

VA4010

USB-Host MP3 Decoder

Datasheet

Revision: 0.7

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Revision History

Version	Date	Description
0.1	November 13 , 2006	Initiated
0.7	May 20, 2008	Update PLL voltage

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1 Description

VA4010 is a fully featured MP3 decoder solution for portable/embedded applications. It is designed to be used with some of the most popular digital media such as USB Flash drive and SD/MMC memory card. VA4010 offers low cost, low power consumption and can be widely used in MP3 player, auto audio, mini audio, toys and giveaways etc. It can also be independently used as USB host/device.

2 Features

- 0.25um CMOS technology
- Exclusive DSP and bit-stream buffering technology for high performance and low power consumption
- Support MPEG1/2/2.5 layer2/3 decode
- Embedded high performance 8051 compatible CPU
- Embedded 16KB OTP ROM and 6(4+2)KB SRAM for program and data storage
- Intelligent USB full-speed SIE with 128(64x2)Byte FIFO supports either host or device function
- SD/MMC memory card and serial Flash/ROM support via buffered high-speed SPI port. The SPI port can be programmed to either master or slave mode and runs up to 6Mbps.
- Support FAT16/32 file system
- Total 5 sets of 8-bit wide 5V tolerant GPIO ports for external interfacing
- Inter-IC Sound (IIS) output supports up to 24-bit IIS and left/right justified formats
- Dual full-duplex UART ports support 4 baud rates: 2400bps, 9600bps, 38400bps and 115200bps @ 24MHz system frequency.
- 2.5/3.3 power supply
- LQFP64 small footprint package

