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

M62447SP

6CH ELECTRIC VOLUME

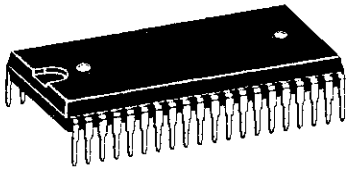
DESCRIPTION

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.

PACKAGE



Outline 42P4B

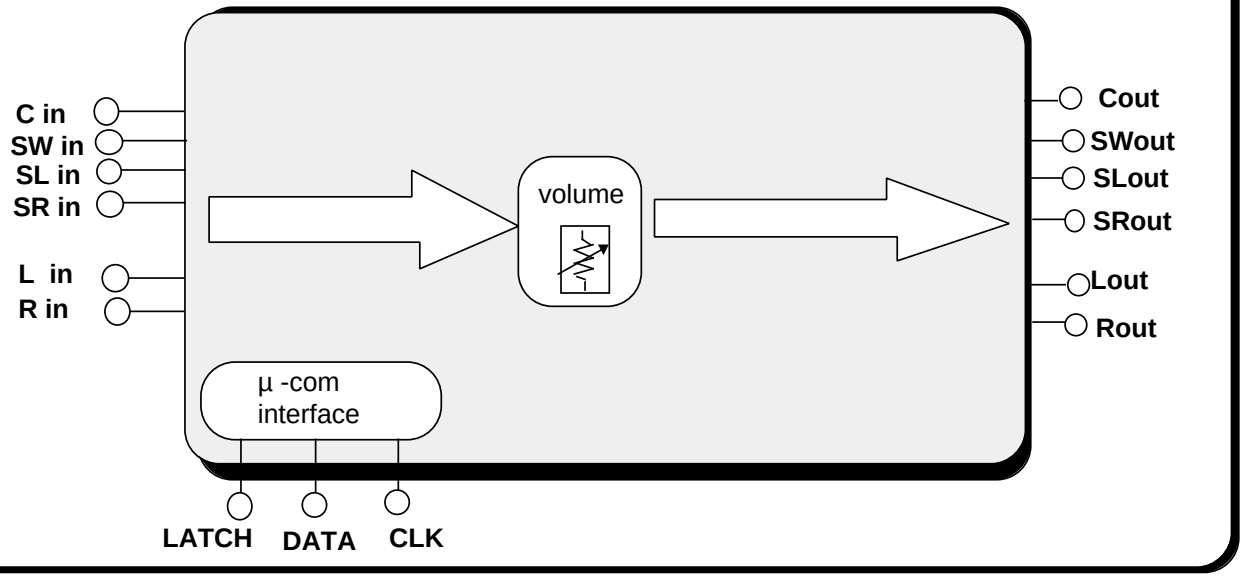
APPLICATION

DVD,Home Audio equipment,TV

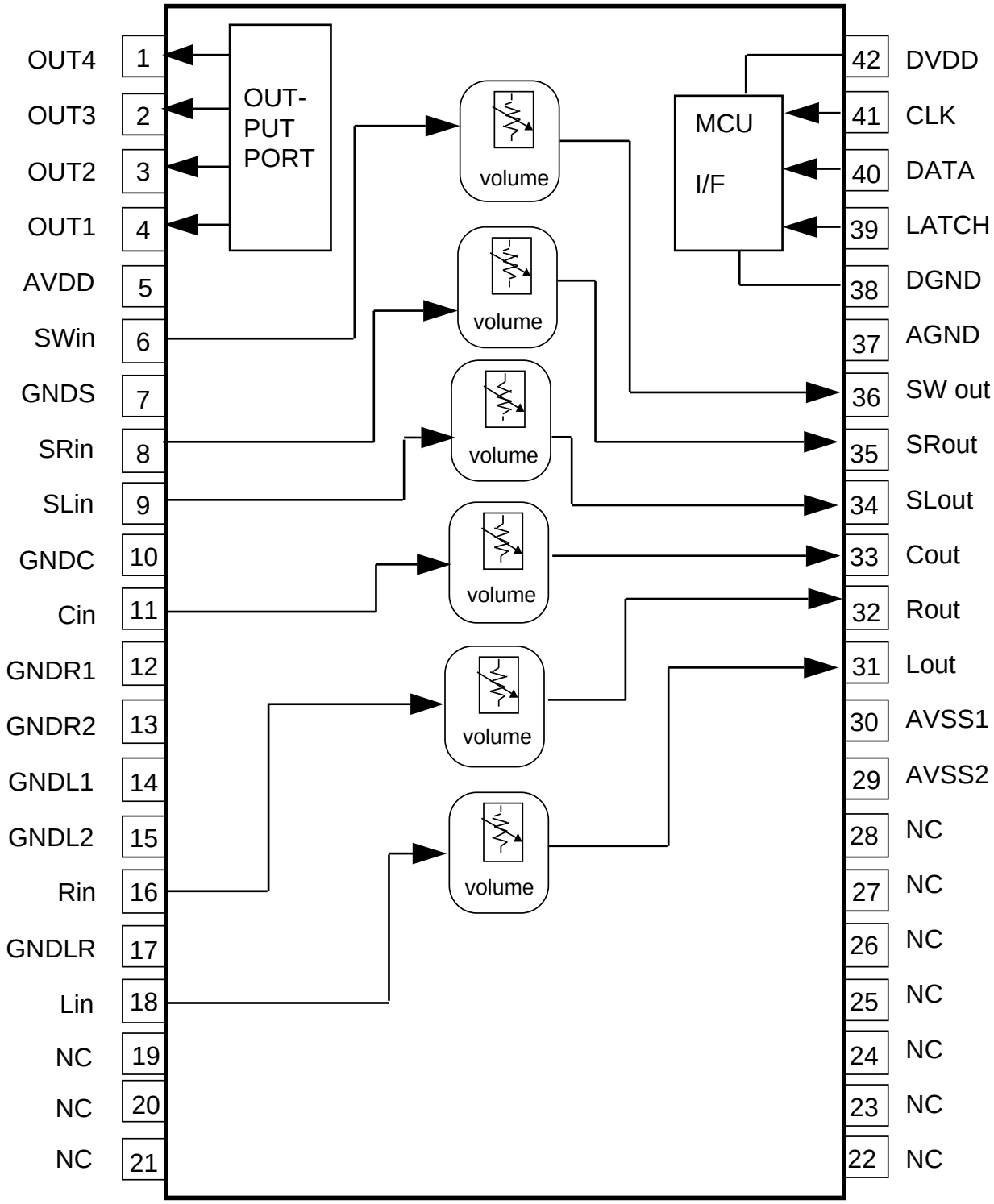
RECOMMENDED OPERATING CONDITIONS

Supply voltage range•••• ±4.5 ~ ±7.3V (analog)
4.5 ~ 5.5V (digital)
