EM57P310

Tiny Controller-Based Sound Processor

Product Specification

DOC. VERSION 0.1

ELAN MICROELECTRONICS CORP.

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Contents

Specification Revision History

Doc. Version	Revision Description	Date
0.1	Preliminary Version Initial Release	2008/02/13

1 General Description

EM57P310 is a tiny-controller-based voice/dual tone and melody/dual tone sound effect IC. It performs all the functions of EM57000 series ICs and is embedded with an OTP (One Time Programmable) ROM.

2 Features

- EM57P310 – ROM: 64k x 10 bits (21 sec@6K sample rate)
- Working Voltage 2.4V ~ 5.1V
- One 4-bit input port, two 4-bit I/O ports, and 32x4 bits RAM
- 8k (maximum) program ROM
- One 6-bit timer overflow control
- ASPCM synthesizer and dual tone melody/sound effect generator
- 4k~32kHz voice play-back playing speed
- Multiple tempos for dual tone melody/sound effect play-back
- Variable beats for dual tone melody/sound effect play-back
- Multiple levels of volume control
- Fixed current D/A output to drive the externally connected transistor for voice output

3 Pin Assignment

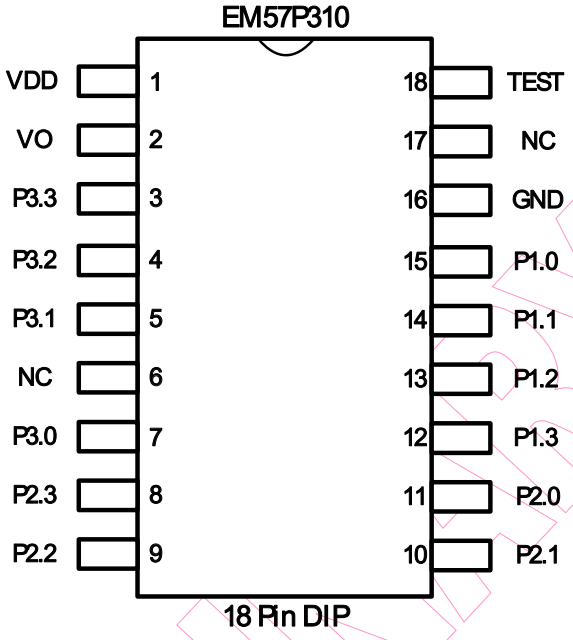

Figure 3-1 EM57P310 Pin Assignment

4 Pin Descriptions

Pin No.	I/O	Symbol	Function
1	I	VDD	Positive power supply
2	O	VO	Voice output
3	I/O	P3.3	Bit 3 of Port 3
4	I/O	P3.2	Bit 2 of Port 3
5	I/O	P3.1	Bit 1 of Port 3
6	--	NC	No connect
7	I/O	P3.0	Bit 0 of Port 3
8	I/O	P2.3	Bit 3 of Port 2
9	I/O	P2.2	Bit 2 of Port 2
10	I/O	P2.1	Bit 1 of Port 2
11	I/O	P2.0	Bit 0 of Port 2
12	I	P1.3	Bit 3 of Port 1
13	I	P1.2	Bit 2 of Port 1
14	I	P1.1	Bit 1 of Port 1
15	I	P1.0	Bit 0 of Port 1
16	I	GND	Negative power supply
17	--	NC	No connect
18	I	TEST	Test

5 Absolute Maximum Ratings

Items	Sym.	Min.	Max.	Unit
Supply voltage	V_{DD} –V_{SS}	–0.3	6.0	V
Input voltage	V_{IN}	V_{SS} –0.3	V_{DD}+0.3	V
Operating Temperature	V_{OT}	–20	70	°C
Storage Temperature	V_{STG}	–55	+125	°C