3 System and Application Block Diagram

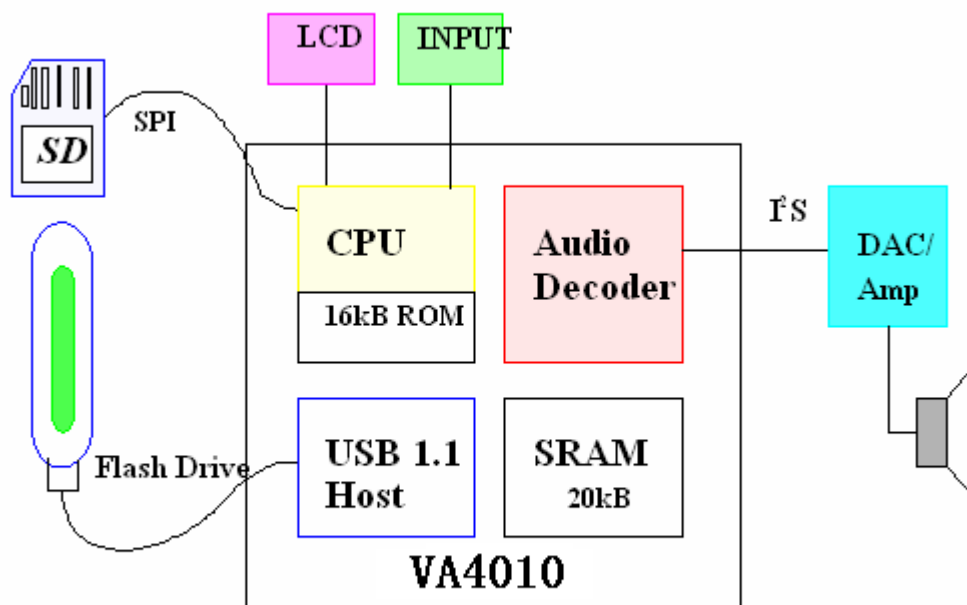


Figure 3-1 VA4010 Application Diagram

4 Pin Layout Drawing

4.1 Ordering Information

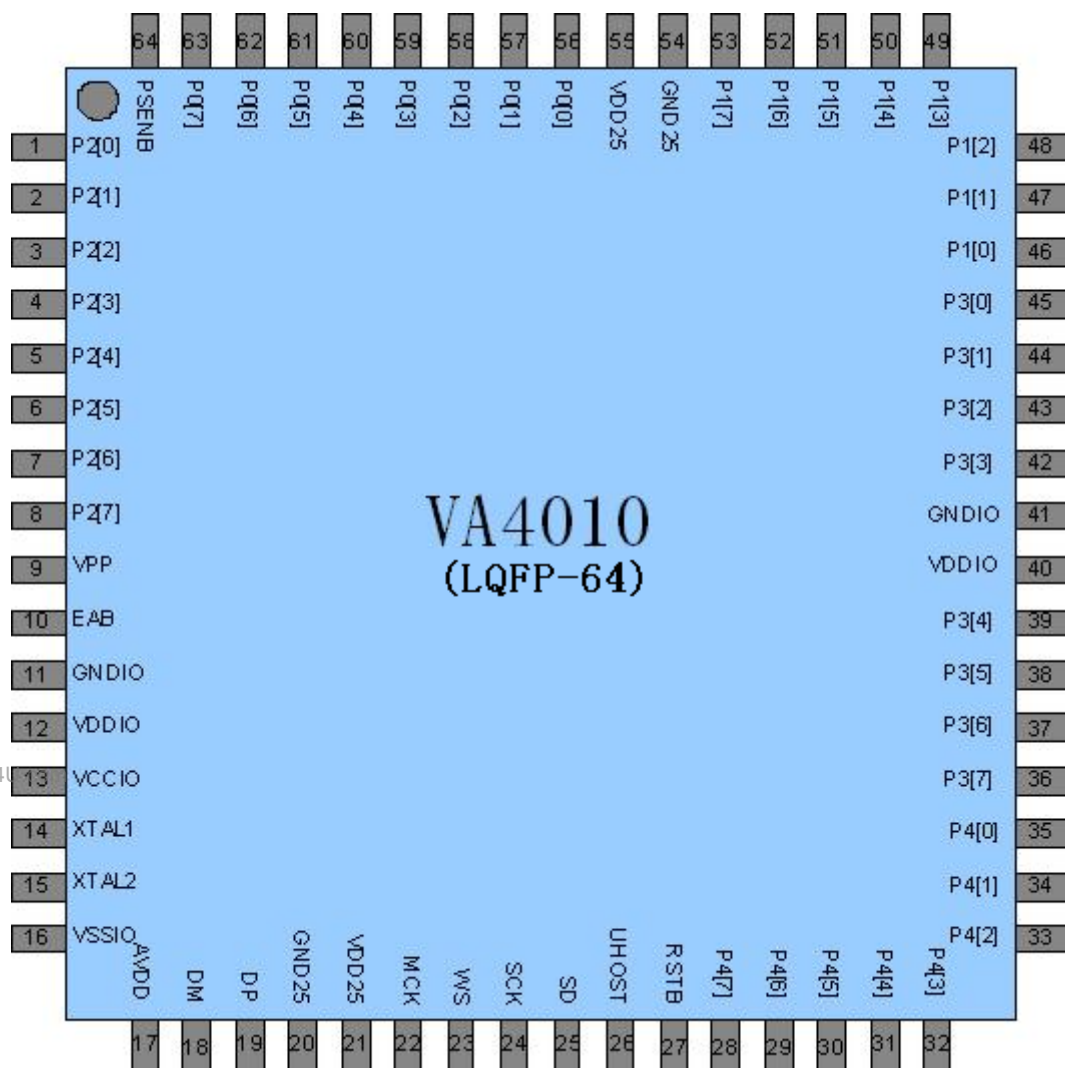


Figure 4-1 VA4010 Top View

4.2 Pin Descriptions

Table 4-1 Pin Description

Pin	Function	Secondary	Program	Type	Description
1	P2[0]	A[8]	ADDR[8]	I/O	GPIO, 5V tolerant
2	P2[1]	A[9]	ADDR[9]	I/O	
3	P2[2]	A[10]	ADDR[10]	I/O	
4	P2[3]	A[11]	ADDR[11]	I/O	
5	P2[4]	A[12]	ADDR[12]	I/O	
6	P2[5]	A[13]	ADDR[13]	I/O	
7	P2[6]	A[14]	NVSTR	I/O	
8	P2[7]	A[15]	AE	I/O	
9	VPP			I	6.5V OTP programming voltage
10	EAB			I	External access enable, active low
11	GNDIO				Digital IO pad ground
12	VDDIO				Digital 3.3V IO pad power
13	VCCIO				Analog 2.5V IO OSC power
14	XTAL1			I	Crystal input
15	XTAL2			I/O	Crystal output
16	VSSIO/AVSS				Analog OSC and PLL ground
17	AVDD				2.5V PLL power supply
18	DM			I/O	USB DM
19	DP			I/O	USB DP
20	GND25				Digital Core ground
21	VDD25				Digital 2.5V core power
22	MCK				DAC master clock (fs * 256)
23	WS			O	DAC word select
24	SCK			O	DAC sample clock
25	SD			O	DAC sample data
26	UHOST			I	USB host mode select
27	RSTB			I	Chip reset, active low
28	P4[7]	A[7]	ADDR[7]	I/O	GPIO, LVTTL, 5V tolerant
29	P4[6]	A[6]			
30	P4[5]	A[5]			
31	P4[4]	A[4]			
32	P4[3]	A[3]			
33	P4[2]	A[2]			
34	P4[1]	A[1]			
35	P4[0]	A[0]			
36	P3[7]	RDB	IFREN	I/O	GPIO, LVTTL, 5V tolerant
37	P3[6]	WRB	SER_PROG		
38	P3[5]	T1			
39	P3[4]	T0			
40	VDDIO				Digital 3.3V IO pad power

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41	GNDIO				Digital IO pad ground
42	P3[3]	INT1		I/O	GPIO, LVTTTL, 5V tolerant
43	P3[2]				
44	P3[1]	TXD			
45	P3[0]	RXD			
