三合微科股份有限公司
SAMHOP Microelectronics Corp.

SM7181

ECHO

REV. 1.20

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ECHO

DESCRIPTIONS

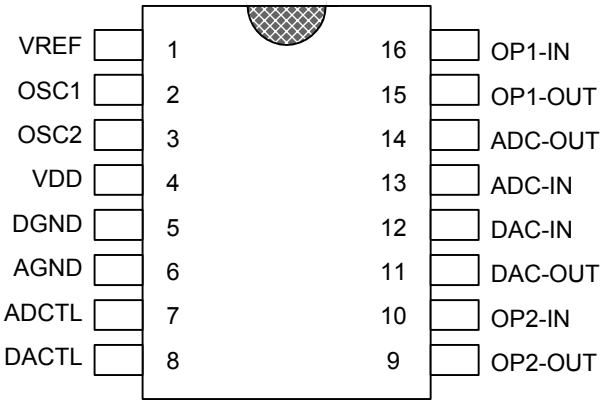
SM7181 is an Audio Echo Processor using CMOS Technology. It has buildin AD/DA and 8KBits SRAM for echo effect time delay.

FEATURE

* Buildin adjustable OSC.
* Buildin power on reset circuit.
* Buildin 8KBits SRAM for delay control.
* By change oscillator resistor to adjust echo effect time.

APPLICATIONS

* VCD
* Karaok
* TV
* Audio System
* Car Stereo



SM7181
DIP 16

PIN DESCRIPTION

PIN NO.	PIN NAME	I/O	FUNCTION
1	VREF	AI/O	Analog referance voltage
2	OSC1	IN	Oscillator
3	OSC2	OUT	
4	VDD	Power	Power
5	DGND	Power	Digital negative power supply
6	AGND	Power	Analog negative power supply
7	ADCTL	AIN	ADC control
8	DACTL	AIN	DAC control
9	OP2-OUT	AOUT	OP2 output
10	OP2-IN	AIN	OP2 input
11	DAC-OUT	AOUT	DAC OP output
12	DAC-IN	AIN	DAC OP input
13	ADC-IN	AIN	ADC OP input
14	ADC-OUT	AOUT	ADC OP output
15	OP1-OUT	AOUT	OP1 output
16	OP1-IN	AIN	OP1 input

AI/O: Analog input/output
AIN: Analog input
AOUT: Analog output

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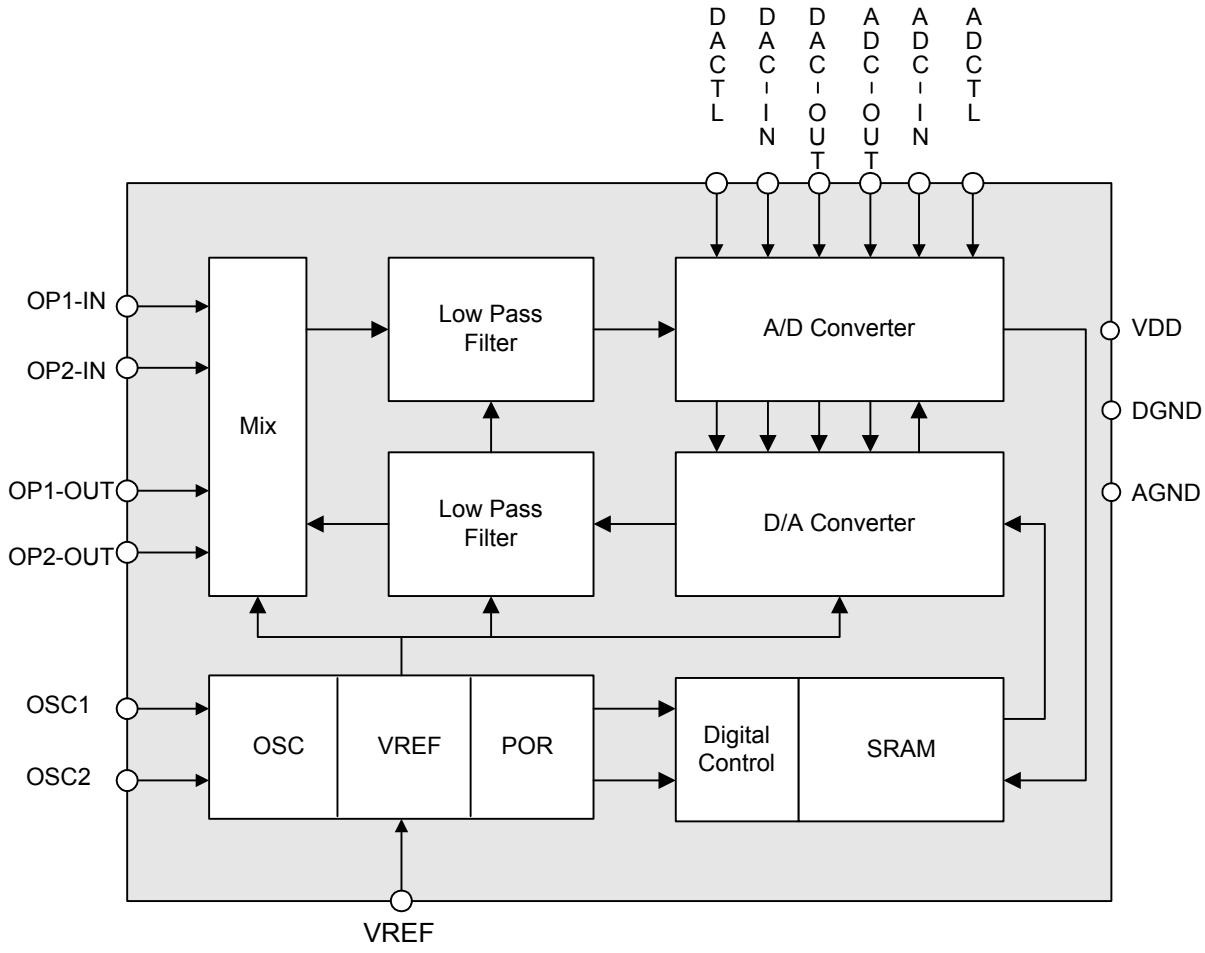
BLOCK DIAGRAM



