FCC ID: SQF8088

Technical Description :

The brief circuit description is listed as follows :

For Main Unit :

- L3 & C1 act as Matching Circuit.
- C2, C3 & L1 act as Filter Circuit.
- Y1, U1 W55MID50 and associated circuit act as MFID Reader.
- U3 EM55450 and associated circuit act as Voice Synthesizer.
- Q1 and associated circuit act as Amplifier for the Speaker.

For Tags :

- L3, C2, U2 W55MID35 and associated circuit act as MFID Transponder.

Antenna Used :

A Loop Antenna has been used.

Winbond Electronics Corp.

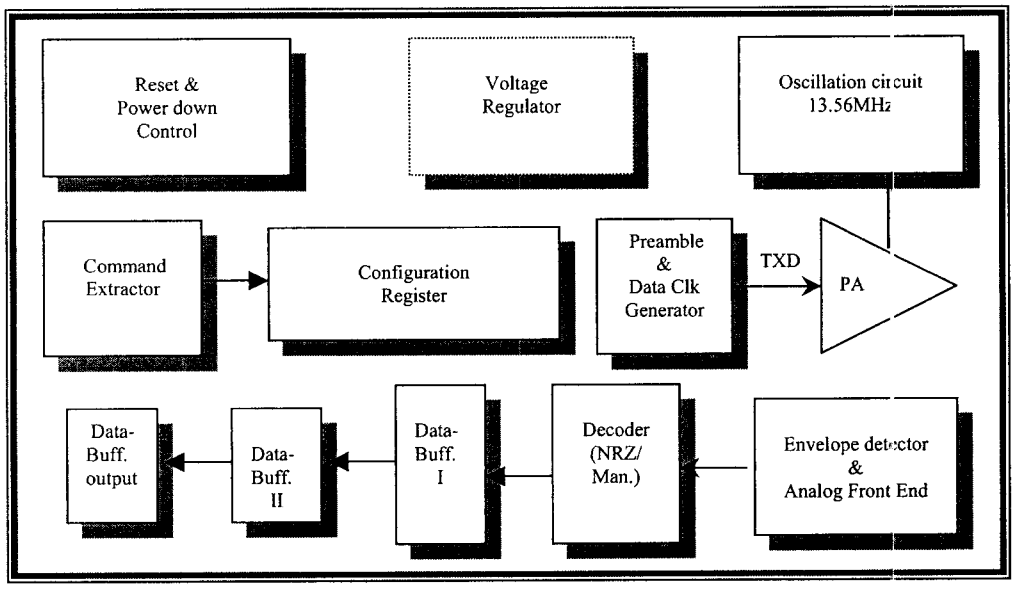
Winbond *MFID*^{WB} Reader

W55MID50

Data Sheet

System Description

2.1 W55MID50 System Block Diagram



2.2 W55MID50 Functional Description

Transmission Power Amplifier (PA)

It provides 4 different selectable transmission power for Reader chip to support *MFID*^{WB} Tag's radiation power supply. The external inductor coupling circuit is designed for 13.56MHz magnetic field resonance. The coupled center frequency will depend on equivalent value of external PCB inductor and capacitor.

Envelope Detector & Analog Front End

The major function of this unit provides *MFID*^{WB} Tag's data can be extracted.

Voltage Regulator

The voltage regulator generates the system needs of device power supply.

Configuration Register

System configuration register controls the all functional settings of W55MID50 such as Tag data

format, Tag detection cycle, output data format, and PA transmission power selection.

Reset and Power-down Control

The function of system power-down control mode is normally used for power consumption saving.

Crystal Oscillation

The 13.56MHz system clock generator generates the need of device system clock.

Decoder NRZ/Manchester

This unit is in charge of Tag data format decoder, which can provide Tag-ID data format decoding of NRZ or Manchester.

Data Buffer and Output

This unit buffers the Tag-ID data, which is under de-frame processing.

Winbond Electronics Corp.

