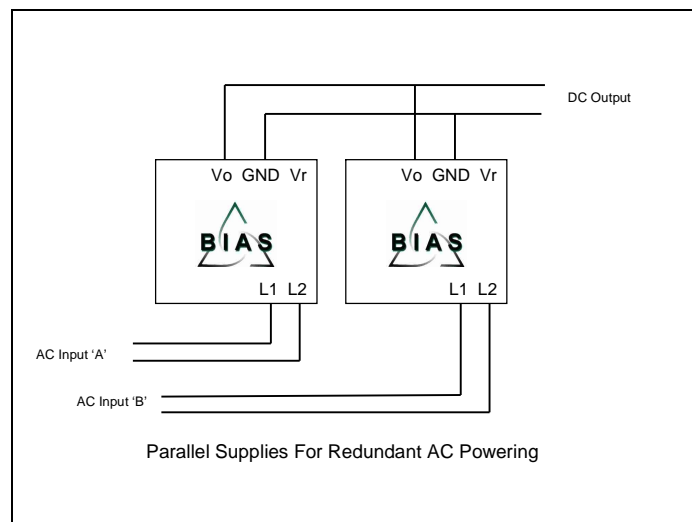


Application Note 424 – Redundant AC Powering (And Bias Power modules in parallel configuration)



Redundant AC Powering

Sometimes it is desirable to design a circuit for ultra-high reliability by duplicating the function of a module. Applications that require redundancy on the AC input for a critical performance product can easily be satisfied using Bias Power products. Connecting multiple power supplies in parallel with separate AC input sources as shown in the figure will provide source power redundancy to the load. The power supplies used must have the same output voltage rating. The supply power ratings must be such that with the loss of any individual supply's AC input, the rest of the supplies will provide enough power to power the load. This configuration will support as many input sources as required by the product without external 'OR'ing diodes. This application can be combined with the N+1 redundancy protection application to provide powering and power supply redundancy.

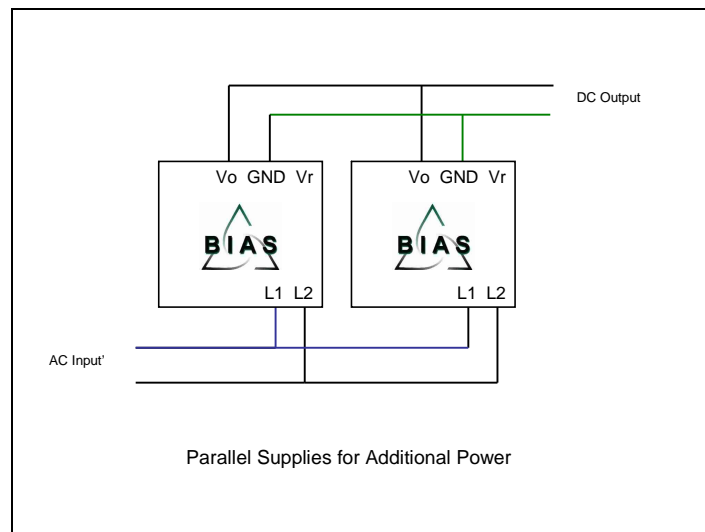


With multiple power supplies providing power to the load, as the load draws more power than a single supply would normally provide, it will cause a minor drop in the output voltage. The other supply(s) respond to this by providing additional power. If an AC source is interrupted, the power supply(s) with the good AC source will support all the power requirements of the unit. When the interrupted source is restored, the power supplies will return to load sharing.

For better efficiency, a series diode can be placed on the output of a power supply. This will be referred to as a secondary unit. The power supply unit without the diode will be referred to as the primary unit. The secondary unit will effectively have an output voltage that is one diode drop less than the output of the primary unit. The primary unit will provide the power to the load with the secondary unit idling. If the primary unit loses input power, the secondary unit would provide the power for the load. When the primary unit's power is restored, the primary will take over providing the power to the load.

Parallel Operation

The configuration shown in the Figure below is a modified version of the redundant configuration. It can also be used when increased power is desired. Placing two identical power modules in parallel will double the power capacity.



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