



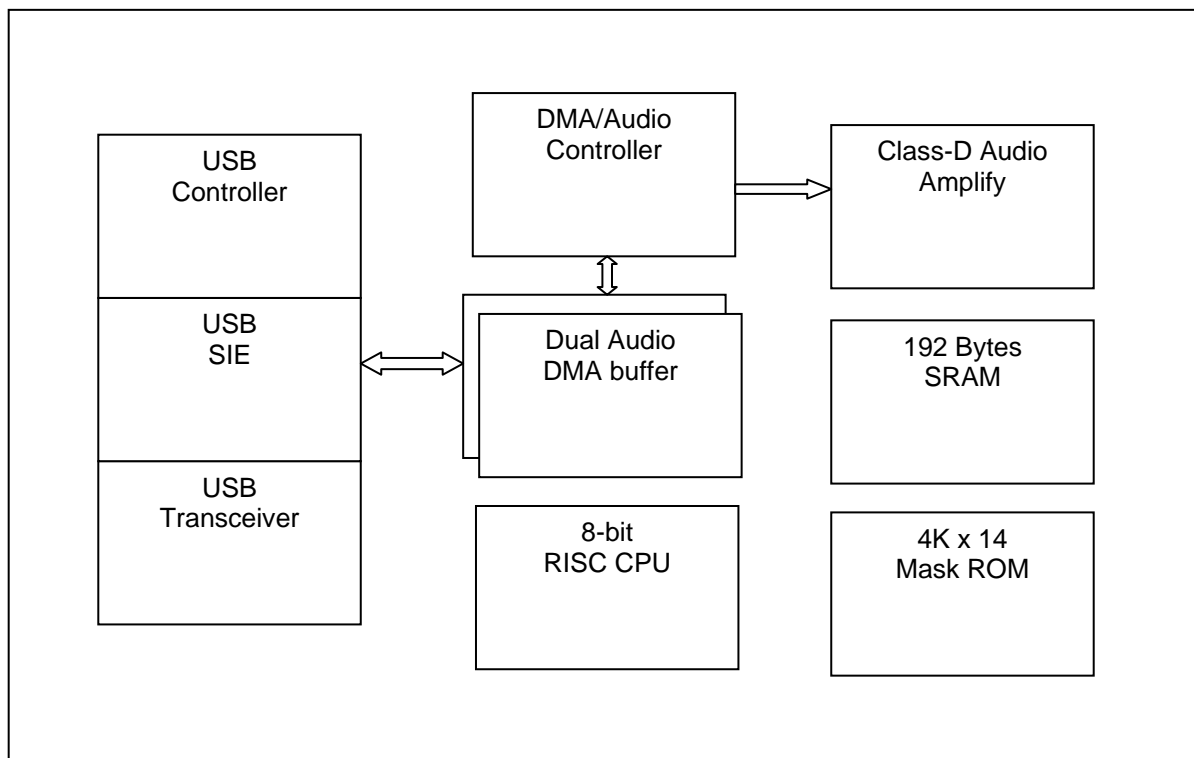
GENERAL DESCRIPTION

The TP6901 is an 8-bit micro-controller embedded device tailored to the USB audio application. It is able to play two channels music through Full-Speed USB bus.

FEATURE

- Compliance with the Universal Serial Bus specification v2.0 Full-Speed
- Built-in USB Transceiver & 3.3V Regulator
- Isochronous transfer with adaptive synchronization
- High performance 48KHz sampling rate for audio playback
- Two channel audio Class-D Amplify for speaker driving
- 16-level volume control
- Support USB Suspend function
- 24MHz crystal oscillation
- 28 pin package

