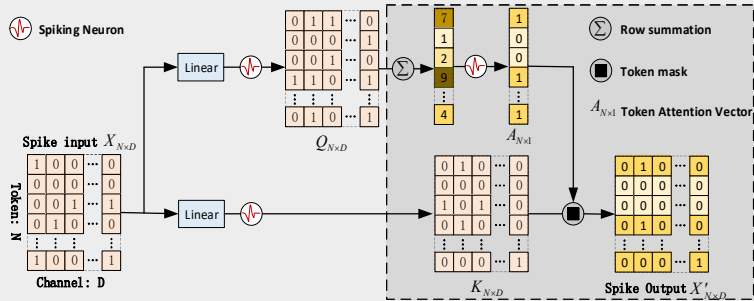
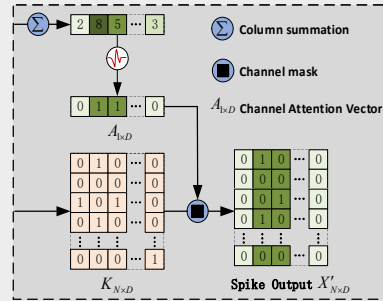


(a) Q-K Attention



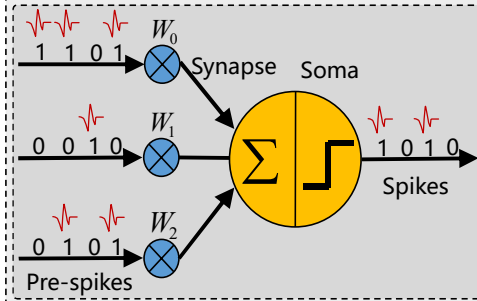
Q-K Token Attention (QKTA)

(b) Spiking Neuron



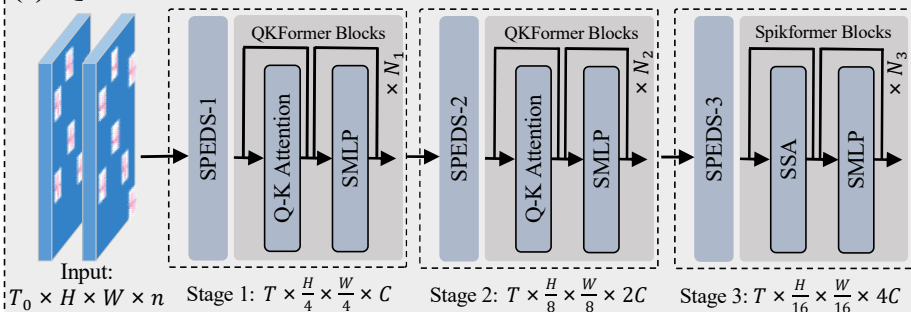
Q-K Channel Attention (QKCA)

(b) Spiking Neuron



Leaky Integrate-and-Fire (LIF) model

(c) QKFormer



(d) SPEDS module

