SONY

CXA1846AM/AN

Electronic volume control

Description

The CXA1846AM/AN is an electrical volume control IC for use in car radios/stereos and radio-cassette recorders featuring serial data control. It has improved over the CXA1846M/N by reducing the 'pop' noise during volume level-switchings.

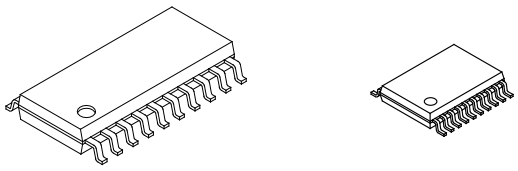
Features

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

Structure

Bipolar silicon monolithic IC

CXA1846AM	CXA1846AN
20 pin SOP (Plastic)	20 pin SSOP (Plastic)



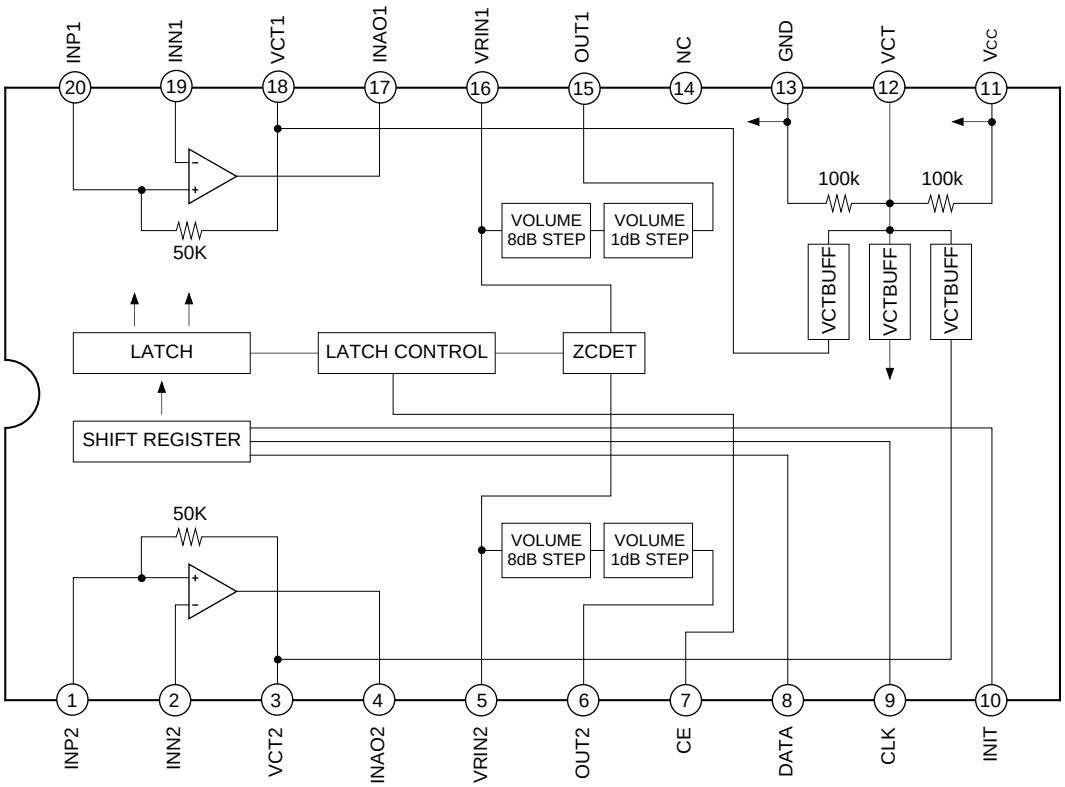
Absolute Maximum Ratings (Ta = 25°C)

• Supply voltage	V_{CC}	13	V
• Operating temperature	Topr	–40 to +85	°C
• Storage temperature	Tstg	–65 to +150	°C
• Allowable power dissipation			
	P_D SOP	350 (75°C)	mW
	SSOP	220 (75°C)	mW

