

# REPORT : ASD-R-1466-A

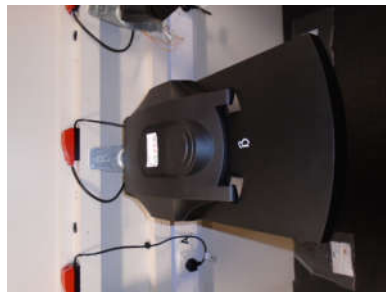
## TYPE : Dimming Output Range

Project Number: 5138  
Customer : ASD Lighting PLC  
Product Type : Street Light  
Project Instigator : D Butler  
Project Start Date : 06/09/2018  
Test Orientation : Installed Attitude  
Project Notes : HWD6 92 LED Range Test

Product Manufact. : ASD Lighting PLC	Luminaire Details
Product Descrip. : HWD6 92 LED c/w optic	Length (mm) : 680
Product Code : HWD6-#4K92xx	Width (mm) : 330
Product Ref. : N.A.	Height (mm) : 170
Driver Type : Osram OT 4 Dim Dali	Test Item A : 2443990
Dimmable : Yes	Test Item B : 2444036
Thermal Management : Passive	Test Item C : 2444038
	Test Item D : 2444030
	Test Item E : 2444023



Item A



Item B



Item C



Item D



Item E

# REPORT : ASD-R-1466-A

## TYPE : Dimming Output Range

Test Number: T1475  
 Test Date: 06/09/2018  
 Stabilization Time (mins): 61  
 Output (%): 29  
 Test Notes : T1  
 Test Start Temp (°C) : 19.00

Nom. Drive Current (mA): 200  
 Test Type: Std  
 Tested By: D Butler  
 Frequency Start Test (Hz) : 50.00  
 Frequency End Test (Hz) : 50.00  
 Test End Temp (°C) : 19.66

ITEM	Voltage (V)	Current (mA)	Power (W)	VA	PF	Lead/Lag
A	250.06	292	60.45	73.04	0.828	Leading
B	250.08	294	60.72	73.61	0.825	Leading
C	250.09	295	61.03	73.84	0.827	Leading
D	250.03	295	60.79	73.84	0.823	Leading
E	250.02	296	60.90	73.93	0.824	Leading
A	240.03	296	60.27	70.98	0.849	Leading
B	240.06	298	60.54	71.51	0.847	Leading
C	240.08	299	60.87	71.75	0.848	Leading
D	240.03	299	60.55	71.74	0.844	Leading
E	240.01	299	60.73	71.74	0.847	Leading
A	230.01	300	60.05	69.10	0.869	Leading
B	230.04	302	60.35	69.56	0.868	Leading
C	230.05	304	60.65	69.84	0.869	Leading
D	230.01	304	60.41	69.86	0.865	Leading
E	230.03	304	60.54	69.84	0.867	Leading
A	220.04	307	59.94	67.48	0.888	Leading
B	220.05	309	60.21	67.89	0.887	Leading
C	220.06	310	60.53	68.16	0.888	Leading
D	220.02	309	60.25	68.09	0.885	Leading
E	220.02	310	60.40	68.19	0.886	Leading
A	210.03	314	59.82	65.99	0.906	Leading
B	210.01	316	60.11	66.42	0.905	Leading
C	210.05	318	60.43	66.73	0.906	Leading
D	209.99	317	60.17	66.61	0.903	Leading
E	210.01	318	60.35	66.73	0.904	Leading

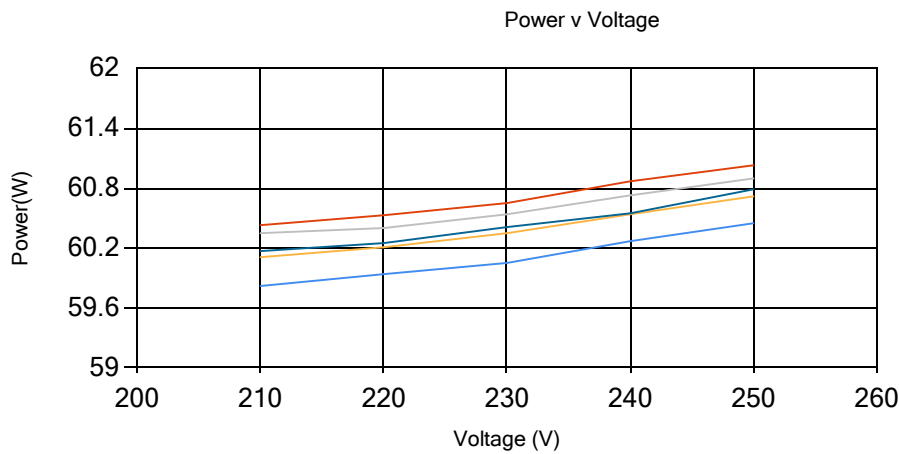
# REPORT : ASD-R-1466-A

## TYPE : Dimming Output Range

Test Number: T1475 Graphical Results Of Previous Page Tests.

