National Semiconductor

SC14425
Complete Baseband processor for DECT Base Stations with Caller-id and Handsfree

General Description

The SC14425SC14425 is a 3.3 Volt CMOS IC optimized to handle all the audio, signal and data processing needed within a DECT base station. An ADPCM transcoder, a very low power 14 bit Codec and Analog Frontend are integrated. Direct connections towards analog or ISDN line interface.

The SC14425 has an on-chip dedicated flexible DSP optimized for telecom applications caller-id, handsfree and allows easy connection to digital telephone answering machine devices.

The SC14425 is designed to be compatible with many radio interfaces. A dedicated TDMA controller handles all physical layer slot formats and radio control. The integrated National Semiconductor's standard CR16B processor core takes care of all the higher protocol stack. Programmable I/O ports can be configured as chip selects for I/O expanders, Serial Flashes, interrupt source or I/O. A digital serial interface can be configured to interface to industry-standard codecs and ISDN devices with μ-Law, a-Law, linear or transparent data formats.

Features

- Integrated DECT base band transceiver optimized for GAP base stations according to ETS 300 175-2,3 & 8.
- 2.7 to 3.3 Volt operating voltage.
- Embedded 16 bit CompactRISC™ CR16B Microprocessor with In System Emulation (ISE) mode.
- On-chip 6kByte Data Memory.

- Embedded flexible dedicated DSP executing Caller-id (CID), Caller-id on Call Waiting (CIDCW) and handsfree, two echo cancellers, two echo suppressors, extended DTMF detection, DTMF generation, sidetone and artificial echo loss.
- Two full duplex 32 kbits/sec ADPCM transcoder.
- On-chip Dedicated Instruction Processor (DiP) for all TDMA based events, which supports 1.152MHz, 0.576MHz and 0.288MHz data rates.
- Protected and unprotected full and double slot B-fields
- Standard DECT encryption with different keys for different MAC-connections.
- At least 6 MAC connections can be handled simultaneously.
- Flexible three wire interface to radio front synthesizer.
- One 14-bit linear CODEC with programmable gain
- Peak hold ADC for RSSI measurement
- Two input 8 bit successive approximation ADC.
- Three general purpose I/O ports with programmable interrupts
- Full duplex UART, SPI™ and MICROWIRE™ interface.
- Flexible 8 kHz synchronous Serial interface to external codecs and ISDN interface circuits.
- Two general purpose timers and watch dog timer.
- Programmable chip selects to 8 bit wide ROM, SRAM NAND Flash Memory and I/O expanders.
- Two Capture timers for frequency measurement for e.g. metering, ringing and call progress tone detection.
- 100 pin TQFP-100 package.

Note 1: CompactRISC™ is a trademark of National Semiconductor Corporation, SPI™ is a trademark of Motorola.

