

PRELIMINARY
Notice ; This is not a final specification.
some parametric limits are subject to change.

MITSUBISHI SOUND PROCESSORS

M62447SP

6CH ELECTRIC VOLUME

DESCRIPTION

The M62447SP is 6 channels electric volume controlled 3-wire serial data.
The IC is suitable for use in home-use audio systems and TV sets.

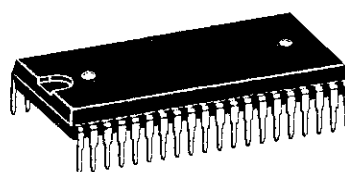
FEATURES

- Electric volume
 - Volume level..... 0dB ~ -79dB, -∞ dB (1dB / step)
- 4 Output ports
- Built-in microcomputer interface circuit controlled by 16-bit serial data.

APPLICATION

DVD, Home Audio equipment, TV

PACKAGE



Outline 42P4B

RECOMMENDED OPERATING CONDITIONS

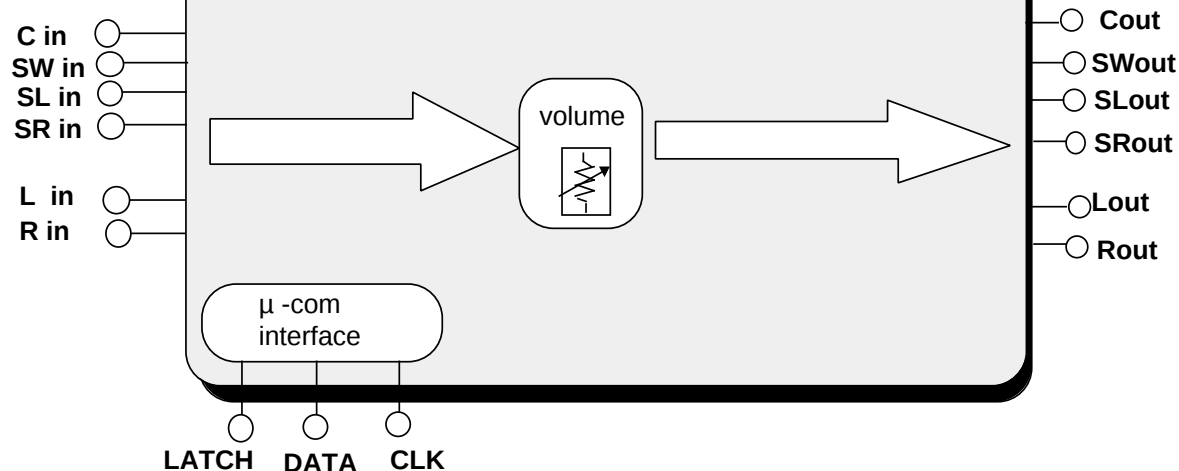
Supply voltage range..... $\pm 4.5 \sim \pm 7.3V$ (analog)

4.5 ~ 5.5V (digital)

Rated supply voltage $\pm 7.0V$ (analog)

5.0V (digital)