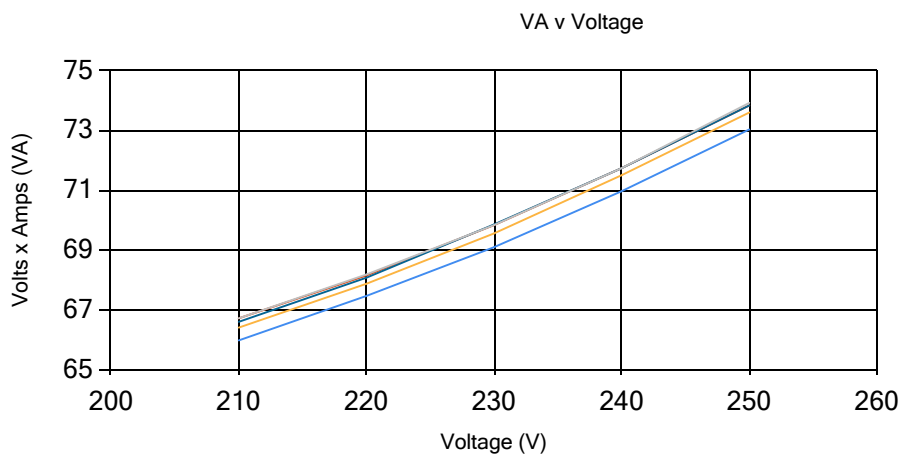
Drive (mA): 200

Output (%): 29



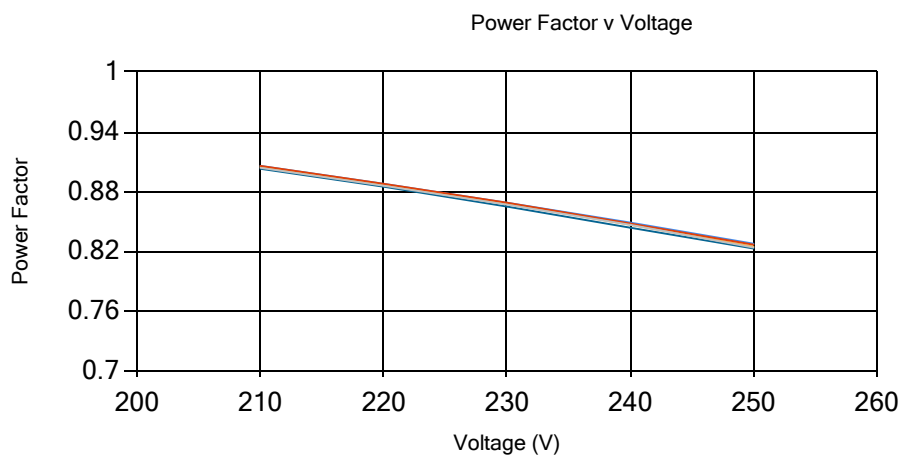
Fitting Designation

- A
- B
- C
- D
- E



Fitting Designation

- A
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Fitting Designation

- A
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# REPORT : ASD-R-1466-A

## TYPE : Dimming Output Range

Test Number: T1476  
 Test Date: 06/09/2018  
 Stabilization Time (mins): 48  
 Output (%): 46  
 Test Notes : T2  
 Test Start Temp (°C) : 19.02

Nom. Drive Current (mA): 325  
 Test Type: Std  
 Tested By: D Butler  
 Frequency Start Test (Hz) : 50.00  
 Frequency End Test (Hz) : 50.00  
 Test End Temp (°C) : 19.72

ITEM	Voltage (V)	Current (mA)	Power (W)	VA	PF	Lead/Lag
A	250.04	408	93.34	102.06	0.915	Leading
B	250.05	409	93.46	102.41	0.913	Leading
C	250.07	411	94.07	102.86	0.915	Leading
D	250.03	410	93.45	102.46	0.912	Leading
E	250.05	410	93.67	102.61	0.913	Leading
A	240.05	418	93.12	100.44	0.927	Leading
B	240.07	420	93.31	100.74	0.926	Leading
C	240.09	422	93.87	101.23	0.927	Leading
D	240.06	420	93.31	100.85	0.925	Leading
E	240.07	421	93.43	101.00	0.925	Leading
A	230.03	430	92.91	98.98	0.939	Leading
B	230.05	432	93.17	99.28	0.939	Leading
C	230.06	434	93.70	99.85	0.939	Leading
D	230.01	432	93.07	99.34	0.937	Leading
E	230.07	433	93.42	99.58	0.938	Leading
A	220.02	445	92.85	97.80	0.949	Leading
B	220.02	445	93.04	98.01	0.949	Leading
C	220.05	448	93.57	98.57	0.949	Leading
D	220.00	446	93.00	98.12	0.948	Leading
E	220.00	447	93.31	98.33	0.948	Leading
A	210.01	460	92.76	96.73	0.959	Leading
B	210.06	462	93.08	97.04	0.959	Leading
C	210.06	465	93.61	97.62	0.959	Leading
D	210.06	463	93.07	97.17	0.957	Leading
E	209.99	463	93.21	97.30	0.958	Leading

