

Electronic volume control

Description

The CXA1846M/N is an electrical volume control IC for use in car radios/stereos and radio-cassette recorders featuring serial data control.

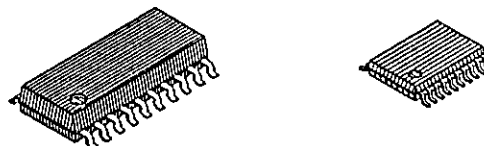
Features

- Volume adjustment (0dB to -87dB, $-\infty$ dB)
- Balance
- Serial data control (DATA, CLK, CE)
- Single 8V power supply
- Zero-cross detection circuit

Structure

Bipolar silicon monolithic IC

CXA1846M 20 pin SOP (Plastic) CXA1846N 20 pin VSOP (Plastic)



Absolute Maximum Ratings (Ta=25°C)

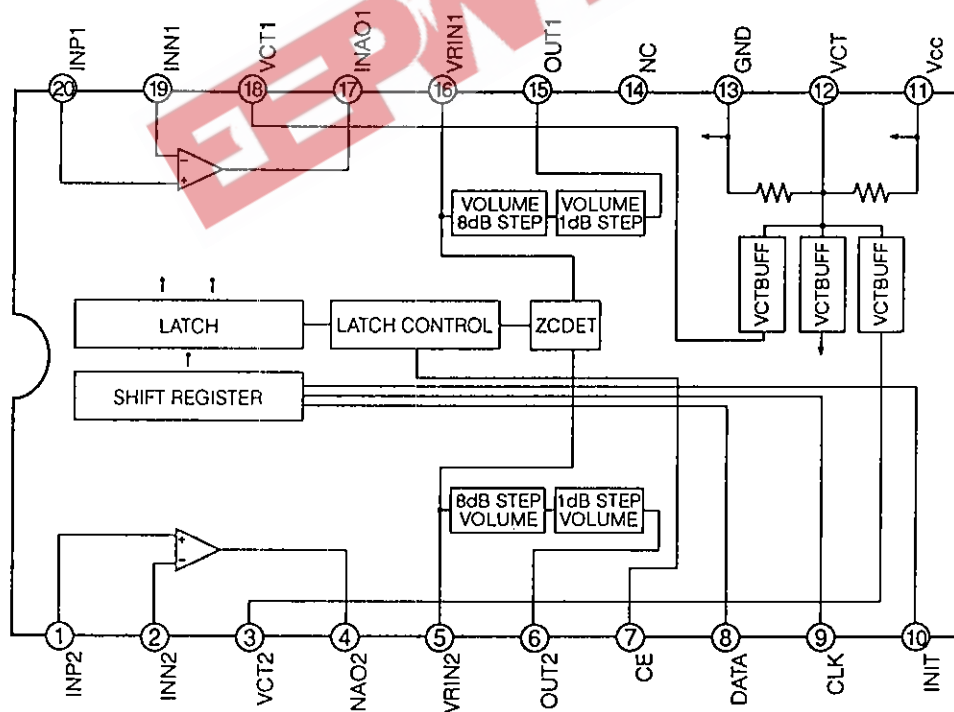
- Supply voltage Vcc 13 V
- Operating temperature Topr -40 to +85 °C
- Storage temperature Tstg -65 to +150 °C
- Allowable power dissipation

