To all our customers

Regarding the change of names mentioned in the document, such as Mitsubishi Electric and Mitsubishi XX, to Renesas Technology Corp.

The semiconductor operations of Hitachi and Mitsubishi Electric were transferred to Renesas Technology Corporation on April 1st 2003. These operations include microcomputer, logic, analog and discrete devices, and memory chips other than DRAMs (flash memory, SRAMs etc.) Accordingly, although Mitsubishi Electric, Mitsubishi Electric Corporation, Mitsubishi Semiconductors, and other Mitsubishi brand names are mentioned in the document, these names have in fact all been changed to Renesas Technology Corp. Thank you for your understanding. Except for our corporate trademark, logo and corporate statement, no changes whatsoever have been made to the contents of the document, and these changes do not constitute any alteration to the contents of the document itself.

Note : Mitsubishi Electric will continue the business operations of high frequency & optical devices and power devices.

Renesas Technology Corp.
Customer Support Dept.
April 1, 2003

PRELIMINARY

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

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), -∞
  (Independent control is allowed in each channel)
- Low noise and low distortion
  VNO = 5μVrms (ATT = -∞, JIS-A)
  THD = 0.01% Typ. (V0 = 0.5Vrms, DIN-AUDIO)

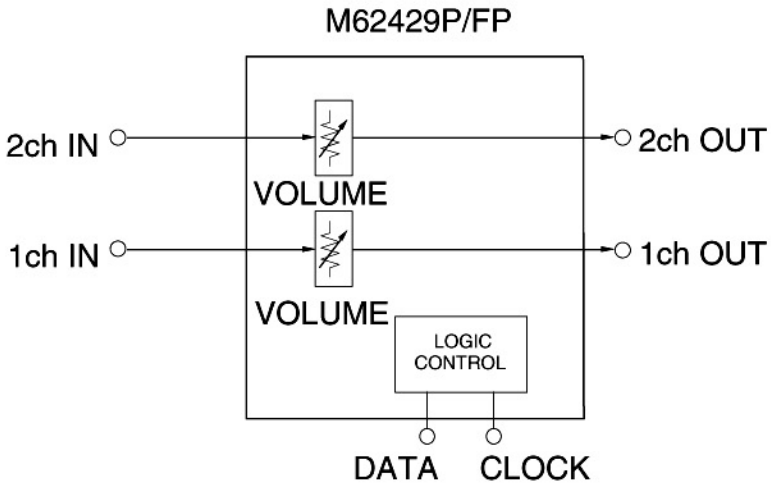
Outline 8P4 (P)
2.54mm pitch 300mil DIP
(6.3mmx8.9mmx3.3mm)

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



PRELIMINARY
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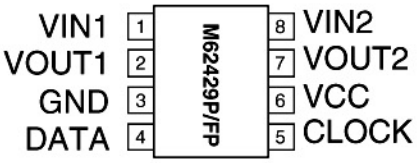
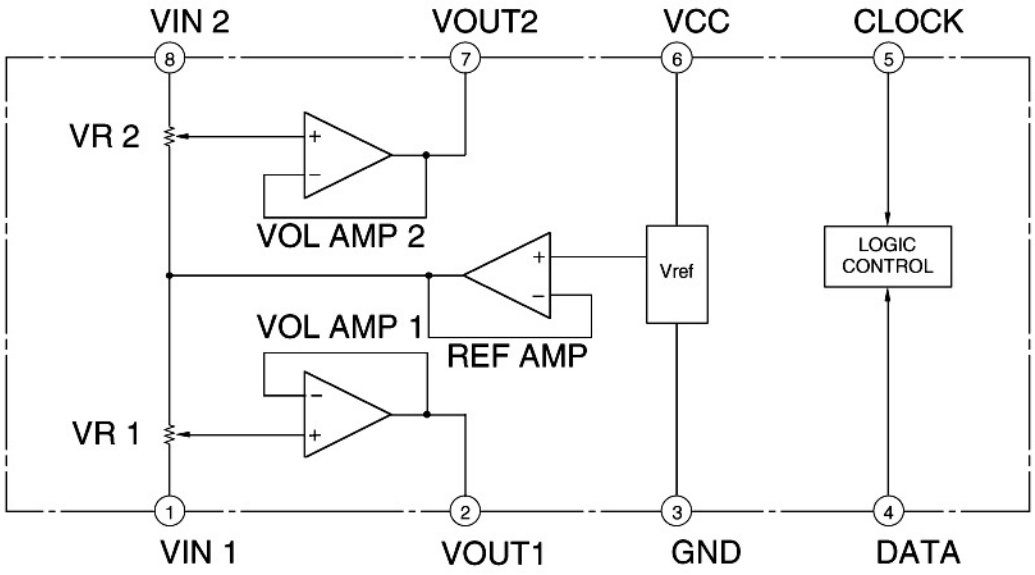
PIN CONFIGURATION (TOP VIEW)