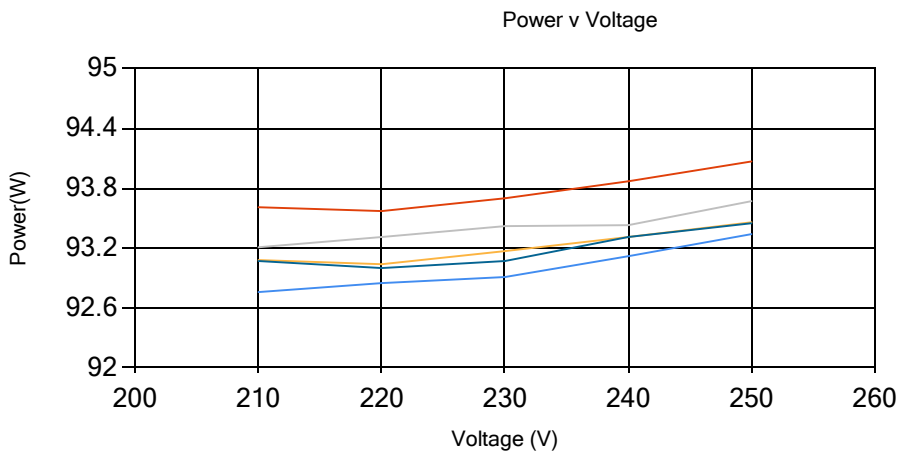
# REPORT : ASD-R-1466-A

## TYPE : Dimming Output Range

Test Number: T1476 Graphical Results Of Previous Page Tests.

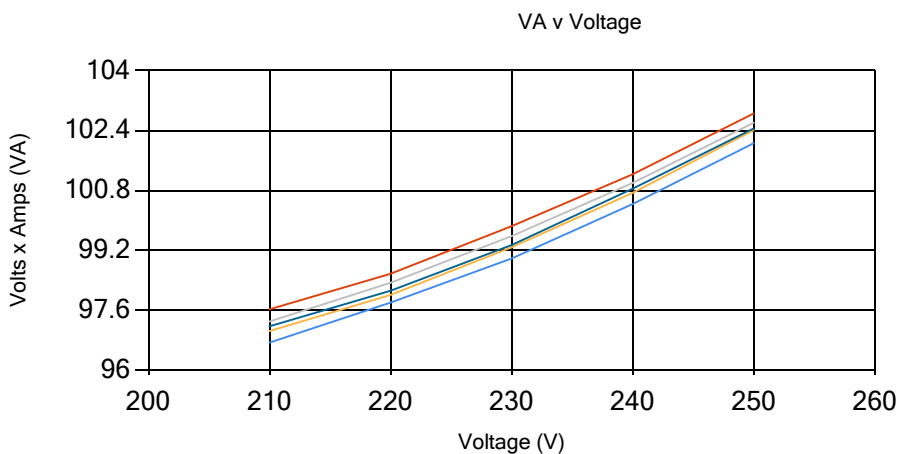
Drive (mA): 325

Output (%): 46



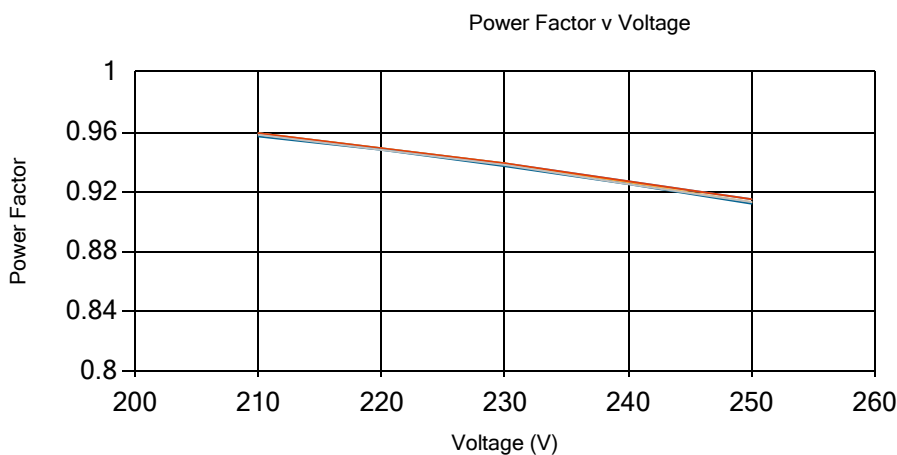
Fitting Designation

- A
- B
- C
- D
- E



Fitting Designation

- A
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- A
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# REPORT : ASD-R-1466-A

