

## PXIE MEBT Chopper Driver Specifications ("Unipolar scheme")

The chopper is a part of the PXIE MEBT chopping system, which will prepare a pre-specified bunch structure of the 2.1 MeV H- beam. For at least 80% of the time, bunches are directed to the absorber, and the remaining part of initially 5 mA CW beam is sent to the linac. The bunch deflection is produced by two synchronized travelling-wave kicker structures, each having an active length of ~500 mm, providing a total kick angle of 7.4 mrad. For mechanical and dispersion reasons, each kicker probably will be further subdivided into two 250 mm long units. Therefore eight, instead of four kicker driver units have to be build.

The electric field in the kicker is generated by applying voltages of equal and opposite polarity to the two opposing helical electrodes of each kicker. This specification assumes that the integrated electric field generated by the electrodes of the helical structure is 90% of that of long continuous plates (to be confirmed by an EM analysis).

The specifications in this document formulate the requirements for a DC-coupled, broadband electronic switch to drive kicker electrodes of helical shape.

Drive scheme:           Unipolar: Voltage is applied to the kicker electrodes to kick beam out. For bunches intended to pass through, the plate voltages are ideally zero. Any bunch can be passed or dumped.

Driver load impedance:	200 ±5 Ohm
Flattop voltage:	>550 V (assuming 90% plate efficiency)
Base voltage for passing bunches:	0±25 V
Frequency of incoming bunches	162.5 MHz
Flattop voltage duration:	≥1.4 ns
Passing bunch duration:	≥1.4 ns
Average (maximum) frequency of switching cycles, averaged over a 1µs interval:	33 MHz
Coupling:	DC
Input level	LVDS or PECL