Chroma Systems Solutions, Inc.

Slew Rate and Minimum Rise Time

6310A series loads

Keywords: 6310A series loads, slew rate, minimum rise time

Title:

Slew Rate and Minimum Rise Time

Product Family: **6312/A, 6314/A, 63101/A, 63102/A, 63103/A, 63105/A, 63106/A, 63107/A, 63108/A, 63110/A, 63112/A, 63113/A**

Scope

The purpose of this Application Note is to explain how the Slew Rate Control operates using the 6310A series loads.

Definition

Slew Rate: The rate of change of the current drawn by the load as a function of time.

Minimum rise-time: The minimum amount of time the loads can slew from one current value to another. This time is measured from the 10% to 90% points. Please refer to the specifications for the slew rates and minimum rise times for the different modules.

Example

If the transition from one setting to another is small, the small signal bandwidth of Load will limit the minimum transition time for all programmable slew rates. Because of the limit, the actual transition time is longer than the expected time based on the slew rate. Therefore, both minimum rise/transition time and slew rate must be considered in the determination of actual transition time. The following two examples show how the signal bandwidth of load limits the minimum transition time and slew rates.

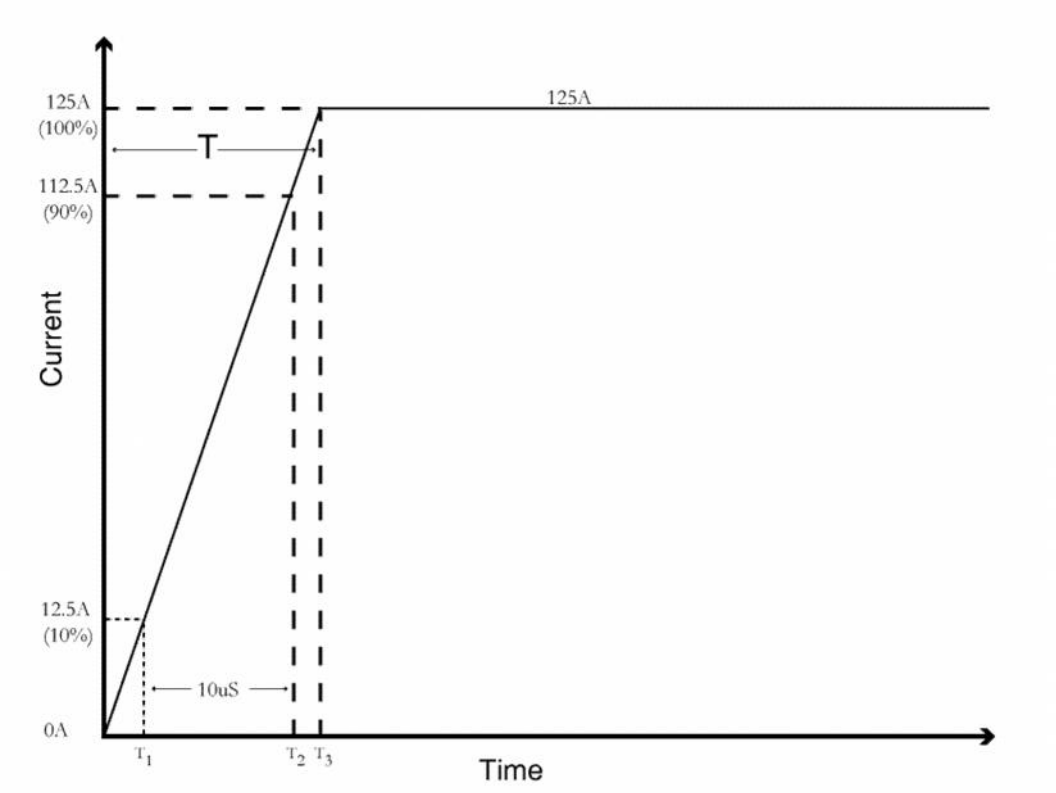

Figure 1 63112/A-125A

$$\textit{slew rate} = \frac{I@90\% - I@10\%}{T_2 - T_1}$$

$$T = T_1 + \textit{slew rate} \times (T_2 - T_1) + (T_3 - T_2)$$

T: actual transition time

T_1: time at 10% of final value

T_2: time at 90% of final value

T_3: time at stabilized final value

As the example in Figure 1 shows, the 63112A load module can slew at a rate of 10A/µS when 125A (I @90% - I @ 10% = 100A Slew) is programmed.

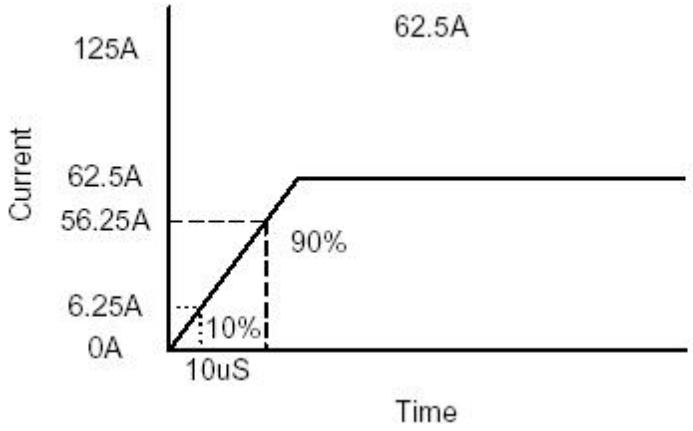

Figure 2 63112/A- 62.5A

As the example in Figure 2 shows above, for a 62.5A (I @ 90% - I @ 10% = 50.0A), the maximum slew rate is 5A/µS (i.e. 50A/10µS). So for a programmed current of 12A (I @ 90% - I @ 10% = 10A), the maximum slew rate is 1A/µS, for 2.5A (I @ 90% - I @ 10% = 2.0A), the maximum slew rate is 0.2A/µS