

# REPORT : ASD-R-1471-A

## TYPE : Dimming Output Range

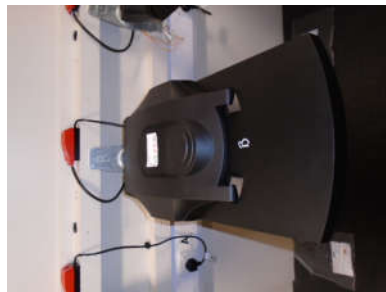
Project Number: 5142  
Customer : ASD Lighting PLC  
Product Type : Street Light  
Project Instigator : D Butler  
Project Start Date : 14/09/2018  
Test Orientation : Installed Attitude  
Project Notes : 60 led HWD6 range test

Product Manufact. : ASD Lighting PLC  
Product Descrip. : HWD6 60 LED  
Product Code : HWD6-#4K60xx  
Product Ref. : N.A.  
Driver Type : Osram OT 4DIM  
Dimmable : Yes  
Thermal Management : Passive

Luminaire Details  
Length (mm) : 680  
Width (mm) : 330  
Height (mm) : 170  
Test Item A : 2443990  
Test Item B : 2444036  
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-1471-A

## TYPE : Dimming Output Range

Test Number: T1499  
 Test Date: 14/09/2018  
 Stabilization Time (mins): 26  
 Output (%): 29  
 Test Notes : T5  
 Test Start Temp (°C) : 20.71

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) : 20.12

ITEM	Voltage (V)	Current (mA)	Power (W)	VA	PF	Lead/Lag
A	250.07	177	39.27	44.25	0.887	Leading
B	250.07	179	39.66	44.69	0.888	Leading
C	250.08	179	39.56	44.67	0.886	Leading
D	250.11	179	39.47	44.81	0.881	Leading
E	250.09	178	39.59	44.62	0.887	Leading
A	240.05	181	39.20	43.40	0.903	Leading
B	240.07	183	39.57	43.83	0.903	Leading
C	240.11	183	39.55	43.84	0.902	Leading
D	240.08	183	39.39	43.86	0.898	Leading
E	240.09	182	39.51	43.74	0.903	Leading
A	230.03	186	39.20	42.69	0.918	Leading
B	230.06	187	39.53	43.04	0.918	Leading
C	230.08	187	39.47	43.01	0.918	Leading
D	230.06	187	39.38	43.09	0.914	Leading
E	230.09	187	39.53	43.01	0.919	Leading
A	220.04	191	39.10	41.96	0.932	Leading
B	220.05	192	39.45	42.36	0.931	Leading
C	220.07	193	39.47	42.39	0.931	Leading
D	220.12	193	39.40	42.45	0.928	Leading
E	220.07	192	39.45	42.31	0.932	Leading
A	210.04	197	39.13	41.46	0.944	Leading
B	210.06	199	39.46	41.82	0.944	Leading
C	210.05	199	39.41	41.74	0.944	Leading
D	210.04	199	39.30	41.76	0.941	Leading
E	210.05	199	39.39	41.70	0.945	Leading

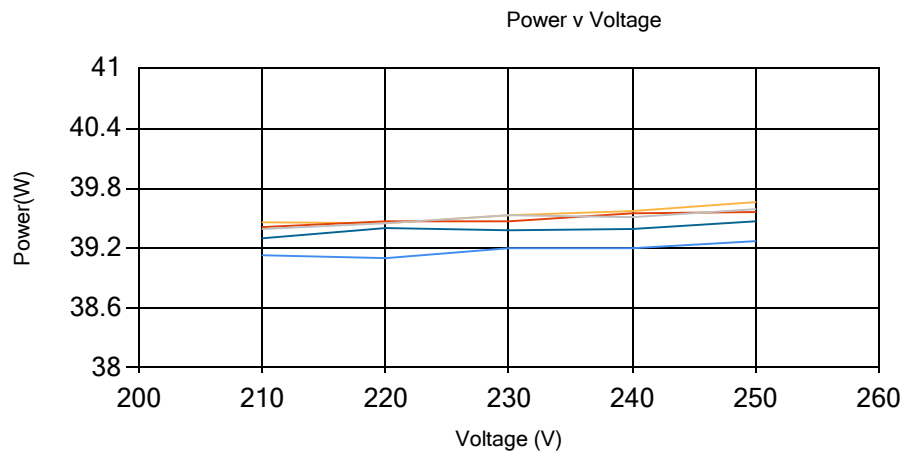
# REPORT : ASD-R-1471-A

## TYPE : Dimming Output Range

Test Number: T1499 Graphical Results Of Previous Page Tests.