Recommended Supply Voltage Range

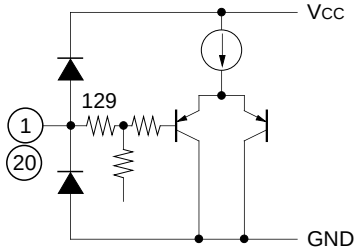
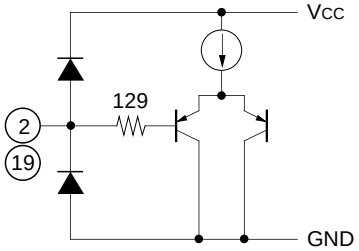
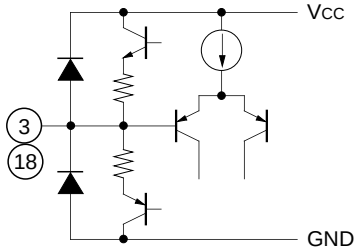
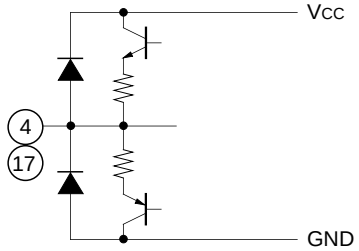
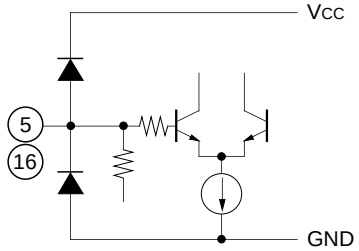
• Supply voltage	V_{CC}	6 to 12	V

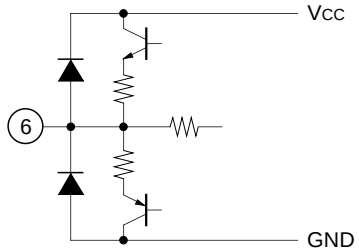
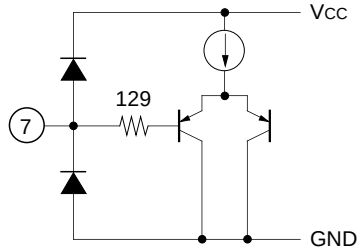
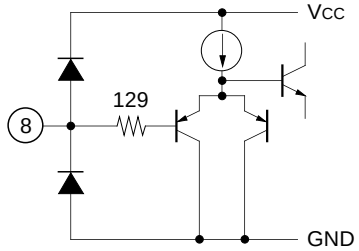
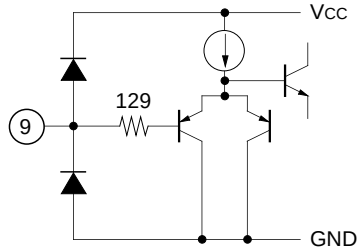
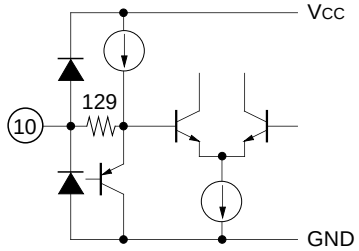
Block Diagram and Pin Configuration



E97102A73

Pin Description

Pin No.	Symbol	I/O resistance voltage	Equivalent circuit	Description
1 20	INP2 INP1	50kΩ 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	8.2kΩ 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 V_{CC} = 8V, Ta = 25°C)

Item		Symbol	Measurement Condition	Min.	Typ.	Max.	Unit
Circuit current		I_{CC}	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	—	V_{CC} – 1	V
Maximum output current		Imax	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
D2 D3 D4 D5	VRC1
D6 D7 D8	VRF1
D9	NOP
D10 D11 D12 D13	VRC2
D14 D15 D16	VRF2