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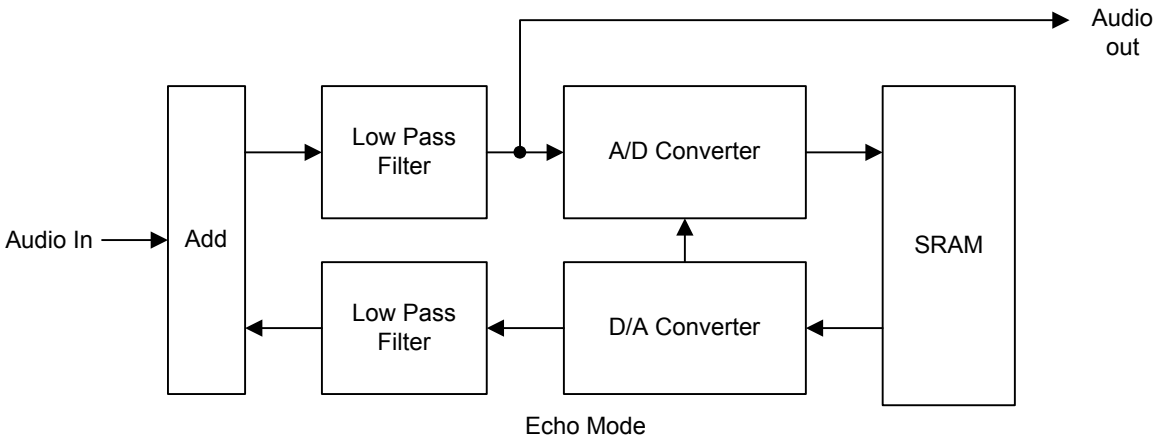
Echo Mode

SM7181 digitize the audio signal through A/D converter and store the value in a First-in- First-out 8Kbits SRAM. After 32768 Tsec (T is the period of oscillator) of delay time the value sto re in the SRAM will be read out and reconstruct by D/A converter then add with the present sound to b ecome an echo signal output. The echo delay is control by the RC of Pin 2, Pin 3.



Echo Mode

ABSOLUTE MAXIMUM RATINGS

(Ta = 25 ^{o}C, unless otherwise noted)

Symbol	Description	Limits	Unit
Vcc	Supply voltage	6.5	V
Icc	Supply current	100	mA
Pd	Power dissipation	0.9	W
Topr	Operation temperature	-20 ~ 75	^{o}C
Tstg	Storage temperature	-25 ~ 125	^{o}C

AC CHARACTERISTICS

(Vcc = 5.0V, f in = 1KHz, Vi = 100mVrms, fck = 390KHz, Ta = 25°C, unless otherwised noted)

