FEATURES

- Built-in 8-bits MCU core.
- Built-in programmable sound generator(PSG)
- Built-in voltage control oscillator with *programmable* PLL(VCO-PLL clock generator).
- Internal system clock speed up to 45 MHz(max. 45 MHz at Vcc = 3.0V).
- Built-in 2M BIT OTP-ROM.
- Built-in SRAM.
- Equipped EQ-OP for signal amplifier or filter.
- Equipped 1 speaker amplifier (0.5W).
- Built-in 2-wired serial bus interface (I2C like , slave mode).
- Built-in micro-controller interface(8-bit parallel interface).
- Equipped 16-bit DAC (voltage DAC) audio output.
- Operating voltage: 2.40V~3.60V(typ. 3.3V).
- Operating current: 35mA(average operating current without audio load).
- Standby current: typ. 2.0μA (25°C).

DESCRIPTION

The A9085 series is based on Ambition's 8-bit MCU (JUPITER) and equipped with a powerful VOICE / SPEECH generator for processing sweet-sounding. In internal system bus, the MCU (JUPITER) features efficient addressing register and memory timing control register (MTR) to access internal/external memory and I/O devices with appropriate timing.

The A9085 equipped 16-bit D/A for audio output, which can support time-sharing mode for processing up to 64-poly sounds. There are many speech processing firmware library for 4-bit ADPCM, 1-bit WFM, and so on. Since the A90XXX has a built-in PSG, it also provides high quality standard MIDI playing library.

The A9085 features 24 general purpose I/O pins. Each can be individually programmed to input or output mode, and with internal pull-up or not. Each I/O of port 0 can be programmed to select interrupt source and the interrupt signal can be falling or rising trigger.

The A9085 features VCO and PLL to provide system clock. The frequency of the system clock is programmable and up to 45 MHz. The device has two built-in 8-bit timers. Each timer is made up of an 8-bit up counter, 8-bit reload data, and pre-scaler. Usually, the timer can be configured to speech sampling frequency. The A90XXX also supports two device interfaces: one is 2-wired serial bus, and the other is 8-bit parallel MCU control interface. The A90XXX acts as a slave device and communicates to the host controller by either one of the interfaces.

IC BODY PACKAGE&I/O LIST

Part No.	Second(s)	DIP8	SOP8	DIP16	SOP16	DIP20	SOP20	DIP28	SOP28	DIP40	COB
A9040	40"	2 I/O		6 I/O		10 I/O		18 I/O		24 I/O	√
A9085	80"	--	--	6 I/O	6 I/O						√
A90170	170"	--	--	5 I/O	--	--	--				√
A90340	340"	--	--	--	--	8 I/O	--	--	15 I/O	23 I/O	√

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营业部：中国深圳市赛格广场二楼 2929 号；TEL/FAX： 86-755-83681751；21258700
E-mail:szyadi@szonline.net；szyadi@126.com；WEB：www.cszyadi.com

ABSOLUTE MAXIMUM RATINGS

Items	Sym.	Min.	Max.	Unit
Supply Voltage	V_{DD}-V_{SS}	0	3.8	V
Input Voltage	V_{IN}	V_{SS}-0.3	V_{DD}+0.3	V
Operating Temperature	T_{OP}	-20	70	$_{o}$C
Storage Temperature	T_{STG}	-55	+125	$_{o}$C