SYSTEM BLOCK DIAGRAM



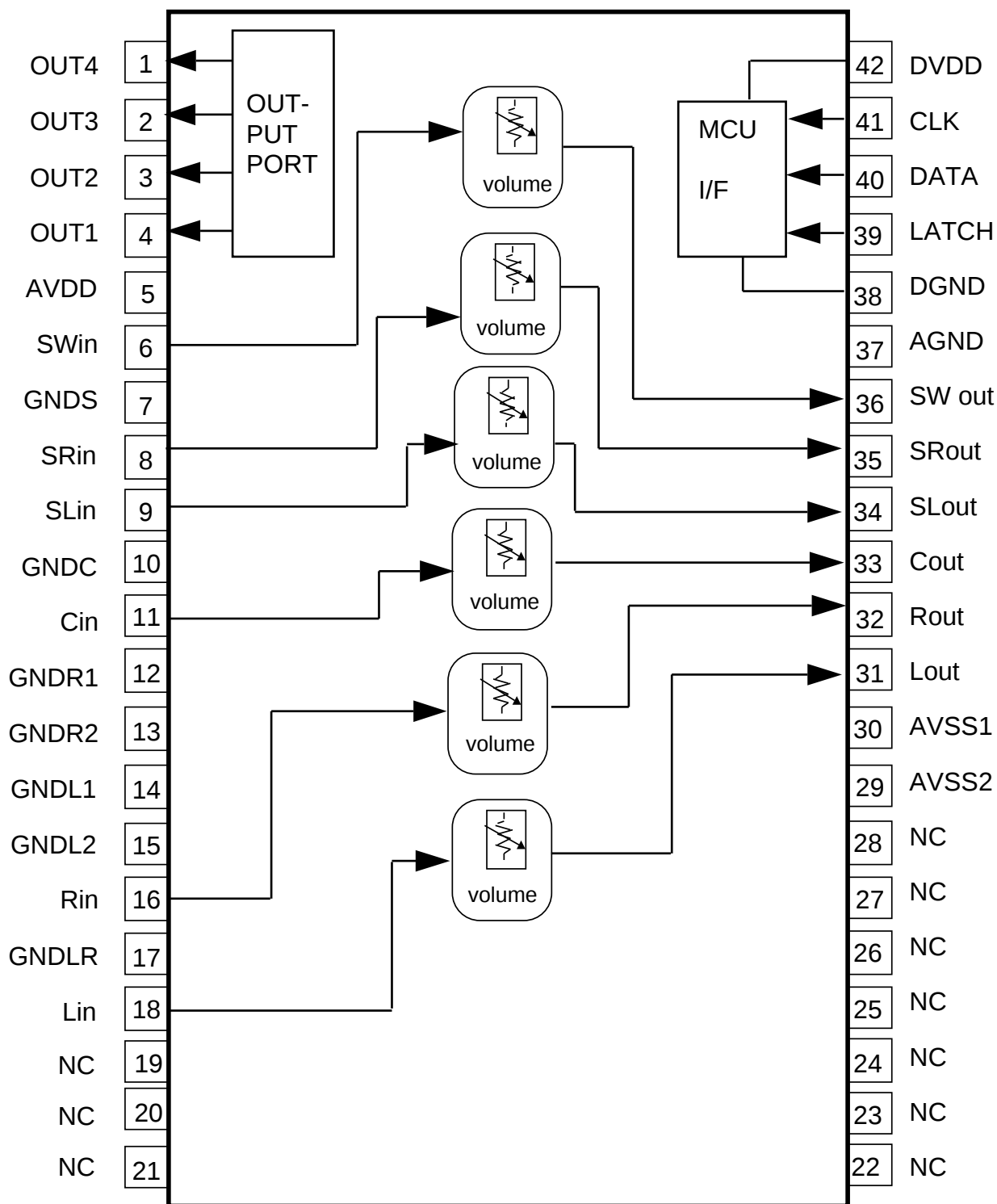
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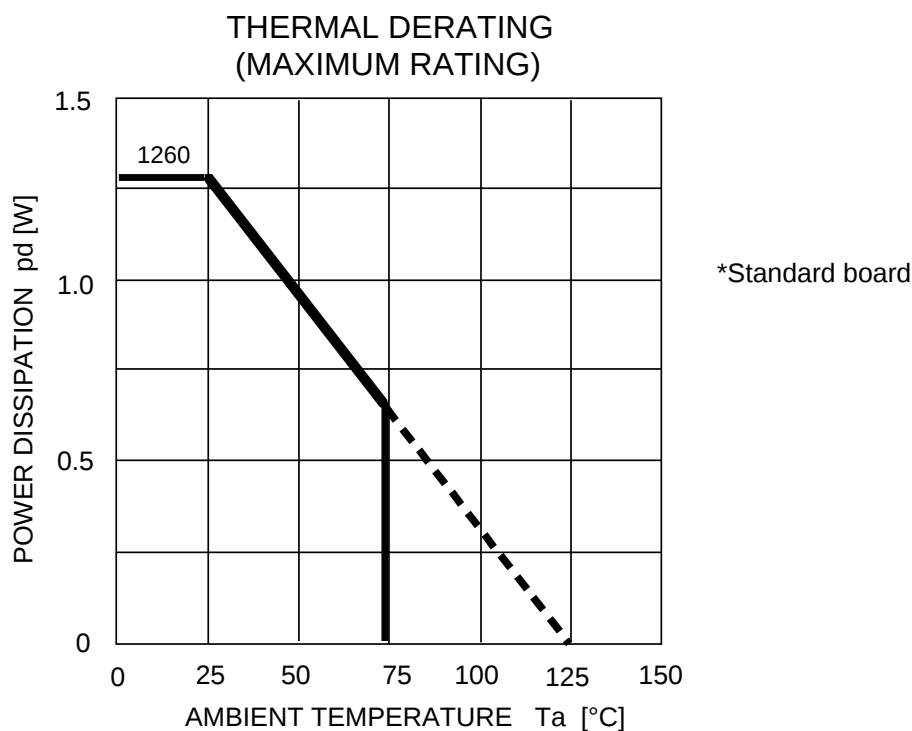
6CH ELECTRIC VOLUME

