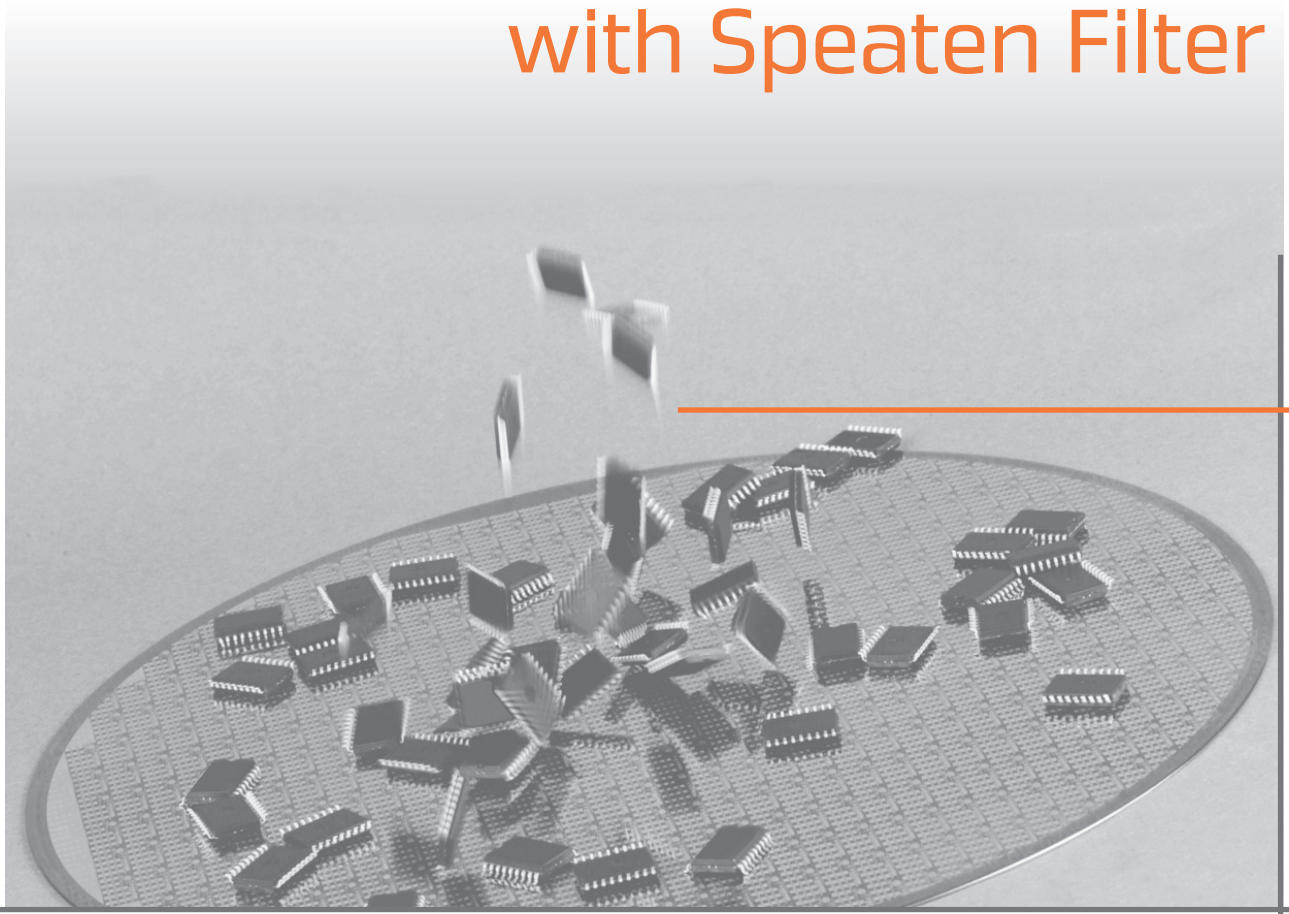
PREMA SEMICONDUCTOR

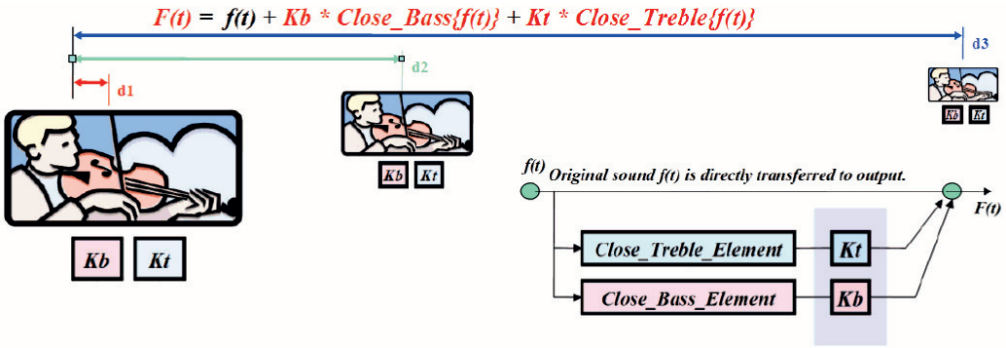
PREMA SEMICONDUCTOR GmbH

Sound Enhancement with Speaten Filter



Quality made in Germany

Sound Enhancement with Speaten Filter



The **Speaten Filter** is a sound enhancement system, producing a clearer sound that makes the sound source appear closer to the listener.
Applications are in TV sets, computer speakers, car audio, hands-free phones, and many more. Small speakers can sound like much larger systems, allowing a compact and lightweight device.

The Integrated Circuit MZ-01 is a joint development with company Dedekind in Japan. For further information about Dedekind visit their website „dedekind.jp".

Dedekind has developed the concept of the Speaten filter, but they also provide the support how to improve the whole system of filter and speaker.
For example, since the Speaten filter enhances the bass, it is important that the speaker is able to comply with the larger amplitude, which often requires a change in membrane suspension and damper. If the system is designed correctly, the result is an astounding improvement in sound quality, while keeping the speaker size and extra cost very small; but if not tuned correctly, it may produce distortion or an unbalanced sound.
Therefore it is important not only to use the filter circuit, but to get advice from Dedekind first.

PREMA has developed and produces the IC used in the enhancement system.
For further information, design-in of the system into your application and commercial aspects please contact Dedekind in Tokushima-shi, Japan:

