

# PRELIMINARY

Notice: This is not a final specification.  
Some parametric limits are subject to change.

mitsubishi SOUND PROCESSOR ICs

# M62429P/FP

## SERIAL DATA CONTROL DUAL ELECTRONIC VOLUME

### DESCRIPTION

The M62429 is a dual channel electronic volume controlled with 2-wire serial data.

The built-in reference circuit can compose of an electronic volume with less external parts.

### FEATURES

- Built-in reference circuit
- Control with serial data  
Volume 0 to -83dB (1dB/step),  $-\infty$   
(Independent control is allowed in each channel)
- Low noise and low distortion  
VNO =  $5\mu\text{Vrms}$  (ATT =  $-\infty$ , JIS-A)  
THD = 0.01% Typ. (V0 = 0.5Vrms, DIN-AUDIO)



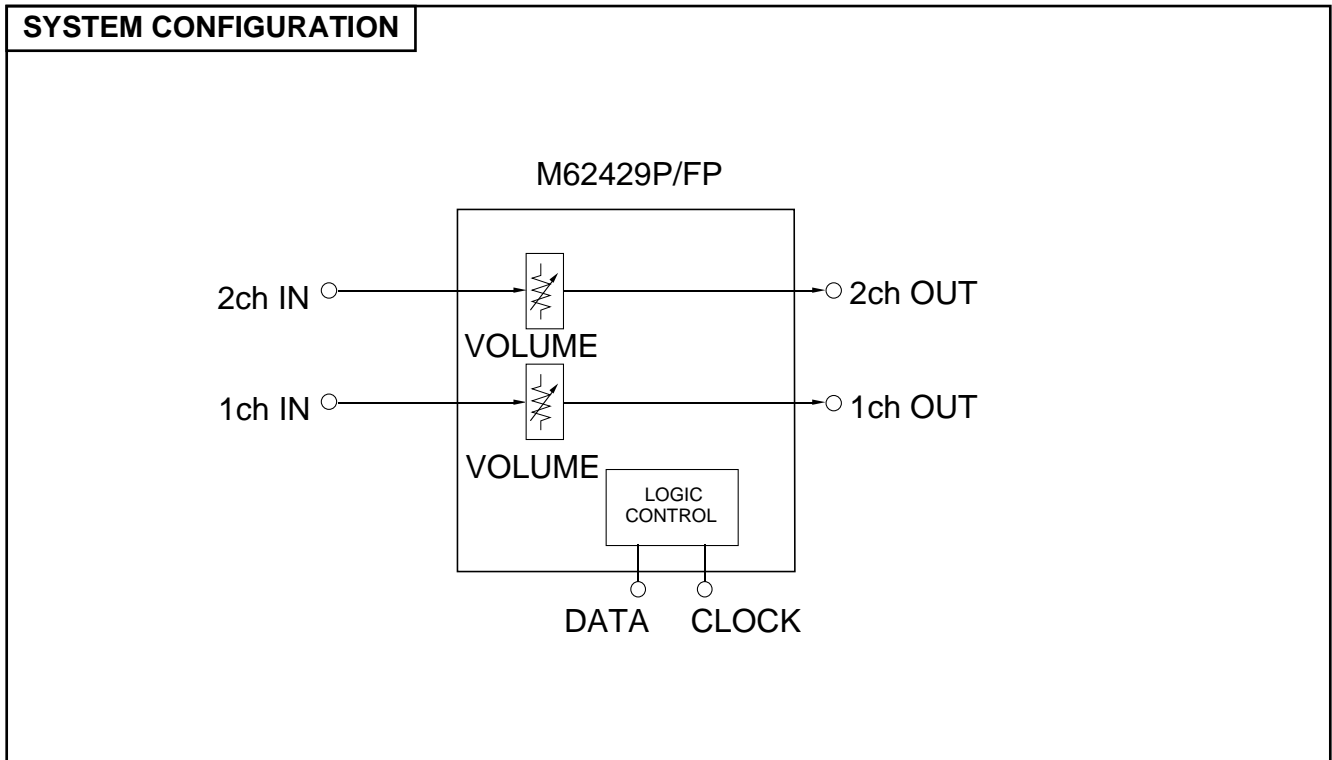
Outline 8P4 (P)  
2.54mm pitch 300mil DIP  
(6.3mmx8.9mmx3.3mm)



