
EM57P310

**Tiny Controller-Based
Sound Processor**

Product Specification

DOC. VERSION 0.1

ELAN MICROELECTRONICS CORP.


February 2008



Trademark Acknowledgments:

IBM is a registered trademark and PS/2 is a trademark of IBM.

Windows is a trademark of Microsoft Corporation.

ELAN and ELAN logo  are trademarks of ELAN Microelectronics Corporation.

Copyright © 2008 by ELAN Microelectronics Corporation

All Rights Reserved

Printed in Taiwan

The contents of this specification are subject to change without further notice. ELAN Microelectronics assumes no responsibility concerning the accuracy, adequacy, or completeness of this specification. ELAN Microelectronics makes no commitment to update, or to keep current the information and material contained in this specification. Such information and material may change to conform to each confirmed order.

In no event shall ELAN Microelectronics be made responsible for any claims attributed to errors, omissions, or other inaccuracies in the information or material contained in this specification. ELAN Microelectronics shall not be liable for direct, indirect, special incidental, or consequential damages arising from the use of such information or material.

The software (if any) described in this specification is furnished under a license or nondisclosure agreement, and may be used or copied only in accordance with the terms of such agreement.

ELAN Microelectronics products are not intended for use in life support appliances, devices, or systems. Use of ELAN Microelectronics product in such applications is not supported and is prohibited.

NO PART OF THIS SPECIFICATION MAY BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS WITHOUT THE EXPRESSED WRITTEN PERMISSION OF ELAN MICROELECTRONICS.



ELAN MICROELECTRONICS CORPORATION

Headquarters:

No. 12, Innovation Road 1
Hsinchu Science Park
Hsinchu, TAIWAN 308
Tel: +886 3 563-9977
Fax: +886 3 563-9966
<http://www.emc.com.tw>

Hong Kong:

**Elan (HK) Microelectronics
Corporation, Ltd.**
Flat A, 19F., World Tech Centre
95 How Ming Street, Kwun Tong
Kowloon, HONG KONG
Tel: +852 2723-3376
Fax: +852 2723-7780
elanhk@emc.com.hk

USA:

**Elan Information
Technology Group (U.S.A.)**
P.O. Box 601
Cupertino, CA 95015
U.S.A.
Tel: +1 408 366-8225
Fax: +1 408 366-8225

Shenzhen:

**Elan Microelectronics
Shenzhen, Ltd.**
3F, SSMEC Bldg., Gaoxin S. Ave. I
Shenzhen Hi-tech Industrial Park
(South Area), Shenzhen
CHINA 518057
Tel: +86 755 2601-0565
Fax: +86 755 2601-0500

Shanghai:

**Elan Microelectronics
Shanghai, Ltd.**
#23, Zone 115, Lane 572, Bibo Rd.
Zhangjiang Hi-Tech Park
Shanghai, CHINA 201203
Tel: +86 21 5080-3866
Fax: +86 21 5080-4600

Contents

1 General Description	1
2 Features	1
3 Pin Assignment	2
4 Pin Descriptions	2
5 Absolute Maximum Ratings	3
6 Electrical Characteristics	3
7 Application Circuit	4

