements were taken only after sufficient time for thermal stabilisation has been allowed.

Test Equipment

Yokogawa WT210 Power Analyzer. Kikusui PCR2000M Stable AC Power Supply

with PC control and data recording



Full data control and recording
using Labview software and full
integration of the AC Stable Power
Supply and Power Analyser

Product Name	28 LED - 500mA - 100% Output
Part/Serial Number	See (Identifier) below
Type of Product	Street Light
Base Type	N/A
Driver Type	Mains
Driver Model	OPTOTRONIC OT90/220-240/700 3DIMLT+E
Light Engine Model	PCB058 CREE XPG LED
Operating Orientation	Base Up
Test Orientation	Base Up
Ambient Temperature	22.2°C
Manufacturer	ASD Lighting plc
Date of Manufacturer	2015
Thermal Management	Passive
Dimmable	Yes
Humidity	<65% RH

Dimension	Sample	Luminous Opening
Diameter/Width	594 mm	275 mm
Length	232 mm	220 mm
Height/Depth	120 mm	0 mm

Test Item	Identifier
TI-4540A	1
TI-4540B	2
TI-4540C	3
TI-4540D	4
TI-4540E	5

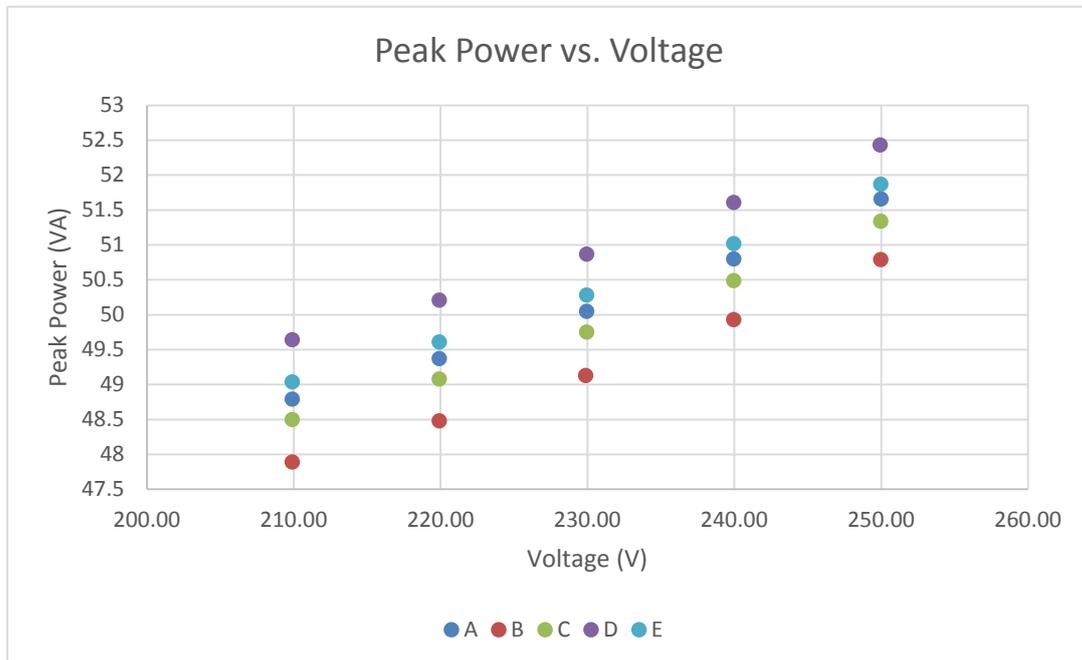
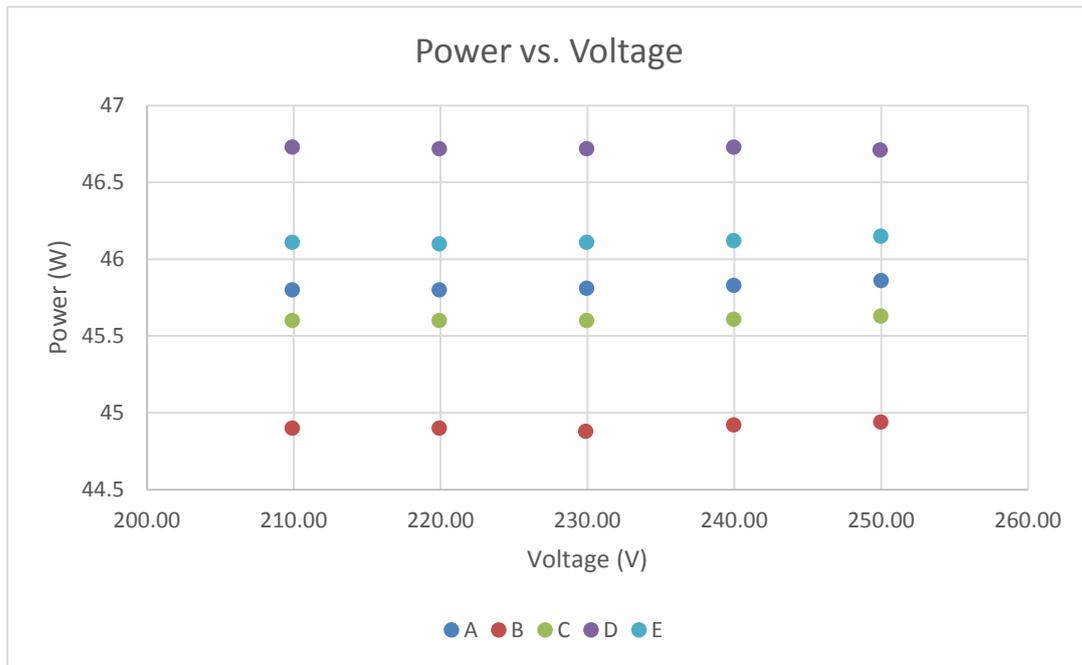
Test Conditions

