



# MODULAR DEVICES, INC.

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An ISO 9001:2015 Registered Company

## Control Pin Operations

### Sync Input

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  $10\% \pm 1\%$  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. Typical DC-DC free running frequencies can be, but not limited to, 90 kHz., 180 kHz and 270 kHz.

Typical sync signal frequencies are 1X or 2X the desired switching frequency. Given the typical free running frequencies noted above, Sync signals could be 100 kHz., 200 kHz., 400 kHz. and 600 kHz. This sync signal frequency will be indicated on the data sheet.