## TYPE : Dimming Output Range

Test Number: T1477  
 Test Date: 07/09/2018  
 Stabilization Time (mins): 46  
 Output (%): 64  
 Test Notes : T3  
 Test Start Temp (°C) : 18.66

Nom. Drive Current (mA): 450  
 Test Type: Std  
 Tested By: D Butler  
 Frequency Start Test (Hz) : 50.00  
 Frequency End Test (Hz) : 50.00  
 Test End Temp (°C) : 19.85

ITEM	Voltage (V)	Current (mA)	Power (W)	VA	PF	Lead/Lag
A	250.01	531	125.87	132.84	0.948	Leading
B	250.10	534	126.32	133.52	0.946	Leading
C	250.11	536	127.01	134.04	0.947	Leading
D	250.07	534	126.41	133.65	0.946	Leading
E	250.04	534	126.29	133.51	0.946	Leading
A	240.02	548	125.75	131.54	0.956	Leading
B	240.06	550	126.05	131.96	0.955	Leading
C	240.07	553	126.78	132.66	0.956	Leading
D	240.07	551	126.21	132.20	0.955	Leading
E	240.08	551	126.28	132.38	0.954	Leading
A	230.02	567	125.60	130.38	0.963	Leading
B	230.02	568	125.89	130.75	0.963	Leading
C	230.05	572	126.62	131.48	0.963	Leading
D	229.99	570	126.15	131.09	0.962	Leading
E	230.08	570	126.06	131.13	0.961	Leading
A	220.05	588	125.54	129.39	0.970	Leading
B	220.04	590	125.88	129.82	0.970	Leading
C	220.03	593	126.61	130.53	0.970	Leading
D	220.00	591	125.98	129.94	0.970	Leading
E	220.05	592	126.07	130.22	0.968	Leading
A	210.02	613	125.57	128.65	0.976	Leading
B	210.06	614	125.95	129.11	0.976	Leading
C	210.05	617	126.59	129.60	0.977	Leading
D	210.04	615	126.01	129.17	0.976	Leading
E	210.05	616	126.10	129.41	0.975	Leading

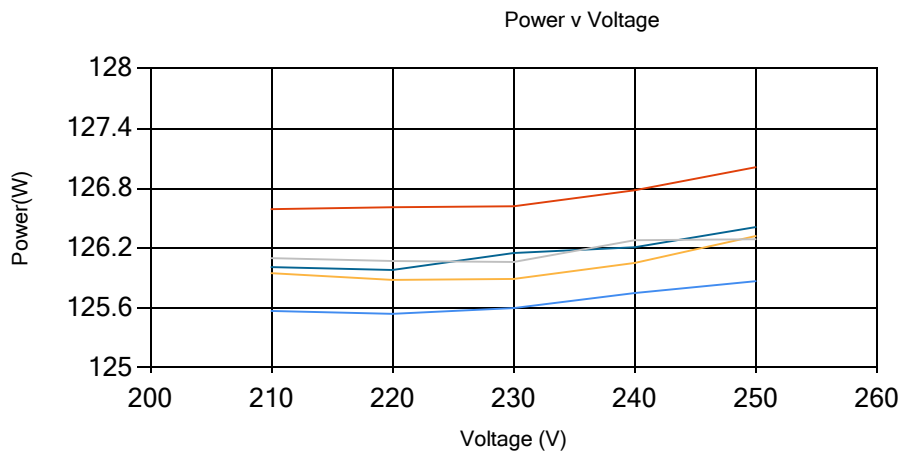
# REPORT : ASD-R-1466-A

## TYPE : Dimming Output Range

Test Number: T1477 Graphical Results Of Previous Page Tests.