6 Electrical Characteristics

VDD = 3V, 25°C unless otherwise specified

Parameter	Sym.	Min.	Typ.	Max.	Unit	Condition
Operating voltage	V_{DD}	2.4	3.0	5.5	V	
Standby current	I_{DDS}	-	-	2.0	μA	V_{DD} = 3V
Operating current	I_{DDO}	-	-	280	μA	V_{DD} = 3V, No load
Drive current of P2,P3	I_{OD}	2.0	-	-	mA	V_{DD} = 3V, VO = 2.4V
Sink current of P2,P3	I_{OS}	2.3	-	-	mA	V_{DD} = 3V, VO = 0.4V
Output current of VO	I_{VO}	2.0	3.0	4.0	mA	V_{DD} = 3V, VO = 0.7V
Oscillator frequency	F_{OSC}	0.95	1.0	1.05	MHz	V_{DD} = 3V

7 Application Circuit

The following notes apply to all conditions illustrated in the application diagrams below:

1. For noisy power supply application, adding a ceramic capacitor between VDD and ground is recommended. The recommend capacitor value is 0.1µF.
2. For heavy loading application, adding an electrolytic capacitor between VDD and ground is recommended. The recommended capacitor value for button cell application is 10µF.

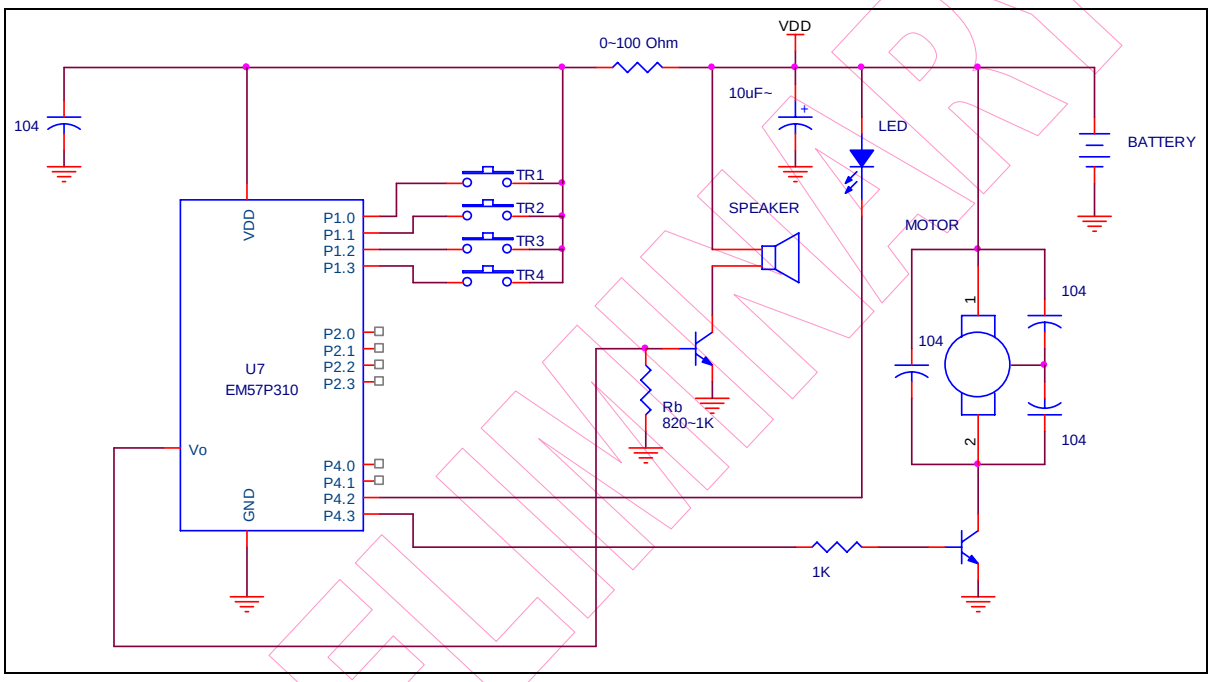

Figure 7-1 EM57P310 Application Circuit for Large Loading