MSB

LSB

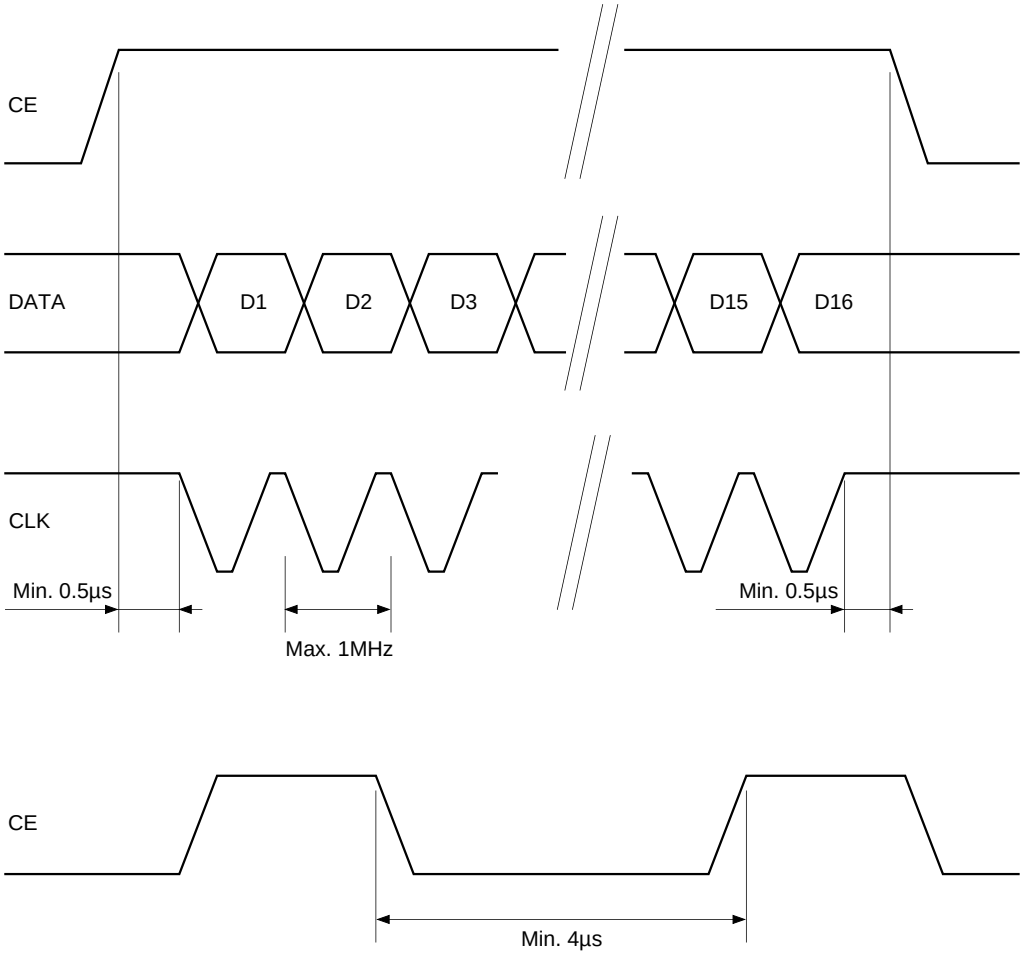
VRC1/VRC2

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

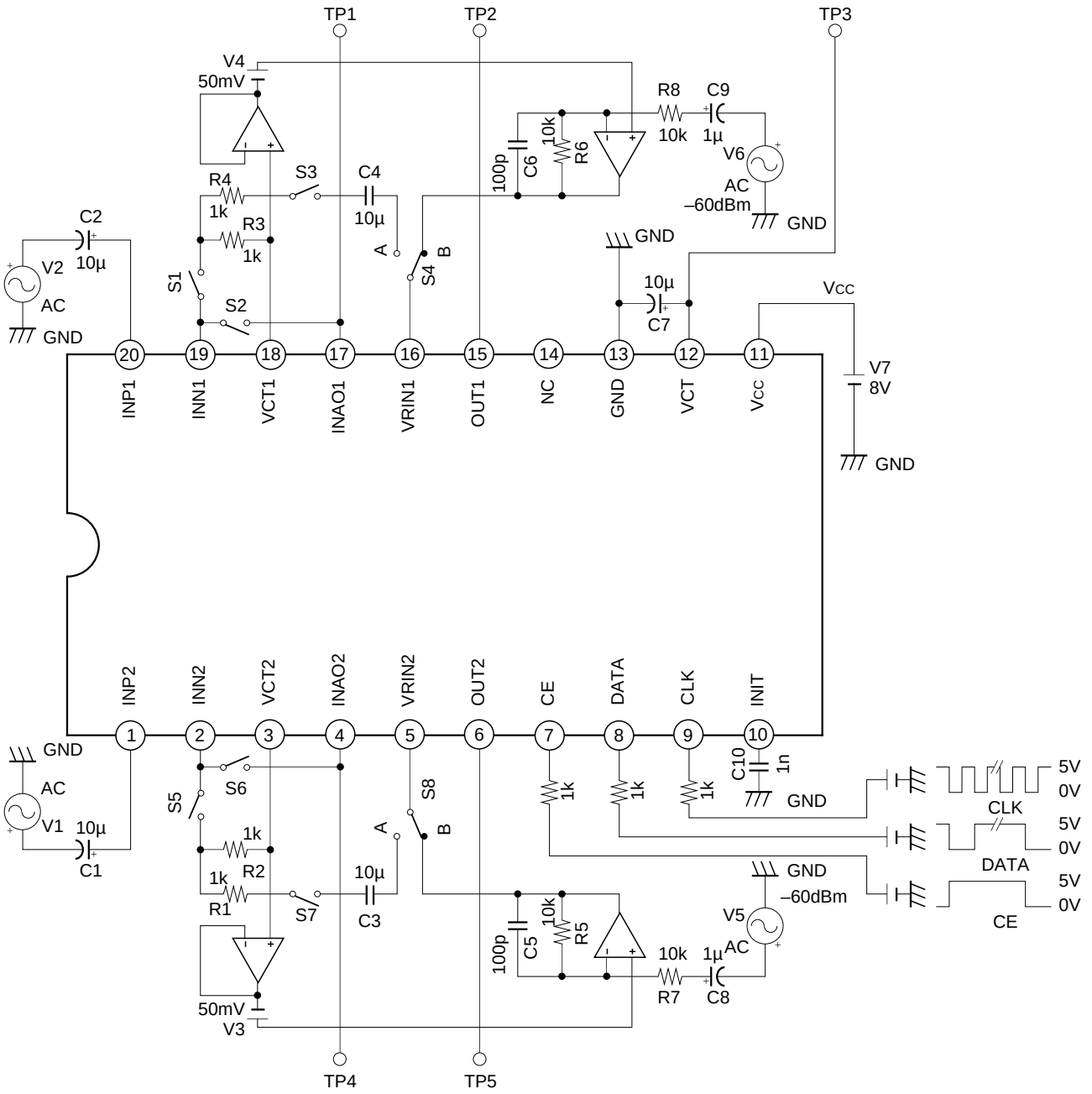
VRF1/VRF2

