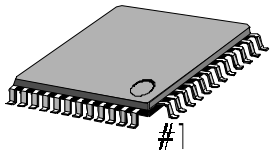
INTRODUCTION

The KA22293/Q is a monolithic integrated circuit for an audio system.
The KA22293/Q consists of a MIC AMP, MIC and MICOM or Manual selection part for PHONO, TUNER, CD, TAPE, AUX, and VTR input.

48–QFP–1010D/1010E



FEATURES

- 6-Input Dual Analog Switch
- Dual Phono Amp
- Dual Buffer Amp 2
- Dual MIC Mix
- MICOM Interface for function selection.
- Manual function selection switch without MICOM
- LEC Driving circuit for indication of selected function
- Operating voltage : V_{CC} = 6V ~ 12V

ORDERING INFORMATION

Device	Package	Operating Temperature	Pitch
KA22293	48–QFP–1010D	–20°C ~ + 70°C	0.8 mm
KA22293Q	48–QFP–1010E	–20°C ~ + 70°C	0.75 mm

BLOCK DIAGRAM

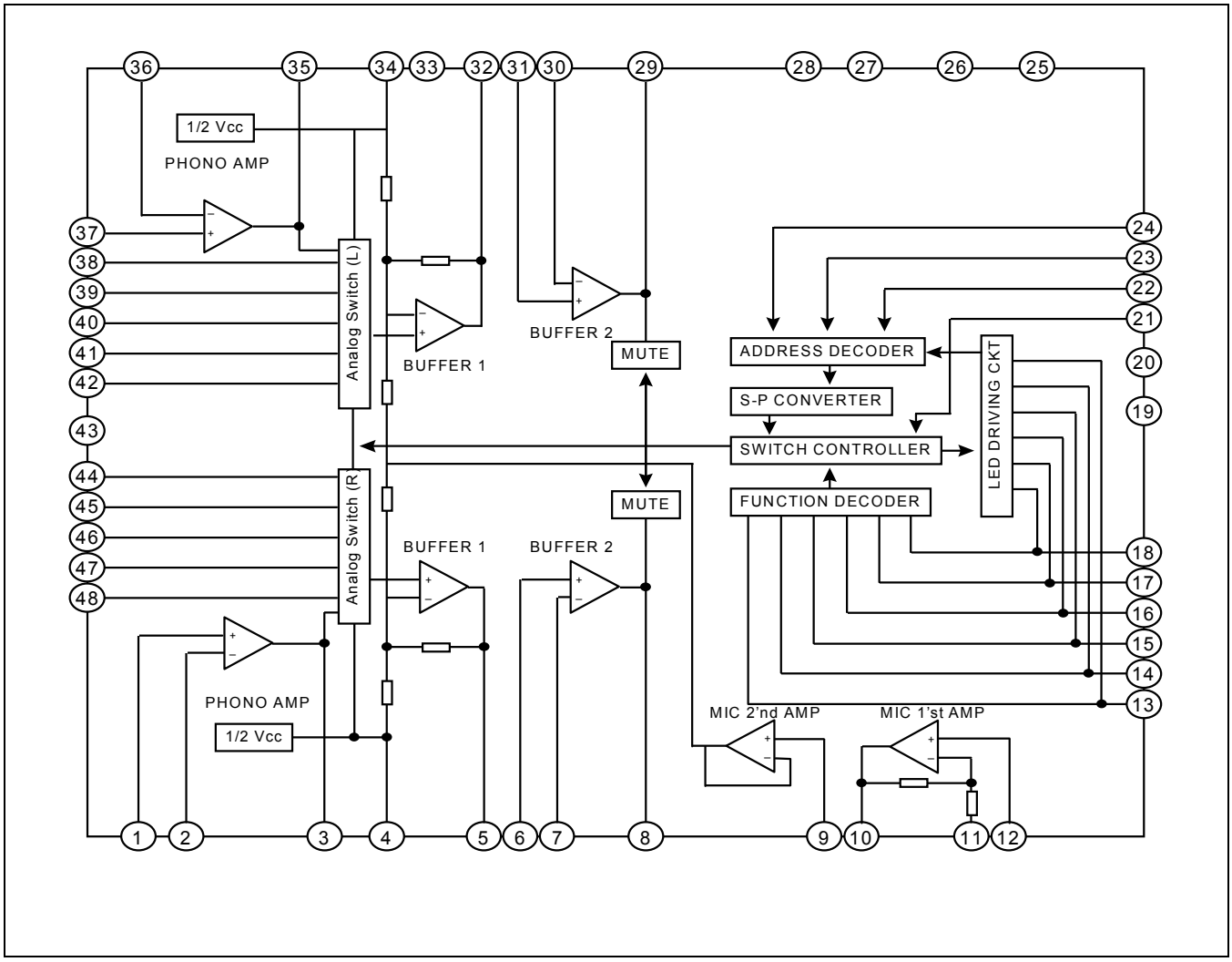


Figure 1.

