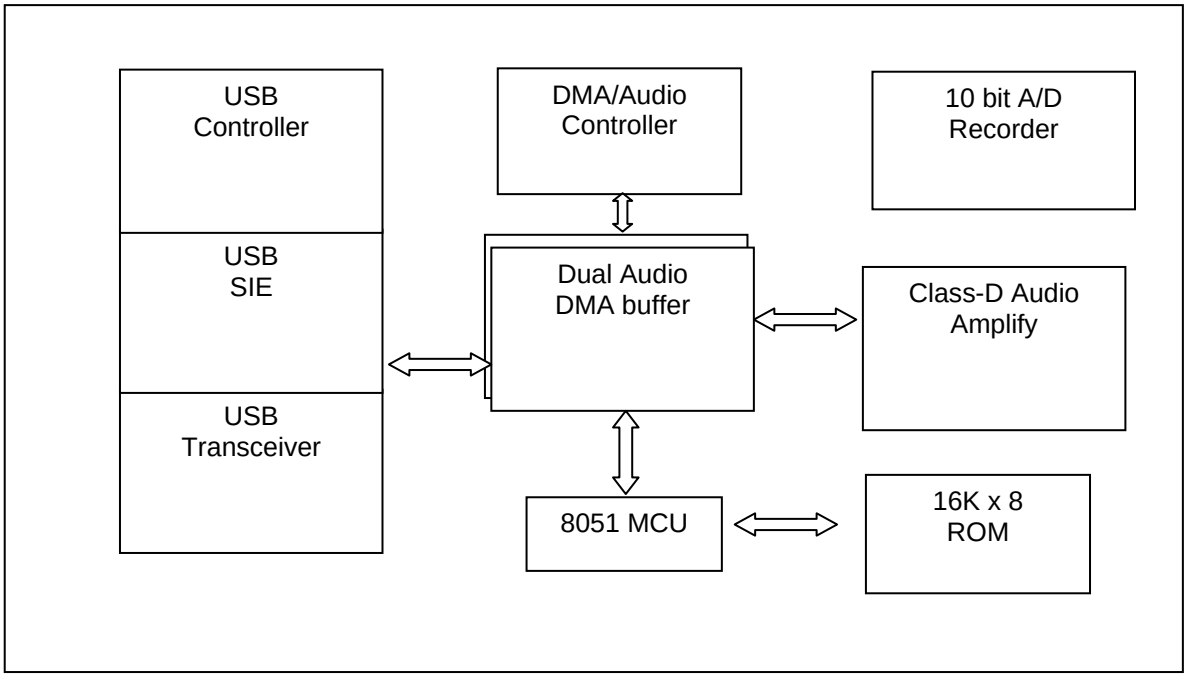
GENERAL DESCRIPTION

The TP6911 is an 8-bit micro-controller embedded device tailored to the USB audio application. It is able to play two channels PC audio and record one channel voice through Full-Speed USB bus.

FEATURE

- Compliance with the Universal Serial Bus specification v2.0 Full-Speed
- Built-in USB Transceiver and 3.3V Regulator
- Isochronous transfer with adaptive synchronization
- High performance 48KHz sampling rate for audio playback
- 24KHz sampling rate for voice recording
- Two channel audio Class-D Amplify for speaker driving
- 64-level volume control
- ADC control line support 12-keys for USB Audio and USB phone
- In USB phone mode, Support 24-keys matrix
- Embedded 10 bits ADC input
- Support USB Suspend function
- 12MHz crystal oscillation
- 28 / 48 pin package

