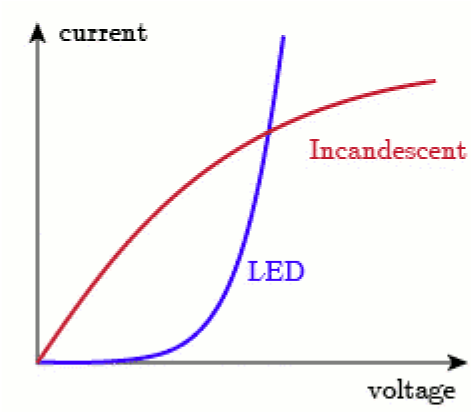
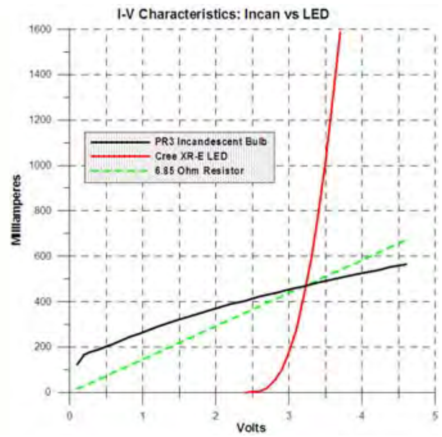
Non-Standard Uses for LEDs

(12/26/2016)

LEDs are standardly used to produce light efficiently, for indoor gardening, task lighting, infrared spotting, ultraviolet spotting, and many other uses. This they do a good job at. However, after time one will have some burned out LED bulbs. They will still have some good LEDs in them that could be used for other purposes. What could these uses be, especially after the Pole Shift?





Unusual Uses of LEDs

Could a LED be used as a light intensity sensor to covert light to electric flow? Yes, within limits.
Yes, it does this but not with very much power after taking in lots of light. It is of the order of less than a 0.1 microwatt.

Could a LED be used as a crude Lux Meter? Yes, with in limits.
A test using 4 series connected 3W 280 lm bead LEDs was used. As a light source these 4 beads in series supply about 22,100 Lux at 42.4ma at12volts. As a light sensor the same 4 LED beads produced 1.480 volts on a good digital volt meter with high input resistance when 31,300 Lux was shined on it. The maximum current flow was of the order of 0.1microamp. if one were to attempt to make a crude Lux meter, then first it would take a good high input impedance volt meter capable of mv measurements. One would need to make a number of LEDs connected in series and parallel to dive the meter stably for the range of light intensity's needed. Then, calibrate it using some existing Lux meter as a standard. I doubt it could be used effectively down into the range of light expected after a pole shift. However, it could be used effectively to tell relative intensities of one measurement to another to tell which has more intensity.

Could LEDs be used as a diode to convert AC to DC and also produce light as by product in the process? Yes, with some modifications.

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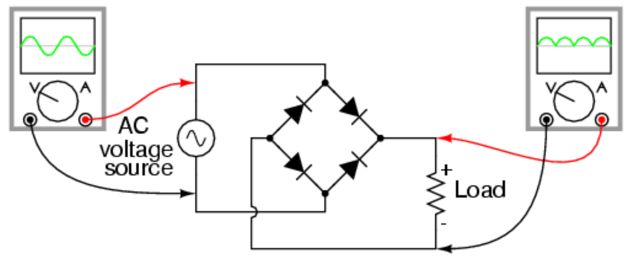
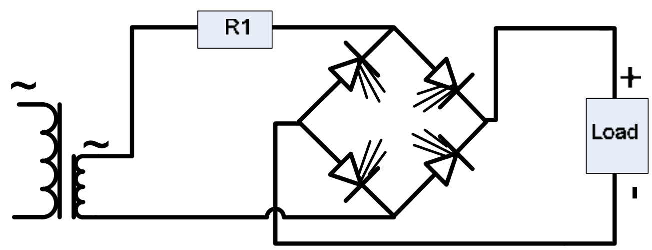


The above is how normal rectifier diodes work.

One would use a full bridge rectifying circuit and not allow the voltage drop across the LEDs to go higher than that rated for the color of light produced or the LED specifications, whatever you have available. One would limit current to no more than the maximum current the LED can withstand by adjusting R1 with the load shorted as shown in the circuit below. Also, one would monitor the heat dissipated and if the LEDs got hot to touch back off on the current flow. LEDs typical have a reverse voltage max a bit higher than the forwarded voltage max yet a bridge network with the current limiter R1 before the diodes; one should be able to go above the rated value of reverse voltage. Testing would be needed. The resulting circuit might look something like the following. You could save your dead LED bulbs and use the good diodes after testing to determine witch ones are salvageable.