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

IC INTERNAL BLOCK DIAGRAM



PIN DESCRIPTION

Pin No.	Symbol	Function
①	$V_{IN\,1}$	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

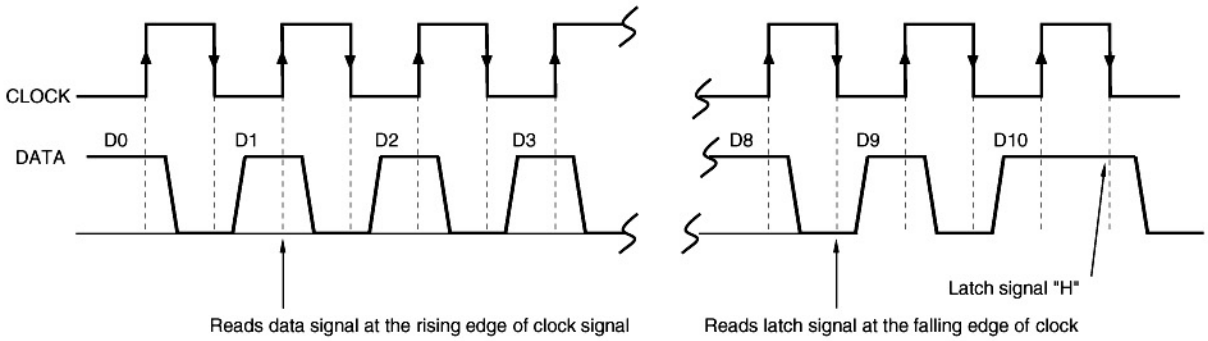
ABSOLUTE MAXIMUM RATINGS

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 (Vcc = 5V, Ta = 25°C, unless otherwise noted)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
I_{CC}	Circuit current			8	16	mA
A_{TT}	Maximum attenuation	A_{TT}=-	-	-90	-80	dB
A_{TT}	Attenuation error	A_{TT}=0	-2.0	0	2.0	dB
V_{IM}	Maximum input voltage	THD=1%, A_{TT}=-6dB	1.5	1.7	-	Vrms
V_{OM}	Maximum output voltage	THD=1%	0.8	1.3	-	Vrms
V_{NO1}	Output noise voltage	A_{TT}=0, R_g=0, JIS-A	-	4	10	μVrms
V_{NO2}		A_{TT}=- , R_g=0, JIS-A	-	5	10	μVrms
THD	Total harmonic distortion	f=1kHz, V_O=0.5Vrms, A_{TT}=0	-	0.01	0.05	%
CS	Channel separation	f=1kHz, JIS-A	-	-80	-70	dB

