



# LA4582CM

## Pre + Power Amplifier for 3-V Headphone Stereo Systems

### Overview

The LA4582CM is a preamplifier plus power amplifier IC that support auto-reverse, and was developed for 3-V headphone stereo systems.

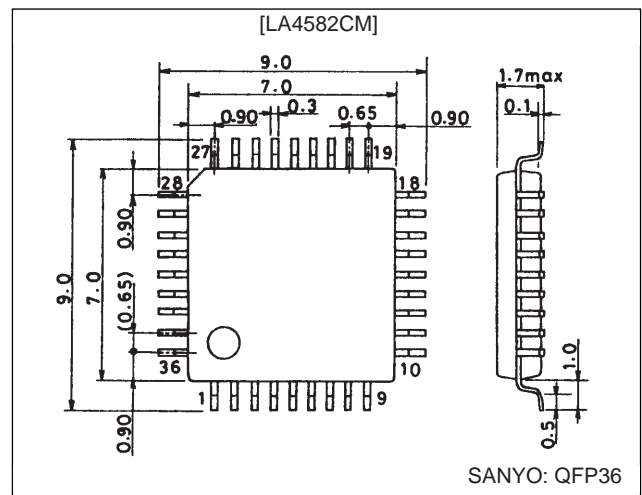
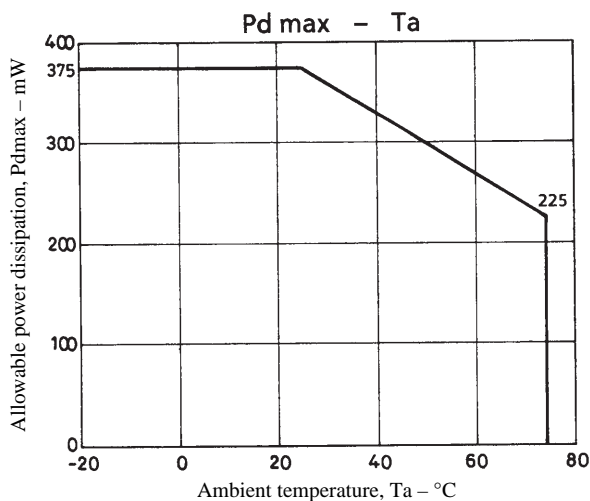
### Features

- The LA4582CM was developed for cassette playback systems, and in addition to preamplifier and power amplifier functions, it also provides low boost and automatic power limitation (PVSS: Peak Volume Select System) functions.

- Provided in a 36-pin miniature flat package (0.65 mm lead pitch) that is optimal for set miniaturization.
- Capable of driving 8-Ω speakers
- Two-channel playback auto-reverse preamplifier
- Two-channel headphone power amplifier
- Low-frequency boost function (auto-loudness effect)
- Output suppression function (PVSS)
- Two-channel radio input switch (pre-mute switch)
- Power mute switch

### Package Dimension

unit: mm



### Specifications

#### Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V <sub>CC</sub> max		4.5	V
Allowable power dissipation	Pd max		375	mW
Operating temperature	T <sub>opr</sub>		-20 to +75	°C
Storage temperature	T <sub>stg</sub>		-40 to +150	°C

#### Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V <sub>CC</sub>		3.0	V
Operating voltage range	V <sub>CC</sub> op		1.8 to 3.6	V