Outline 8P2S-A(FP)  
1.27mm pitch 225mil SOP  
(4.4mmx5.0mmx1.5mm)

### RECOMMENDED OPERATING CONDITIONS

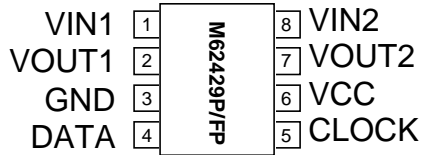
Supply voltage range..... Vcc = 4.5 to 5.5V  
Rated supply voltage..... Vcc = 5V



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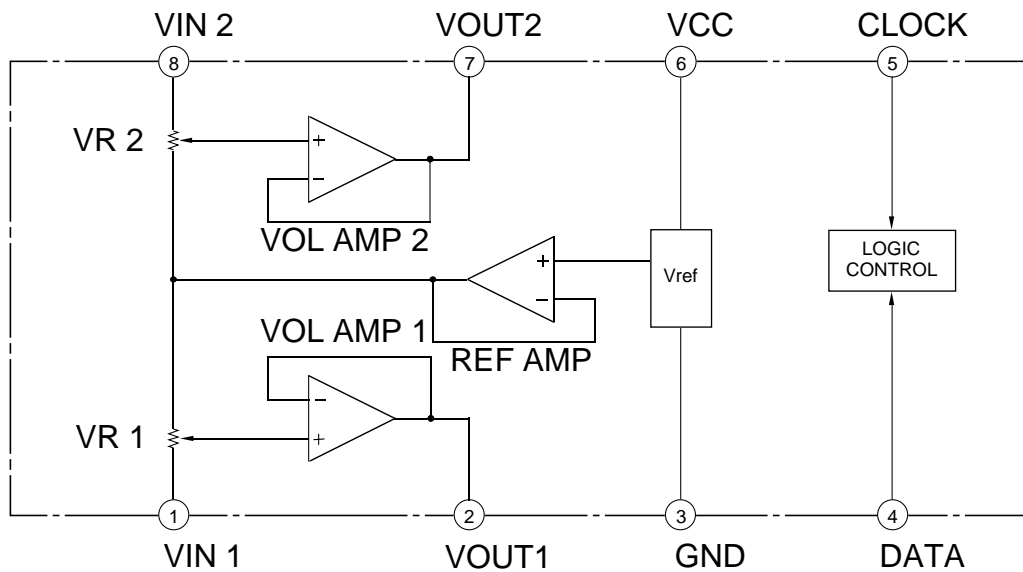
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**PIN CONFIGURATION (TOP VIEW)**



Outline 8P4(P)  
8P2S-A(FP)

**IC INTERNAL BLOCK DIAGRAM**



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**SERIAL DATA CONTROL DUAL ELECTRONIC VOLUME**

**PIN DESCRIPTION**

Pin No.	Symbol	Function
①	V <sub>IN1</sub>	1-ch input pin
②	V <sub>OUT1</sub>	1-ch output pin
③	GND	Ground pin
④	DATA	Control data input pin. Inputs data in synchronization with clock.
⑤	CLOCK	Clock input pin for transferring serial data.
⑥	V <sub>CC</sub>	Power supply pin. Stabilize the pin with decoupling capacitor.
⑦	V <sub>OUT2</sub>	2-ch output pin
⑧	V <sub>IN2</sub>	1-ch input pin