PIN DESCRIPTION

Pin Description

Pin No	Symbol	I/O	Description
1	PHRIN	I	Right Channel PHONO AMP Input
2	PHRNF	I	Right Channel PHONO AMP Negative feedback
3	PHROUT	O	Right Channel PHONO AMP Output
4	RHV_{CC}	–	Right Channel 1/2 V_{CC}
5	BFR1 OUT	O	Right Channel 1st Buffer Output
6	BFR2 INPUT	I	Right Channel 2nd Buffer Input
7	BRF2 NF	I	Right Channel 2nd Buffer Negative feedback
8	BFR2 OUT	O	Right Channel 2nd Buffer Output
9	MIC 2/N	I	Mic 2nd AMP Input
10	MIC 1OUT	O	Mic 1st AMP Output
11	MIC1	I	Mic 1st AMP Negative feedback
12	MIC	I	Mic 1st AMP Input
13	MSPH	I/O	Manual Selection S/W for PHONO function
14	MSTU	I/O	Manual Selection S/W for Tuner function
15	MSCD	I/O	Manual Selection S/W for Compact Disc
16	MSTA	I/O	Manual Selection S/W for Tape
17	MSAU	I/O	Manual Selection S/W for Aux
18	MSVT	I/O	Manual Selection S/W for VTR
19	D-GND	–	Digital GND
20	RESET	–	RESET
21	MUTIN	I	Not use
22	CEIN	I	Enable Input from MICOM
23	CLIN	I	Clock Input from MICOM
24	DAIN	I	DATA Input from MICOM
25	u/M SEL	–	u-com/Manual Selection
26	MUTIM	–	Muting time decision during Manual Control
27	V_{CC}	–	V_{CC} (Digital)
28	V_{CC}	–	V_{CC} (Analog)
29	BFL2 OUT	O	Left Channel 2nd Buffer Output pin
30	BFL2 NF	I	Left Channel 2nd Buffer Negative feedback
31	BFL2 INT	I	Left Channel 2nd Buffer Input

Pin Description (Continued)

Pin No	Symbol	I/O	Description
32	MFL1 OUT	O	Left Channel 1st Buffer Output
33	RRF/L	–	Ripple Rejection filter
34	LHV_{CC}	–	Left Channel 1/2 V_{CC}
35	PHLOUT	O	Left Channel PHONO Ouptut
36	PHLNF	I	Left Channel PHONO AMP Negative feedback
37	PHLIN	I	Left Channel PHONO AMP Input
38	TULIN	I	Left Channel Tuner Input
39	CDLIN	I	Left Channel Compact Disc Input
40	TALIN	I	Left Channel TAPE Input
41	AULIN	I	Left Channel Aux Input
42	VTLIN	I	Left Channel VTR Input
43	A-GND	–	Analog GND
44	VTR IN	I	Right Channel VTR Input
45	AUR IN	I	Right Channel Aux Input
46	TAR IN	–	Right Channel TAPE Input
47	CDRIN	I	Right Channel Compact Disc Input
48	TURIN	I	Right Channel Tuner Input

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

Characteristic	Symbol	Value	Unit
Supply Voltage	V_{CC}	12	V
Power Dissipation	P_D	400	mW
Operating Temperature	T_{OPR}	–20 ~ 75	°C
Storage Temperature	T_{STG}	–55 ~ 125	°C

ELECTRICAL CHARACTERISTICS

V_{CC} = 12V, f = 1kHz unless otherwise specified.

