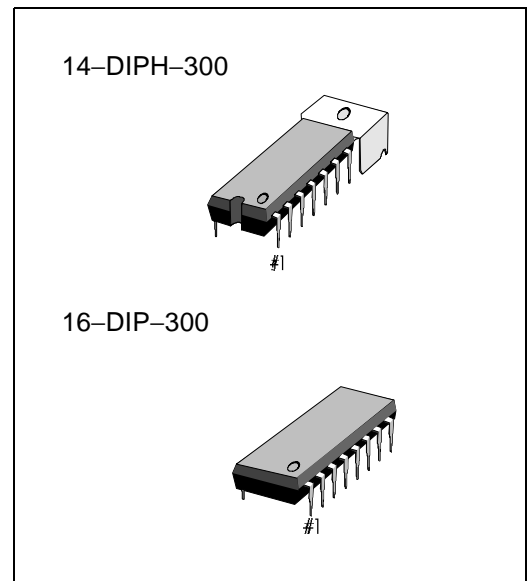


## INTRODUCTION

The S1A2213C01 is a monolithic integrated circuit consisting of a preamplifier, ALC circuit, and power amplifier in a 14-pin/16 pin plastic dual-in-line package with heat sink.

## FEATURES

- Suitable for playing and recording functions of mono cassette tape recorders
- Wide operating supply voltage range:  $V_{CC} = 4V - 12V$
- High gain pre-amplifier and power amplifier
- Output power of power amplifier state  
 $P_O = 1W$  at  $V_{CC} = 6V$ ,  $R_L = 4\Omega$ , THD = 10%
- Soft tone quality at the time of output saturation
- Wide ALC range and small variation in output voltage
- Reduced shock noise at the time of power on/off due to built-in prevention circuit
- Variable monitor capability due to recording amplifier consisting of pre-amplifier alone
- Minimum number of external parts required

