



# LA1806

## AM/FM-IF/MPX Tuner System for Radio-Cassette Recorders, Music Centers

### Overview

The LA1806 is a characteristics-improved version of the LA1811, with the same pin assignment and package as those of the LA1811. Improvements are made on the following points:

- Separation (35 dB → 48 dB) and its dependence on free-running frequency (Refer to the separate catalog of the LA1805.)
- FM main distortion (0.8% → 0.45%)
- AM detection output (approximately 5 dB increased)

The constants on five external parts are changed as LA1811

### Functions

- FM-IF: IF amplifier quadrature detector, soft muting, tuning indicator
- MPX: PLL stereo decoder, stereo indicator, forced monaural, VCO stop
- AM: RF amplifier, MIX, OSC (with ALC), IF amplifier, detector, AGC, tuning indicator

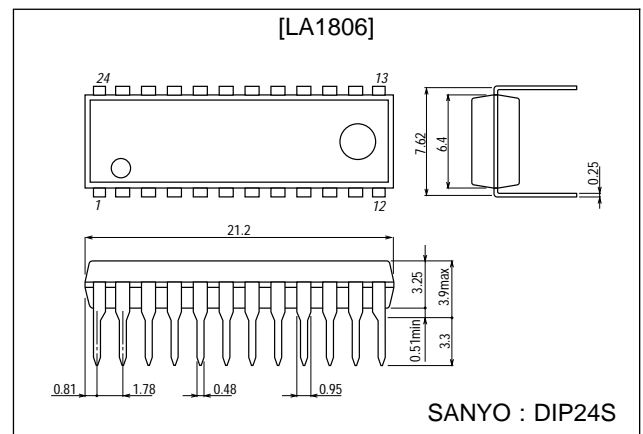
### Features

- FM/AM/MPX functions contained on a single chip
- Minimum number of external parts required
- On-chip FM muting function
- High sensitivity
- Less carrier leak of MPX

### Package Dimensions

unit : mm

#### 3067-DIP24S



■ Any and all SANYO products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your SANYO representative nearest you before using any SANYO products described or contained herein in such applications.

■ SANYO assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all SANYO products described or contained herein.

**SANYO Electric Co., Ltd. Semiconductor Company**

TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

13097HA(II)/N149TA, TS No.3210-1/4

# LA1806

## Specifications

### Maximum Ratings at $T_a = 25^\circ\text{C}$ , See specified Test Circuit

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{CC}$ max	Pins 3, 7, 8, 11, 20, 21	9	V
Maximum supply current	$I_{CC}$ max	Pins 3 + 20 + 21	50	mA
Flow-in current (Indicator drive current)	$I_{LED}$	Pins 7, 8	20	mA
Flow-out current	$I_{23}$	Pin 23	0.1	mA
Allowable power dissipation	$P_d$ max	$T_a \leq 70^\circ\text{C}$	500	mW
Operating temperature	$T_{opr}$		-20 to +70	$^\circ\text{C}$
Storage temperature	$T_{stg}$		-40 to +125	$^\circ\text{C}$

### Operating Conditions at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	$V_{CC}$		4.5	V
Operating voltage range	$V_{CCOP}$		3.0 to 8.0	V

\* The FM output level forms an N curve (LA1805) and an S curve (LA1806).

LA1805: N curve (for US band)

LA1806: S curve (for Japanese band). Since an output load resistor is connected to pins 9, 10 externally, your desired output level can be set by varying the output resistance.