BLOCK DIAGRAM

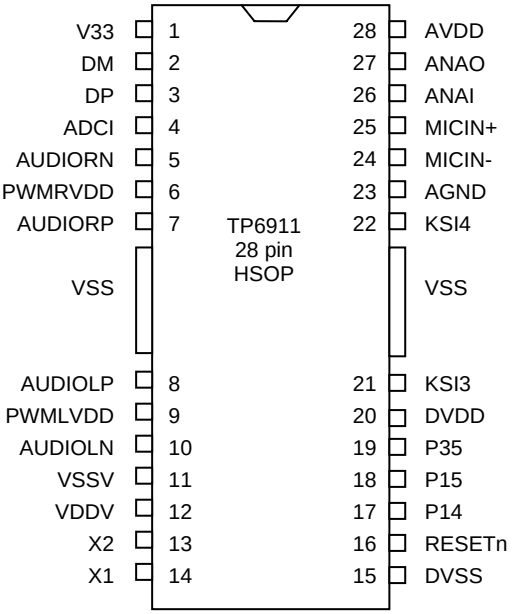


PIN DESCRIPTION

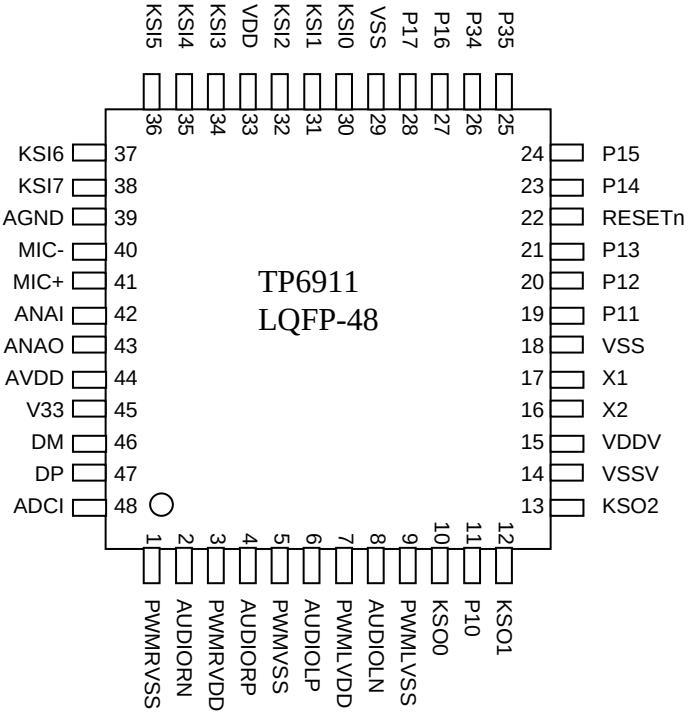
Name	I/O	Description
V33	O	3.3V Regulator output
VSS	P	Ground
VDD	P	5V Power from USB cable
VDDV	P	5V Power for PLL
VSSV	P	Ground for PLL
AVDD	P	5V Power for Recorder
AGND	P	Ground for Recorder
PWMVDD	P	5V Power for Audio Output
PWMVSS	P	Ground for Audio Output
ADCI	I	VR input for volume adjustment
X1	I	Crystal in (12MHz)
X2	O	Crystal out
RESETn	I	Chip reset (active low)
DP	I/O	USB positive data signal
DM	I/O	USB negative data signal
AUDIOLP	O	Audio output
AUDIOLN	O	Audio output
AUDIORP	O	Audio output
AUDIORN	O	Audio output
MICIN+	I	MIC IN+
MICIN-	I	MIC IN-
ANAO	O	Recorder AC Couple Out
ANAI	I	Recorder AC Couple In
KSI[7:0]	I	Keyscan Input
KSO[2:0]	O	Keyscan Output
P1[7:0]	I/O	General purpose I/O
P3[5,4]	I/O	General purpose I/O