## LA4582CM

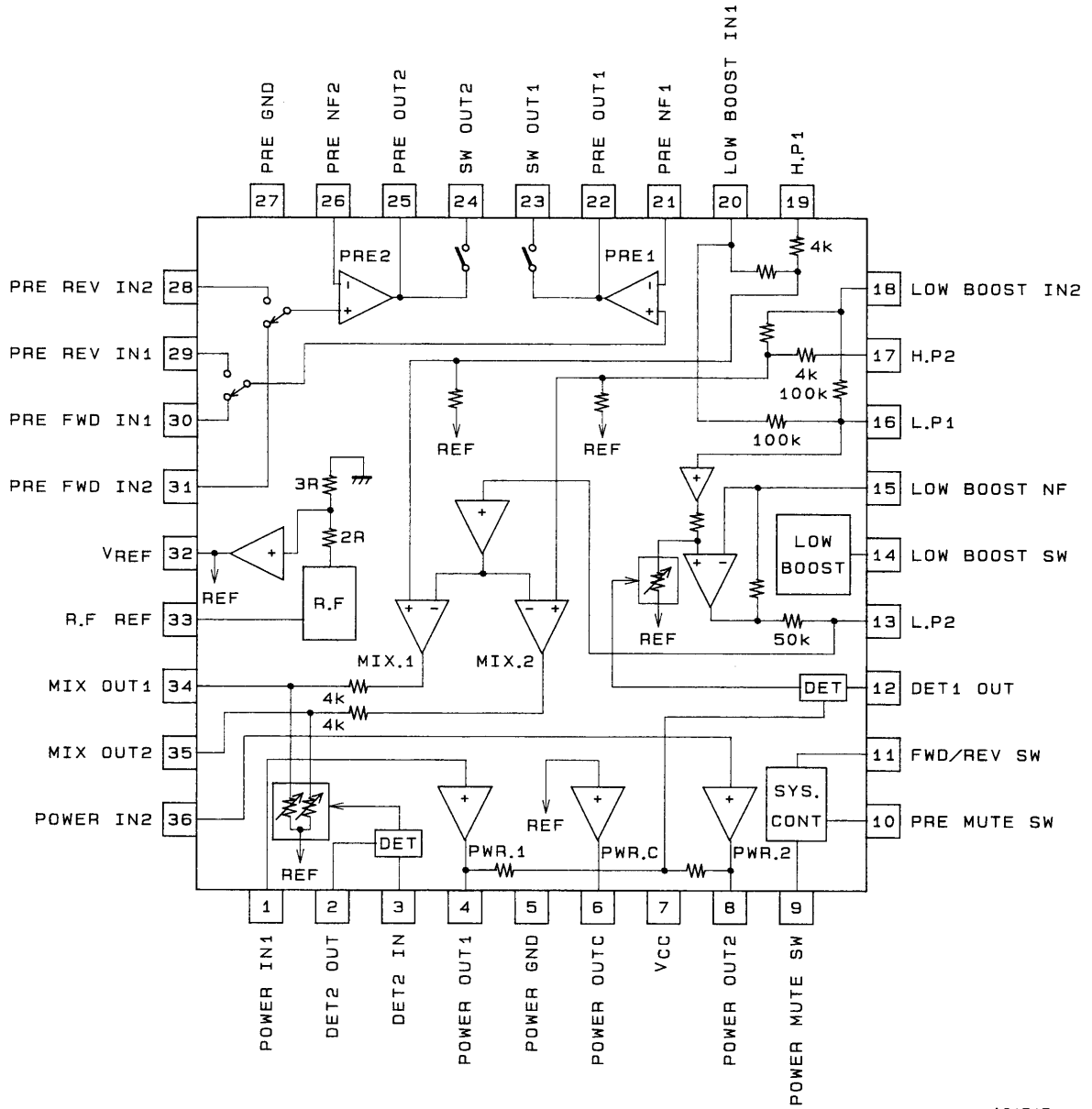
**Operating Characteristics at  $T_a = 25^\circ\text{C}$ ,  $V_{CC} = 3.0\text{ V}$ ,  $f_i = 1\text{ kHz}$ ,  $0.775\text{ V} = 0\text{ dBm}$   
 $R_L = 10\text{ k}\Omega$  (preamplifier),  $R_L = 30\text{ k}\Omega$  (low boost),  $R_L = 16\text{ }\Omega$  (power amplifier)**