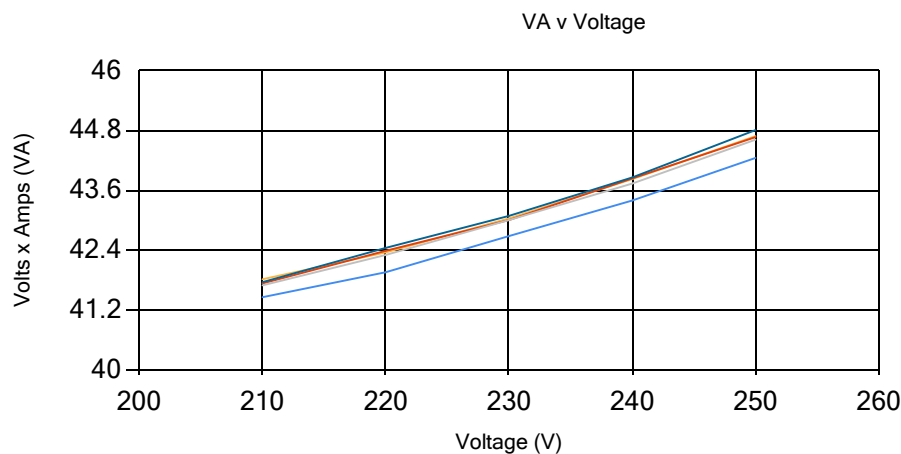
Drive (mA): 200

Output (%): 29



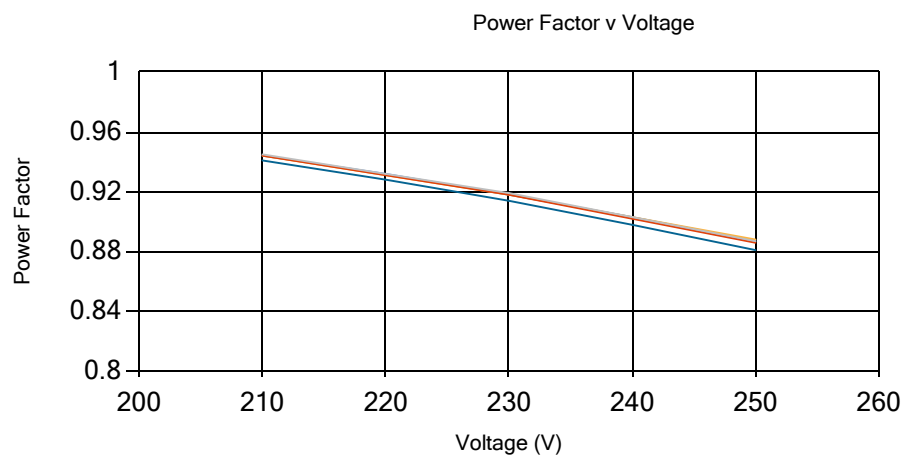
Fitting Designation

- A
- B
- C
- D
- E



Fitting Designation

- A
- B
- C
- D
- E



Fitting Designation

- A
- B
- C
- D
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# REPORT : ASD-R-1471-A

## TYPE : Dimming Output Range

Test Number: T1498  
 Test Date: 14/09/2018  
 Stabilization Time (mins): 27  
 Output (%): 46  
 Test Notes : T4  
 Test Start Temp (°C) : 20.23

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) : 20.30

ITEM	Voltage (V)	Current (mA)	Power (W)	VA	PF	Lead/Lag
A	250.08	258	60.79	64.40	0.944	Leading
B	250.08	258	60.87	64.40	0.945	Leading
C	250.08	258	61.03	64.57	0.945	Leading
D	250.07	258	60.87	64.61	0.942	Leading
E	250.09	258	61.02	64.47	0.947	Leading
A	240.04	265	60.67	63.66	0.953	Leading
B	240.06	266	60.81	63.74	0.954	Leading
C	240.06	266	60.95	63.88	0.954	Leading
D	240.06	266	60.73	63.81	0.952	Leading
E	240.06	266	60.94	63.81	0.955	Leading
A	230.02	274	60.63	63.09	0.961	Leading
B	230.04	275	60.76	63.21	0.961	Leading
C	230.07	275	60.90	63.31	0.962	Leading
D	230.05	275	60.74	63.23	0.961	Leading
E	230.01	275	60.88	63.26	0.962	Leading
A	220.04	285	60.65	62.64	0.968	Leading
B	220.07	285	60.79	62.78	0.968	Leading
C	220.06	286	60.92	62.86	0.969	Leading
D	220.05	286	60.78	62.83	0.968	Leading
E	220.06	286	60.94	62.86	0.969	Leading
A	210.05	297	60.74	62.30	0.975	Leading
B	210.05	297	60.81	62.38	0.975	Leading
C	210.06	297	60.95	62.47	0.976	Leading
D	210.04	297	60.78	62.37	0.974	Leading
E	210.01	298	60.96	62.49	0.976	Leading