PIN ASSIGNMENT

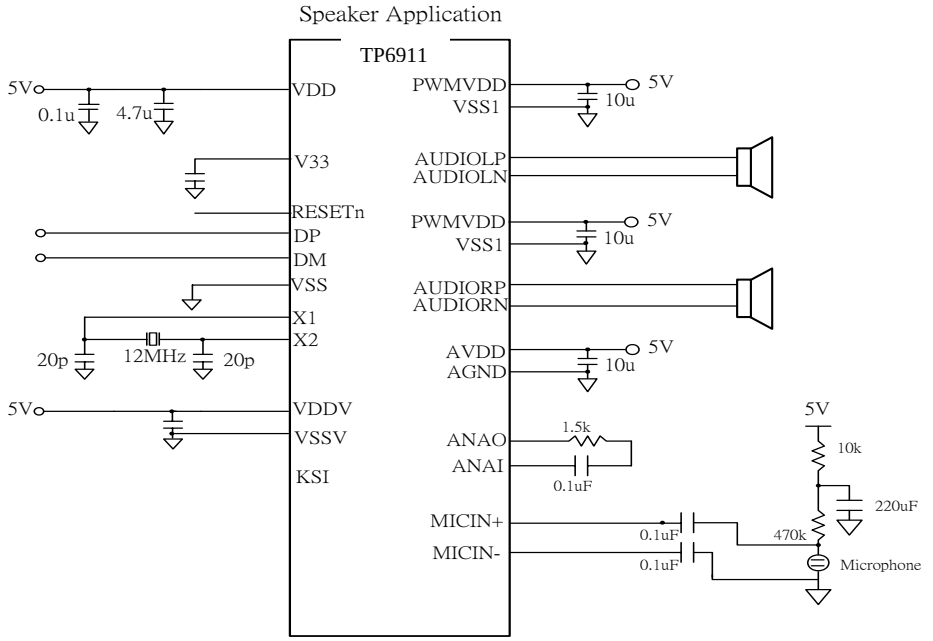
HSOP28

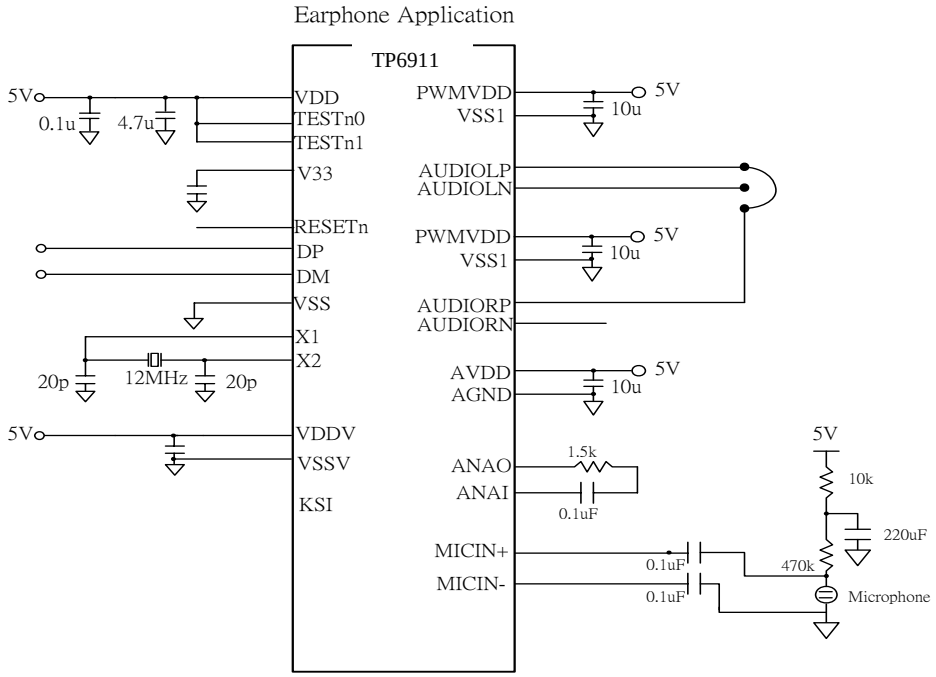


LQFP48



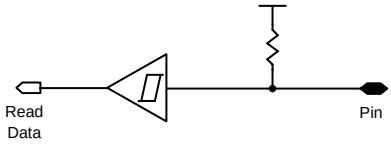
APPLICATION CIRCUIT





KSI

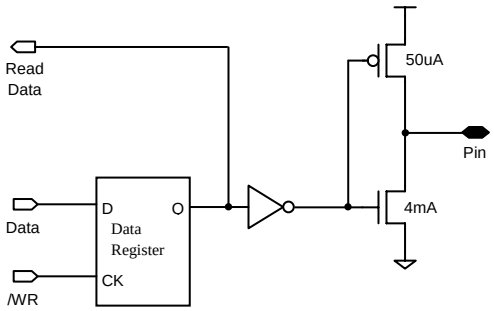
These pins are used as keyboard scan inputs. Each one of them has a pull up resistor. In addition, each KSI pin can cause Keyboard interrupt (KBDint) if the corresponding interrupt mask bit (KBDmask) is 0. The KBDint is asserted at the falling edge of KSI pin.



KSI

KSO[2:0]

These pins are used as keyboard scan outputs. They have at least 4mA drive and sink strength.



KSO[2:0]

ABSOLOUTE MAXIMUM RATINGS

GND= 0V

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

OPERATING CONDITION

at Ta= -20℃ to 70℃,GND= 0V

Name	Symb.	Min.	Typ.	Max.	Unit
Supply Voltage	VDD	4.5		5.5	V
Input “H” Voltage	Vih	4.0		5.5	V
Input “L” Voltage	Vil	0		1.0	V
Crystal frequency	Fosc		12		MHz

ELECTRICAL PARAMETER

at Ta= -20℃ to 70℃,GND= 0V

Name	Symb.	Typ	Unit
Maximum Audio Output Current per Channel @ 8ohm Load	Iout	456	mA