PIN CONFIGURATION AND IC INTERNAL BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Conditions	Ratings	Unit
V _{supply}	Supply Voltage	AVDD-AVSS	15.0	V
P _d	Power dissipation	T _a ≤ 25°C	1260	mW
K _θ	Thermal derating	T _a > 25°C, *standard board	12.6	mW/°C
T _{opr}	Operating temperature		-20 ~ +75	°C
T _{stg}	Storage temperature		-40 ~ +125	°C

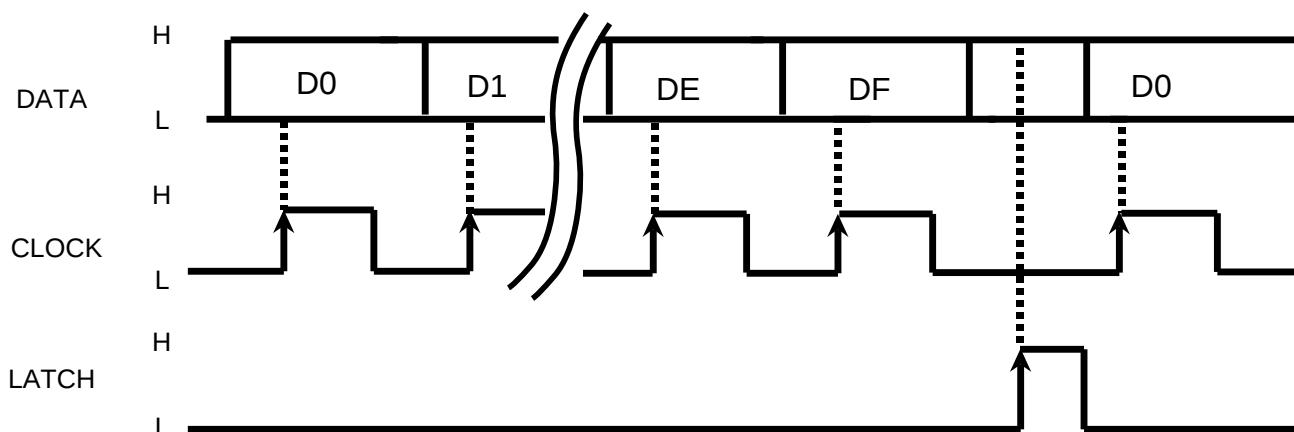


RECOMMENDED OPERATING CONDITION

Parameter	Symbol	Condition	MIN	TYP	MAX	Unit
Analog positive Supply Voltage	AVDD		4.5	7.0	7.3	V
Analog negative Supply Voltage	AVSS		-7.3	-7.0	-4.5	V
Digital Supply Voltage	DVDD		4.5	5.0	5.5	V
High-level Input Voltage	VIH		DVDD/2+1	—	DVDD	V
Low-level Input Voltage	VIL		DGND	—	DVDD/2-1	V