Characteristic		Symbol	Test Conditions	SPEC			UNIT
				Min.	Typ.	Max.	
Quiescent Circuit Current	Manual	$I_{CCQ}1$	LED Currnet	25	40	55	mA
	u-Com	$I_{CCQ}2$	Exception	20	35	50	
Function Begining Selection		Vfo	Manual Mode	–	0.2	0.5	V
Function Indication Selection		Vf1	Manual / u-Com	–	0.2	0.5	V
Phono Amp Close Loop Gain		G_{VP}	f = 1kHz	34	35	36	dB
1st Amp Close Loop Gain		$G_{VB}1$	f = 1kHz	5	6	7	dB
2nd Amp Close Loop Gain		$G_{VB}2$	f = 1kHz	5	6	7	dB
1st Mic Amp Gain		Gvm1	f = 1kHz	33	34	35	dB
2st Mic Amp Gain		Gvm2	f = 1kHz	5	6	7	dB
Analog S/W Max Input Voltage		Vin amx	f = 1kHz, THD = 1%	1.2	1.5	–	Vrms
1st Buffer Max Ouptut Voltage		Vob 1max	f = 1kHz, THD = 1%	2.5	3.0	–	Vrms
2st Buffer Max Ouptut Voltage		Vobmax	f = 1kHz, THD = 1%	2.5	3.0	–	Vrms
1st Mic Max Output Voltage		Vom1max	f = 1kHz, THD = 1%	1.2	1.5	–	Vrms
Function Cross Talk		CT1	f = 1kHz R_G = 4.7kΩ V_{OB2} = 1V_{RMS}	75	85	–	dB
Channel Cross Talk	Phono	CT2	f = 1kHz R_G = 0Ω	55	65	–	dB
	Phono exception	CT3	V_{OB2} = 1V_{RMS}	65	75	–	
S/N ratio	Phono	S/N 1	f = 1kHz R_G = 0Ω	55	65	–	dB
	Phono exception	S/N2	V_{OB2} = 200mV_{RMS}	75	85	–	
THD	Phono	THD1	f = 1kHz R_G = 0Ω	–	0.05	0.1	%
	Phono exception	THD2	V_{OB2} = 1V_{RMS}	–	0.03	0.05	