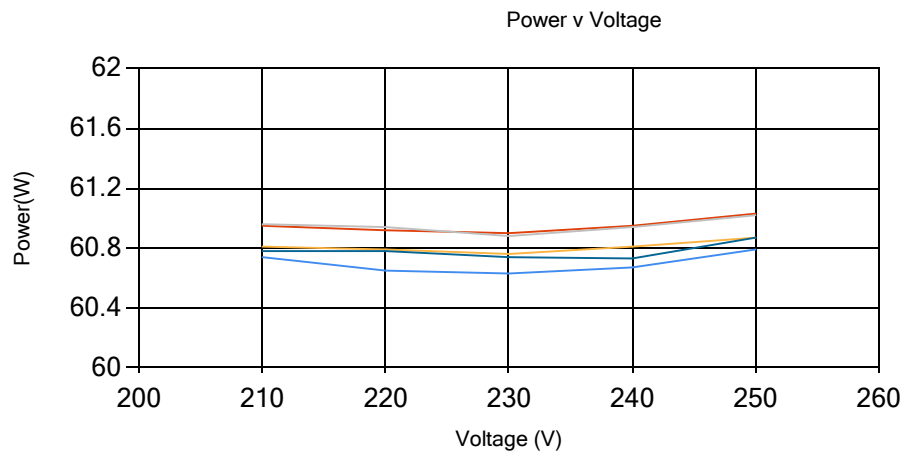
# REPORT : ASD-R-1471-A

## TYPE : Dimming Output Range

Test Number: T1498 Graphical Results Of Previous Page Tests.