Dedekind R&D
attn. Mr. Junichi Kakumoto or Mr. Futoshi Itami
email: sales@dedekind.jp
phone +81-88-644-2220

This brochure is provided by the manufacturer of the MZ-01 chip:

PREMA Semiconductor GmbH
Robert-Bosch-Str. 6 · 55129 Mainz · Germany
Phone: +49-6131-5062-0 · Fax: +49-6131-5062-220
Email: prema@prema.com · www.prema.com

The following pages contain information provided by **Dedekind R&D**.

An Algorithm which Makes Liveliness Sound

Dedekind R&D Junichi Kakumoto

¥drd¥speaten¥spec¥speaten_abstruct-E

1. **We produce :** a technology to construct sound quality with a sense of reality. It is easy to adjust via realistic sensation components. The impact is sound without distortion. Moreover, this technology will help you eliminate sound distortion and simultaneously maximize speech and music sound quality.
2. **How to make a realistic sensation :** The “realistic sensation component” has a super high tones and a super low tones component. Because of their sound wave characteristics, these tones are hard to propagate through speakers. In addition, our technology doesn’t distort the middle tones, which is important for the human sense of hearing. This means that the middle low and middle high tones relational waveform is not distorted. Thus, this technology increases the realism of not only instrumental audio but also speech.
3. **Applications :** Home Audio, Audio-Visual Equipment, Portable Audio, Personal Computer Audio, Car Audio, Communication, Power Amplifier Equipment
4. **Expression :**