46	P1[0]	SCK		I/O	GPIO, LVTTTL, 5V tolerant
47	P1[1]	SS			
48	P1[2]	MO/SI			
49	P1[3]	MI/SO			
50	P1[4]				
51	P1[5]				
52	P1[6]				
53	P1[7]				
54	GND25				Digital Core ground
55	VDD25				Digital 2.5V core power
56	P0[0]	D[0]	DIN[0]	I/O	GPIO, LVTTTL, 5V tolerant
57	P0[1]	D[1]	DIN[1]		
58	P0[2]	D[2]	DIN[2]		
59	P0[3]	D[3]	DIN[3]		
60	P0[4]	D[4]	DIN[4]		
61	P0[5]	D[5]	DIN[5]		
62	P0[6]	D[6]	DIN[6]		
63	P0[7]	D[7]	DIN[7]		
64	PSENB			O	Program select enable, active low

5 Electrical Characteristic

5.1 Absolute Maximum Ratings

Table 5-1 Absolute Maximum Ratings

Parameter	Description	Rating.	Unit
VDD25	Core Power Supply Voltage	-0.3~2.7	V
VDDIO	I/O Power Supply Voltage	-0.3~5.5	V
VPP	VPP Power Supply Voltage	0~6.5	V
AVDD	PLL Power Supply Voltage	-0.3~2.7	V
	GPIO Sink/Source Current	25	mA
T _{stg}	Storage Temperature	-65~125	°C

Note: “Absolute Maximum Ratings” are the values beyond which the safety and normal function of the device cannot be guaranteed.

5.2 Recommended Operating Conditions

Table 5-2 Recommended Operating Conditions

Parameter	Description	Min.	Type	Max.	Unit
VDD25	Core Power Supply Voltage	2.3	2.5	2.7	V
VDDIO	I/O Power Supply Voltage	3.0	3.3	3.6	V
VPP	VPP Power Supply Voltage	6.0		6.5	V
AVDD	PLL Power Supply Voltage	2.3	2.5	2.7	V
T _{opr}	Operating Temperature	0		70	°C
	Crystal Frequency		48		MHz

5.3 DC Characteristics

Table 5-3 DC Characteristics

Parameter	Description	Conditions	Min.	Type	Max.	Unit
VIH	Input High Voltage		2.0		3.6	V
VIL	Input Low Voltage					V
VOH	Output High Voltage	IOH=	2.4			V
VOL	Output Low Voltage	IOL=			0.4	V
IOH	Output High Current					mA
IOL	Output Low Current					mA
IL	Input Leakage Current					uA
ICC	Supply Current					mA