TEST CIRCUIT

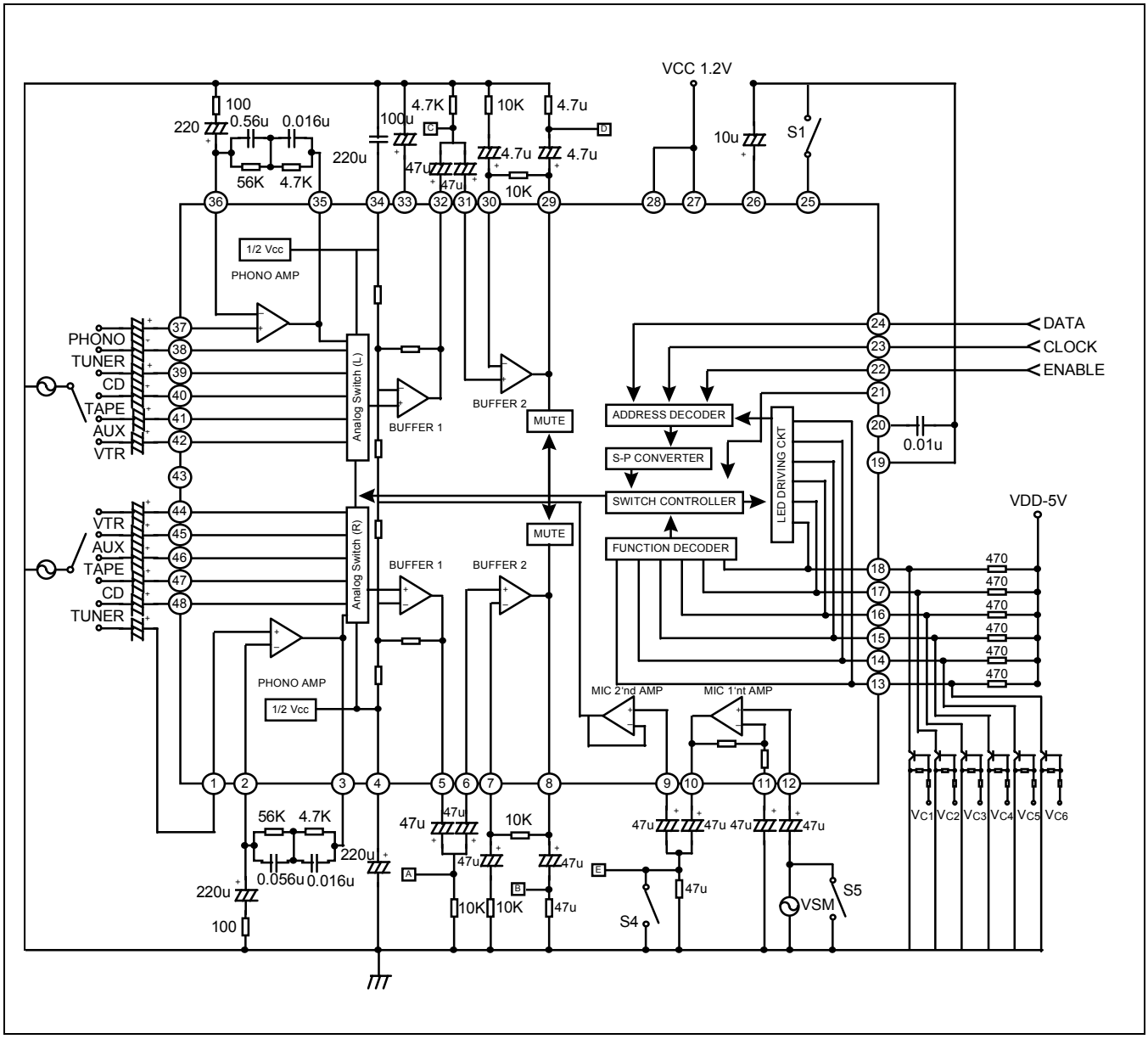


Figure 2.

APPLICATION INFORMATION

Logic Part

First of all, if you let the MICOM operate, pin 25 has to connect to the GND.
The KA22293/Q obtains the MICOM data such as the following: timing diagram, and then, converts the data from serial to parallel type by the use of internal analog switches.
The signal input from MICOM, consists of the 12-bit serial data, and the data consists of the 4-bit address and the 8-bit data for the selection of the switch input.

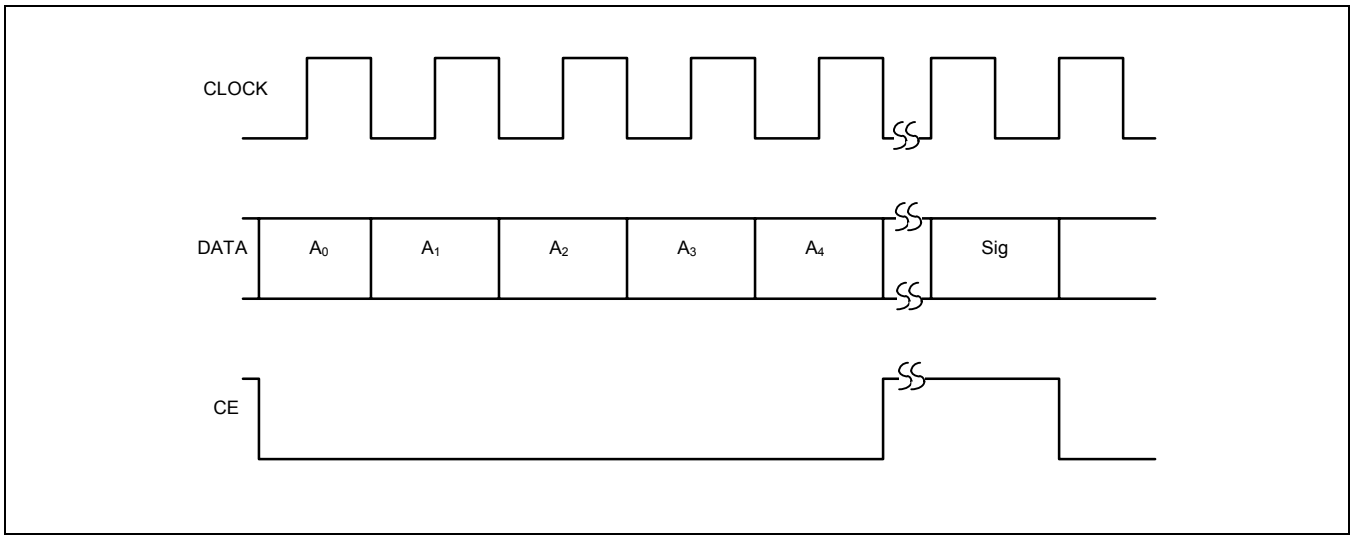


Figure 3.

