

Smart Lamp Testing - Initial Results



Results of Smart Lamp Testing, November 2014

Please note: The results presented here represent testing of one sample only and should be used as indicative only.

In this document, smart lamps are defined as wirelessly controllable LED lamps. These lamps utilise an LED light engine, combined with a control system (e.g. for dimming and colour tuning) as well as a wireless communications network interface such as Zigbee, 6LoWPAN, Bluetooth, WiFi, etc. Typically, a smartphone app is used to control the lamp(s).

The primary purpose of this document is to provide indicative data on the network standby power consumption of smart lamps - the power used by the lamps when emitting no light but remaining connected to a communications network.

11 models of smart lamps were purchased in the USA in 2014, by [Erik Page & Associates, Inc.](#), who also managed the testing and analysis of results. Lamps were tested at ITL Boulder, a NVLAP accredited photometric laboratory in November 2014. Typically, one sample of each lamp was tested.

Three of the tested models were supplied with a separate “bridge” which was housed in separate plastic enclosure with its own mains power supply. The function of the bridge is to create a communications link between the network containing the controlling application (e.g. smartphone app on WiFi network) and the lamp network (e.g. Zigbee or similar). Typically, a bridge can be used by several lamps. One of the smart lamps tested for this study had the bridge function inbuilt into the lamps themselves - all lamps were both WiFi and 6LoWPAN capable but only one lamp is nominated as the bridge. This lamp model exhibited the highest standby power of all lamps tested (regardless of the lamp acting as the bridge or not).

The network standby power of all tested lamps is shown in the table below, along with full power and full light output measurements, and efficacy. The power of the bridge is also shown, where applicable. Note that three of the lamps have very low light output and thus are probably not suited to general purpose illumination*.

Model #	Lamp Network Standby Power (W)	Bridge Power (W)	Lamp Full Power (W)	Lamp Full Light Output (lm)	Efficacy @ Full Power (lm/W)
1	0.17	1.72	11.50	809	70.3
2	0.25		7.36	497	67.5
3	0.28		4.01	48*	12.0
4	0.31		8.32	630	75.7
5	0.36	1.77	5.30	461	87.0
6	0.42	2.17	9.67	662	68.4
7	0.56		6.72	403	60.0
8	0.58		2.74	52*	19.0

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Model #	Lamp Network Standby Power (W)	Bridge Power (W)	Lamp Full Power (W)	Lamp Full Light Output (lm)	Efficacy @ Full Power (lm/W)
9	0.60		6.28	366	58.3
10	0.61		3.67	72*	19.6
11	2.70		17.17	549	32.0

Please note: regarding photometric data, colour tunable lamps were tested with colour set between 2700K and 3200K. Three of the lamps had very low light output (< 100 lm) and are not considered useful for general purpose illumination.