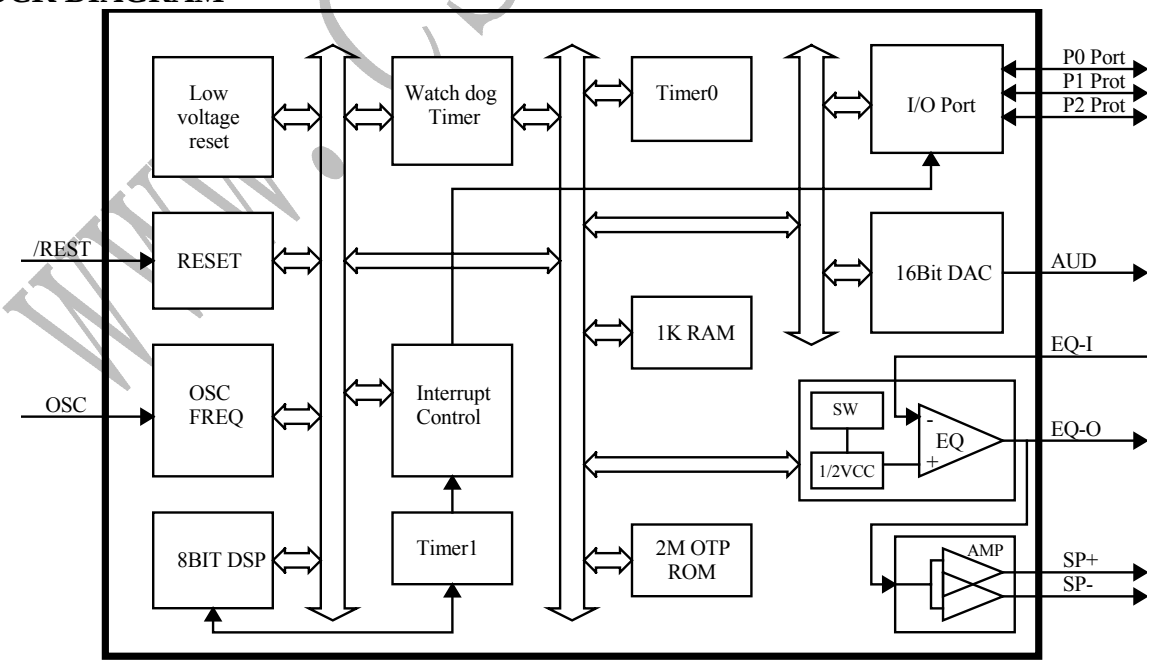
DC ELECTRICAL CHARACTERISTICS

Parameter	Sym.	Min.	Typ.	Max.	Unit	Condition
Operating voltage	V_{DD}	2.4	3.0	3.6	V	
Standby current	I_{DDS}		2.0		μA	V_{DD}=3V 20 $_{o}$C
Operating current	I_{DDO}		35		mA	V_{DD}=3V without audio load
Drive current of I/O Port	I_{OD}		4.0		mA	V_{OH}=2.7V
Sink current of I/O Port	I_{OS}		4.0		mA	V_{OL}=0.3V
Sink current of Audio L/R	I_{aS}		4.0		mA	V_{OL}=0.3V
Osci llation resistor	R_{OSC}		270		K	V_{DD}=3V
High Voltage	Vh		2/3Vdd		V	
Low Voltage	Vl		1/3Vdd		V	
AMP_P AMP_N Output current	Iout		360		mA	RL=8 Ω

AC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Min	Typ	Max	Unit	Condition
TAS	Address Set-Up Time	0			nS	
TAH	Address Hold time	0			nS	
TDS	Data Set-Up Time	20			nS	
TDH	Data Hold time	2			nS	
TAC	Access Time	0			nS	
TPW	Pulse Width time	20			nS	

BLOCK DIAGRAM



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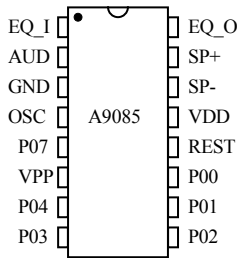
DIP16 PIN DESCRIPTIONS

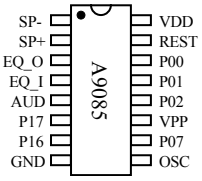
DIP16



PIN NO.	I/O	Symbol	Function
01	A	EQ_I	OP negative input pin
02	A	AUD	16-bit D/A output pin
03	P	GND	Power ground
04	I	OSC	Resistor of base voltage control oscillator
05	I/O	P07	I/O PORT0/BIT7
06	P	VPP	Power supply input
07	I/O	P04	I/O PORT0/BIT4
08	I/O	P03	I/O PORT0/BIT3
09	I/O	P02	I/O PORT0/BIT2
10	I/O	P01	I/O PORT0/BIT1
11	I/O	P00	I/O PORT0/BIT0
12	I	REST	Chip reset, low active.
13	P	VDD	Power supply input
14	A	SP-	Speaker amplifier positive output2 pin
15	A	SP+	Speaker amplifier positive output1 pin
16	A	EQ_O	OP negative output pin

SOP16 PIN DESCRIPTIONS

SOP16 150mil



PIN NO.	I/O	Symbol	Function
01	A	SP-	Speaker amplifier positive output2 pin
02	A	SP+	Speaker amplifier positive output1 pin
03	A	EQ_O	OP negative output pin
04	A	EQ_I	OP negative input pin
05	A	AUD	16-bit D/A output pin
06	I/O	P17	I/O PORT1/BIT7
07	I/O	P16	I/O PORT1/BIT6
08	P	GND	Power ground
09	I/O	OSC	Resistor of base voltage control oscillator
10	I/O	P07	I/O PORT0/BIT7
11	I/O	VPP	Power supply input
12	I	P02	I/O PORT0/BIT2
13	P	P01	I/O PORT0/BIT1
14	A	P00	I/O PORT0/BIT0
15	A	REST	Chip reset, low active
16	A	VDD	Power supply input

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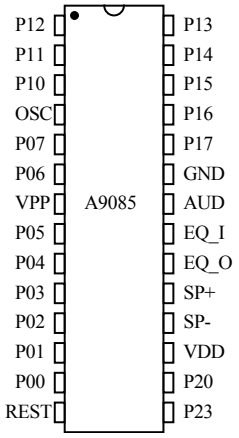
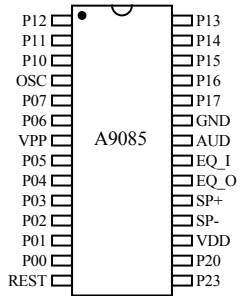
DIP28&SOP28 PIN DESCRIPTIONS