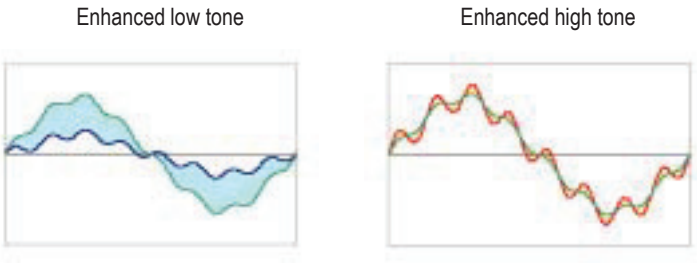
$$F(t)=\sum K_{2i} * S_{2i}\{f(t)\}$$

$S_{2i}\{\}$: Function for Enhancement

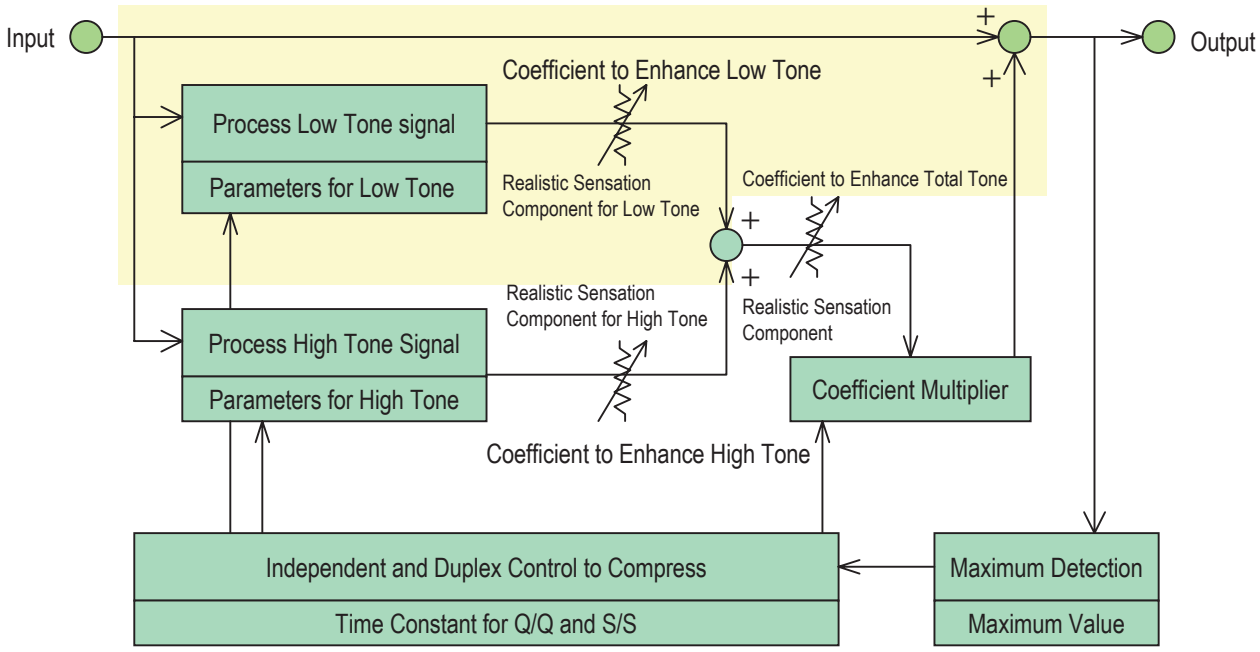
$i = \ldots -2, -1, 0, +1, +2, \ldots$

$f(t)$: Input Signal

K_{2i} : Coefficient for Sound Quality



Speaten Filter



MZ-01S ;