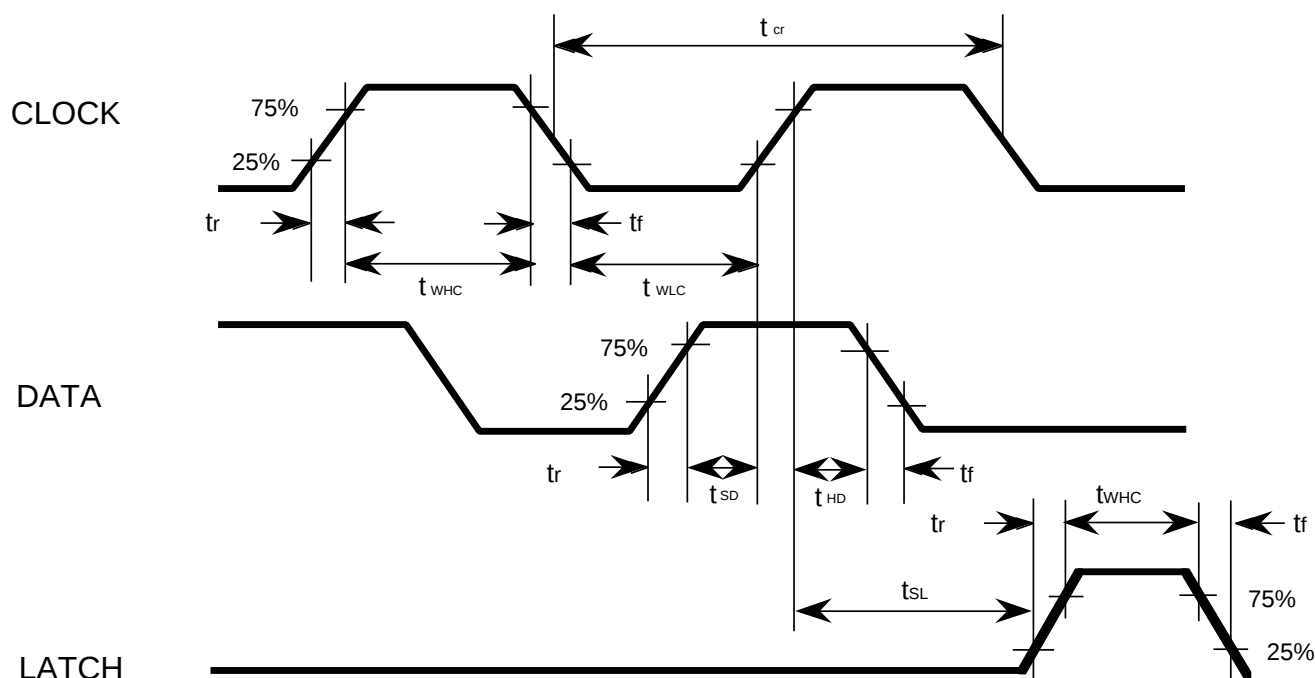
(note)AVSS≤DGND<DVDD≤AVDD

DATA TIMING (Recommended conditions)



note : CLOCK and LATCH function at raising edges of pulse .

CLOCK, DATA, LATCH TIMING



DIGITAL BLOCK TIMING REGULATION

Symbol	Parameter	Limits			Unit
		Min	typ	Max	
t_{cr}	CLOCK cycle time	8	—	—	μsec
t_{WHC}	CLOCK pulse width ("H"level)	3.2	—	—	
t_{WLC}	CLOCK pulse width ("L"level)	3.2	—	—	
t_r	CLOCK, DATA, LATCH rise time	—	—	0.8	
t_f	CLOCK, DATA, LATCH fall time	—	—	0.8	
t_{SD}	DATA setup time	1.6	—	—	
t_{HD}	DATA hold time	1.6	—	—	
t_{SL}	LATCH setup time	2	—	—	
t_{WHL}	LATCH pulse width	3.2	—	—	

DIGITAL CONTROL SPECIFICATION

Fore kinds of input format options are available by changing slot settings of DE and DF.
 (When the IC is powered up , the internal settings are not fixed.)