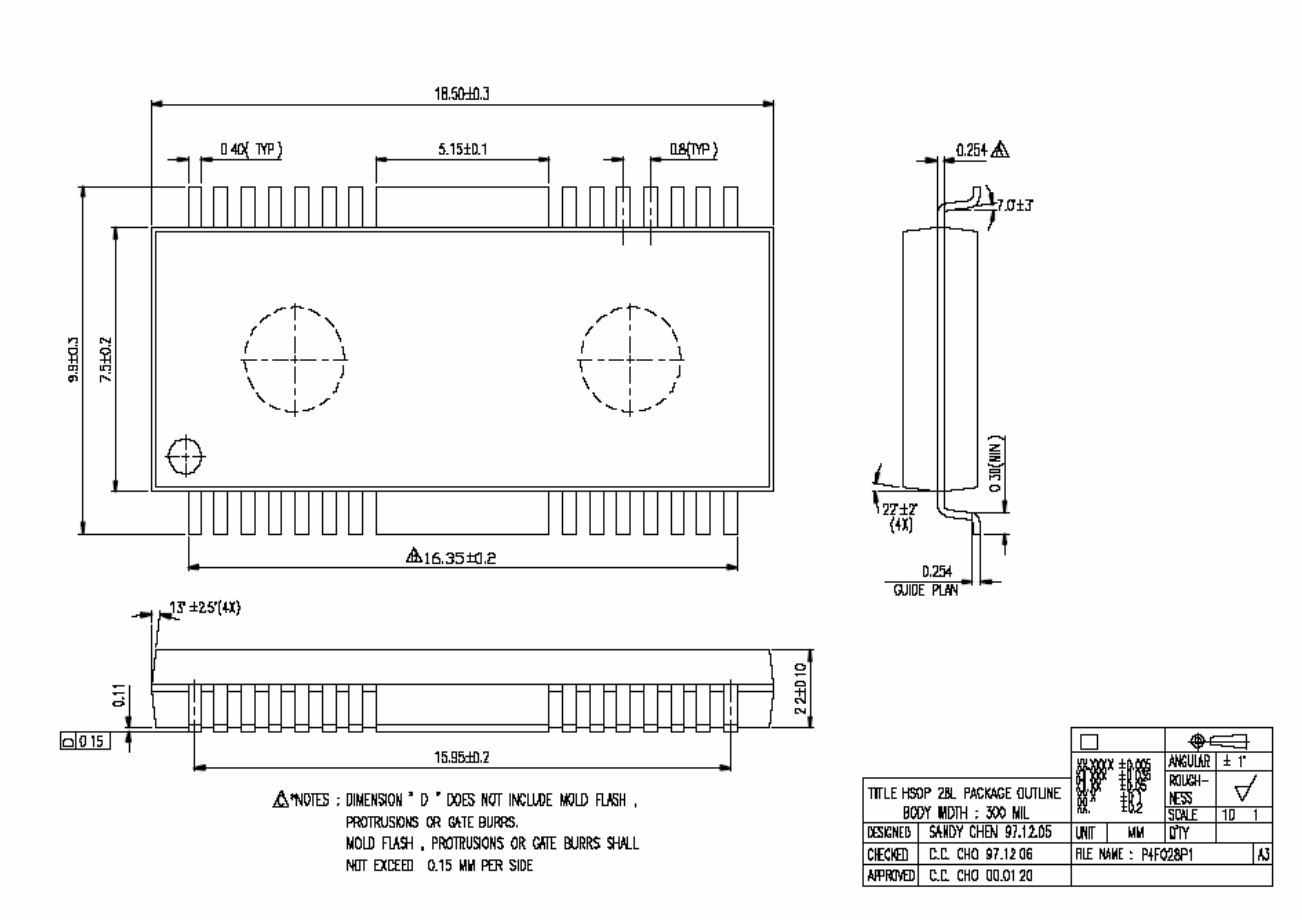
DC ELECTRICAL CHARACTERISTICS:

at Ta=-25 ℃,VDD5=5.0V, VSS= 0V, Fosc=12MHz

Name	Symb.	Min.	Typ.	Max.	Unit	Condition	Note
Operating current	Icc		50		mA	Fosc=12MHz	
P14/P15 Output High Voltage	Voh		4.0		V	Ioh=30uA	
P14/P15 Output Low Voltage	Vol		0.4		V	Iol=14mA	
LED(P3.5) Output Low Voltage	Vol		0.4		V	Iol=34mA	
V33 output voltage	V33	3.2		3.4	V	VDD=5V	

