FCC ID: SWEBW8035

Technical Description :

The brief circuit description is listed as follows :

Main Unit:
- HL5233, 13.56M1 and associated circuit act as RFID Reader and 13.56 MHz Crystal Oscillator.
- SNC112 and associated circuit act as Speech Controller.

Tag:
- HL5230 and associated circuit act as RFID Tag.

Antenna Used :

A Loop Antenna has been used.

Sino Matrix Technology

HL5233
HF RFID Reader IC
Preliminary Version
Jan. 2003

Features

- Low standby current.
- Low power consumption.
- Simple application circuit.
- Stable performance.
- The system and oscillator can be enable separately.
- 3 kinds of Decoder outputs.
- Level hold mode and one shot Trigger mode.
- High Active and low Active output selectable.

Applications

- Toy RFID.
- Asset control.
- Contactless entry control.
- Education.

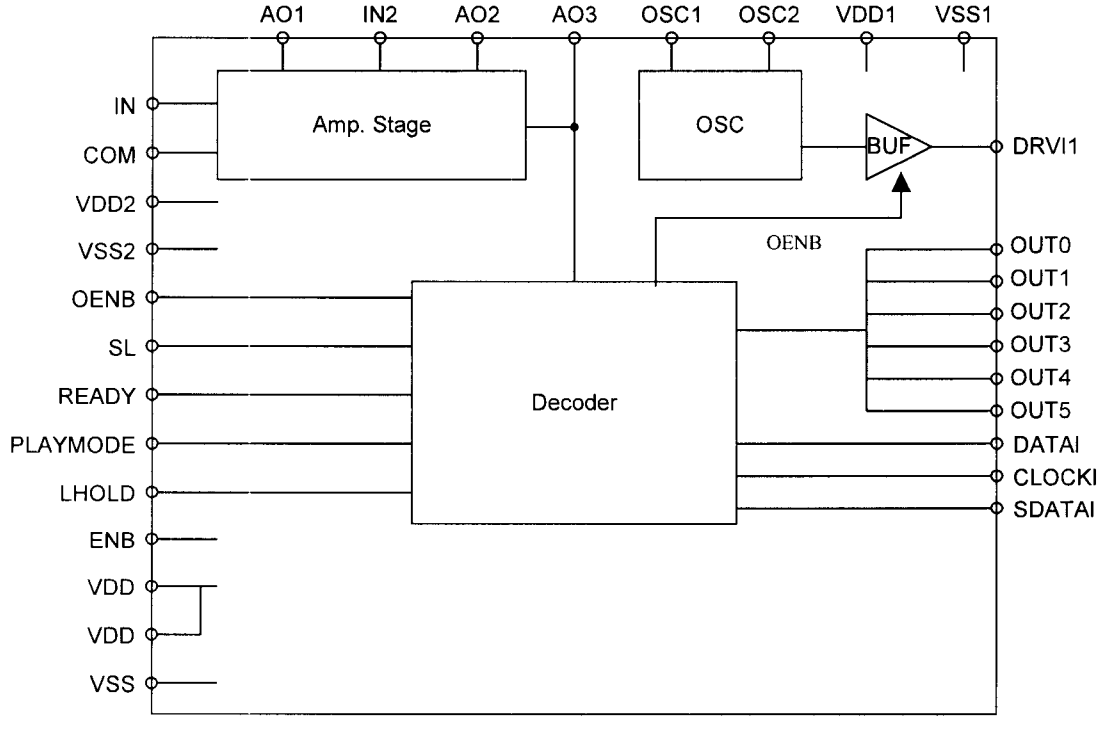
General Description

HL5233 is a CMOS IC used to perform the function of a RFID Reader. A RFID contains two parts: RFID TAG (HL5230) and RFID Reader (HL5233). HL5233 contains of a 13.56MHz crystal oscillator, a 13.56MHz output buffer, a preamplifier and data decoder. The output buffer drives an antenna which can transmits RF signal to the RFID TAG.