DIP28 SK 300mil



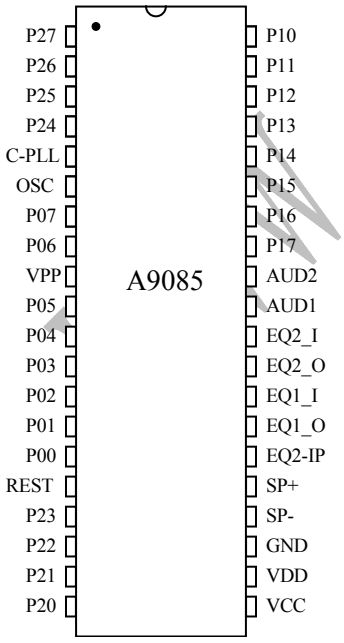
SOP28 300mil



PIN NO.	I/O	Symbol	Function
01	I/O	P12	I/O PORT1/BIT2
02	I/O	P11	I/O PORT1/BIT1
03	I/O	P10	I/O PORT1/BIT0
04	I	OSC	Resistor of base voltage control oscillator
05	I/O	P07	I/O PORT0/BIT7
06	I/O	P06	I/O PORT0/BIT6
07	P	VPP	Power supply input
08	I/O	P05	I/O PORT0/BIT5
09	I/O	P04	I/O PORT0/BIT4
10	I/O	P03	I/O PORT0/BIT3
11	I/O	P02	I/O PORT0/BIT2
12	I/O	P01	I/O PORT0/BIT1
13	I/O	P00	I/O PORT0/BIT0
14	I	REST	Chip reset, low active
15	I/O	P23	I/O PORT2/BIT3
16	I/O	P20	I/O PORT2/BIT0
17	P	VDD	Power supply input
18	A	SP-	Speaker amplifier positive output2 pin
19	A	SP+	Speaker amplifier positive output1 pin
20	A	EQ_O	OP negative output pin
21	A	EQ_I	OP negative input pin
22	A	AUD	16-bit D/A output pin
23	P	GND	Power ground
24	I/O	P17	I/O PORT1/BIT7
25	I/O	P16	I/O PORT1/BIT6
26	I/O	P15	I/O PORT1/BIT5
27	I/O	P14	I/O PORT1/BIT4
28	I/O	P13	I/O PORT1/BIT3

DIP40 PIN DESCRIPTIONS

DIP40



PIN NO.	I/O	Symbol	Function
01	I/O	P27	I/O PORT2/BIT7
02	I/O	P26	I/O PORT2/BIT6
03	I/O	P25	I/O PORT2/BIT5
04	I/O	P24	I/O PORT2/BIT4
05	--	C-PLL	--
06	I	OSC	Resistor of base voltage control oscillato
07	I/O	P07	I/O PORT0/BIT7
08	I/O	P06	I/O PORT0/BIT6
09	P	VPP	Power supply input
10	I/O	P05	I/O PORT0/BIT5
11	I/O	P04	I/O PORT0/BIT4
12	I/O	P03	I/O PORT0/BIT3
13	I/O	P02	I/O PORT0/BIT2
14	I/O	P01	I/O PORT0/BIT1
15	I/O	P00	I/O PORT0/BIT0
16	I	REST	Chip reset, low active
17	I/O	P23	I/O PORT2/BIT3
18	I/O	P22	I/O PORT2/BIT2
19	I/O	P21	I/O PORT2/BIT1
20	I/O	P20	I/O PORT2/BIT0
21	P	VCC	Analog Power supply input
22	P	VDD	Digital Power supply input
23	P	GND	Power ground

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24	A	SP-	Speaker amplifier positive output2 pin
25	A	SP+	Speaker amplifier positive output1 pin
26	A	EQ2-IP	--
27	A	EQ1_O	OP1 negative output pin
28	A	EQ1_I	OP1 negative input pin
28	A	EQ2_O	OP2 negative output pin
30	A	EQ2_I	OP2 negative input pin
31	A	AUD1	16-bit D/A CH1 output pin
32	A	AUD2	16-bit D/A CH2 output pin
33	I/O	P17	I/O PORT1/BIT7
34	I/O	P16	I/O PORT1/BIT6
35	I/O	P15	I/O PORT1/BIT5
36	I/O	P14	I/O PORT1/BIT4
37	I/O	P13	I/O PORT1/BIT3
38	I/O	P12	I/O PORT1/BIT2
39	I/O	P11	I/O PORT1/BIT1
40	I/O	P10	I/O PORT1/BIT0

应用说明：

1、I/O：可编程双向端口，I：输入端口，A：模拟信号引脚，P：电源引脚。

2、可以根据客户的 I/O 口的数量，选择不同的封装，根据客户的功能要求进行编程。

3、 以根据客户的需要定做 OTP 裸片，或 OTP COB。

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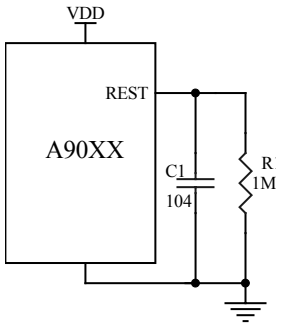
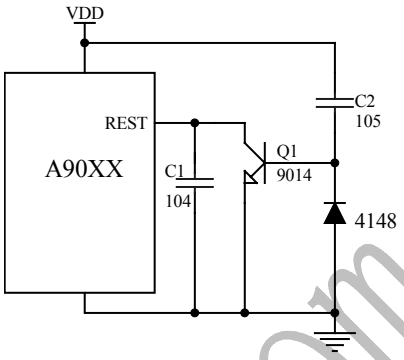
CHIP RESET CIRCUIT

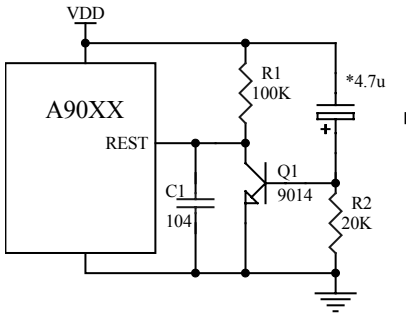
简易复位电路



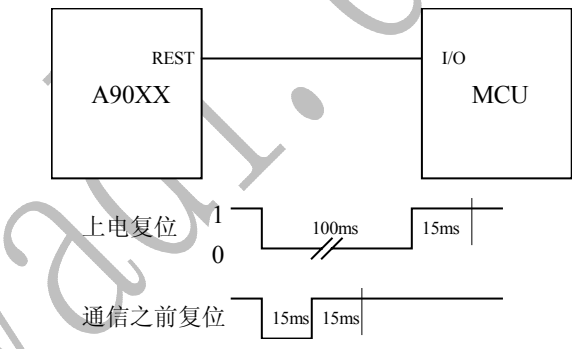
标准复位电路 1



标准复位电路 2



外部 MCU 复位电路



1、 REST 信号由低电平转到高电平时，P00、P01 禁止同时为低电平状态。(即 IC 上电瞬间 P00、P01 禁止同时为低电平状态)。

2、 若有用 MCU 控制的条件，为增加电路可靠性，第一次上电，用 MCU 给该 IC 的 REST 复位脚加 100ms 的低电平，然后加 15ms 的高电平；通电后，送控制信号前，给 REST 复位脚加 15ms 的低电平，然后加 5~15ms 的高电平后才送控制信号。