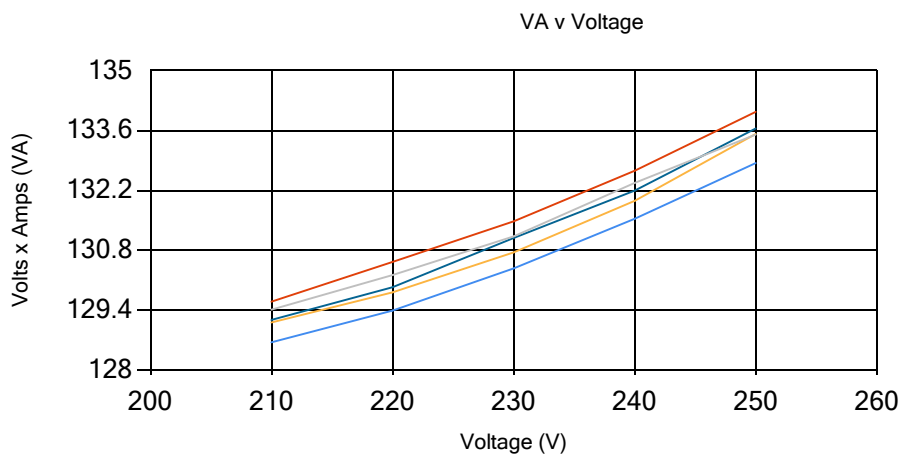
Drive (mA): 450

Output (%): 64



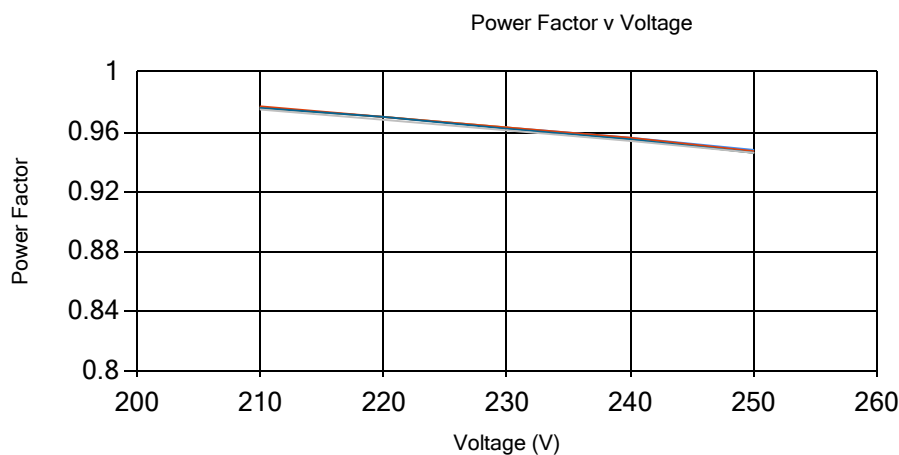
Fitting Designation

- A
- B
- C
- D
- E



Fitting Designation

- A
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# REPORT : ASD-R-1466-A

## TYPE : Dimming Output Range

Test Number: T1478  
 Test Date: 07/09/2018  
 Stabilization Time (mins): 42  
 Output (%): 82  
 Test Notes : T4  
 Test Start Temp (°C) : 19.57

Nom. Drive Current (mA): 575  
 Test Type: Std  
 Tested By: D Butler  
 Frequency Start Test (Hz) : 50.00  
 Frequency End Test (Hz) : 50.00  
 Test End Temp (°C) : 20.82

ITEM	Voltage (V)	Current (mA)	Power (W)	VA	PF	Lead/Lag
A	250.03	664	159.74	165.93	0.963	Leading
B	250.08	665	159.94	166.26	0.962	Leading
C	250.09	669	161.01	167.30	0.962	Leading
D	250.00	666	160.13	166.53	0.962	Leading
E	250.07	667	160.16	166.70	0.961	Leading
A	240.03	686	159.55	164.74	0.969	Leading
B	240.08	687	159.75	165.01	0.968	Leading
C	240.06	692	160.87	166.04	0.969	Leading
D	240.05	689	160.12	165.44	0.968	Leading
E	240.07	690	160.08	165.58	0.967	Leading
A	230.02	712	159.55	163.86	0.974	Leading
B	230.05	713	159.75	164.10	0.974	Leading
C	230.06	717	160.75	165.02	0.974	Leading
D	230.05	715	159.93	164.38	0.973	Leading
E	230.06	716	160.19	164.70	0.973	Leading
A	220.05	741	159.58	163.08	0.979	Leading
B	220.04	742	159.75	163.36	0.978	Leading
C	220.05	747	160.78	164.29	0.979	Leading
D	220.04	744	159.99	163.64	0.978	Leading
E	220.05	745	160.15	163.85	0.977	Leading
A	210.01	774	159.64	162.47	0.983	Leading
B	210.03	775	159.91	162.79	0.982	Leading
C	210.05	780	161.02	163.84	0.983	Leading
D	210.04	777	160.15	163.11	0.982	Leading
E	210.05	777	160.23	163.20	0.982	Leading



