

# Current and Voltage Characterisation of the Gemma Lighting Product

Prepared for: Gemma Lighting Limited  
Unit 3  
Marshlands Spur  
Farlington  
Portsmouth  
Hampshire  
PO6 1RX  
United



Product Service

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Project Management	Richard Poate	09 November 2017	
Authorised Signatory	Andy Lawson	09 November 2017	

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD Product Service document control rules.

### EXECUTIVE SUMMARY

A sample of this product was characterised for voltage and current supplies.

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Product Service

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## 1 Report Summary

### 1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Issue	Description of Change	Date of Issue
1	First Issue	?? September 2017

**Table 1**

### 1.2 Introduction

Applicant	Gemma Lighting Limited
Manufacturer	Gemma Lighting Limited
Model Number(s)	Conquest 70, Conquest 30 and Conquest 130
Serial Number(s)	Conquest 70 S/N: 06170001, 06172498, 06172499, 06172996 and 06172997 Conquest 30 S/N: 06172501, 06172993, 06170001, 06172994 and 06172500 Conquest 130 S/N: 06172502, 06172503, 08172597, 08172598 and 08172599
Hardware Version(s)	Not Known
Software Version(s)	Not known
Number of Samples Tested	10
Order Number	P7097
Date	25-July-2017
Date of Receipt of EUT	10-August-2017
Start of Test	10-August-2017
Finish of Test	05-September-2017
Name of Engineer(s)	Colin McKean and Jack Tuckwell
Related Document(s)	Not Applicable

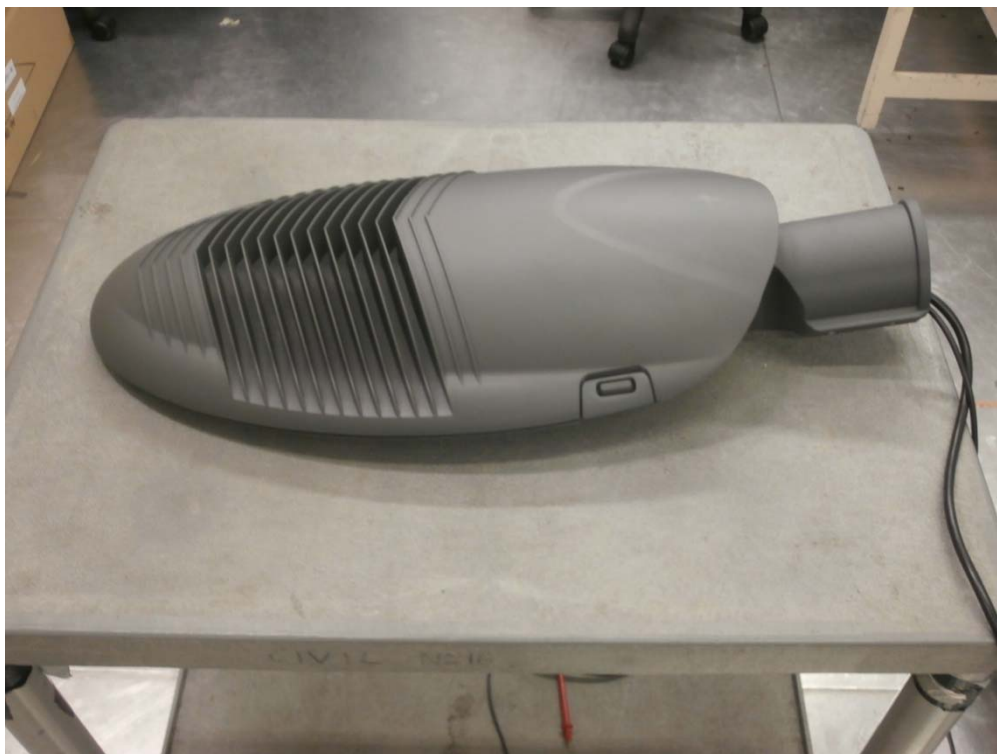
### **1.3 Product Information**

#### **1.3.1 Technical Description**

The Equipment Under Test (EUT) was a Gemma Lighting, Conquest 70, Conquest 30 and Conquest 130 Street Light.