3、 A9085 内部 I/O 有上拉电阻 10K 左右，作为按键或地址输入时一般会开启内部上拉电阻，应用时应注意此电阻带来的电流。若希望外部接上拉电阻则可要求在编程关闭上拉电阻。

4、以下是 A9085 DIP16 封装的部分应用线路，供客户参考。

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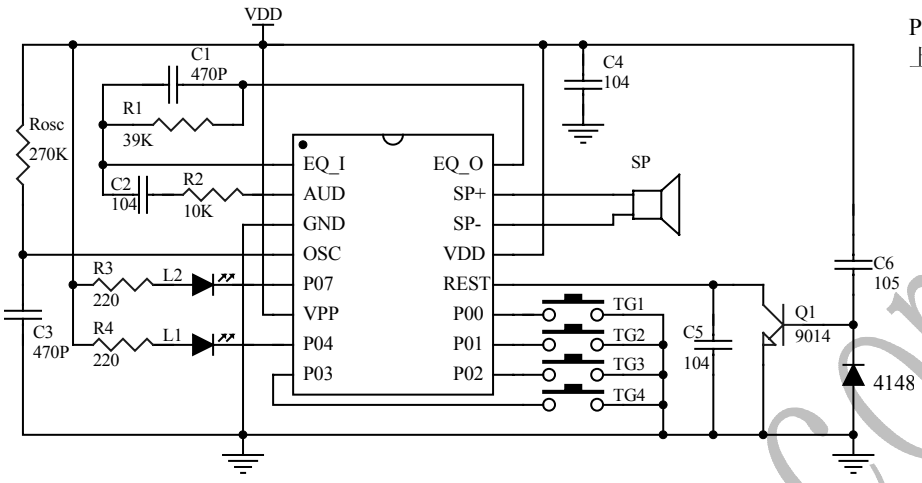
APPLICATION CIRCUIT