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

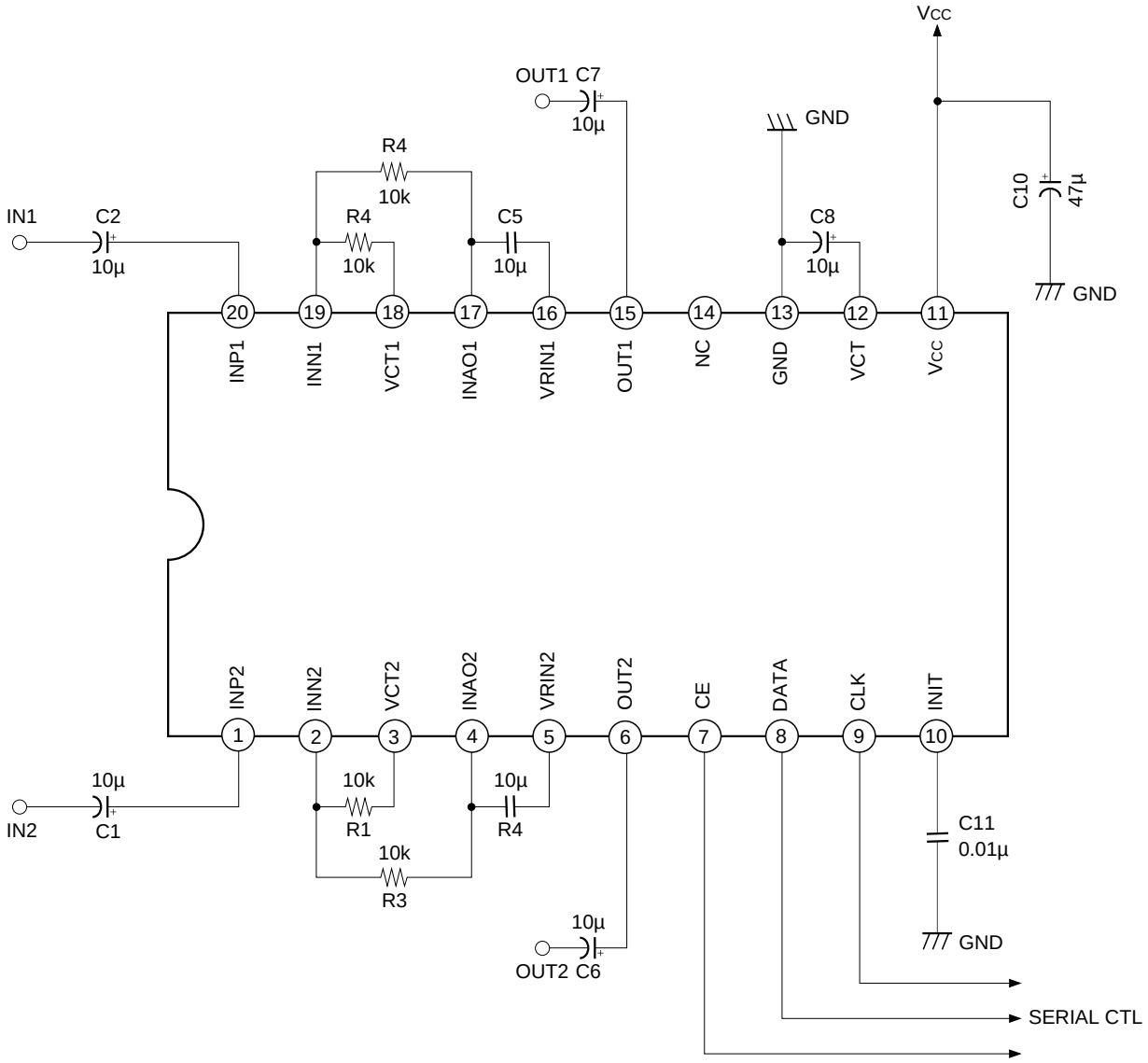
Data Timing


CE
DATA
D1
D2
D3
D15
D16
CLK
Min. 0.5µs
Max. 1MHz
Min. 0.5µs
CE
Min. 4µs

