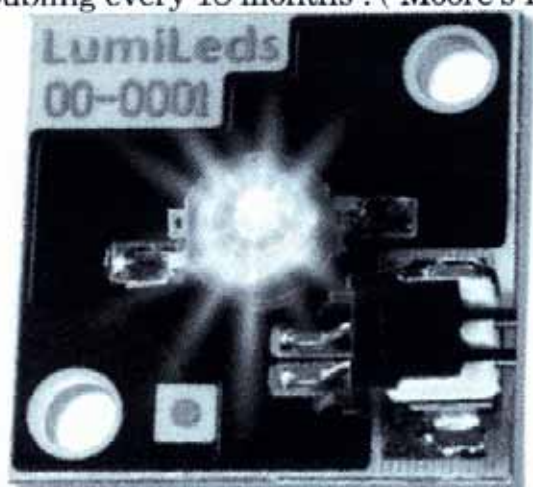


**Fig 11.9 Old style dichroic halogen reflector, compared to multi-element L.E.D lamp**

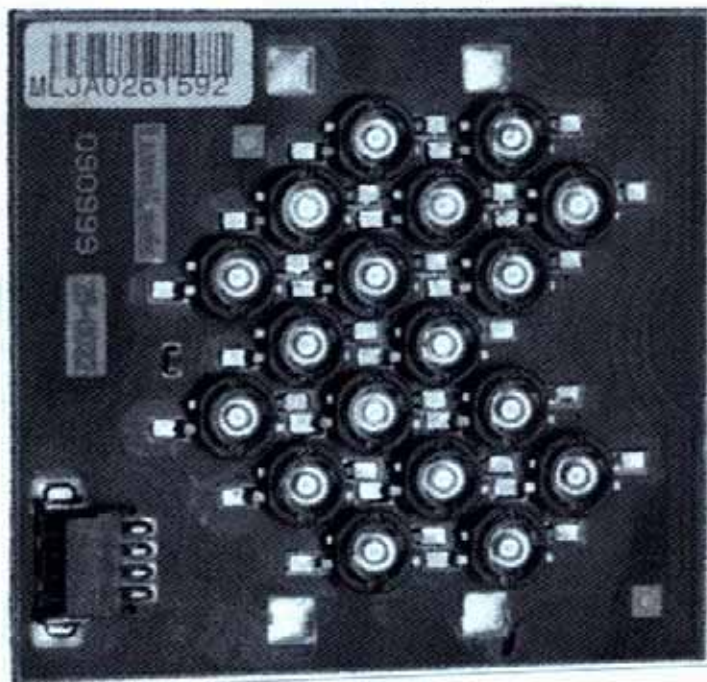
*On the right is a standard 20 watt halogen reflector lamp. On the left is it's high tech replacement, the compound motherboard with 18 "super flux" L.E.D's, and next to it, the daughterboard with the current regulator componentry. The led's are already cheaper in the long run, and far more so in a solar power installation*

"Lumileds" is a joint venture between Philips lighting industries and Agilent technologies. From a practical point of view, it is the efficiency, cost and lifespan of L.E.D lamps that need to be appreciated and understood, and we will discuss these issues in that order :Fig 11.8 shows the relative efficiencies of the various lighting technologies. The basic tungsten filament bulb has a luminous efficacy of 17 lumens per watt, whilst a tungsten halogen bulb is 25 lumens per watt. A high power L.E.D such as the "Luxeon" emitter ( Fig 11.10 ) already surpasses these, at 45 lumen's for the white unit, and most importantly, L.E.D efficiencies are doubling every 18 months ! ( Moore's Law )

As far as price goes, the basic Luxeon emitter in white, sells for US \$ 6 each, direct from the manufacturer. Any electronics hobbyist could easily construct multiple arrays of these devices very cheaply for a myriad of applications. The Luxeon 800 lumen cluster, ( 50 watt halogen equivalent ) shown in fig 11.11, is currently US \$135, but prices for these devices are on "the slide", so jump on board !!



**Fig 11.10 Hi power, 1 Watt Luxeon Emitter**  
*Basic building block allows fully integrated L.E.D lighting solutions for the avante garde designer.*



**Fig 11.11. 800 Lumen, 18 Watt Luxeon lamp**  
*The future of lighting has arrived. Solid state circuit board of 18 x 1 Watt Luxeon emitters. 50,000 Hr life.*

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