Pd	SOP	500 (75°C)	mW
	VSOP	220 (75°C)	mW

Recommended Supply Voltage Range

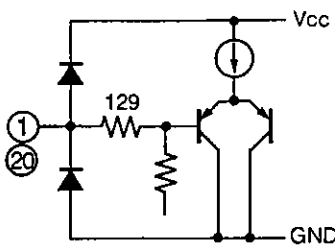
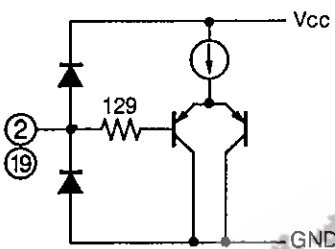
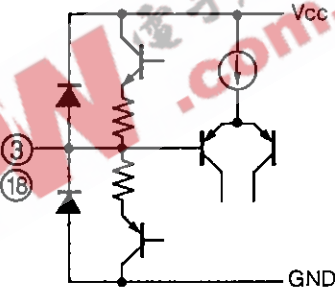
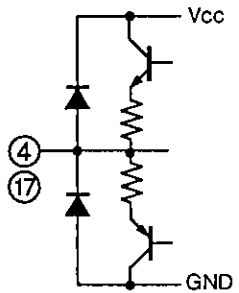
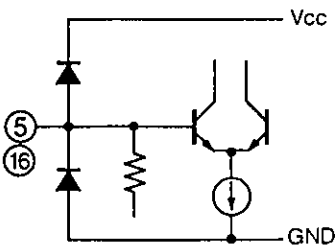
- Supply voltage Vcc 6 to 12 V

Block Diagram and Pin Configuration



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Pin Description

Pin No.	Symbol	I/O resistance voltage	Equivalent circuit	Description
1 20	INP2 INP1	50k Ω VCT		Input operational amplifier positive phase input
2 19	INN2 INN1	— VCT		Input operational amplifier reversed phase input
3 18	VCT2 VCT1	— VCT		VCT buffer output
4 17	INAO2 INAO1	— VCT		Input operational amplifier
5 16	VRIN2 VRIN1	8.2k Ω VCT		Volume input

Pin No.	Symbol	I/O resistance voltage	Equivalent circuit	Description
6 15	OUT2 OUT1	— VCT		Volume output
7	CE	∞ —		Latch enable
8	DATA	∞ —		Serial data input
9	CLK	∞ —		Serial clock
10	INIT	— —		System reset
11	Vcc	—		+power supply
12	VCT	— VCT		Mid-point potential
13	GND	— —		GND

Electrical Characteristics

(Unless otherwise specified Vcc=8V, Ta=25°C)

Item		Symbol	Measurement Condition	Min.	Typ.	Max.	Unit
Circuit current		Icc	No signal	5	8	12	mA
Total harmonic distortion		THD	1kHz, 5dBm	—	0.003	0.01	%
Output noise voltage		Vn	Input shorted	—	5	7	μVrms
Maximum output voltage		Vom	1kHz	8	—	—	dBm
Separation		CS	1kHz	85	90	—	dB
Maximum attenuation		ATTm		85	90	—	dB
Input voltage	High	Vsh	Data, INIT	3	—	6	V
	Low	Vsl	CLK, CE	0	—	1.5	V
Input voltage range		Vin		1	—	Vcc-1	V
Maximum output current		I _{max}	Input buffer amplifier output current	—	—	1	mA

RESET

The IC is reset by reducing the voltage at the INIT pin to 1V or less when CLK is high. Reset can not be performed when CLK is low. The table below shows the status when the IC has been reset.