Test Circuit

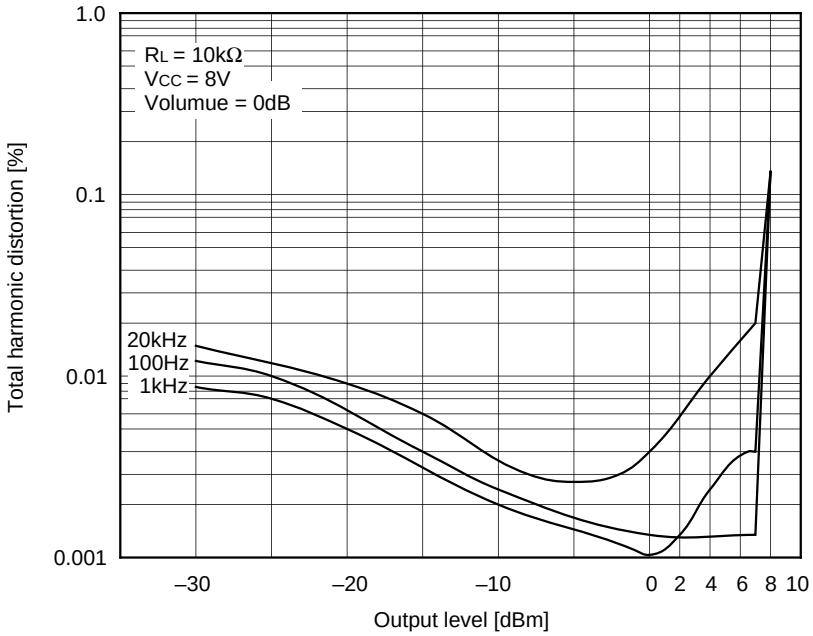


Application Circuit



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 patent and other right due to same.