Rated supply voltage •••• ±7.0V (analog)
5.0V (digital)

SYSTEM BLOCK DIAGRAM



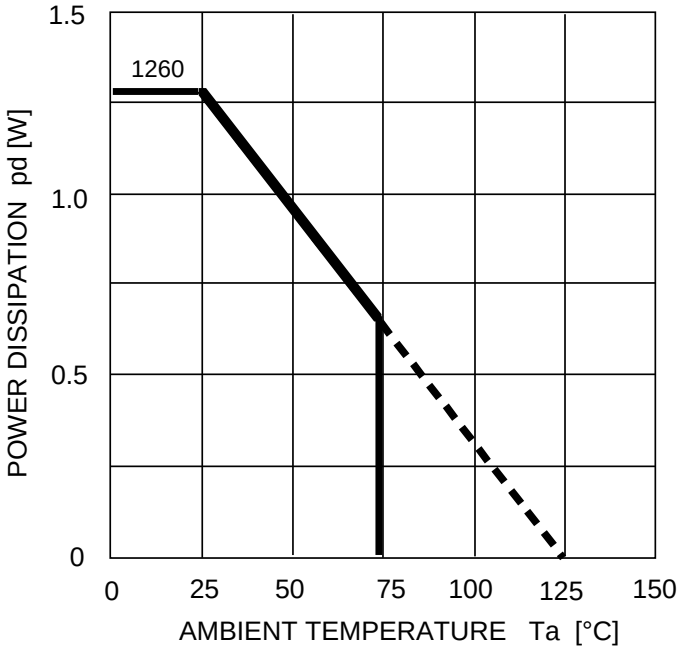
PIN CONFIGURATION AND IC INTERNAL BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Conditions	Ratings	Unit
Vsupply	Supply Voltage	AVDD-AVSS	15.0	V
Pd	Power dissipation	Ta≤25°C	1260	mW
K_θ	Thermal derating	Ta>25°C, *standard board	12.6	mW/°C
Topr	Operating temperature		-20 ~ +75	°C
Tstg	Storage temperature		-40 ~ +125	°C

THERMAL DERATING
(MAXIMUM RATING)