Lens Color	Forward Voltage		Forward Current	
	Typical	Maximum	@Typical	@Maximum
RED	1.6 Volts	2.0 Volts	.010 Amp	.020 Amp
GREEN	2.2 Volts	3.0 Volts	.010 Amp	.020 Amp
YELLOW	2.2 Volts	3.0 Volts	.010 Amp	.020 Amp
* Blue * (Note)	3.8 Volts	4.5 Volts	.020 Amp	.020 Amp

NOTE 1: The above mentioned Voltage and Current ratings are based on several everyday generic LEDS in the 3 mm and 5 mm size ranges.

NOTE 2: Blue color LEDS may typically have forward working voltages exceeding those used in the above example. Forward working voltages for some Blue color LEDS may also fall in the 4.9 to 5.5 Volt ranges.

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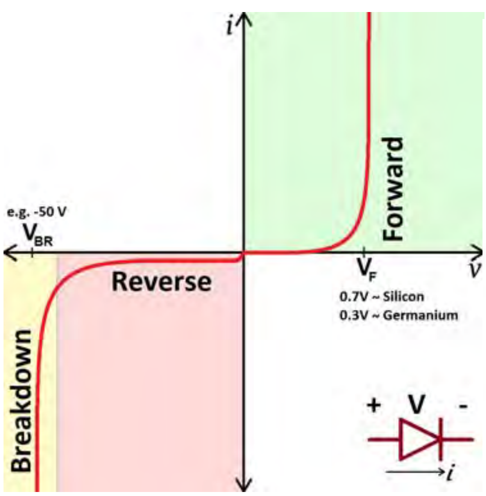
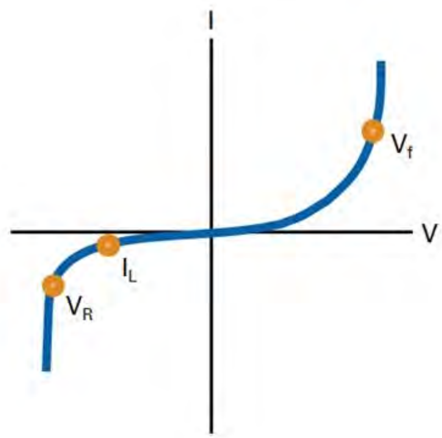
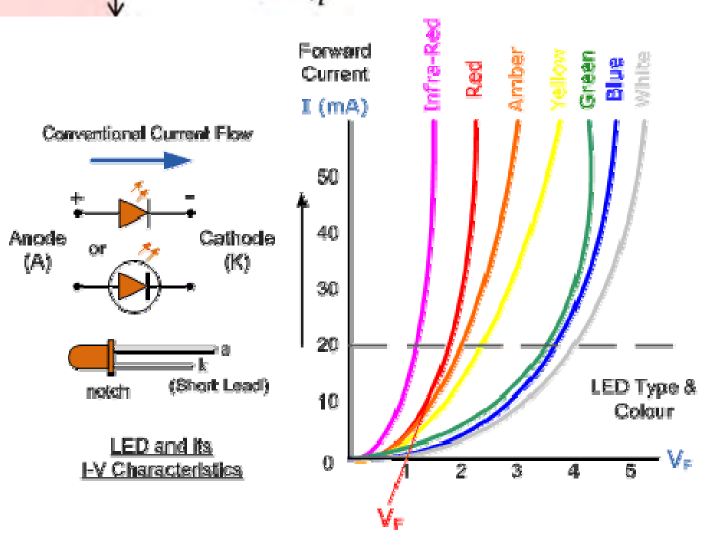
DIALIGHT P/N	EMITTED COLOR	MATERIAL	LENS COLOR	LUMINOUS INTENSITY (mcd)			DOMINANT WAVELENGTH (nm)			FORWARD VOLTAGE (V)			VIEWING ANGLE
				If = 20 ma			If = 20 ma			If = 20 ma			° DEGREES
				MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	
598-8010-107F	RED	AlInGaP	Water Clear	30	40	80	630	635	642	1.7	2.2	2.4	140
598-8020-107F	RED-ORANGE	AlInGaP	Water Clear	120	150	200	620	625	630	1.7	2	2.4	140
598-8030-107F	ORANGE	AlInGaP	Water Clear	70	-	150	600	-	610	1.7	2	2.4	140
598-8040-107F	YELLOW	AlInGaP	Water Clear	100	130	160	590	-	595	1.7	2	2.2	140
598-8050-107F	YELLOW	AlInGaP	Water Clear	100	130	160	583	-	590	1.7	2	2.4	140
598-8060-107F	YELLOW-GREEN	AlInGaP	Water Clear	20	40	60	570	-	575	1.8	2	2.4	140
598-8070-107F	GREEN	GaP	Water Clear	10	20	40	562	-	570	1.8	2	2.4	140
598-8081-107F	GREEN	InGaN	Water Clear	220	300	400	520	523	525	3	3.2	3.5	140
598-8091-107F	BLUE	InGaN	Water Clear	90	140	160	470	473	475	2.8	3.2	3.5	140

Note: The voltage for white is the same as for blue about 3.2 volts.

