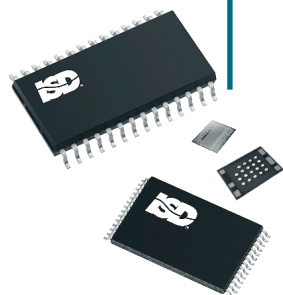# ISD5116

**Single-Chip Voice Record/Playback Device with
Up to 16-Minute Duration with Digital Storage Capability**

**Product Brief**

The ISD5116 ChipCorder® product provides high quality, fully integrated, single-chip record/playback solutions for applications with up to 16 minutes of messaging. It also provides digital memory capability for storing information such as phone numbers, system configuration parameters, or the message address table (MAT) for message management.

Unlike alternate DSP and flash solutions requiring complex, speech compression algorithms, the ISD5116 product is designed for low power applications requiring minimal software development. It is designed for use in a micro-processor- or microcontroller-based system. Address, control, and duration are enabled through an I²C interface which minimizes pin count (ONLY 2 control lines required).

Additional analog functions and audio gating have also been integrated into the ISD5116 product allowing easy interface with integrated digital cellular chipsets. Audio paths have been designed to enable full duplex conversation record, voice memo, answering machine (including outgoing message playback) and call screening features. This product also enables playback of messages while the phone is in standby AND both simplex and duplex playback of messages while using a phone.

Recordings are stored in on-chip non-volatile memory cells, providing zero-power message storage. This is made possible through ISD's patented multi-level storage technology. Voice and audio signals are stored directly into solid-state memory in their natural, uncompressed form, providing superior quality voice and music reproduction.

**ISD5116 CAN BE USED IN NUMEROUS APPLICATIONS:**

- Digital cellular phones
- Automotive communications
- GPS/navigation systems
- Portable handheld communication products

## FEATURES

### Fully-Integrated Solution
- Single-chip voice record/playback solution
- Storage of digital and audio data
- Integrated sampling clock, anti-aliasing and smoothing filters, and multi-level storage array
- Integrated analog features such as AGC, audio gating switches, speaker driver, summing amplifiers, volume control, and an Aux In/Aux Out interface (e.g. for car kits)

### Digital Memory Features
- Read or written in blocks of 64 bits
- Entire array available to store digital data
- Individual bytes are read or written as part of a block only
- Digital memory performs 10K read/write cycles (typical)

### High Quality Solution
- ISD's standard 100-year message retention (typical)
- 100,000 record cycles (typical) for analog

### Low-Power Consumption
- +2.7 to +3.3V (VCC) supply voltage
- Operating current:
  $I_{CC}$ Play = 15 mA (typical)
  $I_{CC}$ Rec = 30 mA (typical)
- Standby Current:
  $I_{SB}$ = 1µA (typical)
- Power consumption controlled by I²C control register
- Most stages can be individually powered down to minimize power consumption

### Enhanced Voice Storage Features for Digital Cellular
- One- or two-way (full duplex) conversation record, record signal summation and message playback
- Voice memo record and playback
- Private call screening
- In-terminal answering machine
- Personalized outgoing message (given caller ID information from host chip set)
- Private call announce while on call (given CIDCW information from host chip set)
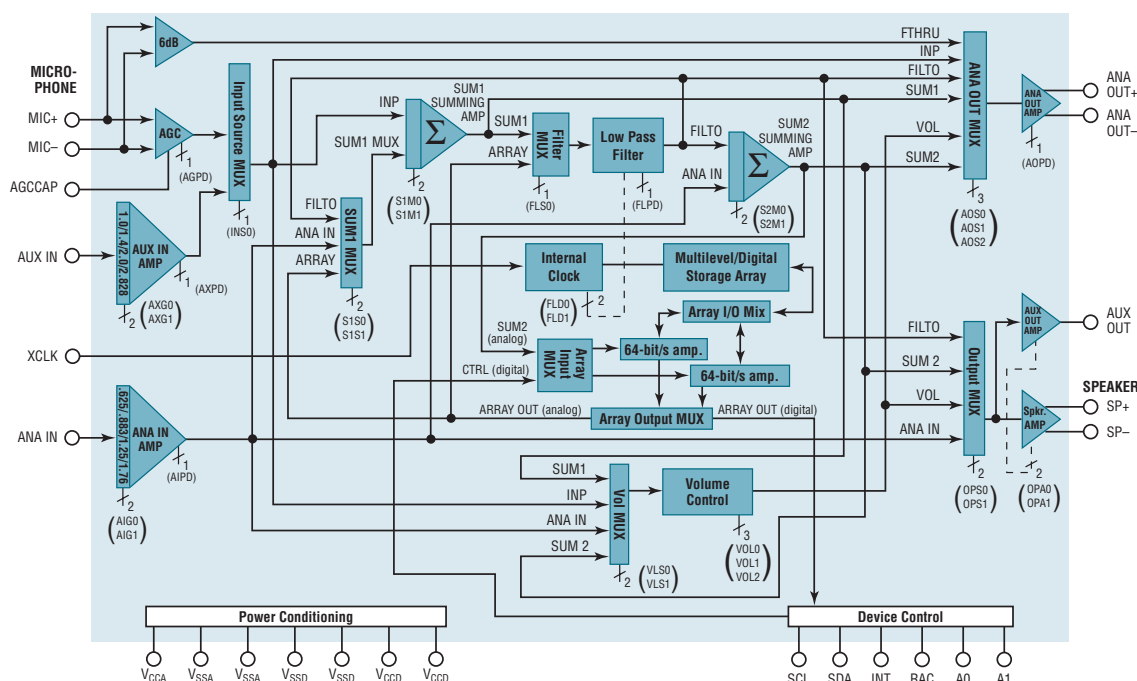
## *Easy-to-Use and Control*

- No compression algorithm development required
- User-controllable sample rates of 8.0, 6.4, 5.3 or 4.0 KHz providing up to 16 minutes of voice storage
- I²C Interface
- Fully addressable to handle multiple messages

## *Options*

- Compact chip scale package available for portable applications
- Available in die form, SOIC, TSOP and CSP packages
- Extended and industrial temperature versions available
- Support 2.0 and 3.0V logic interface options

### ISD5116 PACKAGE AND TEMPERATURE AVAILABILITY

| | TSOP | PDIP | SOIC | DIE |
|---|---|---|---|---|
| Commercial Die (0 to +50°) | | | | ● |
| Commercial Packaged (0 to +70°) | ● | ● | ● | |
| Extended (−20 to +70°) | ● | ● | ● | |
| Industrial (−40 to +85°) | ● | ● | ● | |

### ISD5116 BLOCK DIAGRAM



### ORDERING THE ISD5116 PRODUCTS

# ISD5116 __ __

*Product*

ISD5116
(up to 16 minutes)

*Package Type*

E = 28-Lead 8 × 14.4mm TSOP Type 1
S = 28-Lead 0.300-in. SOIC
X = Die
Z = Chip-Scale Package (CSP, μBGA)

*Special Temperature Field*

Blank = Commercial Die (0 to +50°C)
 or Commercial Packaged (0 to +70°C)
D = Extended (−20 to +70°C)
I = Industrial (−40 to +85°C)

**ISD**
*A Winbond Company*

*To Order Products or More Information:*

**ADDRESS**
2727 N. First Street
San Jose, CA 95134

**PHONE**
1-800-677-0769 (US Only)
408-943-6666
408-544-1786 (Fax)

**WEBSITE**
www.isd.com

**e-mail**
info@isd.com