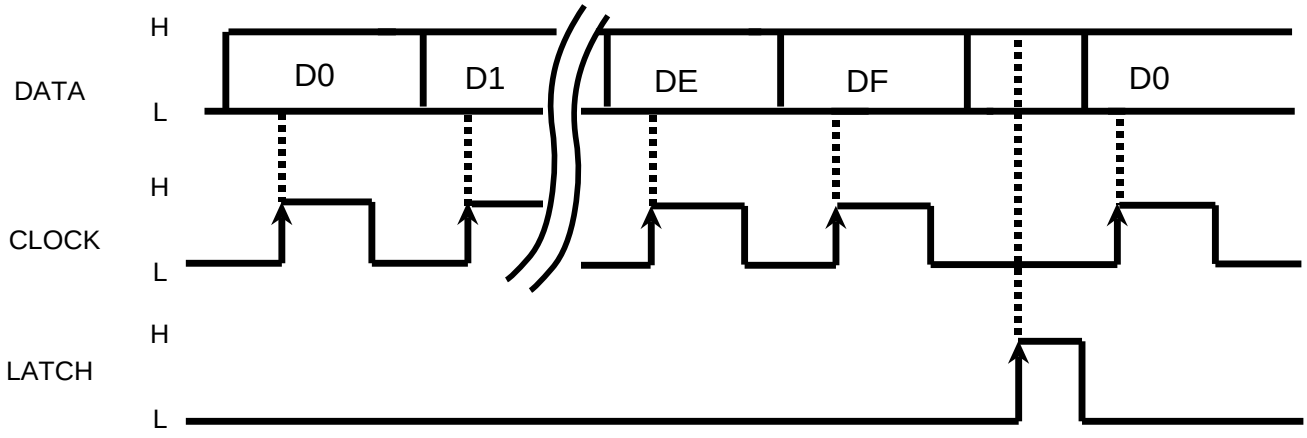
*Standard board

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

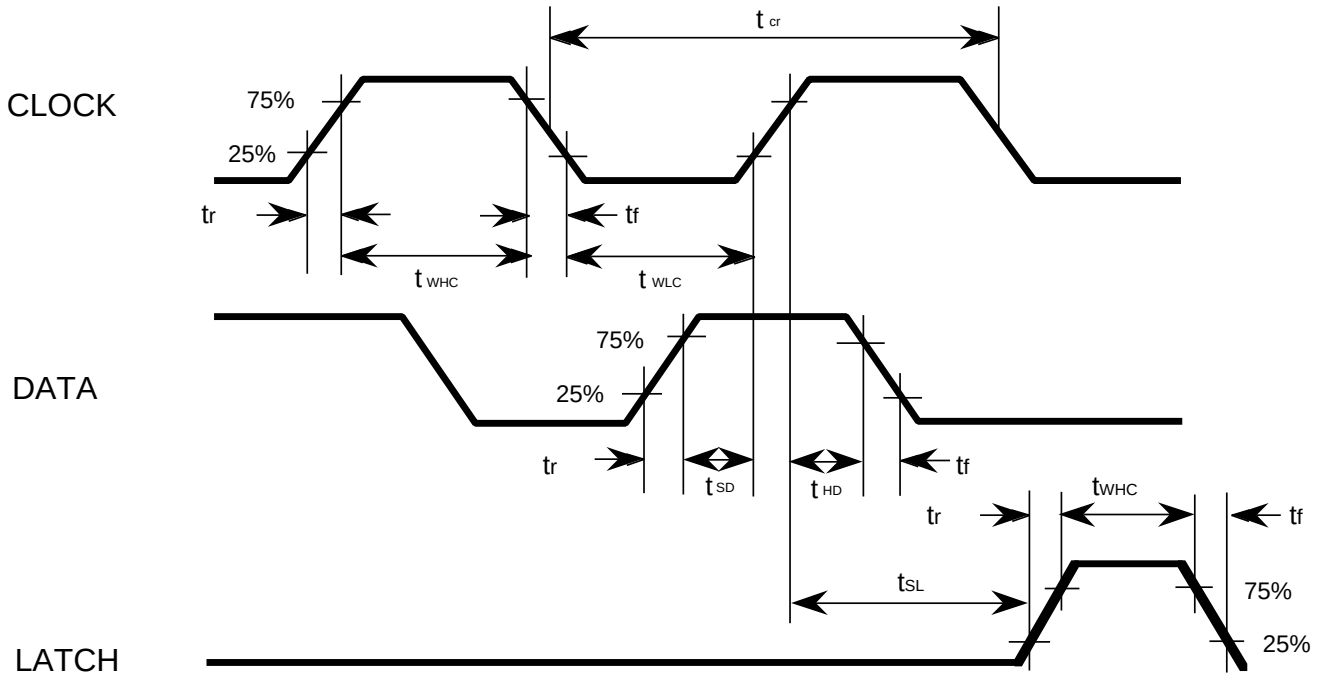
(note)AVSS≤DGND<DVDD≤AVDD

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.