(1)

DO1	D11	D21	D31	D41	D51	D61	D71	D81	D91	DA1	DB1	DC1	DD1	DE	DF
				1	2	3	4								
0	0	0	0	OUTPUT PORT n 1: High 0: Low				0	0	0	0	0	1	0	0

(2)

DO2	D12	D22	D32	D42	D52	D62	D72	D82	D92	DA2	DB2	DC2	DD2	DE	DF
VOLUME Lch							VOLUME Rch							0	1

(3)

DO3	D13	D23	D33	D43	D53	D63	D73	D83	D93	DA3	DB3	DC3	DD3	DE	DF
VOLUME Cch							VOLUME SWch							1	0

(4)

DO4	D14	D24	D34	D44	D54	D64	D74	D84	D94	DA4	DB4	DC4	DD4	DE	DF
VOLUME SLch							VOLUME SRch							1	1

SETTING CODE

Note : Do not input other data than the above.

(1) Port output

		D41	D51	D61	D71
PORT1	0	L	-	-	-
	1	H			
PORT2	0	-	L	-	-
	1		H		
PORT3	0	-	-	L	-
	1			H	
PORT4	0	-	-	-	L
	1				H

(2) VOLUME (0 ~ -39dB)

Note : Do not input other data than the above.

A T T	VOLUME	D0X	D1X	D2X	D3X	D4X	D5X	D6X
		D7X	D8X	D9X	DAX	DBX	DCX	DDX
- 0	dB	0	0	0	0	0	0	0
- 1	dB	0	0	0	0	0	0	1
- 2	dB	0	0	0	0	0	1	0
- 3	dB	0	0	0	0	0	1	1
- 4	dB	0	0	0	0	1	0	0
- 5	dB	0	0	0	0	1	0	1
- 6	dB	0	0	0	0	1	1	0
- 7	dB	0	0	0	0	1	1	1
- 8	dB	0	0	0	1	0	0	0
- 9	dB	0	0	0	1	0	0	1
- 10	dB	0	0	0	1	0	1	0
- 11	dB	0	0	0	1	0	1	1
- 12	dB	0	0	0	1	1	0	0
- 13	dB	0	0	0	1	1	0	1
- 14	dB	0	0	0	1	1	1	0
- 15	dB	0	0	0	1	1	1	1
- 16	dB	0	0	1	0	0	0	0
- 17	dB	0	0	1	0	0	0	1
- 18	dB	0	0	1	0	0	1	0
- 19	dB	0	0	1	0	0	1	1
- 20	dB	0	0	1	0	1	0	0
- 21	dB	0	0	1	0	1	0	1
- 22	dB	0	0	1	0	1	1	0
- 23	dB	0	0	1	0	1	1	1
- 24	dB	0	0	1	1	0	0	0
- 25	dB	0	0	1	1	0	0	1
- 26	dB	0	0	1	1	0	1	0
- 27	dB	0	0	1	1	0	1	1
- 28	dB	0	0	1	1	1	0	0
- 29	dB	0	0	1	1	1	0	1
- 30	dB	0	0	1	1	1	1	0
- 31	dB	0	0	1	1	1	1	1
- 32	dB	0	1	0	0	0	0	0
- 33	dB	0	1	0	0	0	0	1
- 34	dB	0	1	0	0	0	1	0
- 35	dB	0	1	0	0	0	1	1
- 36	dB	0	1	0	0	1	0	0
- 37	dB	0	1	0	0	1	0	1
- 38	dB	0	1	0	0	1	1	0
- 39	dB	0	1	0	0	1	1	1

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VOLUME (-40 ~ - ∞dB)

Note : Do not input other data than the above.