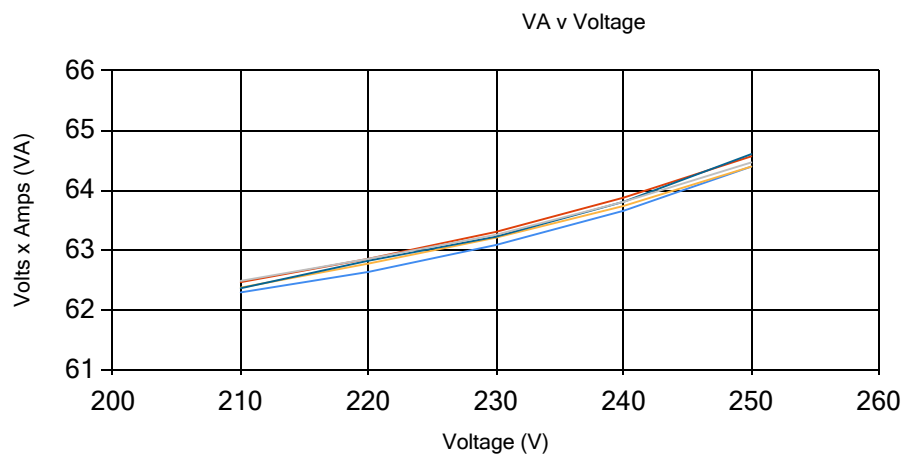
Drive (mA): 325

Output (%): 46



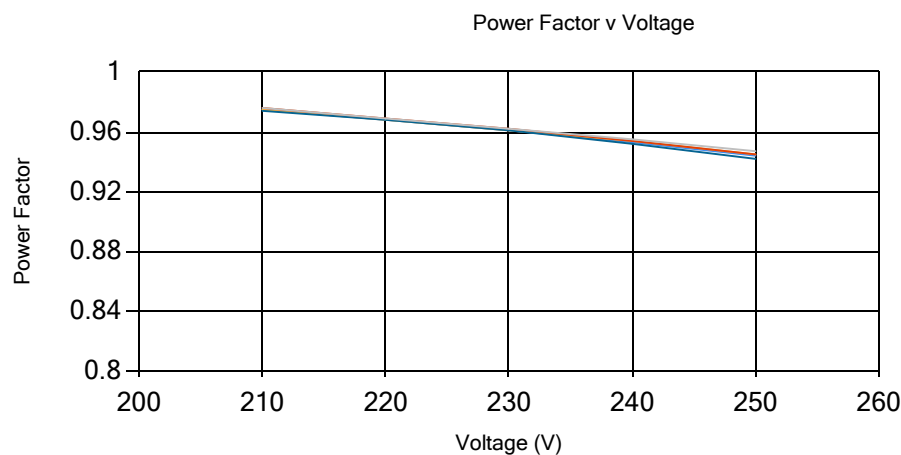
Fitting Designation

- A
- B
- C
- D
- E



Fitting Designation

- A
- B
- C
- D
- E



Fitting Designation

- A
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# REPORT : ASD-R-1471-A

## TYPE : Dimming Output Range

Test Number: T1497  
 Test Date: 14/09/2018  
 Stabilization Time (mins): 43  
 Output (%): 64  
 Test Notes : T3  
 Test Start Temp (°C) : 18.87

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) : 19.97

ITEM	Voltage (V)	Current (mA)	Power (W)	VA	PF	Lead/Lag
A	250.06	339	81.55	84.68	0.963	Leading
B	250.07	340	81.85	85.01	0.963	Leading
C	250.08	341	82.04	85.26	0.962	Leading
D	250.08	342	82.18	85.51	0.961	Leading
E	250.10	341	81.97	85.21	0.962	Leading
A	240.05	351	81.53	84.15	0.969	Leading
B	240.06	351	81.65	84.33	0.968	Leading
C	240.07	353	81.97	84.64	0.968	Leading
D	240.07	353	82.02	84.81	0.967	Leading
E	240.02	352	81.86	84.56	0.968	Leading
A	230.04	364	81.46	83.63	0.974	Leading
B	230.08	365	81.72	83.93	0.974	Leading
C	230.08	366	81.94	84.13	0.974	Leading
D	230.06	366	82.03	84.29	0.973	Leading
E	230.06	366	81.94	84.20	0.973	Leading
A	220.05	379	81.54	83.34	0.978	Leading
B	220.07	380	81.84	83.66	0.978	Leading
C	220.06	381	81.99	83.77	0.979	Leading
D	220.06	382	82.10	83.96	0.978	Leading
E	220.07	381	82.05	83.90	0.978	Leading
A	210.00	395	81.54	82.99	0.983	Leading
B	210.05	397	81.86	83.34	0.982	Leading
C	210.07	398	82.13	83.56	0.983	Leading
D	210.05	399	82.25	83.75	0.982	Leading
E	210.07	398	82.04	83.54	0.982	Leading

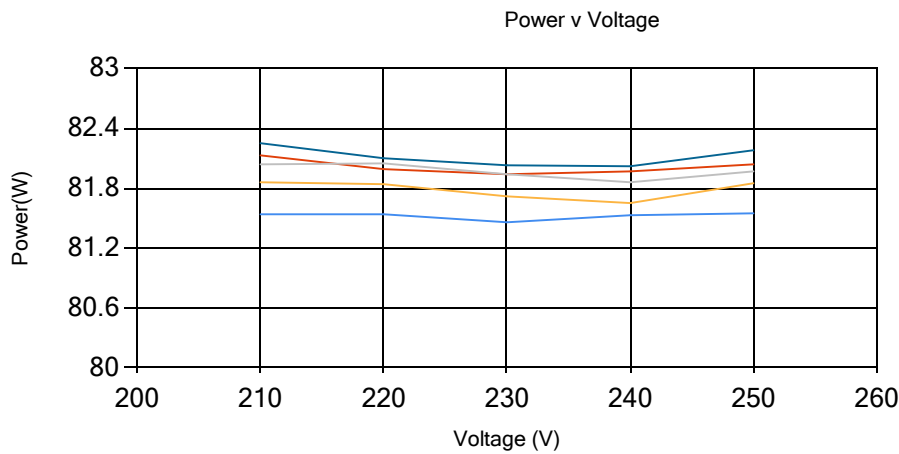
# REPORT : ASD-R-1471-A

## TYPE : Dimming Output Range

Test Number: T1497 Graphical Results Of Previous Page Tests.