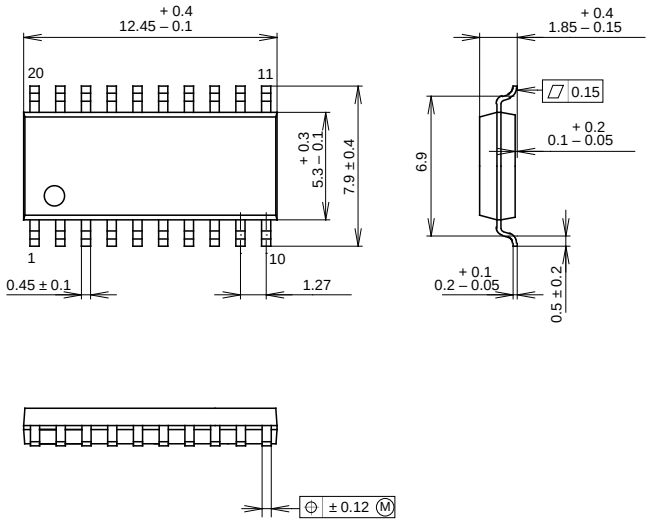
Total harmonic distortion



Package Outline Unit: mm

CXA1846AM

20PIN SOP (PLASTIC) 300mil



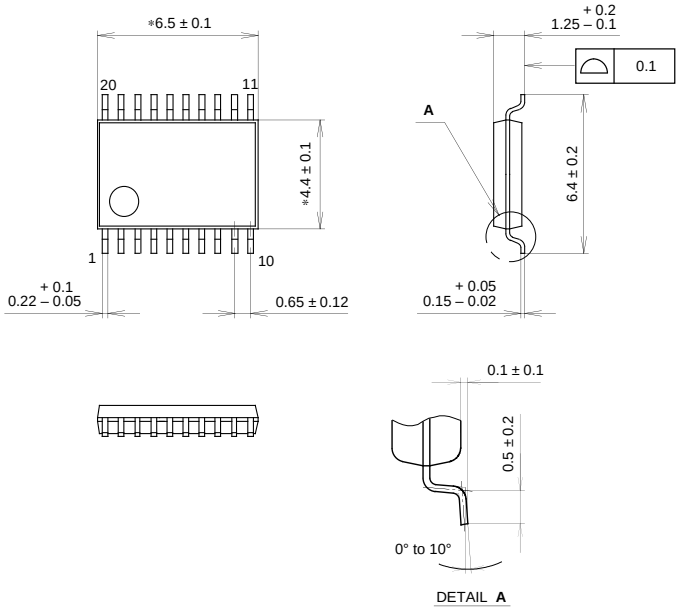
PACKAGE STRUCTURE

SONY CODE	SOP-20P-L01
EIAJ CODE	∗SOP020-P-0300-A
JEDEC CODE	————

PACKAGE MATERIAL	EPOXY / PHENOL RESIN
LEAD TREATMENT	SOLDER PLATING
LEAD MATERIAL	COPPER ALLOY
PACKAGE WEIGHT	0.3g

CXA1846AN

20PIN SSOP (PLASTIC)



NOTE: Dimension "∗" does not include mold protrusion.

PACKAGE STRUCTURE

SONY CODE	SSOP-20P-L01
EIAJ CODE	SSOP020-P-0044
JEDEC CODE	————

PACKAGE MATERIAL	EPOXY RESIN
LEAD TREATMENT	SOLDER / PALLADIUM PLATING
LEAD MATERIAL	COPPER / 42 ALLOY
PACKAGE WEIGHT	0.1g