A T T	VOLUME	D0X	D1X	D2X	D3X	D4X	D5X	D6X
		D7X	D8X	D9X	DAX	DBX	DCX	DDX
- 40 dB		0	1	0	1	0	0	0
- 41 dB		0	1	0	1	0	0	1
- 42 dB		0	1	0	1	0	1	0
- 43 dB		0	1	0	1	0	1	1
- 44 dB		0	1	0	1	1	0	0
- 45 dB		0	1	0	1	1	0	1
- 46 dB		0	1	0	1	1	1	0
- 47 dB		0	1	0	1	1	1	1
- 48 dB		0	1	1	0	0	0	0
- 49 dB		0	1	1	0	0	0	1
- 50 dB		0	1	1	0	0	1	0
- 51 dB		0	1	1	0	0	1	1
- 52 dB		0	1	1	0	1	0	0
- 53 dB		0	1	1	0	1	0	1
- 54 dB		0	1	1	0	1	1	0
- 55 dB		0	1	1	0	1	1	1
- 56 dB		0	1	1	1	0	0	0
- 57 dB		0	1	1	1	0	0	1
- 58 dB		0	1	1	1	0	1	0
- 59 dB		0	1	1	1	0	1	1
- 60 dB		0	1	1	1	1	0	0
- 61 dB		0	1	1	1	1	0	1
- 62 dB		0	1	1	1	1	1	0
- 63 dB		0	1	1	1	1	1	1
- 64 dB		1	0	0	0	0	0	0
- 65 dB		1	0	0	0	0	0	1
- 66 dB		1	0	0	0	0	1	0
- 67 dB		1	0	0	0	0	1	1
- 68 dB		1	0	0	0	1	0	0
- 69 dB		1	0	0	0	1	0	1
- 70 dB		1	0	0	0	1	1	0
- 71 dB		1	0	0	0	1	1	1
- 72 dB		1	0	0	1	0	0	0
- 73 dB		1	0	0	1	0	0	1
- 74 dB		1	0	0	1	0	1	0
- 75 dB		1	0	0	1	0	1	1
- 76 dB		1	0	0	1	1	0	0
- 77 dB		1	0	0	1	1	0	1
- 78 dB		1	0	0	1	1	1	0
- 79 dB		1	0	0	1	1	1	1
- ∞ dB		1	0	1	0	0	0	0



MITSUBISHI
ELECTRIC

ELECTRICAL CHARACTERISTICS

(Ta=25°C, AVDD=7.0V, AVSS=-7.0V, DVDD=5.0V, f=1kHz, unless otherwise noted.

TONE CONTROL, VOLUME are set to 0dB)

(1) Power supply characteristics

Parameter	Symbol	Test condition	Limits			Unit
			Min	typ	Max	
Analog positive circuit current	Aldd	Current at pin 5 No signal	—	25	35	mA
Analog negative circuit current	Alss	Current at pin 29 ~ 30 No signal	—	25	35	mA
Digital circuit current	Dldd	Current at pin 42 No signal	—	0.5	2.0	mA