MODE	Setting
VRC1	—∞
VRF1	-7dB
VRC2	—∞
VRF2	-7dB

Data Allocation

Fast bit

D1	NOP	MSB
D2	VRC1	
D3		
D4		
D5		
D6	VRF1	
D7		
D8		
D9	NOP	
D10	VRC2	
D11		
D12		
D13		
D14	VRF2	
D15		
D16		
		LSB

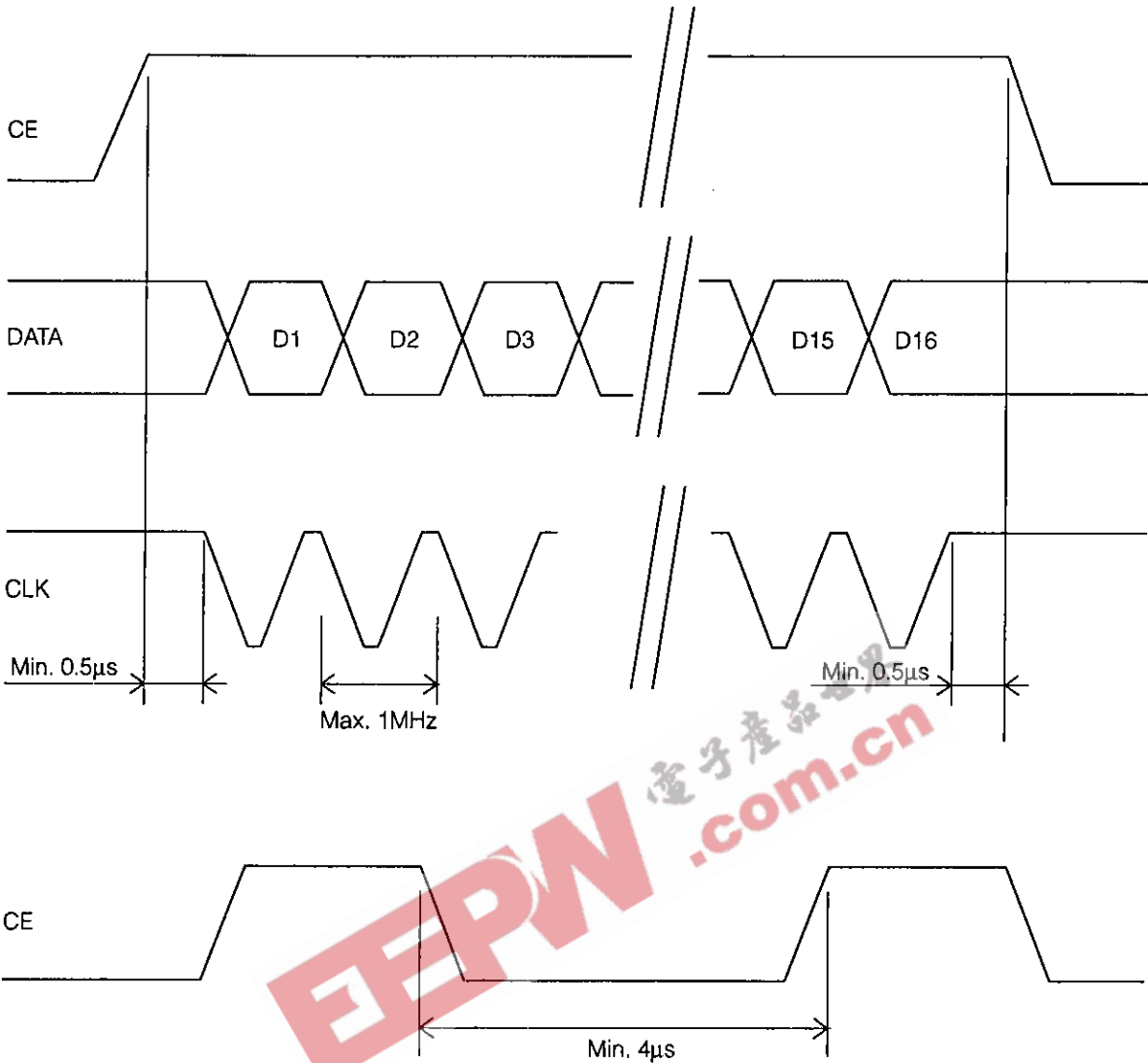
VRC1/VRC2

Setting	D2/D10	D3/D11	D4/D12	D5/D13
0	1	1	1	1
-8	1	1	1	0
-16	1	1	0	1
-24	1	1	0	0
-32	1	0	1	1
-40	1	0	1	0
-48	1	0	0	1
-56	1	0	0	0
-64	0	1	1	1
-72	0	1	1	0
-80	0	1	0	1
-∞	0	1	0	0
-∞	0	0	0	0