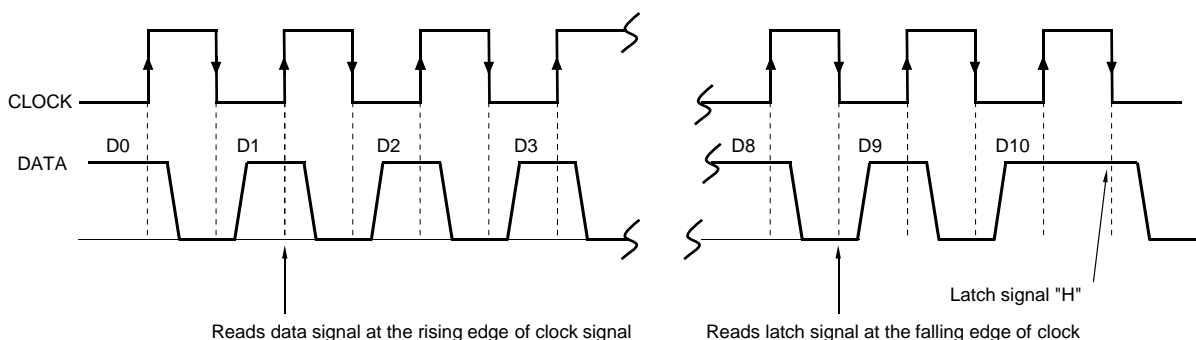
**ABSOLUTE MAXIMUM RATINGS**

Symbol	Parameter	Ratings	Unit
V <sub>CC</sub> , V <sub>DD</sub>	Supply voltage	6.0	V
P <sub>d</sub>	Power dissipation	625(P), 440(FP)	mW
T <sub>opr</sub>	Operating temperature	-20 to +75	°C
T <sub>stg</sub>	Storage temperature	-55 to +125	°C

**ELECTRICAL CHARACTERISTICS** (V<sub>CC</sub> = 5V, T<sub>a</sub> = 25°C, unless otherwise noted)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
I <sub>CC</sub>	Circuit current			8	16	mA
ATT	Maximum attenuation	ATT=-	-	-90	-80	dB
ATT	Attenuation error	ATT=0	-2.0	0	2.0	dB
V <sub>IM</sub>	Maximum input voltage	THD=1%, ATT=-6dB	1.5	1.7	-	V <sub>rms</sub>
V <sub>OM</sub>	Maximum output voltage	THD=1%	0.8	1.3	-	V <sub>rms</sub>
V <sub>NO1</sub>	Output noise voltage	ATT=0, R <sub>g</sub> =0, JIS-A	-	4	10	μV <sub>rms</sub>
V <sub>NO2</sub>		ATT=-, R <sub>g</sub> =0, JIS-A	-	5	10	μV <sub>rms</sub>
THD	Total harmonic distortion	f=1kHz, V <sub>O</sub> =0.5V <sub>rms</sub> , ATT=0	-	0.01	0.05	%
CS	Channel separation	f=1kHz, JIS-A	-	-80	-70	dB

**RELATIONSHIP BETWEEN DATA AND CLOCK**



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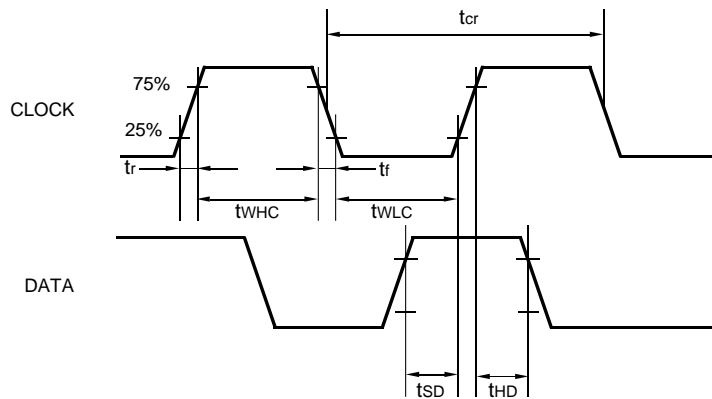
**DC CHARACTERISTICS OF DIGITAL BLOCK**

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
V <sub>IL</sub>	"L" level input voltage	Data, clock pin	0	~	0.2V <sub>CC</sub>	V
V <sub>IH</sub>	"H" level input voltage		0.8V <sub>CC</sub>	~	V <sub>CC</sub>	V
I <sub>IL</sub>	"L" level input current	V <sub>I</sub> =0	-10	-	10	μA
I <sub>IH</sub>	"H" level input current	V <sub>I</sub> =5V	-	-	10	μA

**AC CHARACTERISTICS OF DIGITAL BLOCK**

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
t <sub>cr</sub>	Cycle time of clock		4	-	-	μs
t <sub>WHC</sub>	Pulse width of clock ("H" level)		1.6	-	-	μs
t <sub>WLC</sub>	Pulse width of clock ("L" level)		1.6	-	-	μs
t <sub>r</sub>	Clock rising time		-	-	0.4	μs
t <sub>f</sub>	Clock falling time		-	-	0.4	μs
t <sub>SD</sub>	Data setup time		0.8	-	-	μs
t <sub>HD</sub>	Data hold time		0.8	-	-	μs