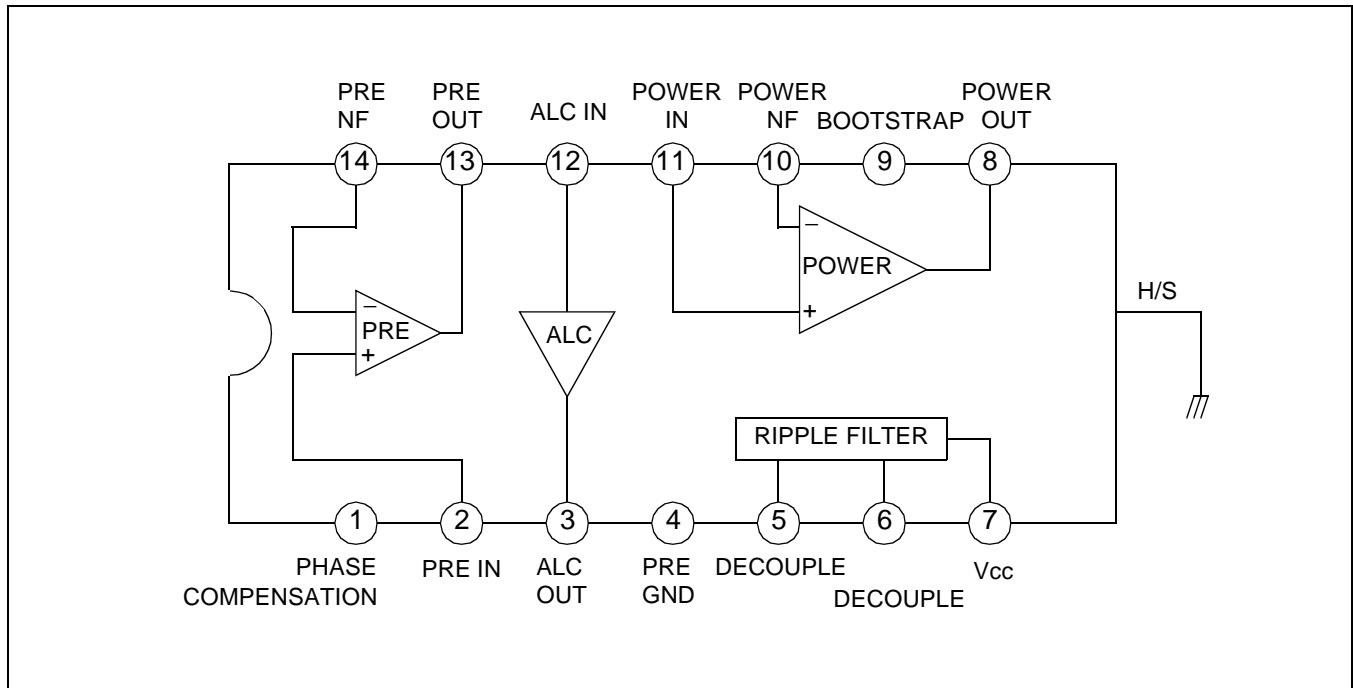


## ORDERING INFORMATION

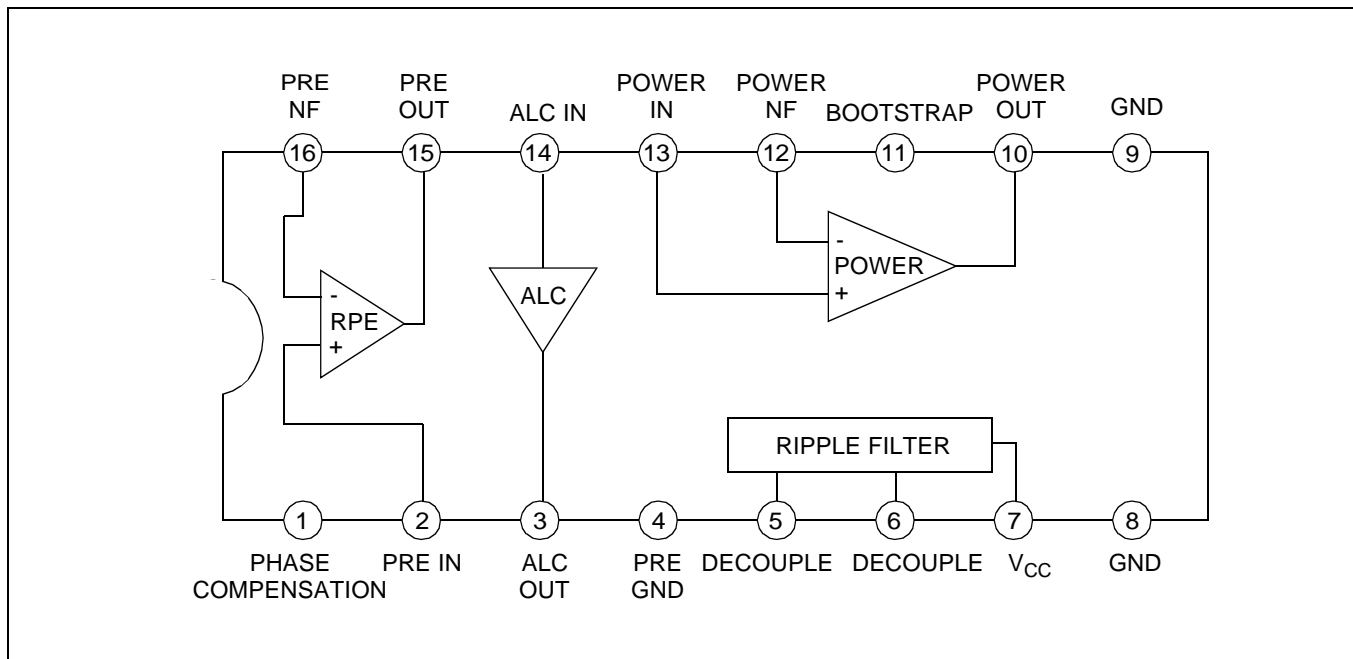
Device	Package	Operating Temperature
S1A2213C01-D0B0	16-DIP-300	-20°C - +70°C
S1A2213C01-H0B0	14-DIPH-300	