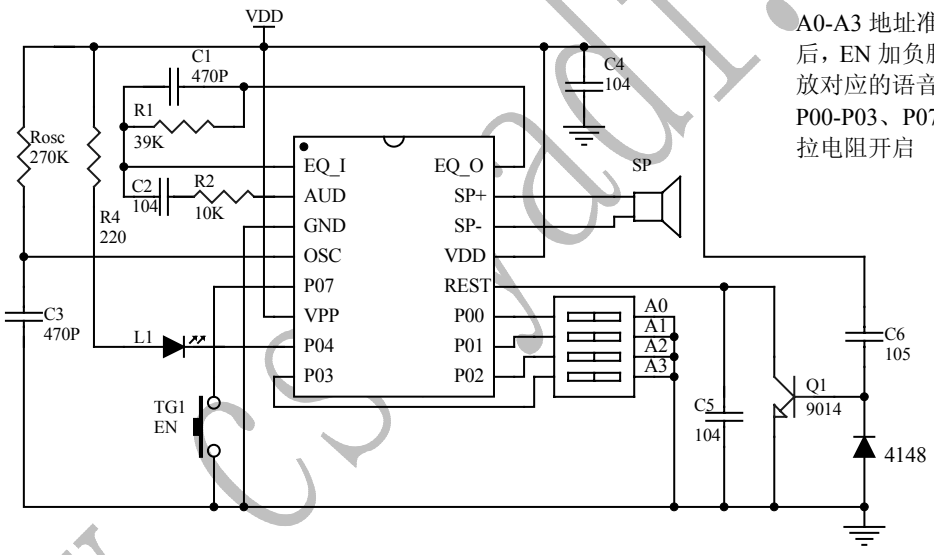
可根据客户要求定制
各种触发方式及
LED 输出方式

A9085 DIP16 ALONE KEY MODE



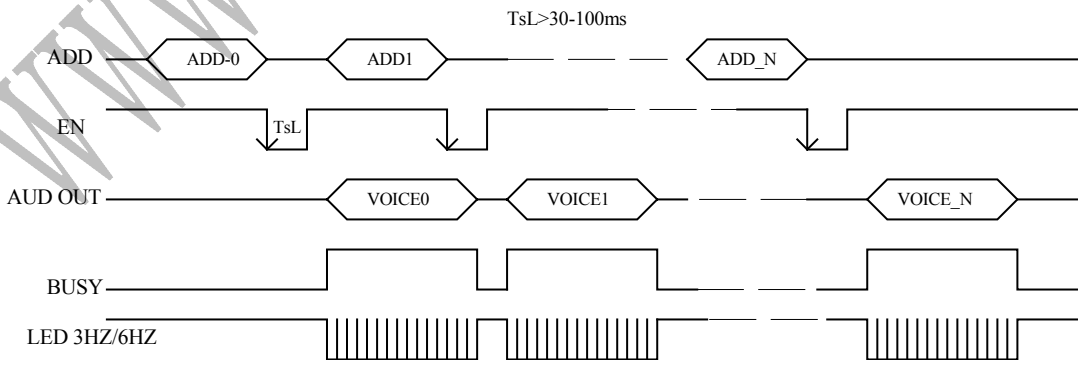
P00-P03 内部
上拉电阻开启

A9085 DIP16 4BIT BCD MCU MODE



A0-A3 地址准备好
后，EN 加负脉冲则播
放对应的语音内容
P00-P03、P07 内部上
拉电阻开启

CPU 并列模式时序图



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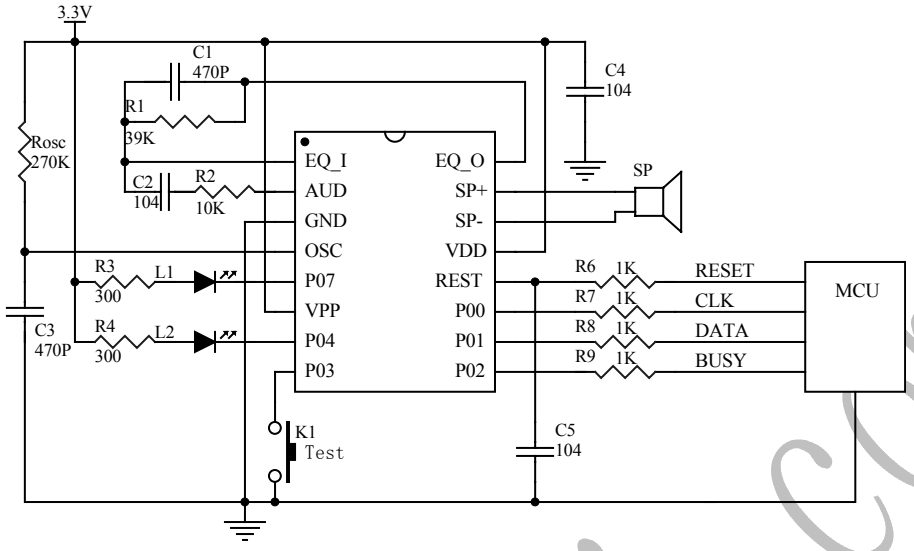
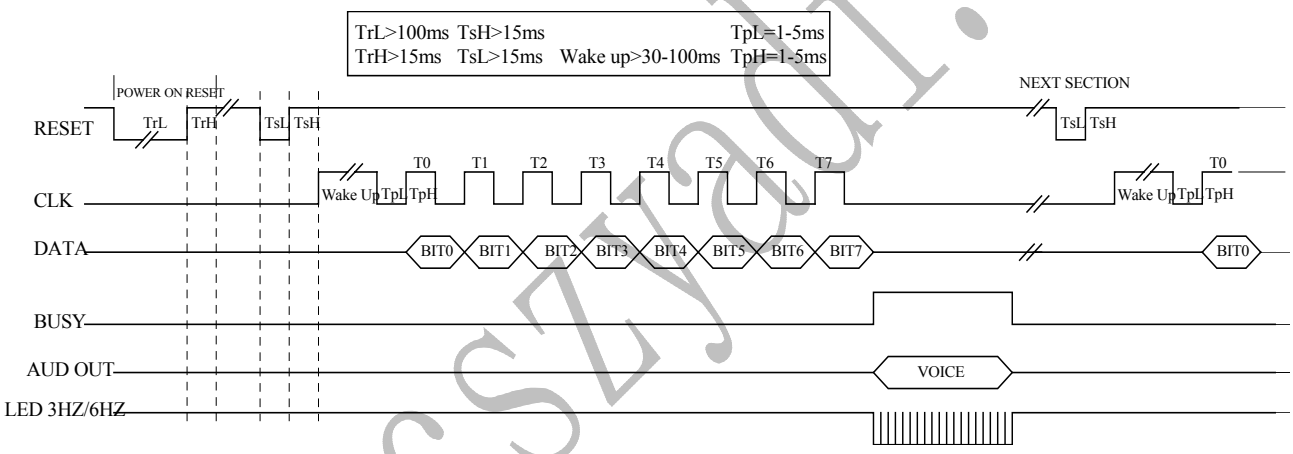
A9085 DIP16 Serial MCU MODE