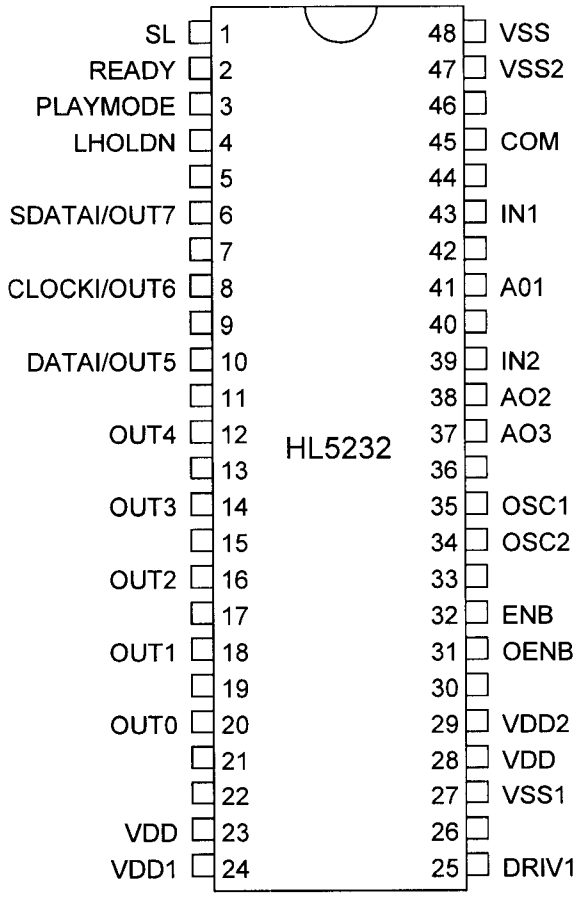
If TAG is close enough to the Reader, the encoder of TAG will send out a data train. The data train is used to modulate the RF signal in the TAG, and the amplitude of RF signal in the Reader will be modulated also. Preamplifier is used to amplify the modulating signal. The decoder is used to decoder the encoded data transmitted from TAG.

There are three kinds of output data: Synchronous, Asynchronous and direct drive outputs. In order to interface to most of power Speech IC, the data rate of the outputs is slower than the data rate of the RFID TAG.

Block Diagram



Pin Connection



Pin Description

PIN NO.	PIN NAME	DESCRIPTION
1	SL.	Data Bit Rate Select pin It is used to determine the bit rate received from TAG. SL = 1, Bit rate = 8KHz; SL = 0, Bit rate = 4KHz
2	READY	When PLAYMODE pin is high, this pin is used as Output Polarity Control Pin. When PLAYMODE pin is low this pin is used as Ready input pin. When READY = 0, output signal is not available.
3	PLAYMODE	This is an output DATA mode control pin. When PLAYMODE = 1, Out0 ~ Out4, DATAI, CLOCKI, and SDATAI is used as direct output pin. When PLAYMODE = 0, Out0 ~ Out4 is also used as direct output, but DATAI, CLOCKI and SDATAI is used as serial data output pin.
4	LHOLDN	Level-Hold control pin. When LHOLDN = 0, DATA will be sent out continuously or output will active as long as TAG is closed to Reader. When LHOLDN = 1, only one set of DATA will be sent out or output will active for a short time.
5	SDATAI	Serial Data Output. When PLAYMODE = 0, this pin is used as serial data output, i.e., DATA and CLOCK exist at same output. When PLAYMODE = 1, this pin is used as one of the direct output.
6	CLOCKI	CLOCK Output. When PLAYMODE = 0, this pin (combined with DATAI,) is used as synchronous

HL5230
HF 8-bit Read-only RFID Tag IC
Preliminary Version
Aug. 2001

Features

- Carrier frequency 13.56MHz Read-only in RF field.
- Low power consumption.
- Wide operating range.
- 8-bit ID selected by wire bonding.
- On chip rectifier and voltage limiter.
- Low operating current.