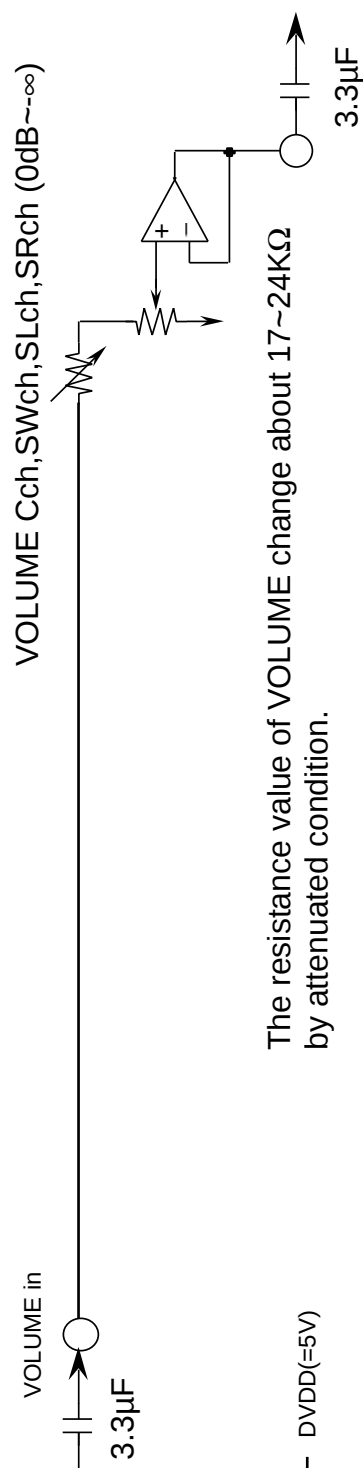
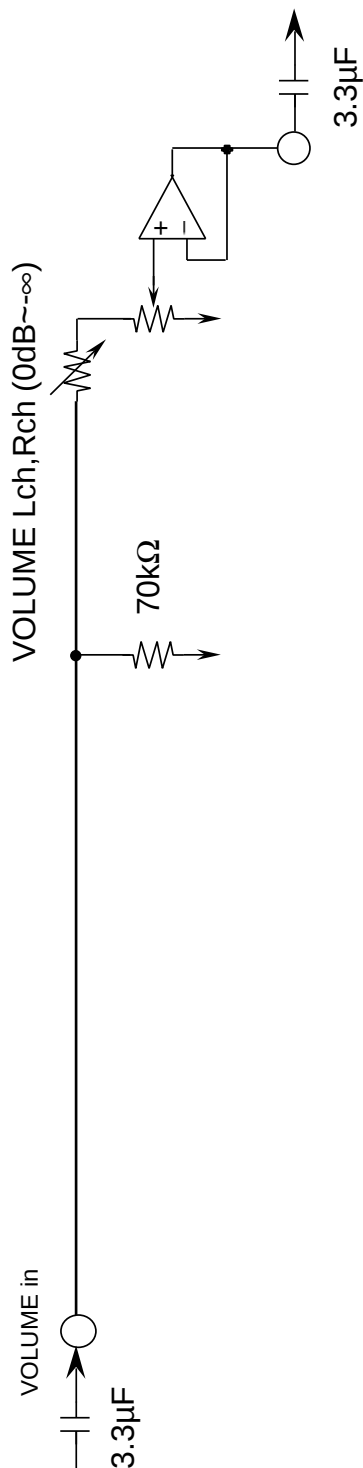
(2) Input / Output characteristics

Parameter	Symbol	Test condition	Limits			Unit
			Min	typ	Max	
Maximum output voltage	VOM	6,8,9,11,16,18pin INPUT 31 ~ 36pin OUTPUT RL =10KΩ, THD=1%	3.0	4.0	—	Vrms
Pass gain	Gv	Vi=0.2Vrms, FLAT 6,8,9,11,16,18pin INPUT 31 ~ 36pin OUTPUT	-2.0	0	2.0	dB
Distortion	THD	BW=400 ~ 30kHz Vi=0.2Vrms, RL=10KΩ	—	0.02	0.09	%
Output noise voltage	Vn(VOL)	31 ~ 36pin, Rg=0KΩ, JIS-A, VOL=0dB	—	2	6	μVrms
Maximum attenuation	ATTmax	31 ~ 36pin, Rg=1KΩ, JIS-A, VOL=-∞dB	-86	—	—	dB
Volume gain between channels	Dvol		-1.5	0	1.5	dB
Crosstalk between channels	CT	Vo=0.5Vrms, RL=10KΩ, JIS-A Rg=1KΩ	—	-80	-65	dB
Port output current	IL		0.2	—	—	mA

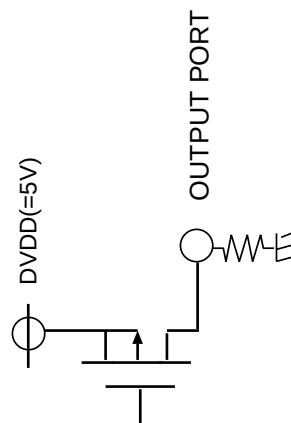
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SYSTEM DIAGRAM



The resistance value of VOLUME change about 17~24KΩ
 by attenuated condition.