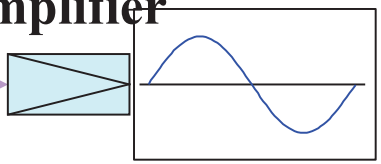
Amplifies Closeness -Feeling

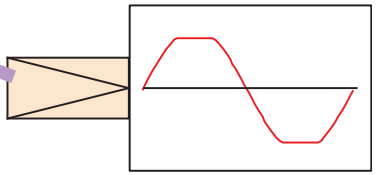
Focusses a Vocal-line

Carries out distinctly

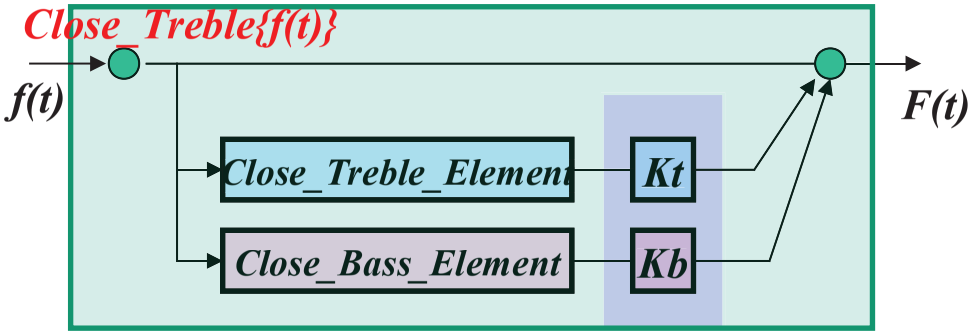
MZ-01S

Saturation free for amplifier





*F(t) = f(t) + Kb * Close_Bass{f(t)} + Kt * Close_Treble{f(t)}*



Original sound f(t) is directly transferred to the output.