CPU 串列模式时序图



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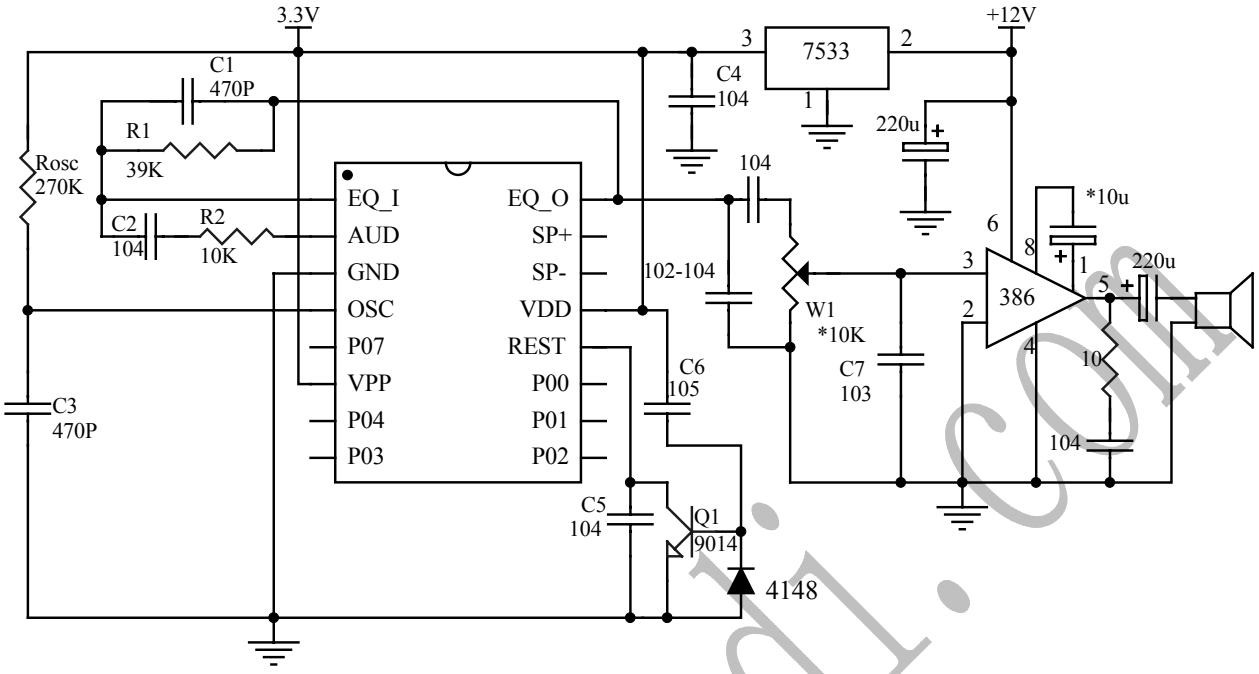
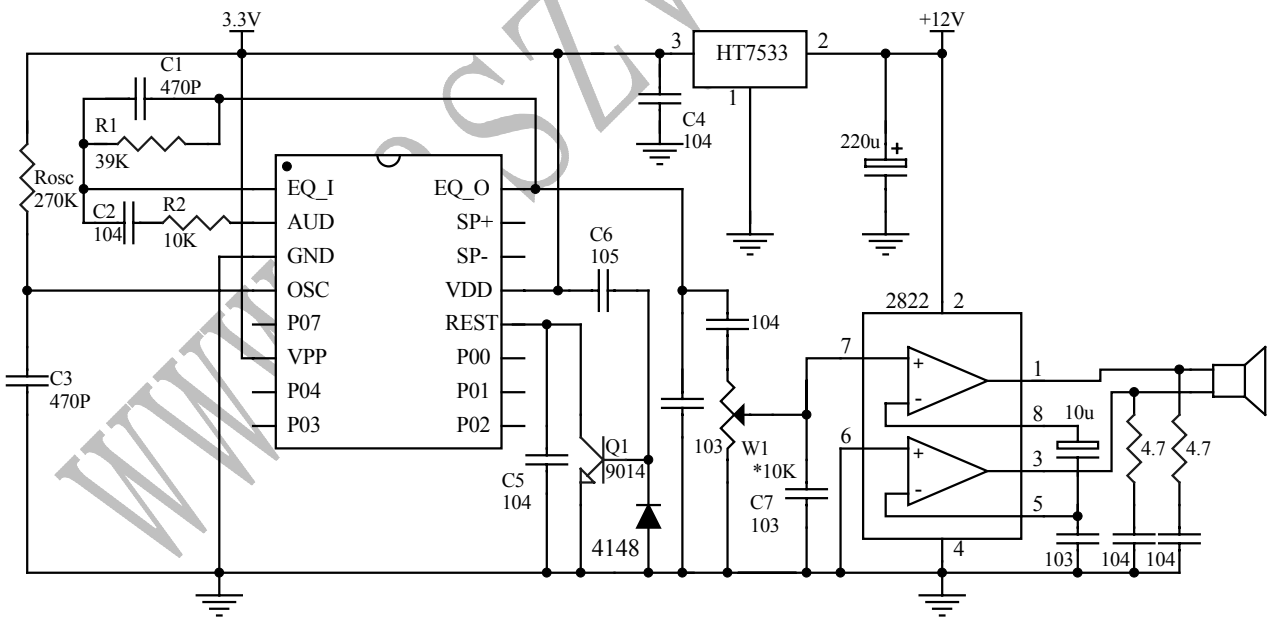
A9085 DIP16 AND LM386 APPLICATION CIRCUIT



