

Technical Article

Power Boost and Advanced Power Boost

By Delta Electronics (Thailand) Public Company Limited



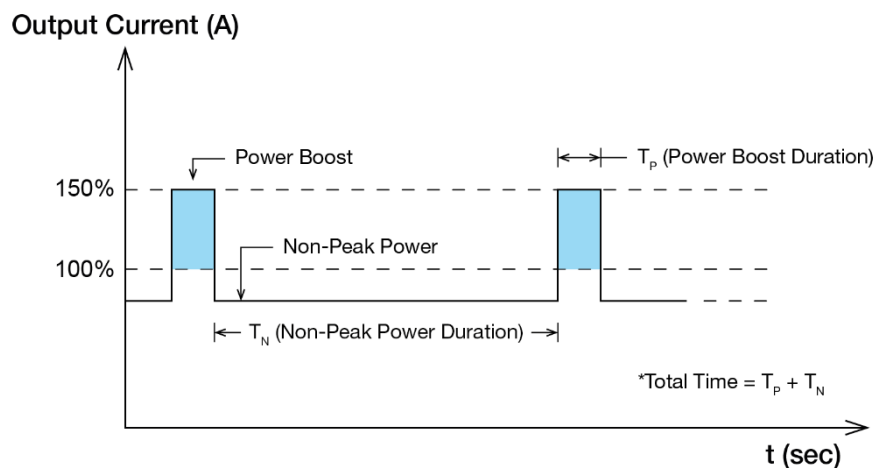
Power Boost and Advanced Power Boost

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Delta CliQ series of products feature Power Boost and Advanced Power Boost (APB) features to enhance the reliability of a system. This article addresses the technology and key functions behind the two features.

Power Boost

Power Boost is a reserve power which is available constantly, to allow reliable startups supporting sudden and short spikes of loads with high inrush currents, typically during turn on to remove the need of more expensive higher rated power supply units. After the output has reached its steady state set value, the power supply can support surge loads with a higher short-term power demand up to 150% of maximum rated load ($I_o \text{ Max}$), for a maximum duration of 5 seconds. The Power Boost is available repetitively, provided that the average output power (R.M.S) shall not exceed the continuous maximum operating condition. See duty cycle calculation below.



$$\text{Duty cycle (\%)} = \frac{T_P}{\text{Total Time}}$$

$$\text{Average Output Power } (P_{Avg}) = \frac{(\text{Power Boost} \times T_P) + (\text{Non-Peak Power} \times T_N)}{\text{Total Time}}$$

OR

$$\text{Non-Peak Power} = \frac{(P_{Avg} \times \text{Total Time}) - (\text{Power Boost} \times T_P)}{T_N}$$

An example of Power Boost and Average Output Power for 120W:

| Power Boost | Peak Power (W_P) | Power Boost Duration (T_P) | Duty Cycle | Non-Peak Power (W_N) | Non-Peak Power Duration (T_N) | Total Time (T) |
|-------------|----------------------|--------------------------------|------------|--------------------------|-----------------------------------|----------------|
| 150% | 180 | 1 sec | 10% | 113W | 9 sec | 10 sec |
| 150% | 180 | 5 sec | 30% | 94W | 11.5 sec | 16.5 sec |
| 120% | 144 | 1 sec | 10% | 117W | 9 sec | 10 sec |
| 120% | 144 | 5 sec | 30% | 110W | 11.5 sec | 16.5 sec |

Advanced Power Boost (APB)

With multiple loads connected in a system, a large outrush current could be drawn (demanded) due to one fault load. This will be detected by APB. The APB will trip the circuit breaker (circuit breaker with appropriate rating based on the system load) on the current path of the fault load due to high current. This thus prevents the system from shutting down while the other connected current paths continue to operate without interruption.

The following waveforms demonstrate the typical output voltage and output current when APB is activated:

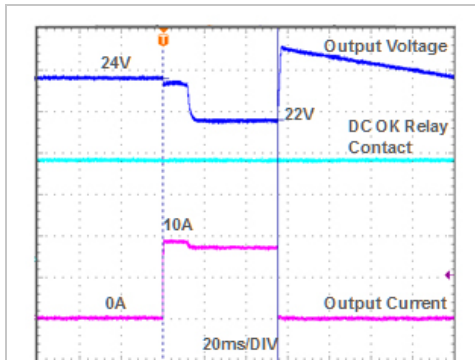


Figure 1.1. APB 200% of Nominal Output Current for 50ms

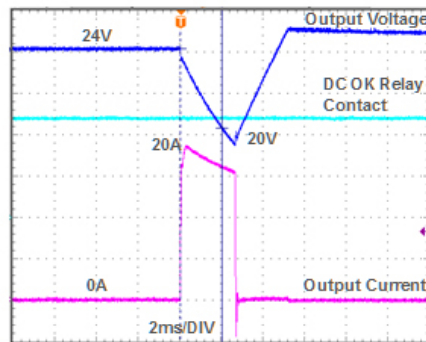


Figure 1.2. APB 400% of Nominal Output Current for 2ms

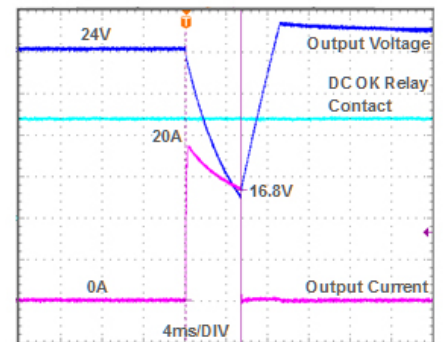


Figure 1.3. APB 400% of Nominal Output Current for 5ms

Learn More

To learn more how to enhance the reliability of a system with Power Boost and Advanced Power Boost, kindly contact your [local distributor](#) or please visit www.DeltaPSU.com for more information and other types of Delta power supplies.



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