*3696 500 Watt Proton Rad Hard 100K+ ® Space Power Supply
APPLICATION NOTE

Control Pin Operations

Sync Input Pin 1

The sync pin should be left open if not used.

In certain applications, the user may want to synchronize the DC-DC switching frequency. Synchronization of DC-DC switching frequency can synchronize any DC-DC noise with the sync signal frequency generated by the user's system.

The pulse width modulation duty cycle is generated by the coincidence of a ramp crossing a DC level.

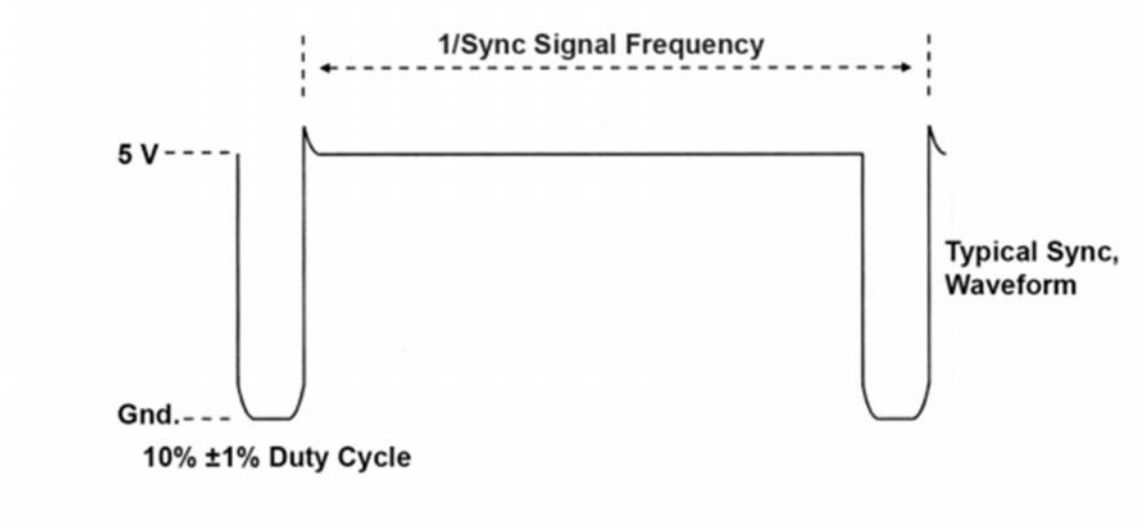
The frequency may be "pulled" upward by applying a narrow negative going pulse to the sync pin (usually pin 4). This negative going pulse terminates the ramp and locks the ramp to the frequency of the negative pulses. The sync signal should sit at a nominal 5 VDC and transition to ground level at a 10 %+/- 1% duty cycle.

When the ramp frequency increases due to synchronization, the DC-DC feedback loop automatically adjusts the duty cycle to the necessary duty cycle to maintain voltage regulation.

The sync input is capacitively coupled and the sync signal can be referenced to the input return. If the sync signal is generated on the output side, it can be coupled to the input side using a small pulse transformer. Alternatively, if an RF ground exists between the input side and the output side, and the input to output differential is less than 100 VDC. the sync signal can use the coupling capacitor inboard of the sync pin. If the input output differential is greater than 100 VDC. the pulse transformer coupling should be used.

The data sheet for the specific part will indicate the nominal free running frequency and also the recommended sync Frequency. The typical *3696 free running frequency is 250kHz.

Typical sync signal frequencies are 2X the desired switching frequency. Given the typical free running frequencies noted above, Sync signals can be 550 kHz to 600 kHz.



Control Pin Operations (continued)

Inhibit Not (Pin 2)

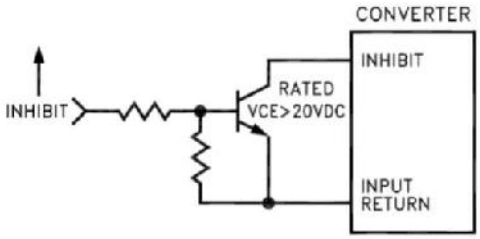
Inhibit input for remote turn-on and turn-off, and is referenced to the input return through the negative EMI filter leg. The inhibit not input should be left open if not used.

An "inhibit not" function means that the converter will turn off when the inhibit pin is grounded. Up to 3 milliamperes can flow to ground when the inhibit not pin is brought to zero. The open circuit voltage at the inhibit pin for the inhibit not configuration is approximately 5.7VDC. This pin is best driven by an open collector. The transition voltageis approximately 2.7 VDC.

INHIBIT NOT

INPUT	OUTPUT
GROUND	OFF
OPEN	ON

Suggested circuit for the inhibit pin interface is shown below.



Control Pin Operations (continued)

UV Lockout (pin 3)

The UV lockout is set for a nominal 76 VDC, however the UV lockout can be set higher by an external resistor connected between pin 3 and the input return. The external resistor value can be set according to the following table:

76 VDC	Open
80 VDC	174K
85 VDC	71.5K
90 VDC	42.2 K
95 VDC	28.7K
100 VDC	21.4K

If not adjusted, the UV adjust pin can be left open. To disable the UV lockout, connect pin3 to input return.

***3696 Output Modes:**

The ***3696** has two output regulation modes. The default mode is precision line and load regulation. This mode uses the following optional P1 connections:

+ Remote sense (pin 10) connect at the positive remote load point. Remote sense can recover a total of 0.5 VDC. If not needed, leave this pin open.

- Remote sense (pin 9) connect at the negative remote load point. Remote sense can recover a total of 0.5 VDC. If not needed, leave this pin open.

Share bus (pin 7) Connect to up to three other *3696 DC/DC Converters pin 7's to actively share a common output load. To use the share bus, the output returns of each converter must terminate into a ground plane or a single point star connection with equal wire drops from each converter.

Output Adjust (pin 8) allows the user to set the output voltage +/- 5% away from nominal. If used with multiple converters using the active share bus, each individual converter must be set to the adjusted voltage with the share bus disconnected.

Let Vadj be the converters desired output voltage;

For an upward output voltage adjustment, a resistor is placed between the external adjust pin (P1 pin 8) and the output return (J2 pin 3).

For an downward output voltage adjustment, a resistor is placed between the external adjust pin (P1 pin 8) and the positive output (J2 pin 1).

Vout	**R from + out to adj.**	
26.6	1575.264	K
26.7	1704.415	K
26.8	1855.092	K
26.9	2033.164	K
27	2246.85	K
27.1	2508.022	K
27.2	2834.488	K
27.3	3254.229	K
27.4	3813.883	K
27.5	4597.4	K
27.6	5772.675	K
27.7	7731.467	K
27.8	11649.05	K
27.9	23401.8	K
28	**R from adj to out ret.**	
28.1	1307.35	K
28.2	646.175	K
28.3	425.7833	K
28.5	249.47	K
28.6	205.3917	K
28.7	173.9071	K
28.8	150.2938	K
29	117.235	K
29.1	105.2136	K
29.2	95.19583	K
29.3	86.71923	K
29.4	79.45357	K

The **optional regulation mode**, which can be set at the factory, is the precision droop mode. This allows converters to be paralleled by simple parallel connection, however it is not as precise are the active current sharing mode.

In the precision droop mode, the no load voltage is nominally 29 VDC and the full load voltage is nominally 27 VDC.