

Migration Guide for ISD2500 Series to ISD1700 Series

AN-CC1009

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1. Introduction

This document provides design guideline consideration for migrating from ISD2500 family to ISD1700 family.

2. Replacement Option

Table 1 provides a replacement option with respect to the duration of ISD1700 and ISD2500 Series.

Table 1 : Replacement Option with respect to Duration

| ISD2500 Series | | | ISD1700 Possible Replacement ^[1] |
|----------------|---------------|-------------|---------------------------------------------|
| Part # | Sampling Freq | Duration | |
| ISD2532 | 8 kHz | 32 seconds | ISD1730 |
| ISD2540 | 6.4 kHz | 40 seconds | ISD1730/1740 |
| ISD2548 | 5.3 kHz | 48 seconds | ISD1730/1740/1750 |
| ISD2564 | 4 kHz | 64 seconds | ISD1730/1740/1750/1760 |
| ISD2560 | 8 kHz | 60 seconds | ISD1760 |
| ISD2575 | 6.4 kHz | 75 seconds | ISD1760 |
| ISD2590 | 5.3 kHz | 90 seconds | ISD1760/1790 |
| ISD25120 | 4 kHz | 120 seconds | ISD1760/1790/17120 |

^[1] ISD1700 is specified with duration at 8 kHz sampling frequency.

3. Feature Comparison

Table 2 illustrates the differences in features.

Table 2 : Feature Comparison

| Features | ISD1700 | ISD2500 (EOL) |
|-----------------------|---------------------------------------------------------|----------------------------------|
| Power Supply | 2.4V ~ 5.5V | 4.5V ~ 5.5V |
| Operation modes | Standalone or SPI | Standalone |
| µController Interface | SPI | None |
| Sampling Freq Range | 12 ~ 4 kHz | 8 / 6.4 / 5.3 / 4 kHz |
| Sampling Freq Option | User selectable | Fixed |
| Industrial Temp Grade | Available | Optional |
| Package Types | die, PDIP, SOIC and TSOP | die, PDIP, SOIC and TSOP |
| Pb-free Package | Available | Optional |
| Message Management | Built-in | None |
| Random Access | SPI | Address pins |
| Cascading Feature | No need (wide range of duration) | Able to cascade multiple devices |
| Address Mode | via SPI | 9 ~ 10 pins (A0 ~ A8/A9) |
| Input Control | REC, PLAY, ERASE, FWD, VOL, FT, RESET, Rosc, and/or SPI | CE, PD, P/R, XCLK, A0~A9 |
| Outputs | LED, RDY/INT | EOM, OVf |
| Analog Inputs | Mic+, Mic-, AnaIn, AGC | Mic, MicRef, ANAIN, AUXIN, AGC |
| Analog Outputs | SP+, SP-, AUD/AUX | Sp+, SP- |

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| Features | ISD1700 | ISD2500 (EOL) |
|----------------|-------------|---------------|
| Speaker Output | Class D PWM | Class AB |

3.1 Function Comparison

Table 3 reviews the functional differences among the two devices.

Table 3 : Function Comparison

| Functions | ISD1700 | ISD2500 (EOL) |
|------------------------------|--------------------------------------------------|------------------------------------------------------------|
| Recording | $\overline{\text{REC}}$ or SPI | $\overline{\text{CE}}$ and $\text{P}/\overline{\text{R}}$ |
| Playback | $\overline{\text{PLAY}}$ or SPI | $\overline{\text{CE}}$ and $\text{P}/\overline{\text{R}}$ |
| Erase | $\overline{\text{ERASE}}$ or SPI | Implemented in Record |
| Reset | $\overline{\text{RESET}}$ or SPI | PD |
| Halt Playback | Yes | No |
| Feed-Through | $\overline{\text{FT}}$ and AnalIn | AUXIN |
| Volume Control | $\overline{\text{VOL}}$ or SPI | No |
| Power Down | Automatic in Standalone mode or SPI | PD to control |
| Forward | $\overline{\text{FWD}}$ or SPI | Operational mode M0 ^[1] |
| Delete EOM marker | Not needed | Operational mode M1 ^[1] |
| Looping | Level-trigger on $\overline{\text{PLAY}}$ or SPI | Operational mode M3 ^[1] |
| Consecutive Addressing | Built-in | Operational mode M4 ^[1] |
| CE Level-activated | Not needed | Operational mode M5 ^[1] |
| Push-button mode | Standalone mode | Operational mode M6 ^[1] |
| EOM (ISD2500), LED (ISD1700) | LED on = recording LED blinks = playback | EOM pulses Low at end of message & stays Low when Overflow |
| External Clock | SPI | XCLK |
| Overflow | No needed | OVF |

^[1] Require multiple pins to operate.