The primary function of the EUT is to light up city streets.

A full description and detailed product specification details are available from the manufacturer.



**Figure 1 - General View**

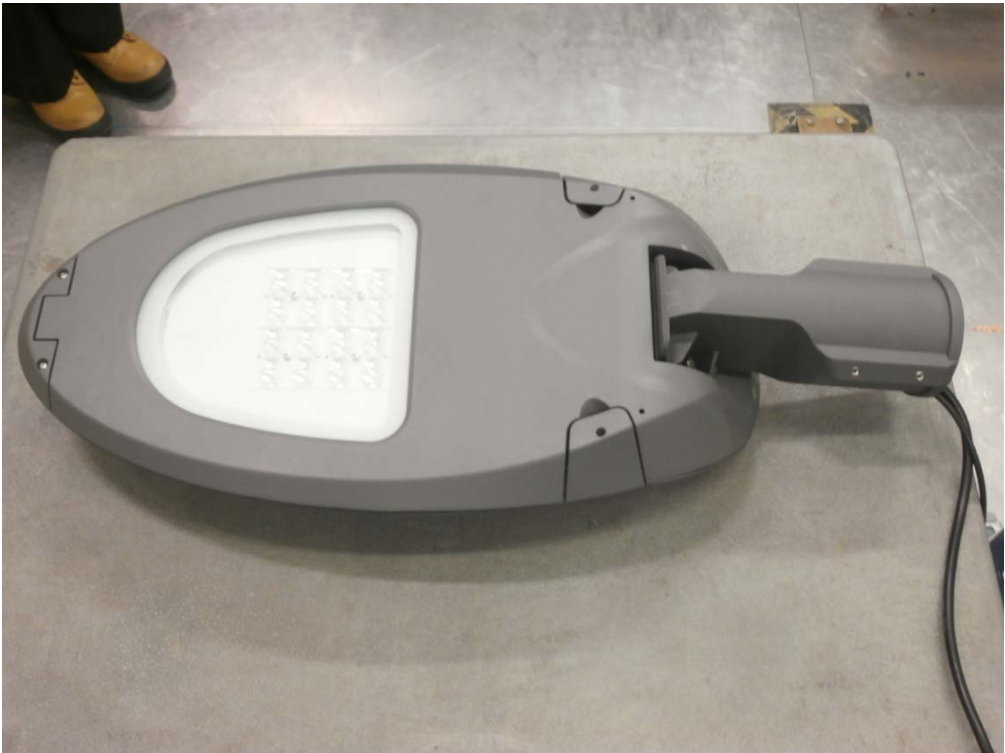


Figure 2 - Underside View

1.3.2 EUT Port/Cable Identification

Port	Max Cable Length specified	Usage	Type	Screened
AC Powered - Illuminating				
AC Mains Cable	>3M	Mains	3 Core Flex	No
Signal Cable	>3M	Signal	3 Core Flex	No

Table 2

1.3.3 Test Configuration

Configuration	Description
AC Powered	The EUT was powered using a 240V AC 50Hz supply.

Table 3

1.3.4 Modes of Operation

Mode	Description
Measuring	The EUT was Illuminating at different levels

Table 4



Product Service

## **1.4 Test Location**

Office Address:

TUV SUD Product Service  
Octagon House  
Concorde Way  
Segensworth North  
Fareham  
Hampshire  
PO15 5RL  
United Kingdom

## 2 Test Details

### 2.1 Current and Voltage Characterisation

#### 2.1.1 Equipment Under Test and Modification State

Conquest 70 S/N: 06170001, 06172498, 06172499, 06172996 and 06172997.