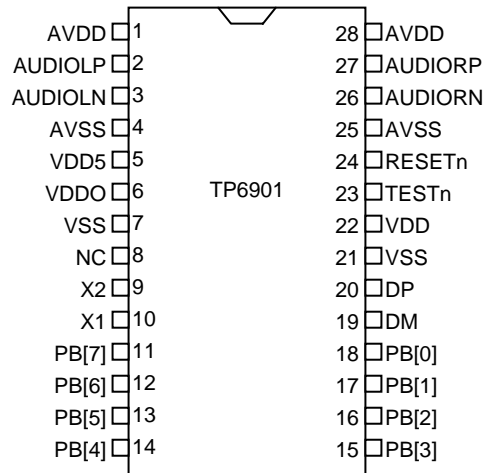
BLOCK DIAGRAM



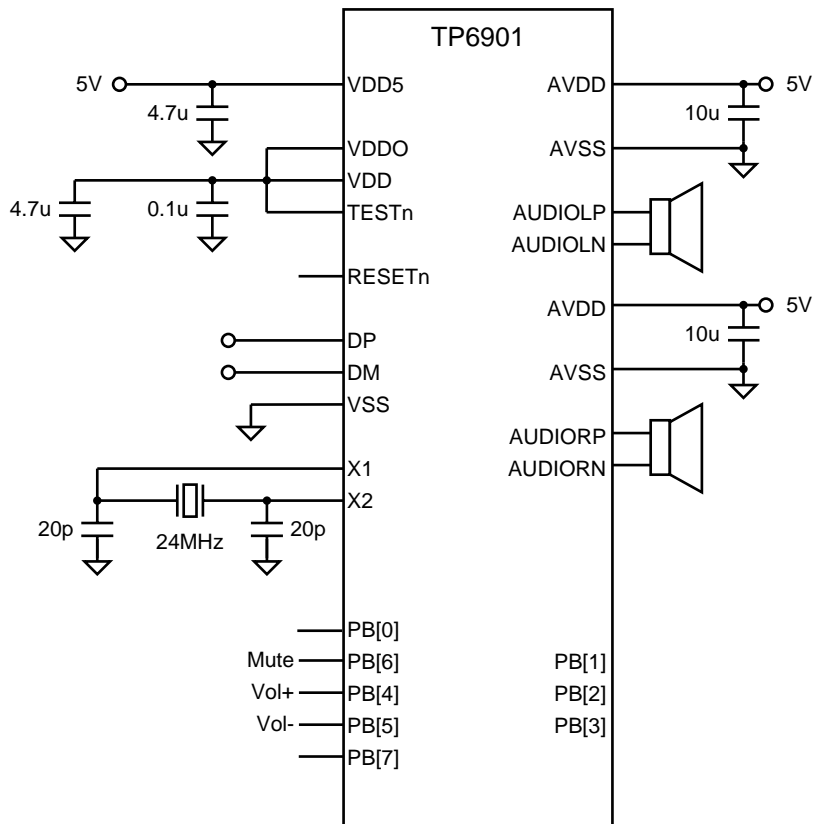
PIN DESCRIPTION

Name	I/O	Description
VDDO	O	3.3V Regulator output
VSS	P	Ground
VDD5	P	5V Power from USB cable
VDD	P	3.3V power
X1	I	Crystal in (24MHz)
X2	O	Crystal out
RESETn	I	Chip reset (active low)
TESTn	I	Test Mode control (active low)
DP	I/O	USB positive data signal
DM	I/O	USB negative data signal
AVDD	P	5V Power for Audio output
AVSS	P	Ground for Audio output
AUDIOLP	O	Audio output
AUDIOLN	O	Audio output
AUDIORP	O	Audio output
AUDIORN	O	Audio output
PB[7:0]	I/O	General purpose I/O (Pseudo Open Drain)

PIN ASSIGNMENT



APPLICATION CIRCUIT



ABSOLUTE MAXIMUM RATINGS

GND= 0V

Name	Symbol	Range	Unit
Maximum Supply Voltage	VDD5	-0.3 to 5.5	V
Maximum Supply Voltage	VDD	-0.3 to 3.6	V
Maximum Input Voltage	Vin	-0.3 to VDD3+0.3	V
Maximum output Voltage	Vout	-0.3 to VDD3+0.3	V
Maximum Operating Temperature	Topg	-20 to +70	
Maximum Storage Temperature	Tstg	-25 to +125	

OPERATING CONDITION

at Ta= 0 to 70 ,GND= 0V

Name	Symb.	Min.	Typ.	Max.	Unit
Supply Voltage	VDD5	4.5		5.5	V
Input "H" Voltage	Vih	2.4		3.6	V
Input "L" Voltage	Vil	0		0.8	V
Crystal frequency	Fosc		24		MHz

ELECTRICAL PARAMETER

at Ta= 25 ,GND= 0V, VDD=5V

Name	Symb.	Typ	Unit
Maximum Audio Output Current per Channel @ 4ohm Load	Iout	410	mA
Maximum Audio Output Current per Channel @ 8ohm Load	Iout	320	mA
Signal/Noise ratio (1kHz sine wave)	SNR	65	dB