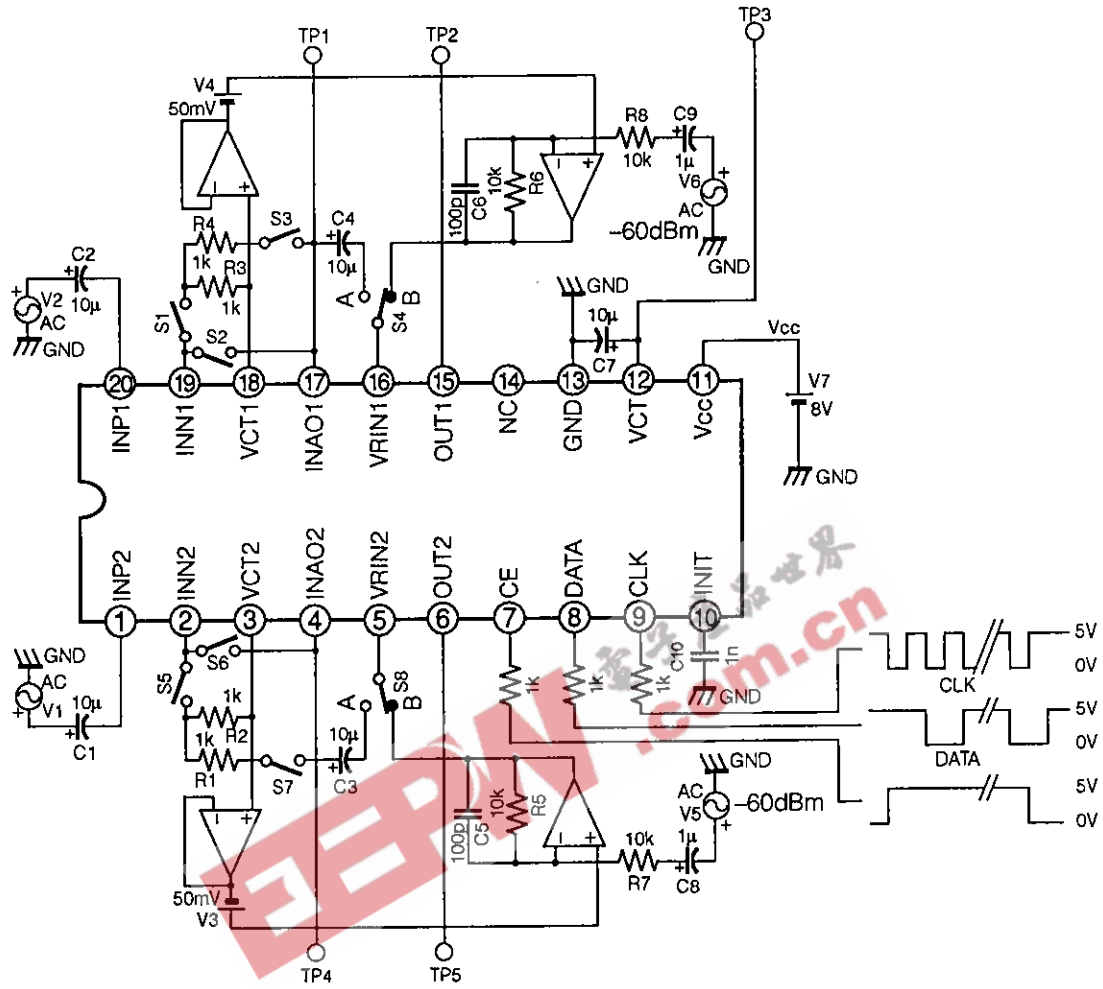
VRF1/VRF2

Setting	D6/D14	D7/D15	D8/D16
0	1	1	1
-1	1	1	0
-2	1	0	1
-3	1	0	0
-4	0	1	1
-5	0	1	0
-6	0	0	1
-7	0	0	0