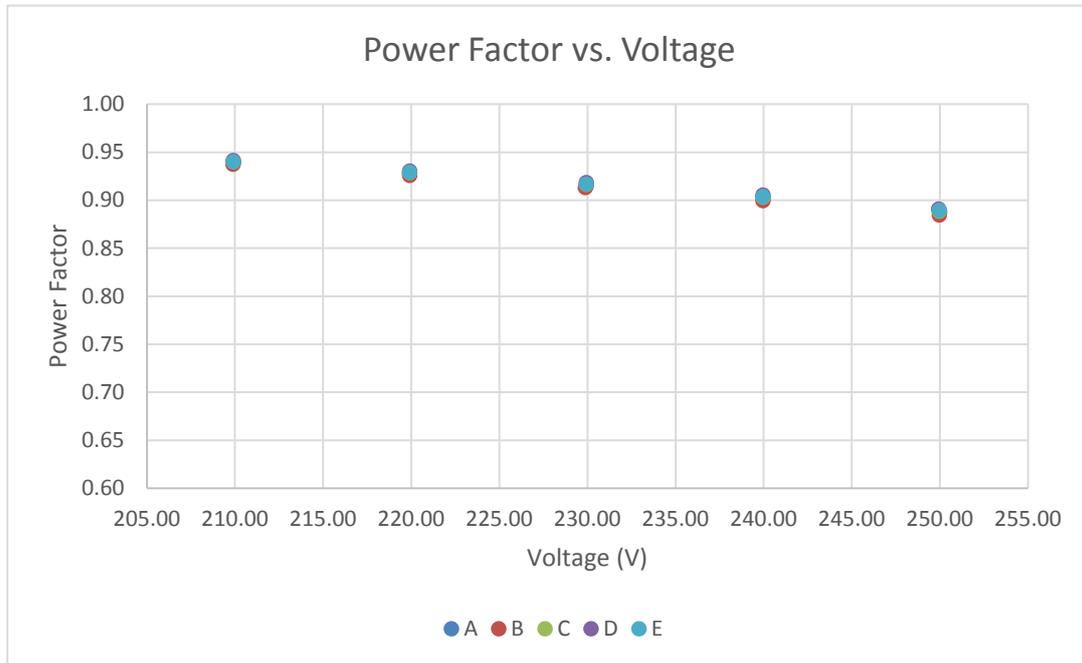
	Before Test	After Test
AC Supply Voltage (V)	249.92V	249.98V
AC Supply Frequency (Hz)	50Hz	49.99Hz
Voltage RMS Summation of the Harmonic Components (THD)	0.079%	0.09%

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.