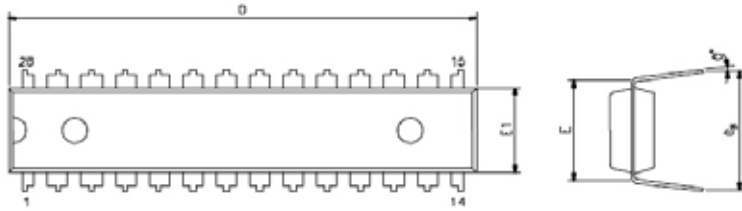
DC ELECTRICAL CHARACTERISTICS:

at Ta=25 ,VDD5=5.0V, VSS= 0V, Fosc=24MHz

Name	Symb.	Min.	Typ.	Max.	Unit	Condition	Note
Operating current	Icc		40		mA	Fosc=24MHz	Audio playing
Suspend current	Isus		300		uA		
PB Output High Voltage	Vboh1		3.0		V	Ioh=4mA	Only one clock time
	Vboh2		2.5		V	Ioh=40uA	
PB Output Low Voltage	Vbol		0.4		V	Iol=10mA	
Audio Output High Voltage		4.0			V	Ioh=200mA	Max. scale volume
Audio Output Low Voltage				0.8	V	Iol=200mA	Max. scale volume
VDDO output voltage	V3o	3.2		3.4	V	VDD5=5V	

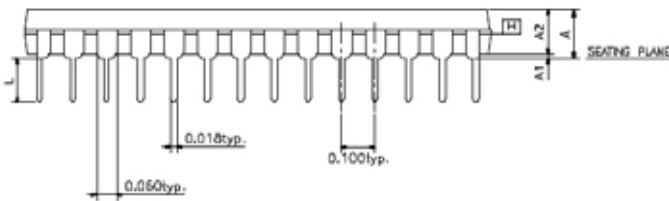
PACKAGE INFORMATION

a. 300 mil Skinny

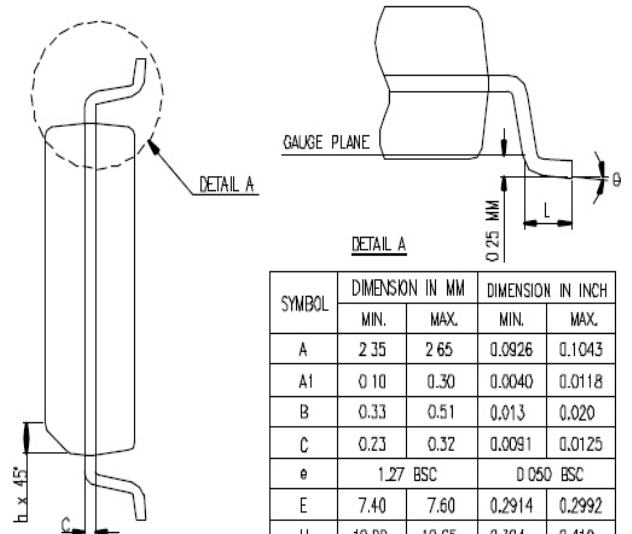
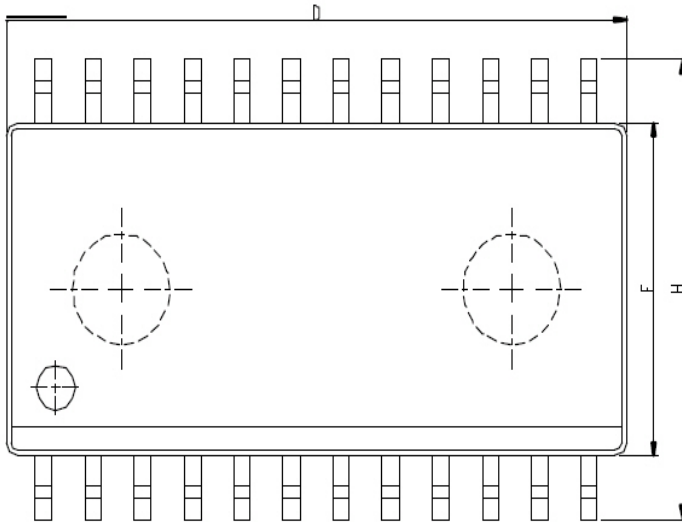


SYMBOLS	MIN.	NOR.	MAX.
A	—	—	0.210
A1	0.015	—	—
A2	0.125	0.130	0.135
D	1.385	1.390	1.400
E	0.310 BSC		
E1	0.283	0.288	0.293
L	0.115	0.130	0.150
e_B	0.330	0.350	0.370
θ°	0	7	15

UNIT : INCH



b. 300 mil SOP



SYMBOL	DIMENSION IN MM		DIMENSION IN INCH	
	MIN.	MAX.	MIN.	MAX.
A	2.35	2.65	0.0926	0.1043
A1	0.10	0.30	0.0040	0.0118
B	0.33	0.51	0.013	0.020
C	0.23	0.32	0.0091	0.0125
e	1.27 BSC		0.050 BSC	
E	7.40	7.60	0.2914	0.2992
H	10.00	10.65	0.394	0.419
L	0.40	1.27	0.016	0.050
h	0.25	0.75	0.010	0.029
θ	θ'	θ''	θ'	θ''
D	17.7	18.1	0.697	0.713