LEDs can be used as a zener diode substitute to regulate voltage. Both have a very similar curve. Unlike the zener diode one could use the led in a forward or reverse orientation depending on whether one needed a low or higher voltage. They could be used in series to get even higher voltages. The circuit configuration that works for zener diodes should work using an LED instead. See the following curves for LEDs.





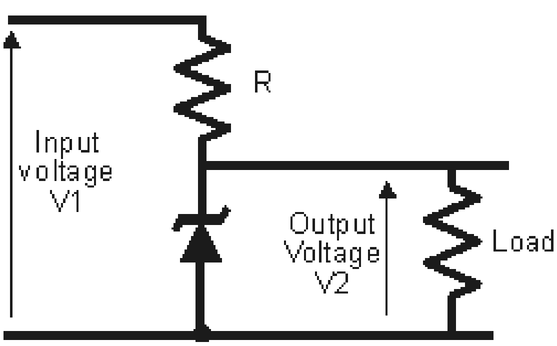


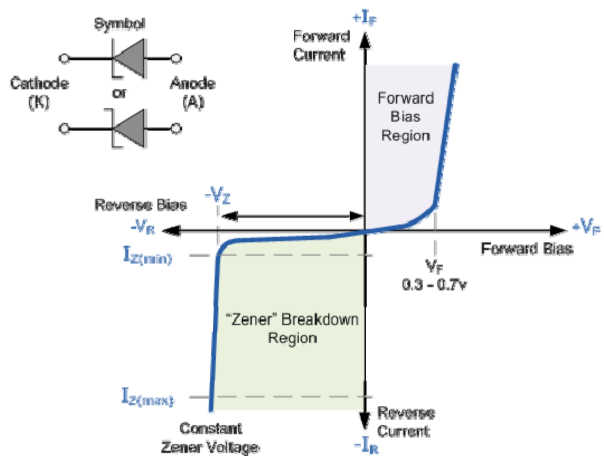
LED - Colors & voltage drop

Color	Wavelength (nm)	Voltage (V)	Semiconductor Material
Infrared	$\lambda > 760$	$\Delta V < 1.9$	Gallium arsenide (GaAs) Aluminum gallium arsenide (AlGaAs)
Red	$610 < \lambda < 760$	$1.63 < \Delta V < 2.03$	Aluminium gallium arsenide (AlGaAs) Gallium arsenide phosphide (GaAsP) Aluminum gallium indium phosphide (AlGaInP) Gallium(III) phosphide (GaP)
Orange	$590 < \lambda < 610$	$2.03 < \Delta V < 2.10$	Gallium arsenide phosphide (GaAsP) Aluminium gallium indium phosphide (AlGaInP) Gallium(III) phosphide (GaP)
Yellow	$570 < \lambda < 590$	$2.10 < \Delta V < 2.18$	Gallium arsenide phosphide (GaAsP) Aluminium gallium indium phosphide (AlGaInP) Gallium(III) phosphide (GaP)
Green	$500 < \lambda < 570$	$1.9 < \Delta V < 4.0$	Indium gallium nitride (InGaN) / Gallium(III) nitride (GaN) Gallium(III) phosphide (GaP) Aluminium gallium indium phosphide (AlGaInP) Aluminium gallium phosphide (AlGaP)
Blue	$450 < \lambda < 500$	$2.48 < \Delta V < 3.7$	Zinc selenide (ZnSe), Indium gallium nitride (InGaN), Silicon carbide (SiC) as substrate, Silicon (Si)
Violet	$400 < \lambda < 450$	$2.76 < \Delta V < 4.0$	Indium gallium nitride (InGaN)
Purple	multiple types	$2.48 < \Delta V < 3.7$	Dual blue/red LEDs,blue with red phosphor,or white with purple plastic
Ultra-violet	$\lambda < 400$	$3.1 < \Delta V < 4.4$	diamond (235 nm), Boron nitride (215 nm) , Aluminium nitride (AlN) (210 nm) Aluminium gallium nitride (AlGaN) (AlGaInN) — (to 210 nm)
White	Broad spectrum	$\Delta V = 3.5$	Blue/UV diode with yellow phosphor

Temperature	Source
1,700 K	Match flame
1,850 K	Candle flame, sunset/sunrise
2,700–3,300 K	Incandescent lamps
3,000 K	Soft (or Warm) White compact fluorescent lamps
3,200 K	Studio lamps, photofloods, etc.
3,350 K	Studio "CP" light
4,100–4,150 K	Moonlight[2]
5,000 K	Horizon daylight
5,000 K	tubular fluorescent lamps or cool white/daylight compact fluorescent lamps (CFL)
5,500–6,000 K	Vertical daylight, electronic flash
6,200 K	Xenon short-arc lamp[3]
6,500 K	Daylight, overcast
5,500–10,500 K	LCD or CRT screen
15,000–27,000 K	Clear blue poleward sky
These temperatures are merely characteristic; considerable variation may be present.	

A typical circuit that uses a zener diode to regulate voltage along with typical voltage current curves is shown next.





LED or Zener diode used as a voltage limiter.