System Diagram
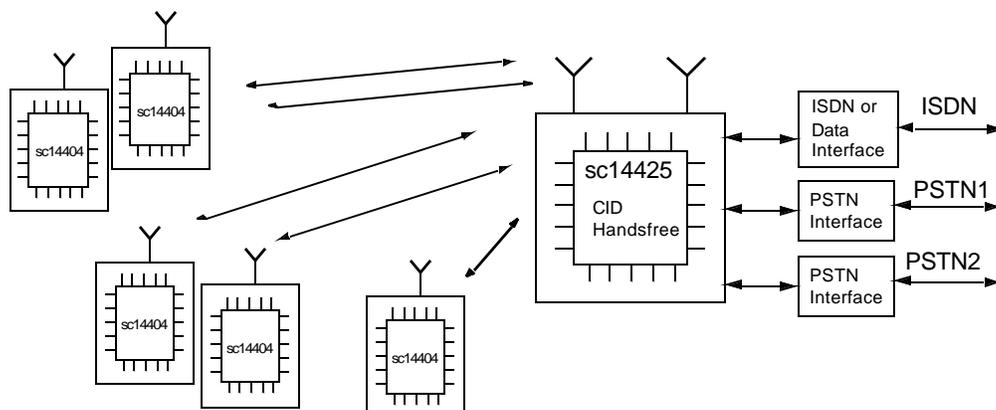
1.0 CONNECTION DIAGRAM
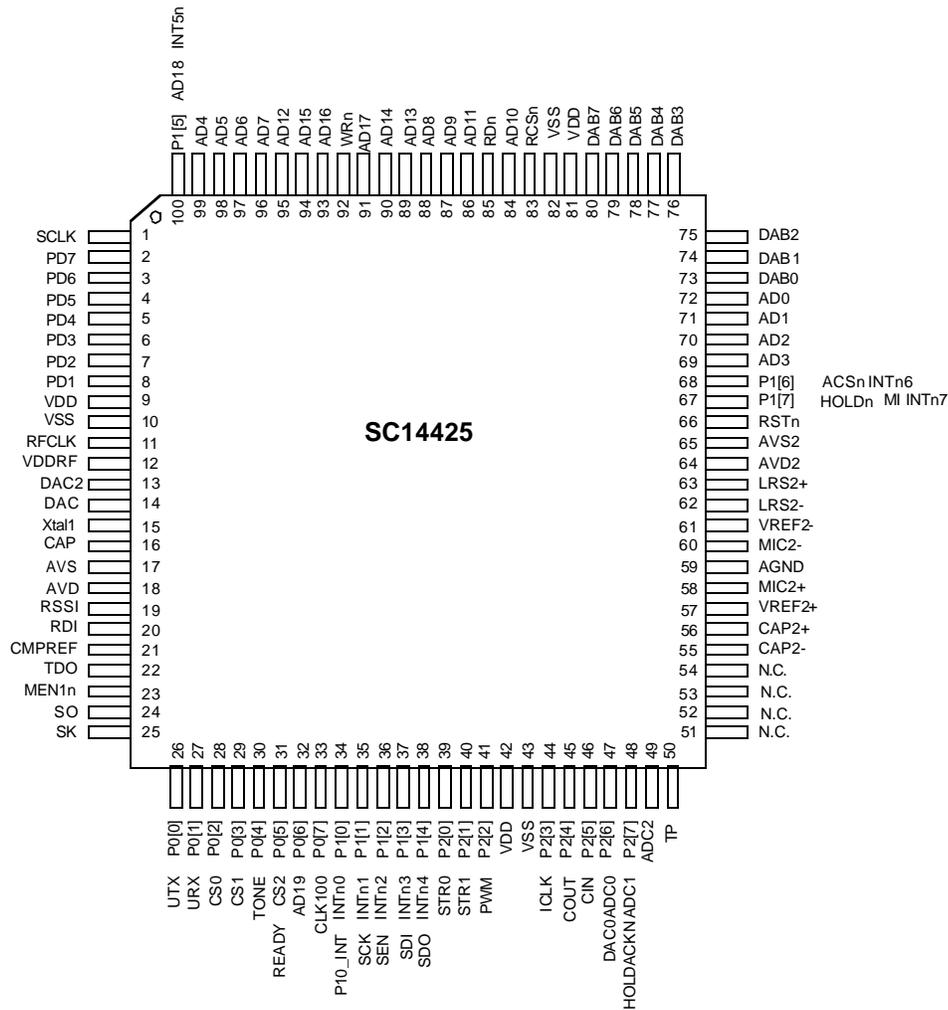
SC14425

Order Number SC14425XVJG (Standard version)
X=silicon revision
See NS Package Number VJG100A

Note 1: All digital outputs can sink/source 2 mA unless otherwise specified. All digital inputs are Schmitt trigger types. After reset all I/Os are set to input and all pull-up or pull-down resistors are enabled unless otherwise specified.