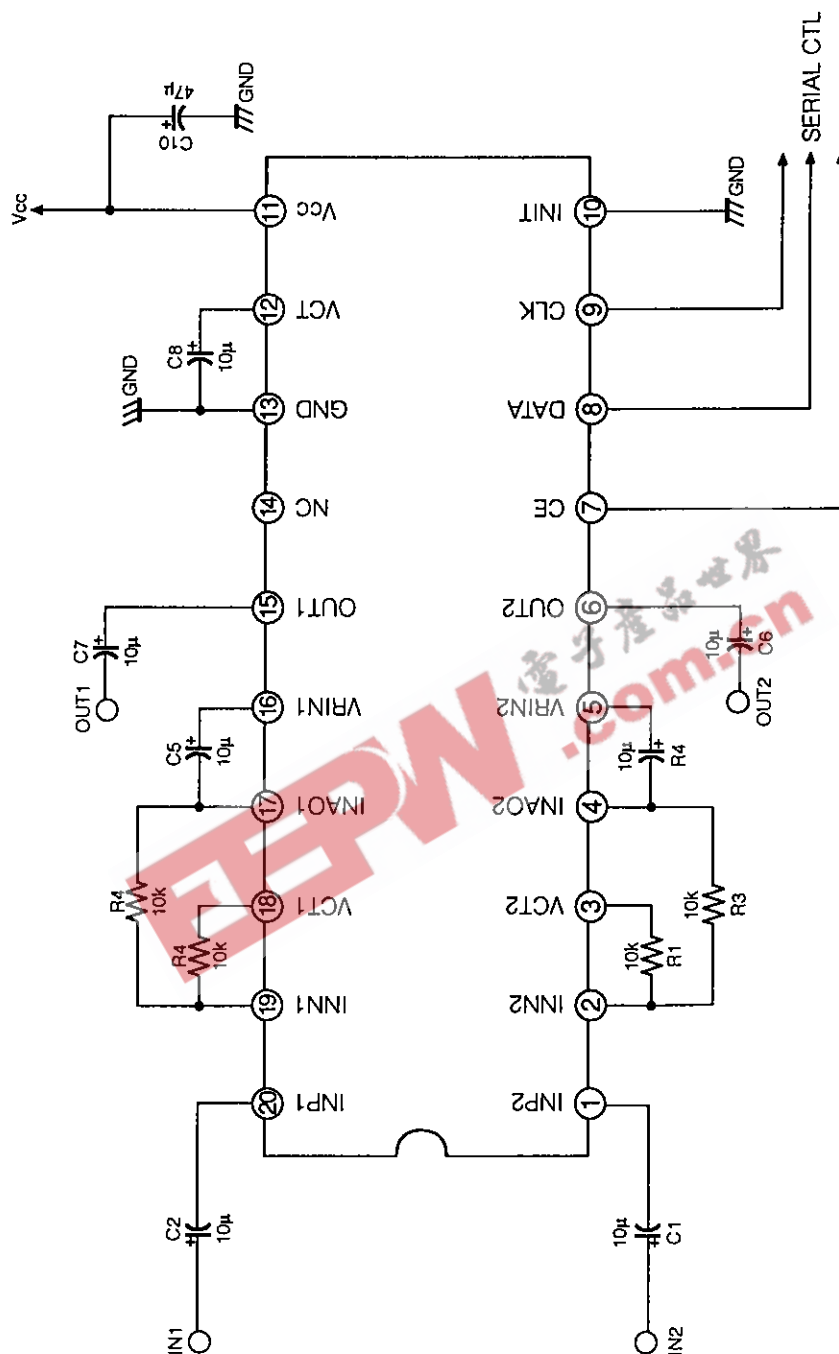
Data Timing



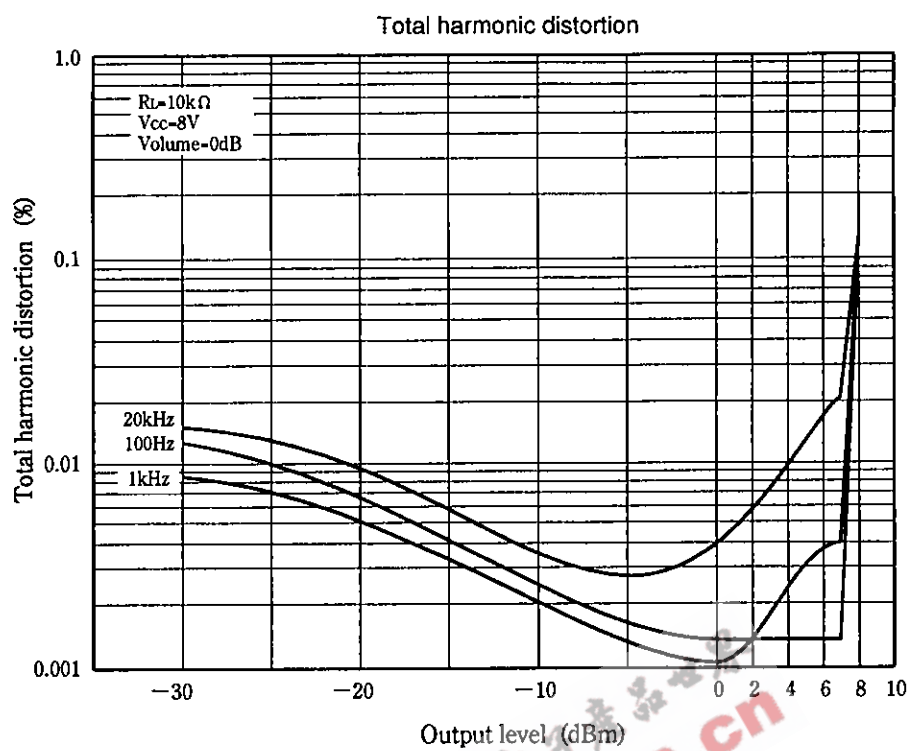
Test Circuit



Application Circuit



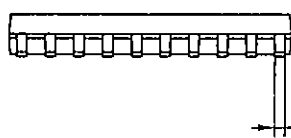
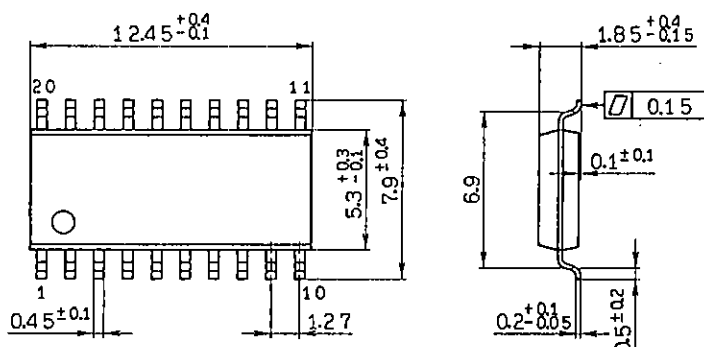
Application circuits shown are typical examples illustrating the operation of the devices. Sony cannot assume responsibility for any problems arising out of the use of these circuits or for any infringement of third party and other right due to same.