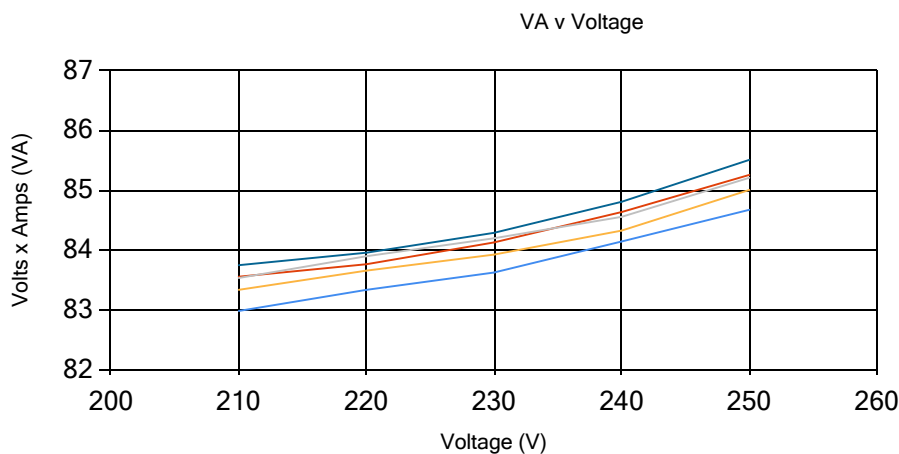
Drive (mA): 450

Output (%): 64



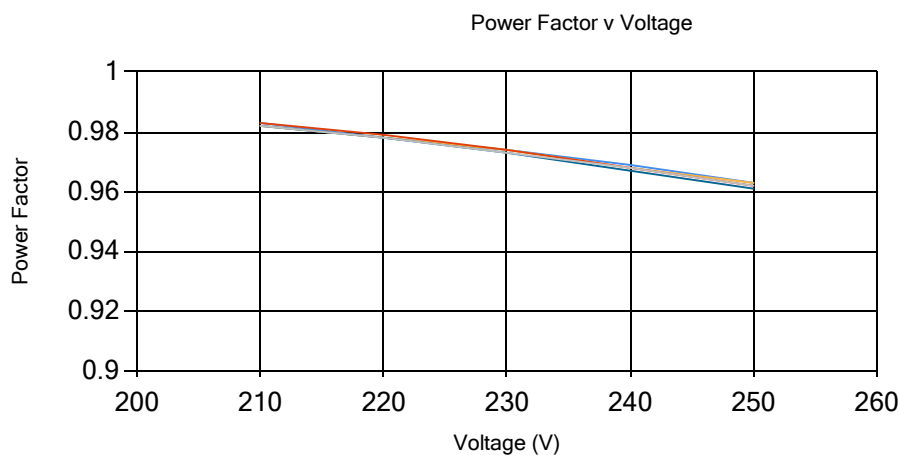
Fitting Designation

- A
- B
- C
- D
- E



Fitting Designation

- A
- B
- C
- D
- E



Fitting Designation

- A
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# REPORT : ASD-R-1471-A

## TYPE : Dimming Output Range

Test Number: T1496  
 Test Date: 14/09/2018  
 Stabilization Time (mins): 31  
 Output (%): 82  
 Test Notes : T2  
 Test Start Temp (°C) : 20.55

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) : 20.42

ITEM	Voltage (V)	Current (mA)	Power (W)	VA	PF	Lead/Lag
A	250.07	435	105.15	108.83	0.966	Leading
B	250.07	433	104.79	108.34	0.967	Leading
C	250.10	434	104.81	108.55	0.966	Leading
D	250.08	434	104.96	108.62	0.966	Leading
E	250.09	435	105.15	108.66	0.968	Leading
A	240.04	450	105.01	108.10	0.971	Leading
B	240.05	449	104.76	107.75	0.972	Leading
C	240.07	450	104.77	107.94	0.971	Leading
D	240.06	450	104.93	108.04	0.971	Leading
E	240.08	450	105.05	108.03	0.972	Leading
A	230.03	468	104.94	107.57	0.976	Leading
B	230.05	466	104.72	107.22	0.977	Leading
C	230.06	467	104.72	107.38	0.975	Leading
D	230.10	467	104.91	107.51	0.976	Leading
E	230.08	467	105.02	107.59	0.977	Leading
A	220.03	487	105.07	107.24	0.980	Leading
B	220.05	486	104.84	106.92	0.981	Leading
C	220.05	486	104.76	106.98	0.979	Leading
D	220.09	487	104.88	107.10	0.980	Leading
E	220.12	487	105.08	107.15	0.981	Leading
A	210.02	509	105.10	106.89	0.983	Leading
B	210.04	507	104.82	106.52	0.984	Leading
C	210.05	508	104.84	106.64	0.983	Leading
D	210.05	508	104.92	106.72	0.983	Leading
E	210.06	508	105.10	106.78	0.984	Leading