RELATIONSHIP BETWEEN DATA AND CLOCK



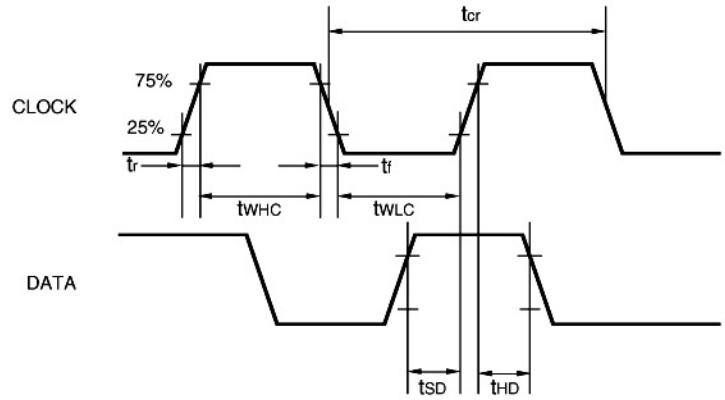
DC CHARACTERISTICS OF DIGITAL BLOCK

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

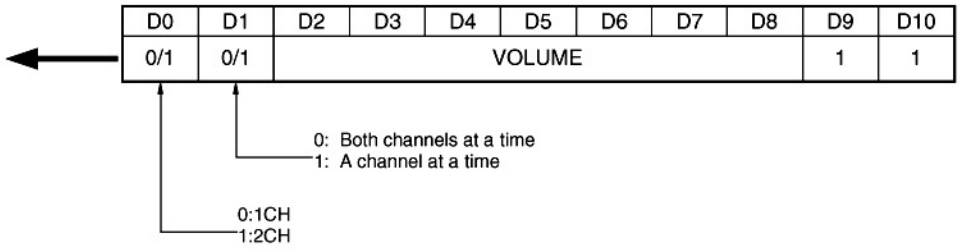
AC CHARACTERISTICS OF DIGITAL BLOCK

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



DATA INPUT FORMAT

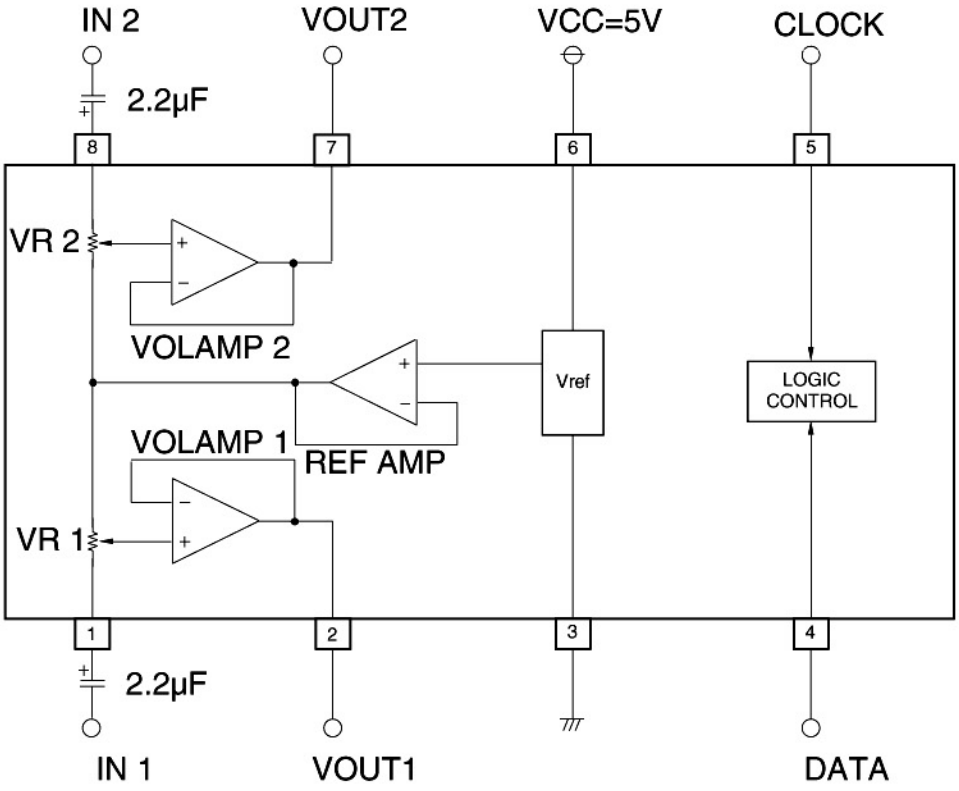


VOLUME CODE

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

APPLICATION EXAMPLE



Units Resistance : Ω
Capacitance : F