Conquest 30 S/N: 06172501, 06172993, 06170001, 06172994 and 06172500.

Conquest 130 S/N: 06172502, 06172503, 08172597, 08172598 and 08172599.

#### 2.1.2 Date of Test

10-August-2017 and 05-September-2017

#### 2.1.3 Test Method

The equipment under test including associated cabling was placed on a non-conductive table 0.8m above a reference ground plane all within a test laboratory.

Measurements were taken with the EUT's supply adjusted from 210V to 250V in 5 steps and at 5 different illuminating settings.

#### 2.1.4 Environmental Conditions

Ambient Temperature 22.0 to 22.1 °C

Relative Humidity 56.0 to 61%

#### 2.1.5 Test Results

**Results for Configuration and Mode: AC Powered - Illuminating.**

Detailed results are shown below.

##### Conquest 70 (S/N 06170001)

Voltage(Volts)	Power(Watts)	Set for 70	Set for 60	Set for 50	Set for 40	Set for 30
210	Watts	69.28	59.24	49.17	39.68	29.34
	VA	71.2	61.4	51.5	42.6	33.3
220	Watts	69.56	59.44	49.28	39.51	29.44
	VA	72.0	62.0	52.3	43.2	34.3
230	Watts	69.23	59.27	49.37	39.68	29.70
	VA	72.1	62.3	53.0	44.0	35.1
240	Watts	69.23	59.48	49.75	39.65	30.1
	VA	72.6	63.1	53.9	44.6	36.5
250	Watts	69.64	59.44	49.64	39.71	30.17
	VA	73.60	63.7	54.5	45.8	37.5
Average Reading	Watts	69.39	59.37	49.44	39.65	29.75
	VA	72.30	62.50	53.04	44.04	35.34

**Table 5**

### Conquest 70 (S/N 06172498)

Voltage(Volts)	Power(Watts)	Set for 70	Set for 60	Set for 50	Set for 40	Set for 30
210	Watts	69.03	59.42	49.53	39.66	29.45
	VA	70.8	61.4	51.8	42.8	33.5
220	Watts	68.95	59.47	49.68	39.85	29.90
	VA	71.3	62.0	52.5	43.4	34.5
230	Watts	68.96	59.52	49.76	39.69	29.99
	VA	71.8	62.6	53.2	43.9	35.4
240	Watts	69.21	59.32	49.6	39.91	30.17
	VA	72.5	63.0	53.6	44.8	36.5
250	Watts	69.42	59.74	49.88	40.19	30.34
	VA	73.5	64.1	54.9	46.3	37.9
Average Reading	Watts	69.11	59.49	49.69	39.86	29.97
	VA	71.98	62.62	53.20	44.24	35.56

**Table 6**

### Conquest 70 (S/N 06172499)

Voltage(Volts)	Power(Watts)	Set for 70	Set for 60	Set for 50	Set for 40	Set for 30
210	Watts	69.13	59.03	49.31	39.52	29.66
	VA	71.2	61.3	51.6	42.7	33.7
220	Watts	69.38	59.25	49.33	39.45	29.79
	VA	71.8	61.8	52.2	43.2	34.7
230	Watts	69.10	59.30	49.50	39.60	29.77
	VA	72.0	62.5	53.3	44.1	35.6
240	Watts	69.16	59.44	49.46	39.60	29.76
	VA	72.6	63.0	53.9	44.7	36.5
250	Watts	69.40	59.21	49.86	39.74	29.93
	VA	73.3	63.4	54.9	45.9	37.6
Average Reading	Watts	69.23	59.25	49.49	39.58	29.78
	VA	72.18	62.40	53.18	44.12	35.62