MZ-01S Specifications

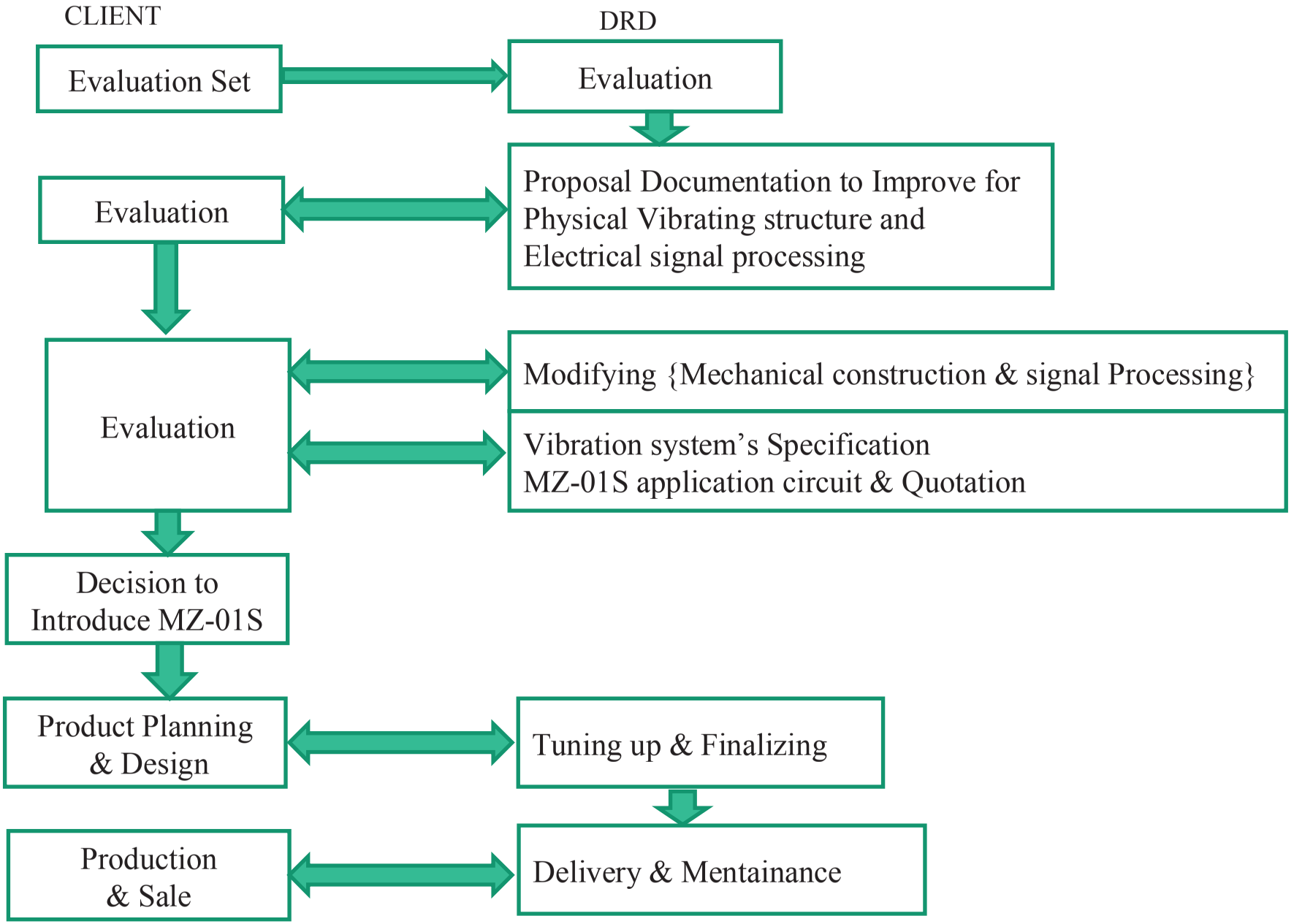
Dedekind

1. **Function: Close-Sound-Element-Analog-Amplifier**

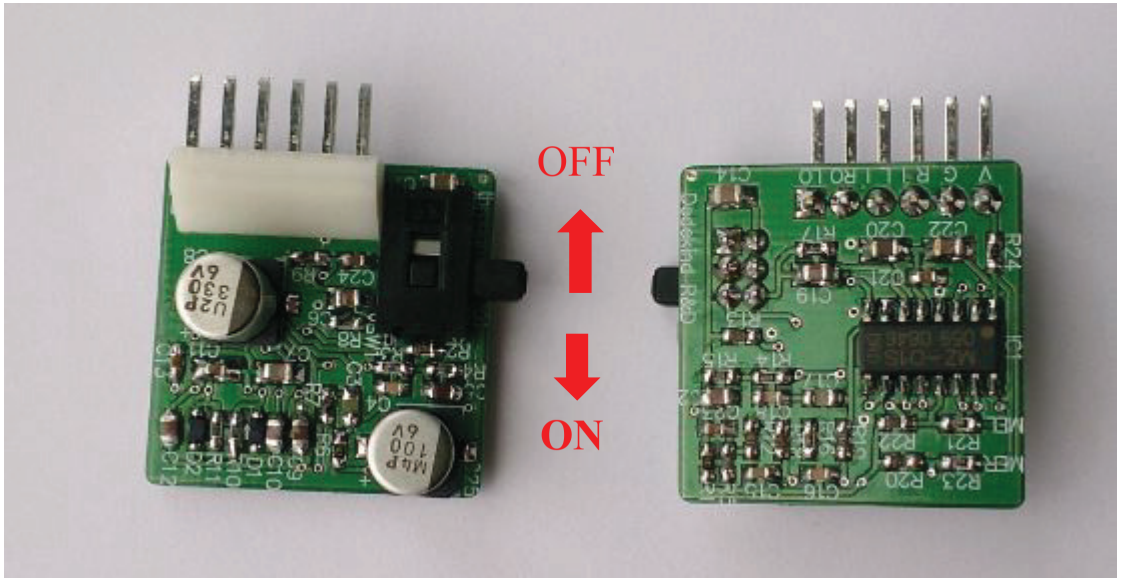
   (amplified close sound in the input signal is added on the input signal)
2. **Application: for small speaker system**
3. **Supply Voltage: 3v to 12v**
4. **Package and Pins:**
5. **Current Consumption: 1.8mA at 4V**
6. **Input &Output Signal Level: min. 0.1vrms (140mv peak) to max. 1vrms (1.41v peak)**
7. **Max. out put level of the close-element-amplifier: 140mV peak to 1.4V peak by a resistor**
8. **Frequency Range: DC to 20kHz**
9. **Remained Noise: -92dBv**
10. **Bass Enhancement: max.23dB & adjustable by resisters at min.30Hz to max.90Hz**
11. **Treble Enhancement: max.17dB & adjustable by resisters at min.8kHz to max.14kHz**
12. **Total Characteristic: Arbitrary to vertical and horizontal by resisters**
13. **Low Cut: Cascaded secondary and/or third stage by capacitors and resisters**
14. **Compression: Double compression by Q/Q and S/S for only close element signal**
15. **Muting for remained noise: 10 dB muting for only enhancement in small signal range**

MZ-01S procedure for introducing

Tedekind



MZ-01S Evaluation Board



The Best Solution

Dedekind

for an Emotional Sound

by MinZ-01

New: Now with integrated surround function

MZ-01
Amplifies
Closeness
in the Music

Made by

PREMA® SEMICONDUCTOR