

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)



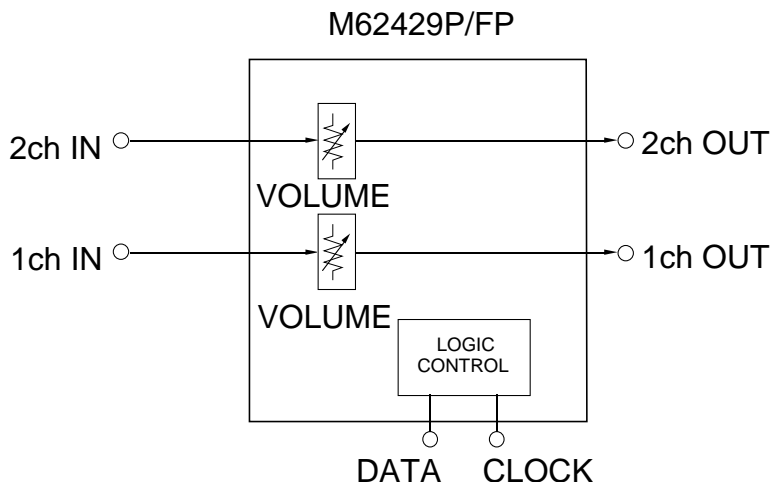
Outline 8P2S-A (FP)
1.27mm pitch 225mil SOP
(4.4mmx5.0mmx1.5mm)

RECOMMENDED OPERATING CONDITIONS

Supply voltage range..... Vcc = 4.5 to 5.5V

Rated supply voltage..... Vcc = 5V

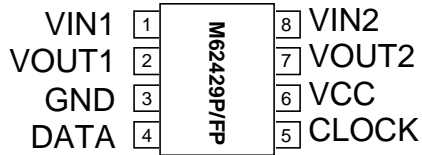
SYSTEM CONFIGURATION



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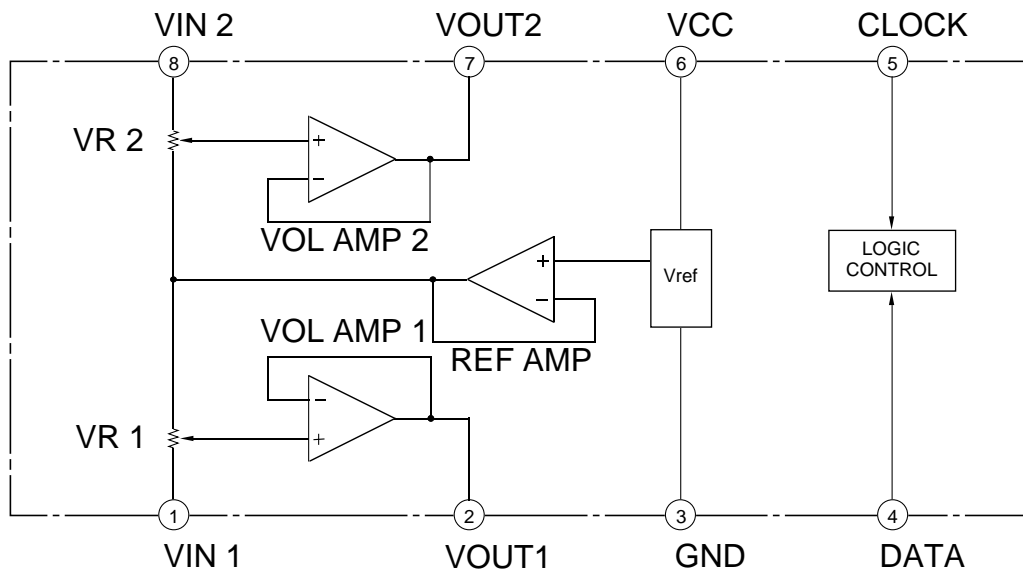
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PIN CONFIGURATION (TOP VIEW)



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 _{IN1}	1-ch input pin
②	V _{OUT1}	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 _{CC}	Power supply pin. Stabilize the pin with decoupling capacitor.
⑦	V _{OUT2}	2-ch output pin
⑧	V _{IN2}	1-ch input pin