**Table 7**



**Conquest 70 (S/N 06172996)**

Voltage(Volts)	Power(Watts)	Set for 70	Set for 60	Set for 50	Set for 40	Set for 30
210	Watts	68.89	59.32	49.28	39.26	29.48
	VA	70.6	61.3	51.6	42.3	33.6
220	Watts	68.99	59.37	49.26	39.51	29.66
	VA	71.4	61.9	52.1	43.1	34.4
230	Watts	69.07	59.42	49.65	39.63	29.65
	VA	71.8	62.3	53.1	44.0	35.0
240	Watts	68.80	59.42	49.40	39.76	29.78
	VA	72.1	63.1	53.6	44.7	36.1
250	Watts	68.84	59.54	49.45	40.14	29.92
	VA	72.7	63.7	54.4	45.9	37.3
Average Reading	Watts	68.92	59.41	49.41	39.66	29.70
	VA	71.72	62.46	52.96	44.00	35.28

**Table 8**

**Conquest 70 (S/N 06172997)**

Voltage(Volts)	Power(Watts)	Set for 70	Set for 60	Set for 50	Set for 40	Set for 30
210	Watts	68.78	58.86	48.87	39.09	29.7
	VA	70.5	60.9	51.2	42.1	33.2
220	Watts	68.84	58.84	49.21	39.12	29.24
	VA	71.0	61.5	52.2	42.7	33.9
230	Watts	68.81	58.95	49.26	39.51	29.67
	VA	71.5	61.9	52.9	43.7	35.3
240	Watts	68.86	59.02	49.42	39.47	29.71
	VA	72.5	62.6	53.5	44.6	36.1
250	Watts	68.94	58.81	49.42	39.82	29.74
	VA	72.9	63.2	54.2	45.6	37.2
Average Reading	Watts	68.85	58.90	49.24	39.40	29.61
	VA	71.68	62.02	52.80	43.74	35.14

**Table 9**



**Conquest 30 (S/N 06172501)**

Voltage(Volts)	Power(Watts)	Set for 30	Set for 25.5	Set for 21	Set for 16.5	Set for 12.5
210	Watts	29.46	25.4	20.73	16.62	12.31
	VA	30.3	26.3	21.9	18.4	14.5
220	Watts	29.66	25.21	20.75	16.73	12.47
	VA	30.8	26.4	22.4	18.8	15.3
230	Watts	29.76	25.52	21.25	17.0	12.83
	VA	31.0	27.0	23.0	19.5	16.1
240	Watts	30.6	25.52	21.38	17.03	13.05
	VA	31.6	27.3	23.7	19.9	16.6
250	Watts	30.26	25.74	21.43	17.42	13.07
	VA	32.3	27.8	24.2	20.7	17.3
Average Reading	Watts	29.95	25.48	21.11	16.96	12.75
	VA	31.20	26.96	23.04	19.46	15.96

**Table 10**

**Conquest 30 (S/N 06172993)**

Voltage(Volts)	Power(Watts)	Set for 30	Set for 25.5	Set for 21	Set for 16.5	Set for 12.5
210	Watts	29.59	25.36	20.78	16.76	12.33
	VA	30.6	26.4	22.1	18.6	14.7
220	Watts	29.69	25.39	20.92	16.58	12.82
	VA	30.8	26.6	22.5	18.8	15.7
230	Watts	30.00	25.82	21.18	16.71	12.99
	VA	30.3	27.3	23.2	19.4	16.2
240	Watts	30.15	25.74	21.39	17.12	13.11
	VA	31.8	27.5	23.9	20.1	17.0
250	Watts	30.15	25.86	21.74	17.09	13.42
	VA	32.4	28.1	24.7	20.7	17.6
Average Reading	Watts	29.92	25.63	21.20	16.85	12.93
	VA	31.18	27.18	23.28	19.52	16.24