ATT	VOLUME	D0X D7X	D1X D8X	D2X D9X	D3X DAX	D4X DBX	D5X DCX	D6X 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

VOLUME (-40 ~ - ∞dB)

Note : Do not input other data than the above.

ATT VOLUME	D0X D7X	D1X D8X	D2X D9X	D3X DAX	D4X DBX	D5X DCX	D6X 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

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)

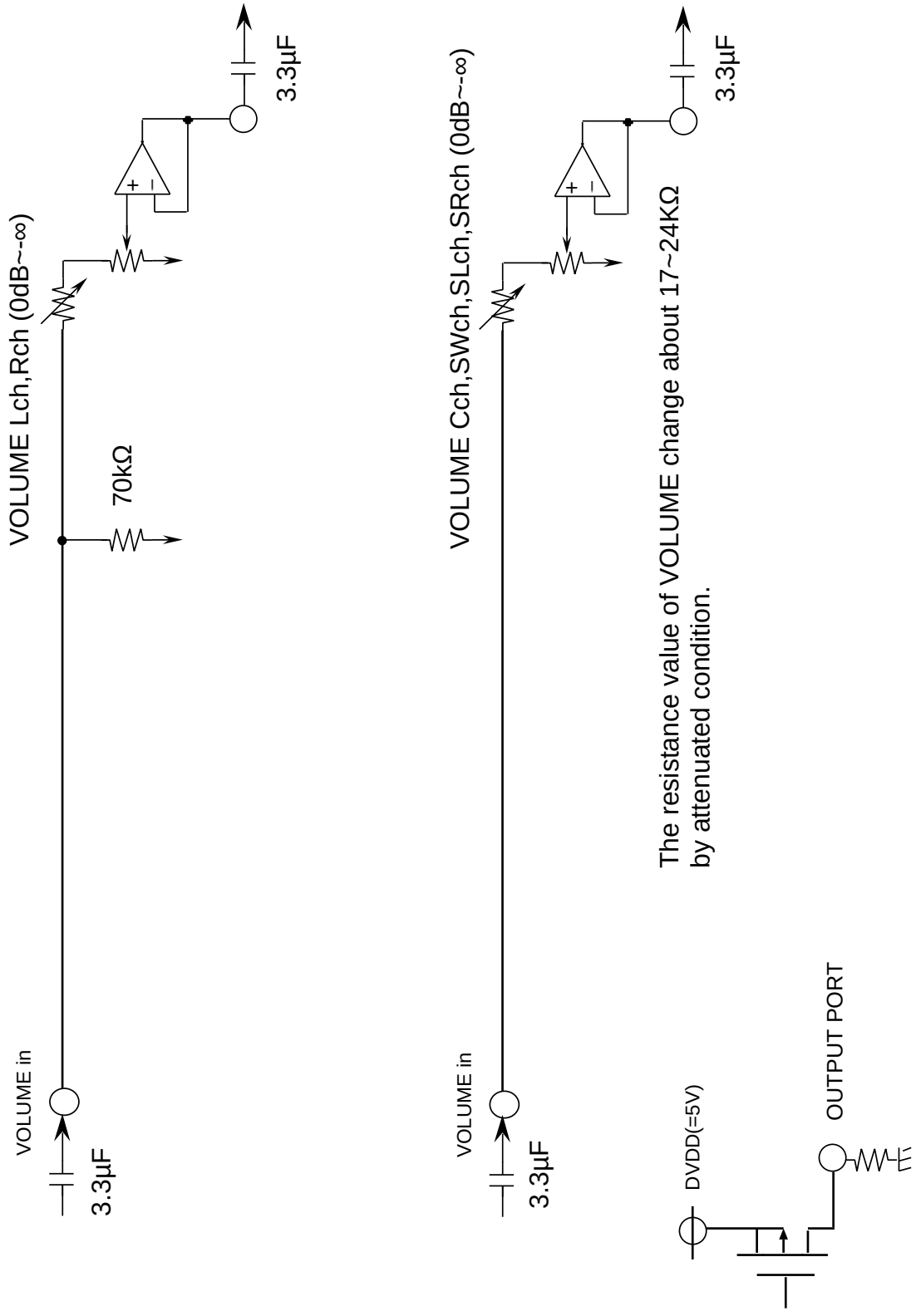
(1) Power supply characteristics

Parameter	Symbol	Test condition	Limits			Unit
			Min	typ	Max	
Analog positive circuit current	AIdd	Current at pin 5 No signal	—	25	35	mA
Analog negaitive circuit current	AIss	Current at pin 29 ~ 30 No signal	—	25	35	mA
Digital circuit current	DIdd	Current at pin 42 No signal	—	0.5	2.0	mA