Package Outline Unit : mm

CXA1846M

20pin SOP (Plastic) 300mil 0.3g

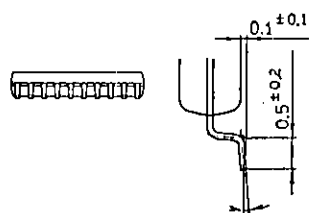
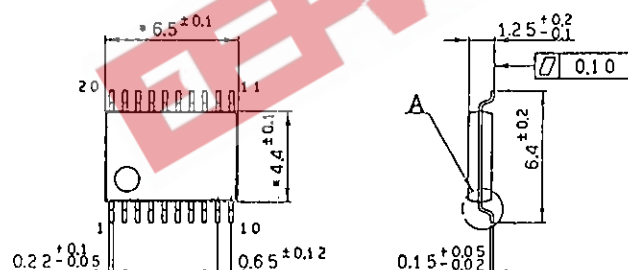


SONY NAME	SOP-20P-L01
EIAJ NAME	*SOP020-P-0300-A
JEDEC CODE	

±0.12

CXA1846N

20pin VSOP (Plastic) 225mil



SONY NAME	VSOP-20P-L01
EIAJ NAME	SSOP020-P-0225-similar A
JEDEC CODE	

0° - 10°

Detailed diagram of A

Note) Dimensions marked with * do not include resin residue.