DATA INPUT METHOD

	ADDRESS	DATA
PHONO	0101	10000000
TUNER	0101	01000000
CD	0101	00100000
TAPE	0101	00010000
AUX	0101	00001000
VTR	0101	00000100

APPLICATION CIRCUIT

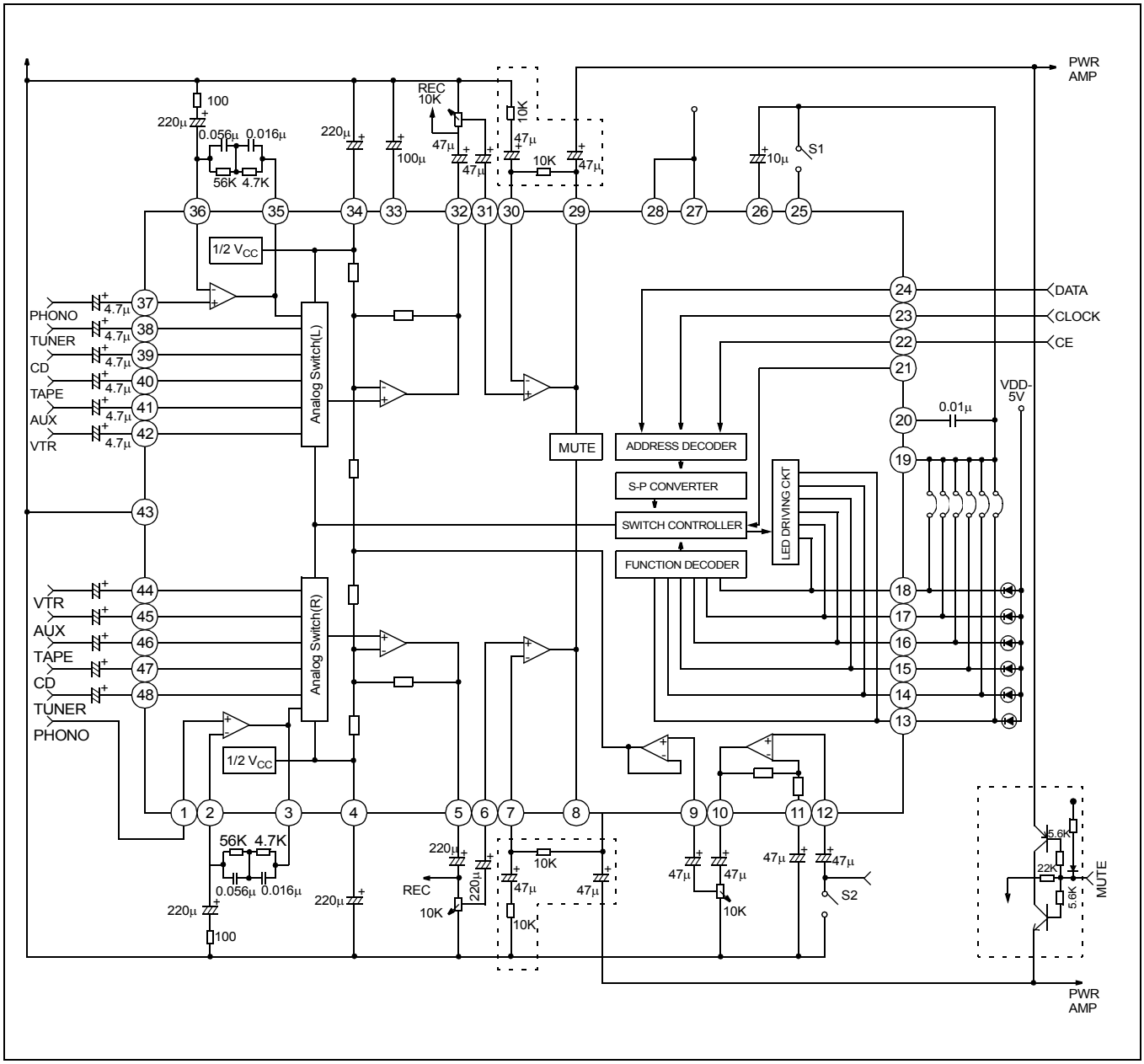


Figure 4.