PU = Pull-up resistor enabled, PD = Pull-down resistor enabled, I = input
A-I, B-I = In Boot mode A or B input and pull-up or pull-down resistor disabled,
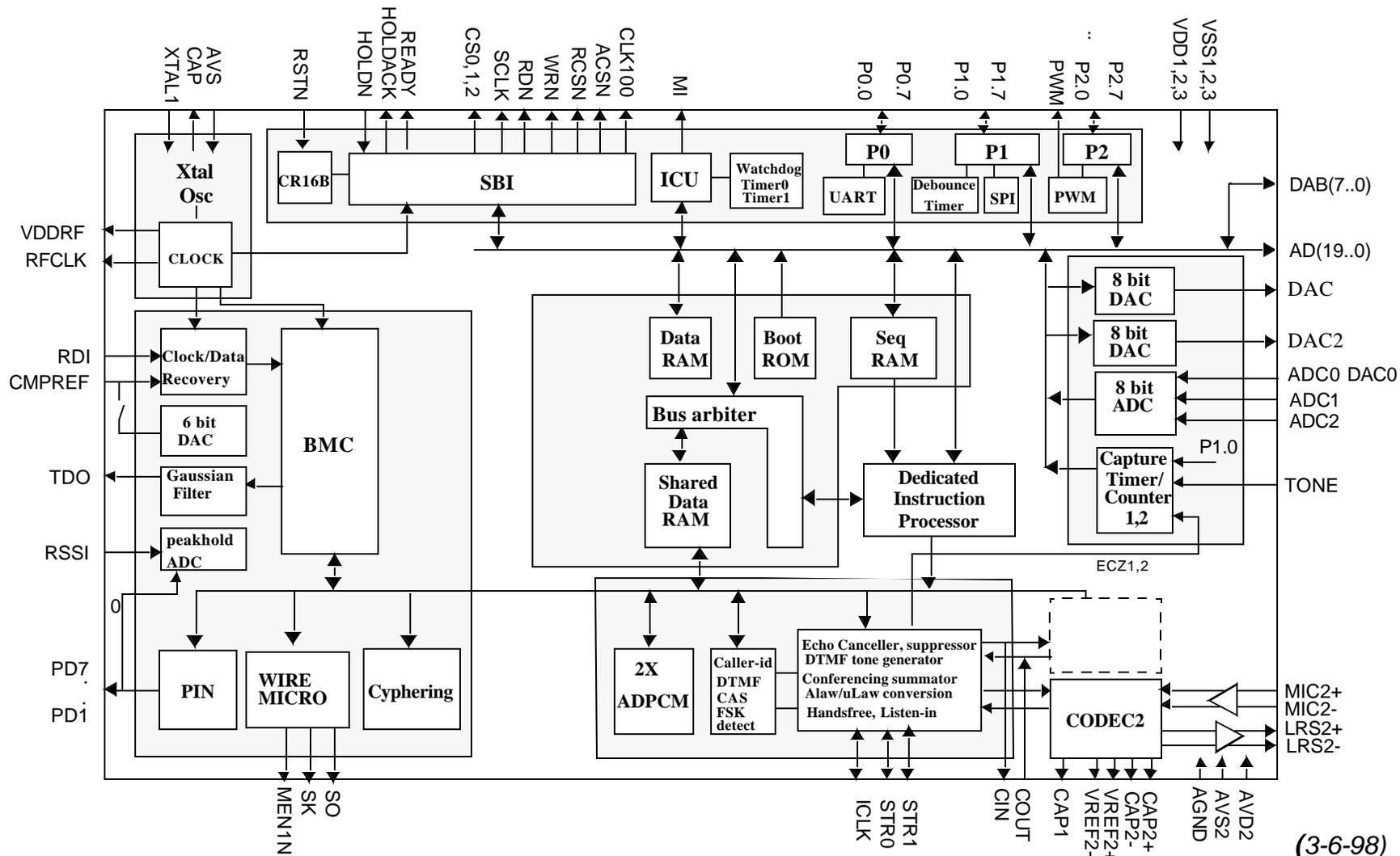A-PD, B-PU = In Boot mode A, Pull-down resistor enabled. In Boot mode B, pull-up resistor enabled.