SYMBOL	PARAMETER	Test condition		Min	Typ	Max	Unit
Icco	Sypply current				3	6	mA
Gv	Voltage gain	RL = 47K Ω			-0.5	2.5	dB
Vomax	Maximum output voltage	THD = 10%		0.7	1.7		Vrms
THD	Output disortion	30KHz L.P.F.	Echo mode		2	3.0	%
			Surround mode		2	3.0	%
No	Output noise voltage	DIN Audio	Echo mode		-76	-60	dBV
			Surround mode		-78	-60	dBV
PSRR	Power supply rejection ratio	△ Vcc = -20dBV f = 100Hz			-40	-25	dB
Tmute	Mute time	Echo mode		76	84	92	msec
		Surround mode		76	84	92	msec

DC CHARACTERISTICS

Symbol	Parameter	Limits			Unit
		Min	Typ	Max	
Vcc	Supply voltage	4.5	5	5.5	V
Icc	Supply current		3	6	mA
V_{IH}	"H" input voltage	3.5			V
V_{IL}	"L" input voltage			1.5	V

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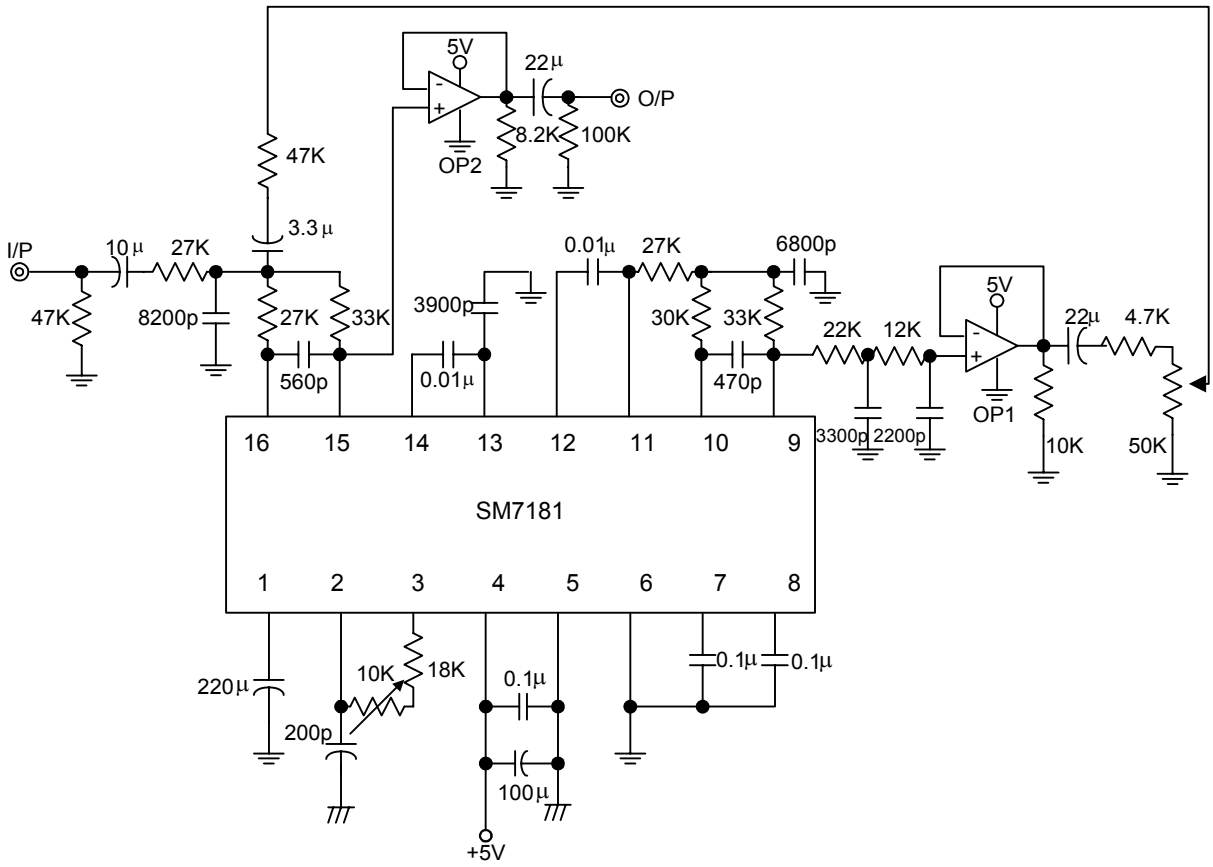
ECHO MODE APPLICATION CIRCUIT

Echo Mode



1 ⏚ Represent Analog Ground.

2. ⏚ Represent Digital Ground.