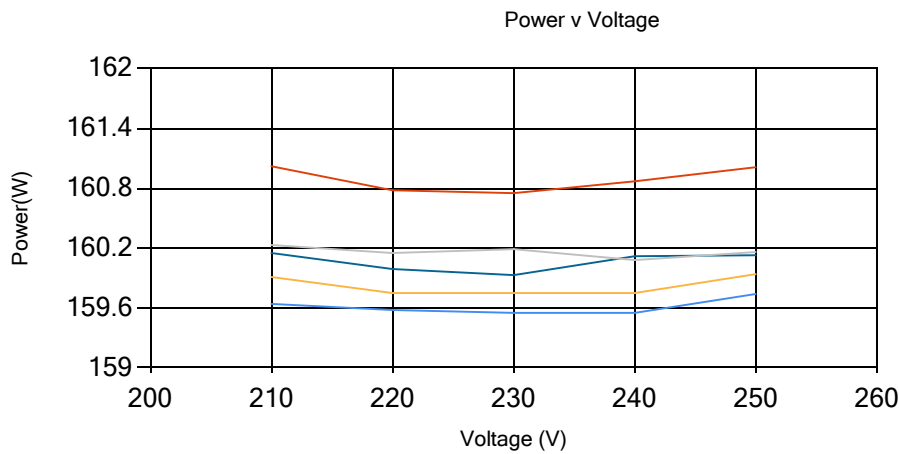
# REPORT : ASD-R-1466-A

## TYPE : Dimming Output Range

Test Number: T1478 Graphical Results Of Previous Page Tests.

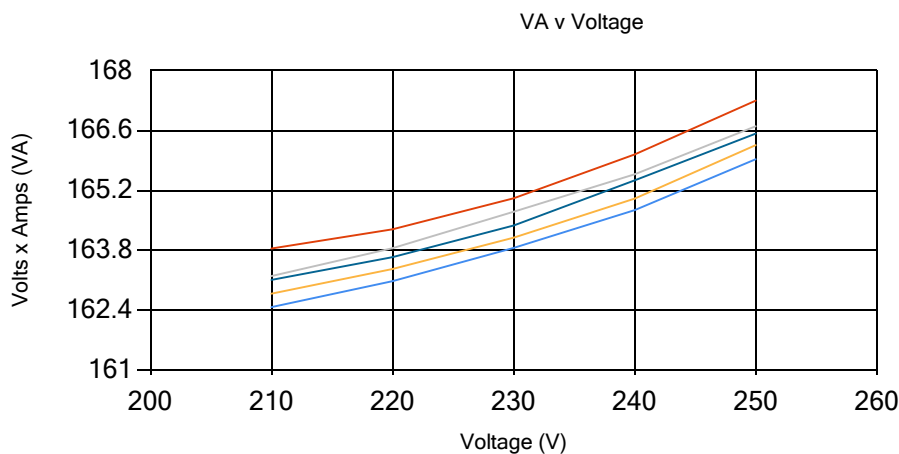
Drive (mA): 575

Output (%): 82



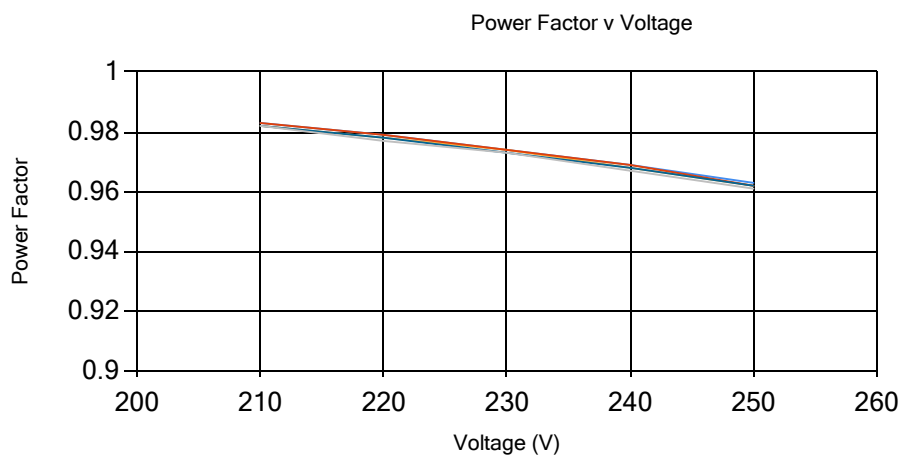
Fitting Designation

- A
- B
- C
- D
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Fitting Designation

- A
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- D
- E



Fitting Designation

- A
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# REPORT : ASD-R-1466-A

## TYPE : Dimming Output Range

Test Number: T1479  
 Test Date: 07/09/2018  
 Stabilization Time (mins): 41  
 Output (%): 100  
 Test Notes : T5  
 Test Start Temp (°C) : 20.13

Nom. Drive Current (mA): 700  
 Test Type: Std  
 Tested By: D Butler  
 Frequency Start Test (Hz) : 50.00  
 Frequency End Test (Hz) : 50.00  
 Test End Temp (°C) : 22.04