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[PRE + L.BOOST + PVSS + POWER]						
Quiescent current	I <sub>CCO1</sub>	R <sub>g</sub> = 2.2 k $\Omega$ , low boost off, PVSS off	13	19	29	mA
	I <sub>CCO2</sub>	R <sub>g</sub> = 2.2 k $\Omega$ , low boost on, PVSS on	14	20	30	
Voltage gain (closed loop)	V <sub>G<sub>T</sub></sub>	V <sub>O</sub> = -5 dBm	62.5	64.5	67.5	dB
[Preamplifier]						
Voltage gain (open loop)	V <sub>G<sub>0</sub></sub>	V <sub>O</sub> = -5 dBm	70	83		dB
Voltage gain (closed loop)	V <sub>G<sub>1</sub></sub>	V <sub>O</sub> = -5 dBm		40		dB
Maximum output voltage	V <sub>O max1</sub>	THD = 1%, V <sub>CC</sub> = 1.8 V	0.1	0.2		V
Total harmonic distortion	THD <sub>1</sub>	V <sub>O</sub> = 0.2 V, V <sub>G</sub> = 40 dB/NAB		0.05	0.5	%
Equivalent input noise voltage	V <sub>NI</sub>	R <sub>g</sub> = 2.2 k $\Omega$ , BPF = 20 Hz to 20 kHz		1.3	2.0	$\mu\text{V}$
Crosstalk	CT <sub>1</sub>	R <sub>g</sub> = 2.2 k $\Omega$ , TUNE 1 kHz	60	80		dB
Ripple rejection	R <sub>r1</sub>	R <sub>g</sub> = 2.2 k $\Omega$ , V <sub>CC</sub> = 1.8 V, V <sub>r</sub> = -20 dBm, f <sub>r</sub> = 100 Hz	40	50		dB
[Power Amplifier]						
Output power	P <sub>O</sub>	THD = 10%	23	34		mW
Voltage gain (closed loop)	V <sub>G<sub>2</sub></sub>	V <sub>O</sub> = -5 dBm	27	29	32	dB
Total harmonic distortion	THD <sub>2</sub>	P <sub>O</sub> = 1 mW		0.4	1.0	%
Interchannel crosstalk	CT <sub>2</sub>	V <sub>O</sub> = -5 dBm, R <sub>V</sub> = 0 $\Omega$	30	40		dB
Output noise voltage	V <sub>NO1</sub>	R <sub>V</sub> = 0 $\Omega$ , BPF = 20 Hz to 20 kHz		25	40	$\mu\text{V}$
Ripple rejection	R <sub>r2</sub>	R <sub>V</sub> = 0 $\Omega$ , V <sub>r</sub> = -20 dBm f <sub>r</sub> = 100 Hz, V <sub>CC</sub> = 1.8 V	45	55		dB
Input resistance	R <sub>i</sub>		22	30	38	k $\Omega$
DC offset voltage	V <sub>ODC OFF</sub>	Between pin 8 and pins 4 to 6	-90		+90	mV
[L- BOOST]						
Voltage gain	V <sub>G<sub>3</sub></sub>	V <sub>IN</sub> = -30 dBm, boost: on/off	-2.3	-3.8	-5.3	dB
Boost	BST <sub>1</sub>	V <sub>INBST</sub> = -30 dBm, f = 100 Hz, boost: on	11.2	14.7	18.2	dB
	BST <sub>2</sub>	V <sub>INBST</sub> = -30 dBm, f = 10 Hz, boost: on	7.0	8.5	10	dB
Maximum output voltage	V <sub>O max2</sub>	THD = 1%, boost: on	0.3	0.5		V
Total harmonic distortion	THD <sub>3</sub>	V <sub>O</sub> = 0.1 V, boost: on		0.04	0.5	%
Interchannel crosstalk	CT <sub>3</sub>	V <sub>O</sub> = -20 dBm, R <sub>g</sub> = 0, boost: on	25	32		dB
Output noise voltage	V <sub>NO2</sub>	R <sub>g</sub> = 0, BPF = 20 Hz to 20 kHz, boost: off		2.0	5.0	$\mu\text{V}$
Ripple rejection	R <sub>r3</sub>	R <sub>g</sub> = 0, f <sub>r</sub> = 100 Hz, V <sub>r</sub> = -20 dBm, V <sub>CC</sub> = 1.8 V, boost: on	45	53		dB
[L- BOOST + PVSS + POWER] R <sub>V</sub> = 30 k $\Omega$ max						
Voltage gain	V <sub>G<sub>4</sub></sub>	V <sub>IN</sub> = -40 dBm, f = 1 kHz, boost: on/off	22.0	24.5	28.0	dB
Low boost output voltage	V <sub>O1</sub>	V <sub>IN</sub> = -43 dBm, f = 100 Hz, boost: on	0.13	0.23	0.33	V
	V <sub>O2</sub>	V <sub>IN</sub> = -28 dBm, f = 100 Hz, boost: on	0.25	0.4	0.55	V
Low boost total harmonic distortion	THD <sub>4</sub>	V <sub>IN</sub> = -40 dBm, f = 100 Hz, boost: on		0.5	1.2	%
PVSS voltage	V <sub>O3</sub>	V <sub>IN</sub> = -40 dBm, PVSS2	-40	-37	-34	dBm
PVSS width	W <sub>PVSS</sub>	Input increment between the point where operation starts and the point where the output is +4 dB from there. PVSS: on	30	40		dB
PVSS total harmonic distortion	THD <sub>5</sub>	V <sub>IN</sub> = -40 dBm, PVSS2		0.5	1.2	%
PVSS start input	V <sub>OPIN</sub>	PVSS2	-67	-63	-59	dBm

Note: The amount of boost for a 1-kHz signal.