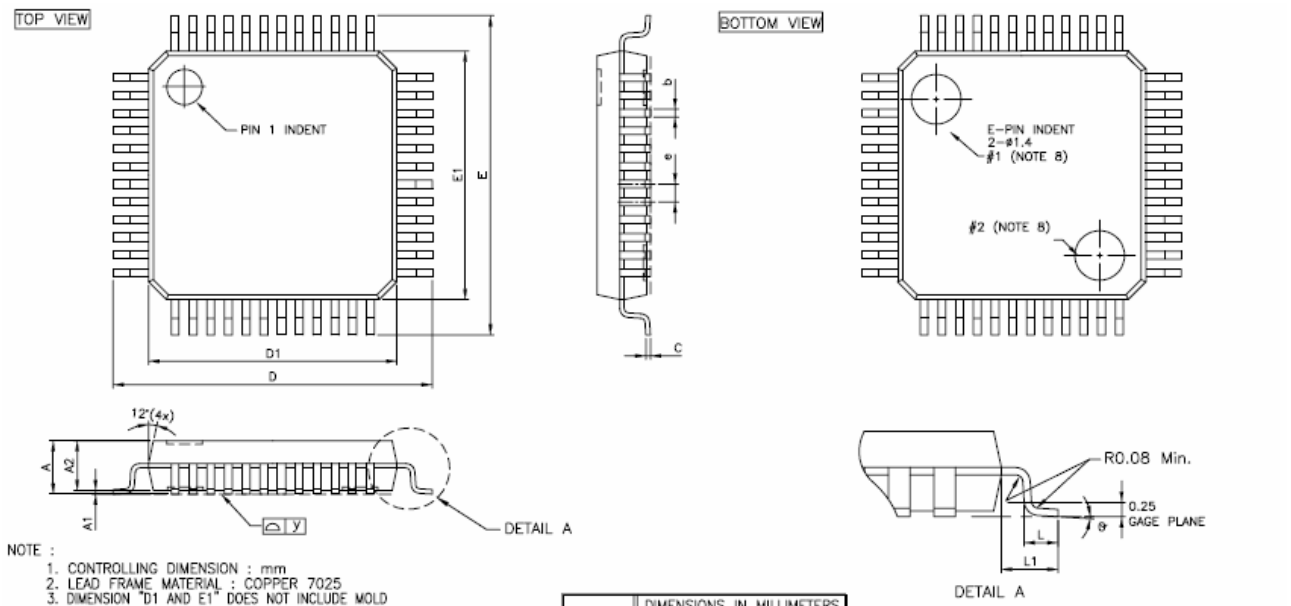
PACKAGE INFORMATION

HSOP - 28Pin

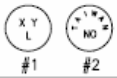


PACKAGE INFORMATION

LQFP - 48Pin



NOTE :
1. CONTROLLING DIMENSION : mm
2. LEAD FRAME MATERIAL : COPPER 7025
3. DIMENSION "D1 AND E1" DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS SHALL NOT EXCEED 0.010"[0.25mm] PER SIDE.
4. DIMENSION "b" DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.003"[0.08mm] TOTAL IN EXCESS OF THE "b" DIMENSION AT MAXIMUM MATERIAL CONDITION. DAMBAR CANNOT BE LOCATED ON THE LOWER RADIUS OR THE FOOT. MINIMUM SPACE BETWEEN PROTRUSION AND AN ADJACENT LEAD TO BE 0.0028"[0.07mm]
5. TOLERANCE : ±0.010"[0.25mm] UNLESS OTHERWISE SPECIFIED.
6. OTHERWISE DIMENSION FOLLOW ACCEPTABLE SPEC.
7. REFERENCE DOCUMENT : JEDEC SPEC MS-026-BBC
8. BOTTOM E-PIN INDENT IN MARKED AS BELOW :



X : A, B, C,...
Y : 1 ~ 12
NO : DENOTE MOLD SET NUMBER

SYMBOL	DIMENSIONS IN MILLIMETERS		
	MIN.	NOM.	MAX.
A	——	——	1.60
A1	0.05	——	0.15
A2	1.35	1.40	1.45
b	0.17	0.22	0.27
C	0.09	——	0.20
E	8.80	9.00	9.20
E1	6.90	7.00	7.10
D	8.80	9.00	9.20
D1	6.90	7.00	7.10
e	——	0.50	——
L	0.45	0.60	0.75
L1	——	1.00	——
θ	0°	3.5°	7°
y	0.0	——	0.08

CUSTOMER :		LINGSEN 5-1 NAN 2ND ROAD T.E.P.Z. PRECISION IND., LTD. TAICHUNG, TAIWAN, R. O. C.	
APPROVED BY	DATE	TITLE: 48L LQFP PACKAGE OUTLINE DRAWING (7x7x1.4 mm) (2.0 mm FOOTPRINT)	
DRAW BY: Dave Chen	05/05/00		
CHECK BY:			
APPROVAL:		DWG. NO. PO-LQFP-002	REV. 0
APPROVAL:		UNIT : mm / SCALE : 10/1	SHEET 1 OF 1