**Table 11**

**Conquest 30 (S/N 06170001)**

Voltage(Volts)	Power(Watts)	Set for 30	Set for 25.5	Set for 21	Set for 16.5	Set for 12.5
210	Watts	29.22	25.3	20.65	16.55	13.10
	VA	30.1	26.3	22.1	18.4	17.4
220	Watts	29.37	25.33	21.02	16.83	13.17
	VA	30.4	26.5	22.8	19.0	17.0
230	Watts	29.61	25.72	21.03	16.85	12.93
	VA	31.0	27.2	23.1	19.5	16.3
240	Watts	29.85	25.49	21.09	16.9	13.18
	VA	31.6	27.5	23.6	20.2	17.0
250	Watts	29.88	25.97	21.33	17.36	13.42
	VA	32.0	28.5	24.4	21.2	17.7
Average Reading	Watts	29.59	25.56	21.02	16.90	13.16
	VA	31.02	27.20	23.20	19.66	17.08

**Table 12**

**Conquest 30 (S/N 06172994)**

Voltage(Volts)	Power(Watts)	Set for 30	Set for 25.5	Set for 21	Set for 16.5	Set for 12.5
210	Watts	29.57	25.37	21.01	16.54	12.6
	VA	30.4	26.3	22.3	18.4	15.1
220	Watts	29.78	25.57	21.00	16.83	12.62
	VA	30.9	26.7	22.8	18.9	15.6
230	Watts	30.00	25.63	21.40	16.82	12.74
	VA	31.4	27.3	23.5	19.6	16.1
240	Watts	29.83	25.75	21.55	17.15	13.03
	VA	31.5	27.8	24.0	20.5	16.7
250	Watts	30.00	26.19	21.62	17.55	13.34
	VA	32.1	28.6	24.4	21.1	17.9
Average Reading	Watts	29.84	25.70	21.32	16.98	12.87
	VA	31.26	27.34	23.40	19.70	16.28

**Table 13**

**Conquest 30 (S/N 06172500)**

Voltage(Volts)	Power(Watts)	Set for 30	Set for 25.5	Set for 21	Set for 16.5	Set for 12.5
210	Watts	29.32	25.10	20.58	16.61	12.57
	VA	30.1	26.1	21.9	18.5	14.9
220	Watts	29.6	25.59	21.11	16.82	12.40
	VA	30.8	26.8	22.8	19.0	15.3
230	Watts	29.82	25.63	21.01	16.77	12.69
	VA	31.2	27.3	23.2	19.2	16.0
240	Watts	29.74	25.76	21.03	16.85	13.15
	VA	31.5	27.6	23.6	19.9	17.1
250	Watts	30.15	26.05	21.26	17.09	13.09
	VA	32.3	28.3	24.3	20.8	17.5
Average Reading	Watts	29.73	25.63	21.00	16.83	12.78
	VA	31.18	27.22	23.16	19.48	16.16

**Table 14**

**Conquest 130 (S/N 06172502)**

Voltage(Volts)	Power(Watts)	Set for 130	Set for 115	Set for 100	Set for 85	Set for 70
210	Watts	128.72	114.01	98.88	83.95	69.20
	VA	130.1	115.6	101.1	87.8	72.5
220	Watts	128.6	113.6	98.9	84.05	69.48
	VA	103.3	115.9	101.7	88.2	73.1
230	Watts	128.32	113.61	98.98	84.10	69.61
	VA	130.7	116.2	102.3	88.6	73.6
240	Watts	128.3	113.95	99.11	84.31	69.72
	VA	130.9	116.9	102.6	89.5	74.7
250	Watts	128.2	114.02	99.15	84.43	69.81
	VA	131.7	117.2	103.1	90.3	75.6
Average Reading	Watts	128.43	113.84	99.01	84.17	69.56
	VA	130.74	116.36	102.16	88.88	73.9

