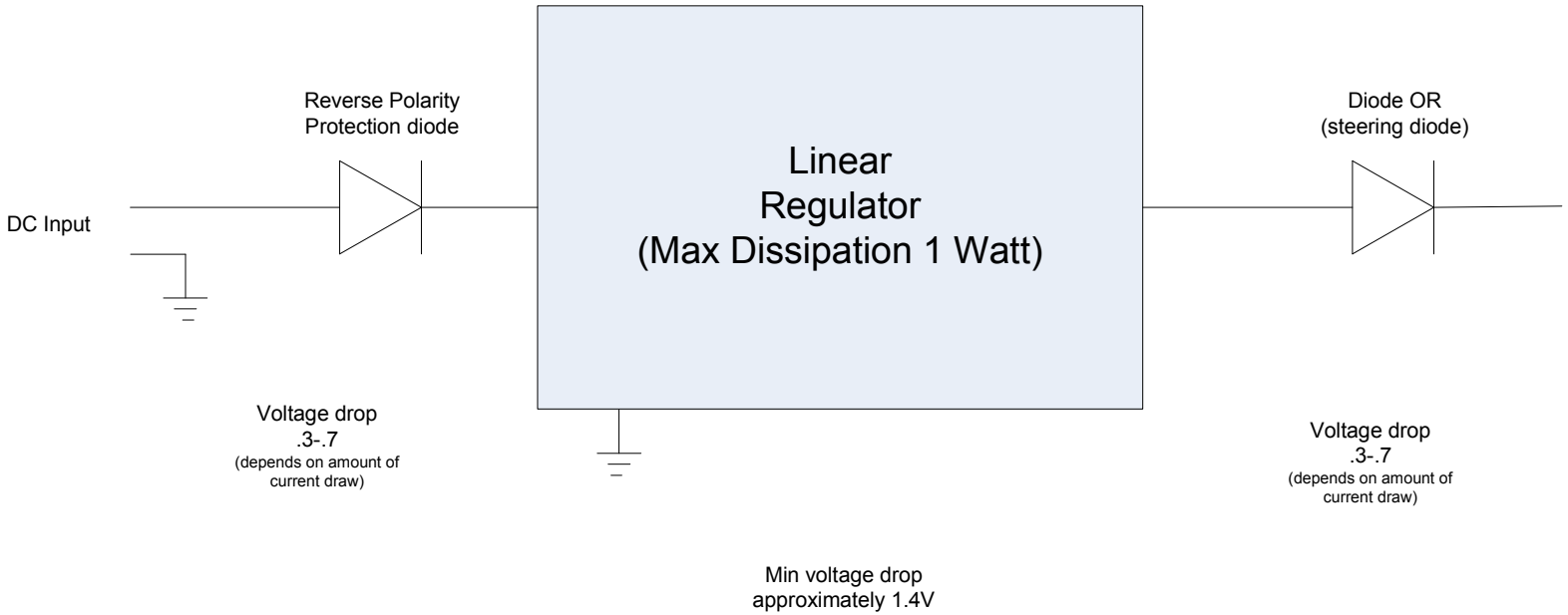
Application Note
Choosing a DC input voltage for a GPSS External Power Option



Input Voltage vs output voltage
Input voltage must be higher than the output voltage by the combined voltage drops of these circuit components (reverse polarity diode drop + min regulator drop + diode OR drop + output voltage)
Example for 5 volts output .7 + 1.4 + .7 +5 = 7.8. so if you need 5 volts out you should have at least an 8 volt power supply for the input voltage

Input voltage vs max current
The maximum current that can be provided by the GPS external power option is determined by the maximum wattage the regulator has to dissipate.
The limit for most GPSS devices is 1 watt @ 25C higher temperatures will decrease this limit.
Remember to add the internal current of the device used to the amount of external current used for the total current load of the device.
Now consider a GPSS device using 48 ma total current (device current + antenna current) so the amount of power the device would be dissipating would be determined by the input voltage – reverse polarity diode drop (least case) – steering diode drop (least case) – output voltage so 8 - .3 - .3 – 5 = 2.4 volts.
2.4 volts across the regulator gives 2.4V * 48ma = 115mW of power dissipated by the regulator which is well below the 1 watt total dissipation limit.

Lets say instead of using an 8 volt power supply we chose instead to use a 24 volt power supply.
So the calculation would be 24 - .3 – 1.4 -.3 – 5 = 17 volts across the regulator so 17 * 48 = 816 mW of power dissipated by the regulator.
This is very close to the 1 watt limit of the linear regulator.

So when choosing a DC input level choose one high enough to over come the voltage drop of the circuit but not so high that it limits the amount of current the regulator can provide to below your required current.
If you only have a high voltage available then keep in mind it lowers the amount of total current the device can provide.