A9085 DIP16 AND TDA2822 APPLICATION CIRCUIT



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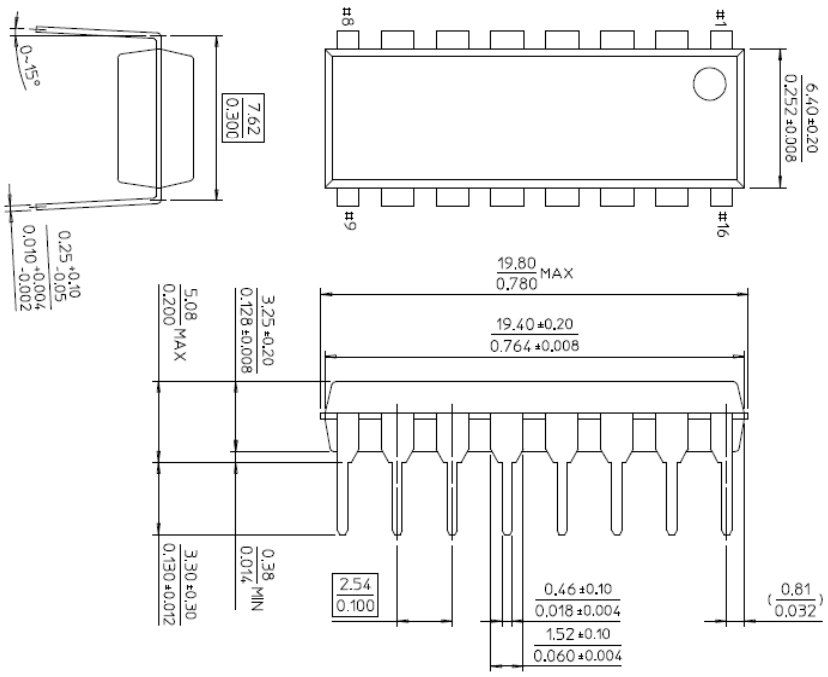
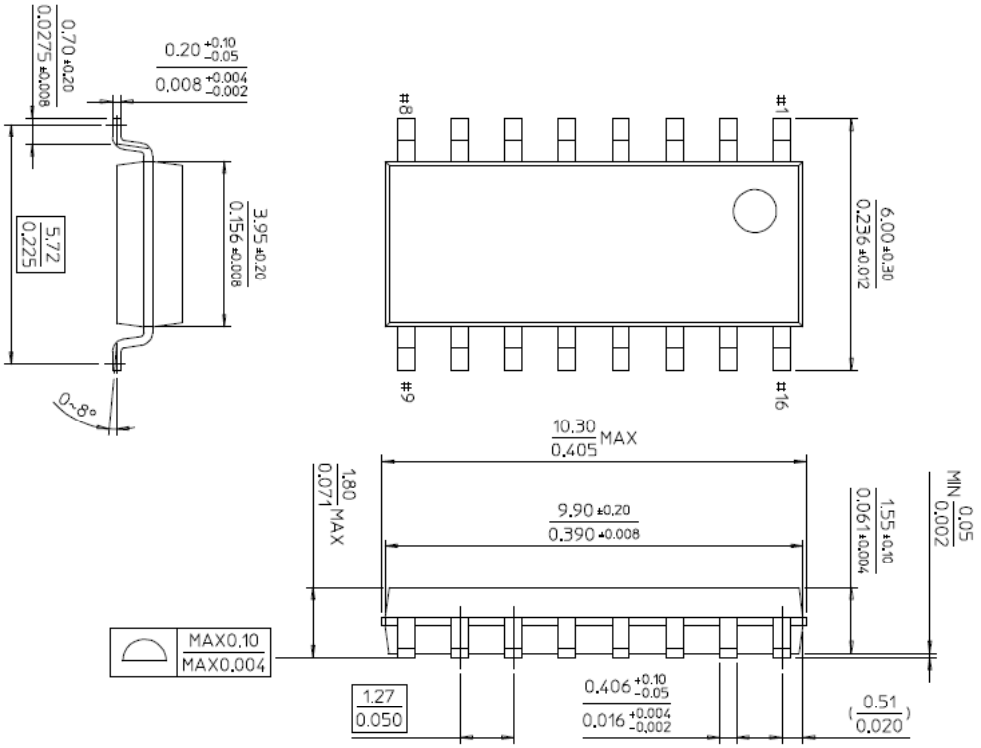
PACKAGES LIST

16-Pin 300mil P-DIP Package



16-Pin 150mil SOP Package



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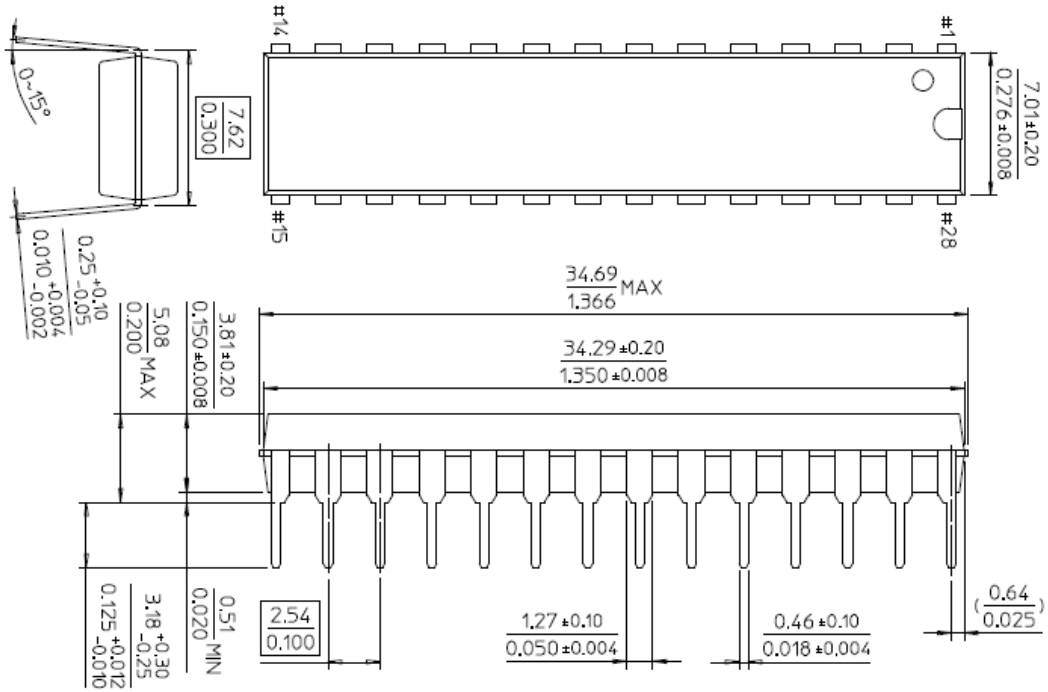
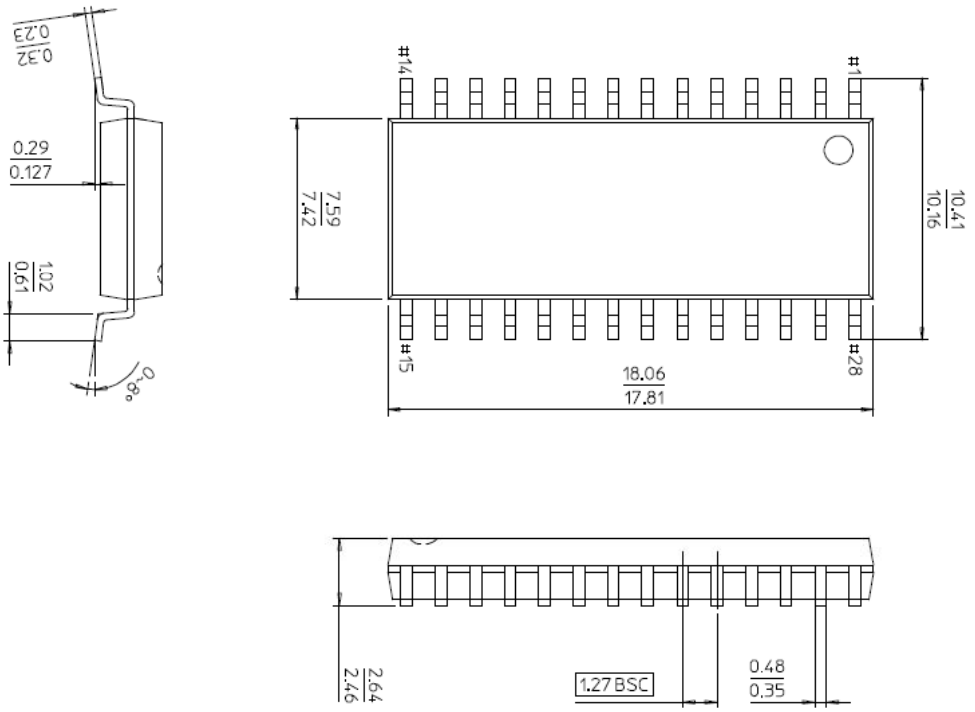
28-Pin 300mil DIP SKINNY Package