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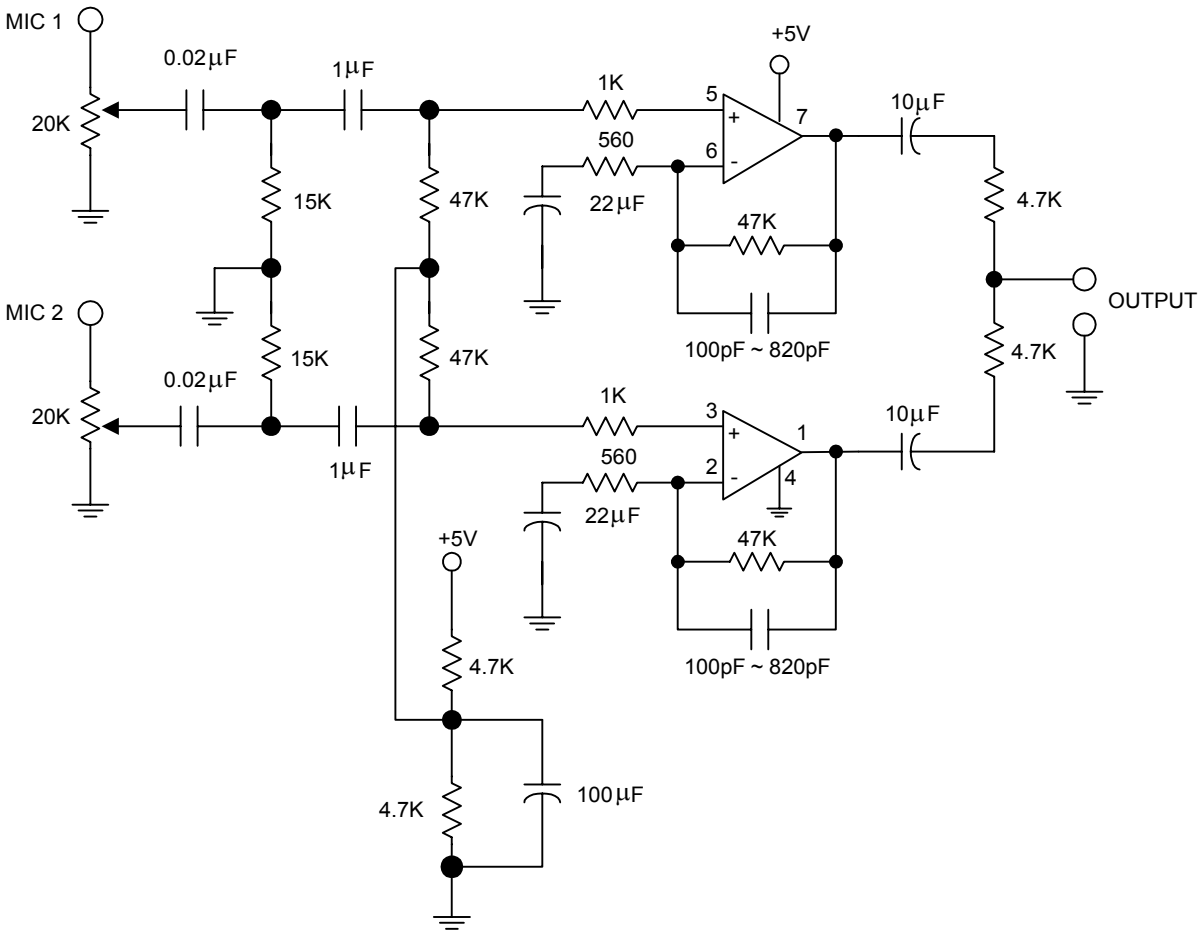
MIC PRE-AMP CIRCUIT



