Voice over Internet Protocol (VoIP) and Automatic Speech Recognition (ASR) enabled smart speakers are changing the way we live.

Audio dynamics processing is a crucial component of smart speakers’ VoIP and ASR.

Existing single-band and multiband dynamics processing (MBDP) schemes fail to maximize bass and loudness, can produce distortions and nonlinear echo, which result in poor ASR and full-duplex voice communication performance.

A novel reconfigurable multitask MBDP scheme is proposed by using a perfect reconstruction filterbank, a flexible multiband compressor, and a scalable multiband limiter.

The proposed MBDP is integrated with an acoustic echo cancellation (AEC) system in smart speakers.

The proposed MBDP maximizes bass and loudness, enhances listening experience.

The proposed MBDP minimizes speakers’ total harmonic distortion (THD), prevents audio from clipping, drives speakers in linear range, reduces nonlinear echo.

The proposed MBDP can achieve the optimal VoIP and ASR performance.