28-Pin 300mil SOP Package



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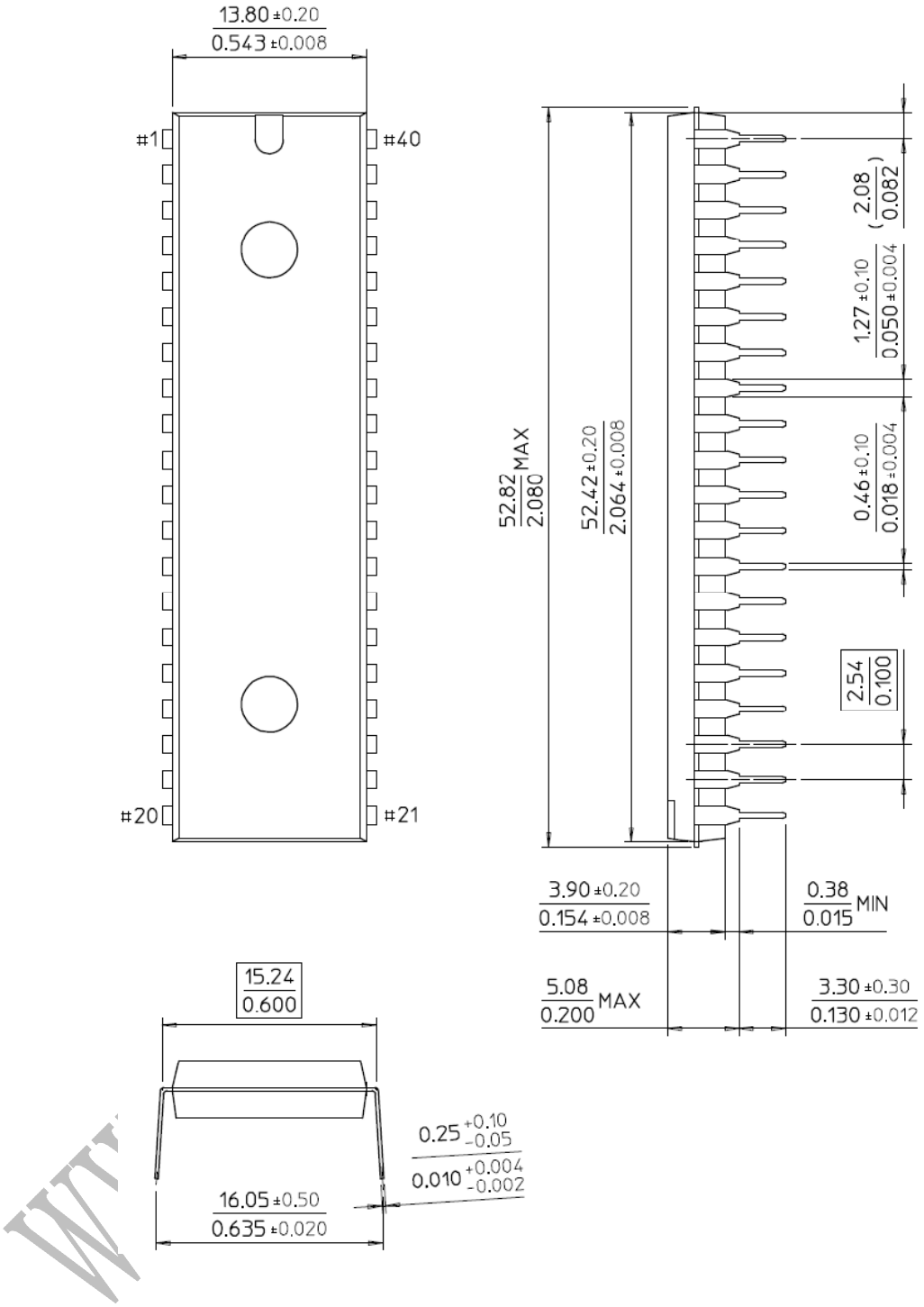
40-Pin 600mil DIP Package



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