PRELIMINARY

Specification Revision History

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

PRELIMINARY

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

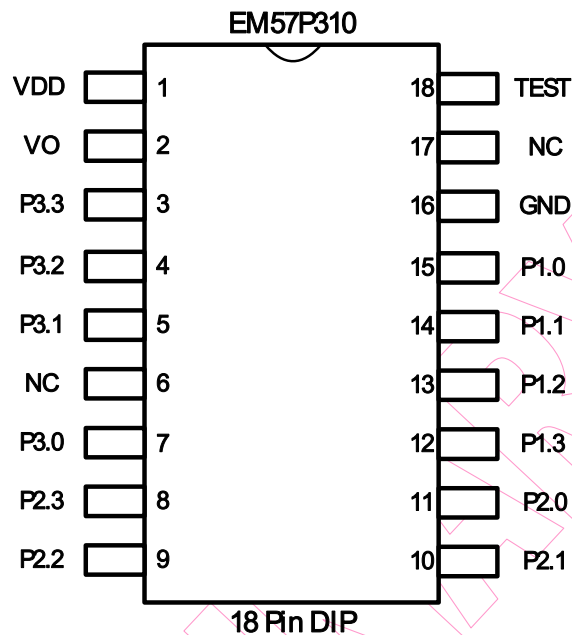


Figure 3-1 EM57P310 Pin Assignment

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

$V_{DD} = 3V$, 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	$V_{DD} = 3V$, $V_O = 2.4V$
Sink current of P2,P3	I_{OS}	2.3	-	-	mA	$V_{DD} = 3V$, $V_O = 0.4V$
Output current of VO	I_{VO}	2.0	3.0	4.0	mA	$V_{DD} = 3V$, $V_O = 0.7V$
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 0.1 μ F.
2. For heavy loading application, adding an electrolytic capacitor between VDD and ground is recommended. The recommended capacitor value for button cell application is 10 μ F.

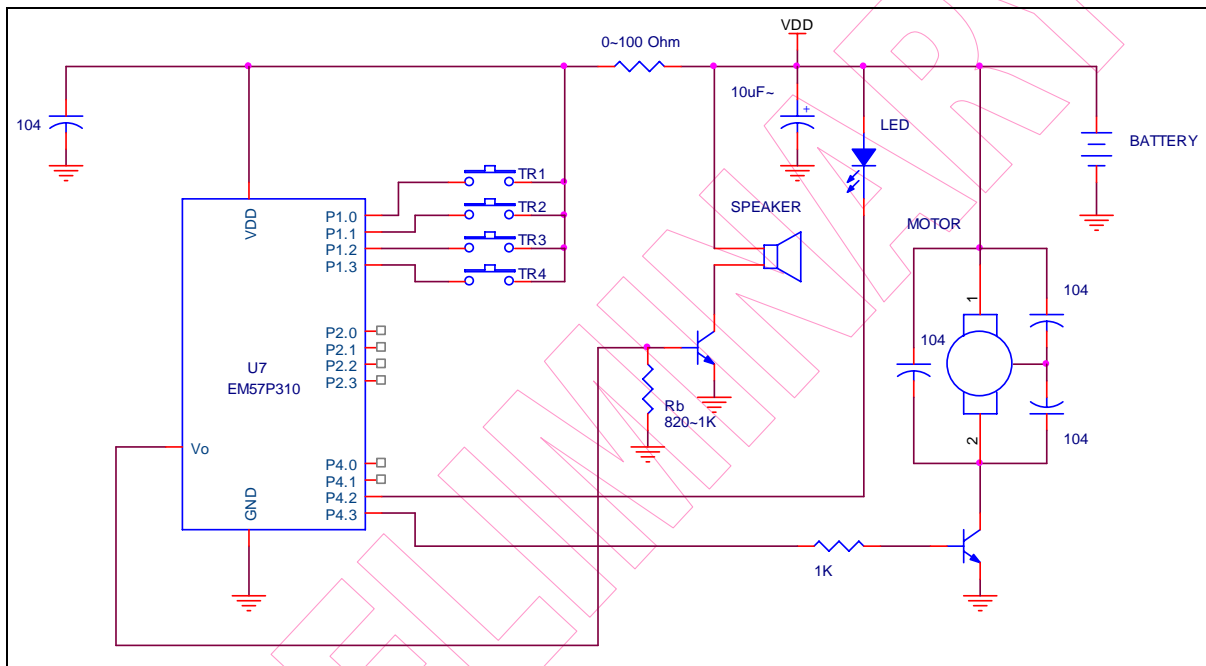


Figure 7-1 EM57P310 Application Circuit for Large Loading