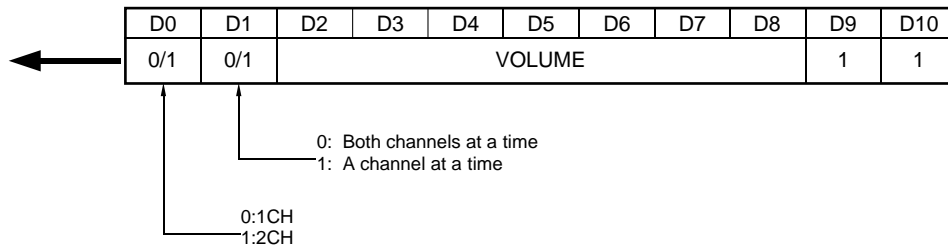
**CLOCK AND DATA TIMING**



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**DATA INPUT FORMAT**



**VOLUME CODE**

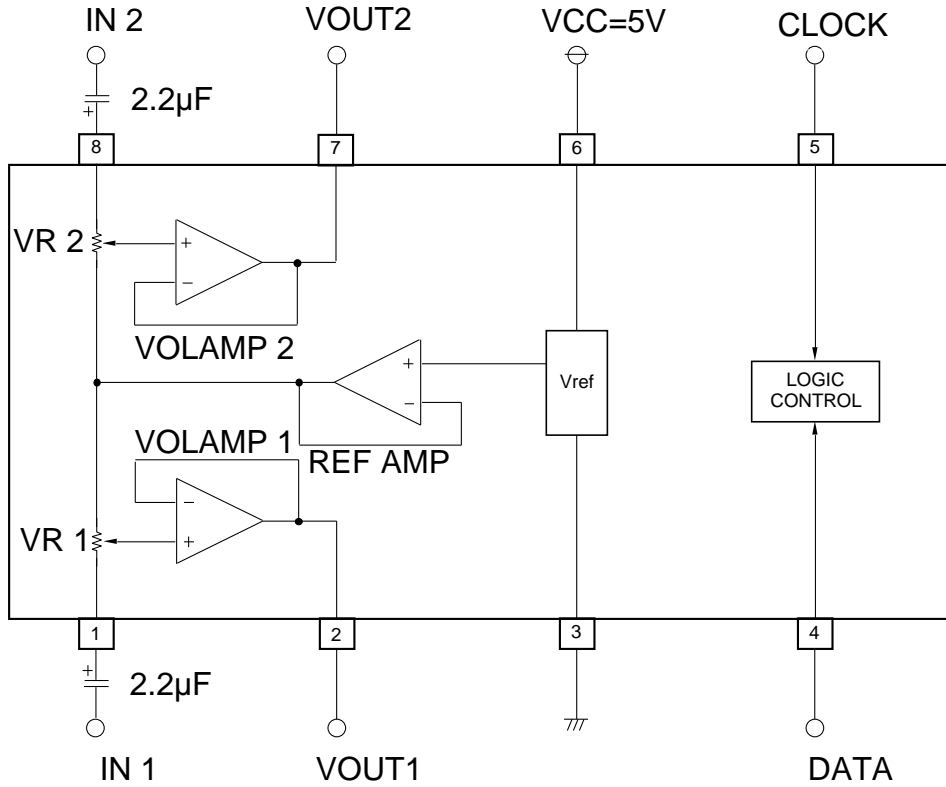
ATT1	D2	D3	D4	D5	D6
0dB	H	L	H	L	H
-4dB	L	L	H	L	H
-8dB	H	H	L	L	H
-12dB	L	H	L	L	H
-16dB	H	L	L	L	H
-20dB	L	L	L	L	H
-24dB	H	H	H	H	L
-28dB	L	H	H	H	L
-32dB	H	L	H	H	L
-36dB	L	L	H	H	L
-40dB	H	H	L	H	L
-44dB	L	H	L	H	L
-48dB	H	L	L	H	L
-52dB	L	L	L	H	L
-56dB	H	H	H	L	L
-60dB	L	H	H	L	L
-64dB	H	L	H	L	L
-68dB	L	L	H	L	L
-72dB	H	H	L	L	L
-76dB	L	H	L	L	L
-80dB	H	L	L	L	L
-	L	L	L	L	L

ATT2	D7	D8
0dB	H	H
-1dB	L	H
-2dB	H	L
-3dB	L	L

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**APPLICATION EXAMPLE**



Units Resistance :  
Capacitance : F