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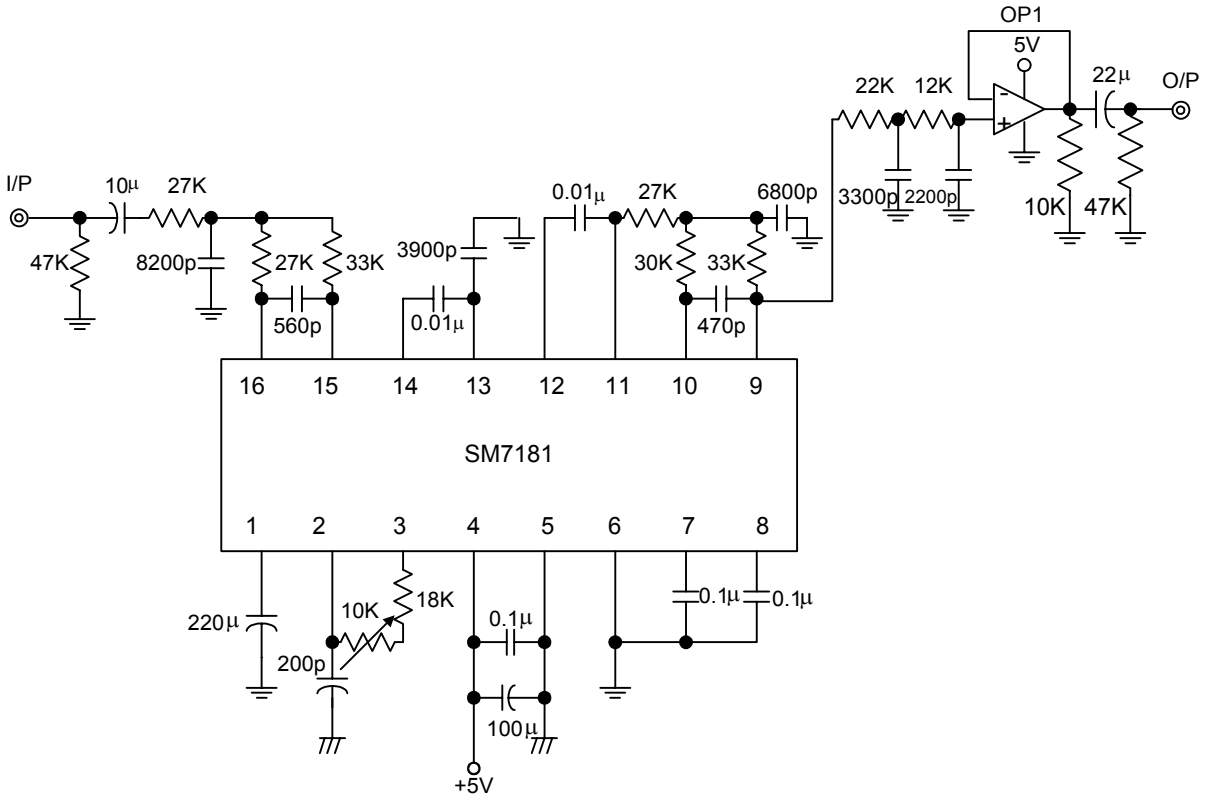
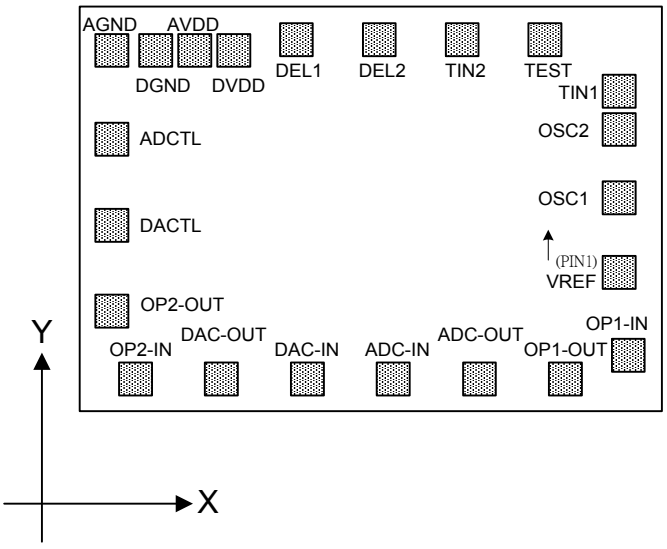
SURROUND MODE APPLICATION CIRCUIT



1 ⏚ Represent Analog Ground.

2. ⏚ Represent Digital Ground.



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Pad Coordinates in Microns

VREF	1640.50,	421.95
OSC1	1640.50,	648.70
OSC2	1640.50,	856.45
TIN1	1640.50,	973.00
TEST	1415.00,	1129.80
TIN2	1163.00,	1129.80
DEL2	911.00,	1129.80
DEL1	659.00,	1129.80
DVDD	468.50,	1096.80
AVDD	350.00,	1096.80
DGND	231.50,	1096.80
AGND	98.00,	1096.80
ADCTL	98.00,	827.05
DACTL	98.00,	565.05
OP2-OUT	98.00,	304.05
OP2-IN	169.75,	98.00
DAC-OUT	430.75,	98.00
DAC-IN	692.75,	98.00
ADC-IN	953.75,	98.00
ADC-OUT	1215.75,	98.00
OP1-OUT	1476.75,	98.00
OP1-IN	1668.25,	169.75

DIE SPECIFICATIONS:

DIE SIZE: 1770 microns x 1230 microns
BOND PAD SIZE: 4 mil x 4 mil

Note: TIN1, TEST, TIN2, DEL2, DEL1 are testing PAD.