LA4582CM

Block Diagram

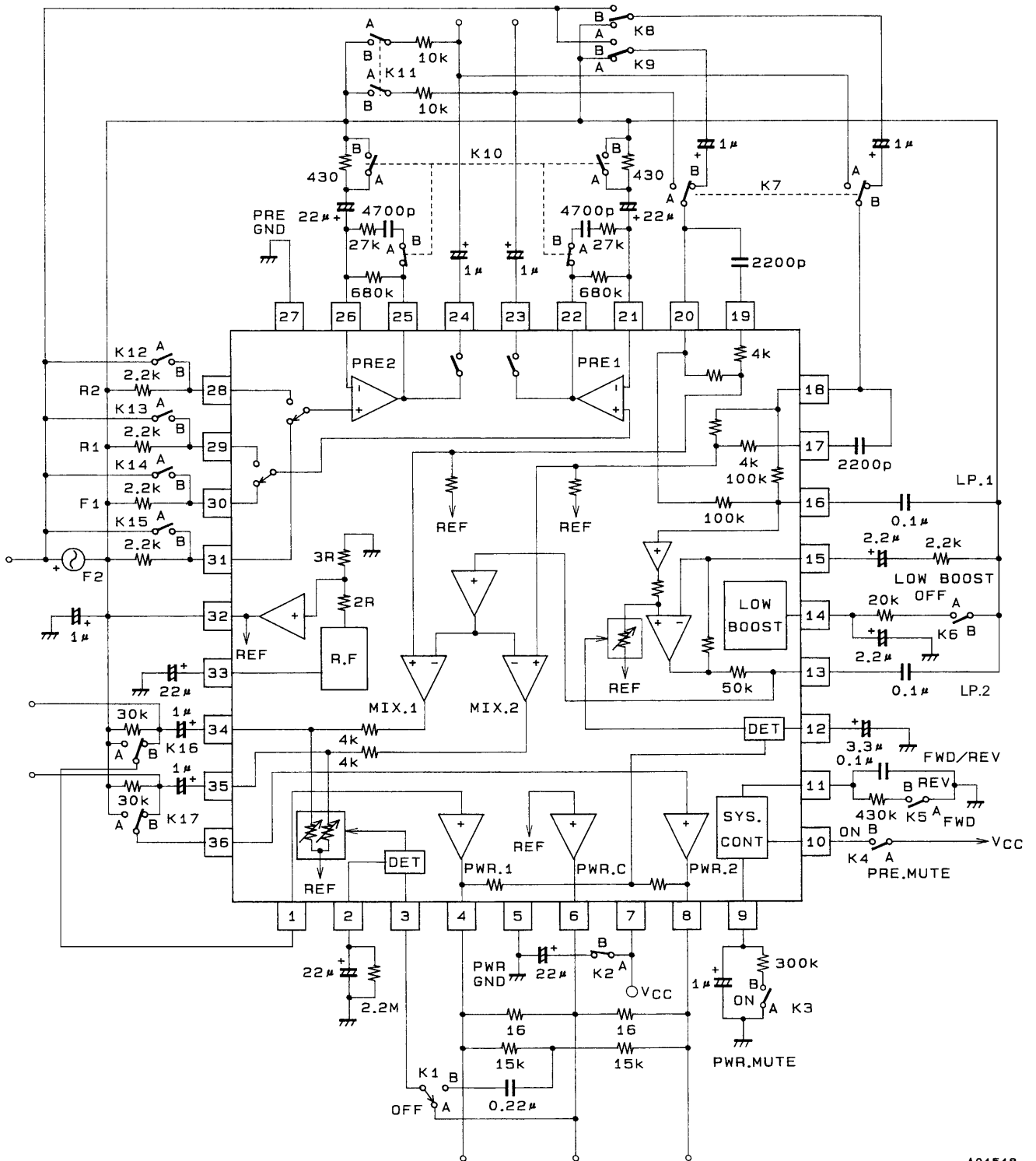


A01517

Unit (Resistance: Ω)