ITEM	Voltage (V)	Current (mA)	Power (W)	VA	PF	Lead/Lag
A	250.04	817	196.66	204.38	0.962	Leading
B	250.06	815	196.24	203.89	0.963	Leading
C	250.07	817	196.30	204.20	0.961	Leading
D	250.06	815	196.15	203.90	0.962	Leading
E	250.08	816	196.33	204.14	0.962	Leading
A	240.03	845	196.21	202.73	0.968	Leading
B	240.08	843	195.95	202.41	0.968	Leading
C	240.06	844	195.89	202.59	0.967	Leading
D	240.06	843	195.77	202.29	0.968	Leading
E	240.07	844	195.97	202.66	0.967	Leading
A	230.02	876	195.91	201.38	0.973	Leading
B	230.06	874	195.70	201.12	0.973	Leading
C	230.05	875	195.61	201.26	0.972	Leading
D	230.05	874	195.58	201.03	0.973	Leading
E	230.06	875	195.67	201.30	0.972	Leading
A	220.05	911	195.86	200.39	0.977	Leading
B	220.04	909	195.47	200.00	0.977	Leading
C	220.05	910	195.46	200.20	0.976	Leading
D	220.09	909	195.57	200.08	0.977	Leading
E	220.06	910	195.57	200.23	0.977	Leading
A	210.00	950	195.80	199.57	0.981	Leading
B	210.02	948	195.48	199.19	0.981	Leading
C	210.03	949	195.46	199.41	0.980	Leading
D	210.07	949	195.47	199.26	0.981	Leading
E	210.05	949	195.55	199.42	0.981	Leading

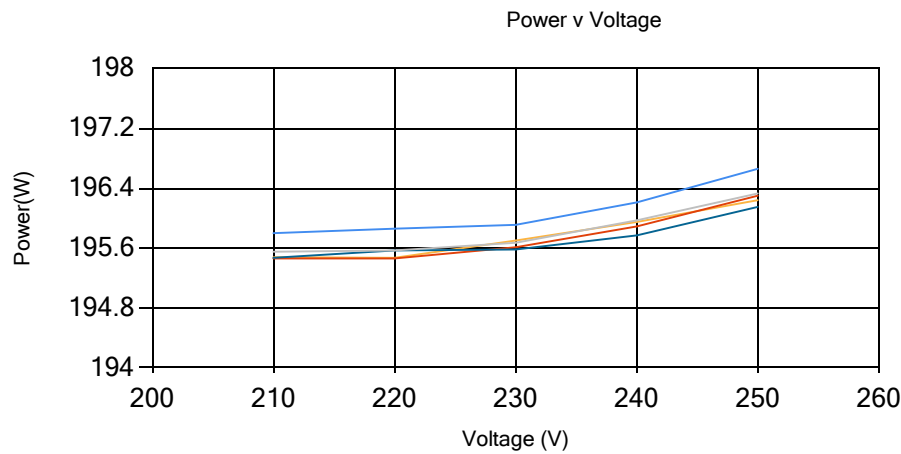
# REPORT : ASD-R-1466-A

## TYPE : Dimming Output Range

Test Number: T1479 Graphical Results Of Previous Page Tests.