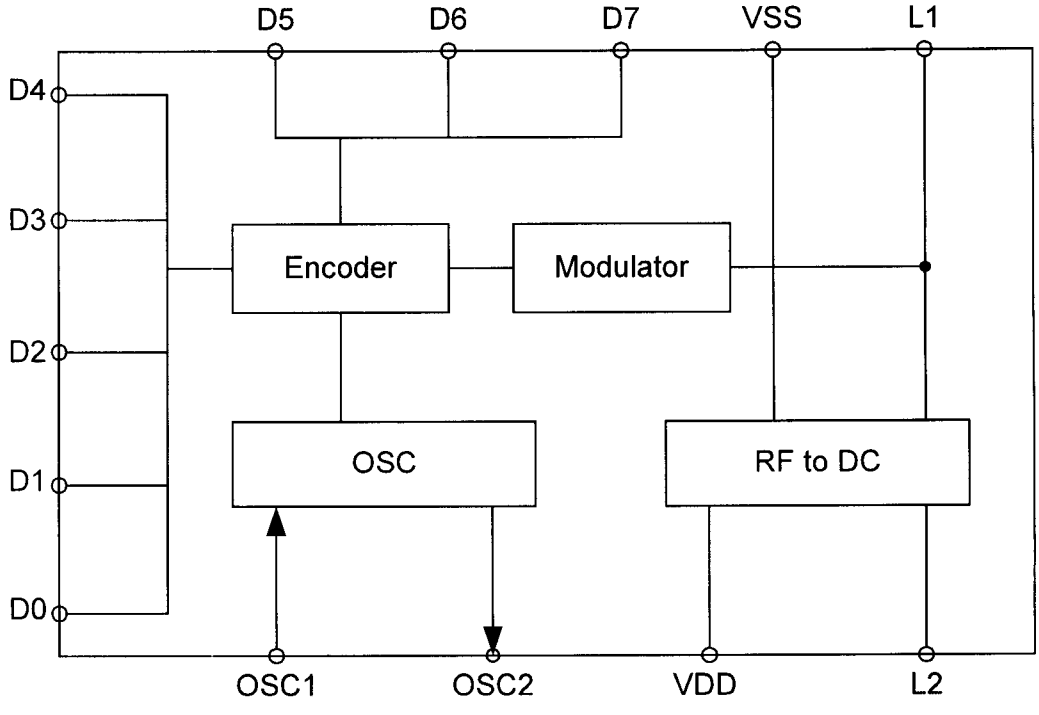
Applications

- Toy RFID.
- Asset control.
- Contactless entry control.
- Education.

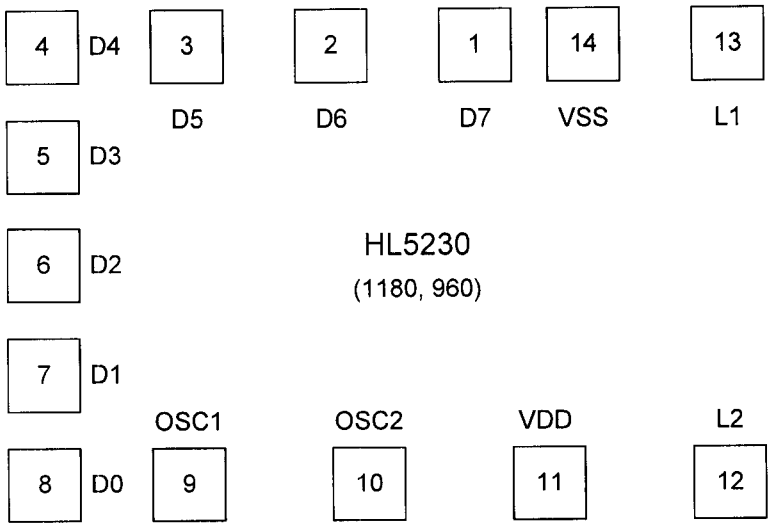
General Description

HL5230 is a low power CMOS RF Identification device (RFID). There are build-in power rectifier and data modulator for HL5230 to operate under RF magnetic field generated by Data Reader without external power supply. HL5230 provides 8-bit data for user programming, which is selected by wire bonding. HL5230 is suitable for application in the toy products, asset control and education.

Block Diagram



Bonding Pad Diagram



Units: μm

PAD NO.	NAME	X	Y	PAD NO.	NAME	X	Y
1	D7	680	710	9	OSC1	330	110
2	D6	490	710	10	OSC2	540	110
3	D5	300	710	11	VDD	730	130
4	D4	110	710	12	L2	960	130
5	D3	110	560	13	L1	980	710
6	D2	110	410	14	VSS	830	710
7	D1	110	260				
8	D0	110	110				

Note: Substrate is connected to VSS.

Pad Description

PIN NAME	PIN NO.	FUNCTION
VDD	11	Positive power supply
VSS	14	Negative power supply
D7 ~ D0	1 ~ 8	Data select inputs , with weak pull high device
OSC1	9	Oscillator input
OSC2	10	Oscillator output
L1	13	Coil input 1
L2	12	Coil input 2