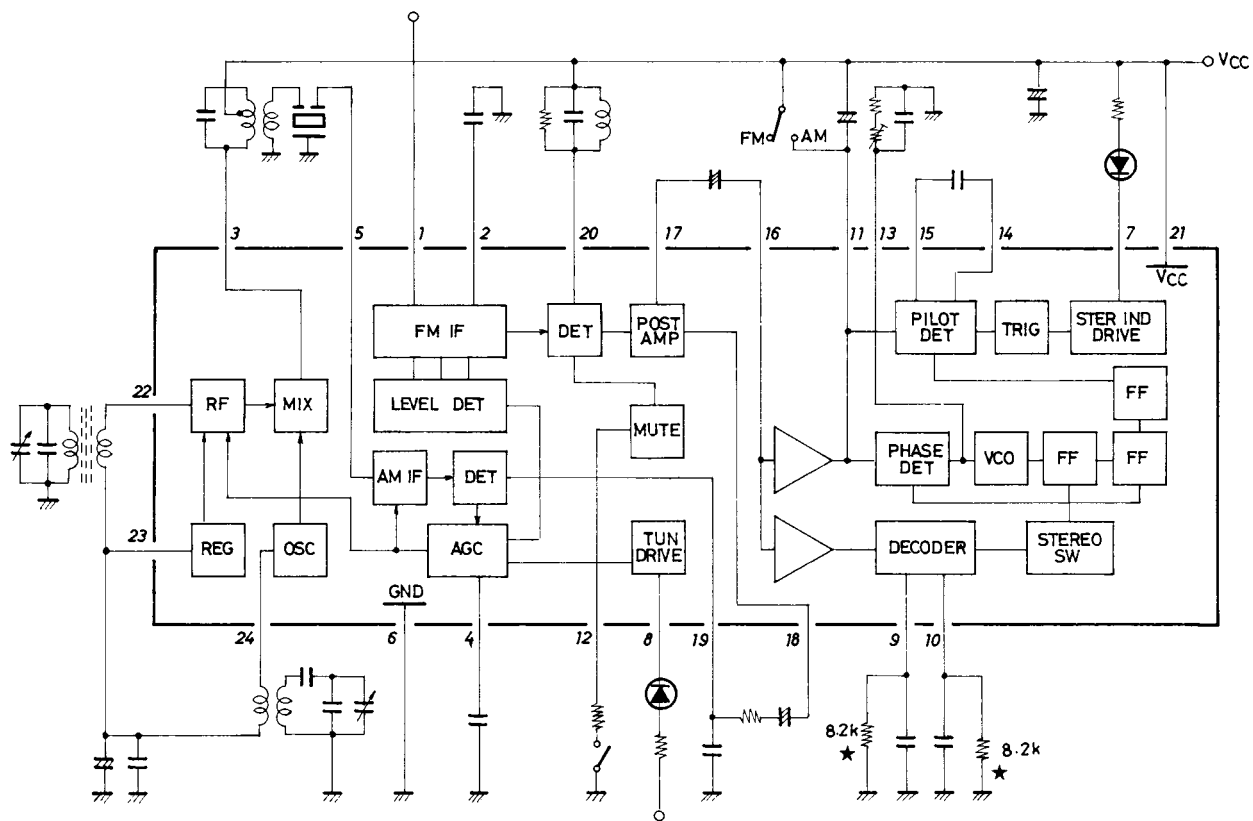
### Operating Characteristics at $T_a = 25^\circ\text{C}$ , $V_{CC} = 4.5\text{ V}$ , See specified Test Circuit.

Parameter	Symbol	Conditions	min	typ	max	Unit
FM characteristics (Mono): $f_c = 10.7\text{ MHz}$ , $f_m = 1\text{ kHz}$						
Quiescent current	$I_{CCO}$	No input		13	20	mA
-3 dB sensitivity	-3dBLS.	Referenced to $V_{IN} = 100\text{ dB}\mu$ , 100%, down 3 dB		28	35	dB $\mu$
Demodulation output	$V_0$	$V_{IN} = 100\text{ dB}\mu$ , 100% mod.	154	226	308	mV
Channel balance	C.B.	$V_{IN} = 100\text{ dB}\mu$ , 100% mod.	0	0	1.5	dB
Total harmonic distortion	THD	$V_{IN} = 100\text{ dB}\mu$ , 100% mod.		0.45	1.2	%
Signal to noise ratio	S/N	$V_{IN} = 100\text{ dB}\mu$ , 100% mod.	70	80		dB
LED ON sensitivity	$V_{LED}$	$I_L = 1\text{ mA}$	23	33	43	dB $\mu$
FM Characteristics (Stereo) : $f_c = 10.7\text{ MHz}$ , $f_m = 1\text{ kHz}$ , L + R = 90%, pilot = 10%, $V_{IN} = 100\text{ dB}\mu$						
Separation	Sep		32	48		dB
Stereo distortion	THD (MAIN)			0.45	1.2	%
LED ON level	$V_{LED-on}$		2.4	3.9	5.4	%
LED OFF level	$V_{LED-off}$			2.7		%
AM Characteristics: $f_c = 1000\text{ kHz}$ , $f_m = 1\text{ kHz}$						
Quiescent current	$I_{CCO}$	No input		9.5	14.5	mA
Detection output	$V_{O1}$	$V_{IN} = 23\text{ dB}\mu$ , 30% mod.	29	54	97	mV
	$V_{O2}$	$V_{IN} = 80\text{ dB}\mu$ , 30% mod.	78	126	193	mV
Signal to noise ratio	S/N1	$V_{IN} = 23\text{ dB}\mu$ , 30% mod.	17	21		dB
	S/N2	$V_{IN} = 80\text{ dB}\mu$ , 30% mod.	50	55		dB
Total harmonic distortion	THD1	$V_{IN} = 80\text{ dB}\mu$ , 30% mod.		0.45	1.2	%
	THD2	$V_{IN} = 100\text{ dB}\mu$ , 30% mod.		0.6	1.5	%
LED ON sensitivity	$V_{LED}$	$I_L = 1\text{ mA}$ Note : Be fully careful of dielectric breakdown.	16	24	32	dB $\mu$

Note : For further details, refer to the separate catalog of the LA1805.