**BLOCK DIAGRAM**

**14- DIP- 300**



**16- DIP- 300**



**ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)**

Characteristic	Symbol	Value	Unit
Supply Voltage	V <sub>CC</sub>	13	V
Power Dissipation	P <sub>D</sub>	1.2 (2.25*)	W
Operating Temperature	T <sub>OPR</sub>	- 20 — + 70	°C
Storage Temperature	T <sub>STG</sub>	- 40 — +150	°C

\* Mounted and soldered on a 50mm x 50mm copper foil of PCB

**ELECTRICAL CHARACTERISTICS**

(Ta = 25°C, V<sub>CC</sub> = 6V, f = 1kHz, unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Quiescent Circuit Current	I <sub>CCQ</sub>	V <sub>CC</sub> = 6V, V <sub>I</sub> = 0	-	14	30	mA
		V <sub>CC</sub> = 9V, V <sub>I</sub> = 0	-	19	40	mA
<b>Pre-Amplifier</b>						
Open Loop Voltage Gain	G <sub>VO</sub>	Open loop	-	85	-	dB
Closed Loop Voltage Gain	G <sub>VC</sub>	Closed loop, Play	-	40	-	dB
Output Voltage	V <sub>O</sub>	THD = 1%, Play	0.9	1.2	-	V
Input Resistance	R <sub>I</sub>	-	21	30	-	kΩ
Equivalent Input Noise Voltage	V <sub>NI</sub>	Play	-	1.0	2.0	μV
ALC Input Level	V <sub>I (ALC)</sub>	THD = 1%, Rec	- 20	- 12	-	dBm
<b>Power Amplifier</b>						
Closed Loop Voltage Gain	G <sub>VC</sub>	R <sub>F</sub> = 51Ω	43	45	47	dB
Output Power	P <sub>O</sub>	V <sub>CC</sub> = 6V, R <sub>L</sub> = 4Ω, THD = 10%	0.7	1.0	-	W
		V <sub>CC</sub> = 7.5V, R <sub>L</sub> = 4Ω THD = 10%	1.0	1.5	-	W
		V <sub>CC</sub> = 9V, R <sub>L</sub> = 4Ω, THD = 10%	1.7	2.2	-	W
Total Harmonic Distortion	THD	P <sub>O</sub> = 250mW	-	0.3	1.5	%
Input Resistance	R <sub>I</sub>	-	-	30	-	kΩ
Output Noise Voltage	V <sub>NO</sub>	R <sub>G</sub> = 10kΩ	-	0.6	1.8	mV
Ripple Rejection Ratio	RR	R <sub>G</sub> = 0Ω, V <sub>R</sub> = 150mV, f = 100Hz	40	45	-	dB