**Table 15**



**Conquest 130 (S/N 06172503)**

Voltage(Volts)	Power(Watts)	Set for 130	Set for 115	Set for 100	Set for 85	Set for 70
210	Watts	128.8	114.01	99.2	84.20	69.40
	VA	129.9	115.4	100.9	86.7	72.0
220	Watts	128.75	113.7	99.11	84.19	69.51
	VA	130.1	115.8	101.5	87.0	72.4
230	Watts	128.6	113.8	99.01	84.29	69.57
	VA	130.2	116.1	101.7	87.4	72.9
240	Watts	128.2	113.8	98.97	84.48	69.63
	VA	130.6	116.6	102.1	88.2	73.9
250	Watts	128.1	113.52	98.99	84.52	69.5
	VA	131.2	116.8	102.9	88.7	74.6
Average Reading	Watts	128.49	113.77	99.06	84.34	69.522
	VA	130.4	116.14	101.82	87.6	73.16

**Table 16**

**Conquest 130 (S/N 08172597)**

Voltage(Volts)	Power(Watts)	Set for 130	Set for 115	Set for 100	Set for 85	Set for 70
210	Watts	129.1	114.02	99.41	84.2	69.39
	VA	130.8	116.0	101.6	87.0	72.4
220	Watts	128.47	113.95	99.14	84.25	69.29
	VA	130.6	116.4	102.0	87.5	73.5
230	Watts	128.44	113.7	99.26	84.22	69.18
	VA	130.9	116.6	102.6	87.8	73.8
240	Watts	128.37	114.01	99.17	83.99	69.24
	VA	131.5	117.1	103.2	88.5	74.9
250	Watts	128.2	113.98	99.09	84.4	69.33
	VA	131.6	117.9	103.9	89.5	75.8
Average Reading	Watts	128.52	113.93	99.21	84.21	69.29
	VA	131.08	116.8	102.66	88.06	74.08

**Table 17**

**Conquest 130 (S/N 08172598)**

Voltage(Volts)	Power(Watts)	Set for 130	Set for 115	Set for 100	Set for 85	Set for 70
210	Watts	128.8	114.38	99.41	84.5	69.50
	VA	130.4	116.4	101.6	87.1	72.7
220	Watts	128.7	114.42	99.36	84.35	69.55
	VA	130.8	116.7	102.0	87.5	73.03
230	Watts	128.7	114.56	99.43	84.3	69.66
	VA	131.1	117.2	102.8	88.0	74.2
240	Watts	128.8	114.46	99.48	84.55	69.75
	VA	131.7	117.5	103.1	88.8	75.2
250	Watts	129.01	114.3	99.91	84.91	70.27
	VA	132.1	118.3	104.1	89.6	76.1
Average Reading	Watts	128.80	114.42	99.52	84.52	67.75
	VA	131.22	117.22	102.72	88.2	74.25

**Table 18**

**Conquest 130 (S/N 08172597)**

Voltage(Volts)	Power(Watts)	Set for 130	Set for 115	Set for 100	Set for 85	Set for 70
210	Watts	128.70	113.95	99.13	83.42	68.97
	VA	130.5	115.4	101.0	86.3	71.9
220	Watts	128.62	113.89	98.97	83.55	68.81
	VA	130.7	115.9	101.5	86.5	72.8
230	Watts	128.54	113.81	98.83	83.82	68.8
	VA	130.9	116.1	101.9	87.2	73.2
240	Watts	128.31	113.7	98.75	83.95	68.91
	VA	131.3	116.7	102.4	88.1	73.9
250	Watts	128.28	113.5	98.71	84.07	69.01
	VA	131.6	117.3	102.9	89.1	75.2
Average Reading	Watts	128.49	113.77	98.88	83.76	68.9
	VA	131	116.28	101.94	87.44	73.4

**Table 19**



**Figure 3 – Test Setup**

#### 2.1.6 Test Location and Test Equipment Used

This test was carried out in EMC Laboratory 1.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Harmonics & Flicker System	Schaffner	1000-1	2764	12	28-Mar-2018
AC Power Source (5kVA)	Schaffner	NSG1007	2765	12	28-Mar-2018

**Table 20**