4. Pinout Compatibility

The pinout arrangements between two families are different. Thus, a re-design is necessary to accommodate the ISD1700 device.

5. Schematic Comparison

The ISD2500 has a maximum of 10 address pins and 5 control/feedback pins for controlling. In most of the multiple messages applications on ISD2500 device, utilizing a microcontroller is almost a must. Fully operating under address mode for ISD2500 needs a maximum of 15 I/O pins, but for ISD1700, only 4 to 5 I/Os are sufficient.

Besides the huge range of various applications, the control pins on the ISD2500 can be manipulated in so many different ways. As a result, it is hardly unlikely to recommend a generic solution for ISD1700 to fit all the applications employed on the ISD2500. Thus, migration will

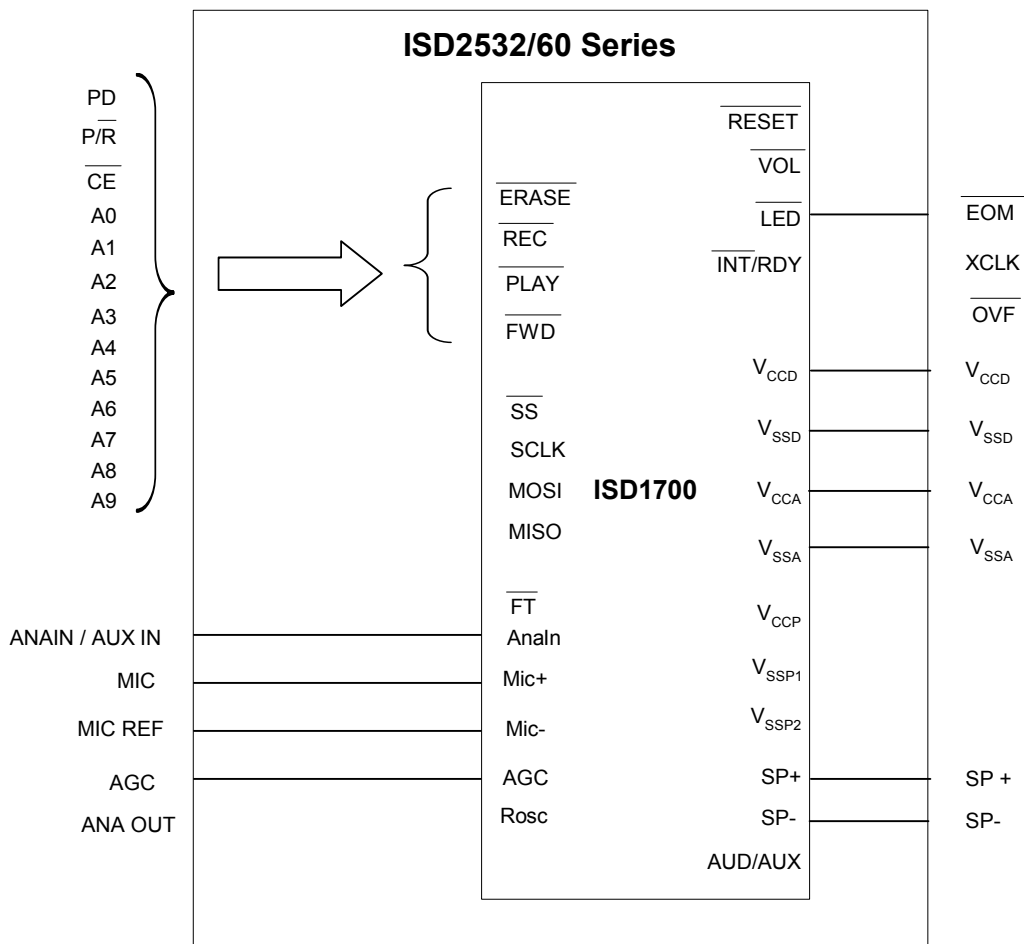
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inevitably require a re-design in order to utilize the ISD1700 device. Furthermore, the complexity of re-design and re-layout are totally depending upon how the ISD2500 device is originally designed.

The below diagrams show the concept on how the connections may be plotted from ISD2500 to ISD1700.