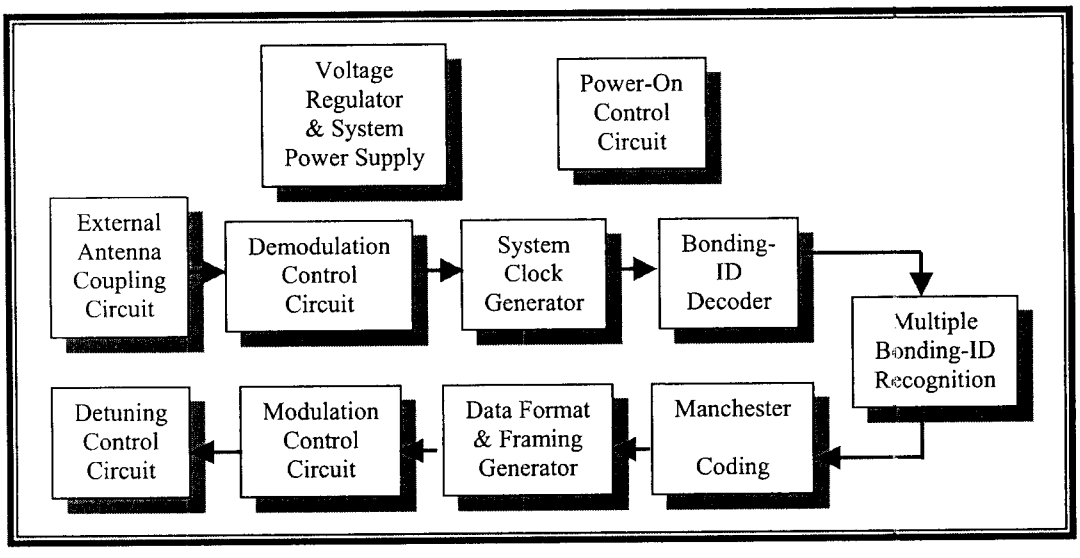
Winbond *MFID*^{WB} Transponder

W55MID35

Data Sheet

System Description

2.1 W55MID35 System Block Diagram



2.2 W55MID35 Functional Description

External Inductor Coupling Circuit

The external inductor coupling circuit is designed for 13.56MHz magnetic field resonatnce. The coupled center frequency will depend on equivalent inductor of external PCB inductor and a paralleled capacitor.

Voltage Regulator & System Power Supply

The voltage regulator generates the need of device power supply.

Power-On Control Circuit

System power-on contro circuit initiates the device to get into initial state.

Demodulation Control Circuit

The demodulation control circuit demodulates the signal of command, which is magnetic field coupling from W55MID50 *MFID*^{WB} Reader system.

System Clock Generator

The system clock generator generates the need of device system clock.

Bonding-ID Decoder

The Bonding-ID decoder circuit decodes the mapping location of IDs array, which indicates by external RS0, RS1, RS2, RS3, and RS4 the 3-state Bonding Finger (Winbond patented).

Multiple Bonding-ID Recognition

The multiple Bonding-ID recognition provides total up to 8 different customer-IDs and 10bit ID length can be recognize in the same time.

Data Format and Framing Generator

The data format and framing generator is in charge of the entire bonding-ID and command data into Winbond defined *MFID*^{WB} transponder data format.

Modulation Control Circuit

The modulation control circuit modulates the Winbond defined *MFID*^{WB} tag format into the magnetic field resonation.

Electronic Characteristics

3.1 W55MID35 Absolute Maximum Ratings

Parameter	Rating	Unit
Maximum Current in COIL	10	mA
Power Dissipation (T_a = 70°C)	100	mW
Ambient Operating Temperature	0 to +70	°C
Storage Temperature	-40 to +85	°C

Note: Exposure to conditions beyond those listed under Absolute Maximum Ratings may adversely affect the life and reliability of the device.

3.2 W55MID35 DC Characteristics

(VDD-VSS = 4.5 V, Ta = 25°C; unless otherwise specified)

Parameter	Sym.	Conditions	Min.	Typ.	Max.	Unit
Operating Magnetic Field	f_{OP}	Field in resonation	-	13.56	-	MHz
Operating Voltage	V_{DD}	Field in resonation	3	-	5.5	V
Operating Temperature	Tamb	Ambient operating temp	0	25	70	°C
Operating Current	I_{OP}	f_{OP} = 13.56MHz	-	2	-	uA
Magnetic Resonat Voltage	V_M		6	-	9	V

Preliminary

GENERAL DESCRIPTION

EM55000 series is a series of 3 to 340 seconds single chip high quality voice synthesizer IC which contains one 4-bit Input port (provided for EM55100 and above), three 4-bit I/O ports and a tiny controller. By programming through the tiny controller, user's application includes section combination, trigger mode, control outputs, keyboard matrix and other logic function can be easily implemented.

FEATURES

EM55XXX	001	002	100	200	250	300	350
Duration(sec)	3		5	10	15	21	31
ROM(bits)	10K x 10		16K x 10	32K x 10	48K x 10	64K x 10	96K x 10
PROGRAM ROM (bits)	10K x 10		16K x 10	32K x 10			
RAM (nibbles)	32		64	128			
IO PORTs	4 I/O	8 I/O	4 I+ 8 I/O				
D/A	Traditional DAC	Direct Drive	Direct Drive/Traditional DAC				
OSC	Ring type		Ring or Crystal type by option				
Reset Pin	No		Yes				

EM55XXX	400	450	500	550	600	650	700
Duration(sec)	42	63	85	127	170	255	340
ROM(bits)	128K x 10	192K x 10	256K x 10	384K x 10	512K x 10	768K x 10	1024K x 10
PROGRAM ROM (bits)	32K x 10						
RAM (nibbles)	128						
IO PORTs	4 I+ 8 I/O	4 I+ 12 I/O					
D/A	Direct Drive/Traditional DAC						
OSC	Ring or Crystal type by option						
Reset Pin	Yes						

- Single power supply.
- Crystal/Ring oscillator option.
- 3-340 seconds voice capacity.
- Power down mode for saving power consumption.
- Reset pin available.
- Single ROM for voice program. Maximum 32 K program addressing size available.
- Readable ROM data.
- One 6 bit timer overflow control is provided.
- Two stack for subroutine call.
- 5 bits ASPCM synthesis.
- 38K Hz modulation for IR transmission.
- 15 steps volume control.
- Direct Drive/traditional DAC.
- 8 bits resolution D/A.
- Green Voice™.