# LA1806

## Equivalent Circuit Block Diagram

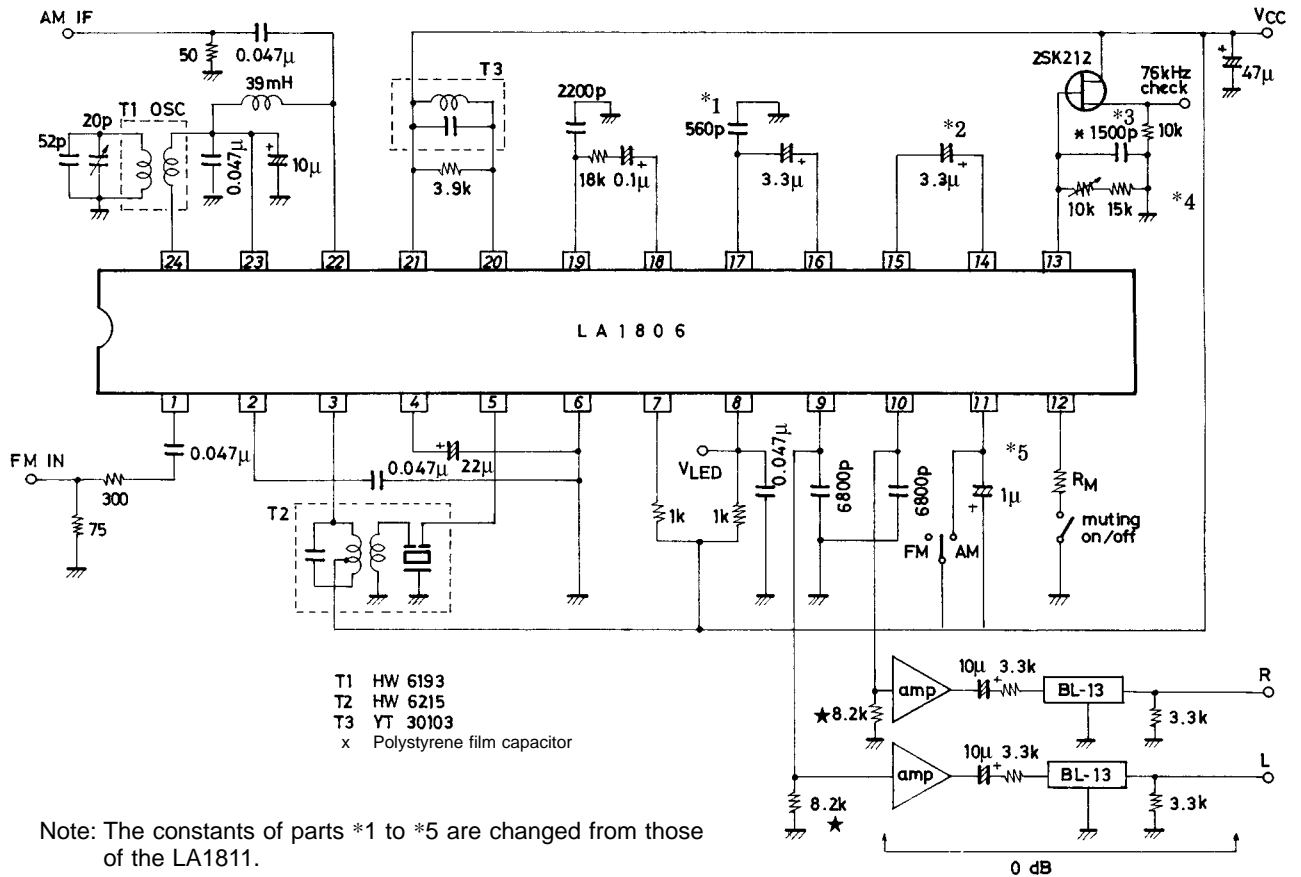


★:Not required for the LA1805

Unit (resistance:  $\Omega$ )

# LA1806

## Test Circuit



- Specifications of any and all SANYO products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.
- SANYO Electric Co., Ltd. strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could give rise to accidents or events that could endanger human lives, that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.
- In the event that any or all SANYO products(including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining the export license from the authorities concerned in accordance with the above law.
- No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written permission of SANYO Electric Co., Ltd.
- Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the SANYO product that you intend to use.
- 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 January, 1997. Specifications and information herein are subject to change without notice.