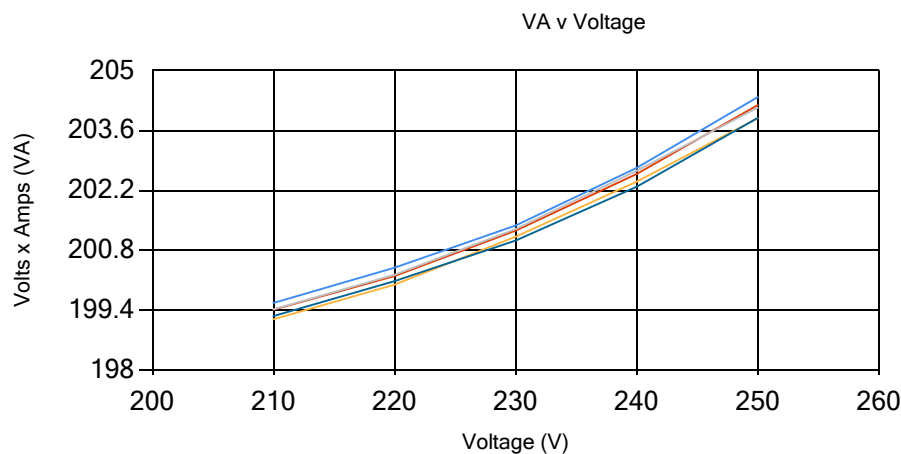
Drive (mA): 700

Output (%): 100



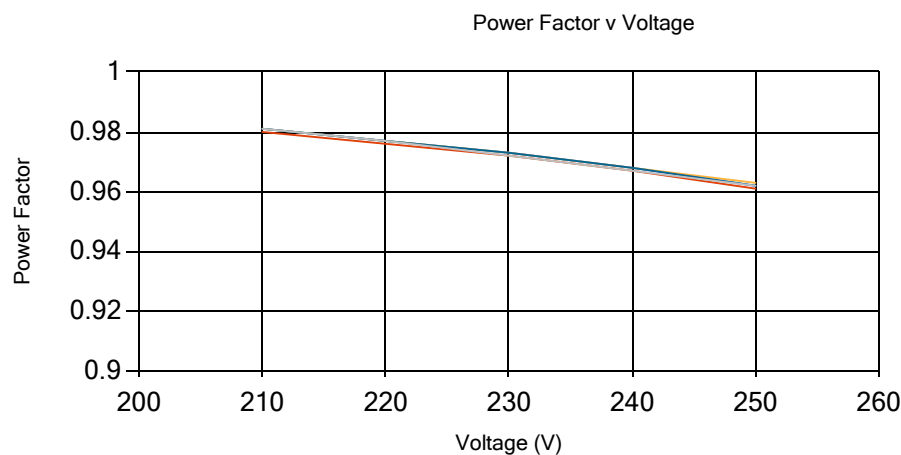
Fitting Designation

- A
- B
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- D
- E



Fitting Designation

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## TYPE : Dimming Output Range

### Test Method.

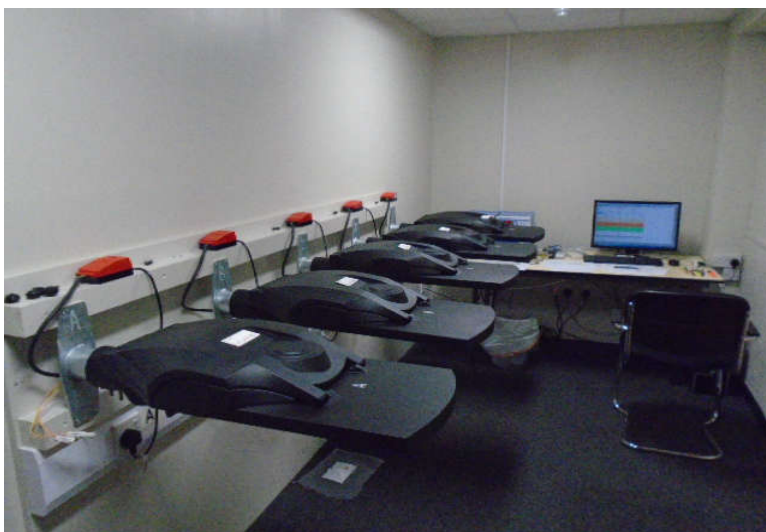
This UMSUG test was conducted in line with the requirements of the Unmetered Supplies Operational Information Document Version 17.0. Using a batch of 5 luminaires of identical product specification, Wattage and VA v Voltage readings were taken at 210, 220, 230, 240, and 250 Volt 50Hz.

The measurements included the drivers required to operate from the mains supply. Before results were recorded the equipment under test was allowed to reach steady state load conditions. This was achieved by powering up at 250V nominal voltage and taking power readings of all five fittings at one minute intervals, in line with LM79-08. The Pre-Burn test period at 250V was set at 15 minutes. The recording of the results commenced after the Pre-Burn period had expired and all five individual fittings had a % difference in power of less than 0.5% taken over a subsequent 15 minute rolling period. The dwell time before recording results, at the 4 reduced voltage levels, was 10 minutes at each reduction. All testing was conducted at a nominal ambient temperature of 20 degrees C. (+/- 3 deg). When testing for a dimming / range code data is taken at full load output, minimum dimmed load and 3 additional dim levels between these extremes. The percentage output dimming level is shown with each set of data. Equipment used: KiKusui PCR 2000M stabilised supply, Yokogawa WT332E and Yokogawa WT333E Digital Power Meters.

### Measurement Uncertainty Between 4W and 500W.

Measured Value.	Accuracy.
Voltage (300V range, 250V 50Hz)	+/- 0.40 V
Current (500 mA, 250V 50Hz)	+/- 0.75 mA
Current (1000 mA, 250V 50Hz)	+/- 1.5 mA
Current (2000 mA, 250V 50Hz)	+/- 3.0 mA
Power (50W , 250V 50Hz)	+/- 0.125 W
Power (150W , 250V 50Hz)	+/- 0.225 W
Power (250W , 250V 50Hz)	+/- 0.40 W
Power (500W , 250V 50Hz)	+/- 0.80 W
Frequency(50Hz)	+/- 0.03 Hz

Measurements of Power of 4W or greater are made with an uncertainty of less than or equal to +/- 2% at a 95% confidence level. Below 4W Uncertainty is less than +/- 0.08 W at a 95% confidence level.



Typical Test Setup.

REPORT : ASD-R-1466-A  
TYPE : Dimming Output Range

Dimming Curve: Avg. Power Of A To E Luminaires at 240V v Dimming Level Set