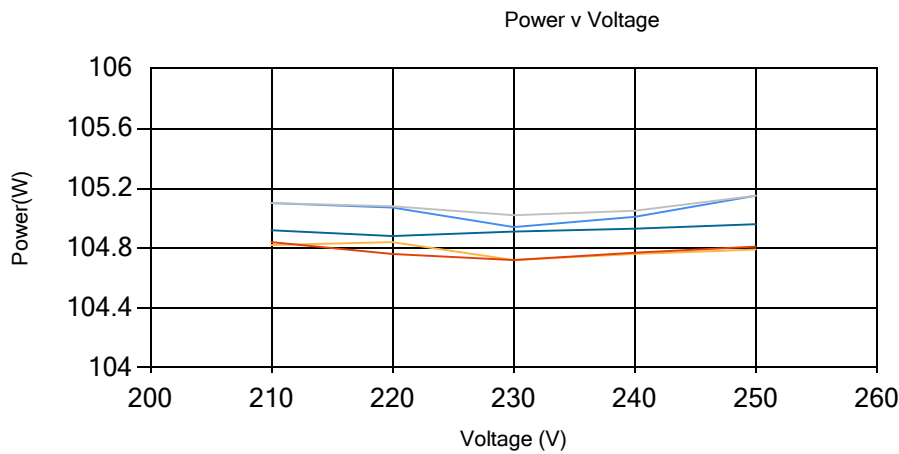
# REPORT : ASD-R-1471-A

## TYPE : Dimming Output Range

Test Number: T1496 Graphical Results Of Previous Page Tests.