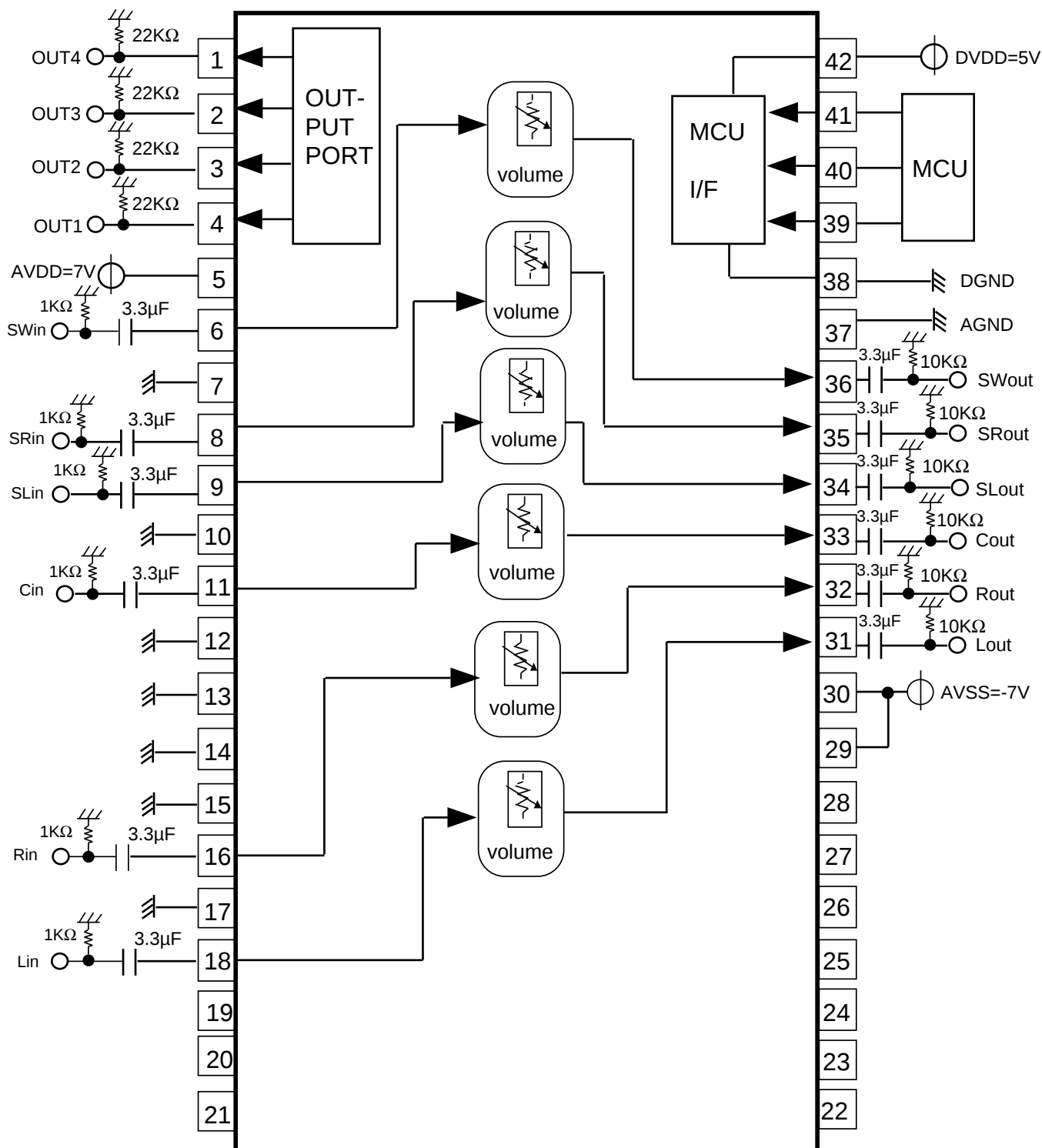
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APPLICATION EXAMPLE



Units Resistance : Ω
 Capacitance : F