Note 2: Reset state of address and WRn, RDn pins:
Hi-Z/1 means Hi-Z if RSTn is LOW, if RSTn goes HIGH is takes 32 SCLK cycles = 25 usec before these pin drives a '1'.

Note 3: 5 Volt protection pads: type *P may NOT be connected to an external pull down resistor

FIGURE 1. SC14425 Block diagram

(3-6-98)

1.0 Package information

16.0+/- 0.15)

14.00+/- 0.10)

13.95+/-0.10

pin 1

.17-.27

.5

1.4+/-0.108

13.95+/-0.10

.09-.20

SEATING
PLANE

14.00+/-0.10

0.25

0.60+/-0.15

16.0+/-0.15
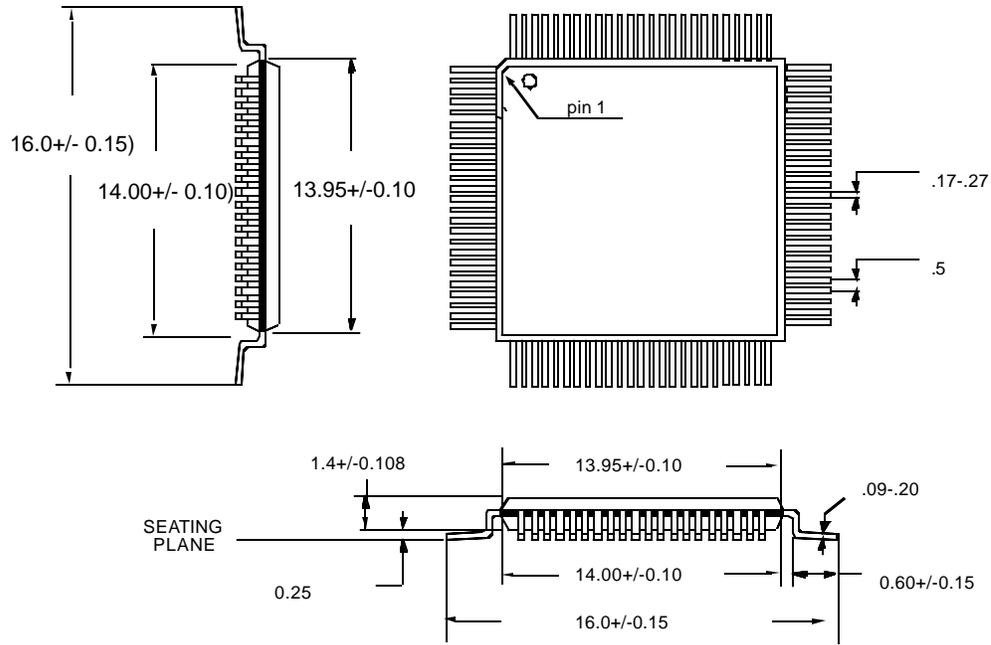
4220180

FIGURE 1. 100 pins TP Quad Flat Pack. NS Package Number VJG100A

2.0 Product status definitions

Definition of Terms

Data Sheet Identification	Product Status	Definition
Advance Information	Formative or In Design	This data sheet contains the design specifications for product development. Specifications may change in any manner without notice.
Preliminary	First Production	This data sheet contains preliminary data. Supplementary data will be published at a later date. National Semiconductor Corporation reserves the right to make changes at any time without notice in order to improve design and supply the best possible product.
No Identification Noted	Full Production	This data sheet contains final specifications. National Semiconductor Corporation reserves the right to make changes at any time without notice in order to improve design and supply the best possible product.
Obsolete	Not In Production	This data sheet contains specifications on a product that has been discontinued by National Semiconductor Corporation. The datasheet is printed for reference information only.

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