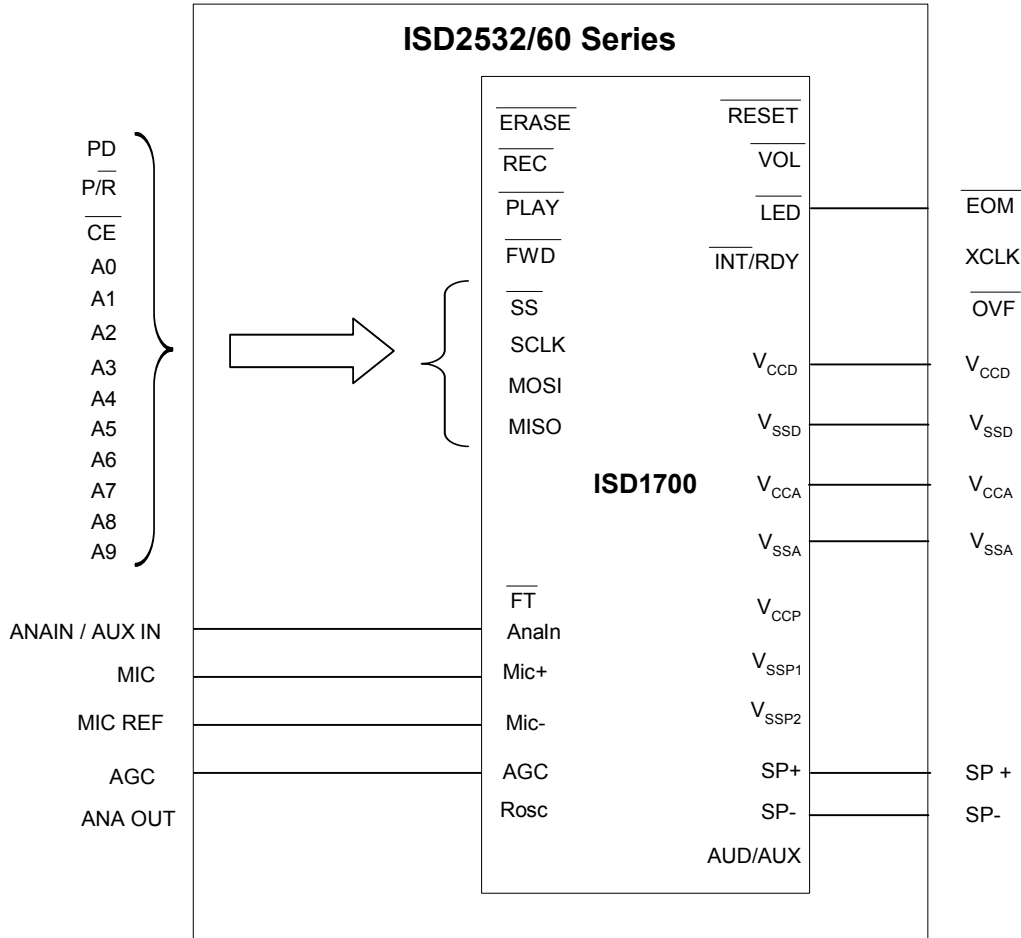
- Standalone mode



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- SPI mode



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Revision History

| Version | Date | Description |
|---------|------------|-----------------|
| 0 | March 2007 | Initial version |



Headquarters

No. 4, Creation Rd. III,
Science-Based Industrial Park,
Hsinchu, Taiwan
TEL: 886-3-5770066
FAX: 886-3-5665577
<http://www.winbond.com.tw/>

Taipei Office

9F, No.480, Rueiguang Rd.,
Neihu District, Taipei, 114,
Taiwan, R.O.C.
TEL: 886-2-8177-7168
FAX: 886-2-8751-3579

Winbond Electronics Corporation America

2727 North First Street, San Jose,
CA 95134, U.S.A.
TEL: 1-408-9436666
FAX: 1-408-5441798

Winbond Electronics Corporation Japan

7F Daini-ueno BLDG, 3-7-18
Shinyokohama Kohoku-ku,
Yokohama, 222-0033
TEL: 81-45-4781881
FAX: 81-45-4781800

Winbond Electronics (Shanghai) Ltd.

27F, 2299 Yan An W. Rd. Shanghai,
200336 China
TEL: 86-21-62365999
FAX: 86-21-62365998

Winbond Electronics (H.K.) Ltd.

Unit 9-15, 22F, Millennium City,
No. 378 Kwun Tong Rd.,
Kowloon, Hong Kong
TEL: 852-27513100
FAX: 852-27552064

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