6 Package Information

64 pin LQFP package. Unit: mm

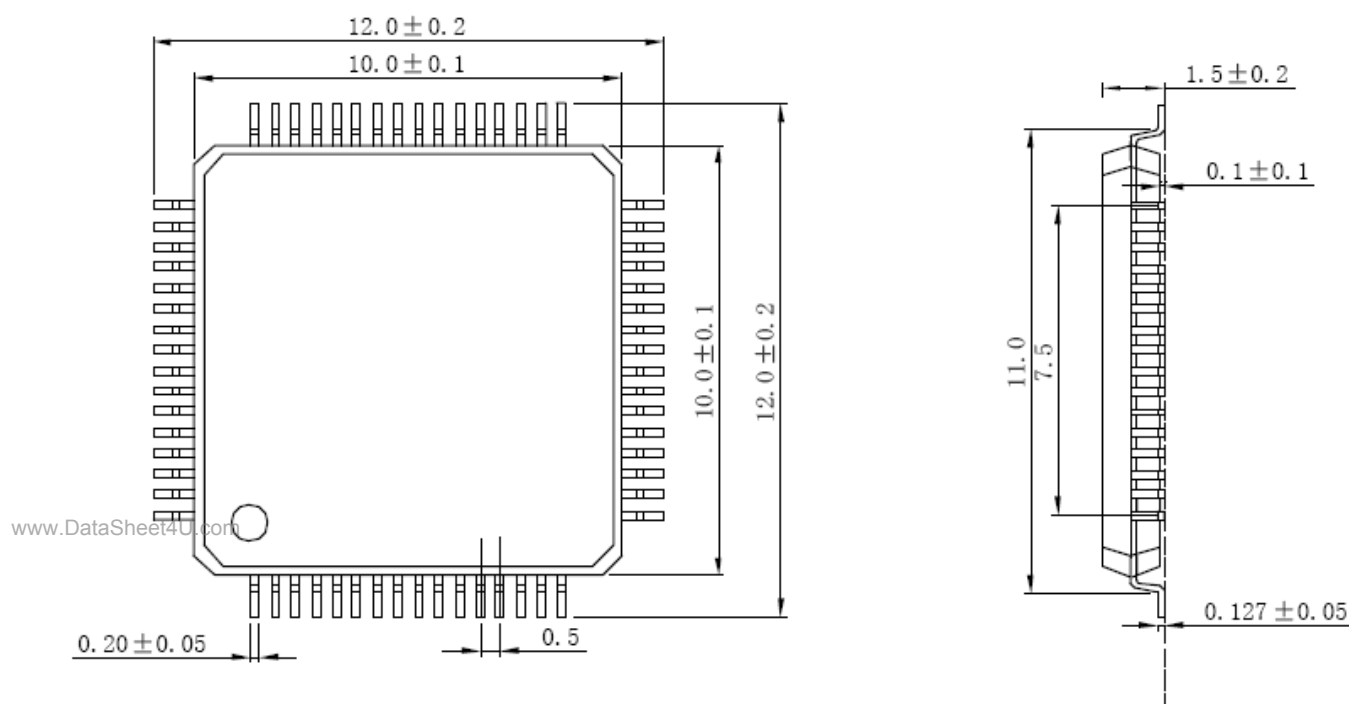
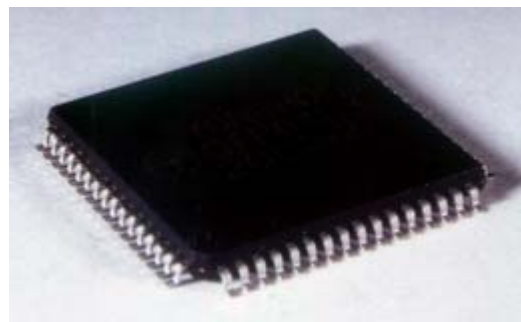


Figure 6-1 LQFP64 Package Information

7 Development Support

Viaon Technology will provide SW and HW development tools to our customers for application development, including HAL, FAT16/32 stack, USB Host/Device stack, and schematics for chip evaluation and ROM programming.