Single-trial ERP estimation remains a challenging problem for cognitive research, mainly because of the low SNR in EEG. The advent of high-density EEG delivers a promise to convert this 'hard' problem to an 'easy' one. We introduced a new approach to the problem that relies on modeling of the ERP component descriptors to be estimated and utilizes a spatial filter to constrain the output in the temporal domain. Results on cognitive EEG data with very low SNR show that our method successfully extracts the P300 component while other traditional methods fail. Some possible improvements on the present method are also discussed.