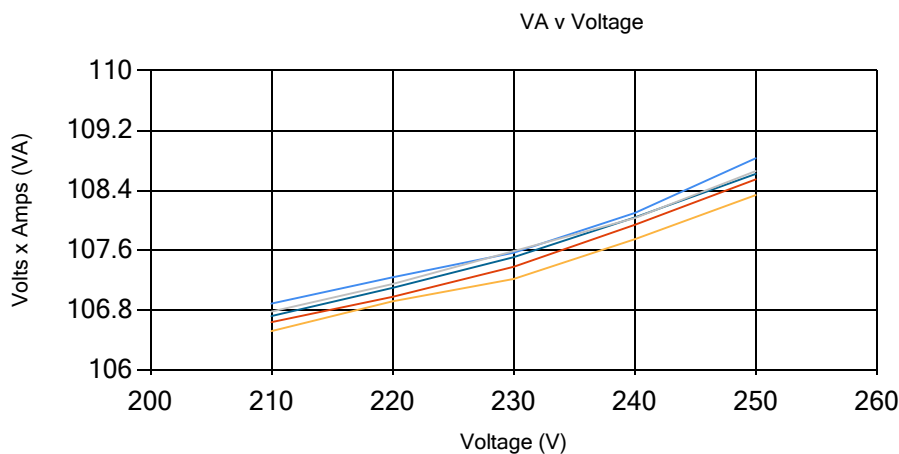
Drive (mA): 575

Output (%): 82



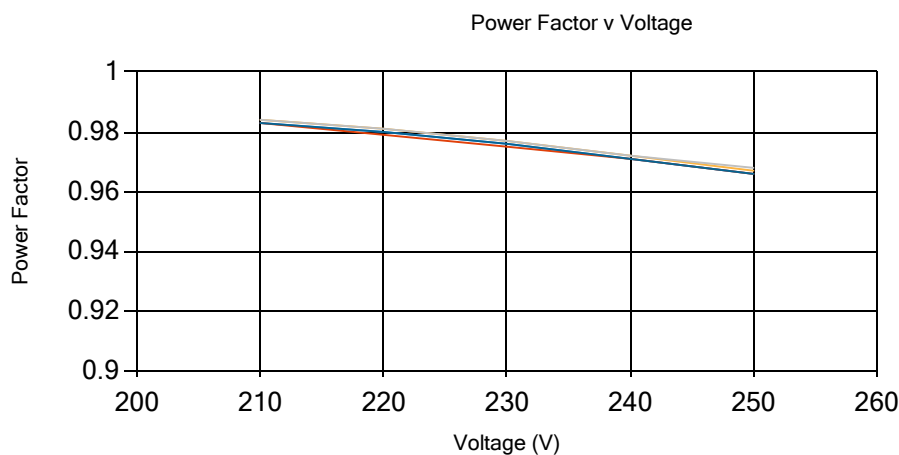
Fitting Designation

- A
- B
- C
- D
- E



Fitting Designation

- A
- B
- C
- D
- E



Fitting Designation

- A
- B
- C
- D
- E

# REPORT : ASD-R-1471-A

## TYPE : Dimming Output Range

Test Number: T1495  
 Test Date: 14/09/2018  
 Stabilization Time (mins): 36  
 Output (%): 100  
 Test Notes : T1  
 Test Start Temp (°C) : 18.82

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) : 20.34

ITEM	Voltage (V)	Current (mA)	Power (W)	VA	PF	Lead/Lag
A	250.09	525	128.35	131.23	0.978	Leading
B	250.10	524	128.08	130.95	0.978	Leading
C	250.09	525	128.34	131.28	0.978	Leading
D	250.09	525	128.28	131.15	0.978	Leading
E	250.10	525	128.59	131.40	0.979	Leading
A	240.04	544	128.16	130.58	0.982	Leading
B	240.08	543	127.88	130.26	0.982	Leading
C	240.06	544	128.08	130.53	0.981	Leading
D	240.06	544	128.13	130.54	0.982	Leading
E	240.07	545	128.35	130.73	0.982	Leading
A	230.06	566	128.10	130.09	0.985	Leading
B	230.07	564	127.84	129.79	0.985	Leading
C	230.09	565	128.02	130.07	0.984	Leading
D	230.05	565	127.98	130.00	0.985	Leading
E	230.07	566	128.28	130.24	0.985	Leading
A	220.05	590	128.06	129.72	0.987	Leading
B	220.05	588	127.78	129.35	0.988	Leading
C	220.08	589	127.93	129.62	0.987	Leading
D	220.05	589	127.98	129.65	0.987	Leading
E	220.07	590	128.18	129.80	0.988	Leading
A	210.04	617	128.18	129.53	0.990	Leading
B	210.03	615	127.77	129.06	0.990	Leading
C	210.07	616	128.00	129.38	0.989	Leading
D	210.04	616	128.06	129.45	0.989	Leading
E	210.06	617	128.24	129.55	0.990	Leading

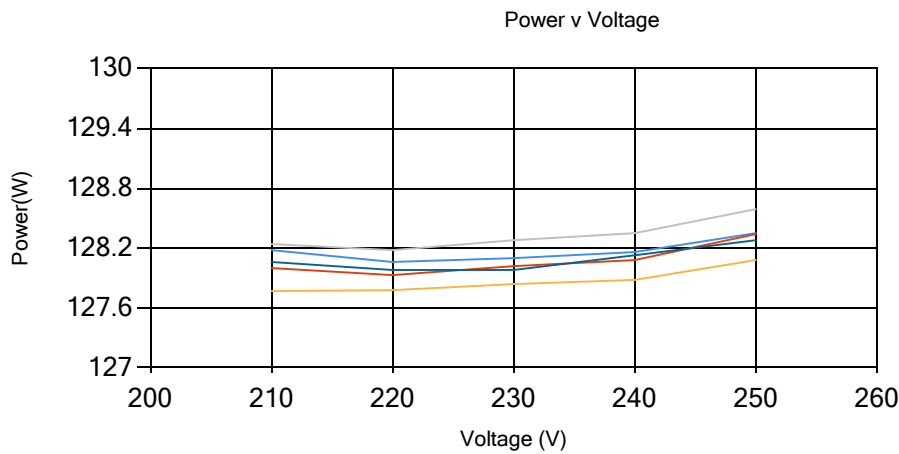
# REPORT : ASD-R-1471-A

## TYPE : Dimming Output Range

Test Number: T1495 Graphical Results Of Previous Page Tests.