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	249.98	206.68	45.86	22.20	51.66	0.888	Leading
B	249.97	203.20	44.94	22.21	50.79	0.885	Leading
C	249.97	205.39	45.63	22.31	51.34	0.889	Leading
D	249.92	209.78	46.71	22.26	52.43	0.891	Leading
E	249.97	207.49	46.15	22.23	51.87	0.890	Leading
A	239.95	211.70	45.83	22.28	50.80	0.902	Leading
B	239.95	208.07	44.92	22.25	49.93	0.900	Leading
C	239.96	210.41	45.61	22.14	50.49	0.903	Leading
D	239.95	215.07	46.73	22.03	51.61	0.906	Leading
E	239.95	212.62	46.12	22.14	51.02	0.904	Leading
A	229.93	217.69	45.81	22.30	50.05	0.915	Leading
B	229.88	213.73	44.88	22.20	49.13	0.913	Leading
C	229.93	216.36	45.60	22.13	49.75	0.917	Leading
D	229.93	221.22	46.72	22.14	50.87	0.919	Leading
E	229.93	218.66	46.11	22.21	50.28	0.917	Leading
A	219.91	224.50	45.80	22.28	49.37	0.928	Leading
B	219.90	220.47	44.90	22.26	48.48	0.926	Leading
C	219.91	223.19	45.60	22.31	49.08	0.929	Leading
D	219.91	228.33	46.72	22.36	50.21	0.930	Leading
E	219.91	225.59	46.10	22.31	49.61	0.929	Leading
A	209.90	232.44	45.80	22.19	48.79	0.939	Leading
B	209.89	228.16	44.90	22.18	47.89	0.938	Leading
C	209.90	231.07	45.60	22.10	48.50	0.940	Leading
D	209.90	236.48	46.73	22.27	49.64	0.942	Leading
E	209.90	233.63	46.11	22.15	49.04	0.940	Leading

Test Item Photographs

TI-4540

Images of Product(s) under test. Identification of each of the products can be found on page 3 of this report





Internal Circuitry including Rating Labels

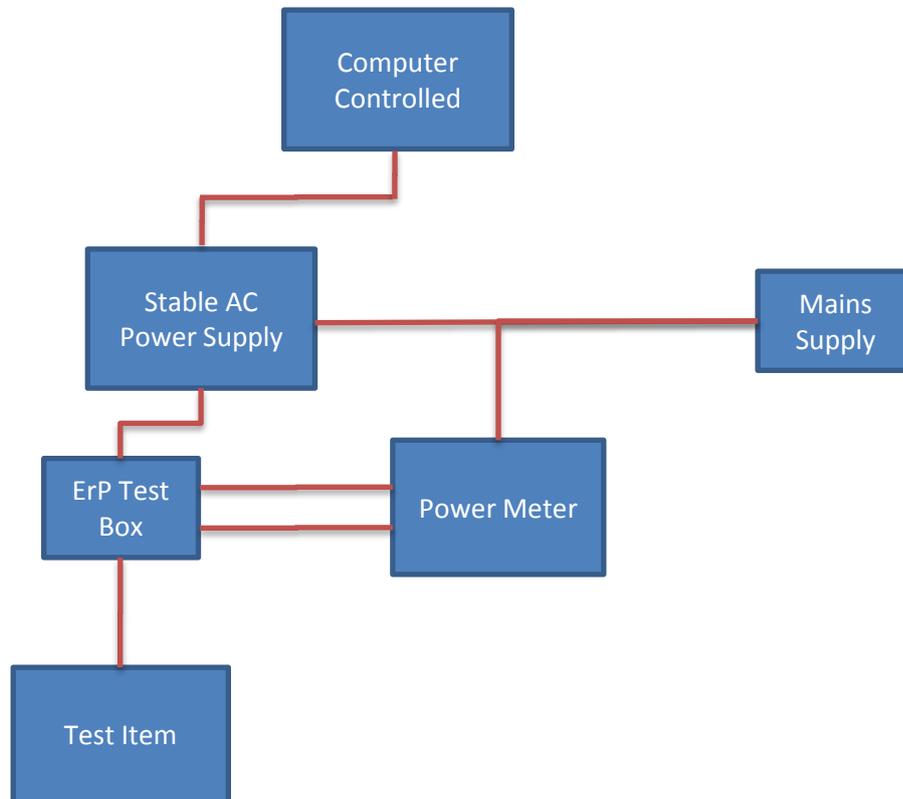


Driver in Situ



Light Engine

Appendix 1: Test item set-up



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