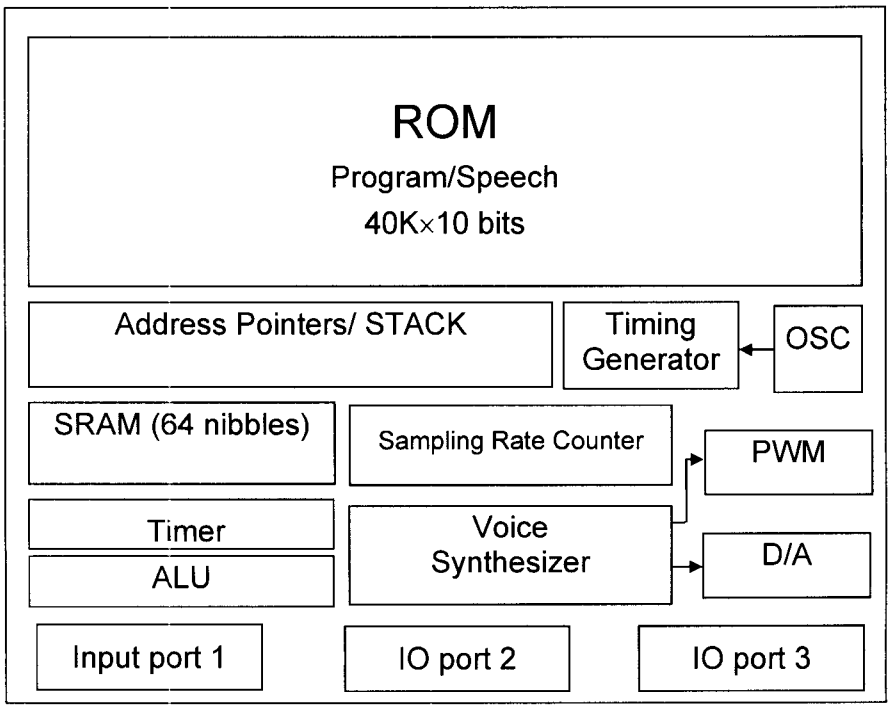
1 INTRODUCTION

SNC112 is a one-channel voice synthesizer IC with PWM direct drive circuit. It built-in a 4-bit tiny controller with one 4-bit input port, two 4-bit I/O ports. By programming through the tiny controller in SNC112, user's varied applications including voice section combination, key trigger arrangement, output control, and other logic functions can be easily implemented.

2 FEATURES

- Single power supply 2.4V – 5.5V
- 13 seconds voice capacity are provided(@6KHZ sample rate)
- Built in a 4-bit tiny controller
- One 4-bit input port, two 4-bit I/O ports are provided
- 64*4 bits RAM are provided
- 40K*10 ROM size are provided for voice data and program
- Maximum 16k program ROM is provided
- Built in a high quality speech synthesizer
- Adaptive playing speed from 2.5k-20kHz is provided
- One voice channel
- Built in a PWM Direct Drive circuit and a fixed current D/A output
- System clock : 2MHz
- Low Power Reset

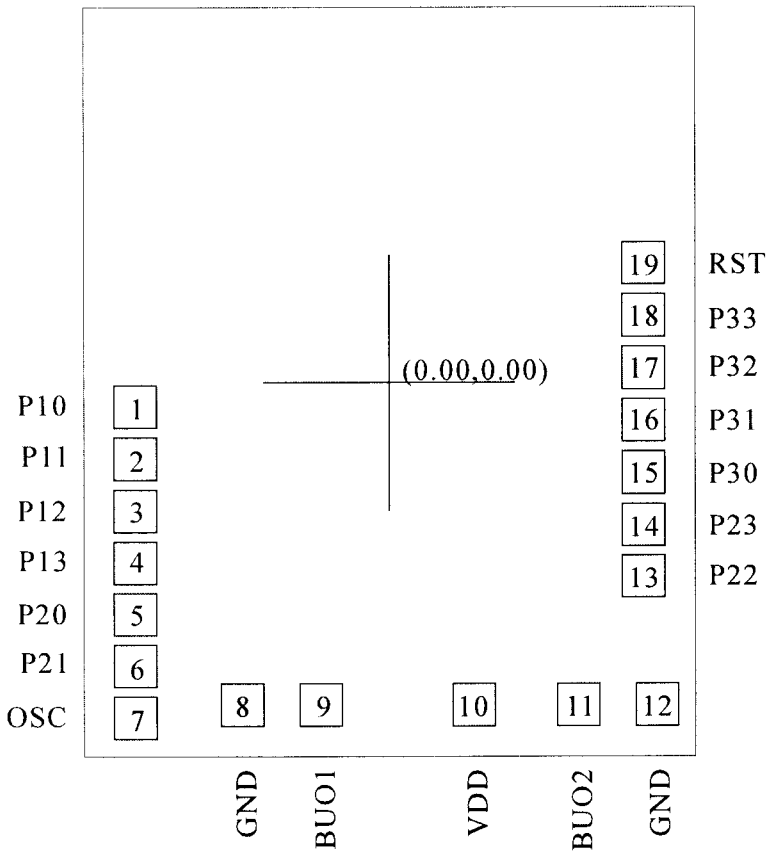
3 Block Diagram



4 PIN ASSIGNMENT

Symbol	I/O	Function Description
P13 ~ P10	I	Bit3 ~ Bit0 of Input port 1
P23 ~ P20	I/O	Bit3 ~ Bit0 of I/O port 2
P33 ~ P30	I/O	Bit3 ~ Bit0 of I/O port 3
VDD	P	Positive power supply
GND	P	Negative power supply
RST	I	Reset pin (active high)
OSC	I	Oscillator Input
BUO1/VO	O	Positive Output of PWM or DA output
BUO2	O	Negative Output of PWM

10 BONDING PAD



SNC112

Note: The substrate MUST be connected to Vss in PCB layout.