LA4582CM

Test Circuit

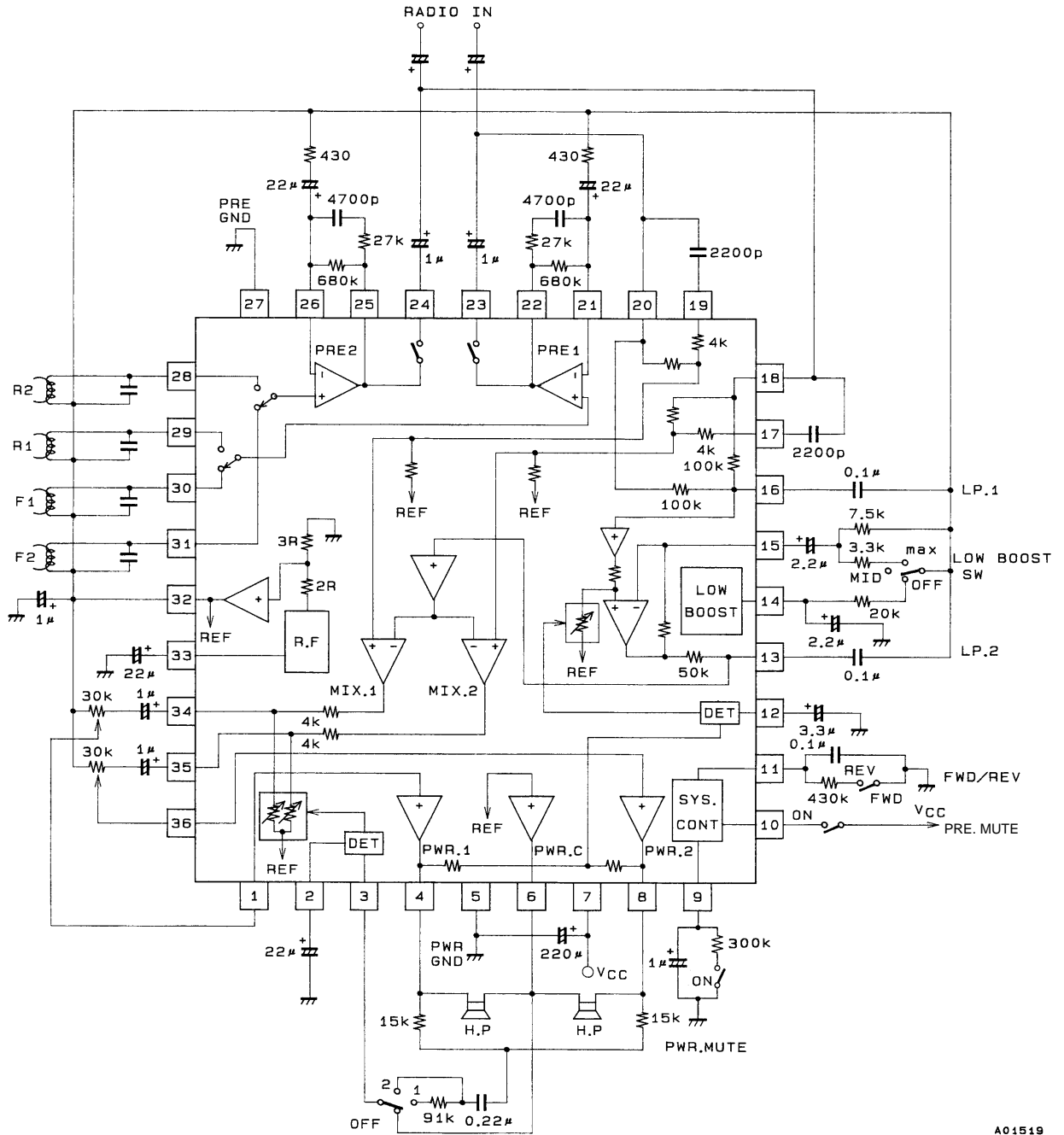


A01518

Unit (Resistance: Ω, Capacitance: F)

LA4582CM

Sample Application Circuit



A01519

Unit (Resistance: Ω, Capacitance: F)

- No products described or contained herein are intended for use in surgical implants, life-support systems, aerospace equipment, nuclear power control systems, vehicles, disaster/crime-prevention equipment and the like, the failure of which may directly or indirectly cause injury, death or property loss.
- Anyone purchasing any products described or contained herein for an above-mentioned use shall:
  - ① Accept full responsibility and indemnify and defend SANYO ELECTRIC CO., LTD., its affiliates, subsidiaries and distributors and all their officers and employees, jointly and severally, against any and all claims and litigation and all damages, cost and expenses associated with such use:
  - ② Not impose any responsibility for any fault or negligence which may be cited in any such claim or litigation on SANYO ELECTRIC CO., LTD., its affiliates, subsidiaries and distributors or any of their officers and employees jointly or severally.
- Information (including circuit diagrams and circuit parameters) herein is for example only; it is not guaranteed for volume production. SANYO believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.

This catalog provides information as of June, 1997. Specifications and information herein are subject to change without notice.