

Technical description for the CTF3 gun

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The Note summarizes the technical specifications that will be used by LAL, as a "Cahier des charges" for the design and the construction of the CTF3 gun.
This gun should be used in the CTF3 "Initial and Nominal stages".

E-GUN simulations will be performed to check that the beam radius does not exceed 10 mm between the anode and the exit of the gun monitor that allows measuring the beam current.
These simulations should be performed for nominal beam characteristics, i.e. 7 A for both voltages 150 kV and 100 kV.

The gun pulser should be able to deliver the train of pulses given in Figure 1 with a repetition rate of 5 Hz. Studies will be done in order to modulate the grid at 1.5 GHz with a large bandwidth amplifier (250 MHz).

Table 1 gives the CTF3 gun characteristics.

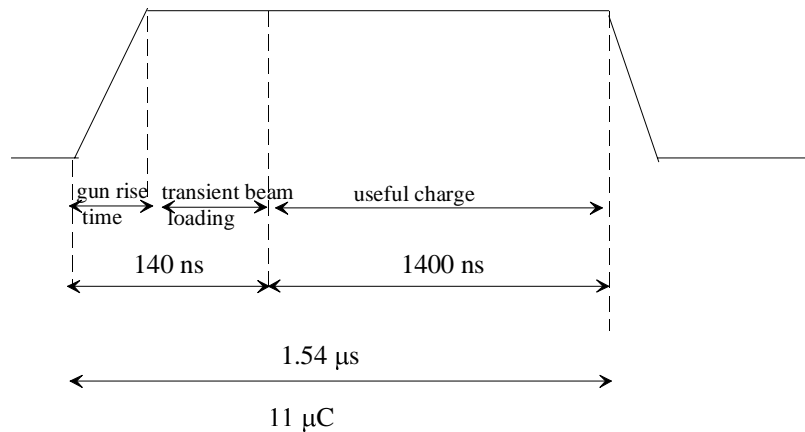


Figure 1: Pulse at the CTF3 gun exit

Table 1: Parameters for the CTF3 gun used for the Initial and Nominal stages

| Parameters | Unit | Initial and Nominal |
|--------------------------------|---------------|----------------------------|
| Voltage | kV | 150 (*) |
| Pulse length | μs | 1.6 |
| Gun current | A | 7 |
| Charge per pulse | μC | 11 |
| Rise/ Fall time | ns | ≤ 10 |
| Voltage stability $\Delta V/V$ | % | ≤ 0.1 |
| Charge flatness on flat top | % | ≤ 0.1 |
| Emittance (norm., rms) | mm.mrad | ≤ 10 |
| Repetition rate | Hz | 5 |

(*) Preliminary value which may be reduced in the course of the injector design study.