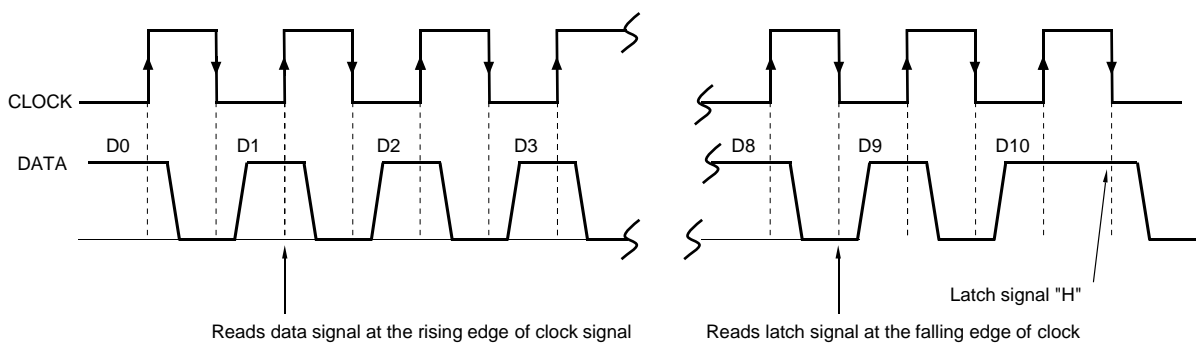
ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Ratings	Unit
V _{CC} , V _{DD}	Supply voltage	6.0	V
P _d	Power dissipation	625(P), 440(FP)	mW
T _{opr}	Operating temperature	-20 to +75	°C
T _{stg}	Storage temperature	-55 to +125	°C

ELECTRICAL CHARACTERISTICS (V_{CC} = 5V, T_a = 25°C, unless otherwise noted)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
I _{CC}	Circuit current			8	16	mA
ATT	Maximum attenuation	ATT=-	-	-90	-80	dB
ATT	Attenuation error	ATT=0	-2.0	0	2.0	dB
V _{IM}	Maximum input voltage	THD=1%, ATT=-6dB	1.5	1.7	-	V _{rms}
V _{OM}	Maximum output voltage	THD=1%	0.8	1.3	-	V _{rms}
V _{NO1}	Output noise voltage	ATT=0, R _g =0, JIS-A	-	4	10	μV _{rms}
V _{NO2}		ATT=-, R _g =0, JIS-A	-	5	10	μV _{rms}
THD	Total harmonic distortion	f=1kHz, V _O =0.5V _{rms} , 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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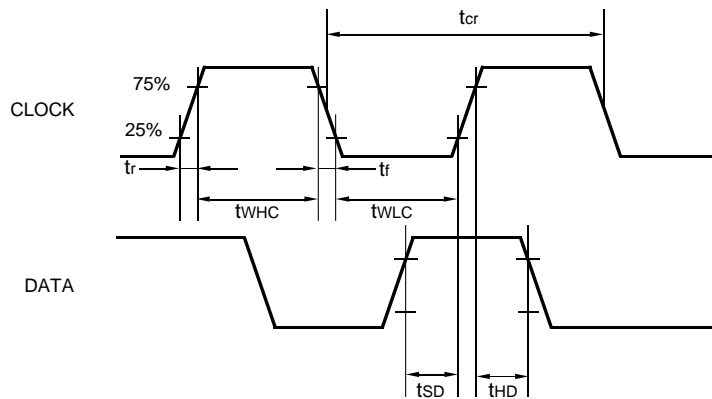
DC CHARACTERISTICS OF DIGITAL BLOCK

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

AC CHARACTERISTICS OF DIGITAL BLOCK

Symbol	Parameter	Test conditions		Limits			Unit
				Min.	Typ.	Max.	
t _{cr}	Cycle time of clock			4	-	-	μs
t _{WHC}	Pulse width of clock ("H" level)			1.6	-	-	μs
t _{WLC}	Pulse width of clock ("L" level)			1.6	-	-	μs
t _r	Clock rising time			-	-	0.4	μs
t _f	Clock falling time			-	-	0.4	μs
t _{SD}	Data setup time			0.8	-	-	μs
t _{HD}	Data hold time			0.8	-	-	μs