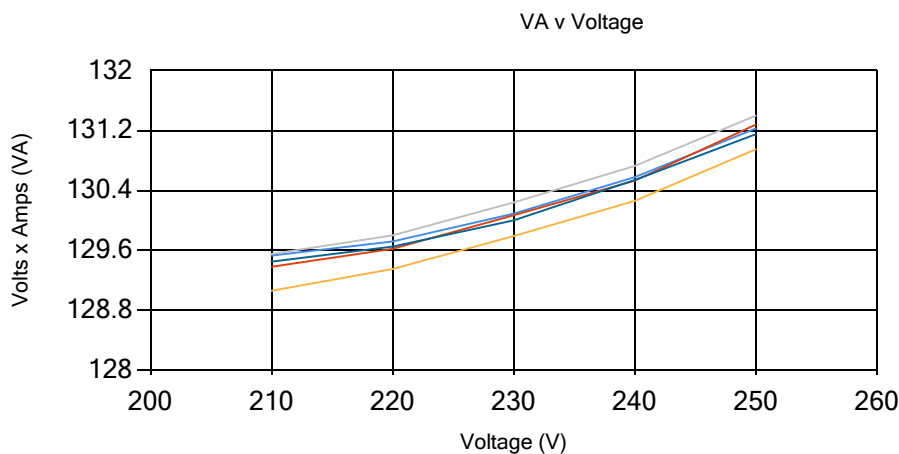
Drive (mA): 700

Output (%): 100



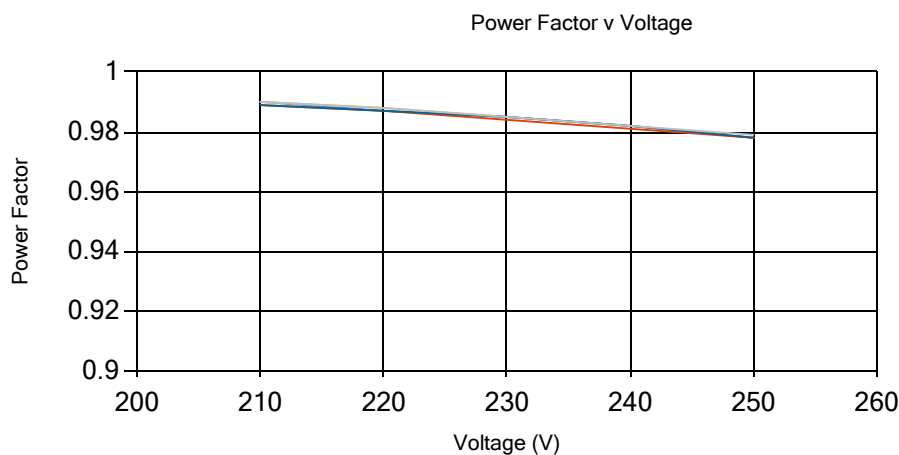
Fitting Designation

- A
- B
- C
- D
- E



Fitting Designation

- A
- B
- C
- D
- E



Fitting Designation

- A
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## TYPE : Dimming Output Range

### Test Method.

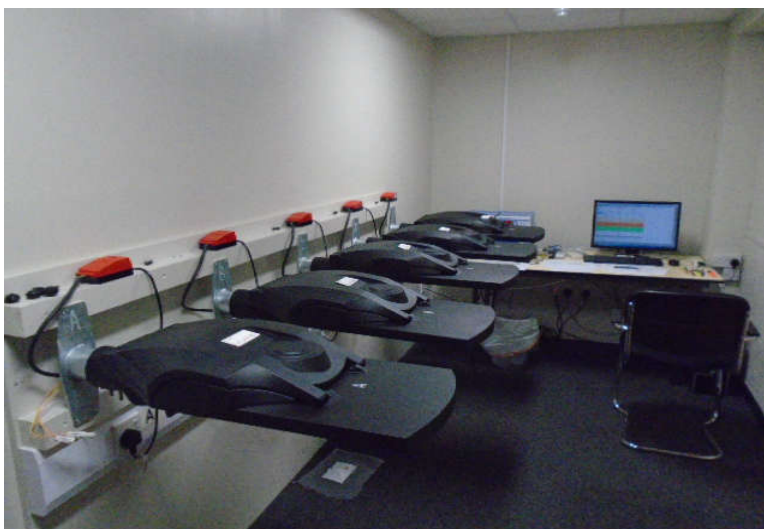
This UMSUG test was conducted in line with the requirements of the Unmetered Supplies Operational Information Document Version 17.0. Using a batch of 5 luminaires of identical product specification, Wattage and VA v Voltage readings were taken at 210, 220, 230, 240, and 250 Volt 50Hz.

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-1471-A  
TYPE : Dimming Output Range

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