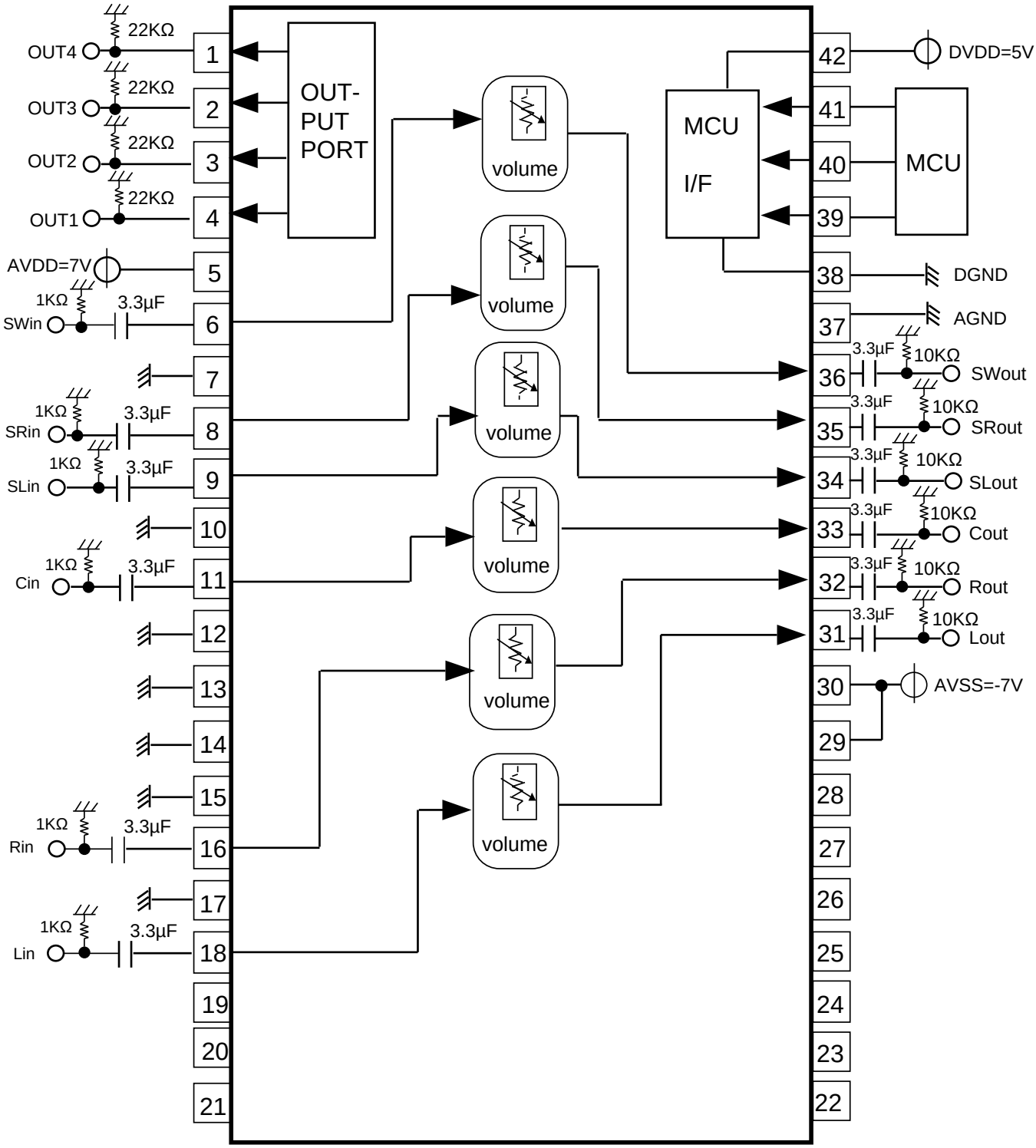
(2) Input / Output characteristics

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

SYSTEM DIAGRAM



APPLICATION EXAMPLE



Units Resistance : Ω
Capacitance : F