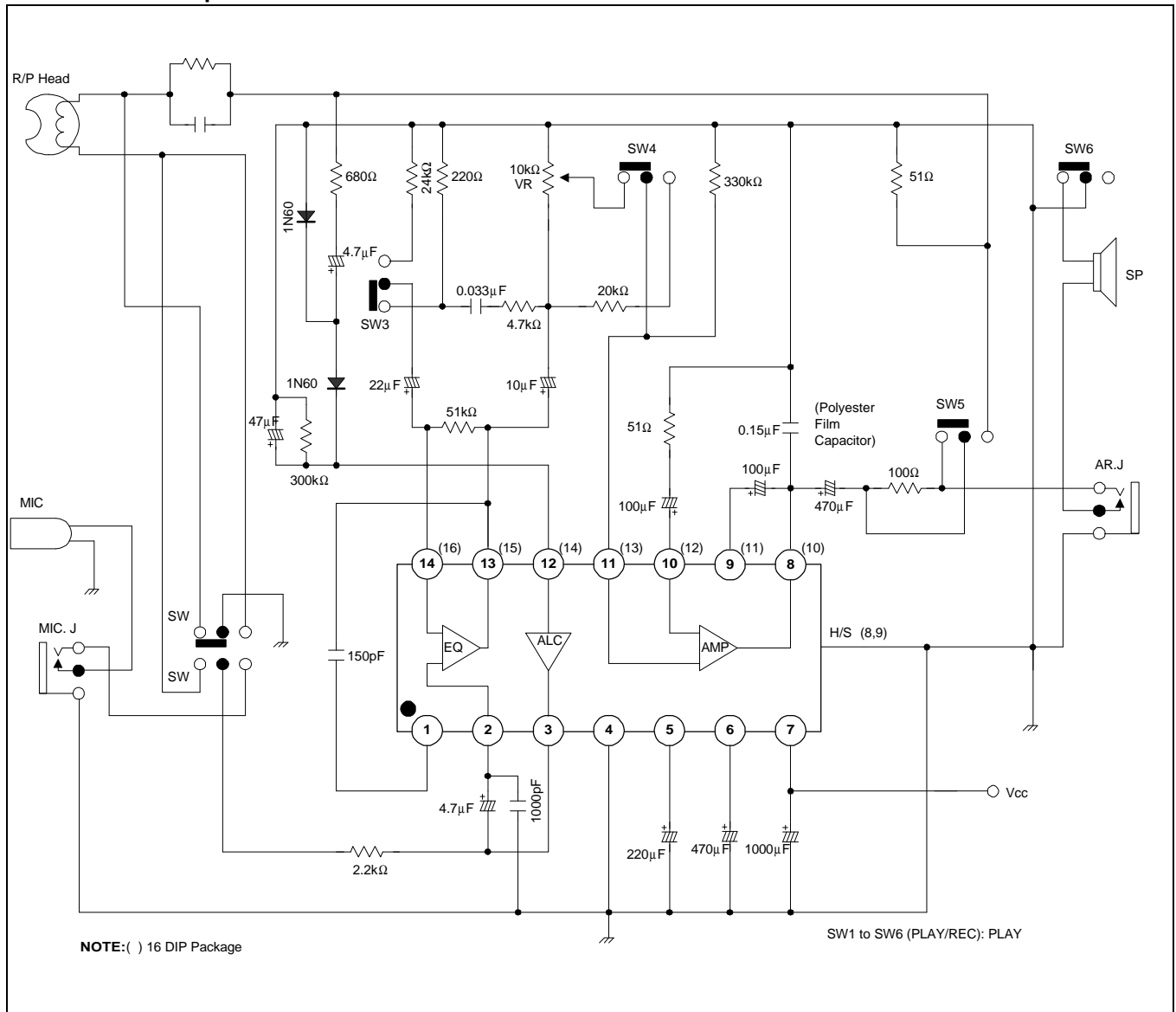


## TEST METHOD

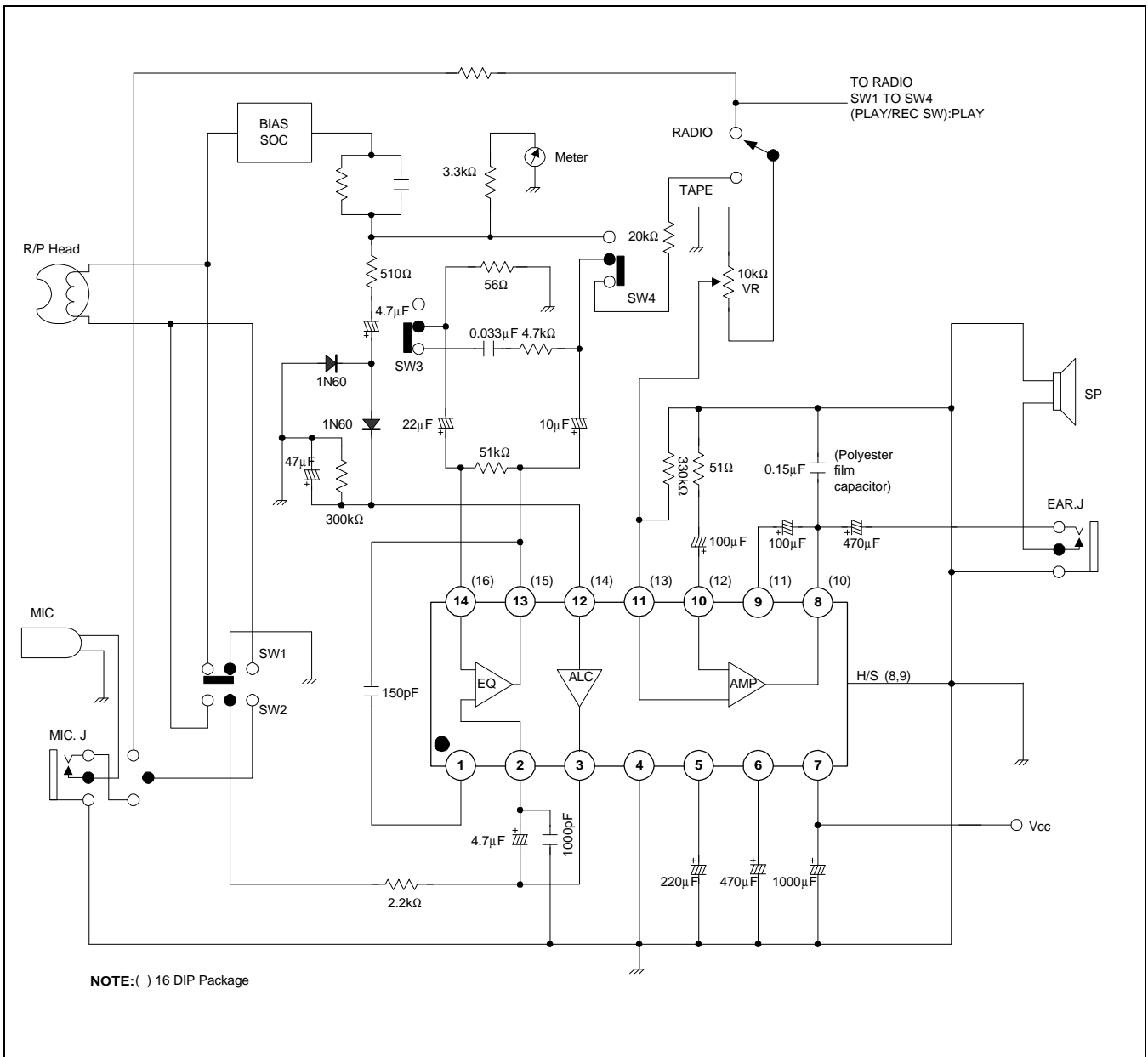
Characteristic	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8	Test Point	Test Method	
Power Amplifier	$I_{CCQ}$		on	on	off	on	on	off	off	E	Test circuit current
	$G_{VC}$	2	off	off	off	on	on	off	off	A.D	$G_{VC} = 20 \log V_O/V_I$ (dB)
	$P_O$	2	off	off	off	on	on	off	off	D	Test output voltage at THD = 10%
	THD	2	off	off	off	on	on	off	off	D	Test THD at output voltage $V_O = 1V$
	$V_{NO}$		on	off	off	on	on	off	off	D	Test output noise voltage
	RR		on	off	off	on	on	off	off	D	RR = $20 \log V_{RO}/150$ (dB) Test output ripple voltage (VRO)
Pre-Amplifier	$G_{VO}$	1	off	off	on	off	on	off	off	A.B	$G_{VO} = 20 \log V_O/V_I$ (dB)
	$V_O$	1	off	off	off	on	on	off	off	B	Test output voltage at THD = 1%
	$V_{NI}$		off	on	off	on	on	on	off	C	Convert output noise voltage at $R_G = 2.2k\Omega$ , $V_{NI} = V_{NO}/G_V$
	$V_{I(ALC)}$	1	off	off	off	off	off	off	on	A.B	Test input voltage at THD = 1%

TYPICAL APPLICATION CIRCUITS

Mono Cassette Tape Recorder



Radio Cassette Tape Recorder



NOTES