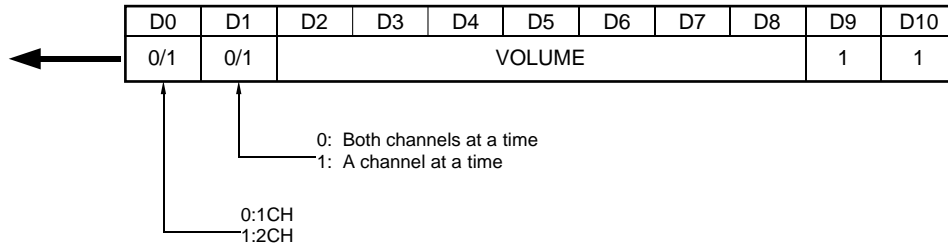
CLOCK AND DATA TIMING



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DATA INPUT FORMAT



VOLUME CODE

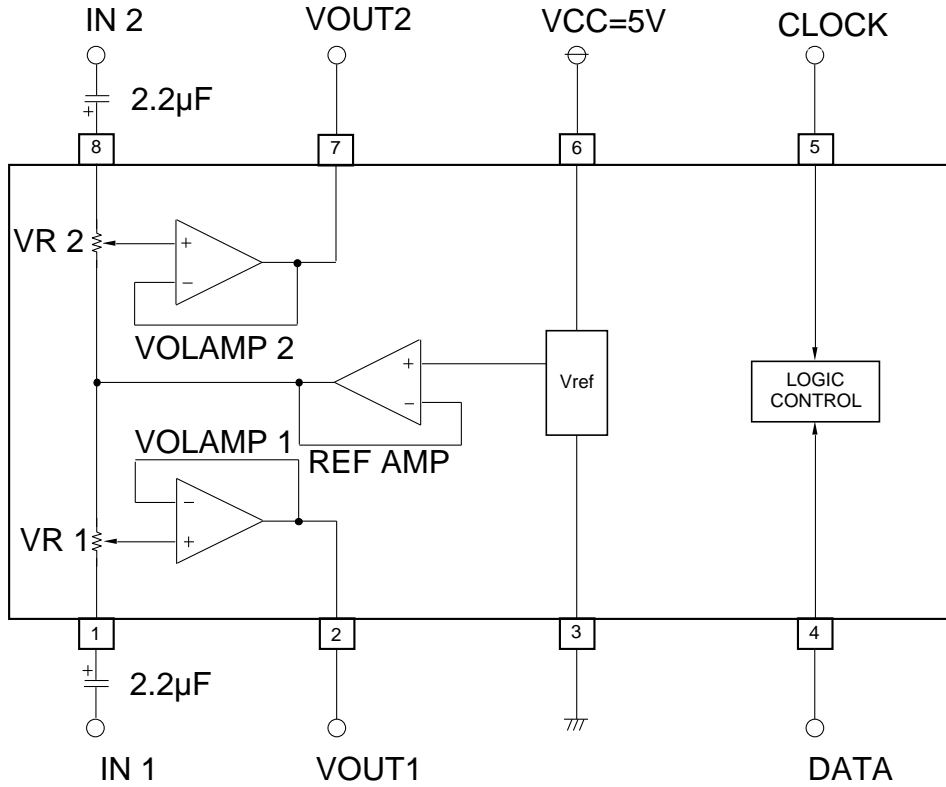
ATT1	D2	D3	D4	D5	D6
0dB	H	L	H	L	H
-4dB	L	L	H	L	H
-8dB	H	H	L	L	H
-12dB	L	H	L	L	H
-16dB	H	L	L	L	H
-20dB	L	L	L	L	H
-24dB	H	H	H	H	L
-28dB	L	H	H	H	L
-32dB	H	L	H	H	L
-36dB	L	L	H	H	L
-40dB	H	H	L	H	L
-44dB	L	H	L	H	L
-48dB	H	L	L	H	L
-52dB	L	L	L	H	L
-56dB	H	H	H	L	L
-60dB	L	H	H	L	L
-64dB	H	L	H	L	L
-68dB	L	L	H	L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